

Level Measurement







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You can download all instructions, catalogs and certificates for SITRANS L free of charge: www.siemens.com/level

Level Measurement

Product Overview

Overview






	Application	Device description	Page	Programming Software
Point level measurement - Capacitance switches				
	Powerful range of level switches suitable for a variety of industries	Pointek CLS100/CLS200/CLS300/CLS500	4/12	SIMATIC PDM
		<ul style="list-style-type: none"> CLS100: compact 2-wire inverse frequency shift capacitance switch for level detection in constricted spaces, interfaces, solids, liquids, slurries, and foam 	4/18	SIMATIC PDM
		<ul style="list-style-type: none"> CLS200: a versatile inverse frequency shift capacitance level switch with optional rod/cable choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces; digital version (with PROFIBUS PA) includes a display and provides additional diagnostic features 	4/44	SIMATIC PDM
		<ul style="list-style-type: none"> CLS300: inverse frequency shift capacitance level switch with optional rod/cable choices and configurable output. It is ideal for detecting liquids, solids, slurries, foam and interfaces in demanding conditions where high pressure and temperatures are present; digital version (with PROFIBUS PA) includes a display and provides additional diagnostic features 	4/64	SIMATIC PDM
	<ul style="list-style-type: none"> CLS500: inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of high temperature and pressure; HART communication for remote commissioning 			
Point level measurement - Vibrating switches				
	Reliable vibrating point level switches for liquid and slurry applications across all industries	SITRANS LVL100/LVL200	4/82	-
		<ul style="list-style-type: none"> LVL100: compact vibrating level switch for use in liquid and slurry applications such as overflow, high, low, and demand level applications. Also ideal for dry run protection LVL200: advanced vibrating level switch for use in liquid and slurry applications. Suited for most hazardous area applications such as: overflow, high, low, demand, and dry run protection; can also be used for Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 	4/88	-
	Reliable vibrating point level switches for bulk solids in a wide variety of applications at a competitive price	SITRANS LVS100/LVS200	4/104	-
		Vibrating point level switch designed to be impervious to external vibrations and to provide reliable performance in demanding bulk solids applications	4/107	-
Point level measurement - Rotating paddle switch				
	Reliable rotating point level switches for bulk solids in a wide variety of applications at a competitive price	SITRANS LPS200	4/116	-
		<ul style="list-style-type: none"> Rotating paddle switch for detection of high, low, and demand levels for a wide variety of bulk solids industries. Unique engineering provides long-lasting reliable performance 		

Application	Device description	Page	Programming Software
Point level measurement - Ultrasonic non-contacting switch			
	<p>Ultrasonic non-contacting switch with two switch points for level detection of bulk solids, liquids and slurries in a wide variety of industries</p> <p>Pointek ULS200</p> <ul style="list-style-type: none"> • Rugged design, no moving parts, and virtually maintenance-free • Transducer available in ETFE or PVDF copolymer and therefore inert to most chemicals 	4/127	-
Continuous measurement - Ultrasonic transmitters			
	<p>2-wire loop powered ultrasonic transmitter for level, volume, and flow monitoring of liquids in open channels, storage vessels and simple process vessels</p> <p>SITRANS Probe LU</p> <ul style="list-style-type: none"> • Continuous level measurement up to 12 m (40 ft) range • Patented Sonic Intelligence signal processing • Auto False-Echo Suppression 	4/136	-
	<p>Compact level transmitter with integrated transducer for accurate level measurement for liquid applications</p> <p>The Probe</p> <ul style="list-style-type: none"> • Simple, compact and competitively priced ultrasonic level transmitter in several versions for maximum versatility: <ul style="list-style-type: none"> - Three-wire system with alarm relay - Two-wire system with current loop 	4/141	SIMATIC PDM
Continuous measurement - Ultrasonic controllers			
	<p>The Siemens SITRANS LUT400 series controllers are compact, single point, long-range ultrasonic controllers for continuous level or volume measurement of liquids, slurries, and solids, and high accuracy monitoring of open channel flow.</p> <p>SITRANS LUT420/430/440</p> <p>In addition to industry leading 1 mm (0.04 inch) accuracy, each of the three models in the series are compatible with our full range of EchoMax transducers and offer varying degrees of pump, alarm, and other control functionality, all from a very compact and easy-to-use interface.</p> <ul style="list-style-type: none"> • 1 mm accuracy • HART communications • Next Generation Sonic Intelligence 	4/144	SIMATIC PDM
	<p>Versatile short- to medium-range ultrasonic single- and dual-vessel level controller for virtually any application in a wide range of industries</p> <p>MultiRanger 100/200</p> <ul style="list-style-type: none"> • Using non-contacting ultrasonic technology, the controller measures the level in short to medium range applications up to 15 m (50 ft) of solids, liquids, or slurries • Auto False-Echo Suppression of false echoes 	4/152	SIMATIC PDM
	<p>Ultrasonic level controller for up to six pumps - control, differential control, and open channel flow monitoring</p> <p>HydroRanger 200</p> <ul style="list-style-type: none"> • An economical, low-maintenance solution delivering control efficiency and productivity needed to meet today's exacting standards • Auto False-Echo Suppression of false echoes 	4/156	SIMATIC PDM

Level Measurement

Product Overview





	Application	Device description	Page	Programming Software
	Ultrasonic long-range level monitoring system for liquids and solids	SITRANS LU01/LU02 SITRANS LU10 <ul style="list-style-type: none"> Automatic conversion of level into volume for standard or custom tank shapes Easy to install and program Optional fieldbus card, e.g. PROFIBUS DP 	4/160	Dolphin Plus
		Output module for SITRANS LU10	SITRANS LU AO <ul style="list-style-type: none"> SITRANS LU AO analog output module provides remote analog outputs for the measurement points of the SITRANS LU10 transceiver 	4/168
Continuous measurement - Ultrasonic transducers				
	ST-H: ETFE or PVDF transducer for chemicals	ST-H/EchoMax XRS-5 <ul style="list-style-type: none"> ST-H: The narrow design of the ST-H allows the sensor to be mounted using a 2 inch connection 	4/171	-
	XRS-5: Standard transducer for applications to 8 m (26 ft)	<ul style="list-style-type: none"> XRS-5: narrow beam angle of only 10°, measuring range maximum 8 m (26 ft) for measurement of liquids, solids, and slurries 	4/174	-
	Transducers for liquids and bulk solids XPS series: Hermetically sealed PVDF enclosure for chemical immunity	EchoMax XPS <ul style="list-style-type: none"> XPS series offers versions for various distances up to 30 m (100 ft) and up to a maximum temperature of 95 °C (203 °F) 	4/178	-
Continuous measurement - Radar transmitters				
	2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft)	SITRANS Probe LR <ul style="list-style-type: none"> Uni-Construction polypropylene rod antenna standard Process Intelligence signal processing Auto False-Echo Suppression of false echoes 	4/194	SIMATIC PDM

	Application	Device description	Page	Programming Software
	2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft)	SITRANS LR200 <ul style="list-style-type: none"> • Program without opening the lid, even in hazardous areas, using patented infrared IS handheld programmer • Special Uni-Construction hermetically sealed polypropylene rod antenna has integrated threaded connection • Built-in alphanumeric display with support in four languages 	4/198	SIMATIC PDM AMS SITRANS DTM
	2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft); antenna designs ideal for small vessels, low dielectric media, food & beverages and corrosive/aggressive media	SITRANS LR250 <i>NEW</i> <ul style="list-style-type: none"> • Simple operation using the graphical local user interface (LUI) • Plug-and-play setup using the intuitive Quick Start Wizard • 25 GHz high frequency allows for small horn antennas and easy mounting in nozzles • Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions 	4/213	SIMATIC PDM AMS SITRANS DTM
	2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of solids and liquids up to 30 m (98.4 ft); ideal for measurement in extreme dust and high temperatures	SITRANS LR260 <ul style="list-style-type: none"> • Simple operation using the graphical local user interface (LUI) • Plug-and-play setup using the intuitive Quick Start Wizard • 25 GHz high frequency allows for small horn antennas and easy mounting in nozzles • Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions 	4/269	SIMATIC PDM
	4-wire, 24 GHz FMCW radar level transmitter with extremely high signal-to-noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft); ideal for measurement in extreme dust	SITRANS LR460 <ul style="list-style-type: none"> • Process Intelligence for advanced signal processing and quick and easy adjustment • Self-guided Quick Start Wizard for plug and play start-up • 100 m (328 ft) range for long-range and difficult applications 	4/274	SIMATIC PDM
	2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids in silos to a range of 100 m (329 ft)	SITRANS LR560 <ul style="list-style-type: none"> • Rugged stainless steel design • 78 GHz high frequency provides very narrow beam, virtually no mounting nozzle noise, and optimal reflection from sloped solids • Aimer option to direct beam to area of interest, such as draw point of cone • Air purge connection is included for self-cleaning of extremely sticky solids • Lens antenna is highly resistant to product build-up • Local display interface (LDI) allows local programming and diagnostics 	4/280	SIMATIC PDM AMS SITRANS DTM

Level Measurement

Product Overview

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Application	Device description	Page	Programming Software
Continuous measurement - Guided wave radar transmitters			
	<p>Guided wave radar transmitters for short- and medium-range level, level/interface, and volume measurement of liquids, slurries, and solids. The four LG models are unaffected by changes in process conditions, high temperatures and pressures, and provide a wide range of hygienic options.</p>	<p>SITRANS LG240/250/260/270 <i>NEW</i></p> <ul style="list-style-type: none"> Measures accurately on materials with dielectric (dK) as low as 1.4 Guided wave radar measurement for up to 2 mm (0.08 inch) accuracy Measures level, level/interface, and volume of solids, slurries, and liquids 4 button programming for quick setup Reliable level measurement on harsh applications with pressure up to 400 bar g (40 000 kPa) and temperatures as high as 450 °C (842 °F) 	<p>4/289</p> <p>SIMATIC PDM</p>
Continuous level - Capacitance transmitters			
	<p>For liquids and solids applications, ideal for standard industrial applications in chemical, hydrocarbon processing, food and beverage, and mining, aggregate and cement industries</p>	<p>SITRANS LC300</p> <ul style="list-style-type: none"> Sophisticated, but easy-to-adjust microprocessor combined with field-proven probes Patented active shield technology ensures measurements are unaffected by vapors, product deposits, dust, and condensation 	<p>4/322</p> <p>-</p>
	<p>Level and interface transmitter for extreme and critical process conditions, such as oil and liquid natural gas (LNG), toxic and aggressive chemicals and vapours</p>	<p>SITRANS LC500</p> <ul style="list-style-type: none"> Equipped with the HART Smart protocol for remote setup and calibration Patented active shield technology ensures measurements are unaffected by vapors, product deposits, dust, and condensation 	<p>4/336</p> <p>SIMATIC PDM</p>
Communication			
	<p>SmartLinx Module, Dolphin Plus software</p> <ul style="list-style-type: none"> Optional communication modules, SmartLinx, provide direct digital connection to popular industrial fieldbus systems Dolphin Plus for quick and easy configuring, monitoring, tuning, and diagnostics of Siemens devices 	<p>4/360</p> <p>4/361</p>	<p>-</p> <p>-</p>

Level Measurement Product Overview

Level Measurement Selector

Continuous Level						
Conditions	Ultrasonic	Radar	Guided Wave Radar	Capacitance	Gravimetric	Hydrostatic pressure
Measurement						
Level	■	■	■	■	◆	■
Interface (liquid/liquid)			■	◆		■
Interface (liquid/solid)	◆			◆		
Volume	■	■	◆	◆	◆	■
Mass					■	■
Flow (open channel)	■	◆				
Level Applications						
Changing density	■	■	■	■		
Changing dielectric	■	■	■	◆	■	■
Aggressive chemicals	■	■	■	■	■	■
Pressure/vacuum		■	■	■	■	■
High temperature		■	■	■	■	■
Cryogenic			■	■	■	
Turbulence	■	■	◆	◆	■	■
Steam		◆	■	◆	■	■
Hydrocarbon vapors/solvents		■	■	■	■	■
Foam	◆	◆	◆	◆	■	■
Build-up	◆	◆	◆	◆	■	◆
High viscosity	■	■	◆	◆	■	◆
Dust	◆	■	■	■	■	
Solids powders	◆	■	◆	◆	■	
Solids granules/pellets < 25 mm (1 inch)	■	■	◆	◆	■	
Solids > 25 mm (1 inch)	■	■			■	
High angle of repose	◆	■	■	◆	■	

■ preferred
 ◆ condition dependent

Level Measurement

Product Overview

Level Measurement Selector

Point Level				
Conditions	Vibration	Capacitance	Paddle	Ultrasonic
Measurement				
Level	■	■	■	■
Interface (liquid/liquid)		■		
Interface (liquid/solid)	◆	◆		
Volume				
Mass				
Flow (open channel)				
Level Applications				
Changing density	■	■	■	■
Changing dielectric	■	◆	■	■
Aggressive chemicals	■	■	◆	■
Pressure/vacuum	■	■	■	
High temperature	■	■	■	
Cryogenic		■		
Turbulence	◆	◆		■
Steam	■	◆	■	
Hydrocarbon vapors/solvents	■	◆		
Foam	◆	◆		◆
Build-up	◆	◆	■	◆
High viscosity	◆	◆	◆	■
Dust	■	■	■	◆
Solids powders	■	◆	■	◆
Solids granules/pellets < 25 mm (1 inch)	■	◆	■	■
Solids > 25 mm (1 inch)	◆	◆	■	■
High angle of repose	■	■	■	◆

■ preferred
 ◆ condition dependent

Overview

Introduction

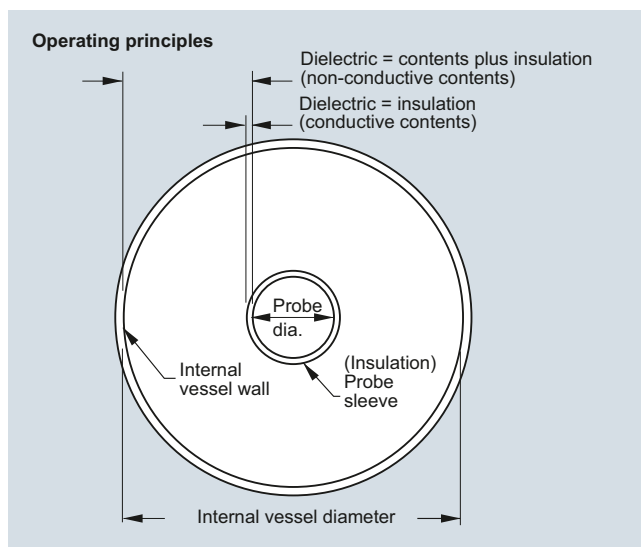
Inverse frequency shift capacitance point level and material detection switches are designed to withstand the harsh environments of high pressure and high temperature applications.

Inverse Frequency Technology

Siemens inverse frequency shift capacitance devices incorporate a unique frequency-based approach to level measurement. The capacitance units monitor the effect of capacitance based on frequency change. The relationship between capacitance and frequency is inverse. Because small level changes result in a large frequency change, the result is excellent resolution and accuracy.

Principle of Operation

Inverse frequency shift capacitance devices require two components: a reference electrode of a variable capacitor and the measurement electrode. In capacitive level measurement, the environment (typically the vessel wall) acts as the reference electrode, while the probe supplies the measurement electrode. The dielectric is composed of the vessel contents and, if the measurement electrode is insulated, the insulating layer.



Inverse frequency shift capacitance operation

Capacitance is affected by the surface area of the electrodes, the separation distance between the electrodes and the dielectric constant of the vessel contents. The dielectric constant is the measure of a material's ability to store energy. The relative dielectric constant of air (vacuum) is 1; all other materials have a higher value.

Mode of operation

Common Terms

Capacitance

The property of a system of conductors and dielectrics that permits the storage of electricity when a potential difference exists between the conductors. Its value is expressed as the ratio of a quantity of electricity to a potential difference and the unit is a Farad.

Capacitor

A device in a circuit that has the potential to store an electric charge. Typically a capacitor has two conductors or electrodes separated by a layer of a non-conducting material called a dielectric. With the conductors on opposite sides of the dielectric layer oppositely charged by a source of voltage, the electrical energy of the charged system is stored in the polarized dielectric.

Dielectric constant

The ability of a dielectric to store electrical potential energy under the influence of an electric field. This is measured by a ratio which compares the capacitance of a condenser with the material as dielectric to its capacitance with a vacuum/dry air as dielectric: the dielectric constant of air is 1.

Active shield

The portion of the probe isolated from the active measurement section. The sensor signal is connected to the active shield portion of the probe, eliminating the electrical potential difference between the shield and the measurement section. So, the shield portion of the probe near the process connection is not affected by changes in vapor concentration, material buildup, dust, or condensation.

Level Measurement

Point level measurement – Capacitance switches

Capacitance

Technical specifications

Point Level Measurement				
Criteria	Pointek CLS100	Pointek CLS200	Pointek CLS300	Pointek CLS500
Typical applications	Liquids, slurries, powders, granules, applications in constricted spaces	Liquids, slurries, powders, granules, foam, food, and pharmaceuticals, petrochemicals	Liquids, slurries, powders, granules, relatively high pressure and temperature, hazardous areas	Water in oil level, foam or liquid/ foam level, glycol regenerators, high-pressure coalescers
Max. length including sensor	100 mm (4 inch)	Rod: 5.5 m (18 ft) Cable: up to 30 m (98 ft)	Rod: 1 m (40 inch) Cable: 25 m (82 ft)	Rod: 1 m (40 inch)
Process temperature (Temperature ratings are pressure dependent. See Pressure/Temperature curves for respective product.)	Stainless steel process connection: • -30 ... +100 °C (22 ... +212 °F) Fully Synthetic (PPS process connection): • -10 ... +100 °C (14 ... 212 °F)	• -40 ... +85 °C (-40 ... +185 °F) • With thermal isolator: -40 ... +125 °C (-40 ... +257 °F)	• -40 ... +200 °C (-40 ... +392 °F) • HT version: -40 ... +400 °C (-40 ... +752 °F)	• -50 ... +200 °C (-58 ... +392 °F) • HT version: -60 ... +400 °C (-76 ... +752 °F)
Process pressure (Pressure ratings are temperature dependent. See Pressure/Temperature curves for respective product.)	Up to 10 bar g (146 psi g)	Rod versions: • Up to 25 bar g (365 psi g) Cable version: • Up to 10 bar g (146 psi g)	Up to 35 bar g (511 psi g)	• Up to 150 bar g (2 175 psi g)
Output	Stainless steel cable or enclosure version: • 4 ... 20/20 ... 4 mA 2-wire current loop • Solid-state output Fully-synthetic version (PPS) • Relay output	Standard: • 1 SPDT Form C relay, solid-state switch Digital: • Solid-state switch included	Standard: • 1 SPDT Form C relay, solid-state switch Digital: • Solid-state switch included	• 4 ... 20/20 ... 4 mA 2-wire current loop • Solid-state switch
Communications		Standard: • 3 LED indicators Digital: • PROFIBUS PA; SIMATIC PDM compatible	Standard: • 3 LED indicators Digital: • PROFIBUS PA; SIMATIC PDM compatible	HART, SIMATIC PDM compatible
Power Specifications	Standard: • 12 ... 33 V DC Intrinsically Safe (Stainless steel version only): • 10 ... 30 V DC	Standard: • 12 ... 250 V AC/DC, 0 ... 60 Hz, 2 W max. Digital: • Bus voltage: 12 ... 30 V DC, IS version 12 ... 24 V DC • Current consumption: 12.5 mA	Standard: • 12 ... 250 V AC/DC, 0 ... 60 Hz, 2 W max. Digital: • Bus voltage: 12 ... 30 V DC, IS version 12 ... 24 V DC • Current consumption: 12.5 mA	• 12 ... 33 V DC • 3.6 ... 22 mA/ 22 ... 3.6 mA (2-wire current loop)
Approvals	Stainless steel cable or enclosure version: CE, CSA, FM, ATEX, RCM, Lloyds Register, WHG Fully-synthetic version (PPS): CSA, FM	CSA, FM, CE, ATEX, RCM, Lloyds Register, WHG, Vlare II	CSA, FM, CE, ATEX, RCM, Lloyds Register, WHG, Vlare II	CE, CSA, FM, ATEX, RCM, Lloyds Register, Bureau Veritas, Current Signaling according to NAMUR NE 43

Application

SIEMENS

Capacitance Application Questionnaire

Customer information

Contact: _____ Prepared By: _____
 Company: _____ Date: _____
 Address: _____ Notes on the Application: _____
 City: _____ Country: _____
 Zip/Postal Code: _____ Phone: () _____
 E-mail: _____ Fax: () _____

Tank/Vessel Information

(Supply sketch where possible) Sketch attached

<p>Type: <input type="checkbox"/> Storage <input type="checkbox"/> Process <input type="checkbox"/> Separator <input type="checkbox"/> FPSO (Floating Processing Storage and Offloading)</p> <p>Tank top: <input type="checkbox"/> Open <input type="checkbox"/> Flat <input type="checkbox"/> Conical <input type="checkbox"/> Parabolic</p>	<p>Tank construction: <input type="checkbox"/> Metallic <input type="checkbox"/> Non-metallic <input type="checkbox"/> Agitated top, bottom or side</p> <p>Pressure: Normal: _____ Maximum (relief): _____</p> <p>Tank bottom: <input type="checkbox"/> Sloped <input type="checkbox"/> Flat <input type="checkbox"/> Conical <input type="checkbox"/> Parabolic</p>	<p>Dimensions: Height: _____ m/ft Width/Diameter: _____ m/ft</p>	<p>Critical Information</p> <p>Nozzle Length: _____ cm/inch Nozzle Diameter: _____ cm/inch</p>
<p>Mounting: <input type="checkbox"/> Top Mount <input type="checkbox"/> Side Mount <input type="checkbox"/> Pipe Mount</p>			

Process Data

Material being measured: _____ Liquid Solid Slurry

Material temperature: Norm: _____ °C/°F Max: _____ °C/°F

Measurement type: Point level
 Continuous level
 Interface level

Constant dielectric: No Yes DK Value _____

Upper material: _____ DK Value _____
Lower material: _____ DK Value _____

Process pressure: _____ Min. _____ Max. **Atmospheric steam:** No Yes

Coating build-up: No Yes **Conductive material:** No Yes _____ DK Value

Installation

(indicate all that apply)

Power available: _____

Outputs required: 4 ... 20 mA Relay Solid state

Communications: HART / 4 ... 20 mA PROFIBUS PA

Products recommended:

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS100

Overview



Pointek CLS100 is a compact 2-wire inverse frequency shift capacitance switch for level and material detection in constricted spaces, interfaces, solids, liquids, slurries and foam, with the ability to tune out build-up on probe.

Benefits

- Easy installation with verification by built-in LED
- Low maintenance with no moving parts
- Sensitivity adjustment
- Integrated cable or PBT enclosure versions available
- Intrinsically Safe, Dust Ignition Proof, and General Purpose options available

Application

Pointek CLS100's short insertion length of 100 mm (4 inch) and versatility in various applications and in vessels or pipes makes it a good replacement for traditional capacitance sensors.

Its advanced tip-sensing technology provides accurate, repeatable switchpoint performance. The PPS (Polyphenylene sulfide) probe [optional PVDF (Polyvinylidene Fluoride)] is chemically resistant with an effective process operating temperature range from -30 to +100 °C (-22 to +212 °F) (7ML5501), and -10 to +100 °C (14 to 212 °F) (7ML5610). The fully potted design ensures reliability in a vibrating environment such as agitated tanks up to 4 g. When used with a SensGuard protection cover, the CLS100 is protected from shearing, impact, and abrasion in tough primary processes.

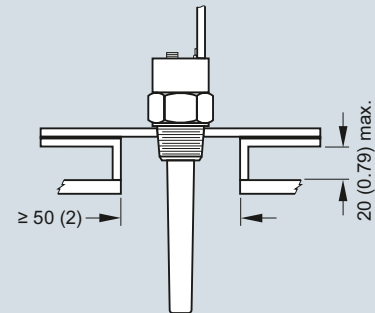
The Pointek CLS100 is available in three versions. The integral cable version has a stainless steel process connection and probe options of PPS or PVDF. The fully synthetic version has a thermoplastic polyester enclosure with a PPS process connection combined with a PPS probe. The standard enclosure version has a thermoplastic polyester enclosure with a stainless steel process connection in combination with a PPS or PVDF probe.

- Key Applications: liquids, slurries, powders, granules, food and pharmaceuticals, chemicals, hazardous areas

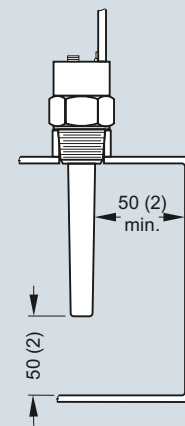
Configuration

Installation

Standpipes



Wall restriction



Pointek CLS100 installation, dimensions in mm (inch)

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS100

Technical specifications

	Stainless steel process connection (integral cable or enclosure version) (7ML5501)	Fully synthetic process connection (enclosure version only) (7ML5610)
Mode of operation		
Measuring principle	Inverse frequency shift capacitive level detection	Inverse frequency shift capacitive level detection
Input		
Measured variable	Change in picoFarad (pF)	Change in picoFarad (pF)
Output		
Output signal		
• Alarm output	4 ... 20/20 ... 4 mA 2-wire loop	4 ... 20/20 ... 4 mA 2-wire loop
• Switch output ¹⁾	Solid-state: 30 V DC/30 V AC, max. 82 mA	Max. switching voltage: 60 V DC/30 V AC Max. switching current: 1 A
• Fail-safe mode	Min. or max.	Min. or max.
Accuracy		
Repeatability	2 mm (0.08 inch)	2 mm (0.08 inch)
Rated operating conditions²⁾		
Installation conditions		
• Location	Indoor/outdoor	Indoor/outdoor
Ambient conditions		
• Ambient temperature	-30 ... +85 °C (-22 ... +185 °F)	-10 ... +85 °C (14 ... 185 °F)
• Installation category	I	I
• Pollution degree	4	4
Medium conditions		
• Relative dielectric constant ϵ_r	Min. 1.5	Min. 1.5
• Process temperature	-30 ... +100 °C (-22 ... +212 °F)	-10 ... +100 °C (14 ... 212 °F)
• Pressure (vessel)	-1 ... +10 bar g (-14.6 ... +146 psi g), nominal ²⁾	-1 ... +10 bar g (-14.6 ... +146 psi g), nominal
• Degree of protection		
- Enclosure version	IP68/Type 4/NEMA 4	IP68/Type 4/NEMA 4
- Integral cable version	IP65/Type 4/NEMA 4	Not applicable
• Cable inlet	½" NPT (M20x1.5 optional)	½" NPT (M20x1.5 optional)
Design		
	<u>Enclosure/Integral cable version</u>	<u>Fully synthetic version</u>
Material		
• Body (Enclosure version)	Thermoplastic polyester	Thermoplastic polyester
• Lid (Enclosure version)	Transparent thermoplastic polycarbonate (PC)	Transparent thermoplastic polycarbonate (PC)
• Integrated cable body (Integral cable version)	316L stainless steel	Not applicable

	Stainless steel process connection (integral cable or enclosure version) (7ML5501)	Fully synthetic process connection (enclosure version only) (7ML5610)
Sensor length (nominal)	100 mm (4 inch)	100 mm (4 inch)
Process connection material of probe/wetted parts ³⁾	Connection: 316L stainless steel; Process seal: FKM (optional FFKM); Sensor: PPS (optional PVDF) ⁴⁾	PPS process connection and PPS sensor (Uni-Construction)
Connection (Enclosure version)	Internal 5-point terminal block, ½" NPT wiring entrance, M20x1.5 optional	Removable internal 5-point terminal block, ½" NPT wiring entrance, M20 x 1.5 optional
Connection (Integral cable version)	4 conductors, 1 m (3.3 ft), 0.5 mm ² (22 AWG), shielded, polyester jacket	Not applicable
Process connection	¾" NPT [(Taper), ANSI/ASME B1.20.1] R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	¾" NPT [(Taper), ANSI/ASME B1.20.1] R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]
Power supply		
• Standard	12 ... 33 V DC	12 ... 33 V DC
• Intrinsically Safe	10 ... 30 V DC (Intrinsically Safe barrier required)	Not applicable
Certificates and approvals	<ul style="list-style-type: none"> • General: CE, CSA, FM, RCM • Marine: Lloyds Register of Shipping, categories ENV1, ENV2, and ENV5 Dust Ignition Proof (barrier required): CSA/FM Class II and III, Div. 1, Groups E, F, G T4 • Intrinsically Safe (barrier required): CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G T4 ATEX II 1 GD 1/2GD EEx ia IIC T4 to T6 T107 °C • Overfill protection: WHG (Germany) 	<ul style="list-style-type: none"> • General: CSA, FM RCM

¹⁾ When synthetic process connection version (7ML5610) is used in wet locations, switching voltage of the relay is limited to 35 V DC/16 V AC.

²⁾ When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 4/16.

³⁾ For Caustic Materials please contact ceg.smpi@siemens.com <http://www.siemens.com/automation/support-request> for alternative O Rings

⁴⁾ When FFKM O-ring (Option A22) is selected, process temperature is restricted to -20 °C (-4 °F).

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS100

Selection and Ordering data	Article No.
Pointek CLS100, stainless steel process connection Compact 2-wire inverse frequency shift capacitance switch for level and material detection in constricted spaces, interfaces, solids, liquids, slurries and foam, with the ability to tune out build-up on probe. Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5501-0
Process connection 3/4" NPT [(Taper), ANSI/ASME B1.20.1] R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	A E J
Approvals General Purpose: CE, CSA, FM, RCM CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G T4; ATEX II 1 GD 1/2GD EEx ia IIC T4 to T6 T107 °C ¹⁾ CSA/FM Class II and III, Div. 1, Groups E, F, G ¹⁾	A C G
Device version Integral cable version (PPS probe) Enclosure version (PPS probe), 1/2" NPT cable inlet Integral cable version with PVDF probe body Enclosure version with PVDF probe body (1/2" NPT cable inlet) Enclosure version (PPS probe), M20 x 1.5 cable inlet Enclosure version with PVDF probe body, M20 x 1.5 cable inlet	1 3 5 6 7 8
Overfill protection Not required Required	0 1
¹⁾ Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.	

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 20 characters) specify in plain text	Y17
FFKM seal O-ring ¹⁾	A22
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions Quick start manual, multi-language Note: due to ATEX regulations one Quick start manual is included with every product. This device is shipped with the Siemens Milltronics manual DVD containing ATEX Quick Starts and Operating Instructions.	Article No. A5E32146158

¹⁾ See Temperature restriction on page 4/16

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

Selection and Ordering data	Article No.
Accessories SensGuard, 3/4" NPT (PPS) Only available for CLS100 with 3/4" NPT thread SensGuard, R 1" (BSPT) (PPS) Only available for CLS100 with 3/4" NPT thread Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosures Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia 1/2" NPT cable gland, nickel plated brass, fits cable diameter 6 ... 12 mm (0.24 ... 0.47 inch) -40 ... +100 °C (-40 ... +212 °F), IP68 (General Purpose) M20 x 1.5 cable gland, PA polyamide, ATEX II 2G EEx e II, fits cable diameter 7 ... 12 mm (0.28 ... 0.47 inch), -20 ... +70 °C (-4 ... +158 °F), IP68 (General Purpose)	7ML1830-1DL 7ML1830-1DM 7ML1930-1AC 7NG4124-0AA00 7ML1830-1JA 7ML1830-1JC

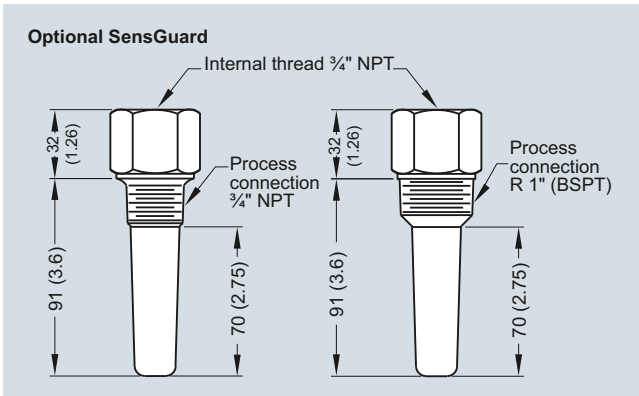
Selection and Ordering data	Article No.
Pointek CLS100, PPS process connection Compact 2-wire inverse frequency shift capacitance switch for level and material detection in constricted spaces, interfaces, solids, liquids, slurries and foam, with the ability to tune out build-up on foam. Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5610-0
Process connection (PPS) 3/4" NPT [(Taper), ANSI/ASME B1.20.1] (PPS probe body) R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] (PPS probe body)	A B
Approvals General Purpose: CSA, FM	D
Versions/Options Enclosure version, PPS process connection, 1/2" NPT cable inlet Enclosure version, PPS process connection, M20 x 1.5	1 2
Overfill protection Not required Required	0 1

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 20 characters) specify in plain text	Y17
FFKM seal O-ring ¹⁾	A22
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions Quick start manual, multi-language Note: due to ATEX regulations one Quick start manual is included with every product. This device is shipped with the Siemens Milltronics manual DVD containing ATEX Quick Starts and Operating Instructions.	Article No. A5E32146158
Accessories SensGuard, 3/4" NPT (PPS) Only available for CLS100 with 3/4" NPT thread SensGuard, R 1" (BSPT) (PPS) Only available for CLS100 with 3/4" NPT thread Tag, stainless steel, 12 x 45 mm, (0.47 x 1.77 inch) one text line, suitable for enclosures	7ML1830-1DL 7ML1830-1DM 7ML1930-1AC

¹⁾ See Temperature restriction on page 4/16

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

Options



Optional SensGuard, dimensions in mm (inch)

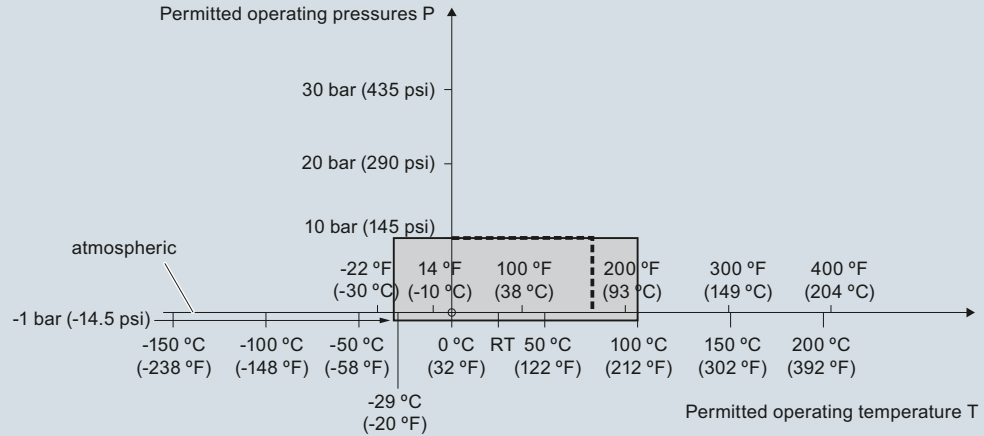
Level Measurement

Point level measurement – Capacitance switches

Pointek CLS100

Characteristic curves

Pressure/temperature curve
CLS100
Threaded process connections
(7ML5501)

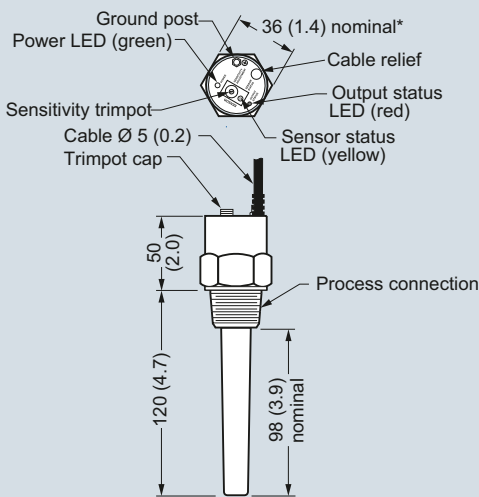


--- Example:
 Permitted operating pressure = 10 bar (145 psi) at 75 °C

Pointek CLS100 Process Pressure/Temperature derating curves

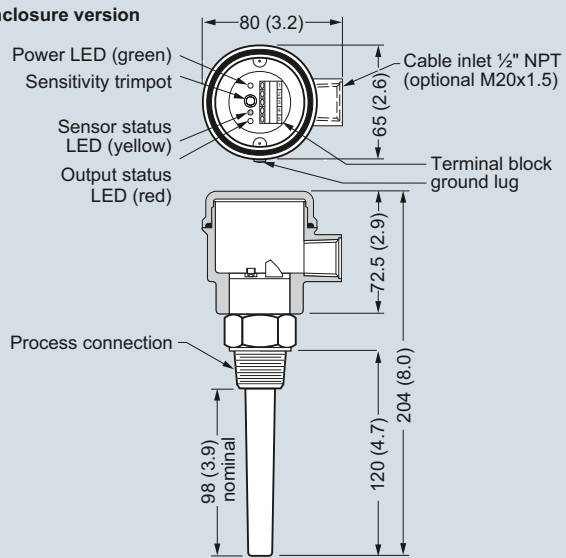
Dimensional drawings

Integral cable version



*Some G thread configurations deviate from this size.

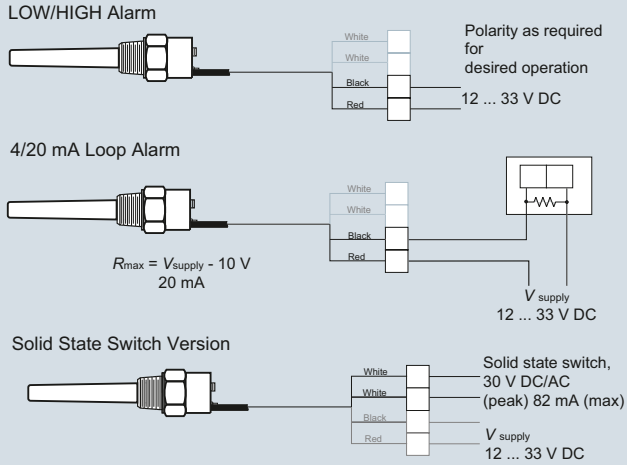
Enclosure version



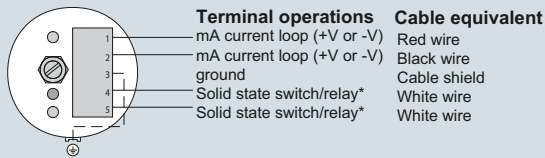
Pointek CLS100, dimensions in mm (inch)

Schematics

Integral Cable Version - Non Intrinsically Safe only



Enclosure and Fully Synthetic Version



* Switch/relay normally open in unpowered state
* Relay not available on Pointek CLS100 IS version (7ML5501)

Note:
When driving an inductive load (for example, an external relay), a protection diode must be connected in the correct polarity to prevent possible switch damage due to inductive spikes generated by switching the inductor (please refer to instruction manual). Intrinsically Safe Models - please follow local regulations and area classifications; refer to instruction manual for more details.

Pointek CLS100 connections

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Standard

Overview



Pointek CLS200 (standard version) is a versatile inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam and interfaces and has the ability to tune out build-up on the probe.

Benefits

- Potted construction protects signal circuit from shock, vibration, humidity and/or condensation
- High chemical resistance
- Level detection independent of tank or pipe earth reference
- Insensitive to product buildup due to high frequency oscillation
- 3 LED indicators for sensor status, output status, and power

Application

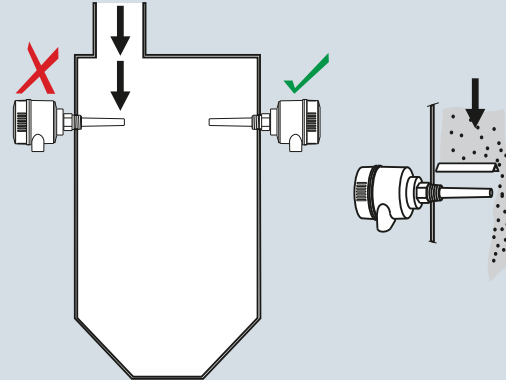
Pointek CLS200 standard version has 3 LED indicators with basic relay and solid-state switch alarms. Universal switch for solids/liquids and interface.

The power supply is galvanically isolated and accepts a wide range of voltages (12 to 250 V AC/DC). When used with thermal isolator, the stainless steel and PPS (PVDF optional) materials used in the probe construction provide a temperature rating up to 125 °C (257 °F) on the process wetted portion of the probe. The switch responds to any material with a dielectric constant of 1.5 or more by detecting a change in oscillating frequency, and it can be set to detect before contact or on contact with the probe. The CLS200 operates independently of the tank wall or pipe so it does not require an external reference electrode for level detection in a non-conductive vessel such as concrete or plastic (EMC regulations applicable in some regions).

- Key Applications: liquids, slurries, powders, granules, pressurized applications, hazardous areas

Configuration

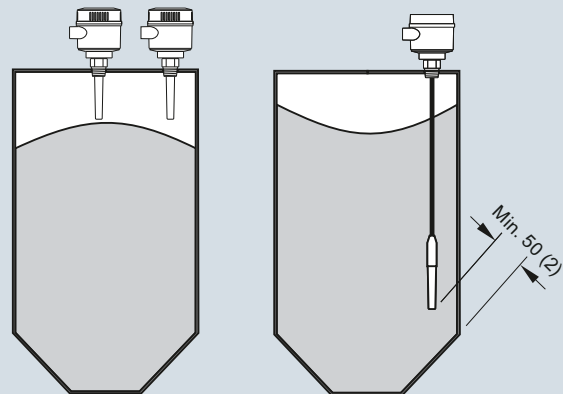
Installation



Keep unit out of path of falling material, or protect probe from falling material.



Avoid areas where material build up occurs.



Install probe at least 50 (2) from tank wall.

Pointek CLS200 installation, dimensions in mm (inch)

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Standard

Technical specifications

Mode of operation	
Measuring principle	Inverse frequency shift capacitive level detection
Input	
Measured variable	Change in picoFarad (pF)
Output	
Output signal	
• Relay output	1 SPDT Form C relay
- Max. contact voltage	• 30 V DC • 250 V AC
- Max. contact current	• 5 A DC • 8 A AC
- Max. switching capacity	150 W DC 2 000 VA AC
- Time delay (ON and/or OFF)	1 ... 60 s
• Solid-state output	
- Output	Galvanically isolated
- Protection	Against reversed polarity (bipolar)
- Max. switching voltage	• 30 V DC • 30 V peak AC
- Max. load current	82 mA
- Voltage drop	< 1 V, typical at 50 mA
- Time delay (pre or post switching)	1 ... 60 s
Rated operating conditions¹⁾	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F) ²⁾
• Installation category	II
• Pollution degree	4
Medium conditions	Liquids, bulk solids, slurries and interfaces
• Relative dielectric constant ϵ_r	Min. 1.5
• Process temperature	
- Without thermal isolator	-40 ... +85 °C (-40 ... +185 °F) ²⁾
- With thermal isolator	-40 ... +125 °C (-40 ... +257 °F)
• Process pressure (rod version)	-1 ... +25 bar g (-14.6 ... +365 psi g) (nominal)
• Process pressure (cable version) ³⁾	-1 ... +10 bar g (-14.6 ... +150 psi g) (nominal)
• Process pressure (sliding coupling version)	-1 ... +10 bar g (-14.6 ... +150 psi g) (nominal)
Electromagnetic Compatibility	To comply with CE EMC regulations (where applicable); the CLS200 should be installed per the instruction manual.

Design	
Material	Epoxy-coated aluminum with gasket 316L stainless steel
• Enclosure	
• Optional thermal isolator	
Connection	Removable terminal block, max. 2.5 mm ²
Degree of protection	IP65/Type 4/NEMA 4 (optional IP68)
Cable inlet	2 x M20x1.5 thread (option: 2 x 1/2" NPT conduit entry including 1 plugged entry)
Power supply	
	12 ... 250 V AC/DC, 0 ... 60 Hz max. 2 W
Certificates and approvals	
General Purpose	CSA, FM, CE, RCM
Dust Ignition Proof	ATEX II 1/2 D T100 °C
Flameproof Enclosure With IS Probe	ATEX II 1 G EEx d[ia] IIC T6...T4 ATEX II 1/2 D T100 °C
Dust Ignition Proof with IS Probe	CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Explosion Proof Enclosure With IS Probe	CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Marine	Lloyds Register of Shipping, Categories ENV1, ENV2 and ENV5
Overfill Protection	WHG (Germany) VLAREM II
Others	Pattern Approval (China)

¹⁾ When operation is in areas classified as hazardous, observe restrictions according to relevant certificate.
See also Pressure/Temperature curves on page 4/37.

²⁾ Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)

³⁾ Pressure rating of process seal is temperature dependent.
See Pressure/Temperature curves on page 4/37.

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Standard

Design: Probe				
	Rod version	Sanitary version	Cable version	Sliding Coupling version
Max. length	5 500 mm (216.53 inch)	5 500 mm (216.53 inch)	30 000 mm (1 181.1 inch) liquids and slurries 5 000 mm (196.85 inch) solids (under loads)	5 500 mm (216.53 inch)
Process connection	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ANSI/ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 316L stainless steel ASME/EN flange	1½", 2" sanitary fitting clamp 316L stainless steel	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ANSI/ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 316L stainless steel ASME/EN flange	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ANSI/ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
Extension material	316L stainless steel optional PFA coated ¹⁾	316L stainless steel	Fluoroethylene propylene (FEP) cable with stainless steel core	316L stainless steel
Sensor wetted parts	PPS (optional PVDF)	PPS (optional PVDF)	PPS (optional PVDF)	PPS (optional PVDF)
O-ring seal material	FKM (optional FFKM) ²⁾	FKM (optional FFKM) ²⁾	FKM (optional FFKM) ²⁾	FKM (optional FFKM) ²⁾
Thermal isolator ³⁾	Optional	Optional	Optional	Optional
Extension	User selected length	User selected length	Cable extension	User selected length

¹⁾ PFA coating (7ML5634 and 7ML5644) has 120 micron thickness.

²⁾ For Caustic Materials please contact ceg.smpi@siemens.com for alternative O-Rings

³⁾ Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F).


Selection and Ordering data	Article No.
Pointek CLS200 - Standard - Rod Version with Threaded or Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional rod/ cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5630-
Process connection Threaded, 316L stainless steel ¾" NPT [(Taper), ANSI/ASME B1.20.1] ● 0 A 1" NPT [(Taper), ANSI/ASME B1.20.1] ● 0 B 1¼" NPT [(Taper), ANSI/ASME B1.20.1] ● 0 C 1½" NPT [(Taper), ANSI/ASME B1.20.1] ● 0 D R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ● 1 A R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ● 1 B R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ● 1 D G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] ● 3 A G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] ● 3 B G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] ● 3 D Welded flange, 316L stainless steel, raised face 1" ASME, 150 lb ● 5 A 1" ASME, 300 lb ● 5 B 1" ASME, 600 lb ● 5 C 1½" ASME, 150 lb ● 5 D 1½" ASME, 300 lb ● 5 E 1½" ASME, 600 lb ● 5 F 2" ASME, 150 lb ● 5 G 2" ASME, 300 lb ● 5 H 2" ASME, 600 lb ● 5 J 3" ASME, 150 lb ● 5 K 3" ASME, 300 lb ● 5 L 3" ASME, 600 lb ● 5 M 4" ASME, 150 lb ● 5 N 4" ASME, 300 lb ● 5 P 4" ASME, 600 lb ● 5 Q Welded flange, 316L stainless steel, Type A flat faced DN 25, PN 16 ● 6 A DN 25, PN 40 ● 6 B DN 40, PN 16 ● 6 C DN 40, PN 40 ● 6 D DN 50, PN 16 ● 6 E DN 50, PN 40 ● 6 F DN 80, PN 16 ● 6 G DN 80, PN 40 ● 6 H DN 100, PN 16 ● 6 J DN 100, PN 40 ● 6 K (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.) Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths Compact [threaded 120 mm (4.72 inch), Flanged 98 mm (3.86 inch)] ● A Extended rod, 250 mm (9.84 inch) ● B Extended rod, 350 mm (13.78 inch) ● C Extended rod, 500 mm (19.69 inch) ● D Extended rod, 750 mm (29.53 inch) ● E Extended rod, 1 000 mm (39.37 inch) ● F Extended rod, 1 250 mm (49.21 inch) ● G Extended rod, 1 350 mm (53.15 inch) ● H Extended rod, 1 500 mm (59.06 inch) ● J Extended rod, 1 750 mm (68.90 inch) ● K Extended rod, 2 000 mm (78.74 inch) ● L	

Selection and Ordering data	Article No.
Pointek CLS200 - Standard - Rod Version with Threaded or Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional rod/ cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. Add Order code Y01 and plain text: "Insertion length ... mm" Extended rod, 210 ... 1 000 mm (8.27 ... 39.37 inch) ● M Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch) ● N Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch) ● P Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch) ● Q Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch) ● R Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch) ● S Thermal isolator Without thermal isolator ● 0 With thermal isolator [for process connection temperatures over 85 °C (185 °F)] ● 1 Remote mount electronics and mounting bracket With 2 m (79 inch) of cable ¹⁾ ● 2 With 5 m (197 inch) of cable ¹⁾ ● 3 Wetted seals FKM ● 0 FFKM [for process temperatures above -20 °C (-4 °F)] ● 1 Probe material 316L stainless steel with PPS probe body ● 0 316L stainless steel with PVDF probe body ● 1 Approvals Dust Ignition Proof: CE, RCM, ATEX II 1/2 D T100 °C ● C Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1 G EEx d[ia] IIC T6 ... T4, ATEX II 1/2 D T100 °C ● D Flameproof Enclosure with IS Probe, with WHG approval: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6 ... T4, ATEX II 1/2 D T100 °C ● E Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 ● F Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 ● G General Purpose (CSA, FM) ● H General Purpose (CE, RCM) ● J General Purpose (CSA, FM, CE, RCM) with WHG approval ● K Enclosure and lid Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65 ● A 2 x M20 x 1.5 cable inlet IP65 ● B 2 x ½" NPT via adapter - cable inlet, IP68 ● C 2 x M20 x 1.5 cable inlet IP68 ● D 1) Available with Approvals options F ... H ● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	7ML5630-

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Standard

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	
Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/36
Accessories	
<ul style="list-style-type: none"> We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix. 	See page 4/36

Selection and Ordering data	Article No.
Pointek CLS200 - Standard - Cable Version with Threaded or Flanged process connection	7ML5631- - - - - - 0
Versatile inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	
<ul style="list-style-type: none"> Click on the Article No. for the online configuration in the PIA Life Cycle Portal. 	
Process connection	
<u>Threaded, 316L stainless steel</u>	
3/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 A
1" NPT [(Taper), ANSI/ASME B1.20.1]	0 B
1 1/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 C
1 1/2" NPT [(Taper), ANSI/ASME B1.20.1]	0 D
R 3/4" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 A
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 B
R 1 1/2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
G 3/4" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 A
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 B
G 1 1/2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
<u>Welded flange, 316L stainless steel, raised face</u>	
1" ASME, 150 lb	5 A
1" ASME, 300 lb	5 B
1" ASME, 600 lb	5 C
1 1/2" ASME, 150 lb	5 D
1 1/2" ASME, 300 lb	5 E
1 1/2" ASME, 600 lb	5 F
2" ASME, 150 lb	5 G
2" ASME, 300 lb	5 H
2" ASME, 600 lb	5 J
3" ASME, 150 lb	5 K
3" ASME, 300 lb	5 L
3" ASME, 600 lb	5 M
4" ASME, 150 lb	5 N
4" ASME, 300 lb	5 P
4" ASME, 600 lb	5 Q
<u>Welded flange, 316L stainless steel, Type A flat faced</u>	
DN 25, PN 16	6 A
DN 25, PN 40	6 B
DN 40, PN 16	6 C
DN 40, PN 40	6 D
DN 50, PN 16	6 E
DN 50, PN 40	6 F
DN 80, PN 16	6 G
DN 80, PN 40	6 H
DN 100, PN 16	6 J
DN 100, PN 40	6 K
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	
Probe length (length from flange face) (threaded lengths include process thread)	
Note: No Y01 needed in Order code for standard lengths	
<u>Extended cable, 3 000 mm (118.11 inch), length can be determined by customer on assembly¹⁾</u>	A
<u>Extended cable, 6 000 mm (236.22 inch), length can be determined by customer on assembly¹⁾</u>	B
<u>Add Order code Y01 and plain text: "Insertion length ... mm"</u>	
Extended cable, 500 ... 5 000 mm (19.69 ... 196.85 inch)	C
Extended cable, 5 001 ... 10 000 mm (196.89 ... 393.70 inch)	D
Extended cable, 10 001 ... 15 000 mm (393.74 ... 590.55 inch)	E
Extended cable, 15 001 ... 20 000 mm (590.59 ... 787.4 inch)	F
Extended cable, 20 001 ... 25 000 mm (787.44 ... 984.25 inch)	G
Extended cable, 25 001 ... 30 000 mm (984.29 ... 1 181.1 inch)	H

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Standard

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
Pointek CLS200 - Standard - Cable Version with Threaded or Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	7ML5631- 	Further designs Please add "-Z" to Article No. and specify Order code(s). Total insertion length: enter the total insertion length in plain text description	Y01
Thermal isolator Without thermal isolator	0	Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	1	Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	C11
Remote mount electronics and mounting bracket With 2 m (79 inch) of cable ²⁾	2	Inspection Certificate Type 3.1 per EN 10204	C12
With 5 m (197 inch) of cable ²⁾	3	Operating Instructions Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/36
Wetted seals FKM and PTFE	0	Accessories We can offer shorter delivery times for configurations designated with the Quick Ship Symbol. For details see page 9/5 in the appendix.	See page 4/36
FFKM and PTFE [for process temperatures above -20 °C (-4 °F)]	1		
Probe material FEP jacketed cable with PPS probe body	0		
FEP jacketed cable with PVDF probe body	1		
Approvals Dust Ignition Proof: CE, RCM, ATEX II 1/2 D T100 °C			C
Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C			D
Flameproof Enclosure with IS Probe, with WHG approval: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C			E
Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4			F
Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4			G
General Purpose (CSA, FM)			H
General Purpose (CE, RCM)			J
General Purpose (CSA, FM, CE, RCM) with WHG approval			K
Enclosure and lid Aluminum epoxy coated			
2 x 1/2" NPT via adapter - cable inlet, IP65			A
2 x M20 x1.5 cable inlet, IP65			B
2 x 1/2" NPT via adapter - cable inlet, IP68			C
2 x M20 x1.5 cable inlet, IP68			D

¹⁾ Sensor detached to allow customer to set desired cable length

²⁾ Available with Approvals options F ... H

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol. For details see page 9/5 in the appendix.

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Standard

4

Selection and Ordering data	Article No.
Pointek CLS200 - Standard - Rod with Sanitary process connection	7ML5632-0
Versatile inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection Sanitary 316L stainless steel	
1" sanitary fitting clamp	8 A
1½" sanitary fitting clamp	8 B
2" sanitary fitting clamp	8 C
2½" sanitary fitting clamp	8 D
3" sanitary fitting clamp	8 E
(Note: Sanitary connection dimensionally corresponds to the applicable ISO 2852 standard)	
Probe length (length from process connection face)	
Note: No Y01 needed in Order code for standard lengths	
Compact 98 mm (3.86 inch)	A
Extended rod, 250 mm (9.84 inch)	B
Extended rod, 350 mm (13.78 inch)	C
Extended rod, 500 mm (19.69 inch)	D
Extended rod, 750 mm (29.53 inch)	E
Extended rod, 1 000 mm (39.37 inch)	F
Extended rod, 1 250 mm (49.21 inch)	G
Extended rod, 1 350 mm (53.15 inch)	H
Extended rod, 1 500 mm (59.06 inch)	J
Extended rod, 1 750 mm (68.90 inch)	K
Extended rod, 2 000 mm (78.74 inch)	L
Add Order code Y01 and plain text: "Insertion length ... mm"	
Extended rod, 1 10 ... 350 mm (4.3 ... 13.78 inch)	M
Extended rod, 351 ... 1 000 mm (13.78 ... 39.37 inch)	N
Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch)	P
Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch)	Q
Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch)	R
Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch)	S
Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch)	T
Thermal isolator	
Without thermal isolator	0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	1
Remote mount electronics and mounting bracket	
Remote mount electronics with 2 m (79 inch) of cable ¹⁾	2
Remote mount electronics with 5 m (197 inch) of cable ¹⁾	3
Wetted seals	
FKM	0
FFKM	1
[for process temperatures above -20 °C (-4 °F)]	
Probe material	
316L stainless steel with PPS probe body	0
316L stainless steel with PVDF probe body	1

Selection and Ordering data	Article No.
Pointek CLS200 - Standard - Rod with Sanitary process connection	7ML5632-0
Versatile inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	
Approvals	
Dust Ignition Proof: CE, RCM, ATEX II 1/2 D T100 °C	C
Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1 G EEx d[ia] IIC T6 ... T4, ATEX II 1/2 D T100 °C	D
Flameproof Enclosure with IS Probe, with WHG approval: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6 ... T4, ATEX II 1/2 D T100 °C	E
Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	F
Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	G
General Purpose (CSA, FM)	H
General Purpose (CE, RCM)	J
General Purpose (CSA, FM, CE, RCM) with WHG approval	K
Enclosure and lid Aluminum epoxy coated	
2 x ½" NPT via adapter - cable inlet, IP65	A
2 x M20x1.5 cable inlet, IP65	B
2 x ½" NPT via adapter - cable inlet, IP68	C
2 x M20x1.5 cable inlet, IP68	D
¹⁾ Available with Approvals options F ... H We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	
Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/36
Accessories	
We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	See page 4/36

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Standard


Selection and Ordering data	Article No.
Pointek CLS200 - Standard - Sliding Coupling with Threaded process connection Versatile inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5633-0
Process connection Threaded, 316L stainless steel ¾" NPT [(Taper), ANSI/ASME B1.20.1] 0 A 1" NPT [(Taper), ANSI/ASME B1.20.1] 0 B 1¼" NPT [(Taper), ANSI/ASME B1.20.1] 0 C 1½" NPT [(Taper), ANSI/ASME B1.20.1] 0 D R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] 1 A R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] 1 B R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] 1 D G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 3 A G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 3 B G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 3 D	
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths Extended rod, 350 mm (13.78 inch) C Extended rod, 500 mm (19.69 inch) D Extended rod, 750 mm (29.53 inch) E Extended rod, 1 000 mm (39.37 inch) F Extended rod, 1 250 mm (49.21 inch) G Extended rod, 1 350 mm (53.15 inch) H Extended rod, 1 500 mm (59.06 inch) J Extended rod, 1 750 mm (68.90 inch) K Extended rod, 2 000 mm (78.74 inch) L Add Order code Y01 and plain text: "Insertion length ... mm" Extended rod, 350 ... 1 000 mm (13.78 ... 39.37 inch) M Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch) N Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch) P Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch) Q Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch) R Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch) S	
Thermal isolator Without thermal isolator 0 With thermal isolator [for process connection temperatures over 85 °C (185 °F)] 1	
Remote mount electronics and mounting bracket With 2 m (79 inch) of cable ¹⁾ 2 With 5 m (197 inch) of cable ¹⁾ 3	
Wetted seals FKM and PTFE 0 FFKM and PTFE [for process temperatures above -20 °C (-4 °F)] 1	
Probe material 316L stainless steel with PPS probe body 0 316L stainless steel with PVDF probe body 1	


Selection and Ordering data	Article No.
Pointek CLS200 - Standard - Sliding Coupling with Threaded process connection Versatile inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	7ML5633-0
Approvals Dust Ignition Proof: CE, RCM, ATEX II 1/2 D T100 °C C Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C D Flameproof Enclosure with IS Probe, with WHG approval: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C E Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 F Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 G General Purpose (CSA, FM) H General Purpose (CE, RCM) J General Purpose (CSA, FM, CE, RCM) with WHG approval K	
Enclosure and lid Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65 A 2 x M20x1.5 cable inlet, IP65 B 2 x ½" NPT via adapter - cable inlet, IP68 C 2 x M20x1.5 cable inlet, IP68 D	
1) Available with Approvals options F ... H We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆ . For details see page 9/5 in the appendix.	
Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description Y01	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text Y15	
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000 C11	
Inspection Certificate Type 3.1 per EN 10204 C12	
Operating Instructions Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/36
Accessories	See page 4/36
We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆ . For details see page 9/5 in the appendix.	

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Standard

Selection and Ordering data	Article No.
Pointek CLS200 - Standard - PFA Coated Rod with PFA Coated Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional rod/ cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5634- 
Process connection Welded flange, 316L stainless steel, raised face 1" ASME, 150 lb 1" ASME, 300 lb 1" ASME, 600 lb 1½" ASME, 150 lb 1½" ASME, 300 lb 1½" ASME, 600 lb 2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb 3" ASME, 150 lb 3" ASME, 300 lb 3" ASME, 600 lb 4" ASME, 150 lb 4" ASME, 300 lb 4" ASME, 600 lb Welded flange, 316L stainless steel, Type A flat faced DN 25, PN 16 DN 25, PN 40 DN 40, PN 16 DN 40, PN 40 DN 50, PN 16 DN 50, PN 40 DN 80, PN 16 DN 80, PN 40 DN 100, PN 16 DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	5 A 5 B 5 C 5 D 5 E 5 F 5 G 5 H 5 J 5 K 5 L 5 M 5 N 5 P 5 Q
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths Compact 98 mm (3.86 inch) Extended rod, 250 mm (9.84 inch) Extended rod, 350 mm (13.78 inch) Extended rod, 500 mm (19.69 inch) Extended rod, 750 mm (29.53 inch) Extended rod, 1 000 mm (39.37 inch) Extended rod, 1 250 mm (49.21 inch) Extended rod, 1 350 mm (53.15 inch) Extended rod, 1 500 mm (59.06 inch) Extended rod, 1 750 mm (68.90 inch) Extended rod, 2 000 mm (78.74 inch) Add Order code Y01 and plain text: "Insertion length ... mm" Extended rod, 200 ... 1 000 mm (7.87 ... 39.37 inch) Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch) Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch) Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch) Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch) Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch)	A B C D E F G H J K L M N P Q R S

Selection and Ordering data	Article No.
Pointek CLS200 - Standard - PFA Coated Rod with PFA Coated Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional rod/ cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. Thermal isolator Without thermal isolator With thermal isolator [for process connection temperatures over 85 °C (185 °F)] Remote mount electronics and mounting bracket With 2 m (79 inch) of cable With 5 m (197 inch) of cable Wetted seals FKM FFKM [for process temperatures above -20 °C (-4 °F)] Probe material PFA Coated 316L stainless steel with PPS probe body PFA Coated 316L stainless steel with PVDF probe body Approvals Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 General Purpose (CSA, FM) Enclosure and lid Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65 2 x M20x1.5 cable inlet, IP65 2 x ½" NPT via adapter - cable inlet, IP68 2 x M20x1.5 cable inlet, IP68	7ML5634-  0 1 2 3 0 1 0 1 F G H A B C D
Selection and Ordering data Further designs Please add "-Z" to Article No. and specify Order code(s). Total insertion length: enter the total insertion length in plain text description Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000 Inspection Certificate Type 3.1 per EN 10204 Operating Instructions Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	Order code Y01 Y15 C11 C12 See page 4/36 See page 4/36
Accessories	See page 4/36

Overview



Pointek CLS200 (digital version) is a versatile inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam and interfaces and has the ability to tune out build-up on the probe. The digital version includes PROFIBUS PA, an LCD display, and advanced diagnostic features.

Benefits

- Potted construction protects signal circuit from shock, vibration, humidity and/or condensation
- High chemical resistance
- Level detection independent of tank or pipe earth reference
- Insensitive to product buildup due to high frequency oscillation
- High sensitivity allows installation in a wide range of liquids, solids or slurry applications
- Integral LCD display allows for easy menu-driven setup
- PROFIBUS PA communication (SIMATIC PDM compatible)

Application

Pointek CLS200 digital version provides an integral LCD display for stand-alone use, and also provides PROFIBUS PA communication (Profile version 3.0, Class B) for connection to a network.

The power supply is galvanically isolated and accepts a wide range of voltages (12 to 30 V DC). When used with thermal isolator, the stainless steel and PPS (PVDF optional) materials used in the probe construction provide a temperature rating up to 125 °C (257 °F) on the process wetted portion of the probe. The switch responds to any material with a dielectric constant of 1.5 or more by detecting a change in oscillating frequency, and it can be set to detect before contact or on contact with the probe. The menu-driven setup allows precise control of the switch point signal damping and alarm functions.

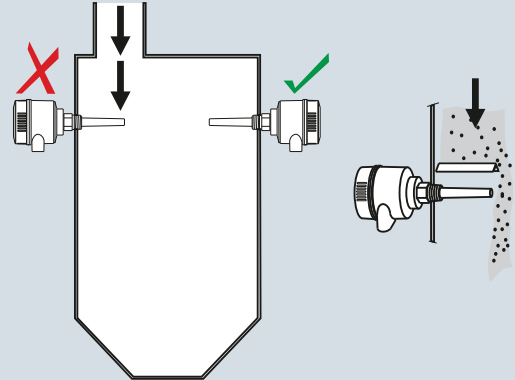
When connected to the PROFIBUS network, advanced diagnostics and set up using SIMATIC PDM are possible.

The CLS200 operates independently of the tank wall or pipe so it does not require an external reference electrode for level detection in a non-conductive vessel such as concrete or plastic (EMC regulations applicable in some regions).

- Key Applications: liquids, slurries, powders, granules, pressurized applications, hazardous areas

Configuration

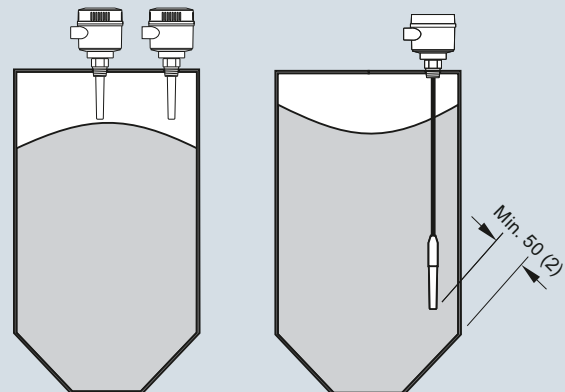
Installation



Keep unit out of path of falling material, or protect probe from falling material.



Avoid areas where material build up occurs.



Install probe at least 50 (2) from tank wall.

Pointek CLS200 installation, dimensions in mm (inch)

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Digital

Technical specifications

Mode of operation	
Measuring principle	Inverse frequency shift capacitive level detection
Input	
Measured variable	Change in picoFarad (pF)
Output	
Output signal	
• Solid-state output	
- Output	Galvanically isolated
- Protection	Against reversed polarity (bipolar)
- Max. switching voltage	• 30 V (DC) • 30 V peak (AC)
- Max. load current	82 mA
- Voltage drop	< 1 V, typical at 50 mA
- Time delay (ON and/or OFF)	Programmable by user (0 ... 100 s)
• Fail-safe mode	Min. or max.
• Connection	Removable terminal block
Rated operating conditions¹⁾	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F) ²⁾
• Installation category	II
• Pollution degree	4
Medium conditions	Liquids, bulk solids, slurries and interfaces
• Relative dielectric constant ϵ_r	Min. 1.5
• Process temperature	
- Without thermal isolator	-40 ... +85 °C (-40 ... +185 °F) ²⁾
- With thermal isolator	-40 ... +125 °C (-40 ... +257 °F)
• Process pressure (rod version)	-1 ... +25 bar g (-14.6 ... +365 psi g) (nominal)
• Process pressure (cable version) ³⁾	-1 ... +10 bar g (-14.6 ... +150 psi g) (nominal)
• Process pressure (sliding coupling version)	-1 ... +10 bar g (-14.6 ... +150 psi g) (nominal)
Design	
• Material	
- Enclosure	Epoxy-coated aluminum with gasket
- Optional thermal isolator	316L stainless steel
• Connection	Removable terminal block, max. 2.5 mm ²
• Degree of protection	IP65/Type 4/NEMA 4 (optional IP68)
• Cable inlet	2 x M20x1.5 thread (option: 2 x 1/2" NPT conduit entry including 1 plugged entry)
Electromagnetic Compatibility	To comply with CE EMC regulations (where applicable); the CLS200 should be installed per the instruction manual.

Power supply	
Bus voltage	Standard: 12 ... 30 V DC Intrinsically Safe: 12 ... 24 V DC
Current consumption	12.5 mA
Certificates and approvals	
General Purpose	CSA, FM, CE, RCM
Dust Ignition Proof	ATEX II 1/2 D T100 °C
Dust Ignition Proof with IS Probe	CSA/FM Class II, Div. 1, Groups E, F, G
	CSA/FM Class III T4
Flameproof Enclosure with IS Probe	ATEX II 1/2 G EEx d[ia] IIC T6...T4 ATEX II 1/2 D T100 °C
Explosion Proof with IS Probe	CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Intrinsically Safe ⁴⁾	ATEX II 1 G EEx ia IIC T6 ... T4 ATEX II 1/2 D IP6X T100 °C CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 or T6
Non-incendive	CSA/FM Class I, Div. 2, Groups A, B, C, D CSA/FM Class II, Div. 2, Groups F, G CSA/FM Class III T4 or T6
Non-Sparking	ATEX II 3 G Ex nA II T6...T4 ATEX II 2 D IP6X T100 °C
Marine	Lloyds Register of Shipping, Categories ENV1, ENV2 and ENV5
Others	Pattern Approval (China)
Communication	
	PROFIBUS PA (IEC 61158 CPF3 CP3/2) Bus physical layer: IEC 61158-2 MBP (IS) Device profile: PROFIBUS PA profile for Process Control Devices Version 3.0, Class B FISCO field device

¹⁾ When operation is in areas classified as hazardous, observe restrictions according to relevant certificate.
See also Pressure/Temperature curves on page 4/37.

²⁾ Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)

³⁾ Pressure rating of process seal is temperature dependent.
See Pressure/Temperature curves on page 4/37.

⁴⁾ Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Digital

Design: Probe				
	Rod version	Sanitary version	Cable version	Sliding Coupling version
Max. length	5 500 mm (216.53 inch)	5 500 mm (216.53 inch)	30 000 mm (1 181.1 inch) liquids and slurries 5 000 mm (196.85 inch) solids (under loads)	5 500 mm (216.53 inch)
Process connection	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ANSI/ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 316L stainless steel ASME/EN flange	1½", 2" sanitary fitting clamp 316L stainless steel	R ¾", 1", 1¼", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ANSI/ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 316L stainless steel ASME/EN flange	R ¾", 1", 1¼", 1½" inch [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] ¾", 1", 1¼", 1½" NPT [(Taper), ANSI/ASME B1.20.1] G ¾", 1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
Extension material	316L stainless steel optional PFA coated ¹⁾	316L stainless steel	Fluoroethylene propylene (FEP) cable with stainless steel core	316L stainless steel
Sensor wetted parts	PPS (optional PVDF)	PPS (optional PVDF)	PPS (optional PVDF)	PPS (optional PVDF)
O-ring seal material	FKM (optional FFKM) ²⁾	FKM (optional FFKM) ²⁾	FKM (optional FFKM) ²⁾	FKM (optional FFKM) ²⁾
Thermal isolator ³⁾	Optional	Optional	Optional	Optional
Extension	User selected length	User selected length	Cable extension	User selected length

¹⁾ PFA coating (7ML5634 and 7ML5644) has 120 micron thickness

²⁾ For Caustic Materials, please contact ceg.smpi@siemens.com for alternative O-Rings

³⁾ Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F).

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Digital

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - Rod with Threaded or Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5640-
Process connection Threaded, 316L stainless steel ¾" NPT [(Taper), ANSI/ASME B1.20.1] 0 A 1" NPT [(Taper), ANSI/ASME B1.20.1] 0 B 1¼" NPT [(Taper), ANSI/ASME B1.20.1] 0 C 1½" NPT [(Taper), ANSI/ASME B1.20.1] 0 D R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] 1 A R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] 1 B R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] 1 D G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 3 A G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 3 B G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 3 D	
Welded flange, 316L stainless steel, raised face 1" ASME, 150 lb 5 A 1" ASME, 300 lb 5 B 1" ASME, 600 lb 5 C 1½" ASME, 150 lb 5 D 1½" ASME, 300 lb 5 E 1½" ASME, 600 lb 5 F 2" ASME, 150 lb 5 G 2" ASME, 300 lb 5 H 2" ASME, 600 lb 5 J 3" ASME, 150 lb 5 K 3" ASME, 300 lb 5 L 3" ASME, 600 lb 5 M 4" ASME, 150 lb 5 N 4" ASME, 300 lb 5 P 4" ASME, 600 lb 5 Q	
Welded flange, 316L stainless steel, Type A flat faced DN 25, PN 16 6 A DN 25, PN 40 6 B DN 40, PN 16 6 C DN 40, PN 40 6 D DN 50, PN 16 6 E DN 50, PN 40 6 F DN 80, PN 16 6 G DN 80, PN 40 6 H DN 100, PN 16 6 J DN 100, PN 40 6 K	
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths Compact [threaded 120 mm (4.72 inch), Flanged 98 mm (3.86 inch)] A Extended rod, 250 mm (9.84 inch) B Extended rod, 350 mm (13.78 inch) C Extended rod, 500 mm (19.69 inch) D Extended rod, 750 mm (29.53 inch) E Extended rod, 1 000 mm (39.37 inch) F Extended rod, 1 250 mm (49.21 inch) G Extended rod, 1 350 mm (53.15 inch) H Extended rod, 1 500 mm (59.06 inch) J Extended rod, 1 750 mm (68.90 inch) K Extended rod, 2 000 mm (78.74 inch) L	

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - Rod with Threaded or Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. Add Order code Y01 and plain text: "Insertion length ... mm"	7ML5640-
Extended rod, 210 ... 1 000 mm (8.27 ... 39.37 inch) M Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch) N Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch) P Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch) Q Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch) R Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch) S	
Thermal isolator Without thermal isolator 0 With thermal isolator [for process connection temperatures over 85 °C (185 °F)] 1	
Remote mount electronics and mounting bracket With 2 m (79 inch) of cable 2 With 5 m (197 inch) of cable 3	
Wetted seals FKM 0 FFKM [for process temperatures above -20 °C (-4 °F)] 1	
Probe material 316L stainless steel with PPS probe body 0 316L stainless steel with PVDF probe body 1	
Approvals Non-Sparking: CE, RCM, ATEX II 3 G Ex nA II T6...T4, ATEX II 2 D IP6X T100 °C B Dust Ignition Proof: CE, RCM, ATEX II 1/2 D T100 °C C Intrinsically Safe: ¹⁾ CE, RCM, ATEX II 1 G EEx ia IIC T6...T4, ATEX II 1/2 D IP6X T100 °C D Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C E Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D CSA/FM Class II, Div. 2, Groups F, G CSA/FM Class III T4 or T6 F Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 G Intrinsically Safe: ¹⁾ CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 H Explosion Proof with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 J General Purpose (CSA, FM) K General Purpose (CE, RCM) L	

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Digital

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - Rod with Threaded or Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	7ML5640-
Enclosure and lid Aluminum epoxy coated	
2 x 1/2" NPT via adapter - cable inlet, IP65 2 x M20x1.5 cable inlet, IP65 2 x 1/2" NPT via adapter - cable inlet, IP68 2 x M20x1.5 cable inlet, IP68	A B C D
1) Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.	

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/36
Accessories	See page 4/36
We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.	

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - Cable with Threaded or Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	7ML5641-
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection Threaded, 316L stainless steel	
3/4" NPT [(Taper), ANSI/ASME B1.20.1] 1" NPT [(Taper), ANSI/ASME B1.20.1] 1 1/4" NPT [(Taper), ANSI/ASME B1.20.1] 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1]	0 A 0 B 0 C 0 D
R 3/4" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] R 1 1/2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 A 1 B 1 D
G 3/4" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] G 1 1/2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 A 3 B 3 D
Welded flange, 316L stainless steel, raised face	
1" ASME, 150 lb 1" ASME, 300 lb 1" ASME, 600 lb	5 A 5 B 5 C
1 1/2" ASME, 150 lb 1 1/2" ASME, 300 lb 1 1/2" ASME, 600 lb	5 D 5 E 5 F
2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb	5 G 5 H 5 J
3" ASME, 150 lb 3" ASME, 300 lb 3" ASME, 600 lb	5 K 5 L 5 M
4" ASME, 150 lb 4" ASME, 300 lb 4" ASME, 600 lb	5 N 5 P 5 Q
Welded flange, 316L stainless steel, Type A flat faced	
DN 25, PN 16 DN 25, PN 40 DN 40, PN 16	6 A 6 B 6 C
DN 40, PN 40 DN 50, PN 16 DN 50, PN 40	6 D 6 E 6 F
DN 80, PN 16 DN 80, PN 40 DN 100, PN 16 DN 100, PN 40	6 G 6 H 6 J 6 K
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Digital

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - Cable with Threaded or Flanged process connection	7ML5641-
Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	
Probe length (length from flange face) (threaded lengths include process thread)	
<u>Note: No Y01 needed in Order code for standard lengths</u>	
Extended cable, 3 000 mm (118.11 inch), length can be determined by customer on assembly	● A
Extended cable, 6 000 mm (236.22 inch), length can be determined by customer on assembly	● B
<u>Add Order code Y01 and plain text: "Insertion length ... mm"</u>	
Extended cable, 500 ... 5 000 mm (19.69 ... 196.85 inch)	● C
Extended cable, 5 001 ... 10 000 mm (196.89 ... 393.70 inch)	● D
Extended cable, 10 001 ... 15 000 mm (393.74 ... 590.55 inch)	● E
Extended cable, 15 001 ... 20 000 mm (590.59 ... 787.40 inch)	● F
Extended cable, 20 001 ... 25 000 mm (787.44 ... 984.25 inch)	● G
Extended cable, 25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	● H
Thermal isolator	
Without thermal isolator	● 0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	● 1
Remote mount electronics and mounting bracket	
With 2 m (79 inch) of cable	● 2
With 5 m (197 inch) of cable	● 3
Wetted seals	
FKM and PTFE	● 0
FFKM and PTFE [for process temperatures above -20 °C (-4 °F)]	● 1
Probe material	
FEP jacketed cable with PPS probe body	● 0
FEP jacketed cable with PVDF probe body	● 1
Approvals	
Non-Sparking:	
CE, RCM, ATEX II 3 G Ex nA II T6...T4, ATEX II 2 D IP6X T100 °C	● B
Dust Ignition Proof:	
CE, RCM, ATEX II 1/2 D T100 °C	● C
Intrinsically Safe: ¹⁾	
CE, RCM, ATEX II 1 G EEx ia IIC T6...T4, ATEX II 1/2 D IP6X T100 °C	● D
Flameproof Enclosure with IS Probe:	
CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C	● E
Non-incendive:	
CSA/FM Class I, Div. 2, Groups A, B, C, D	● F
CSA/FM Class II, Div. 2, Groups F, G	
CSA/FM Class III T4 or T6	
Dust Ignition Proof with IS Probe:	
CSA/FM Class II, Div. 1, Groups E, F, G	● G
CSA/FM Class III T4	
Intrinsically Safe: ¹⁾	
CSA/FM Class I, Div. 1, Groups A, B, C, D	● H
CSA/FM Class II, Div. 1, Groups E, F, G	
CSA/FM Class III T4	
Explosion Proof with IS Probe:	
CSA/FM Class I, Div. 1, Groups A, B, C, D	● J
CSA/FM Class II, Div. 1, Groups E, F, G	
CSA/FM Class III T4	
General Purpose (CSA, FM)	● K
General Purpose (CE, RCM)	● L

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - Cable with Threaded or Flanged process connection	7ML5641-
Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	
Enclosure and lid	
<u>Aluminum epoxy coated</u>	
2 x 1/2" NPT via adapter - cable inlet, IP65	● A
2 x M20x1.5 cable inlet, IP65	● B
2 x 1/2" NPT via adapter - cable inlet, IP68	● C
2 x M20x1.5 cable inlet, IP68	● D
1) Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection	
● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	● Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	● Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	● C11
Inspection Certificate Type 3.1 per EN 10204	● C12
Operating Instructions	
Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/36
Accessories	
● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	See page 4/36

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Digital

4

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - Rod with Sanitary process connection Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5642- 0
Process connection Sanitary 316L stainless steel	
1" sanitary fitting clamp	8 A
1½" sanitary fitting clamp	8 B
2" sanitary fitting clamp	8 C
2½" sanitary fitting clamp	8 D
3" sanitary fitting clamp (Note: Sanitary connection dimensionally corresponds to the applicable ISO 2852 standard.)	8 E
Probe length (length from process connection face) Note: No Y01 needed in Order code for standard lengths	
Compact 98 mm (3.86 inch)	A
Extended rod, 250 mm (9.84 inch)	B
Extended rod, 350 mm (13.78 inch)	C
Extended rod, 500 mm (19.69 inch)	D
Extended rod, 750 mm (29.53 inch)	E
Extended rod, 1 000 mm (39.37 inch)	F
Extended rod, 1 250 mm (49.21 inch)	G
Extended rod, 1 350 mm (53.15 inch)	H
Extended rod, 1 500 mm (59.06 inch)	J
Extended rod, 1 750 mm (68.90 inch)	K
Extended rod, 2 000 mm (78.74 inch)	L
Add Order code Y01 and plain text: "Insertion length ... mm"	
Extended rod, 110 ... 350 mm (4.3 ... 13.78 inch)	M
Extended rod, 351 ... 1 000 mm (13.82 ... 39.37 inch)	N
Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch)	P
Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch)	Q
Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch)	R
Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch)	S
Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch)	T
Thermal isolator	
Without thermal isolator	0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	1
Remote mount electronics and mounting bracket	
With 2 m (79 inch) of cable	2
With 5 m (197 inch) of cable	3
Wetted seals	
FKM	0
FFKM [for process temperatures above -20 °C (-4 °F)]	1
Probe material	
316L stainless steel with PPS probe body	0
316L stainless steel with PVDF probe body	1
Approvals	
Non-Sparking: CE, RCM, ATEX II 3 G Ex nA II T6...T4, ATEX II 2 D IP6X T100 °C	B
Dust Ignition Proof: CE, RCM, ATEX II 1/2 D T100 °C	C
Intrinsically Safe: ¹⁾ CE, RCM, ATEX II 1 G EEx ia IIC T6...T4, ATEX II 1/2 D IP6X T100 °C	D
Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C	E

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - Rod with Sanitary process connection Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	7ML5642- 0
Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D CSA/FM Class II, Div. 2, Groups F, G CSA/FM Class III T4 or T6	F
Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	G
Intrinsically Safe: ¹⁾ CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	H
Explosion Proof with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	J
General Purpose (CSA, FM)	K
General Purpose (CE, RCM)	L
Enclosure and lid <u>Aluminum epoxy coated</u>	
2 x ½" NPT via adapter - cable inlet, IP65	A
2 x M20x1.5 cable inlet, IP65	B
2 x ½" NPT via adapter - cable inlet, IP68	C
2 x M20x1.5 cable inlet, IP68	D
¹⁾ Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection	
• We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.	


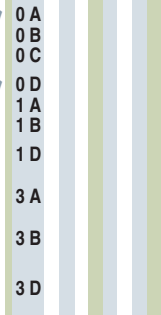
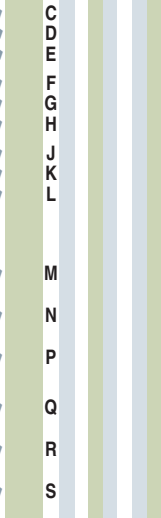


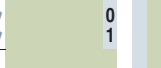


Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/36
Accessories	See page 4/36
• We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.	


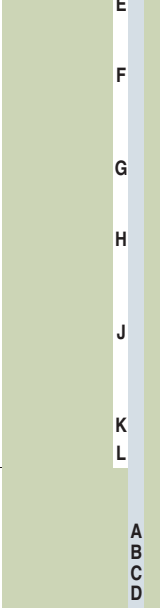
Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Digital

4

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - Rod with Sliding coupling with Threaded process connection Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5643- 
Process connection Threaded, 316L stainless steel 3/4" NPT [(Taper), ANSI/ASME B1.20.1] 0 A 1" NPT [(Taper), ANSI/ASME B1.20.1] 0 B 1 1/4" NPT [(Taper), ANSI/ASME B1.20.1] 0 C 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1] 0 D R 3/4" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] 1 A R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] 1 B R 1 1/2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] 1 D G 3/4" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 3 A G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 3 B G 1 1/2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] 3 D	
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths Extended rod, 350 mm (13.78 inch) C Extended rod, 500 mm (19.69 inch) D Extended rod, 750 mm (29.53 inch) E Extended rod, 1 000 mm (39.37 inch) F Extended rod, 1 250 mm (49.21 inch) G Extended rod, 1 350 mm (53.15 inch) H Extended rod, 1 500 mm (59.06 inch) J Extended rod, 1 750 mm (68.90 inch) K Extended rod, 2 000 mm (78.74 inch) L Add Order code Y01 and plain text: "Insertion length ... mm" Extended rod, 350 ... 1 000 mm (13.82 ... 39.37 inch) M Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch) N Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch) P Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch) Q Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch) R Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch) S	
Thermal isolator Without thermal isolator 0 With thermal isolator [for process connection temperatures over 85 °C (185 °F)] 1	
Remote mount electronics and mounting bracket With 2 m (79 inch) of cable 2 With 5 m (197 inch) of cable 3	
Wetted seals FKM and PTFE 0 FFKM and PTFE [for process temperatures above -20 °C (-4 °F)] 1	
Probe material 316L stainless steel with PPS probe body 0 316L stainless steel with PVDF probe body 1	
Approvals Non-Sparking: CE, RCM, ATEX II 3 G Ex nA II T6...T4, ATEX II 2 D IP6X T100 °C B Dust Ignition Proof: CE, RCM, ATEX II 1/2 D T100 °C C Intrinsically Safe: ¹⁾ CE, RCM, ATEX II 1 G EEx ia IIC T6...T4, ATEX II 1/2 D IP6X T100 °C D	

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - Rod with Sliding coupling with Threaded process connection Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C E Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D F CSA/FM Class II, Div. 2, Groups F, G F CSA/FM Class III T4 or T6 F Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G G CSA/FM Class III T4 G Intrinsically Safe: ¹⁾ CSA/FM Class I, Div. 1, Groups A, B, C, D H CSA/FM Class II, Div. 1, Groups E, F, G H CSA/FM Class III T4 H Explosion Proof with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D J CSA/FM Class II, Div. 1, Groups E, F, G J CSA/FM Class III T4 J General Purpose (CSA, FM) K General Purpose (CE, RCM) L	7ML5643- 
Enclosure and lid Aluminum epoxy coated 2 x 1/2" NPT via adapter - cable inlet, IP65 A 2 x M20x1.5 cable inlet, IP65 B 2 x 1/2" NPT via adapter - cable inlet, IP68 C 2 x M20x1.5 cable inlet, IP68 D	

¹⁾ Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s). Total insertion length: enter the total insertion length in plain text description Y01 Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text Y15 Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000 C11 Inspection Certificate Type 3.1 per EN 10204 C12	
Operating Instructions Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/36
Accessories	See page 4/36

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - PFA Rod with PFA Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5644-
Process connection Welded flange, PFA coated, 316L stainless steel, raised face 1" ASME, 150 lb 1" ASME, 300 lb 1" ASME, 600 lb 1½" ASME, 150 lb 1½" ASME, 300 lb 1½" ASME, 600 lb 2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb 3" ASME, 150 lb 3" ASME, 300 lb 3" ASME, 600 lb 4" ASME, 150 lb 4" ASME, 300 lb 4" ASME, 600 lb Welded flange, PFA coated, 316L stainless steel, Type A flat faced DN 25, PN 16 DN 25, PN 40 DN 40, PN 16 DN 40, PN 40 DN 50, PN 16 DN 50, PN 40 DN 80, PN 16 DN 80, PN 40 DN 100, PN 16 DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.) Probe length (length from process connection face) Note: No Y01 needed in Order code for standard lengths Compact 98 mm (3.86 inch) Extended rod, 250 mm (9.84 inch) Extended rod, 350 mm (13.78 inch) Extended rod, 500 mm (19.69 inch) Extended rod, 750 mm (29.53 inch) Extended rod, 1 000 mm (39.37 inch) Extended rod, 1 250 mm (49.21 inch) Extended rod, 1 350 mm (53.15 inch) Extended rod, 1 500 mm (59.06 inch) Extended rod, 1 750 mm (68.90 inch) Extended rod, 2 000 mm (78.74 inch) Add Order code Y01 and plain text: "Insertion length ... mm" Extended rod, 200 ... 1 000 mm (7.87 ... 39.37 inch) Extended rod, 1 001 ... 2 000 mm (39.41 ... 78.74 inch) Extended rod, 2 001 ... 3 000 mm (78.78 ... 118.11 inch) Extended rod, 3 001 ... 4 000 mm (118.15 ... 157.48 inch) Extended rod, 4 001 ... 5 000 mm (157.52 ... 196.85 inch) Extended rod, 5 001 ... 5 500 mm (196.89 ... 216.53 inch) Thermal isolator Without thermal isolator With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	5 A 5 B 5 C 5 D 5 E 5 F 5 G 5 H 5 J 5 K 5 L 5 M 5 N 5 P 5 Q 6 A 6 B 6 C 6 D 6 E 6 F 6 G 6 H 6 J 6 K A B C D E F G H J K M N P Q R S 0 1

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - PFA Rod with PFA Flanged process connection Versatile inverse frequency shift capacitance level and material detection switch with optional process connection choices and configurable output. CLS200 is ideal for detection of liquids, solids, slurries, foam, and interfaces, and has the ability to tune out build-up on the probe.	7ML5644-
Remote mount electronics and mounting bracket With 2 m (79 inch) of cable With 5 m (197 inch) of cable Wetted seals FKM FFKM [for process temperatures above -20 °C (-4 °F)] Probe material PFA Coated 316L stainless steel with PPS probe body PFA Coated 316L stainless steel with PVDF probe body Approvals Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D CSA/FM Class II, Div. 2, Groups F, G CSA/FM Class III T4 or T6 Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 Intrinsically Safe: ¹⁾ CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 Explosion Proof with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 General Purpose (CSA, FM) Enclosure and lid Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65 2 x M20x1.5 cable inlet, IP65 2 x ½" NPT via adapter - cable inlet, IP68 2 x M20x1.5 cable inlet, IP68 ¹⁾ Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection	2 3 0 1 0 1 F G H J K A B C D

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/36
Accessories	See page 4/36

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Standard and Digital

Selection and Ordering data

Operating Instructions - Standard

English

Article No.

7ML1998-5JH04

German

7ML1998-5JH34

Note: The Operating Instructions should be ordered as a separate line on the order.

Quick Start manual, multi-language

A5E32221251

This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Operating Instructions - Digital

English

7ML1998-5JJ05

German

7ML1998-5JJ34

French

7ML1998-5JJ11

Note: The Operating Instructions should be ordered as a separate line on the order.

Quick Start manual, multi-language

A5E32221496

This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Accessories

SensGuard, 3/4" NPT (PPS)

Only available for CLS200 with 3/4" NPT thread

7ML1830-1DL

SensGuard, R 1" (BSPT) (PPS)

Only available for CLS200 with 3/4" NPT thread

7ML1830-1DM

One metallic cable gland M20x1.5, -40 ... +80 °C (-40 ... +176 °F) with integrated shield connection (available for PROFIBUS PA)

7ML1930-1AQ

General Purpose

1/2" NPT General Purpose Cable Entry IP68/IP69K NEMA6, -40 ... -100 °C (-40 ... -212 °F), cable size 6 ... 12 mm (0.236 ... 0.472 inch)

7ML1830-1JA

M20x1.5 General Purpose Cable Entry IP68/IP69K NEMA6,-40 ... -100 °C (-40 ... -212 °F), cable size 7 ... 12 mm (0.275 ... 0.472 inch)

7ML1830-1JC

Hazardous Locations

1/2" NPT EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22, and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)

7ML1830-1JB

M20 EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22 and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)

7ML1830-1JD

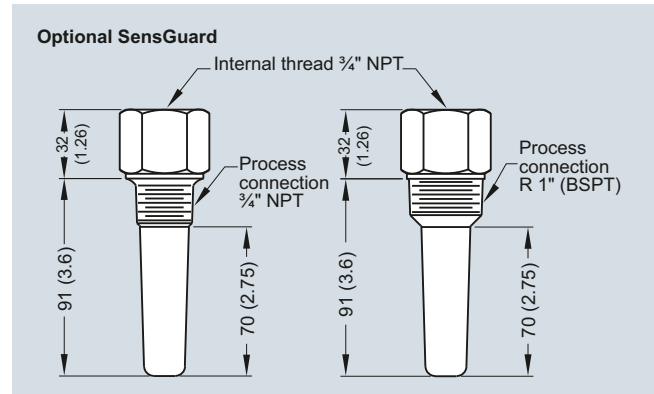
Blind threaded flanges are available.

Please contact ceg.smpi@siemens.com with a completed application data sheet on page 4/11

Pointek Specials

See page 4/80

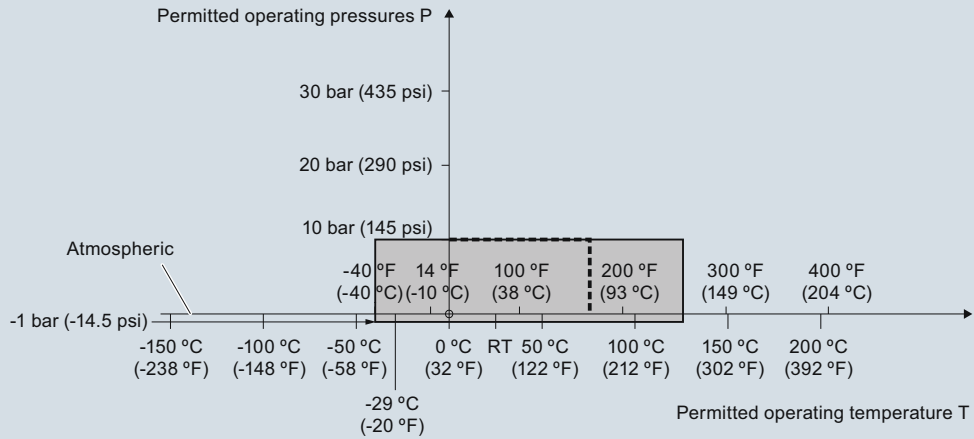
Options



Optional SensGuard, dimensions in mm (inch)

Characteristic curves

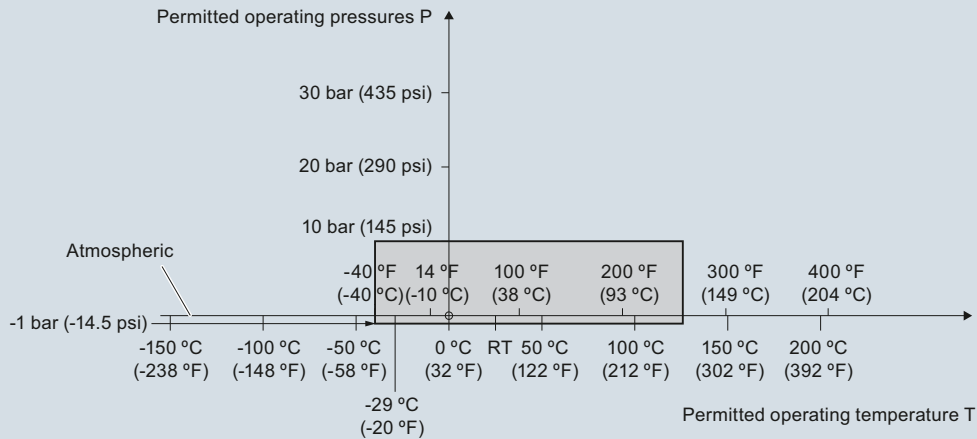
Pressure/temperature curve
CLS200 sliding coupling
threaded process connections
(7ML5633 and 7ML5643)



--- Example:
Permitted operating pressure = 10 bar (145 psi) at 75 °C

Pointek CLS200 Process Pressure/Temperature derating curves (7ML5633 and 7ML5643)

Pressure/temperature curve
CLS200 cable
Threaded process connections
(7ML5631 and 7ML5641)



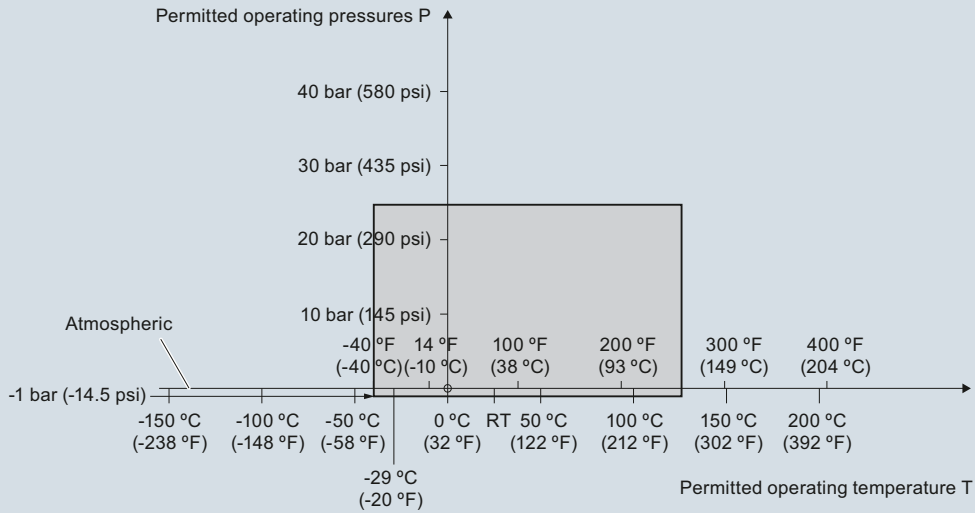
Pointek CLS200 Process Pressure/Temperature derating curves (7ML5631 and 7ML5641)

Level Measurement

Point level measurement – Capacitance switches

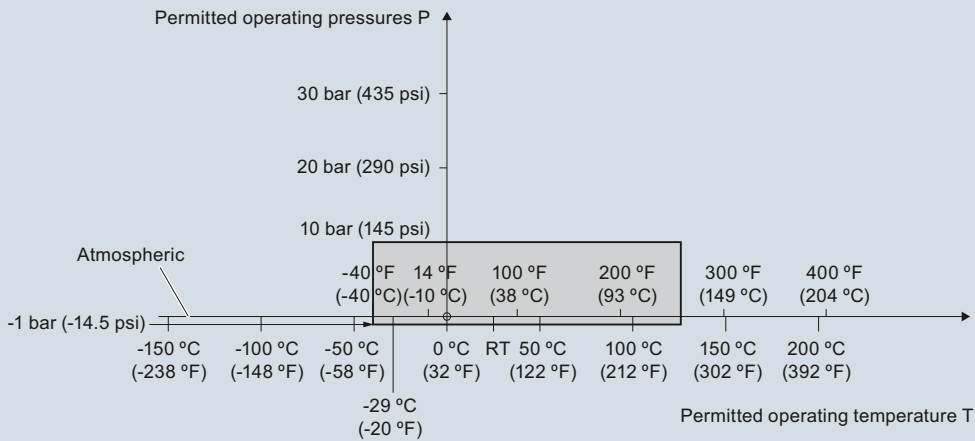
Pointek CLS200 – Standard and Digital

Pressure/temperature curve
CLS200 compact and extended rod
Threaded process connections
(7ML5630 and 7ML5640)



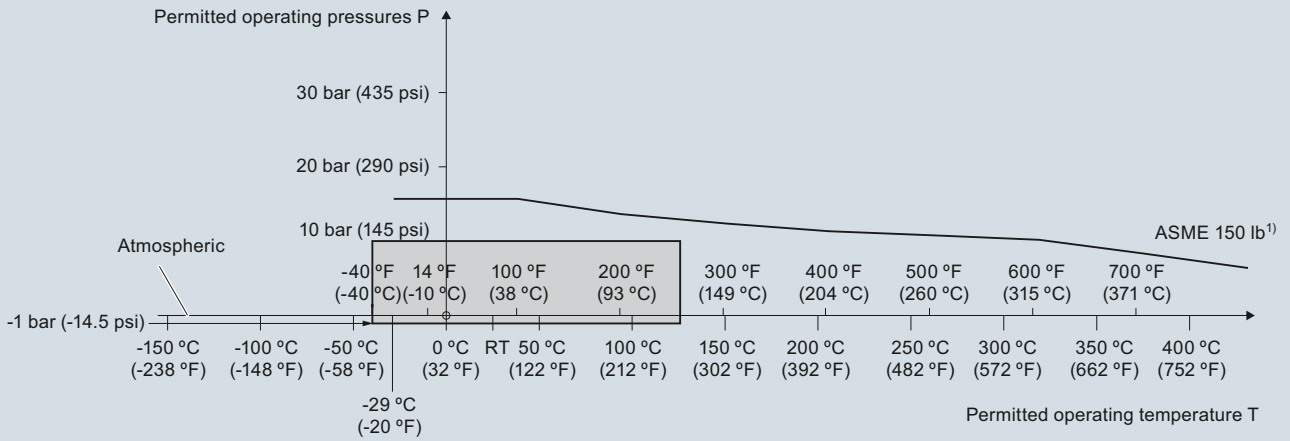
Pointek CLS200 Process Pressure/Temperature derating curves (7ML5630 or 7ML5640)

Pressure/temperature curve
CLS200 compact and extended sanitary type
Sanitary process connections
(7ML5632 and 7ML5642)



Pointek CLS200 Process Pressure/Temperature derating curves (7ML5632 and 7ML5642)

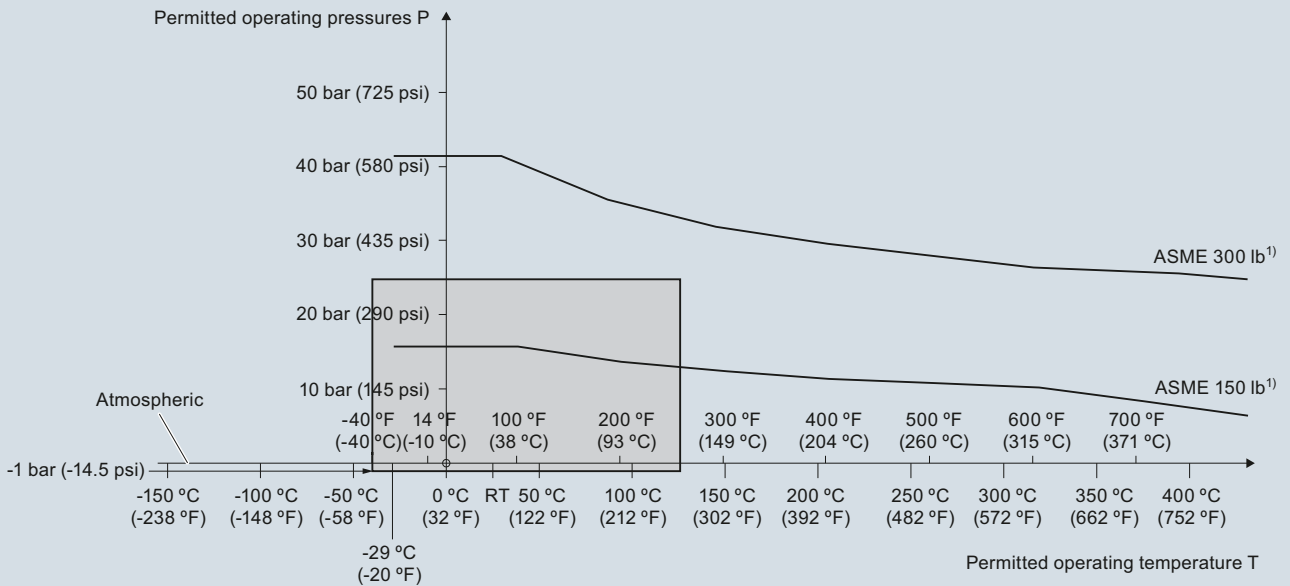
Pressure/temperature curve
CLS200 cable
ASME flanged process connections
(7ML5631 and 7ML5641)



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 Process Pressure/Temperature derating curves (7ML5631 and 7ML5641)

Pressure/temperature curve
CLS200 compact and extended rod
ASME flanged process connections
(7ML5630 and 7ML5640)



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

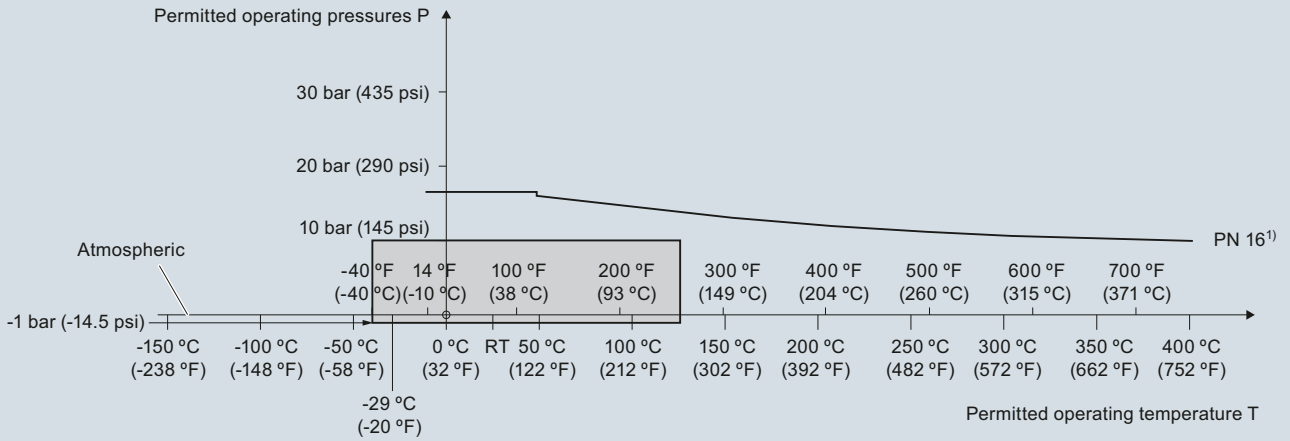
Pointek CLS200 Process Pressure/Temperature derating curves (7ML5630 and 7ML5640)

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS200 – Standard and Digital

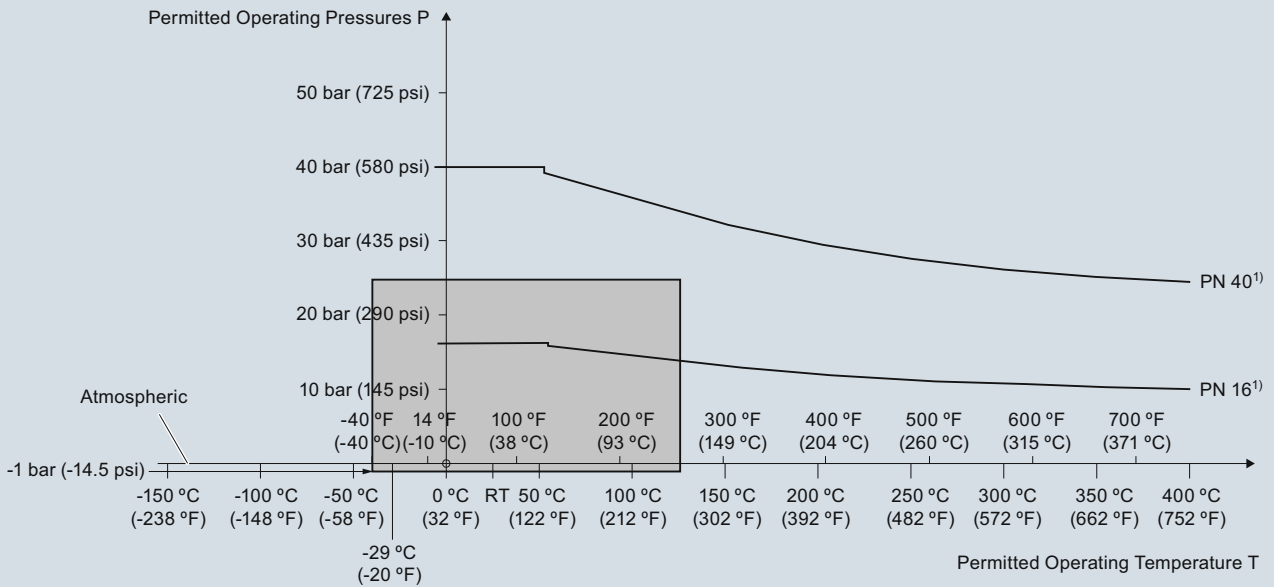
Pressure/temperature curve
CLS200 cable
EN flanged process connections
(7ML5631 and 7ML5641)



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 Process Pressure/Temperature derating curves (7ML5631 and 7ML5641)

Pressure/Temperature Curve
CLS200 Compact and Extended Rod
EN Flanged Process Connections
(7ML5630 and 7ML5640)



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 Process Pressure/Temperature derating curves (7ML5630 and 7ML5640)

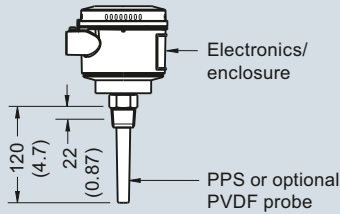
Level Measurement

Point level measurement – Capacitance switches

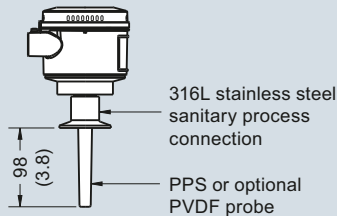
Pointek CLS200 – Standard and Digital

Dimensional drawings

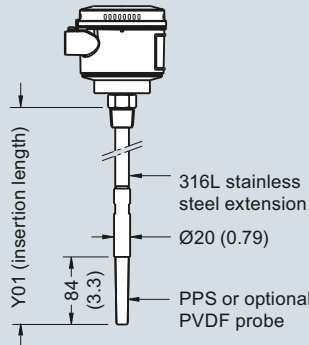
Compact version
Threaded
(7ML5630 and 7ML5640)



Sanitary compact version
Sanitary fitting
(7ML5632 and 7ML5642)

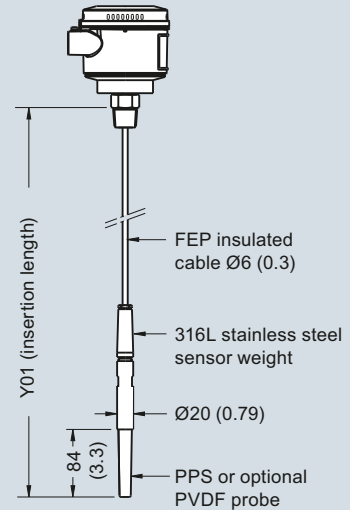


Extended rod version
Threaded
(7ML5630 and 7ML5640)

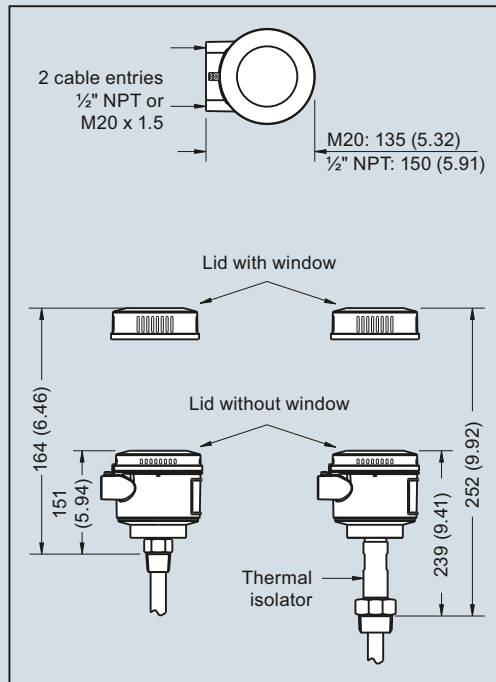


Min. insertion length = 200 (7.87)
Max. insertion length = 5 500 (216)

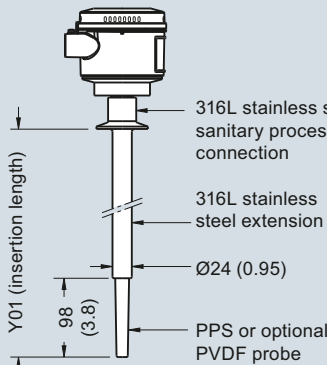
Extended cable version
Threaded
(7ML5631 and 7ML5641)



Min. insertion length = 500 (19.69)
Max. insertion length = 30 000 (1 181)
Applicable for liquids and solids applications. Cable can be shortened on site.

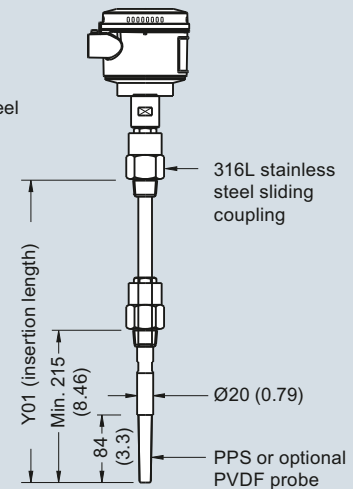


Sanitary extended version
Sanitary fitting
(7ML5632 and 7ML5642)



Min. insertion length = 110 (4.3)
Max. insertion length = 5 500 (216)

Sliding coupling version
Threaded
(7ML5633 and 7ML5643)



Min. insertion length = 350 (13.82)
Max. insertion length = 5 500 (216)

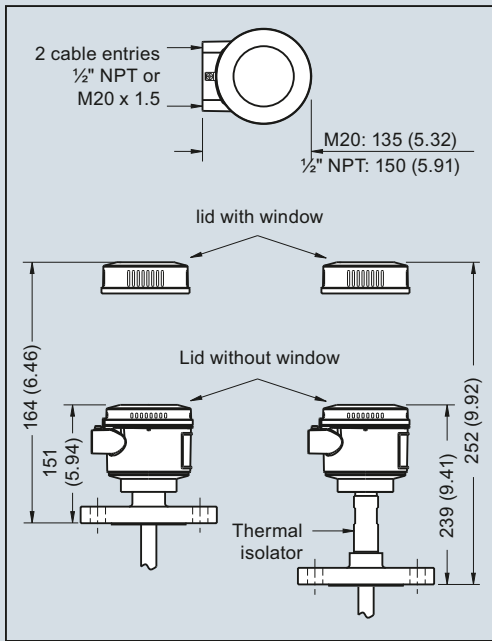
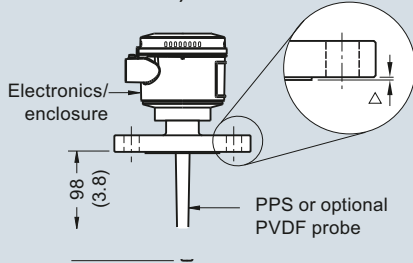
Pointek CLS200 - Threaded/sanitary process connections, dimensions in mm (inch)

Level Measurement

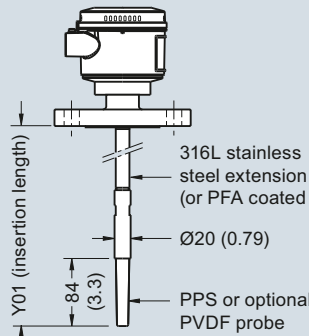
Point level measurement – Capacitance switches

Pointek CLS200 – Standard and Digital

Compact version
Welded Flange (7ML5630 and 7ML5640)
Welded Flange, PFA coated
(7ML5634 and 7ML5644)

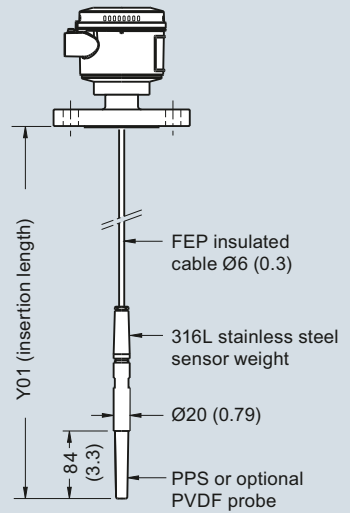


Extended rod version
Welded Flange (7ML5630 and 7ML5640)
Welded Flange, PFA coated
(7ML5634 and 7ML5644)



Min. insertion length = 200 (7.87)
 Max. insertion length = 5 500 (216)

Extended cable version
Welded Flange
(7ML5631 and 7ML5641)



Min. insertion length = 500 (19.69)
 Max. insertion length = 30 000 (1 181)
 Applicable for liquids and solids applications. Cable can be shortened on site.

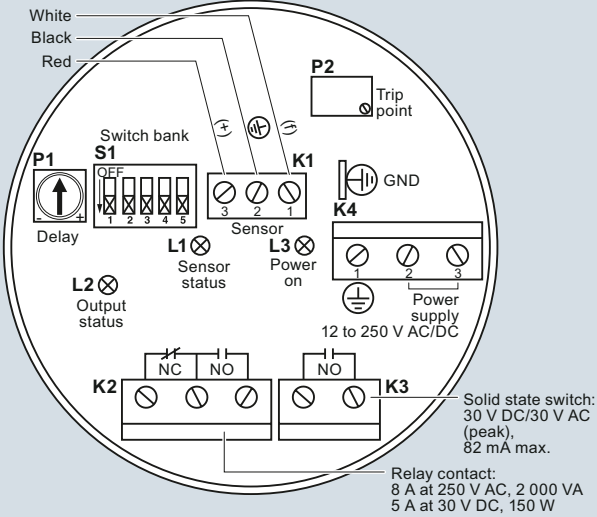
Flange Facing (raised face)	
Flange Class	Facing thickness
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/40	2 (0.08)

Insertion length does not include any raised face/gasket face dimension (see Flange Facing Table above)

Pointek CLS200 - Flanged Process Connections, dimensions in mm (inch)

Schematics

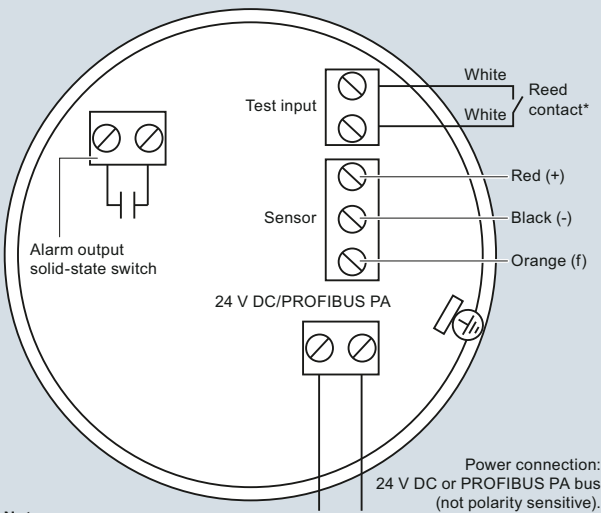
Wiring: Pointek CLS200 standard



Notes:

- Identification label is on underside of lid. Switch and potentiometer settings are for illustration purposes only (refer to operation/setup in manual).
- All field wiring must have insulation suitable for at least 250 V.
- Relay contact terminals are for use with equipment having no accessible live parts and wiring having insulation suitable for at least 250 V.
- Maximum working voltage between adjacent relay contacts shall be 250 V.
- Refer to the Instruction Manual or contact Siemens representative for detailed wiring information.

Wiring: Pointek CLS200 Digital



Notes:

Refer to the instruction manual or contact a Siemens representative for detailed wiring information.

*Magnet activated sensor Test

A magnet can be used to test the sensor without opening the lid of the Pointek CLS200 Digital version. Bring the magnet close to the test area indicated on the enclosure. The sensor test starts and finishes automatically after 10 seconds.



Pointek CLS200 connections

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Standard

Overview



Pointek CLS300 (standard version) is an inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present and has the ability to tune out build-up on the probe.

Benefits

- Patented Active-Shield technology so measurement is unaffected by material buildup or nozzle interference in active shield section
- Performs in extremely abrasive conditions because of solid rod construction
- Three LED indicators for adjustment control, output status and power
- High-temperature version up to 400 °C (752 °F)

Application

Pointek CLS300 standard version has three LED indicators with basic relay and solid-state switch alarms.

The robust design of CLS300 makes it specifically applicable for heavy solids applications where abrasive materials occur as in the mining industry.

The fully potted electronics are unaffected by condensation, dust or vibration.

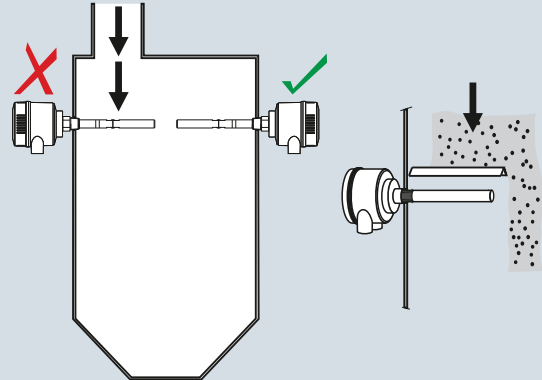
Wetted parts are made of stainless steel with a PFA shield for high chemical resistance, and of ceramic and stainless steel for high temperature version. Materials with low or high dielectric constants can be accurately detected. The unique Active Shield suppresses interference from material buildup or long installation nozzles.

The unique modular design of the Pointek CLS300 provides a wide range of configurations, process connections, extensions and approvals to meet the temperature and pressure requirements of specific applications. The modular design makes ordering easier and reduces stocking requirements. A wide range of probe configurations are available, including rod and cable versions.

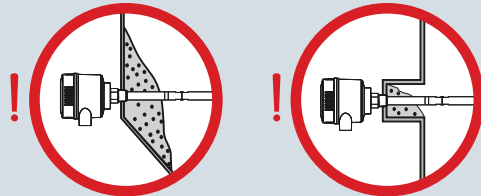
- Key Applications: liquids, slurries, bulk solids, relatively high pressure and temperature, hazardous areas, milling and mining applications

Configuration

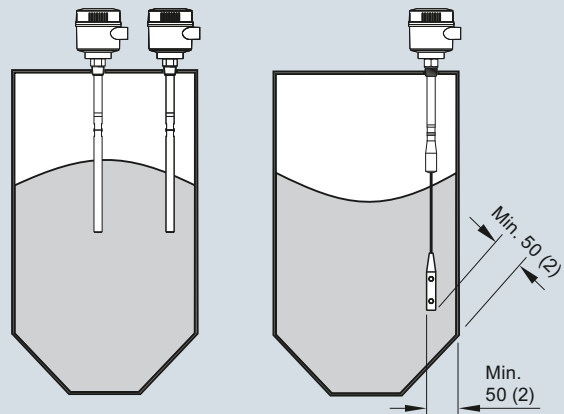
Installation



Keep unit out of path of falling material, or protect probe from falling material.



Build up of material in active shield area does not affect switch operation.



Install probe at least 50 (2) from tank wall.
Note angle of repose and adjust accordingly.

Pointek CLS300 installation, dimensions in mm (inch)

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Standard

Technical specifications

Mode of operation		Design	
Measuring principle	Inverse frequency shift capacitive level detection	Material (enclosure)	Powder-coated aluminum with gasket
Input		Degree of Protection	Standard: Type 4/NEMA 4/IP65 Optional: Type 4/NEMA 4/IP68
Measured variable	Change in picoFarad (pF)	Cable inlet	2 x M20x1.5 thread (option: 2 x 1/2" NPT conduit entry including 1 plugged entry)
Output		Controls and displays	
Output signal		Displays	3 LEDs, for probe status, output status and power supply
• Relay output	1 SPDT Form C relay	Potentiometers	2 potentiometers for time delay and sensitivity
- Max. contact voltage	• 30 V DC • 250 V AC	Switches	5 DIP switches for delay on/off, fail-safe high/low, time delay test/adjust, high/low sensitivity, test delay settings
- Max. contact current	• 5 A (DC) • 8 A (AC)	Power supply	
- Max. switching capacity	• 150 W (DC) • 2 000 VA (AC)	Supply	12 ... 250 V AC/DC, 0 ... 60 Hz, galvanically isolated, 2 W
- Time delay (ON and/or OFF)	1 ... 60 s	Certificates and approvals	
• Solid-state output		General Purpose	CSA, FM, CE, RCM
- Output	Galvanically isolated	Flameproof Enclosure with IS Probe	ATEX II 1/2 G EEx d[ia] IIC T6...T1 ATEX II 1/2 D T100 °C
- Protection	Against reversed polarity (bipolar)	Dust Ignition Proof with IS Probe	ATEX II 1/2 D T100 °C CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
- Max. switching voltage	• 30 V (DC) • 30 V peak (AC)	Explosion Proof Enclosure with IS Probe	CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
- Max. load current	82 mA	Marine	Lloyds Register of Shipping, Categories ENV1, ENV2 and ENV5
- Voltage drop	< 1 V, typical at 50 mA	Overfill Protection	WHG (Germany) VLAREM II (Belgium)
- Time delay (pre or post switching)	1 ... 60 s	Others	Pattern Approval (China)
Accuracy		¹⁾ When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves starting on page 4/58. ²⁾ Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F). ³⁾ Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves starting on page 4/58.	
Resolution			
• Min. sensitivity (pF)	1 % change in actual capacitance		
• Max. temperature error	0.2 % of actual capacitance value		
Rated operating conditions¹⁾			
Installation conditions			
• Location	Indoor/outdoor		
Ambient conditions			
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F) ²⁾		
Medium conditions			
	Liquids, bulk solids, slurries and interfaces, and applications with viscous materials		
• Relative dielectric constant ϵ_r	Min. 1.5		
• Process temperature			
- Rod/Cable version	-40 ... +200 °C (-40 ... +392 °F) ²⁾		
- High-temperature version	-40 ... +400 °C (-40 ... +752 °F)		
• Process pressure ³⁾	-1 ... +35 bar g (-14.6 ... +511 psi g)		

Design: Probe

	Rod version	High Temperature version	Cable version
Length	Min. 250 mm (9.8 inch), max. 1 000 mm (40 inch)	Min. 250 mm (9.8 inch), max. 1 000 mm (40 inch)	Min. 1 000 mm (40 inch), max. 25 000 mm (984 inch)
Sensor wetted parts	PFA (no insulation on active probe), 316L stainless steel, PEEK isolators	Ceramic (ZrO ₂ ¹⁾) isolators (no insulation on active probe), 316L stainless steel	316 stainless steel, optional PFA, PEEK isolators
O-ring seal material	FKM (optional FFKM) ²⁾	Graphite ²⁾	FKM (optional FFKM) ²⁾
Thermal isolator	Optional	Standard	Optional
Extension	User selectable length	User selectable length	User selectable cable length

¹⁾ Zirconium Oxide

²⁾ For Caustic Materials, please contact ceg.smpi@siemens.com for alternative O-Rings.

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Standard


Selection and Ordering data	Article No.
Pointek CLS300 - Standard - Rod Version with Threaded or Flanged process connection	7ML5650-
Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out build-up on the probe.	
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection	
Threaded, 316L stainless steel	
3/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 A
1" NPT [(Taper), ANSI/ASME B1.20.1]	0 B
1 1/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 C
1 1/2" NPT [(Taper), ANSI/ASME B1.20.1]	0 D
R 3/4" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 A
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 B
R 1 1/2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
G 3/4" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 A
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 B
G 1 1/2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
Welded flange, 316L stainless steel, raised face	
1" ASME, 150 lb	5 A
1" ASME, 300 lb	5 B
1" ASME, 600 lb	5 C
1 1/2" ASME, 150 lb	5 D
1 1/2" ASME, 300 lb	5 E
1 1/2" ASME, 600 lb	5 F
2" ASME, 150 lb	5 G
2" ASME, 300 lb	5 H
2" ASME, 600 lb	5 J
3" ASME, 150 lb	5 K
3" ASME, 300 lb	5 L
3" ASME, 600 lb	5 M
4" ASME, 150 lb	5 N
4" ASME, 300 lb	5 P
4" ASME, 600 lb	5 Q
Welded flange, 316L stainless steel, Type A flat faced	
DN 25, PN 16	6 A
DN 25, PN 40	6 B
DN 40, PN 16	6 C
DN 40, PN 40	6 D
DN 50, PN 16	6 E
DN 50, PN 40	6 F
DN 80, PN 16	6 G
DN 80, PN 40	6 H
DN 100, PN 16	6 J
DN 100, PN 40	6 K
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	
Probe length (length from flange face) (threaded lengths include process thread)	
Note: No Y01 needed in Order code for standard lengths	
Standard version, rod 350 mm (13.78 inch)	A
Extended rod, length 500 mm (19.69 inch)	B
Extended rod, length 750 mm (29.53 inch)	C
Extended rod, length 1 000 mm (39.37 inch)	D

Selection and Ordering data	Article No.
Pointek CLS300 - Standard - Rod Version with Threaded or Flanged process connection	7ML5650-
Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out build-up on the probe.	
Add Order code Y01 and plain text: "Insertion length ... mm"	
Extended rod, factory adjusted length 250 ... 499 mm (9.8 ... 19.65 inch)	E
Extended rod, factory adjusted length 500 ... 749 mm (19.69 ... 29.49 inch)	F
Extended rod, factory adjusted length 750 ... 999 mm (29.53 ... 39.3 inch)	G
Thermal isolator	
Without thermal isolator	0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	1
Wetted seals	
FKM	0
FFKM [for process temperatures above -20 °C (-4 °F)]	1
Probe material	
316L stainless steel with PFA lining and PEEK isolators	0
Approvals	
Dust Ignition Proof with IS Probe: CE, RCM, ATEX II 1/2 D T100 °C	C
Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T1, ATEX II 1/2 D T100 °C	D
Flameproof Enclosure with IS Probe, with WHG approval: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T1, ATEX II 1/2 D T100 °C	E
Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	F
Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	G
General Purpose (CSA, FM)	H
General Purpose (CE, RCM)	J
General Purpose with WHG approval (CSA, FM, CE, RCM)	K
Enclosure and lid	
Aluminum epoxy coated	
2 x 1/2" NPT via adapter - cable inlet, IP65	A
2 x M20x1.5 cable inlet, IP65	B
2 x 1/2" NPT via adapter - cable inlet, IP68	C
2 x M20x1.5 cable inlet, IP68	D
Active shield length	
Standard length - (125 mm threaded, 105 mm flanged)	0
Extended shield - (250 mm threaded, 230 mm flanged) ¹⁾	1
Extended shield - (400 mm threaded, 380 mm flanged) ²⁾	2
¹⁾ Available with Probe version options B ... D, F, G only [≥ 500 mm (19.69 inch)]	
²⁾ Available with Probe version options C, D, and, G only [≥ 750 mm (29.53 inch)]	
➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Standard

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs		Pointek CLS300 - Standard - Cable Version with Threaded or Flanged process connection Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out build-up on the probe. ➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5651- - - - - -
Please add "-Z" to Article No. and specify Order code(s).			
Total insertion length: enter the total insertion length in plain text description	Y01		
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15		
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	C11	➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Inspection Certificate Type 3.1 per EN 10204	C12		
Operating Instructions		Process connection	
Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.		Threaded, 316L stainless steel	
Accessories		1¼" NPT [(Taper), ANSI/ASME B1.20.1]	0 C
		1½" NPT [(Taper), ANSI/ASME B1.20.1]	0 D
➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol  . For details see page 9/5 in the appendix.		R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
		G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
		Welded flange, 316L stainless steel, raised face	
		1½" ASME, 150 lb	5 D
		1½" ASME, 300 lb	5 E
		1½" ASME, 600 lb	5 F
		2" ASME, 150 lb	5 G
		2" ASME, 300 lb	5 H
		2" ASME, 600 lb	5 J
		3" ASME, 150 lb	5 K
		3" ASME, 300 lb	5 L
		3" ASME, 600 lb	5 M
		4" ASME, 150 lb	5 N
		4" ASME, 300 lb	5 P
		4" ASME, 600 lb	5 Q
		Welded flange, 316L stainless steel, Type A flat faced	
		DN 40, PN 16	6 C
		DN 40, PN 40	6 D
		DN 50, PN 16	6 E
		DN 50, PN 40	6 F
		DN 80, PN 16	6 G
		DN 80, PN 40	6 H
		DN 100, PN 16	6 J
		DN 100, PN 40	6 K
		(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	
		Probe length (length from flange face) (threaded lengths include process thread)	
		Note: No Y01 needed in Order code for standard lengths	
		Extended cable, 3 000 mm (118.11 inch), length can be shortened by customer	A
		Extended cable, 6 000 mm (236.22 inch), length can be shortened by customer	B
		Add Order code Y01 and plain text: "Insertion length ... mm"	
		Extended cable, 500 ... 1 000 mm (19.69 ... 39.37 inch)	E
		Extended cable, 1 001 ... 5 000 mm (39.41 ... 196.85 inch)	F
		Extended cable, 5 001 ... 10 000 mm (196.89 ... 393.70 inch)	G
		Extended cable, 10 001 ... 15 000 mm (393.74 ... 590.55 inch)	H
		Extended cable, 15 001 ... 20 000 mm (590.59 ... 787.40 inch)	J
		Extended cable, 20 001 ... 25 000 mm (787.44 ... 984.25 inch)	K

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Standard

Selection and Ordering data

Article No.

Pointek CLS300 - Standard - Cable Version with Threaded or Flanged process connection

7ML5651-

Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out build-up on the probe.

Thermal isolator

Without thermal isolator 0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)] 1

Wetted seals

FKM 0
FFKM [for process temperatures above -20 °C (-4 °F)] 1

Probe material

Bare 316L stainless steel cable, PEEK isolators and 316L stainless steel cable weight 0
PFA coated cable, PEEK isolators and 316L stainless steel cable weight 1

Approvals

Dust Ignition Proof with IS Probe: CE, RCM, ATEX II 1/2 D T100 °C C
Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T1, ATEX II 1/2 D T100 °C D
Flameproof Enclosure with IS Probe, with WHG approval: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T1, ATEX II 1/2 D T100 °C E
Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 F
Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 G
General Purpose (CSA, FM) H
General Purpose (CE, RCM) J
General Purpose with WHG approval (CSA, FM, CE, RCM) K

Enclosure and lid

Aluminum epoxy coated

2 x 1/2" NPT via adapter - cable inlet, IP65 A
2 x M20x1.5 cable inlet, IP65 B
2 x 1/2" NPT via adapter - cable inlet, IP68 C
2 x M20x1.5 cable inlet, IP68 D

Active shield length

Standard length - (125 mm threaded, 105 mm flanged) 0
Extended shield - (250 mm threaded, 230 mm flanged)¹⁾ 1
Extended shield - (400 mm threaded, 380 mm flanged)¹⁾ 2

¹⁾ Available with Probe version options A, B, F ... K, only [≥ 1 000 mm (39.7 inch)]

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Total insertion length: enter the total insertion length in plain text description **Y01**

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text **Y15**

Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 **C11**

Inspection Certificate Type 3.1 per EN 10204 **C12**

Operating Instructions

Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.

See page 4/57

Accessories

See page 4/57

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

Selection and Ordering data	Article No.
Pointek CLS300 - Standard - High Temperature Rod Version with Threaded or Flanged process connection	7ML5652-
Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out build-up on the probe.	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection	
<u>Threaded, 316L stainless steel</u>	
3/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 A
1" NPT [(Taper), ANSI/ASME B1.20.1]	0 B
1 1/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 C
1 1/2" NPT [(Taper), ANSI/ASME B1.20.1]	0 D
R 3/4" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 A
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 B
R 1 1/2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
G 3/4" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 A
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 B
G 1 1/2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
<u>Welded flange, 316L stainless steel, raised face</u>	
1" ASME, 150 lb	5 A
1" ASME, 300 lb	5 B
1" ASME, 600 lb	5 C
1 1/2" ASME, 150 lb	5 D
1 1/2" ASME, 300 lb	5 E
1 1/2" ASME, 600 lb	5 F
2" ASME, 150 lb	5 G
2" ASME, 300 lb	5 H
2" ASME, 600 lb	5 J
3" ASME, 150 lb	5 K
3" ASME, 300 lb	5 L
3" ASME, 600 lb	5 M
4" ASME, 150 lb	5 N
4" ASME, 300 lb	5 P
4" ASME, 600 lb	5 Q
<u>Welded flange, 316L stainless steel, Type A flat faced</u>	
DN 25, PN 16	6 A
DN 25, PN 40	6 B
DN 40, PN 16	6 C
DN 40, PN 40	6 D
DN 50, PN 16	6 E
DN 50, PN 40	6 F
DN 80, PN 16	6 G
DN 80, PN 40	6 H
DN 100, PN 16	6 J
DN 100, PN 40	6 K
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	
Probe length (length from flange face) (threaded lengths include process thread)	
Note: No Y01 needed in Order code for standard lengths	
Standard version rod 350 mm (13.78 inch)	A
Extended rod, length 500 mm (19.69 inch)	B
Extended rod, length 750 mm (29.53 inch)	C
Extended rod, length 1 000 mm (39.37 inch)	D

Selection and Ordering data	Article No.
Pointek CLS300 - Standard - High Temperature Rod Version with Threaded or Flanged process connection	7ML5652-
Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. CLS300 is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present, and has the ability to tune out build-up on the probe.	
Add Order code Y01 and plain text: "Insertion length ... mm"	
Extended rod, factory adjusted length 250 ... 499 mm (9.8 ... 19.65 inch)	E
Extended rod, factory adjusted length 500 ... 749 mm (19.69 ... 29.49 inch)	F
Extended rod, factory adjusted length 750 ... 999 mm (29.53 ... 39.3 inch)	G
Wetted seals	
Graphite	0
Probe material	
316L stainless steel with ceramic (ZrO ₂) isolators	0
Approvals	
Dust Ignition Proof with IS Probe: CE, RCM, ATEX II 1/2 D T100 °C	C
Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T1, ATEXII 1/2 D T100 °C	D
Flameproof Enclosure with IS Probe, with WHG approval: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T1, ATEX II 1/2 D T100 °C	E
Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	F
Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	G
General Purpose (CSA, FM)	H
General Purpose (CE, RCM)	J
General Purpose with WHG approval (CSA, FM, CE, RCM)	K
Enclosure and lid	
<u>Aluminum epoxy coated</u>	
2 x 1/2" NPT via adapter - cable inlet, IP65	A
2 x M20x1.5 cable inlet, IP65	B
2 x 1/2" NPT via adapter - cable inlet, IP68	C
2 x M20x1.5 cable inlet, IP68	D
Active shield length	
Standard length - (125 mm threaded, 105 mm flanged)	0
Extended shield - (250 mm threaded, 230 mm flanged) ¹⁾	1
Extended shield - (400 mm threaded, 380 mm flanged) ²⁾	2
¹⁾ Available with Probe version options B ... D, F, G only [≥ 500 mm (19.69 inch)]	
²⁾ Available with Probe version options C, D, and, G only [≥ 750 mm (29.53 inch)]	
• We can offer shorter delivery times for configurations designated with the Quick Ship Symbol •. For details see page 9/5 in the appendix.	

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Standard

Selection and Ordering data	Order code
Further designs	
Please add *-Z to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	◆ Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	◆ Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	◆ C11
Inspection Certificate Type 3.1 per EN 10204	◆ C12
Operating Instructions	
Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/57
Accessories	
◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.	See page 4/57

Overview

Pointek CLS300 (digital version) is an inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. It is ideal for detecting liquids, solids, slurries, foam and interfaces in demanding conditions where high pressure and temperatures are present and has the ability to tune out build-up on the probe. The digital version includes PROFIBUS PA, an LCD display, and advanced diagnostic features.

Benefits

- Patented Active-Shield technology so measurement is unaffected by material buildup or nozzle interference in active shield section
- Performs in extremely abrasive conditions because of solid rod construction
- Push-button calibration, full-function diagnostics
- High sensitivity allows installation in a wide range of liquids, solids or slurry applications
- Integral LCD display allows for easy menu-driven setup
- PROFIBUS PA communication (SIMATIC PDM compatible)

Application

Pointek CLS300 digital version provides an integral LCD display for stand-alone use, with PROFIBUS PA communication (Profile version 3.0, Class B) when required. Solid-state switch alarm is standard.

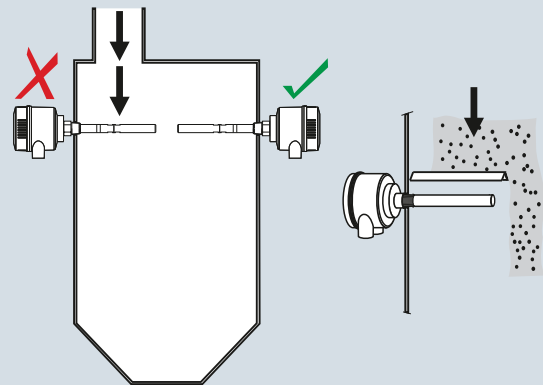
The robust design of CLS300 makes it specifically applicable for heavy solids applications where abrasive materials occur as in the mining industry.

The fully potted electronics are unaffected by condensation, dust or vibration.

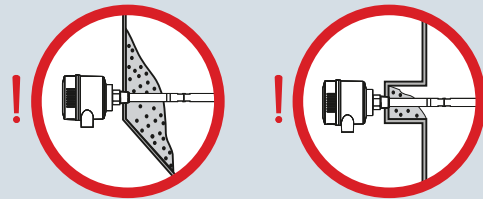
Wetted parts are made of stainless steel with a PFA shield for high chemical resistance, and of ceramic and stainless steel for high temperature version. Materials with low or high dielectric constants can be accurately detected. The unique Active Shield suppresses interference from material buildup or long installation nozzles.

The unique modular design of the Pointek CLS300 provides a wide range of configurations, process connections, extensions and approvals to meet the temperature and pressure requirements of specific applications. The modular design makes ordering easier and reduces stocking requirements. A wide range of probe configurations are available, including rod and cable versions.

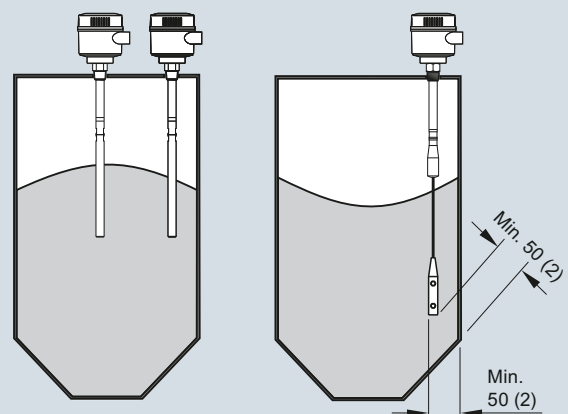
- Key Applications: liquids, slurries, bulk solids, relatively high pressure and temperature, hazardous areas, milling and mining applications

Configuration**Installation**

Keep unit out of path of falling material, or protect probe from falling material.



Build up of material in active shield area does not affect switch operation.



Install probe at least 50 (2) from tank wall.
Note angle of repose and adjust accordingly.

Pointek CLS300 installation, dimensions in mm (inch)

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Digital

Technical specifications

Mode of operation	
Measuring principle	Inverse frequency shift capacitive level detection
Input	
Measured variable	Change in picoFarad (pF)
Output	
Solid-state output	
• Output	Galvanically isolated
• Protection	Against reversed polarity (bipolar)
• Max. switching voltage	• 30 V (DC) • 30 V peak (AC)
• Max. load current	82 mA
• Voltage drop	< 1 V, typical at 50 mA
• Time delay (pre or post switching)	Programmable by user (0 ... 100 s)
Fail-safe mode	Min. or max.
Connection	Removable terminal block
Accuracy	
Resolution	
• Min. sensitivity (pF)	1 % change in actual capacitance
• Max. temperature error	0.2 % of actual capacitance value
Rated operating conditions¹⁾	
Installation conditions	
Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F) ²⁾
Medium conditions	Liquids, bulk solids, slurries and interfaces, and applications with viscous materials
• Relative dielectric constant ϵ_r	Min. 1.5
• Process temperature	
- Rod/Cable version	-40 ... +200 °C (-40 ... +392 °F) ²⁾
- High Temperature version	-40 ... +400 °C (-40 ... +752 °F)
• Process pressure ³⁾	-1 ... +35 bar g (-14.6 ... +511 psi g)
Design	
Material (enclosure)	Powder-coated aluminum with gasket
Degree of protection	Standard: Type 4/NEMA 4/IP65 Optional: Type 4/NEMA 4/IP68
Cable inlet	2 x M20x1.5 thread (option: 2 x 1/2" NPT conduit entry including 1 plugged entry)

Controls and displays	
Local display	LCD
Configuration	<ul style="list-style-type: none"> Locally, using 3 button keypad (for standalone operation) Remotely, using SIMATIC PDM (for installation on a network)
Power supply	
Bus voltage (at process connection)	<ul style="list-style-type: none"> Standard: 12 ... 30 V DC Intrinsically Safe: 12 ... 24 V DC
Current consumption	12.5 mA
Certificates and approvals	
General Purpose	CSA, FM, CE, RCM
Dust Ignition Proof	ATEX II 1/2 D, 2 D IP6X T100 °C
Flameproof Enclosure With IS Probe	ATEX II 1/2 G EEx d[ia] IIC T6...T4 ATEX II 1/2 D T100 °C
Dust Ignition Proof With IS Probe	CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Intrinsically Safe ⁴⁾	ATEX II 1 G EEx ia IIC T6...T4 ATEX II 1/2 D, 2 D IP6X T100 °C CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Non-incendive	CSA/FM Class I, Div. 2, Groups A, B, C, D CSA/FM Class II, Div. 2, Groups F, G CSA/FM Class III T4 or T6
Explosion Proof with IS Probe	CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4
Marine	Lloyds Register of Shipping, Categories ENV1, ENV2 and ENV5
Others	Pattern Approval (China)
Communication	
	PROFIBUS PA (IEC 61158 CPF3 CP3/2)
	Bus physical layer: IEC 61158-2 MBP-(IS)
	Device profile: PROFIBUS PA profile for Process Control Devices Version 3.0, Class B
	FISCO field device

¹⁾ When operation is in areas classified as hazardous, observe restrictions according to relevant certificate.
See also Pressure/Temperature curves starting on page 4/58.

²⁾ Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)

³⁾ Pressure rating of process seal is temperature dependent.
See Pressure/Temperature curves starting on page 4/58.

⁴⁾ Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection

Design: Probe

	Rod version	High Temperature version	Cable version
Length	Min. 250 mm (9.8 inch), max. 1 000 mm (40 inch)	Min. 250 mm (9.8 inch), max. 1 000 mm (40 inch)	Min. 1 000 mm (40 inch), max. 25 000 mm (984 inch)
Sensor wetted parts	PFA (no insulation on active probe), 316L stainless steel, PEEK isolators	Ceramic (ZrO ₂ ¹⁾) isolators (no insulation on active probe), 316L stainless steel	316 stainless steel, optional PFA, PEEK isolators
O-ring seal material	FKM (optional FFKM) ²⁾	Graphite ²⁾	FKM (optional FFKM) ²⁾
Thermal isolator	Optional	Standard	Optional
Extension	User selectable length	User selectable length	User selectable cable length

¹⁾ Zirconium Oxide

²⁾ For Caustic Materials, please contact ceg.smpi@siemens.com for alternative O-Rings

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Digital

Selection and Ordering data	Article No.
Pointek CLS300 - Digital - Rod with Threaded or Flanged process connection	➔ 7ML5660-
Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. It is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present and has the ability to tune out build-up on the probe.	
➔ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection Threaded, 316L stainless steel	
3/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 A
1" NPT [(Taper), ANSI/ASME B1.20.1]	0 B
1 1/4" NPT [(Taper), ANSI/ASME B1.20.1]	0 C
1 1/2" NPT [(Taper), ANSI/ASME B1.20.1]	0 D
R 3/4" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 A
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 B
R 1 1/2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
G 3/4" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 A
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 B
G 1 1/2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
Welded flange, 316L stainless steel, raised face	
1" ASME, 150 lb	5 A
1" ASME, 300 lb	5 B
1" ASME, 600 lb	5 C
1 1/2" ASME, 150 lb	5 D
1 1/2" ASME, 300 lb	5 E
1 1/2" ASME, 600 lb	5 F
2" ASME, 150 lb	5 G
2" ASME, 300 lb	5 H
2" ASME, 600 lb	5 J
3" ASME, 150 lb	5 K
3" ASME, 300 lb	5 L
3" ASME, 600 lb	5 M
4" ASME, 150 lb	5 N
4" ASME, 300 lb	5 P
4" ASME, 600 lb	5 Q
Welded flange, 316L stainless steel, Type A flat faced	
DN 25, PN 16	6 A
DN 25, PN 40	6 B
DN 40, PN 16	6 C
DN 40, PN 40	6 D
DN 50, PN 16	6 E
DN 50, PN 40	6 F
DN 80, PN 16	6 G
DN 80, PN 40	6 H
DN 100, PN 16	6 J
DN 100, PN 40	6 K
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	
Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for standard lengths	
Standard version, rod 350 mm (13.78 inch)	A
Extended rod, length 500 mm (19.69 inch)	B
Extended rod, length 750 mm (29.53 inch)	C
Extended rod, length 1 000 mm (39.37 inch)	D

Selection and Ordering data	Article No.
Pointek CLS300 - Digital - Rod with Threaded or Flanged process connection	7ML5660-
Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. It is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present and has the ability to tune out build-up on the probe.	
Add Order code Y01 and plain text: "Insertion length ... mm"	
Extended rod, factory adjusted length 250 ... 499 mm (9.8 ... 19.65 inch)	E
Extended rod, factory adjusted length 500 ... 749 mm (19.69 ... 29.49 inch)	F
Extended rod, factory adjusted length 750 ... 999 mm (29.53 ... 39.3 inch)	G
Thermal isolator	
Without thermal isolator	0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	1
Wetted seals	
FKM	0
FFKM [for process temperatures above -20 °C (-4 °F)]	1
Probe material	
316L stainless steel with PFA lining and PEEK isolators	0
Approvals	
Dust Ignition Proof: CE, RCM, ATEX II 1/2 D, 2 D IP6X T100 °C	B
Intrinsically Safe ¹⁾ CE, RCM, ATEX II 1 G EEx ia IIC T6...T4, ATEX II 1/2 D, 2 D IP6X T100 °C	C
Flameproof Enclosure with IS Probe: CE, RCM, ATEX II 1/2 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C	D
Dust Ignition Proof with IS Probe: CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	E
Intrinsically Safe ¹⁾ CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	F
Explosion Proof Enclosure with IS Probe: CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	G
General Purpose (CSA, FM)	H
General Purpose (CSA, FM, CE, RCM)	J
<ul style="list-style-type: none"> • We can offer shorter delivery times for configurations designated with the Quick Ship Symbol •. For details see page 9/5 in the appendix. 	

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Digital

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Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
Pointek CLS300 - Digital - Rod with Threaded or Flanged process connection Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. It is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present and has the ability to tune out build-up on the probe.	7ML5660- 	Pointek CLS300 - Digital - Cable with Threaded or Flanged process connection Inverse frequency shift capacitance level and material detection switch with optional rod/cable choices and configurable output. It is ideal for detecting liquids, solids, slurries, foam, and interfaces in demanding conditions where high pressure and temperatures are present and has the ability to tune out build-up on the probe.	7ML5661-
Enclosure and Lid Aluminum epoxy coated 2 x 1/2" NPT via adapter - cable inlet, IP65 2 x M20x1.5 cable inlet, IP65 2 x 1/2" NPT via adapter - cable inlet, IP68 2 x M20x1.5 cable inlet, IP68	A B C D	↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. Process connection Threaded, 316L stainless steel 1/4" NPT [(Taper), ANSI/ASME B1.20.1] 1/2" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G 1 1/2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	0 C 0 D 1 D 3 D
Active shield length Standard length - (125 mm threaded, 105 mm flanged) Extended shield - (250 mm threaded, 230 mm flanged) ²⁾ Extended shield - (400 mm threaded, 380 mm flanged) ³⁾	0 1 2	<u>Welded flange, 316L stainless steel, raised face</u> 1 1/2" ASME, 150 lb 1 1/2" ASME, 300 lb 1 1/2" ASME, 600 lb 2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb 3" ASME, 150 lb 3" ASME, 300 lb 3" ASME, 600 lb 4" ASME, 150 lb 4" ASME, 300 lb 4" ASME, 600 lb	5 D 5 E 5 F 5 G 5 H 5 J 5 K 5 L 5 M 5 N 5 P 5 Q
1) Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection 2) Available with Probe version options B ... D, F, G only [≥ 500 mm (19.69 inch)] 3) Available with Probe version options C, D, and, G only [≥ 750 mm (29.53 inch)] ● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.		<u>Welded flange, 316L stainless steel, Type A flat faced</u> DN 40, PN 16 DN 40, PN 40 DN 50, PN 16 DN 50, PN 40 DN 80, PN 16 DN 80, PN 40 DN 100, PN 16 DN 100, PN 40 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B 16.5 or EN 1092-1 standard.)	6 C 6 D 6 E 6 F 6 G 6 H 6 J 6 K
Further designs Please add "-Z" to Article No. and specify Order code(s). Total insertion length: enter the total insertion length in plain text description ● Y01 Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text ● Y15 Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 ● C11 Inspection Certificate Type 3.1 per EN 10204 ● C12		Probe length (length from flange face) (threaded lengths include process thread) Note: No Y01 needed in Order code for <u>standard lengths</u> Extended cable, 3 000 mm (118.11 inch), length can be shortened by customer ● A Extended cable, 6 000 mm (236.22 inch), length can be shortened by customer ● B Add Order code Y01 and plain text: <u>"Insertion length ... mm"</u> Extended cable, 500 ... 1 000 mm (19.69 ... 39.37 inch) ● E Extended cable, 1 001 ... 5 000 mm (39.41 ... 196.85 inch) ● F Extended cable, 5 001 ... 10 000 mm (196.89 ... 393.70 inch) ● G Extended cable, 10 001 ... 15 000 mm (393.74 ... 590.55 inch) ● H Extended cable, 15 001 ... 20 000 mm (590.59 ... 787.40 inch) ● J Extended cable, 20 001 ... 25 000 mm (787.44 ... 984.25 inch) ● K	
Operating Instructions Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/57		
Accessories ● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	See page 4/57		

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Standard and Digital

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs		Operating Instructions - Standard	
Please add *-Z to Article No. and specify Order code(s).		English	7ML1998-5JH04
Total insertion length: enter the total insertion length in plain text description	◆ Y01	German	7ML1998-5JH34
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	◆ Y15	Note: The Operating Instructions should be ordered as a separate line on the order.	
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	◆ C11	Quick Start manual, multi-language	A5E32221251
Inspection Certificate Type 3.1 per EN 10204	◆ C12	This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
Operating Instructions		Operating Instructions - Digital	
Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.	See page 4/57	English	7ML1998-5JJ05
		French	7ML1998-5JJ11
		German	7ML1998-5JJ34
Accessories	See page 4/57	Note: The Operating Instructions should be ordered as a separate line on the order.	
◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.		Quick Start manual, multi-language	A5E32221496
		This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
		Accessories	
		One metallic cable gland M20x1.5, -40 ... +80 °C (-40 ... +176 °F) with integrated shield connection (available for PROFIBUS PA)	7ML1930-1AQ
		General Purpose	
		1/2" NPT General Purpose Cable Entry IP68/IP69K NEMA6, -40 ... -100 °C (-40 ... -212 °F), cable size 6 ... 12 mm (0.236 ... 0.472 inch)	7ML1830-1JA
		M20x1.5 General Purpose Cable Entry IP68/IP69K NEMA6, -40 ... -100 °C (-40 ... -212 °F), cable size 7 ... 12 mm (0.275 ... 0.472 inch)	7ML1830-1JC
		Hazardous Locations	
		1/2" NPT EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22, and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)	7ML1830-1JB
		M20 EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22 and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)	7ML1830-1JD
		Blind threaded flanges are available. Please contact ceg.smpi@siemens.com with a completed application data sheet on page 4/11	
		Pointek Specials	See page 4/80

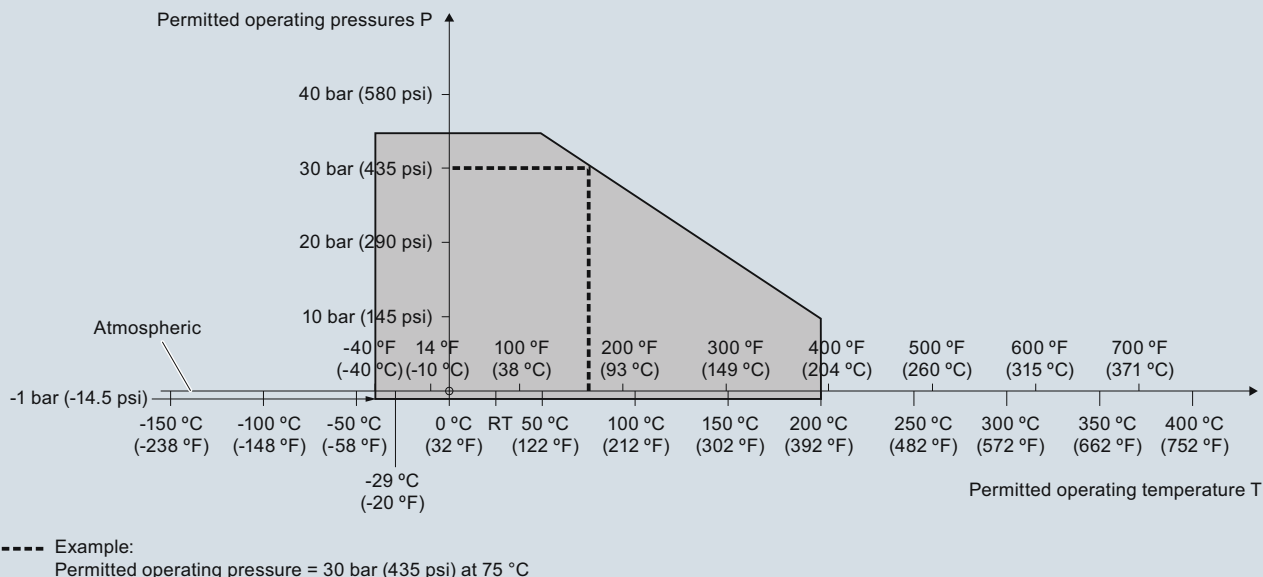
Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Standard and Digital

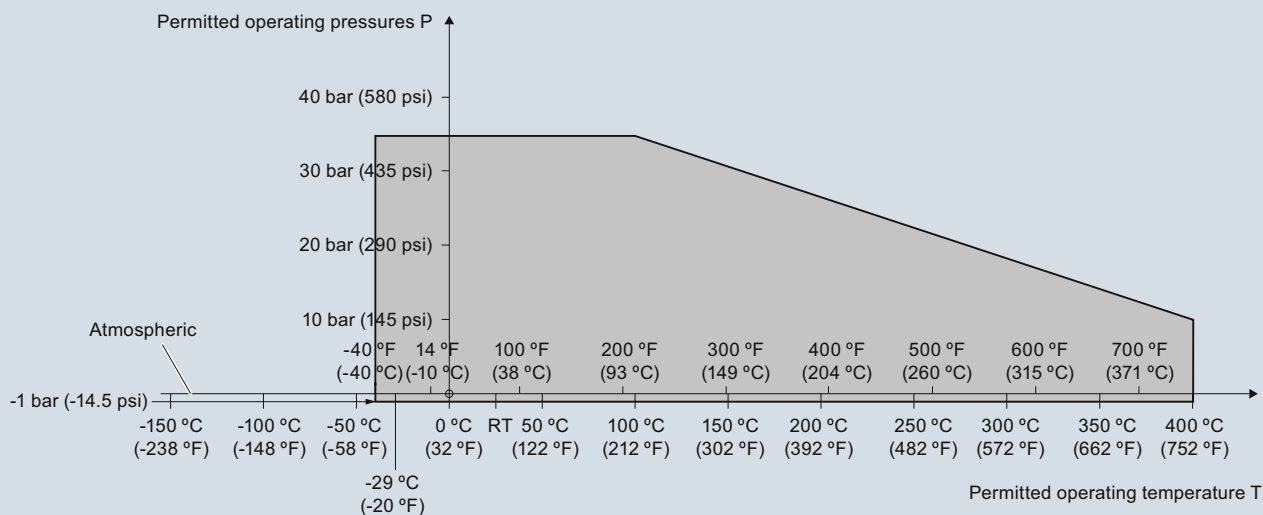
Characteristic curves

Pressure/temperature curve
CLS300 extended rod and cable probes
Threaded process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)



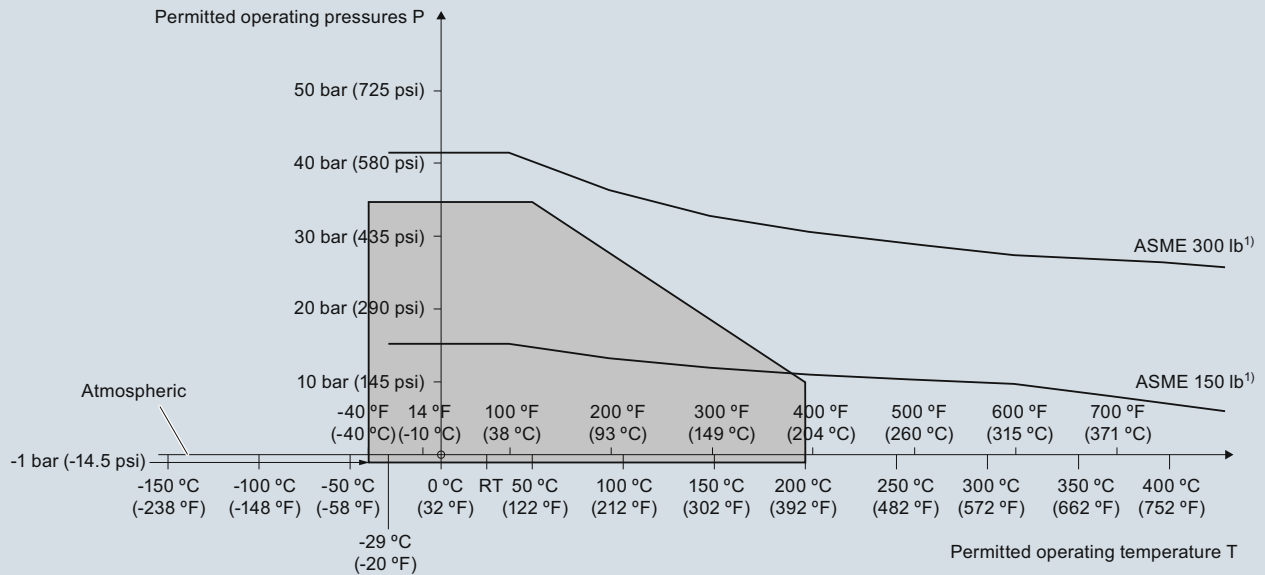
Pointek CLS300 Process Pressure/Temperature derating curves (7ML5650, 7ML5651, 7ML5660 and 7ML5661)

Pressure/temperature curve
CLS300 high temperature rod probes
Threaded process connections
(7ML5652 and 7ML5662)



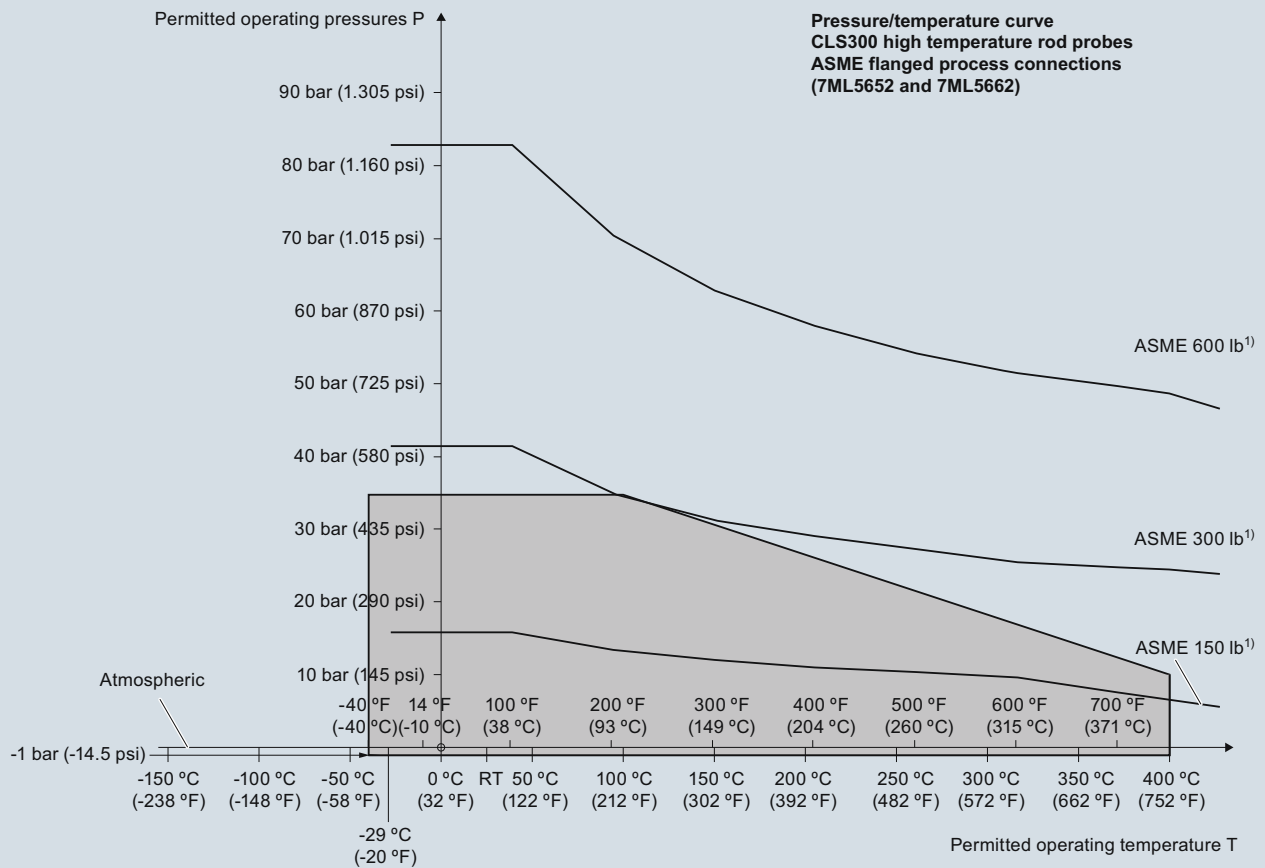
Pointek CLS300 Process Pressure/Temperature derating curves (7ML5652 and 7ML5662)

**Pressure/temperature curve
CLS300 extended rod and cable probes
ASME flanged process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)**



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS300 Process Pressure/Temperature derating curves (7ML5650, 7ML5651, 7ML5660, and 7ML5661)



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

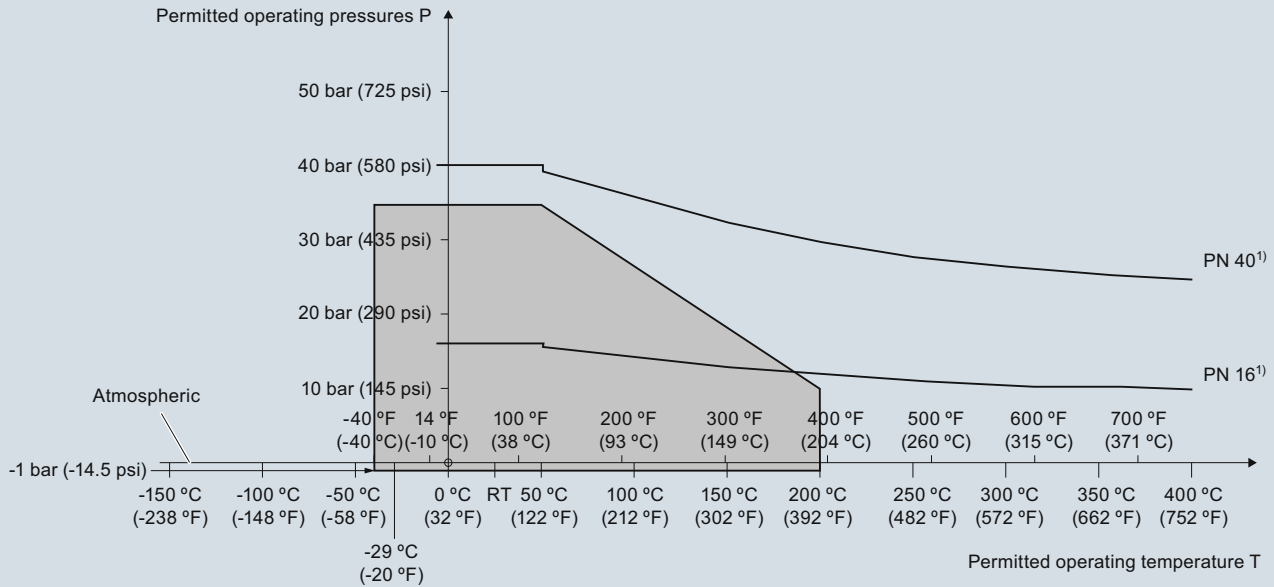
Pointek CLS300 Process Pressure/Temperature derating curves (7ML5652 and 7ML5662)

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS300 – Standard and Digital

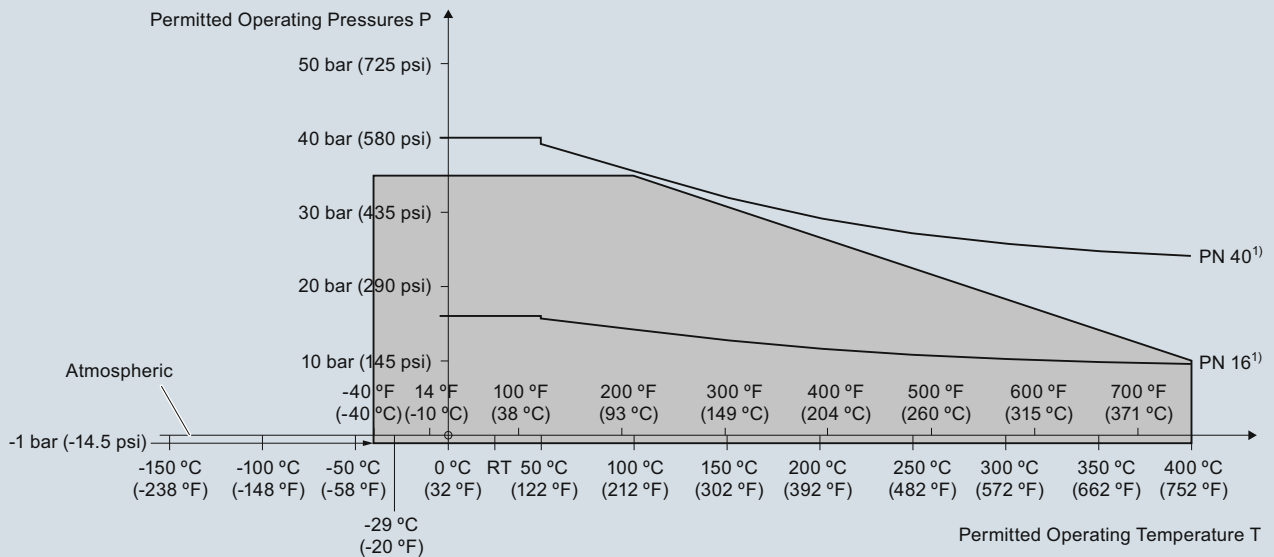
Pressure/temperature curve
CLS300 extended rod and cable probes
EN flanged process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS300 Process Pressure/Temperature derating curves (7ML5650, 7ML5651, 7ML5660 and 7ML5661)

Pressure/Temperature Curve
CLS300 High Temperature Rod Probes
EN Flanged Process Connections (7ML5652 and 7ML5662)

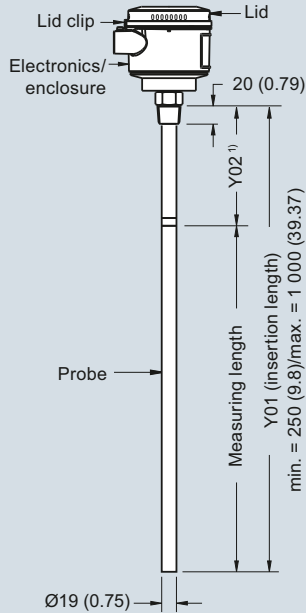


¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

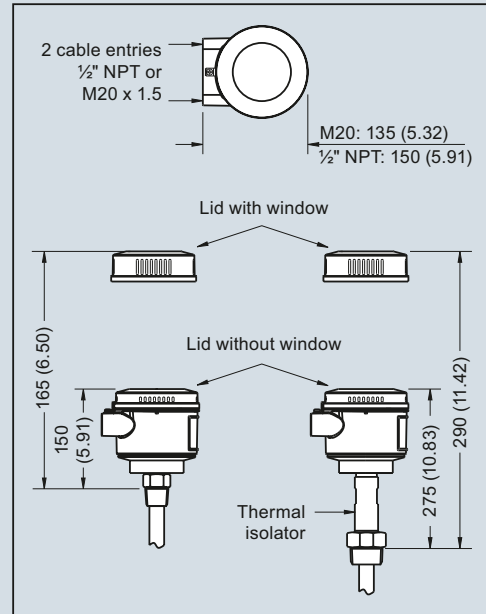
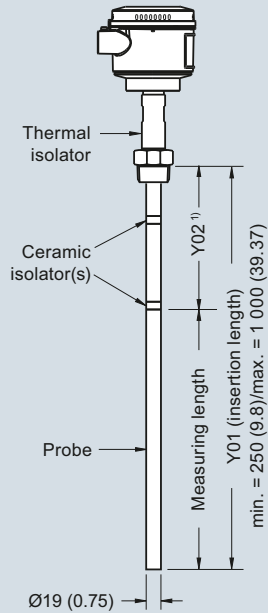
Pointek CLS300 Process Pressure/Temperature derating curves (7ML5652 and 7ML5662)

Dimensional drawings

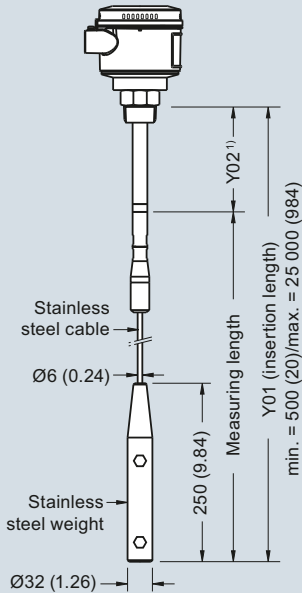
Rod version
Threaded (7ML5650 and 7ML5660)



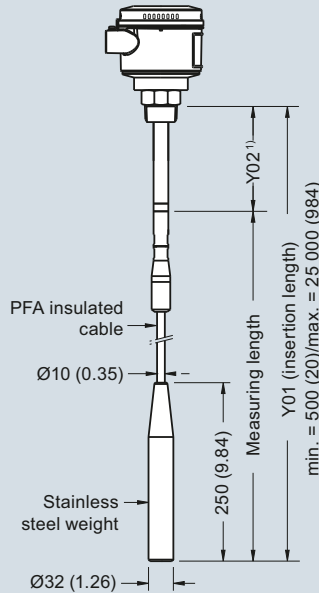
High temperature rod version
Threaded (7ML5652 and 7ML5662)



Cable version, non-insulated
Threaded (7ML5651 and 7ML5661)



Cable version, insulated
Threaded (7ML5651 and 7ML5661)



Note:

¹⁾ Extended Active Shield (Y02): standard length 125 (4.92). Optional active shield lengths: 250 (9.84) or 400 (15.75).

Pointek CLS300 - Threaded Process Connections, dimensions in mm (inch)

Level Measurement

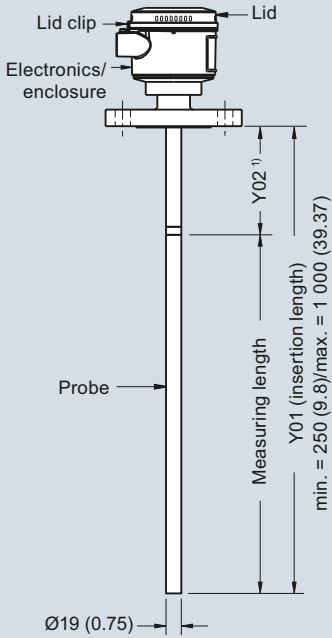
Point level measurement – Capacitance switches

Pointek CLS300 – Standard and Digital

4

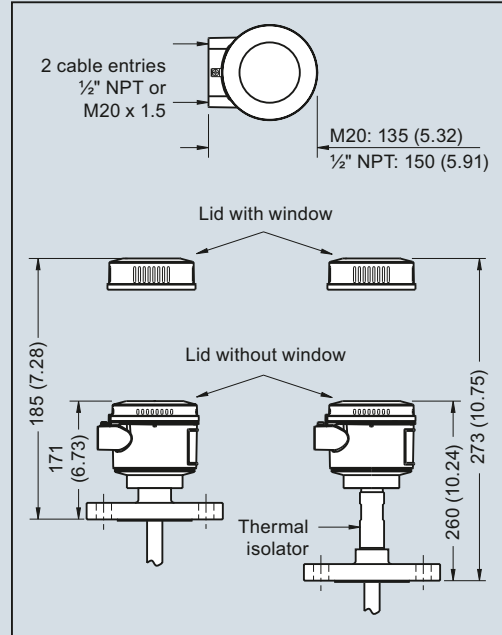
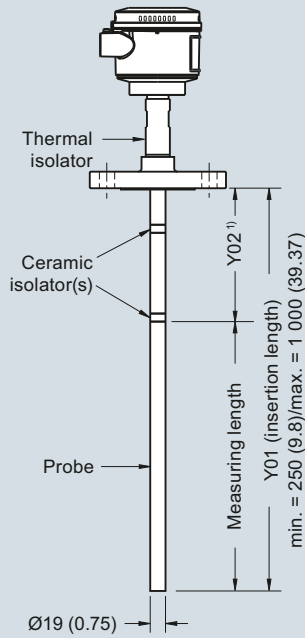
Rod version

Welded flange (7ML5650 and 7ML5660)



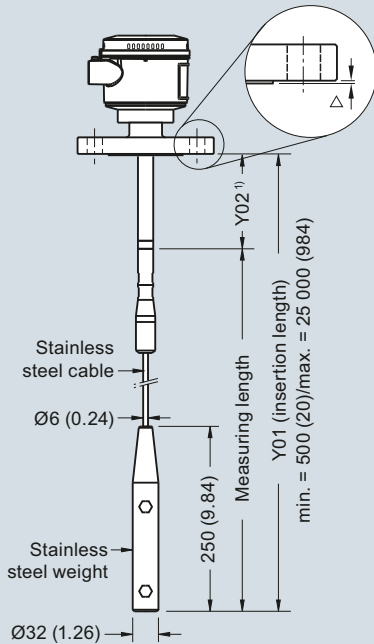
High temperature rod version

Welded flange (7ML5652 and 7ML5662)



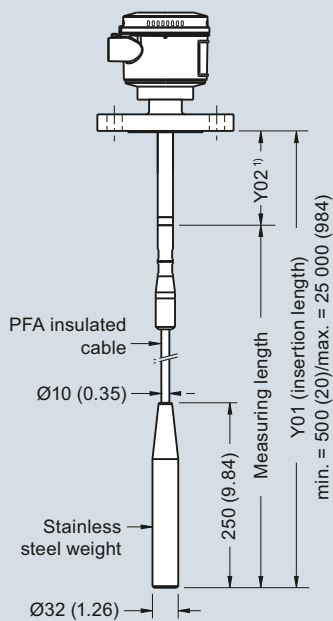
Cable version, non-insulated

Welded flange (7ML5651 and 7ML5661)



Cable version, insulated

Welded flange (7ML5651 and 7ML5661)



Flange Facing (raised face)	
Flange Class	Facing thickness
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/40	2 (0.08)

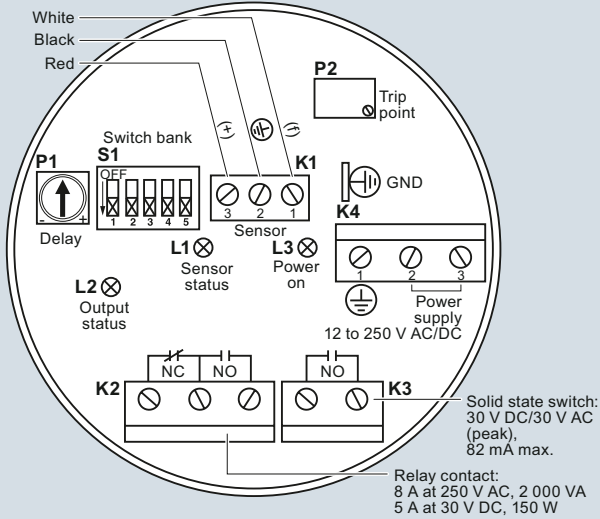
Note:

¹⁾ Extended Active Shield (Y02): standard length 105 (4.13). Optional active shield lengths: 230 (9.06) or 380 (14.96). Insertion length does not include any raised face/gasket face dimension (see Flange Facing Table above)

Pointek CLS300 - Flanged Process Connections, dimensions in mm (inch)

Schematics

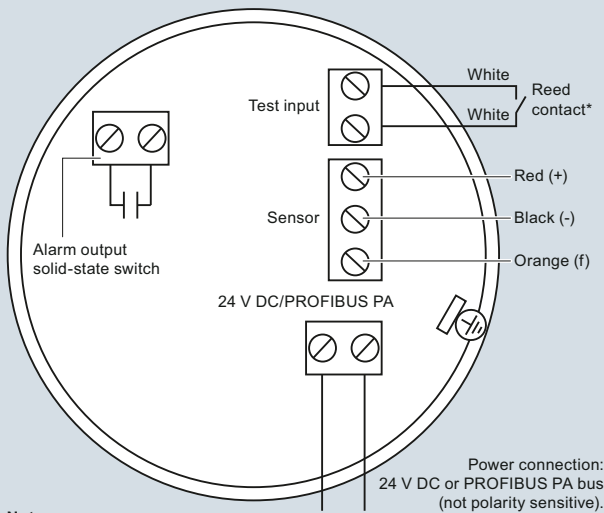
Wiring: Pointek CLS300 standard



Notes:

- Identification label is on underside of lid. Switch and potentiometer settings are for illustration purposes only (refer to operation/setup in manual).
- All field wiring must have insulation suitable for at least 250 V.
- Relay contact terminals are for use with equipment having no accessible live parts and wiring having insulation suitable for at least 250 V.
- Maximum working voltage between adjacent relay contacts shall be 250 V.
- Refer to the Instruction manual or contact Siemens representative for detailed wiring information.

Wiring: Pointek CLS300 digital



Notes:

Refer to the instruction manual or contact a Siemens representative for detailed wiring information.

***Magnet activated sensor test**

A magnet can be used to test the sensor without opening the lid of the Pointek CLS300 digital version. Bring the magnet close to the test area indicated on the enclosure. The sensor test starts and finishes automatically after 10 seconds.



Pointek CLS300 connection

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS500

Overview



Pointek CLS500 is an inverse frequency shift capacitance level and material detection switch ideal for detecting interfaces, solids, liquids, toxic, and aggressive chemicals in critical conditions of high temperature and pressure. CLS500 also has the ability to tune out build-up on the probe.

Benefits

- Patented Active-Shield technology so measurement is unaffected by material buildup in active shield section
- 2-wire loop powered with solid-state switch or 4 to 20/20 to 4 mA output
- Simple push-button calibration and integrated local display
- Full function diagnostics
- HART communications for remote commissioning and inspection

Application

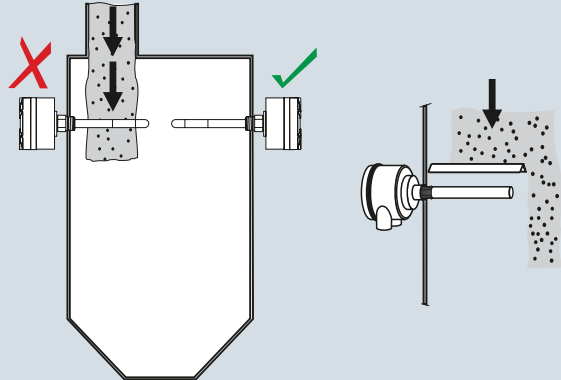
Patented Active-Shield technology ensures that measurement is unaffected by vapors, product deposits, dust and condensation. The unique mechanical probe design coupled with a high performance transmitter gives superior performance in a wide range of level detection applications.

Pointek CLS500's microprocessor-based electronics provide one-point calibration, making setup possible without shutting down your production process.

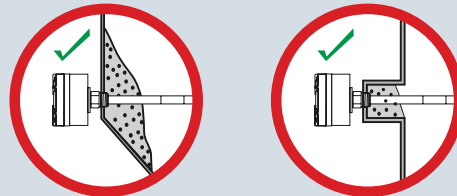
- Key Applications: foam or liquid/foam level, glycol regenerators, high-pressure coalescers, LNG applications

Configuration

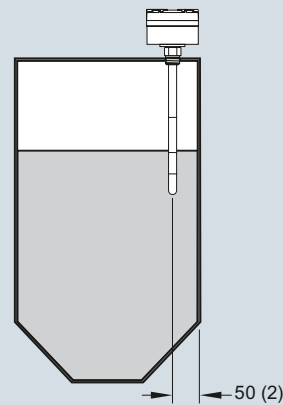
Installation



Keep unit out of path of falling material, or protect probe from falling material.



Build up of material in active shield area does not affect switch operation.



Install probe at least 50 (2) from tank wall.

Pointek CLS500 installation, dimensions in mm (inch)

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS500

Technical specifications

Input		Design	
Measuring range	0 ... 330 pF	Material	
Span	Min. 1 pF	<ul style="list-style-type: none"> Wetted parts material - Standard rod Probe isolation (rod) 	316L stainless steel PFA
Output		Probe diameter	
Solid-state switch		<ul style="list-style-type: none"> Standard rod version (PFA) High temperature rod version (Stainless steel) 	16 mm (0.63 inch) 19 mm (0.75 inch)
<ul style="list-style-type: none"> Output Protection Max. switching voltage 	Galvanically isolated Against reversed polarity (bipolar) <ul style="list-style-type: none"> 30 V (DC) 30 V peak (AC) 	Probe length	
<ul style="list-style-type: none"> Max. load current Voltage drop Time delay (pre or post switching) 	82 mA < 1 V, typical at 50 mA 1 ... 60 s	<ul style="list-style-type: none"> Standard rod version (PFA) High temperature rod version (Stainless steel) 	Max. 1 000 mm (39.4 inch) with 16 mm (0.63 inch) diameter probe Max. measuring length 1 000 mm (39.4 inch) with 19 mm (0.75 inch) diameter probe
Current loop	4 ... 20 mA/20 ... 4 mA	Process connection of probe	
Accuracy (transmitter)		<ul style="list-style-type: none"> Threaded mounting Flange mounting 	NPT [(Taper), ANSI/ASME B1.20.1] R [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G [(BSPP), EN ISO 228-1/P (JIS-P), JIS B 0202] ASME, EN 1092-1
Temperature stability	0.15 pF (0 pF) or < 0.25 % (typical < 0.1 %) of actual measurement value, whichever is greater over the full temperature range	Enclosure	Aluminum, epoxy-coated (Stainless steel option available). Contact ceg.smpi@siemens.com
Non-linearity and repeatability	0.1 % of full scale and actual measurement respectively	<ul style="list-style-type: none"> Material Cable inlet Degree of protection 	2 x 1/2" NPT Type 4X/NEMA4X/IP65, IP68
Accuracy	Deviation < 0.1 % of measured value	Power supply	Max. 33 V DC
Rated operating conditions¹⁾		Features	
Installation conditions		Measurement current signaling	NAMUR NE 43
- Location	Indoor/outdoor	Safety	<ul style="list-style-type: none"> Inputs/outputs fully galvanically isolated Polarity-insensitive current loop Fully potted Integrated safety barrier
Ambient conditions		<ul style="list-style-type: none"> Diagnostics with fault alarm when: 	Primary variable (PV) out of limits, system failure in measurement circuit, deviation between A/D and D/A converter, check sum, watch dog and self-checking facility
<ul style="list-style-type: none"> Ambient temperature (transmitter) Installation category Pollution degree 	-40 ... +85 °C (-40 ... +185 °F) ²⁾ I 4	<ul style="list-style-type: none"> Function rotary switch SMART communication 	Positions 0 ... 9, A ... F Conforming to HART Communication Foundation (HCF)
Medium conditions		Certificates and approvals	
<ul style="list-style-type: none"> Relative dielectric constant ϵ_r Process temperature 	Min. 1.5 Temperature ratings are pressure dependent. See Pressure/Temperature curves on page 4/72.	<ul style="list-style-type: none"> General Purpose Non incensive/Non sparking Dust Ignition Proof Explosion Proof Marine 	CE, CSA/FM, RCM CSA/FM Class I, Div. 2, Groups A, B, C, D T4 ATEX II 3G 2D EEx n A [ib] IIC T6 ... T4 T100 °C CSA/FM Class II and III, Div. 1, Groups E, F, G T4 ATEX II 1/2 GD EEx d [ia] T6 ... T1 T100 °C FM Class 1, Div. 1, Groups A, B, C, D T4 ATEX II 1/2 GD EEx d [ia] IIC T6 ... T1 T100 °C Lloyds Register of Shipping, Categories ENV1, ENV2, ENV3, ENV5, Bureau Veritas
<ul style="list-style-type: none"> Standard (PFA) High temperature stainless steel version with thermal isolator Cryogenic version 	-50 ... +200 °C (-58 ... +392 °F) -60 ... +400 °C (-76 ... +752 °F) -200 ... +200 °C (-328 ... +392 °F) Contact ceg.smpi@siemens.com for details.	¹⁾ When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 4/72. ²⁾ Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)	
Process pressure	Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 4/72.		
<ul style="list-style-type: none"> Standard (PFA) High temperature version (Stainless steel) 	-1 ... +150 bar g (-14.6 ... +2 175 psi g) -1 ... +35 bar g (-14.6 ... +507.6 psi g)		

Level Measurement

Point level measurement – Capacitance switches

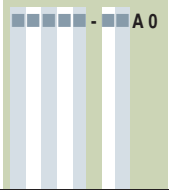
Pointek CLS500

Pointek CLS500 probe version	Standard	HT Series
Process connection types	Standard (PFA) (7ML5601, 7ML5602, 7ML5603)	High Temperature (Stainless steel) (7ML5604)
Threaded	Available as standard	–
Flange	Available as standard	Available as standard
Process connection materials		
316L stainless steel	Available as standard	Available as standard
Probe insulation		
None	–	HT Stainless: available as standard
PFA	Available as standard	–
Length parameters		
Max. rod length	1 000 mm (40 inch)	1 000 mm (40 inch)
Process conditions¹⁾		
Max. process pressure	150 bar g (2 175 psi g)	Stainless steel: ²⁾ 35 bar g (507 psi g)
Max. process temperature	200 °C (392 °F)	400 °C (752 °F)

¹⁾ When operation is in areas classified as hazardous, observe restrictions according to relevant certificate.
See also Pressure/Temperature curves on page 4/72. Pressure rating of process seal is temperature dependent.

²⁾ Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 4/72.

– Not available as standard

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
<p>Pointek CLS500, threaded Inverse frequency shift capacitance level and material detection switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure. CLS500 also has the ability to tune out build-up on the probe.</p> <p>➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>	<p>➤ 7ML5601-</p> 	<p>Further designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p>	
<p>Electronic transmitter No transmitter supplied MSP 2002-1 (330 pF)</p>	<p>0 1</p>	<p>Total insertion length: enter the total insertion length in plain text description</p>	<p>Y01</p>
<p>Process connection 3/4" 1" 1 1/4" 1 1/2" 2"</p>	<p>A B C D E</p>	<p>Active Shield length - minimum length is 50 mm Y02: to mm¹⁾</p>	<p>Y02</p>
<p>Threaded connection and rating NPT [(Taper), ANSI/ASME B1.20.1] R [(BSPT), EN 10226/PT (JIS-T) JIS B 0203] G [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]</p>	<p>A B D</p>	<p>Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text</p>	<p>Y15</p>
<p>Probe insulation/material of process connection PFA insulation/316L stainless steel</p>	<p>1</p>	<p>Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000</p>	<p>C11</p>
<p>Approvals General Purpose: CE, CSA/FM, RCM CSA/FM Class I, Div. 2, Groups A, B, C, D T4; ATEX II 3GD 2D EEx nA [ib] IIC T6 to T4 T100 °C; CSA/FM Class II and III Div. 1, Groups E, F, G T4 ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 T100 °C FM Class I, Div. 1, Groups A, B, C, D T4</p>	<p>1 2 4 6</p>	<p>Inspection Certificate Type 3.1 per EN 10204</p>	<p>C12</p>
<p>Probe/electrode diameter 16 mm (0.63 inch) rigid rod, minimum insertion length 200 mm (7.9 inch), maximum insertion length 1 000 mm (39.4 inch)¹⁾</p>	<p>1</p>	<p>Operating Instructions</p> <p>Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.</p>	<p>See page 4/71</p>
<p>Thermal isolator/remote version Rigid thermal isolator [for process connection temperature over 85 °C (185 °F)] No thermal isolator</p>	<p>A B</p>	<p>Pointek Specials</p>	<p>See page 4/71</p>
<p>¹⁾ Add Order code Y01 and Y02 in plain text: "Insertion/active shield length to mm"</p>		<p>¹⁾ See dimension drawings on page 4/77 for further explanation of Y02</p>	

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS500

Selection and Ordering data

Pointek CLS500, welded flange

Inverse frequency shift capacitance level and material detection switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure. CLS500 also has the ability to tune out build-up on the probe.

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Electronic transmitter

MSP 2002-1 (330 pF)

Process connection and pressure rating

Welded flange, 316L stainless steel, raised face

- 2" ASME, 150 lb
- 2" ASME, 300 lb
- 3" ASME, 150 lb
- 3" ASME, 300 lb¹⁾
- 4" ASME, 150 lb¹⁾
- 4" ASME, 300 lb¹⁾
- 6" ASME, 150 lb¹⁾
- 6" ASME, 300 lb¹⁾

Welded flange, 316L stainless steel,
Type A flat faced

- DN 50 PN 16
- DN 50 PN 40
- DN 80 PN 16
- DN 80 PN 40
- DN 100 PN 16¹⁾
- DN 125 PN 16¹⁾

(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)

Probe insulation/material of process connection

PFA insulation/316L stainless steel

Approvals

- General Purpose 1
- CSA/FM Class I, Div. 2, Groups A, B, C, D T4; 2
- ATEX II 3GD 2D EEx nA [ib] IIC T6 to T4 T100 °C; 4
- CSA/FM Class II and III Div. 1, Groups E, F, G T4 6
- ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 T100 °C
- FM Class I, Div. 1, Groups A, B, C, D T4

Probe/electrode diameter

16 mm (0.63 inch) rigid rod, min. length 200 mm (7.9 inch), max. length 1 000 mm (39.4 inch)

Thermal isolator

- Rigid thermal isolator A
- [for process temperature over 85 °C (185 °F)]
- No thermal isolator B

Article No.

➤ 7ML5602-

AA - A0

1

AA

AB

BA

BB

CA

CB

DA

DB

EC

ED

FC

FD

GC

HC

1

1

2

4

6

1

A

B

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Total insertion length: enter the total insertion length in plain text description

Active Shield length - minimum length is 50 mm. Y02: to mm¹⁾

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text

Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000

Inspection Certificate Type 3.1 per EN 10204

Operating Instructions

Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.

Pointek Specials

Order code

Y01

Y02

Y15

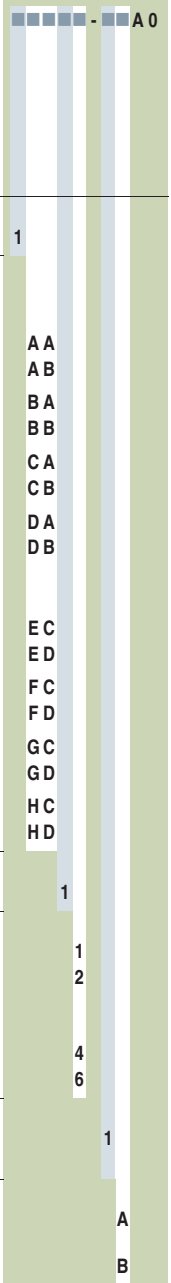
C11

C12

See page 4/71

See page 4/71

¹⁾ See dimensional drawings on page 4/77 for further explanation of Y02

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
<p>Pointek CLS500, single piece flange</p> <p>Inverse frequency shift capacitance level and material detection switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure. CLS500 also has the ability to tune out build-up on the probe.</p> <p>Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>	<p>7ML5603- A 0</p> 	<p>Further designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p> <p>Total insertion length: enter the total insertion length in plain text description Y01</p> <p>Active Shield length - minimum length is 50 mm. Y02: to mm¹⁾ Y02</p> <p>Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text Y15</p> <p>Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 C11</p> <p>Inspection Certificate Type 3.1 per EN 10204 C12</p>	
<p>Electronic transmitter</p> <p>MSP 2002-1 (330 pF)</p>	<p>1</p>	<p>Operating Instructions</p> <p>Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and manual library.</p>	<p>See page 4/71</p>
<p>Process connection and pressure rating</p> <p>Single piece flange, 316L stainless steel, raised face</p> <p>2" ASME, 150 lb 2" ASME, 300 lb 3" ASME, 150 lb 3" ASME, 300 lb¹⁾ 4" ASME, 150 lb¹⁾ 4" ASME, 300 lb¹⁾ 6" ASME, 150 lb¹⁾ 6" ASME, 300 lb¹⁾</p> <p>Single piece flange, 316L stainless steel, Type B1 raised faced</p> <p>DN 50 PN 16 DN 50 PN 25 DN 80 PN 16 DN 80 PN 25 DN 100 PN 16¹⁾ DN 100 PN 25¹⁾ DN 125 PN 16¹⁾ DN 125 PN 25¹⁾</p>	<p>AA AB BA BB CA CB DA DB EC ED FC FD GC GD HC HD</p>	<p>Accessories</p>	<p>See page 4/71</p>
<p>Probe insulation/material of process connection</p> <p>PFA insulation/316L stainless steel</p>	<p>1</p>	<p>¹⁾ See dimensional drawings on page 4/77 for further explanation of Y02</p>	
<p>Approvals</p> <p>General Purpose: CE, CSA/FM, RCM</p> <p>CSA/FM Class I, Div. 2, Groups A, B, C, D T4; ATEX II 3GD 2D EEx nA [ib] IIC T6 to T4 T100 °C; CSA/FM Class II and III Div. 1, Groups E, F, G T4</p> <p>ATEX II 1/2 GD EEx d [ja] IIC T6 to T1 T100 °C</p> <p>FM Class I, Div. 1, Groups A, B, C, D T4</p>	<p>1 2 4 6</p>	<p>Probe/electrode diameter</p> <p>16 mm (0.63 inch) rigid rod, maximum length 1 000 mm (39.4 inch) (Y01)</p>	
<p>Thermal isolator</p> <p>Rigid thermal isolator [for process connection temperature over 85 °C (185 °F)]</p> <p>No thermal isolator</p>	<p>A B</p>		

¹⁾ Custom shipping methods required. Contact factory for more details

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS500

Selection and Ordering data	Article No.
Pointek CLS500 High temperature Inverse frequency shift capacitance level and material detection switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure. CLS500 also has the ability to tune out build-up on the probe.	7ML5604-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Electronic transmitter MSP 2002-1 (330 pF)	1
Process connection and pressure rating 316L stainless steel, raised face ¹⁾	
2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb 2" ASME, 900 lb 3" ASME, 150 lb 3" ASME, 300 lb ²⁾ 3" ASME, 600 lb ²⁾ 3" ASME, 900 lb ²⁾ 4" ASME, 150 lb ²⁾ 4" ASME, 300 lb ²⁾ 4" ASME, 600 lb ²⁾ 4" ASME, 900 lb ²⁾ 6" ASME, 150 lb ²⁾ 6" ASME, 300 lb ²⁾ 6" ASME, 600 lb ²⁾ 6" ASME, 900 lb ²⁾	A 1 A 2 A 3 A 4 B 1 B 2 B 3 B 4 C 1 C 2 C 3 C 4 D 1 D 2 D 3 D 4
316L stainless steel, Type B1 flat faced	
DN 50 PN 16 DN 50 PN 25 DN 50 PN 40 DN 50 PN 63 DN 80 PN 16 DN 80 PN 25 DN 80 PN 40 ²⁾ DN 80 PN 63 ²⁾ DN 100 PN 16 ²⁾ DN 100 PN 25 ²⁾ DN 100 PN 40 ²⁾ DN 100 PN 64 ²⁾ DN 125 PN 16 ²⁾ DN 125 PN 25 ²⁾ DN 125 PN 40 ²⁾ DN 125 PN 64 ²⁾	E 1 E 2 E 3 E 4 F 1 F 2 F 3 F 4 G 1 G 2 G 3 G 4 H 1 H 2 H 3 H 4
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	

Selection and Ordering data	Article No.
Pointek CLS500 High temperature Inverse frequency shift capacitance level and material detection switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure. CLS500 also has the ability to tune out build-up on the probe.	7ML5604-
Probe material of process connection No insulation/316L stainless steel ³⁾⁴⁾	1
Stilling well No stilling well	0
Approvals General Purpose CSA/FM Class I, Div. 2, Groups A, B, C, D T4; ATEX II 3GD 2D EEx nA [ib] IIC T6 to T4 T100 °C; CSA/FM Class II and III Div. 1, Groups E, F, G T4 ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 T100 °C FM Class I, Div. 1, Groups A, B, C, D T4	A B D F
Probe/electrode diameter Maximum length 1 000 mm (39.37 inch) ⁴⁾	A
Thermal isolator Rigid thermal isolator [for process connection temperature over 85 °C (185 °F)]	1

- ¹⁾ Welded flange for no insulation option only
- ²⁾ Custom shipping methods required
- ³⁾ Non-conductive material only, stainless steel non-insulated probe diameter 19 mm (0.75 inch)
- ⁴⁾ Add Order code Y01 and Y02 in plain text: "Insertion/active shield length to mm"
 Minimum insertion length depends on probe version selected. See dimensional drawings on page 4/77 for more details.

Selection and Ordering data	Order code
Further designs	
Please add *-Z to Article No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	Y01
Active Shield length - minimum length is 50 mm. Y02: to mm ¹⁾	Y02
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	
English	7ML1998-5GG03
German	7ML1998-5GG32
French	7ML1998-5GG11
Dutch	7ML1998-5GG41
Note: The Operating Instructions should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
Quick Start manual, multi-language	A5E32243995
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
Accessories	
<u>General Purpose</u>	
1/2" NPT General Purpose Cable Entry IP68/IP69K NEMA6, -40 ... -100 °C (-40 ... -212 °F), cable size 6 ... 12 mm (0.236 ... 0.472 inch)	7ML1830-1JA
M20x1.5 General Purpose Cable Entry IP68/IP69K NEMA6, -40 ... -100 °C (-40 ... -212 °F), cable size 7 ... 12 mm (0.275 ... 0.472 inch)	7ML1830-1JC
Transmitter, MSP 2002-1, 330 PF	7ML1830-1JP
<u>Hazardous Locations</u>	
1/2" NPT EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22, and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)	7ML1830-1JB
M20 EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22 and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)	7ML1830-1JD
Pointek Specials	See page 4/80

¹⁾ See dimensional drawings on page 4/77 for further explanation of Y02

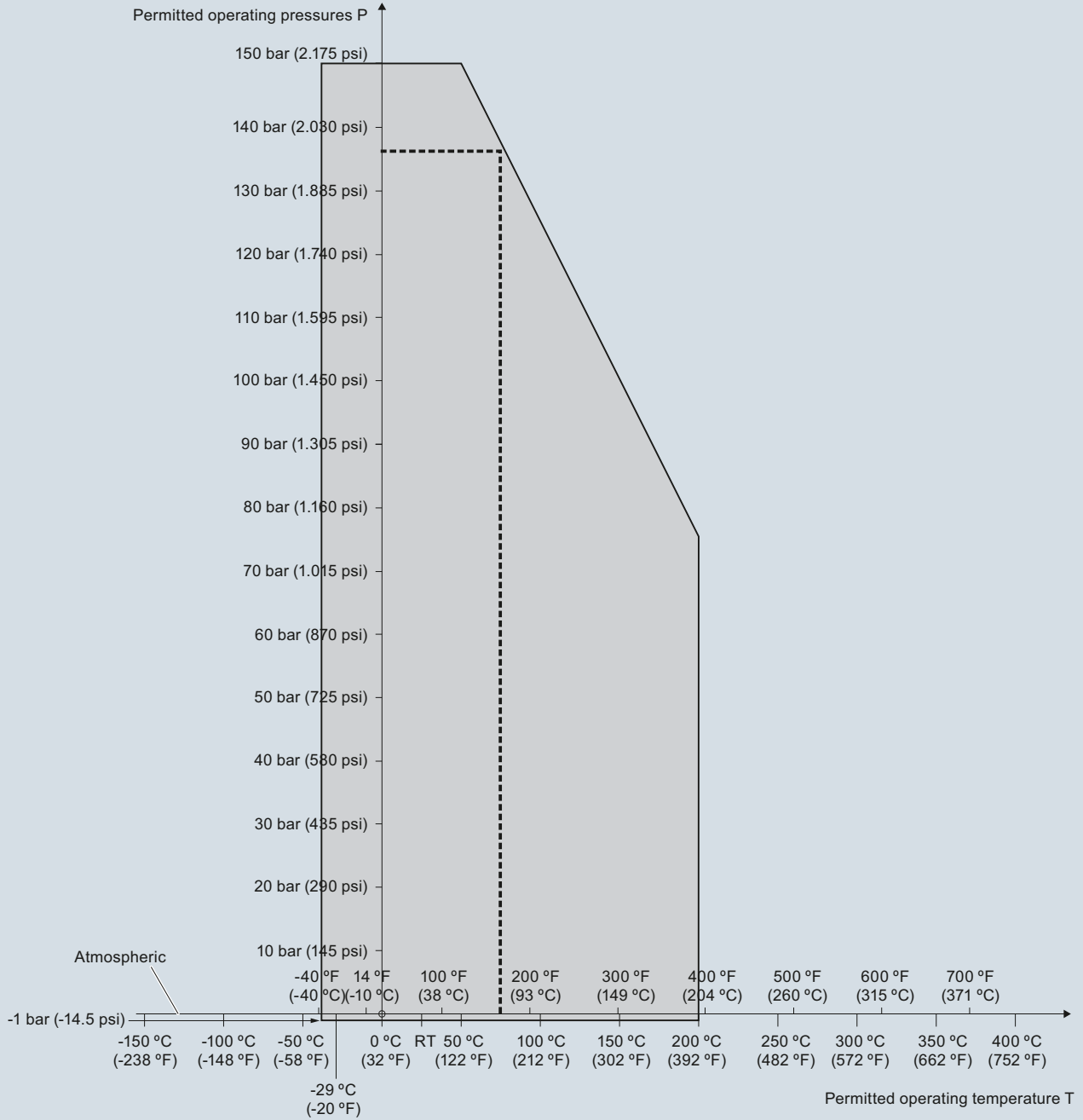
Level Measurement

Point level measurement – Capacitance switches

Pointek CLS500

Characteristic curves

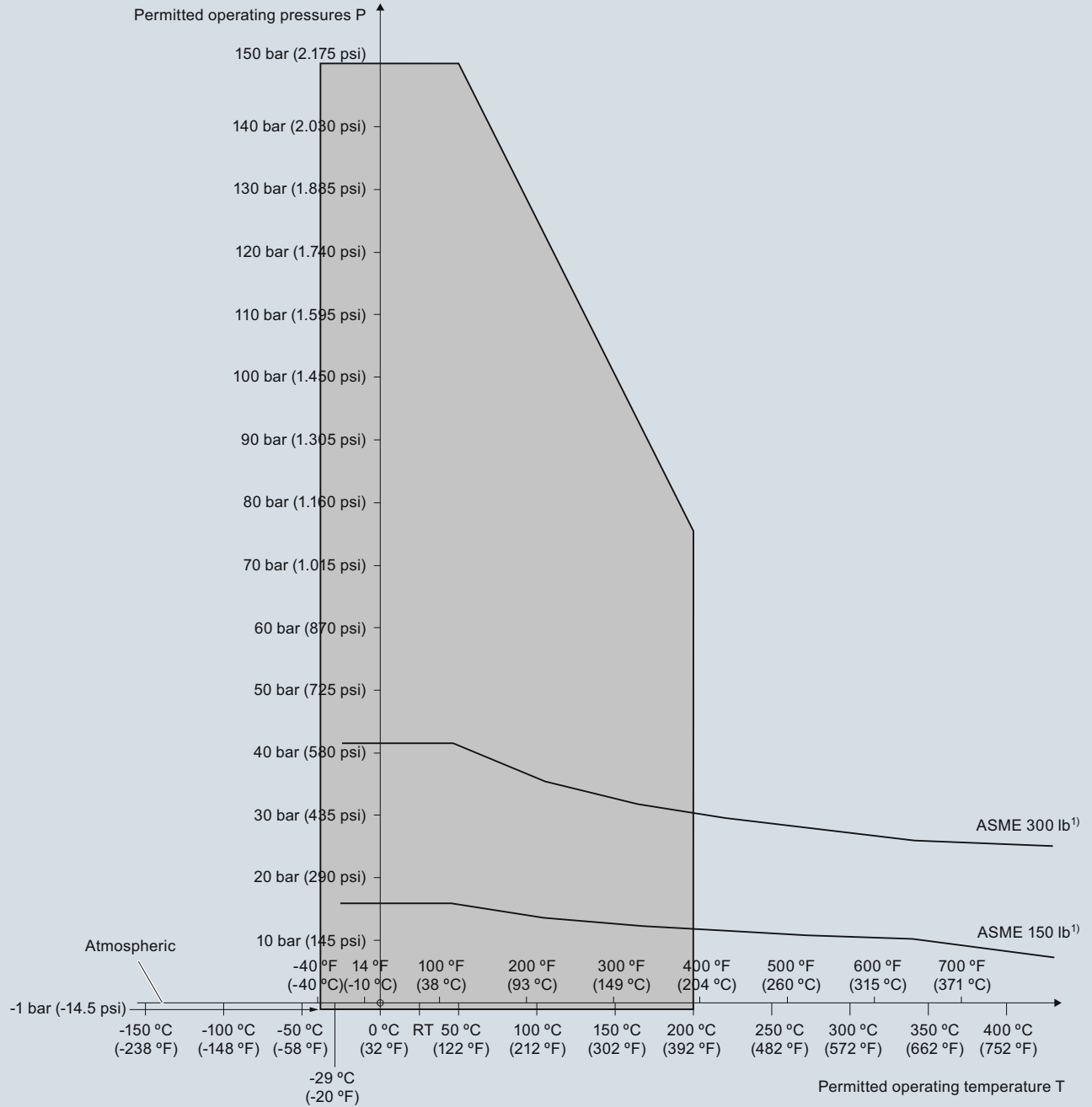
Pressure/temperature curve
CLS500 rod probes
Threaded process connections
(7ML5601)



----- Example:
Permitted operating pressure = 137 bar (1988 psi) at 75 °C

Pointek CLS500 Process Pressure/Temperature derating curves (7ML5601)

Pressure/temperature curve
CLS500 rod probes
ASME flanged process connections
(7ML5602 and 7ML5603)



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

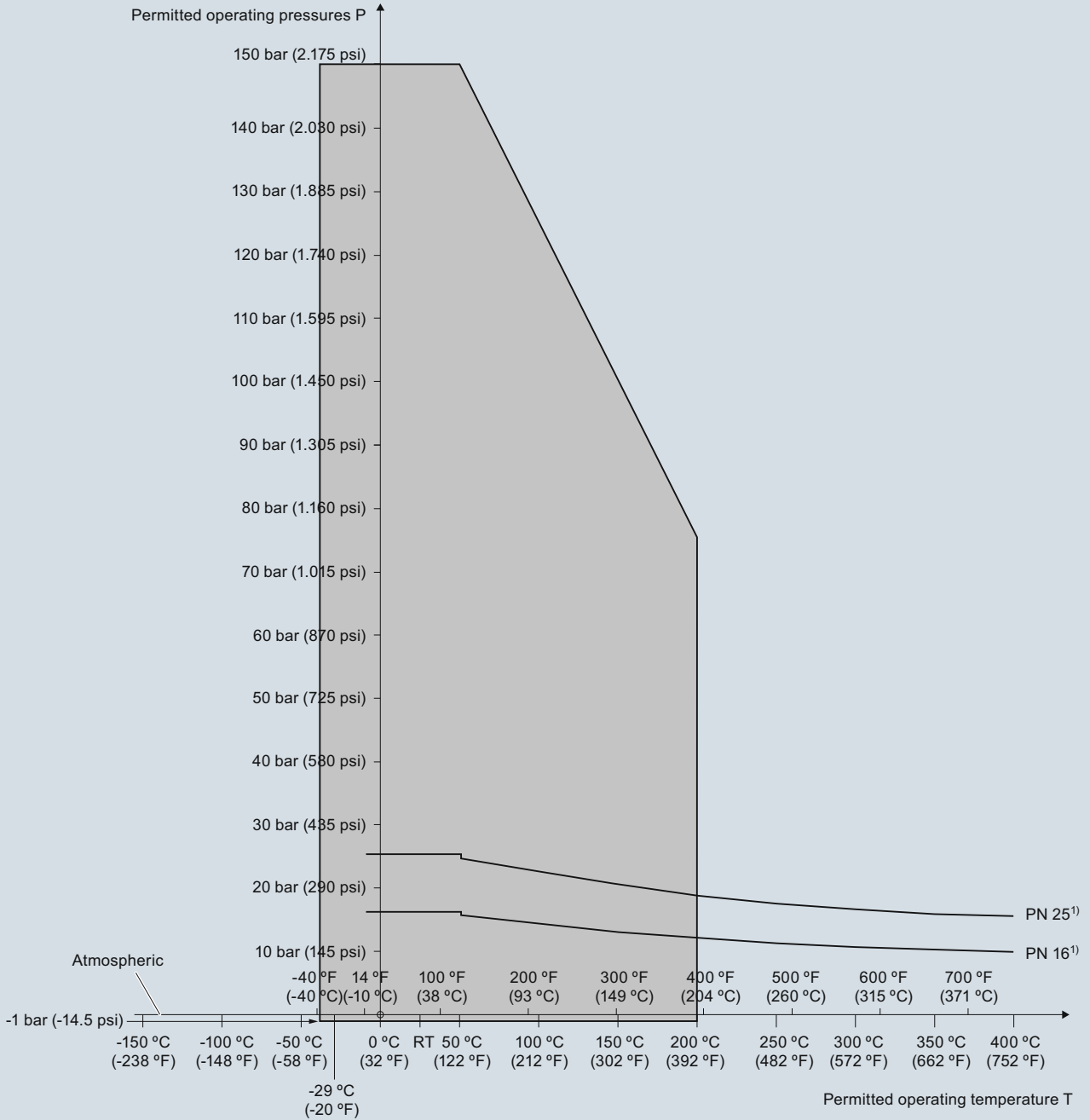
Pointek CLS500 Process Pressure/Temperature derating curves (7ML5602 and 7ML5603)

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS500

Pressure/temperature curve
CLS500 rod probes
EN flanged process connections
(7ML5602 and 7ML5603)

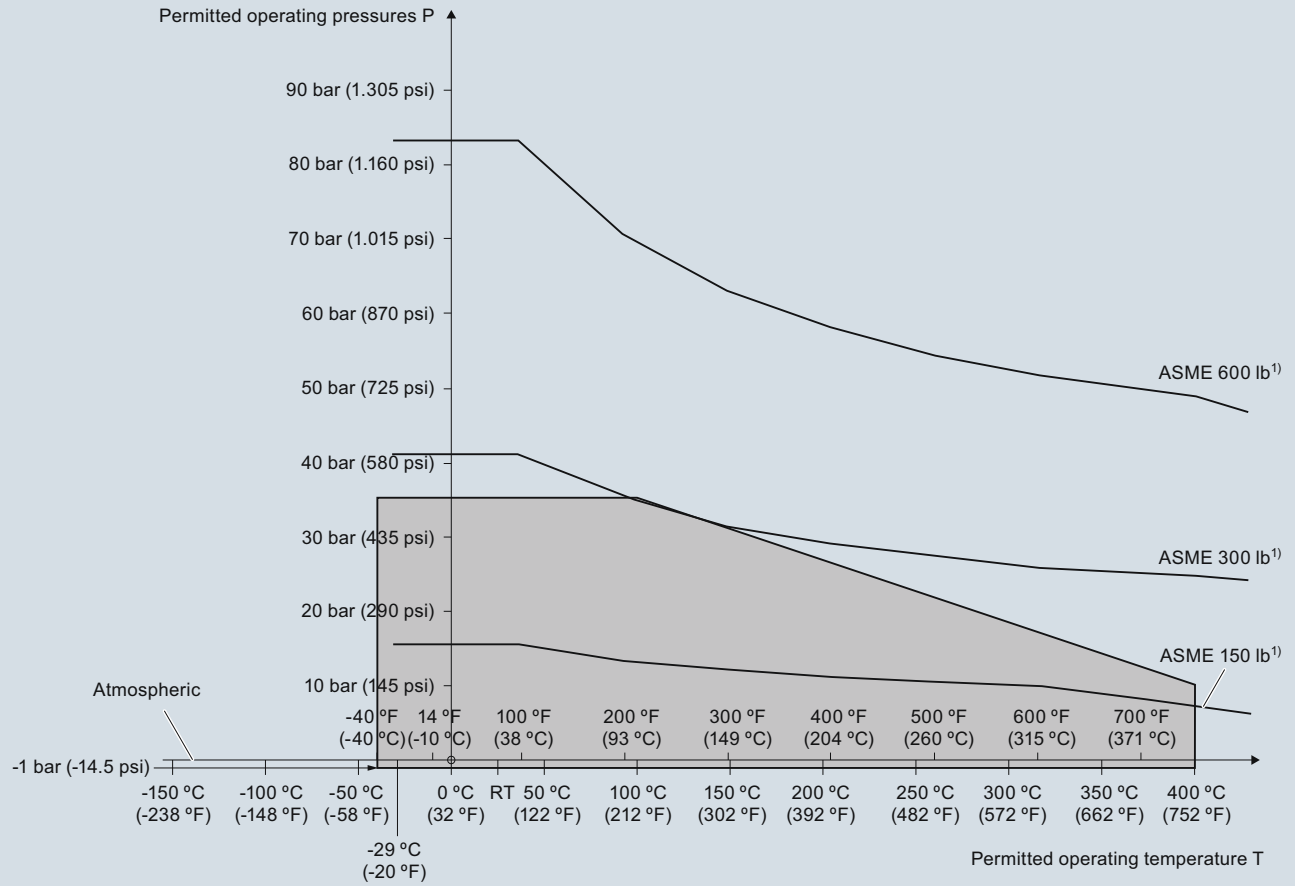


1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS500 Process Pressure/Temperature derating curves (7ML5602 and 7ML5603)

4

**Pressure/temperature curve
CLS500 high temperature (no insulation)
ASME flanged process connections
(7ML5604)**



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS500 Process Pressure/Temperature derating curves (7ML5604)

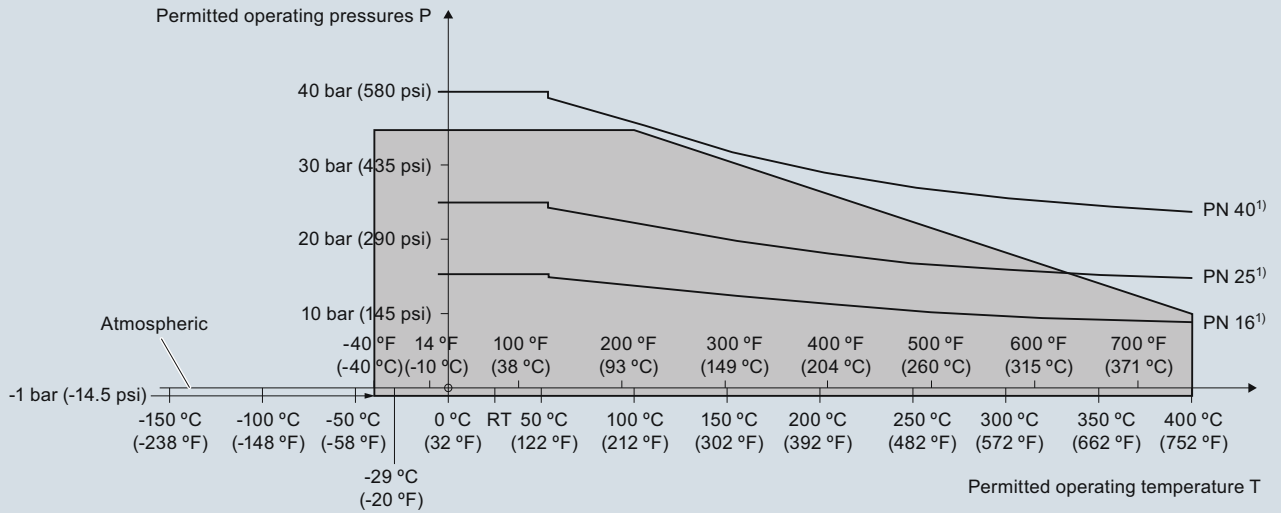
4

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS500

Pressure/temperature curve
CLS500 high temperature (no insulation)
EN flanged process connections
(7ML5604)

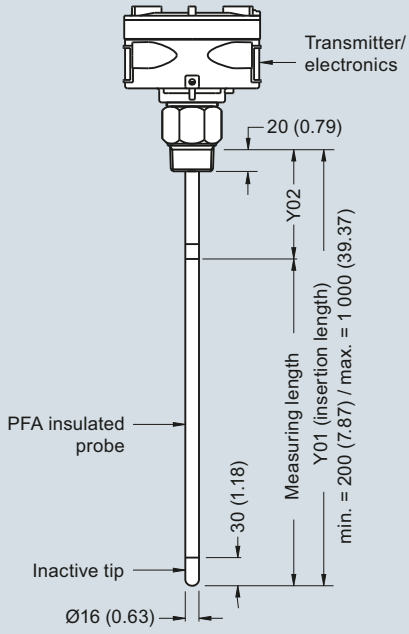


¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

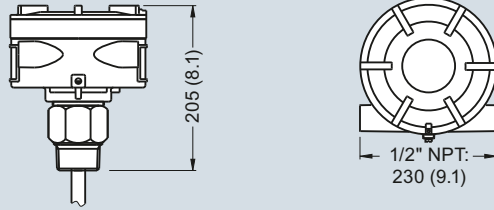
Pointek CLS500 Process Pressure/Temperature derating curves (7ML5604)

Dimensional drawings

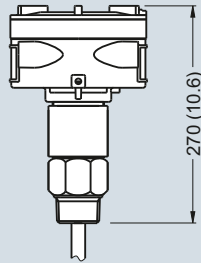
**Standard rod version
Threaded (7ML5601)**



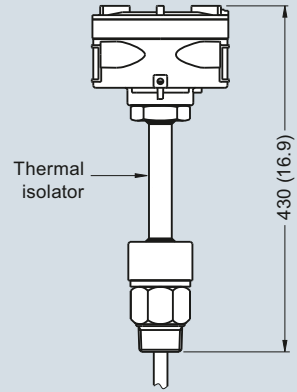
**Standard configuration
(7ML5601)**



**With explosion-proof seal option
(all versions)**



**With thermal isolator option
(all versions)**



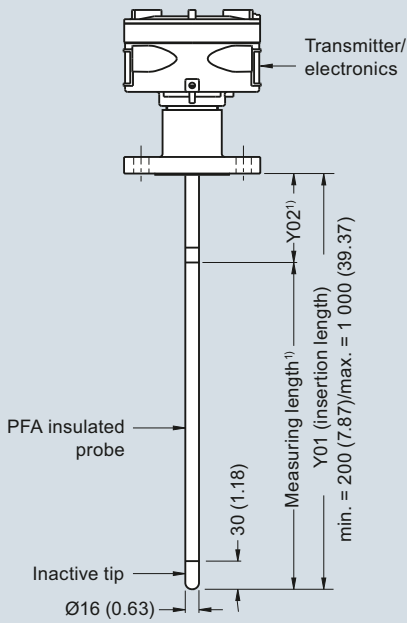
Pointek CLS500 - Threaded Process Connections, dimensions in mm (inch)

Level Measurement

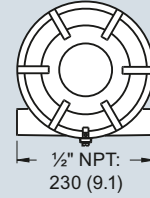
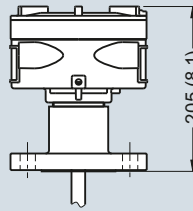
Point level measurement – Capacitance switches

Pointek CLS500

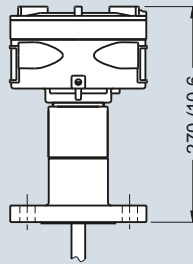
Standard Rod version
Welded Flange (7ML5602)
Single Piece Flange (7ML5603)



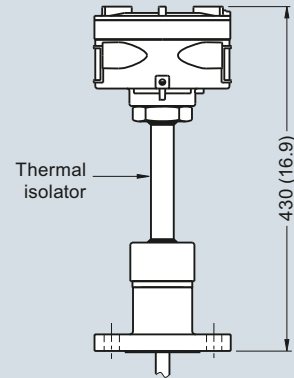
Standard configuration
(7ML5602, 7ML5603)



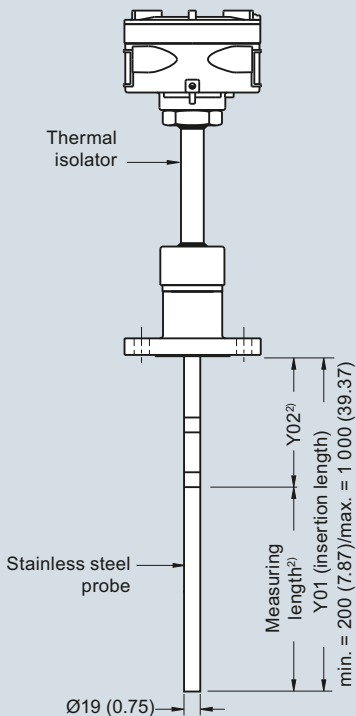
With explosion-proof seal option
(all versions)



With thermal isolator option
(all versions)



High temperature rod version
Welded Flange (7ML5604), Stainless steel rod⁴⁾



Flange Facing (raised face)	
Flange Class	Facing thickness
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/25/40/64	2 (0.08)

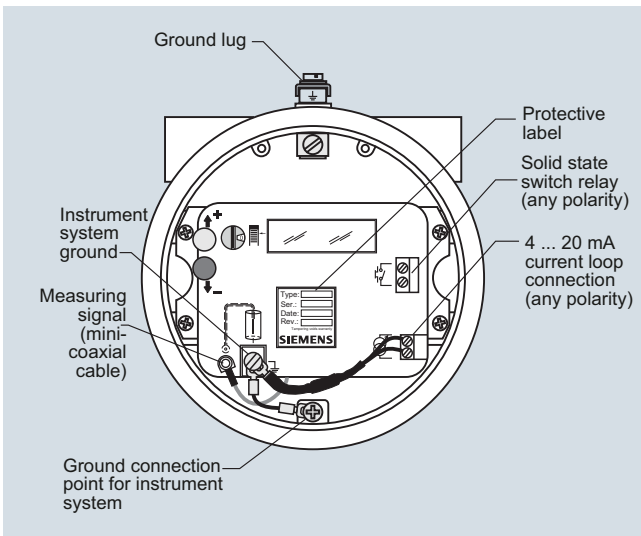
Notes:

- ¹⁾ Min. Y02 (active shield length) = 50 (1.96)
- ²⁾ Min. Y02 (active shield length) = 105 (4.13)
- ³⁾ Min. Y02 (active shield length) = 100 (3.94)
- ⁴⁾ Non conductive materials only

Insertion length does not include any raised face/gasket face dimension (see Flange Facing Table above)

Pointek CLS500 - Flanged Process Connections, dimensions in mm (inch)

Schematics



Pointek CLS500 connections

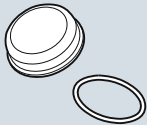

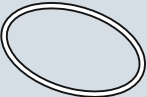
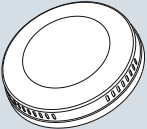
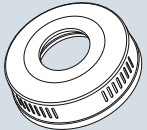

Level Measurement

Point level measurement – Capacitance switches

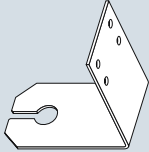


Pointek CLS Specials

Selection and ordering data

Pointek Specials¹⁾

	Article No.
CLS100 Polycarbonate Lid and Gasket, FKM	
	
Kit, Lid and gasket, CLS100 enclosure version	A5E01163671
CLS100 Miscellaneous Parts	
Custom length of cable is available only for 7ML5501-xxx1x and 7ML5501-xxx5x ²⁾	
CLS200 Gasket (IP65), Synprene	
	
Spare gasket, enclosure version (IP65 versions only)	A5E01163672
CLS200 Gasket (IP68), Silicone	
	
Spare gasket, enclosure version (IP68 versions)	A5E01163673
CLS200 Blind Lid	
	
Spare aluminum blind lid (for standard versions only)	A5E01163674
CLS200 Lid with window	
	
Spare aluminum lid with window	A5E01163676
CLS200 Sensor Kit for cable units	
	
Kit, Sensor for cable units, PPS, Standard, FKM	A5E01163677



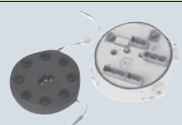

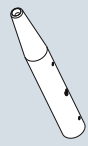
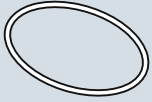
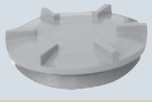
Pointek Specials¹⁾

	Article No.
Kit, Sensor for cable units, PPS, Digital, FKM	A5E01163678
Kit, Sensor for cable units, PPS, Standard, FFKM	A5E01163679
Kit, Sensor for cable units, PPS, Digital, FFKM	A5E01163680
Kit, Sensor for cable units, PVDF, Standard, FKM	A5E01163681
Kit, Sensor for cable units, PVDF, Digital, FFKM	A5E01163682
Kit, Sensor for cable units, PVDF, Standard, FFKM	A5E01163683
Kit, Sensor for cable units, PVDF, Digital, FFKM	A5E01163684
CLS200 Mounting Bracket, 316L stainless steel	
	
Spare mounting bracket	A5E01163685
CLS200 PROFIBUS Connector (IP65)	
	
Spare, PROFIBUS connector (IP65 versions only)	A5E01163686
CLS200 Miscellaneous Parts	
CLS200 with FFKM O-rings (any version) ²⁾	
CLS200 Electronics	
Test magnet, digital version	7ML1830-1JE
Amplifier/power supply kit, standard version	A5E03251681
Amplifier/power supply, digital version	7ML1830-1JF
LCD display, digital version	7ML1830-1JK
CLS300 Cable Extensions, 316L stainless steel	
	
Kit, stainless steel cable extension, 1 m, adjustable by customer	A5E01163688
Kit, stainless steel cable extension, 3 m, adjustable by customer	A5E01163689
Kit, stainless steel cable extension, 5 m, adjustable by customer	A5E01163690
Kit, stainless steel cable extension, 10 m, adjustable by customer	A5E01163691
Kit, stainless steel cable extension, 15 m, adjustable by customer	A5E01163693
Kit, stainless steel cable extension, 20 m, adjustable by customer	A5E01163695

Level Measurement

Point level measurement – Capacitance switches

Pointek CLS Specials

Pointek Specials ¹⁾	Article No.	Pointek Specials ¹⁾	Article No.
CLS300 Cable Extensions, 316 stainless steel with PFA coating Kit, PFA cable extension, 1 m, adjustable by customer Kit, PFA cable extension, 3 m, adjustable by customer Kit, PFA cable extension, 5 m, adjustable by customer Kit, PFA cable extension, 10 m, adjustable by customer Kit, PFA cable extension, 15 m, adjustable by customer Kit, PFA cable extension, 20 m, adjustable by customer		CLS300 Electronics Kits with drivers (for rod or cable versions) Kit, Electronics with driver, standard CLS300. To be used in rod or cable versions with length less than 5 m. ³⁾⁴⁾ Kit, Electronics with driver, digital CLS300. To be used in rod or cable versions with length less than 5 m. ³⁾⁴⁾ CLS300 Electronics Kits with drivers (for cable versions) Kit, Electronics with driver, standard CLS300. To be used in cable versions with length greater than 5 m. ³⁾⁴⁾ Kit, Electronics with driver, digital CLS300. To be used in cable versions with length greater than 5 m. ³⁾⁴⁾ CLS300 Electronics Test magnet, digital version Amplifier/power supply kit, standard version Amplifier/power supply, digital version LCD display, digital version CLS300 Weight Kit, 316L stainless steel Kit, Spare stainless steel weight. To be used in any cable version of CLS300 CLS500 Gasket (IP65), Silicone Spare gasket, CLS500 enclosure version, IP65 CLS500 Blind Lid Spare CLS500 aluminum blind lid CLS500 Electronics Kit Transmitter, MSP 2002-1, 330 PF	
	A5E01163697		A5E01163723
	A5E01163698		A5E01163725
	A5E01163699		
	A5E01163700		A5E01163724
	A5E01163701		A5E01163726
	A5E01163702		A5E01163727
CLS300 Rod Kits, 316L stainless steel Kit, stainless steel rod 180 mm (7.09 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 350 mm (13.78 inch). Kit, stainless steel rod 330 mm (12.99 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 500 mm (19.69 inch). Kit, stainless steel rod 580 mm (22.83 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 750 mm (29.53 inch). Kit, stainless steel rod 830 mm (32.68 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 1 000 mm (39.37 inch). Kit, stainless steel rod 1 330 mm (52.36 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 1 500 mm (59.06 inch). ²⁾ Kit, stainless steel rod 1 830 mm (72.05 inch) to be used with CLS300 units only (with standard active shield). Insertion length after installation is 2 000 mm (78.74 inch). ²⁾ Kit, stainless steel rod customized length up to 1 m ²⁾ Kit, stainless steel rod customized length up to 2 m ²⁾			
	A5E01163719	A5E01163728	
	A5E01163720		
	A5E01163721	A5E01163729	
	A5E01163722		
	A5E01163722	A5E01163729	
	A5E01163722	7ML1830-1JP	

¹⁾ Special flange sizes and facings are available. Please contact ceg.smpi@siemens.com for part number and pricing. Submit Application Questionnaire found on page 4/11.

²⁾ Please contact ceg.smpi@siemens.com for part number and pricing.

³⁾ For General Purpose approvals only.

⁴⁾ To maintain approvals, qualified trained Siemens personnel required for part replacement.

Please contact ceg.smpi@siemens.com for special requests.

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL100

Overview



SITRANS LVL100 is a compact vibrating level switch for material detection in liquid and slurry applications such as overflow, high, low and demand applications, as well as pump protection. It is ideal for use in confined spaces.

Benefits

- Proven vibrating level switch technology for liquids
- Compact insertion length of 40 mm (1.57 inch) for confined space applications
- Fault monitoring for corrosion, loss of vibration, or line break to the piezo drive
- Integrated test function to confirm correct operation

Application

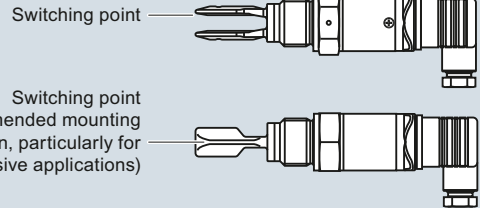
SITRANS LVL100 is a compact level switch designed for industrial use in all areas of process technology and can be used for material detection with liquids and slurries. With an insertion length of only 40 mm (1.57 inch), SITRANS LVL100 can be mounted in small pipes and confined space applications. It is virtually unaffected by the chemical and physical properties of the liquid. The LVL100 can be used in difficult conditions including turbulence, air bubbles, foam generation, buildup, or external vibration.

The tuning fork is piezoelectrically energized and vibrates at a mechanical resonance frequency of approximately 1 200 Hz. The vibration frequency changes when the tuning fork is covered by the medium. This change is detected by the integrated oscillator and converted into a switching command. The integrated electronics evaluate the level signal and output a switching signal to connected devices.

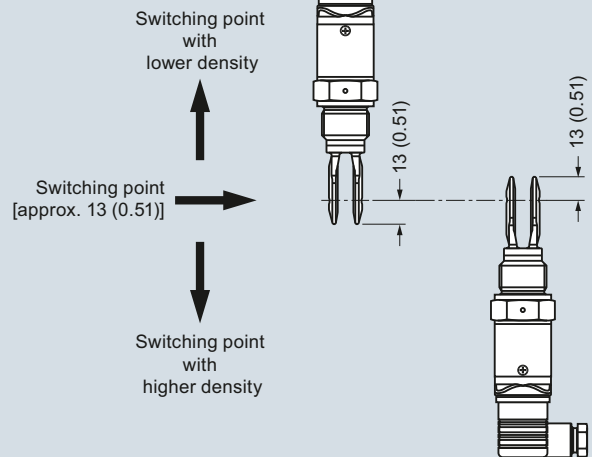
- Key Applications: For use in liquids and slurries, for level measurement, overflow, and dry run protection

Configuration

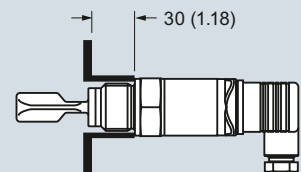
Horizontal mounting



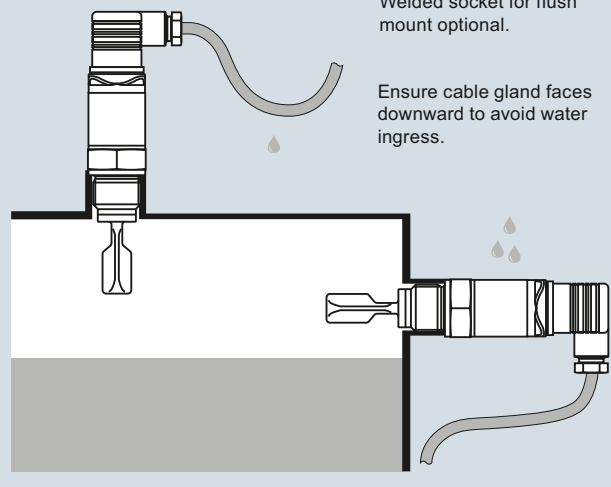
Vertical mounting



Horizontal mounting in viscous or adhesive applications



Moisture protection



SITRANS LVL100 Installation, dimensions in mm (inch)

Level Measurement

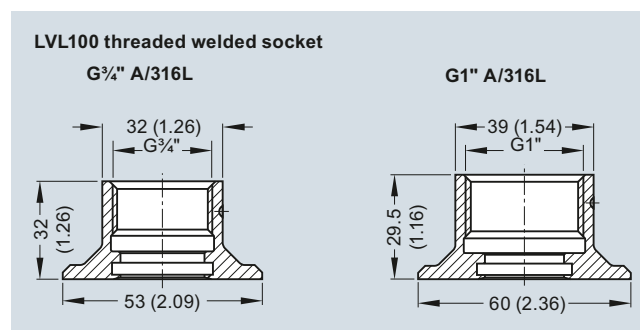
Point level measurement – Vibrating switches

SITRANS LVL100

Technical specifications

Mode of operation	
Measuring principle	Vibrating point level switch
Input	
Measured variable	High and low and demand
Output	
Output options	Contactless electronic switch Transistor output PNP
Measuring Accuracy	
• Hysteresis	Approx. 2 mm (0.08 inch) with vertical installation
• Switching delay	Approx. 500 ms (on/off)
• Frequency	Approx. 1 200 Hz
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +70 °C (-40 ... +158 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	
• Temperature	
- Standard	-40 ... +100 °C (-40 ... +212 °F)
- High temperature option	-40 ... +150 °C (-40 ... +302 °F)
• Pressure (vessel)	-1 ... 64 bar g (-14.5 ... 928 psi g)
• Density	0.7 ... 2.5 g/cm ³ (0.025 ... 0.09 lb/in ³)
Design	
Material	
• Enclosure	316L and Plastic PEI
• Tuning fork	316L (1.4404 or 1.4435)
• Process connection (threaded)	316L (1.4404 or 1.4435)
• Process seal	Klingersil C-4400
Process connection	
• Pipe thread, cylindrical (ISO 228 T1)	G ½" A, G ¾" A or G 1" A
• Pipe thread, tapered	½" NPT, ¾" NPT or 1" NPT
• Hygienic fittings	Bolting DN 40 PN 40 Tri-clamp 1", 1½", 2" PN 10
Degree of protection	
	IP65/Type 4/NEMA 4 (with DIN 43650 valve plug), IP66/67 or IP68 (with M12 connector)
Conduit entry	
Weight (housing)	1 x M12 [IP66/IP67 or IP68 (0.2 bar)] 250 g (9 oz)
Power supply	
Supply voltage	20 ... 253 V AC, 50/60 Hz 20 ... 253 V DC
Power consumption	Max. 0.5 W
Certificates and approvals	
	• Overfill protection (WHG) • Shipping approvals

Options



SITRANS LVL100 welded socket, dimensions in mm (inch)

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL100

Selection and Ordering data

Article No.

SITRANS LVL100

Compact vibrating level switch for use in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. Ideal for use in confined spaces.

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Approvals

Without approvals 1
 Shipping approvals⁵⁾ 2
 Overfill protection (WHG)¹⁾ 3

Process temperature

Standard -40 ... +100 °C (-40 ... +212 °F)²⁾ A
 Extended -40 ... +150 °C (-40 ... +302 °F)²⁾ B
 Hygienic applications -40 ... +150 °C (-40 ... +302 °F)³⁾ C

Process connection

Thread G $\frac{3}{4}$ " A PN 64/316L A 0
 Thread G $\frac{3}{4}$ " A PN 64/316L Ra < 0.8 µm A 1
 Thread $\frac{3}{4}$ " NPT PN 64/316L A 2
 Thread $\frac{3}{4}$ " NPT PN 64/316L Ra < 0.8 µm A 3
 Thread G1" A PN 64/316L A 4
 Thread G1" A PN 64/316L Ra < 0.8 µm A 5
 Thread 1" NPT PN 64/316L A 6
 Thread 1" NPT PN 64/316L Ra < 0.8 µm A 7
 Tri-Clamp 1" PN 16 DIN 32676/316L Ra < 0.8 µm A 8
 Tri-Clamp 1½" PN 16 DIN 32676/316L Ra < 0.8 µm B 0
 Tri-Clamp 2" PN 16 DIN 32676/316L Ra < 0.8 µm B 1
 Bolting DN25 PN 40 DIN 11851/316L Ra < 0.8 µm B 2
 Bolting DN40 PN 40 DIN 11851/316L Ra < 0.8 µm B 3
 Bolting DN50 PN 25 DIN 11851/316L Ra < 0.8 µm B 4
 SMS DN38 PN 6 316L Ra < 0.8 µm B 5
 Hygienic fitting with compression nut F40 PN 25/316L Ra < 0.8 µm B 6
 Thread G½" (DIN 3852-A) PN64 / 316L C 0
 Thread G½" (DIN 3852-A) PN64 / 316L Ra < 0.8 µm C 1
 Thread ½" NPT (ASME B1.20.1) PN 64/316L C 2
 Thread ½" NPT (ASME B1.20.1) PN 64/316L Ra < 0.8 µm C 3

Electronics

Contactless electronic switch 20 ... 250 V AC/DC⁴⁾ 1
 Transistor output PNP 10 ... 55 V DC 2

Housing

316L 1

Electrical connection/Protection

M12x1/IP67 A
 According to DIN 43650 including plug/IP65 B
 Acc. to DIN 43650 incl. plug with QuickOn connection/IP65 C
 M12x1 incl. 5 m cable/IP68 (0.2 bar) D

1) Available with process connection A0, A2, A4, and A6 only

2) Available with process connection A1, A3, A5, and A7 ... B6 only

3) Available with Electrical connection/Protection option B and C only

4) Available with Process Temperature option A only

5) Available with Process Temperature option A only

➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Cleaning including certificate (oil, grease and silicone free) W01

Identification Label, foil laser marking ◆ Y16

Acceptance test certificate 3.1 for instrument ◆ C12

Acceptance test Certificate 2.2 for material EN10204 ◆ C15

Additional Operating Instructions

LVL100 (Contactless electronic switch)

• English 7ML1998-5KN01
 • French 7ML1998-5KN11
 • Spanish 7ML1998-5KN21
 • German 7ML1998-5KN31

LVL100 (Transistor PNP)

• English 7ML1998-5KP01
 • French 7ML1998-5KP11
 • Spanish 7ML1998-5KP21
 • German 7ML1998-5KP31

This device is shipped with the Siemens Milltronics manual DVD containing the Operating Instructions library.

Spare Parts

LVL100 Threaded Welded Socket

G $\frac{3}{4}$ " A/316L with FKM Seal 7ML1930-1EE

G1" A/316L with FKM Seal 7ML1930-1EF

M27x1.5/316L with FKM Seal 7ML1930-1EG

G $\frac{3}{4}$ " A/316L with EPDM Seal 7ML1930-1EH

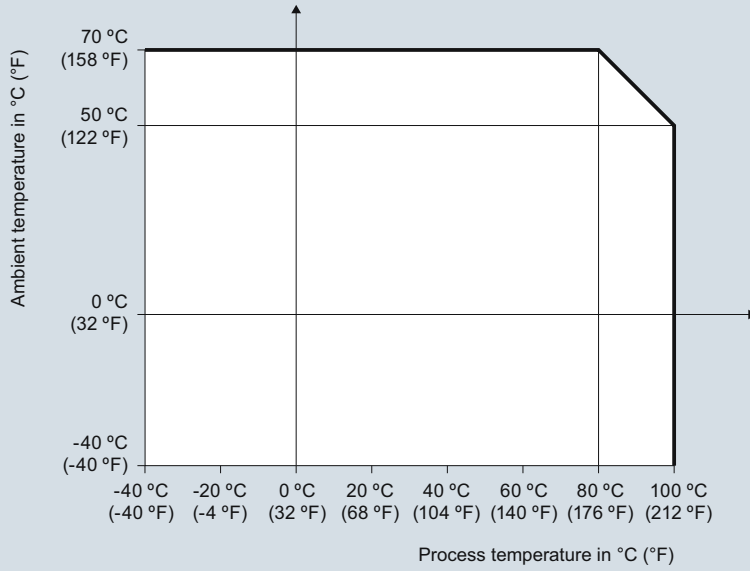
G1" A/316L with EPDM Seal 7ML1930-1EJ

M27x1.5/316L with EPDM Seal 7ML1930-1EK

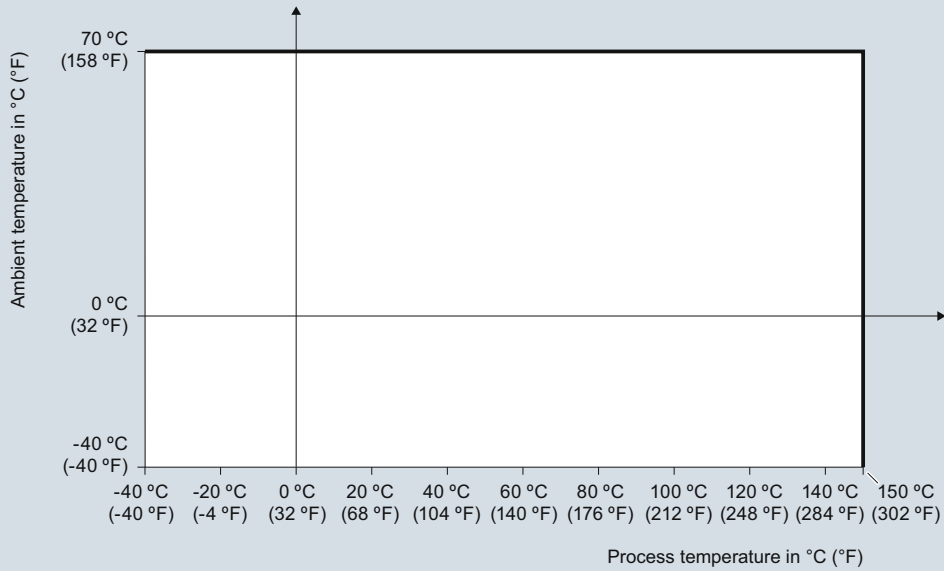
➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Characteristic curves

Ambient temperature to process temperature dependency (standard version)



Ambient temperature to process temperature dependency (high temperature version)



SITRANS LVL100 Ambient Temperature/Process Temperature derating curves

4

Level Measurement

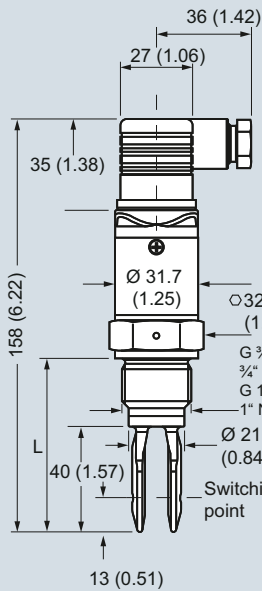
Point level measurement – Vibrating switches

SITRANS LVL100

Dimensional drawings

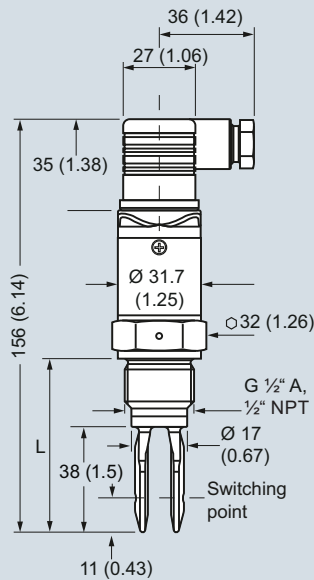
SITRANS LVL100 (standard)

Thread G 3/4" A, G 1" A
(DIN ISO 228/1),
3/4" NPT or 1" NPT
(valve plug ISO 4400)



L =
Length with G 3/4" A, 3/4" NPT: 66 (2.6)
Length with G 1" A, 1" NPT: 69 (2.7)

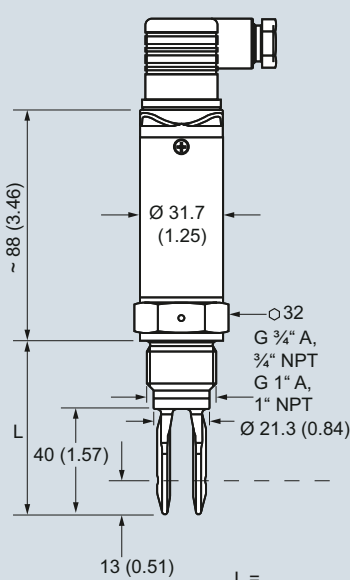
Thread G 1/2" A
(DIN ISO 228/1),
1/2" NPT
(valve plug ISO 4400)



L =
Length with G 1/2" A, 1/2" NPT: 62 (2.4)

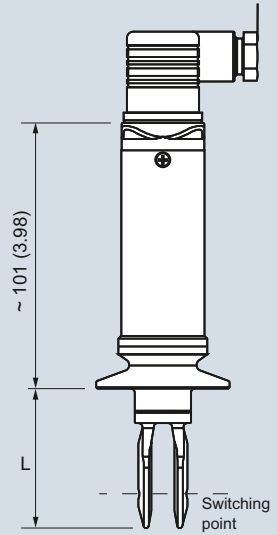
SITRANS LVL100 (extended high temperature)

Thread G 3/4" A, G 1" A
(DIN ISO 228/1),
3/4" NPT or 1" NPT
(valve plug DIN 43650)

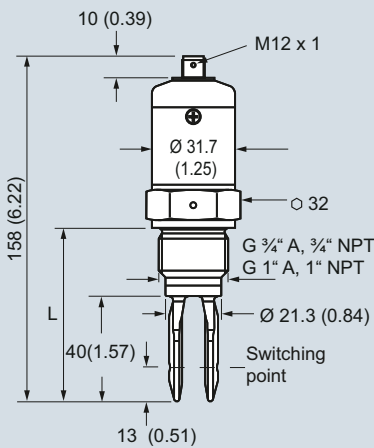


L =
Length with G 3/4" A, 3/4" NPT: 66 (2.6)
Length with G 1" A, 1" NPT: 69 (2.7)
Length with Tri-clamp: 53 (2.1)

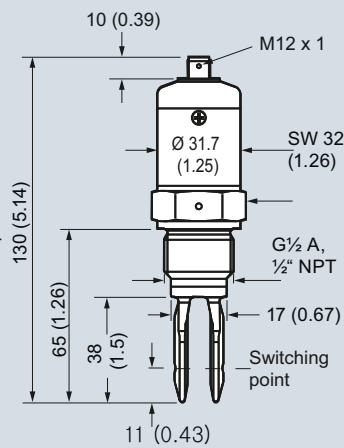
Tri-clamp (valve plug DIN 43650)



SITRANS LVL100 (standard with M12 connector)



L =
Length with G 3/4" A, 3/4" NPT: 66 (2.6)
Length with G 1" A, 1" NPT: 69 (2.7)

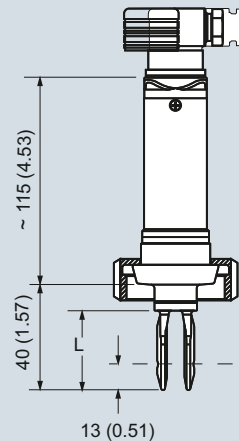


L =
Length with G 1/2" A, 1/2" NPT: 62 (2.4)

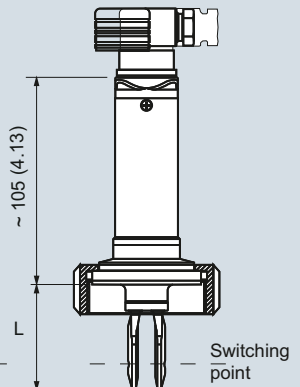
SITRANS LVL100 (extended, high temperature)

Bolting DIN 11851
(valve plug DIN 43650)

SMS 1145
(valve plug DIN 43650)



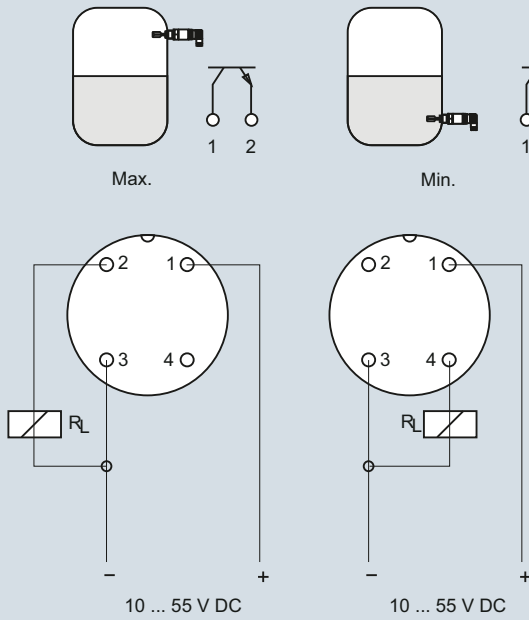
L =
Length with bolting: 53 (2.1)
Length with SMS 1145: 53 (2)



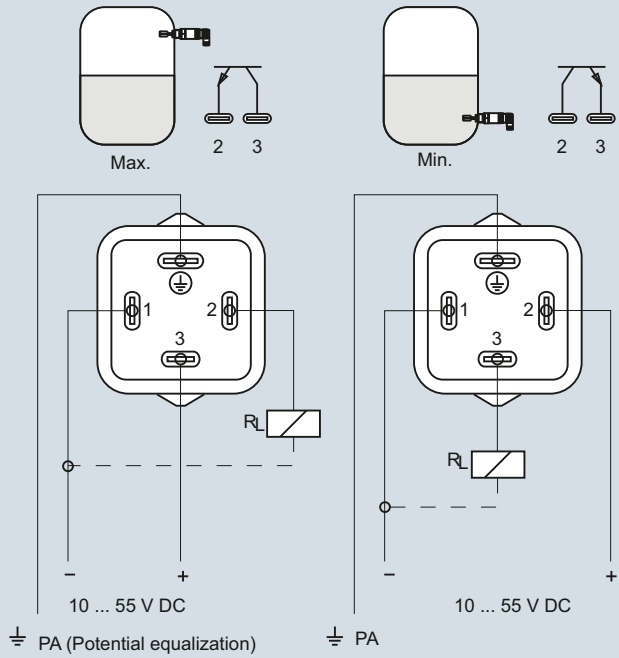
SITRANS LVL100, dimensions in mm (inch)

Schematics

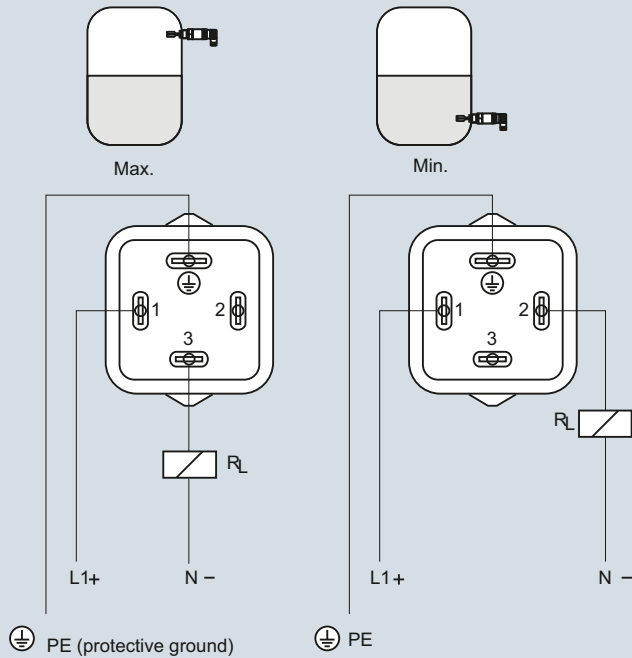
Transistor PNP (M12 x 1 plug connection)



Transistor PNP (with valve plug DIN 43650)



Contactless electronic switch (valve plug DIN 43650)



SITRANS LVL100, connections

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Overview



SITRANS LVL200 is a standard vibrating level switch for material detection in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 applications.

Benefits

- Proven vibrating level switch technology for liquids
- Compact insertion length of 40 mm (1.57 inch) for confined space applications
- Fault monitoring for corrosion, loss of vibration or line break to the piezo drive
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511
- Hygienic process connections

Application

SITRANS LVL200 is a level switch designed for industrial use in all areas of process technology and can be used with liquids and slurries. With a tuning fork insertion length of only 40 mm (1.57 inch), SITRANS LVL200 can be mounted in small pipes and applications with confined space. The LVL200 can be used to measure products with a minimum density of $> 0.5 \text{ g/cm}^3$ (0.018 lb/in^3). The LVL200 can be used in difficult conditions including turbulence, air bubbles, foam generation, buildup, or external vibration.

SITRANS LVL200 continuously monitors faults via frequency evaluation, providing early detection of strong corrosion or damage on the tuning fork, loss of vibration, or a line break to the piezo drive.

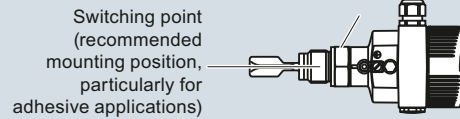
The tuning fork is piezoelectrically energized and vibrates at its mechanical resonance frequency of approximately 1 200 Hz. The vibration frequency changes when the tuning fork is covered by the medium. This change is detected by the integrated oscillator and converted into a switching command. The integrated electronics evaluate the level signal and output a switching signal, directly operating connected devices.

- Key Applications: For use in liquids and slurries, for level measurement, overflow, and dry run protection

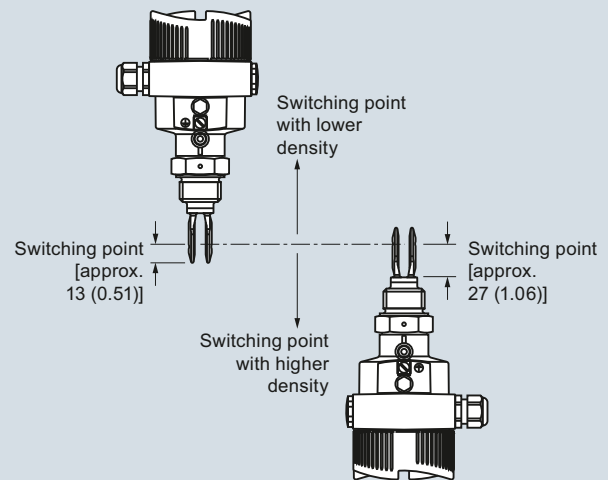
Configuration

Horizontal mounting

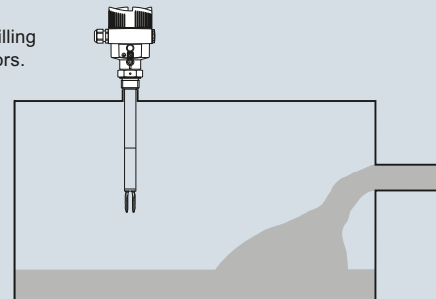
Marked with screwed version on top, with flange versions directed to the flange holes



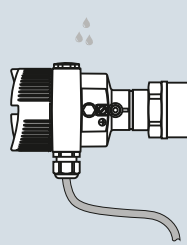
Vertical mounting



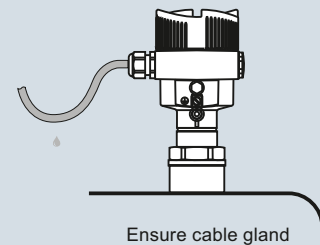
Mount away from filling openings or agitators.



Moisture protection



NOTE:
Welded socket for flush mount optional



Ensure cable gland faces downward to avoid water ingress.

SITRANS LVL200 installation, dimensions in mm (inch)

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Technical specifications

Mode of operation	
Measuring principle	Vibrating point level switch
Input	
Measured variable	High and low and demand (via mode switch)
Output	
Output options	<ul style="list-style-type: none"> Relay output (DPDT), 2 floating SPDTs Contactless electronic switch 2 wire Namur signal output
Measuring Accuracy	
Repeatability	0.1 mm (0.004 inch)
Hysteresis	Approx. 2 mm (0.08 inch) with vertical installation
Switching delay	Approx. 500 ms (on/off)
Frequency	Approx. 1 200 Hz
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +70 °C (-40 ... +158 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	
• Temperature	
- LVL200S Standard	-50 ... +150 °C (-58 ... +302 °F)
- LVL200S High temperature option	-50 ... +250 °C (-58 ... +482 °F)
- LVL200E Standard: with 316L/Hastelloy	-50 ... +150 °C (-58 ... +302 °F)
- LVL200E High temperature option: with 316L/Hastelloy	-50 ... +250 °C (-58 ... +482 °F)
• Pressure (vessel)	-1 ... 64 bar g (-14.5 ... 928 psi g)
• Density	0.7 ... 2.5 g/cm ³ (0.025 ... 0.09 lb/in ³); 0.5 ... 2.5 g/cm ³ (0.018 ... 0.09 lb/in ³) by switching over
Design	
Material	
• Enclosure	Aluminum die-cast AlSi10Mg, powder-coated, basis: Polyester Stainless steel housing, electro-polished 316L
• Tuning fork	316L (1.4404 or 1.4435), Hastelloy
• Extension tube [ø 21.3 mm (0.839 inch)]	316L (1.4404 or 1.4435), Hastelloy
• Process connection: threaded	316L (1.4404 or 1.4435), Hastelloy
• Process connection: flange	316L (1.4404 or 1.4435), 316L with Hastelloy, ECTFE, or PFA coating Klingersil C-4400
• Process seal	
Process connection	
• Pipe thread, cylindrical (ISO 228 T1)	G ¾" A, G 1" A
• Pipe thread, tapered	¾" NPT, 1" NPT, 1½" NPT
• Flanges	DIN from DN25, ANSI from 1"
• Hygienic fittings	Bolting DN 40 PN 40, 1, 1½, 2, 2½" Tri-Clamp PN 10, conus DN 25 PN 40, Tuchenhagen Varivent DN 50 PN 10, SMS

Degree of protection	Type 4X/NEMA 4X/IP66/IP67
Conduit entry	<ul style="list-style-type: none"> 1 x M20x1.5 (cable: ø5 ... 9 mm), 1 x blind stopper M20x1.5; attached 1 x M20x1.5 cable entry 1 x ½" NPT cable entry, 1 x blind stopper ½" NPT, 1 x ½" NPT cable entry 1 x M12x1; 1 x blind stopper M20x1.5
Weight	
• Device weight (dependent on process fitting)	Approx. 0.8 ... 4 kg (0.18 ... 8.82 lb)
• Tube extension (extended version)	Approx 920 g/m (10 oz/ft)
Power supply	
Supply voltage	
• Relay DPDT	20 ... 253 V AC, 50/60 Hz, 20 ... 72 V DC [at U>60 V DC]
• Contactless	20 ... 253 V AC, 50/60 Hz, 20 ... 253 V DC
• 2 wire NAMUR	
Operating voltage (characteristics according to standard) for connection to an amplifier according to NAMUR	IEC 60947-5-6, approx. 8.2 V Off-load voltage U ₀ approx. 8.2 V Short-circuit current I _U approx. 8.2 mA
Power consumption	1 ... 8 VA (AC), approx. 1.3 W (DC)
• Relay DPDT	1 ... 8 VA (AC), approx. 1.3 W (DC)
• Contactless	Domestic current requirement approx. 3 mA (via load circuit)
	Load current
	- Min. 10 mA
	- Max. 400 mA [with I > 300 mA the ambient temperature can be max. 60 °C (140 °F)]
	- Max. 4 A up to 40 ms (not WHG specified)
• 2 wire Namur	Current consumption
	- Falling characteristics ≥ 2.6 mA uncovered/≤ 0.6 mA covered
	- ≤ 0.6 mA uncovered/≥ 2.6 mA covered
	- Failure message ≤ 0.6 mA
Certificates and approvals	
	<ul style="list-style-type: none"> CE, CSA Overfill Protection WHG and VLAREM II FM (Non-Incendive) Class I, Div. 2, Groups A, B, C, D FM (Explosion-Proof) Class I, Div. 1, Groups A, B, C, D; (Dust Ignition-Proof) Class II, III, Div. 1, Groups E, F, G1) IECEX d IIC T6...T2 Ga/Gb EHEDG ATEX II 1/2G, 2G EEx d IIC T6 ATEX II 1G, 1/2G, 2G EEx ia IIC T6
	Shipping approvals
	• BR-Ex d IIC T6...T2
	• FDA, 3A, Ehedge
	• SIL/IEC61508 Declaration of Conformity [SIL-2 (min/max detection)]

4

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Selection and Ordering data

Article No.

SITRANS LVL200, Standard

Compact vibrating level switch for material detection in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.

➔ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Electronics

Contactless electronic switch 20...250 V AC/DC **1**
 Double relay (DPDT) 20 ... 72 V DC/20 ... 250 V AC **2**
 NAMUR signal¹⁾ **4**

Approvals

Without approvals **A**
 Overfill protection (WHG) **B**
 ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + WHG ²⁾ **C**
 ATEX II 1/2G, 2G EEx d IIC T6 + WHG ³⁾ **D**
 ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + shipping approvals²⁾ **E**
 ATEX II 1/2G, 2G EEx d IIC T6 + shipping approvals³⁾ **F**
 ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + ATEX II 1/2 D IP6X T²⁾ **G**
 IECEx Ex ia IIC T6²⁾ **H**
 Shipping approvals **K**
 FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ²⁾⁴⁾ **N**
 FM (XP) Class I, Div. 1, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G ³⁾⁴⁾ **P**
 FM (NI) Class I, Div. 2, Groups A, B, C, D⁴⁾ **Q**
 IECEx d IIC T6...T2 Ga/Gb **R**
 CSA(XP)CL I, II, III Div. 1, Groups A, B, C, D, E, F, G **S**
 CSA(NI)CL I, II, III, Div. 2, Groups A, B, C, D, E, F, G **T**
 BR-Ex d IIC T6...T2 **U**
 CSA(IS)CL I, II, III Div. 1, Groups A, B, C, D, E, F, G **V**

Process connection

Thread G³/₄" A, PN 64/316L **A 0 0**
 Thread G³/₄" A, PN 64/316L Ra < 0.8 µm **A 0 1**
 Thread ³/₄" NPT, PN 64/316L **A 0 2**
 Thread ³/₄" NPT, PN 64/316L Ra < 0.8 µm **A 0 3**
 Thread ³/₄" NPT, PN 64/Monel **A 0 4**
 Thread G³/₄" A, PN 64/Hastelloy **A 0 5**
 Thread ³/₄" NPT, PN 64/Hastelloy **A 0 6**
 Thread G1" A, PN 64/316L **A 0 7**
 Thread G1" A, PN 64/316L ECTFE coated MB1982⁵⁾ **A 0 8**
 Thread G1" A, PN 64/316L PFA coated⁵⁾ **A 1 0**
 Thread G1" A, PN 64/Monel **A 1 1**
 Thread G1" A, PN 64 / 316L Ra<0.8µm **A 1 2**
 Thread G1" A, PN 64/316L Ra < 0.8 µm **A 1 3**
 Thread 1" NPT, PN 64/316L ⁵⁾ **A 1 4**
 Thread 1" NPT, PN 64/316L ECTFE coated MB1982⁵⁾ **A 1 5**
 Thread 1" NPT, PN 64/316L PFA-coated **A 1 6**
 Thread 1" NPT, PN 64/Monel **A 1 7**
 Thread 1" NPT, PN 64/316L Ra < 0.8 µm **A 1 8**
 Thread G1" A, PN 64/Hastelloy **A 2 0**
 Thread G1¹/₂" A, PN 64/316L **A 2 1**
 Thread G1¹/₂" A, PN 64/316L Ra<0,8µm **A 2 2**
 Thread G1¹/₂" A, PN 64/Hastelloy **A 2 3**
 Thread 1" NPT, PN 64/Hastelloy **A 2 4**
 Thread 1¹/₂" NPT, PN 64/316L **A 2 5**
 Thread 1¹/₂" NPT, PN 64/316L Ra<0,8µm **A 2 6**
 Thread 1¹/₂" NPT, PN 64/Hastelloy **A 2 7**
 Thread G2" A, PN 64/316L **A 2 8**

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Selection and Ordering data

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SITRANS LVL200, Standard

Compact vibrating level switch for material detection in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.



Thread M27x1.5, PN 64/316L **A 3 0**
 Conus DN 25, PN 40/316L Ra < 0.3 µm **A 3 1**
 Conus DN 25, PN 40/316L Ra < 0.8 µm **A 3 2**
 Conus DN 25, PN 40/ECTFE (ZB3033)⁵⁾ **A 3 3**
 Conus M52, PN 40/316L **A 3 4**
 Conus M52, PN 40/316L Ra < 0.3 µm **A 3 5**
 Conus M52, PN 40/316L Ra < 0.8 µm **A 3 6**
 Tri-Clamp 1", PN 16/316L Ra < 0.3 µm **A 3 7**
 Tri-Clamp 1", PN 16/Hastelloy **A 3 8**
 Tri-Clamp 1", PN 16/316L Ra < 0.8 µm **A 4 0**
 Tri-Clamp 1¹/₂", PN 16/316L Ra < 0.3 µm **A 4 1**
 Tri-Clamp 1¹/₂", PN 16/Hastelloy **A 4 2**
 Tri-Clamp 1¹/₂", PN 16/316L Ra < 0.8 µm **A 4 3**
 Tri-Clamp 2", PN 16/316L Ra < 0.3 µm **A 4 4**
 Tri-Clamp 2", PN 16/Hastelloy **A 4 5**
 Tri-Clamp 2", PN 16/316L Ra < 0.8 µm **A 4 6**
 Tri-Clamp 2¹/₂", PN 10/316L Ra < 0.3 µm **A 4 7**
 Tri-Clamp 2¹/₂", PN 10/316L Ra < 0.8 µm **A 4 8**
 Tri-Clamp 3", PN 10/316L Ra < 0.3 µm **A 5 0**
 Tri-Clamp 3", PN 10/316L Ra < 0.8 µm **A 5 1**
 Bolting DN 32, PN 40 DIN11851/316L Ra < 0.3 µm **A 5 2**
 Bolting DN 32, PN 40 DIN11851/316L Ra < 0.8 µm **A 5 3**
 Bolting DN 25, PN 40 DIN11851/316L Ra < 0.3 µm **A 5 4**
 Bolting DN 25, PN 40 DIN11851/316L Ra < 0.8 µm **A 5 5**
 Bolting DN 40, PN 40 DIN11851/316L Ra < 0.3 µm **A 5 6**
 Bolting DN 40, PN 40 DIN11851/316L Ra < 0.8 µm **A 5 7**
 Bolting DN 40, PN 40 DIN11864-1 A/316L Ra < 0.8 µm ZB3052 **A 5 8**
 Bolting DN 50, PN 25 DIN11851/316L Ra < 0.3 µm **A 6 0**
 Bolting DN 50, PN 25 DIN11851/316L Ra < 0.8 µm **A 6 1**
 Bolting DN 50, PN 25 DIN11864-1 A/316L Ra < 0.8 µm ZB3052 **A 6 2**
 Hygienic w. compr. nut F40, PN 25/316L **A 6 3**
 Hygienic w. compr. nut F40, PN 25/316L Ra < 0.3 µm **A 6 4**
 Hygienic w. compr. nut F40, PN 25/316L Ra < 0.8 µm **A 6 5**
 Varivent N50-40/316L Ra < 0.3 µm **A 6 6**
 Varivent N50-40/316L Ra < 0.8 µm **A 6 7**
 Varivent N125/100/316L Ra < 0.8 µm **A 6 8**
 DRD flange, PN 40/316L ZB3007 **A 7 0**
 SMS DN 38/316L Ra < 0.8 µm⁵⁾ **A 7 1**
 SMS DN 51, PN 6/316L Ra < 0.8 µm⁵⁾ **A 7 2**
 Swagelok VCR screwing ZG2579, PN 64/316L **A 7 3**
 Neumo biocontrol size 25, PN 16/316L Ra < 0.8 µm **A 7 4**
 Neumo biocontrol size 50, PN 16/316L Ra < 0.8 µm⁵⁾ **A 7 5**
 Neumo biocontrol size 65, PN 16/316L Ra < 0.8 µm **A 7 6**
 Neumo biocontrol size 80, PN 16/316L Ra < 0.8 µm **A 7 7**
 SÜDMO DN 50, PN 10/316L Ra<0,8µm **A 7 8**
 Small flange DN 25, PN 1.5 DIN 28403/316L pol. Ra < 0.8 µm **A 8 0**
 Small flange DN 40, PN 1.5 DIN 28403/316L pol. Ra < 0.8 µm **A 8 1**
 Ingold connection, PN 16/316L Ra < 0.8 µm **A 8 2**
 Ingold connection, PN 16/Hastelloy **A 8 3**
 Terminal DN 33.7 PN 40 DIN11864-3-A-/316L BN2 Ra < 0.8 µm⁵⁾ **A 8 4**
 Hygienic fl. DN 50 PN 16 DIN11864-2-A-/316L Ra < 0.8 µm **A 8 5**

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 A 0

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LVL200, Standard Compact vibrating level switch for material detection in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.	7ML5746- 	SITRANS LVL200, Standard Compact vibrating level switch for material detection in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.	7ML5746- 
Flange DN 25, PN 6 Form C, DIN 2501/316L	A 8 6	Flange DN 80, PN 40 Form C, DIN 2501/PFA ⁵⁾	B 5 6
Flange DN 25, PN 6 Form C, DIN 2501/PFA ⁵⁾	A 8 7	Flange DN 80, PN 40 Form C, DIN 2501/Enamelled ⁶⁾	B 5 7
Flange DN 25, PN 40 Form C, DIN 2501/316L	A 8 8	Flange DN 80, PN 40 Form F, DIN 2501/316L	B 5 8
Flange DN 25, PN 40 Form C, DIN 2501/Hastelloy	B 0 0	Flange DN 80, PN 40 Form N, DIN 2501/316L	B 6 0
Flange DN 25, PN 40 Form C, DIN 2501/ECTFE ⁵⁾	B 0 1	Flange DN 100, PN 16 Form C, DIN 2501/316L	B 6 2
Flange DN 25, PN 40 Form C, DIN 2501/PFA ⁵⁾	B 0 2	Flange DN 100, PN 16 Form C, DIN 2501/Hastelloy	B 6 3
Flange DN 25, PN 40 Form C, DIN 2501/Enamelled	B 0 3	Flange DN 100, PN 16 Form C, DIN 2501/ECTFE ⁵⁾	B 6 4
Flange DN 25, PN 40 Form D, DIN 2501/316L	B 0 4	Flange DN 100, PN 16 Form C, DIN 2501/PFA ⁵⁾	B 6 5
Flange DN 25, PN 40 Form F, DIN 2501/316L	B 0 5	Flange DN 100, PN 16 Form C, DIN 2501/Enamelled ⁶⁾	B 6 6
Flange DN 25, PN 40 Form N, DIN 2501/316L	B 0 6	Flange DN 100, PN 16 Form D, DIN 2501/316L	B 6 7
Flange DN 25, PN 40 Form N, DIN 2501/Hastelloy	B 0 7	Flange DN 100, PN 16 Form F, DIN 2501/316L	B 6 8
Flange DN 25, PN 40 Form N, DIN 2501/Monel solid	B 0 8	Flange DN 100, PN 16 Form N, DIN 2501/316L	B 7 0
Flange DN 25, PN 40 V13, DIN 2501/316L	B 1 0	Flange DN 100, PN 40 Form C, DIN 2501/316L	B 7 1
Flange DN 32, PN 40 Form C, DIN 2501/316L	B 1 1	Flange DN 100, PN 40 Form C, DIN 2501/ECTFE ⁵⁾	B 7 2
Flange DN 32, PN 40 Form C, DIN 2501/ECTFE ⁵⁾	B 1 2	Flange DN 100, PN 40 Form C, DIN 2501/PFA ⁵⁾	B 7 3
Flange DN 40, PN 6 Form C, DIN 2501/316L	B 1 3	Flange DN 100, PN 40 Form C, DIN 2501/Enamelled ⁶⁾	B 7 4
Flange DN 40, PN 6 Form C, DIN 2501/ECTFE ⁵⁾	B 1 4	Flange DN 100, PN 40 Form F, DIN 2501/316L	B 7 5
Flange DN 40, PN 40 Form C, DIN 2501/316L	B 1 5	Flange DN 100, PN 40 Form N, DIN 2501/316L	B 7 6
Flange DN 40, PN 40 Form C, DIN 2501/Hastelloy	B 1 6	Flange DN 100, PN 40 V13, DIN 2501/316L	B 7 7
Flange DN 40, PN 40 Form C, DIN 2501/ECTFE ⁵⁾	B 1 7	Flange DN 100, PN 64 Form E, DIN 2501/316L	B 7 8
Flange DN 40, PN 40 Form C, DIN 2501/PFA ⁵⁾	B 1 8	Flange DN 100, PN 100 Form E, DIN 2501/316L	B 8 0
Flange DN 40, PN 40 Form C, DIN 2501/Enamelled ⁶⁾	B 2 0	Flange DN 100, PN 100 Form L, DIN 2501/316L	B 8 1
Flange DN 40, PN 40 Form F, DIN 2501/316L	B 2 1	Flange DN 125, PN 16 Form F, DIN 2501/316L	B 8 2
Flange DN 40, PN 40 Form N, DIN 2501/316L	B 2 2	Flange DN 125, PN 40 Form C, DIN 2501/316L	B 8 3
Flange DN 40, PN 40 Form E, DIN 2501/316L	B 2 3	Flange DN 125, PN 40 Form N, DIN 2512/ 316L	B 8 4
Flange DN 40, PN 40 V13, DIN 2501/316L	B 2 4	Flange DN 150, PN 16 Form C, DIN 2501/316L	B 8 5
Flange DN 50, PN 40 Form C, DIN 2501/316L	B 2 5	Flange DN 150, PN 16 Form C, DIN 2501/Hastelloy	B 8 6
Flange DN 50, PN 40 Form C, DIN 2501/Hastelloy	B 2 6	Flange DN 150, PN 16 Form C, DIN 2501/ECTFE ⁵⁾	B 8 7
Flange DN 50, PN 40 Form C, DIN 2501/ECTFE ⁵⁾	B 2 7	Flange DN 150, PN 16 Form C, DIN 2501/PFA ⁵⁾	B 8 8
Flange DN 50, PN 40 Form C, DIN 2501/ECTFE (ZB3108) ⁵⁾	B 2 8	Flange DN 150, PN 16 Form D, DIN 2501/316L	C 0 0
Flange DN 50, PN 40 Form C, DIN 2501/PFA ⁵⁾	B 3 0	Flange DN 150, PN 40 Form C, DIN 2501/316L	C 0 1
Flange DN 50, PN 40 Form D, DIN 2501/316L	B 3 1	Flange DN 150, PN 40 Form C, DIN 2501/Hastelloy	C 0 2
Flange DN 50, PN 40 Form D, DIN 2501/Hastelloy	B 3 2	Flange DN 150, PN 40 Form F, DIN 2501/316L	C 0 3
Flange DN 50, PN 40 Form F, DIN 2501/316L	B 3 3	Flange DN 150, PN 40 Form N, DIN 2512/316L	C 0 4
Flange DN 50, PN 40 Form N, DIN 2501/316L	B 3 4	Flange DN 200, PN 10 Form C, DIN 2501/ECTFE ⁵⁾	C 0 5
Flange DN 50, PN 40 Form N, DIN 2501/Hastelloy	B 3 5	Flange DN 200, PN 16 Form C, DIN 2501/316L	C 0 6
Flange DN 50, PN 40 Form E, DIN 2501/316L	B 3 6	Flange DN 25, PN 40 Form B1, EN 1092-1/316L	C 0 7
Flange DN 50, PN 40 V13, DIN 2501/316L	B 3 7	Flange DN 25, PN 40 Form B1, EN 1092-1/Hastelloy	C 0 8
Flange DN 50, PN 40 R13, DIN 2501/316L	B 3 8	Flange DN 25, PN 40 Form B1, EN/ 316L/ PFA ⁵⁾	C 1 0
Flange DN 50, PN 64 Form F, DIN 2501/316L	B 4 0	Flange DN 25, PN 40 Form B1, EN 1092-1/Enamelled ⁶⁾	C 1 1
Flange DN 50, PN 64 Form N, DIN 2501/Hastelloy	B 4 1	Flange DN 25, PN 40 Form B2, EN 1092-1/316L	C 1 2
Flange DN 50, PN 64 Form C, DIN 2501/316L	B 4 2	Flange DN 25, PN 40 Form F, EN 1092-1/316L	C 1 3
Flange DN 50, PN 64 Form L, DIN 2501/316L	B 4 3	Flange DN 25, PN 63 Form B1, EN 1092-1/316L	C 1 4
Flange DN 50, PN 100 Form E, DIN 2501/316L	B 4 4	Flange DN 25, PN 100 Form B2, EN 1092-1/316L	C 1 5
Flange DN 50, PN 100 Form L, DIN 2501/316L	B 4 5	Flange DN 40, PN 40 Form B1, EN/ 316L	C 1 6
Flange DN 65, PN 40 Form C, DIN 2501/316L	B 4 6	Flange DN 40, PN 40 Form B1, EN 1092-1/PFA ⁵⁾	C 1 7
Flange DN 65, PN 40 Form C, DIN 2501/Hastelloy	B 4 7	Flange DN 40, PN 40 Form B2, EN/316L	C 1 8
Flange DN 65, PN 40 Form C, DIN 2501/ECTFE ⁵⁾	B 4 8	Flange DN 50, PN 40 Form B1, EN/316L	C 2 0
Flange DN 65, PN 40 Form C, DIN 2501/PFA ⁵⁾	B 5 0	Flange DN 50, PN 40 Form B1, EN 1092-1/Hastelloy	C 2 1
Flange DN 65, PN 40 Form F, DIN 2501/316L	B 5 1	Flange DN 50, PN 40 Form B1, EN 1092-1/Monel ZB2977	C 2 2
Flange DN 65, PN 64 Form E, DIN 2501/316L	B 5 2	Flange DN 50, PN 40 Form B1, EN 1092-1/ECTFE ⁵⁾	C 2 3
Flange DN 80, PN 40 Form C, DIN 2501/316L	B 5 3	Flange DN 50, PN 40 Form B1, EN/ 316L/PFA ⁵⁾	C 2 4
Flange DN 80, PN 40 Form C, DIN 2501/ Hastelloy	B 5 4		
Flange DN 80, PN 40 Form C, DIN 2501/ECTFE ⁵⁾	B 5 5		

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Selection and Ordering data

Article No.

SITRANS LVL200, Standard

Compact vibrating level switch for material detection in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.

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- A 0

Flange DN 50, PN 40 Form B1, EN 1092-1/Enamelled ⁶⁾	C 2 5
Flange DN 50, PN 40 Form C, EN 1092-1/316L	C 2 6
Flange DN 50, PN 40 Form D, EN/316L	C 2 7
Flange DN 50, PN 40 Form D, EN 1092-1/Hastelloy	C 2 8
Flange DN 50, PN 40 Form B2, EN 1092-1/316L	C 3 0
Flange DN 50, PN 40 Form E, EN 1092-1/316L	C 3 1
Flange DN 80, PN 40 Form B1, EN 1092-1/316L	C 3 2
Flange DN 80, PN 40 Form B1, EN 1092-1/Hastelloy	C 3 3
Flange DN 80, PN 40 Form B1, EN 1092-1/ECTFE ⁵⁾	C 3 4
Flange DN 80, PN 40 Form B1, EN 1092-1/Enamelled ⁶⁾	C 3 5
Flange DN 80, PN 40 Form B2, EN 1092-1/316L	C 3 6
Flange DN 100, PN 16 Form B1, EN 1092-1/316L	C 3 7
Flange DN 100, PN 16 Form B1, EN 1092-1/Hastelloy	C 3 8
Flange DN 100, PN 16 Form B1, EN 1092-1/Enamelled ⁶⁾	C 4 0
Flange DN 100, PN 40 Form B1, EN 1092-1/316L	C 4 1
Flange DN 100, PN 40 Form B1, EN 1092-1/Enamelled ⁶⁾	C 4 2
Flange DN 100, PN 40 Form C, EN 1092-1/316L	C 4 3
Flange DN 100, PN 63 Form B2, EN 1092-1/316L	C 4 4
Flange DN 150, PN 16 Form B1, EN 1092-1/316L	C 4 5
Flange DN 150, PN 16 Form B1, EN 1092-1/PFA ⁵⁾	C 4 6
Flange DN 150, PN 40 Form B1, EN 1092-1/316L	C 4 7
Flange DN 150, PN 40 Form B1, EN 1092-1/ECTFE ⁵⁾	C 4 8
Flange DN 150, PN 40 Form B2, EN 1092-1/316L	C 5 0
Flange 1" 150 lb ANSI B16.5/316L	C 5 1
Flange 1" 150 lb RF, ANSI B16.5/Hastelloy	C 5 2
Flange 1" 150 lb RF, ANSI B16.5/Monel ZB2977	C 5 3
Flange 1" 150 lb RF, ANSI B16.5/ECTFE ⁵⁾	C 5 4
Flange 1" 150 lb RF, ANSI B16.5/PFA ⁵⁾	C 5 5
Flange 1" 150 lb RF, ANSI B16.5/Enamelled ⁶⁾	C 5 6
Flange 1" 300 lb RF, ANSI B16.5/316L	C 5 7
Flange 1" 300 lb RF, ANSI B16.5/ECTFE ⁵⁾	C 5 8
Flange 1" 600 lb RF, ANSI B16.5/316L	C 6 0
Flange 1½" 150 lb RF, ANSI B16.5/316L	C 6 1
Flange 1½" 150 lb RF, ANSI B16.5/Hastelloy	C 6 2
Flange 1½" 150 lb RF, ANSI B16.5/ECTFE ⁵⁾	C 6 3
Flange 1½" 150 lb RF, ANSI B16.5/PFA ⁵⁾	C 6 4
Flange 1½" 150 lb RF, ANSI B16.5 Enamelled ⁶⁾	C 6 5
Flange 1½" 150 lb FF, ANSI B16.5/ECTFE ⁵⁾	C 6 6
Flange 1½" 300 lb RF, ANSI B16.5/316L	C 6 7
Flange 1½" 300 lb RF, ANSI B16.5/Monel ZB2977	C 6 8
Flange 1½" 300 lb RF, ANSI B16.5/ECTFE ⁶⁾	C 7 0
Flange 1½" 600 lb RF, ANSI B16.5/316L	C 7 1
Flange 2" 150 lb RF, ANSI B16.5/316L	C 7 2
Flange 2" 150 lb RF, ANSI B16.5/Hastelloy	C 7 3
Flange 2" 150 lb RF, ANSI B16.5/Monel ZB2977	C 7 4
Flange 2" 150 lb RF, ANSI B16.5/ECTFE ⁵⁾	C 7 5
Flange 2" 150 lb RF, ANSI B16.5/PFA ⁵⁾	C 7 6
Flange 2" 150 lb RF, ANSI B16.5/Enamelled ⁶⁾	C 7 7
Flange 2" 150 lb FF, ANSI B16.5/316L	C 7 8
Flange 2" 150 lb FF, ANSI B16.5/ECTFE ⁵⁾	C 8 0
Flange 2" 150 lb SG (small groove), ANSI B16.5/316L	C 8 1

Selection and Ordering data

Article No.

SITRANS LVL200, Standard

Compact vibrating level switch for material detection in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.

7ML5746-


- A 0

Flange 2" 300 lb RF, ANSI B16.5/316L	C 8 2
Flange 2" 300 lb RF, ANSI B16.5/Hastelloy	C 8 3
Flange 2" 300 lb RF, ANSI B16.5/ECTFE ⁵⁾	C 8 5
Flange 2" 300 lb RF, ANSI B16.5/PFA ⁵⁾	C 8 6
Flange 2" 300 lb RF, ANSI B16.5 Enamelled ⁶⁾	C 8 7
Flange 2" 300 lb RJF, ANSI B16.5/316L	C 8 8
Flange 2" 300 lb ST, ANSI B16.5/316L	D 0 0
Flange 2" 300 lb LG (large groove), ANSI B16.5/316L	D 0 1
Flange 2" 300 lb LT, ANSI B16.5/316L	D 0 2
Flange 2" 600 lb RF, ANSI B16.5/316L	D 0 3
Flange 2" 600 lb RF, ANSI B16.5/Monel ZB2977	D 0 4
Flange 2" 600 lb RF, ANSI B16.5/ECTFE ⁵⁾	D 0 5
Flange 2" 600 lb RJF, ANSI B16.5/316L	D 0 6
Flange 2" 600 lb LG, ANSI B16.5/316L	D 0 7
Flange 2" 900 lb RJF, ANSI B16.5/316L	D 0 8
Flange 2½" 150 lb RF, ANSI B16.5/316L	D 1 0
Flange 2½" 300 lb RF, ANSI B16.5/316L	D 1 1
Flange 3" 150 lb RF, ANSI B16.5/316L	D 1 2
Flange 3" 150 lb RF, ANSI B16.5/Hastelloy	D 1 3
Flange 3" 150 lb RF, ANSI B16.5/ECTFE ⁵⁾	D 1 4
Flange 3" 150 lb RF, ANSI B16.5/PFA ⁵⁾	D 1 5
Flange 3" 150 lb RF, ANSI B16.5/Enamelled ⁶⁾	D 1 6
Flange 3" 150 lb FF, ANSI B16.5/316L	D 1 7
Flange 3" 150 lb FF, ANSI B16.5/ECTFE ⁵⁾	D 1 8
Flange 3" 150 lb FF, ANSI B16.5/PFA ⁵⁾	D 2 0
Flange 3" 300 lb RF, ANSI B16.5/316L	D 2 1
Flange 3" 300 lb RF, ANSI B16.5/Hastelloy	D 2 2
Flange 3" 300 lb RF, ANSI B16.5/ECTFE ⁵⁾	D 2 3
Flange 3" 300 lb RF, ANSI B16.5/PFA ⁵⁾	D 2 4
Flange 3" 300 lb RF, ANSI B16.5/Enamelled ⁶⁾	D 2 5
Flange 3" 600 lb RF, ANSI B16.5/316L	D 2 6
Flange 3½" 150 lb RF, ANSI B16.5/316L	D 2 7
Flange 3½" 150 lb RF, ANSI B16.5/ECTFE ⁵⁾	D 2 8
Flange 4" 150 lb RF, ANSI B16.5/316L	D 3 0
Flange 4" 150 lb RF, ANSI B16.5/Hastelloy	D 3 1
Flange 4" 150 lb RF, ANSI B16.5/ECTFE ⁵⁾	D 3 2
Flange 4" 150 lb RF, ANSI B16.5/PFA ⁵⁾	D 3 3
Flange 4" 150 lb RF, ANSI B16.5/Enamelled ⁶⁾	D 3 4
Flange 4" 150 lb LT, ANSI B16.5/316L	D 3 5
Flange 4" 300 lb RF, ANSI B16.5/316L	D 3 6
Flange 4" 300 lb RF, ANSI B16.5/Hastelloy	D 3 7
Flange 4" 300 lb RF, ANSI B16.5/ECTFE ⁵⁾	D 3 8
Flange 4" 300 lb RJF, ANSI B16.5/316L	D 4 0
Flange 4" 300 lb LG, ANSI B16.5/316L	D 4 1
Flange 4" 300 lb LT, ANSI B16.5/316L	D 4 2
Flange 4" 600 lb RF, ANSI B16.5/316L	D 4 3
Flange 4" 600 lb RJF, ANSI B16.5/316L	D 4 4
Flange 6" 150 lb RF, ANSI B16.5/316L	D 4 5
Flange 6" 150 lb RF, ANSI B16.5/Hastelloy	D 4 6
Flange 6" 150 lb RF, ANSI B16.5/ECTFE ⁵⁾	D 4 7
Flange 6" 150 lb RF, ANSI B16.5/PFA ⁵⁾	D 4 8
Flange 6" 150 lb RJF, ANSI B16.5/316L	D 5 0
Flange 6" 300 lb RF, ANSI B16.5/316L	D 5 1
Flange 8" 150 lb RF, ANSI B16.5/316L	D 5 2
Flange 8" 150 lb RF, ANSI B16.5/ECTFE ⁵⁾	D 5 3
Flange 1" BS.10 Table E/316L	D 5 4

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS LVL200, Standard Compact vibrating level switch for material detection in liquid and slurry applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.	7ML5746- 	Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 ¹⁾	C20
		Dye penetration test + 3.1 certificate/instrument ¹⁾	C13
		X-ray test + 3.1 certificate/instrument ¹⁾	C14
		Positive material identification test + 3.1 certificate/instrument ¹⁾	C16
		Roughness test + 3.1 certificate/instrument ¹⁾	C18
		Pressure test + 3.1 certificate/instrument ¹⁾	C31
		Helium leak test + 3.1 certificate/instrument ¹⁾	C32
		Ferrite measuring accuracy to DIN32514-1 + 3.1 certificate/instrument ¹⁾	C60
		Pressure test according to Norsok + 3.1 certificate/instrument ¹⁾	C61
Adapter/Process temperature Without adapter/-50 ... +150 °C (-58 ... +302 °F)	1	Additional Operating Instructions	
With adapter/-50 ... +200 °C (-58 ... +392 °F) ⁷⁾	2	LVL200 (DPDT Relay)	
With adapter/-50 ... +250 °C (-58 ... +482 °F)	3	• English	7ML1998-5KR01
With gas-tight leadthrough/-50 ... +150 °C (-58 ... +302 °F)	4	• French	7ML1998-5KR11
With gas-tight leadthrough/-50 ... +250 °C (-58 ... +482 °F)	5	• Spanish	7ML1998-5KR21
		• German	7ML1998-5KR31
Housing/ Cable entry Aluminium IP66/IP67/M20x1.5	A	LVL200 (Contactless electronic switch)	
Aluminium IP66/IP67/½" NPT	B	• English	7ML1998-5KQ01
316L stainless steel (electropolished) IP66/IP67/M20x1.5 ⁸⁾⁹⁾	C	• French	7ML1998-5KQ11
316L stainless steel (electropolished) IP66/IP67/½" NPT ⁸⁾⁹⁾	D	• Spanish	7ML1998-5KQ21
		• German	7ML1998-5KQ31
		Electronics module LVL200 Relay	
		• English	7ML1998-5LS01
		• French	7ML1998-5LS11
		• Spanish	7ML1998-5LS21
		• German	7ML1998-5LS31
		This device is shipped with the Siemens Milltronics manual DVD containing the Operating Instructions library.	
		Spare Parts and Accessories	
		Electronics module SITRANS LVL200 Relay	7ML1830-1NC
		Electronics module SITRANS LVL200 Contactless LVL200 Threaded Welded Socket	7ML1930-6AA
		• G¾" A/316L with FKM Seal	7ML1930-1EE
		• G1" A/316L with FKM Seal	7ML1930-1EF
		• M27x1.5/316L with FKM Seal	7ML1930-1EG
		• G¾" A/316L with EPDM Seal	7ML1930-1EH
		• G1" A/316L with EPDM Seal	7ML1930-1EJ
		• M27x1.5/316L with EPDM Seal	7ML1930-1EK
		¹⁾ Listed Certificates are not available with all configurations, please contact factory for more information	
Selection and Ordering data	Order code		
Further designs Please add "-Z" to Article No. and specify Order code(s).			
Cleaning including Certificate (oil, grease, and silicone free)	W01		
Identification Label (measurement loop) stainless steel: max. 16 characters add in plain text	Y17		
Identification Label (measurement loop) Foil: max. 16 characters add in plain text	Y18		
Acceptance test certificate 3.1 NACE MR 0775 for material EN10204 ¹⁾	D07		
Acceptance test certificate 3.1 for instrument EN10204 ¹⁾	C12		
Acceptance test Certificate 2.2 for material EN10204 ¹⁾	C15		

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Selection and Ordering data

Article No.

SITRANS LVL200, Rigid extension

7ML5747-

Compact vibrating level switch for material detection in liquid applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.

➔ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Electronics

Contactless electronic switch 20...250 V AC/DC
Double relay (DPDT) 20 ... 72 V DC/20 ... 250 V AC
NAMUR signal⁽¹⁾

Approvals

Without approvals

Overfill protection (WHG)

ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + WHG⁽²⁾

ATEX II 1/2G, 2G EEx d IIC T6 + WHG^(3/4)

ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + shipping approvals⁽²⁾

ATEX II 1/2G, 2G EEx d IIC T6 + shipping approvals^(3/4)

ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + ATEX II 1/2D IP6X T⁽²⁾

IECEX Ex ia IIC T6⁽²⁾

Shipping approvals

FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G^(2/5)

FM (XP) Class I, Div. 1, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G^(3/4/5)

FM (NI) Class I, Div. 2, Groups A, B, C, D⁽⁵⁾

IECEX d IIC T6...T2 Ga/Gb⁽⁴⁾

CSA(XP)CL I,II,III Div. 1, Groups A, B, C, D, E, F, G...T2⁽⁴⁾ Ga/Gb

CSA(NI)CL I,II,III, Div. 2, Groups A, B, C, D, E, F, G BR-Ex d IIC T6...T2

CSA(IS)CL I, II, III Div. 1, Groups A, B, C, D, E, F, G

Process connection

Thread G $\frac{3}{4}$ " A, PN 64/316L

Thread G $\frac{3}{4}$ " A, PN 64/316L Ra < 0.8 µm

Thread $\frac{3}{4}$ " NPT, PN 64/316L

Thread $\frac{3}{4}$ " NPT, PN 64/316L Ra < 0.8 µm

Thread $\frac{3}{4}$ " NPT, PN 64/Monel

Thread G $\frac{3}{4}$ " A, PN 64/Hastelloy

Thread $\frac{3}{4}$ " NPT, PN 64/Hastelloy

Thread G1" A, PN 64/316L

Thread G1" A, PN 64/316L ECTFE coated MB1982⁽⁶⁾

Thread G1" A, PN 64/316L PFA coated⁽⁶⁾

Thread G1" A, PN 64/Monel

Thread G1" A, PN 64/316L Ra < 0.8 µm

Thread 1" NPT, PN 64/316L

Thread 1" NPT, PN 64/316L ECTFE coated MB1982⁽⁶⁾

Thread 1" NPT, PN 64/316L PFA coated⁽⁶⁾

Thread 1" NPT, PN 64/Monel

Thread 1" NPT, PN 64/316L Ra < 0.8 µm

Thread G1" A, PN 64/Hastelloy

Thread G1 $\frac{1}{2}$ " A, PN 64/316L

Thread G1 $\frac{1}{2}$ " A, PN 64/316L Ra < 0.8 µm

Thread G1 $\frac{1}{2}$ " A, PN 64/Hastelloy

Thread 1" NPT, PN 64/Hastelloy

Thread 1 $\frac{1}{2}$ " NPT, PN 64/316L

Thread 1 $\frac{1}{2}$ " NPT, PN 64/316L Ra < 0.8 µm

Thread 1 $\frac{1}{2}$ " NPT, PN 64/Hastelloy

Thread G2" A, PN 64/316L

Thread M27x1.5 PN 64/316L

Selection and Ordering data

Article No.

SITRANS LVL200, Rigid extension

7ML5747-

Compact vibrating level switch for material detection in liquid applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.

Cyl. socket/316Ti/1.4581 ECTFE coated ZB2984⁽⁶⁾

Conus DN 25 PN 40/316L Ra < 0.3 µm

Conus DN 25 PN 40/316L Ra < 0.8 µm.

Conus DN 25 PN 40/ECTFE (ZB3033)⁽⁶⁾

Conus M52 PN 40/316L

Conus M52 PN 40/316L Ra < 0.3 µm

Conus M52 PN 40/316L Ra < 0.8 µm

Tri-Clamp 1" PN 16/316L Ra < 0.3 µm

Tri-Clamp 1" PN 16/Hastelloy

Tri-Clamp 1" PN 16/316L Ra < 0.8 µm

Tri-Clamp 1 $\frac{1}{2}$ " PN 16/316L Ra < 0.3 µm

Tri-Clamp 1 $\frac{1}{2}$ " PN 16/Hastelloy

Tri-Clamp 1 $\frac{1}{2}$ " PN 16/316L Ra < 0.8 µm

Tri-Clamp 2" PN 16/316L Ra < 0.3 µm

Tri-Clamp 2" PN 16/Hastelloy

Tri-Clamp 2" PN 16/316L Ra < 0.8 µm

Tri-Clamp 2 $\frac{1}{2}$ " PN 10/316L Ra < 0.3 µm

Tri-Clamp 2 $\frac{1}{2}$ " PN 10/316L Ra < 0.8 µm

Tri-Clamp 3" PN 10/316L Ra < 0.3 µm

Tri-Clamp 3" PN 10/316L Ra < 0.8 µm

Bolting DN 32 PN 40 DIN11851/316L Ra < 0.3 µm

Bolting DN 32 PN 40 DIN11851/316L Ra < 0.8 µm

Bolting DN 25 PN 40 DIN11851/316L Ra < 0.3 µm

Bolting DN 25 PN 40 DIN11851/316L Ra < 0.8 µm

Bolting DN 40 PN 40 DIN11851/316L Ra < 0.3 µm

Bolting DN 40 PN 40 DIN11851/316L Ra < 0.8 µm

Bolting DN 40 PN 40 DIN11864-1 A/316L

Ra < 0.8 µm ZB3052

Bolting DN 50 PN 25 DIN11851/316L Ra < 0.3 µm

Bolting DN 50 PN 25 DIN11851/316L Ra < 0.8 µm

Bolting DN 50 PN 25 DIN11864-1 A/316L

Ra < 0.8 µm ZB3052

Hygienic w.compr.nut F40 PN 25/316L

Hygienic w.compr.nut F40 PN 25/316L Ra < 0.3 µm

Hygienic w.compr.nut F40 PN 25/316L Ra < 0.8 µm

Varivent N50-40/316L Ra < 0.3 µm

Varivent N50-40/316L Ra < 0.8 µm

Varivent N125/100/316L Ra < 0.8 µm

DRD flange PN 40/316L ZB3007

SMS DN 38/316L Ra < 0.8 µm⁽⁶⁾

SMS DN 51 PN 6/316L Ra < 0.8 µm⁽⁶⁾

Swagelok VCR screwing ZG2579 PN 64/316L

Neumo biocontrol size 25 PN 16/316L Ra < 0.8 µm

Neumo biocontrol size 50 PN 16/316L Ra < 0.8 µm

Neumo biocontrol size 65 PN 16/316L Ra < 0.8 µm

Neumo biocontrol size 80 PN 16/316L Ra < 0.8 µm

SÜDMO DN 50 PN 10/316L Ra < 0.8 µm

Small flange DN 25 PN 1.5 DIN 28403/316L pol.

Ra < 0.8 µm

Small flange DN 40 PN 1.5 DIN 28403/316L pol.

Ra < 0.8 µm

Ingold connection PN 16/316L Ra < 0.8 µm

Terminal DN 33.7 PN 40 DIN 11864-3-A-/316L BN2

Ra < 0.8 µm

Hygienic fl. DN 50 PN 16 DIN 11864-2-A-/316L

Ra < 0.8 µm

Flange DN 25 PN 6 Form C, DIN 2501/316L

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LVL200, Rigid extension Compact vibrating level switch for material detection in liquid applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.	7ML5747-	SITRANS LVL200, Rigid extension Compact vibrating level switch for material detection in liquid applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.	7ML5747-
Flange DN 25 PN 6 Form C, DIN 2501/PFA ⁶⁾	A 87	Flange DN 80 PN 40 Form N, DIN 2501/316L	B 57
Flange DN 25 PN 40 Form C, DIN 2501/316L	A 88	Flange DN 80 PN 40 Form N, DIN 2501/Hastelloy	B 58
Flange DN 25 PN 40 Form C, DIN 2501/Hastelloy	B 00	Flange DN 100 PN 16 Form C, DIN 2501/316L	B 60
Flange DN 25 PN 40 Form C, DIN 2501/ECTFE ⁶⁾	B 01	Flange DN 100 PN 16 Form C, DIN 2501/Hastelloy	B 61
Flange DN 25 PN 40 Form C, DIN 2501/PFA ⁶⁾	B 02	Flange DN 100 PN 16 Form C, DIN 2501/ECTFE ⁶⁾	B 62
Flange DN 25 PN 40 Form D, DIN 2501/316L	B 03	Flange DN 100 PN 16 Form C, DIN 2501/PFA ⁶⁾	B 63
Flange DN 25 PN 40 Form F, DIN 2501/316L	B 04	Flange DN 100 PN 16 Form D, DIN 2501/316L	B 64
Flange DN 25 PN 40 Form N, DIN 2501/316L	B 05	Flange DN 100 PN 16 Form F, DIN 2501/316L	B 65
Flange DN 25 PN 40 Form N, DIN 2501/Hastelloy	B 06	Flange DN 100 PN 16 Form N, DIN 2501/316L	B 66
Flange DN 25 PN 40 Form N, DIN 2501/Monel solid	B 07	Flange DN 100 PN 40 Form C, DIN 2501/316L	B 67
Flange DN 25 PN 40 V13, DIN 2501/316L	B 08	Flange DN 100 PN 40 Form C, DIN 2501/ECTFE ⁶⁾	B 68
Flange DN 32 PN 40 Form C, DIN 2501/316L	B 10	Flange DN 100 PN 40 Form C, DIN 2501/PFA ⁶⁾	B 70
Flange DN 32 PN 40 Form C, DIN 2501/ECTFE ⁶⁾	B 11	Flange DN 100 PN 40 Form C, DIN 2501/Enamelled ⁷⁾	B 71
Flange DN 40 PN 6 Form C, DIN 2501/316L	B 12	Flange DN 100 PN 40 Form F, DIN 2501/316L	B 72
Flange DN 40 PN 6 Form C, DIN 2501/ECTFE ⁶⁾	B 13	Flange DN 100 PN 40 Form N, DIN 2501/316L	B 73
Flange DN 40 PN 40 Form C, DIN 2501/316L	B 14	Flange DN 100 PN 40 V13, DIN 2501/316L	B 74
Flange DN 40 PN 40 Form C, DIN 2501/Hastelloy	B 15	Flange DN 100 PN 64 Form E, DIN 2501/316L	B 75
Flange DN 40 PN 40 Form C, DIN 2501/ECTFE ⁶⁾	B 16	Flange DN 100 PN 100 Form E, DIN 2501/316L	B 76
Flange DN 40 PN 40 Form C, DIN 2501/PFA ⁶⁾	B 17	Flange DN 100 PN 100 Form L, DIN 2501/316L	B 77
Flange DN 40 PN 40 Form C, DIN 2501/Enamelled ⁷⁾	B 18	Flange DN 125 PN 16 Form F, DIN 2501/316L	B 78
Flange DN 40 PN 40 Form F, DIN 2501/316L	B 20	Flange DN 125 PN 40 Form C, DIN 2501/316L	B 80
Flange DN 40 PN 40 Form N, DIN 2501/316L	B 21	Flange DN 125 PN 40 Form N, DIN 2512/316L	B 81
Flange DN 40 PN 40 Form E, DIN 2501/316L	B 22	Flange DN 150 PN 16 Form C, DIN 2501/316L	B 82
Flange DN 40 PN 40 V13, DIN 2501/316L	B 23	Flange DN 150 PN 16 Form C, DIN 2501/Hastelloy	B 83
Flange DN 50 PN 40 Form C, DIN 2501/316L	B 24	Flange DN 150 PN 16 Form C, DIN 2501/ECTFE ⁶⁾	B 84
Flange DN 50 PN 40 Form C, DIN 2501/Hastelloy	B 25	Flange DN 150 PN 16 Form C, DIN 2501/PFA ⁶⁾	B 85
Flange DN 50 PN 40 Form C, DIN 2501/ECTFE ⁶⁾	B 26	Flange DN 150 PN 16 Form D, DIN 2501/316L	B 86
Flange DN 50 PN 40 Form C, DIN 2501/ECTFE (ZB3108) ⁶⁾	B 27	Flange DN 150 PN 40 Form C, DIN 2501/316L	B 87
Flange DN 50 PN 40 Form C, DIN 2501/PFA ⁶⁾	B 28	Flange DN 150 PN 40 Form C, DIN 2501/Hastelloy	B 88
Flange DN 50 PN 40 Form D, DIN 2501/316L	B 30	Flange DN 150 PN 40 Form F, DIN 2501/316L	C 00
Flange DN 50 PN 40 Form D, DIN 2501/Hastelloy	B 31	Flange DN 150 PN 40 Form N, DIN 2512/316L	C 01
Flange DN 50 PN 40 Form F, DIN 2501/316L	B 32	Flange DN 200 PN 10 Form C, DIN 2501/ECTFE ⁶⁾	C 02
Flange DN 50 PN 40 Form N, DIN 2501/316L	B 33	Flange DN 200 PN 16 Form C, DIN 2501/316L	C 03
Flange DN 50 PN 40 Form N, DIN 2501/Hastelloy	B 34	Flange DN 25 PN 40 Form B1, EN 1092-1/316L	C 04
Flange DN 50 PN 40 Form E, DIN 2501/316L	B 35	Flange DN 25 PN 40 Form B1, EN 1092-1/Hastelloy	C 05
Flange DN 50 PN 40 V13, DIN 2501/316L	B 36	Flange DN 25 PN 40 Form B1, EN/316L/PFA ⁶⁾	C 06
Flange DN 50 PN 40 R13, DIN 2501/316L	B 37	Flange DN 25 PN 40 Form B1, EN 1092-1/Enamelled ⁷⁾	C 07
Flange DN 50 PN 64 Form F, DIN 2501/316L	B 38	Flange DN 25 PN 40 Form B2, EN 1092-1/316L	C 08
Flange DN 50 PN 64 Form N, DIN 2501/Hastelloy	B 40	Flange DN 25 PN 40 Form F, EN 1092-1/316L	C 10
Flange DN 50 PN 64 Form C, DIN 2501/316L	B 41	Flange DN 25 PN 63 Form B1, EN 1092-1/316L	C 11
Flange DN 50 PN 64 Form L, DIN 2501/316L	B 42	Flange DN 25 PN 100 Form B2, EN 1092-1/316L	C 12
Flange DN 50 PN 100 Form E, DIN 2501/316L	B 43	Flange DN 40 PN 40 Form B1, EN/316L	C 13
Flange DN 50 PN 100 Form L, DIN 2501/316L	B 44	Flange DN 40 PN 40 Form B1, EN 1092-1/PFA ⁶⁾	C 14
Flange DN 65 PN 40 Form C, DIN 2501/316L	B 45	Flange DN 40 PN 40 Form B2, EN/316L	C 15
Flange DN 65 PN 40 Form C, DIN 2501/Hastelloy	B 46	Flange DN 50 PN 40 Form B1, EN/316L	C 16
Flange DN 65 PN 40 Form C, DIN 2501/ECTFE ⁶⁾	B 47	Flange DN 50 PN 40 Form B1, EN 1092-1/Hastelloy	C 17
Flange DN 65 PN 40 Form C, DIN 2501/PFA ⁶⁾	B 48	Flange DN 50 PN 40 Form B1, EN 1092-1/Monel ZB2977	C 18
Flange DN 65 PN 40 Form F, DIN 2501/316L	B 50	Flange DN 50 PN 40 Form B1, EN 1092-1/ECTFE ⁶⁾	C 20
Flange DN 65 PN 64 Form E, DIN 2501/316L	B 51	Flange DN 50 PN 40 Form B1, EN/316L/PFA ⁶⁾	C 21
Flange DN 80 PN 40 Form C, DIN 2501/316L	B 52	Flange DN 50 PN 40 Form B1, EN 1092-1/Enamelled ⁷⁾	C 22
Flange DN 80 PN 40 Form C, DIN 2501/Hastelloy	B 53	Flange DN 50 PN 40 Form C, EN 1092-1/316L	C 23
Flange DN 80 PN 40 Form C, DIN 2501/ECTFE ⁶⁾	B 54		
Flange DN 80 PN 40 Form C, DIN 2501/PFA ⁶⁾	B 55		
Flange DN 80 PN 40 Form F, DIN 2501/316L	B 56		

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Selection and Ordering data

Article No.

SITRANS LVL200, Rigid extension

Compact vibrating level switch for material detection in liquid applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.

Flange DN 50 PN 40 Form D, EN/316L	C 24
Flange DN 50 PN 40 Form D, EN 1092-1/ Hastelloy	C 25
Flange DN 50 PN 40 Form B2, EN 1092-1/316L	C 26
Flange DN 50 PN 40 Form E, EN 1092-1/316L	C 27
Flange DN 80 PN 40 Form B1, EN 1092-1/316L	C 28
Flange DN 80 PN 40 Form B1, EN 1092-1/Hastelloy	C 30
Flange DN 80 PN 40 Form B1, EN 1092-1/ECTFE ⁶⁾	C 31
Flange DN 80 PN 40 Form B1, EN 1092-1/ Enamelled ⁷⁾	C 32
Flange DN 80 PN 40 Form B2, EN 1092-1/316L	C 33
Flange DN 100 PN 16 Form B1, EN 1092-1/316L	C 34
Flange DN 100 PN 16 Form B1, EN 1092-1/ Hastelloy	C 35
Flange DN 100 PN 16 Form B1, EN 1092-1/ Enamelled ⁷⁾	C 36
Flange DN 100 PN 40 Form B1, EN 1092-1/316L	C 37
Flange DN 100 PN 40 Form B1, EN 1092-1/ Enamelled ⁷⁾	C 38
Flange DN 100 PN 40 Form C, EN 1092-1/316L	C 40
Flange DN 100 PN 63 Form B2, EN 1092-1/316L	C 41
Flange DN 150 PN 16 Form B1, EN 1092-1/316L	C 42
Flange DN 150 PN 16 Form B1, EN 1092-1/PFA ⁶⁾	C 43
Flange DN 150 PN 40 Form B1, EN 1092-1/316L	C 44
Flange DN 150 PN 40 Form B1, EN 1092-1/ ECTFE ⁶⁾	C 45
Flange DN 150 PN 40 Form B2, EN 1092-1/316L	C 46
Flange 1" 150 lb ANSI B16.5/316L	C 47
Flange 1" 150 lb RF, ANSI B16.5/Hastelloy	C 48
Flange 1" 150 lb RF, ANSI B16.5/Monel ZB2977	C 50
Flange 1" 150 lb RF, ANSI B16.5/ECTFE ⁶⁾	C 51
Flange 1" 150 lb RF, ANSI B16.5/PFA ⁶⁾	C 52
Flange 1" 150 lb RF, ANSI B16.5/Enamelled ⁷⁾	C 53
Flange 1" 300 lb RF, ANSI B16.5/316L	C 54
Flange 1" 300 lb RF, ANSI B16.5/ECTFE ⁶⁾	C 55
Flange 1" 600 lb RF, ANSI B16.5/316L	C 56
Flange 1½" 150 lb RF, ANSI B16.5/316L	C 57
Flange 1½" 150 lb RF, ANSI B16.5/Hastelloy	C 58
Flange 1½" 150 lb RF, ANSI B16.5/ECTFE ⁶⁾	C 60
Flange 1½" 150 lb RF, ANSI B16.5/PFA ⁶⁾	C 61
Flange 1½" 150 lb RF, ANSI B16.5 Enamelled ⁷⁾	C 62
Flange 1½" 150 lb FF, ANSI B16.5/ECTFE ⁶⁾	C 63
Flange 1½" 300 lb RF, ANSI B16.5/316L	C 64
Flange 1½" 300 lb RF, ANSI B16.5/Monel ZB2977	C 65
Flange 1½" 300 lb RF, ANSI B16.5/ECTFE ⁶⁾	C 66
Flange 1½" 600 lb RF, ANSI B16.5/316L	C 67
Flange 2" 150 lb RF, ANSI B16.5/316L	C 68
Flange 2" 150 lb RF, ANSI B16.5/Hastelloy	C 70
Flange 2" 150 lb RF, ANSI B16.5/Monel ZB2977	C 71
Flange 2" 150 lb RF, ANSI B16.5/ECTFE ⁶⁾	C 72
Flange 2" 150 lb RF, ANSI B16.5/PFA ⁶⁾	C 73
Flange 2" 150 lb RF, ANSI B16.5/Enamelled ⁷⁾	C 74
Flange 2" 150 lb FF, ANSI B16.5/316L	C 75
Flange 2" 150 lb FF, ANSI B16.5/ECTFE ⁶⁾	C 76
Flange 2" 150 lb SG (small groove), ANSI B16.5/316L	C 77
Flange 2" 300 lb RF, ANSI B16.5/316L	C 78
Flange 2" 300 lb RF, ANSI B16.5/Hastelloy	C 80

Selection and Ordering data

Article No.

SITRANS LVL200, Rigid extension

Compact vibrating level switch for material detection in liquid applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.

Flange 2" 300 lb RF, ANSI B16.5/ECTFE ⁶⁾	C 82
Flange 2" 300 lb RF, ANSI B16.5/PFA ⁶⁾	C 83
Flange 2" 300 lb RF, ANSI B16.5 Enamelled ⁷⁾	C 84
Flange 2" 300 lb RJF, ANSI B16.5/316L	C 85
Flange 2" 300 lb ST, ANSI B16.5/316L	C 86
Flange 2" 300 lb LG (large groove), ANSI B16.5/316L	C 87
Flange 2" 300 lb LT, ANSI B16.5/316L	C 88
Flange 2" 600 lb RF, ANSI B16.5/316L	D 00
Flange 2" 600 lb RF, ANSI B16.5/Monel ZB2977	D 01
Flange 2" 600 lb RF, ANSI B16.5/ECTFE ⁶⁾	D 02
Flange 2" 600 lb RJF, ANSI B16.5/316L	D 03
Flange 2" 600 lb LG, ANSI B16.5/316L	D 04
Flange 2" 900 lb RJF, ANSI B16.5/316L	D 05
Flange 2½" 150 lb RF, ANSI B16.5/316L	D 06
Flange 2½" 300 lb RF, ANSI B16.5/316L	D 07
Flange 3" 150 lb RF, ANSI B16.5/316L	D 08
Flange 3" 150 lb RF, ANSI B16.5/Hastelloy	D 10
Flange 3" 150 lb RF, ANSI B16.5/Monel ZB2977	D 11
Flange 3" 150 lb RF, ANSI B16.5/ECTFE ⁶⁾	D 12
Flange 3" 150 lb RF, ANSI B16.5/PFA ⁶⁾	D 13
Flange 3" 150 lb RF, ANSI B16.5/Enamelled ⁷⁾	D 14
Flange 3" 150 lb FF, ANSI B16.5/316L	D 15
Flange 3" 150 lb FF, ANSI B16.5/ECTFE ⁶⁾	D 16
Flange 3" 150 lb FF, ANSI B16.5/PFA ⁶⁾	D 17
Flange 3" 300 lb RF, ANSI B16.5/316L	D 18
Flange 3" 300 lb RF, ANSI B16.5/Hastelloy	D 20
Flange 3" 300 lb RF, ANSI B16.5/ECTFE ⁶⁾	D 21
Flange 3" 300 lb RF, ANSI B16.5/PFA ⁶⁾	D 22
Flange 3" 300 lb RF, ANSI B16.5/Enamelled ⁷⁾	D 23
Flange 3" 600 lb RF, ANSI B16.5/316L	D 24
Flange 3½" 150 lb RF, ANSI B16.5/316L	D 25
Flange 3½" 150 lb RF, ANSI B16.5/ECTFE ⁶⁾	D 26
Flange 4" 150 lb RF, ANSI B16.5/316L	D 27
Flange 4" 150 lb RF, ANSI B16.5/Hastelloy	D 28
Flange 4" 150 lb RF, ANSI B16.5/ECTFE ⁶⁾	D 30
Flange 4" 150 lb RF, ANSI B16.5/PFA ⁶⁾	D 31
Flange 4" 150 lb RF, ANSI B16.5/Enamelled ⁷⁾	D 32
Flange 4" 150 lb LT, ANSI B16.5/316L	D 33
Flange 4" 300 lb RF, ANSI B16.5/316L	D 34
Flange 4" 300 lb RF, ANSI B16.5/Hastelloy	D 35
Flange 4" 300 lb RF, ANSI B16.5/ECTFE ⁶⁾	D 36
Flange 4" 300 lb RJF, ANSI B16.5/316L	D 37
Flange 4" 300 lb LG, ANSI B16.5/316L	D 38
Flange 4" 300 lb LT, ANSI B16.5/316L	D 40
Flange 4" 600 lb RF, ANSI B16.5/316L	D 41
Flange 4" 600 lb RJF, ANSI B16.5/316L	D 42
Flange 5" 150 lb RF, ANSI B16.5/316L	D 43
Flange 6" 150 lb RF, ANSI B16.5/316L	D 44
Flange 6" 150 lb RF, ANSI B16.5/Hastelloy	D 45
Flange 6" 150 lb RF, ANSI B16.5/ECTFE ⁶⁾	D 46
Flange 6" 150 lb RF, ANSI B16.5/PFA ⁶⁾	D 47
Flange 6" 150 lb RJF, ANSI B16.5/316L	D 48
Flange 6" 300 lb RF, ANSI B16.5/316L	D 50
Flange 8" 150 lb RF, ANSI B16.5/316L	D 51
Flange 8" 150 lb RF, ANSI B16.5/ECTFE ⁶⁾	D 52
Flange 1" BS.10 Table E/316L	D 53

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LVL200, Rigid extension Compact vibrating level switch for material detection in liquid applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.	7ML5747-	SITRANS LVL200, Rigid extension Compact vibrating level switch for material detection in liquid applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.	7ML5747-
Flange 1" BS.10 Table E/PFA ⁶⁾	D 5 4	Rigid Extension 316L Ra ≤ 0.8 µm	
Flange 1½" BS.10 Table E/316L	D 5 5	80 ... 500 mm	D 0
Flange 3½" BS.10 Table E/316L	D 5 6	501 ... 1 000 mm	D 1
Flange 4" BS.10 Table E/ECTFE ⁶⁾	D 5 7	1 001 ... 1 500 mm	D 2
Flange DN 40 10K, JIS/316L	D 5 8	1 501 ... 2 000 mm	D 3
Flange DN 50 10K, JIS/316L	D 6 0	2 001 ... 2 500 mm	D 4
Flange DN 80 10K, JIS/316L	D 6 1	2 501 ... 3 000 mm	D 5
Flange DN 100 10K, JIS/316L	D 6 2	3 001 ... 3 500 mm	D 6
		3 501 ... 4 000 mm	D 7
Adapter/Process temperature		Rigid Extension 316L Ra ≤ 0.3 µm	
Without adapter/-50 ... +150 °C	1	80 ... 500 mm	E 0
With adapter/-50 ... +200 °C ⁸⁾	2	501 ... 1 000 mm	E 1
With adapter/-50... +250 °C	3	1 001 ... 1 500 mm	E 2
With gas-tight leadthrough/-50 ... +150 °C	4	1 501 ... 2 000 mm	E 3
With gas-tight leadthrough/-50 ... +250 °C	5	2 001 ... 2 500 mm	E 4
		2 501 ... 3 000 mm	E 5
Housing/ Cable entry		3 001 ... 3 500 mm	E 6
Aluminium IP66/IP67/M20x1.5	A	3 501 ... 4 000 mm	E 7
Aluminium IP66/IP67/½" NPT	B		
316L stainless steel (electropolished) IP66/IP67/M20X1.5 ⁹⁾¹⁰⁾	C	Rigid Extension Enamelled version⁷⁾	
316L stainless steel (electropolished) IP66/IP67/½" NPT ⁹⁾¹⁰⁾	D	80 ... 250 mm	F 0
		251 ... 500 mm	F 1
		501 ... 750 mm	F 2
		751 ... 1 000 mm	F 3
		1 001 ... 1 250 mm	F 4
		1 251 ... 1 500 mm	F 5
NOTE: When selecting a Rigid Extension option, extension coating must match the process connection coating and the material and surface roughness type.		Rigid Extension Hastelloy	
		80 ... 500 mm	G 0
		501 ... 1 000 mm	G 1
		1 001 ... 1 500 mm	G 2
		1 501 ... 2 000 mm	G 3
		2 001 ... 2 500 mm	G 4
		2 501 ... 3 000 mm	G 5
		3 001 ... 3 500 mm	G 6
		3 501 ... 4 000 mm	G 7
Rigid Extension 316L		Rigid Extension Monel	
80 ... 500 mm	A 0	80 ... 500 mm	H 0
501 ... 1 000 mm	A 1	501 ... 1 000 mm	H 1
1 001 ... 1 500 mm	A 2	1 001 ... 1 500 mm	H 2
1 501 ... 2 000 mm	A 3	1 501 ... 2 000 mm	H 3
2 001 ... 2 500 mm	A 4	2 001 ... 2 500 mm	H 4
2 501 ... 3 000 mm	A 5	2 501 ... 3 000 mm	H 5
3 001 ... 3 500 mm	A 6		
3 501 ... 4 000 mm	A 7		
Rigid Extension ECTFE coated⁶⁾			
80 ... 500 mm	B 0		
501 ... 1 000 mm	B 1		
1 001 ... 1 500 mm	B 2		
1 501 ... 2 000 mm	B 3		
2 001 ... 2 500 mm	B 4		
2 501 ... 3 000 mm	B 5		
Rigid Extension PFA coated⁶⁾			
80 ... 500 mm	C 0		
501 ... 1 000 mm	C 1		
1 001 ... 1 500 mm	C 2		
1 501 ... 2 000 mm	C 3		
2 001 ... 2 500 mm	C 4		
2 501 ... 3 000 mm	C 5		

¹⁾ Available with Adapter/Process temperature options 1, 3, 4, and 5 only

²⁾ Available with Electronics option 4 only

³⁾ Available with Adapter/Process temperature options 1 and 3 only

⁴⁾ Extension length restricted to 2 956 mm

⁵⁾ Available with Housing/Cable entry option B only

⁶⁾ Available with Adapter/Process temperature options 1 and 4 only

⁷⁾ Available with Adapter/Process temperature options 1, 2, and 4 only

⁸⁾ Available with enamelled Process connection and Extension options only

⁹⁾ Available with Approval options A, B, C only

¹⁰⁾ Not available with SIL/IEC61508 Certificate of conformity (SIL-2 min. and max. detection)

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Cleaning including Certificate (oil, grease and silicone free)

W01

Enter the total insertion length in plain text description, max. 4 000 mm (157.48 inch)

Y01

Identification Label (measurement loop) stainless steel: max. 16 characters add in plain text

Y17

Identification Label (measurement loop) Foil: max. 16 characters add in plain text

Y18

Acceptance test certificate 3.1 NACE MR 0775 for material EN10204¹⁾

D07

Acceptance test certificate 3.1 for instrument EN10204¹⁾

C12

Acceptance test Certificate 2.2 for material EN10204¹⁾

C15

Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511¹⁾

C20

Dye penetration test + 3.1 certificate/instrument¹⁾

C13

X-ray test + 3.1 certificate/instrument¹⁾

C14

Positive material identification test + 3.1 certificate/instrument¹⁾

C16

Roughness test + 3.1 certificate/instrument¹⁾

C18

Pressure test + 3.1 certificate/instrument¹⁾

C31

Helium leak test + 3.1 certificate/instrument¹⁾

C32

Ferrite measuring accuracy to DIN32514-1 + 3.1 certificate/instrument¹⁾

C60

Pressure test according to Norsok + 3.1 certificate/instrument¹⁾

C61

Additional Operating Instructions

Article No.

LVL200 Extended (DPDT Relay)

- English
- French
- Spanish
- German

7ML1998-5KW01

7ML1998-5KW11

7ML1998-5KW21

7ML1998-5KW31

LVL200 (Contactless electronic switch)

- English
- French
- Spanish
- German

7ML1998-5KV01

7ML1998-5KV11

7ML1998-5KV21

7ML1998-5KV31

Electronics module LVL200 Relay

- English
- French
- Spanish
- German

7ML1998-5LS01

7ML1998-5LS11

7ML1998-5LS21

7ML1998-5LS31

This device is shipped with the Siemens Milltronics manual DVD containing the Operating Instructions library.

Selection and Ordering data

Order code

Spare Parts and Accessories

Electronics module SITRANS LVL200 Relay

7ML1830-1NC

Electronics module SITRANS LVL200 Contactless

7ML1930-6AA

Lock fitting, unpressurized, G1" A/316L

7ML1930-1DQ

Lock fitting, unpressurized, 1" NPT/316L

7ML1930-1DR

Lock fitting, unpressurized, G1 ... 1/2" A/316L

7ML1930-1DS

Lock fitting, unpressurized, 1 ... 1/2" NPT/316L

7ML1930-1DT

Lock fitting, -1 ... 16 bar, G1" A/316L

7ML1930-1DU

Lock fitting, -1 ... 16 bar, 1" NPT/316L

7ML1930-1DV

Lock fitting, -1 ... 16 bar, G1 ... 1/2" A/316L

7ML1930-1DW

Lock fitting, -1 ... 16 bar, 1 ... 1/2" NPT/316L

7ML1930-1DX

Lock fitting, -1 ... 64 bar, G1" A/316L

7ML1930-1EA

Lock fitting, -1 ... 64 bar, 1" NPT/316L

7ML1930-1EB

Lock fitting, -1 ... 64 bar, G1 ... 1/2" A/316L

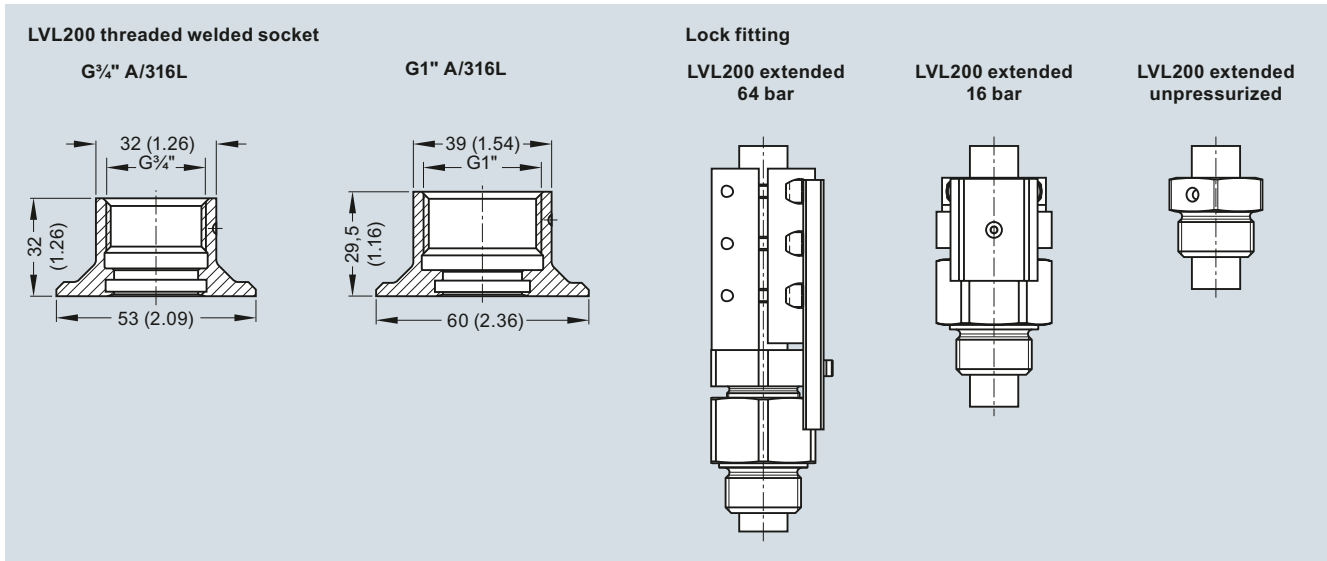
7ML1930-1EC

Lock fitting, -1 ... 64 bar, 1 ... 1/2" NPT/316L

7ML1930-1ED

¹⁾ Listed Certificates are not available with all configurations, please contact factory for more information

Options



SITRANS LVL200 welded socket and lock fitting, dimensions in mm (inch)

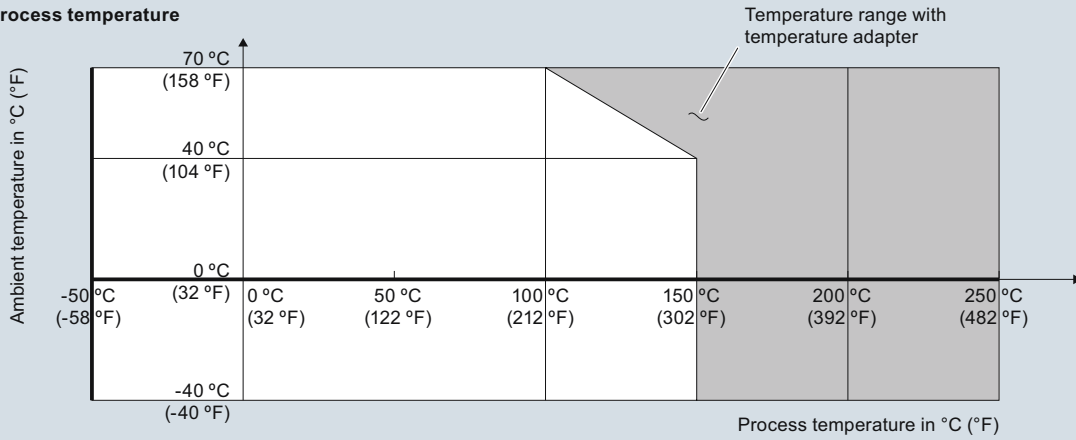
Level Measurement

Point level measurement – Vibrating switches

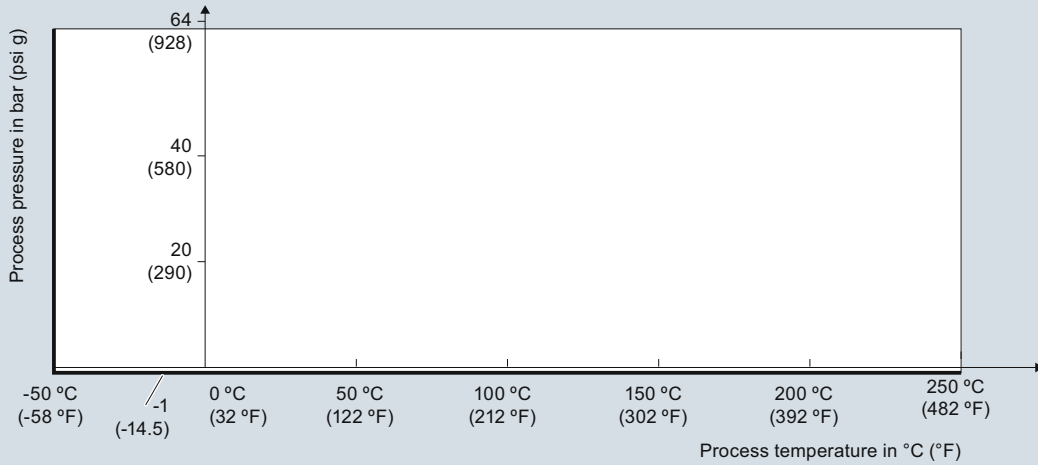
SITRANS LVL200

Characteristic curves

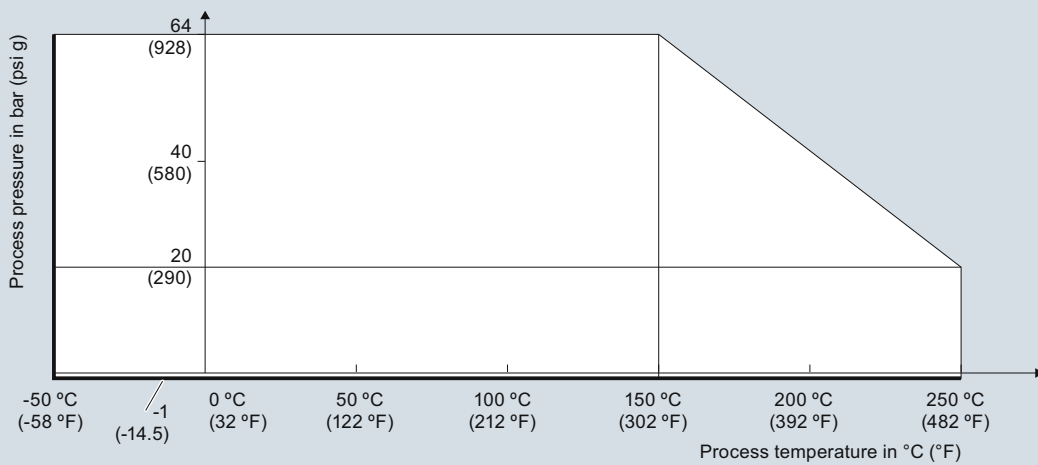
Ambient/Process temperature



Process pressure with switch position 0.7 g/cm³ (mode switch)

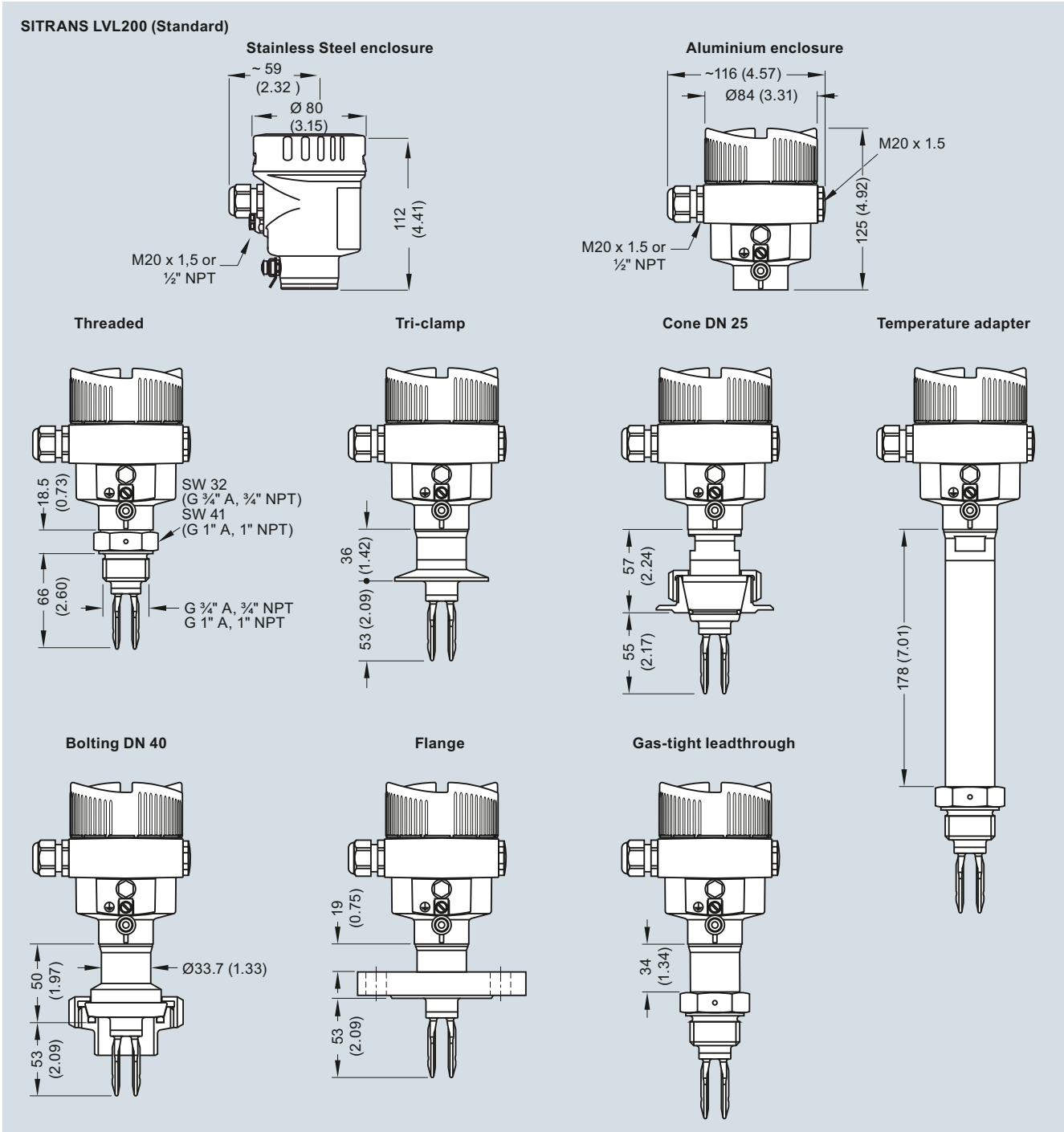


Process pressure with switch position 0.5 g/cm³ (mode switch)



SITRANS LVL200 Process Pressure/Process Temperature/Ambient Temperature derating curves

Dimensional drawings



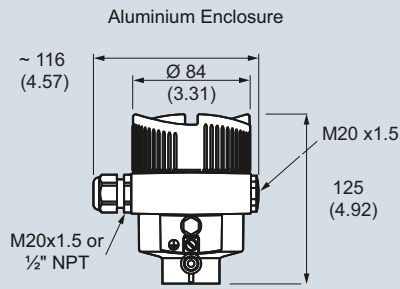
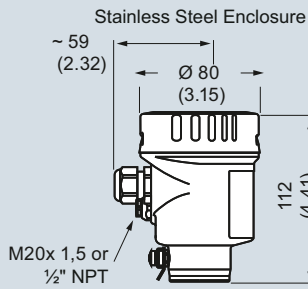
SITRANS LVL200 (Standard), dimensions in mm (inch)

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVL200

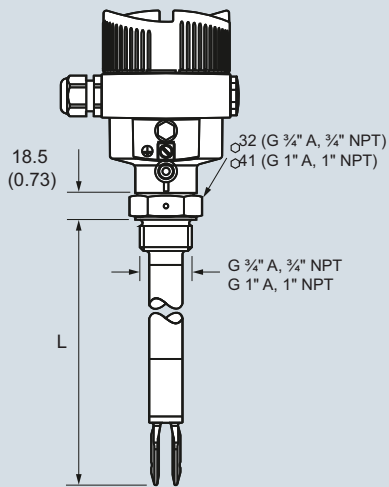
SITRANS LVL200 (Extended)



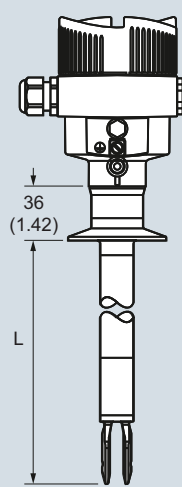
Sensor length (L)

316L, Hastelloy C4 (2.4610)	80 ... 6 000 mm (3.15 ... 236.2 inch)
Hastelloy C4 (2.4610) enamelled	80 ... 1 500 mm (3.15 ... 59.06 inch)
316L, ECTFE coated	80 ... 3 000 mm (3.15 ... 118.1 inch)
316L, PFA coated	80 ... 3 000 mm (3.15 ... 118.1 inch)

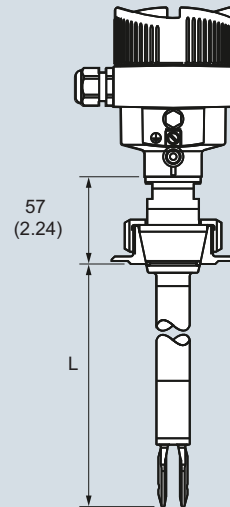
Threaded



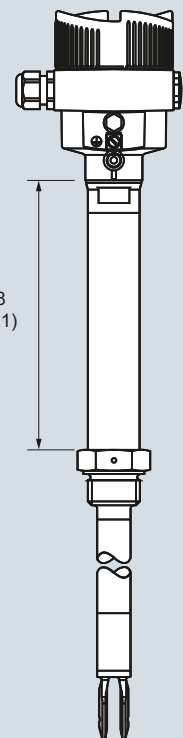
Tri-clamp



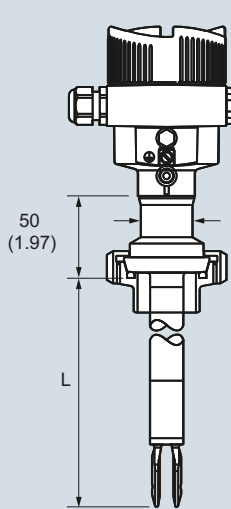
Cone DN 25



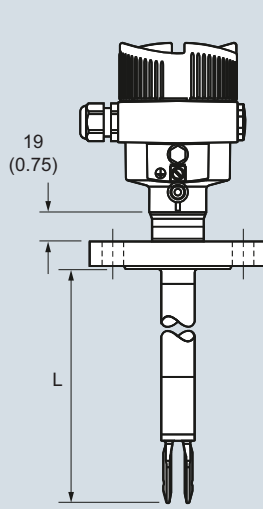
Temperature adapter



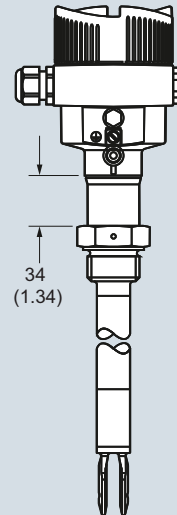
Bolting DN 40



Flanged



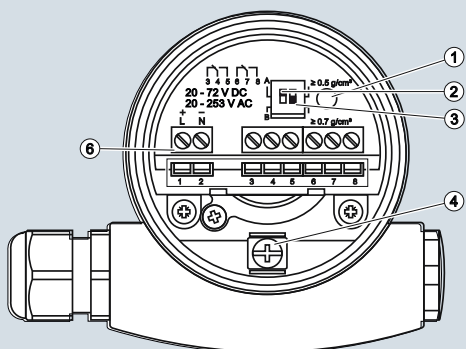
Gas-tight leadthrough



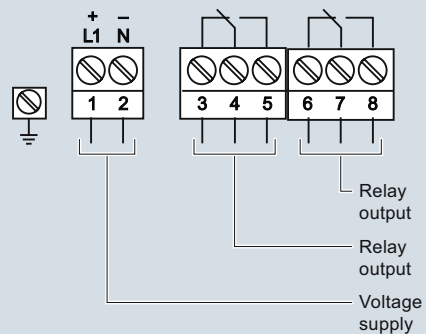
SITRANS LVL200 (Extended), dimensions in mm (inch)

Schematics

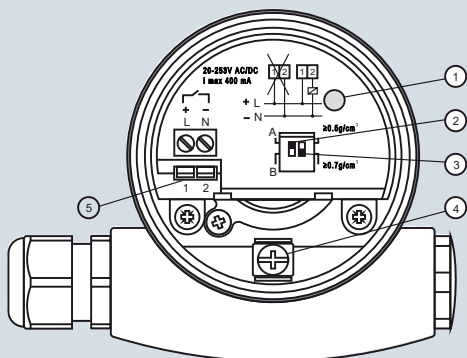
Relay (DPDT)



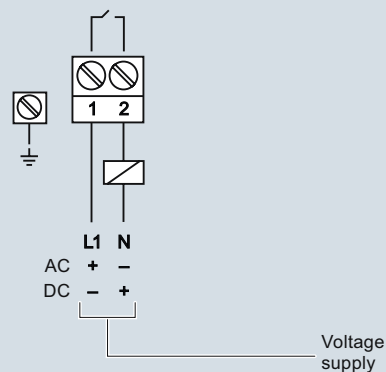
- | | |
|---|---|
| ① | Control lamp |
| ② | DIL switch for characteristics reversal |
| ③ | DIL switch for sensitivity adjustment |
| ④ | Ground terminal |
| ⑥ | Connection terminals |



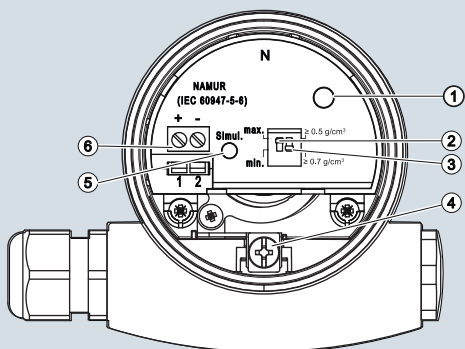
Contactless



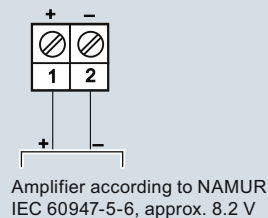
- | | |
|---|---|
| ① | Control lamp |
| ② | DIL switch for mode adjustment |
| ③ | DIL switch for switching point adaptation |
| ④ | Ground terminal |
| ⑥ | Connection terminals |



NAMUR



- | | |
|---|---|
| ① | Control lamp |
| ② | DIL switch for characteristics reversal |
| ③ | DIL switch for sensitivity adjustment |
| ④ | Ground terminal |
| ⑥ | Simulation key |
| ⑥ | Connection terminals |



SITRANS LVL200 connections

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVS100

Overview



SITRANS LVS100 is a vibrating point level switch for material detection in bulk solids.

Benefits

- High resistance to mechanical forces
- Sliding sleeve options for adjustable insertion length and ease of cleaning
- Rotatable enclosure for ease of installation and wiring
- Suitable for point level detection of materials starting at a bulk density of 30 g/l (1.9 lb/ft³)
- Customer desired extensions up to 4 000 mm (157.48 inch)

Application

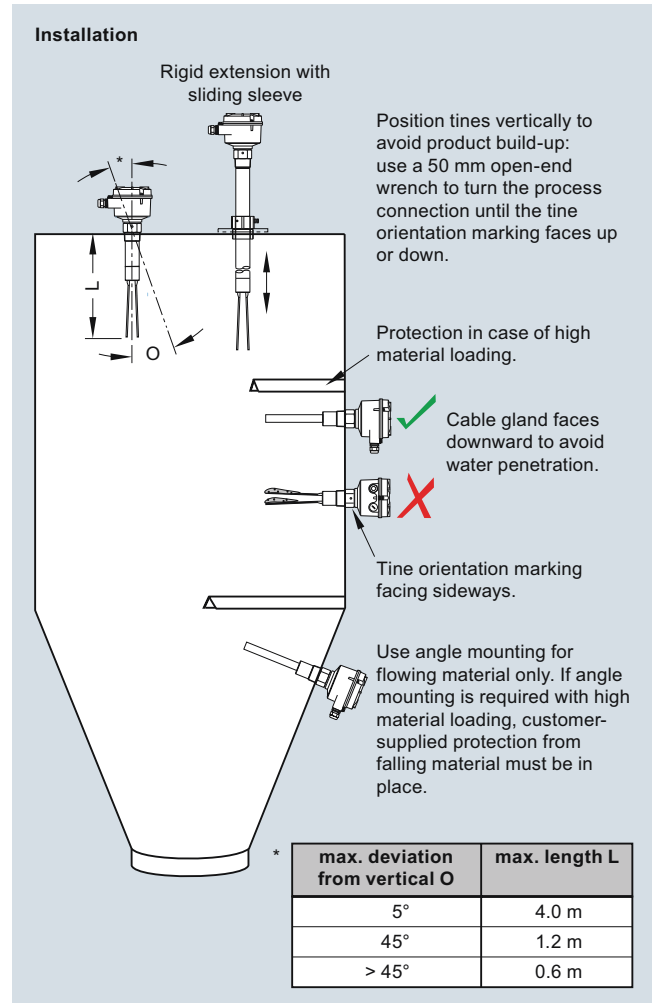
SITRANS LVS100 detects high, low or demand levels of dry bulk solids in bins, silos or hoppers.

SITRANS LVS100 has a compact design and can be top, side, or angle mounted. The vibrating fork design ensures the tines are kept clean. The unique design of the fork and crystal assembly eliminates false high level readings even if tines become damaged.

A signal from the electronic circuit excites a crystal in the probe causing the fork to vibrate. If the fork is covered by material, the change in vibration is detected by the electronic circuitry which causes the relay to change state after a one second delay. When the fork is free from material pressure, full vibration resumes and the relay reverts to its normal condition.

- Key Applications: dry bulk solids in bins, silos, hoppers

Configuration



SITRANS LVS100 installation, dimensions in mm (inch)

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVS100

Technical specifications

Mode of Operation	
Measuring principle	Vibrating point level switch
Input	
Measured variable	High, low and demand
Measuring frequency	200 Hz
Output	
Relays	DPDT relay
Relay delay	From loss of vibration: approximately 1 second From resumption of vibration: approximately 1 ... 2 s
Signal delay	Probe uncovered to covered: approximately 1 s Probe covered to uncovered: approximately 1 ... 2 s
Relay fail-safe	High or low, switch selectable
Alarm output	Relay 8 A at 250 V AC, non-inductive Relay 5 A at 30 V DC, non-inductive
Sensitivity	
High or low, switch selectable	
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	
• Process temperature	-40 ... +150 °C (-40 ... +302 °F)
• Max. threaded bushing temperature	60 °C (140 °F)
• Max. enclosure surface temperature (Category 2D)	90 °C (194 °F)
• Max. extension surface temperature (Category 1D)	150 °C (302 °F)
• Pressure (vessel)	Max. 10 bar g (145 psi g) European Pressure Directive 97/23/EC: Category 1
Minimum material density	Approx. 30 g/l (1.9 lb/ft ³)

Design

Material	Epoxy coated aluminum
• Enclosure	• Thread 1¼" NPT [(Taper), ANSI/ASME B1.20.1], R 1½" [(BSPT), EN 10226]
Process connection	• Thread R 1½" [(BSPT), EN 10226], ½" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69 inch)] • Thread material: stainless steel 304 (1.4301) or 316Ti (1.4571) depending on configuration
Tine material	Stainless steel 316Ti (1.4571)
Degree of protection	IP66/Type 4/NEMA 4
Conduit entry	2 x M20x1.5 or 2 x ½" NPT
Weight	Standard version, no extensions: approx. 1.7 kg (3.7 lb)
Power supply	
• 19 ... 230 V AC, +10 %, 50 ... 60 Hz, 8 VA • 19 ... 40 V DC, +10 %, 1.5 W	

Certificates and approvals

- CSA/FM General Purpose
- CE
- CSA/FM Dust Ignition Proof
- RCM
- ATEX II 1/2 D
- IECex

Level Measurement

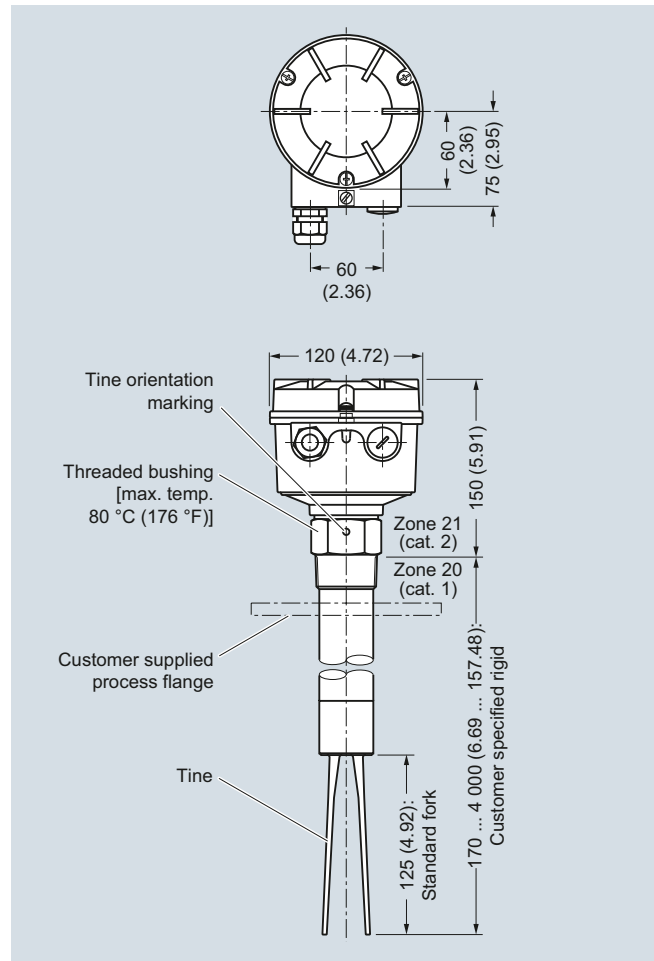
Point level measurement – Vibrating switches

SITRANS LVS100

Selection and Ordering data	Article No.
SITRANS LVS100, standard Vibrating point level switch for high or low level detection of bulk solids. Sensitivity > 30 g/l.	7ML5735- - 0 A 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Input Voltage	
DPDT Relay - 19 ... 230 V AC, 19 ... 40 V DC	1
DPDT Relay - 19 ... 230 V AC, 19 ... 40 V DC (stocked version) ¹⁾	2
Process temperature	
Up to 150 °C (302 °F)	A
Process connection	
Threaded	
R 1½" [(BSPT), EN 10226]	A
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	B
R 1½" [(BSPT), EN 10226] DIN 2999 thread, sliding sleeve - min. length 500 mm (19.69 inch) ²⁾	C
1½" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69 inch)] ²⁾	D
Extension length	
Stainless steel 316TI (1.4571)	
Standard length, 170 mm (6.69 inch)	11
Add Order code Y01 and plain text: "Insertion length ... mm"	
Stainless steel 304 (1.4301)	
• 300 ... 500 mm (11.81 ... 19.69 inch)	12
• 501 ... 1 000 mm (19.72 ... 39.37 inch)	13
• 1 001 ... 1 500 mm (39.41 ... 59.06 inch)	14
• 1 501 ... 2 000 mm (59.09 ... 78.74 inch)	15
• 2 001 ... 2 500 mm (78.78 ... 98.43 inch)	16
• 2 501 ... 3 000 mm (98.46 ... 118.11 inch)	17
• 3 001 ... 3 500 mm (118.15 ... 137.80 inch)	18
• 3 501 ... 4 000 mm (137.83 ... 157.48 inch)	20
Approvals	
CSA/FM General Purpose, CE, RCM	A
CSA/FM Class II, Div. 1, Group E, F, G, Class III, ATEX II 1/2 D, RCM	B
IEC-Ex t IIIC Da/Db	C

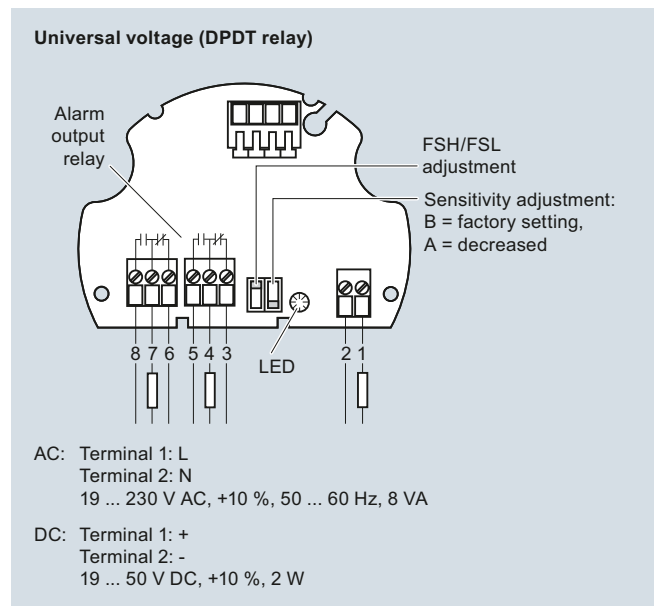
¹⁾ Only available with the following configurations 7ML5735-2AA11-0AA0 or 7ML5735-2AB11-0AA0
²⁾ Not available with extension length options 11, 12
 We can offer shorter delivery times for configurations designated with the Quick Ship Symbol. For details see page 9/5 in the appendix.

Dimensional drawings



SITRANS LVS100, dimensions in mm (inch)

Schematics



SITRANS LVS100 connections

Selection and Ordering data	Order code
Further Designs	
Please add "-Z" to Article No. and specify Order code(s).	
Total insertion length: Enter the total insertion length in plain text description, max. (50 mm increments)	Y01
Signal bulb inserted in M20 cable gland ¹⁾	A20
Operating Instructions	Article No.
Multi-language This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	7ML1998-5FT63
Spare Parts	
Replacement Electronics Module LVS100 DPDT Relay (19 ... 253 V AC, 19 ... 55 V DC)	7ML1830-1NS
R 1½" [(BSPT), EN 10226] DIN 2999 thread, sliding sleeve	7ML1830-1NT
1½" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69 inch)]	7ML1830-1NU

¹⁾ Available only with approval CE

Overview



SITRANS LVS200 is a vibrating point level switch for high, low, or demand level detection of bulk solids.

Benefits

- High resistance to mechanical forces
- Strong vibration resistance to high bulk material loads
- Rotatable enclosure for convenient wiring
- Suitable for low density material: standard version, 20 g/l (1.3 lb/ft³); liquid/solid interface version, 50 g/l (3 lb/ft³) and low density option min. 5 g/l (0.3 lb/ft³)
- Customer desired extensions up to 20 000 mm (787 inch)
- Optional detection of solids within liquid
- Durable short fork option with 165 mm (6.5 inch) insertion length

Application

The standard LVS200 detects high, low, or demand levels of dry bulk solids in bins, silos, or hoppers. The liquid/solid interface version can also detect settled solids within liquids or solids within confined spaces such as feed pipes. It is designed to ignore liquids in order to detect the interface between a solid and a liquid.

A pipe extension version is available with either the standard or liquid/solid interface electronics and fork, separated by a customer supplied 1 inch pipe.

SITRANS LVS200 has an optional 4 ... 20 mA output for monitoring buildup on the fork to determine when preventative maintenance should be performed in sticky applications.

The LVS200 has a compact design and can be top, side or angle mounted. The vibrating fork design ensures the tines are kept clean. The unique design of the fork and crystal assembly eliminates false high level readings even if tines become damaged.

A signal from the electronic circuit excites a crystal in the probe causing the fork to vibrate. If the fork is covered by material, the change in vibration is detected by the electronic circuitry which causes the relay to change state after a one second delay. When the fork is free from material pressure, full vibration resumes and the relay reverts to its normal condition.

- Key Applications: dry bulk solids in bins, silos, hoppers or settled solids within liquids (interface version)

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVS200

Technical specifications


Mode of operation		Medium conditions	
Measuring principle	Vibrating point level switch	<ul style="list-style-type: none"> Process temperature 	<ul style="list-style-type: none"> All except CSA Class II, Group G: -40 ... +150 °C (-40 ... +302 °F) CSA Class II, Group G: -40 ... +140 °C (-40 ... +284 °F), CSA temperature code T3B
Input		Design	
Measured variable	High, low and demand	Material	Epoxy coated aluminum
Measuring frequency	125 Hz	<ul style="list-style-type: none"> Enclosure 	<ul style="list-style-type: none"> Thread 1½" NPT [(Taper), ANSI/ASME B1.20.1], R ½" [(BSPT), EN 10226] and flange options Optional sliding bushing with 2" NPT [(Taper), ANSI/ASME B1.20.1] or BSP thread Thread material: stainless steel 303 (1.4301)
<ul style="list-style-type: none"> Standard Liquid/solid interface and short fork version 	350 Hz	Process connection	<ul style="list-style-type: none"> Thread 1½" NPT [(Taper), ANSI/ASME B1.20.1], R ½" [(BSPT), EN 10226] and flange options Optional sliding bushing with 2" NPT [(Taper), ANSI/ASME B1.20.1] or BSP thread Thread material: stainless steel 303 (1.4301)
Output		Tine material	Stainless steel 316TI (1.4571), PTFE-coated tines are available upon special request
PNP	Open collector: Permanent load max. 0.4 A, short-circuit and overload protected Turn-on voltage: max. 50 V (reverse protection)	Degree of protection	IP65/Type 4/NEMA 4
2-wire without contact	Load current: <ul style="list-style-type: none"> Min. 10 mA Max. 500 mA permanent Max. 2A < 200 ms Max. 5A < 50 ms Voltage drop on the electronic module: max. 7 V with closed electric circuit Cutoff current with open electric circuit: max. 5 mA	Conduit entry	2 x M20x1.5 or 2 x ½" NPT
Relays	SPDT relay DPDT relay	Weight	<ul style="list-style-type: none"> Standard version, no extensions: approx. 2.0 kg (4.4 lb) Solids/liquids version, no extensions: approx. 1.9 kg (4.2 lb)
<ul style="list-style-type: none"> Version with 1 relay Version with 2 relays 	<ul style="list-style-type: none"> From loss of vibration: approximately 1 second From resumption of vibration: approximately 1 ... 2 seconds Probe uncovered to covered: approximately 1 second Probe covered to uncovered: approximately 1 ... 2 seconds 	Power supply	
Relay delay	High or low, switch selectable	<ul style="list-style-type: none"> 19 ... 230 V AC, +10 %, 50 ... 60 Hz, 8 VA 19 ... 55 V DC, +10 %, 1.5 W 	
Signal delay	<ul style="list-style-type: none"> Relay 8 A at 250 V AC, non-inductive Relay 5 A at 30 V DC, non-inductive 	Certificates and approvals	
Relay fail-safe	8/16 mA or 4 ... 20 mA	<ul style="list-style-type: none"> CSA/FM General Purpose CE CSA/FM Dust Ignition Proof RCM ATEX II 1/2 D CSA/FM IS Class I, II, III Div. 1, Groups A, B, C, D, E, F, G, FM Class 1, Aex ia IIC, CSA Class 1, Ex ia IIC, available only with power supply option 5 and 6 ATEX II 1G and 1/2 G Eex ia IIC; ATEX II 1D and 1/2 D, available only with power supply option 5 	
Alarm output	4 ... 20 mA ± 0.1 mA		
mA output	High or low, switch selectable		
<ul style="list-style-type: none"> Resolution 			
Sensitivity			
High or low, switch selectable			
Rated operating conditions			
Installation conditions	Indoor/outdoor		
<ul style="list-style-type: none"> Location 			
Ambient conditions	-40 ... +60 °C (-40 ... +140 °F)		
<ul style="list-style-type: none"> Ambient temperature Installation category Pollution degree 	III 2		

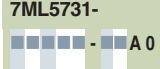
Level Measurement

Point level measurement – Vibrating switches


SITRANS LVS200

4

Selection and Ordering data	Article No.
SITRANS LVS200, standard SITRANS LVS200 is a vibrating point level switch for high, low, or demand level detection of bulk solids. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5731- 
Power supply 19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT) ¹⁾	1
19 ... 230 V AC, 19 ... 55 V DC, two relay outputs (DPDT) ¹⁾	2
18 ... 50 V DC PNP ¹⁾	3
19 ... 230 V AC/DC without contact, 2-wire loop powered ¹⁾	4
7 ... 9 V DC (requires NAMUR switch amplifier) NAMUR IEC 60947-5-6, 2-wire ²⁾	5
8/16 mA or 4 ... 20 mA; 12.5 ... 35 V DC, 2-wire ³⁾	6
19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT) basic version ⁴⁾⁵⁾	7
Process temperature Without temperature isolator	A
With temperature isolator	B
Separated enclosure - cable length 1.5 m (4.92 ft) [max. temperature process 150 °C (302 °F)/ max. temperature electronics 60 °C (140 °F)]	C
Separated enclosure - cable length 4.0 m (13.12 ft) [max. temperature process 150 °C (302 °F)/ max. temperature electronics 60 °C (140 °F)]	D
Process connection Threaded	
R 1½" [(BSPT), EN 10226]	A
1½" NPT [(Taper), ANSI/ASME B1.20.1]	B
G 2" [(BSPP), EN ISO 228-1], sliding sleeve [min. length 500 mm (19.69 inch)] ⁶⁾	C
2" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69 inch)] ⁶⁾	D
Flanged	
DN 100 PN 6, EN 1092-1 ⁷⁾	E
DN 100 PN 16, EN 1092-1	F
2" ASME 150 lb B16.5	G
3" ASME 150 lb B16.5	H
4" ASME 150 lb B16.5	J
2" Tri-clamp (DN 50) ISO 2852	K
Extension length Stainless steel 304 (1.4301) Standard length, 235 mm (9.25 inch)	11
Add Order code Y01 and plain text: "Insertion length ... mm"	
• 300 ... 500 mm (11.81 ... 19.69 inch)	12
• 501 ... 750 mm (19.72 ... 29.53 inch)	13
• 751 ... 1 000 mm (29.57 ... 39.37 inch)	14
• 1 001 ... 1 250 mm (39.41 ... 49.21 inch)	15
• 1 251 ... 1 500 mm (49.25 ... 59.06 inch)	16
• 1 501 ... 1 750 mm (59.09 ... 68.90 inch)	17
• 1 751 ... 2 000 mm (68.94 ... 78.74 inch)	18
• 2 001 ... 2 250 mm (78.78 ... 88.58 inch)	21
• 2 251 ... 2 500 mm (88.62 ... 98.43 inch)	22
• 2 501 ... 2 750 mm (98.46 ... 108.27 inch)	23
• 2 751 ... 3 000 mm (108.31 ... 118.11 inch)	24
• 3 001 ... 3 250 mm (118.15 ... 127.95 inch)	25
• 3 251 ... 3 500 mm (127.99 ... 137.80 inch)	26
• 3 501 ... 3 750 mm (137.83 ... 147.64 inch)	27
• 3 751 ... 4 000 mm (147.68 ... 157.48 inch)	28

Selection and Ordering data	Article No.
SITRANS LVS200, standard SITRANS LVS200 is a vibrating point level switch for high, low, or demand level detection of bulk solids. Stainless steel 316L (1.4404) Standard length, 235 mm (9.25 inch)	7ML5731- 
Add Order code Y01 and plain text: "Insertion length ... mm"	
300 ... 500 mm (11.81 ... 19.69 inch)	31
501 ... 750 mm (19.72 ... 29.53 inch)	32
751 ... 1 000 mm (29.57 ... 39.37 inch)	33
1 001 ... 1 250 mm (39.41 ... 49.21 inch)	34
1 251 ... 1 500 mm (49.25 ... 59.06 inch)	35
1 501 ... 1 750 mm (59.09 ... 68.90 inch)	36
1 751 ... 2 000 mm (68.94 ... 78.74 inch)	37
2 001 ... 2 250 mm (78.78 ... 88.58 inch)	38
2 251 ... 2 500 mm (88.62 ... 98.43 inch)	41
2 501 ... 2 750 mm (98.46 ... 108.27 inch)	42
2 751 ... 3 000 mm (108.31 ... 118.11 inch)	43
3 001 ... 3 250 mm (118.15 ... 127.95 inch)	44
3 251 ... 3 500 mm (127.99 ... 137.80 inch)	45
3 501 ... 3 750 mm (137.83 ... 147.64 inch)	46
3 751 ... 4 000 mm (147.68 ... 157.48 inch)	47
Material process connection/extension	
Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301) ⁸⁾	1
Stainless steel 316L (1.4404) ⁹⁾	2
Approvals CSA/FM Dust Ignition Proof, RCM	A
ATEX II 1/2 D, RCM	B
CSA/FM General Purpose, RCM	C
CE, RCM	D
CSA/FM IS Class I, II, III Div. 1, Groups A, B, C, D, E, F, G, FM Class 1, Aex ia IIC, CSA Class 1, Ex ia IIC, RCM	E
ATEX II 1G and 1/2G Eex ia IIC; ATEX II 1D and 1/2D, RCM	F
IEC-Ex t IIIC Da/Db	G

- 1) Available with Approval options A ... D, G only
- 2) Available with Approval options D, E, F only
- 3) Available with Approval options B, D, G only
- 4) Available with configurations 7ML5731-7AA11-1BA0 or 7ML5731-7AB11-1AA0 only
- 5) Basic version is cost effective and offers fast delivery
- 6) Not available with extension length options 11, 12, 31, 32
- 7) Max. 6 bar (87 psi)
- 8) Available with option extension length 11 ... 28
- 9) Available with option extension length 31 ... 48

- We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.
- ▶ Available ex stock. For details see page 9/5 in the appendix.

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVS200


4

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
<p>Further Designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p>		<p>SITRANS LVS200, short fork for liquids/solids interface</p> <p>Vibrating point level switch for solids or solids within liquid interface applications, and high load applications with short insertion requirements</p> <p>Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>	<p>7ML5732- - - - - - A 0</p>
<p>Total insertion length: Enter the total insertion length in plain text description, max. 4 000 mm (157.48 inch)</p>	Y01	<p>Power supply</p> <p>19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)</p> <p>19 ... 230 V AC, 19 ... 55 V DC, two relay outputs (DPDT)</p> <p>18 ... 50 V DC PNP</p> <p>19 ... 230 V AC/DC without contact, 2-wire loop powered</p> <p>8/16 mA or 4 ... 20 mA; 12.5 ... 35 V DC, 2-wire¹⁾</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p>
<p>Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text</p>	Y14	<p>Process temperature</p> <p>Without temperature isolator</p> <p>With temperature isolator</p> <p>Separated enclosure - cable length 1.5 m (4.92 ft) [max. temperature process 150 °C (302 °F)/ max. temperature electronics 60 °C (140 °F)]</p> <p>Separated enclosure - cable length 4.0 m (13.12 ft) [max. temperature process 150 °C (302 °F)/ max. temperature electronics 60 °C (140 °F)]</p>	<p>A</p> <p>B</p> <p>C</p> <p>D</p>
<p>Enhanced sensitivity > 5 g/l via electronics and increased fork length to 195 mm (7.68 inch)³⁾</p>	K05	<p>Process connection</p> <p>Threaded</p> <p>R 1½" [(BSPT), EN 10226]</p> <p>1½" NPT [(Taper), ANSI/ASME B1.20.1]</p> <p>G 2" [(BSPP), EN ISO 228-1], sliding sleeve [min. length 500 mm (19.69 inch)]²⁾</p> <p>2" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69 inch)]²⁾</p> <p>Flanged</p> <p>DN 100 PN 6, EN 1092-1³⁾</p> <p>DN 100 PN 16, EN 1092-1</p> <p>2" ASME 150 lb B16.5</p> <p>3" ASME 150 lb B16.5</p> <p>4" ASME 150 lb B16.5</p> <p>2" Tri-clamp (DN 50) ISO 2852</p>	<p>A</p> <p>B</p> <p>C</p> <p>D</p> <p>E</p> <p>F</p> <p>G</p> <p>H</p> <p>J</p> <p>K</p>
<p>Enhanced sensitivity < 5 g/l via electronics, increased fork length to 195 mm (7.68 inch), and increased aluminum fork width¹⁾³⁾</p>	G01		
<p>Signal bulb inserted in M20 cable gland²⁾</p>	A20		
<p>NAMUR 8/16 mA switch amplifiers available, contact factory for pricing</p>			
<p>Operating Instructions</p> <p>Multi-language</p> <p>This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.</p>	Article No. 7ML1998-5FT63		
<p>Spare Parts</p> <p>Replacement Electronics Module (125 Hz) [19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)]</p> <p>Sliding sleeve, 2" BSP (ISO 228)</p> <p>Sliding sleeve, 2" NPT (ASME B1.20.1)</p> <p>Namur Isolator switch amplifier relay output KFD2-SR2-Ex1.W</p>	7ML1830-1KL 7ML1830-1JM 7ML1830-1JN A5E03496569		
<p>Available ex stock</p> <p>For details see page 9/5 in the appendix.</p> <p>SITRANS LVS200, standard, power supply 7, process temperature A, process connection A, extension length 11, material process connection/ extension 1, and approval B</p> <p>SITRANS LVS200, standard, power supply 7, process temperature A, process connection B, extension length 11, material process connection/ extension 1, and approval A</p>	7ML5731-7AA11-1BA0 7ML5731-7AB11-1AA0		
<p>¹⁾ Available only with power supply 1 and Approval C, D and with Process connection flange E ... J</p> <p>²⁾ Available with Approval option D only</p> <p>³⁾ K05 and G01 are not available together</p>			
		<p>Extension length</p> <p>Stainless steel 304 (1.4301)</p> <p>Standard length, 165 mm (6.50 inch)</p> <p>Add Order code Y01 and plain text: "Insertion length ... mm"</p> <p>200 ... 500 mm (7.87 ... 19.69 inch)</p> <p>501 ... 750 mm (19.72 ... 29.53 inch)</p> <p>751 ... 1 000 mm (29.57 ... 39.37 inch)</p> <p>1 001 ... 1 250 mm (39.41 ... 49.21 inch)</p> <p>1 251 ... 1 500 mm (49.25 ... 59.06 inch)</p> <p>1 501 ... 1 750 mm (59.09 ... 68.90 inch)</p> <p>1 751 ... 2 000 mm (68.94 ... 78.74 inch)</p> <p>2 001 ... 2 250 mm (78.78 ... 88.58 inch)</p> <p>2 251 ... 2 500 mm (88.62 ... 98.43 inch)</p> <p>2 501 ... 2 750 mm (98.46 ... 108.27 inch)</p> <p>2 751 ... 3 000 mm (108.31 ... 118.11 inch)</p> <p>3 001 ... 3 250 mm (118.15 ... 127.95 inch)</p> <p>3 251 ... 3 500 mm (127.99 ... 137.80 inch)</p> <p>3 501 ... 3 750 mm (137.83 ... 147.64 inch)</p> <p>3 751 ... 4 000 mm (147.68 ... 157.48 inch)</p>	<p>11</p> <p>12</p> <p>13</p> <p>14</p> <p>15</p> <p>16</p> <p>17</p> <p>18</p> <p>21</p> <p>22</p> <p>23</p> <p>24</p> <p>25</p> <p>26</p> <p>27</p> <p>28</p>

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVS200

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS LVS200, short fork for liquids/solids interface Vibrating point level switch for solids or liquids within liquid interface applications, and high load applications with short insertion requirements <u>Stainless steel 316L (1.4404)</u> Standard length, 165 mm (6.50 inch) <u>Add Order code Y01 and plain text: "Insertion length ... mm"</u> 200 ... 500 mm (7.87 ... 19.69 inch) 501 ... 750 mm (19.72 ... 29.53 inch) 751 ... 1 000 mm (29.57 ... 39.37 inch) 1 001 ... 1 250 mm (39.41 ... 49.21 inch) 1 251 ... 1 500 mm (49.25 ... 59.06 inch) 1 501 ... 1 750 mm (59.09 ... 68.90 inch) 1 751 ... 2 000 mm (68.94 ... 78.74 inch) 2 001 ... 2 250 mm (78.78 ... 88.58 inch) 2 251 ... 2 500 mm (88.62 ... 98.43 inch) 2 501 ... 2 750 mm (98.46 ... 108.27 inch) 2 751 ... 3 000 mm (108.31 ... 118.11 inch) 3 001 ... 3 250 mm (118.15 ... 127.95 inch) 3 251 ... 3 500 mm (127.99 ... 137.80 inch) 3 501 ... 3 750 mm (137.83 ... 147.64 inch) 3 751 ... 4 000 mm (147.68 ... 157.48 inch)	7ML5732-  A 0 3 1 3 2 3 3 3 4 3 5 3 6 3 7 3 8 4 1 4 2 4 3 4 4 4 5 4 6 4 7 4 8	Further Designs Please add "-Z" to Article No. and specify Order code(s). Total insertion length: Enter the total insertion length in plain text description, max. 4 000 mm (147.48 inch) Y01 Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text Y14 Signal bulb inserted in M20 cable gland ¹⁾ A20 Adjustable sensitivity (by potentiometer) for solids/liquids interface detection ¹⁾²⁾ G02	
Material process connection/extension Stainless steel threads 304 (1.4301), flanges 321(1.4541), Tri-clamp 304 (1.4301) ⁴⁾ Stainless steel 316L (1.4404) ⁵⁾	1 2	Operating Instructions Multi-language This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. 7ML1998-5FT63
Approvals CSA/FM Dust Ignition Proof, RCM ATEX II 1/2 D, RCM CSA/FM General Purpose, RCM CE, RCM IEC-Ex t IIIC Da/Db	1 2 A B C D E	Spare Parts Replacement Electronics Module (350 Hz) [19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)] 7ML1830-1KM Sliding sleeve, 2" BSP (ISO 228) 7ML1830-1JM Sliding sleeve, 2" NPT (ASME B1.20.1) 7ML1830-1JN	
¹⁾ Available with Approval option B, D, E only ²⁾ Not available with extension length options 11,12, 31, 32 ³⁾ Max. 6 bar (87psi) ⁴⁾ Available with option extension length 11 ... 28 ⁵⁾ Available with option extension length 31 ... 48		¹⁾ Available with Approval option D only ²⁾ Available with power supply option 1 only	
● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.			

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVS200

Selection and Ordering data	Article No.
SITRANS LVS200, pipe extension Vibrating point level switch for high or low levels of bulk solids Extended using 1" pipe extension (customer supplied) ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5733-
Power supply 19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT) ¹⁾ 19 ... 230 V AC, 19 ... 55 V DC, two relay outputs (DPDT) ¹⁾ 18 ... 50 V DC PNP ¹⁾ 19 ... 230 V AC/DC without contact, 2-wire loop powered ¹⁾ 7 ... 9 V DC (requires NAMUR switch amplifier) NAMUR IEC 60947-5-6, 2-wire ²⁾ 8/16 mA or 4 ... 20 mA; 12.5 ... 35 V DC, 2-wire ³⁾	1 2 3 4 5 6
Process temperature Up to 150 °C (302 °F)	A
Process connection <u>Threaded</u> R 1½" [(BSPT), EN 10226] 1½" NPT [(Taper), ANSI/ASME B1.20.1] <u>Flanged</u> DN 100 PN 6, EN 1092-1 ⁴⁾ DN 100 PN 16, EN 1092-1 2" ASME 150 lb B16.5 3" ASME 150 lb B16.5 4" ASME 150 lb B16.5 2" Tri-clamp (DN 50) ISO 2852	A B C D E F G K
Process connection material Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301) Stainless steel 316L (1.4404)	1 2
Extension length Customer supplied 1" pipe extension Length: 300 ... 3 800 mm (11.81 ... 149.61 inch)	1
Application type Dry bulk solids (125 Hz) Liquids/solids interface (350 Hz)	1 2
Approvals CSA/FM Dust Ignition Proof, RCM ATEX II 1/2 D, RCM CSA/FM General Purpose, RCM CE, RCM CSA/FM IS Class I, II, III Div. 1, Groups A, B, C, D, E, F, G, FM Class 1, Aex ia IIC, CSA Class 1, Ex ia IIC, RCM ATEX II 1G and 1/2G Eex ia IIC; ATEX II 1D and 1/2D, RCM IEC-Ex t IIIC Da/Db	A B C D E F H

- 1) Available with Approval options A, B, C, D, G only
- 2) Available with Approval options D, E and F only. Not available for application type 2 "Liquids/solids interface".
- 3) Available with Approval options B, D, G only
- 4) Max. 6 bar (87 psi)

Selection and Ordering data	Order code
Further Designs Please add "-Z" to Article No. and specify Order code(s). Total insertion length: Enter the total insertion length in plain text description, max. 3 800 mm (149.61 inch) Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text Enhanced sensitivity > 5 g/l via electronics and increased fork length to 195 mm (7.68 inch) ⁵⁾ Enhanced sensitivity < 5 g/l via electronics, increased fork length to 195 mm (7.68 inch) and increased aluminum fork width ¹⁾⁴⁾⁵⁾ Adjustable sensitivity (by potentiometer) for solids/liquids interface detection ²⁾³⁾⁴⁾ Signal bulb inserted in M20 cable gland ²⁾	Y01 Y14 K05 G01 G02 A20
Operating Instructions Multi-language This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. 7ML1998-5FT63
Spare Parts Replacement Electronics Module (125 Hz) [19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)] Replacement Electronics Module (350 Hz) [19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)] Isolated switch amplifier relay output KFD2-SR2-Ex1.W	7ML1830-1KL 7ML1830-1KM A5E03496569

- 1) Available only with power supply 1 and Approvals C, D and with Process connection flange C ... G
- 2) Available with approval options D only
- 3) Available with power supply option 1 only and application type 2
- 4) Not available with option K05
- 5) Available with Application type 1 only

Level Measurement

Point level measurement – Vibrating switches

SITRANS LVS200

Selection and Ordering data	Article No.
SITRANS LVS200, cable extended Vibrating point level switch for high or low level detection of bulk solids materials ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5734-
Power supply 19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT) ¹⁾ 19 ... 230 V AC, 19 ... 55 V DC, two relay outputs (DPDT) ¹⁾ 18 ... 50 V DC PNP ¹⁾ 19 ... 230 V AC/DC without contact, 2-wire loop powered ¹⁾ 7 ... 9 V DC (requires NAMUR switch amplifier) NAMUR IEC 60947-5-6, 2-wire ²⁾ 8/16 mA or 4 ... 20 mA; 12.5 ... 35 V DC, 2-wire ³⁾	1 2 3 4 5 6
Process temperature Up to 80 °C (176 °F)	A
Process connection Threaded R 1½" [(BSPT), EN 10226] (1.4301/304) 1½" NPT [(Taper), ANSI/ASME B1.20.1] (1.4301/304) Flanged DN 100 PN 6, EN 1092-1 (1.4541/321) ⁴⁾ DN 100 PN 16, EN 1092-1 (1.4541/321) 2" ASME 150 lb B16.5 (1.4541/321) 3" ASME 150 lb B16.5 (1.4541/321) 4" ASME 150 lb B16.5 (1.4541/321)	A B C D E F G
Extension length 750 ... 1 000 mm (29.5 ... 39.4 inch) [max. length 20 000 mm (787.4 inch), not with Power supply option 5 (max. 10 000 mm, 393.7 inch)] Add Order code Y01 and plain text: "Insertion length ... mm" 1 001 ... 2 000 mm (39.41 ... 78.74 inch) 2 001 ... 3 000 mm (78.78 ... 118.11 inch) 3 001 ... 4 000 mm (118.15 ... 157.48 inch) 4 001 ... 5 000 mm (157.52 ... 196.85 inch) 5 001 ... 6 000 mm (196.89 ... 236.22 inch) 6 001 ... 7 000 mm (236.26 ... 275.59 inch) 7 001 ... 8 000 mm (275.63 ... 314.96 inch) ⁵⁾ 8 001 ... 9 000 mm (315 ... 354.33 inch) ⁵⁾ 9 001 ... 10 000 mm (354.37 ... 393.70 inch) ⁵⁾ 10 001 ... 11 000 mm (393.74 ... 433.07 inch) ⁵⁾⁶⁾ 11 001 ... 12 000 mm (433.11 ... 472.44 inch) ⁵⁾⁶⁾ 12 001 ... 13 000 mm (472.48 ... 511.81 inch) ⁵⁾⁶⁾ 13 001 ... 14 000 mm (511.85 ... 551.18 inch) ⁵⁾⁶⁾ 14 001 ... 15 000 mm (551.22 ... 590.55 inch) ⁵⁾⁶⁾ 15 001 ... 16 000 mm (590.59 ... 629.92 inch) ⁵⁾⁶⁾ 16 001 ... 17 000 mm (629.96 ... 669.29 inch) ⁵⁾⁶⁾ 17 001 ... 18 000 mm (669.33 ... 708.66 inch) ⁵⁾⁶⁾ 18 001 ... 19 000 mm (708.70 ... 748.03 inch) ⁵⁾⁶⁾ 19 001 ... 20 000 mm (748.07 ... 787.40 inch) ⁵⁾⁶⁾	10 11 12 13 14 15 16 17 18 20 21 22 23 24 25 26 27 28 30 31
Application type Dry bulk solids (125 Hz) Liquid/solids interface (350 Hz) ⁷⁾	1 2

Selection and Ordering data	Article No.
SITRANS LVS200, cable extended Vibrating point level switch for high or low level detection of bulk solids materials Approvals CSA/FM Dust Ignition Proof, RCM ATEX II 1/2 D, RCM CSA/FM General Purpose, RCM CE, RCM CSA/FM IS Class I, II, III Div. 1, Groups A, B, C, D, E, F, G, FM Class 1, Aex ia IIC, CSA Class 1, Ex ia IIC, RCM ATEX II 1G and 1/2G Eex ia IIC; ATEX II 1D and 1/2D, RCM ⁶⁾ IEC-Ex t IIIC Da/Db	↗ 7ML5734-
1) Available with Approval options A, B, C, D, G only 2) Available with Approval option D, E and F only. Not available for application type 2 "Liquids/solids interface". 3) Available with Approval option D only 4) Max. 6 bar (87 psi) 5) Not available with application type option 2 6) Not available with Power supply option 5 7) Cable length is limited to 7 000 mm (275.59 inch).	A B C D E F G

Selection and Ordering data	Order code
Further Designs Please add "-Z" to Article No. and specify Order code(s). Enter the total insertion length in plain text description, max. 20 000 mm (787.40 inch)	Y01
Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]; Measuring-point number/identification (max. 27 characters); specify in plain text	Y14
Enhanced sensitivity > 5 g/l via electronics and increased fork length to 195 mm (7.68 inch)	K05
Enhanced sensitivity < 5 g/l via electronics and increased fork length to 195 mm (7.68 inch) and increased aluminum fork width ¹⁾	G01
Signal bulb inserted in M20 cable gland ²⁾	A20
Operating Instructions Multi-language This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. 7ML1998-5FT63
Spare Parts Replacement Electronics Module (125 Hz) [19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)]	7ML1830-1KL
Replacement Electronics Module (350 Hz) [19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)]	7ML1830-1KM
Isolated switch amplifier relay output KFD2-SR2-Ex1.W	A5E03496569
1) Available only with power supply 1 and Approvals C, D and with process connection flange C ... G 2) Available with Approval options C and D only	

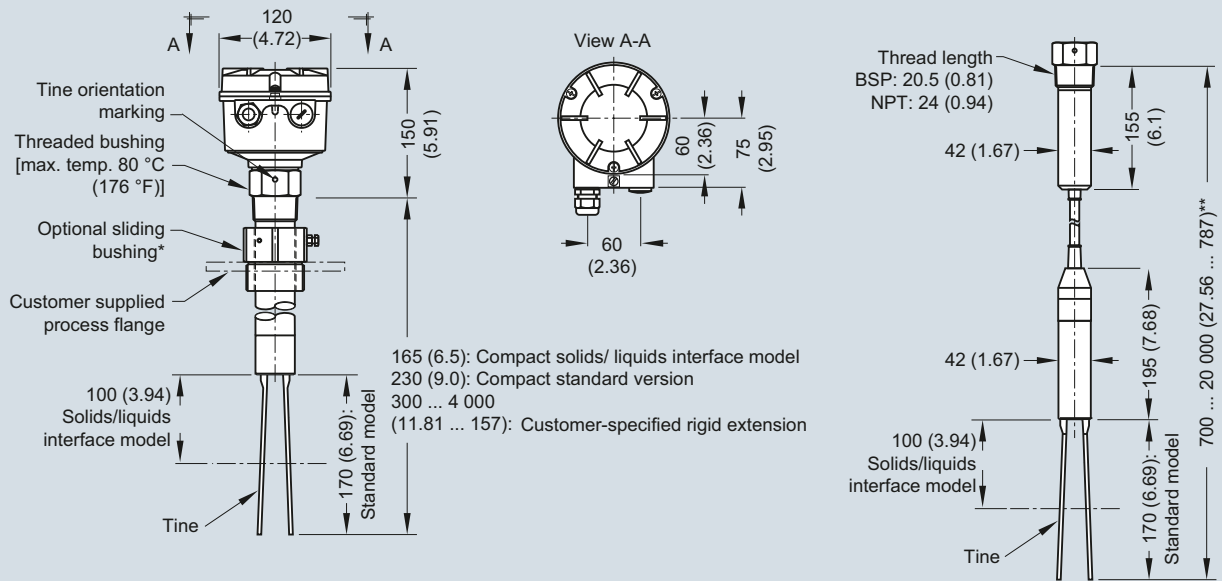


Level Measurement

Point level measurement – Vibrating switches

SITRANS LVS200

Dimensional drawings

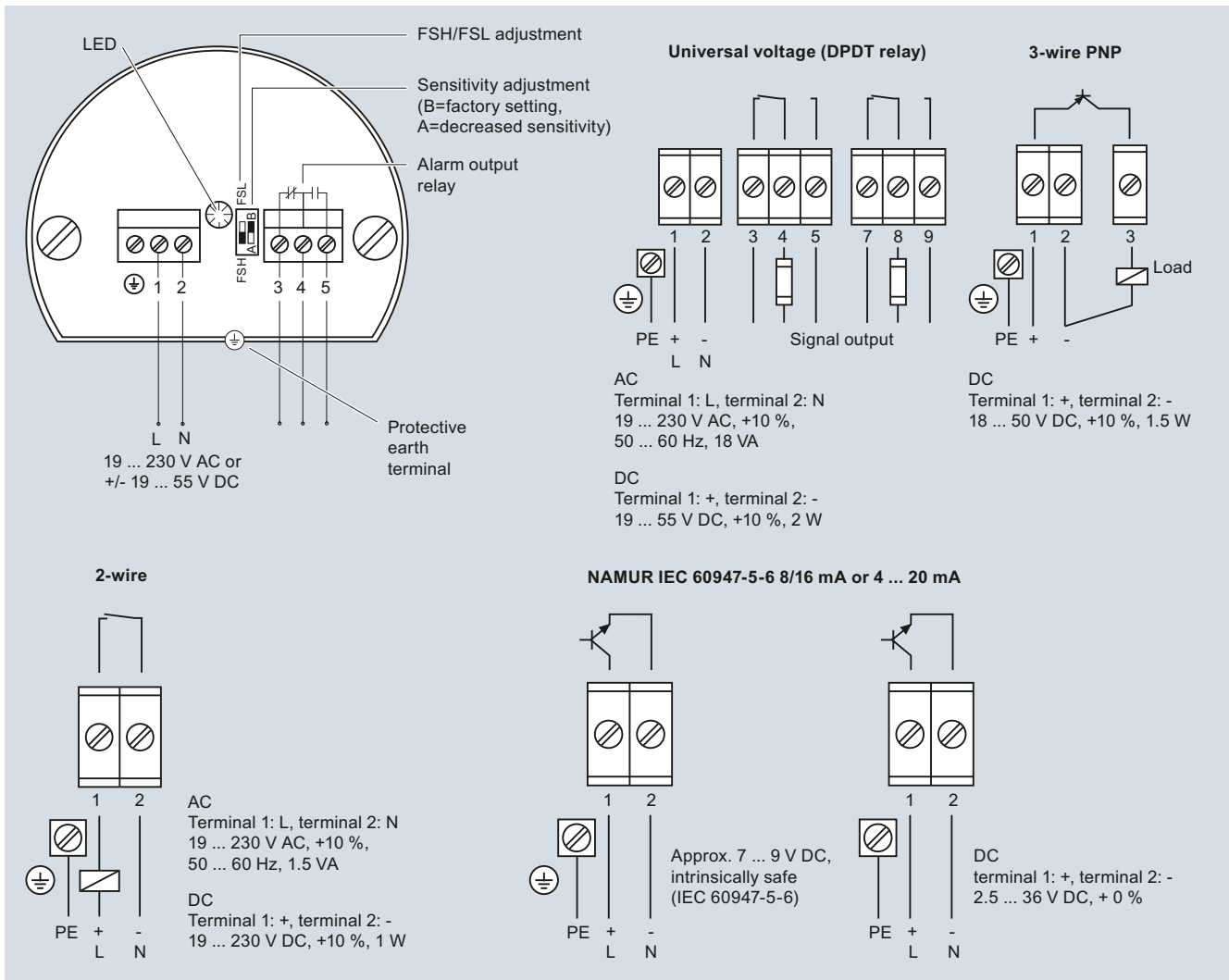


Notes:

- * The clamping screws of the sliding bushing must be tightened to 10 Nm.
- ** Cable version with liquids/solids interface model option length to 7 000 mm (275.59 inch)
Cable version with NAMUR electronics length to 10 000 mm (393.7 inch) tightened to 10 Nm.
See drawing 23650563 for pipe extended version details. (Pipe is customer supplied.)

SITRANS LVS200, dimensions in mm (inch)

Schematics



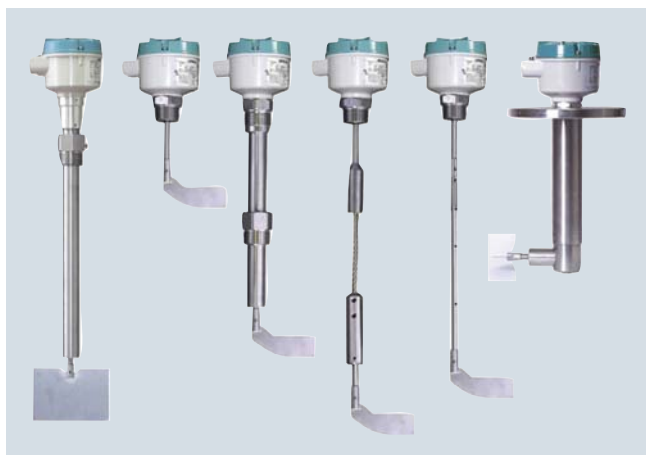
SITRANS LVS200 connections

Level Measurement

Point level measurement – Rotation paddle switches

SITRANS LPS200

Overview



SITRANS LPS200 is a rotary paddle switch for point level and material detection in bulk solids.

Benefits

- Proven paddle switch technology for bulk solids
- High integrity mechanical seal
- Optional switch selectable power supply
- Unique friction clutch mechanism prevents damage from falling material
- Rotatable enclosure for convenient wiring
- Optional paddles for use with low density materials
- Small paddle makes for simple installation through existing process connection
- High temperature model and optional extension kit available
- Optional fail-safe configuration detects loss of rotation

Application

The paddle switch technology detects full, empty, or demand conditions on materials such as grain, feed, cement, plastic granulate, and wood chips. The paddle switch can handle bulk densities as low as 15 g/l (2,19 lb/ft³) with the optional rectangular vane or 100 g/l (6.25 lb/ft³) with the standard measuring vane.

A low revolution geared motor with slip clutch drives a rotating measuring vane which senses the presence of material at the mounted level of the LPS200. As material comes into contact with the rotating paddle, rotation stops, which changes the microswitch state. When the paddle is no longer covered by material, rotation resumes and the relay reverts to its normal condition.

The LPS200 has a rugged design for use in harsh conditions in the solids industry. The sensitivity of the paddle can be adjusted for varying material properties like buildup on the vane.

The LPS200 comes in a variety of configurations including compact, extended and cable extension. It is equipped with a standard vane which is effective in most applications, but can be configured with a hinged or rectangular vane for increased sensitivity for light materials.

- Key Applications: bulk solids such as grain, feed, cement, plastic granulate, wood chips

Technical specifications

Mode of operation	
Measuring principle	Rotating point level switch
Input	
Measured variable	High and low and demand
Output	
Output signal	Microswitch 5 A at 250 V AC, non inductive Microswitch SPDT contact 4 A at 30 V DC, non-inductive Standard (1 rpm model): approx 1.3 seconds Optional process applications (5 rpm model): approx. 0.26 seconds
• Alarm output	
• Pickup delay	
Sensitivity	
Adjustable via reset force of spring or geometry of measuring vane	
Rated operating conditions	
Installation conditions	Indoor/outdoor
• Location	
Ambient conditions	
• Ambient temperature	-25 ... +60 °C (-13 ... +140 °F)
• Installation category	
• Pollution degree	
Medium conditions	Bulk solids
• Temperature	-25 ... +80 °C (-13 ... +176 °F)
- Standard	
- Optional	
• Pressure (vessel)	-25 ... +600°C (-13 ... +1 112 °F)
- Standard	
- Optional	Max. 0.5 bar g (7.25 psi g)
• Minimum material density	Max. 10 bar g (145 psi g)
- Standard measuring vane	
- Optional measuring vane	
• Can detect down to 100 g/l (6.25 lb/ft ³)	
• Can detect down to 15 g/l (2.19 lb/ft ³)	
Design	
Material	Epoxy coated aluminum
• Enclosure	
• Process connection, measuring shaft and vane	Stainless steel or aluminum
Process connection	Thread NPT, BSP, and flange options
Degree of protection	IP65/Type 4/NEMA 4
Conduit entry	2 x M20x1.5 or 2 x ½" NPT
Power supply	
• Jumper selectable	• 115 V AC, ± 15 %, 50 ... 60 Hz, 4 VA or 230 V AC, ± 15 %, 50 Hz, 6 VA, or 48 V AC, or 24 V AC or 24 V DC, ± 15 %, 2.5 W
• Universal voltage (DPDT replay)	
24 V DC ± 15 % 50 ... 60 Hz, 22...230 V, ± 10 %, max. 10 VA	
Certificates and approvals	
• CSA/FM General Purpose	
• CE	
• CSA/FM Dust Ignition Proof	
• ATEX II 1/2 D	
• RCM	
• IECex	

Level Measurement

Point level measurement – Rotation paddle switches

SITRANS LPS200

Selection and Ordering data	Article No.	Ord. code
SITRANS LPS200, compact Rotary paddle switch for level and material detection in bulk solids. Compact design for side or top mounted applications.	7ML5725-	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Process temperature		
Up to 80 °C (176 °F)	1	
Up to 150 °C (302 °F)	2	
Up to 250 °C (482 °F)	3	
Up to 600 °C (1 112 °F) ¹⁾²⁾	4	
Up to 80 °C (176 °F) basic version aluminum ³⁾	5	
Up to 80 °C (176 °F) basic version stainless steel ⁴⁾	6	
Power supply		
230 V AC, 1 rev/min.	A	
230 V AC, 1 rev/min., fail-safe	B	
230 V AC, 5 rev/min.	C	
230 V AC, 5 rev/min., fail-safe	D	
115 V AC, 1 rev/min.	E	
115 V AC, 1 rev/min., fail-safe	F	
115 V AC, 5 rev/min.	G	
115 V AC, 5 rev/min., fail-safe	H	
48 V AC, 1 rev/min.	J	
24 V AC, 1 rev/min.	K	
24 V DC, 1 rev/min.	L	
24 V DC, 1 rev/min., fail-safe	M	
24 V DC, 5 rev/min.	N	
24 V DC, 5 rev/min., fail-safe	P	
Switch selectable 230 V AC/115 V AC/24 V DC multi-voltage, 1 rev/min.	Q	
Switch selectable 230 V AC/115 V AC/24 V DC multi-voltage, 5 rev/min.	R	
48 V AC, 1 rev/min., fail-safe	Z	J 1 A
48 V AC, 5 rev/min.	Z	J 1 B
48 V AC, 5 rev/min., fail-safe	Z	J 1 C
24 V AC, 1 rev/min., fail-safe	Z	J 1 D
24 V AC, 5 rev/min.	Z	J 1 E
24 V AC, 5 rev/min., fail-safe	Z	J 1 F
Universal Voltage, 1 rev/min. ¹³⁾	Z	J 2 A
Universal Voltage, 1 rev/min, fail-safe ¹³⁾	Z	J 2 B
Universal Voltage, 5 rev/min. ¹³⁾	Z	J 2 C
Universal Voltage, 5 rev/min, fail-safe ¹³⁾	Z	J 2 D
Process connection		
Threaded		
G 1¼" [(BSPP), EN ISO 228-1]	A	
G 1" [(BSPP), EN ISO 228-1]	B	
G 1½" [(BSPP), EN ISO 228-1]	C	
1" NPT [(Taper), ANSI/ASME B1.20.1]	D	
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	E	
1½" NPT [(Taper), ANSI/ASME B1.20.1]	F	
Flanged		
DN 32 PN 6, EN 1092-1 ⁵⁾	G	
DN 100 PN 6, EN 1092-1 ⁵⁾	H	
DN 100 PN 16, EN 1092-1	J	
2" ASME 150 lb B16.5	K	
3" ASME 150 lb B16.5	L	
4" ASME 150 lb B16.5	M	
2" Tri-clamp (DN 50) ISO2852 ⁶⁾	N	

Selection and Ordering data	Article No.	Ord. code
SITRANS LPS200, compact Rotary paddle switch for level and material detection in bulk solids. Compact design for side or top mounted applications.	7ML5725-	
Process pressure		
Up to 0.5 bar (7.25 psi)	1	
Up to 5 bar (72.5 psi)	2	
Up to 10 bar (145 psi)	3	
Process connection material		
Aluminum ⁷⁾	1	
Stainless steel, threads 303 (1.4305), flanges 321 (1.4541), Tri-clamp 304 (1.4301)	2	
Stainless steel 316L (1.4404) ⁸⁾	3	
Extension length		
100 mm (3.94 inch) ⁹⁾	1	
150 mm (5.91 inch)	2	
200 mm (7.87 inch)	3	
250 mm (9.84 inch)	4	
300 mm (11.81 inch)	5	
Measuring vane		
Boot shaped, 35 x 106 mm (1.38 x 4.17 inch) ¹⁰⁾	A	
Hinged vane, 65 x 200 mm (2.56 x 7.87 inch) ¹⁰⁾¹¹⁾	B	
Boot shaped, 28 x 98 mm (1.10 x 3.86 inch)	C	
Rectangular 50 x 150 mm (1.97 x 5.91 inch) ¹²⁾	D	
Rectangular 50 x 250 mm (1.97 x 9.84 inch) ¹²⁾	E	
Rectangular 98 x 150 mm (3.86 x 5.91 inch) ¹¹⁾¹²⁾	F	
Rectangular 98 x 250 mm (3.86 x 9.84 inch) ¹¹⁾¹²⁾	G	
Rectangular 50 x 98 mm (1.97 x 3.86 inch) ¹²⁾	H	
Approvals		
CSA/FM Dust Ignition Proof, RCM	A	
ATEX II 1/2 D, RCM	B	
CSA/FM General Purpose, RCM	C	
CE, RCM	D	
IEC Ex ta/tb IIIC	E	

- 1) Available with approval option C and D only, up to 0.5 bar
 - 2) Not available with process connection A, B, D, E and G
 - 3) Only available with the following configurations 7ML5725-5AC11-2AD0 or 7ML5725-5EE11-2AC0
 - 4) Only available with the following configurations 7ML5725-6QC12-2AB0 or 7ML5725-6QE12-2AA0
 - 5) Available with process pressure 1 and 2 only
 - 6) Available with process temperature 1 only
 - 7) Available with process connections A ... F only, process pressure option 1 and process temperature 1 and 5 only
 - 8) Available with process connection C, F, H ... N and Measuring vane A
 - 9) Available with measuring vane option A, C, D, E, H only
 - 10) Add 16 mm (0.63 inch) to extension length
 - 11) Available with extension lengths 2, 3, 4, 5
 - 12) Available with process connections H ... M only
 - 13) Available with approval option B, D, and E only
- ◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.
- ▶ Available ex stock. For details see page 9/5 in the appendix.

Level Measurement

Point level measurement – Rotation paddle switches

SITRANS LPS200

Selection and Ordering data	Order code	Selection and Ordering data	Order code
<p>Further Designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p>		<p>Available ex stock</p> <p>For details see page 9/5 in the appendix.</p>	
Heating of enclosure ¹⁾²⁾	A35	SITRANS LPS200, compact for up to 80 °C (176 °F), aluminum, with power supply A, process connection C, process pressure 1, process connection material 1, extension length 2, measuring vane A, and approval D	7ML1830-1KG
Signal bulb inserted in M20 cable gland ¹⁾	A20		
Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing ³⁾	K01	SITRANS LPS200, compact for up to 80 °C (176 °F), aluminum, with power supply E, process connection E, process pressure 1, process connection material 1, extension length 2, measuring vane A, and approval C	7ML5725-5EE11-2AC0
Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	Y14		
<p>Additional Operating Instructions</p> <p>Multi-language This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.</p>	Article No. 7ML1998-5FS62	SITRANS LPS200, compact for up to 80 °C (176 °F), stainless steel, with power supply Q, process connection C, process pressure 1, process connection material 2, extension length 2, measuring vane A, and approval B	7ML5725-6QC12-2AB0
<p>Spare Parts</p> <p>Motor gear /PLC, multi-voltage</p>	7ML1830-1KG	SITRANS LPS200, compact for up to 80 °C (176 °F), stainless steel, with power supply Q, process connection E, process pressure 1, process connection material 2, extension length 2, measuring vane A, and approval A	7ML5725-6QE12-2AA0
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17 inch)	7ML1830-1KH		
Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)	7ML1830-1KJ		
<p>Rigid extension kit</p> <p>(includes spring coupling, rigid tube extension and required pins)</p>			
Extension: 500, 400, 300 mm (19.7, 15.8, 11.8 inch)	7ML5711-0AA		
Extension: 1 000, 900, 800, 700, 600 mm (39.4, 35.4, 31.5, 27.6, 23.6 inch)	7ML5711-1AA		
Extension: 1 500, 1 400, 1 300, 1 200, 1 100 mm (59.1, 55.1, 51.2, 47.2, 43.3 inch)	7ML5711-2AA		

¹⁾ Available with approval option D only

²⁾ Available with power supply options A ,C, E, G, J, K, L, N, J1B, J1D, J1E, J2A, J2C only

³⁾ Available up to 250 °C (482 °F). This option does not automatically implement a food conform design.

Selection and Ordering data	Article No.	Ord. code
SITRANS LPS200, shaft protected Rotary paddle switch for level and material detection in bulk solids; ideal for heavy, sticky, or high impact applications. Designed with added protection tube for enhanced shaft protection and protection against build-up on shaft (sidewall build-up).	7ML5726-	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Process temperature		
Up to 80 °C (176 °F)	1	
Up to 150 °C (302 °F)	2	
Up to 250 °C (482 °F)	3	
Up to 600 °C (1 112 °F) ¹⁾²⁾	4	
Up to 80 °C (176 °F) basic version ³⁾	5	
Power supply		
230 V AC, 1 rev/min.	A	
230 V AC, 1 rev/min., fail-safe	B	
230 V AC, 5 rev/min.	C	
230 V AC, 5 rev/min., fail-safe	D	
115 V AC, 1 rev/min.	E	
115 V AC, 1 rev/min., fail-safe	F	
115 V AC, 5 rev/min.	G	
115 V AC, 5 rev/min., fail-safe	H	
48 V AC, 1 rev/min.	J	
24 V AC, 1 rev/min.	K	
24 V DC, 1 rev/min.	L	
24 V DC, 1 rev/min., fail-safe	M	
24 V DC, 5 rev/min.	N	
24 V DC, 5 rev/min., fail-safe	P	
Switch selectable 230 V AC/115 V AC/24 V DC multi-voltage, 1 rev/min.	Q	
Switch selectable 230 V AC/115 V AC/24 V DC multi-voltage, 5 rev/min.	R	
48 V AC, 1 rev/min., fail-safe	Z	J 1 A
48 V AC, 5 rev/min.	Z	J 1 B
48 V AC, 5 rev/min., fail-safe	Z	J 1 C
24 V AC, 1 rev/min., fail-safe	Z	J 1 D
24 V AC, 5 rev/min.	Z	J 1 E
24 V AC, 5 rev/min., fail-safe	Z	J 1 F
Universal Voltage, 1 rev/min. ¹⁴⁾	Z	J 2 A
Universal Voltage, 1 rev/min, fail-safe ¹⁴⁾	Z	J 2 B
Universal Voltage, 5 rev/min. ¹⁴⁾	Z	J 2 C
Universal Voltage, 5 rev/min, fail-safe ¹⁴⁾	Z	J 2 D
Process connection		
<u>Threaded</u>		
G 1¼" [(BSPP), EN ISO 228-1]	A	
G 1½" [(BSPP), EN ISO 228-1]	B	
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	C	
1½" NPT [(Taper), ANSI/ASME B1.20.1]	D	
<u>Flanged</u>		
DN 32 PN 6, EN 1092-1 ⁴⁾	E	
DN 100 PN 6, EN 1092-1 ⁴⁾	F	
DN 100 PN 16, EN 1092-1	G	
2" ASME 150 lb B16.5	H	
3" ASME 150 lb B16.5	J	
4" ASME 150 lb B16.5	K	
2" Tri-clamp (DN 50) ISO2852 ⁵⁾	L	

Selection and Ordering data	Article No.	Ord. code
SITRANS LPS200, shaft protected Rotary paddle switch for level and material detection in bulk solids; ideal for heavy, sticky, or high impact applications. Designed with added protection tube for enhanced shaft protection and protection against build-up on shaft (sidewall build-up).	7ML5726-	
Process pressure		
Up to 0.5 bar (7.25 psi)	1	
Up to 5 bar (72.5 psi)	2	
Up to 10 bar (145 psi)	3	
Process connection material		
Aluminum ⁶⁾	1	
Stainless steel, threads 303 (1.4305), flanges 321 (1.4541), Tri-clamp 304 (1.4301)	2	
Stainless steel 316L (1.4404) ⁷⁾	3	
Extension length		
150 mm (5.91 inch) ⁸⁾	1	
200 mm (7.87 inch)	2	
250 mm (9.84 inch)	3	
300 mm (11.81 inch)	4	
Extension material (protection tube)		
Aluminum ⁹⁾	A	
Stainless steel 303 (1.4305)	B	
Stainless steel 316L (1.4404) ¹⁰⁾	C	
Measuring vane		
Boot shaped 35 x 106 mm (1.38 x 4.17 inch) ¹¹⁾	A	
Hinged vane 65 x 200 mm (2.56 x 7.87 inch) ¹¹⁾¹²⁾	B	
Rectangular 50 x 150 mm (1.97 x 5.91 inch) ¹³⁾	D	
Rectangular 50 x 250 mm (1.97 x 9.84 inch) ¹³⁾	E	
Rectangular 98 x 150 mm (3.86 x 5.91 inch) ¹²⁾¹³⁾	F	
Rectangular 98 x 250 mm (3.86 x 9.84 inch) ¹²⁾¹³⁾	G	
Rectangular 50 x 98 mm (1.97 x 3.86 inch) ¹³⁾	H	
Approvals		
CSA/FM Dust Ignition Proof, RCM	1	
ATEX II 1/2 D, RCM	2	
CSA/FM General Purpose, RCM	3	
CE, RCM	4	
IEC Ex ta/tb IIIC	5	
1) Available with approval option 3 and 4 only and up to max 0.5 bar		
2) Not available with process connections A, C, E		
3) Only available with the following configurations 7ML5726-5QB12-2BA2 or 7ML5726-5QC12-2BA1		
4) Available with process pressure 1 and 2 only		
5) Available with process temperature 1 only		
6) Available with process connections A ... E only, available with process pressure option 1 only, and process temperature 1 only		
7) Extension and vane will also change to 316L, only for process connection B, D, F ... L and vane A		
8) Available with measuring vane options A, D, E, H only		
9) Available with process pressure 1 and process temperature 1 only		
10) Available with process connections B, D, F ... L and vane A		
11) Add 16 mm (0.63 inch) to extension length		
12) Available with extension length options 2 ... 4 only		
13) Available with process connections F, G, H, J, K only		
14) Available with approval options 2, 4 and 5 only		
• We can offer shorter delivery times for configurations designated with the Quick Ship Symbol •. For details see page 9/5 in the appendix.		
▶ Available ex stock. For details see page 9/5 in the appendix.		

Level Measurement

Point level measurement – Rotation paddle switches

SITRANS LPS200

4

Selection and Ordering data	Order code	Selection and Ordering data	Article No.	Ord. code
Further Designs Please add "-Z" to Article No. and specify Order code(s).		SITRANS LPS200, cable extension Rotary paddle switch for level and material detection in bulk solids. Cable extension for increased length in top-mounted applications	7ML5727-	
Heating of enclosure ¹⁾²⁾ Signal bulb inserted in M20 cable gland ¹⁾	A35 A20 K01	➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing ³⁾	Y14	Process temperature Up to 80 °C (176 °F) Up to 150 °C (302 °F) Up to 250 °C (482 °F)	1 2 3	
Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	Y14	Up to 600 °C (1 112 °F) ¹⁾²⁾ Up to 80 °C (176 °F) basic version ³⁾	4 5	
Additional Operating Instructions Multi-language This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. 7ML1998-5FS62	Power supply 230 V AC, 1 rev/min. 230 V AC, 1 rev/min., fail-safe 230 V AC, 5 rev/min.	A B C	
Spare Parts Motor gear /PLC, multi-voltage Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17 inch) Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)	7ML1830-1KG 7ML1830-1KH 7ML1830-1KJ	230 V AC, 5 rev/min., fail-safe 115 V AC, 1 rev/min. 115 V AC, 1 rev/min., fail-safe 115 V AC, 5 rev/min. 115 V AC, 5 rev/min., fail-safe 48 V AC, 1 rev/min.	D E F G H J	
Available ex stock For details see page 9/5 in the appendix. SITRANS LPS200, extended for up to 80 °C (176 °F), power supply B, process connection B, process pressure 1, process connection material 2, extension length 2, extension material B, measuring vane A, and approval 2 SITRANS LPS200, extended for up to 80 °C (176 °F), power supply Q, process connection C, process pressure 1, process connection material 2, extension length 2, extension material B, measuring vane A, and approval 1	7ML5726-5QB12-2BA2 7ML5726-5QC12-2BA1	24 V AC, 1 rev/min. 24 V DC, 1 rev/min. 24 V DC, 1 rev/min., fail-safe 24 V DC, 5 rev/min. 24 V DC, 5 rev/min., fail-safe Switch selectable 230 V AC/115 V AC/24 V DC multi-voltage, 1 rev/min. Switch selectable 230 V AC/115 V AC/24 V DC multi-voltage, 5 rev/min. 48 V AC, 1 rev/min., fail-safe 48 V AC, 5 rev/min. 48 V AC, 5 rev/min., fail-safe 24 V AC, 1 rev/min., fail-safe 24 V AC, 5 rev/min.	K L M N P Q R	
¹⁾ Available with approval option 4 only ²⁾ Available with power supply options A ,C, E, G, J, K, L, N, J1B, J1D, J1E, J2A, J2C only ³⁾ Available up to 250 °C (482 °F). This option does not automatically implement a food conform design.		48 V AC, 1 rev/min., fail-safe 48 V AC, 5 rev/min. 48 V AC, 5 rev/min., fail-safe 24 V AC, 1 rev/min., fail-safe 24 V AC, 5 rev/min. 24 V AC, 5 rev/min., fail-safe Universal Voltage, 1 rev/min. ⁹⁾ Universal Voltage, 1 rev/min, fail-safe ⁹⁾ Universal Voltage, 5 rev/min. ⁹⁾ Universal Voltage, 5 rev/min, fail-safe ⁹⁾	Z Z Z Z Z Z Z Z Z Z Z Z	J 1 A J 1 B J 1 C J 1 D J 1 E J 1 F J 2 A J 2 B J 2 C J 2 D
		Process connection <u>Threaded</u> G 1¼" [(BSPP), EN ISO 228-1] G 1½" [(BSPP), EN ISO 228-1] 1¼" NPT [(Taper), ANSI/ASME B1.20.1] 1½" NPT [(Taper), ANSI/ASME B1.20.1] <u>Flanged</u> DN 32 PN 6, EN 1092-1 ⁴⁾ DN 100 PN 6, EN 1092-1 ⁴⁾ DN 100 PN 16, EN 1092-1 2" ASME 150 lb B16.5 3" ASME 150 lb B16.5 4" ASME 150 lb B16.5	A B C D E F G H J K	

Level Measurement
Point level measurement – Rotation paddle switches

SITRANS LPS200

Selection and Ordering data	Article No.	Ord. code	Selection and Ordering data	Order code
SITRANS LPS200, cable extension Rotary paddle switch for level and material detection in bulk solids. Cable extension for increased length in top-mounted applications	7ML5727-		Further Designs Please add "-Z" to Article No. and specify Order code(s). Total insertion length: Enter the total insertion length in plain text description, max. 10 000 mm (393.70 inch) Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text Reinforced cable (max. 28 kN pulling force) ¹⁾ Heating of enclosure ²⁾³⁾ Signal bulb inserted in M20 cable gland ²⁾ Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing ⁴⁾	Y01 Y14 P01 A35 A20 K01
Process pressure Up to 0.5 bar (7.25 psi) ● Up to 5 bar (72.5 psi) Up to 10 bar (145 psi)	1 2 3		Additional Operating Instructions Article No. Multi-language This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	7ML1998-5FS62
Process connection material Aluminum ⁵⁾ ● Stainless steel, threads 303 (1.4305), flanges 321 (1.4541) ●	1 2		Spare Parts Motor gear /PLC, multi-voltage Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17 inch) Hinged vane, 65 x 200 mm (2.56 x 7.87 inch) Rope extension kit, 2 m (6.56 ft)	7ML1830-1KG 7ML1830-1KH 7ML1830-1KJ 7ML1830-1KK
Cable extension length Standard cable length, 2 000 mm (78.74 inch) Add Order code Y01 and plain text: "Insertion length ... mm" 500 ... 1 000 mm (19.69 ... 39.37 inch) ● Cable length 1 001 ... 2 000 mm (39.41 ... 78.74 inch) ● Cable length 2 001 ... 3 000 mm (78.78 ... 118.11 inch) ● Cable length 3 001 ... 4 000 mm (118.15 ... 157.48 inch) ● Cable length 4 001 ... 5 000 mm (157.52 ... 196.85 inch) ● Cable length 5 001 ... 6 000 mm (196.89 ... 236.22 inch) ● Cable length 6 001 ... 7 000 mm (236.26 ... 275.59 inch) ● Cable length 7 001 ... 10 000 mm (275.63 ... 393.70 inch) ● Without extension ⁸⁾	0 1 2 3 4 5 6 7 8 9	N 1 A	Available ex stock For details see page 9/5 in the appendix. SITRANS LPS200, cable extension for up to 80 °C (176 °F), power supply Q, process connection B, process pressure 1, process connection material 2, extension length 0, measuring vane A, and approval B SITRANS LPS200, cable extension for up to 80 °C (176 °F), power supply Q, process connection C, process pressure 1, process connection material 2, extension length 0, measuring vane A, and approval A	7ML5727-5QB12-0AB0 7ML5727-5QC12-0AA0
Measuring vane Boot shaped, 35 x 106 mm (1.38 x 4.17 inch) ⁶⁾ ● Hinged vane, 65 x 200 mm (2.56 x 7.87 inch) ⁶⁾ ● Boot shaped, 28 x 98 mm (1.10 x 3.86 inch) ⁷⁾ ● Rectangular 50 x 150 mm (1.97 x 5.91 inch) ⁷⁾ ● Rectangular 50 x 250 mm (1.97 x 9.84 inch) ⁷⁾ ● Rectangular 98 x 150 mm (3.86 x 5.91 inch) ⁷⁾ ● Rectangular 50 x 98 mm (1.97 x 3.86 inch) ⁷⁾ ●	A B C D E F G		1) Available only for process temperature up to 80 °C (176 °F) and process connection material 2 2) Available with approval option D only 3) Available with power supply options A ,C, E, G, J, K, L, N, J1B, J1D, J1E, J2A, J2C only 4) Available up to 250 °C (482 °F). This option does not automatically implement a food conform design	
Approvals CSA/FM Dust Ignition Proof, RCM ● ATEX II 1/2 D, RCM ● CSA/FM General Purpose, RCM ● CE, RCM ● IEC Ex ta/tb IIIC	A B C D E			

1) Available with approval option C and D up to max. 0.5 bar
 2) Not available with process connections A, C, E
 3) Only available with the following configurations 7ML5727-5QC12-0AA0 or 7ML5727-5QB12-0AB0
 4) Available with process pressure 1 and 2 only
 5) Available with process connections A ... E only, process pressure option 1 only and process temperature options 1 and 5 only
 6) Add 16 mm (0.63 inch) to extension length
 7) Available with process connections F ... K only
 8) Not available with P01 and available with Approval D, mounting kit for rope extension included
 9) Available with approval options B,D, and E only
 ● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.

Level Measurement

Point level measurement – Rotation paddle switches

SITRANS LPS200

Selection and Ordering data

Article No. Ord. code

SITRANS LPS200, angled extension

Rotary paddle switch with robust design for level and material detection in bulk solids; ideal for heavy or sticky applications. Angled extension is designed to avoid falling material and rotates horizontally in side mount applications to continue working even with heavy build-up.

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Process temperature

Up to 80 °C (176 °F)
Up to 150 °C (302 °F)
Up to 250 °C (482 °F)

Power supply

230 V AC, 1 rev/min.
230 V AC, 1 rev/min., fail-safe
230 V AC, 5 rev/min.
230 V AC, 5 rev/min., fail-safe
115 V AC, 1 rev/min.
115 V AC, 1 rev/min., fail-safe
115 V AC, 5 rev/min.
115 V AC, 5 rev/min., fail-safe
48 V AC, 1 rev/min.
24 V AC, 1 rev/min.
24 V DC, 1 rev/min.
24 V DC, 1 rev/min., fail-safe
24 V DC, 5 rev/min.
24 V DC, 5 rev/min., fail-safe
Switch selectable 230 V AC/115 V AC/24 V DC multi-voltage, 1 rev/min.
Switch selectable 230 V AC/115 V AC/24 V DC multi-voltage, 5 rev/min.
48 V AC, 1 rev/min., fail-safe
48 V AC, 5 rev/min.
48 V AC, 5 rev/min., fail-safe
24 V AC, 1 rev/min., fail-safe
24 V AC, 5 rev/min.
24 V AC, 5 rev/min., fail-safe
Universal Voltage, 1 rev/min.²⁾
Universal Voltage, 1 rev/min, fail-safe²⁾
Universal Voltage, 5 rev/min.²⁾
Universal Voltage, 5 rev/min, fail-safe²⁾

7ML5728-

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D E F

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Selection and Ordering data

Article No. Ord. code

SITRANS LPS200, angled extension

Rotary paddle switch with robust design for level and material detection in bulk solids; ideal for heavy or sticky applications. Angled extension is designed to avoid falling material and rotates horizontally in side mount applications to continue working even with heavy build-up.

Measuring vane

Rectangular vane, 50 x 98 mm (1.97 x 3.86 inch)
Rectangular vane, 50 x 150 mm (1.97 x 5.91 inch)
Rectangular vane, 50 x 250 mm (1.97 x 9.84 inch)

Rectangular vane 98 x 150 mm (3.86 x 5.91 inch)
Rectangular vane 98 x 250 mm (3.86 x 9.84 inch)
Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)

Approvals

CSA/FM Dust Ignition Proof, RCM
ATEX II 1/2 D, RCM
CSA/FM General Purpose, RCM
CE, RCM
IEC Ex ta/tb IIIC

¹⁾ Available with process pressure 1 and 2 only

²⁾ Available with approval option B,D, and E only

7ML5728-

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Selection and Ordering data

Order code

Further Designs

Please add "-Z" to Article No. and specify Order code(s).

Heating of enclosure¹⁾²⁾

A35

Signal bulb inserted in M20 cable gland¹⁾

A20

Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing³⁾

K01

Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text

Y14

Additional Operating Instructions

Multi-language
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Article No.

7ML1998-5FS62

Spare Parts

Motor gear /PLC, multi-voltage

7ML1830-1KG

Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17 inch)

7ML1830-1KH

Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)

7ML1830-1KJ

¹⁾ Available with approval option D only

²⁾ Available with power supply options A, C, E, G, J, K, L, N, J1B, J1D, J1E, J2A, J2C only

³⁾ This option does not automatically implement a food conform design

Selection and Ordering data	Article No.	Ord. code	Selection and Ordering data	Article No.	Ord. code
SITRANS LPS200, rigid extension Rotary paddle switch for top mount point level and material detection in bulk solids ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5730-		SITRANS LPS200, rigid extension Rotary paddle switch for top mount point level and material detection in bulk solids	7ML5730-	
Process temperature Up to 80 °C (176 °F) 1 Up to 150 °C (302 °F) 2 Up to 250 °C (482 °F) 3 Up to 600 °C (1 112 °F) ¹⁾²⁾ 4			Process pressure Up to 0.5 bar (7.25 psi) 1 Up to 5 bar (72.5 psi) 2 Up to 10 bar (145 psi) 3		
Power supply 230 V AC, 1 rev/min. A 230 V AC, 1 rev/min., fail-safe B 230 V AC, 5 rev/min. C 230 V AC, 5 rev/min., fail-safe D 115 V AC, 1 rev/min. E 115 V AC, 1 rev/min., fail-safe F 115 V AC, 5 rev/min. G 115 V AC, 5 rev/min., fail-safe H 48 V AC, 1 rev/min. J 24 V AC, 1 rev/min. K 24 V DC, 1 rev/min. L 24 V DC, 1 rev/min., fail-safe M 24 V DC, 5 rev/min. N 24 V DC, 5 rev/min., fail-safe P Switch selectable 230 V AC/115 V AC/24 V DC multi-voltage, 1 rev/min. Q Switch selectable 230 V AC/115 V AC/24 V DC multi-voltage, 5 rev/min. R 48 V AC, 1 rev/min., fail-safe Z 48 V AC, 5 rev/min. Z 48 V AC, 5 rev/min., fail-safe Z 24 V AC, 1 rev/min., fail-safe Z 24 V AC, 5 rev/min. Z 24 V AC, 5 rev/min., fail-safe Z Universal Voltage, 1 rev/min. ¹⁴⁾ Z Universal Voltage, 1 rev/min, fail-safe ¹⁴⁾ Z Universal Voltage, 5 rev/min. ¹⁴⁾ Z Universal Voltage, 5 rev/min, fail-safe ¹⁴⁾ Z			Process connection material Aluminum ⁵⁾ 1 Stainless steel, threads 303 (1.4305), flanges 321 (1.4541), Tri-clamp 304 (1.4301) 2 Stainless steel 316L (1.4404) ⁶⁾ 3		
Process connection Threaded G 1¼" [(BSPP), EN ISO 228-1] A G 1½" [(BSPP), EN ISO 228-1] B 1¼" NPT [(Taper), ANSI/ASME B1.20.1] C 1½" NPT [(Taper), ANSI/ASME B1.20.1] D Flanged DN 32 PN 6, EN 1092-1 ³⁾ E DN 100 PN 6, EN 1092-1 ³⁾ F DN 100 PN 16, EN 1092-1 G 2" ASME 150 lb B16.5 H 3" ASME 150 lb B16.5 J 4" ASME 150 lb B16.5 K 2" Tri-clamp 2" (DN 50) ISO2852 ⁴⁾ L			Extension material (protection tube) Aluminum ⁷⁾⁸⁾ 0 Stainless steel 303 (1.4305) ⁹⁾ 1 Stainless steel 316L (1.4404) ¹⁰⁾¹¹⁾ 2		
			Extension length Aluminum 250 ... 500 mm (9.84 ... 19.69 inch) A 501 ... 750 mm (19.72 ... 29.53 inch) B 751 ... 1 000 mm (29.57 ... 39.37 inch) C 1 001 ... 1 250 mm (39.41 ... 42.21 inch) D 1 251 ... 1 500 mm (49.25 ... 59.06 inch) E 1 501 ... 1 750 mm (59.09 ... 68.90 inch) F 1 751 ... 2 000 mm (68.94 ... 78.74 inch) G 2 001 ... 2 250 mm (78.78 ... 88.58 inch) H 2 251 ... 2 500 mm (88.62 ... 98.43 inch) J 2 501 ... 2 750 mm (98.46 ... 108.27 inch) K 2 751 ... 3 000 mm (108.31 ... 118.11 inch) L 3 001 ... 3 250 mm (118.15 ... 127.95 inch) M 3 251 ... 3 500 mm (127.99 ... 137.80 inch) N 3 501 ... 3 750 mm (137.83 ... 147.64 inch) P 3 751 ... 4 000 mm (147.67 ... 157.48 inch) Q Stainless steel 303 (1.4305) 250 ... 500 mm (9.84 ... 19.69 inch) R 501 ... 750 mm (19.72 ... 29.53 inch) S 751 ... 1 000 mm (29.57 ... 39.37 inch) T 1 001 ... 1 500 mm (39.41 ... 59.05 inch) U 1 501 ... 2 000 mm (59.09 ... 78.74 inch) V 2 001 ... 2 500 mm (78.78 ... 98.42 inch) W 2 501 ... 3 000 mm (98.46 ... 118.11 inch) X 3 001 ... 4 000 mm (118.15 ... 157.48 inch) Y Stainless steel 316L (1.4404) 250 ... 500 mm (9.84 ... 19.69 inch) Z 501 ... 750 mm (19.72 ... 29.53 inch) Z 751 ... 1 000 mm (29.57 ... 39.37 inch) Z 1 001 ... 1 500 mm (39.41 ... 59.05 inch) Z 1 501 ... 2 000 mm (59.09 ... 78.74 inch) Z 2 001 ... 2 500 mm (78.78 ... 98.42 inch) Z 2 501 ... 3 000 mm (98.46 ... 118.11 inch) Z 3 001 ... 4 000 mm (118.5 ... 157.48 inch) Z		
					P1A P1B P1C P1D P1E P1F P1G P1H

Level Measurement

Point level measurement – Rotation paddle switches

SITRANS LPS200

Selection and Ordering data

Article No. Ord. code

SITRANS LPS200, rigid extension

Rotary paddle switch for top mount point level and material detection in bulk solids

7ML5730-

Measuring vane

Boot shaped, 35 x 106 mm (1.34 x 4.17 inch)¹²⁾ ●

Hinged vane, 60 x 200 mm (2.36 x 7.87 inch)¹²⁾ ●

Rectangular 50 x 150 mm (1.97 x 5.91 inch)¹³⁾ ●

Rectangular 50 x 250 mm (1.97 x 9.84 inch)¹³⁾ ●

Rectangular 98 x 150 mm (3.86 x 5.91 inch)¹³⁾ ●

Rectangular 98 x 250 mm (3.86 x 9.84 inch)¹³⁾ ●

Rectangular 50 x 98 mm (1.97 x 3.86 inch)¹³⁾ ●

Approvals

CSA/FM Dust Ignition Proof, RCM ●

ATEX II 1/2 D, RCM ●

CSA/FM General Purpose, RCM ●

CE, RCM ●

IEC Ex ta/tb IIIC ●

A
B
C
D
E
F
G1
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4
5

- 1) Available with approval option 3 and 4, up to max 0.5 bar
- 2) Not available with process connection A, C, E
- 3) Available with process pressure 1 and 2 only
- 4) Available with process temperature 1 only
- 5) Available with process connections A ... E only, with process pressure option 1 only and process temperature 1 only
- 6) Available with process connection B, D, F ... L and measuring vane option A
- 7) Available with process pressure 1 and process temperature 1 only
- 8) Available with extension length options A ... Q only
- 9) Available with extension length options R ... Y only
- 10) Available with process connection B, D, F ... L and measuring vane A, process connection material 3. Available only with extension length options P1A ... P1H only
- 11) Only available with seal at tube end, option P06 ... P09
- 12) Add 16 mm (0.63 inch) to extension length
- 13) Available with process connections F, G, H, J, K only
- 14) Available with approval options 2, 4 and 5 only
- We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix

Selection and Ordering data

Order code

Further Designs

Please add "-Z" to Article No. and specify Order code(s).

Total insertion length: Enter the total insertion length in plain text description, max. 4 000 mm (157.48 inch)

Y01

Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text

Y14

Heating of enclosure¹⁾²⁾

A35

Signal bulb inserted in M20 cable gland¹⁾

A20

Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing³⁾⁴⁾

K01

Seal at tube end for ingress protection and shaft stability

Max. temperature 80 °C (176 °F)

P06

Max. temperature 150 °C (302 °F)

P07

Max. temperature 250 °C (482 °F)

P08

Max. temperature 600 °C (1 112 °F)

P09

Sliding sleeve (standard, max. pressure 0.5 bar)¹⁾⁵⁾

P12

Sliding sleeve (pressure tight, for over-pressure application starting from 1 bar max., dependent on pressure option ordered)⁶⁾

P13

Additional Operating Instructions

Article No.

Multi-language

This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

7ML1998-5FS62

Spare Parts

Motor gear/PLC, multi-voltage

7ML1830-1KG

Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17 inch)

7ML1830-1KH

Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)

7ML1830-1KJ

1) Available with approval option 4 only

2) 15) Available with power supply options A, C, E, G, J, K, L, N, J1B, J1D, J1E, J2A, J2C only

3) Available when ordered with ingress protection seal P06 ... P09 only

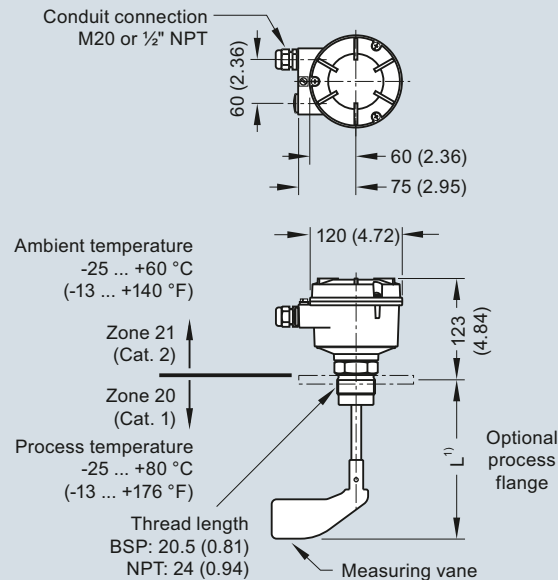
4) Available up to 250 °C (482 °F). This option does not automatically implement a food conform design

5) Available with process pressure 1 only

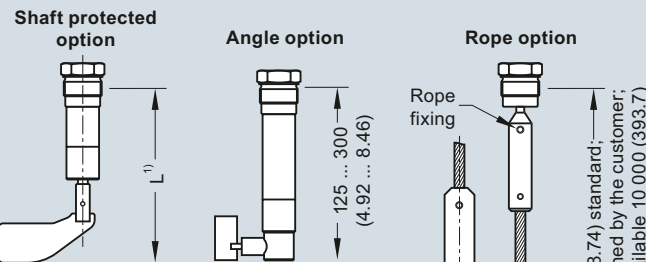
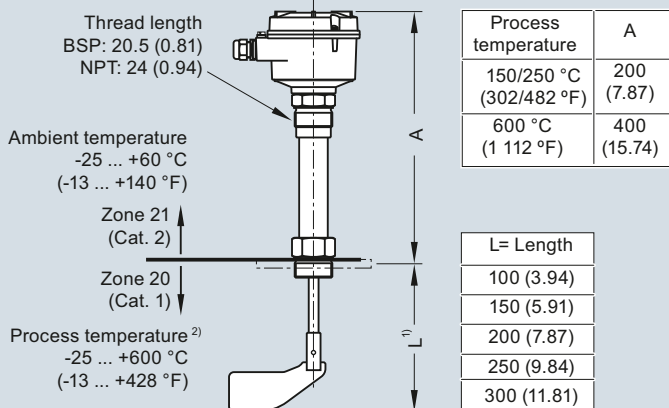
6) Available up to 250 °C (482 °F)

Dimensional drawings

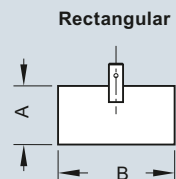
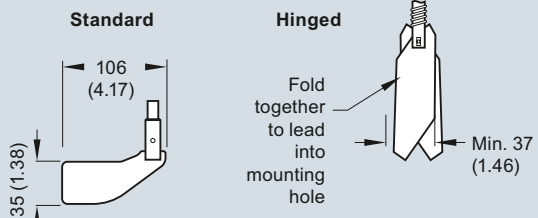
Standard model: compact version



High temperature model: compact version



Measuring vanes



Rectangular vane options

	A	B
	50 (1.97)	98 (3.86)
	50 (1.97)	150 (5.90)
	98 (3.86)	250 (9.84)
	98 (3.86)	150 (5.90)

Vane	Completely covered with material		Covered up to 10 cm (3.93 inch) with material	
	Spring adjustment		Spring adjustment	
	Light	Central (factory setting)	Light	Central (factory setting)
boot shaped 35 x 106 mm	200 g/l (12.5 lb/ft ³)	300 g/l (18.7 lb/ft ³)	100 g/l (6.2 lb/ft ³)	150 g/l (9.4 lb/ft ³)
boot shaped 28 x 98 mm	300 g/l (18.7 lb/ft ³)	500 g/l (31.2 lb/ft ³)	150 g/l (9.4 lb/ft ³)	150 g/l (9.4 lb/ft ³)
rectangular 50 x 98 mm	300 g/l (18.7 lb/ft ³)	500 g/l (31.2 lb/ft ³)	150 g/l (9.4 lb/ft ³)	250 g/l (15.6 lb/ft ³)
rectangular 50 x 150 mm	80 g/l (5.0 lb/ft ³)	120 g/l (7.5 lb/ft ³)	40 g/l (2.5 lb/ft ³)	60 g/l (3.7 lb/ft ³)
rectangular 50 x 250 mm	30 g/l (1.9 lb/ft ³)	50 g/l (3.1 lb/ft ³)	15 g/l (0.9 lb/ft ³)	25 g/l (1.6 lb/ft ³)
rectangular 98 x 150 mm	30 g/l (1.9 lb/ft ³)	50 g/l (3.1 lb/ft ³)	15 g/l (0.9 lb/ft ³)	25 g/l (1.6 lb/ft ³)
rectangular 98 x 250 mm	20 g/l (1.2 lb/ft ³)	30 g/l (1.9 lb/ft ³)	15 g/l (0.9 lb/ft ³)	15 g/l (0.9 lb/ft ³)
hinged 65 x 210 mm	70 g/l (4.4 lb/ft ³)	100 g/l (6.2 lb/ft ³)	35 g/l (2.2 lb/ft ³)	50 g/l (3.1 lb/ft ³)
hinged 60 x 200 mm	70 g/l (4.4 lb/ft ³)	100 g/l (6.2 lb/ft ³)	35 g/l (2.2 lb/ft ³)	50 g/l (3.1 lb/ft ³)

- For 35 x 106 mm boot shaped and 65 x 210 mm hinged measuring vanes, add 16 mm to extension length.
- For use with all approval options except CSA class II. See manual for more details.

Notes

For heavy material, only top mounting of paddle switch is recommended.
Compact LPS200 is recommended for side mounting on bins for low or intermediate material levels.

SITRANS LPS200, dimensions in mm (inch)

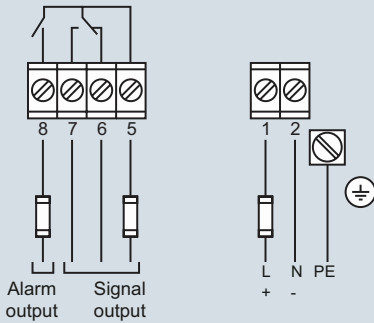
Level Measurement

Point level measurement – Rotation paddle switches

SITRANS LPS200

Schematics

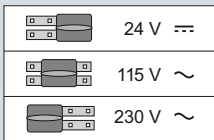
AC or DC version, SPDT, fail-safe



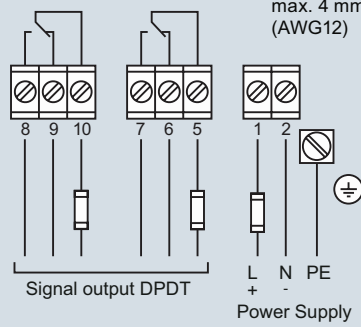
Switching and timing behaviour:
If the vane is not covered, the rotating vane shaft will send pulses at 20 second intervals. In case of fault, the pulses are missed. After 30 seconds, the alarm relay will open.

OR $\frac{24\text{ V or }48\text{ V or }115\text{ V or }230\text{ V AC, }50/60\text{ Hz, }5\text{ VA}}{24\text{ VDC, }2.5\text{ W All voltages } \pm 15\%}$

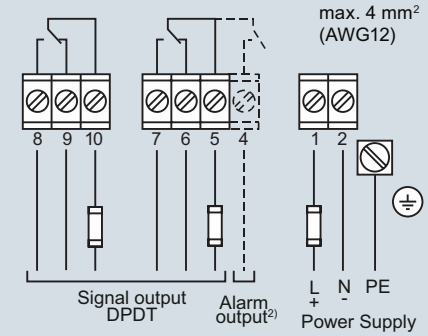
Voltage selector



AC version DPDT FSH/FSL



Universal voltage (DPDT relay)



²) With option Fail safe alarm (rotation control)
Contact open when de-energised

SITRANS LPS200 connections

Overview

The Pointek ULS200 is an ultrasonic non-contacting switch with two switch points for level detection of bulk solids, liquids and slurries in a wide variety of industries; ideal for sticky materials.

Benefits

- 2 switch outputs for high-high, high, low and low-low level alarms or pump up/pump down control
- Integral temperature compensation
- AC or DC power supply
- Electronics provided with fail-safe function
- Threaded and sanitary fitting clamp process connections
- Polycarbonate enclosure, Type 6/NEMA 6/IP67
- Easy, two-button programming

Application

The measuring range for bulk solids is max. 3 m (9.8 ft) and 5 m (16.4 ft) for liquids and slurries. Unlike invasive contacting devices, there is no material buildup on the sensor.

The level switch has a rugged design, combining the transducer and electronics in one durable device. It has no moving parts and is virtually maintenance-free.

The transducer, available in ETFE or PVDF copolymer, is inert to most chemicals. This means the device can be used in the chemical, petrochemical, water, and wastewater industries. A sanitary version of the ULS200, with an industry standard flange option, is easy to remove from the application for cleaning. It thus satisfies the prerequisites for use in the food, beverage, and pharmaceutical industries. The Pointek ULS200 delivers superior performance while reducing maintenance, downtime, and equipment replacement costs.

- Key Applications: liquids, slurries, fluid materials, plugged chute detection, chemical industry

Design**Installation**

The Pointek ULS200 should be mounted in an area that is within the temperature range specified and that is suitable to the enclosure rating and materials of construction. The cover should be accessible to allow programming, wiring and display viewing.

It is advisable to keep the Pointek ULS200 away from high voltage or current runs, contactors and SCR control drives.

Locate the Pointek ULS200 so that it has a clear sound path perpendicular to the material surface. The sound path should not intersect the fill path, rough walls, seams, rungs etc.

Mounting and Interconnection

The Pointek ULS200 is available in three thread types: 2" NPT, R 2" (BSPT), EN 10226 or PF2 and can be fitted with the optional 75 mm (3 inch) flange adapter for mating to 3" ASME, DN 65, PN 10, and JIS 10K 3B sized flanges.

Separate cables and conduit may be required to conform to standard instrumentation wiring or electrical codes.

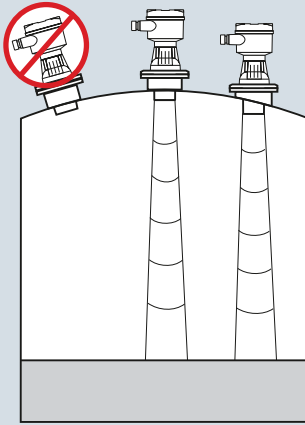
Level Measurement

Point level measurement – Ultrasonic non-contacting switch

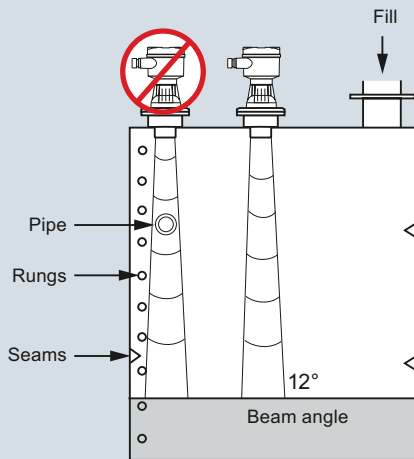
Pointek ULS200

Configuration

Parabolic mounting



Flat mounting and Beam angle



Pointek ULS200 Mounting

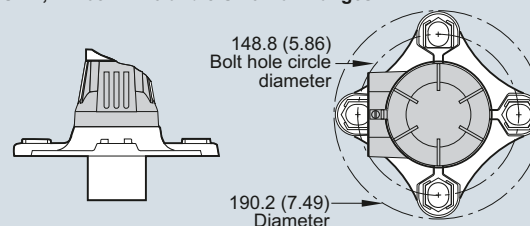
Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level switch
Measuring range	
Measuring range in liquids	0.25 ... 5 m (0.8 ... 16.4 ft)
Measuring range in bulk solids	0.25 ... 3 m (0.8 ... 9.8 ft)
Output	
AC Version (relay)	2 SPDT Form C contacts, rated 5 A at 250 V AC or 30 V DC, resistive load; rated 1 A at 48 V DC resistive load
DC Version (relay)	2 SPDT Form C contacts, rated 5 A at 30 V DC, resistive load; rated 1 A at 48 V DC resistive load
DC Version (transistor)	2 switches, rated max. 100 mA, 48 V DC
Accuracy	
AC/DC version	
• Resolution	3 mm (0.1 inch)
• Repeatability	0.25 % of measuring range
Rated operation conditions	
Installation conditions	
• Location	Indoors/outdoors
• Beam angle	12°
Ambient conditions	
• Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)
• If mounted in metal threads	-20 ... +60 °C (-5 ... +140 °F)
Medium conditions	
• Process pressure	0.5 bar (7.25 psi) max.
Design	
Material	Polycarbonate with gasket
Weight	Approx. 1.5 kg (3.3 lb)
Transducer material	PVDF or ETFE copolymer
Threaded mounting	2" NPT [(Taper), ANSI/ASME B1.20.1] R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
• Optional flange adapter	For 3" ASME, DN 65, PN 10 and JIS 10 K3B
Sanitary mounting	4" sanitary fitting clamp
Power supply	
AC version	100 ... 230 V AC, ± 15 %, 50/60 Hz, max. 12 VA, 5 W
DC version	18 ... 30 V DC, 3 W
Displays and controls	
Display	LCD, three digits, 9 mm (0.35 inch) high for display of distance between sensor face and material, multi-segment graphic for operating state
Memory	EEPROM, non-volatile
Programming	2 keys

Electronics/enclosure	Connection: terminal block, max. 2.5 mm ² (14 AWG) solid/ 1.5 mm ² (16 AWG) stranded
Degree of protection	IP67/Type 6/NEMA 6
Cable inlet	2 x ½" NPT or 2 x PG 13.5
Certificates and approvals	• CE (EMC certificate available on request), CSA US/C, FM

Options

Flange adapter for mating 2" NPT or 2" BSP process connections to 3" ASME, DN 65 PN 10 and JIS 10K 3B flanges



Pointek ULS200 Optional Flange Adapter, dimensions in mm (inch)

Level Measurement

Point level measurement – Ultrasonic non-contacting switch

Pointek ULS200

Selection and Ordering data

Pointek ULS200

Ultrasonic non-contacting switch with two switch points for level detection of bulk solids, liquids and slurries in a wide variety of industries; ideal for sticky materials

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Power supply

24 V DC, relay output

24 V DC, transistor output

100 ... 230 V AC, relay output

Approvals

CE, RCM, CSA Class I, II, Div. 2¹⁾

CE, RCM, CSA_{US/C}, FM

Transducer/Process connection

ETFE, 2" NPT [(Taper), ANSI/ASME B1.20.1]

EFTE, R 2" [(BSPT), EN 10226]

EFTE, G 2" [(BSPP), EN ISO 228-1]

PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1]

PVDF copolymer, R 2" [(BSPT), EN 10226]

PVDF copolymer, G [(BSPP), EN ISO 228-1]

PVDF copolymer, 4" sanitary mounting²⁾

Enclosure/cable inlet

Polycarbonate

• Cable inlet PG 13.5

• Cable inlet ½" NPT

Article No.

➤ **7ML1510-**

0

1

2

3

J

K

A

B

C

E

F

G

J

1

2

Selection and Ordering data

Further designs

Please add **"-Z"** to Article No. and specify Order code(s)

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: **Y15**
Measuring-point number/identification (max. 27 characters) specify in plain text

Operating Instructions

Quick Start manual, multi-language

This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Accessories

Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosures

Universal Box Bracket Mounting Kit

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT

2" BSPT Locknut, plastic

2" NPT Locknut

4" sanitary mounting clamp

Spare Parts

Polycarbonate Lid

➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol **◆**. For details see page 9/5 in the appendix.

Order code

Y15

Article No.

A5E32268616

7ML1930-1AC

7ML1830-1BK

7ML1830-1BT

7ML1830-1BU

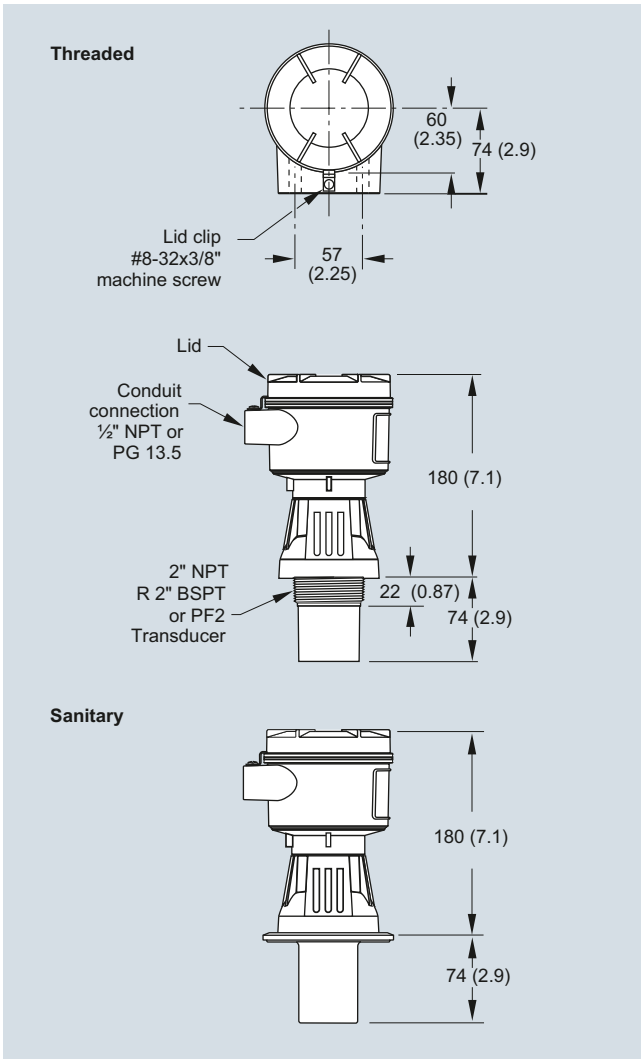
7ML1830-1DQ

7ML1830-1DT

7ML1830-1BR

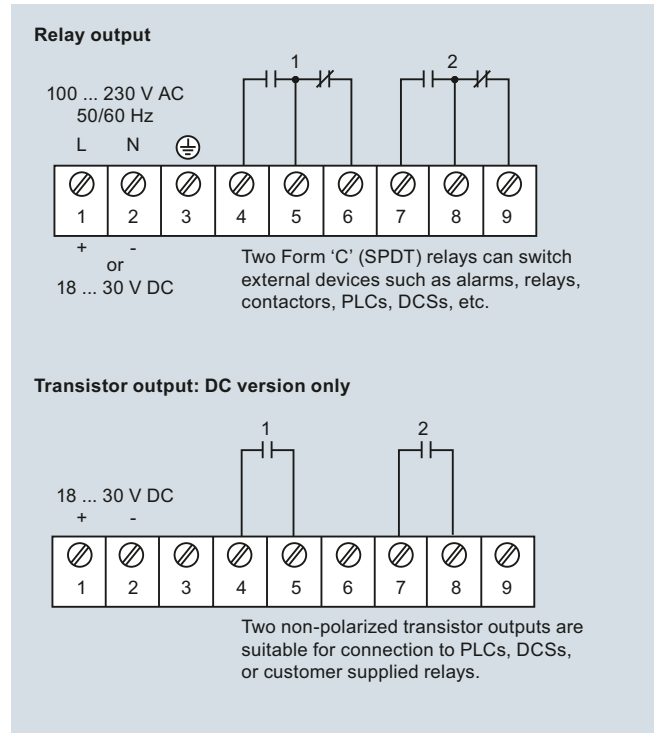
7ML1830-1LG

Dimensional drawings



Pointek ULS200, dimensions in mm (inch)

Schematics



Pointek ULS200 connections

Level Measurement

Continuous level measurement – Ultrasonic

Ultrasonic

Overview

Introduction

Ultrasonic measurement is based on the speed of sound. Sound can be used as a measurement tool because there is a measurable time lapse between sound generation and the "hearing" of the sound. This time lapse is then converted into usable information. Ultrasonic sensing equipment generates a sound above 20 000 Hz and then interprets the time lapse of the returned echo. The transducer creates the sound and senses the echo and then a transceiver interprets the sound and converts it into information.

Siemens ultrasonic units include Sonic Intelligence, a patented signal processing technology. Using unique algorithms, Sonic Intelligence differentiates between true echoes from the material and false echoes from obstructions or electrical noise, providing intelligent processing of echo profiles.

Typical System

Ultrasonic level measurement requires two components: one to generate the sound and catch the echo (transducer) and one to interpret the data and derive a measurement (transceiver). Even though some ultrasonic instruments combine the components in one unit, the individual functionality remains distinct. The measurement output is communicated to the unit, PLCs or PCs for process control.

Principle of Operation

A piezoelectric crystal inside the transducer converts an electrical signal into sound energy, firing a burst into the air which travels to the target and then is reflected back to the transducer. The transducer then acts as a receiving device and converts the sonic energy back into an electrical signal contained in the transceiver. An electronic signal processor analyzes the return echo and calculates the distance between the transducer and the target. The time lapse between firing the sound burst and receiving the return echo is directly proportional to the distance between the transducer and the material in the vessel. This basic principle lies at the heart of the ultrasonic measurement technology and is illustrated in the equation:

Distance = (Velocity of Sound x Time)/2.

Mode of operation

Common Terms

Attenuation

Denotes a decrease in signal magnitude in transmission from one point to another. Attenuation may be expressed as a scalar ratio of the input magnitude to the output magnitude or in decibels.

Beam angle

The diameter of a conical boundary centered around the axis of transmission when the power (radiating perpendicular to the transducer face on the axis of transmission) is reduced by half (-3 dB).

Blanking distance

Specified zone extending downward from the transducer face in which received echoes are ignored by the transceiver. Blanking distance ignores echoes from ringing.

Echo confidence

The recognition of the validity of the echo as material level. A measure of echo reliability.

Ringing

The inherent nature of the transducer to continue vibrating after the transmit pulse has ceased; the decay of the transmit pulse.

Transducer/Transceiver

A transducer provides the initial ultrasonic pulse and receives its echo. An ultrasonic transducer amplifies the sound wave created by the piezoelectric crystal and transmits that sound wave to the face of the transducer while at the same time dampening the sound wave from the other sides of the crystal.

Transceivers analyze the echo from the transducer to determine the required measurement.

Technical specifications

Ultrasonic Transmitter/Controller Selection Guide

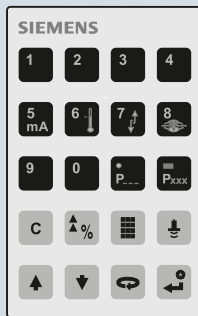
Criteria	SITRANS Probe LU	SITRANS LUT400	HydroRanger 200	MultiRanger 100/200	SITRANS LU
Range	6 m (20 ft) or 12 m (40 ft)	0.3 ... 60 m (1 ... 196 ft), transducer and application dependent	15 m (50 ft) transducer and application dependent	15 m (50 ft) transducer and application dependent	60 m (200 ft) transducer and application dependent
Typical applications	Chemical storage vessels, filter beds, liquid storage vessels	Wet wells, reservoirs, flumes/weirs, chemical storage, liquid storage, hoppers, crusher bins, dry solids storage	Wet wells, flumes/weirs, bar screen control	Wet wells, flumes/weirs, bar screen control, hoppers, chemical storage, liquid storage, crusher bins, dry solids storage	Chemical storage, liquid storage, bulk solids storage (sugar, flour bins, grains, cereals), plastic pellets
Output	HART model: 4 ... 20 mA/HART PROFIBUS PA model: PROFIBUS	4 ... 20 mA/HART 3 relays	6 relays standard, two 4 ... 20 mA outputs (isolated)	1 relay (option on MultiRanger 100) 3 relays standard 6 relays (option) Two 4 ... 20 mA outputs (isolated)	4 relays (LU01, LU02) Up to 40 relays (LU10) 4 ... 20 mA isolated
Communications	HART or PROFIBUS PA Options: • SIMATIC PDM for remote configuration and diagnostics	HART 7.0, USB, SIMATIC PDM	Built-in Modbus RTU/ASCII via RS-485 Options: • SIMATIC PDM • SmartLinx (PROFIBUS DP, DeviceNet)	Built-in Modbus RTU or ASCII via RS-485 Options: • SIMATIC PDM • SmartLinx (PROFIBUS DP, DeviceNet)	Dolphin, RS-232/RS-485 (LU01, LU02) Dolphin via infrared (LU10)
Power specifications	HART: 4 ... 20 mA, 24 V DC nominal, max. 550 Ω, 30 V DC max. PROFIBUS PA: 12, 13, 15, or 20 mA, dependent on programming	AC version: 100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA Fuse: 5 x 20 mm, Slow Blow, 0.25 A, 250 V DC version: 10 ... 32 V DC, 10 W Fuse: 5 x 20 mm, Slow Blow, 1.6 A, 125 V	AC version: 100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA/17 W DC version: 12 ... 30 V DC, 20 W	AC version: 100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA/17 W DC version: 12 ... 30 V DC, 20 W	LU01, LU02: AC version: 100/115/200/ 230 V AC DC version: 18 ... 30 V DC, 25 W LU10: 100/115/200/ 230 V AC
Approvals	CE, CSA _{US/C} , FM, RCM, ATEX, IECEx	CE, CSA _{US/C} , UL Listed, FM, RCM, Lloyd's Register, ABS	CE, CSA _{US/C} , UL Listed, FM, RCM	CE, CSA _{US/C} , UL Listed, FM, RCM	CE, CSA _{US/C} , FM, Lloyd's Register

Level Measurement

Continuous level measurement – Ultrasonic

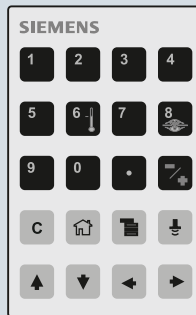
Ultrasonic

7ML1830-2AN



SITRANS Probe LU HART*
SITRANS LU

7ML5830-2AJ



SITRANS Probe LU PROFIBUS

7ML1830-2AK



MultiRanger 100/200
HydroRanger 200

* **Note:** To order the IS version of this hand programmer, order 7ML5830-2AH.

Handheld programmer selection guide

Application

SIEMENS

Ultrasonic Level Application Questionnaire

Customer information

Contact: _____ Prepared By: _____
 Company: _____ Date: _____
 Address: _____ Notes on the Application: _____
 City: _____ Country: _____
 Zip/Postal Code: _____ Phone: () _____
 Fax: () _____ E-mail: _____

Tanks/Vessel information

 (Supply sketch where possible) Sketch attached

Type: Storage Process Pump station Open channel

Dimensions:
 Height: _____ m/ft
 Width/Diameter: _____ m/ft

Critical Information

Nozzle Length: _____ cm/inch
Nozzle Diameter: _____ cm/inch

Tank top: Open Flat Conical Parabolic

Tank bottom: Sloped Flat Conical Parabolic

Internal equipment and/or obstructions: No Yes Please list _____
 (Eg. Agitator, heating coils, supports, other)

Measurement type: Point Level Continuous Level Volume Flow

Area safety classification: (Specify code required) _____

Material

Material being measured: _____ Slurry Liquid Solid

Material temperature: Norm: _____ °C/°F Max: _____ °C/°F

Atmosphere: Air Other _____ **Homogenous:** Yes No

Dust: None Light Heavy

Installation

 (indicate all that apply)

Power available: _____

Inputs required: 4 ... 20 mA Pump Interlocks (#): _____

Outputs required: 4 ... 20 mA Relays (#): _____

Communications:
 HART/4 ... 20 mA AB Remote I/O
 PROFIBUS DP AB DeviceNet
 PROFIBUS PA Other
 Modbus RTU/ASCII None

Products recommended:

Level Measurement

Continuous level measurement – Ultrasonic transmitters

SITRANS Probe LU

Overview



SITRANS Probe LU is a 2-wire loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels, and simple process vessels.

Benefits

- Continuous level measurement up to 12 m (40 ft) range
- Easy installation and simple start-up
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART Communicator
- Communication using HART or PROFIBUS PA
- ETFE or PVDF transducers for chemical compatibility
- Patented Sonic Intelligence signal processing
- Auto False-Echo Suppression for fixed obstruction avoidance
- Level to volume or level to flow conversion

Application

The SITRANS Probe LU is ideal for level monitoring in the water and wastewater industry, chemical storage vessels, and small bulk hoppers.

The range of SITRANS Probe LU is 6 or 12 m (20 or 40 ft). Using Sonic Intelligence, Auto False Echo Suppression for fixed obstruction avoidance, and accuracy of 0.15 % of range or 6 mm (0.25 inch), the Probe LU provides unmatched reliability.

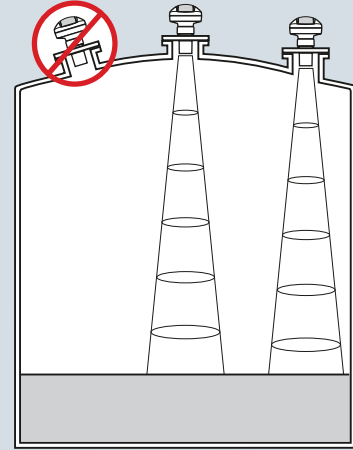
The Probe LU offers two communications options: HART or PROFIBUS PA (Profile version 3.0, Class B).

The transducer on the Probe LU is available as ETFE or PVDF to suit the chemical conditions of your application. As well, for applications with varying material and process temperatures, the Probe LU incorporates an internal temperature sensor to compensate for temperature changes.

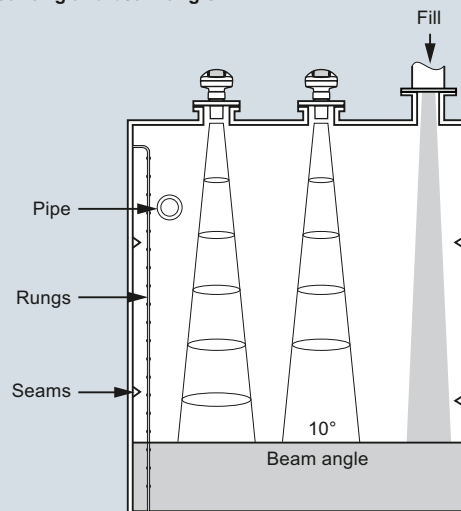
- Key Applications: chemical storage vessels, filter beds, liquid storage vessels

Configuration

Parabolic mounting



Flat mounting and beam angle



SITRANS Probe LU mounting

Level Measurement

Continuous level measurement – Ultrasonic transmitters

SITRANS Probe LU

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level measurement
Typical application	Level measurement in storage vessels and simple process vessels
Inputs	
Measuring range	
• 6 m (20 ft) model	0.25 ... 6 m (10 inch ... 20 ft)
• 12 m (40 ft) model	0.25 ... 12 m (10 inch ... 40 ft)
Frequency	54 kHz
Outputs	
mA/HART	
• Range	4 ... 20 mA
• Accuracy	± 0.02 mA
PROFIBUS PA	
	Profile 3, Class B
Performance	
Resolution	≤ 3 mm (0.12 inch)
Accuracy	± the greater of 0.15 % of range or 6 mm (0.24 inch)
Repeatability	≤ 3 mm (0.12 inch)
Blanking distance	0.25 m (10 inch)
Update time	≤ 5 s
• 4 ... 20 mA/HART version	≤ 5 s at 4 mA
• PROFIBUS version	≤ 4 s at 15 mA current loop
Temperature compensation	Built-in to compensate over temperature range
Beam angle	10°
Rated operating conditions	
Ambient conditions	
• Location	Indoor/outdoor
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Relative humidity/ingress protection	Suitable for outdoor
• Installation category	I
• Pollution degree	4
• Medium conditions	
- Temperature at flange or threads	-40 ... +85 °C (-40 ... +185 °F)
- Pressure (vessel)	0.5 bar g (7.25 psi g)
Design	
Material (enclosure)	PBT (Polybutylene Terephthalate)
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6/IP67/IP68 enclosure
Weight	2.1 kg (4.6 lb)
Cable inlet	2 x M20x1.5 cable gland or 2 x ½" NPT thread or 1 x M20 x 1.5 and 1 x ½" NPT
Material (transducer)	ETFE (Ethylene Tetrafluoroethylene) or PVDF (Polyvinylidene Fluoride)

Process connection	
• Threaded connection	2" NPT [(Taper), ANSI/ASME B1.20.1] R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
• Flange connection	3 inch (80 mm) universal flange
• Other connection	FMS 200 mounting bracket (see page 4/187) or customer supplied mount
Display and Controls	
Interface	Local: LCD display with bar graph Remote: Available via HART or PROFIBUS PA
Configuration	Using Siemens SIMATIC PDM (PC) or HART handheld communicator or Siemens infrared handheld programmer
Memory	Non-volatile EEPROM
Power supply	
4 ... 20 mA/HART	Nominal 24 V DC with 550 Ω maximum; maximum 30 V DC 4 ... 20 mA
PROFIBUS PA	12, 13, 15, or 20 mA depending on programming (General Purpose or Intrinsically Safe version) per IEC 61158-2
Certificates and Approvals	
General	CSA _{US/C} , FM, CE, RCM
Marine (only applies to HART communication option)	• Lloyd's Register of Shipping • ABS Type Approval
Hazardous	
• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga
• Intrinsically Safe (USA/Canada)	CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
• Intrinsically Safe (International)	SIR 13.0008X Ex ia IIC T4 Ga
• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga
• Non-incendive (USA)	FM Class I, Div. 2, Groups A, B, C, D T4
Handheld Programmer	
Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Approvals for handheld programmer	ATEX II 1GD / IECEx SIR 09.0073 Ex ia IIC T4 Ga Ex iaD 20 T135 °C FM/CSA Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G T6
Ambient temperature	-20 ... 50 °C (-5 ... 122 °F)
Interface	Proprietary infrared pulse signal
Power	3 V lithium battery (non-replaceable)

Level Measurement

Continuous level measurement – Ultrasonic transmitters

SITRANS Probe LU

Selection and Ordering data	Article No.
SITRANS Probe LU 2-wire, loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels, and simple process vessels.	➔ 7ML5221-
➔ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Enclosure/Cable Inlet	
Plastic (PBT), 1 x M20x1.5 and 1 x ½" NPT (no cable glands supplied)	0
Plastic (PBT), 2 x M20x1.5 (includes 1 general purpose cable gland: 7ML1930-1AM)	1
Plastic (PBT), 2 x ½" NPT (no cable glands supplied)	2
Range/Transducer material	
6 m (20 ft), ETFE	A
6 m (20 ft), PVDF Copolymer	B
12 m (40 ft), ETFE	C
12 m (40 ft), PVDF Copolymer	D
Process connection	
2" NPT [(Taper), ANSI/ASME B1.20.1]	A
R 2" [(BSPT), EN 10226]	B
G 2" [(BSPP), EN ISO 228-1]	C
Communication/Output	
4 ... 20 mA, HART	1
PROFIBUS PA	2
Approvals	
General Purpose, FM, CSA _{US/C} , CE, RCM, KCC	1
Non-incendive, FM Class I, Div. 2 Groups A,B,C,D T5 ¹⁾	4
Intrinsically Safe, CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 ²⁾	5
Intrinsically Safe ATEX 1G / JECEX / INMETRO Ex ia IIC T4 Ga, RCM, KCC ²⁾	6
Intrinsically Safe ATEX 1G / JECEX / INMETRO Ex ia IIC T4 Ga, RCM, KCC ³⁾	7
Intrinsically safe, CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1 Groups E, F, G; Class III T4 ³⁾	8

1) Available with Enclosure/Cable Inlet option 2 only.

2) Available with communication option 2 only.

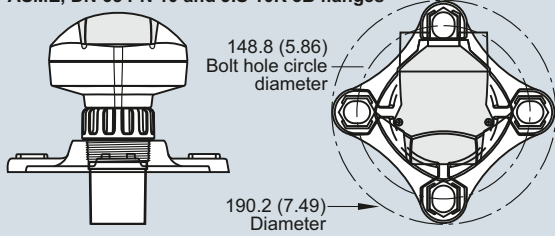
3) Available with communication option 1 only.

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	◆ Y15
Operating Instructions for HART/mA device	Article No.
English	A5E32337695
French	7ML1998-5HT11
German	A5E34957881
Note: The Operating Instructions should be ordered as a separate item on the order.	
Additional Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	A5E32168031
Operating Instructions for PROFIBUS PA device	
English	A5E32337708
German	A5E34957884
Note: The Operating Instructions should be ordered as a separate item on the order.	
Additional Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	A5E32081626
Accessories	
Handheld programmer, Intrinsically Safe, EEx ia	7ML5830-2AH
Handheld programmer, General Purpose approvals	7ML1830-2AN
Handheld programmer, Infrared, Intrinsically Safe, PROFIBUS PA	7ML5830-2AJ
HART modem/USB (for use with a PC and SIMATIC PDM)	7MF4997-1DB
2" NPT locknut, plastic	7ML1830-1DT
2" BSPT locknut, plastic	7ML1830-1DQ
3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT	7ML1830-1BT
3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT	7ML1830-1BU
One General Purpose polymeric cable gland M20x1.5, rated for -20 ... +80 °C (-4 ... +176 °F)	7ML1930-1AM
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F) for General Purpose or ATEX EEx e installations (available for HART only)	7ML1930-1AP
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F) with integrated shield connection (available for PROFIBUS PA)	7ML1930-1AQ
Probe LU, rock guard/sunshield kit, 304 stainless steel	7ML1930-1GH
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch see point level measurement section.	
Spare Parts	
Plastic lid	7ML1830-1KB

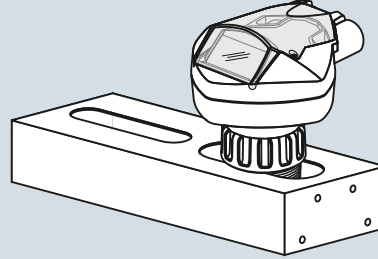
Options

Flange adapter for mating 2" NPT or 2" BSP process connections to 3" ASME, DN 65 PN 10 and JIS 10K 3B flanges



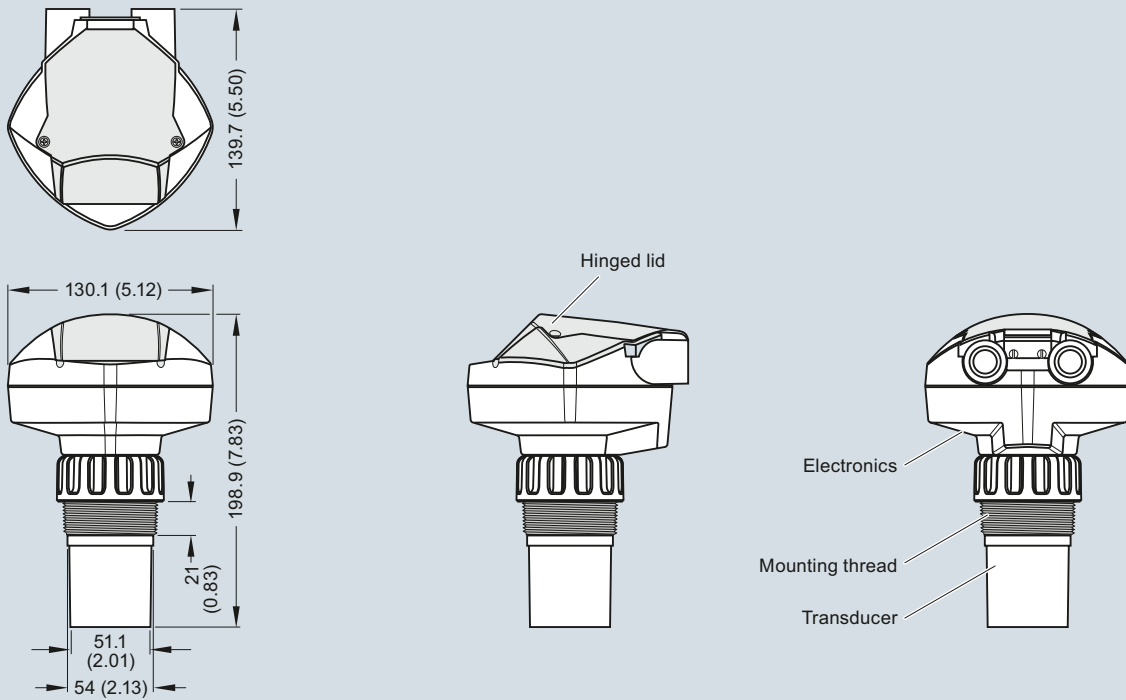
SITRANS Probe LU optional flange adapter, dimensions in mm (inch)

SITRANS Probe LU with FMS 200 mounting bracket



SITRANS Probe LU with optional mounting bracket

Dimensional drawings



Note: Above model is shown without M20 cable glands or 1/2" NPT conduit connectors.

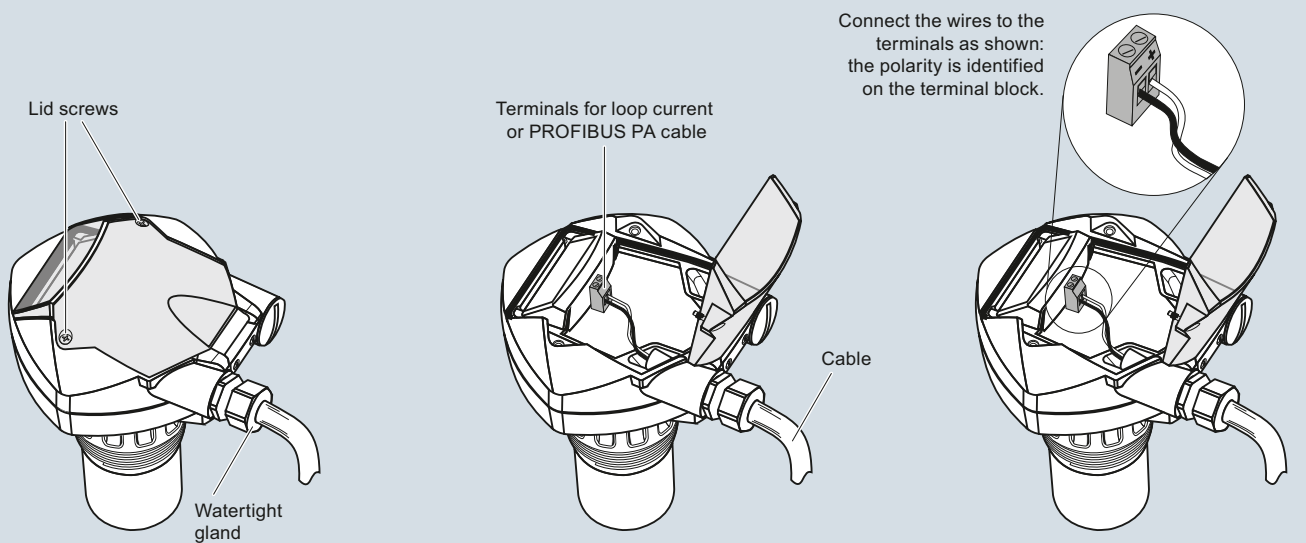
SITRANS Probe LU, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Ultrasonic transmitters

SITRANS Probe LU

Schematics



Note:

- HART model above is shown with M20 cable glands. 1/2" NPT threaded connection is also available.
- DC terminal shall be supplied from an SELV source in accordance with IEC-1010-1 Annex H.
- All field wiring must have insulation suitable for rated input voltages.
- Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS Probe LU connections

Overview



The Probe is a short-range integrated ultrasonic level transmitter, ideal for liquids and slurries in open or closed vessels.

Benefits

- Easy to install, program and maintain
- Accurate and reliable
- Sanitary models available
- Patented Sonic Intelligence echo processing
- Integral temperature compensation

Application

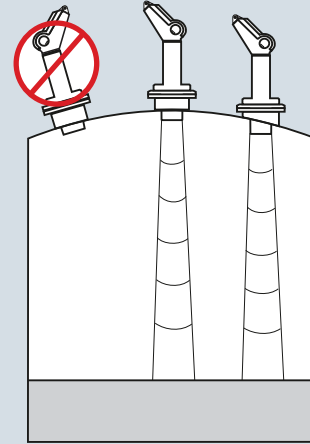
The transducer is available in PVDF copolymer, making the device suitable for use in a wide variety of applications. The Probe is easy to install and maintain, and can be quickly removed for cleaning as required by the food, beverage and pharmaceutical industries.

The reliability of the level data is based on the Sonic Intelligence echo processing algorithms. A filter discriminates between the true echo and false echoes from acoustic or electrical noises and agitator blades in motion. The ultrasonic pulse propagation time to the material and back is temperature-compensated and converted into distance for display, analog output and relay actuation.

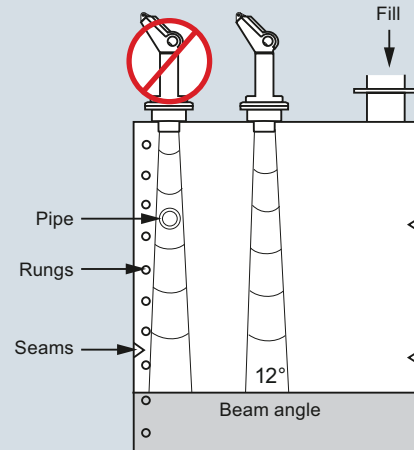
- Key Applications: chemical storage vessels, filter beds, mud pits, liquid storage vessels, food applications

Configuration

Parabolic mounting



Flat mounting and beam angle



The Probe mounting

Level Measurement

Continuous level measurement – Ultrasonic transmitters

The Probe

Technical specifications

	Three-wire version	Two-wire version (standard)
Mode of operation		
Measuring principle	Ultrasonic level measurement	Ultrasonic level measurement
Input		
Measuring range	0.25 ... 5 m (0.8 ... 16.4 ft)	0.25 ... 5 m (0.8 ... 16.4 ft)
Frequency	54 kHz	54 kHz
Output		
• mA	4 ... 20 mA	4 ... 20 mA
- Span	Proportional/ inversely proportional	Proportional/ inversely proportional
- Max. load	750 Ω at 24 V DC	600 Ω in the loop at 24 V DC
• Relay	For level alarm or fault	No
Power supply		
Supply voltage	18 ... 30 V DC, max. 0.2 A	12 ... 30 V DC, 0.1 A surge
Max. power consumption	5 W (200 mA at 24 V DC)	0.75 W (25 mA at 24 V DC)
Certificates and approvals		
	CE, RCM, CSA _{US/C} , FM	CE, RCM, CSA _{US/C}
Accuracy		
• Error in measurement	0.25 % of measuring range (in air)	
• Resolution	3 mm (0.125 inch)	
• Temperature compensation	Built in	
• Echo processing	Sonic Intelligence	
Rated operation conditions		
• Beam angle	12°	
• Ambient temperature		
- Standard	-40 ... +60 °C (-40 ... +140 °F)	
- Metallic mounting	-20 ... +60 °C (-4 ... +140 °F)	
• Max. static operating pressure	Normal atmospheric pressure	
• Degree of protection	IP65	
Design		
• Weight		
- Without flange adapter	1.5 kg (3.3 lb)	
- With flange adapter	1.7 kg (3.7 lb)	
• Material	PVC	
- Electronics enclosure		
- Transducer	PVDF copolymer	
• Degree of protection	IP65	
• Process connection	2" NPT [(Taper), ANSI/ASME B1.20.1] R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]	
• Flange adapter	3" Universal, (fits DN 65, PN 10 and 3"ASME) 4" sanitary	
• Cable inlet	2 inlets for PG 16 or ½" NPT cable glands	

Selection and Ordering data

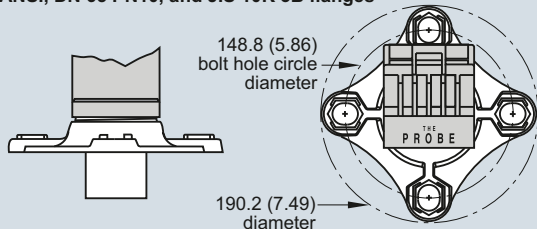
	Article No.
The Probe	7ML1201-00
Short-range integrated ultrasonic level transmitter, ideal for liquids and slurries in open or closed vessels	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Measuring range	1
5 m (16.40 ft)	
Transducer/Process connection	E
PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1]	
PVDF copolymer, R 2" [(BSPT), EN 10226]	F
PVDF copolymer, G 2" [(BSPP), EN ISO 228-1]	G
PVDF copolymer, 4" Sanitary mounting	J
Model/Approval	E
3 Wire, 24 V DC, CE, RCM, CSA, FM	
2 Wire, 24 V DC, CE, RCM, CSA	F
We can offer shorter delivery times for configurations designated with the Quick Ship Symbol. For details see page 9/5 in the appendix.	

Selection and Ordering data

	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 20 characters) specify in plain text	Y17
Additional Operating Instructions	Article No.
3 Wire, 24 V model, Multi-language manual	7ML1998-5GD62
2 Wire model, Multi-language manual	A5E32243983
Accessories	
Universal Box Bracket Mounting kit	7ML1830-1BK
Sanitary 4" mounting clamp	7ML1830-1BR
3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT	7ML1830-1BT
3" ASME, DN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" BSPT	7ML1830-1BU
2" NPT locknut, plastic	7ML1830-1DT
2" BSPT locknut, plastic	7ML1830-1DQ
Plastic M20 cable gland with metal locknut	7ML1930-1DB
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch see point level measurement section.	
We can offer shorter delivery times for configurations designated with the Quick Ship Symbol. For details see page 9/5 in the appendix.	

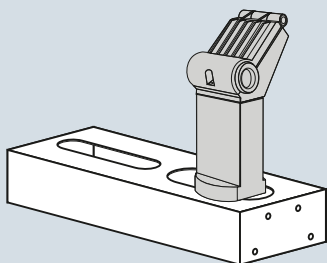
Options

Flange adapter for mating 2" NPT or 2" BSP process connections to 3" ANSI, DN 65 PN10, and JIS 10K 3B flanges



The Probe Optional Flange Adapter, dimensions in mm (inch)

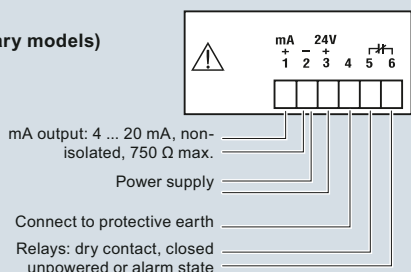
The Probe with FMS 200 mounting bracket



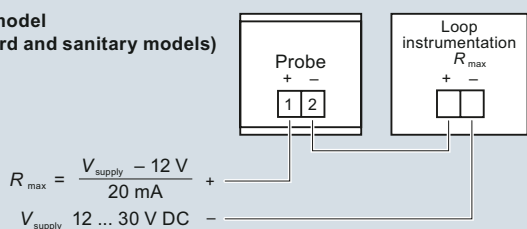
The Probe with Optional Mounting Bracket

Schematics

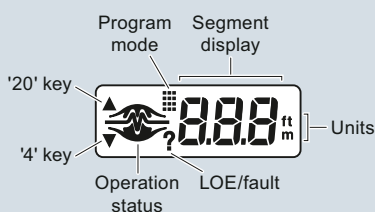
3 wire model (standard and sanitary models)



2 wire model (standard and sanitary models)



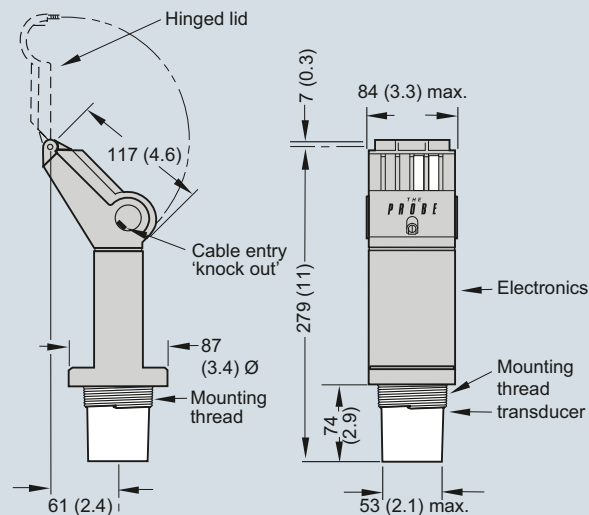
Display



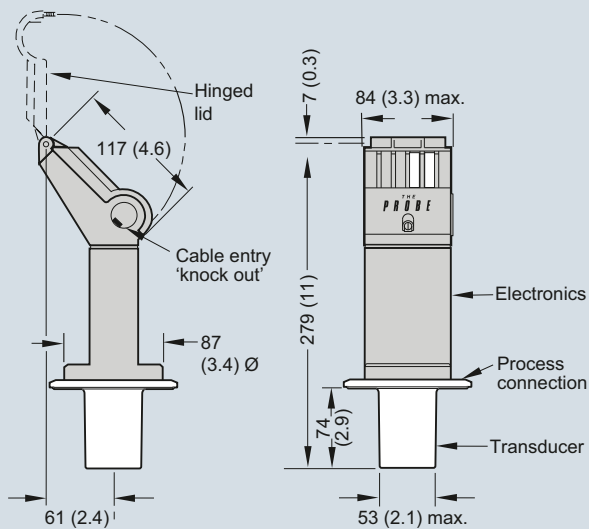
The Probe connections

Dimensional drawings

Standard model



Sanitary model



The Probe, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LUT400 series

Overview



The Siemens SITRANS LUT400 series controllers are compact, single point, long-range ultrasonic controllers for continuous level or volume measurement of liquids, slurries, and solids, and high accuracy monitoring of open channel flow.

Benefits

- Small 1/2 DIN enclosure [144 h x 144 d x 146 w mm (5.7 x 5.7 x 5.75 inch)] with standard universal mounting bracket for wall, pipe, and DIN rail, plus an optional panel mount
- Easy to use HMI display with local four-button programming, menu-driven parameters, and Wizard support for key applications
- English, German, French, Spanish, Chinese, Italian, Portuguese, and Russian texts on the HMI.
- Level, Volume, OCM Flow monitoring
- Three relays combined with a suite of pump, alarm, and relay control features
- HART Communications
- EDDs for SIMATIC PDM, AMS Device Manager, and Field Communicator 375/475, plus DTMs for FDTs (Field Device Tools)
- Web browser for local programming from an intuitive web-based interface
- Two discrete inputs for backup level override and pump interlock functions
- Echo profile and trend views from the local display
- Patented digital receiver for improved performance in electrically noisy applications (close proximity to VSDs)
- Real time clock with daylight savings time, supporting an integrated datalogger and energy saving algorithms for minimizing pump operation during high cost energy periods
- Removable terminal blocks for ease of wiring
- MCERTS Certified for Open Channel Flow

Application

The SITRANS LUT400 comes in three different models, depending on the application, level of performance and functionality required:

- SITRANS LUT420 Level Controller: Level or volume measurement of liquids, slurries, and solids, as well as basic pump control functions, and basic data logging capability
- SITRANS LUT430 Level, Pump and Flow Controller: Includes all features of the LUT420 plus a full suite of advanced pump control and alarm functionality, open channel flow monitoring, and basic flow data logging capability
- SITRANS LUT440 High Accuracy OCM: Our most featured, highest accuracy model. Includes all features of the LUT430, plus the industry's best accuracy (± 1 mm within 3 m), full suite of advanced control functionality, and enhanced flow logging capability
- Key applications: wet wells, reservoirs, flumes/weirs, chemical storage, liquid storage, hoppers, crusher bins, dry solids storage

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LUT400 series

Technical specifications

Mode of Operation	Ultrasonic level, volume, pump, and open channel flow
Measuring range	0.3 ... 60 m (1 ... 196 ft), transducer dependent
Input	
Discrete	0 ... 50 V DC switching level Logical 0 ≤ 10 V DC Logical 1 = 10 ... 50 V DC Max. 3 mA
Output	
Transducer frequency	10 ... 52 kHz
Ultrasonic transducer	Compatible transducers: All Echo-Max and ST-H series transducers
Relays	<ul style="list-style-type: none"> • 1 SPDT Form C, NO or NC relay, rated 1A at 250 V AC, non-inductive and 3A at 30 V DC • 2 SPST Form A, NO relays, rated 5A at 250 V AC, non-inductive and 3 A at 30 V DC
mA output	4 ... 20 mA, isolated
• Max. load	600 Ω max. in ACTIVE mode, 750 Ω max. in PASSIVE mode
• Resolution	0.1 % of range
Accuracy	
Error in measurement	<ul style="list-style-type: none"> • Standard operation: ± 1 mm (0.04 inch) plus 0.17 % of measured distance • High accuracy OCM: ± 1 mm (0.04 inch), within 3 m (9.84 ft) range
Resolution	<ul style="list-style-type: none"> • Standard operation: 0.1 % of range or 2 mm (0.08 inch), whichever is greater • High accuracy OCM: 0.6 mm (0.02 inch), within 3 m (9.84 ft) range
Temperature compensation	<ul style="list-style-type: none"> • -40 ... +150 °C (-40 ... +300 °F) • Integral temperature sensor in transducer • External TS-3 temperature sensor (optional) • Programmable fixed temperature values
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Ambient conditions	
• Ambient temperature (enclosure)	-20 ... +50 °C (-4 ... +122 °F)

Design	
Weight	
• Enclosure with display lid	1.3 kg (2.87 lb)
• Enclosure with blank lid:	1.2 kg (2.65 lb)
Material (enclosure)	Polycarbonate
Degree of protection	
• Enclosure with display or blank lid:	IP65/Type 4X/NEMA 4X
• Enclosure with blank lid and knock-out removed:	IP20
Remote display lid:	IP65/Type 3/NEMA 3
Cable	
Transducer and mA output signal	<ul style="list-style-type: none"> • Transducer, mA output: 2 copper conductors, twisted, with foil shield/drain wire, 300 V 0.5 ... 0.75 mm² (22 ... 18 AWG) • Relay/power to be copper conductors per local requirements to meet 250 V 5 A contact rating
Max. separation between transducer and transceiver	365 m (1 200 ft)
Displays and controls	
	60 x 40 mm (2.36 x 1.57 inch) removable LCD, 240 x 160 pixels resolution, operational up to 5 m from enclosure base
Programming	
• Primary	4 Local push buttons
• Secondary	<ul style="list-style-type: none"> • PC running SIMATIC PDM • PC running Emerson AMS Device Manager • PC running a web browser • PC running a Field Device Tool (FDT) • Field Communicator 375/475 (FC375/FC475)
Memory	<ul style="list-style-type: none"> • 512 kB flash EPROM • 1.5 MByte flash for data logging
Power supply	
AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA Fuse: 5 x 20 mm, Slow Blow, 0.25 A, 250 V
DC version	10 ... 32 V DC, 10 W Fuse: 5 x 20 mm, Slow Blow, 1.6 A, 125 V
Certificates and approvals	
General	CSA _{US/CA} , CE, FM, UL listed, RCM, MCERTS certified for Open Channel Flow
Hazardous	
• Non-incendive (Canada)	CSA Class I, Div. 2, Groups A, B, C, D; Class II, Div. 2, Groups F, G; Class III
• Shipping	Lloyd's Register, ABS
Communication	HART 7.0, USB

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LUT400 series

Category	Feature	SITRANS LUT420 Level Controller	SITRANS LUT430 Level, pump and flow controller	SITRANS LUT440 High accuracy OCM controller
Operations	Level, space, and distance measurement	✓	✓	✓
	Open channel flow measurement		✓	✓
	Volume conversion	✓	✓	✓
Specifications	Compatible with EchoMax and ST-H transducers	✓	✓	✓
	Standard accuracy: ± 1 mm +0.17 % of measured distance	✓	✓	✓
	High accuracy: ± 1 mm within 3 meters			✓
	Mounting options: wall or panel, pipe, DIN-rail	✓	✓	✓
Data logging and communications	HART communications	✓	✓	✓
	4 ... 20 mA output (active and passive)	✓	✓	✓
	Integrated datalogger for measurement value and alarms	✓	✓	✓
	Integrated datalogger for fixed rate flow logging		✓	✓
	Integrated datalogger for variable rate flow logging triggered by changes in flow condition			✓
	Daily data logging for maximum, minimum and average flow, daily totalized volume, and minimum and maximum temperature		✓	✓
Flow monitoring	High accuracy open channel flow measurement			✓
	9 digit daily and running flow totalizers		✓	✓
	High and low flowrate alarms		✓	✓
	External totalizer and sampler control		✓	✓
	MCERTS Class 1 Certification			✓
	MCERTS Class 2 Certification		✓	
Pump control	Energy saving algorithms for pump control		✓	✓
	Wall cling reduction	✓	✓	✓
	Pump run-on functionality		✓	✓
	Pump start and power resumption delays		✓	✓
	Alternate duty pump routines	✓	✓	✓
	Fixed duty and service ratio pump routines		✓	✓
	Pumped volume totalizer		✓	✓
	Submergence detection	✓	✓	✓
	Discrete input pump interlocks		✓	✓
Time to spill calculation		✓	✓	

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LUT400 series

4

Selection and Ordering data	Article No.	Communications Manual	
SITRANS LUT420 and LUT430 Compact ultrasonic level controllers for continuous short to long-range level or volume measurement of liquids, slurries, and solids. Both units include basic relay functions for pumps, alarms, and other controls, plus onboard data logging. LUT430 offers additional advanced pump control and alarm functionality, open channel flow monitoring, and basic flow data logging capability. Functionality varies by model. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5050- 	English French Spanish German Italian Note: The communications manual should be ordered as a separate line item on the order.	7ML1998-5NE01 7ML1998-5NE11 7ML1998-5NE21 7ML1998-5NE31 7ML1998-5NE51
Model SITRANS LUT420 - Level controller SITRANS LUT430 - Level, Pump & Flow controller	A B	Accessories Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosure TS-3 Temperature Sensor - see TS-3 on page 4/189 Panel mount cable extension, 2.5 m (8.2 ft) Qty 3 cable glands and retaining nuts USB cable, 2 m (6.56 ft) - Standard USB-A to USB-mini B Hart modem/USB (for use with a PC and SIMATIC PDM) Sunshield, 304 stainless steel SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML1930-1AC 7ML1813-... 7ML1930-1GF 7ML1930-1GB 7ML1930-1GD 7MF4997-1DB 7ML1930-1GE 7ML5741-... 7ML5740-... 7ML5744-... 7ML5750-...
Enclosure display options With display With remote panel mount display [Includes panel mount cable extension, 2.5 m (8.2 ft)] No display (blank lid provided) Note: Enclosure includes back-plate for wall and pipe mounting, and an integrated clip for DIN-rail mounting. DIN-rail mounting for standard TS35 x 7.5 and TS35 x 15 mm DIN-rail to IEC 60715, EN 60715	A B C	Spare parts Panel mount retrofit kit (convert standard unit with display to panel mount version) Terminal block replacement kit (5 piece kit with one of each removable terminal) Wall/Pipe mount plate Enclosure (include blank label) SITRANS LUT400 Lid (with Display) SITRANS LUT400 Lid (blank) Fuse - AC (0.25 A, 250 V, Slow Blow) Fuse - DC (1.6 A, 125 V, Slow Blow) Battery BR2032 Panel mount gasket and fastener kit DIN-rail clip	7ML1830-1PA 7ML1830-1PB 7ML1830-1PC 7ML1830-1PD 7ML1830-1PE 7ML1830-1PF 7ML1830-1PG 7ML1830-1PH 7ML1830-1PJ 7ML1830-1PK 7ML1830-1PL
Input voltage 100 ... 230 V AC ± 15 % 10 ... 32 V DC	1 2		
Cable inlet 3 cable inlets, cable glands not supplied 3 cable inlets, 3 M20 plastic cable glands supplied	1 2		
Number of measurement points Single point system (includes one transducer input, one mA output, and one external temperature sensor input)	1		
Communications and I/O HART, 2 discrete inputs, 3 relays	D		
Approvals General purpose CE, FM, CSA _{US/C} , UL, RCM Hazardous locations CSA Class I, II, III, Div. 2 (Groups A, B, C, D, F, G)	A C		
● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.			
Selection and Ordering data	Order code		
Further designs Please add "-Z" to Article No. and specify Order code(s).			
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	● C11		
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	● Y15		
Namur NE43 failsafe setting - device preset to failsafe < 3.6 mA	● N07		
Operating Instructions	Article No.		
English	7ML1998-5MV01		
French	7ML1998-5MV11		
Spanish	7ML1998-5MV21		
German	7ML1998-5MV31		
Italian	7ML1998-5MV51		
Multi-language compact operating instructions Note: The operating instructions should be ordered as a separate line item on the order.	7ML1998-5XU81		
● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.			

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LUT400 series

Selection and Ordering data	Article No.
SITRANS LUT440 The SITRANS LUT440 is the most accurate and featured model in the LUT400 series. It includes high accuracy open channel monitoring, relay functions for external samplers, totalizers, alarms, and enhanced data logging, as well as all pump and control functions available with other models in the LUT400 series. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5050-
Model SITRANS LUT440 - High accuracy Open Channel Monitor ¹⁾	C
Enclosure display options With display With remote panel mount display [Includes panel mount cable extension, 2.5 m (8.2 ft)] No display (blank lid provided) Note: Enclosure includes back-plate for wall and pipe mounting, and an integrated clip for DIN-rail mounting. DIN-rail mounting for standard TS35 x 7.5 and TS35 x 15 mm DIN-rail to IEC 60715, EN 60715	A B C
Input voltage 100 ... 230 V AC ± 15 % 10 ... 32 V DC	1 2
Cable inlet 3 cable inlets, cable glands not supplied 3 cable inlets, 3 M20 plastic cable glands supplied	1 2
Number of measurement points Single point system (includes one transducer input, one mA output, and one external temperature sensor input)	1
Communications and I/O HART, 2 discrete inputs, 3 relays	D
Approvals General purpose CE, FM, CSA _{US/C} , UL, RCM Hazardous locations CSA Class I, II, III, Div. 2, (Groups A, B, C, D, F, G)	A C
¹⁾ Compatible with all EchoMax Transducers. High accuracy OCM performance with the use of an XRS-5 transducer and TS-3 temperature sensor (each sold separately). ● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	

Communications Manual

English	7ML1998-5NE01
French	7ML1998-5NE11
Spanish	7ML1998-5NE21
German	7ML1998-5NE31
Italian	7ML1998-5NE51

Note: The communications manual should be ordered as a separate line item on the order.

Accessories

Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosure	7ML1930-1AC
TS-3 Temperature Sensor - see TS-3 on page 4/189	7ML1813-...
Panel mount cable extension 2.5 m (8.2 ft)	7ML1930-1GF
Qty 3 cable glands and retaining nuts	7ML1930-1GB
USB cable 2 m (6.56 ft) - Standard USB-A to USB-mini B	7ML1930-1GD
HART modem/USB (for use with PC and SIMATIC PDM)	7MF4997-1DB
Sunshield, 304 stainless steel	7ML1930-1GE
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...

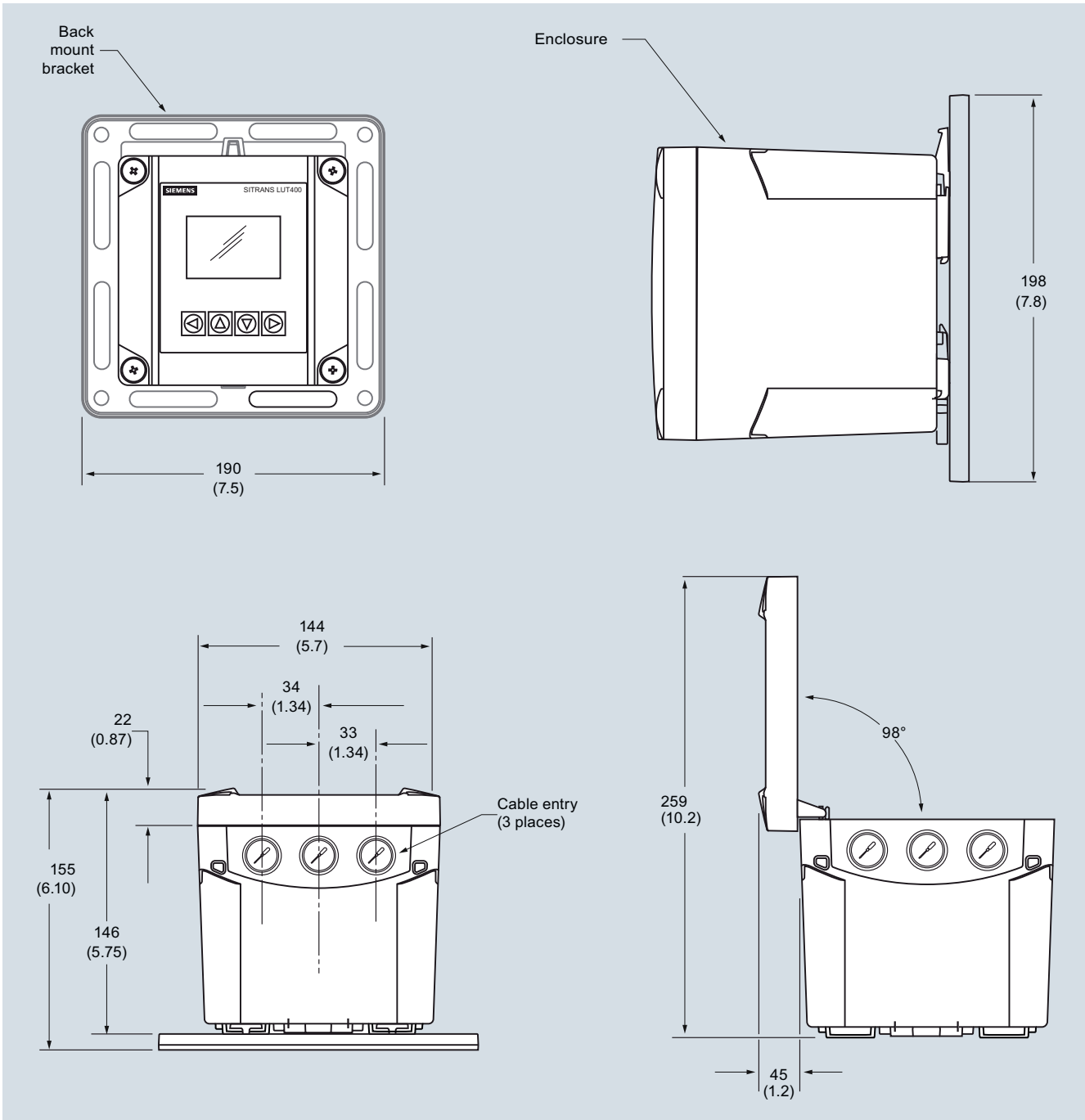
Spare parts

Panel mount retrofit kit (convert standard unit with display to panel mount version)	7ML1830-1PA
Terminal block replacement kit (5 piece kit with one of each removable terminal)	7ML1830-1PB
Wall/Pipe mount plate	7ML1830-1PC
Enclosure (include blank label)	7ML1830-1PD
SITRANS LUT400 Lid (with Display)	7ML1830-1PE
SITRANS LUT400 Lid (blank)	7ML1830-1PF
Fuse - AC (0.25 A, 250 V, Slow Blow)	7ML1830-1PG
Fuse - DC (1.6 A, 125 V, Slow Blow)	7ML1830-1PH
Battery BR2032	7ML1830-1PJ
Panel mount gasket and fastener kit	7ML1830-1PK
DIN-rail clip	7ML1830-1PL

● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix

Selection and Ordering data	Order code
Further designs Please add " -Z " to Article No. and specify Order code(s).	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	● C11
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	● Y15
Namur NE43 failsafe setting - device preset to failsafe < 3.6 mA	● N07
Operating Instructions	Article No.
English	7ML1998-5MV01
French	7ML1998-5MV11
Spanish	7ML1998-5MV21
German	7ML1998-5MV31
Italian	7ML1998-5MV51
Note: The operating instructions should be ordered as a separate line item on the order.	

Dimensional drawings

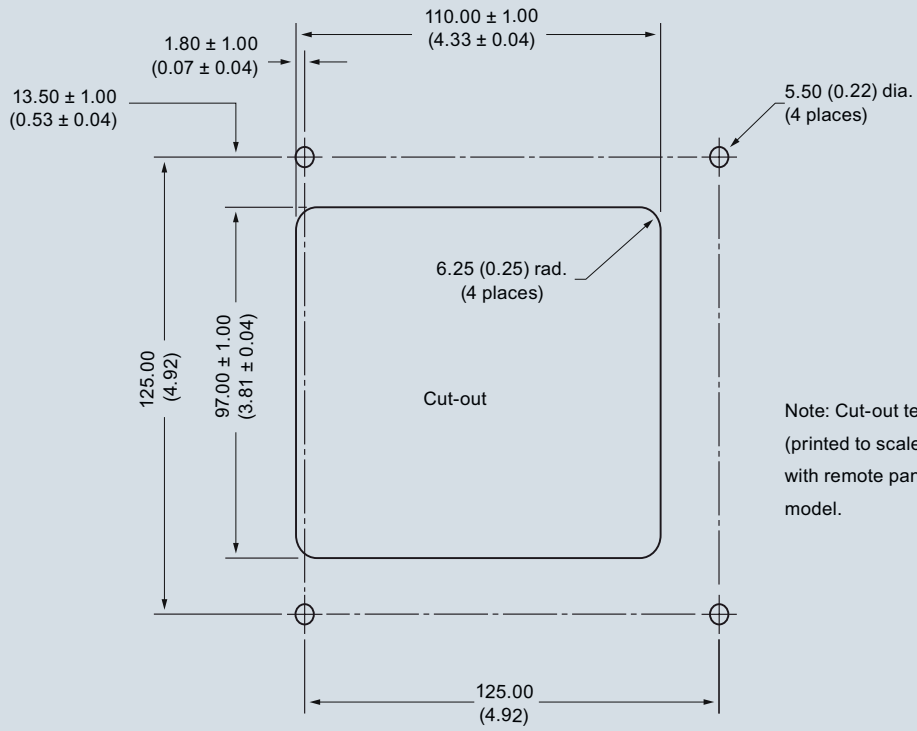


SITRANS LUT400, dimensions in mm (inch)

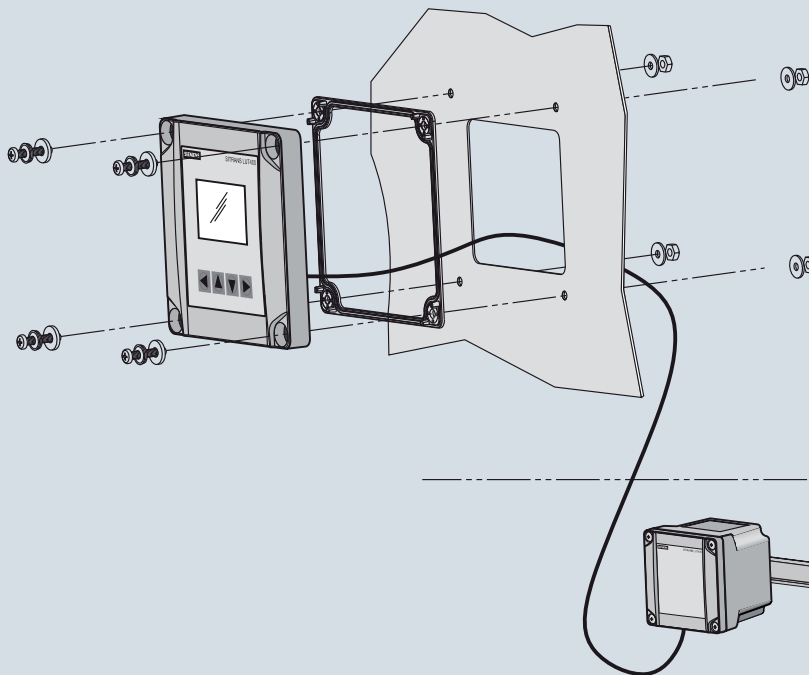
Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LUT400 series

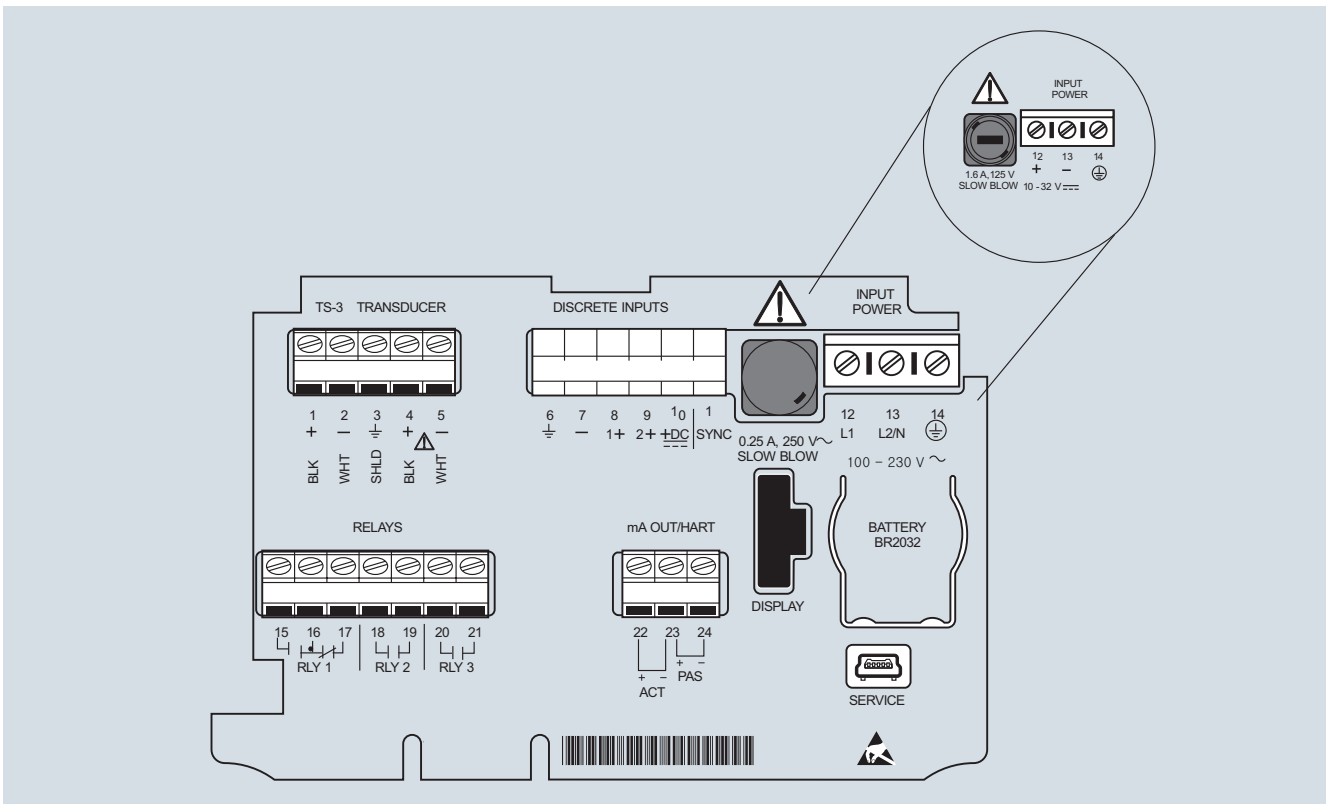


Note: Cut-out template (printed to scale) shipped with remote panel mount model.



SITRANS LUT400, dimensions in mm (inch)

Schematics



SITRANS LUT400 connections

Level Measurement

Continuous level measurement – Ultrasonic controllers

MultiRanger 100/200

Overview



MultiRanger is a versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.

Benefits

- Digital input for back-up level override from point level device
- Communication using built-in Modbus RTU via RS-485
- Compatible with SmartLinx system and SIMATIC PDM configuration software
- Single or dual point level monitoring
- Auto False-Echo Suppression for fixed obstruction avoidance
- Differential amplifier transceiver for common mode noise reduction and improved signal-to-noise ratio
- MultiRanger 100: level measurements, simple pump control, and level alarm functions
- MultiRanger 200: level, volume and flow measurements in open channels, differential control, extended pump control, and alarm functions
- Wall and panel mounting options

Application

MultiRanger can be used on different materials, including fuel oil, municipal waste, acids, woodchips, or on materials with high angles of repose. MultiRanger offers true dual point monitoring, digital communications with built-in Modbus RTU via RS-485, as well as compatibility with SIMATIC PDM, allowing PC configuration and setup. MultiRanger features Sonic Intelligence advanced echo-processing software for increased reading reliability.

MultiRanger 100 offers cost-effective level alarming, as well as on/off and alternating pump control. MultiRanger 200 will monitor open channel flow and features more advanced relay alarming and pump control functions as well as volume conversion.

It is compatible with chemical-resistant EchoMax transducers that can be used in hostile environments at temperatures as high as 145 °C (293 °F).

- Key Applications: wet wells, flumes/weirs, bar screen control, hoppers, chemical storage, liquid storage, crusher bins, dry solids storage

Design

The MultiRanger is available in wall or panel mounting options.

Level Measurement

Continuous level measurement – Ultrasonic controllers

MultiRanger 100/200

Technical specifications

Mode of Operation		Design	
Measuring principle	Ultrasonic level measurement	Weight	
Measuring range	0.3 ... 15 m (1 ... 50 ft)	• Wall mount	1.37 kg (3.02 lb)
Measuring points	1 or 2	• Panel mount	1.50 kg (3.31 lb)
Input		Material (enclosure)	Polycarbonate
• Analog (MultiRanger 200 only)	0 ... 20 mA or 4 ... 20 mA, from alternate device, scalable	Degree of protection (enclosure)	
• Discrete	10 ... 50 V DC switching level Logical 0 ≤ 0.5 V DC Logical 1 = 10 ... 50 V DC Max. 3 mA	• Wall mount	IP65/Type 4X/NEMA 4X
Output		• Panel mount	IP54/Type 3/NEMA 3
EchoMax transducer	44 kHz	Electrical connection	
Ultrasonic transducer	Compatible transducers: ST-H and EchoMax series XPS-10, XPS 15/15F, and XRS-5	• Transducer and mA output signal	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm ² (22 ... 18 AWG), Belden 8760 or equivalent is acceptable 365 m (1 200 ft)
Relays	Rating 5 A at 250 V AC, non-inductive	• Max. separation between transducer and transceiver	
• Version with 1 relay (MultiRanger 100 only)	1 SPST Form A	Displays and controls	
• Version with 3 relays	2 SPST Form A/1 SPDT Form C	100 x 40 mm (4 x 1.5 inch) multi-block LCD with backlighting	
• Version with 6 relays	4 SPST Form A/2 SPDT Form C	Programming using hand-held programmer, SIMATIC PDM or via PC with Dolphin Plus software	
mA output	0 ... 20 mA or 4 ... 20 mA	Power supply	
• Max. load	750 Ω, isolated	• AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA (17 W)
• Resolution	0.1 % of range	• DC version	12 ... 30 V DC (20 W)
Accuracy		Certificates and approvals	
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater	<ul style="list-style-type: none"> • CE, RCM²⁾ • Lloyd's Register of Shipping • ABS Type Approval • FM, CSA_{US/C}, UL listed • CSA Class I, Div. 2, Groups A, B, C and D, Class II, Div.2, Groups F and G, Class III (wall mount only), ATEX II 3D 	
Resolution	0.1 % of measuring range ¹⁾ or 2 mm (0.08 inch), whichever is greater	Communication	
Temperature compensation	<ul style="list-style-type: none"> • -50 ... +150 °C (-58 ... +302 °F) • Integral temperature sensor • External TS-3 temperature sensor (optional) • Programmable fixed temperature values 	<ul style="list-style-type: none"> • RS 232 with Modbus RTU or ASCII via RJ-11 connector • RS 485 with Modbus RTU or ASCII via terminal strips • Optional: SmartLinX cards for <ul style="list-style-type: none"> - PROFIBUS DP - DeviceNet 	
Rated operating conditions		¹⁾ Program range is defined as the empty distance to the face of the transducer plus any range extension ²⁾ EMC performance available on request	
Installation conditions			
• Location	Indoor/outdoor		
• Installation category	II		
• Pollution degree	4		
Ambient conditions			
• Ambient temperature (housing)	-20 ... +50 °C (-4 ... +122 °F)		

Level Measurement

Continuous level measurement – Ultrasonic controllers

MultiRanger 100/200

Selection and Ordering data

Selection and Ordering data	Article No.
MultiRanger 100/200 Versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries	7ML5033-
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Versions	
MultiRanger 100, level measurement only	1
MultiRanger 200, level, volume, flow and differential measurements	2
Mounting, enclosure design	
Wall mount, standard enclosure	A
Wall mount, 4 entries, 4 M20 cable glands included	B
Panel mount (CE, CSA _{US/IC} , FM, UL)	C
Power supply	
100 ... 230 V AC	A
12 ... 30 V DC	B
Number of measurement points	
Single point version	0
Dual point version	1
Communication (SmartLinX)	
Without module	0
SmartLinX PROFIBUS DP module	2
SmartLinX DeviceNet module See SmartLinX product on page 4/360 for more information.	3
Output relays	
3 relays (2 Form A, 1 Form C), 250 V AC	1
6 relays (4 Form A, 2 Form C), 250 V AC	2
1 relay (1 Form A), 250 V AC (available on MultiRanger 100 model only)	3
Approvals	
General Purpose CE, FM, CSA _{US/IC} , UL listed, RCM	A
CSA Class I, Div. 2, Groups A, B, C and D; Class II, Div. 2, Groups F and G; Class III ¹⁾	B
ATEX II 3D ²⁾	C

¹⁾ For wall mount applications only

²⁾ For standard enclosure wall mount, option A only

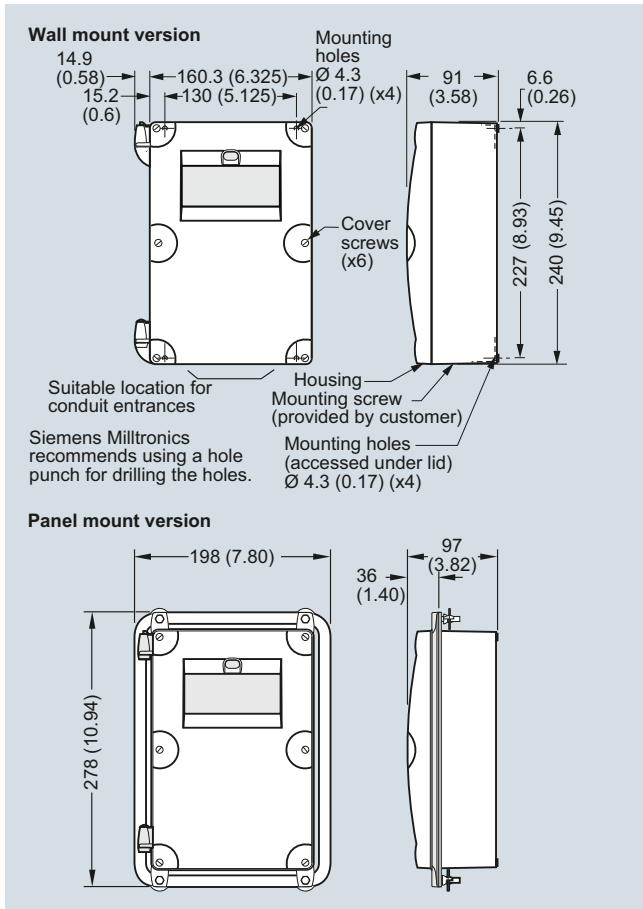
◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Selection and Ordering data

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)];	◆ Y15
Measuring-point number/identification (max. 27 characters) specify in plain text	
Operating Instructions	Article No.
English	7ML1998-5FB06
French	7ML1998-5FB13
Spanish	7ML1998-5FB23
German	7ML1998-5FB36
Quick Start guide, multi-language Note: The Operating Instructions should be ordered as a separate item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	7ML1998-5QD83
Other Operating Instructions	
SmartLinX PROFIBUS DP, English	7ML1998-1AQ03
SmartLinX PROFIBUS DP, German	7ML1998-1AQ33
SmartLinX PROFIBUS DP, French	7ML1998-1AQ13
SmartLinX DeviceNet, English Note: The appropriate SmartLinX Operating Instructions should be ordered as a separate line on the order.	7ML1998-1BH02
Accessories	
Handheld programmer	7ML1830-2AK
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosure	7ML1930-1AC
M20 cable gland kit (4 M20 cable glands, 4 M20 nuts, 4 washers)	7ML1930-1FV
Sunshield kit, 304 stainless steel	7ML1930-1GA
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
Spare parts	
Power Supply Board (100 ... 230 V AC)	7ML1830-1MD
Power Supply Board (12 ... 30 V DC)	7ML1830-1ME
Display Board	7ML1830-1MF

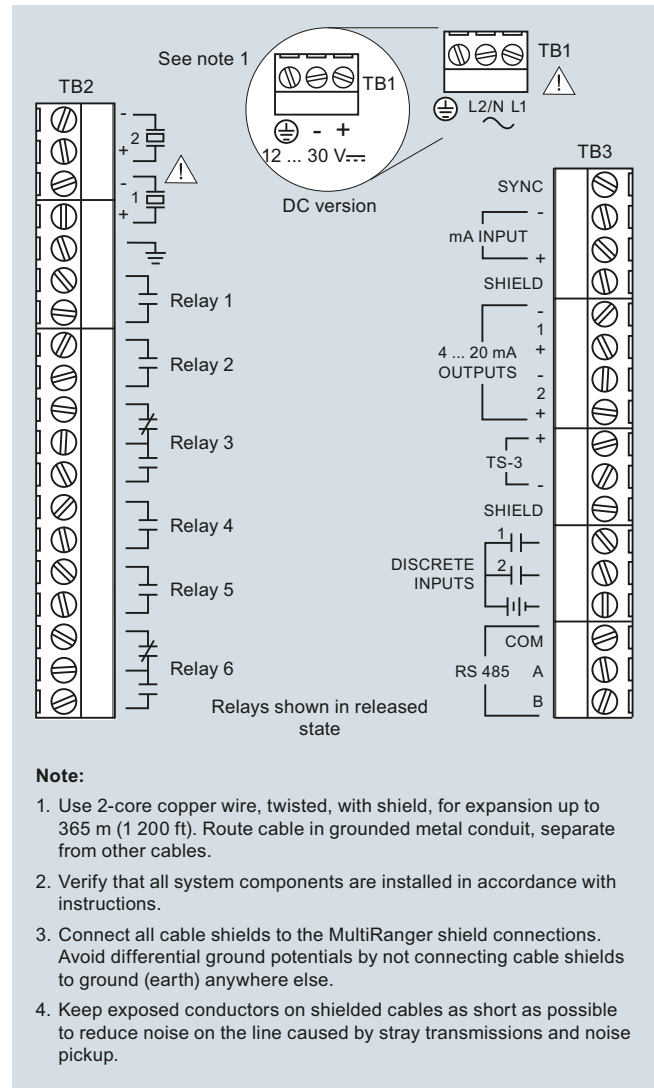
◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Dimensional drawings



MultiRanger, dimensions in mm (inch)

Schematics



MultiRanger connections

Level Measurement

Continuous level measurement – Ultrasonic controllers

HydroRanger 200

Overview



HydroRanger 200 is an ultrasonic level controller for up to six pumps and provides control, differential control, and open channel flow monitoring.

Benefits

- Monitors wet wells, weirs and flumes
- Digital communications with built-in Modbus RTU via RS-485
- Compatible with SmartLinx system and SIMATIC PDM configuration software
- Single or dual point level monitoring
- 6 relay (standard), 1 or 3 relay (optional)
- Auto False-Echo Suppression for fixed obstruction avoidance
- Anti-grease ring/tide mark buildup
- Differential amplifier transceiver for common mode noise rejection and improved signal-to-noise ratio
- Wall and panel mounting options

Application

For water authorities, municipal water, and wastewater plants, HydroRanger 200 is an economical, low-maintenance solution delivering control efficiency and productivity needed to meet today's exacting standards. It offers single point monitoring with all models, and optional dual-point monitoring with 6 relay model. As well, it has digital communications with built-in Modbus RTU via RS-485.

The standard 6 relay HydroRanger 200 will monitor open channel flow and features more advanced relay alarming and pump control functions as well as volume conversion. It is compatible with SIMATIC PDM, allowing for PC configuration and setup. Sonic Intelligence advanced echo-processing software provides increased reading reliability. The optional 1 or 3 relay models provide accurate level measurement functions only; these two models do not provide open channel flow, differential level measurement or volume conversion functions.

HydroRanger 200 uses proven continuous ultrasonic echo ranging technology to monitor water and wastewater of any consistency up to 15 m (50 ft) in depth. Achievable resolution is 0.1 % with accuracy to 0.25 % of range. Unlike contacting devices, HydroRanger 200 is immune to problems caused by suspended solids, harsh corrosives, grease or silt in the effluent, reducing downtime.

- Key Applications: wet wells, flumes/weirs, bar screen control

Level Measurement

Continuous level measurement – Ultrasonic controllers

HydroRanger 200

Technical specifications

Mode of Operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 15 m (1 ... 50 ft), transducer dependent
Measuring points	1 or 2
Input	
Analog	0 ... 20 mA or 4 ... 20 mA, from alternate device, scalable (6 relay model)
Discrete	10 ... 50 V DC switching level Logical 0 ≤ 0.5 V DC Logical 1 = 10 ... 50 V DC Max. 3 mA
Output	
EchoMax transducer	44 kHz
Ultrasonic transducer	Compatible transducers: ST-H and EchoMax series XPS-10, XPS 15/15F, and XRS-5
Relays ¹⁾	Rating 5 A at 250 V AC, non-inductive
• Model with 1 relay ²⁾	1 SPST Form A
• Model with 3 relays ²⁾	2 SPST Form A/1 SPDT Form C
• Model with 6 relays	4 SPST Form A/2 SPDT Form C
mA output	0 ... 20 mA or 4 ... 20 mA
• Max. load	750 Ω, isolated
• Resolution	0.1 % of range
Accuracy	
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater
Resolution	0.1 % of measuring range or 2 mm (0.08 inch), whichever is greater ³⁾
Temperature compensation	<ul style="list-style-type: none"> • -50 ... +150 °C (-58 ... +302 °F) • Integral temperature sensor in transducer • External TS-3 temperature sensor (optional) • Programmable fixed temperature values
Rated operating conditions	
Installation conditions	
• Location	Indoor / outdoor
• Installation category	II
• Pollution degree	4
Ambient conditions	
• Ambient temperature (enclosure)	-20 ... +50 °C (-4 ... +122 °F)

Design	
Weight	<ul style="list-style-type: none"> • Wall mount 1.37 kg (3.02 lb) • Panel mount 1.50 kg (3.31 lb)
Material (enclosure)	Polycarbonate
Degree of protection (enclosure)	<ul style="list-style-type: none"> • Wall mount IP65/Type 4X/NEMA 4X • Panel mount IP54/Type 3/NEMA 3
Cable	<ul style="list-style-type: none"> • Transducer and mA output signal 2-core copper conductor, twisted, shielded, 300 Vrms, 0.82 mm² (18 AWG), Belden 8 760 or equivalent is acceptable • Max. separation between transducer and transceiver 365 m (1 200 ft)
Displays and controls	
Programming	100 x 40 mm (4 x 1.5 inch) multi-block LCD with backlighting
Programming	Programming using handheld programmer or via PC with SIMATIC PDM software
Power supply⁴⁾	
AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA (17 W)
DC version	12 ... 30 V DC (20 W)
Certificates and approvals	
<ul style="list-style-type: none"> • CE, RCM⁵⁾ • Lloyd's Register of Shipping • ABS Type Approval • FM, CSA_{US/C}, UL listed • CSA_{US/C} Class I, Div. 2, Groups A, B, C and D, Class II, Div. 2, Groups F and G, Class III (wall mount only) • MCERTS Class 3 approved for Open Channel Flow 	
Communication	
<ul style="list-style-type: none"> • RS 232 with Modbus RTU or ASCII via RJ-11 connector • RS 485 with Modbus RTU or ASCII via terminal blocks • Optional: SmartLinx cards for <ul style="list-style-type: none"> - PROFIBUS DP - DeviceNet 	

¹⁾ All relays certified for use with equipment that fails in a state at or under the rated maximums of the relays

²⁾ This model is level control only; no open channel flow, differential level or volume conversion functions

³⁾ Program range is defined as the empty distance to the face of the transducer plus any range extension

⁴⁾ Maximum power consumption is listed

⁵⁾ EMC performance available upon request

Level Measurement

Continuous level measurement – Ultrasonic controllers

HydroRanger 200

Selection and Ordering data

Siemens HydroRanger 200

Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring. The HydroRanger 200 is also available as a level measurement controller only. Select option from number of measurement points options below.

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Mounting

Wall mount, standard enclosure
Wall mount, 4 entries, 4 M20 cable glands included
Panel mount¹⁾

Power supply

100 ... 230 V AC
12 ... 30 V DC

Number of measurement points

Single point model, 6 relays
Dual point model, 6 relays
Single point model, level only, 1 relay²⁾
Single point model, level only, 3 relays²⁾

Communication (SmartLinX)

Without module
SmartLinX PROFIBUS DP module
SmartLinX DeviceNet module
See SmartLinX product on page 4/360 for more information.

Approvals

General Purpose CE, FM, CSA_{USC}, UL listed, RCM
CSA Class I, Div. 2, Groups A, B, C, and D;
Class II, Div. 2, Groups F and G; Class III
(for wall mount applications only)

¹⁾ Available with approval option 1 only

²⁾ This model is level control only; no open channel flow, differential level, or volume conversion functions.

Article No.

7ML5034-



Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:
Measuring-point number/identification
(max. 27 characters) specify in plain text

Operating Instructions

English

French

German

Note: The Operating Instructions should be ordered as a separate item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Other Operating Instructions

SmartLinX PROFIBUS DP, English

SmartLinX PROFIBUS DP, German

SmartLinX PROFIBUS DP, French

SmartLinX DeviceNet, English

Note: The appropriate SmartLinX Operating Instructions should be ordered as a separate line on the order.

Accessories

Handheld programmer

Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosure

Sunshield kit, 304 stainless steel

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

Spare parts

Power Supply Board (100 ... 230 V AC)

Power Supply Board (12 ... 30 V DC)

Display Board

Order code

Y15

Article No.

7ML1998-5FC03

7ML1998-5FC11

7ML1998-5FC33

7ML1998-1AQ03

7ML1998-1AQ33

7ML1998-1AQ13

7ML1998-1BH02

7ML1830-2AK

7ML1930-1AC

7ML1930-1GA

7ML5741-...

7ML5740-...

7ML5744-...

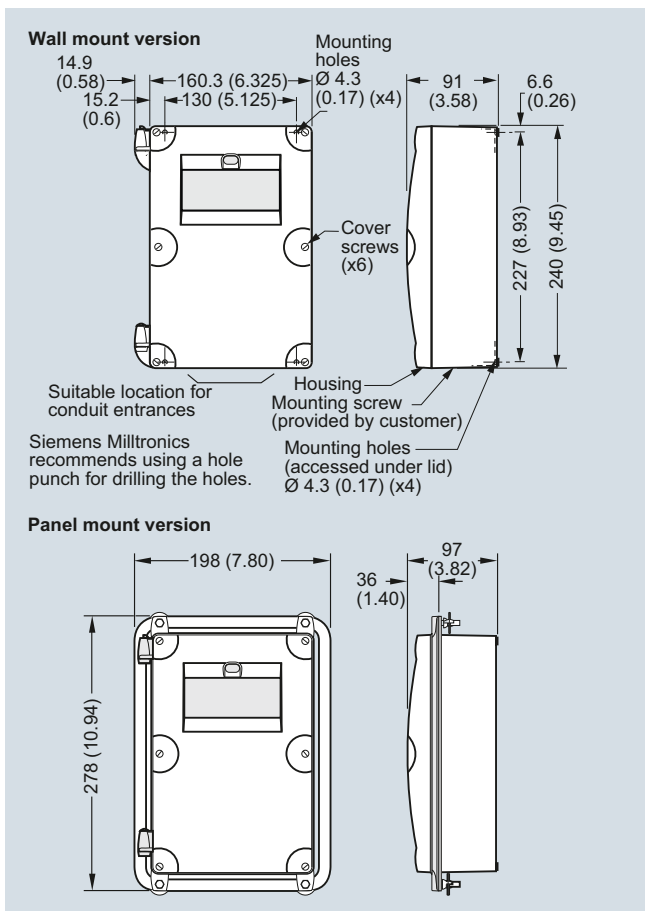
7ML5750-...

7ML1830-1MD

7ML1830-1ME

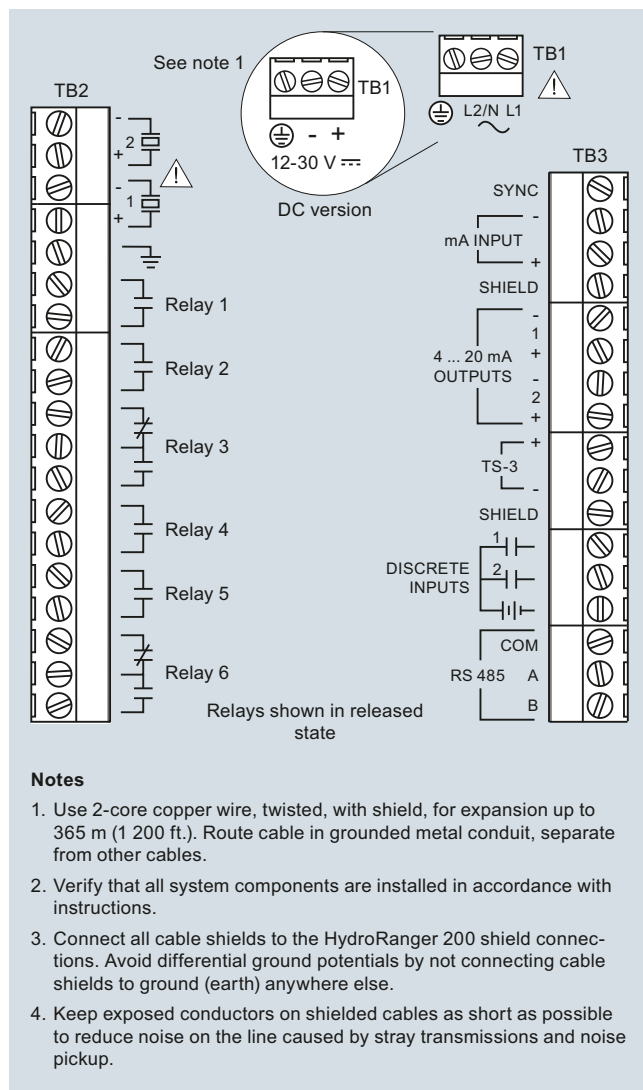
7ML1830-1MF

Dimensional drawings



HydroRanger 200, dimensions in mm (inch)

Schematics



Notes

1. Use 2-core copper wire, twisted, with shield, for expansion up to 365 m (1 200 ft.). Route cable in grounded metal conduit, separate from other cables.
2. Verify that all system components are installed in accordance with instructions.
3. Connect all cable shields to the HydroRanger 200 shield connections. Avoid differential ground potentials by not connecting cable shields to ground (earth) anywhere else.
4. Keep exposed conductors on shielded cables as short as possible to reduce noise on the line caused by stray transmissions and noise pickup.

HydroRanger 200 connections

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LU01 and LU02

Overview



The SITRANS LU01 is an ultrasonic long-range level controller for liquids and solids in a single vessel up to 60 m (200 ft). Handheld programmer shown is an accessory and must be ordered separately.

Benefits

- Single point, long-range level monitoring
- Easy to install; easy to program using removable infrared keypad (optional)
- Compatible with all EchoMax transducers
- Backlit LCD display with reading in standard engineering units
- Automatic level-to-volume conversion for standard or custom tank shapes
- Dolphin Plus compatible
- High/low alarms

Application

The system consists of a SITRANS LU01 monitor linked to a non-contacting ultrasonic transducer that can be mounted up to 365 m (1 200 ft) away. The SITRANS LU01 will measure distance, level or volume, and it features patented Sonic Intelligence echo processing software for superior reliability.

Readings are displayed in user-selectable linear engineering units on the backlit LCD.

Modules for popular industrial buses can be factory installed or added later to meet changing needs. No external gateway is required, reducing hardware and cabling costs.

- Key Applications: chemical storage, liquid storage, bulk solids storage (gravel, flour bins, grains, cereals), plastic pellets

Overview



The SITRANS LU02 is a dual point ultrasonic long-range level controller for liquids and solids in one or two vessels up to 60 m (200 ft). Handheld programmer shown is an accessory and must be ordered separately.

Benefits

- Dual point, long-range level monitoring
- Easy to install; easy to program using removable infrared keypad (optional)
- Compatible with all EchoMax transducers
- Backlit LCD display with reading in standard engineering units
- Automatic level-to-volume conversion for standard or custom tank shapes
- Dolphin Plus compatible
- High/low alarms

Application

SITRANS LU02 will measure liquids, solids or a combination of both in one or two vessels of different sizes, shapes and configurations up to 60 m (200 ft).

The system uses ultrasonic technology to measure level, space, distance, volume or average/differential. It features patented Sonic Intelligence echo processing software for superior reliability. Transducers can be mounted up to 365 m (1 200 ft) from the monitor.

Readings are displayed in user-selectable linear engineering units on the backlit LCD.

- Key Applications: chemical storage, liquid storage, bulk solids storage (gravel, flour bins, grains, cereals), plastic pellets, tripper car

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LU01 and LU02

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 60 m (1 ... 200 ft)
Measuring points	SITRANS LU01: Max. one point; SITRANS LU02 Max. two points
Output signal	
Ultrasonic transducer	EchoMax series, ST-H transducers
Relays	4 SPDT Form C relays, rated at 5 A at 250 V AC, resistive load
mA output	0/4 ... 20 mA, optically isolated
• Max. load	750 Ω, isolated, 30 V
• Resolution	0.1 % of range
• Outputs	SITRANS LU01: Max. one mA output SITRANS LU02: Max. two mA outputs
Accuracy	
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater
Resolution	0.1 % of measuring range or 2 mm (0.08 inch), whichever is greater
Temperature compensation	-50 ... +150 °C (-58 ... +302 °F) <ul style="list-style-type: none"> • Integral temperature sensor • External TS-3 temperature sensor (optional) • Programmable fixed temperature
Rated operating conditions	
Ambient conditions	
Ambient temperature for enclosure	-20 ... +50 °C (-4 ... +122 °F)
Design	
Weight	2.7 kg (6 lb)
Material (enclosure)	Polycarbonate
Degree of protection (wall mount)	IP65
Electrical connection	
Ultrasonic transducer cable extension	RG62-A/U coaxial cable with low capacitance
mA output signal	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm ² (22 ... 18 AWG), Belden 8 760 or equivalent is acceptable
Electrical connection and relay connection	Copper conductor according to local requirements, rated 250 V
Synchronization	5 A Up to 16 LU01/LU02 units can be synchronized together
Power supply	
AC model	100/115/200/230 V AC ± 15 %, 50/60 Hz, 31 VA
DC model	18 ... 30 V DC, 25 W
Displays and controls	
Memory	EEPROM (non-volatile), no backup battery required
Programming	Using removable programmer (ordered separately) or Dolphin Plus (option)
Certificates and approvals	
	CE, CSA _{US/C} , FM, ATEX II 3D Lloyd's register of Shipping (Categories ENV1, ENV2, ENV3 and ENV5)
Options	
External temperature sensor	TS-3
Communications	<ul style="list-style-type: none"> • Dolphin Plus: Siemens Windows-compatible interface and ComVerter link (infrared)

Selection and Ordering data

SITRANS LU01/LU02

Single or dual point ultrasonic long-range level monitoring system for liquids and solids, and ranges up to 60 m (200 ft).

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Number of measuring points

LU01 version, 1 point
LU02 version, 2 points

Input voltage

100/115/200/230 V AC, voltage selector switch
18 ... 30 V DC

Feature software

Standard

Application software

Standard

Data communications

No module (SmartLinx ready)

Enclosure

Wall mount
Wall mount, drilled, 6 x M20
Note: Cable glands are not included and should be ordered as a separate line on the order.

Approvals

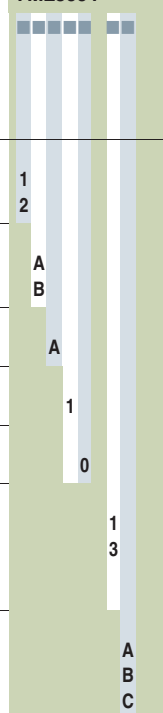
CE, CSA_{US/C}, FM¹⁾
CE
ATEX II 3D²⁾

¹⁾ Available with enclosure option 1 only

²⁾ Available with enclosure option 3 only

Article No.

➤ **7ML5004-**



Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LU01 and LU02

Selection and Ordering data

Order code

Further designs

Please add **"-Z"** to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:
Measuring-point number/identification
(max. 27 characters) specify in plain text

Y15

Operating Instructions

SITRANS LU01

English

French

German

SITRANS LU02

English

French

German

Note: The Operating Instructions should be ordered as a separate line item.
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Article No.

7ML1998-5BE02

7ML1998-5BE12

7ML1998-5BE32

7ML1998-5BD02

7ML1998-5BD12

7ML1998-5BD32

Selection and Ordering data

Article No.

Accessories

Handheld programmer

7ML1830-2AN

Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch),
one text line, suitable for enclosures

7ML1930-1AC

M20 cable gland kit (6 M20 cable glands,
6 M20 nuts, 3 stop plugs)

7ML1830-1GM

M20 cable gland kit (4 M20 cable glands,
4 M20 nuts, 4 washers)

7ML1930-1FV

TS-3 Temperature Sensor - see TS-3 on page 4/189

7ML1830-2AN

Sunshield kit, 304 stainless steel

7ML1930-1GA

Spare parts

Card, LU01 mother main, AC, comm ready

7ML1830-1KX

Card, LU02 mother main, AC, comm ready

7ML1830-1MA

Card, LU02 daughter, comm ready

7ML1830-1LP

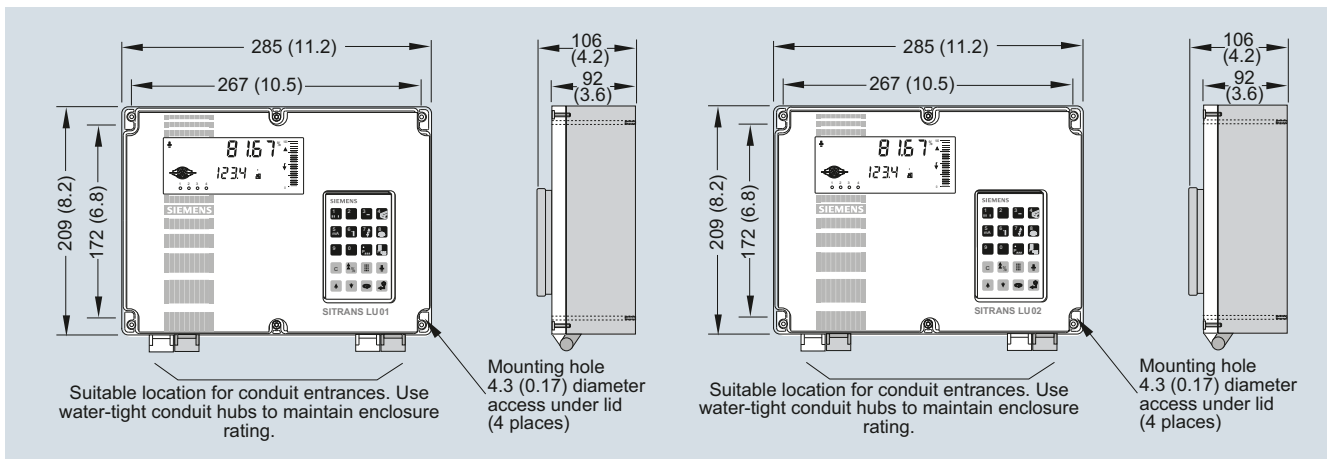
Card, LU01 daughter, comm ready

7ML1830-1LN

Card, display
See SmartLinx product page 4/360 for
more information.

7ML1830-1LQ

Dimensional drawings



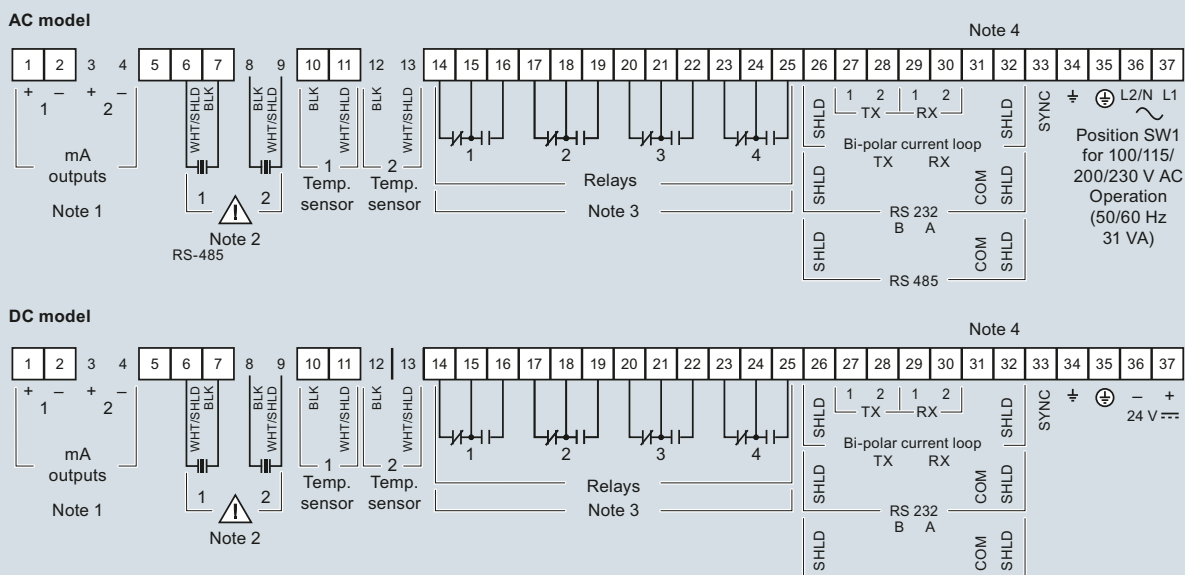
Dimensional drawings for SITRANS LU01 (left) and SITRANS LU02 (right), dimensions in mm (inch)

Level Measurement

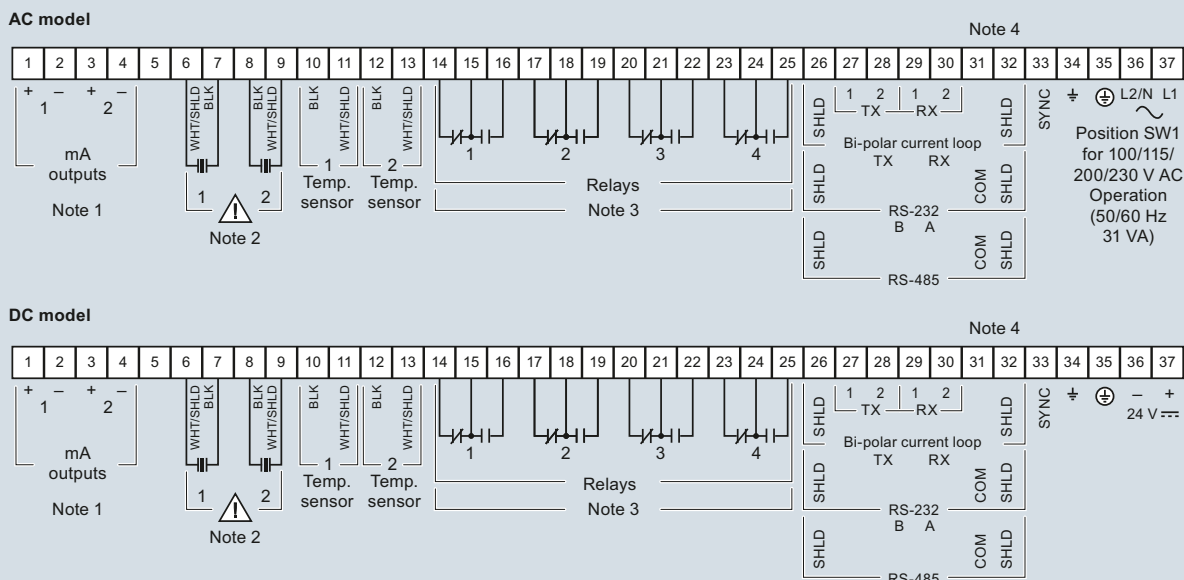
Continuous level measurement – Ultrasonic controllers

SITRANS LU01 and LU02

Schematics



SITRANS LU01 connections



SITRANS LU02 connections

4

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LU10

Overview



SITRANS LU10 is an ultrasonic long-range level monitor for liquids and solids, offering 10-point monitoring in a single unit. Handheld programmer shown is an accessory and must be ordered separately.

Benefits

- Ten point, long-range level monitoring
- Automatic level-to-volume conversion for standard or custom tank shapes
- Dolphin Plus compatible
- Backlit LCD display with reading in standard engineering units
- Easy to install, easy to program using removable infrared keypad (optional)

Application

It can be used in a wide range of applications to scan liquids, solids or a combination of both contained in vessels of differing size, shape, and configuration up to 60 m (200 ft).

SITRANS LU10 uses ultrasonic technology to measure level, space, distance, volume, or average/differential. Transducers can be mounted up to 365 m (1 200 ft) from the monitor.

The SITRANS LU10 features patented Sonic Intelligence echo processing software for superior reliability. Readings are displayed in user-selectable linear engineering units on the LCD.

- Key Applications: chemical storage, liquid storage, bulk solids storage (sugar, flour bins, grains, cereals), plastic pellets, tank farms

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LU10

Technical specifications

Mode of operation		Power supply	
Measuring principle	Ultrasonic level measurement		100/115/200/230 V AC ± 15 %, 50/60 Hz, 31 VA
Measuring range	Max. 0.3 ... 60 m (1 ... 200 ft)	Displays and controls	51 x 127 mm (2 x 5 inch) graphics LCD with backlighting
Measuring points	Max. 10	Memory	EEPROM (non-volatile), no backup battery required
Output		Programming	Using removable programmer (ordered separately) or Dolphin Plus (option)
Ultrasonic transducer	EchoMax series, ST-H transducers	Certificates and approvals	
Relays	SPDT Form C relays, rated 5 A at 250 V AC, resistive load	<ul style="list-style-type: none"> • CE, RCM, FM, CSA_{US/CA}, ATEX II 3D • Lloyd's register of Shipping (Categories ENV1, ENV2, ENV3 and ENV5) 	
mA output	SITRANS LU AO module (option): 0/4 ... 20 mA, optically isolated	Options	
<ul style="list-style-type: none"> • Max. load • Resolution 	750 Ω, isolated 0.1 % of range	Expansion card	TIB-9, increases the number of TS-3 inputs from 1 ... 10
Accuracy		<ul style="list-style-type: none"> • External temperature sensor • Communications • I/O devices 	TS-3
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater	<ul style="list-style-type: none"> • Dolphin Plus: Siemens Windows-compatible interface and ComVerter link (infrared) • Max. 3 I/O devices per SITRANS LU10 • SITRANS LU AO analog output module (max. 1) 	
Resolution	0.1 % of measuring range or 2 mm (0.08 inch), whichever is greater		
Temperature compensation	-50 ... +150 °C (-58 ... +302 °F) <ul style="list-style-type: none"> • Integral temperature sensor • External TS-3 temperature sensor (expandable to 10 inputs with optional TIB-9 card) • Programmable fixed temperature 		
Rated operating conditions			
Ambient conditions			
Ambient temperature for enclosure	-20 ... +50 °C (-4 ... +122 °F)		
Design			
Weight	2.7 kg (6 lb)		
Material (enclosure)	Polycarbonate		
Degree of protection (wall mount)	IP65/Type 4X/NEMA 4X		
Electrical connection			
Ultrasonic transducer	RG62-A/U coaxial cable with low capacitance		
Signal transmission	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm ² (22 ... 18 AWG), Belden 8760 or equivalent is acceptable		
Electrical connection and relay connection	Copper conductor according to local requirements, rated 250 V 5 A		
Synchronization	Up to 16 LU10 units can be synchronized together		

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LU10

Selection and Ordering data

SITRANS LU10

Ten point ultrasonic long-range level monitoring system for liquids and solids applications, and ranges up to 60 m (200 ft).

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Input voltage

100/115, 200/230 V AC, selectable

Feature software

Standard

Application software

Standard

Data communications

No module (SmartLinx ready)

TIB-9 temperature card

None

With TIB-9 card

Enclosure

Wall mount

Wall mount, drilled, 12 x M20 x1.5 for cable glands

Note: Cable glands are not included and should be ordered as a separate line on the order.

Approvals

CE, CSA_{US/C}, FM¹⁾

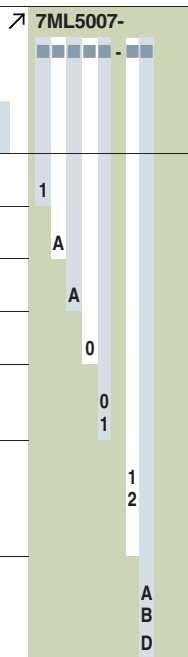
ATEX II 3D¹⁾

CE, RCM²⁾

¹⁾ Available with enclosure option 1 only

²⁾ Available with enclosure option 2 only

Article No.



Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:
Measuring-point number/identification
(max. 27 characters) specify in plain text

Order code

Y15

Operating Instructions

English

French

German

Article No.

7ML1998-5AN02

7ML1998-5AN12

7ML1998-5AN32

Accessories

Handheld programmer

Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch),
one text line, suitable for enclosures

Temperature Card TIB 9-card

M20 cable gland kit (6 M20 cable glands,
6 M20 nuts, 3 stop plugs)

M20 cable gland kit (4 M20 cable glands,
4 M20 nuts, 4 washers)

TS-3 Temperature Sensor - see TS-3 on page 4/189

Sunshield kit, 304 stainless steel

7ML1830-2AN

7ML1930-1AC

7ML1830-1CN

7ML1830-1GM

7ML1930-1FV

7ML1930-1GA

Spare parts

Card, mother main, AC, comm ready

Card, daughter, comm ready

Card, display

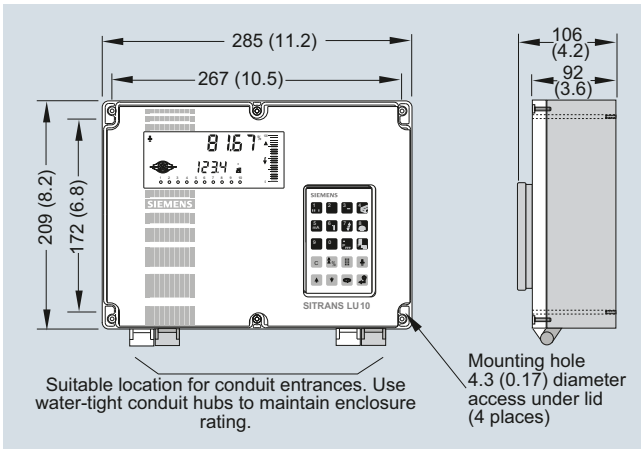
See SmartLinx product on page 4/360 for more
information.

7ML1830-1ML

7ML1830-1LY

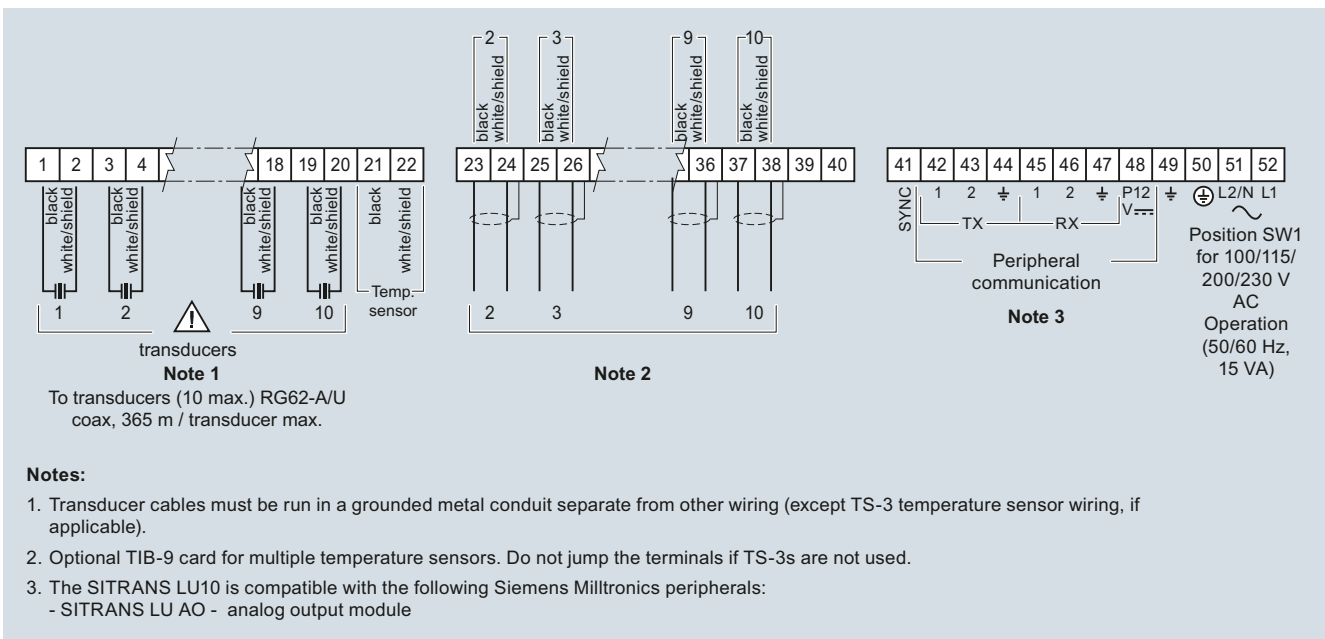
7ML1830-1LQ

Dimensional drawings



SITRANS LU10, dimensions in mm (inch)

Schematics



Notes:

1. Transducer cables must be run in a grounded metal conduit separate from other wiring (except TS-3 temperature sensor wiring, if applicable).
2. Optional TIB-9 card for multiple temperature sensors. Do not jump the terminals if TS-3s are not used.
3. The SITRANS LU10 is compatible with the following Siemens Milltronics peripherals:
 - SITRANS LU AO - analog output module

SITRANS LU10 connections

Level Measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LU AO

Overview



The SITRANS LU AO Analog Output Module provides remote analog output for the measurement points of the SITRANS LU10 level monitor.

Benefits

- Analog outputs can be up to 1 500 m (5 000 ft) from the SITRANS LU 10
- Analog outputs can be per transducer and/or average of 2 or more

Application

The operation of the SITRANS LU AO is programmed via the SITRANS LU10. The only on-board settings are for bank selection and output testing.

The SITRANS LU AO can provide up to 10 analog outputs (each sharing a common negative bus which is electrically isolated from ground).

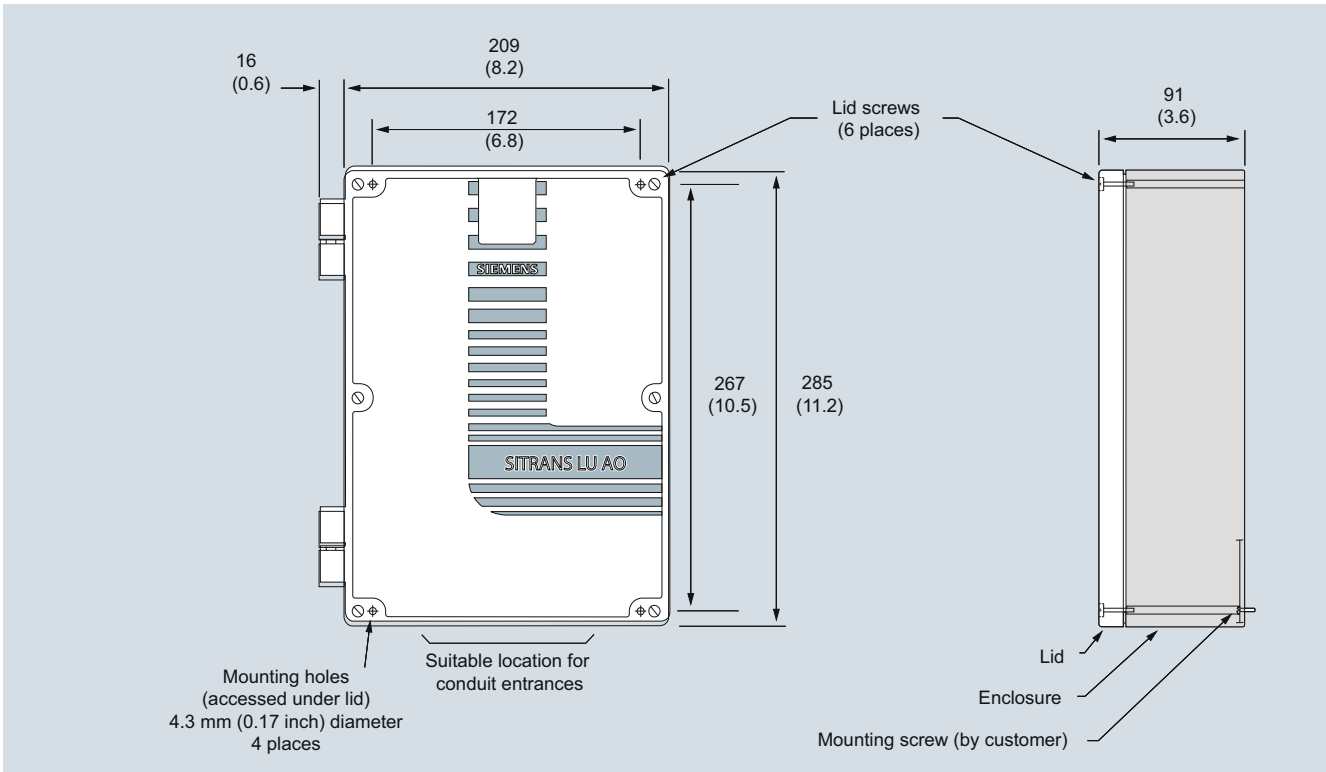
Technical specifications

Mode of operation	
Input	
Communications	Data from SITRANS LU10
Transmission rate	4 800 bits/s
Voltage	± 20 mA bipolar current loop
Polarization	Non-polarized
Max. load	1 receiving unit
Output	
Analogue outputs	10 analog outputs, programmable from SITRANS LU10
	0 or 4 ... 20 mA, isolated
± 20 mA bipolar current loop	Input and transmission
• Max. load	750 Ω
• Resolution	0.1 %
Rated operating conditions	
Ambient conditions	
Ambient temperature for enclosure	-20 ... +50 °C (-5 ... +122 °F)
Location	Indoor/outdoor
Installation category	II
Pollution degree	4
Design	
Weight	2 kg (4.4 lb)
Material (enclosure)	Polycarbonate
Degree of protection	Type 4X/NEMA 4X/IP65
Cable connection	2 copper conductors, twisted, with foil shield/drain wire, 300 V 0.5 ... 0.75 mm ² (22 ... 18 AWG)
Electrical connection and relay connection	Copper conductor according to local requirements, rated 250 V 5 A
Power supply	100/115/200/230 V AC ± 15 %, 50/60 Hz, 15 VA
Displays and controls	1 LED for display of voltage/communications state
Certificates and approvals	CE, FM, CSA _{US/C} , RCM

Selection and Ordering data

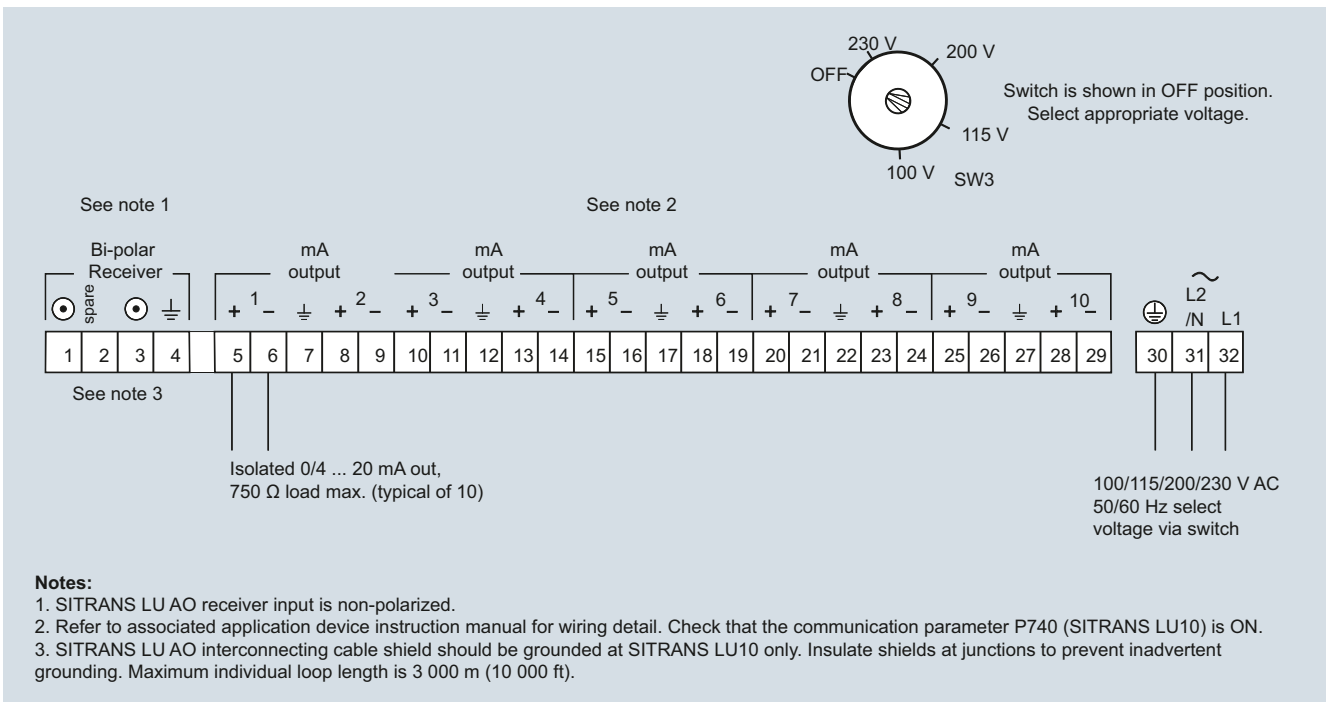
	Article No.
SITRANS LU AO Provides remote analog output for the measurement points of the SITRANS LU10 level monitor. Approvals: CSA _{US/C} , FM, CE, RCM	7ML5810-1A
Operating Instructions	
English	7ML1998-5CE01
German	7ML1998-5CE31
Note: Operating Instructions should be ordered as a separate line item on the order.	
This device is shipped with the Siemens Milltronics manual DVD containing the Quick Start and Operating Instructions library.	
Accessories	
Sun Shield, 304 stainless steel	7ML1930-1GA

Dimensional drawings



SITRANS LU AO, dimensions in mm (inch)

Schematics



SITRANS LU AO connections

Level Measurement

Continuous level measurement – Ultrasonic transducers

Ultrasonic transducers

Overview

Ultrasonic Transducers

Ultrasonic measuring systems are the cost-effective choice for monitoring and control in short- to long-range applications for liquids, slurries, and solids in a wide range of industries. Transducers are impervious to dust, moisture, corrosion, vibration, flooding, and extreme temperature. They are easy to install and virtually maintenance-free. Choose from a wide selection of models designed for short or long range applications on liquids or solids.

Technical specifications

EchoMax Transducers					
	Liquids		Liquids and Solids		
	XRS-5	ST-H	Standard XPS-10	XPS-15	XPS-30
Max. range¹⁾	8 m (26 ft)	10 m (33 ft)	10 m (33 ft)	15 m (50 ft)	30 m (100 ft)
Min. range	0.3 m (1 ft)	0.3 m (1 ft)	0.3 m (1 ft)	0.3 m (1 ft)	0.6 m (2 ft)
Max. temperature	65 °C (149 °F)	73 °C (164 °F)	95 °C (203 °F)	95 °C (203 °F)	95 °C (203 °F)
Min. temperature	-20 °C (-4 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)
Typical Applications	Wet wells and open channels	Chemical storage and liquid tanks	Dusty solids and slurries	Deep wet wells and solids	Powders, pellets and solids
Frequency	44 kHz	44 kHz	44 kHz	44 kHz	30 kHz
Beam angle (-3dB)	10°	12°	12°	6°	6°
Thread size	R 1" [(BSPT), EN 10226] 1" NPT	1" and 2" NPT R 2" [(BSPT), EN 10226], 2" [(BSPP), EN ISO 228-1]	R 1" [(BSPT), EN 10226] 1" NPT	R 1" [(BSPT), EN 10226] 1" NPT	R 1.5" [(BSPT), EN 10226] Universal thread 1.5" NPT
Enclosure	<ul style="list-style-type: none"> PVDF Copolymer CSM Option: Flange with PTFE facing 	<ul style="list-style-type: none"> ETFE Option: PVDF 	<ul style="list-style-type: none"> PVDF Option: Foam facing Flange with PTFE facing 	<ul style="list-style-type: none"> PVDF Option: Foam facing Flange with PTFE facing 	<ul style="list-style-type: none"> PVDF Option: Foam facing Flange with PTFE facing
Compatible with:					
SITRANS LUT400	•	•	•	•	•
SITRANS LU	•	•	•	•	•
HydroRanger 200	•	•	•	•	
MultiRanger 100/200	•	•	•	•	

¹⁾ Application conditions such as extreme dust or angle of repose may reduce the usable maximum range. Consult your local Siemens representative for further information.

Level Measurement

Continuous level measurement – Ultrasonic transducers

ST-H

Overview



ST-H transducers use ultrasonic technology to measure level in chemical storage and liquid tanks.

Benefits

- Can be mounted on a narrow standpipe
- Immune to corrosive and harsh environments
- Integral temperature sensor

Application

The narrow design of the ST-H allows the transducer to be mounted on a narrow standpipe. When mounted correctly, it is completely protected from the process and can even be used in harsh, corrosive environments.

During operation, the ultrasonic transducer emits acoustic pulses in a narrow beam perpendicular to the transducer face. The level transceiver measures the propagation time between pulse emission and reception of the echo to calculate the distance from the transducer to the material. Variations in sound velocity due to changes in temperature within the permissible range are automatically compensated by the integral temperature sensor.

- Key Applications: chemical storage, liquid tanks

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic transducer
Input	
Measuring range	0.3 ... 10 m (1 ... 33 ft)
Output	
Frequency	44 kHz
Beam angle	12°
Accuracy	
Temperature compensation	Compensated by integral temperature sensor
Rated operating conditions	
Pressure	Normal atmospheric pressure
Ambient conditions	
• Ambient temperature	-20 ... +60 °C (-5 ... +140 °F) (ATEX approved model) -40 ... +73 °C (-40 ... +163 °F) (CSA/FM approved model)
Design	
Weight ¹⁾	1.4 kg (3 lb)
Material (enclosure)	Base and lid made of ETFE or PVDF (epoxy fitted joint) ²⁾
Process connection	2" NPT [(Taper), ANSI/ASME B1.20.1], R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
Degree of protection	IP68
Cable connection	2-core shielded/twisted, 0.519 mm ² (20 AWG), PVC sheath
Cable (max. length)	365 m (1 200 ft) with RG 62 A/U coaxial cable
Options	
• Flange adapter	3" Universal (fits DN 65, PN 10 and 3" ASME)
Certificates and approvals	
CE, CSA Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G T3 (ETFE only), FM Class I, II, Div. 1, Groups C, D, E, F, G T4A, ATEX II 2G / INMETRO Ex mb IIC T5 Gb, RCM, KCC	

¹⁾ Approximate shipping weight of transducer with standard cable length

²⁾ When measuring chemicals, check compatibility of ETFE or PVDF and epoxy, or mount joint external to process.

Level Measurement

Continuous level measurement – Ultrasonic transducers

ST-H

Selection and Ordering data

EchoMax ST-H ultrasonic transducer

Level measurement in chemical storage and liquid tanks. The narrow design of the ST-H allows the transducer to be mounted on a 2 inch standpipe. Measuring range: min. 0.3 m (1 ft), max. 10 m (33 ft).

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Process connection

ETFE, 2" NPT [(Taper), ANSI/ASME B1.20.1]

ETFE, R 2" [(BSPT), EN 10226]

ETFE, G 2" [(BSPP), EN ISO 228-1]

PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1]

PVDF copolymer, R 2" [(BSPT), EN 10226]

PVDF copolymer, G 2" [(BSPP), EN ISO 228-1]

Cable length

5 m (16.40 ft)

10 m (32.81 ft)

30 m (98.43 ft)

50 m (164.04 ft)

100 m (328.08 ft)

Approvals

CE, FM Class I, II, Div. 1, Groups C,D,E,F,G T4A

ATEX 2G / INMETRO Ex mb IIC T5 Gb, RCM, KCC

CSA Class I, II, III, Div. 1, Groups A,B,C,D,E,F,G T3

CE, ATEX 2G / INMETRO Ex mb IIC T5 Gb, RCM, KCC

Operating Instructions

Quick Start Manual, multi-language

Applications Guidelines, multi-language

Note: The Applications Guidelines should be ordered as a separate line item on the order.

This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

¹⁾ Available with Process connection options 0 ... 2 only

²⁾ Available with Process connection options 3 ... 5 only

³⁾ Not suitable for Ketone, Hexane, Ester or Ethyl Acetate atmospheres

Article No.

➤ **7ML1100-**

A 0

0

1

2

3

4

5

A

B

C

D

E

2

3

4

Article No.

A5E32105880

7ML1998-5HV61

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters) specify in plain text

Accessories

Universal box bracket, mounting kit

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" NPT

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" BSPT

Easy Aimer 2, NPT with 3/4" x 1" PVC coupling

Easy Aimer 2, aluminum with M20 adapter and 1" and 1 1/2" BSPT aluminum couplings

Easy Aimer 304, with stainless steel coupling

Easy Aimer 304, with M20 adapter and 1" and 1 1/2" BSPT 304 stainless steel couplings

Order code

Y17

Article No.

7ML1830-1BK

7ML1830-1BT

7ML1830-1BU

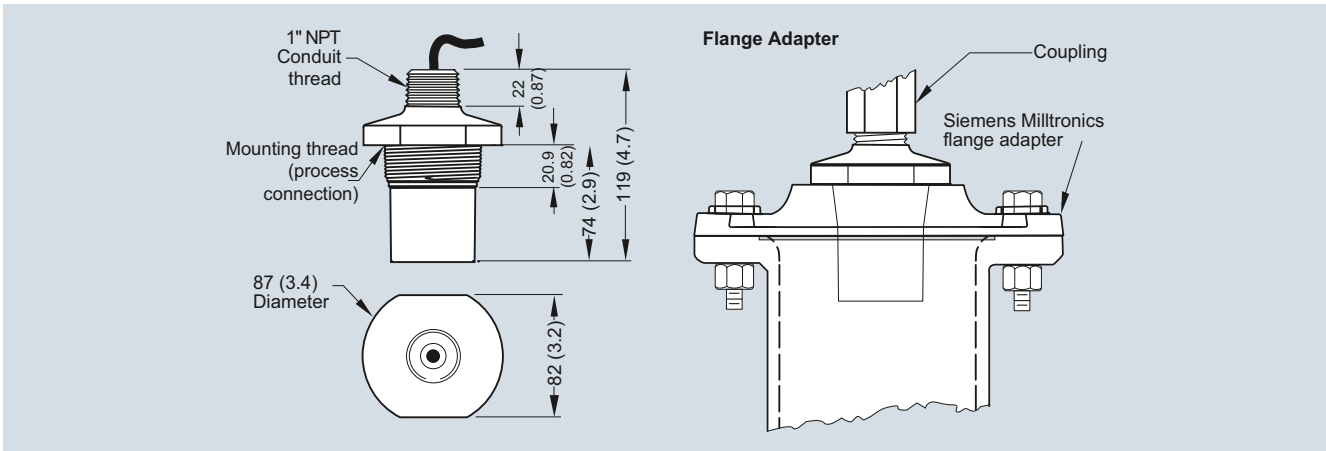
7ML1830-1AQ

7ML1830-1AX

7ML1830-1AU

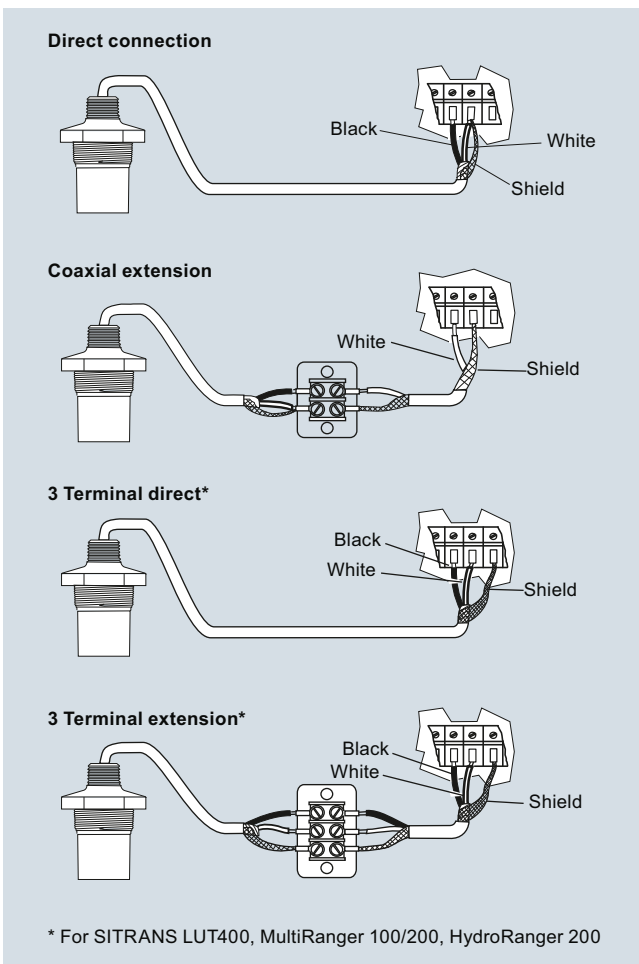
7ML1830-1GN

Dimensional drawings



ST-H ultrasonic transducer, dimensions in mm (inch)

Schematics



ST-H ultrasonic transducer connections

Level Measurement

Continuous level measurement – Ultrasonic transducers

EchoMax XRS-5

Overview



EchoMax XRS-5 ultrasonic transducer provides reliable, continuous level monitoring of liquids and slurries in narrow lift stations/wet wells, flumes, weirs and filter beds using a beam angle of just 10° and a CSM rubber face.

Benefits

- Narrow beam angle of only 10°
- Chemically resistant PVDF copolymer enclosure and CSM rubber face
- Measuring range: 8 m (26 ft) for measurement of liquids and slurries
- Fully submersible: IP68 degree of protection
- Easy installation with 1" NPT or R 1" BSPT connection

Application

The XRS-5 is non-contacting with a measuring range from 0.3 ... 8 m (1 ... 26 ft). Advanced echo processing ensures reliable data even in conditions with obstructions, turbulence and foam.

The hermetically sealed CSM rubber face and the PVDF copolymer enclosure are designed for maximum resistance to methane, salt water, caustics and harsh chemicals common to wastewater installations. With an IP68 degree of protection, this rugged sensor is fully submersible in the event of flood conditions. Use a submergence shield if full submergence is possible in the application. A submergence shield will maintain a high level reading output during submerged conditions.

The low-cost XRS-5 transducer is compatible with a full range of Siemens controllers, from a basic system for high/low alarm or simple pump control, up to advanced control systems with communications, telemetry and SCADA integration capabilities.

- Key Applications: wet wells, flumes, weirs, filter beds

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic transducer
Input	
Measuring range	0.3 ... 8 m (1 ... 26 ft), dependent on application
Output	
Frequency	44 kHz
Beam angle	10°
Accuracy	
Temperature error	Compensated by integral temperature sensor
Rated operating conditions	
Vessel pressure	Normal atmospheric pressure
Ambient conditions	
• Ambient temperature	-20 ... +65 °C (-4 ... +149 ° F)
Design	
Weight (approximate shipping weight of sensor with standard cable length)	1.2 kg (2.6 lb)
Material (enclosure)	PVDF copolymer enclosure and CSM face
Process connection	1" NPT [(Taper), ANSI/ASME B1.20.1] or R 1" [(BSPT), EN 10226]
Degree of protection	IP65/IP68
Cable connection	2-core shielded/twisted, 0.5 mm ² (20 AWG), PVC sheath
Cable (max. length)	<ul style="list-style-type: none"> • 365 m (1 200 ft) with RG 62 A/U coaxial cable • 365 m (1 200 ft) with 2-core twisted pair, foil shield, 0.5 mm² (20 AWG), PVC sheath, only for MultiRanger 100/200
Options	
Flange version	Factory flange with PTFE face for ASME, EN or JIS configuration
Submergence shield	For applications with flooding possible
Certificates and approvals	
CE, RCM, KCC CSA Class I, Div. 2, Groups A,B,C,D, Class II, Div. 1 Groups E,F,G FM Class I, Zone 1, AEx m IIC, T6 Class II, III, Div. 1, Groups E,F,G T6 ATEX II 2GD / IECEx / INMETRO Ex mb IIC T6 Gb, Ex tb IIIC T85 °C Db	

Selection and Ordering data	Article No.
<p>EchoMax XRS-5 transducer</p> <p>With a beam angle of 10°, the XRS-5 provides reliable, continuous level monitoring of liquids and slurries in narrow lift stations/wet wells, flumes, weirs and filter beds. Measuring range: min. 0.3 m (1 ft), max. 8 m (26 ft)</p> <p>➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>	<p>➤ 7ML1106-0-0</p>
<p>Process connection</p> <p>1" NPT [(Taper), ANSI/ASME B1.20.1] ➤ 1 R 1" [(BSPT), EN 10226] ➤ 2</p>	
<p>Cable length</p> <p>5 m (16.40 ft) ➤ A 10 m (32.81 ft) ➤ B 30 m (98.43 ft) ➤ C</p>	
<p>Facing</p> <p>Standard (CSM rubber) ➤ A PTFE (flange versions) ➤ B</p>	
<p>Approvals</p> <p>CE, RCM, KCC, CSA Class I, Div. 2, Groups A,B,C,D, Class II, Div. 1 Groups E,F,G FM Class I, Zone 1, AEx m IIC, T6 Class II, III, Div. 1, Groups E,F,G T6 ATEX II 2GD / IECEx / INMETRO Ex mb IIC T6 Gb, Ex tb IIIC T85 °C Db</p>	➤ 2
<p>Mounting flange (flush mount)</p> <p>None ➤ A 3" ASME, 150 lb, flat faced ➤ B 4" ASME, 150 lb, flat faced ➤ C 6" ASME, 150 lb, flat faced ➤ D DN 80, PN 10/16, Type A, flat faced ➤ J DN 100, PN 10/16, Type A, flat faced ➤ K DN 150, PN 10/16, Type A, flat faced ➤ L JIS10K 3B style ➤ Q JIS10K 4B style ➤ R JIS10K 6B style ➤ S</p> <p>Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.</p>	
<p>Operating Instructions</p> <p>Quick Start Manual, multi-language ➤ A5E32299685 Applications Guidelines, multi-language ➤ 7ML1998-5HV61</p> <p>Note: The Applications Guidelines should be ordered as a separate line item on the order.</p> <p>This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.</p>	

➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ➤. For details see page 9/5 in the appendix.

Selection and Ordering data	Order code
<p>Further designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p> <p>Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters) specify in plain text ➤ Y17</p>	
<p>Accessories</p> <p>Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors ➤ 7ML1930-1BJ</p> <p>Submergence shield kit ➤ 7ML1830-1BH</p> <p>Easy Aimer 2, NPT with 3/4" x 1" PVC coupling ➤ 7ML1830-1AQ</p> <p>Easy Aimer 2, aluminum with M20 adapter and 1" and 1 1/2" BSPT aluminum couplings ➤ 7ML1830-1AX</p> <p>Easy Aimer 304, with stainless steel coupling ➤ 7ML1830-1AU</p> <p>Easy Aimer 304, with M20 adapter and 1" and 1 1/2" BSPT 304 stainless steel couplings ➤ 7ML1830-1GN</p> <p>FMS-200 universal box bracket, mounting kit ➤ 7ML1830-1BK</p> <p>FMS-210 channel bracket, wall mount ➤ 7ML1830-1BL</p> <p>FMS-220 extended channel bracket, wall mount ➤ 7ML1830-1BM</p> <p>FMS-310 channel bracket, floor mount ➤ 7ML1830-1BN</p> <p>FMS-320 extended channel bracket, floor mount ➤ 7ML1830-1BP</p> <p>FMS-350 bridge channel bracket, floor mount (see Mounting Brackets on page 4/187 for more information) ➤ 7ML1830-1BQ</p> <p>1" NPT locknut, plastic ➤ 7ML1830-1DS</p> <p>1" BSPT locknut, plastic ➤ 7ML1830-1DR</p>	

➤ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ➤. For details see page 9/5 in the appendix.

Level Measurement

Continuous level measurement – Ultrasonic transducers

EchoMax XRS-5

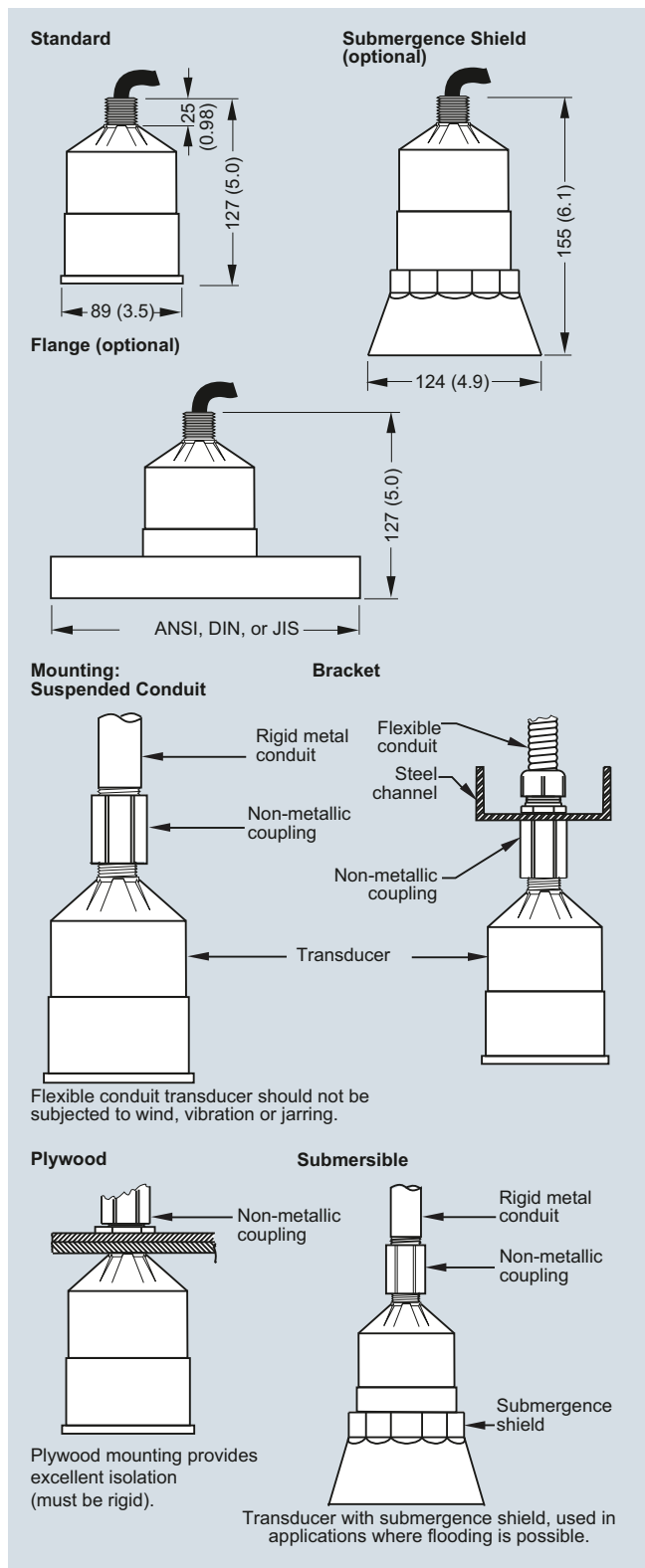
Selection and Ordering data	Article No.
EchoMax XRS-5C transducer With a beam angle of 10°, the XRS-5 provides reliable, continuous level monitoring of liquids and slurries in narrow lift stations/wet wells, flumes, weirs and filter beds. Measuring range: min. 0.3 m (1 ft), max. 8 m (26 ft) ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML1105-
Process connection 1" NPT [(Taper), ANSI/ASME B1.20.1]	1
Cable length 5 m (16.40 ft) 10 m (32.81 ft) 30 m (98.43 ft)	A B C
Facing Standard (CSM rubber) PTFE (flange versions)	A B
Approvals CSA Class I Div. 1, Group A,B,C,D; Class II Div. 1, Group E,F,G; Class III	1
Mounting flange (flush mount) None 3" ASME, 150 lb, flat faced 4" ASME, 150 lb, flat faced 6" ASME, 150 lb, flat faced Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.	A B C D
Operating Instructions Quick Start Manual, multi-language Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. A5E32299685 7ML1998-5HV61

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s). Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/identification (max. 16 characters) specify in plain text	Y17
Accessories Submergence shield kit Easy Aimer 2, NPT with 3/4" x 1" PVC coupling Easy Aimer 304, with stainless steel coupling FMS-200 universal box bracket, mounting kit FMS-210 channel bracket, wall mount FMS-220 extended channel bracket, wall mount FMS-310 channel bracket, floor mount FMS-320 extended channel bracket, floor mount FMS-350 bridge channel bracket, floor mount (see Mounting Brackets on page 4/187 for more information)	Article No. 7ML1830-1BH 7ML1830-1AQ 7ML1830-1AU 7ML1830-1BK 7ML1830-1BL 7ML1830-1BM 7ML1830-1BN 7ML1830-1BP 7ML1830-1BQ

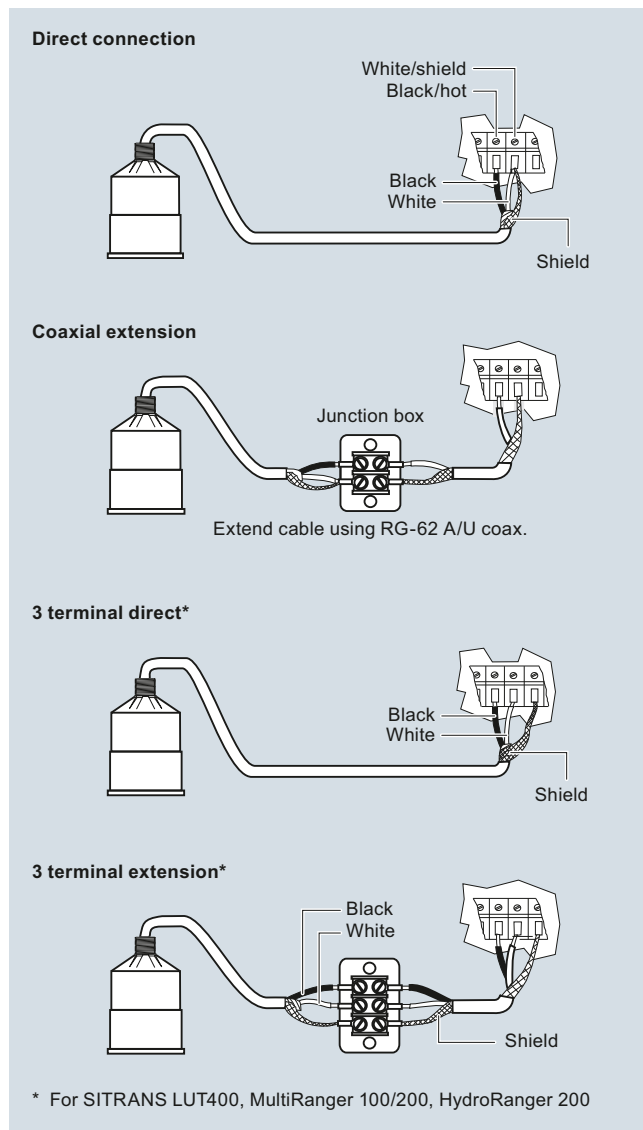
We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

Dimensional drawings



XRS-5 ultrasonic transducer, dimensions in mm (inch)

Schematics



XRS-5 ultrasonic transducer connections

Level Measurement

Continuous level measurement – Ultrasonic transducers

EchoMax XPS

Overview



EchoMax XPS transducers use ultrasonic technology to measure level in a wide range of liquids and solids.

Benefits

- Integral temperature compensation
- Low ringing effect reduces blanking distance
- Optional foam facing for dusty applications
- Self-cleaning and low-maintenance
- Chemically resistant
- Hermetically sealed

Application

XPS transducers can be fully immersed, are resistant to steam and corrosive chemicals, and can be installed without flanges.

The XPS series offers versions for various measuring ranges up to 30 m (100 ft) and up to a max. temperature of 95 °C (203 °F).

During operation, the EchoMax transducers emit acoustic pulses in a narrow beam. The level monitor measures the propagation time between pulse emission and its reflection (echo) to calculate the distance.

Level Measurement

Continuous level measurement – Ultrasonic transducers

EchoMax XPS

Technical specifications


























Input	XPS-10	XPS-15 (standard and F models)	XPS-30
Measuring range	0.3 ... 10 m (1 ... 33 ft)	<u>Standard:</u> 0.3 ... 15 m (1 ... 50 ft) <u>XPS-15F:</u> 0.45 ... 15 m (1.5 ... 50 ft)	0.6 ... 30 m (2 ... 100 ft)
Output			
Frequency	44 kHz	44 kHz	30 kHz
Beam angle	12°	6°	6°
Environmental			
Location	Indoors/outdoors		
Ambient temperature	-40 ... +95 °C (-40 ... +203 °F)	<u>XPS-15F:</u> -20 ... +95 °C (-4 ... +203 °F)	-40 ... +95 °C (-40 ... +203 °F)
Pollution degree	4		
Pressure	8 bar g (120 psi g) <u>Flanged:</u> 0.5 bar g (7.25 psi g)	8 bar g (120 psi g) <u>Flanged:</u> 0.5 bar g (7.25 psi g)	0.5 bar g (7.25 psi g) <u>Flanged:</u> 0.5 bar g (7.25 psi g)
Design			
Weight	0.8 kg (1.8 lb)	1.3 kg (2.8 lb) <u>Flanged:</u> 2 kg (4.4 lb)	4.3 kg (9.5 lb)
Power supply	Operation of transducer only with approved Siemens Milltronics controllers		
Material	<u>Standard:</u> PVDF <u>Flanged:</u> PVDF with CPVC flange <u>Option:</u> PTFE face with CPVC flange	<u>Standard:</u> PVDF <u>Flanged:</u> PVDF with CPVC flange <u>Option:</u> PTFE face with CPVC flange	<u>Standard:</u> PVDF <u>Flanged:</u> PVDF with CPVC flange <u>Option:</u> PTFE face with CPVC flange
Color	Blue	<u>Standard:</u> Blue <u>XPS-15F:</u> Gray	Blue
Process connection	1" NPT or 1" BSPT	<u>Standard:</u> 1" NPT or 1" BSPT <u>XPS-15F:</u> 1" NPT	1.5" universal thread (NPT or BSPT)
Degree of protection	IP66/68	IP66/68	IP66/68
Cable	2 wire twisted pair/braided and foil shielded 0.5 mm ² (20 AWG) PVC jacket		
Separation	Max. 365 m (1 200 ft)		
Certificates and approvals	<u>Standard:</u> CE, CSA, FM, ATEX, IECEx	<u>Standard:</u> CE, CSA, FM, ATEX, IECEx <u>XPS-15F:</u> FM Class I, Div. 1, Groups A, B, C and D, Class II Div. 1, Groups E, F and G, Class III	CE, CSA, FM, ATEX, IECEx

¹⁾ EMC certificate available on request.

Level Measurement

Continuous level measurement – Ultrasonic transducers



EchoMax XPS

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
EchoMax XPS-10 ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. Measuring range: min. 0.3 m, max. 10 m ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML1115- 	Further designs Please add "-Z" to Article No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring point number/ identification (max. 27 characters) specify in plain text	
Mounting thread and facing 1" NPT [(Taper), ANSI/ASME B1.20.1]  0 1" NPT [(Taper), ANSI/ASME B1.20.1] with foam facing ¹⁾  1 1" NPT [(Taper), ANSI/ASME B1.20.1] with PTFE facing ²⁾  2 R 1" [(BSPT), EN 10226]  3 R 1" [(BSPT), EN 10226] with foam facing ¹⁾  4 R 1" [(BSPT), EN 10226] with PTFE facing ²⁾  5		Operating Instructions Quick Start guide, multi-language Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. A5E32282889 7ML1998-5HV61
Cable length 5 m (16.40 ft)  B 10 m (32.81 ft)  C 30 m (98.43 ft)  E 50 m (164.04 ft)  F 100 m (328.08 ft)  K		Accessories Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors Submergence shield kit Easy Aimer 2, with 3/4" x 1" NPT PVC coupling Easy Aimer 2, aluminum with M20 adapter and 1" and 1 1/2" BSPT aluminum couplings Easy Aimer 304, with stainless steel coupling Easy Aimer 304, with M20 adapter and 1" and 1 1/2" BSPT 304 stainless steel couplings Universal box bracket, mounting kit Channel bracket, wall mount Extended channel bracket, wall mount Channel bracket, floor mount Extended channel bracket, floor mount Bridge channel bracket, floor mount (see Mounting Brackets on page 4/187 for more information) 1" NPT locknut, plastic 1" BSPT locknut, plastic	7ML1930-1BJ 7ML1830-1BH 7ML1830-1AQ 7ML1830-1AX 7ML1830-1AU 7ML1830-1GN 7ML1830-1BK 7ML1830-1BL 7ML1830-1BM 7ML1830-1BN 7ML1830-1BP 7ML1830-1BQ 7ML1830-1DS 7ML1830-1DR
Mounting flange None  A 3" ASME, 150 lb, flat faced  C 4" ASME, 150 lb, flat faced  D 6" ASME, 150 lb, flat faced  E 8" ASME, 150 lb, flat faced  F DN 80, PN 10/16, Type A, flat faced  G DN 100, PN 10/16, Type A, flat faced  J DN 150, PN 10/16, Type A, flat faced  L JIS10K3B Style  M JIS10K4B Style  P JIS10K6B Style  R (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)			
Approvals ATEX 2GD Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db;  3 IECEx SIR 13.0009X Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; FM Class I, Div. 2, Groups A,B,C,D; Class II, Div. 1, Groups E,F,G; Class III CSA Class I, Div. 1, Groups A,B,C,D, Class II, Div. 1, Groups E,F,G, Class III ³⁾  4			

¹⁾ Not available with flanged versions

²⁾ Available with flanged versions only

³⁾ Valid with mounting thread and facing options 0 ... 2 only

 We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

Level Measurement

Continuous level measurement – Ultrasonic transducers

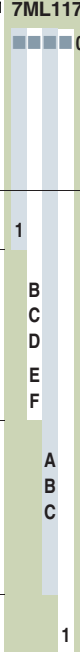
EchoMax XPS

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
EchoMax XPS-15 ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. Measuring range: min. 0.3 m, max. 15 m ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML118- ■■■■ 0	Further designs Please add "-Z" to Article No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: ● Y15 Measuring point number/ identification (max. 27 characters) specify in plain text	
Mounting thread and facing 1" NPT [(Taper), ANSI/ASME B1.20.1] ● 0 1" NPT [(Taper), ANSI/ASME B1.20.1] with foam facing ¹⁾ 1 1" NPT [(Taper), ANSI/ASME B1.20.1] with PTFE facing ²⁾ 2 R 1" [(BSPT), EN 10226] ● 3 R 1" [(BSPT), EN 10226] with foam facing ¹⁾ 4 R 1" [(BSPT), EN 10226] with PTFE facing ²⁾ 5	■■■■ B ■■■■ C ■■■■ E ■■■■ F ■■■■ K	Operating Instructions Quick Start guide, multi-language A5E32282889 Applications Guidelines, multi-language 7ML1998-5HV61 Note: The Applications Guidelines should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. A5E32282889 7ML1998-5HV61
Cable length 5 m (16.40 ft) ● B 10 m (32.81 ft) ● C 30 m (98.43 ft) ● E 50 m (164.04 ft) F 100 m (328.08 ft) K	■■■■ A ■■■■ D ■■■■ E ■■■■ J ■■■■ K ■■■■ N ■■■■ P	Accessories Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors 7ML1930-1BJ Submergence shield kit 7ML1830-1BJ Universal box bracket, mounting kit 7ML1830-1BK Channel bracket, wall mount 7ML1830-1BL Extended channel bracket, wall mount 7ML1830-1BM Channel bracket, floor mount 7ML1830-1BN Extended channel bracket, floor mount 7ML1830-1BP Bridge channel bracket, floor mount (see Mounting Brackets on page 4/187 for more information) 7ML1830-1BQ 1" NPT locknut, plastic 7ML1830-1DS 1" BSPT locknut, plastic 7ML1830-1DR Easy Aimer 2, with ¾" x 1" NPT PVC coupling 7ML1830-1AQ Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings 7ML1830-1AX Easy Aimer 304 with stainless steel coupling 7ML1830-1AU Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings 7ML1830-1GN	
Mounting flange None ● A 6" ASME, 150 lb, flat faced D 8" ASME, 150 lb, flat faced E DN 150, PN 10/16, Type A, flat faced J DN 200, PN 10, Type A, flat faced K JIS10K 6B N JIS10K 8B P (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)		1" NPT locknut, plastic 7ML1830-1DS 1" BSPT locknut, plastic 7ML1830-1DR Easy Aimer 2, with ¾" x 1" NPT PVC coupling 7ML1830-1AQ Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings 7ML1830-1AX Easy Aimer 304 with stainless steel coupling 7ML1830-1AU Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings 7ML1830-1GN	
Approvals ATEX 2GD Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; ● 3 IECEx SIR 13.0009X Ex mb IIC T4 Gb, Ex tb IIIC T135 °C Db; FM Class I, Div. 2, Groups A,B,C,D; Class II, Div. 1, Groups E,F,G; Class III CSA Class I, Div. 1 Groups A,B,C,D, Class II, Div. 1, Groups E,F,G, Class III ³⁾ ● 4		Easy Aimer 2, with ¾" x 1" NPT PVC coupling 7ML1830-1AQ Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings 7ML1830-1AX Easy Aimer 304 with stainless steel coupling 7ML1830-1AU Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings 7ML1830-1GN	
¹⁾ Not available with flanged versions ²⁾ Available with flanged versions only ³⁾ Available with mounting options 0 ... 2 only ● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.		● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	


Level Measurement

Continuous level measurement – Ultrasonic transducers

EchoMax XPS

Selection and Ordering data	Article No.
EchoMax XPS-15F ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. Measuring range: min. 0.3 m, max. 15 m ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML1171- 
Mounting thread and facing 1" NPT [(Taper), ANSI/ASME B1.20.1]	1
Cable length 5 m (16.40 ft) 10 m (32.81 ft) 30 m (98.43 ft) 50 m (164.04 ft) 100 m (328.08 ft)	B C D E F
Mounting flange, flush mount None 6" ASME, 150 lb, flat faced 8" ASME, 150 lb, flat faced (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.)	A B C
Approvals FM Class I, Div. 1, Groups A, B, C, and D, Class II Div. 1, Groups E, F, and G, Class III	1

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring point number/ identification (max. 27 characters) specify in plain text	Y15
Operating Instructions English Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. A5E32725813 7ML1998-5HV61
Accessories Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors Submergence shield kit Universal box bracket, mounting kit Channel bracket, wall mount Extended channel bracket, wall mount Channel bracket, floor mount Extended channel bracket, floor mount Bridge channel bracket, floor mount (see Mounting Brackets on page 4/187 for more information) 1" NPT locknut, plastic Easy Aimer 2, with ¾" x 1" NPT PVC coupling Easy Aimer 304 with stainless steel coupling	7ML1930-1BJ 7ML1830-1BJ 7ML1830-1BK 7ML1830-1BL 7ML1830-1BM 7ML1830-1BN 7ML1830-1BP 7ML1830-1BQ 7ML1830-1DS 7ML1830-1AQ 7ML1830-1AU

Selection and Ordering data	Article No.
EchoMax XPS-30 ultrasonic transducer High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. 1½" universal thread compatible with 1½" NPT and R 1½" [(BSPT), EN 10226] Measuring range: min. 0.6 m (1.97 ft), max. 30 m (98.43 ft) ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML1123- 
Mounting thread and facing 1½" universal thread 1½" universal thread, foam facing ¹⁾ 1½" universal thread, PTFE facing ²⁾	0 1 2
Cable length 5 m (16.40 ft) 10 m (32.81 ft) 30 m (98.43 ft) 50 m (164.04 ft) 100 m (328.08 ft)	B C E F K
Mounting flange None 6" ASME, 150 lb, flat faced 8" ASME, 150 lb, flat faced DN 150, PN 10/16, Type A, flat faced DN 200, PN 10, Type A, flat faced JIS10K 6B JIS10K 8B (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)	A D E J K N P
Approvals ATEX 2G 1D Ex mb IIC T4 Gb, Ex ta IIIC T135 °C Da; IECEx SIR 13.0009X Ex mb IIC T4 Gb, Ex ta IIIC T135 °C Da 1) Not available with flanged versions 2) Available with flanged versions only	5

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Operating Instructions Quick Start guide, multi-language Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. A5E32282889 7ML1998-5HV61
Accessories Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch), one text line for fastening on sensors 1½" BSPT locknut, plastic Easy Aimer 2, 1½" NPT galvanized coupling Easy Aimer 304, NPT with 1½" coupling Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	7ML1930-1BJ 7ML1830-1DP 7ML1830-1AN 7ML1830-1AT 7ML1830-1AX 7ML1830-1GN

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
<p>EchoMax XPS-30C ultrasonic transducer ↗ 7ML1155-</p> <p>High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. 1½" universal thread compatible with 1½" NPT and R 1½" [(BSPT), EN 10226] Measuring range: min. 0.6 m (1.97 ft), max. 30 m (98.43 ft)</p> <p>↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>	<p>1</p>	<p>Further designs</p> <p>Please add "-Z" to Article No. and specify Order code(s).</p> <p>Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]: Measuring-point number / identification (max. 27 characters) specify in plain text</p>	<p>Y15</p>
<p>Mounting thread and facing</p> <p>1½" universal thread 1½" universal thread, foam facing¹⁾ 1½" universal thread, PTFE facing²⁾</p>	<p>0 1 2</p>	<p>Operating Instructions</p> <p>Quick Start guide, multi-language</p> <p>Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.</p> <p>This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.</p>	<p>Article No. A5E32282889 7ML1998-5HV61</p>
<p>Cable length</p> <p>5 m (16.40 ft) 10 m (32.81 ft) 30 m (98.43 ft) 50 m (164.04 ft) 100 m (328.08 ft)</p>	<p>B C E F K</p>	<p>Accessories</p> <p>Easy Aimer II NPT 1.5" Galvanized Easy Aimer 304, NPT with 1.5" coupling 1½" BSPT locknut, plastic</p>	<p>7ML1830-1AN 7ML1830-1AT 7ML1830-1DP</p>
<p>Mounting flange</p> <p>None 6" ASME, 150 lb, flat faced 8" ASME, 150 lb, flat faced DN 150, PN 10/16, Type A, flat faced DN 200, PN 10, Type A, flat faced JIS10K 6B JIS10K 8B (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)</p>	<p>A D E J K N P</p>	<p>¹⁾ Not available with flanged version ²⁾ Available for flanged versions only</p>	
<p>Approvals</p> <p>CSA, Class I, Div. 2, Groups A,B,C,D; Class II, Div. 1, Groups E,F, G; Class III</p>	<p>4</p>		

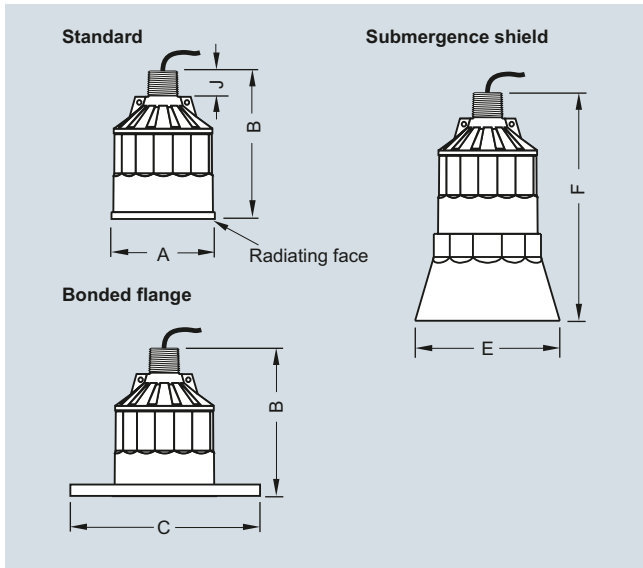


Level Measurement

Continuous level measurement – Ultrasonic transducers

EchoMax XPS

Dimensional drawings

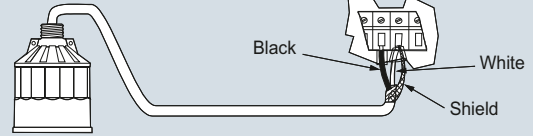


XPS ultrasonic transducer, dimensions in mm (inch)

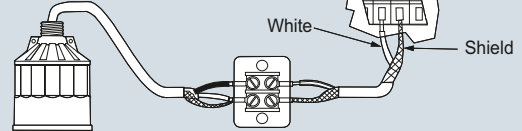
Version	XPS-10	XPS-15	XPS-30
Dimension			
A	88 mm (3.464 inch)	121 mm (4.764 inch)	175 mm (6.890 inch)
B	122 mm (4.803 inch)	132 mm (5.197 inch)	198 mm (7.795 inch)
C	According to ASME, DIN and JIS		
E	124 mm (4.882 inch)	158 mm (6.220 inch)	n/a
F	152 mm (5.984 inch)	198 mm (7.795 inch)	n/a
J	28 mm (1.1 inch)	28 mm (1.1 inch)	28 mm (1.1 inch)

Schematics

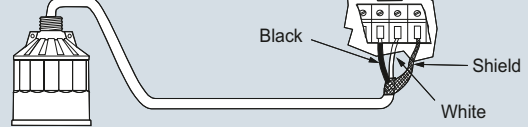
Direct connection



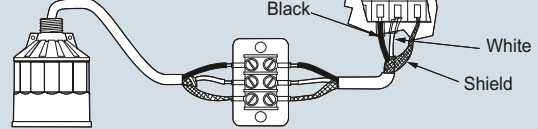
Coaxial connection



3 terminal direct*



3 terminal extension*



* For SITRANS LUT400, MultiRanger 100/200, HydroRanger 200

Mounting

Make particularly sure that the radiating face of the transducer is protected from damage. Mount the transducer so that it is above the maximum material level by at least the blanking value. On liquid applications, the transducer must be mounted so that the axis of transmission is perpendicular to the liquid surface. On solids applications, a Milltronics Easy Aimer should be used to facilitate aiming the transducer. Consider the optional temperature sensor when mounting the transducer.

Interconnection

Do not route cable openly or near high voltage or current runs, contactors and SCR control drives. For optimum isolation against electrical noise, run cable separately in a grounded metal conduit. Seal all thread connections to prevent ingress of moisture.

XPS ultrasonic transducer connections

Application

EA 304 aiming device

The Easy Aimer 304 flange is a stainless steel aiming device for alignment of Siemens ultrasonic transducers used for level measurement of bulk solids.

The sensor must be mounted aimed towards the low level draw point in the silo. The sensor can be rotated through 360° and angled at 0 to 27° off vertical. It must be mounted using an access plate with welded studs or a flange in order to isolate the mounting holes from the pressurized environment. When installed properly, the EA 304 aiming device is capable of withstanding pressures up to 0.5 bar (Europe) or 15 psi (North America). It can even be used in corrosive and aggressive environments.

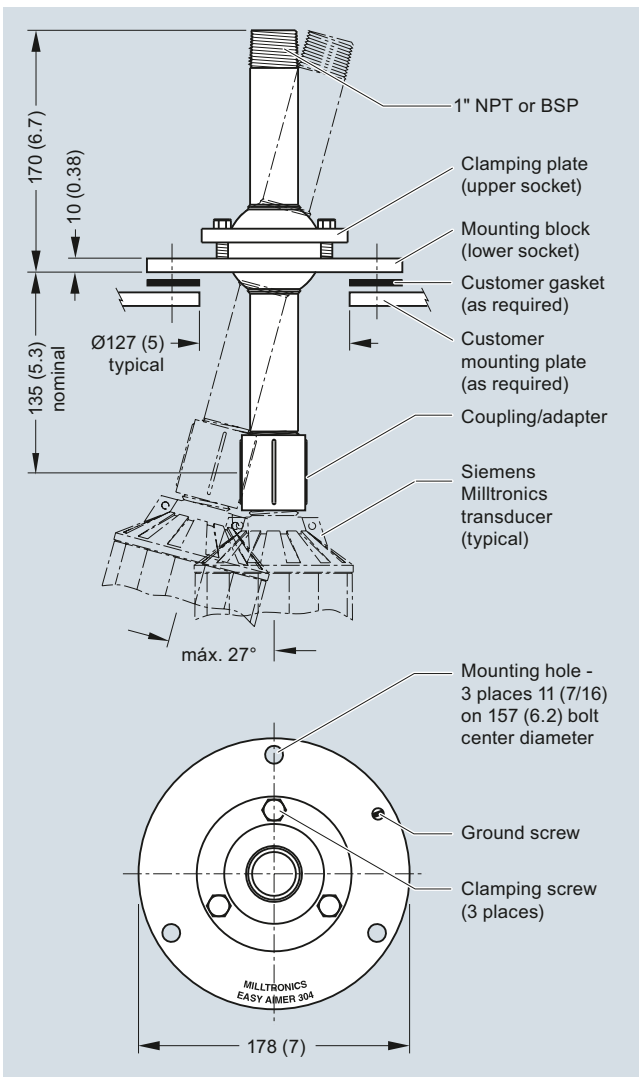
Application

EA 2 aiming device

The Easy Aimer 2 flange is a cast aluminum aiming device for alignment of Siemens ultrasonic transducers.

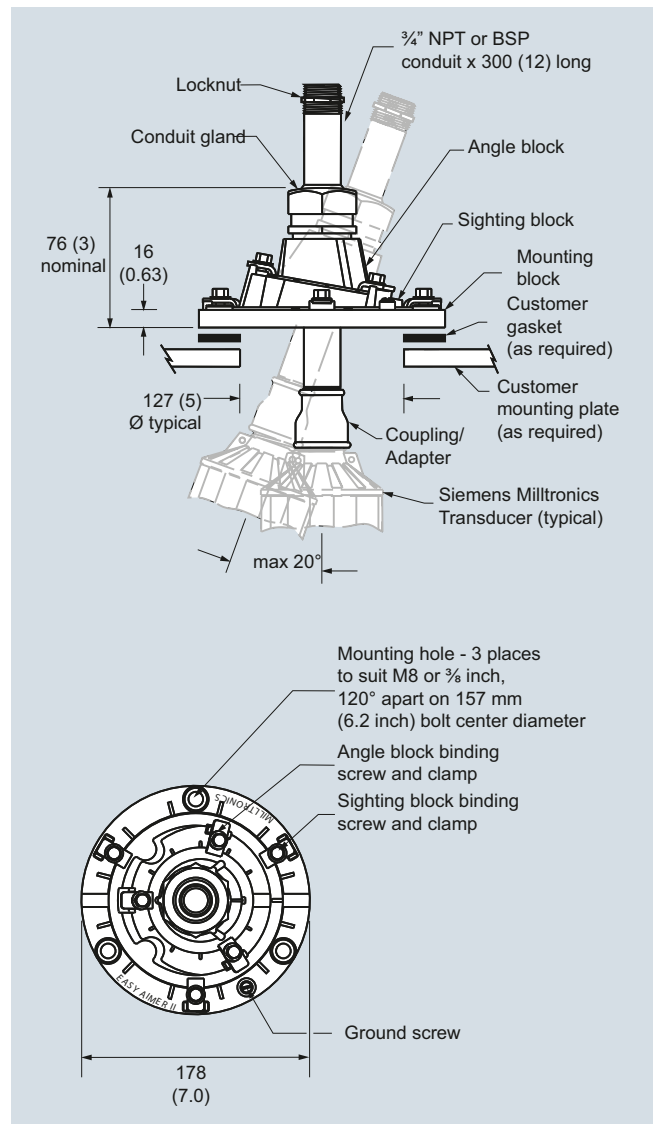
The flange has graduated adjustments and an adjustable insertion length. When used for applications with bulk solids, the sensor is mounted so that it is aimed towards the lower level draw point in the silo. The sensor can be rotated through 360° and angled at 0 to 20° off vertical. It must be mounted using an access plate with welded studs or a flange in order to isolate the mounting holes from the pressurized environment. When installed properly, the EA 2 aiming device is capable of withstanding pressures up to 0.5 bar (Europe) or 15 psi (North America). It can even be used in corrosive and aggressive environments.

Dimensional drawings



EA 304 aiming device, dimensions in mm (inch)

Dimensional drawings



EA 2 aiming device, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Accessories for ultrasonic

EA aiming devices

Selection and Ordering data	Article No.
Easy aimer Used on solids applications to aim transducers for optimal performance. Available in a 304 stainless steel model, or a cast aluminum model.	
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	7ML1830-1AX
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	7ML1830-1GN
Easy Aimer 2, aluminum, BSPT conduit	7ML1830-1AL
Easy Aimer 2, aluminum, NPT with 1½" galvanized coupling ¹⁾	7ML1830-1AN
Easy Aimer 2, aluminum, NPT with 1" galvanized coupling	7ML1830-1AP
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	7ML1830-1AQ
Easy Aimer 304, BSPT conduit	7ML1830-1AS
Easy Aimer 304, NPT with 1½" coupling ¹⁾	7ML1830-1AT
Easy Aimer 304, NPT with 1" coupling	7ML1830-1AU
Operating Instructions Easy Aimer 2 and 304 Operating Instructions, Multi-language Note: The Operating Instructions should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the Quick Start and Operating Instructions library.	7ML1998-5HG62

¹⁾ For use with XPS-30 transducers only

Application

Siemens mounting brackets permit simple, fast installation of ultrasonic transducers. These rugged, high quality mounting brackets are constructed of 304 (1.4301) stainless steel and are suitable for use indoors and outdoors. They adjust to fit almost any application, saving you the time and expense of building custom brackets. Each kit includes all mounting parts.

**FMS-200
universal box bracket system**

Mounting of units with 1 inch or 2 inch threaded connection.

Distance from sensor to wall or beam: 20 ... 31 cm (8 ... 12 inch).

The unique box design also acts as a sun shield for transducers with 1 inch threaded connections.

**FMS-210
wall mounting set**

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to wall or beam: 12 ... 48 cm (5 ... 19 inch).

**FMS-220
extended wall mounting set**

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to wall or beam: 32 ... 98 cm (13 ... 39 inch).

**FMS-310
floor mounting set**

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to floor: 20 ... 48 cm (8 ... 19 inch).

Distance from mounting support: 5 ... 57 cm (2 ... 22 inch).

**FMS-320
extended floor mounting set**

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to floor: 20 ... 48 cm (8 ... 19 inch).

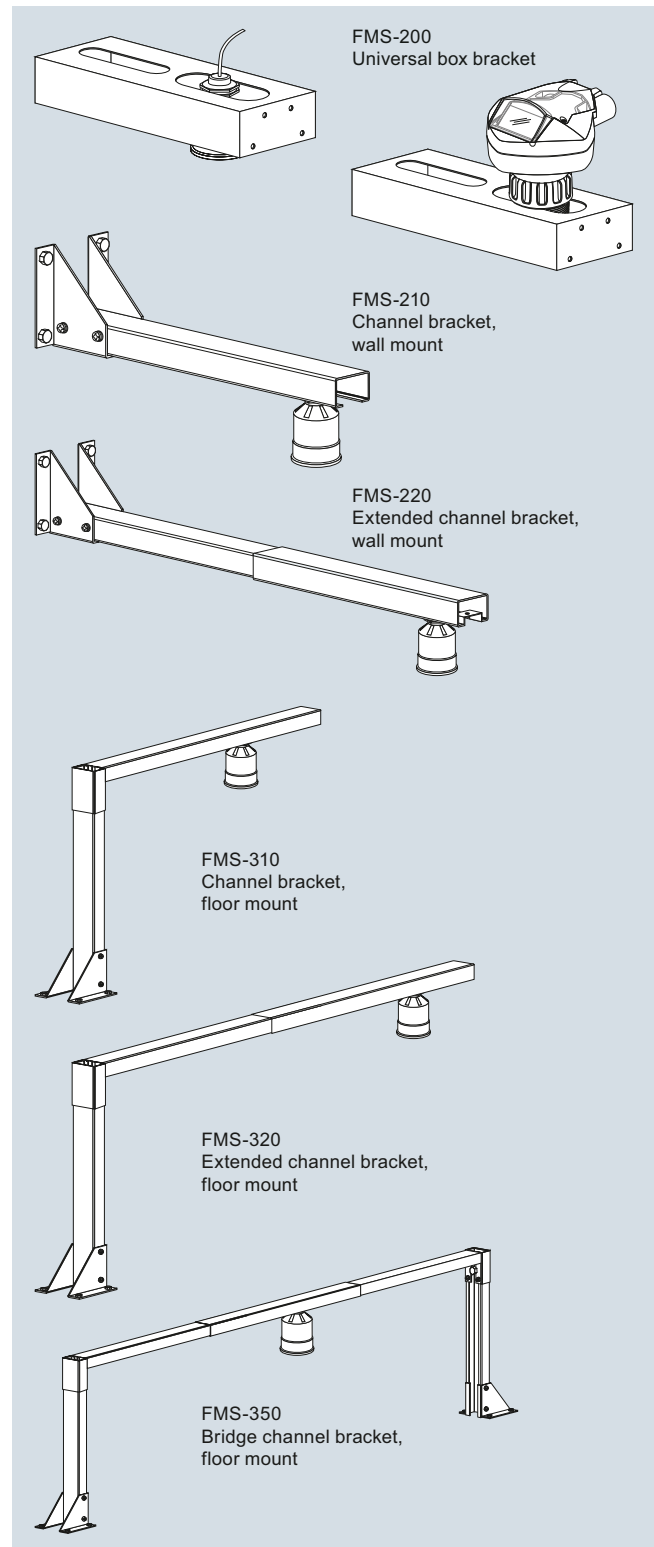
Distance from mounting support: 41 ... 108 cm (16 ... 43 inch).

**FMS-350
floor mounting set, bridge**

Mounting of transducers with 1 inch threaded connection.

Distance from transducer to floor: 20 ... 48 cm (8 ... 19 inch), anywhere along the complete width of the bridge [166 cm (65 inch)].

This kit is particularly suitable for measurements on open channels (OCM) by providing a very stable mount for the transducer above a flume or weir.

Integration

FMS mounting brackets

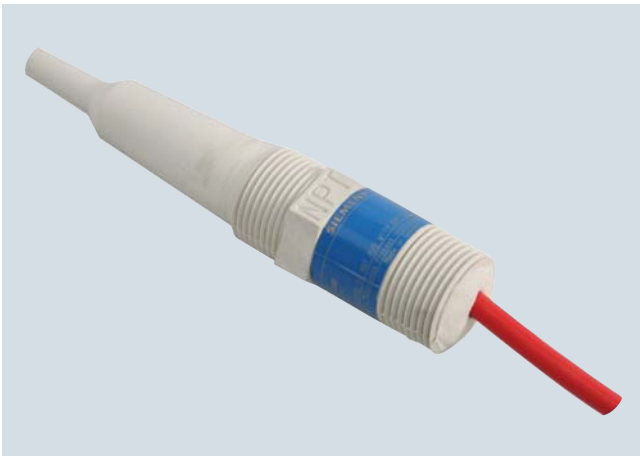
Level Measurement

Continuous level measurement – Accessories for ultrasonic

FMS mounting brackets

Selection and Ordering data	Article No.
Mounting brackets for XPS-10 sensors	
FMS-200 universal box bracket set	7ML1830-1BK
FMS-210 wall mounting set	7ML1830-1BL
FMS-220 extended wall mounting set	7ML1830-1BM
FMS-310 floor mounting set	7ML1830-1BN
FMS-320 extended floor mounting set	7ML1830-1BP
FMS-350 floor mounting set, bridge	7ML1830-1BQ
<i>Additional Operating Instructions</i>	
FMS-200	7ML1998-5BK61
FMS-210	7ML1998-5BL61
FMS-220	7ML1998-5BM61
FMS-310	7ML1998-5BN61
FMS-320	7ML1998-5BP61
FMS-350	7ML1998-5BQ61
Note: The Operating Instructions should be ordered as a separate line item on the order.	

Overview



The TS-3 temperature sensor provides an input signal for temperature compensation of specific Siemens ultrasonic level controllers.

Benefits

- Chemically resistant ETFE enclosure
- Fast response time
- Approved for use in potentially explosive atmospheres

Application

Temperature compensation is essential in applications where temperature variations of the sound medium are expected.

By installing the temperature sensor close to the sound path of the associated ultrasonic transducer, a signal representative of the sound medium's ambient temperature is obtained. The temperature sensor should not be mounted in direct sunlight.

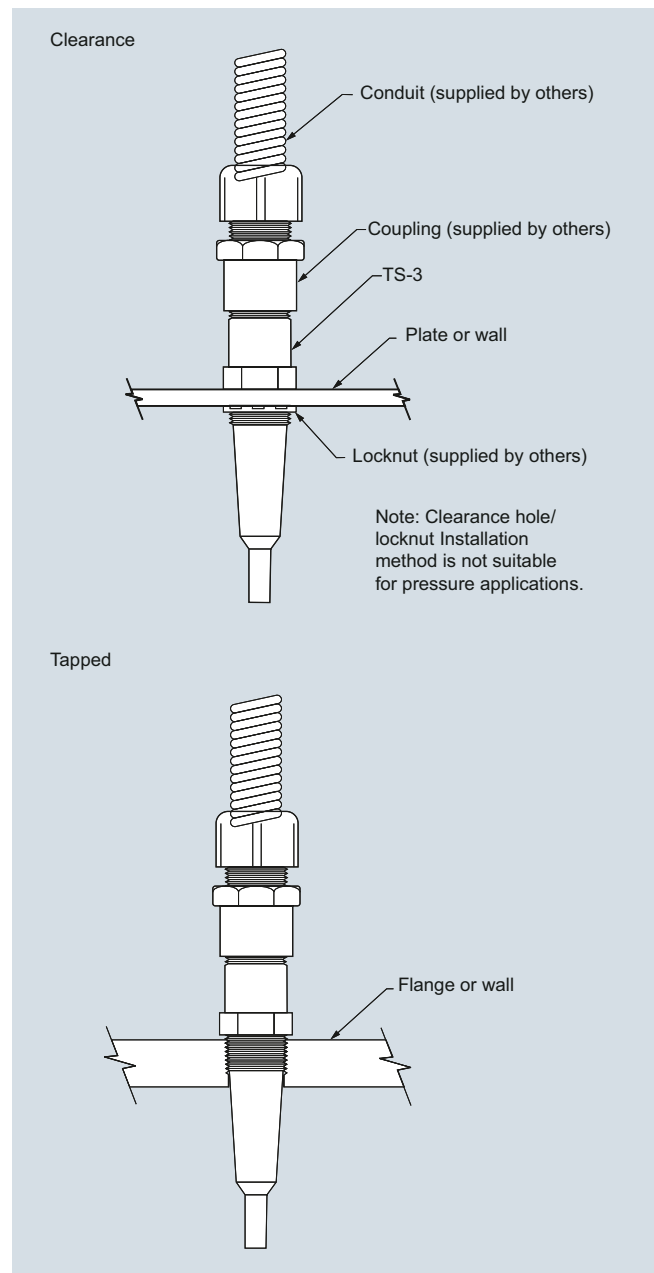
The TS-3 is used in conjunction with ultrasonic transducers that do not have an integral temperature sensor. It is also recommended in cases where the integral temperature sensor of the transducer cannot be used.

The following conditions are typical for use of the TS-3 sensor: where a fast reaction to temperature variations is required, where a flanged ultrasonic transducer is used, or where high temperatures are encountered.

The TS-3 is not compatible with devices using the TS-2 or LTS-1 temperature sensors. Refer to the associated controller manual for more details.

- Key Applications: For use in applications where temperature sensor measurement from transducer does not accurately represent vessel temperature. Used for applications requiring quick temperature response (open channel monitoring).

Design



Note: Clearance hole/locknut installation method is not suitable for pressure applications.

TS-3 temperature sensor

Level Measurement

Continuous level measurement – Accessories for ultrasonic

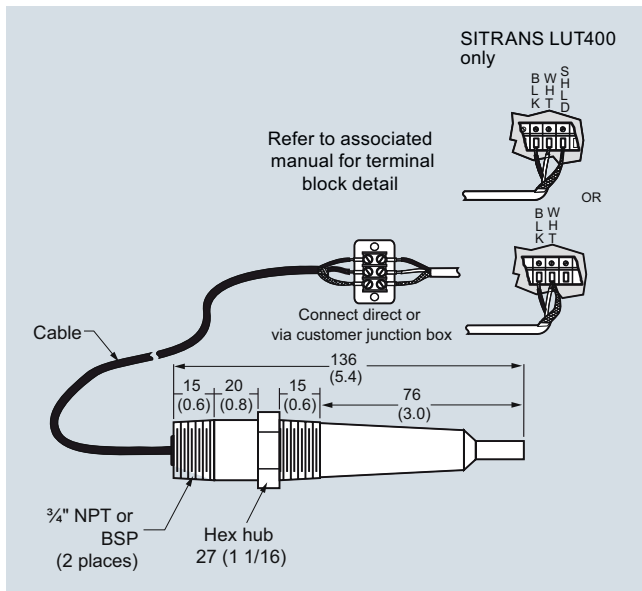
TS-3 temperature sensor

Technical specifications

Mode of operation	
Measuring principle	Temperature sensor
Input	
Measuring range	-40 ... +100 °C (-40 ... +212 °F)
Output	
Response time	
• Forced circulation (temperature variation: 63 %)	55 s
• Flange, forced circulation	90 s
• Natural convection	150 s
Rated operating conditions	
• Installation instructions	Mounted indoors/outdoors, but not exposed to direct sunlight
• Pressure	Max. 4 bar (60 psi/400 kPa)
Design	
Material (enclosure)	ETFE ¹⁾
Cable connection	2-core, 0.5 mm ² (20 AWG), shielded, silicone sheath
Process connection	¾" NPT [(Taper), ANSI/ASME B1.20.1] R ¾" [(BSPT), EN 10226], totally encapsulated
Certificates and approvals	
CE, IEC Ex, FM, CSA, ATEX	

¹⁾ ETFE is a fluoropolymer inert to most chemicals. For exposure to specific environments, check the chemical compatibility charts before installing the TS-3 in your application.

Dimensional drawings



TS-3 temperature sensor, dimensions in mm (inch)

Selection and Ordering data

TS-3 temperature sensor

TS-3 provides an input signal for temperature compensation of specific Siemens ultrasonic level controllers.

Compensation is essential in applications where variation in temperature of the sound medium is expected.

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Cable length

1 m (3.28 ft)
5 m (16.40 ft)
10 m (32.81 ft)
30 m (98.43 ft)
50 m (164.04 ft)
70 m (229.66 ft)
90 m (295.28 ft)

Process connection

¾" NPT [(Taper), ANSI/ASME B1.20.1]
R ¾" [(BSPT), EN 10226]

Approvals

CSA, FM
CE, ATEX, IEC Ex

Operating Instructions

English

German

Note: The Operating Instructions should be ordered as a separate line item on the order.

This device is shipped with the Siemens Miltronics manual DVD containing ATEX Quick Starts and Operating Instructions.

Accessories

¾" NPT locknut, aluminum
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch) for fastening on sensors

Article No.

7ML1813-

B

1

2

3

4

5

6

7

A

B

3

4

A5E32337739

A5E34990011

7ML1930-1BE

7ML1930-1BJ

Overview

Radar measurement technology is non-contacting and low maintenance. Because microwaves require no carrier medium, they are virtually unaffected by the process atmosphere (vapor, pressure, dust, or temperature extremes). Siemens offers a variety of models to meet the specific needs of your application.

SITRANS Probe LR is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft).

SITRANS LR200 is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature, pressure, agitation, and turbulence to a range of 20 m (65 ft).

SITRANS LR250 is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, corrosive or aggressive materials, to a range of 20 m (66 ft). Ideal for small vessels and low dielectric media.

SITRANS LR260 is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of solids in silos to a range of 30 m (98.4 ft). Ideal for applications with extreme dust and high temperatures to 200 °C (392 °F) and liquids in vessels.

SITRANS LR460 is a 4-wire, 24 GHz FMCW radar level transmitter with extremely high signal to noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft). It is ideal for measurement in extreme dust.

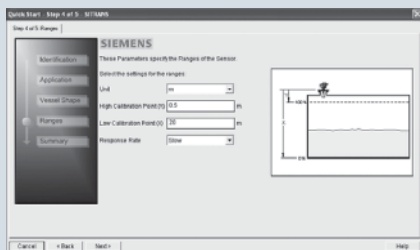
SITRANS LR560 2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids in silos to a range of 100 m (329 ft).

Auto False-Echo Suppression

SITRANS LR instruments offer the unique advantage of Process Intelligence signal processing technology. This in-depth knowledge and experience is built into the software's advanced algorithms to provide intelligent processing of echo profiles. The result is repeatable, fast and reliable measurement.

A special feature of SITRANS radar devices is Auto False-Echo Suppression, an echo processing technique that automatically detects and suppresses false echoes from vessel obstructions. You can implement this feature using two parameters on the local interface or SIMATIC PDM communicating over HART or PROFIBUS PA.

Local display interface – graphically displays echo profiles and diagnostic information (available with LR200, LR250, LR260 and LR560)
Quick to configure – Quick Start Wizard via SIMATIC PDM guides you during setup (available with LR200, LR250, LR260, LR460, LR560)



Mode of operation

Principle of Operation

Radar measurement technology measures the time of flight from the transmitted signal to the return signal. From this time, distance measurement and level are determined.

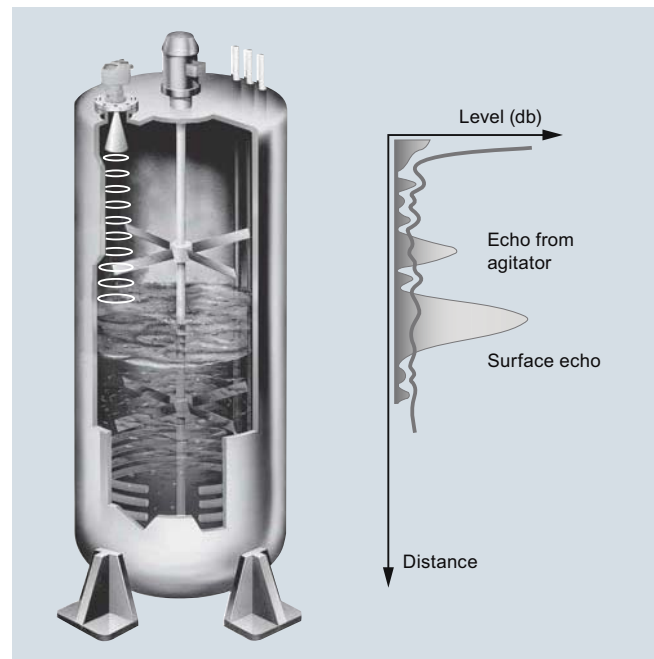
Unlike ultrasonic measurement, radar technology does not require a carrier medium and travels at the speed of light (300 000 000 m/s). Most industrial radar devices operate from 6 to 26 GHz.

Siemens offers pulse radar transmitters (SITRANS Probe LR, SITRANS LR200, SITRANS LR250, SITRANS LR260) and FMCW (Frequency Modulated Continuous Wave) radar transmitters (SITRANS LR460, SITRANS LR560).

Pulse radar emits a microwave pulse from the antenna at a fixed repetition rate that reflects off the interface between the two materials with different dielectric constants (the atmosphere and the material being monitored). The echo is detected by a receiver and the transmit time is used to calculate level.

Reflected echoes are digitally converted to an echo profile. The profile is analyzed to determine the distance from the material surface to the reference point on the instrument.

FMCW (Frequency Modulated Continuous Wave) radar devices send microwaves to the surface of the material. The wave frequency is modulated continuously. At the same time, the receiver is also receiving continuously and the difference in frequency between the transmitter and the receiver is directly proportional to the distance to the material.



Radar operation in a reactor vessel

Level Measurement

Continuous level measurement – Radar transmitters

Radar transmitters

Technical specifications

Radar Selection Guide

Criteria	SITRANS Probe LR	SITRANS LR200	SITRANS LR250	SITRANS LR260	SITRANS LR460	SITRANS LR560
Typical industries	Chemicals, petrochemicals, water/waste-water, drilling mud	Chemicals, petrochemicals, aluminum, wastewater	Chemicals, petrochemicals, and oil and gas, mining, marine, food and beverage, and pharmaceutical	Cement, power generation, petrochemical, food processing, mineral processing, mining	Cement, power generation, food processing, mineral processing, mining	Cement, power generation, food processing, mineral processing, mining
Typical applications	Liquids, storage vessels, wet wells, and drilling mud tanks	Liquids, process vessels with agitators, build-up, and high temperatures	Liquids, storage and process vessels with agitators, vaporous liquids, high temperatures, low dielectric media, and crude oil produced water	Cement, plastics, grain, flour, coal, liquids < 20 m, and low dielectric liquids < 30 m	Cement, fly ash, grain, coal, flour, plastics	Cement, fly ash, grain, coal, flour, plastics
Range	0.3 ... 20 m (1 ... 65 ft)	0.4 ... 20 m (1.3 ... 65 ft)	50 mm (2 inch) from end of horn to 20 m (65 ft), horn dependent	30 m (98.4 ft)	100 m (328 ft)	40 m (131 ft) 100 m (328 ft)
Frequency	5.8 GHz (North America 6.3 GHz)	5.8 GHz (North America 6.3 GHz)	K-band (25.0 GHz)	K-band (25.0 GHz)	24 ... 25 GHz FMCW	78 ... 79 GHz
Performance accuracy	0.1 % of range or 10 mm (0.4 inch)	0.1 % of range or 10 mm (0.4 inch)	≤ 5 mm (0.02 inch)	25 mm (1 inch) from minimum detectable distance to 300 mm (11.8 inch) Remainder of range = 10 mm (0.39 inch) or 0.1 % of span (whichever is greater)	0.25 %	0.25 %
Temperature	Ambient: -40 ... +80 °C (-40 ... +176 °F) Process: -40 ... +80 °C (-40 ... +176 °F)	Ambient: -40 ... +80 °C (-40 ... +176 °F) Process: -40 ... +200 °C (-40 ... +392 °F), dependent on antenna type	Ambient: -40 ... +80 °C (-40 ... +176 °F) Process: -40 ... +200 °C (-40 ... +392 °F), dependent on antenna type	Ambient: -40 ... +80 °C (-40 ... +176 °F) Process: -40 ... +200 °C (-40 ... +392 °F), dependent on antenna type	Ambient: +65 °C (+149 °F) Process: +200 °C (+392 °F)	Ambient: -40 ... +80 °C (-40 ... +176 °F) Process: -40 ... +100 °C (-40 ... 212 °F) Optional: +200 °C (+392 °F)
Output/communications/remote configuration and diagnostics	<ul style="list-style-type: none"> 4 ... 20 mA/HART SIMATIC PDM 	<ul style="list-style-type: none"> 4 ... 20 mA/HART PROFIBUS PA SIMATIC PDM AMS SITRANS DTM/FDT for PACTware, Fieldcare, etc. 	<ul style="list-style-type: none"> 4 ... 20 mA/HART PROFIBUS PA FOUNDATION Fieldbus SIMATIC PDM AMS SITRANS DTM/FDT for PACTware, Fieldcare, etc. 	<ul style="list-style-type: none"> 4 ... 20 mA/HART PROFIBUS PA SIMATIC PDM 	<ul style="list-style-type: none"> 4 ... 20 mA/HART PROFIBUS PA SIMATIC PDM 	<ul style="list-style-type: none"> 4 ... 20 mA/HART PROFIBUS PA FOUNDATION Fieldbus SIMATIC PDM AMS SITRANS DTM/FDT for PACTware, Fieldcare, etc.
Power	<ul style="list-style-type: none"> 24 V DC nominal Loop powered 	<ul style="list-style-type: none"> 24 V DC nominal Loop powered 	<ul style="list-style-type: none"> 24 V DC nominal Loop powered 	<ul style="list-style-type: none"> 24 V DC nominal Loop powered 	<ul style="list-style-type: none"> 100 ... 230 V AC, ±15 %, 50/60 Hz, 6 W 24 V DC, +25/-20 %, 6 W 	<ul style="list-style-type: none"> 24 V DC nominal Loop powered
Approvals	CE, RCM, Lloyds Register of Shipping, ABS, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, GOST-R, IECEx, ANZEx, TIIS	CE, RCM, Lloyds Register of Shipping, ABS, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, GOST-R, IECEx, ANZEx, TIIS, NEPSI	CE, RCM, Lloyds Register of Shipping, ABS, BV, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, GOST-R, IECEx, TIIS, NEPSI Functional safety SIL-2, EHEDG, 3-A, USP Class VI	CE, RCM, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, GOST, IECEx	CE, RCM, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, IECEx, GOST	CE, RCM, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, IECEx, NEPSI, GOST

Application

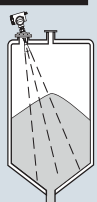
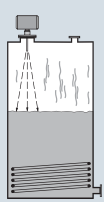
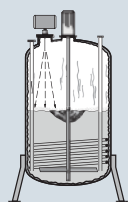
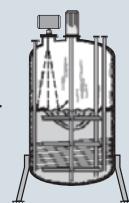
SIEMENS

Radar Application Questionnaire

Customer information

Contact: _____ Prepared By: _____
 Company: _____ Date: _____
 Address: _____ Notes on the Application: _____
 City: _____ Country: _____
 Zip/Postal Code: _____ Phone: () _____
 E-mail: _____ Fax: () _____

Vessel Information

Storage Solids  Storage Liquids  Process  Reactor 

Sketch attached

Area safety classification: (specify code required) _____

Height: _____ m/ft Diameter: _____ m/ft Filling method: _____

Top: Flat Parabolic Conical **Atmosphere:** (indicate all that apply) Foam Dust Vapor Steam Deposit (build-up) Pressure: _____
 Normal: _____
 Maximum (relief): _____

Mounting connection (specify type) _____

Distance to sidewall: _____ cm/inch

Mounting connection maximum temperature: _____ °C/°F

Max. temperature at electronics: _____ °C/°F

Critical Information
 Nozzle Length: _____ cm/inch
 Nozzle Diameter: _____ cm/inch

Stilling well or Still Pipe mounting: Yes No Stilling well diameter: _____ cm/inch

Material

Material being measured: _____ Liquid Solid Liquefied gas

Material temperature: Norm: _____ °C/°F Max: _____ °C/°F

Material surface: Flat Tu Agitated Vortex Dielectric constant: $\epsilon_r < 3$ $\epsilon_r > 3$

Installation

Power available: _____

Communications:
 HART /4 ... 20 mA
 PROFIBUS PA
 FOUNDATION Fieldbus None

Products recommended: _____

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS Probe LR

Overview



SITRANS Probe LR is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft).

Benefits

- Uni-Construction polypropylene rod antenna standard
- Easy installation and simple start-up
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART handheld communicator
- Communication using HART
- Process Intelligence signal processing
- Extremely high signal-to-noise ratio
- Auto False-Echo Suppression of false echoes

Application

The Probe LR is ideal for applications with chemical vapors, temperature gradients, vacuum or pressure, such as simple chemical storage or water treatment vessels. SITRANS Probe LR has a range of 0.3 to 20 m (1 to 65 ft).

Probe LR is designed for safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna includes an internal, integrated shield that eliminates vessel nozzle interference.

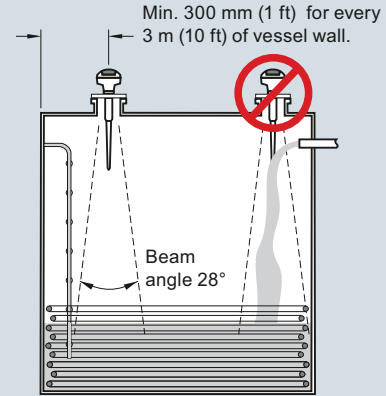
SITRANS Probe LR incorporates Process Intelligence signal processing. The Probe LR also has a high signal-to-noise ratio leading to improved reliability.

Start-up is easy with as few as two parameters for basic operation. Programming is simple using SIMATIC PDM, HART handheld communicator or the Intrinsically Safe handheld programmer.

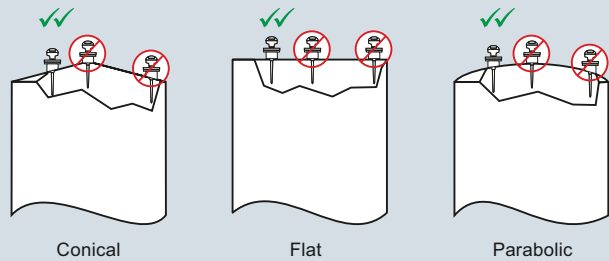
- Key Applications: chemical storage, wastewater wet well, and drilling mud

Configuration

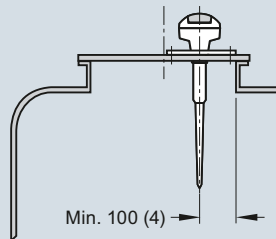
Installation



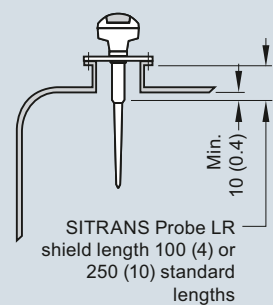
Mounting unit on vessel



Mounting on a manhole cover



Mounting on a nozzle



SITRANS Probe LR installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS Probe LR

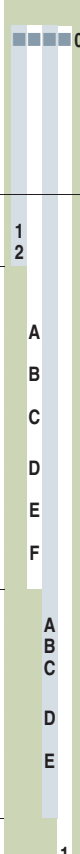
Technical specifications

Mode of operation		Power supply	
Measuring principle	Pulse radar level measurement		<ul style="list-style-type: none"> Nominal 24 V DC with max. 550 Ω, maximum 30 V DC 4 ... 20 mA
Frequency	5.8 GHz (North America 6.3 GHz)	Certificates and approvals	
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)	General	CSA _{US/IC} , CE, FM, RCM
Output		Marine	<ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval
Analog output	4 ... 20 mA	Radio	FCC, Industry Canada and European (R&TTE), RCM
Accuracy	± 0.02 mA	Hazardous	
Span	Proportional or inversely proportional	<ul style="list-style-type: none"> Intrinsically Safe (Brazil) Intrinsically Safe (Canada) 	INMETRO Ex ia IIC T4 Ga CSA Class I, Div.1, Groups A,B,C,D; Class II, Div. 1, Group G; Class III ATEX II 1G EEx ia IIC T4
Communications	HART	<ul style="list-style-type: none"> Intrinsically Safe (Europe) Intrinsically Safe (International) Intrinsically Safe (Russia) Intrinsically Safe (USA) 	IECEX Ex ia IIC T4 GOST-R Ex ia FM Class I, Div.1, Groups A,B,C,D; Class II, Div. 1, Groups E,F, G; Class III
Performance (reference conditions)		Programming	
Accuracy	± the greater of 0.1 % of range or 10 mm (0.4 inch)	Handheld programmer	HART communicator 375
Influence of ambient temperature	0.003 %/K	PC	SIMATIC PDM
Repeatability	± 5 mm (2 inch)	Intrinsically safe Siemens handheld programmer (optional)	Infrared receiver
Fail-safe	mA signal programmable as high, low or hold (LOE)	<ul style="list-style-type: none"> Approvals (handheld programmer) 	ATEX II 1G EEx ia IIC T4 CSA and FM Class I, Div.1, Groups A,B,C,D, T6 at max. ambient
Rated operating conditions		Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages
Installation conditions			
<ul style="list-style-type: none"> Location 	Indoor/outdoor		
Ambient conditions (enclosure)			
<ul style="list-style-type: none"> Ambient temperature Installation category Pollution degree 	-40 ... +80 °C (-40 ... +176 °F) I 4		
Medium conditions			
Dielectric constant ϵ_r	$\epsilon_r > 1.6$ (for $\epsilon_r < 3$, use stillpipe)		
Vessel temperature	-40 ... +80 °C (-40 ... +176 °F)		
Vessel pressure	3 bar g (43.5 psi g)		
Design			
Enclosure			
<ul style="list-style-type: none"> Body construction Lid construction Cable inlet 	PBT (Polybutylene Terephthalate) PEI (Polyether Imide) 2 x M20x1.5 or 2 x 1/2" NPT with adapter		
Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68		
Weight	1.97 kg (4.35 lb)		
Antenna			
<ul style="list-style-type: none"> Material Dimensions 	Polypropylene rod, hermetically sealed construction Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle or optional 250 mm (10 inch) long shield		
Process connections	1 1/2" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2" [(BSPT), EN 10226] G 1 1/2" [(BSPP), EN ISO 228-1]		

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS Probe LR

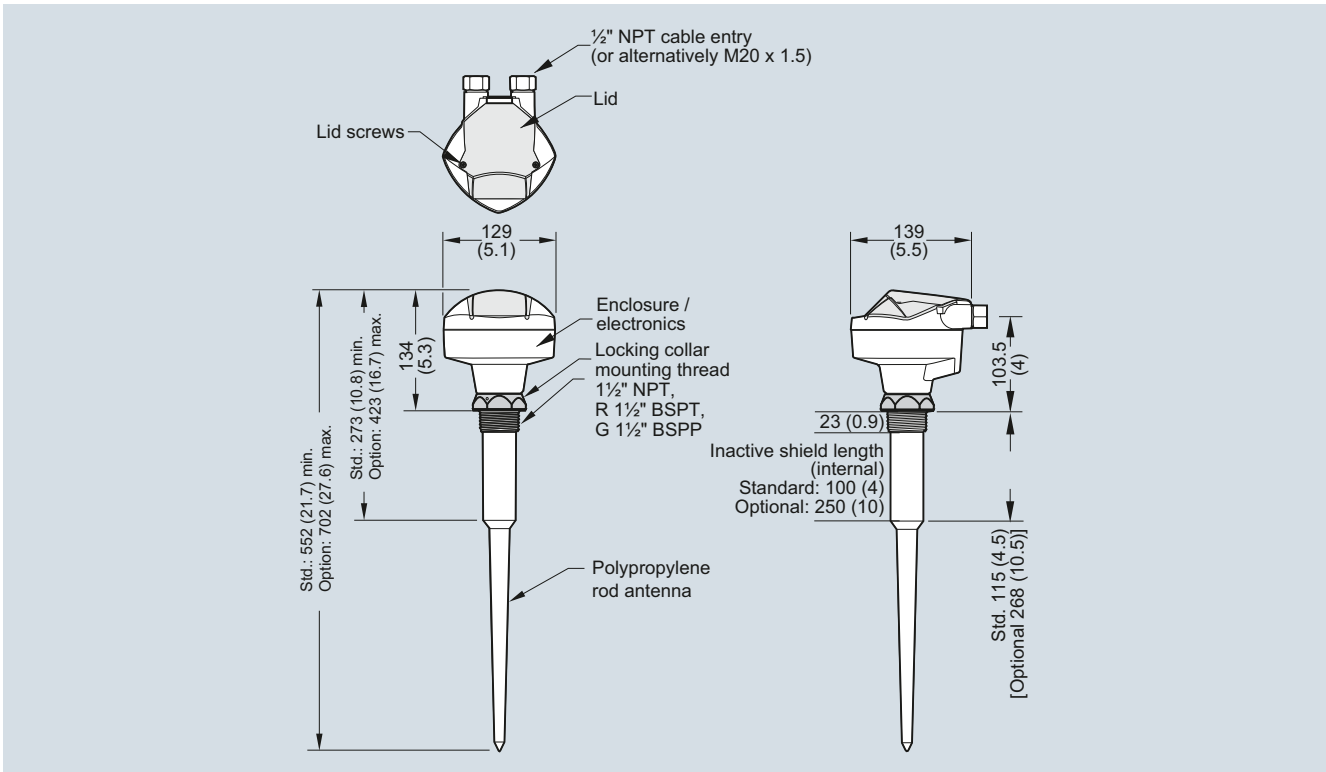
Selection and Ordering data	Article No.
SITRANS Probe LR 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft). Max. 3 bar g (43.5 psi g) pressure and 80 °C (176 °F) ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5430- 
Enclosure/Cable inlet Plastic, (PBT), 2 x 1/2" NPT Plastic, (PBT), 2 x M20x1.5	1 2
Antenna type/Material - (max. 3 bar and 80 °C) Polypropylene Antenna 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 100 mm shield R 1 1/2" [(BSPT), EN 10226], comes with integral 100 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], comes with integral 100 mm shield 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 250 mm shield R 1 1/2" [(BSPT), EN 10226], comes with integral 250 mm shield G 1 1/2" [(BSPP), EN ISO 228-1], comes with integral 250 mm shield	A B C D E F
Approvals General Purpose, CE, R&TTE, RCM General Purpose, CSA _{US/C} , FM, FCC CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1 Group G, Class III, FCC, Intrinsically Safe FM, Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Intrinsically Safe IECEx Ex ia IIC T4; ATEX II 1G EEx ia IIC T4, R&TTE, RCM, Intrinsically Safe; INMETRO Ex ia IIC T4 Ga; GOST-R	A B C D E
Communication/Output 4 ... 20 mA, HART	1

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: ● Y15 Measuring-point number/identification (max. 27 characters) specify in plain text Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 ● C11	
Operating Instructions English French Spanish German Note: The Operating Instructions should be ordered as a separate item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	Article No. A5E32337711 7ML1998-5HR11 7ML1998-5HR21 A5E34957879
Additional Operating Instructions Multi-language Quick Start manual	A5E32106153
Accessories Handheld programmer, Intrinsically Safe, ATEX II 1G, Ex ia HART modem/USB (for use with a PC and SIMATIC PDM) One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F) SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 For applicable back up point level switch - see point level measurement section	7ML5830-2AH 7MF4997-1DB 7ML1930-1AP 7ML5741-... 7ML5740-... 7ML5744-... 7ML5750-...
Spare parts Plastic lid For applicable back up point level switch - see point level measurement section	7ML1830-1KB

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.

Dimensional drawings



SITRANS Probe LR, dimensions in mm (inch)

Schematics

Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

Strain relief (or NPT cable inlet)

Hand Programmer

SIEMENS			
1	2	3	4
5 mA	6 ↓	7 ↑	8
9	0	P...	P...
C	▲%	■	⏏
▲	▼	↺	↻

SITRANS Probe LR
Part number: 7ML5830-2AH

Notes:

- DC terminal shall be supplied from an SELV source in accordance with IEC-1010-1 Annex H.
- All field wiring must have insulation suitable for rated input voltages.
- Use shielded twisted pair cable (14-22 AWG)
- Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

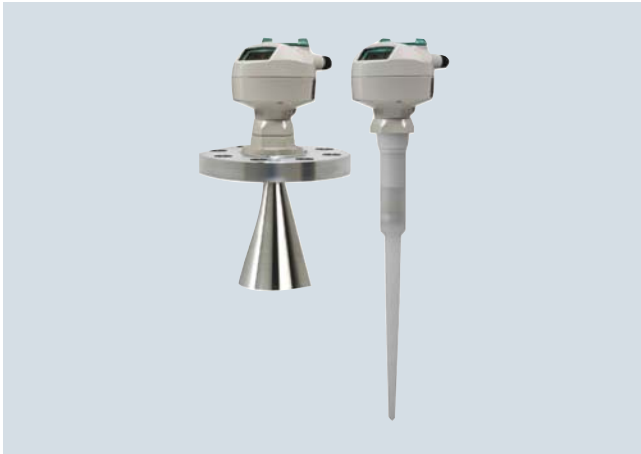
SITRANS Probe LR connections

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200

Overview



SITRANS LR200 is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature, pressure, agitation, and turbulence to a range of 20 m (65 ft).

Benefits

- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- Communication using HART or PROFIBUS PA
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or SIMATIC PDM

Application

SITRANS LR200's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It also features a built-in alphanumeric display in four languages.

The SITRANS LR200 has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna features an internal, integrated shield that eliminates vessel nozzle interference.

Start-up is easy with as few as two parameters for basic operation. Installation is simplified as the electronics are mounted on a rotating head that swivels, allowing the instrument to line up with conduit or wiring connections or simply to adjust the position for easy viewing. SITRANS LR200 features Process Intelligence signal-processing technology for superior reliability.

- Key Applications: liquid process vessels with agitators, vaporous liquids, high temperatures, asphalt, digesters

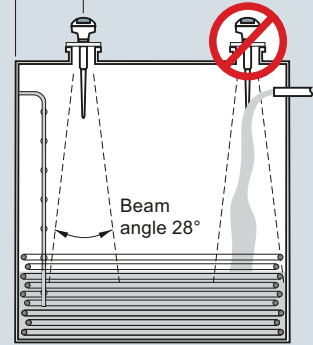
Configuration

Installation

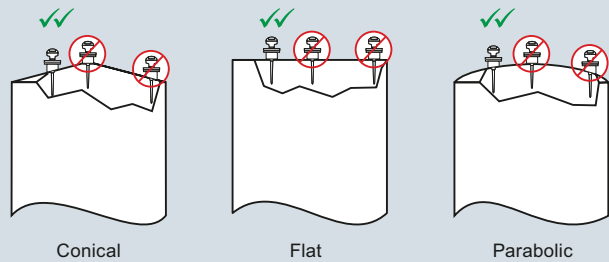
Min. 300 mm (1 ft) for every 3 m (10 ft) of vessel wall.

Note:

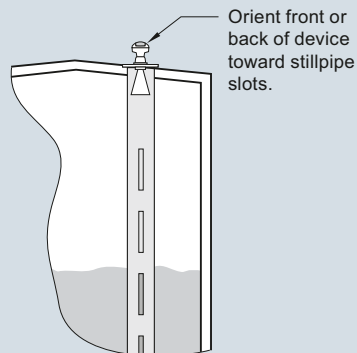
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- Beam angle for horn antenna dependent on horn size
- The peak energy density is directly in front of and in line with the rod antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



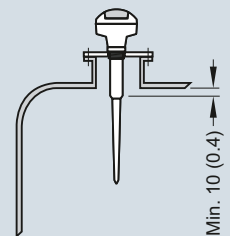
Mounting unit on vessel



Mounting unit on stilling well



Mounting on a nozzle



SITRANS LR200 installation, dimensions in mm (inch)

Technical specifications

Mode of operation		Power supply	
Measuring principle	Radar level measurement	4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω Nominal 24 V DC (max. 30 V DC) with max. 250 Ω
Frequency	5.8 GHz (North America 6.3 GHz)	<ul style="list-style-type: none"> General Purpose, Non-incendive, Intrinsically Safe Flame proof, Increased safety, Explosion proof 	
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)	PROFIBUS PA	<ul style="list-style-type: none"> 10.5 mA Per IEC 61158-2
Output		Certificates and approvals	
<ul style="list-style-type: none"> Analog output Accuracy Span Communications 	4 ... 20 mA ± 0.02 mA Proportional or inversely proportional HART Optional: PROFIBUS PA (Profile 3.0, Class B) Programmable as high, low or hold (Loss of Echo)	General	CSA _{US/C} , CE, FM, RCM
<ul style="list-style-type: none"> Fail-safe 		Marine	<ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval
Performance (according to reference conditions IEC60770-1)		Radio	FCC, Industry Canada and European (R&TTE), RCM
<ul style="list-style-type: none"> From end of antenna to 600 mm: Remainder of range: 	40 mm (1.57 inch) 10 mm (0.4 inch) or 0.1 % of span (whichever is greater)	Hazardous	INMETRO Ex ia IIC T4 Ga CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, T4 CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, T4 FM, Class I, Div. 2, Groups A, B, C, D, T5 NEPSI Ex d mb ia IIC T4/ Ex e mb ia IIC T4 ATEX II 1/2 G Ex d mb ia IIC T4 Ga/Gb ATEX II 1/2 G Ex e mb ia IIC T4 Ga/Gb ATEX II 1G Ex ia IIC T4 IECEx Ex ia IIC T4 GOST-R Ex ia
Rated operating conditions		<ul style="list-style-type: none"> Intrinsically Safe (Brazil) Explosion Proof (Canada/USA) Intrinsically Safe (Canada/USA) Non-incendive (USA) Flame Proof/Increased Safety (China) Flame Proof (Europe) Increased Safety (Europe) Intrinsically Safe (Europe) Intrinsically Safe (International) Intrinsically Safe (Russia) 	
Installation conditions	Indoor/outdoor	Programming	
<ul style="list-style-type: none"> Location 		<ul style="list-style-type: none"> Intrinsically Safe Siemens handheld programmer - Approvals for handheld programmer 	Infrared receiver
Ambient conditions (enclosure)	-40 ... +80 °C (-40 ... +176 °F)	IS model:	
<ul style="list-style-type: none"> Ambient temperature Installation category Pollution degree 		<ul style="list-style-type: none"> 1 4 	ATEX II 1GD Ex ia IIC T4 Ga Ex iaD 20 T135 °C T _a = -20 ... +50 °C CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = +50 °C HART communicator 375
Medium conditions		<ul style="list-style-type: none"> Handheld communicator PC Display (local) 	<ul style="list-style-type: none"> SIMATIC PDM AMS
<ul style="list-style-type: none"> Dielectric constant ϵ_r Vessel temperature and pressure 	$\epsilon_r > 1.6$ (for $\epsilon_r < 3$, use stillpipe) Varies with connection type; see Pressure/Temperature curves for more information	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages	
Design			
Enclosure	Aluminum, polyester powder coated		
<ul style="list-style-type: none"> Material Cable inlet 		2 x M20x1.5 or 2 x 1/2" NPT with adapter	
Degree of protection	< 2.82 kg (6.21 lb) (polypropylene rod antenna)		
Weight		Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68	
Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages		
Antenna			
<ul style="list-style-type: none"> Material 	Polypropylene rod, hermetically sealed construction, optional PTFE		
<ul style="list-style-type: none"> Dimensions 	Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle, or optional 250 mm (10 inch) long shield		
<ul style="list-style-type: none"> Optional rods and horn 	Refer to SITRANS LR200 Antennas for optional rods and horns		
Process connections	1 1/2" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2" [(BSPT), EN 10226], or G 1 1/2" [(BSPP), EN ISO 228-1] (polypropylene rod antenna)		
<ul style="list-style-type: none"> Process connection 			
<ul style="list-style-type: none"> Flange connection 	Refer to SITRANS LR200 Antennas for more connections		

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200

Selection and Ordering data

SITRANS LR200, Uni-Construction polypropylene rod antenna version

2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft).

Max. 3 bar g (43.5 psi g) pressure and 80 °C (176 °F)

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Enclosure/Cable inlet

Aluminum, epoxy painted
2 x 1/2" NPT
2 x M20x1.5

Polypropylene antenna type - (Max. 3 Bar pressure and 80 °C)

1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield
R 1 1/2" [(BSPT), EN 10226], c/w integral 100 mm shield
G 1 1/2" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield

1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield
R 1 1/2" [(BSPT), EN 10226], c/w integral 250 mm shield
G 1 1/2" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield

Approvals

General Purpose, CE, R&TTE, RCM
General Purpose, CSA, FM, Industry Canada, FCC
Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada

Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC
Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, RCM; GOST-R Non incandive, FM Class I, Div. 2, Groups A, B, C, D, FCC¹⁾

Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; GOST-R²⁾

Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; GOST-R³⁾

Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC¹⁾

Communication/Output

PROFIBUS PA
4 ... 20 mA, HART, start-up at < 3.6 mA

¹⁾ Available with enclosure option 2 only

²⁾ Available with enclosure option 3 only

³⁾ Available with communication option 3 only

Article No.

7ML5422-

0

2

3

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B

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C

D

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C

D

E

F

A

B

C

D

E

F

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters); specify in plain text

Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000

Namur NE43 compliant, device preset to failsafe < 3.6 mA¹⁾

Operating Instructions for HART/mA device

English

German

Note: The Operating Instructions should be ordered as a separate line item on the order.

Multi-language Quick Start manual
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Operating Instructions for PROFIBUS PA device

English

German

Note: The Operating Instructions should be ordered as a separate line item on the order.

Multi-language Quick Start manual
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Accessories

Handheld programmer, Intrinsically safe, EEx ia

HART modem/USB
(for use with a PC and SIMATIC PDM)

One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART²⁾

One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA²⁾

One general purpose polymeric cable gland M20x1.5, rated -20 ... +80 °C (-40 ... +176 °F)

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

For applicable back up point level switch - see point level measurement section

¹⁾ Available with communication option 3 only

²⁾ Product shipped with plastic cable gland, rated to -20 °C.

If -40 °C rating required, then metallic cable gland is recommended.

Order code

Y15

C11

N07

Article No.

A5E32337676

A5E34942758

A5E31993614

A5E32337680

A5E34942820

A5E32153438

7ML1930-1BK

7MF4997-1DB

7ML1930-1AP

7ML1930-1AQ

7ML1930-1AM

7ML5741-...

7ML5740-...

7ML5744-...

7ML5750-...

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200

Selection and Ordering data	Article No.
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft). ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5423-
Antenna material (uses antenna adapter) PTFE, uses antenna adapter and additional process connection below	1
Process connection (refer to Pressure/Temperature curves, page 4/208) Flanges (316L stainless steel) DN 50 PN 16, Type A, flat faced DN 80 PN 16, Type A, flat faced DN 100 PN 16, Type A, flat faced DN 150 PN 16, Type A, flat faced 2" ASME 150 lb, flat faced 3" ASME 150 lb, flat faced 4" ASME 150 lb, flat faced 6" ASME 150 lb, flat faced DN 50 PN 40, flat faced DN 80 PN 40, flat faced DN 100 PN 40, flat faced DN 150 PN 40, flat faced 2" ASME 300 lb, flat faced, available with Pressure rating option 1 only due to flange hole spacing 3" ASME 300 lb, flat faced 4" ASME 300 lb, flat faced 6" ASME 300 lb, flat faced JIS DN 50 10K JIS DN 80 10K JIS DN 100 10K JIS DN 150 10K (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.) Threaded connection (316L stainless steel) 1½" NPT [(Taper), ANSI/ASME B1.20.1] 2" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226] R 2" [(BSPT), EN 10226] G 1½" [(BSPP), EN ISO 228-1] G 2" [(BSPP), EN ISO 228-1]	AA BA CA DA FB GB HB JB AC BC CC DC FD GD HD JD AE BE CE DE LA MA LC MC LE ME
Antenna extensions or Inactive shield length No antenna extension 50 mm (2 inch) extension, PTFE 100 mm (4 inch) extension, PTFE 100 mm (4 inch) extension, 316L stainless steel shield ¹⁾ 150 mm (6 inch) extension, 316L stainless steel shield ¹⁾ 200 mm (8 inch) extension, 316L stainless steel shield ¹⁾ 250 mm (10 inch) extension, 316L stainless steel shield ¹⁾	0 1 2 3 4 5 6
Process seal/gasket Integral Gasket, for flat faced flange process connections only, not for Antenna extension options 3 ... 6 FKM O-ring, not available for combination of flat faced flanges with Antenna extension options 0, 1 or 2	0 1
Enclosure/Cable inlet Aluminum, Epoxy painted	

Selection and Ordering data	Article No.
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft). 2 x ½" NPT 2 x M20x1.5	7ML5423-
Communication/Output PROFIBUS PA 4 ... 20 mA, HART, start-up at < 3.6 mA	2 3 B C
Approvals General Purpose, CE, R&TTE, RCM General Purpose, CSA FM, Industry Canada, FCC Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, RCM; GOST-R Non incensive, FM Class I, Div. 2, Groups A, B, C, D, FCC ²⁾ Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; GOST-R ³⁾⁴⁾ Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/ Gb, CE, R&TTE, RCM; GOST-R ⁴⁾ Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC ²⁾⁴⁾	A B C D E F G H J
Pressure rating Rating per Pressure/Temperature curves in manual 0.5 bar g (7.25 psi g) maximum	0 1
1) Available with process connection options BA, CA, DA, GB, HB, JB, BC, CC, DC, GD, HD, JD, BE, CE, DE, MA, MC, ME only 2) Available with enclosure option 2 only 3) Available with enclosure option 3 only 4) Available with communication option C only	

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200

Selection and Ordering data	Order code
Further designs	
Please add *-Z to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters); specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Namur NE43 compliant, device preset to failsafe < 3.6 mA ³⁾	N07
Operating Instructions for HART/mA device	
English	A5E32337676
German	A5E34942758
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	A5E31993614
Operating Instructions for PROFIBUS PA device	
English	A5E32337680
German	A5E34942820
Note: The Operating Instructions should be ordered as a separate line item on the order.	
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	A5E32153438
Accessories	
Handheld programmer, Intrinsically safe, EEx ia	7ML1930-1BK
Antenna, rod, PTFE	7ML1830-1HC
Antenna extension, 50 mm (2 inch), PTFE	7ML1830-1CH
Antenna extension, 100 mm (4 inch), PTFE	7ML1830-1CG
HART modem / USB (for use with PC and SIMATIC PDM)	7MF4997-1DB
Metallic cable gland M20 x 1.5, rated -40 °C (-40 °F) ... 80 °C. (176 °F), HART (two are required)	7ML1930-1AP
Metallic cable gland M20 x 1.5, rated -40 °C (-40 °F) ... 80 °C. (176 °F), PROFIBUS PA (two are required)	7ML1930-1AQ
One General Purpose polymeric cable gland M20 x 1.5, rating for -20°C (-4°F) ... + 80°C. (176 °F)	7ML1930-1AM
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	

Selection and Ordering data	Article No.
SITRANS LR200, Flange adapter/Horn Antenna version	7ML5425-
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft).	
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Antenna material (uses antenna adapter)	
316L stainless steel with PTFE cone emitter	0
316L stainless steel with PTFE cone emitter and purge connection with 1/8" NPT inlet ¹⁾	1
Sliding waveguide system with 1 000 mm (40 inch) waveguide ¹⁾²⁾	2
Process connection (refer to Pressure/Temperature curves, page 4/209)	
Flanges (316L stainless steel)	
DN 50 PN 16 EN 1092-1 Type A flat faced ¹⁾	AA
DN 80 PN 16 EN 1092-1 Type A flat faced	BA
DN 100 PN 16 EN 1092-1 Type A flat faced	CA
DN 150 PN 16 EN 1092-1 Type A flat faced	DA
DN 200 PN 16 EN 1092-1 Type A flat faced	EA
DN 80 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾	BF
DN 100 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾	CF
DN 150 PN 10/16 DIN EN 1092-1 Type B1 raised face ³⁾	DF
DN 200 PN 16 DIN EN 1092-1 Type B1 raised face ³⁾	EF
2" ASME 150 lb, flat faced ¹⁾	FB
3" ASME 150 lb, flat faced	GB
4" ASME 150 lb, flat faced	HB
6" ASME 150 lb, flat faced	JB
8" ASME 150 lb, flat faced	KB
DN 50 PN 40, flat faced ³⁾	AC
DN 80 PN 40, flat faced ³⁾	BC
DN 100 PN 40, flat faced ³⁾	CC
DN 200 PN 40, flat faced ³⁾	EC
DN 80 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾	CG
DN 100 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾	DG
DN 150 PN 25/40 DIN EN 1092-1 Type B1 raised face ³⁾	EG
2" ASME 300 lb, flat faced ¹⁾³⁾	FD
3" ASME 300 lb, flat faced ³⁾	GD
4" ASME 300 lb, flat faced ³⁾	HD
JIS DN 50 10K ¹⁾	AE
JIS DN 80 10K	BE
JIS DN 100 10K	CE
JIS DN 150 10K	DE
JIS DN 200 10K	EE
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard.)	
Communication/Output	
PROFIBUS PA	1
4 ... 20 mA, HART, start-up at < 3.6 mA	2

Selection and Ordering data	Article No.
SITRANS LR200, Flange adapter/Horn Antenna version	7ML5425-
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft).	
Process seal/gasket	
FKM (-40 ... +200 °C)	0
Nitrile (-40 ... +60 °C), sliding waveguide systems only	1
FFKM (-35 ... +200 °C)	2
Enclosure/Cable inlet	
Aluminum, Epoxy painted	
2 x 1/2" NPT	2
2 x M20x1.5	3
Horn size/Waveguide options	
80 mm (3 inch) horn ⁴⁾	B
100 mm (4 inch) horn ⁴⁾	C
150 (6 inch) mm horn	D
200 (8 inch) mm horn	E
100 mm (4 inch) horn with 100 mm (4 inch) waveguide extension ⁴⁾	F
100 mm (4 inch) horn with 150 mm (6 inch) waveguide extension ⁴⁾	G
100 mm (4 inch) horn with 200 mm (8 inch) waveguide extension ⁴⁾	H
100 mm (4 inch) horn with 250 mm (10 inch) waveguide extension ⁴⁾	J
150 mm (6 inch) horn with 100 mm (4 inch) waveguide extension	K
150 mm (6 inch) horn with 150 mm (6 inch) waveguide extension	L
150 mm (6 inch) horn with 200 mm (8 inch) waveguide extension	M
150 mm (6 inch) horn with 250 mm (10 inch) waveguide extension	N
200 mm (8 inch) horn with 100 mm (4 inch) waveguide extension	P
200 mm (8 inch) horn with 150 mm (6 inch) waveguide extension	Q
200 mm (8 inch) horn with 200 mm (8 inch) waveguide extension	R
200 mm (8 inch) horn with 250 mm (10 inch) waveguide extension	S
(Add Order code Y01 and plain text: "waveguide length ... mm")	

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200

Selection and Ordering data

SITRANS LR200,

Flange adapter/Horn Antenna version

2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in process vessels including high temperature and pressure, to a range of 20 m (66 ft).

Approvals

General Purpose, CE, R&TTE, RCM
General Purpose, CSA, FM, Industry Canada, FCC
Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada

Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC

Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, RCM; GOST-R
Non Incendive, FM Class I, Div. 2, Groups A, B, C, D, FCC⁵⁾

Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; GOST-R⁶⁾⁷⁾

Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, RCM; GOST-R⁷⁾

Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC⁵⁾⁷⁾

Pressure rating

Rating per Pressure/Temperature curves in manual
0.5 bar g (7.25 psi g) maximum

¹⁾ Available with pressure rating option 1 only

²⁾ Maximum Process Temperature 60 °C (140 °F)

³⁾ Available with Antenna Material option 0 and 1 only

⁴⁾ For stillpipe applications only

⁵⁾ Available with enclosure option 2 only

⁶⁾ Available with enclosure option 3 only

⁷⁾ Available with communication option 2 only

Article No.

7ML5425-



A

B

C

D

E

F

G

H

J

0

1

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)];
Measuring-point number/identification
(max. 27 characters); specify in plain text

Y15

Manufacturer's test certificate: M to DIN 55350,
Part 18 and to ISO 9000

C11

Inspection Certificate Type 3.1 per EN 10204

C12

Namur NE43 compliant, device preset to failsafe
< 3.6 mA¹⁾

N07

Operating Instructions for HART/mA device

English

Article No.

A5E32337676

German

A5E34942758

Note: The Operating Instructions should be
ordered as a separate line item on the order.

Multi-language Quick Start manual
This device is shipped with the Siemens Milltronics
manual DVD containing the ATEX Quick Start and
Operating Instructions library.

A5E31993614

Operating Instructions for PROFIBUS PA device

English

A5E32337680

German

A5E34942820

Note: The Operating Instructions should be
ordered as a separate line item on the order.

Multi-language Quick Start manual
This device is shipped with the Siemens Milltronics
manual DVD containing the ATEX Quick Start and
Operating Instructions library.

A5E32153438

Accessories

Handheld programmer, Intrinsically safe, EEx ia
HART modem/USB
(for use with a PC and SIMATIC PDM)

7ML1930-1BK

7MF4997-1DB

One metallic cable gland M20x1.5,
rated -40 ... +80 °C (-40 ... +176 °F), HART²⁾

7ML1930-1AP

One metallic cable gland M20x1.5,
rated -40 ... +80 °C (-40 ... +176 °F),
PROFIBUS PA³⁾

7ML1930-1AQ

One general purpose polymeric cable gland
M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F)

7ML1930-1AM

SITRANS RD100, loop powered display -
see Chapter 7

7ML5741-...

SITRANS RD200, universal input display with
Modbus conversion - see Chapter 7

7ML5740-...

SITRANS RD300, dual line display with totalizer
and linearization curve and Modbus conversion -
see Chapter 7

7ML5744-...

SITRANS RD500 web, universal remote monitoring
solution for instrumentation - see Chapter 7

7ML5750-...

For applicable back up point level switch -
see point level measurement section

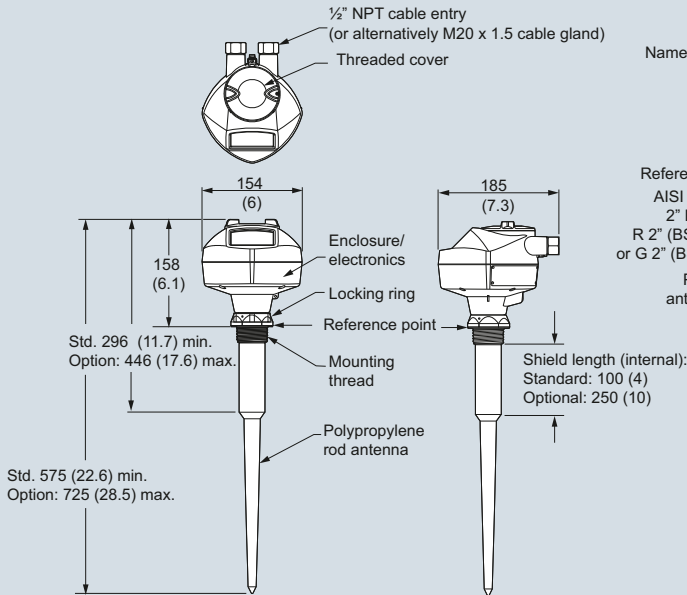
¹⁾ Available with communication option 2 only

²⁾ Product shipped with plastic cable gland, rated to -20 °C.
If -40 °C rating required, then metallic cable gland is recommended.

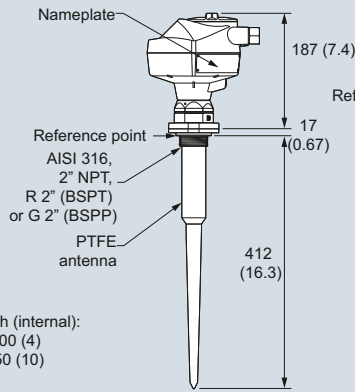
³⁾ Available with enclosure option 2 only

Dimensional drawings

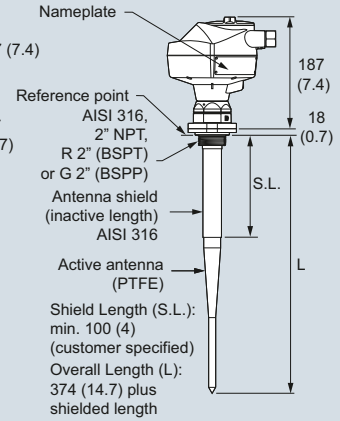
SITRANS LR200 with polypropylene shielded rod antenna



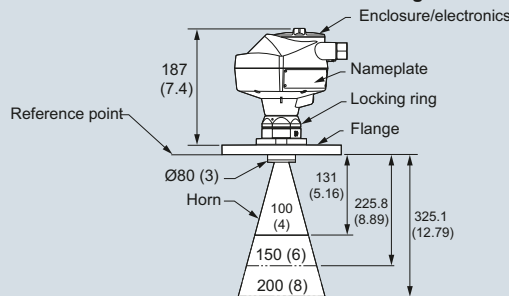
PTFE rod antenna, threaded



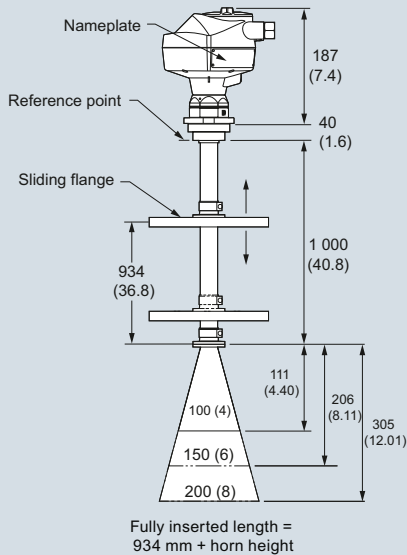
Threaded connection PTFE rod, external shield



Horn antenna with flat faced flange



Sliding waveguide



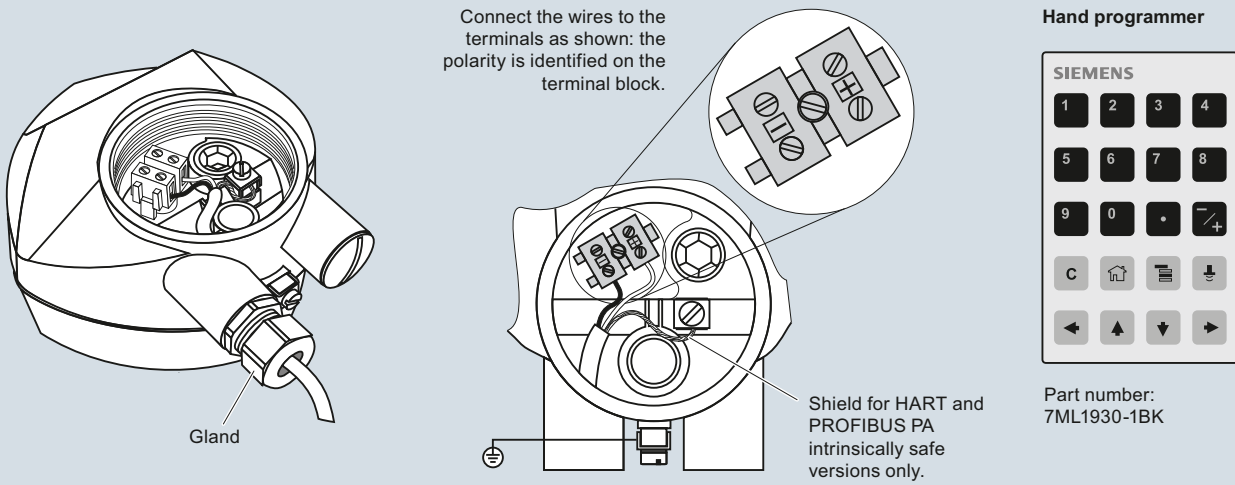
SITRANS LR200, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200

Schematics



Notes:

1. DC terminal shall be supplied from an SELV source in accordance with IEC 1010-1 Annex H.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR200 connections

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200 Antennas

Integration



Antenna configurations for SITRANS LR200

Technical specifications

Antenna Types	Flat Faced Flange with Rod	Shielded Rod	Horn (4", 6", 8" sizes available)
Connection type	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6 inch)	Threaded 2" NPT, R 2" (BSPT), G 2" (BSPP) or flat faced flange nominal pipe sizes 80, 100 mm (3, 4 inch)	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6 inch)
Wetted parts	PTFE	PTFE, 316L stainless steel, FKM o-ring	316L stainless steel PTFE, FKM o-ring
Extensions	50 or 100 mm (2 or 4 inch) PTFE or UHMW-PE	100, 150, 200 or 250 mm (4, 6, 8 or 10 inch) standard shield length	Use waveguide for extensions to 6 m (20 ft) long
Dielectric constant	> 3	> 3	> 3
Insertion length (max.)	41 cm (16.3 inch)	Variable	Variable with extension
Purging option (liquid or gas)	No	No	Yes
Sliding waveguide option for digesters¹⁾	Yes	No	Yes
Weight²⁾	6.5 kg (14.3 lb)	5.0 kg (11 lb)	7.5 kg (16.5 lb)

¹⁾ Maximum pressure 0.5 bar g at 60 °C (7.25 psi g at 140 °F)

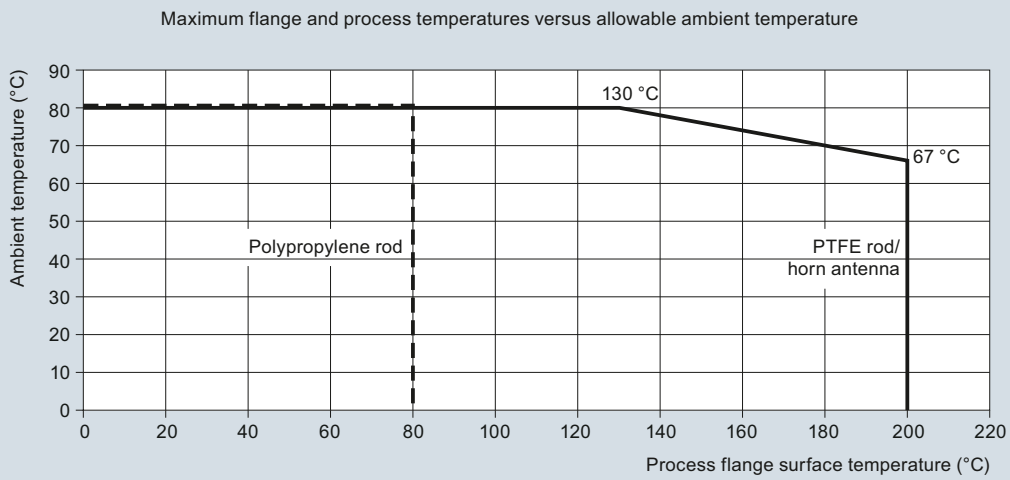
²⁾ Not including extensions, includes SITRANS LR200 and smallest process connection

Level Measurement

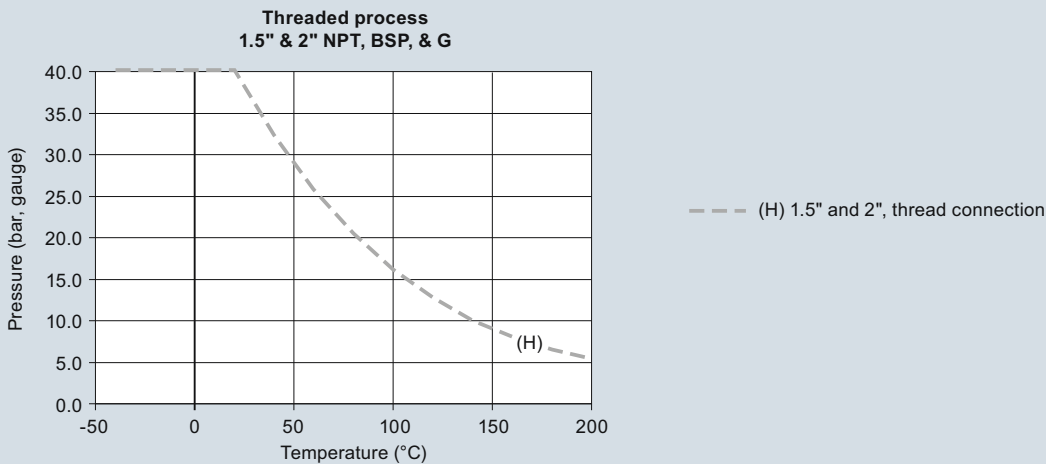
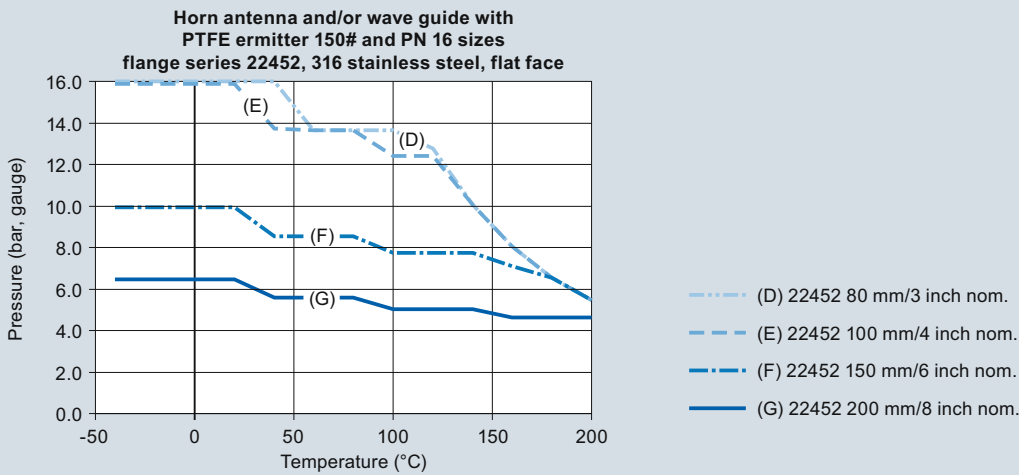
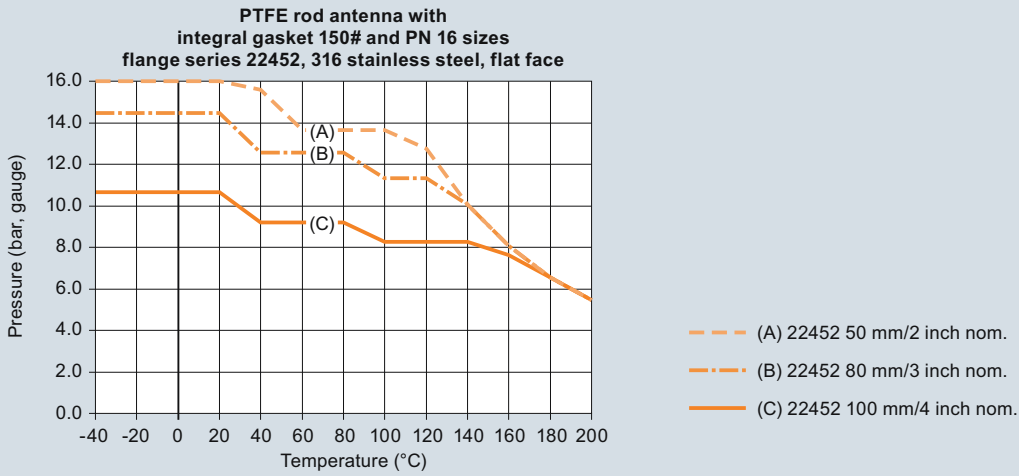
Continuous level measurement – Radar transmitters

SITRANS LR200 Antennas

Characteristic curves



SITRANS LR200 Ambient/Process Flange Surface Temperature Curve



SITRANS LR200 Process Pressure/Temperature derating curves



Level Measurement

Continuous level measurement – Radar transmitters


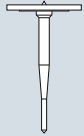
SITRANS LR200 Specials


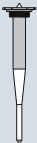
Selection and ordering data


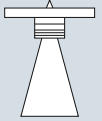
SITRANS LR200 Specials

	Article No.
<p>SITRANS LR200 PROFIBUS PA Aluminum Enclosure Kit with electronics and covers (7ML5422, 7ML5423, 7ML5424, 7ML5425), calibrated for use with standard rod antenna</p> 	
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection. ⁵⁾	A5E01483420
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection. ⁵⁾	A5E01483440
SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection. ⁵⁾	A5E01483456
SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option C, with PROFIBUS PA communication, no process connection. ⁵⁾	A5E01483547
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option E, with PROFIBUS PA communication, no process connection. ⁵⁾	A5E01483559
<p>SITRANS LR200 HART aluminum enclosure kit with electronics and covers (7ML5422, 7ML5423, 7ML5424, 7ML5425), calibrated for use with standard rod antenna</p> 	
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	A5E02956419
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	A5E02956420
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	A5E02956421
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	A5E02956422

SITRANS LR200 Specials

	Article No.
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	A5E03617085
SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	A5E03617086
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, NPT cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	A5E03617087
SITRANS LR200 aluminum enclosure with board stack, LUI display, 6.3 GHz, NPT cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection. ⁵⁾	A5E03617088
<p>SITRANS LR200 Horn Antenna Kits with mounting screws (no emitter supplied)</p> 	
80 mm (3 inch) horn antenna kit	PBD:25500K02A
100 mm (4 inch) horn antenna kit	PBD:25500K03A
150 mm (6 inch) horn antenna kit	PBD:25500K05A
200 mm (8 inch) horn antenna kit	PBD:25500K07A
<p>SITRANS LR200 Extension Kits for Horn Antenna with mounting screws</p>	
100 mm (4 inch) extension kit for horn antenna	PBD:25501K0100A
150 mm (6 inch) extension kit for horn antenna	PBD:25501K0150A
200 mm (8 inch) extension kit for horn antenna	PBD:25501K0200A
250 mm (10 inch) extension kit for horn antenna	PBD:25501K0250A
500 mm (20 inch) extension kit for horn antenna	PBD:25501K0500A
1 000 mm (40 inch) extension kit for horn antenna	PBD:25501K1000A
<p>SITRANS LR200 Flanged Rod Antenna Kit with 316L stainless steel flat faced flanges</p> 	
Flanged PTFE rod antenna kit, 2" ASME, 150 lb. See drawing 51003 on http://www.siemens.com/radar ¹⁾⁴⁾	PBD:51003K020AAAA
Flanged PTFE rod antenna kit, DN 50 PN 16. See drawing 51003 on http://www.siemens.com/radar ¹⁾⁴⁾	PBD:51003K050AJAA
Flanged PTFE rod antenna kit, JIS 10K DN 50. See drawing 51003 on http://www.siemens.com/radar ¹⁾⁴⁾	PBD:51003K050AOAA

SITRANS LR200 Specials	
	Article No.
<p>SITRANS LR200 PTFE Rod Antenna Kit with 316L stainless steel 1½" pipe thread process connection</p>  <p>PTFE rod antenna kit, 1½" NPT 316L stainless steel process connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar⁴⁾</p> <p>PTFE rod antenna kit, R 1½" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring; see drawing 51004 on http://www.siemens.com/radar⁴⁾</p> <p>PTFE rod antenna kit, 1½" G 316L stainless steel process connection, FKM O-ring; see drawing 51004 on http://www.siemens.com/radar⁴⁾</p>	<p>PBD: 51004K1AAA</p> <p>PBD: 51004K2AAA</p> <p>PBD: 51004K3AAA</p>
<p>SITRANS LR200 PTFE Rod Antenna Kit with 316L stainless steel 2" pipe thread process connection</p>  <p>PTFE rod antenna kit, 2" NPT 316L stainless steel process connection, FKM O-ring; see drawing 51005 on http://www.siemens.com/radar⁴⁾</p> <p>PTFE rod antenna kit, R 2" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring; see drawing 51005 on http://www.siemens.com/radar⁴⁾</p> <p>PTFE rod antenna kit, 2" G 316L stainless steel process connection, FKM O-ring; see drawing 51005 on http://www.siemens.com/radar⁴⁾</p>	<p>PBD: 51005K1AAA</p> <p>PBD: 51005K2AAA</p> <p>PBD: 51005K3AAA</p>

SITRANS LR200 Specials	
	Article No.
<p>SITRANS LR200 PTFE Rod Antenna Kit (100 mm shield) with 316L stainless steel 2" pipe thread process connection</p>  <p>PTFE rod antenna shielded kit, 2" NPT 316L stainless steel process connection, FKM O-ring, 100 mm 316L stainless steel shield. See drawing 51002 on http://www.siemens.com/radar³⁾⁴⁾</p> <p>PTFE rod antenna shielded kit, R 2" (BSPT), EN 10226 316L stainless steel process connection, FKM O-ring, 100 mm 316L stainless steel shield. See drawing 51002 on http://www.siemens.com/radar³⁾⁴⁾</p> <p>PTFE rod antenna shielded kit, 2" G 316L stainless steel process connection, FKM O-ring, 100 mm 316L stainless steel shield. See drawing 51002 on http://www.siemens.com/radar³⁾⁴⁾</p>	<p>PBD: 51002K0100AAA</p> <p>PBD: 51002K0100BAA</p> <p>PBD: 51002K0100CAA</p>
<p>SITRANS LR200 Horn Antenna Kit with 316L stainless steel flat faced flange, with PTFE emitter (without waveguide)</p>  <p>Horn antenna kit, 2" ASME 316L stainless steel flange 3" horn, PTFE emitter¹⁾⁴⁾</p> <p>Horn antenna kit, 2" ASME 316L stainless steel flange 4" horn, PTFE emitter¹⁾²⁾</p> <p>Horn antenna kit, 2" ASME 316L stainless steel flange 6" horn, PTFE emitter¹⁾²⁾</p> <p>Horn antenna kit, 2" ASME 316L stainless steel flange 8" horn, PTFE emitter¹⁾²⁾</p> <p>Horn antenna kit, DN 50 PN 16 316L stainless steel flange 80 mm horn, PTFE emitter¹⁾²⁾</p> <p>Horn antenna kit, DN 50 PN 16 316L stainless steel flange 100 mm horn, PTFE emitter¹⁾²⁾</p> <p>Horn antenna kit, DN 50 PN 16 316L stainless steel flange 150 mm horn, PTFE emitter¹⁾²⁾</p> <p>Horn antenna kit, DN 50 PN 16 316L stainless steel flange 200 mm horn, PTFE emitter¹⁾²⁾</p>	<p>PBD: 51006K020AAAA</p> <p>PBD: 51006K020AABA</p> <p>PBD: 51006K020AACA</p> <p>PBD: 51006K020AADA</p> <p>PBD: 51006K050AJAA</p> <p>PBD: 51006K050AJBA</p> <p>PBD: 51006K050AJCA</p> <p>PBD: 51006K050AJDA</p>

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR200 Specials

SITRANS LR200 Specials

Article No.

SITRANS LR200 PTFE flanged rod antenna kit with 316L stainless steel shield and 316L stainless steel flat faced flange



PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 100 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD:
51014K0100AAA

PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 100 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD:
51014K0100EJA

PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 150 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD:
51014K0150AAA

PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 150 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD:
51014K0150EJA

PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 200 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD:
51014K0200AAA

PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 200 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD:
51014K0200EJA

PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L stainless steel flange, 250 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD:
51014K0250AAA

PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L stainless steel flange, 250 mm 316L stainless steel shield. ¹⁾⁴⁾

PBD:
51014K0250EJA

SITRANS LR200 Specials

Article No.

PTFE paste

Kit, PTFE paste, Tube, 250 mL

PBD:51036065

Cable gland

One polymeric cable gland M20x1.5, rated -20 ... +80 °C (-4 ... +176 °F) for General Purpose and ATEX EEx e

7ML1930-1AN

One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART

7ML1930-1AP

One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA

7ML1930-1AQ

Please contact ceg.smpi@siemens.com for special requests.

- ¹⁾ Available in flange sizes including ASME, DIN and JIS: please contact ceg.smpi@siemens.com.
- ²⁾ Available with no pressure rating
- ³⁾ Available in other shield lengths: please contact ceg.smpi@siemens.com.
- ⁴⁾ Available with Pressure rating; serial number of original unit required with completed Application Questionnaire found on page 4/193.

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Horn Antenna

Overview



SITRANS LR250 is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).

Benefits

- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency allows for small antennas for easy mounting in nozzles
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Short blanking distance for improved minimum measuring range to 50 mm (2 inch) from the end of the antenna
- Communication using HART, PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools, such as PACWare or Fieldcare via SITRANS DTM
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511
- 3 mm (0.118 inch) accuracy in accordance with IEC 60770-1

Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Start-up is easy using the Quick Start wizard with a few parameters required for basic operation.

The 25 GHz frequency creates a narrow, focused beam allowing for smaller horn antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without saving to open the instrument's lid.

SITRANS LR250 measures superbly on low dielectric media, and in small vessels, as well as tall and narrow vessels.

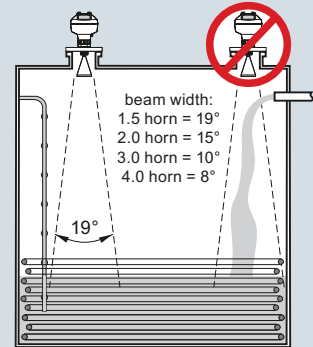
- Key Applications: liquid bulk storage tanks, process vessels, vaporous liquids, high temperatures, low dielectric media and applications with functional safety requirements

Configuration

Installation

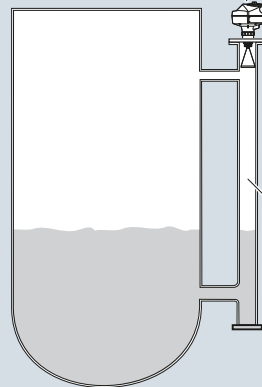
Note:

- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the horn antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.
- Use largest possible antenna.



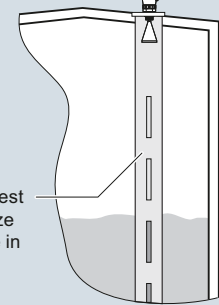
Mounting unit on bypass

Orient front or back of device toward vent.

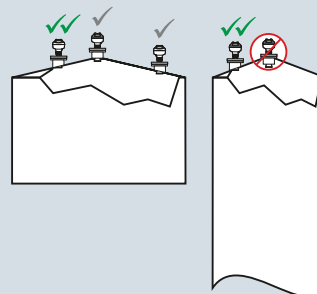


Mounting unit on stilling well

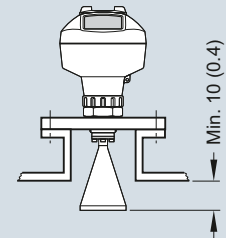
Orient front or back of device toward stillpipe slots.



Mounting unit on vessel



Mounting on a nozzle



SITRANS LR250 installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Horn Antenna

Technical specifications

Mode of operation		Process connections	
Measuring principle	Radar level measurement	• Process connection	1½", 2" or 3" NPT [(Taper), ANSI/ASME B1.20.1] R 1½", 2" or 3" [(BSPT), EN 10226] G 1½", 2" or 3" [(BSPP), EN ISO 228-1]
Frequency	K-band (25.0 GHz)	• Flange connection	2", 3", 4" (ANSI 150, 300 lb), 50, 80, 100 mm (PN 16, 40, JIS 10K)
Minimum measuring range	50 mm (2 inch) from end of antenna	Power supply	
Maximum measuring range	20 m (65 ft), antenna dependent	4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
Output		PROFIBUS PA	• 15 mA • Per IEC 61158-2
HART:	Version 5.1	FOUNDATION Fieldbus	• 20.0 mA • Per IEC 61158-2
• Analog output	4 ... 20 mA	Certificates and approvals	
• Accuracy	± 0.02 mA	General	
• Fail-safe	• Programmable as high low or hold (loss of echo) • NE 43 programmable	Radio	
PROFIBUS PA:	Profile 3.01	CSA _{US/C} , CE, FM, NE 21, RCM	
• Function blocks	2 Analog Input (AI)	Hazardous	
FOUNDATION Fieldbus	H1	• Explosion Proof (Brazil)	
• Functionality	Basic or LAS	• Increased Safety (Brazil)	
• Version	ITK 5.2.0	• Intrinsic Safety (Brazil)	
• Function blocks	2 Analog Input (AI)	• Explosion Proof (Canada/USA)	
Performance (according to reference conditions IEC60770-1)		• Intrinsic Safety (Canada/USA)	
Maximum measured error	3 mm (0.118 inch)	• Explosion Proof (Canada/USA)	
Influence of ambient temperature	< 0.003 %/K	• Intrinsic Safety (Canada/USA)	
Rated operating conditions		• Non-incendive (Canada/USA)	
Installation conditions		• Flame Proof/Increased Safety (China)	
• Location	Indoor/outdoor	• Intrinsic Safety (China)	
Ambient conditions (enclosure)		• Non-sparking (China)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	• Intrinsic Safety (Europe)	
• Installation category	I	• Non-sparking (Europe)	
• Pollution degree	4	• Flame Proof (International/Europe)	
Medium conditions		• Increased Safety (International/Europe)	
Dielectric constant ϵ_r	> 1.6, antenna and application dependent	• Intrinsic Safety (International)	
Process temperature	-40 ... +200 °C (-40 ... +392 °F) (at process connection with FKM O-ring) -20 ... +200 °C (-4 ... +392 °F) (at process connection with FFKM O-ring)	• Explosion Proof (Russia)	
Process pressure	Up to 40 bar g (580 psi g), process connection and temperature dependent. See Pressure/Temperature curves for more information	• Increased Safety (Russia)	
Design		• Intrinsic Safety (Russia)	
Enclosure		• Marine	
• Material	Aluminum, polyester powder-coated	• Functional Safety	
• Cable inlet	2 x M20x1.5 or 2 x ½" NPT	SIL-2 suitable in accordance with IEC 61508/61511	
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68		
Weight	< 3 kg (6.6 lb) 3.75 mm (1½ inch) threaded connection with 1½" horn antenna		
Display (local)	Graphic local user interface including quick start wizard and echo profile display		
Antenna			
• Material	316L stainless steel [optional alloy N06022/2.4602 (Hastelloy C-22 or equivalent)]		
• Dimensions (nominal horn sizes)	Standard 1.5 inch (40 mm), 2 inch (48 mm), 3 inch (75 mm), 4 inch (95 mm) horn and optional 100 mm (4 inch) horn extension		

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Horn Antenna

Programming

<ul style="list-style-type: none"> • Intrinsically Safe Siemens handheld programmer - Approvals for handheld programmer 	Infrared receiver IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135 °C T _a = -20 ... +50 °C CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = +50 °C IECEx SIR 09.0073
<ul style="list-style-type: none"> • Handheld communicator • PC 	HART communicator 375/475 <ul style="list-style-type: none"> • SIMATIC PDM • Emerson AMS • SITRANS DTM (for connection into FDT, such as PACTware or Fieldcare)
<ul style="list-style-type: none"> • Display (local) 	Graphic local user interface including quick start wizard and echo profile displays

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Horn Antenna

Selection and Ordering data	Article No.
SITRANS LR250 horn antenna	7ML5431-
2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft) (antenna dependent). Ideal for small vessels and low dielectric media.	0 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process Connection and Antenna Material	
316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FKM seal ¹⁾	0
316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FFKM seal ¹⁾	1
Hastelloy C-22/2.4602 (or equivalent), PTFE emitter, FKM seal ²⁾	2
Hastelloy C-22/2.4602 (or equivalent), PTFE emitter, FFKM seal ²⁾	3
Process Connection Type	
Threaded connection 316L	
1½" NPT (ASME B1.20.1) (tapered thread) ³⁾	AA
R 1½" [(BSPT), EN 10226-1] (tapered thread) ³⁾	AB
G 1½" [(BSPP), EN ISO 228-1] (parallel thread) ³⁾	AC
2" NPT (ASME B1.20.1) (tapered thread)	AD
R 2" [(BSPT), EN 10226-1] (tapered thread)	AE
G 2" [(BSPP), EN ISO 228-1] (parallel thread)	AF
3" NPT (ASME B1.20.1) (tapered thread)	AG
R 3" [(BSPT), EN 10226-1] (tapered thread)	AH
G 3" [(BSPP), EN ISO 228-1] (parallel thread)	AJ
Flanged connection 316L	
2" Class 150 ASME B16.5 flat faced ⁴⁾	BA
3" Class 150 ASME B16.5 flat faced ⁴⁾	BB
4" Class 150 ASME B16.5 flat faced ⁴⁾	BC
2" Class 300 ASME B16.5 flat faced ⁴⁾	CA
3" Class 300 ASME B16.5 flat faced ⁴⁾	CB
4" Class 300 ASME B16.5 flat faced ⁴⁾	CC
DN 50 PN 16 EN 1092-1 Type A flat faced ⁴⁾	DA
DN 80 PN 16 EN 1092-1 Type A flat faced ⁴⁾	DB
DN 100 PN 16 EN 1092-1 Type A flat faced ⁴⁾	DC
DN 50 PN 40 EN 1092-1 Type A flat faced ⁴⁾	EA
DN 80 PN 40 EN 1092-1 Type A flat faced ⁴⁾	EB
DN 100 PN 40 EN 1092-1 Type A flat faced ⁴⁾	EC
50A 10K JIS B 2220 flat faced ⁴⁾	FA
80A 10K JIS B 2220 flat faced ⁴⁾	FB
100A 10K JIS B 2220 flat faced ⁴⁾	FC
DN 50 PN 16 DIN EN 1092-1 Type B1 raised face	GA
DN 80 PN 16 DIN EN 1092-1 Type B1 raised face	GB
DN 100 PN 16 DIN EN 1092-1 Type B1 raised face	GC
DN 150 PN 16 DIN EN 1092-1 Type B1 raised face	GD
DN 50 PN 40 DIN EN 1092-1 Type B1 raised face	HA
DN 80 PN 40 DIN EN 1092-1 Type B1 raised face	HB
DN 100 PN 40 DIN EN 1092-1 Type B1 raised face	HC
DN 150 PN 40 DIN EN 1092-1 Type B1 raised face	HD

Selection and Ordering data	Article No.
SITRANS LR250 horn antenna	7ML5431-
2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft) (antenna dependent). Ideal for small vessels and low dielectric media.	0 -
Flanged connection Hastelloy C	
2" Class 150 ASME B16.5 raised faced ⁴⁾	JA
3" Class 150 ASME B16.5 raised faced ⁴⁾	JB
4" Class 150 ASME B16.5 raised faced ⁴⁾	JC
2" Class 300 ASME B16.5 raised faced ⁴⁾	JD
3" Class 300 ASME B16.5 raised faced ⁴⁾	JE
4" Class 300 ASME B16.5 raised faced ⁴⁾	JF
DN 50 PN 16 EN 1092-1 Type B1 raised faced ⁴⁾	KA
DN 80 PN 16 EN 1092-1 Type B1 raised faced ⁴⁾	KB
DN 100 PN 16 EN 1092-1 Type B1 raised faced ⁴⁾	KC
DN 50 PN 40 EN 1092-1 Type B1 raised faced ⁴⁾	KD
DN 80 PN 40 EN 1092-1 Type B1 raised faced ⁴⁾	KE
DN 100 PN 40 EN 1092-1 Type B1 raised faced ⁴⁾	KF
50A 10K JIS B 2220 raised faced ⁴⁾	LA
80A 10K JIS B 2220 raised faced ⁴⁾	LB
100A 10K JIS B 2220 raised faced ⁴⁾	LC
DN 50 PN 16 EN 1092-1 Type B1 raised face	MA
DN 80 PN 16 EN 1092-1 Type B1 raised face	MB
DN 100 PN 16 EN 1092-1 Type B1 raised face	MC
DN 150 PN 16 EN 1092-1 Type B1 raised face	MD
DN 50 PN 40 EN 1092-1 Type B1 raised face	ME
DN 80 PN 40 EN 1092-1 Type B1 raised face	MF
DN 100 PN 40 EN 1092-1 Type B1 raised face	MG
DN 150 PN 40 EN 1092-1 Type B1 raised face	MH
Communication/Output	
PROFIBUS PA	1
4 ... 20 mA, HART, start-up at < 3.6 mA	2
FOUNDATION Fieldbus	3
Enclosure/Cable inlet	
Aluminum, Epoxy painted	
2 x ½" NPT	0
2 x M20x1.5	1
Antenna	
1½" horn	A
2" horn (fits 2" ASME or DN 50 nozzles)	B
3" horn (fits 3" ASME or DN 80 nozzles)	C
4" horn (fits 4" ASME or DN 100 nozzles)	D
1½" horn with 100 mm extension	E
2" horn with 100 mm extension	F
3" horn with 100 mm extension	G
4" horn with 100 mm extension	H
Hastelloy C22 (or equivalent)	
2" horn (fits 2" ASME or DN 50 nozzles)	J
3" horn (fits 3" ASME or DN 80 nozzles)	K
4" horn (fits 4" ASME or DN 100 nozzles)	L
2" horn (fits 2" ASME or DN 50 nozzles) with 100 mm extension	M
3" horn (fits 3" ASME or DN 80 nozzles) with 100 mm extension	N
4" horn (fits 4" ASME or DN 100 nozzles) with 100 mm extension	P

Selection and Ordering data	Article No.
SITRANS LR250 horn antenna	7ML5431-
2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft) (antenna dependent). Ideal for small vessels and low dielectric media.	0 -
Approvals	
General Purpose: CE, CSA, FM, FCC, R&TTE, RCM	A
Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div.1, Groups E,F, G, Class III T4 FCC, Industry Canada	B
Intrinsically Safe: IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM	C
Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada	D
Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, R&TTE, RCM	E
Increased Safety: IECEx/ATEX II 1/2 GD, 1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ⁵⁾	F
Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ⁵⁾	G
Explosion proof: CSA/FM Class I, II and III, Div.1, Groups A, B, C, D, E, F, G, FCC, Industry Canada ⁵⁾	H
Non Sparking: NEPSI Ex nA IIC T4 Gc	K
Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C	L
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C ⁵⁾	M
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C ⁵⁾	N
Pressure rating	
Rating per Pressure/Temperature curves in manual	0
0.5 bar g (7.25 psi g) maximum	1

- 1) Available with process connection options AA ... HD & Antenna Versions A ... H only
 - 2) Available with process connection options JA ... MH & Antenna Versions J ... P only
 - 3) Available For antenna versions A and E only, max. range 10 m (32.8 ft), dk > 3. Can measure dk > 1.6 [20 m (65.6 ft)] when mounted in a stillpipe/ bypass.
 - 4) Siemens Milltronics type flange (flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2220 standard), see operating instructions for details
 - 5) Applicable with communication option 2 only
- ◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

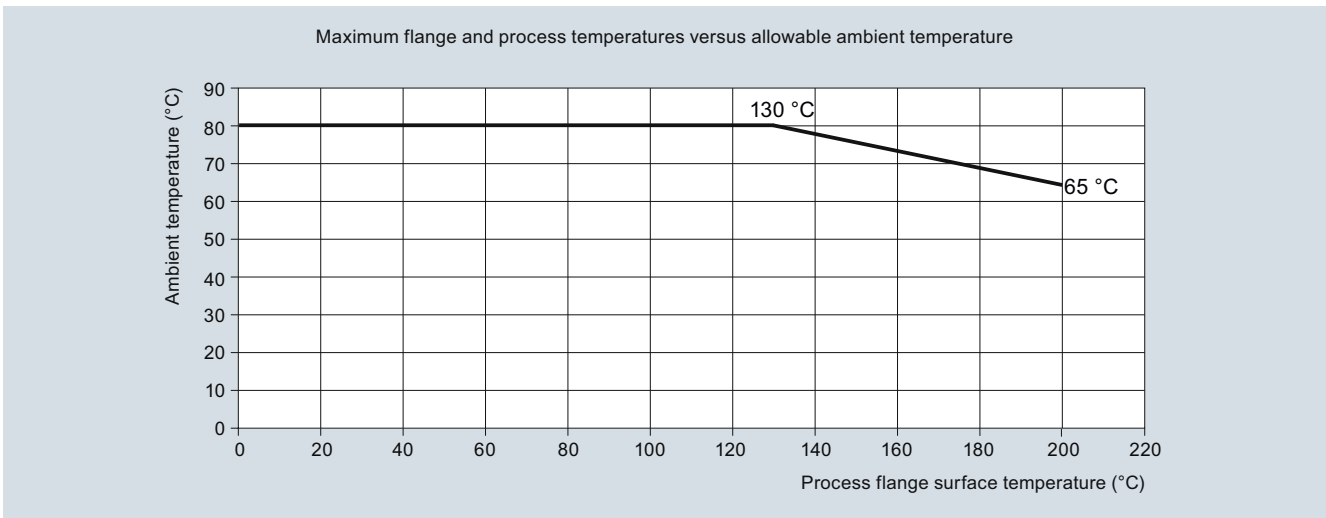
Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Horn Antenna

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs		Operating Instructions for FOUNDATION Fieldbus device	
Please add "-Z" to Article No. and specify Order code(s).		English	A5E32221411
Plug M12 with mating Connector ¹⁾²⁾³⁾	◆ A50	German	A5E32376112
Plug 7/8" with mating Connector ²⁾³⁾⁴⁾	◆ A55	Note: The Operating Instructions should be ordered as a separate line item on the order.	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	◆ Y15	Compact Operating Instructions for FOUNDATION Fieldbus device	
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	◆ C11	English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33472700
Inspection certificate 3.1 of EN 10204	◆ C12	English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33472738
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 ³⁾⁵⁾	◆ C20	This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	
Namur NE43 compliant, device preset to failsafe < 3.6 mA ⁵⁾	◆ N07	Accessories	
Operating Instructions for HART/mA device	Article No.	Handheld programmer, Intrinsically safe, EEx ia	7ML1930-1BK
English	A5E32220602	HART modem/USB (for use with a PC and SIMATIC PDM)	7MF4997-1DB
German	A5E32376088	One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (two are required)	7ML1930-1AP
Note: The Operating Instructions should be ordered as a separate line item on the order.		One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (two are required) ⁶⁾	7ML1930-1AQ
Compact Operating Instructions for HART/mA device		FDA approved FKM o-ring for 2" G (BSPP) process connections -28 ... +80 °C (-28 ... +176 °F)	7ML1830-3AN
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33469191	SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33469171	SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.		SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
Operating Instructions for PROFIBUS PA device		SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
English	A5E32221386	For applicable back up point level switch - see point level measurement section	
German	A5E32376094		
Note: The Operating Instructions should be ordered as a separate line item on the order.			
Compact Operating Instructions for PROFIBUS PA device			
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33469239		
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33472685		
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.			
		1) Available with enclosure option 1 only	
		2) To be used with communication options 1 and 3 only. Connector has IP67 rating.	
		3) Available with approval options A and B. Available with approval option C for use on intrinsically safe applications only. Not rated for dust Ex.	
		4) Available with enclosure option 0 only	
		5) Applicable to communication option 2 only	
		6) For use with communication option 1 and 3 only	
		◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.	

Characteristic curves



SITRANS LR250 Ambient/Process Flange Surface Temperature Curve

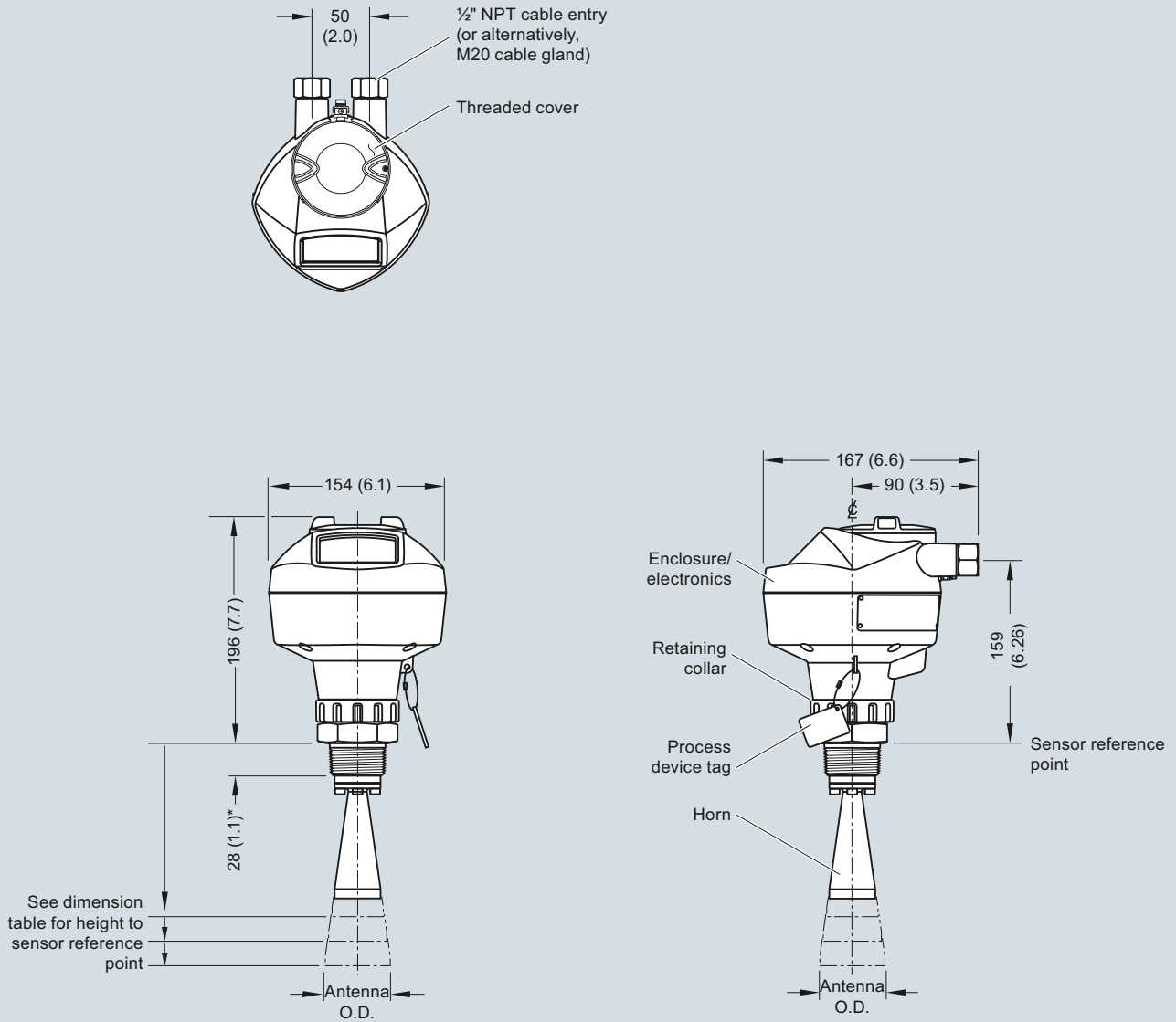
Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Horn Antenna

Dimensional drawings

Threaded Horn Antenna



*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

Antenna Type	Antenna O.D.	Height to sensor reference point			Beam angle	Measurement range
		1-1/2" threaded connection	2" threaded connection	3" threaded connection		
1.5" horn	39.8 (1.57)	135 (5.3)	N/A	N/A	19 degrees	10 m (32.8 ft)
2" horn	47.8 (1.88)	N/A	166 (6.55)	180 (7.09)	15 degrees	20 m (65.6 ft)
3" horn	74.8 (2.94)	N/A	199 (7.85)	213 (8.39)	10 degrees	20 m (65.6 ft)
4" horn	94.8 (3.73)	N/A	254 (10)	268 (10.55)	8 degrees	20 m (65.6 ft)

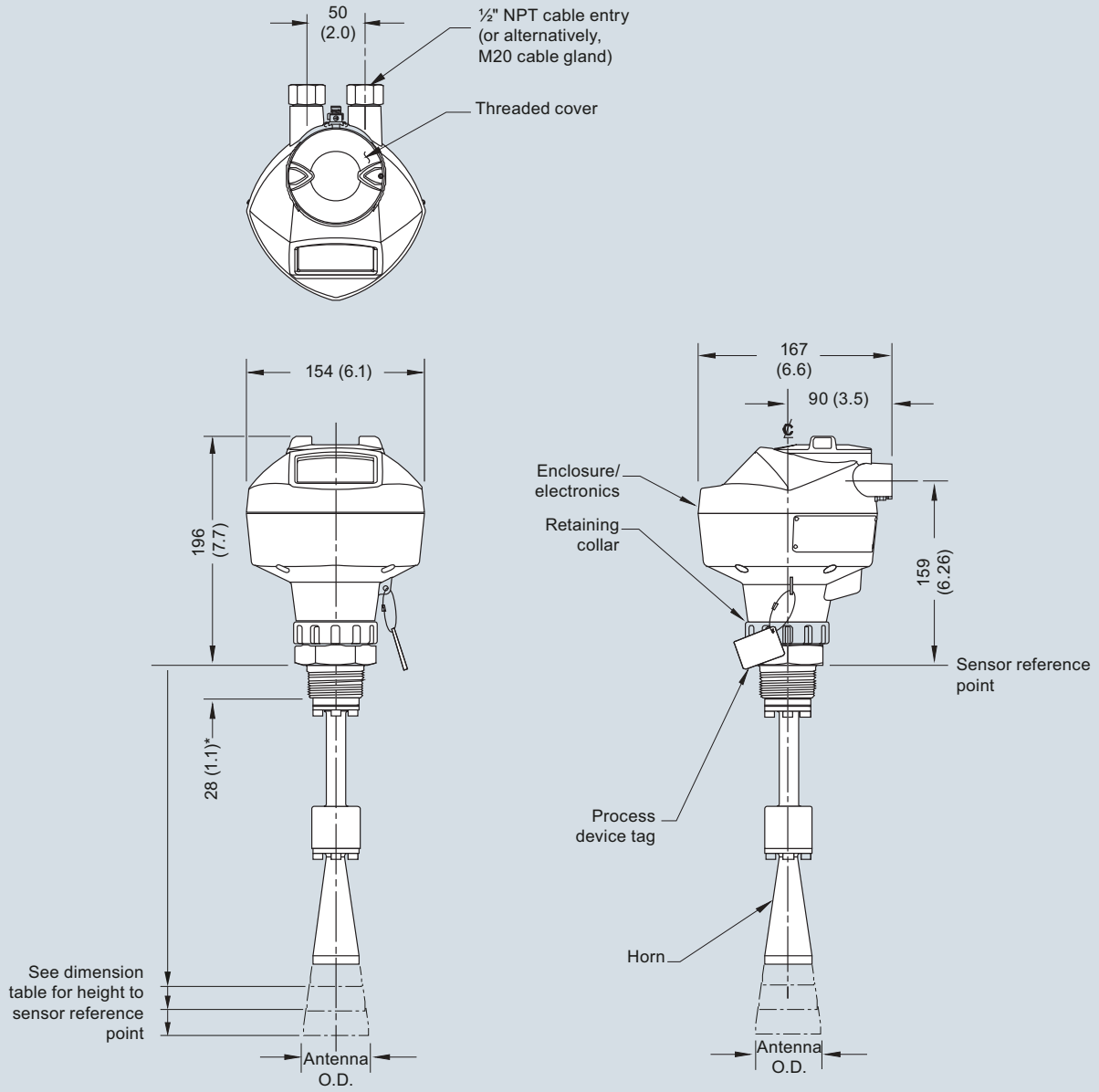
SITRANS LR250 Threaded Horn Antenna, dimensions in mm (inch)

Level Measurement
Continuous level measurement – Radar transmitters

SITRANS LR250 Horn Antenna

4

Threaded Horn Antenna with Extension



*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

Antenna Type	Antenna O.D.	Height to sensor reference point			Beam angle	Measurement range
		1-1/2" threaded connection	2" threaded connection	3" threaded connection		
1.5" horn	139.8 (5.57)	235 (9.3)	N/A	N/A	19 degrees	10 m (32.8 ft)
2" horn	147.8 (5.88)	N/A	266 (10.55)	280 (11.09)	15 degrees	20 m (65.6 ft)
3" horn	174.8 (6.94)	N/A	299 (11.85)	313 (12.39)	10 degrees	20 m (65.6 ft)
4" horn	194.8 (7.73)	N/A	354 (14)	368 (14.55)	8 degrees	20 m (65.6 ft)

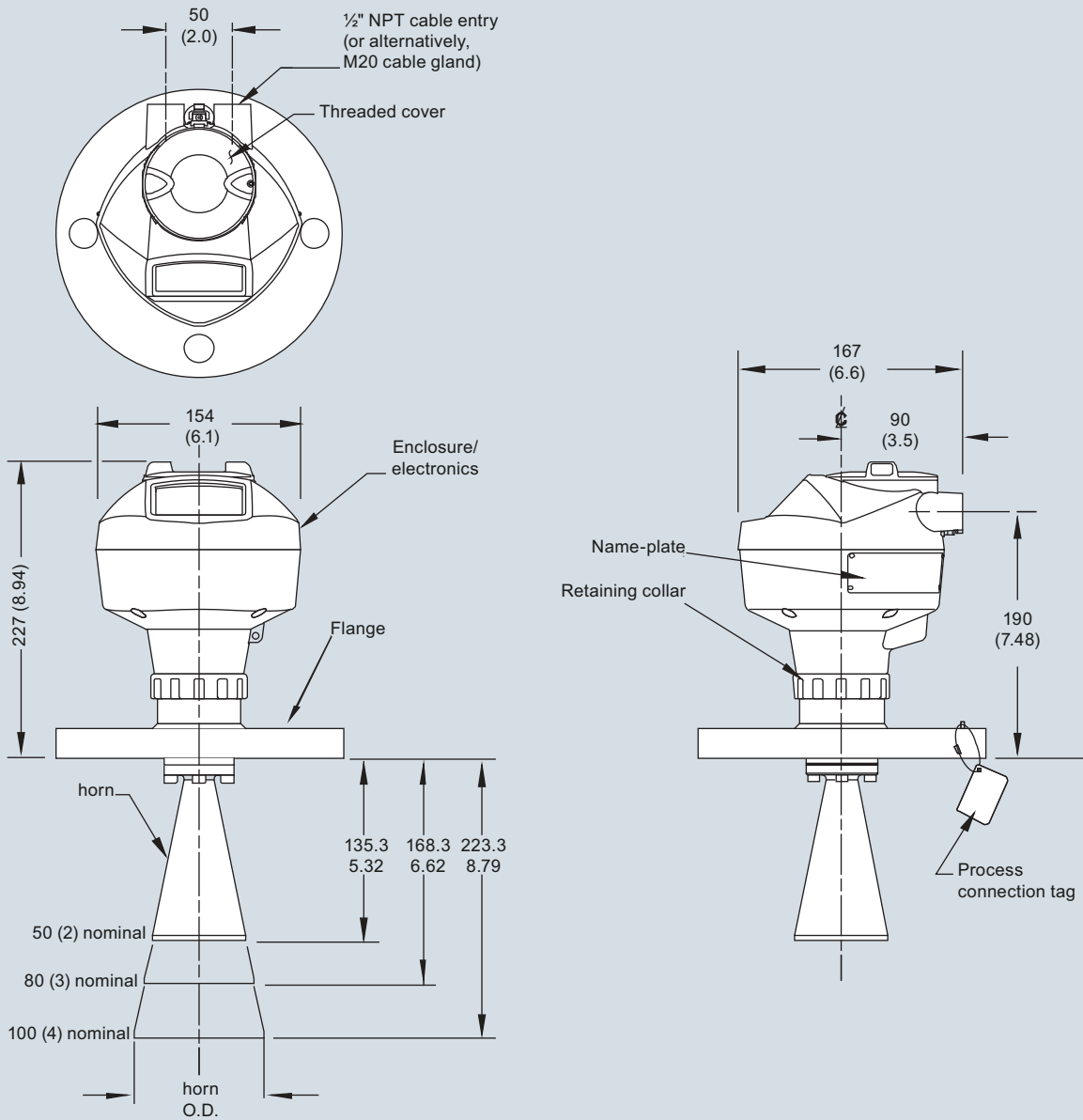
SITRANS LR250 Threaded Horn Antenna with Extension, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Horn Antenna

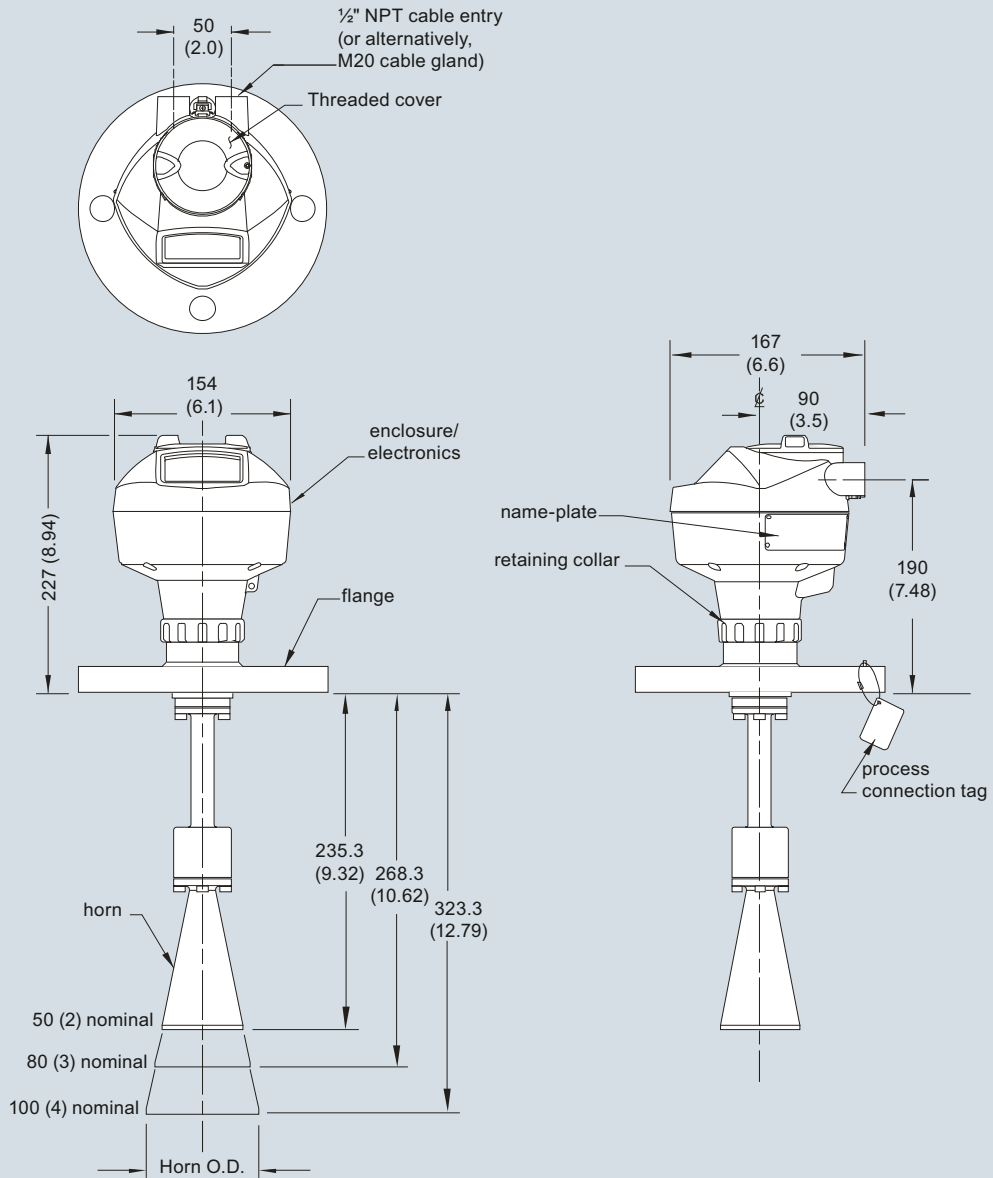
Flanged Horn



Nominal Horn Size	Horn O.D.	Height to sensor reference point		Beam angle	Measurement range
		Stainless steel flange raised or flat-faced	Optional alloy flange		
50 (2)	47.8 (1.88)	135.3 (5.32)	138.3 (5.44)	19 degrees	10 m (32.8 ft)
80 (3)	74.8 (2.94)	168.3 (6.62)	171.3 (6.74)	15 degrees	20 m (65.6 ft)
100 (4)	94.8 (3.73)	223.3 (8.79)	226.3 (8.90)	10 degrees	20 m (65.6 ft)

SITRANS LR250 Flanged Horn Antenna, dimensions in mm (inch)

Flanged Horn with Extension



Nominal Horn Size	Horn O.D.	Height to sensor reference point		Beam angle	Measurement range
		Stainless steel flange raised or flat-faced	Optional alloy flange		
50 (2)	47.8 (1.88)	235.3 (9.32)	238.3 (9.44)	19 degrees	10 m (32.8 ft)
80 (3)	74.8 (2.94)	268.3 (10.62)	271.3 (10.74)	15 degrees	20 m (65.6 ft)
100 (4)	94.8 (3.73)	323.3 (12.79)	326.3 (12.90)	10 degrees	20 m (65.6 ft)

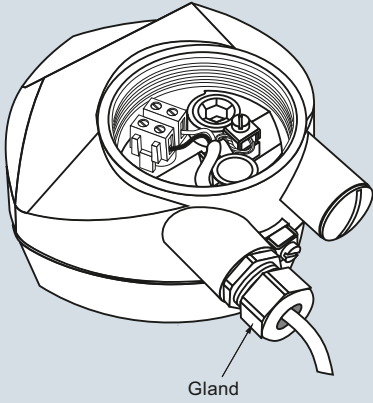
SITRANS LR250 Flanged Horn Antenna with Extension, dimensions in mm (inch)

Level Measurement

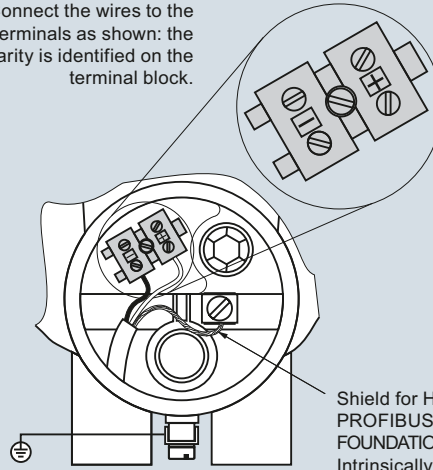
Continuous level measurement – Radar transmitters

SITRANS LR250 Horn Antenna

Schematics

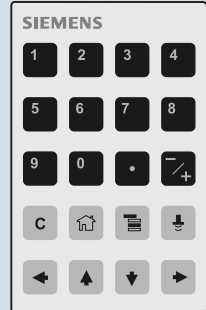


Connect the wires to the terminals as shown: the polarity is identified on the terminal block.



Shield for HART, PROFIBUS PA, and FOUNDATION Fieldbus Intrinsically Safe versions only.

Hand Programmer



Part number:
7ML1930-1BK



Notes:

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.



SITRANS LR250 connections

Selection and ordering data

SITRANS LR250 Specials

	Article No.
SITRANS LR250 horn version enclosures (PROFIBUS PA models) 	
LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E01156836
LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E01156838
LR250 horn version enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection	A5E01156839
LR250 horn version enclosure with board stack, M20 cable inlet, approval option B, with PROFIBUS PA communication, no process connection	A5E01156841
LR250 horn version enclosure with board stack, NPT cable inlet, approval option C, with PROFIBUS PA communication, no process connection	A5E01156843
LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	A5E01156844
LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	A5E01156846
LR250 horn version enclosure with board stack, M20 cable inlet, approval option D, with PROFIBUS PA communication, no process connection	A5E01156848
LR250 enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION FIELDBUS communication, no process connection	A5E03769538
LR250 enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION FIELDBUS communication, no process connection	A5E03769539
LR250 enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION FIELDBUS communication, no process connection	A5E03769543
SITRANS LR250 horn version enclosures (FOUNDATION Fieldbus models) 	
LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	A5E02654608
LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E02653792
LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E02653793
LR250 horn version enclosure with board stack, NPT cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	A5E02654606

SITRANS LR250 Specials

	Article No.
SITRANS LR250 horn version enclosures (< 3.6 mA start-up HART) 	
SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	A5E02956317
SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection	A5E02956319
SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection	A5E02956320
SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection	A5E02956322
SITRANS LR250 horn version enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection	A5E02956323
LR250 horn version enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	A5E03441096
LR250 horn version enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection	A5E03441097
LR250 horn version enclosure with board stack, NPT cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection	A5E03441098
LR250 horn version enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection	A5E03441099
SITRANS LR250 horn antenna and extension kits 	
38 mm (1.5 inch) horn antenna kit, 1.5" Process Connections only	A5E01151539
100 mm (4 inch) horn antenna extension kit, 1.5" Process Connections only	A5E01151553
50 mm (2 inch) stainless steel 316L horn antenna kit	A5E01151569
75 mm (3 inch) stainless steel 316L horn antenna kit	A5E01151571
100 mm (4 inch) stainless steel 316L horn antenna kit	A5E01151573
100 mm (4 inch) horn antenna extension kit, 50 mm (2 inch), 75 mm (3 inch) and 100 mm (4 inch) process connection	A5E01151577
50 mm (2 inch) horn antenna kit, Hastelloy C-22	A5E01151584
75 mm (3 inch) horn antenna kit, Hastelloy C-22	A5E01151585
100 mm (4 inch) horn antenna kit, Hastelloy C-22	A5E01151587
5 Dupont 1Gr Polyback, PTFE grease kit	A5E01151626
LR250 lid with O-ring	A5E02465410

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 threaded PVDF antenna

Overview



SITRANS LR250 with threaded PVDF antenna is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including corrosives or aggressive materials, to a range of 10 m (32.8 ft) or 20 m (66 ft) when used in a stilling pipe.

Benefits

- Fully insulated PVDF antenna design for use in chemical and sanitary environments where aggressive and corrosive materials are used
- Cost effective replacement for transmitters made of exotic materials
- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency and 50 mm (2 inch) process connection/antenna allow for easy mounting in nozzles
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Short blanking distance for improved minimum measuring range to 50 mm (2 inch) from the end of the antenna
- Communication using HART or PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools, such as PACTware or Fieldcare via SITRANS DTM.
- Suitable for use in Safety Related Systems in accordance with IEC 61508/61511 (SIL-2)
- 3 mm (0.118 inch) accuracy in accordance with IEC 60770-1

Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Start-up is easy using the Quick Start wizard with a few parameters required for basic operation.

The 25 GHz frequency creates a narrow, focused beam allowing for smaller antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 10 m (32 ft) on materials with $dk > 3$ or 20 m (66 ft) when used in a stilling pipe with $dk \geq 1.6$.

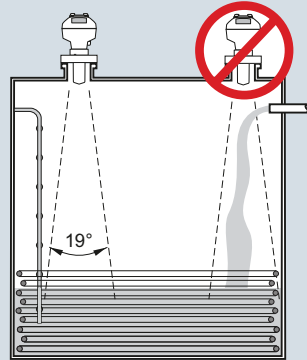
- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, temperatures to 80 °C (176 °F), corrosive and aggressive materials and applications requiring functional safety

Configuration

Installation

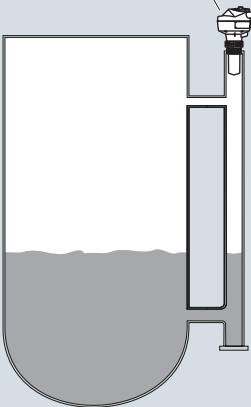
Note:

- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



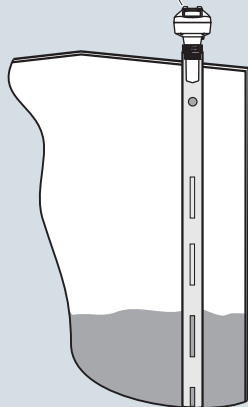
Mounting unit on bypass

Orient front or back of device toward vent.

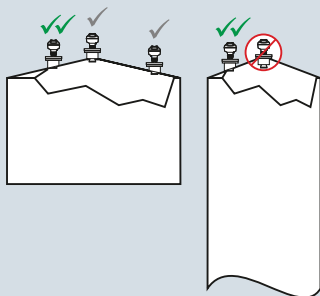


Mounting unit on stilling well

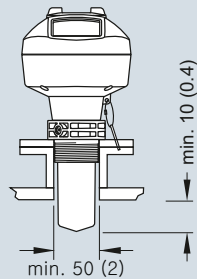
Orient front or back of device toward stillpipe slots.



Mounting unit on vessel



Mounting on a nozzle



SITRANS LR250 PVDF antenna installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 threaded PVDF antenna

Technical specifications

Mode of operation		Power supply	
Measuring principle	Radar level measurement	4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
Frequency	K-band (25.0 GHz)	PROFIBUS PA	<ul style="list-style-type: none"> 15 mA per IEC 61158-2
Minimum measuring range	50 mm (2 inch) from end of antenna	FOUNDATION Fieldbus	<ul style="list-style-type: none"> 20.0 mA per IEC 61158-2
Maximum measuring range	10 m (32.8 ft) or 20 m (66 ft) when used in a stilling pipe with $dk \geq 1.6$	Certificates and approvals	
Output		General	
HART	Version 5.1	Radio	
<ul style="list-style-type: none"> Analog output Accuracy Fail-safe 	4 ... 20 mA ± 0.02 mA <ul style="list-style-type: none"> Programmable as high low or hold (loss of echo) NE 43 programmable 	CSA _{US/C} , CE, FM, NE 21, RCM FCC, Industry Canada and Europe ETSI EN 302-372, RCM	
PROFIBUS PA	Profile 3.1	Hazardous	
<ul style="list-style-type: none"> Function blocks 	2 Analog Input (AI)	<ul style="list-style-type: none"> Explosion Proof (Brazil) 	
FOUNDATION Fieldbus	H1	<ul style="list-style-type: none"> Increased Safety (Brazil) 	
<ul style="list-style-type: none"> Functionality Version Function blocks 	Basic or LAS ITK 5.2.0 2 Analog Input (AI)	<ul style="list-style-type: none"> Intrinsically Safe (Brazil) Explosion Proof (Canada/USA) 	
Performance (according to reference conditions IEC60770-1)		<ul style="list-style-type: none"> Intrinsically Safe (Canada/USA) 	
Maximum measured error	<ul style="list-style-type: none"> > 500 mm from sensor reference point: 3 mm (0.118 inch) < 500 mm from sensor reference point: 25 mm (1 inch) 	<ul style="list-style-type: none"> Non-incendive (Canada/USA) Flame Proof/Increased Safety (China) Intrinsically Safe (China) Non-sparking (China) Intrinsically Safe (Europe) Non-sparking/Energy Limited (Europe) Flame Proof (International/Europe) Increased Safety (International/Europe) Intrinsically Safe (International) Explosion Proof (Russia) Increased Safety (Russia) Intrinsically Safe (Russia) Marine 	
Influence of ambient temperature	< 0.003 %/K	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4 CSA/FM Class I, Div. 2, Groups A, B, C, D T5 Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C NEPSI Ex nA IIC T4 Gc ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia ta IIC T100 °C Da ATEX II 3G Ex nA IIC T4 Gc IECEx/ATEX II 1/2 GD, 1D, 2D, Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da IECEx/ATEX II 1/2 GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIC T100 °C Da GOST-R Ex d GOST-R Ex e GOST-R Ex ia <ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval Bureau Veritas 	
Rated operating conditions		Functional Safety	
Installation conditions		SIL-2 suitable in accordance with IEC 61508/61511	
Location	Indoor/outdoor	Programming	
Ambient conditions (enclosure)		Intrinsically Safe Siemens handheld programmer	
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	<ul style="list-style-type: none"> Approvals for handheld programmer 	
Installation category	I	IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135°C T _a = -20 ... +50 °C CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = +50 °C IECEx SIR 09.0073 HART communicator 375/475 <ul style="list-style-type: none"> SIMATIC PDM Emerson AMS SITRANS DTM (for connection into FDT, such as PACTware or Fieldcare) 	
Pollution degree	4	Handheld communicator PC	
Medium conditions		Display (local)	
Dielectric constant ϵ_r	≥ 3 (1.6 in stillpipe)	Graphic local user interface including quick start wizard and echo profile display	
Process temperature	-40 ... +80 °C (-40 ... +176 °F) at process connection (Is suitable for CIP at 120 °C for 1/2 hr max.)		
Process pressure	Up to 5 bar g (72 psi g) temperature dependent. See Pressure/Temperature curves for more information		
Design			
Enclosure			
<ul style="list-style-type: none"> Material Cable inlet 	Aluminum, polyester powder-coated		
Degree of protection	2 x M20x1.5 or 2 x 1/2" NPT Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68		
Weight	approximately 3.3 kg (7.27 lb)		
Display (local)	Graphic local user interface including quick start wizard and echo profile display		
Antenna			
<ul style="list-style-type: none"> Material Dimensions (nominal sizes) 	PVDF (Polyvinylidene fluoride) 2 inch (48 mm)		
Process connections			
Process connection	2" NPT [(Taper), ASME B1.20.1] 2" [(BSPT), EN 10226] 2" [(BSPP), EN ISO 228-1]		

Level Measurement
Continuous level measurement – Radar transmitters

SITRANS LR250 threaded PVDF antenna

Selection and Ordering data	Article No.
SITRANS LR250 threaded PVDF antenna 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including corrosives or aggressive materials, to a range of 10 m (32.8 ft) or 20m (66ft) when used in a stilling pipe. ➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML5431- 0 -
Process Connection and Antenna Material Threaded PVDF antenna	4
Process Connection Type Threaded connections PVDF 2" NPT (ASME B1.20.1) (tapered thread) R 2" [(BSPT), EN 10226-1] (tapered thread) G 2" [(BSPP), EN ISO 228-1] (parallel thread)	PA PB PC
Communication/Output PROFIBUS PA 4 ... 20 mA, HART, start-up at < 3.6 mA FOUNDATION Fieldbus	1 2 3
Enclosure/Cable inlet Aluminum, Epoxy painted 2 x 1/2" NPT 2 x M20x1.5	0 1
Antenna 2 inch(50 mm) threaded PVDF antenna	R
Approvals General Purpose, CE, CSA, FM, FCC, R&TTE, RCM Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div.1, Groups E, F, G, Class III T4 FCC, Industry Canada Intrinsically Safe: IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, R&TTE, RCM Increased Safety: IECEx/ATEX II 1/2 GD, 1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ¹⁾ Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ¹⁾ Explosion proof: CSA/FM Class I, II and III, Div.1, Groups A, B, C, D, E, F, G, FCC, Industry Canada ¹⁾ Non Sparking: NEPSI Ex nA IIC T4 Gc Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C ¹⁾ Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C ¹⁾	A B C D E F G H K L M N
Pressure rating Rating per Pressure/Temperature curves in manual	2

¹⁾ Applicable to Communication option 2 only
 • We can offer shorter delivery times for configurations designated with the Quick Ship Symbol •. For details see page 9/5 in the appendix.

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s). Plug M12 with mating Connector ¹⁾²⁾³⁾ Plug 7/8" with mating Connector ²⁾³⁾⁴⁾ Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 Inspection Certificate Type 3.1 per EN 10204 Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 ⁵⁾⁶⁾ Namur NE43 compliant, device preset to failsafe < 3.6 mA ⁵⁾	• A50 • A55 • Y15 • C11 • C12 • C20 • N07
Operating Instructions for HART/mA device English German Note: The Operating Instructions should be ordered as a separate line item on the order.	Article No. A5E32220602 A5E32376088
Compact Operating Instructions for HART/mA device English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	A5E33469191 A5E33469171
Operating Instructions for PROFIBUS PA device English German Note: The Operating Instructions should be ordered as a separate line item on the order.	A5E32221386 A5E32376094
Compact Operating Instructions for PROFIBUS PA device English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	A5E33469239 A5E33472685
• We can offer shorter delivery times for configurations designated with the Quick Ship Symbol •. For details see page 9/5 in the appendix.	

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 threaded PVDF antenna

Selection and Ordering data

Article No.

Operating Instructions for FOUNDATION Fieldbus device

English

A5E32221411

German

A5E32376112

Note: The Operating Instructions should be ordered as a separate line item on the order.

Compact Operating Instructions for FOUNDATION Fieldbus device

English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish

A5E33472700

English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian

A5E33472738

This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.

Selection and Ordering data

Article No.

Accessories

Handheld programmer, Intrinsically safe, EEx ia

7ML1930-1BK

HART modem/USB
(for use with a PC and SIMATIC PDM)

7MF4997-1DB

One metallic cable gland M20x1.5,
rated -40 ... +80 °C (-40 ... +176 °F), HART

7ML1930-1AP

One metallic cable gland M20x1.5,
rated -40 ... +80 °C (-40 ... +176 °F),
PROFIBUS PA and FOUNDATION Fieldbus²⁾

7ML1930-1AQ

FDA approved FKM o-ring for 2" G (BSPP) process
connections -28 ... +80 °C (-28 ... +176 °F)

7ML1830-3AN

SITRANS RD100, loop powered display -
see Chapter 7

7ML5741-...

SITRANS RD200, universal input display with
Modbus conversion - see Chapter 7

7ML5740-...

SITRANS RD300, dual line display with totalizer
and linearization curve and Modbus conversion -
see Chapter 7

7ML5744-...

SITRANS RD500 web, universal remote monitoring
solution for instrumentation - see Chapter 7

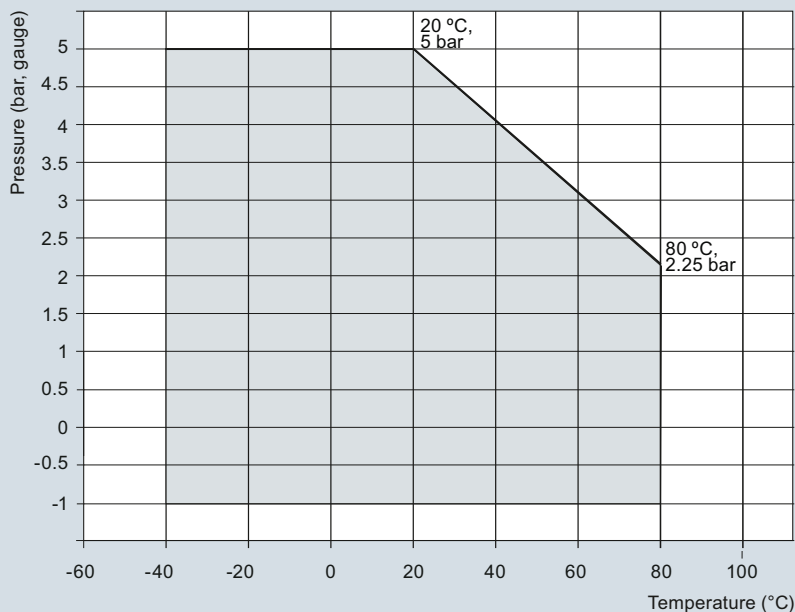
7ML5750-...

For applicable back up point level switch -
see point level measurement section

- 1) Available with Enclosure option 1 only
- 2) To be used with Communication options 1 and 3 only.
Connector has IP67 rating.
- 3) Available with Approval options A and B. Available with approval option C
for use on intrinsically safe applications only. Not rated for dust Ex.
- 4) Available with Enclosure option 0 only
- 5) Available with communication option 2 only
- 6) Available with approval options A ... E only

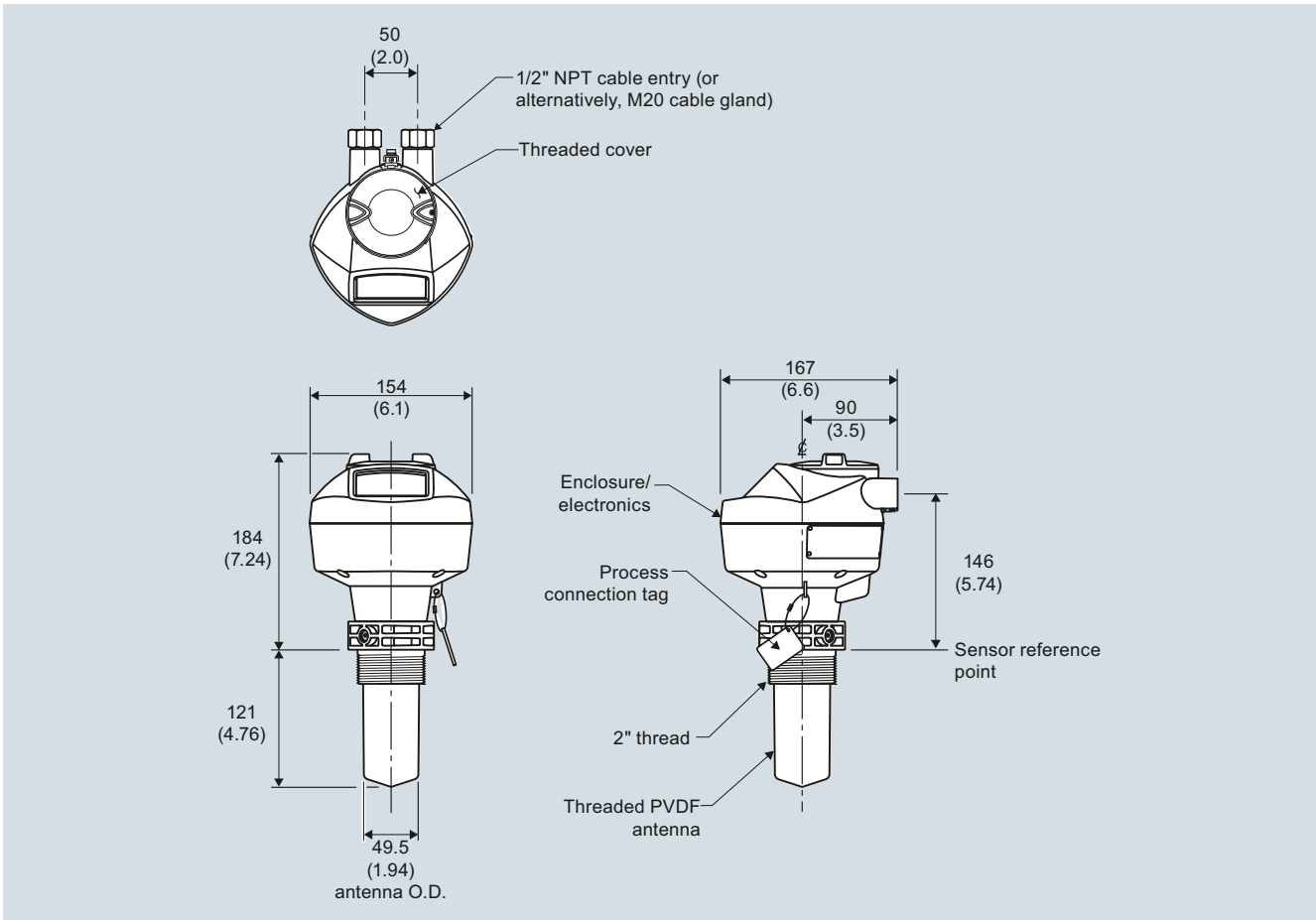
Characteristic curves

Pressure/Temperature Curve



SITRANS LR250 PVDF antenna pressure/temperature curve

Dimensional drawings



SITRANS LR250 PVDF antenna, dimensions in mm (inch)

Schematics

Notes:

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 threaded PVDF Specials

Selection and ordering data

SITRANS LR250 threaded PVDF Specials

	Article No.
SITRANS LR250 threaded PVDF antenna version enclosures (PROFIBUS PA models)	
LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E03588171
LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E03588253
LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection	A5E03588512
LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	A5E03589260
LR250 threaded PVDF antenna version enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS PA communication, no process connection	A5E03589262
LR250 threaded PVDF antenna version enclosure with board stack, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection	A5E03589264
SITRANS LR250 threaded PVDF antenna version enclosures (FOUNDATION Fieldbus models)	
LR250 enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E03589266
LR250 enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E03589275
LR250 enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection	A5E03589277
LR250 enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	A5E03589280
LR250 enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection	A5E03589281
LR250 enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection	A5E03589283

SITRANS LR250 threaded PVDF Specials

	Article No.
SITRANS LR250 threaded PVDF antenna version enclosures (< 3.6 mA start-up HART models)	
LR250 enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	A5E03569747
LR250 enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	A5E03586807
LR250 enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection	A5E03586854
LR250 enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection	A5E03586887
LR250 enclosure with board stack, NPT cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection	A5E03586961
LR250 enclosure with board stack, M20 cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection	A5E03587012
LR250 enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection	A5E03587132
LR250 enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection	A5E03587223
LR250 enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection	A5E03588125
LR250 enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection	A5E03588125
SITRANS LR250 threaded PVDF antenna kits	
Antenna kit 2" NPT threaded PVDF	A5E03528941
Antenna kit 2" R (BSPT) threaded PVDF	A5E03528943
Antenna kit 2" G (BSPP) threaded PVDF	A5E03528947
Kit of hardware parts for LR250 threaded PVDF antenna: consists of O-rings, screws, wavewasher and loctite	A5E03528948

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Overview



SITRANS LR250 with flanged encapsulated antenna is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including corrosives or aggressive materials, to a range of 20 m (66 ft) (antenna dependent).

Benefits

- Fully encapsulated horn antenna design with FDA approved TFM 1600 PTFE lens for use in chemical and sanitary environments where aggressive and corrosive materials are used
- Cost effective replacement for transmitters made of exotic materials
- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency and 50 mm (2 inch) process connection/antenna allow for easy mounting
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Short blanking distance for improved minimum measuring range to 50 mm (2 inch) from the end of the antenna
- Communication using HART, PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools, such as PACTware or Fieldcare via SITRANS DTM
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511

Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves setup and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Start-up is easy using Quick Start Wizard with a few parameters required for basic operation.

The 25 GHz frequency creates a narrow, focused beam allowing for smaller antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 20 m (66 ft) on materials with $dk > 1.6$.

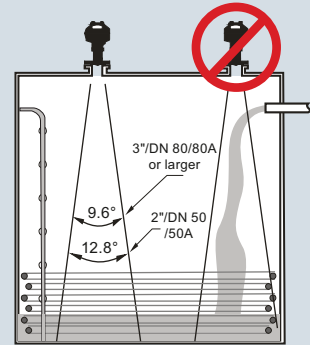
- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, temperatures to 170 °C (338 °F), corrosive and aggressive materials and applications where ease of cleaning is required, such as food or fine chemicals.

Configuration

Installation

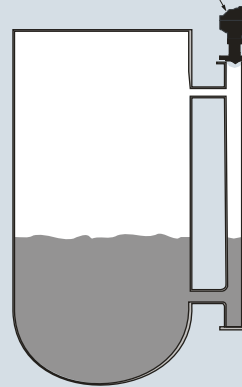
Note:

- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



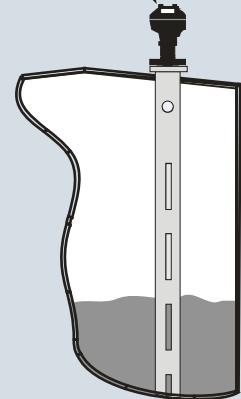
Mounting unit on bypass

Orient front or back of device toward vent.

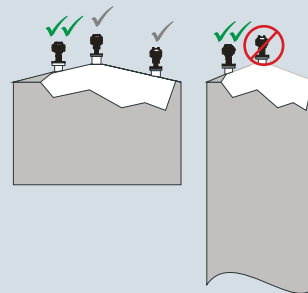


Mounting unit on stilling well

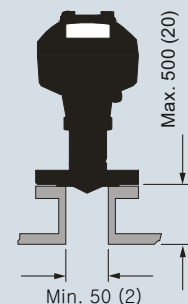
Orient front or back of device toward stillpipe slots.



Mounting unit on vessel



Mounting on a nozzle



SITRANS LR250 flanged encapsulated antenna installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Technical specifications


































Mode of operation		Process connections	
Measuring principle	Radar level measurement	Flanged connection	Raised Face
Frequency	K-band (25.0 GHz)		<ul style="list-style-type: none"> • 2, 3, 4, 6" Class 150 ASME B16.5 • 50A, 80A, 100A, 150A 10K JIS B 2220 • DN 50, DN 80, DN 100 & DN 150 PN 10/16 EN 1092-1 type B1
Minimum measuring range	50 mm (2 inch) from end of antenna		
Maximum measuring range	20 m (66 ft)		
Output		Power supply	
HART	Version 5.1	4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
• Analog output	4 ... 20 mA	PROFIBUS PA	<ul style="list-style-type: none"> • 15 mA • Per IEC 61158-2
• Accuracy	± 0.02 mA	FOUNDATION Fieldbus	<ul style="list-style-type: none"> • 20.0 mA • Per IEC 61158-2
• Fail-safe	<ul style="list-style-type: none"> • Programmable as high low or hold (loss of echo) • NE 43 programmable 		
PROFIBUS PA	Profile 3.01		
• Function blocks	2 Analog Input (AI)		
FOUNDATION Fieldbus	H1		
• Functionality	Basic or LAS		
• Version	ITK 5.2.0		
• Function blocks	2 Analog Input (AI)		
Performance (according to reference conditions IEC60770-1)		Certificates and approvals	
Maximum measured error	<ul style="list-style-type: none"> • > 500 mm from sensor reference point: 3 mm (0.118 inch) • < 500 mm from sensor reference point: 25 mm (1 inch) 	General	CSA _{US/C} , CE, FM, NE 21, RCM
Influence of ambient temperature	< 0.003 %/K	Radio	FCC, Industry Canada and Europe ETSI EN 302-372, RCM
Rated operating conditions		Hazardous	
Installation conditions		• Explosion Proof (Brazil)	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Location	Indoor/outdoor	• Increased Safety (Brazil)	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Ambient conditions (enclosure)		• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	• Explosion Proof (Canada/USA)	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Installation category	I	• Intrinsically Safe (Canada/USA)	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Pollution degree	4	• Non-incendive (Canada/USA)	CSA/FM Class I, Div. 2, Groups A, B, C, D T5
Medium conditions		• Flame Proof/Increased Safety (China)	NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C
Dielectric constant ε _r	≥ 1.6 (antenna dependent)	• Intrinsically Safe (China)	NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C
Process temperature	-40 ... +170 °C (-40 ... +338 °F) at process connection	• Non-sparking/Energy Limited (China)	NEPSI Ex nA IIC T4 Gc
Process pressure	See Pressure/Temperature curves for more information (page 4/237)	• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia ta IIIC T100 °C Da ATEX II 3G Ex nA IIC T4 Gc
Design		• Non-sparking/Energy Limited (Europe)	IECEX/ATEX II 1/2 GD, 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da
Enclosure		• Flame Proof (International/Europe)	IECEX/ATEX II 1/2 GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Material	Aluminum, polyester powder-coated	• Increased Safety (-International/Europe)	IECEX/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIIC T100 °C Da
• Cable inlet	2 x M20x1.5 or 2 x ½" NPT	• Intrinsically Safe (International)	GOST-R Ex d GOST-R Ex e GOST-R Ex ia
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68	• Explosion Proof (Russia)	• Lloyd's Register of Shipping
Weight (dependent on process connection)	<ul style="list-style-type: none"> • Approx. 7 kg (15.43 lb) for 2" Class 150 ASME B16.5 raised face flange (smallest size) • Approx. 17.7 kg (39.02 lb) for 6" Class 150 ASME B16.5 raised face flange (largest size) 	• Increased Safety (Russia)	• ABS Type Approval
Display (local)	Graphic local user interface including quick start wizard and echo profile display	• Intrinsically Safe (Russia)	• Bureau Veritas
Antenna		• Marine	
• Material	Stainless Steel 316L (1.4435 or 1.4404) and TFM 1600 PTFE Lens (lens is the only wetted part)	• Functional Safety	SIL-2 suitable in accordance with IEC 61508/61511
• Dimensions (nominal sizes)	48 mm (2 inch), 80 mm (3 inch), 100 mm (4 inch), 150 mm (6 inch)		

Level Measurement

Continuous level measurement – Radar transmitters



SITRANS LR250 Flanged Encapsulated Antenna

Programming	
Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Approvals for handheld-programmer	IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135 °C T _a = -20 ... +50 °C CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = 50 °C IECEx SIR 09.0073
Handheld communicator	HART communicator 375/475
PC	<ul style="list-style-type: none"> • SIMATIC PDM • Emerson AMS • SITRANS DTM (for connection into FDT, such as PACTware or Fieldcare)
Display (local)	Graphic local user interface including quick start wizard and echo profile displays

Selection and Ordering data	Article No.
SITRANS LR250 flanged encapsulated antenna  7ML5432- 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft) (antenna dependant). Ideal for corrosive, aggressive and low dielectric media. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	0 - 
Process Connection Material Stainless steel 1.4404/1.4435	0
Process Connection Type Flanged Process Connection Types (stainless steel 1.4404/1.4435)	
2" Class 150 ASME B16.5 raised face ¹⁾  B F 3" Class 150 ASME B16.5 raised face  B G 4" Class 150 ASME B16.5 raised face  B H 6" Class 150 ASME B16.5 raised face  B J 50A 10K JIS B 2220 raised face ¹⁾  F D 80A 10K JIS B 2220 raised face  F E 100A 10K JIS B 2220 raised face  F F 150A 10K JIS B 2220 raised face  F G DN 50 PN 10/16 EN 1092-1 type B1 raised face ¹⁾  G A DN 80 PN 10/16 EN 1092-1 type B1 raised face  G B DN 100 PN 10/16 EN 1092-1 type B1 raised face  G C DN 150 PN 10/16 EN 1092-1 type B1 raised face  G D	
Communication/Output	
PROFIBUS PA 	1
4 ... 20 mA, HART, start-up at < 3.6 mA 	2
FOUNDATION Fieldbus 	3
Enclosure/Cable inlet Aluminum, Epoxy painted 2 x 1/2" NPT  2 x M20x1.5 	0 1
Antenna lens material TFM 1600 PTFE Flush Lens 	A
Approvals	
General Purpose, CE, CSA, FM, FCC, R&TTE, RCM 	A
Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div.1, Groups E, F, G, Class III T4 FCC, Industry Canada 	B
Intrinsically Safe: IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM 	C
Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada 	D
Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, R&TTE, RCM 	E
Increased Safety: IECEx/ATEX II 1/2 GD, 1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ²⁾ 	F
Flameproof: IECEx/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ²⁾ 	G
Explosion proof: CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada ²⁾  Non Sparking: NEPSI Ex nA IIC T4 Gc 	H
Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C 	L
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C ²⁾ 	M
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C ²⁾ 	N
Pressure rating Rating per Pressure/Temperature curves in instruction manual 	0

¹⁾ Maximum range 10 m (32.8 ft), dk > 3 [20 m (66 ft)] and dk>1.6 when mounted in stillpipe]

²⁾ Applicable with communication option 2 only

 We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs		Operating Instructions for FOUNDATION Fieldbus device	
Please add *-Z to Article No. and specify Order code(s).		English	A5E32221411
Plug M12 with mating Connector ¹⁾²⁾³⁾	◆ A50	German	A5E32376112
Plug 7/8" with mating Connector ²⁾³⁾⁴⁾	◆ A55	Note: The Operating Instructions should be ordered as a separate line item on the order.	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	◆ Y15	Compact Operating Instructions for FOUNDATION Fieldbus device	
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	◆ C11	English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33472700
Inspection Certificate Type 3.1 per EN 10204	◆ C12	English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33472738
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 ⁵⁾⁶⁾	◆ C20	This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	
Namur NE43 compliant, device preset to failsafe < 3.6 mA ⁵⁾	◆ N07	Accessories	
Operating Instructions for HART/mA device	Article No.	Handheld programmer, Intrinsically safe, EEx ia HART modem/USB (for use with a PC and SIMATIC PDM)	7ML1930-1BK 7MF4997-1DB
English	A5E32220602	One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (2 are required) ⁶⁾	7ML1930-1AP
German	A5E32376088	One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (2 are required) ²⁾	7ML1930-1AQ
Note: The Operating Instructions should be ordered as a separate line item on the order.		SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
Compact Operating Instructions for HART/mA device	A5E33469191	SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33469171	SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian		SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.		For applicable back up point level switch - see point level measurement section	
Operating Instructions for PROFIBUS PA device			
English	A5E32221386		
German	A5E32376094		
Note: The Operating Instructions should be ordered as a separate line item on the order.			
Compact Operating Instructions for PROFIBUS PA device			
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33469239		
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33472685		
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.			

1) Available with enclosure option 1 only

2) Available with communication options 1 and 3 only

3) Available with approval options A, B, C, and L only

4) Available with enclosure option 0 only

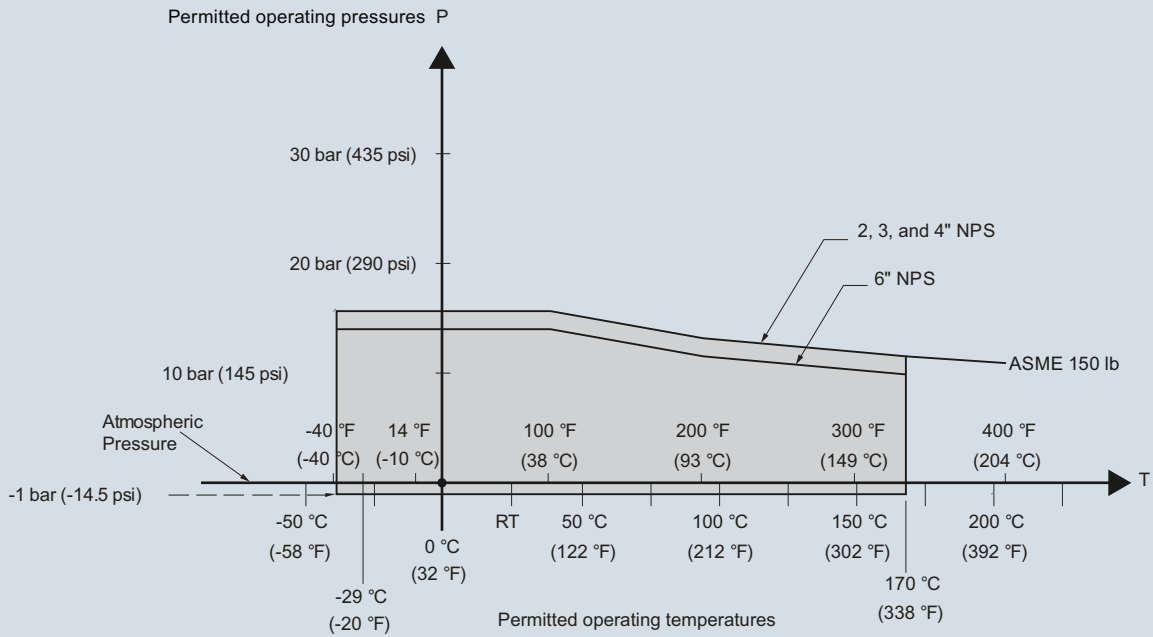
5) Applicable with communication option 2 only

6) Available with approval options A, B, C, D, E, K, and L only

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

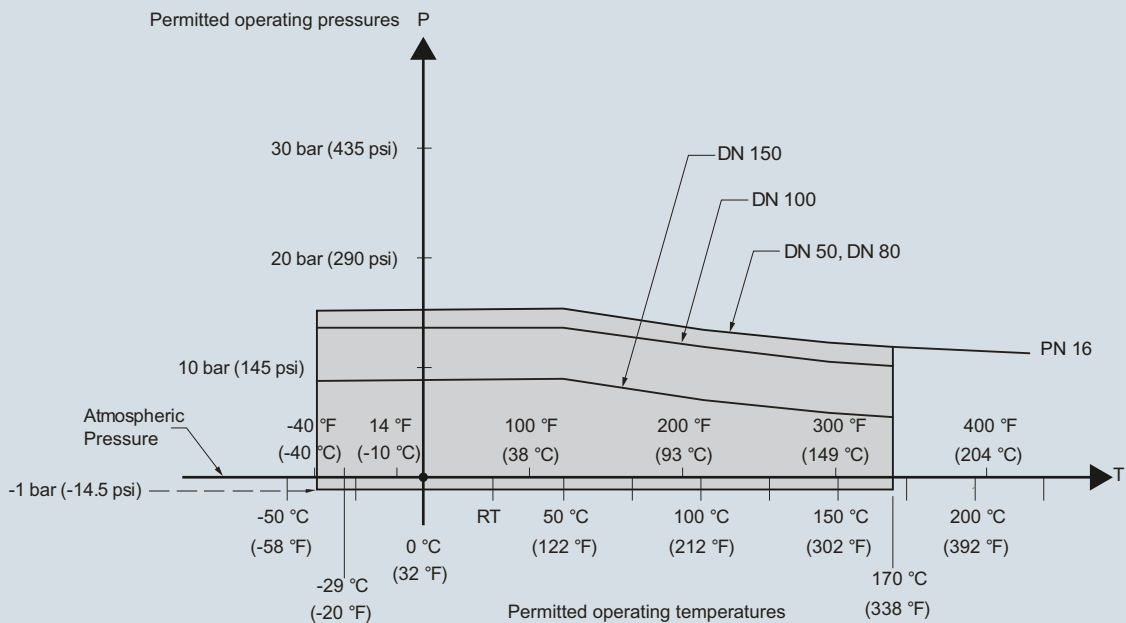
Characteristic curves

**Pressure/ temperature curve
LR250 Flanged Encapsulated Antenna
ASME flanged process connections
(7ML5432)**



SITRANS LR250 flanged encapsulated antenna pressure/temperature curve

**Pressure/ temperature curve
LR250 Flanged Encapsulated Antenna
EN 1092-1 flanged process connections
(7ML5432)**



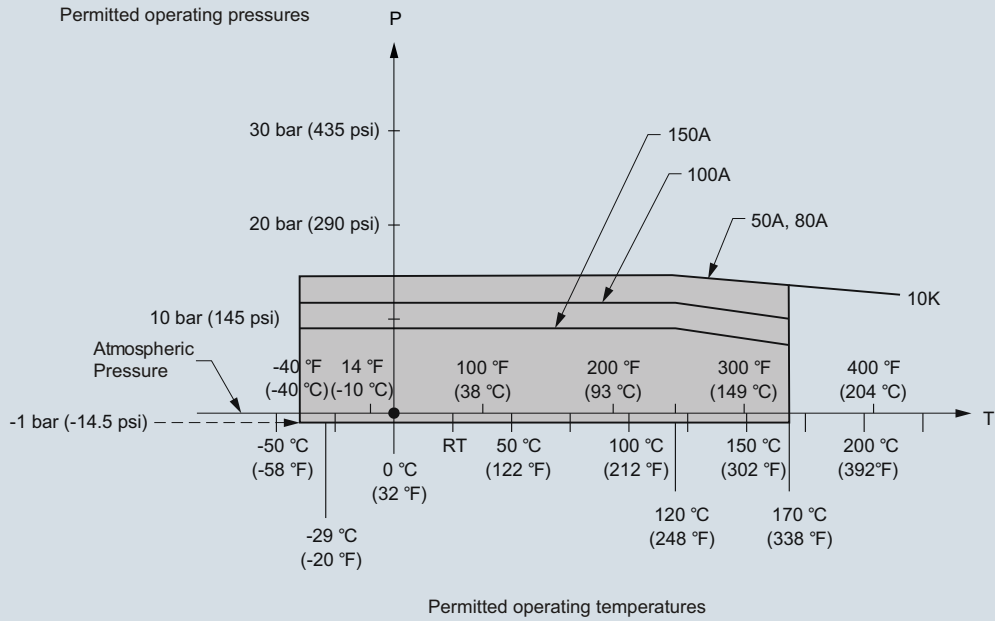
SITRANS LR250 flanged encapsulated antenna pressure/temperature curve

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

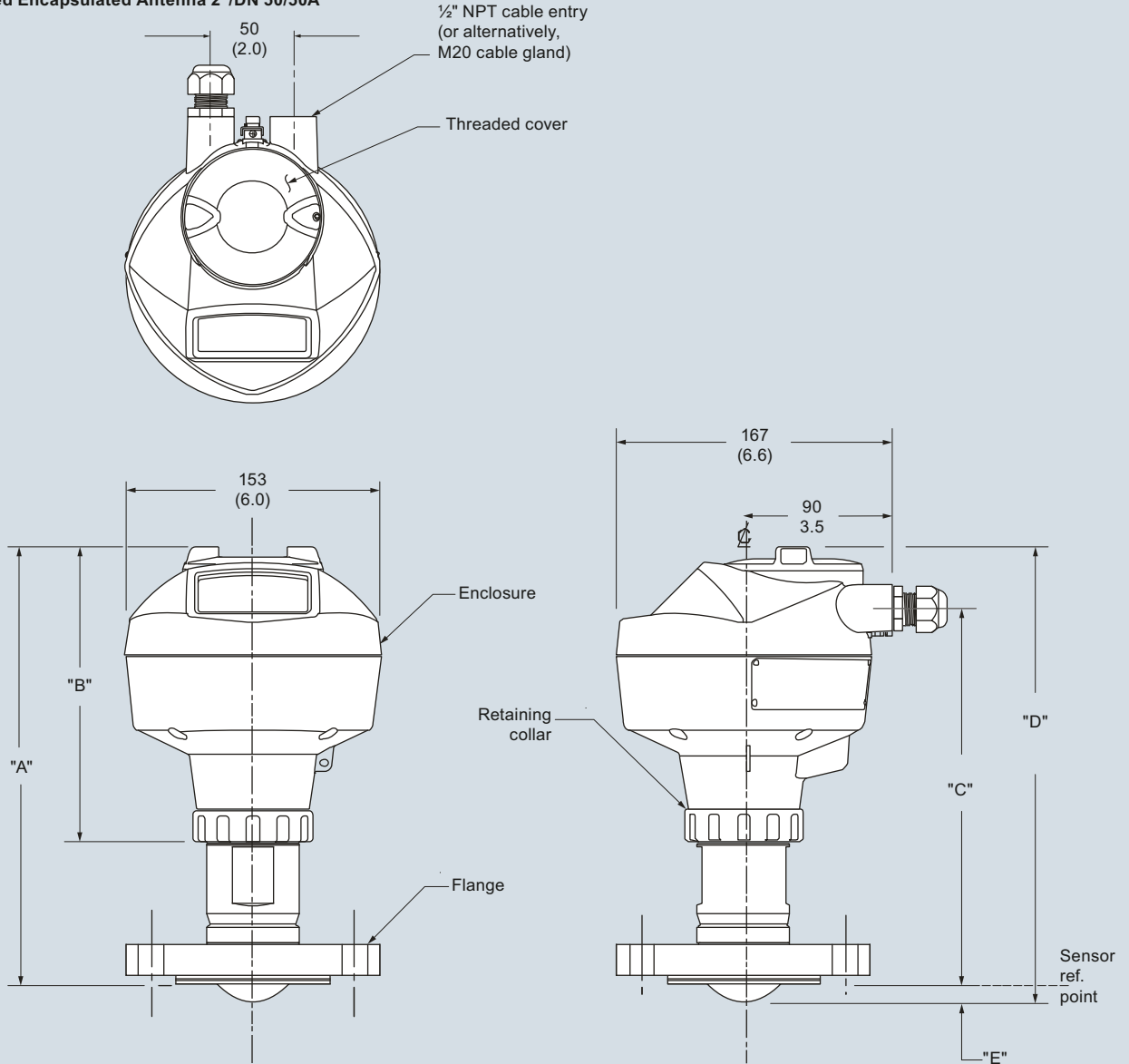
Pressure/ temperature curve
LR250 Flanged Encapsulated Antenna
JIS B 2220 flanged process connections
(7ML5432)



SITRANS LR250 flanged encapsulated antenna pressure/temperature curve

Dimensional drawings

Flanged Encapsulated Antenna 2"/DN 50/50A



Flange Size	Flange Class	Flange O.D.	Antenna aperture size	Height to Sensor reference point dimension E ¹⁾	Beam angle	Measurement Range	Dimension A	Dimension B	Dimension C	Dimension D
2"	150 lb	152 (5.98)	50 (1.97)	11 (0.43)	12.8°	10 m (32.8 ft)	263 (10.35)	178 (7)	223 (8.78)	274 (10.79)
DN 50	PN 10/16	165 (6.50)								
50A	10K	155 (6.10)								

¹⁾ Height from tip of lens to sensor reference point as shown.

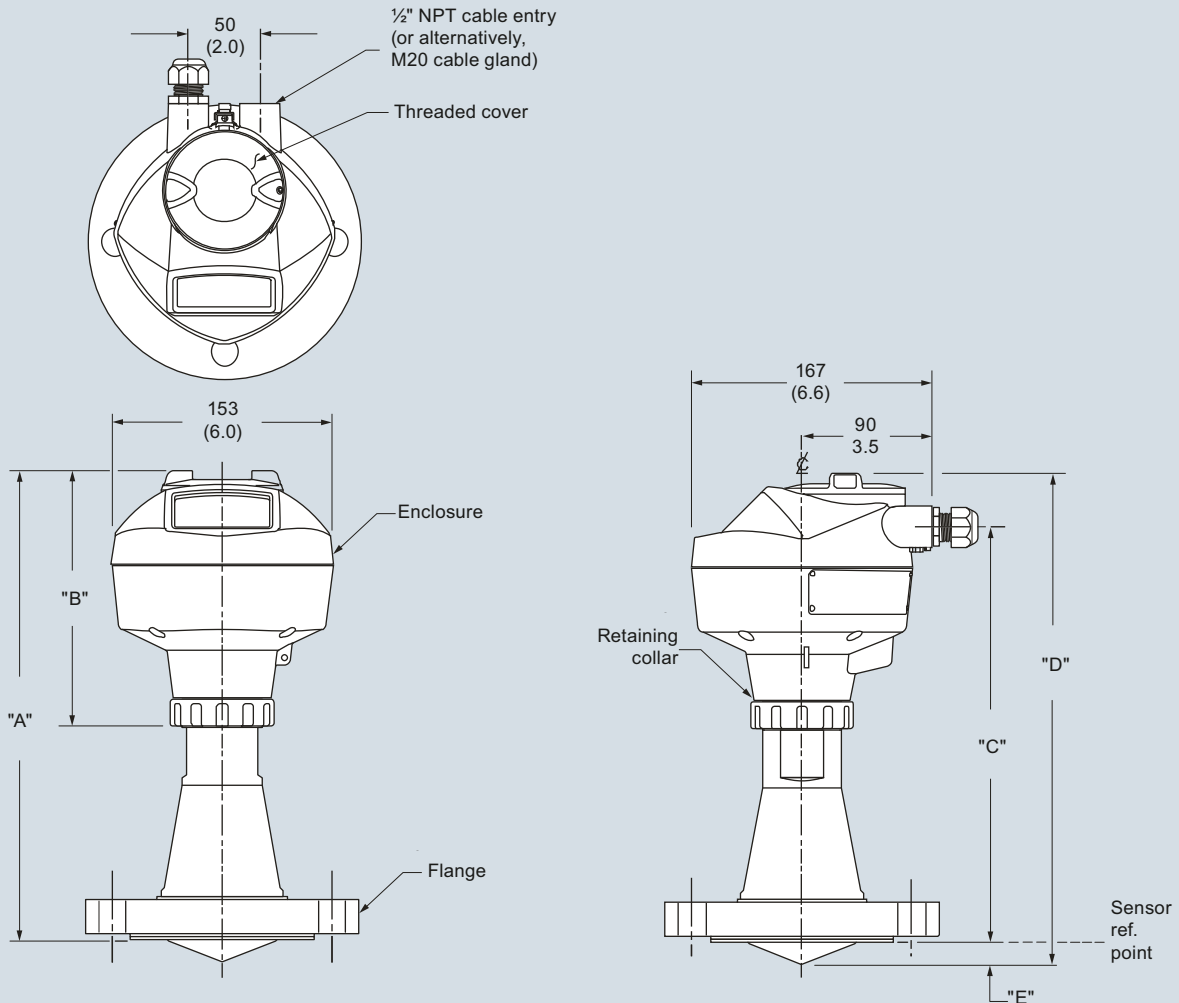
SITRANS LR250 flanged encapsulated antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Flanged Encapsulated Antenna 3"/DN 50/80A or greater



Flange Size	Flange Class	Flange O.D.	Antenna aperture size	Height to Sensor reference point dimension E ¹⁾	Beam angle	Measurement Range	Dimension A	Dimension B	Dimension C	Dimension D
3"	150 lb	190 (7.48)	75 (2.95)	15 (0.59)	9.6°	20 m (65.6 ft)	328 (12.91)	178 (7)	288 (11.34)	343 (13.54)
DN 80	PN 10/16	200 (7.87)								
80A	10K	185 (7.28)								
4"	150 lb	230 (9.06)	75 (2.95)	13 (0.51)	9.6°	20 m (65.6 ft)	328 (12.91)	178 (7)	288 (11.34)	343 (13.50)
DN 100	PN 10/16	220 (8.66)								
100A	10K	210 (8.27)								
6"	150 lb	280 (11.02)	75 (2.95)	15 (0.59)	9.6°	20 m (65.6 ft)	333 (13.11)	178 (7)	293 (11.54)	348 (13.70)
DN 150	PN 10/16	285 (11.25)								
150A	10K	280 (11.02)								

¹⁾ Height from tip of lens to sensor reference point as shown.

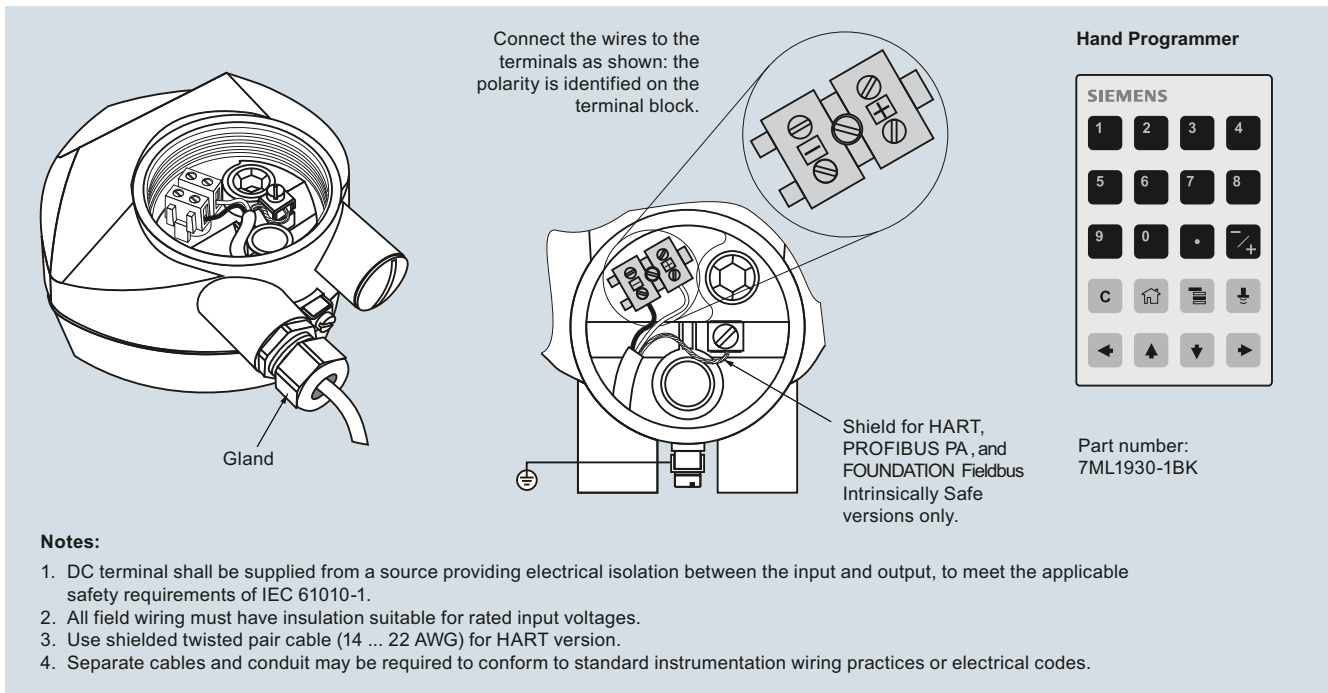
SITRANS LR250 flanged encapsulated antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Flanged Encapsulated Antenna

Schematics



Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

Gland

Shield for HART, PROFIBUS PA, and FOUNDATION Fieldbus Intrinsically Safe versions only.

Hand Programmer

SIEMENS			
1	2	3	4
5	6	7	8
9	0	.	/+
C	↑	↓	↔

Part number:
7ML1930-1BK

Notes:

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Flanged Encapsulated Specials

Selection and ordering data

SITRANS LR250 flanged encapsulated Specials

	Article No.
SITRANS LR250 flanged encapsulated antenna version enclosures (PROFIBUS PA models)	
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E32462853
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection	A5E32462854
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS PA communication, no process connection	A5E32462855
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection	A5E32462856
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS PA communication, no process connection	A5E32462857
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection	A5E32462858
SITRANS LR250 flanged encapsulated antenna version enclosures (FOUNDATION Fieldbus models)	
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E32462859
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with FOUNDATION Fieldbus communication, no process connection	A5E32462860
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with FOUNDATION Fieldbus communication, no process connection	A5E32462861
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with FOUNDATION Fieldbus communication, no process connection	A5E32462862
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with FOUNDATION Fieldbus communication, no process connection	A5E32462863
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with FOUNDATION Fieldbus communication, no process connection	A5E32462864
SITRANS LR250 flanged encapsulated antenna version enclosures (< 3.6 mA start-up HART models)	
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	A5E32462865
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option A, with HART communication start-up at < 3.6 mA, no process connection	A5E32462866

SITRANS LR250 flanged encapsulated Specials

	Article No.
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option B, with HART communication start-up at < 3.6 mA, no process connection	A5E32462867
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option C, with HART communication start-up at < 3.6 mA, no process connection	A5E32462868
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option D, with HART communication start-up at < 3.6 mA, no process connection	A5E32462869
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection	A5E32462830
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection	A5E32462831
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection	A5E32462832
LR250 flanged encapsulated antenna version (7ML5432) enclosure with board stack, NPT cable inlet, approval option H, with HART communication start-up at < 3.6 mA, no process connection	A5E32462833
SITRANS LR250 flanged encapsulated antenna lens kits	
Replacement TFM 1600 Lens and Spring Washer Kit for 2" Class 150 ASME B16.5 raised face	A5E32462817
Replacement TFM 1600 Lens and Spring Washer Kit for 3" Class 150 ASME B16.5 raised face	A5E32462819
Replacement TFM 1600 Lens and Spring Washer Kit for 4" Class 150 ASME B16.5 raised face	A5E32462820
Replacement TFM 1600 Lens and Spring Washer Kit for 6" Class 150 ASME B16.5 raised face	A5E32462821
Replacement TFM 1600 Lens and Spring Washer Kit for 50A 10K JIS B 2220 raised face	A5E32462822
Replacement TFM 1600 Lens and Spring Washer Kit for 80A 10K JIS B 2220 raised face	A5E32462823
Replacement TFM 1600 Lens and Spring Washer Kit for 100A 10K JIS B 2220 raised face	A5E32462824
Replacement TFM 1600 Lens and Spring Washer Kit for 150A 10K JIS B 2220 raised face	A5E32462825
Replacement TFM 1600 Lens and Spring Washer Kit for DN 50 PN 10/16 EN 1092-1 type B1 raised face	A5E32462826
Replacement TFM 1600 Lens and Spring Washer Kit for DN 80 PN 10/16 EN 1092-1 type B1 raised face	A5E32462827
Replacement TFM 1600 Lens and Spring Washer Kit for DN 100 PN 10/16 EN 1092-1 type B1 raised face	A5E32462828
Replacement TFM 1600 Lens and Spring Washer Kit for DN 150 PN 10/16 EN 1092-1 type B1 raised face	A5E32462829

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Overview



The SITRANS LR250 hygienic encapsulated antenna is a 2 wire 25 GHz pulse radar level transmitter with sanitary and hygienic approvals for continuous monitoring of liquids, slurries and pastes within the Food, Beverage, chemical, and pharmaceutical industries to a range of 20 m (66 ft) - antenna dependent (Picture shown with accessories sold separately).

Benefits

- Fully encapsulated horn antenna design with FDA approved and USP Class VI compliant, TFM 1600 PTFE lens.
- $0.8 \mu\text{m}$ Ra surface finish for maximum cleanability and hygiene requirements commonly required in sanitary environments
- Chemically resistant TFM 1600 PTFE lens is also suitable for aggressive or corrosive materials
- Approved device in accordance with 3-A, EHEDG EL Class I and/or EHEDG EL Aseptic Class I
- Cost effective replacement for transmitters made of exotic materials
- Graphical local user interface (LUI) makes operation simple with plug-and-play set-up using the intuitive Quick Start Wizard
- Industry standard process connections including ISO 2852, DIN 11851, DIN 11864-1, DIN 11864-2, DIN 11864-3 and Tuchenhagen Varivent Type F and N
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency and 2 inch (50 mm) process connection/antenna allow for easy mounting
- Insensitive to mounting location and obstructions, and less sensitive to nozzle interference
- Communication using HART, PROFIBUS PA, or FOUNDATION Fieldbus
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or over a network using SIMATIC PDM, Emerson AMS, or Field Device Tools, such as PACTware or Fieldcare via SITRANS DTM.
- Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511

Application

SITRANS LR250 includes a graphical local user interface (LUI) that improves set-up and operation by including an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Start-up is easy using the Quick Start wizard with few parameters required for basic operation.

The 25 GHz frequency creates a narrow, focused beam allowing for smaller antenna options and decreasing sensitivity to obstructions.

SITRANS LR250's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 20 m (66 ft) on materials with $dk > 1.6$.

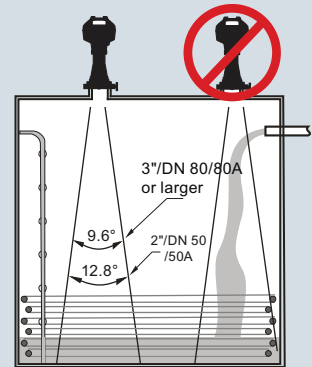
- Key Applications: applications within the Food, Beverage, Chemical and Pharmaceutical industries where sanitary, aseptic or hygienic approvals are required or easy install/clean flush antennas are preferable, such as ice cream, fruit juice, milk, beer, and pharmaceutical or chemical additives and ingredients.

Configuration

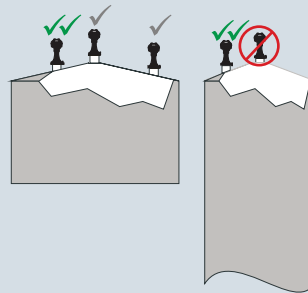
Installation

Note:

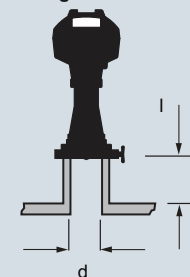
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



Mounting unit on vessel



Mounting on a nozzle



Nozzles should be maximum l/d ratio 1:1 (Eg. 50 mm length, 50 mm diameter)

SITRANS LR250 Hygienic Encapsulated Antenna Installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Technical specifications

Mode of Operation		Process connections	
Measuring principle	Radar level measurement	Hygienic/Sanitary connections	<ul style="list-style-type: none"> 2", 3" & 4" Sanitary Clamp according to ISO 2852 DN 50, DN 80 & DN 100 Aseptic/Hygienic threaded to DIN 11864-1 [Form A] DN 50, DN 80 & DN 100 Aseptic/Hygienic flanged to DIN 11864-2 [Form A] DN 50, DN 80 & DN 100 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A] DN 50, DN 80 & DN 100 Hygienic Union according to DIN 11851 Type F (50 mm) & Type N (68 mm) Tuchenhausen Varivent
Frequency	K-band (25.0 GHz)		
Minimum measuring range	50 mm (2 inch) from end of antenna		
Maximum measuring range	20 m (66 ft)		
Output		Power supply	
HART	Version 5.1	4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
• Analog output	4 ... 20 mA		
• Accuracy	± 0.02 mA		
• Fail-safe	<ul style="list-style-type: none"> Programmable as high low or hold (loss of echo) NE 43 programmable 		
PROFIBUS PA	Profile 3.01	PROFIBUS PA	<ul style="list-style-type: none"> 15 mA Per IEC 61158-2
• Function blocks	2 Analog Input (AI)		
FOUNDATION Fieldbus	H1	FOUNDATION Fieldbus	<ul style="list-style-type: none"> 20.0 mA Per IEC 61158-2
• Functionality	Basic or LAS		
• Version	ITK 5.2.0		
• Function blocks	2 Analog Input (AI)		
Performance (according to reference conditions IEC60770-1)		Certificates and approvals	
Maximum measured error	<ul style="list-style-type: none"> > 500 mm from sensor reference point: 3 mm (0.118 inch) < 500 mm from sensor reference point: 25 mm (1 inch) 	General	CSA _{US/C} , CE, FM, NE 21, RCM
Influence of ambient temperature	< 0.003 %/K	Radio	FCC, Industry Canada and Europe ETSI EN 302-372, RCM
Rated operating conditions		Hazardous	
Installation conditions		• Explosion Proof (Brazil)	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Location	Indoor/outdoor	• Increased Safety (Brazil)	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
Ambient conditions (enclosure)		• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	• Explosion Proof (Canada/USA)	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Installation category	I	• Intrinsically Safe (Canada/USA)	CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Pollution degree	4	• Non-incendive (Canada/USA)	CSA/FM Class I, Div. 2, Groups A, B, C, D T5
Medium conditions		• Flame Proof/Increased Safety (China)	NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C
Dielectric constant ϵ_r	≥ 1.6 (antenna dependent)	• Intrinsically Safe (China)	NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T _A 90 °C
Process temperature	-40 ... +170 °C (-40 ... +338 °F) at process connection	• Non-sparking (China)	NEPSI Ex nA IIC T4 Gc
Process pressure	See Pressure/Temperature curves for more information	• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia ta IIIC T100 °C Da
Design		• Non-sparking (Europe)	ATEX II 3G Ex nA IIC T4 Gc
Enclosure		• Flame Proof (International/Europe)	IECEX/ATEX II 1/2 GD, 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIC T100 °C Da
• Material	Aluminum, polyester powder coated	• Increased Safety (International/Europe)	IECEX/ATEX II 1/2 GD, 1D, 2D, Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Cable inlet	2 x M20x1.5 or 2 x ½" NPT	• Intrinsically Safe (International)	IECEX/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIIC T100 °C Da
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68	• Explosion Proof (Russia)	GOST-R Ex d
Weight (dependent on process connection)	<ul style="list-style-type: none"> Approx. 4.7 kg (10.4 lb) for 2" ISO 2852 (smallest size) Approx. 7.9 kg (17.4 lb) for DN 100 DIN 11864-2 (largest size) 	• Increased Safety (Russia)	GOST-R Ex e
Display (local)	Graphic local user interface including quick start wizard and echo profile display	• Intrinsically Safe (Russia)	GOST-R Ex ia
Antenna		Hygienic/Sanitary	EHEDG EL Class I EHEDG EL Aseptic Class I
• Material	Stainless steel 316L (1.4435 or 1.4404) and TFM 1600 PTFE Lens (lens is the only wetted part)		
• Lens surface finish (R _a)	0.8 μm		

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Programming

Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Approvals for handheld programmer	IS model: ATEX II 1 GD Ex ia IIC T4 Ga Ex ia D 20 T135 °C Ta = -20 ... +50 °C CSA/FM Class I, II, III, Div. 1., Groups A, B, C, D, E, F, G, T6 Ta = 50 °C IECEX SIR 09.0073
Handheld communicator	HART communicator 375/475
PC	<ul style="list-style-type: none"> • SIMATIC PDM • Emerson AMS • SITRANS DTM (for connection into FDT, such as PACTware or Fieldcare)
Display (local)	Graphic local user interface including quick start wizard and echo profile displays

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Selection and Ordering data	Article No.
SITRANS LR250 hygienic encapsulated antenna	7ML5433-
2-wire, 25 Ghz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, up to a range of 20 m (66 ft) (Antenna dependant). Ideal for Hygienic applications including small vessels and low dielectric media.	0 - A
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Hygienic/Sanitary Approvals	
EHEDG EL Class 1 ¹⁾	1
EHEDG EL Aseptic Class 1 ¹⁾	2
3-A (Tuchenhagen connections only - FC ... FF) ²⁾³⁾	3
EHEDG EL Class I & 3-A (excludes Tuchenhagen connections) ⁴⁾	4
Process Connection Types (all types have TFM1600 PTFE lens)	
<u>316L st/st [1.4435 or 1.4404]</u>	
2" Sanitary Clamp according to ISO 2852 ⁵⁾	AA
3" Sanitary Clamp according to ISO 2852	AB
4" Sanitary Clamp according to ISO 2852	AC
<u>316L st/st (1.4435 or 1.4404) & 304L st/st (1.4301)</u>	
DN 50 Aseptic/Hygienic nozzle/ slotted nut (instrument side) to DIN 11864-1 [Form A] ⁵⁾	BA
DN 80 Aseptic/Hygienic nozzle/ slotted nut (instrument side) to DIN 11864-1 [Form A]	BB
DN 100 Aseptic/Hygienic nozzle/ slotted nut (instrument side) to DIN 11864-1 [Form A]	BC
<u>316L st/st [1.4435 or 1.4404]</u>	
DN 50 Aseptic/Hygienic flanged to DIN 11864-2 [Form A] ⁵⁾	CA
DN 80 Aseptic/Hygienic flanged to DIN 11864-2 [Form A]	CB
DN 100 Aseptic/Hygienic flanged to DIN 11864-2 [Form A]	CC
<u>316L st/st [1.4435 or 1.4404]</u>	
DN 50 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A] ⁵⁾	DA
DN 80 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A]	DB
DN 100 Aseptic/Hygienic Clamp according to DIN 11864-3 [Form A]	DC
<u>316L st/st (1.4435 or 1.4404) & 304L st/st (1.4301)</u>	
DN 50 Hygienic nozzle/ slotted nut (instrument side) to DIN 11851 ⁵⁾	EA
DN 80 Hygienic nozzle/ slotted nut (instrument side) to DIN 11851	EB
DN 100 Hygienic nozzle/ slotted nut (instrument side) to DIN 11851	EC
<u>316L st/st [1.4435 or 1.4404]</u>	
Type F (50 mm) Tuchenhagen Varivent (EHEDG only) ⁵⁾	FA
Type N (68 mm) Tuchenhagen Varivent (EHEDG only) ⁵⁾	FB
Type F (50 mm) Tuchenhagen Varivent [3-A only & EPDM process seal -40 °C ... 120 °C (-40 °F ... 248 °F)] ⁵⁾	FC
Type N (68 mm) Tuchenhagen Varivent [3-A only & EPDM process seal -40 °C ... 120 °C (-40 °F ... 248 °F)] ⁵⁾	FD
Type F (50 mm) Tuchenhagen Varivent [3-A only & FKM process seal -20 °C ... 170 °C (-4 °F ... 338 °F)] ⁵⁾	FE
Type N (68 mm) Tuchenhagen Varivent [3-A only & FKM process seal -20 °C ... 170 °C (-4 °F ... 338 °F)] ⁵⁾	FF
EXCLUDE Process Connection - Electronics Head assembly spare only (select all other options as normal)	YY

Selection and Ordering data	Article No.
SITRANS LR250 hygienic encapsulated antenna	7ML5433-
2-wire, 25 Ghz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, up to a range of 20 m (66 ft) (Antenna dependant). Ideal for Hygienic applications including small vessels and low dielectric media.	0 - A
Communication	
PROFIBUS PA	1
4 ... 20 mA HART, start-up at < 3.6 mA	2
FOUNDATION Fieldbus	3
Enclosure (with Cable Inlets)	
Aluminum, Epoxy paint, 2 X ½" NPT	0
Aluminum, Epoxy paint, 2 X M20 x 1.5	1
Approvals	
General Purpose, CE, CSA, FM, FCC, R&TTE, RCM	A
Intrinsically Safe: CSA/FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III T4 FCC, Industry Canada	B
Intrinsically Safe: IECEX/ATEX II 1 GD Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM	C
Non-incendive: CSA/FM Class I, Div. 2, Groups A, B, C, D T5, FCC, Industry Canada	D
Non Sparking: ATEX II 3G Ex nA IIC T4 Gc, CE, R&TTE, RCM	E
Increased Safety: IECEX/ATEX II 1/2 GD, 1D, 2D Ex e mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ⁶⁾	F
Flameproof: IECEX/ATEX II 1/2 GD 1D, 2D Ex d mb ia IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da, CE, R&TTE, RCM ⁶⁾	G
Explosion proof: CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Industry Canada ⁶⁾	H
Non Sparking: NEPSI Ex nA IIC T4 Gc	K
Intrinsically Safe: NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 TA 90 °C	L
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 TA 90 °C ⁶⁾	M
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 TA 90 °C ⁶⁾	N
Pressure Rating	
Rating per pressure/temperature curves in instruction manual	0
We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.	

4

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs		Operating Instructions for FOUNDATION Fieldbus device	
Please add *-Z to Article No. and specify Order code(s).		English	A5E32221411
<u>Electrical Connection cable entry:</u>		German	A5E32376112
Plug M12 (IP 67 rating) with mating connector ²⁾⁷⁾⁸⁾ ●	A50	Note: The Operating Instructions should be ordered as a separate line item on the order.	
Plug 7/8" (IP 67 rating) with mating Connector ²⁾⁸⁾⁹⁾ ●	A55	Compact Operating Instructions for FOUNDATION Fieldbus device	
<u>Test Certificates</u>		English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33472700
Manufacturer's Test Certificate M to DIN 55350, Part 18 and to ISO 9000 ●	C11	English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33472738
Inspection Certificate 3.1 of EN 10204 ●	C12	This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.	
<u>Functional Safety</u>		Accessories	
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511 ⁶⁾¹⁰⁾ ●	C20	Handheld programmer, Intrinsically safe, EEx ia (LUI enabled)	7ML1930-1BK
<u>Namur</u>		HART modem/USB (for use with a PC and SIMATIC PDM)	7MF4997-1DB
Namur NE43 compliant, device preset to failsafe < 3.6 mA ⁶⁾ ●	N07	One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART (two are required) ⁶⁾	7ML1930-1AP
<u>Tagging</u>		One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (two are required) ⁶⁾	7ML1930-1AQ
<u>Stainless steel tag [69 mm x 50 mm (2.71 x 1.97 inch)]</u>		SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
Measuring-point number / identification (max. 27 characters) specify in plain text ●	Y15	SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
Operating Instructions for HART/ma device	Article No.	SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
English	A5E32220602	SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
German	A5E32376088	For applicable back up point level switch - see point level measurement section	
Note: The Operating Instructions should be ordered as a separate line item on the order.		● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.	
Compact Operating Instructions for HART/ma device			
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33469191		
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33469171		
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.			
Operating Instructions for PROFIBUS PA device			
English	A5E32221386		
German	A5E32376094		
Note: The Operating Instructions should be ordered as a separate line item on the order.			
Compact Operating Instructions for PROFIBUS PA device			
English, French, German, Spanish, Italian, Dutch, Danish, Finnish, Greek, Portuguese (Portugal), Swedish	A5E33469239		
English, Bulgarian, Czech, Estonian, Hungarian, Latvian, Lithuanian, Polish, Romanian, Slovakian, Slovenian	A5E33472685		
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Compact Operating Instructions and Operating Instructions library.			

- 1) Available with process connection options AA ... FB & YY only
- 2) Available with Approval options A, B, C, L only
- 3) Available with Process connection FC ... FF only
- 4) Available with process connection options AA ... EC & YY only
- 5) Max. range 10 m (32.8 ft), dk > 3 [20 m (66 ft) and dk > 1.6 if installed in a stillpipe]
- 6) Applicable with Communication option 2 only
- 7) Available with Enclosure option 1 only
- 8) Available with Communication options 1 & 3 only.
- 9) Available with Enclosure option 0 only
- 10) Available with Approval options A, B, C, D, E, K, L only

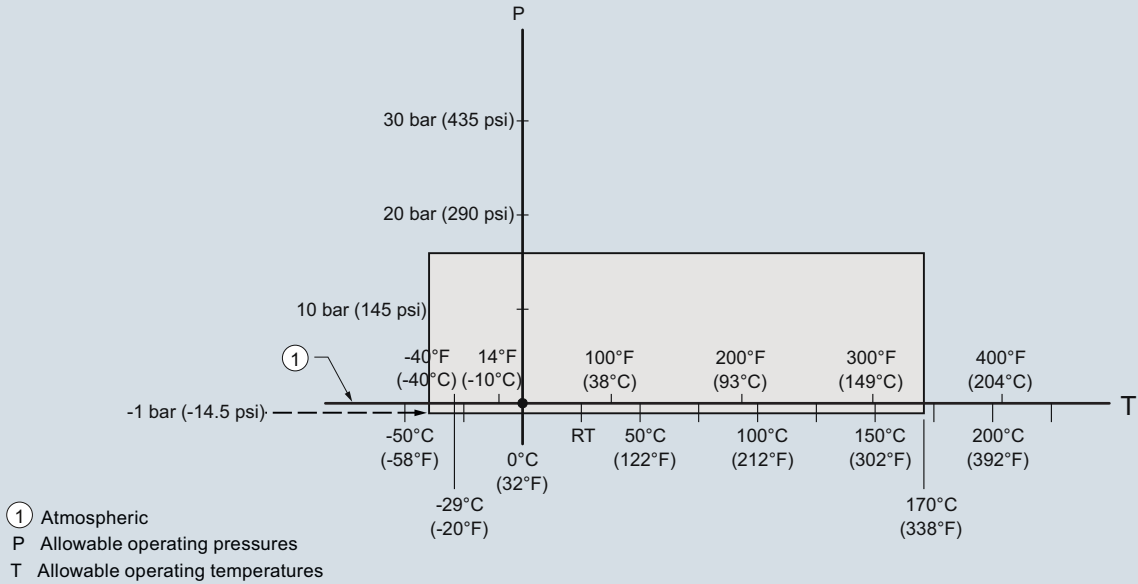
Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

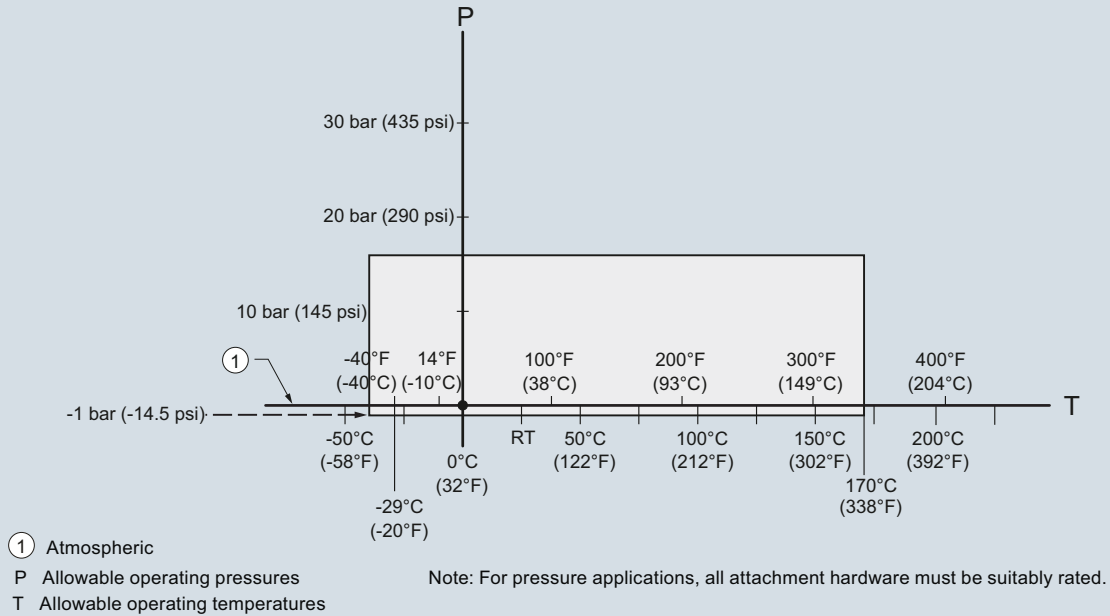
Characteristic curves

DIN 11851 Sanitary/Hygienic nozzle/slotted nut: DN 50, DN 80, and DN 100
 DIN 11864-1 Aseptic/Hygienic nozzle/slotted nut: DN 50, DN 80, and DN 100



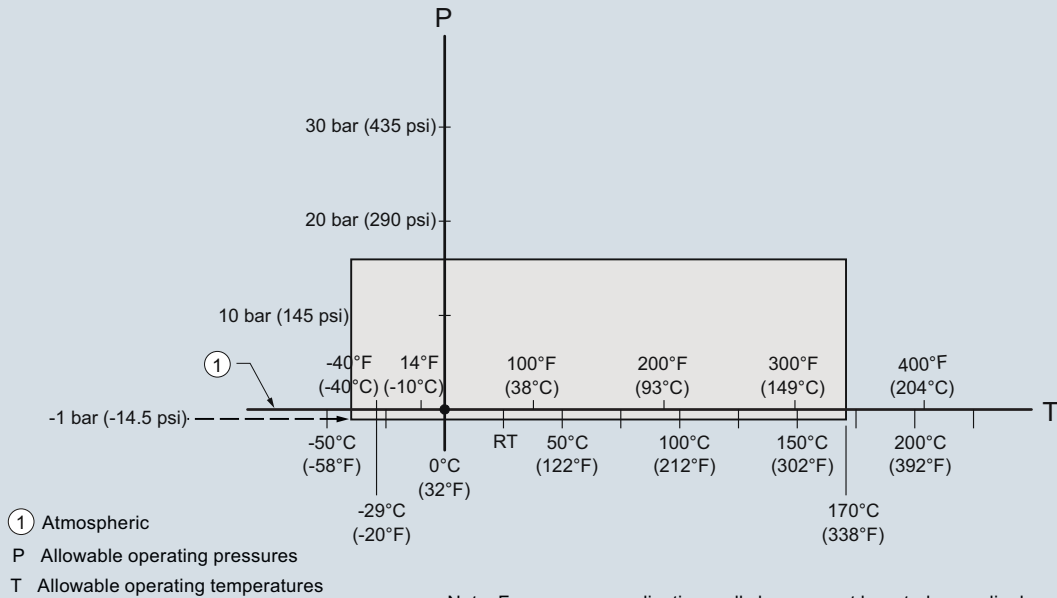
SITRANS LR250 Hygienic Encapsulated Antenna, pressure/temperature curves

DIN 11864-2 Aseptic/Hygienic flanged: DN 50, DN 80, and DN 100



SITRANS LR250 Hygienic Encapsulated Antenna, pressure/temperature curves

DIN 11864-3 Aseptic/Hygienic clamp: DN 50, DN 80, and DN 100
 ISO 2852 Sanitary/Hygienic clamp: 2", 3", and 4"
 Tuohenhagen Varivent face seal clamp: Type N (68 mm) and Type F (50 mm)



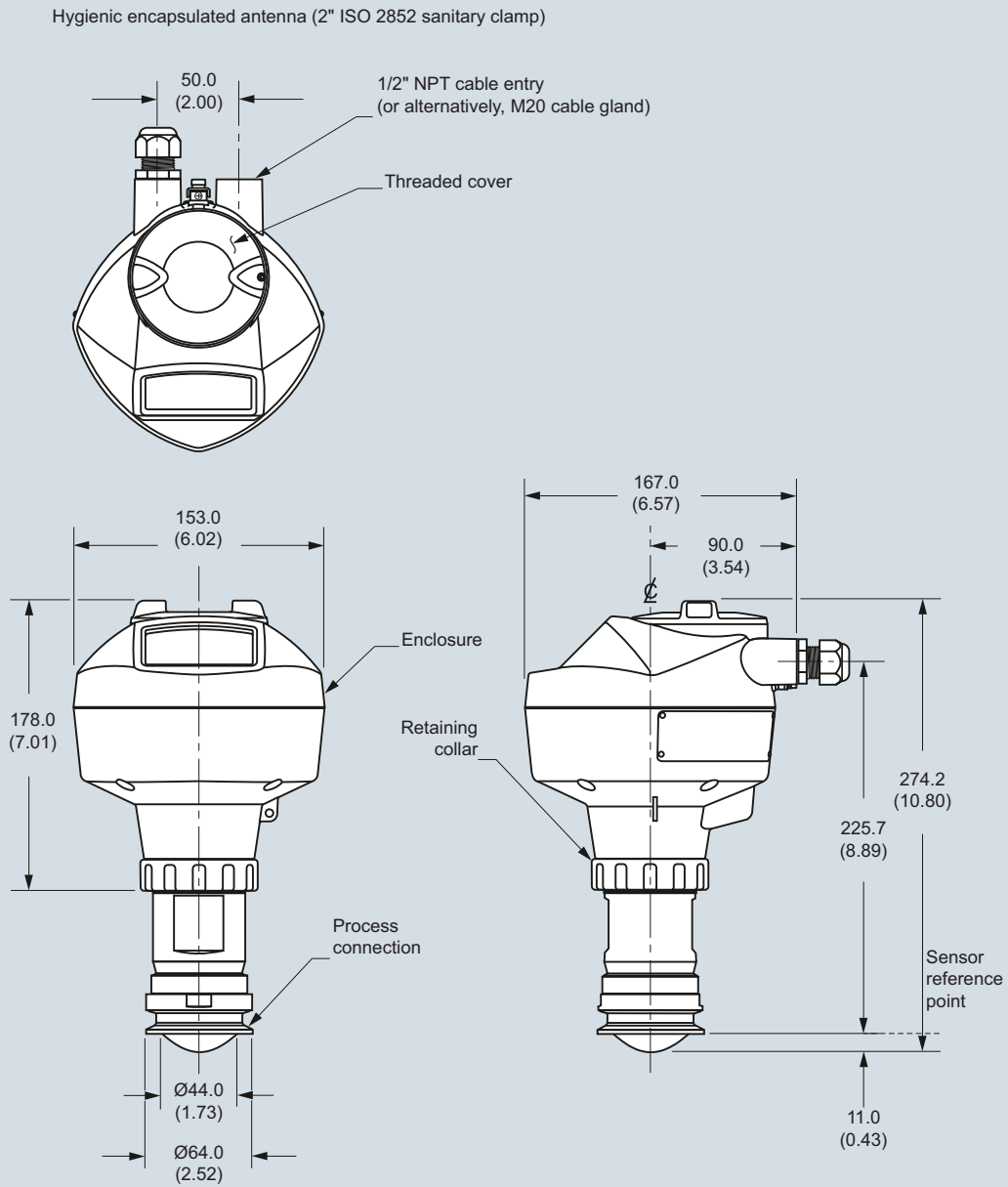
SITRANS LR250 Hygienic Encapsulated Antenna, pressure/temperature curves

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Dimensional drawings

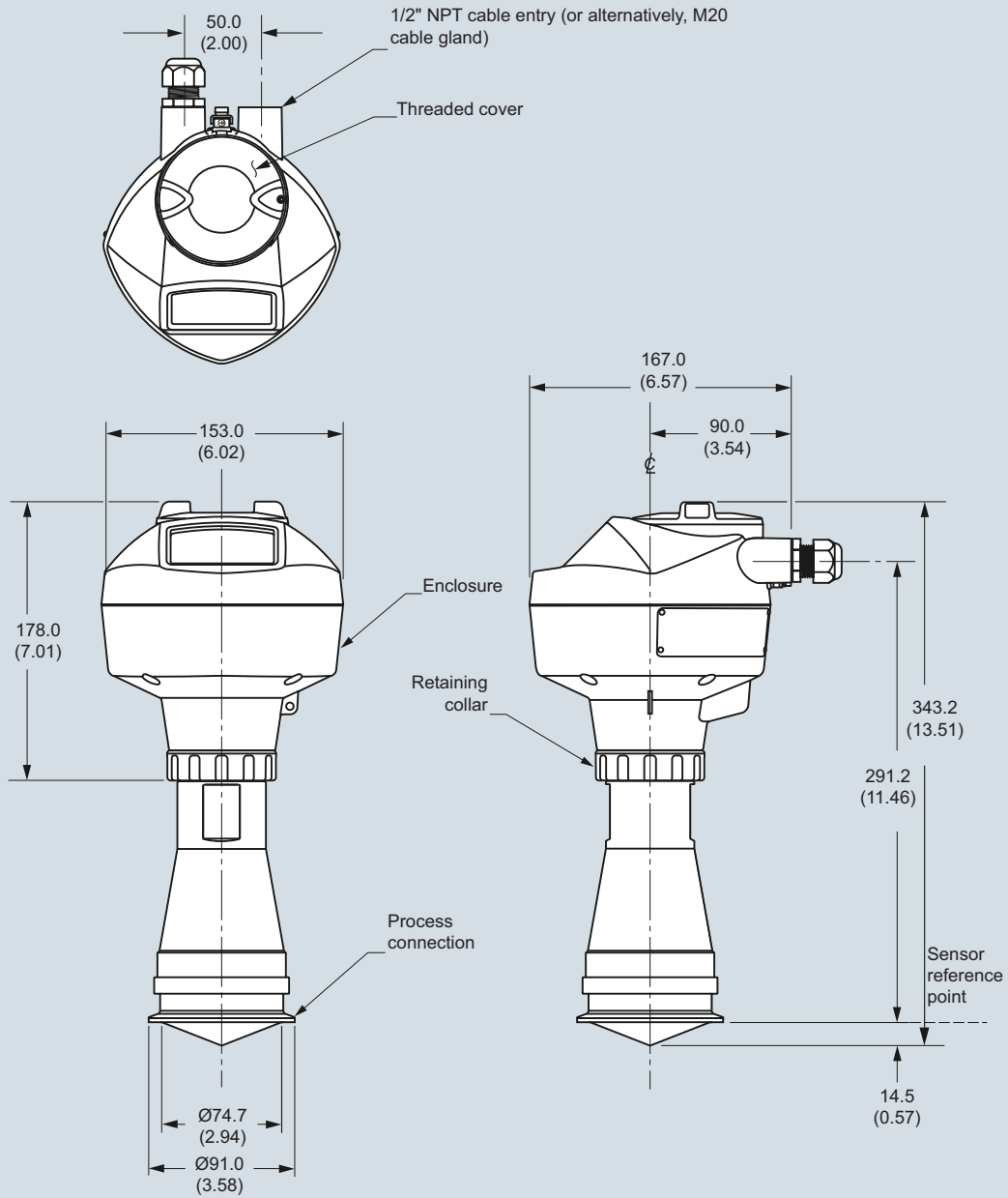


SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement
Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (3" ISO 2852 sanitary clamp)



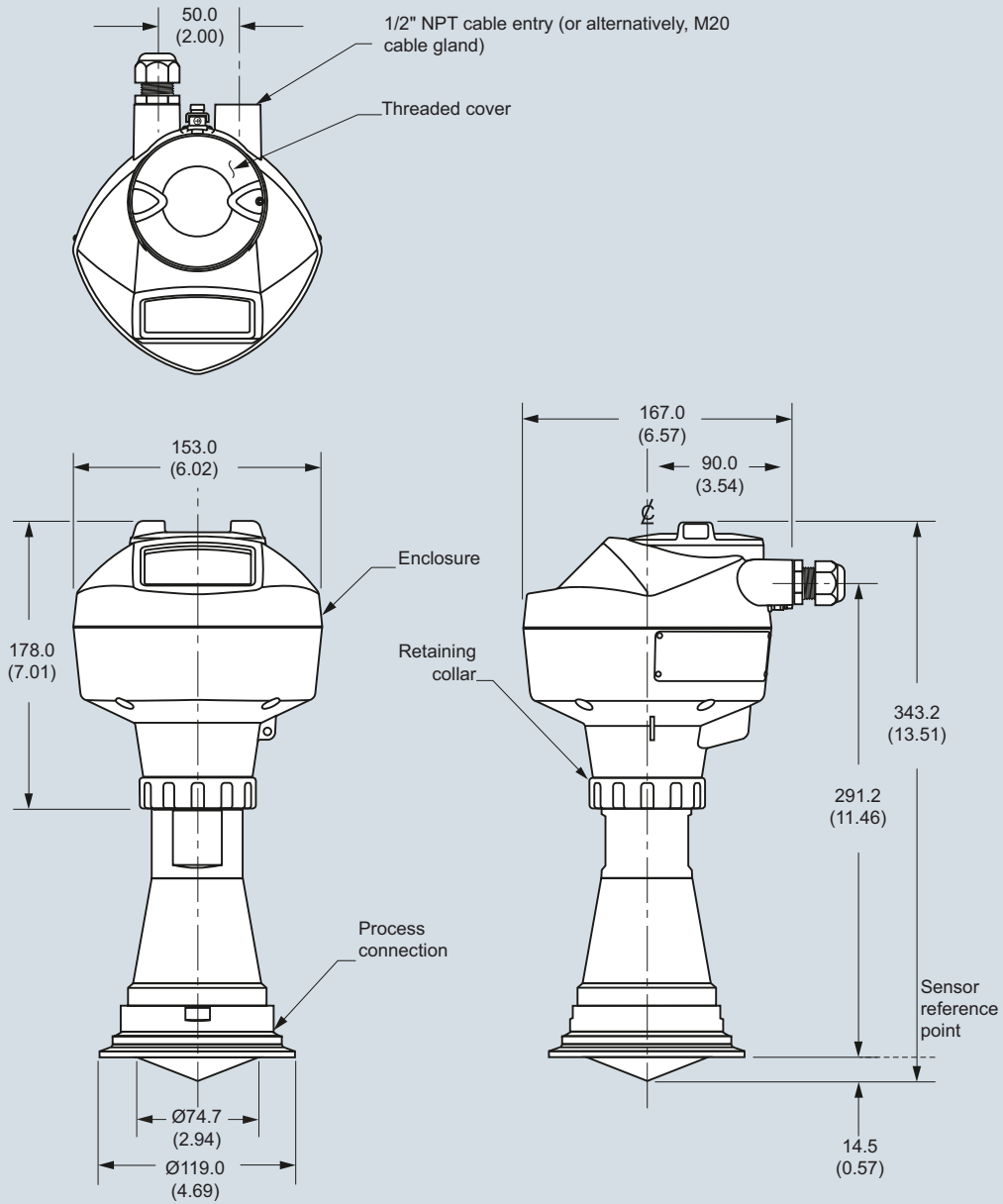
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (4" ISO 2852 sanitary clamp)

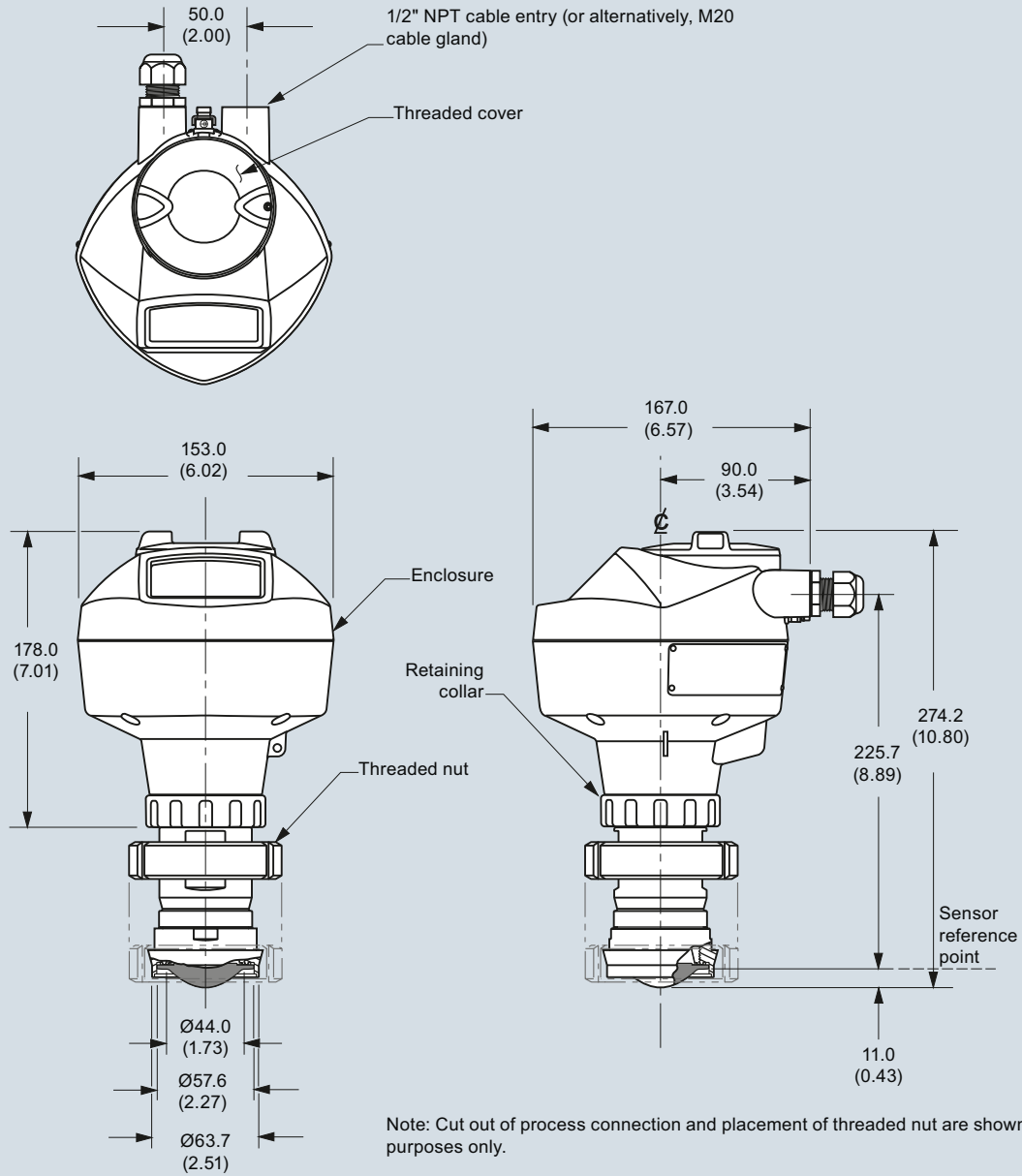


SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement
Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 50 nozzle/slotted nut to DIN 11851)



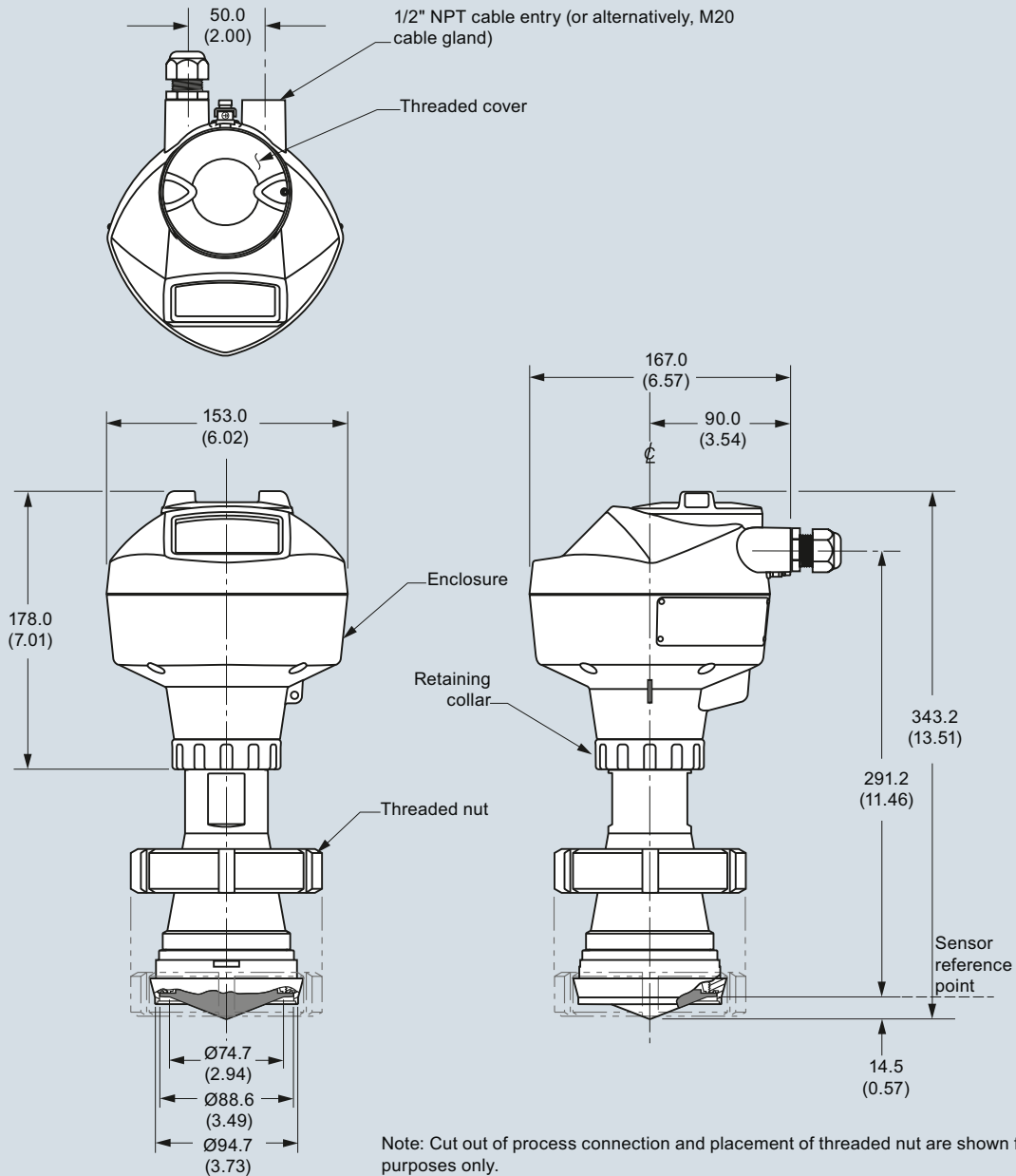
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 80 nozzle/slotted nut to DIN 11851)

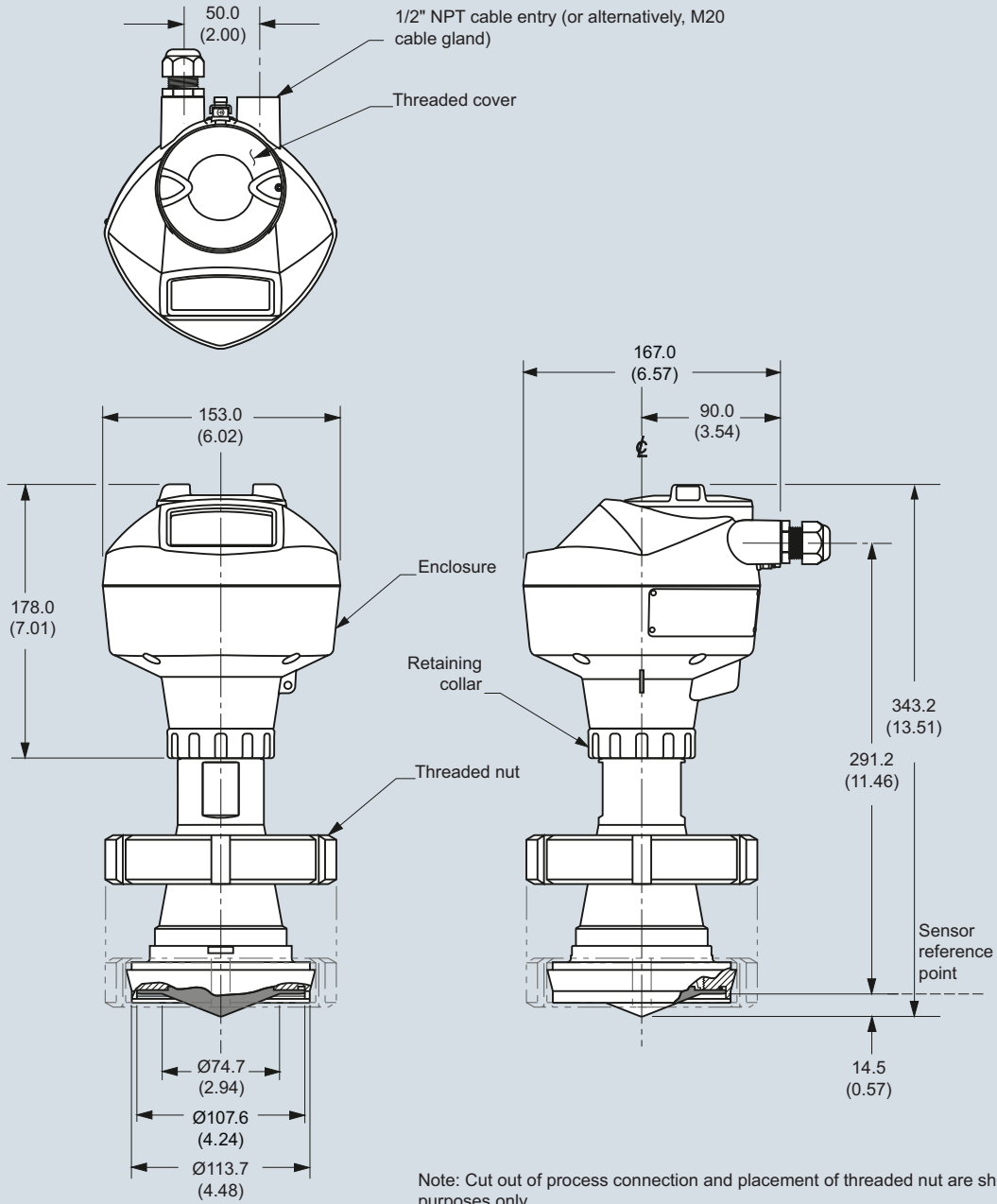


SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement
Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 100 nozzle/slotted nut to DIN 11851)



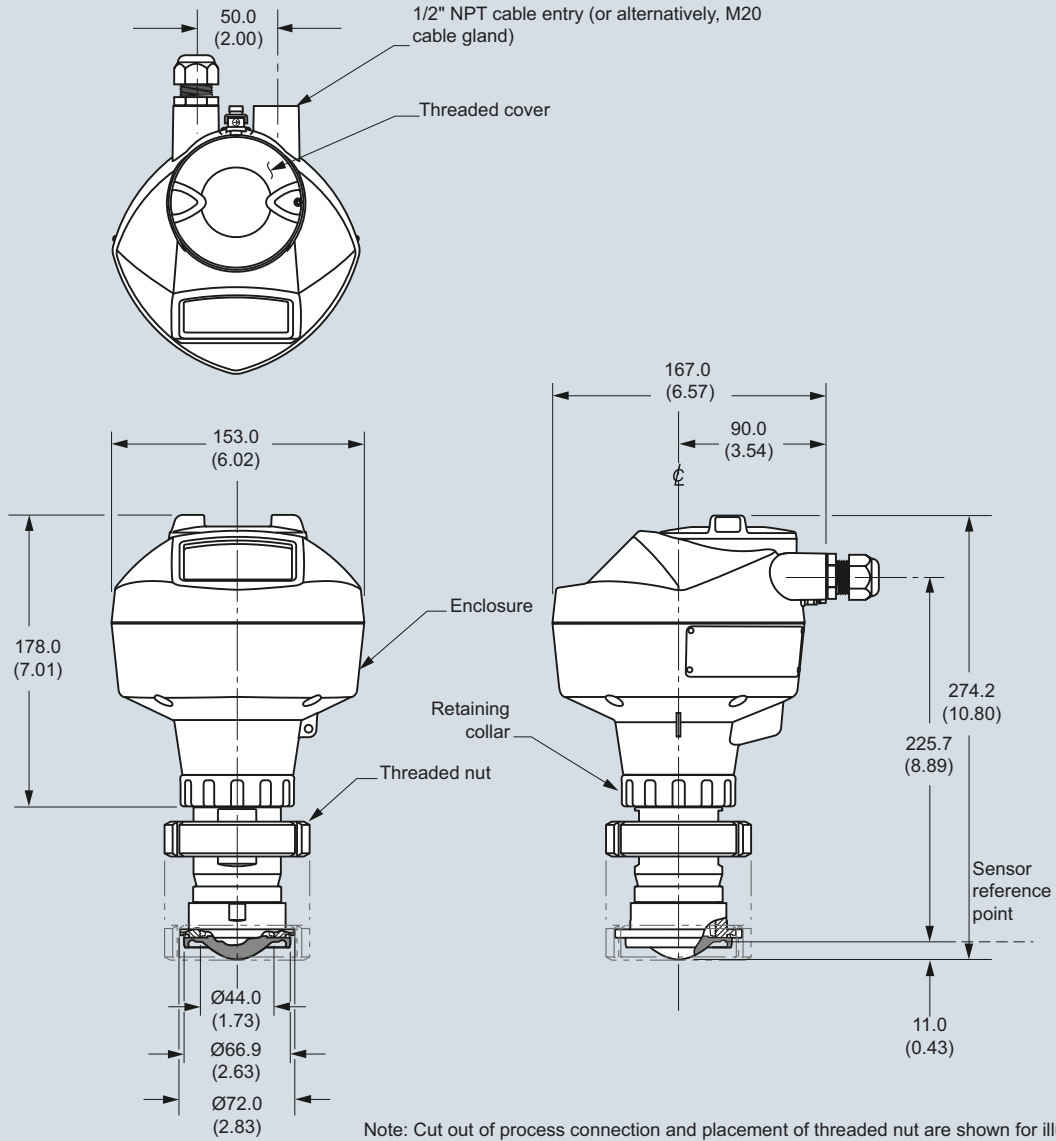
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 50 aseptic clamp to DIN 11864-1)

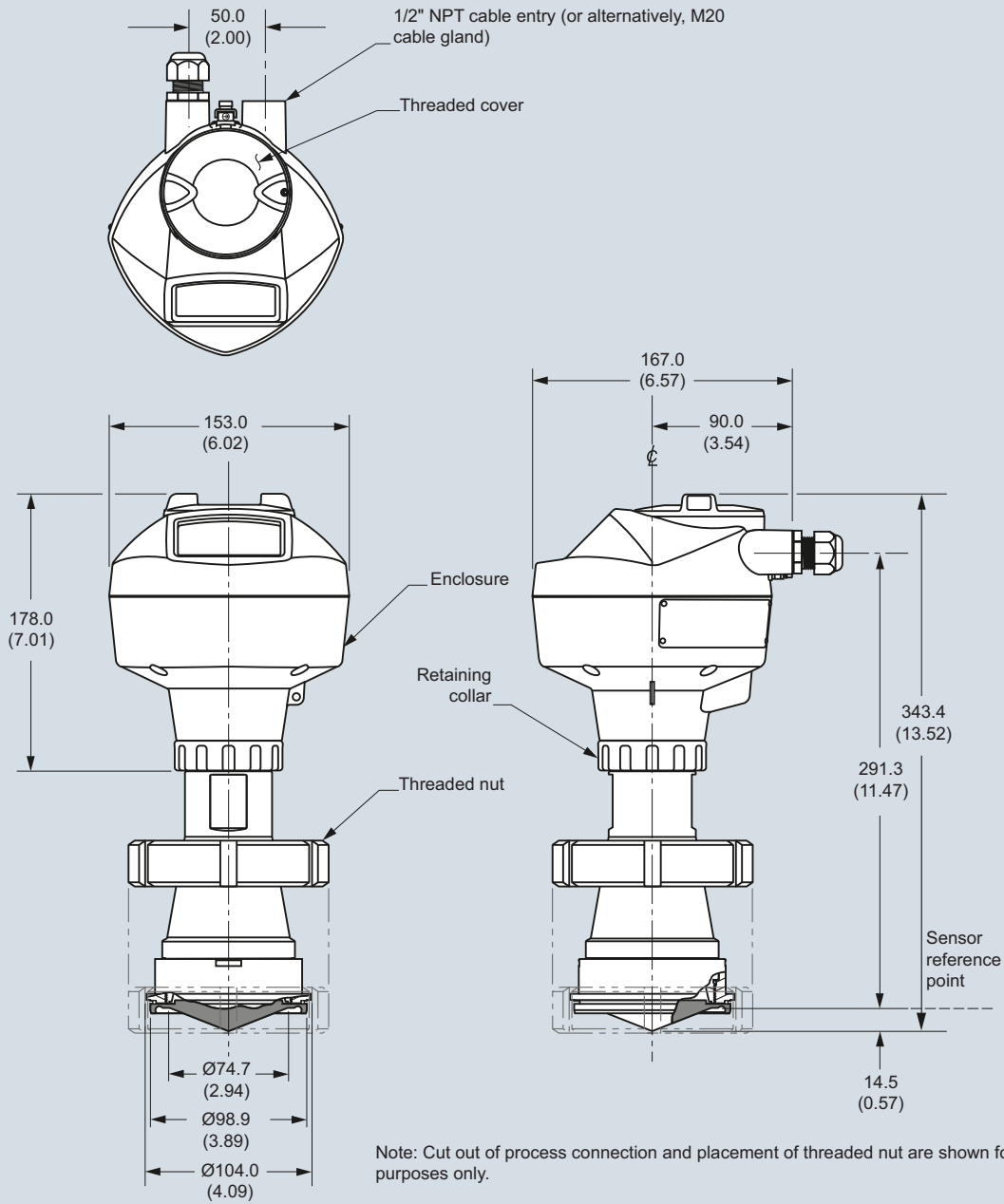


SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement
Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 80 aseptic clamp to DIN 11864-1)



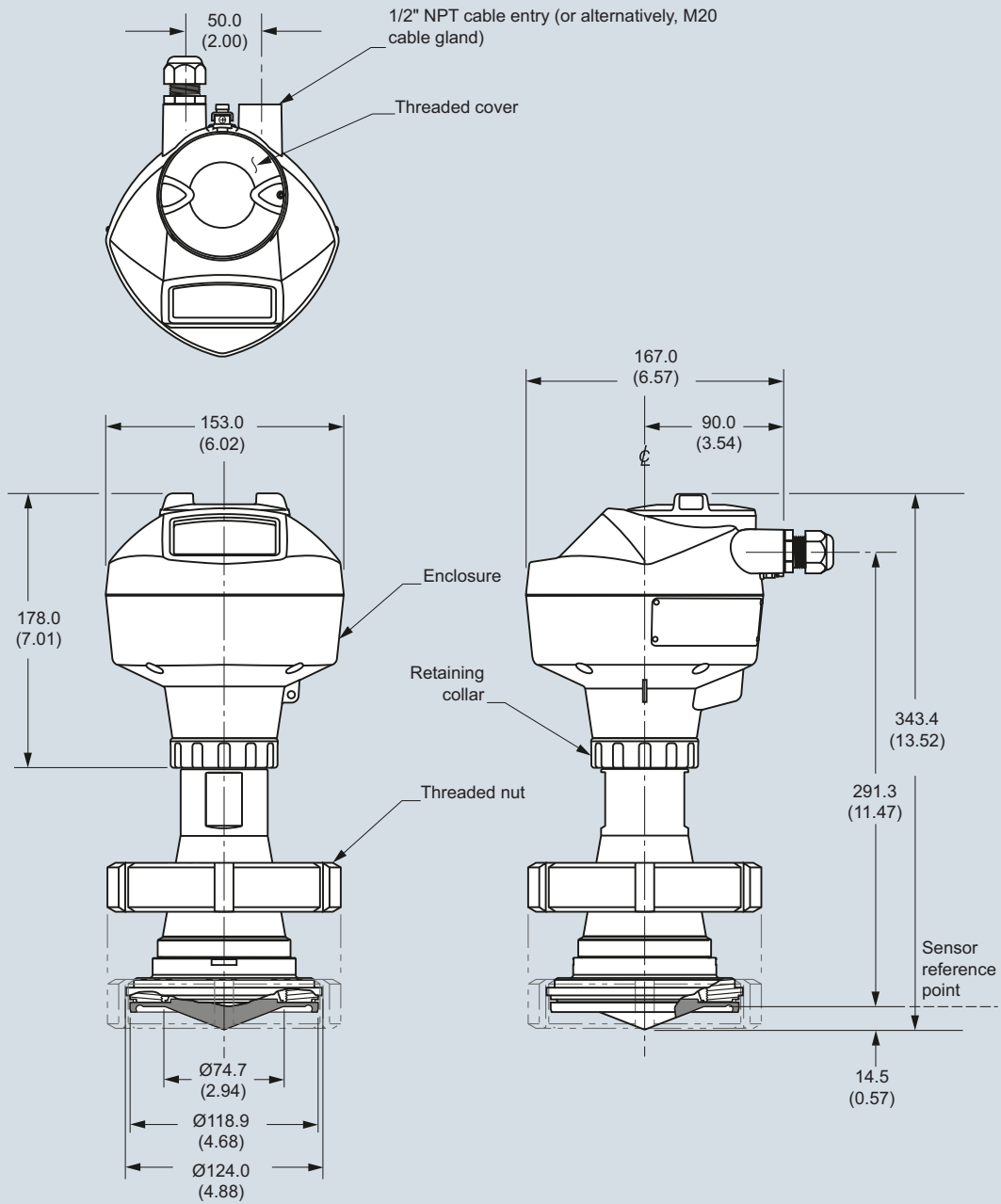
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 100 aseptic clamp to DIN 11864-1)



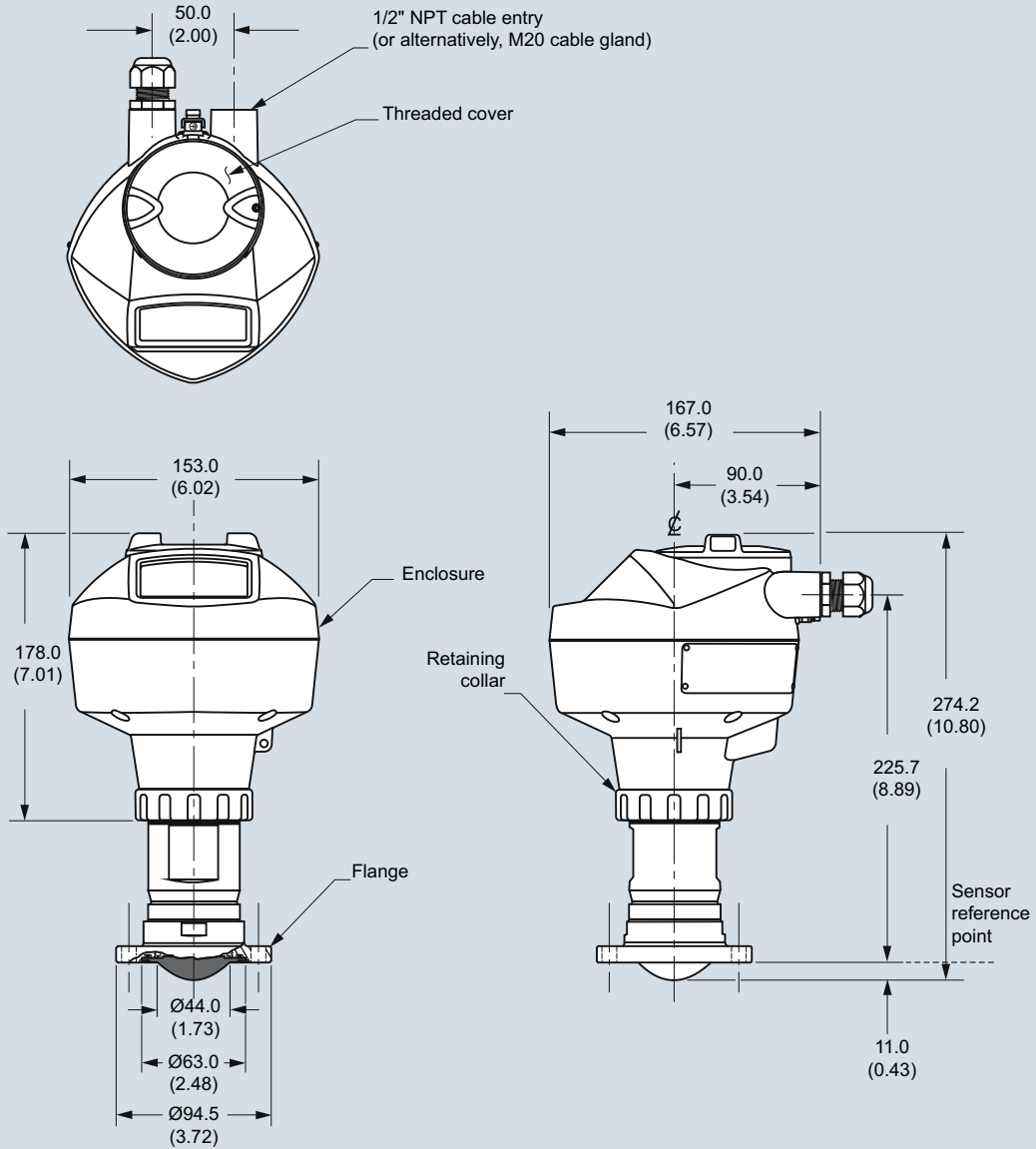
Note: Cut out of process connection and placement of threaded nut are shown for illustration purposes only.

SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement
Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 50 aseptic flange to DIN 11864-2)



Note: Cut out of process connection and flange are shown for illustration purposes only.

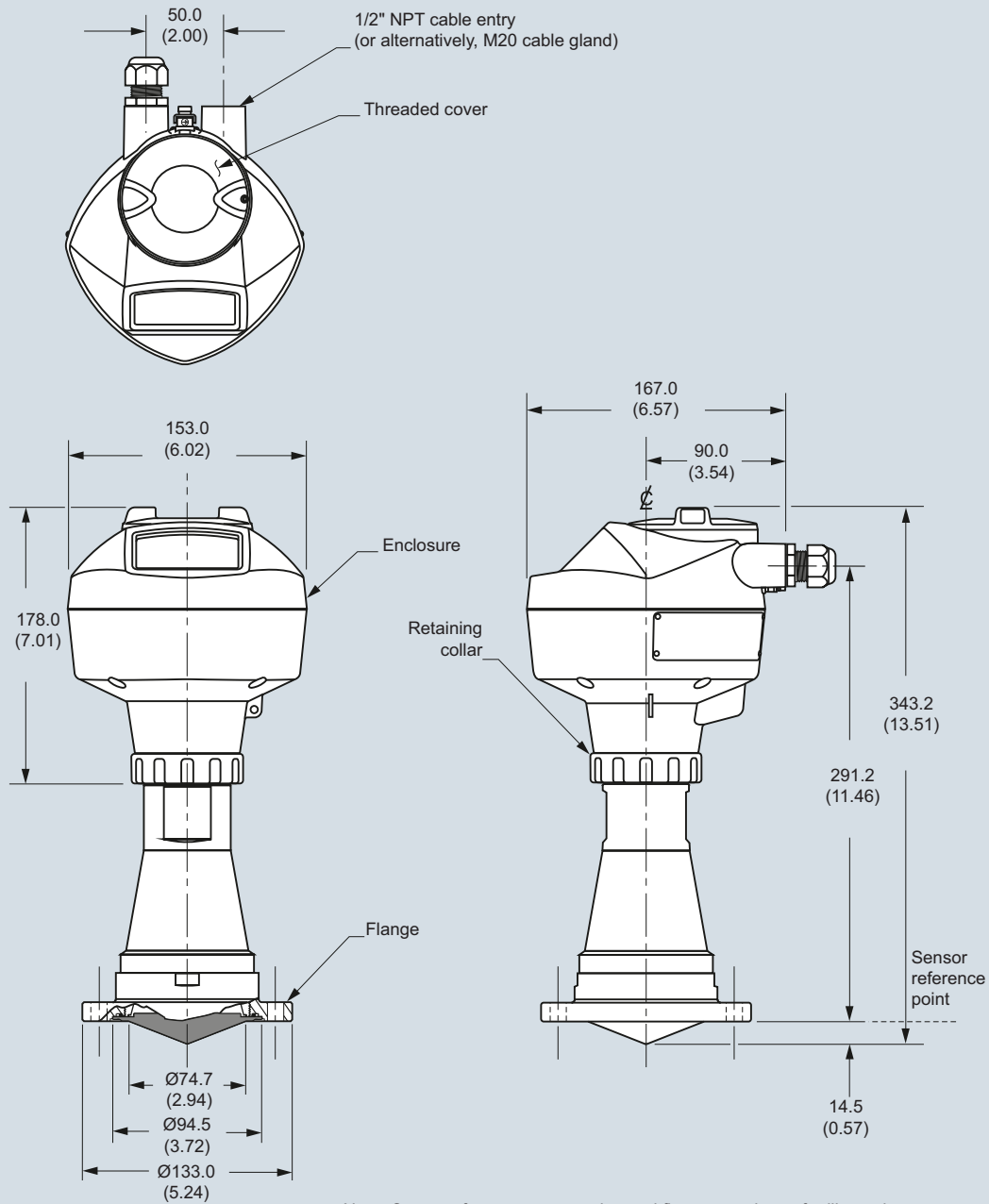
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 80 aseptic flange to DIN 11864-2)

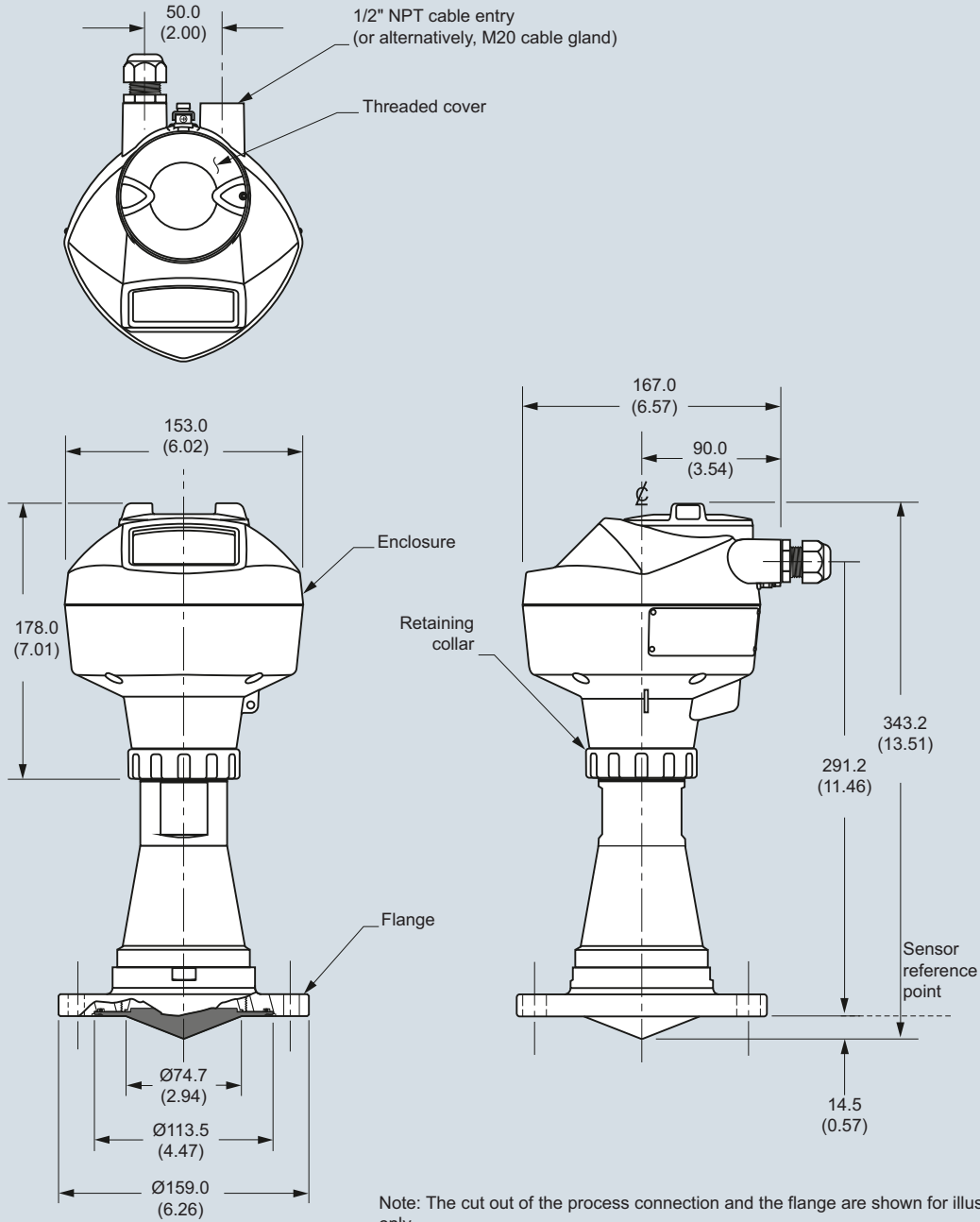


SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement
Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 100 aseptic flange to DIN 11864-2)



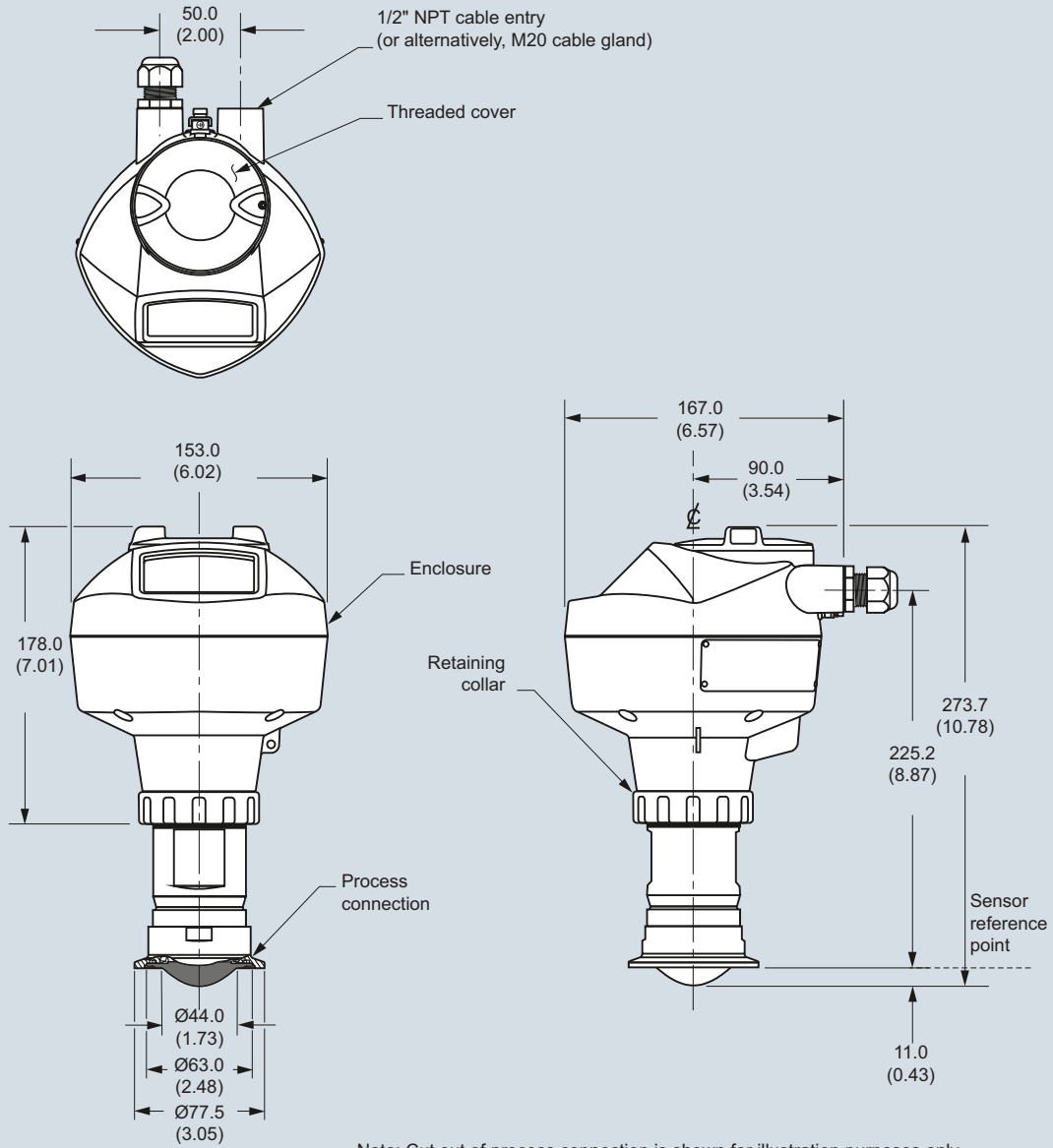
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 50 aseptic clamp to DIN 11864-3)

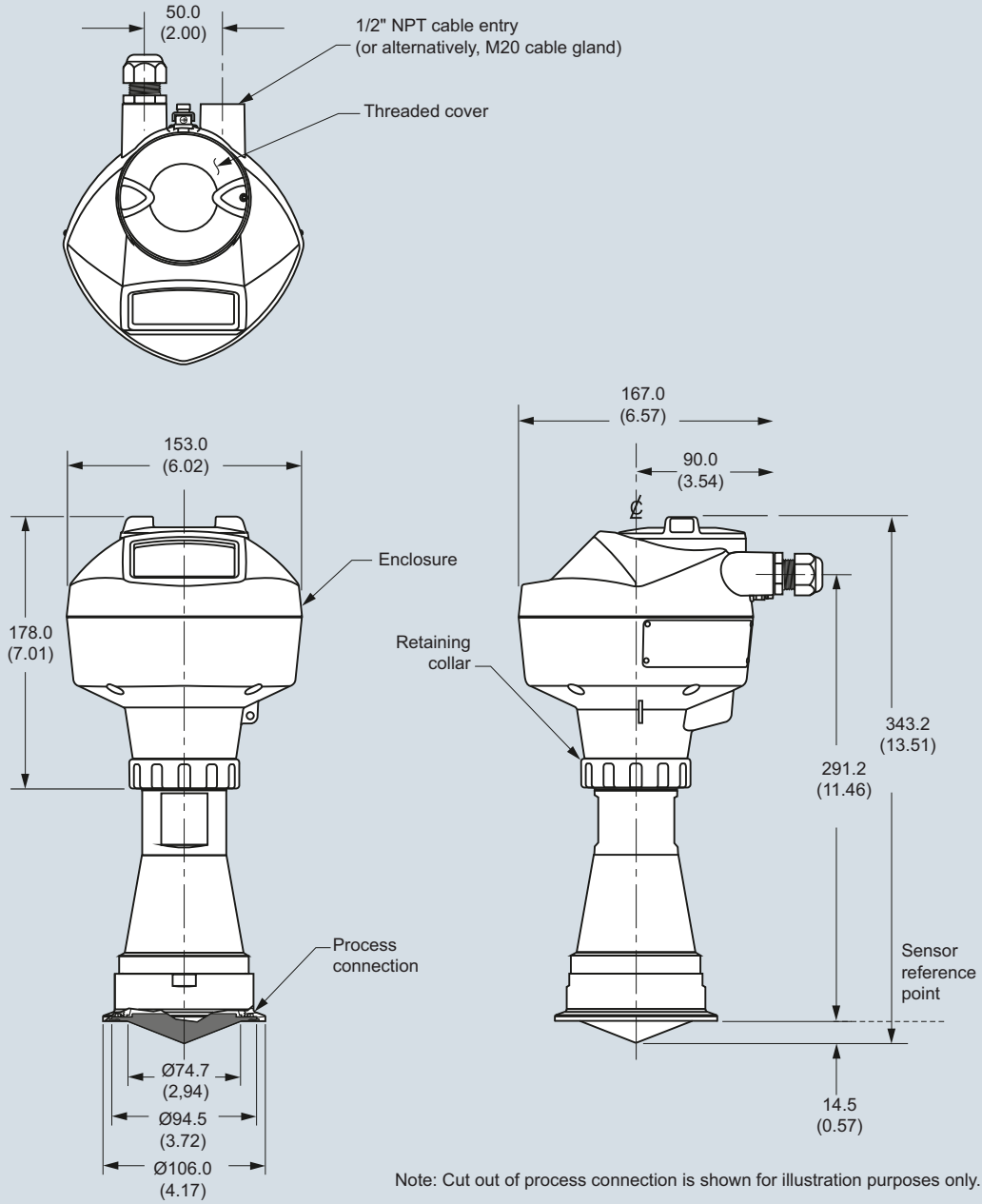


SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement
Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 80 aseptic clamp to DIN 11864-3)



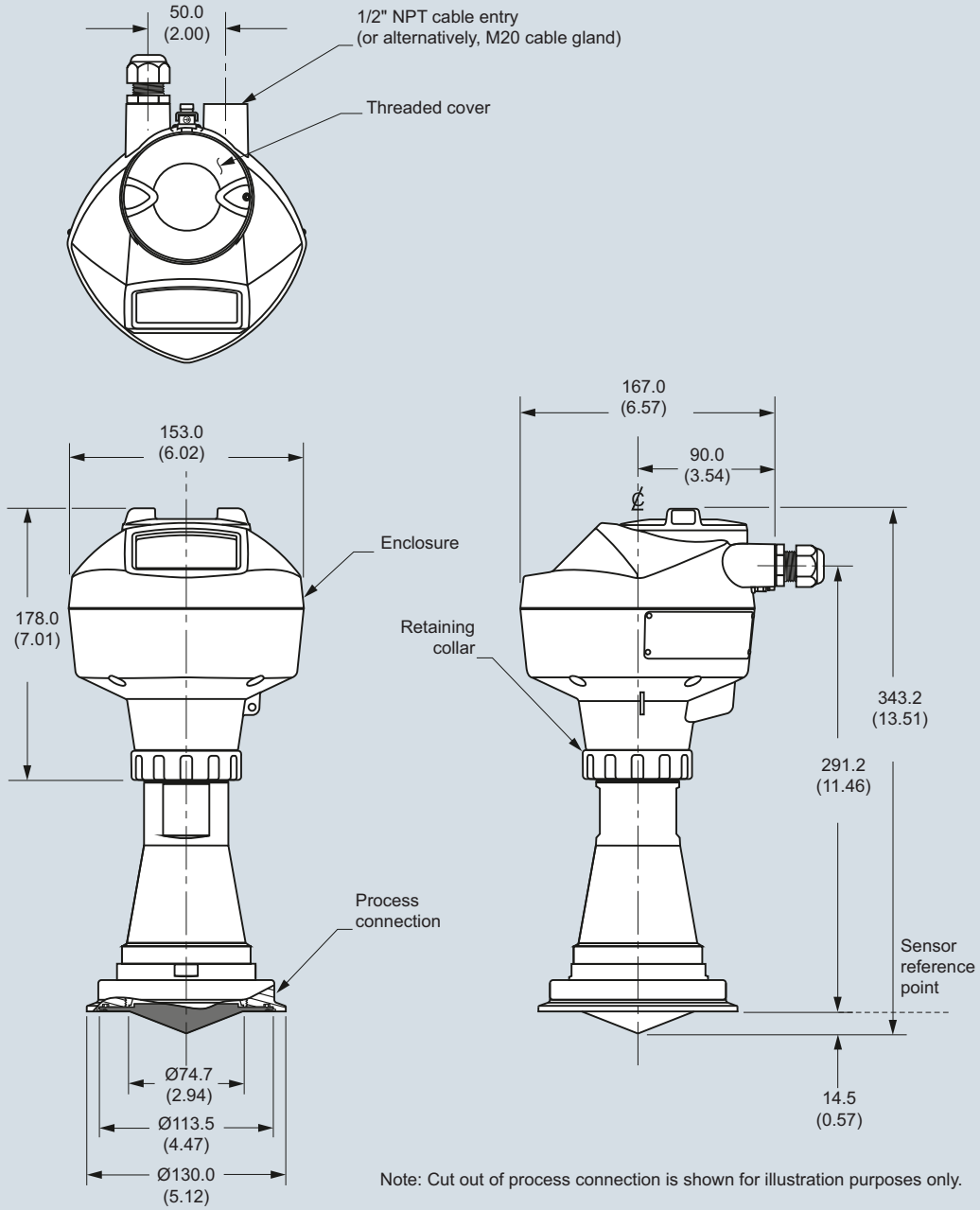
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (DN 100 aseptic clamp to DIN 11864-3)

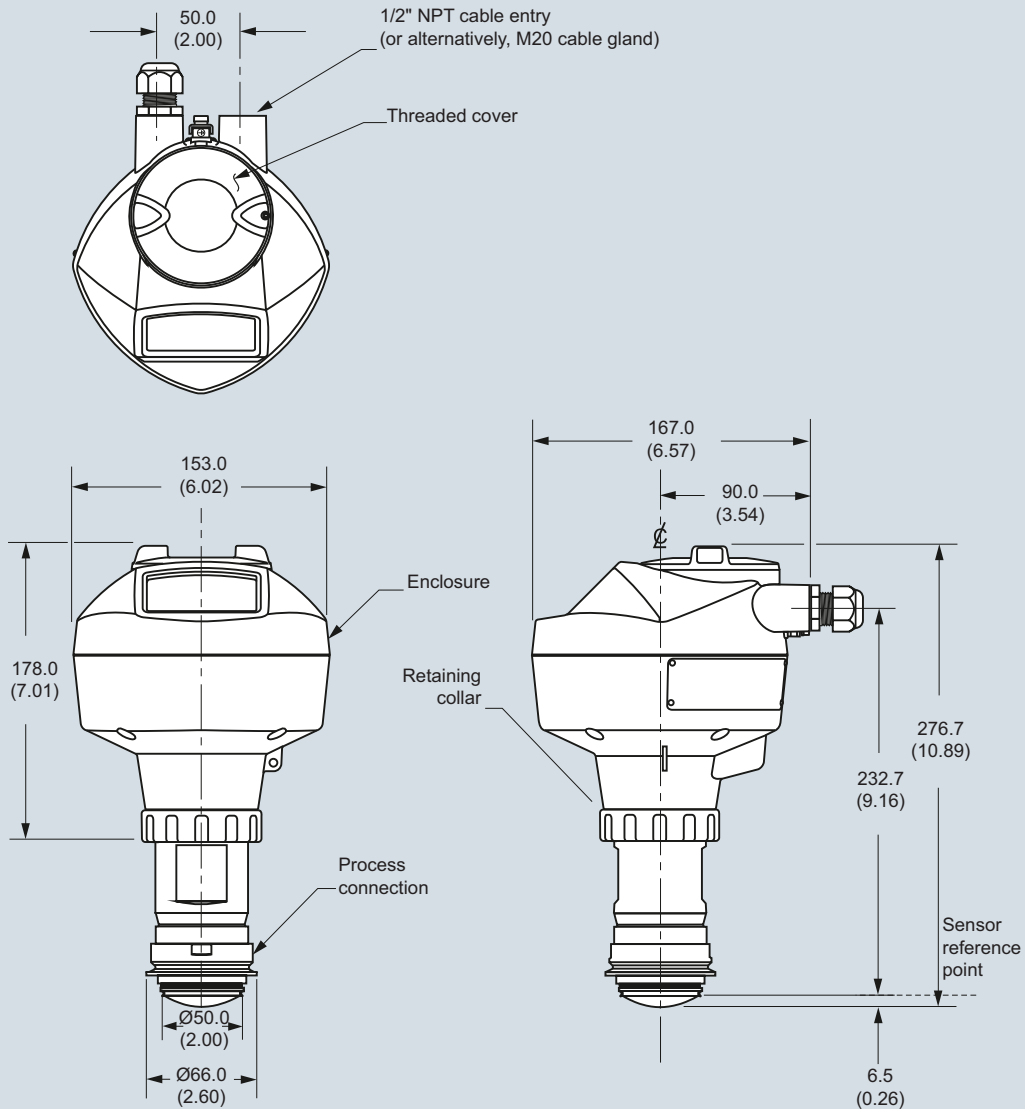


SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement
Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (Tuchenhagen Type F, 50 mm)



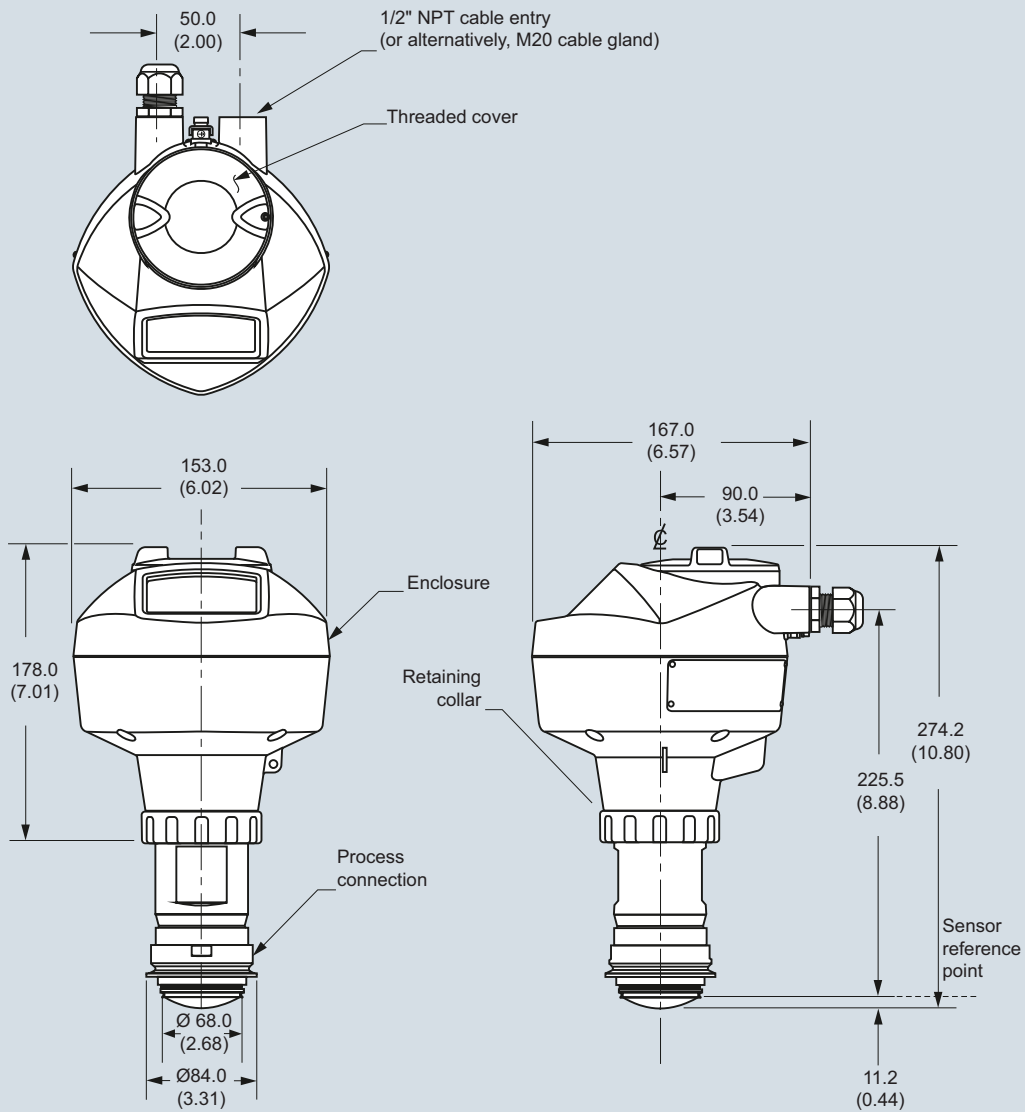
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Hygienic encapsulated antenna (Tuchenhagen Type N, 68 mm)



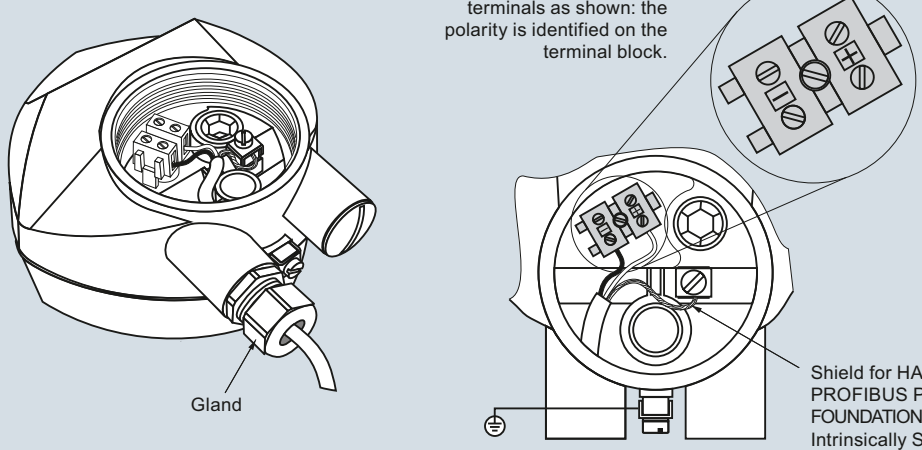
SITRANS LR250 Hygienic Encapsulated Antenna, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Antenna

Schematics



Connect the wires to the terminals as shown: the polarity is identified on the terminal block.

Gland

Shield for HART, PROFIBUS PA, and FOUNDATION Fieldbus Intrinsically Safe versions only.

Hand Programmer

SIEMENS			
1	2	3	4
5	6	7	8
9	0	.	+/−
C	↑	↓	↔

Part number:
7ML1930-1BK

Notes:

1. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR250 connections

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR250 Hygienic Encapsulated Specials

Selection and ordering data

SITRANS LR250 hygienic encapsulated Specials

	Article No.
For "Electronics Head only" follow the standard configuration and choose YY option on positions 9 and 10 of the full part number.	
For example: 7ML5433-1YY20-1AA0 will order an electronics head for the following:	
EHEDG EL Class 1 approval, 4 ... 20mA HART, M20 cable entries, General purpose Haz Loc approval, pressure rating as per manual.	
Spare Lens Kits (Lens and O-ring)	
Kit, 2 inch, ISO2852, HEA, Lens, silicone secondary O-ring	A5E32572731
Kit, 3 inch, ISO2852, HEA, Lens, silicone secondary O-ring	A5E32572745
Kit, 4 inch, ISO2852, HEA, Lens, silicone secondary O-ring	A5E32572747
Kit, DN 50, DIN11851, HEA, Lens, silicone secondary O-ring	A5E32572758
Kit, DN 80, DIN11851, HEA, Lens, silicone secondary O-ring	A5E32572770
Kit, DN 100, DIN11851, HEA, Lens, silicone secondary O-ring	A5E32572772
Kit, DN 50, DIN11864-1, HEA, Lens, silicone secondary O-ring	A5E32572773
Kit, DN 80, DIN11864-1, HEA, Lens, silicone secondary O-ring	A5E32572779
Kit, DN 100, DIN11864-1, HEA, Lens, silicone secondary O-ring	A5E32572782
Kit, DN 50, DIN11864-2/3, HEA, Lens, silicone secondary O-ring	A5E32572785
Kit, DN 80, DIN11864-2/3, HEA, Lens, silicone secondary O-ring	A5E32572790
Kit, DN 100, DIN11864-2/3, HEA, Lens, silicone secondary O-ring	A5E32572791
Kit, Tuchenhausen, Type F, HEA, Lens, silicone secondary O-ring	A5E32572794
Kit, Tuchenhausen, Type N, HEA, Lens, silicone secondary O-ring	A5E32572795
Accessories (customer side process connection and FKM and EPDM seal for each size and type)	
Kit DN 50 DIN 11864-1 GS Form A tank connection, EPDM Seal Class II	A5E32910638
Kit, DN 80 DIN 11864-1 GS Form A tank connection, EPDM Seal Class II	A5E32910649
Kit, DN 100 DIN 11864-1 GS Form A tank connection, EPDM Seal Class II	A5E32910657
Kit DN 50 DIN 11864-1 GS Form A tank connection, FKM Seal Class I	A5E32910658
Kit, DN 80 DIN 11864-1 GS Form A tank connection, FKM Seal Class I	A5E32910671
Kit, DN 100 DIN 11864-1 GS Form A tank connection, FKM Seal Class I	A5E32910681
Kit 2" ISO 2852 tank connection, Clamp, Cleanable EPDM Seal Class II	A5E32910686

SITRANS LR250 hygienic encapsulated Specials

	Article No.
Kit 3" ISO 2852 tank connection, Clamp, Cleanable EPDM Seal Class II	A5E32910697
Kit 4" ISO 2852 tank connection, Clamp, Cleanable EPDM Seal Class II	A5E32910708
Kit DN 50 DIN 11851 SC tank connection, EPDM Seal Class II ¹¹⁾	A5E32910746
Kit DN 80 DIN 11851 SC tank connection, EPDM Seal Class II ¹¹⁾	A5E32910771
Kit DN 100 DIN 11851 SC tank connection, EPDM Seal Class II ¹¹⁾	A5E32910780
Kit DN 50 DIN 11851 SC tank connection, FKM Seal Class II	A5E32910784
Kit DN 80 DIN 11851 SC tank connection, FKM Seal Class II	A5E32910789
Kit DN 100 DIN 11851 SC tank connection, FKM Seal Class II	A5E32910790
Kit DN 50 DIN 11864-2 Form A tank connection, M8 Hardware (nut/bolt/washer), EPDM Seal Class II	A5E32910791
Kit DN 80 DIN 11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), EPDM Seal Class II	A5E32910793
Kit DN 100 DIN 11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), EPDM Seal Class II	A5E32910799
Kit DN 50 DIN 11864-2 Form A tank connection, M8 Hardware (nut/bolt/washer), FKM Seal Class I	A5E32910805
Kit DN 80 DIN 11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), FKM Seal Class I	A5E32910809
Kit DN 100 DIN 11864-2 Form A tank connection, M10 Hardware (nut/bolt/washer), FKM Seal Class I	A5E32910812
Kit DN 50 DIN 11864-3 Form A tank connection, Clamp, EPDM Seal Class II	A5E32910813
Kit DN 80 DIN 11864-3 Form A tank connection, Clamp, EPDM Seal Class II	A5E32910814
Kit DN 100 DIN 11864-3 Form A tank connection, Clamp, EPDM Seal Class II	A5E32910815
Kit DN 50 DIN 11864-3 Form A tank connection, Clamp, FKM Seal Class I	A5E32910816
Kit DN 80 DIN 11864-3 Form A tank connection, Clamp, FKM Seal Class I	A5E32910817
Kit DN 100 DIN 11864-3 Form A tank connection, Clamp, FKM Seal Class I	A5E32910818
Kit Type F, Tuchenhausen, Clamp, EPDM Seal Class II (EHEDG only) - no tank connection	A5E33489537
Kit Type N, Tuchenhausen, Clamp, EPDM Seal Class II (EHEDG only) - no tank connection	A5E33489543
Kit Type F, Tuchenhausen, Clamp, FKM Seal Class I (EHEDG only) - no tank connection	A5E33489828
Kit Type N, Tuchenhausen, Clamp, FKM Seal Class I (EHEDG only) - no tank connection	A5E33489830

¹¹⁾ Class II for low fat applications when EPDM seal used on DIN 11851.

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR260

Overview



SITRANS LR260 is a 2-wire 25 GHz pulse radar level transmitter for continuous monitoring of solids and liquids in storage vessels including extreme levels of dust and high temperatures, to a range of 30 m (98.4 ft).

Benefits

- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency allows for small horn antennas mounted easily in nozzles
- Communication using HART or PROFIBUS PA
- Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions
- Programming using infrared Intrinsically Safe handheld programmer or SIMATIC PDM

Application

SITRANS LR260 includes a graphical local user interface (LUI) that improves setup and operation using an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Start-up is easy using the Quick Start wizard with a few parameters required for basic operation.

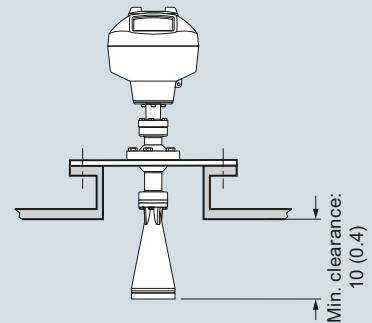
SITRANS LR260's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid.

SITRANS LR260 measures virtually any solids material to a range of 30 m (98.4 ft).

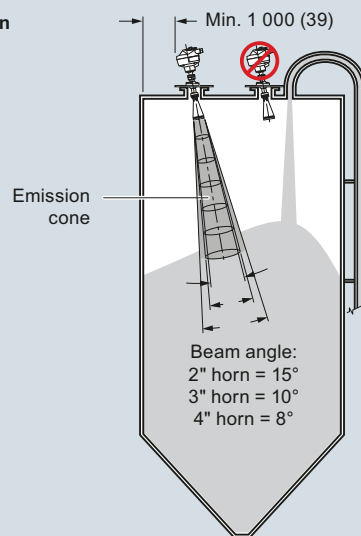
- Key Applications: cement powder, plastic powder/pellets, grain, flour, coal, solids and liquids bulk storage vessels, and other applications.

Configuration

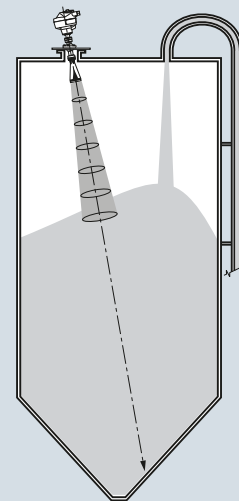
Mounting on a nozzle



Installation



Positioning with easy Aimer



SITRANS LR260 installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR260

Technical specifications

Mode of operation		Design	
Measuring principle	Pulse radar level measurement	Enclosure	Aluminum, polyester powder-coated
Frequency	K-band (25.0 GHz)	• Construction	2 x M20x1.5 or 2 x 1/2" NPT
Minimum detectable distance	0.05 m (2 inch) from end of horn	• Conduit entry	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
Maximum measuring range ¹⁾		Degree of protection	
• Solids	<ul style="list-style-type: none"> • 2" horn: 10 m (32.8 ft) • 3" horn: 20 m (65.6 ft) • 4" horn: 30 m (98.4 ft) 	Weight	< 8.14 kg (17.9 lb) including 4" flange and standard Easy Aimer with 4" horn antenna
• Liquids	<ul style="list-style-type: none"> • 2" horn: 20 m (65.6 ft) • 3" horn: 30 m (98.4 ft) • 4" horn: 30 m (98.4 ft) 	Display (local)	Graphic LCD, with bar graph representing level
Output - HART		Flange and horn (easy aimer model)	
Power	<ul style="list-style-type: none"> • 4 ... 20 mA (\pm 0.02 mA accuracy) • Nominal 24 V DC (max. 30 V DC) 	• Material	304 stainless steel
Fail signal	<ul style="list-style-type: none"> • 3.6 mA ... 23 mA; • or last value 230 ... 600 Ω 	• Horn antenna	2" horn 3" horn 4" horn
Load		Process connections	
Output - PROFIBUS PA		• Universal flanges ²⁾	2 inch/50 mm, 3 inch/80 mm, 4 inch/100 mm, 6 inch/150 mm
	<ul style="list-style-type: none"> • Per IEC 61158-2 • 15.0 mA • Profile version 3.01, Class B 	Mechanical (Threaded Connection model)	
Performance (according to reference conditions IEC60770-1)		• Threaded connection	2" NPT (ASME B1.20.1), R (BSPT, EN 10226-1) or G (BSPP, EN ISO 228-1) 316L/1.4404 or 316L/1.4435 stainless steel PTFE emitter
Maximum measured error (including hysteresis and non-repeatability)	<ul style="list-style-type: none"> • 25 mm (1 inch) from minimum detectable distance to 300 mm (11.8 inch) • Remainder of range = 10 mm (0.39 inch) or 0.1 % of spa(whichever is greater) 	• Materials	
Rated operating conditions		Certificates and approvals	
Installation conditions		General	CSA _{US/C} , CE, FM
• Location	Indoor/outdoor	Radio	Europe (R&TTE), FCC, Industry Canada, RCM
Ambient conditions (enclosure)		Hazardous	CSA/FM Class II, Div. 1, Groups E, F, G, Class III ATEX II 1D, 1/2D, 2D Ex ta IIIC T100 °C Da IECEx/ATEX II 1 GD Ex ia IIC T4 Ga, Ex ta IIIC T100 °C Da CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G SABS ARP0108 Ex ia IIC T4 Ga
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)	Programming	
• Installation category	I	Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Pollution degree	4	• Approvals for handheld programmer	IS model: ATEX II 1GD Ex ia IIC T4 Ga Ex iaD 20 T135 °C Ta = -20 ... +50 °C CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, T6 Ta = 50 °C
Medium conditions		Handheld communicator	HART communicator 375
Dielectric constant ϵ_r	$\epsilon_r > 1.6$, antenna and application dependent	PC	SIMATIC PDM
Process temperature	-40 ... +200 °C (-40 ... +392 °F)	Display (local)	Graphic local user interface including quick start wizard and echo profile displays
Process pressure	<ul style="list-style-type: none"> • 0.5 bar g (7.25 psi g) maximum • 3 bar g (43.5 psi g) optional with 80 °C (176 °F) temperature max 		

¹⁾ From sensor reference point

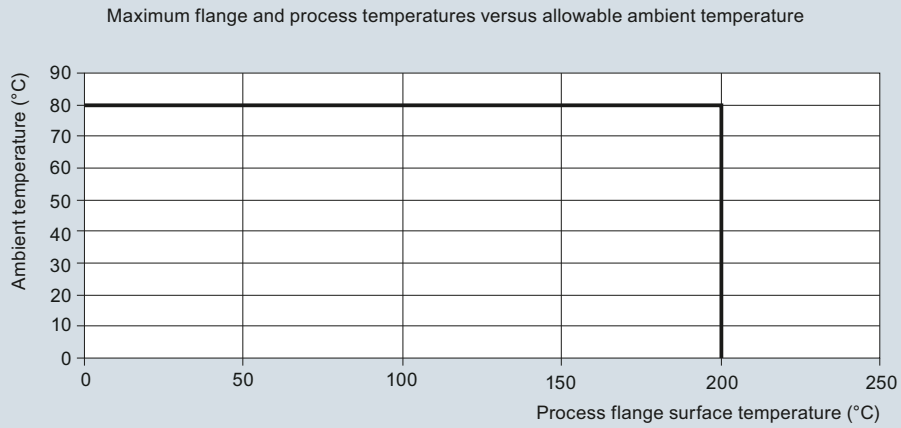
²⁾ Universal flange mates with EN 1092-1 (PN 16)/ASME B16.5 (150 lb)/JIS 2220 (10K) bolt hole pattern

Level Measurement

Continuous level measurement – Radar transmitters

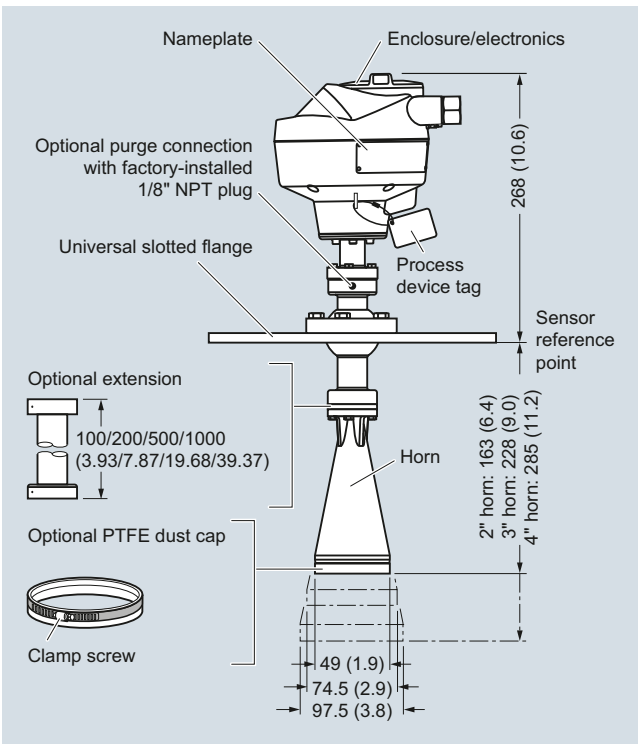
SITRANS LR260

Characteristic curves



SITRANS LR260 Ambient/Process Flange Surface Temperature Curve

Dimensional drawings



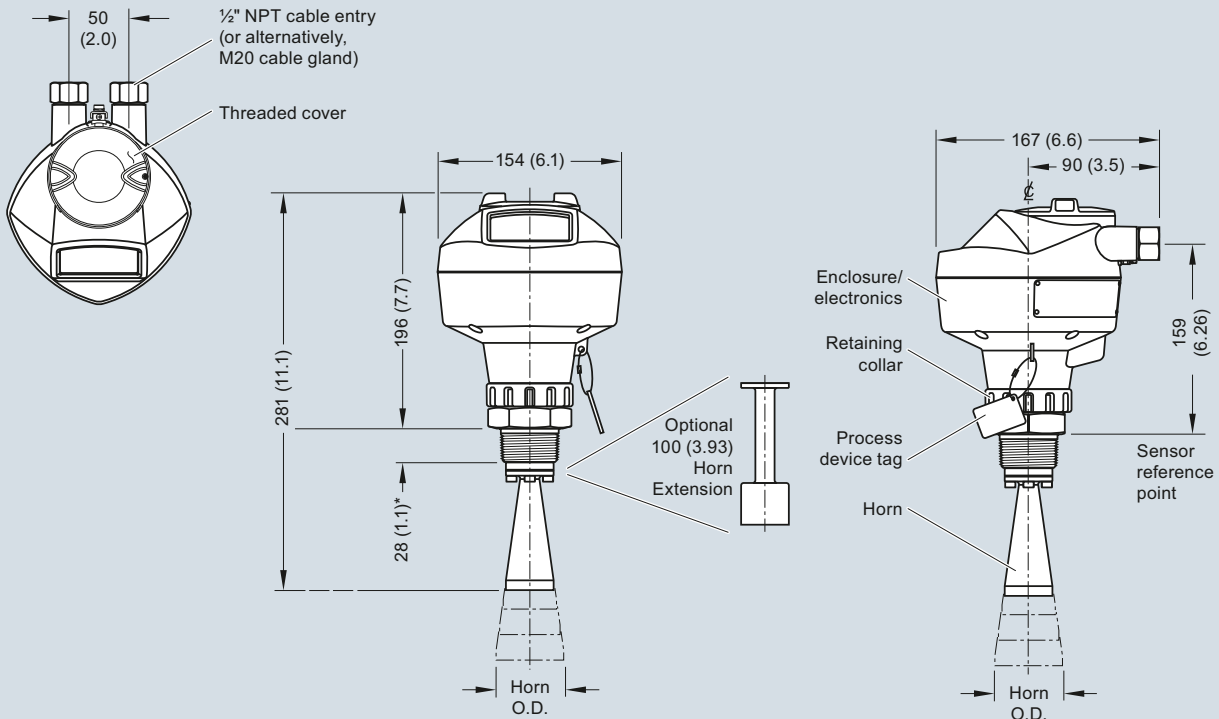
SITRANS LR260, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR260

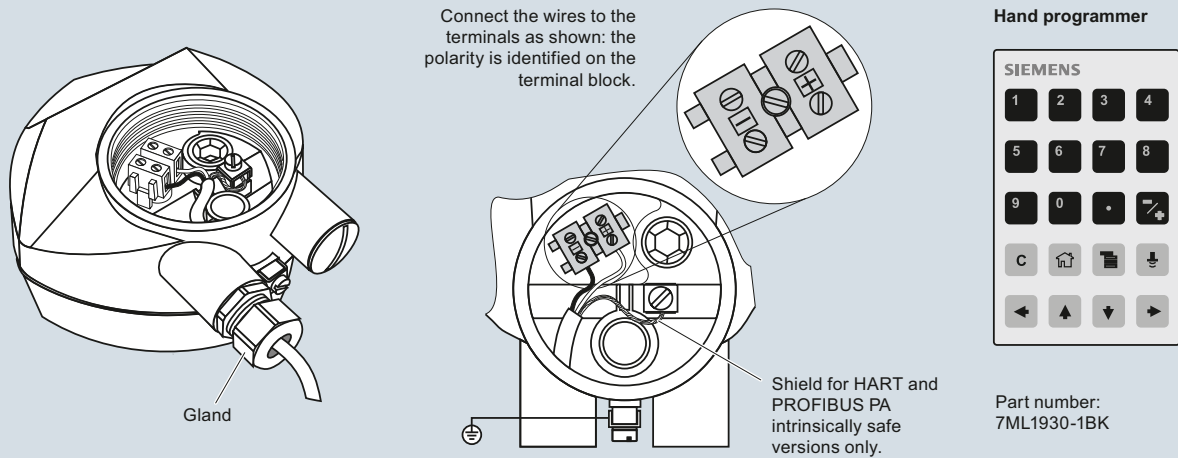
SITRANS LR260



Antenna Type	Antenna O.D.	Height to sensor reference point			Beam angle	Measurement range
		1-1/2" threaded connection	2" threaded connection	3" threaded connection		
2" horn	47.8 (1.88)	N/A	166 (6.55)	180 (7.09)	15 degrees	20 m (65.6 ft)
3" horn	74.8 (2.94)	N/A	199 (7.85)	213 (8.39)	10 degrees	20 m (65.6 ft)
4" horn	94.8 (3.73)	N/A	254 (10)	268 (10.55)	8 degrees	20 m (65.6 ft)

SITRANS LR260, dimensions in mm (inch)

Schematics



Notes:

- DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
- All field wiring must have insulation suitable for rated input voltages.
- Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
- Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR260 connections

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR460

Overview



The SITRANS LR460 is a 4-wire, 24 GHz FMCW radar level transmitter with extremely high signal-to-noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft). It is ideal for measurement in extreme dust.

Benefits

- Process Intelligence for advanced signal processing and quick and easy adjustment
- Self-guided quick start wizard for plug and play start-up
- 24 GHz provides superior reflective properties on solids surfaces
- 100 m (328 ft) range for long-range and difficult applications
- Easy Aimer optimizes signal quality on sloped surfaces
- Programming using infrared Intrinsically Safe handheld programmer or with SIMATIC PDM or HART handheld device

Application

SITRANS LR460 provides excellent results even during conditions of extreme dust. The integral Easy Aimer included on the SITRANS LR460 allows for easy positioning for optimum measurement on solids.

Process Intelligence onboard SITRANS LR460 means advanced signal processing is harnessed for reliable operation on both simple and difficult solids application.

SITRANS LR460 features a robust enclosure, flange and horn components. It is virtually unaffected by atmospheric or temperature conditions within the vessel.

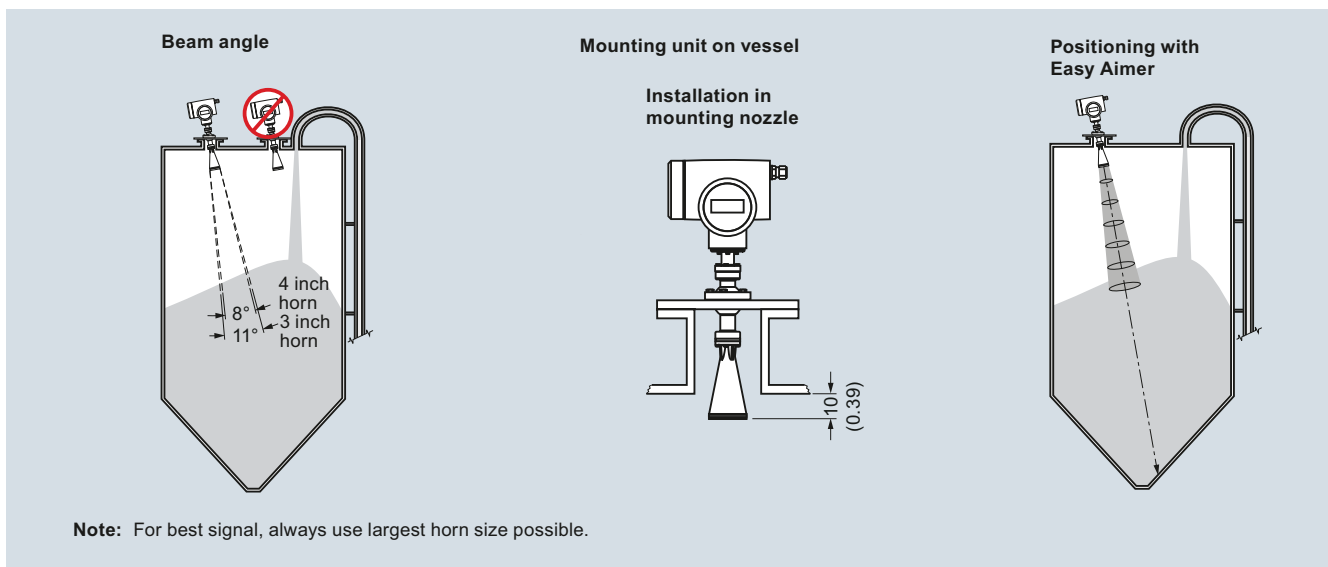
An optional dust cap is available for sticky solids. Optional air purging is also available for extremely sticky applications.

Safe on-site local programming is simple using the Intrinsically Safe handheld programmer. SIMATIC PDM can be used for easy remote programming using HART or PROFIBUS PA.

The characteristics of 24 GHz and high signal-to-noise ratio contribute to exceptional signal reflection, regardless of the dielectric value of the medium.

- Key Applications: long-range dusty applications, cement powder, fly-ash, coal, flour, grain, plastics

Configuration



SITRANS LR460 installation, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR460

Technical specifications

Mode of operation		Programming	
Measuring principle	FMCW radar level measurement	Intrinsically Safe Siemens handheld programmer (ordered separately)	Infrared receiver
Frequency	24.2 ... 25.2 GHz FMCW	• Approvals for handheld programmer	IS model with ATEX II 1G EEx ia IIC T4, CSA/FM Class I, Div. 1, Groups A, B, C, D T6 at max. ambient temperature of 40 °C (104 °F)
Measuring range	0.35 ... 100 m (1.15 ... 328.08 ft)	Handheld communicator	HART Communicator 375
Output		PC	SIMATIC PDM
Analog output (HART)		Display (local)	Alphanumeric LCD for readout and entry
• Signal range	Optically isolated	Power supply	
• Load	Max. 600 Ω	100 ... 230 V AC ± 15 % (50/60 Hz), 6 W (12 VA)	
• Fail-safe	mA signal programmable as high, low or hold (LOE)	or	
Communication	HART, optional PROFIBUS PA	24 V DC +25/-20 %, 6 W (optional)	
Digital output	Relay, NC or NO function, max. 50 V DC, max. 200 mA, rating 5 W	Certificates and approvals	
PROFIBUS PA protocol	Layer 1 and 2, Class A, Profile 3.01	General	CSA _{US/C} , CE, FM, RCM
Performance (Reference conditions according to IEC 60770-1)		Radio	European Radio (R&TTE), Industry Canada, FCC, RCM
• Non-linearity	Greater of 25 mm (1 inch) or 0.25 % of span (including hysteresis and non-repeatability), over the full ambient temperature range	Hazardous Areas	CSA/FM Class II, Div. 1, Groups E, F and G, Class III ATEX II 1D, 1/2 D, 2D T85 °C INMETRO ExtD A20 IP67 T85 °C GOST Ex DIP A20 T _a 85 °C IP67
• Non-repeatability	≤ 10 mm (0.4 inch)	Optional equipment	
Rated operating conditions		Dust cap	PTFE
• Amb. temperature for enclosure	-40 ... +65 °C (-40 ... +149 °F)	Air purge connection	1/8" NPT
• Location	Indoor/outdoor		
• Installation category	II		
• Pollution degree	4		
Medium conditions			
Dielectric constant	$\epsilon_r > 1.4$		
Process temperature range	-40 ... +200 °C (-40 ... +392 °F)		
Vessel pressure	0.5 bar g (7.25 psi g) maximum		
Design			
Weight	Approx. 6.1 kg (13.4 lb) with 3 inch universal flange		
Materials			
• Enclosure	Die-cast aluminum, painted		
• Degree of protection	IP67/Type 4X/NEMA 4X/Type 6/NEMA 6		
• Cable inlet	2x M20x1.5 or ½" NPT		
Process connections			
• Universal flanges, 304 stainless steel, flat faced, with integral Easy Aimer	3 inch/80 mm, 4 inch/100 mm, 6 inch/150 mm (mates with flange EN 1092-1, ASME B16.5, or JIS B2238 bolt pattern), 0.5 bar g (7.25 psi g) max. pressure		

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR460

Selection and Ordering data

SITRANS LR460

4-wire, 24 GHz FMCW radar level transmitter with extremely high signal-to-noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft). It is ideal for measurement in extreme dust.

Order handheld programmer separately

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Process connection

Universal, flat faced, 0.5 bar g (7.25 psi g) maximum with integral Easy Aimer ball

- 3 inch (80 mm)
- 4 inch (100 mm)
- 6 inch (150 mm)

Antenna

- 3" horn antenna, fits 80 mm (3 inch) nozzles
- 3" horn antenna, fits 80 mm (3 inch) nozzles with 100 mm extension
- 3" horn antenna, fits 80 mm (3 inch) nozzles with 200 mm extension
- 3" horn antenna, fits 80 mm (3 inch) nozzles with 500 mm extension¹⁾
- 3" horn antenna, fits 80 mm (3 inch) nozzles with 1 000 mm extension¹⁾
- 4" horn antenna, fits 100 mm (4 inch) nozzles
- 4" horn antenna, fits 100 mm (4 inch) nozzles with 100 mm extension
- 4" horn antenna, fits 100 mm (4 inch) nozzles with 200 mm extension
- 4" horn antenna, fits 100 mm (4 inch) nozzles with 500 mm extension¹⁾
- 4" horn antenna, fits 100 mm (4 inch) nozzles with 1 000 mm extension¹⁾

Purge (self-cleaning) connection

- No purge connection
- Purge connection

Output/Communication

- 4 ... 20 mA, HART
- PROFIBUS PA

Power supply/cable inlet

- 100 ... 230 V AC
- 2 x M20x1.5
- 2 x 1/2" NPT
- 24 V DC
- 2 x M20x1.5
- 2 x 1/2" NPT

Approvals

- General Purpose, CSAUs/c, Industry Canada, FM, FCC, CE and R&TTE, RCM
- CSA/FM Class II, Div. 1, Groups E, F, and G, Class III
- ATEX II 1/2 D T6, CE, R&TTE

¹⁾ Available with Purge option 0 only

Article No.

7ML5426-	
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B	
C	
D	
E	
F	
G	
H	
J	
K	
0	
1	
0	
1	
A	
B	
C	
D	
A	
B	
C	

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text

Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000

Operating Instructions

English

French

German

Multi-language Quick Start manual
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Accessories

Handheld programmer, Infra-red, Intrinsically Safe, EEx ia

Dust cap, PTFE, for 3 inch/80 mm horn

Dust cap, PTFE, for 4 inch/100 mm horn

HART modem/USB
(for use with a PC and SIMATIC PDM)

One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART¹⁾

One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA¹⁾

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

For applicable back up point level switch - see point level measurement section

¹⁾ Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

Order code

Y15

C11

Article No.

7ML1998-5JM02

7ML1998-5JM11

7ML1998-5JM32

A5E32007360

7ML5830-2AJ

7ML1930-1BL

7ML1930-1BM

7MF4997-1DB

7ML1930-1AP

7ML1930-1AQ

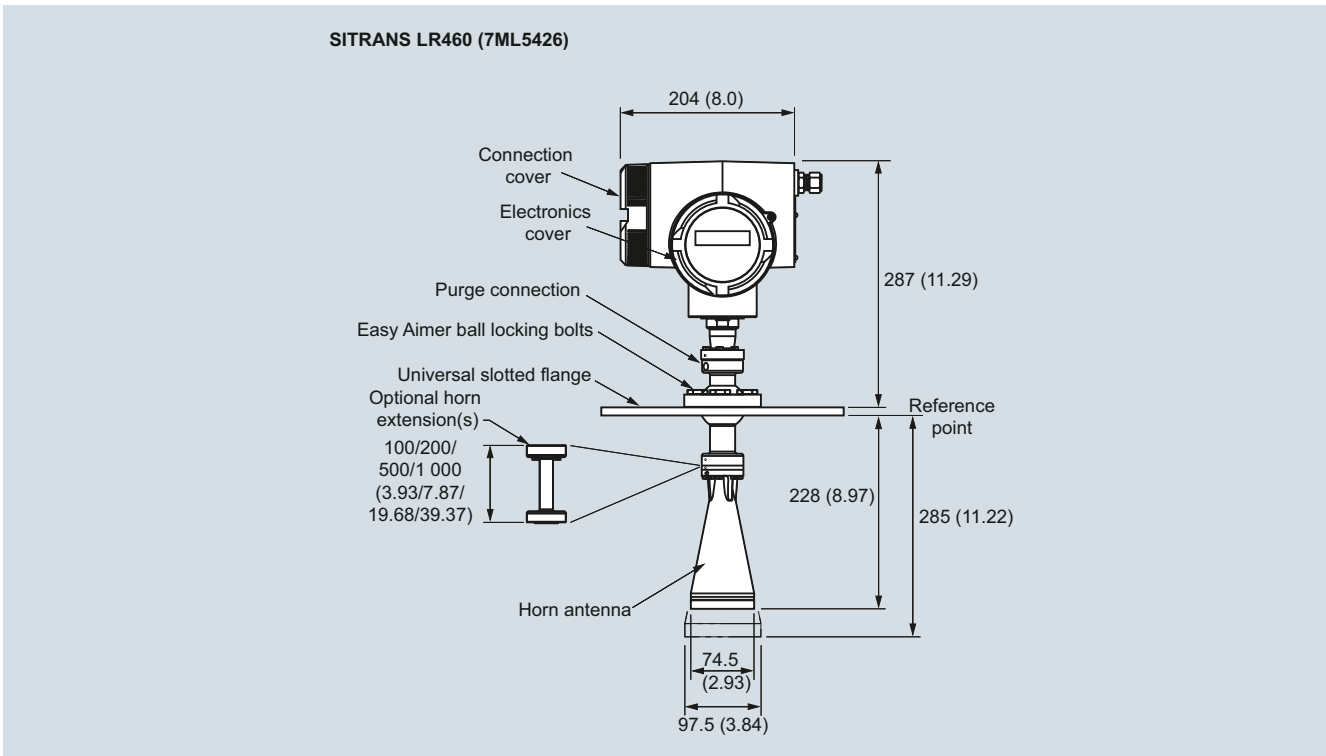
7ML5741-...

7ML5740-...

7ML5744-...

7ML5750-...

Dimensional drawings



SITRANS LR460, dimensions in mm (inch)

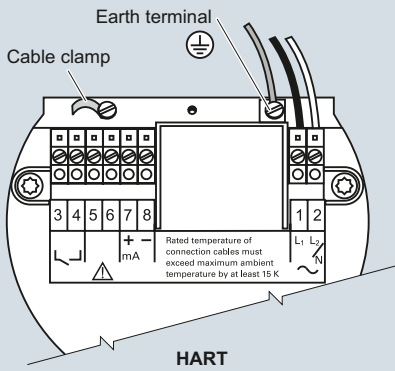
Level Measurement

Continuous level measurement – Radar transmitters

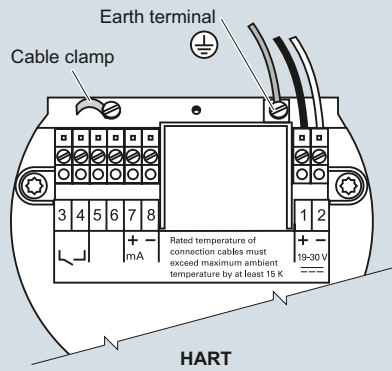
SITRANS LR460

Schematics

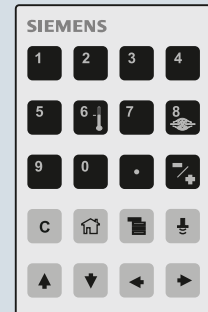
AC version



DC version

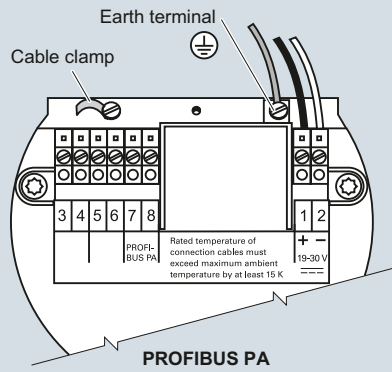
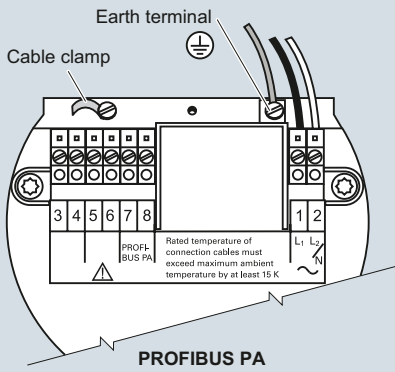


Hand programmer



SITRANS LR460

Part number:
7ML5830-2AJ



Notes

- Recommended torque on terminal clamping screws, 0.5 ... 0.6 Nm
- 4 ... 20 mA, PROFIBUS PA, DC input circuits, 14 ... 20 AWG, shielded copper wire
- AC input circuit, min. 14 AWG copper wire
- All field wiring must have insulation suitable for at least 250 V
- The equipment must be protected by a 15 A fuse or circuit breaker in the building installation

SITRANS LR460 connections


Level Measurement

Continuous level measurement – Radar transmitters

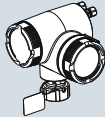
SITRANS LR260/LR460 Specials

Selection and ordering data

SITRANS LR260/LR460 Specials

	Article No.
Process connection part kits - non-pressure-rated	
LR260/LR460, 100 mm extension for horn antenna, no purge ¹⁾	A5E01087872
LR260/LR460, 200 mm extension for horn antenna, no purge ¹⁾	A5E01091262
LR260/LR460, 100 mm extension for horn antenna with purge ¹⁾	A5E01261979
LR260/LR460, 200 mm extension for horn antenna with purge ¹⁾	A5E01261981
LR260/LR460, horn 2", no purge, no emitter ¹⁾	A5E02083905
LR260/LR460, horn 3", no purge, no emitter ¹⁾	A5E01623511
LR260/LR460, horn 4", no purge, no emitter ¹⁾	A5E01623512
LR260/LR460, horn 2", with purge, no emitter ¹⁾	A5E02083906
LR260/LR460, horn 3", with purge, no emitter ¹⁾	A5E01623513
LR260/LR460, horn 4", with purge, no emitter ¹⁾	A5E01623514
LR260/LR460, 3" universal flat faced flange ¹⁾	A5E02303897
LR260/LR460, 4" universal flat faced flange ¹⁾	A5E01259467
LR260/LR460, 6" universal flat faced flange ¹⁾	A5E01261834
LR260/LR460 O-Rings for Easy Aimer ¹⁾	A5E01261836
Kit, Emitter for LR260/LR460 ¹⁾	A5E02360694
LR260 lid with O-ring	A5E02465410
Purge conversion kit – non-pressure-rated (no flange or extension included)	
LR260/LR460 purge conversion, 2" horn ¹⁾	A5E02083914
LR260/LR460 purge conversion, 3" horn ¹⁾	A5E02083915
LR260/LR460 purge conversion, 4" horn ¹⁾	A5E02083916
Enclosure with electronics	
	
LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option A, no process connection	A5E02203605
LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option A, no process connection	A5E02213423
LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option A, no process connection	A5E02165924
LR260 enclosure with board stack, PROFIBUS PA communication, NPT cable inlet, approval option A, no process connection	A5E02213428
Sitrans LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option D, no process connection	A5E03934184
Sitrans LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option E, no process connection	A5E03934187
LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option F, no process connection	A5E03934191
LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option F, no process connection	A5E31820689

SITRANS LR260/LR460 Specials

	Article No.
Enclosure with electronics (LR460)	
	
LR460 enclosure with board stack, HART communication, AC power, M20 cable inlet, approval option A, no process connection	A5E02182085
LR460 enclosure with board stack, PROFIBUS PA communication, AC power, M20 cable inlet, approval option A, no process connection	A5E02212422
LR460 enclosure with board stack, HART communication, AC power, NPT cable inlet, approval option A, no process connection	A5E02212423
LR460 enclosure with board stack, PROFIBUS PA communication, AC power, NPT cable inlet, approval option A, no process connection	A5E02212424
LR460 enclosure with board stack, HART communication, DC power, M20 cable inlet, approval option A, no process connection	A5E02212425
LR460 enclosure with board stack, PROFIBUS PA communication, DC power, M20 cable inlet, approval option A, no process connection	A5E02212426
LR460 enclosure with board stack, HART communication, DC power, NPT cable inlet, approval option A, no process connection	A5E02212428
LR460 enclosure with board stack, PROFIBUS PA communication, DC power, NPT cable inlet, approval option A, no process connection	A5E02212429

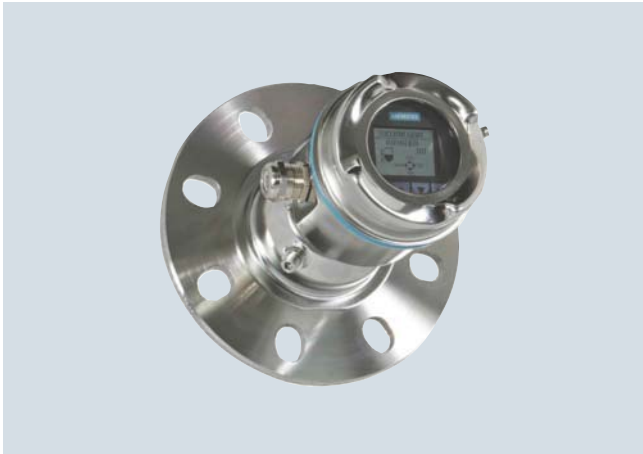
¹⁾ Available with no pressure rating, 0.5 bar g maximum. Please contact ceg.smpi@siemens.com for special requests.

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR560

Overview



SITRANS LR560 2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids in silos to a range of 100 m (329 ft).

Benefits

- Rugged stainless steel design for industrial applications
- 78 GHz high frequency provides very narrow beam, virtually no mounting nozzle noise, and optimal reflection from sloped solids
- Aimer option to direct beam to area of interest, such as draw point of cone
- Lens antenna is highly resistant to product build-up
- Air purge connection is included for self-cleaning of extremely sticky solids
- Local display interface (LDI) allows local programming and diagnostics

Application

SITRANS LR560's plug and play performance is ideal for most solids applications, including those with extreme dust and high temperatures to 200 °C (392 °F). Unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. SITRANS LR560 includes an optional graphical local display interface (LDI) that improves setup and operation using an intuitive Quick Start Wizard, and echo profile display for diagnostic support. Start-up is easy using the Quick Start wizard with a few parameters required for basic operation. SITRANS LR560 measures practically any solids material to a range of 100 m (328 ft).

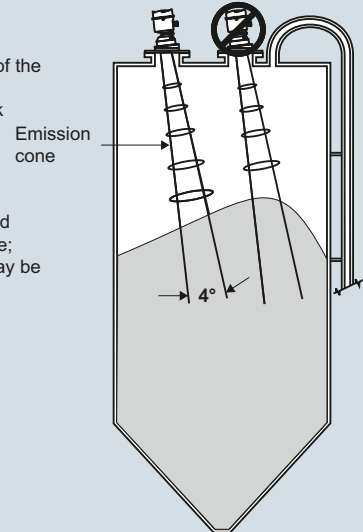
- Key Applications: cement powder, plastic powder/pellets, grain, coal, wood powder, fly ash

Configuration

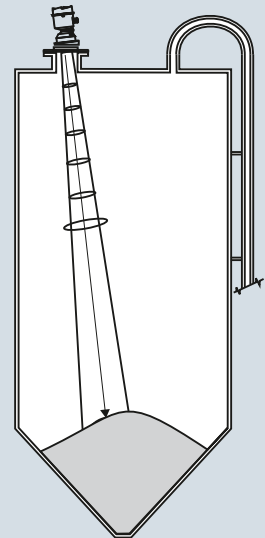
Installation

Note:

- Beam angle is the width of the cone where the energy density is half of the peak energy density
- The peak energy density is directly in front of and in line with the antenna
- There is signal transmitted outside of the beam angle; therefore false targets may be detected



Aiming will assist in measuring material in the cone



SITRANS LR560 installation, dimensions in mm (inch)

Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
Frequency	78 GHz FMCW
Minimum detectable distance	400 mm (15.75 inch) from sensor reference point
Maximum measuring range ¹⁾	<ul style="list-style-type: none"> • 40 m (131 ft) version • 100 m (328 ft) version
Output	
<ul style="list-style-type: none"> • Analog output • Communications 	4 ... 20 mA <ul style="list-style-type: none"> • HART • Optional: PROFIBUS PA • Optional: FOUNDATION Fieldbus
<ul style="list-style-type: none"> • Fail-safe 	<ul style="list-style-type: none"> • Programmable as high, low or hold (Loss of Echo) • NE43 programmable
Performance (according to reference conditions IEC60770-1)	
<ul style="list-style-type: none"> • Maximum measured error (including hysteresis and non-repeatability)²⁾ 	5 mm (0.2 inch)
Rated operating conditions (according to reference conditions IEC60770-1)	
Installation conditions	
<ul style="list-style-type: none"> • Location 	Indoor/outdoor
Ambient conditions (enclosure)	
<ul style="list-style-type: none"> • ambient temperature • installation category • pollution degree 	-40 ... +80 °C (-40 ... +176 °F) I 4
Medium conditions	
<ul style="list-style-type: none"> • Dielectric constant ϵ_r 	> 1.6
Process temperature and pressure	See chart below
Design	
Enclosure	
<ul style="list-style-type: none"> • Construction • Conduit entry • Purge inlet • Lens material 	316L/1.4404 stainless steel M20x1.5, or ½" NPT via adapter 1/8" NPT, 30 cfm at max. 100 psi <ul style="list-style-type: none"> • 40 m version: PEI • 100 m version: PEEK
	Damage to lens could result from continuous purging/cleaning due to abrasive solids. Recommended purging/cleaning only a few seconds every hour
<ul style="list-style-type: none"> • Degree of protection • Weight • Optional local display interface 	Type 4X/NEMA 4X, Type 6/NEMA 6, IP68 with lid closed 3.15 kg (6.94 lb) including 3 inch flange Graphic LCD, with bar graph representing level
Process connections	
Universal flat-faced flanges ³⁾	<ul style="list-style-type: none"> • 3, 4, 6 inch/80, 100, 150 mm, 304 stainless steel • 3, 4, 6 inch/80, 100, 150 mm, 316L/1.4404 or 316L/1.4435 stainless steel
Aimer flanges ³⁾	3, 4, 6 inch/80, 100, 150 mm, polyurethane powder-coated cast aluminum

Power supply	
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
PROFIBUS PA/FOUNDATION Fieldbus	13.5 mA 9 ... 32 V DC, per IEC 61158-2
Certificates and approvals	
General	CSA _{US/C} , CE, FM
Radio	Europe (R&TTE), FCC, Industry Canada, RCM
Hazardous	
<ul style="list-style-type: none"> • Europe/International 	IECEx SIR 09.0149X ATEX II 1D, 1/2D, 2D Ex ta IIIC T139 °C Da IP68 ATEX II 3G Ex nA II T4 Gc Ex nL IIC T4 Gc
<ul style="list-style-type: none"> • US/Canada 	FM/CSA Class II, Div. 1, Groups E, F, G Class III T4 FM/CSA Class I, Div. 2, Groups A, B, C, D, T4
<ul style="list-style-type: none"> • China 	NEPSI Ex nA II T4 Ex nL IIC T4 DIP A20 TA, T139 °C, IP68
<ul style="list-style-type: none"> • Brazil 	INMETRO BR-Ex nA/nL II T4 IP68
Programming	
Intrinsically Safe Siemens handheld programmer	Infrared receiver
<ul style="list-style-type: none"> • Approvals for handheld programmer 	IS model: ATEX II 1GD Ex ia IIC T4 Ga Ex iaD 20 T135 °C T _a = -20 ... +50 °C CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G, T6 T _a = 50 °C
Handheld communicator	HART communicator 375/475
PC	SIMATIC PDM, AMS, PACTware
Display (local)	Graphic local user interface including quick start wizard and echo profile displays

¹⁾ From sensor reference point

²⁾ Under severe EMI/EMC environments per IEC61326-1 or NAMUR NE21, the device error may increase to a maximum of 25 mm (1 inch)

³⁾ Universal flange mates with EN 1092-1 (PN16)/ASME B16.5 (150 lb)/JIS 2220 (10K) bolt hole pattern.

Process temperature and pressure

Version	Stainless steel	Aimer flange: -1 ... 0.5 bar	Aimer flange: -1 ... 3.0 bar
40 m	-40 ... +100 °C (-40 ... +212 °F)	-40 ... +100 °C (-40 ... +212 °F)	-40 ... +100 °C (-40 ... +212 °F)
100 m	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +120 °C (-40 ... +248 °F)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR560

Selection and Ordering data

SITRANS LR560

2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids in silos to a range of 100 m (329 ft).

Order handheld programmer separately

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Measurement and process temperature range

40 m (131 ft) max range, -40 ... +100 °C

100 m (329 ft) max range, -40 ... +200 °C

Process connection

Universal flat-faced flange fits ANSI/DIN/JIS flanges

3 inch/80 mm, 304 stainless steel

4 inch/100 mm, 304 stainless steel

6 inch/150 mm, 304 stainless steel

3 inch/80 mm, 316L stainless steel

4 inch/100 mm, 316L stainless steel

6 inch/150 mm, 316L stainless steel

3 inch/80 mm, painted aluminum, with integral aimer¹⁾

4 inch/100 mm, painted aluminum, with integral aimer¹⁾

6 inch/150 mm, painted aluminum, with integral aimer¹⁾

Enclosure (with cable inlet)

Stainless steel, 1 X 1/2" NPT

Stainless steel, 1 X M20 x 1.5 (plastic gland included)

Pressure rating

0.5 bar g (7.5 psi g) maximum

3 bar g (40 psi g) maximum

Output/communication

4 ... 20 mA, HART

PROFIBUS PA

FOUNDATION Fieldbus

Approvals

General Purpose, CSA_{US/IC}, Industry Canada, FCC, CE, R&TTE, RCM

CSA/FM Class I, Div. 2, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G, Class III

ATEX II 1 D, 1/2 D, 2 D, 3G Ex nA/nL, CE, R&TTE, RCM

Local display interface

Without LDI (local display interface)

With LDI (local display interface)

¹⁾ Rated to 120 °C max. when used with Pressure rating option 1

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol. For details see page 9/5 in the appendix.

Article No.

7ML5440-

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Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Plug M12 with mating connector¹⁾²⁾³⁾

Plug 7/8" with mating connector¹⁾³⁾⁴⁾

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:
Measuring-point number/identification (max. 27 characters); specify in plain text

Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000

Inspection Certificate Type 3.1 per EN 10204⁴⁾

NAMUR NE43 compliant, device preset to failsafe < 3.6 mA⁵⁾

Operating Instructions for HART device

English

German

Multi-language Quick Start manual
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Operating Instructions for PROFIBUS PA device

English

German

Multi-language Quick Start manual
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Operating Instructions for FOUNDATION Fieldbus device

English

German

Multi-language Quick Start manual
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.

Accessories

Hand Programmer, Intrinsically safe

Local display interface

Sun Shield Cover

Housing lid with window

One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART⁶⁾

One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA⁶⁾

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

For applicable back up point level switch - see point level measurement section

¹⁾ Available with Approval option A only

²⁾ Available with Enclosure option B only

³⁾ Available with Output/communication options B and C only

⁴⁾ Available with Pressure rating option 1 only

⁵⁾ Available with Output/communication option A only

⁶⁾ Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

We can offer shorter delivery times for configurations designated with the Quick Ship Symbol. For details see page 9/5 in the appendix.

Order code

A50

A55

Y15

C11

C12

N07

Article No.

7ML1998-5KB02

7ML1998-5KB32

A5E32052143

7ML1998-5LT02

7ML1998-5LT32

A5E32043113

7ML1998-5LY02

7ML1998-5LY32

A5E32034712

7ML1930-1BK

7ML1930-1FJ

7ML1930-1FK

7ML1930-1FL

7ML1930-1AP

7ML1930-1AQ

7ML5741-...

7ML5740-...

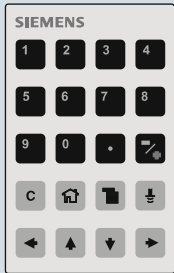
7ML5744-...

7ML5750-...

Options

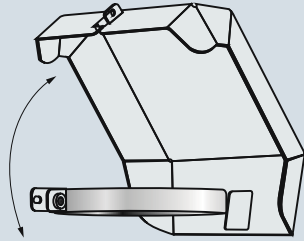
Handheld programmer

Part number:
7ML1930-1BK



Sun shield cover

Part number:
7ML1930-1FK



SITRANS LR560 handheld programmer and sun shield cover

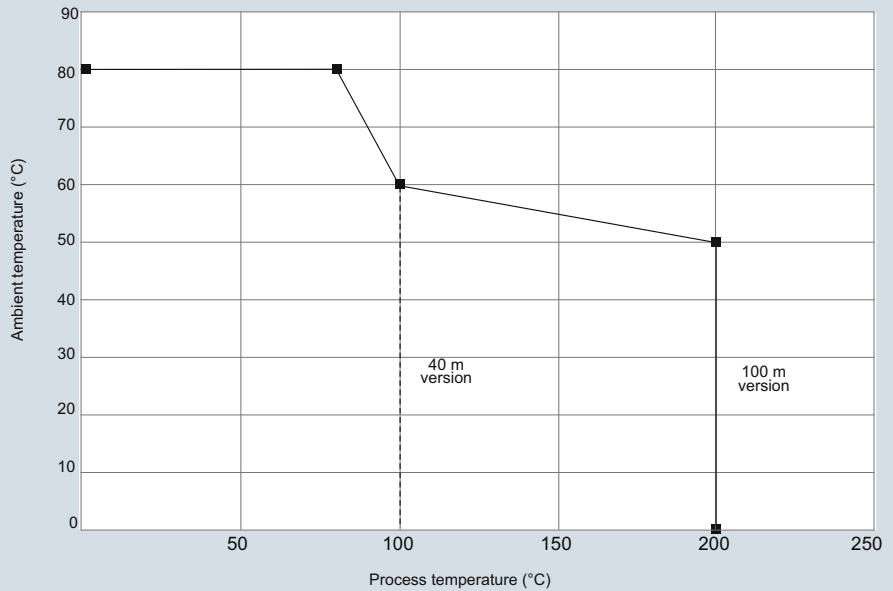
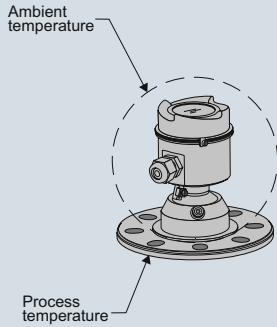
Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR560

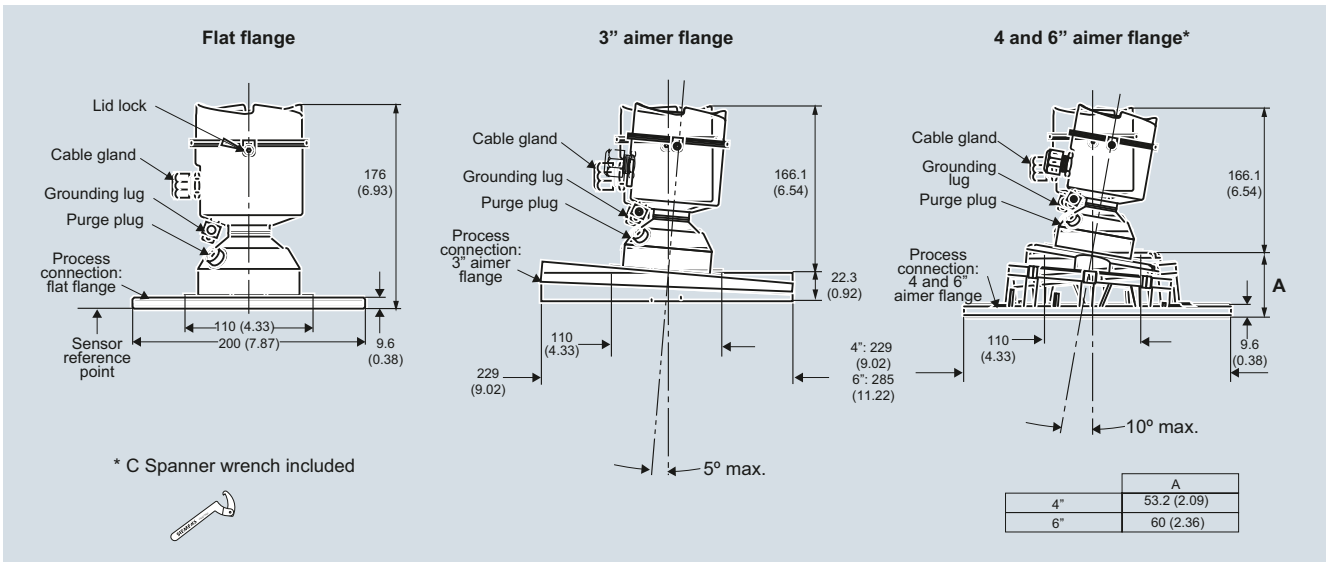
Characteristic curves

Temperature derating curve



SITRANS LR560 temperature derating curve

Dimensional drawings



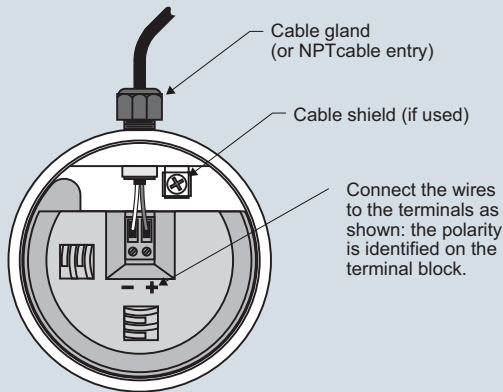
SITRANS LR560, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Radar transmitters

SITRANS LR560 Specials

Schematics



Notes:

1. Depending on the approval rating, glands and plugs may be supplied with your instrument.
2. DC terminal shall be supplied from a source providing electrical isolation between the input and output, to meet the applicable safety requirements of IEC 61010-1.
3. All field wiring must have insulation suitable for rated input voltages.
4. Use shielded twisted pair cable (14 ... 22 AWG) for HART version.
5. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR560 connections

Selection and ordering data

SITRANS LR560 Specials

	Article No.
LR560 Electronics Modules	
LR560 Electronics Module, HART, 100 m range, compatible with 7ML54401XX00XAXX, no enclosure or process connection included.	7ML1830-3AC
LR560 Electronics Module, PROFIBUS PA, 100 m range, compatible with 7ML54401XX00XBXX, no enclosure or process connection included.	7ML1830-3AH
LR560 Electronics Module, FOUNDATION Fieldbus, 100 m range, compatible with 7ML54401XX00XCXX, no enclosure or process connection included.	7ML1830-3AJ
LR560 Electronics Module, HART, 40 m range, compatible with 7ML54400XX00XAXX, no enclosure or process connection included.	7ML1830-3AK
LR560 Electronics Module, PROFIBUS PA, 40 m range, compatible with 7ML54400XX00XBXX, no enclosure or process connection included.	7ML1830-3AL
LR560 Electronics Module, FOUNDATION Fieldbus, 40 m range, compatible with 7ML54400XX00XCXX, no enclosure or process connection included.	7ML1830-3AM
LR560 Miscellaneous Spare Kits	
Kit, Lid Gasket, EPDM, LR560	7ML1830-3AA
Kit, Wrench for 4" and 6" Aimers, LR560	7ML1830-3AB
Kit, O-rings for 3" Aimer, LR560	7ML1830-3AD
Kit, O-rings for 4" Aimer, LR560	7ML1830-3AE
Kit, O-rings for 6" Aimer, LR560	7ML1830-3AF
Kit, Lid Screw and Purge Plug set with Hex Keys, LR560	7ML1830-3AG
Kit, Lid, No Window, LR560	7ML1830-3AP

Please contact ceg.smpi@siemens.com for special requests.

Level Measurement

Continuous level measurement - Guided wave radar transmitters

Guided wave radar transmitters

Overview

Introduction

Guided Wave Radar transmitters use TDR (time domain reflectometry).

Time Domain Reflectometry (TDR)

TDR uses pulses of electromagnetic (EM) energy to measure distances or levels. When a pulse reaches a dielectric discontinuity (created by media surface), part of the energy is reflected. The greater the dielectric difference, the greater the amplitude (strength) of the reflection.

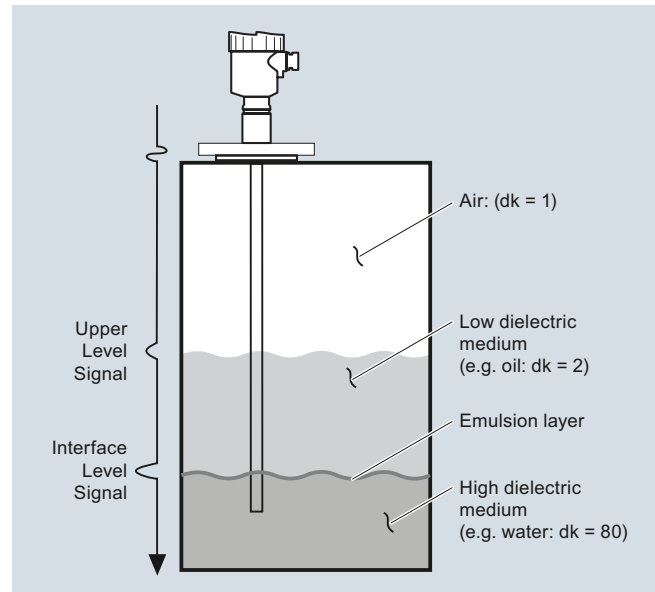
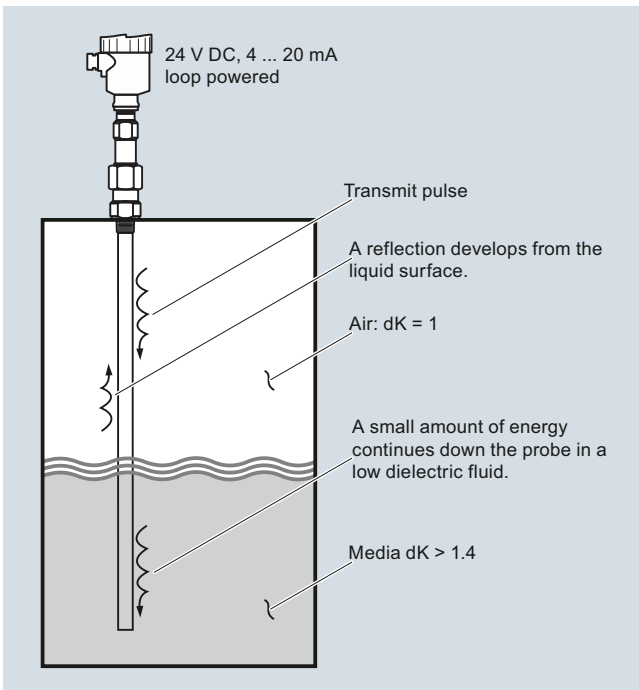
The SITRANS LG includes a transmitter and waveguide that has a characteristic impedance in air and is used as a probe. When part of the probe is immersed in a material other than air, there is lower impedance due to the increase in the dielectric. When an EM pulse is sent down the probe and meets the dielectric discontinuity, a reflection is generated.

Mode of operation

Interface Detection

The SITRANS LG, is a transmitter capable of measuring both an upper level and an interface level. The upper liquid must have a dielectric constant between 1.6 and 10 and the two liquids have a difference in dielectric constants greater than 10. A typical application would be oil over water, with the upper layer of oil being non-conductive with a dielectric constant of approximately 2 and the lower layer of water being very conductive with a dielectric constant of approximately 80. This interface measurement can only be accomplished when the dielectric constant of the upper medium is lower than the dielectric constant of the lower medium.

4



Application



Guided Wave Radar (Level) Application Questionnaire

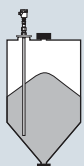
Customer information

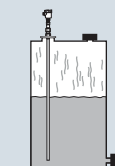
Contact: _____ Prepared By: _____
 Company: _____ Date: _____
 Address: _____ Notes on the Application: _____
 City: _____ Country: _____
 Zip/Postal Code: _____ Phone: () _____
 E-mail: _____ Fax: () _____

Tank/Vessel Information

(supply sketch where possible)

Sketch attached

Solids  Liquids



Tank dimensions:

Height: _____ m/ft
 Diameter: _____ m/ft
 Nozzle Length: _____ cm/inch
 Nozzle Diameter: _____ cm/inch
 Process connection type: _____
 Process connection size: _____
 Distance to sidewall: _____ cm/inch

Tank top:

Open
 Flat
 Conical
 Parabolic

Tank bottom:

Sloped
 Flat
 Conical
 Parabolic

Mounting location:

Top mount
 Thread mount
 Flange mount
 Bypass/Sidepipe mount
 Pipe mount
 Displacer replacement
(please supply drawings)

Pressure:

Normal: _____
 Maximum (relief): _____

Material

Material being measured: _____

Material temperature: Norm: _____ °C/°F Max: _____ °C/°F

Measurement type: Continuous level Interface level

Dielectric constant value: _____

Coating buildup: Yes No Turbulence: Yes No

Maximum viscosity: _____ Density: _____ kg/m³

Kinematic Viscosity (cSt) = Dynamic Viscosity (cP) / Density (kg/m³)

1 ... 5 cSt (like water) 50 ... 100 cSt (like honey)
 5 ... 20 cSt (like machine oil) 100 ... 500 cSt (like syrup/molasses)
 20 ... 50 cSt (like cooking oil) >500 cSt (like tar)

Liquid Solid Slurry

Particle size:

Fine dust/powder, <0.5 cm (0.2 inch)
 Grains (rice, corn), <2 cm (0.8 inch)
 Small stones/gravel, <2 cm (0.8 inch)
 Small rocks/chunks, >2 cm (0.8 inch)
 Large particles, <9 cm (3.5 inch)

Foam type:

None Wet
 Dry Wet/dense

Installation (indicate all that apply)

Power available: _____ Communications: HART/4 ... 20 mA Outputs required: 4 ... 20 mA
 Other (please specify) _____

Products recommended:

Level Measurement

Continuous level measurement - Guided wave radar transmitters

Guided wave radar transmitters

SIEMENS

Guided Wave Radar (Interface) Application Questionnaire

Customer information

Contact: _____ Prepared By: _____
 Company: _____ Date: _____
 Address: _____ Notes on the Application: _____
 City: _____ Country: _____
 Zip/Postal Code: _____ Phone: () _____
 E-mail: _____ Fax: () _____

Tank/Vessel Information

(supply sketch where possible)

Sketch attached

Tank top:

- Open
- Flat
- Conical
- Parabolic

Tank bottom:

- Sloped
- Flat
- Conical
- Parabolic

Mounting location:

- Top mount
- Thread mount
- Flange mount
- Bypass/Sidepipe Mount
- Pipe mount
- Displacer replacement
(please supply drawings)

Tank dimensions:

Height: _____ m/ft
 Diameter: _____ m/ft
 Nozzle Length: _____ cm/inch
 Nozzle Diameter: _____ cm/inch
 Process connection type: _____
 Process connection size: _____
 Distance to sidewall: _____ cm/inch

Pressure:

Normal: _____
 Maximum (relief): _____

Interface Data

Upper material: _____ Lower material: _____ Emulsion layer: Yes
 Upper material thickness: _____ cm/inch Lower material thickness: _____ cm/inch No (preferred)
 Upper material dielectric: _____ Lower material dielectric: _____ Emulsion thickness: _____ cm/inch

Material

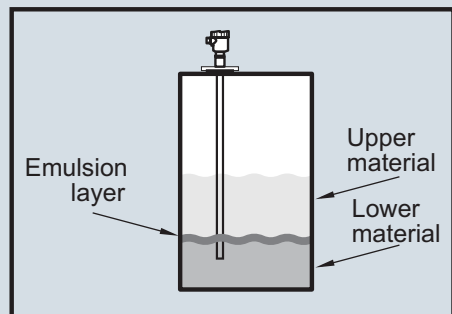
Material being measured: _____ Liquid Slurry

Material temperature: Norm: _____ °C/°F Max: _____ °C/°F

Coating buildup: Yes No Turbulence: Yes No

Maximum Viscosity: _____ Density: _____ kg/m³
Kinematic Viscosity (cSt) = Dynamic Viscosity (cP) / Density (kg/m³)

- 1 ... 5 cSt (like water)
- 5 ... 20 cSt (like machine oil)
- 20 ... 50 cSt (like cooking oil)
- 50 ... 100 cSt (like honey)
- 100 ... 500 cSt (like syrup/molasses)
- >500 cSt (like tar)



Installation

Power available: _____

Outputs required: 4 ... 20 mA

Communications: HART/ 4 ... 20 mA

Other (please specify) _____

Products recommended:

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Overview



The Siemens SITRANS LG series are guided wave radar transmitters for level, level/interface, and volume measurement of liquids and solids. The Sitrans LG product line can handle changes in process conditions, high temperatures and pressures, and steam.

Benefits

- High accuracy to ± 2 mm
- Advanced Diagnostics available for high degree of safety
- Simple menu driven display offers ease of setup
- Large range of options offers reliability in most continuous measurement applications
- Ease of maintenance through module design and field replaceable and adjustable probe options
- Perfect solution for wide range of applications from storage to interface with options for extreme pressure and temperature conditions
- Universally applicable in liquids, interface, slurries and solids
- Highly immune to buildup
- Wide range of Hygienic options

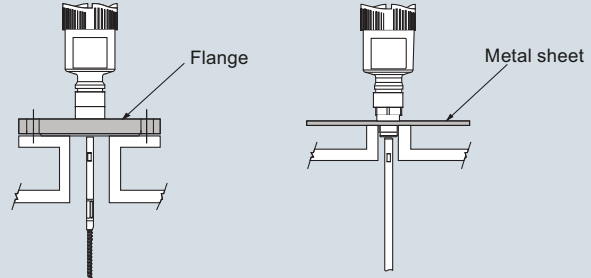
Application

The SITRANS LG series comes in four different models, depending on the applications, level of performance, and functionality required:

- SITRANS LG240 offers configuration options for your hygienic and corrosive application requirements
- SITRANS LG250 Highly flexible solution for liquid level and interface applications. Extremely versatile offering solutions for storage, separation of materials or difficult ammonia applications
- SITRANS LG260 Ideal for measuring level in medium range solids applications including: grains, plastics, and cement
- SITRANS LG270 offers configuration options for extreme conditions including high temperature and high pressure applications such as: harsh applications found in chemical, HPI and energy industries for example, LPG gas tanks, steam boilers and distillation columns

Configuration

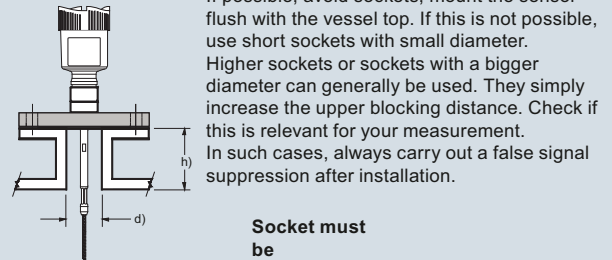
Mounting on nozzle



Installation in non-metal vessel

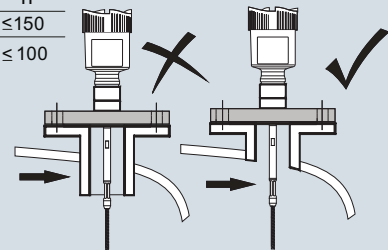
The guided microwave principle requires a metal surface on the process fitting. Therefore, use in plastic vessels etc. an instrument version with flange (from DN 50) or place a metal sheet, $\varnothing > 200$ mm (8 inch), beneath the process fitting when screwing it in. Make sure that the plate has direct contact with the process fitting

Mounting socket



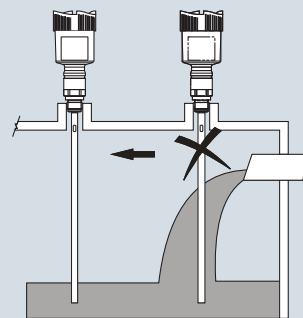
If possible, avoid sockets, mount the sensor flush with the vessel top. If this is not possible, use short sockets with small diameter. Higher sockets or sockets with a bigger diameter can generally be used. They simply increase the upper blocking distance. Check if this is relevant for your measurement. In such cases, always carry out a false signal suppression after installation.

Socket must be installed flush



When welding the socket, make sure that the socket is flush to the vessel top.

Before beginning the welding work, remove the electronics module from the sensor. By doing this, you avoid damage to the electronics through inductive coupling.



Inflowing medium

Do not mount the instruments in or above the filling stream. Make sure that you detect the product surface, not the inflowing product.

SITRANS LG Series installation

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Technical specifications

Mode of operation		Design	
Measuring principle	Guided wave radar measurement	Instrument weight (dependent on process fitting) - see manual for further details	Approx. 0.8 ... 8 kg (0.176 ... 17.64 lb)
Measuring range	300 ... 75 000 mm (11.81 ... 2 952.75 inch)	Materials	
Output		• Enclosure	<ul style="list-style-type: none"> Plastic housing plastic PBT (Polyester) Aluminum die-casting housing, aluminum die-casting AISi10 mg, powder-coated- basis: polyester Stainless steel housing, precision casting 316L Stainless steel housing, electropolished 316L
mA analog output with HART digital signal	4 ... 20 mA/HART (SIL optional)	• Degree of protection	<ul style="list-style-type: none"> Type 4/NEMA 4, IP65 Plastic housing IP66/IP67 Aluminum and stainless steel housings are IP66/68
Output range		• Cable inlet	2x M20x1.5 or 2 x 1/2" NPT
• Analog	Current: minimum 3.8 mA, maximum 20.5 mA	Process connections	
• Start-up current	≤ 10 mA for 5 ms after switching on, ≤ 3.6 mA	• Pipe thread, cylindrical (ISO 228 T1)	G3/4" A, G1" A, G1 1/2" A according to DIN 3852-A
Diagnostic alarm	Failure signal current output (adjustable): last valid measured value, ≥ 21 mA, ≤ 3.6 mA	• American pipe thread, conical (ASME B1.20.1)	3/4" NPT, 1" NPT, 1 1/2" NPT
Digital communication	HART Version 7 x and multidrop compatible	• Flanged	DIN from DN 25, ANSI from 1"
Modbus	Modbus RTU, Modbus ASCII, Levelmaster	• Hygienic	Hygienic fittings
PROFIBUS PA		Programming	
Performance		Local	Four button, menu-driven data entry
Process reference conditions according to DIN EN 61298-1		Handheld communicator	Hart communicator
Non-linearity		PC	SIMATIC PDM, AMS, PACTware
• Coaxial		Power	
• Single rod probes		2 wire Hart version	9.6 ... 35 V DC
• Interface models	See manual for more details	4 wire versions	9.6 ... 48 V DC, 20 ... 42 V AC, 50/60 Hz and 90 ... 253 V AC, 50/60 Hz
Resolution and repeatability	Accuracy ± 2 mm (0.08 inch)	Modbus	8 ... 30 V DC
Accuracy		PROFIBUS PA	9 ... 32 V DC
• Coaxial/rod/cable probes	± 2 mm (0.08 inch)	Note: see manual for specific power based on ordered options	
• Interface models	± 5 mm (0.197 inch) (Note: Typical deviation, Interface measurement) See manual for more details	Certificates and approvals	
Electromagnetic compatibility (check if needed)		Hazardous approvals:	ATEX, FM, CSA, IECex
• Measuring cycle time	< 500 ms	Hygienic approvals	EHDG
• Step response time	≤ 3 s	Overfill protection	WHG
• Temperature Effects	The measurement error from the process conditions is in the specified pressure and temperature range of below 1 %	Ship approval	ABS, CCS, GL
Rated operating conditions			
• Ambient temperature for enclosure	-40 ... +80 °C (-40 ... +176 °F)		
• LCD readable temperature range	-40 ... +80 °C (-40 ... +176 °F) with display heated option		
• Location	Indoor/outdoor		
• Installation category	II		
• Pollution degree	2		
• Relative Humidity	20 ... 85 %		
Medium conditions			
Dielectric constant	dK ≥ 1.4 (configuration dependent) Note: for measurement below 1.4 use probe end tracking.		
Process temperature range	-196 ... +450 °C (-321 ... +842 °F)		
Vessel pressure	-1 ... +400 bar (-100 ... +40 000 kPa)		

	SITRANS LG240	SITRANS LG250	SITRANS LG260	SITRANS LG270
Industries	Food, Beverage and Pharmaceutical	Chemical/HPI/Power/General	Cement, power generation, food, processing, mineral processing, mining	Chemical/HPI/Power/General
Applications	Hygienic and corrosive applications	Liquids, storage and process vessels with agitators, vaporous liquids, interface	Cement, fly ash, grain, coal, flour, plastics	Aggressive applications in Liquids, storage and process vessels with agitators, vaporous liquids, high temperatures and pressures, low dielectric media
Range	32 m	75 m	60 m	60 m
Performance	± 2 mm	± 2 mm	± 2 mm	± 2 mm
Temperature	-40 ... +150 °C (-40 ... +302 °F)	-40 ... +200 °C (-40 ... +392 °F)	-40 ... +200 °C (-40 ... +392 °F)	-196 ... +450 °C (-320.8 ... +842 °F)
Communications	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • Modbus, Modbus RTU, Modbus ASCII, Levelmaster • PROFIBUS PA • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • Modbus, Modbus RTU, Modbus ASCII, Levelmaster • PROFIBUS PA • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • Modbus, Modbus RTU, Modbus ASCII, Levelmaster • PROFIBUS PA • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare 	<ul style="list-style-type: none"> • 4 ... 20 mA/HART • Modbus, Modbus RTU, Modbus ASCII, Levelmaster • PROFIBUS PA • SIMATIC PDM • DTM/FDT for PACTware • Fieldcare

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Order Code	Selection and Ordering data	Article No.	Order Code
SITRANS LG240	7ML5880-		SITRANS LG240	7ML5880-	
Guided Wave Radar sensor for Hygienic and corrosive continuous level and interface measurement of liquids.			Guided Wave Radar sensor for Hygienic and corrosive continuous level and interface measurement of liquids.		
➔ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Approvals					
Ordinary location CE ⁹⁾	0 A		Bolting DN 50, PN 25 DIN11851/PTFE-TFM 1600	1 4	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 ⁹⁾	0 E		Bolting DN 65, PN 25 DIN11851/PTFE-TFM 1600	1 5	
ATEX II 1G, 1/2G 2G Ex ia IIC + ATEX II 1D, 1/2D, 1/3D, 2D, Ex t IIIC IP66 T ¹¹⁾¹³⁾¹⁵⁾²⁴⁾	0 H		Flange DN 25, PN 40 Form C, DIN 2501/PTFE-TFM 1600	2 0	
ATEX II 1/2G, 2G Ex d ia IIC T6 ¹⁾¹²⁾	0 J		Flange DN 40, PN 40 Form C, DIN 2501/PTFE-TFM 1600	2 1	
ATEX II 1/2G, 2G Ex d ia IIC + ATEX II 1/2D, 2D IP6x ¹⁾¹¹⁾¹²⁾¹³⁾¹⁵⁾²⁴⁾	0 K		Flange DN 50, PN 40 Form C, DIN 2501/PTFE-TFM 1600	2 2	
ATEX II 1D, 1/2D, 1/3D, 2D, Ex t IIIC IP66 T ¹¹⁾¹³⁾¹⁵⁾²⁴⁾	0 N		Flange DN 50, PN 40 Form V13, DIN 2513/PTFE-TFM 1600	2 3	
IEC Ex ia IIC T6 ⁹⁾	0 P		Flange DN 65, PN 40 Form C, DIN 2513/PTFE-TFM 1600	2 4	
IEC Ex ia IIC T6 + IEC IP6x T tD ¹¹⁾¹³⁾¹⁵⁾²⁴⁾	0 Q		Flange DN 80, PN 40 Form C, DIN 2501/PTFE-TFM 1600	2 5	
IEC Ex d ia IIC T6 ¹⁾¹²⁾	0 R		Flange DN 100, PN 16 Form C, DIN 2501/PTFE-TFM 1600	2 6	
IEC Ex d ia IIC T6 + IEC IP6x T tD ¹⁾¹¹⁾¹²⁾¹³⁾¹⁵⁾²⁴⁾	0 S		Flange DN 80, PN 40 EN1092-1 Form B1/PTFE-TFM 1600	2 7	
FM (NI) Class I, Div. 2, Groups A, B, C, D	1 A		Flange DN 100, PN 40 EN1092-1 Form B1/PTFE-TFM 1600	2 8	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F	1 B		Flange 2" 150 lb RF, ANSI B16.5/PTFE-TFM 1600	3 0	
FM(XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾¹²⁾	1 C		Flange 2" 300 lb RF, ANSI B16.5/PTFE-TFM 1600	3 1	
CSA (NI) Class I, Div. 2, Groups A, B, C, D (DIP) Class II, III, Div. 1, Groups E, F, G ¹¹⁾¹³⁾¹⁵⁾	1 E		Flange 3" 150 lb RF, ANSI B16.5/PTFE-TFM 1600	3 2	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G	1 F		Flange 4" 150 lb RF, ANSI B16.5/PTFE-TFM 1600	3 3	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾¹²⁾	1 G				
Probe version/Material			Electronics		
Probe cable ø4 mm (0.16 inch) with gravity weight/PFA ²⁾⁷⁾	A		Two-wire 4 ... 20mA/HART	0	
Probe exchangeable rod (ø8 mm) / 1.4435 (BN2), can be autoclaved (Ra < 0.76 µm) ³⁾⁷⁾	B		Four-wire Modbus ¹⁹⁾²⁰⁾²¹⁾²²⁾	1	
Probe exchangeable rod (ø8 mm) / 1.4435 (BN2), (Ra < 0.76 µm) ³⁾⁷⁾	C		Two-wire 4...20mA/HART with SIL qualification ¹⁷⁾¹⁸⁾	2	
Probe rod ø10 mm (0.39 inch)/PFA ²⁾⁷⁾	D		Four-wire 4...20mA/HART; 90...253V AC; 50/60 Hz ¹⁾⁸⁾¹⁰⁾	3	
			Four-wire 4...20mA/HART; 9.6...48V DC; 20...42 V AC ¹⁾⁸⁾¹⁰⁾	4	
			PROFIBUS PA	5	
Process fitting/Material			Seal/Process temperature		
Clamp 2" PN 16 (ø64 mm) DIN 32676, ISO 2852/1.4435 (BN2) ⁴⁾	0 0		Without glass seal/-40 ... +150 °C (-40 ... +302 °F) ⁵⁾¹¹⁾	A	
Clamp 2" PN 16 (ø64 mm) DIN 32676, ISO 2852/PTFE-TFM 1600	0 1		FFKM (Kalrez 6221)/-20...150 °C (-4... +302 °F)	B	
Clamp 2½" PN 10 (ø77.5 mm) DIN 32676, ISO 2852/1.4435 (BN2) ⁴⁾	0 2		EPDM (Freudenberg 70 EPDM 291)/-20...130 °C (-4 ... +266 °F)	C	
Clamp 2½" PN 10 (ø77.5 mm) DIN 32676, ISO 2852/PTFE-TFM 1600	0 3				
Clamp 3" PN 10 (ø91 mm) DIN 32676, ISO 2852/1.4435 (BN2) ⁴⁾	0 4		Housing/Protection/Cable		
Clamp 3" PN 10 (ø91 mm) DIN 32676, ISO 2852/PTFE-TFM 1600	0 5		Plastic IP66/IP67 M20x1.5/blind stopper	A	
Clamp 4" PN6 (ø119 mm) DIN 32676, ISO 2852/1.4435(BN2) ⁴⁾	0 6		Plastic IP66/IP67 ½" NPT/blind stopper	B	
Clamp 4" PN6 (ø119 mm) DIN 32676, ISO 2852/PTFE-TFM 1600	0 7		Aluminium/IP66/IP68 (0.2 bar) M20x1.5/ blind stopper	C	
Bolting DN 32, PN 40 DIN11851/1.4435(BN2) ⁴⁾	0 8		Aluminium/IP66/IP68 (0.2 bar) ½" NPT/ blind stopper	D	
Bolting DN 32, PN 40 DIN11851/PTFE-TFM 1600	1 0		Aluminium double chamber/IP66/IP68 (0.2 bar) M20x1.5/blind stopper	E	
Bolting DN 40, PN 40 DIN11851/1.4435 (BN2) ⁴⁾	1 1		Aluminium double chamber/IP66/IP68 (0.2 bar) ½" NPT/blind stopper	F	
Bolting DN 40, PN 40 DIN11851/PTFE-TFM 1600	1 2		Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20x1.5/blind stopper	G	
Bolting DN 50, PN 25 DIN11851/1.4435(BN2) ⁴⁾	1 3		Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) ½" NPT/blind stopper	H	
			Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20x1.5/blind stopper	J	

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Order Code	Selection and Ordering data	Article No.	Order Code
SITRANS LG240	7ML5880-		SITRANS LG240	7ML5880-	
Guided Wave Radar sensor for Hygienic and corrosive continuous level and interface measurement of liquids.			Guided Wave Radar sensor for Hygienic and corrosive continuous level and interface measurement of liquids.		
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) ½" NPT/blind stopper		K	Further designs (mandatory)		Order Code
Stainless steel double chamber/IP66/IP68 (0.2 bar) M20x1.5/blind stopper		L	Please add "-Z" to Article No. and specify Order code(s).		
Stainless steel double chamber/IP66/IP68 (0.2 bar) ½" NPT/blind stopper		M	Supplementary electronics		
Aluminium/IP66/IP68 (0.2 bar) M20x1.5/ cable gland stainless steel		N	Without	A00	
Aluminium double chamber/IP66/IP68 (0.2 bar) M20x1.5/cable gland stainless steel		P	Additional current output 4 ... 20 mA ¹⁾²³⁾	A01	
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20x1.5/Cable gland stainless steel		Q	Local display interface		
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20x1.5/cable gland stainless steel		R	Without	E00	
Aluminium single chamber / IP66/IP68 (0.2 bar) M20x1.5 / Cable gland brass nickel-plated		W	Mounted	E01	
Aluminium double chamber / IP66/IP68 (0.2 bar) M20x1.5 / Cable gland brass nickel-plated		X	Laterally mounted ¹⁾	E02	
Stainless steel single chamber (precision casting) / IP66/IP68 (0.2 bar) M20x1.5 / Cable gland brass nickel-plated		Y	Language of display		
			German	L00	
			English	L01	
			French	L02	
			Dutch	L03	
			Italian	L04	
			Spanish	L05	
			Portuguese	L06	
			Russian	L07	
			Chinese	L08	
			Japanese	L09	
			Operating instructions		
			German	M00	
			English	M01	
			French	M02	
			Spanish	M03	
Lengths			Selection and Ordering data		Order code
Rod ø8 mm (0.31 inch)/1.4435 (Basle standard 300 ... 4 000 mm)			Further designs (optional)		
300 ... 1 000 mm (11.81 ... 39.37 inch) ¹⁴⁾		0	Please add "-Z" to Article No. and specify Order code(s).		
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ¹⁴⁾		1	Enter the total insertion length in plain text description	Y01	
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ¹⁴⁾		2	Enter the total length of rigid part (cable version only)	Y02	
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ¹⁴⁾		3	Cleaning included certificate: oil, grease and silicone free	W01	
Rod ø10 mm (0.24 inch)/PFA (300 ... 4 000 mm)			Identification Label (measurement loop) stainless steel	Y17	
300 mm (11.81 inch) ¹⁴⁾	9	R 1 A	Identification Label (measurement loop) Foil	Y18	
500 mm (19.69 inch) ¹⁴⁾	9	R 1 B	3.1 Certificate instrument ¹⁶⁾	C12	
300 ... 1 000 mm (11.81 ... 39.37 inch) ¹⁴⁾	9	R 1 C	3.1 Certificate material (NACE0175) ¹⁶⁾	D07	
1 001 ... 5 000 mm (39.41 ... 78.74 inch) ¹⁴⁾	9	R 1 D	3.1 Certificate instrument with test data ¹⁶⁾	C25	
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ¹⁴⁾	9	R 1 E	2.2 Certificate material ¹⁶⁾	C15	
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ¹⁴⁾	9	R 1 F	Quality/test plan ¹⁶⁾	C26	
Cable ø4 mm (0.16 inch)/PFA (500 ... 32 000 mm)			Dye penetration test + 3.1 certificate/instrument ¹⁶⁾	C13	
500 mm (9.69 inch)	9	R 1 G	X-ray test + 3.1 certificate/instrument ¹⁶⁾	C14	
501 ... 1 000 mm (19.72 ... 39.37 inch)	9	R 1 H	Positive material identification test + 3.1 certificate/instrument ¹⁶⁾	C16	
1 001 ... 2 000 mm (39.37 ... 196.85 inch)	9	R 1 J	Roughness test + 3.1 certificate/instrument ¹⁶⁾	C18	
2 001 ... 4 000 mm (196.89 ... 393.70 inch)	9	R 1 K	Pressure test + 3.1 certificate/instrument ¹⁶⁾	C31	
4 001 ... 5 000 mm (393.74 ... 590.55 inch)	9	R 1 L	Helium leak test + 3.1 certificate/instrument ¹⁶⁾	C32	
5 001 ... 10 000 mm (590.59 ... 787.40 inch)	9	R 1 M	Ferrite measuring accuracy to DIN32514-1 + 3.1 certificate/instrument ¹⁶⁾	C60	
10 001 ... 15 000 mm (787.44 ... 984.25 inch)	9	R 1 N	Pressure test according to Norsok + 3.1 certificate/instrument ¹⁶⁾	C61	
15 001 ... 20 000 mm (984.29 ... 1 181.10 inch)	9	R 1 P	5 point calibration certificate + 3.1 certificate/instrument ¹⁶⁾	C62	
20 001 ... 25 000 mm (1 181.14 ... 1 377.95 inch)	9	R 1 Q			
25 001 ... 32 000 mm (1 377.99 ... 1 574.80 inch)	9	R 1 R			

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data

Article No.

Additional Operating Instructions

German

4 ... 20 mA/HART - two-wire, PFA insulated	PBD-51041000
4 ... 20 mA/HART - two-wire, Polished version	PBD-51041001
4 ... 20 mA/HART - four-wire PFA insulated	PBD-51041002
4 ... 20 mA/HART - four-wire Polished version	PBD-51041003
Modbus- PFA insulated	PBD-51041004
Modbus protocol, Polished version	PBD-51041005
PROFIBUS PA, PFA insulated	PBD-51041006
PROFIBUS PA, polished version	PBD-51041007

English

4 ... 20 mA/HART - two-wire PFA insulated	PBD-51041037
4 ... 20 mA/HART - two-wire Polished version	PBD-51041038
4 ... 20 mA/HART - four-wire PFA insulated	PBD-51041039
4 ... 20 mA/HART - four-wire Polished version	PBD-51041040
Modbus- PFA insulated	PBD-51041041
Modbus protocol, Polished version	PBD-51041042
PROFIBUS PA, PFA insulated	PBD-51041043
PROFIBUS PA, polished version	PBD-51041044

French

4 ... 20 mA/HART - two-wire PFA insulated	PBD-51041111
4 ... 20 mA/HART - two-wire Polished version	PBD-51041112
4 ... 20 mA/HART - four-wire PFA insulated	PBD-51041113
4 ... 20 mA/HART - four-wire Polished version	PBD-51041114
Modbus- PFA insulated	PBD-51041115
Modbus protocol, Polished version	PBD-51041116
PROFIBUS PA, PFA insulated	PBD-51041117
PROFIBUS PA, polished version	PBD-51041118

Spanish

4 ... 20 mA/HART - two-wire PFA insulated	PBD-51041074
4 ... 20 mA/HART - two-wire Polished version	PBD-51041075
4 ... 20 mA/HART - four-wire PFA insulated	PBD-51041076
4 ... 20 mA/HART - four-wire Polished version	PBD-51041077
Modbus- PFA insulated	PBD-51041078
Modbus protocol, Polished version	PBD-51041079
PROFIBUS PA, PFA insulated	PBD-51041080
PROFIBUS PA, polished version	PBD-51041081

Selection and Ordering data

Article No.

Accessories

Sitrans LG, GWR sensor Display Module	A5E34143449
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...

For applicable back up point level switch - see point level measurement section

- 1) Available with Housing/Protection/Cable options E,F, L, M only
- 2) Available only with PFA Process Fitting/Material including options 01, 03, 05, 07, 10, 12, 14 ... 33 (PTFE-TFM 1600 options)
- 3) Available only with Process Fitting/Material options 00, 02, 04, 06, 08, 11, and 13 [1.4435 (BN2) options]
- 4) Available with Length options 0, 1, 2, 3 only (Rod ø8 mm 1.4435 options)
- 5) Available with Length options R1A ... R1R only (Rod ø10 mm/PFA and Cable ø4 mm/PFA options)
- 7) Available only with the same rod or cable diameter in Length options
- 8) Available with Supplementary electronic option A00 and Indicating/Adjustment modules E00, E01
- 9) Available with Supplementary electronic option A01 approval options 0A,0E, and 0P
- 10) Available with Approval options 0A,0J,0K,0N,0R,OS,1A,1C,1E,1F, and 1G
- 11) Available with Version/Material options A and D only
- 12) Available with Indicating/adjustment modules E00 and E01
- 13) Available with Seal/Process temperature C only
- 14) Not available with Y02
- 15) Available with Housing/Protection options C, D, E, F, G, H, L, M
- 16) Listed Certificates are not available with all configurations, please contact factory for more information
- 17) SIL electronic option 2 available with Approval options 0A, 0E, 0H, 0N, 0P, 0Q, 1A, 1B, 1E and 1F
- 18) Available with Supplementary electronic option A00, SIL electronics
- 19) Modbus only available with Approval options GP and NI and XP-IS/Ex d ia
- 20) Modbus only available with two chamber housing options
- 21) Modbus not available with Supplementary electronic (only for HART) option
- 22) Modbus not available with lateral mount display option
- 23) Not available with indicating/adjustment module E02
- 24) Available with Housing/protection options D, F, H and M

Selection and Ordering data	Article No.	Order Code
SITRANS LG250	7ML5881-	
A guided wave radar sensor for continuous level and interface measurement of liquids.		
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Approvals		
Ordinary location CE ¹⁶⁾	0 A	
Shipping approval ¹⁹⁾²⁸⁾²⁹⁾	0 B	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 ¹⁶⁾	0 E	
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 + shipping approval GL ¹⁹⁾²⁸⁾²⁹⁾	0 G	
ATEX II 1G, 1/2G 2G Ex ia IIC + ATEX II 1D, 1/2D, 1/3D, 2D, Ex t IIC IP66 T ¹⁾²¹⁾²³⁾⁴⁰⁾	0 H	
ATEX II 1/2G, 2G Ex d ia IIC T6 ¹⁾²¹⁾	0 J	
ATEX II 1/2G, 2G Ex d ia IIC + ATEX II 1D, 1/2D, 1/3D, 2D, Ex t IIC IP66 T ¹⁾²¹⁾²³⁾⁴⁰⁾	0 K	
ATEX II 1/2G, 2G Ex d IIC T6 ¹⁴⁾²⁰⁾	0 L	
ATEX II 1/2G, 2G Ex d IIC + ATEX II 1D, 1/2D, 1/3D, 2D, Ex t IIC IP66 T ¹⁴⁾²⁰⁾²³⁾⁴⁰⁾	0 M	
ATEX II 1D, 1/2D, 1/3D, 2D, Ex t IIC IP66 T ²⁰⁾²³⁾⁴⁰⁾	0 N	
IEC Ex ia IIC ¹⁶⁾	0 P	
IEC Ex ia IIC T6 + IEC IP6x T tD ¹⁶⁾²⁰⁾²³⁾⁴⁰⁾	0 Q	
IEC Ex d ia IIC T6 ¹⁾²¹⁾²³⁾⁴⁰⁾	0 R	
IEC Ex d ia IIC T6 + IEC IP6x T tD ¹⁾²⁰⁾²¹⁾⁴⁰⁾	0 S	
IEC Ex d IIC T6 ¹⁴⁾²⁰⁾	0 T	
IEC Ex d IIC T6 + IEC IP6x T tD ¹⁴⁾²⁰⁾²³⁾⁴⁰⁾	0 U	
FM (NI) Class I, Div. 2, Groups A, B, C, D	1 A	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F	1 B	
FM(XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾²¹⁾	1 C	
FM (XP) Class I, Div. 1, Groups A, B, C, D ²⁰⁾	1 D	
CSA (NI) Class I, Div. 2, Groups A, B, C, D (DIP) Class II, III, Div. 1, Groups E, F, G	1 E	
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G	1 F	
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾²¹⁾	1 G	
CSA (XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁴⁾²⁰⁾	1 H	
Probe version/Material		
Probe exchangeable cable ø2 mm (0.08 inch) with gravity weight/316L ⁸⁾⁹⁾¹¹⁾²⁶⁾	A	
Probe exchangeable cable ø2 mm (0.08 inch) center weight/316L ⁸⁾⁹⁾¹²⁾²⁶⁾	B	
Probe exchangeable cable ø4 mm (0.16 inch) with gravity weight/316L ⁸⁾⁹⁾¹¹⁾²⁶⁾	C	
Probe exchangeable cable ø4 mm (0.16 inch) with center weight/316L ⁸⁾⁹⁾¹²⁾²⁶⁾	D	
Probe exchangeable rod ø8 mm (0.31 inch)/316L ²⁾⁸⁾¹⁰⁾¹¹⁾²⁶⁾	E	
Probe exchangeable rod ø12 mm (0.47 inch)/316L ³⁾⁸⁾¹⁰⁾¹¹⁾²⁴⁾²⁶⁾	F	
Probe coax version ø21.3 mm (0.84 inch) with single hole/316L ⁸⁾⁹⁾¹¹⁾²⁶⁾²⁷⁾	G	
Probe coax version ø21.3 mm (0.84 inch) with multiple hole/316L ⁸⁾⁹⁾¹¹⁾²⁶⁾²⁷⁾	H	
Probe coax version ø21.3 mm (0.84 inch) for Ammonia application/316L ⁴⁾⁸⁾⁹⁾¹¹⁾²⁵⁾³¹⁾	J	
Probe coax version ø42.2 mm (1.66 inch) with multiple hole/316L ⁵⁾⁸⁾⁹⁾¹¹⁾²⁴⁾²⁶⁾²⁷⁾	K	

Selection and Ordering data	Article No.	Order Code
SITRANS LG250	7ML5881-	
A guided wave radar sensor for continuous level and interface measurement of liquids.		
Process fitting/Material		
Thread G ³ / ₄ " (DIN 3852-A) PN 6/316L	0 0	
Thread ³ / ₄ " NPT (ASME B1.20.1) PN 6/316L	0 1	
Thread G ³ / ₄ " (DIN 3852-A) PN 40/316L	0 2	
Thread ³ / ₄ " NPT (ASME B1.20.1) PN 40/316L	0 3	
Thread G ³ / ₄ " (DIN 3852-A) PN 100/316L	0 4	
Thread ³ / ₄ " NPT (ASME B1.20.1) PN 100/316L	0 5	
Thread G1" (DIN 3852-A) PN 40/316L	0 6	
Thread 1" NPT (ASME B1.20.1) PN 40/316L	0 7	
Thread G1" (DIN 3852-A) PN 100/316L	0 8	
Thread 1" NPT (ASME B1.20.1) PN 100/316L	1 0	
Thread G1 ¹ / ₂ " (DIN 3852-A) PN 40/316L	1 1	
Thread 1 ¹ / ₂ " NPT (ASME B1.20.1) PN 40/316L	1 2	
Thread G1 ¹ / ₂ " (DIN 3852-A) PN1 00/316L	1 3	
Thread 1 ¹ / ₂ " NPT (ASME B1.20.1) PN 100/316L	1 4	
Thread 2 NPT PN 40, ASME B1.20.1/316L ³⁷⁾³⁸⁾	1 5	
Flange DN 25 PN 40 Form C, DIN 2501/316L	2 0	
Flange DN 25 PN 40 Form F, DIN 2501/316L	2 1	
Flange DN 40 PN 40 Form C, DIN 2501/316L	2 2	
Flange DN 50 PN 40 Form C, DIN 2501/316L	2 3	
Flange DN 50 PN 40 form V13, DIN 2513/316L	2 4	
Flange DN 80 PN 40 Form C, DIN 2501/316L	2 5	
Flange DN 80 PN 40 Form V13, DIN 2501/316L	2 6	
Flange DN 100 PN 16 Form C, DIN 2501/316L	2 7	
Flange DN 100 PN 16 Form C, DIN 2501/316L	2 8	
Flange DN 100PN 40 Form C, DIN 2501/316L	3 0	
Flange DN 100 PN 40 Form V13, DIN 2513/316L	3 1	
Flange DN 150 PN 16 Form C, DIN 2501/316L	3 2	
Flange DN 50 PN 40 EN1092-1 Form B1/316L	3 3	
Flange DN 80 PN 40 EN1092-1 Form B1/316L	3 4	
Flange 1" 150 lb RF, ANSI B16.5/316L	3 5	
Flange 1 ¹ / ₂ " 150 lb RF, ANSI B16.5/316L	3 6	
Flange 2" 150 lb RF, ANSI B16.5/316L	3 7	
Flange 2" 300 lb RF, ANSI B16.5/316L	3 8	
Flange 3" 150 lb RF, ANSI B16.5/316L	4 0	
Flange 3" 300 lb RF, ANSI B16.5/316L	4 1	
Flange 4" 150 lb RF, ANSI B16.5/316L	4 2	
Flange 4" 300 lb RF, ANSI B16.5/316L	4 3	
Flange 6" 150 lb RF, ANSI B16.5/316L	4 4	
Flange 6" 300lb RF, ANSI B16.5/316L	4 5	
Electronics		
Two-wire 4 ... 20mA/HART	0	
Four-wire Modbus ³³⁾³⁴⁾³⁵⁾³⁶⁾	1	
Two-wire 4...20mA/HART with SIL qualification ²⁴⁾³²⁾	2	
Four-wire 4...20mA/HART; 90...253V AC; 50/60Hz ¹⁾¹⁵⁾¹⁷⁾	3	
Four-wire 4...20mA/HART; 9.6...48V DC; 20...42V AC ¹⁾¹⁵⁾¹⁷⁾	4	
PROFIBUS PA	5	

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data

Article No. Order Code

SITRANS LG250

A guided wave radar sensor for continuous level and interface measurement of liquids.

Seal/Second line of defense/ Process temperature

FKM (SHS FPM 70C3 GLT)/without glass seal/
-40 ... +80 °C (-40 ... +176 °F)⁶⁾

A

FKM (SHS FPM 70C3 GLT)/without glass seal/
-40 ... +150 °C (-40 ... +302 °F)

B

FFKM (Kalrez 6375)/with glass seal/
-20 ... +200 °C (-4 ... +392 °F)

C

EPDM (A+P 75.5/KW75F)/without glass seal/
-40 ... +80 °C (-40 ... +176 °F)

D

EPDM (A+P 75.5/KW75F)/with glass seal/
-40 ... +150 °C (-40 ... +302 °F)

E

FFKM (Kalrez 6375)/with glass seal/
-20 ... +200 °C (-4 ... +392 °F)

F

EPDM (A+P 75.5/KW75F)/without glass seal/
-40 ... +80 °C (-40 ... +176 °F)⁶⁾

G

EPDM (A+P 75.5/KW75F)/without glass seal/
-40 ... +150 °C (-40 ... +302 °F)

H

EPDM (A+P 75.5/KW75F)/with glass seal/
-40 ... +150 °C (-40 ... +302 °F)

J

Silicone FEP coated (A+P FEP-O-SEAL)/with-
out glass seal/-40 ... +80 °C (-40 ... +176 °F)⁶⁾

K

Silicone FEP coated (A+P FEP-O-SEAL)/with-
out glass seal/-40 ... +150 °C (-40 ... +302 °F)

L

Silicone FEP coated (A+P FEP-O-SEAL)/with
glass seal/-40 ... +150 °C (-40 ... +302 °F)

M

With borosilicate glass lead through/with glass
seal/-60 ... +150 °C (-76 ... +302 °F)⁷⁾

N

FFKM (Kalrez 6375)/without glass seal/
-20 ... +200 °C

P

FKM (SHS FPM 70C3 GLT)/with glass seal/
-40 ... 80 °C⁶⁾

Q

Housing/Protection/Cable

Plastic IP66/IP67 M20x1.5/blind stopper

A

Plastic IP66/IP67 ½" NPT/blind stopper

B

Aluminium/IP66/IP68 (0.2 bar) M20x1.5/
blind stopper

C

Aluminium/IP66/IP68 (0.2 bar) ½" NPT/blind
stopper

D

Aluminium double chamber/IP66/IP68
(0.2 bar) M20x1.5/blind stopper

E

Aluminium double chamber/IP66/IP68
(0.2 bar) ½" NPT/blind stopper

F

Stainless steel (precision casting) 316L/
IP66/IP68 (0.2 bar) M20x1.5/blind stopper

L

Stainless steel (precision casting) 316L/
IP66/IP68 (0.2 bar) ½" NPT/blind stopper

M

Stainless steel (electropolished) 316L/
IP66/IP68 (0.2 bar) M20x1.5/blind stopper

N

Stainless steel (electropolished) 316L/
IP66/IP68 (0.2 bar) ½" NPT/blind stopper

P

Stainless steel double chamber/IP66/
IP68 (0.2 bar) M20x1.5/blind stopper

Q

Stainless steel double chamber/IP66/
IP68 (0.2 bar) ½" NPT/blind stopper

R

Aluminium/IP66/IP68 (0.2 bar) M20x1.5/
cable gland stainless steel

S

Aluminium double chamber/IP66/IP68
(0.2 bar) M20x1.5/cable gland stainless steel

T

Stainless steel (precision casting) 316L/IP66/
IP68 (0.2 bar) M20x1.5/cable gland stainless
steel

U

Stainless steel (electropolished) 316L/IP66/IP68
(0.2 bar) M20x1.5/cable gland stainless steel

V

Aluminium single chamber / IP66/IP68
(0.2 bar) M20x1.5 / Cable gland brass
nickel-plated

W

Selection and Ordering data

Article No. Order Code

SITRANS LG250

A guided wave radar sensor for continuous level and interface measurement of liquids.

Aluminium double chamber / IP66/IP68
(0.2 bar) M20x1.5 / Cable gland brass
nickel-plated

X

Stainless steel single chamber (precision
casting) / IP66/IP68 (0.2 bar) M20x1.5/
Cable gland brass nickel-plated

Y

Lengths

Rod ø8 mm/316L

300 ... 1 000 mm (11.81 ... 39.37 inch)²²⁾

0

1 001 ... 2 000 mm (39.41 ... 78.74 inch)²²⁾

1

2 001 ... 3 000 mm (78.78 ... 118.11 inch)²²⁾

2

3 001 ... 4 000 mm (118.15 ... 157.48 inch)²²⁾

3

4 001 ... 5 000 mm (157.52 ... 196.85 inch)²²⁾

4

5 001 ... 6 000 mm (196.89 ... 236.22 inch)²²⁾

5

Rod ø12 mm/316L

300 ... 1 000 mm (11.81 ... 39.37 inch)²²⁾

9

R 2 A

1 001 ... 2 000 mm (39.41 ... 196.85 inch)²²⁾

9

R 2 B

2 001 ... 3 000 mm (78.78 ... 118.11 inch)²²⁾

9

R 2 C

3 001 ... 4 000 mm (118.15 ... 157.48 inch)²²⁾

9

R 2 D

Cable lengths ø2 or 4 mm/316L

501 ... 1 000 mm (19.72 ... 39.37 inch)

9

R 2 E

1 000 ... 5 000 mm (39.37 ... 196.85 inch)

9

R 2 F

5 001 ... 10 000 mm (196.89 ... 393.70 inch)

9

R 2 G

10 001 ... 15 000 mm (393.74 ... 590.55 inch)

9

R 2 H

15 001 ... 20 000 mm (590.59 ... 787.40 inch)

9

R 2 J

20 001 ... 25 000 mm (787.44 ... 984.25 inch)

9

R 2 K

25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)

9

R 2 L

30 001 ... 35 000 mm

9

R 2 M

(1 181.14 ... 1 377.95 inch)

35 001 ... 40 000 mm

9

R 2 N

(1 377.99 ... 1 574.80 inch)

40 001 ... 45 000 mm

9

R 2 P

(1 574.84 ... 1 771.65 inch)

45 001 ... 50 000 mm

9

R 2 Q

(1 771.69 ... 1 968.50 inch)

50 001 ... 55 000 mm

9

R 2 R

(1 968.54 ... 2 165.35 inch)

55 001 ... 60 000 mm

9

R 2 S

(2 165.39 ... 2 362.20 inch)

60 001 ... 65 000 mm

9

R 2 T

(2 362.24 ... 2 559.06 inch)

65 001 ... 70 000 mm

9

R 2 U

(2 559.09 ... 2 755.91 inch)

70 001 ... 75 000 mm

9

R 2 V

(2 759.94 ... 2 952.76 inch)

Coax ø21.3 mm/316L

300 ... 1 000 mm (11.81 ... 39.37 inch)²²⁾

9

R 3 A

1 001 ... 2 000 mm (39.41 ... 78.74 inch)²²⁾

9

R 3 B

2 001 ... 3 000 mm (78.78 ... 118.11 inch)²²⁾

9

R 3 C

3 001 ... 4 000 mm (118.15 ... 157.48 inch)²²⁾

9

R 3 D

4 001 ... 5 000 mm (157.52 ... 196.85 inch)²²⁾

9

R 3 E

5 001 ... 6 000 mm (196.89 ... 236.22 inch)²²⁾

9

R 3 F

Coax ø42.2 mm/316L

300 ... 1 000 mm (11.81 ... 39.37 inch)²²⁾

9

R 3 G

1 001 ... 2 000 mm (39.41 ... 78.74 inch)²²⁾

9

R 3 H

2 001 ... 3 000 mm (78.78 ... 118.11 inch)²²⁾

9

R 3 J

3 001 ... 4 000 mm (118.15 ... 157.48 inch)²²⁾

9

R 3 K

4 001 ... 5 000 mm (157.52 ... 196.85 inch)²²⁾

9

R 3 L

5 001 ... 6 000 mm (196.89 ... 236.22 inch)²²⁾


9

R 3 M

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Order Code	Selection and Ordering data	Order code
SITRANS LG250 A guided wave radar sensor for continuous level and interface measurement of liquids.	7ML5881- 		Further designs (optional) Please add "-Z" to Article No. and specify Order code(s).	
Further designs (mandatory) Please add "-Z" to Article No. and specify Order code(s).	Order Code		Enter the total insertion length in plain text description	Y01
Supplementary electronics Without	A00		Enter the total length of rigid part (cable version only)	Y02
Additional current output 4 ... 20 mA ¹⁾³⁹⁾	A01		Cleaning included certificate: oil, grease and silicone free	W01
Dimensions centering weight (diameter/height) Without	B00		Identification Label (measurement loop) stainless steel	Y17
ø40/30 mm	B01		Identification Label (measurement loop) Foil	Y18
ø45/30 mm (for 2 inch tubes)	B02		3.1 Certificate instrument ³⁰⁾	C12
ø75/30 mm (for 3 inch tubes)	B03		3.1 Certificate material (NACE0175) ³⁰⁾	D07
ø95/30 mm (for 4 inch tubes)	B04		3.1-Certificate instrument with test data ³⁰⁾	C25
ø1.57/1.18 inch (for 2 inch schedule 160)	B05		2.2-Certificate material ³⁰⁾	C15
ø1.77/1.18 inch (for 2 inch schedule 40/80)	B06		Quality/test plan ³⁰⁾	C26
ø2.95/1.18 inch (for 3 inch schedule 10/40)	B07		Dye penetration test + 3.1 certificate/instrument ³⁰⁾	C13
ø3.74/1.18 inch (for 4 inch schedule 80)	B08		X-ray test + 3.1 certificate/instrument ³⁰⁾	C14
Rod mounted Without Rod, applicable for coax or cable probe types only ¹⁸⁾	C00		Positive material identification test + 3.1 certificate/instrument ³⁰⁾	C16
Mounted	C01		Roughness test + 3.1 certificate/instrument ³⁰⁾	C18
Not mounted	C02		Pressure test + 3.1 certificate/instrument ³⁰⁾	C31
Local display interface Without ¹³⁾	E00		Helium leak test + 3.1 certificate/instrument ³⁰⁾	C32
Mounted	E01		Ferrite measuring accuracy to DIN32514-1 + 3.1 certificate/instrument ³⁰⁾	C60
Laterally mounted ¹⁾	E02		Pressure test according to Norsok + 3.1 certificate/instrument ³⁰⁾	C61
Language of display German	L00		5 point calibration certificate + 3.1 certificate/instrument ³⁰⁾⁴¹⁾	C62
English	L01		Additional Operating Instructions	Article No.
French	L02		German	
Dutch	L03		4 ... 20 mA/HART - two-wire	PBD-51041010
Italian	L04		4 ... 20 mA/HART - two-wire coax probe	PBD-51041011
Spanish	L05		4 ... 20 mA/HART - four-wire	PBD-51041012
Portuguese	L06		4 ... 20 mA/HART - four-wire coax probe	PBD-51041013
Russian	L07		Modbus	PBD-51041014
Chinese	L08		Modbus- coax probe	PBD-51041015
Japanese	L09		PROFIBUS PA	PBD-51041016
Operating instructions German	M00		PROFIBUS PA - coax probe	PBD-51041017
English	M01		English	
French	M02		4 ... 20 mA/HART - two-wire	PBD-51041047
Spanish	M03		4 ... 20 mA/HART - two-wire Coax probe	PBD-51041048
			4 ... 20 mA/HART - four-wire	PBD-51041049
			4 ... 20 mA/HART - four-wire Coax probe	PBD-51041050
			Modbus	PBD-51041051
			Modbus - coax probe	PBD-51041052
			PROFIBUS PA	PBD-51041053
			PROFIBUS PA - coax probe	PBD-51041054

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data

French

4 ... 20 mA/HART - two-wire	PBD-51041121
4 ... 20 mA/HART - two-wire Coax probe	PBD-51041122
4 ... 20 mA/HART - four-wire	PBD-51041123
4 ... 20 mA/HART - four-wire Coax probe	PBD-51041124
Modbus	PBD-51041125
Modbus- coax probe	PBD-51041126
PROFIBUS PA	PBD-51041127
PROFIBUS PA - coax probe	PBD-51041128

Spanish

4 ... 20 mA/HART - two-wire	PBD-51041084
4 ... 20 mA/HART - two-wire Coax probe	PBD-51041085
4 ... 20 mA/HART - four-wire	PBD-51041086
4 ... 20 mA/HART - four-wire Coax probe	PBD-51041087
Modbus	PBD-51041088
Modbus- Coax probe	PBD-51041089
PROFIBUS PA	PBD-51041090
PROFIBUS PA - coax probe	PBD-51041091

Accessories

Sitrans LG, GWR sensor Display Module	A5E34143449
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	

Article No.

- 1) Available with Housing/Protection cable options E, F, Q, and R only
- 2) Not available with Process fitting/Material options 04, 05, 08, 10, 13, and 14
- 3) Available only with Process Fitting/Material options 00 ... 10, 11, 12, 23 ... 34 and 37 ... 45 (Not available with threaded connections less than 1.5 inch and flanges < DN 50/2 inch)
- 4) Available with Seal option N only
- 5) Not available with Process fitting/Material options 00 ... 10, 11, 12, 23 ... 34 and 37 ... 45. (Not available with threaded connections less than 1.5 inch and flanges < DN 50/2 inch)
- 6) Available only with Process fitting/Material options 00 and 01 (options with max temp of 80 °C (176 °F) only available with PN 6 rated threaded connections)
- 7) Available with Version/Material option J only
- 8) Available only with the same diameter probe lengths
- 9) Available with Rod mounted option C00 only (Coax and cable version only)
- 10) Available with Rod mounted options C01, C02 only (rod versions only)
- 11) Available only with Centering weight option B00 (no centering weight option)
- 12) Available with Centering weight options B01 ... B08 only
- 13) Available with Housing/Protection cable options E,F, Q, R, T (double chamber options only)
- 14) Available only with Housing/Protection cable options C, D, L, M and approval option 1D
- 15) Available with Supplementary electronic option A00 and Indicating/Adjustment modules E00, E01
- 16) Available with Supplementary electronic option A01 and Approval options 0A,0E, and 0P
- 17) Not Available with Approval options 0B ... 0H 0P, 0Q, 1B, and 1F (not available with Intrinsically Safe and shipping approvals)
- 19) Not available with Length options 3, 4, 5, R2C and R2D
- 20) Available only with Seal options C,E,F,J,M, N and Q [second line of defense (with glass seal) for all explosion proof options]
- 21) Available with Indicating/adjustment modules E00 and E01
- 22) Not available with Y02
- 23) Available with Housing/Protection options C, D, E,F,L,M,Q,R (dust approvals)
- 24) SIL electronics option 2 available with Approval options 0A, 0E, 0G, 0H, 0L, 0M, 0N, 0P, 0U, 0Q 0T,1A, 1B, 1D, 1E, 1F and 1H
- 25) Available with Process Fitting/Material options 04,05,08,10,13 ... 45
- 26) Not available with Process fitting /Material options 04,05,08,10,13, and 14
- 27) Not available with Process Fitting/Material options 00 and 01
- 28) Available with Housing/Protection/Cable options A,B,C,D,E,F,L,M,R,S,T, and U
- 29) Available with Electronic option 0 only
- 30) Listed Certificates are not available with all configurations, please contact factory for more information
- 31) Not available with Process fitting/Material options 02, 03, 06, 07, 11, and 12 or threaded options below PN 100
- 32) Available with supplementary electronic option A00, SIL electronics
- 33) Modbus only available with Approval options GP and NI and XP-IS/Ex d ia
- 34) Modbus only available with two chamber housing options
- 35) Modbus not available with Supplementary electronic (only for HART) option
- 36) Modbus not available with lateral mount display option
- 37) Not available with version/material option K
- 38) Not available with Seal/Process temperature options A,G K and Q
- 39) Not available Indicating/adjustment module E02
- 40) Available with Housing/protection options D, F, M,R (dust approvals)
- 41) Available with Version/Material A, B, C, D, E and F

Level Measurement

Continuous level measurement - Guided wave radar transmitters



SITRANS LG series

Selection and Ordering data	Article No.	Order Code	Selection and Ordering data	Article No.	Order Code
SITRANS LG260	7ML5882-		SITRANS LG260	7ML5882-	
A guided wave radar sensor for level measurement of solids.			A guided wave radar sensor for level measurement of solids.		
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Approvals			Process fitting/Material		
Ordinary location CE ⁴⁾¹²⁾	0 A		Thread G ³ / ₄ " (DIN 3852-A) PN 40/316L	0 0	
Shipping approval ⁹⁾¹⁰⁾	0 B		Thread ³ / ₄ " NPT (ASME B1.20.1) PN 40/316L	0 1	
ATEX II 1G, 1/2G, 2G Ex ia IIC T ₆ ⁴⁾¹²⁾	0 E		Thread G1" (DIN 3852-A) PN 40/316L	0 2	
ATEX II 1G, 1/2G, 2G Ex ia IIC T ₆ + shipping approval GL ⁹⁾	0 G		Thread 1" NPT (ASME B1.20.1) PN 40/316L	0 3	
ATEX II 1G, 1/2G 2G Ex ia IIC + ATEX II 1D, 1/2D, 1/3D, 2D, Ex t IIIC IP66 T ⁸⁾¹⁰⁾¹²⁾²¹⁾	0 H		Thread G1 ¹ / ₂ " (DIN 3852-A) PN 40/316L	0 4	
ATEX II 1/2G, 2G Ex d ia IIC T ₆ ¹⁾⁷⁾¹²⁾	0 J		Thread 1 ¹ / ₂ " NPT (ASME B1.20.1) PN 40/316L	0 5	
ATEX II 1/2G, 2G Ex d ia IIC + shipping approval (GL) ¹⁾⁷⁾⁹⁾¹⁰⁾	0 L		Thread G2" (DIN 3852-A) PN 40/316L	0 6	
ATEX II 1/2G, 2G Ex d IIC + ATEX II 1D, 1/2D, 1/3D, 2D, Ex t IIIC IP66 ⁷⁾⁸⁾¹²⁾²¹⁾	0 M		Flange DN 50 PN 40 Form C, DIN 2501/316L	1 0	
ATEX II 1D, 1/2D, 1/3D, 2D, Ex t IIIC IP66 ¹¹⁾¹²⁾	0 N		Flange DN 80 PN 40 Form C, DIN 2501/316L	1 2	
ATEX II 1/2G, 2G Ex d IIC + shipping approval (GL) ⁹⁾¹⁰⁾¹¹⁾	0 Q		Flange DN 100 PN 16 Form C, DIN 2501/316L	1 3	
ATEX II 1/2G, 2G Ex d IIC + II 1D, 1/2D, 1/3D, 2D IP66 ⁸⁾¹¹⁾¹²⁾²¹⁾	0 R		Flange DN 100 PN 40 Form C, DIN 2501/316L	1 4	
ATEX II 1D, 1/2D, 2D IP6x T ⁸⁾¹¹⁾¹²⁾²¹⁾	0 S		Flange DN 150 PN 16 Form C, DIN 2501/316L	1 5	
IEC Ex ia IIC T ₆ ⁴⁾¹²⁾	0 T		Flange DN 50 PN 40 EN1092-1 Form B1/316L	1 6	
IEC Ex ia IIC T ₆ + IEC IP6x T tD ⁸⁾¹¹⁾¹²⁾²¹⁾	0 U		Flange DN 80 PN 40 EN1092-1 Form B1/316L	1 7	
IEC Ex d ia IIC T ₆ ¹⁾⁷⁾¹²⁾	1 A		Flange DN 100 PN16 EN1092-1 Form B1/316L	1 8	
IEC Ex d ia IIC T ₆ + IEC IP6x T tD ⁷⁾⁸⁾¹²⁾²¹⁾	1 B		Flange 2" 150 lb RF, ANSI B16.5/316L	3 0	
IEC Ex d IIC T ₆ ¹¹⁾¹²⁾	1 C		Flange 2" 300 lb RF, ANSI B16.5/316L	3 2	
IEC Ex d IIC T ₆ + IEC IP6x T tD ⁹⁾¹¹⁾¹²⁾²¹⁾	1 D		Flange 3" 150 lb RF, ANSI B16.5/316L	3 3	
FM (NI) Class I, Div. 2, Groups A, B, C, D ¹²⁾	1 F		Flange 3" 300 lb RF, ANSI B16.5/316L	3 4	
FM (NI) Class I, Div. 2, Groups A, B, C, D + shipping approval (GL) ⁹⁾¹⁰⁾	1 G		Flange 4" 150 lb RF, ANSI B16.5/316L	3 5	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F ¹²⁾	1 H		Flange 4" 300 lb RF, ANSI B16.5/316L	3 6	
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + shipping approval (GL) ⁹⁾¹⁰⁾	1 J		Flange 6" 150 lb RF, ANSI B16.5/316L	3 7	
FM (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾⁷⁾¹²⁾	1 K				
FM (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + shipping approval (GL) ¹⁾⁷⁾⁹⁾¹⁰⁾	1 L				
FM (XP) Class I, Div. 1, Groups A, B, C, D ¹¹⁾¹²⁾	1 M				
CSA (NI) Class I, Div. 2, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G ⁸⁾¹²⁾	1 N				
CSA (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹²⁾	1 P				
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾⁷⁾¹²⁾	1 Q				
CSA (XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹¹⁾¹²⁾	1 R				
Probe version/Material			Electronics		
Probe exchangeable cable ø 4 mm (0.16 inch) with gravity weight/316	A		Two-wire 4 ... 20mA/HART	0	
Probe exchangeable cable ø 6 mm (0.24 inch) with gravity weight/316 ²⁾	B		Four-wire Modbus ¹⁶⁾¹⁷⁾¹⁸⁾¹⁹⁾	1	
Probe exchangeable rod ø 16 mm (0.63 inch) / 316L ²⁾⁶⁾	E		Two-wire 4...20mA/HART with SIL qualification ¹⁴⁾¹⁵⁾	2	
			Four-wire 4...20mA/HART; 90...253V AC; 50/60Hz ¹⁾³⁾⁵⁾	3	
			Four-wire 4...20mA/HART; 9.6...48V DC; 20...42 V AC ¹⁾³⁾⁵⁾	4	
			PROFIBUS PA	5	
			Seal/Process temperature		
			FKM (SHS FPM 70C3 GLT)/-40 ... +80 °C (-40 ... +176 °F)	A	
			FKM (SHS FPM 70C3 GLT)/-40 ... +150 °C (-40 ... +302 °F)	B	
			FFKM (Kalrez 6375)/-20 ... +200 °C (-4 ... +392 °F)	C	
			EPDM (A+P 75.5/KW75F)/-40 ... +80 °C (-40 ... +176 °F)	D	
			EPDM (A+P 75.5/KW75F)/-40 ... +150 °C (-40 ... +392 °F)	E	
			Housing/Protection/Cable		
			Plastic IP66/IP67 M20x1.5/blind stopper	A	
			Plastic IP66/IP67 ¹ / ₂ " NPT/blind stopper	B	
			Plastic 2-chamber/IP66/IP67/M20x1.5/blind stopper	C	
			Plastic 2-chamber/IP66/IP67 ¹ / ₂ " NPT/blind stopper	D	
			Aluminium/IP66/IP68 (0.2 bar) M20x1.5/blind stopper	E	
			Aluminium/IP66/IP68 (0.2 bar) ¹ / ₂ " NPT/blind stopper	F	
			Aluminium double chamber/IP66/IP68 (0.2 bar) M20x1.5/blind stopper	G	
			Aluminium double chamber/IP66/IP68 (0.2 bar) ¹ / ₂ " NPT/blind stopper	H	
			Stainless Steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20x1.5/blind stopper	J	

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No.	Order Code	Selection and Ordering data	Article No.	Order Code
SITRANS LG260	7ML5882-		SITRANS LG260	7ML5882-	
A guided wave radar sensor for level measurement of solids.			A guided wave radar sensor for level measurement of solids.		
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		K	<u>Cable lengths ø6 mm/316L</u>		
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20x1.5/blind stopper		L	500 mm (19.69 inch)	9 R 4 A	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20x1.5/blind stopper		M	501 ... 1 000 mm (19.72 ... 39.37 inch)	9 R 4 B	
Stainless steel double chamber/IP66/IP68 (0.2 bar) M20x1.5/blind stopper		N	1 001 ... 5 000 mm (39.41 ... 196.85 inch)	9 R 4 C	
Stainless steel double chamber/IP66/IP68 (0.2 bar) 1/2" NPT/blind stopper		P	5 001 ... 10 000 mm (196.89 ... 393.70 inch)	9 R 4 D	
Aluminium/IP66/IP68 (0.2 bar) M20x1.5/cable gland stainless steel		Q	10 001 ... 15 000 mm (393.74 ... 590.55 inch)	9 R 4 E	
Aluminium double chamber/IP66/IP68 (0.2 bar) M20x1.5/cable gland stainless steel		R	15 001 ... 20 000 mm (590.59 ... 787.40 inch)	9 R 4 F	
Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20x1.5/cable gland stainless steel		S	20 001 ... 25 000 mm (787.44 ... 984.25 inch)	9 R 4 G	
Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20x1.5/cable gland stainless steel		T	25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	9 R 4 H	
Aluminium single chamber / IP66/IP68 (0.2 bar) M20x1.5 / Cable gland brass nickel-plated		W	30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	9 R 4 J	
Aluminium double chamber / IP66/IP68 (0.2 bar) M20x1.5 / Cable gland brass nickel-plated		X	35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)	9 R 4 K	
Stainless steel single chamber (precision casting) / IP66/IP68 (0.2 bar) M20x1.5 / Cable gland brass nickel-plated		Y	40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)	9 R 4 L	
			45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)	9 R 4 M	
			50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)	9 R 4 N	
			55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)	9 R 4 P	
Lengths			Further designs (mandatory)	Order Code	
<u>Rod ø16 mm/316L</u>			Please add "-Z" to Article No. and specify Order code(s).		
500 mm (19.69 inch)		0	Supplementary electronics		
501 ... 1 000 mm (19.72 ... 39.37 inch)		1	Without ¹⁾	A00	
1 001 ... 2 000 mm (39.41 ... 78.74 inch)		2	Additional current output 4 ... 20 mA ¹⁾²⁰⁾	A01	
2 001 ... 3 000 mm (78.78 ... 118.11 inch)		3	Rod mounted		
3 001 ... 4 000 mm (118.15 ... 157.48 inch)		4	Without Rod, applicable for coax or cable probe types only	C00	
4 001 ... 5 000 mm (157.52 ... 196.85 inch)		5	Mounted	C01	
5 001 ... 6 000 mm (196.89 ... 216.53 inch)		6	Not mounted	C02	
<u>Cable lengths ø2 or 4 mm/316</u>			Local display interface		
501 ... 1 000 mm (19.72 ... 39.37 inch)	9 R 2 E		Without	E00	
1 001 ... 5 000 mm (39.41 ... 196.85 inch)	9 R 2 F		Mounted	E01	
5 001 ... 10 000 mm (196.89 ... 393.70 inch)	9 R 2 G		Laterally mounted ¹⁾	E02	
10 001 ... 15 000 mm (393.74 ... 590.55 inch)	9 R 2 H		Language of display		
15 001 ... 20 000 mm (590.59 ... 787.40 inch)	9 R 2 J		German	L00	
20 001 ... 25 000 mm (787.44 ... 984.25 inch)	9 R 2 K		English	L01	
25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)	9 R 2 L		French	L02	
30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)	9 R 2 M		Dutch	L03	
35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)	9 R 2 N		Italian	L04	
40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)	9 R 2 P		Spanish	L05	
45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)	9 R 2 Q		Portuguese	L06	
50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)	9 R 2 R		Russian	L07	
55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)	9 R 2 S		Chinese	L08	
			Japanese	L09	
			Operating instructions		
			German	M00	
			English	M01	
			French	M02	
			Spanish	M03	

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Order code	Selection and Ordering data	Article No.
Further designs (optional)		Accessories	
Please add "-Z" to Article No. and specify Order code(s).		Sitrans LG, GWR sensor Display Module	A5E34143449
Enter the total insertion length in plain text description	Y01	SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
Cleaning included certificate: oil, grease and silicone free	W01	SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
Identification Label (measurement loop) stainless steel	Y17	SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
Identification Label (measurement loop) Foil	Y18	SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
3.1 Certificate instrument ¹³⁾	C12	For applicable back up point level switch - see point level measurement section	
3.1 Certificate material (NACE0175) ¹³⁾	D07	1) Available only with Housing/Protection/Cable Options G, H, N, P	
3.1-Certificate instrument with test data ¹³⁾	C25	2) Not available with Process/Fitting/Material options 00, 01, 02, and 03	
2.2-Certificate material ¹³⁾	C15	3) Available with Supplementary electronic option A00 and Indicating/adjustment modules E00, E01	
Quality/test plan ¹³⁾	C26	4) Available with Supplementary electronic option A01	
Dye penetration test + 3.1 certificate/instrument ¹³⁾	C13	5) Not Available with Approval options 0B ... 0H 0L, 0Q, 1B, 1F, 1G, 1J, 1L (not available with Intrinsically Safe and shipping approvals)	
X-ray test + 3.1 certificate/instrument ¹³⁾	C14	6) Available with Rod Mounted options C01 and C02	
Positive material identification test + 3.1 certificate/instrument ¹³⁾	C16	7) Available with Indicating/adjustment modules E00 and E01	
Roughness test + 3.1 certificate/instrument ¹³⁾	C18	8) Available with Housing Protection options E, F, G, H, J, K, N, P	
Pressure test + 3.1 certificate/instrument ¹³⁾	C31	9) Not available with Housing/Protection/Cable options L, M, and T	
Helium leak test + 3.1 certificate/instrument ¹³⁾	C32	10) Available with Electronic option 0 only	
Ferrite measuring accuracy to DIN32514-1 + 3.1 certificate/instrument ¹³⁾	C60	11) Available with Seal/Process temperature option C only	
Pressure test according to Norsok + 3.1 certificate/instrument ¹³⁾	C61	12) Available with Version/Material option E only	
5 point calibration certificate + 3.1 certificate/instrument ¹³⁾	C62	13) Listed Certificates are not available with all configurations, please contact factory for more information	
Operating Instructions		14) SIL electronics option 2 available with Approval options 0A, 0E, 0G, 0H, 0N, 0Q, 0R, 0S, 0T, 0U, 1C, 1D, 1F, 1H, 1M, 1N, 1P, and 1R	
German		15) Available with supplementary electronic option A00, SIL electronics	
4 ... 20 mA/HART - two-wire	PBD-51041020	16) Modbus available only with Approval options GP and NI and XP-IS/Ex d ia	
4 ... 20 mA/HART - four-wire	PBD-51041021	17) Modbus available only with two chamber housing options	
Modbus	PBD-51041022	18) Modbus not available with supplementary electronic (only for HART) option	
PROFIBUS PA	PBD-51041023	19) Modbus not available with lateral mount display option	
English		20) Not available with Indicating/adjustment module E02	
4 ... 20 mA/HART - two-wire	PBD-51041057	21) Available with Housing Protection F, H, P and K	
4 ... 20 mA/HART - four-wire	PBD-51041058		
Modbus	PBD-51041059		
PROFIBUS PA	PBD-51041060		
French			
4 ... 20 mA/HART - two-wire	PBD-51041131		
4 ... 20 mA/HART - four-wire	PBD-51041132		
Modbus	PBD-51041133		
PROFIBUS PA	PBD-51041134		
Spanish			
4 ... 20 mA/HART - two-wire	PBD-51041094		
4 ... 20 mA/HART - four-wire	PBD-51041095		
Modbus	PBD-51041096		
PROFIBUS PA	PBD-51041097		

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data

Article No. Order Code

SITRANS LG270

7ML5883-

A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Approvals

Ordinary location CE ³⁾	0 A
Shipping approval ¹⁷⁾¹⁸⁾¹⁹⁾	0 B
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 ³⁾	0 E
ATEX II 1G, 1/2G, 2G Ex ia IIC T6 + shipping approval GL ¹⁷⁾¹⁸⁾¹⁹⁾	0 G
ATEX II 1G, 1/2G, 2G Ex ia IIC + ATEX II 1D, 1/2D, 2D IP6x ¹⁶⁾²⁸⁾	0 H
ATEX II 1/2G, 2G Ex d ia IIC T6 ¹⁾¹⁰⁾¹⁴⁾	0 J
ATEX II 1/2G, 2G Ex d ia IIC + ship (GL) ¹⁾¹⁰⁾¹⁴⁾¹⁷⁾¹⁸⁾¹⁹⁾	0 L
ATEX II 1/2G, 2G Ex d ia IIC + ATEX II 1/2D, 2D IP6x ¹⁰⁾¹⁴⁾¹⁶⁾²⁸⁾	0 M
ATEX II 1/2G, 2G Ex d IIC T6 ¹¹⁾	0 N
ATEX II 1/2G, 2G Ex d IIC + ship approval (GL) ³⁾¹⁷⁾¹⁸⁾¹⁹⁾	0 Q
ATEX II 1/2G, 2G Ex d IIC + ATEX II 1/2D, 2D IP6x ¹⁾¹⁶⁾²⁸⁾	0 R
ATEX II 1D, 1/2D, 2D IP6x T ¹⁶⁾²⁸⁾	0 S
IEC Ex ia IIC T6	0 T
IEC Ex ia IIC T6 + IEC IP6x T tD ¹⁶⁾²⁸⁾	0 U
IEC Ex d ia IIC T6 ¹⁾¹⁰⁾¹⁴⁾	1 A
IEC Ex d ia IIC T6 + IEC IP6x T tD ¹⁰⁾¹⁴⁾¹⁶⁾²⁸⁾	1 B
IEC Ex d IIC T6 ¹¹⁾	1 C
IEC Ex d IIC T6 + IEC IP6x T tD ¹¹⁾¹⁶⁾²⁸⁾	1 D
FM (NI) Class I, Div.2, Groups A, B, C, D	1 F
FM (NI) Class I, Div.2, Groups A, B, C, D + ship approval (GL) ¹⁷⁾¹⁸⁾¹⁹⁾	1 G
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F	1 H
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + ship approval (GL) ¹⁷⁾¹⁸⁾¹⁹⁾	1 J
FM (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾¹⁰⁾¹⁴⁾	1 K
FM (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G + shipping approval (GL) ¹⁾¹⁰⁾¹⁷⁾¹⁸⁾¹⁹⁾	1 L
FM (XP) Class I, Div.1, Groups A, B, C, D	1 M
CSA (NI) Class I, Div. 2, Groups A, B, C, D; (DIP) Class II, III, Div.1, Groups E, F, G ¹⁶⁾	1 N
CSA (IS) Class I, II, III, Div.1, Groups A, B, C, D, E, F, G	1 P
CSA (XP-IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹⁾¹⁰⁾¹⁴⁾	1 Q
CSA (XP) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G ¹¹⁾	1 R
Version/Material	
Probe exchangeable cable ø 2 mm (0.08 inch) with gravity weight/316L ⁴⁾⁷⁾	A
Probe exchangeable cable ø2 mm (0.08 inch) center weight/316L ⁵⁾⁷⁾	B
Probe exchangeable cable ø4 mm (0.16 inch) with gravity weight/316L ⁴⁾⁷⁾	C
Probe exchangeable cable ø4 mm (0.16 inch) with center weight/316L ⁵⁾⁷⁾	D
Probe exchangeable rod ø 16 mm (0.63 inch) /316L ⁴⁾⁷⁾⁹⁾	E
Probe coax version ø 42.2 mm (1.66 inch) with multiple hole/316L ⁴⁾⁷⁾	F
Probe coax version ø 42.2 mm (1.66 inch); multiple hole; reference distances/316L ⁴⁾⁷⁾¹³⁾	G

Selection and Ordering data

Article No. Order Code

SITRANS LG270

7ML5883-



A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications

Process fitting/Material

Thread G1½" (DIN 3852-A) PN400/316L	0 0
Thread 1½" NPT (ASME B1.20.1) PN400/316L	0 1
Thread 1½" NPT (ASME B1.20.1) PN400/C22	0 2
Flange DN 50 PN 40 Form C, DIN 2501/316L	1 0
Flange DN 50 PN 40 form V13, DIN 2513/316L	1 1
Flange DN 65 PN 64 Form V13, DIN 2501/316L	1 2
Flange DN 80 PN 40 Form C, DIN 2501/316L	1 3
Flange DN 80 PN 40 Form V13, DIN 2501/316L	1 4
Flange DN 80 PN 100 Form L, DIN 2501/316L	1 5
Flange DN 100 PN 16 Form C, DIN 2501/316L	1 6
Flange DN 100 PN 16 Form C, DIN 2501/316L	1 7
Flange DN 100 PN 40 Form C, DIN 2501/316L	1 8
Flange DN 100 PN 40 Form V13, DIN 2513/316L	2 0
Flange DN 150 PN 16 Form C, DIN 2501/316L	2 1
Flange DN 50 PN 40 EN1092-1 Form B1/316L	2 2
Flange DN 100 PN 160 GOST 12815-80.7/316L	2 3
Flange DN 80 PN 160 Form C, DIN 2501/316L	6 0
Flange DN 80 PN 250 Form L, DIN 2501/316L	6 1
Flange DN 50 PN 160, EN1092-1 Form B1/316L	6 2
Flange DN 50 PN 160, EN1092-1 Form B2/316L	6 3
Flange DN 50 PN 320, EN1092-1 Form B1/316L	6 4
Flange DN 65 PN 250, EN1092-1 Form B1/316L	6 5
Flange DN 100 PN 160, EN1092-1 Form B2/316L	6 6
Flange 2" 150 lb RF, ANSI B16.5/316L	3 0
Flange 2" 300 lb RF, ANSI B16.5/316L	3 1
Flange 2" 600 lb RF, ANSI B16.5/316L	3 2
Flange 2" 1 500 lb RF, ANSI B16.5/316L	3 3
Flange 3" 150 lb RF, ANSI B16.5/316L	3 4
Flange 3" 300 lb RF, ANSI B16.5/316L	3 5
Flange 3" 600 lb RF, ANSI B16.5/316L	3 6
Flange 3" 900 lb RF, ANSI B16.5/316L	3 7
Flange 3" 2 500 lb RF, ANSI B16.5/316L	3 8
Flange 3 ½" 600 lb RF, ANSI B16.5/316L	4 0
Flange 4" 150 lb RF, ANSI B16.5/316L	4 1
Flange 4" 300 lb RF, ANSI B16.5/316L	4 2
Flange 4" 600 lb RF, ANSI B16.5/316L	4 3
Flange 6" 150 lb RF, ANSI B16.5/316L	4 4
Flange 6" 300 lb RF, ANSI B16.5/316L	4 5
Flange 6" 600 lb RF, ANSI B16.5/316L	4 6
Flange 2" 150 lb Fisher special return/316L	4 7
Flange 2" 900 lb RF, ANSI B16.5/316L	5 0
Flange 3" 1 500 lb RF, ANSI B16.5/316L	5 1
Flange 4" 900 lb RF, ANSI B16.5/316L	5 2
Flange 4" 1 500 lb RF, ANSI B16.5/316L	5 3
Flange 4" 2 500 lb RJF, ANSI B16.5/316L	5 4

Level Measurement
Continuous level measurement - Guided wave radar transmitters


SITRANS LG series

Selection and Ordering data	Article No. Order Code	Selection and Ordering data	Article No. Order Code
<p>SITRANS LG270</p> <p>A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications</p> <hr/> <p>Electronics</p> <p>Two-wire 4 ... 20mA/HART Four-wire Modbus²³⁾²⁴⁾²⁵⁾²⁶⁾</p> <p>Two-wire 4...20mA/HART with SIL qualification²¹⁾²²⁾</p> <p>Four-wire 4...20mA/HART; 90...253V AC; 50/60Hz¹⁾²⁾⁶⁾</p> <p>Four-wire 4...20mA/HART; 9.6...48V DC; 20...42 V AC¹⁾²⁾⁶⁾</p> <p>PROFIBUS PA</p> <hr/> <p>Seal/Second line of defense/ Process temperature</p> <p>Ceramic-graphite/with glass seal/ -196 ... +280 °C (-321 ... +536 °F)</p> <p>Ceramic-graphite /with glass seal/ -196 ... +450 °C (-321 ... +842 °F)</p> <hr/> <p>Housing/Protection/Cable</p> <p>Plastic IP66/IP67 M20x1.5/blind stopper</p> <p>Plastic IP66/IP67 ½" NPT/blind stopper</p> <p>Aluminium/IP66/IP68 (0.2 bar) M20x1.5/blind stopper</p> <p>Aluminium/IP66/IP68 (0.2 bar) ½" NPT/blind stopper</p> <p>Aluminium double chamber/IP66/IP68 (0.2 bar) M20x1.5/blind stopper</p> <p>Aluminium double chamber/IP66/IP68 (0.2 bar) ½" NPT/blind stopper</p> <p>Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20x1.5/blind stopper</p> <p>Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) ½" NPT/blind stopper</p> <p>Stainless steel (electropolished) 316L IP66/IP68 (0.2 bar) M20x1.5/blind stopper</p> <p>Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) ½" NPT/blind stopper</p> <p>Stainless steel double chamber/IP66/IP68 (0.2 bar) M20x1.5/blind stopper</p> <p>Stainless steel double chamber/IP66/IP68 (0.2 bar) ½" NPT/blind stopper</p> <p>Aluminium/IP66/IP68 (0.2 bar) M20x1.5/cable gland stainless steel</p> <p>Aluminium double chamber/IP66/IP68 (0.2 bar) M20x1.5/cable gland stainless steel</p> <p>Stainless steel (precision casting) 316L/IP66/IP68 (0.2 bar) M20x1.5/Cable gland stainless steel</p> <p>Stainless steel (electropolished) 316L/IP66/IP68 (0.2 bar) M20x1.5/cable gland stainless steel</p> <p>Aluminium single chamber / IP66/IP68 (0.2 bar) M20x1.5 / Cable gland brass nickel-plated</p> <p>Aluminium double chamber / IP66/IP68 (0.2 bar) M20x1.5 / Cable gland brass nickel-plated</p> <p>Stainless steel single chamber (precision casting) / IP66/IP68 (0.2 bar) M20x1.5 / Cable gland brass nickel-plated</p>	<p>7ML5883-</p>  <p>0</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>A</p> <p>B</p> <p>A</p> <p>B</p> <p>C</p> <p>D</p> <p>E</p> <p>F</p> <p>L</p> <p>M</p> <p>N</p> <p>P</p> <p>Q</p> <p>R</p> <p>S</p> <p>T</p> <p>U</p> <p>V</p> <p>W</p> <p>X</p> <p>Y</p>	<p>SITRANS LG270</p> <p>A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications</p> <hr/> <p>Lengths</p> <p><u>Rod ø16 mm/316L</u></p> <p>300 mm (11.81 inch)¹⁵⁾</p> <p>500 mm (19.69 inch)¹⁵⁾</p> <p>501 ... 1 000 mm (19.72 ... 39.37 inch)¹⁵⁾</p> <p>1 001 ... 2 000 mm (39.41 ... 78.74 inch)¹⁵⁾</p> <p>2 001 ... 3 000 mm (78.78 ... 118.11 inch)¹⁵⁾</p> <p>3 001 ... 4 000 mm (118.15 ... 157.48 inch)¹⁵⁾</p> <p>4 001 ... 5 000 mm (157.52 ... 196.85 inch)¹⁵⁾</p> <p>5 001 ... 6 000 mm (196.89 ... 216.53 inch)¹⁵⁾</p> <p><u>Cable lengths ø2 or 4 mm/316L</u></p> <p>501 ... 1 000 mm (19.72 ... 39.37 inch)</p> <p>1 000 ... 5 000 mm (39.37 ... 196.85 inch)</p> <p>5 001 ... 10 000 mm (196.89 ... 393.70 inch)</p> <p>10 001 ... 15 000 mm (393.74 ... 590.55 inch)</p> <p>15 001 ... 20 000 mm (590.59 ... 787.40 inch)</p> <p>20 001 ... 25 000 mm (787.44 ... 984.25 inch)</p> <p>25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)</p> <p>30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)</p> <p>35 001 ... 40 000 mm (1 377.99 ... 1 574.80 inch)</p> <p>40 001 ... 45 000 mm (1 574.84 ... 1 771.65 inch)</p> <p>45 001 ... 50 000 mm (1 771.69 ... 1 968.50 inch)</p> <p>50 001 ... 55 000 mm (1 968.54 ... 2 165.35 inch)</p> <p>55 001 ... 60 000 mm (2 165.39 ... 2 362.20 inch)</p> <p><u>Coax ø42.2 mm/316L</u></p> <p>300 ... 1 000 mm (11.81 ... 39.37 inch)¹⁵⁾</p> <p>1 001 ... 2 000 mm (39.41 ... 78.74 inch)¹⁵⁾</p> <p>2 001 ... 3 000 mm (78.78 ... 118.11 inch)¹⁵⁾</p> <p>3 001 ... 4 000 mm (118.15 ... 157.48 inch)¹⁵⁾</p> <p>4 001 ... 5 000 mm (157.52 ... 196.85 inch)¹⁵⁾</p> <p>5 001 ... 6 000 mm (196.89 ... 236.22 inch)¹⁵⁾</p>	<p>7ML5883-</p>  <p>0</p> <p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p> <p>6</p> <p>7</p> <p>9 R 2 E</p> <p>9 R 2 F</p> <p>9 R 2 G</p> <p>9 R 2 H</p> <p>9 R 2 J</p> <p>9 R 2 K</p> <p>9 R 2 L</p> <p>9 R 2 M</p> <p>9 R 2 N</p> <p>9 R 2 P</p> <p>9 R 2 Q</p> <p>9 R 2 R</p> <p>9 R 2 S</p> <p>9 R 3 G</p> <p>9 R 3 H</p> <p>9 R 3 J</p> <p>9 R 3 K</p> <p>9 R 3 L</p> <p>9 R 3 M</p>

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Selection and Ordering data	Article No. Order Code	Selection and Ordering data	Order code
SITRANS LG270 A guided wave radar sensor for continuous level and interface measurement of liquids in aggressive applications	7ML5883- 	Further designs (optional) Please add "-Z" to Article No. and specify Order code(s).	
Further designs (mandatory) Please add "-Z" to Article No. and specify Order code(s).	Order Code	Enter the total insertion length in plain text description	Y01
Supplementary electronics Without Additional current output 4 ... 20 mA ¹⁾²⁷⁾	A00 A01	Enter the total length of rigid part (cable version only, to a maximum of 100 mm)	Y02
Dimensions centering weight (diameter/height) Without ø40/30 mm ø45/30 mm (for 2 inch tubes) ø75/30 mm (for 3 inch tubes) ø95/30 mm (for 4 inch tubes) ø1.57/1.18 inch (for 2 inch schedule 160) ø1.77/ 1.18 inch (for 2 inch schedule 40/80) ø2.95/1.18 inch (for 3 inch schedule 10/40) ø3.74/ 1.18 inch (for 4 inch schedule 80)	B00 B01 B02 B03 B04 B05 B06 B07 B08	Cleaning included certificate: oil, grease and silicone free	W01
Rod mounted Without Rod, applicable for coax or cable probe types only ⁸⁾ Mounted Not mounted	C00 C01 C02	Identification Label (measurement loop) stainless steel	Y17
Local display interface Without Mounted Laterally mounted ¹⁾	E00 E01 E02	Identification Label (measurement loop) Foil	Y18
Language of display German English French Dutch Italian Spanish Portuguese Russian Chinese Japanese	L00 L01 L02 L03 L04 L05 L06 L07 L08 L09	3.1 Certificate instrument ²⁰⁾ 3.1 Certificate material (NACE0175) ²⁰⁾ 3.1-Certificate instrument with test data ²⁰⁾ 2.2-Certificate material ²⁰⁾ Quality/test plan ²⁰⁾ Dye penetration test + 3.1 certificate/instrument ²⁰⁾ X-ray test + 3.1 certificate/instrument ²⁰⁾ Positive material identification test + 3.1 certificate/instrument ²⁰⁾ Roughness test + 3.1 certificate/instrument ²⁰⁾ Pressure test + 3.1 certificate/instrument ²⁰⁾ Helium leak test + 3.1 certificate/instrument ²⁰⁾ Ferrite measuring accuracy to DIN32514-1 + 3.1 certificate/instrument ²⁰⁾ Pressure test according to Norsok + 3.1 certificate/instrument ²⁰⁾ 5 point calibration certificate + 3.1 certificate/instrument ²⁰⁾²⁹⁾	C12 D07 C25 C15 C26 C13 C14 C16 C18 C31 C32 C60 C61 C62
Operating instructions German English French Spanish	M00 M01 M02 M03	Additional Operating Instructions German 4 ... 20 mA/HART - two-wire 4 ... 20 mA/HART - two-wire coax probe 4 ... 20 mA/HART - four-wire 4 ... 20 mA/HART - four-wire coax probe Modbus Modbus- Coax probe PROFIBUS PA PROFIBUS PA, Coax probe	Article No. PBD-51041025 PBD-51041026 PBD-51041027 PBD-51041028 PBD-51041029 PBD-51041030 PBD-51041031 PBD-51041032
		English 4 ... 20 mA/HART - two-wire 4 ... 20 mA/HART - two-wire coax probe 4 ... 20 mA/HART - four-wire 4 ... 20 mA/HART - four-wire coax probe Modbus Modbus- coax probe PROFIBUS PA PROFIBUS PA, Coax probe	PBD-51041062 PBD-51041063 PBD-51041064 PBD-51041065 PBD-51041066 PBD-51041067 PBD-51041068 PBD-51041069

Selection and Ordering data	Article No.
French	
4 ... 20 mA/HART - two-wire	PBD-51041136
4 ... 20 mA/HART - two-wire coax probe	PBD-51041137
4 ... 20 mA/HART - four-wire	PBD-51041138
4 ... 20 mA/HART - four-wire coax probe	PBD-51041139
Modbus	PBD-51041140
Modbus- Coax probe	PBD-51041141
PROFIBUS PA	PBD-51041142
PROFIBUS PA, Coax probe	PBD-51041143
Spanish	
4 ... 20 mA/HART - two-wire	PBD-51041099
4 ... 20 mA/HART - two-wire coax probe	PBD-51041100
4 ... 20 mA/HART - four-wire	PBD-51041101
4 ... 20 mA/HART - four-wire coax probe	PBD-51041102
Modbus	PBD-51041103
Modbus- Coax probe	PBD-51041104
PROFIBUS PA	PBD-51041105
PROFIBUS PA, Coax probe	PBD-51041105
Accessories	
Sitrans LG, GWR sensor Display Module	A5E34143449
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	
<p>1) Available with Housing/Protection/Cable options E, F, Q, R, and T</p> <p>2) Available with Supplementary electronic option A00 and Indicating/adjustment modules E00, E01</p> <p>3) Available with Supplementary electronics A01</p> <p>4) Available with Centering weight option B00 only</p> <p>5) Available with Centering weight options B01 ... B08 only</p> <p>6) Available with Approval options 0A,0B,0J,0K,0N,0R,0S,1A,1C,1E,1F, and 1G</p> <p>7) Available only with the same diameter probe lengths</p> <p>8) Available with Version/Material options A, B, C, D, F, G</p> <p>9) Available with Rod Mounted options C01 and C02</p> <p>10) Available with Indicating/adjustment modules E00 and E01</p> <p>11) Available with Housing/Protection Cable options C, D, L, M only</p> <p>12) Version/Material Hastelloy C22, temperature is limited to 400 °C (752 °F)</p> <p>13) Not available with Length R3G</p> <p>14) Available with Housing/Protection Cable options E, F, Q, and R</p> <p>15) Y02 only available with Cable options</p> <p>16) Available with Housing protection options C, D, E,F,L, M,Q, and R</p> <p>17) Not available with Housing/Protection/Cable options N, P, and V</p> <p>18) Available with Electronic option 0 only</p> <p>19) Not available with Version/Material options E, F, and G</p> <p>20) Listed Certificates are not available with all configurations, please contact factory for more information</p> <p>21) SIL electronics option 2 available with Approval options 0A, 0E, 0G, 0H, 0N, 0Q, 0R, 0S, 0T, 0U, 1C, 1D, 1F, 1H, 1M, 1N, 1P and 1R</p> <p>22) Available with Supplementary electronic option A00, SIL electronics</p> <p>23) Available with Approval options 0A, 0H, 0K, 0R, 0S, 0U, 1A, 1C, 1D, 1E, 1F, 1H, 1N, 1P and 1R</p> <p>24) Modbus only available with two chamber housing options</p> <p>25) Modbus not available with Supplementary electronic (only for HART) option</p> <p>26) Modbus not available with lateral mount display option</p> <p>27) Not available with Indicating/adjustment module E02</p> <p>28) Available with Housing protection options D, F, M and R</p> <p>29) Available with Version/Material A, B, C, D and E</p>	

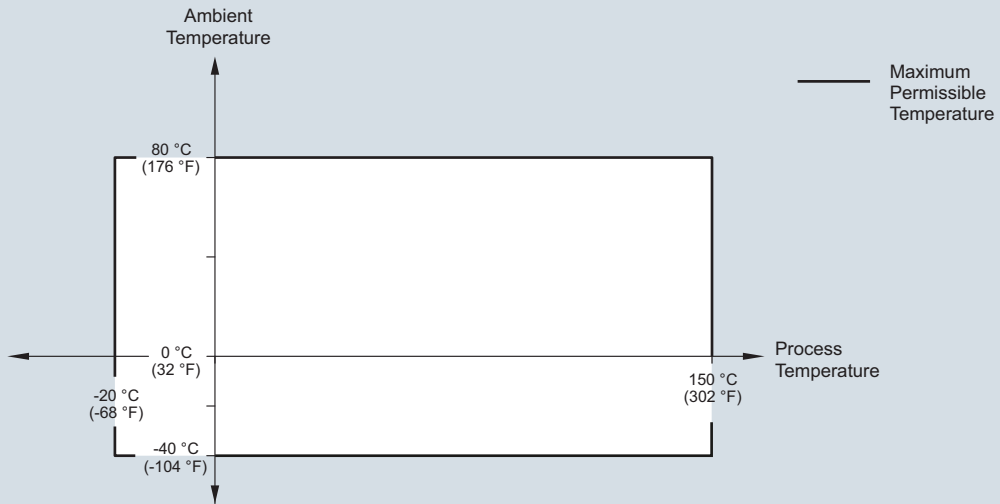
Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

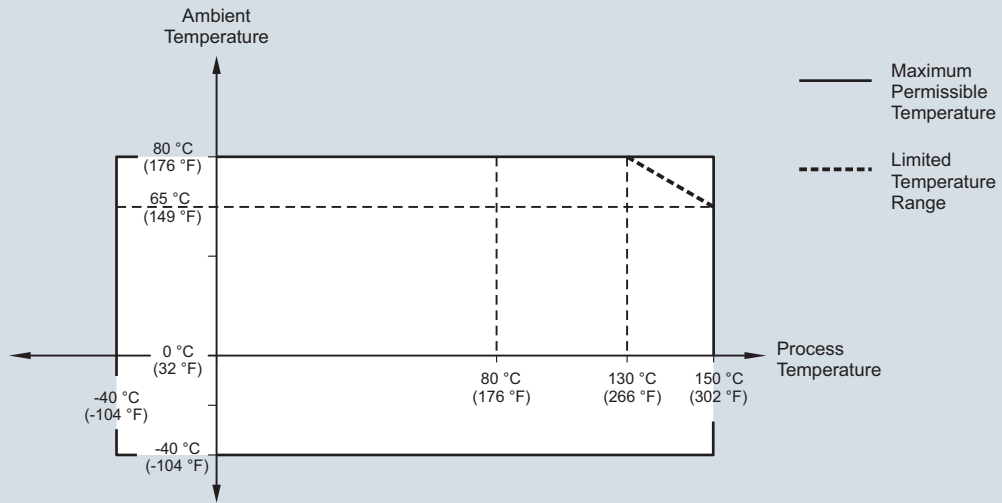
Characteristic curves

SITRANS LG240, Ambient temperature/process temperature, standard version

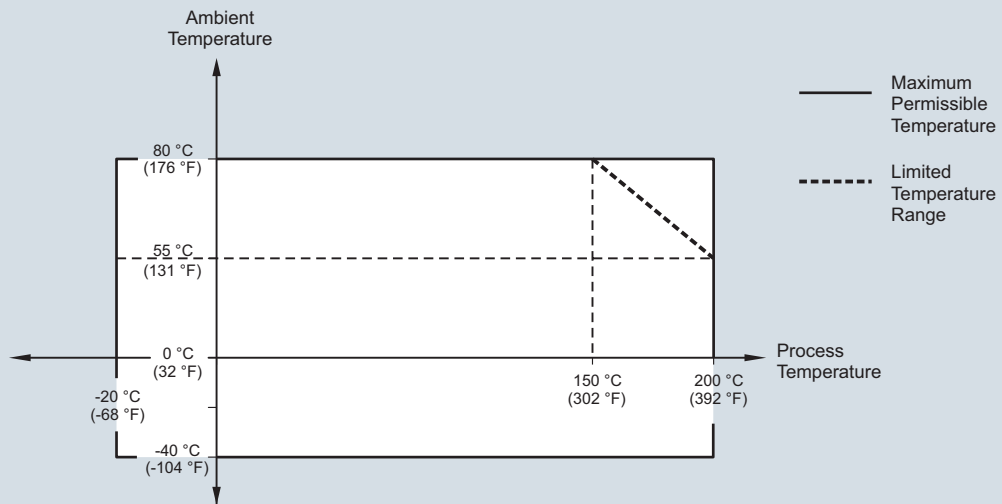


SITRANS LG240, Ambient temperature/process temperature curve

SITRANS LG250, Ambient temperature/process temperature, standard version



SITRANS LG250, Ambient temperature/process temperature, temperature adapter version



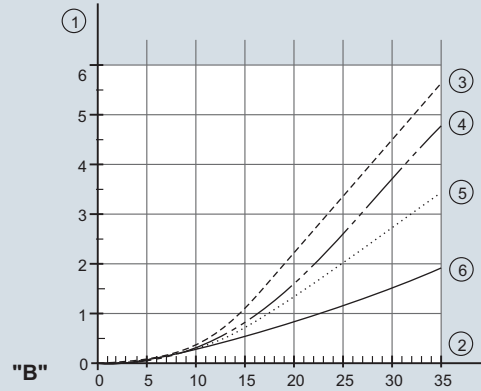
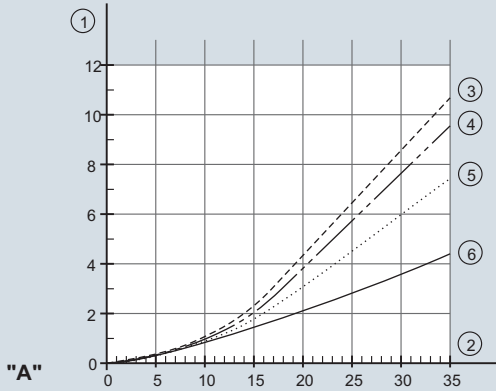
SITRANS LG250, Ambient temperature/process temperature curves

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

SITRANS LG260, Maximum tensile load with cereals and plastic granules - cable: \varnothing 4 mm (0.157 inch)



A. Cereals

B. Plastic granules

1. Tensile force in kN (the determined value must be multiplied with safety factor 2)

2. Cable length in m

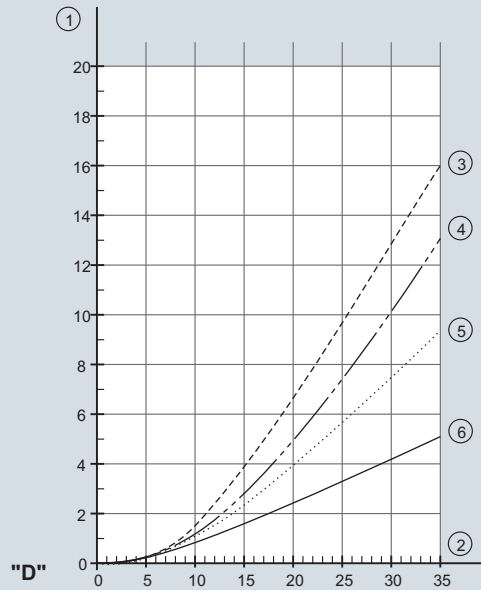
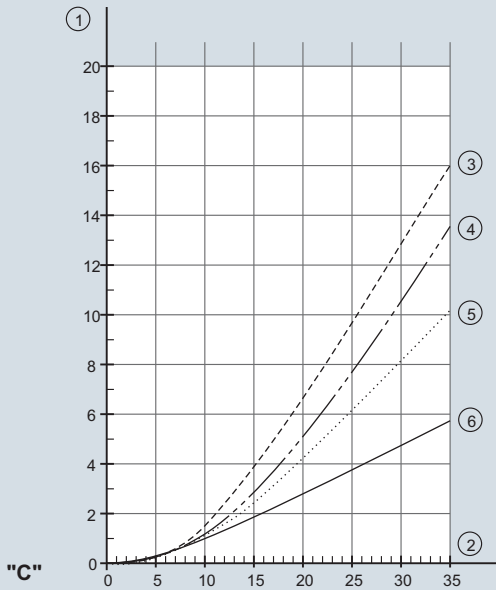
3. Vessel diameter 12 m (39.37 ft)

4. Vessel diameter 9 m (29.53 ft)

5. Vessel diameter 6 m (19.69 ft)

6. Vessel diameter 3 m (9.843 ft)

SITRANS LG260, Maximum tensile load with sand and cement - cable: \varnothing 4 mm (0.157 inch)



C. Sand

D. Cement

1. Tensile force in kN (the determined value must be multiplied with safety factor 2)

2. Cable length in m

3. Vessel diameter 12 m (39.37 ft)

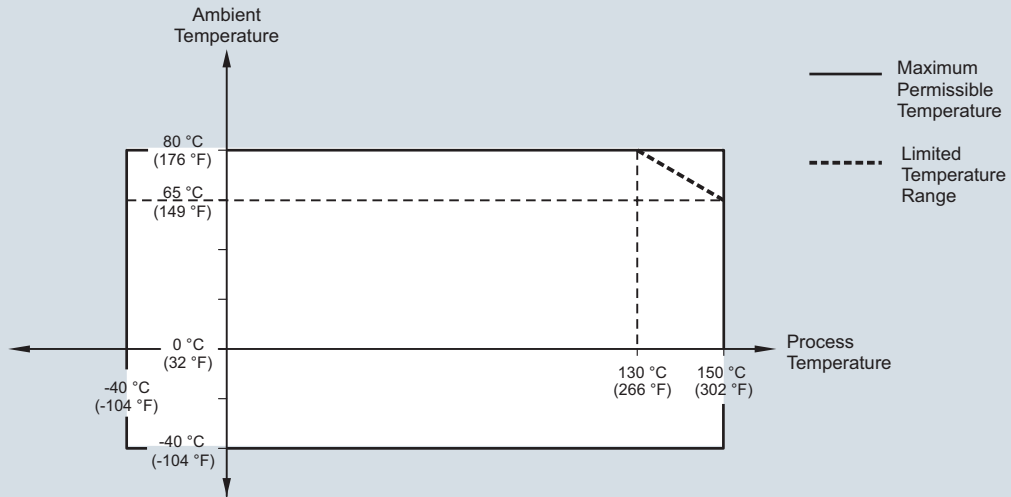
4. Vessel diameter 9 m (29.53 ft)

5. Vessel diameter 6 m (19.69 ft)

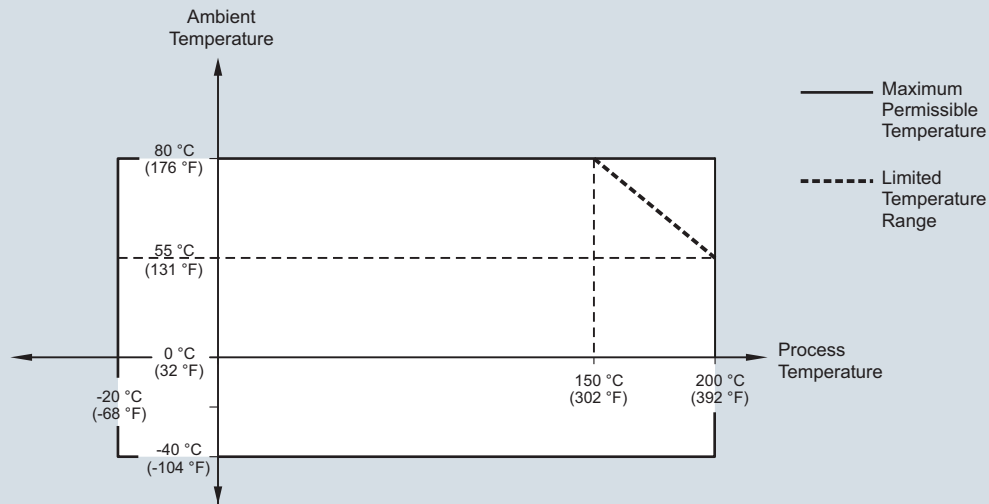
6. Vessel diameter 3 m (9.843 ft)

SITRANS LG260, Maximum tensile load curves

SITRANS LG260, Ambient temperature/process temperature, standard version
Cable version with \varnothing 4 mm (0.157 inch)
Cable version, PA coated with \varnothing 6 mm (0.236 inch)



SITRANS LG260, Ambient temperature/process temperature, temperature adapter version
Cable version with \varnothing 4 mm (0.157 inch)
Cable version, PA coated with \varnothing 6 mm (0.236 inch)



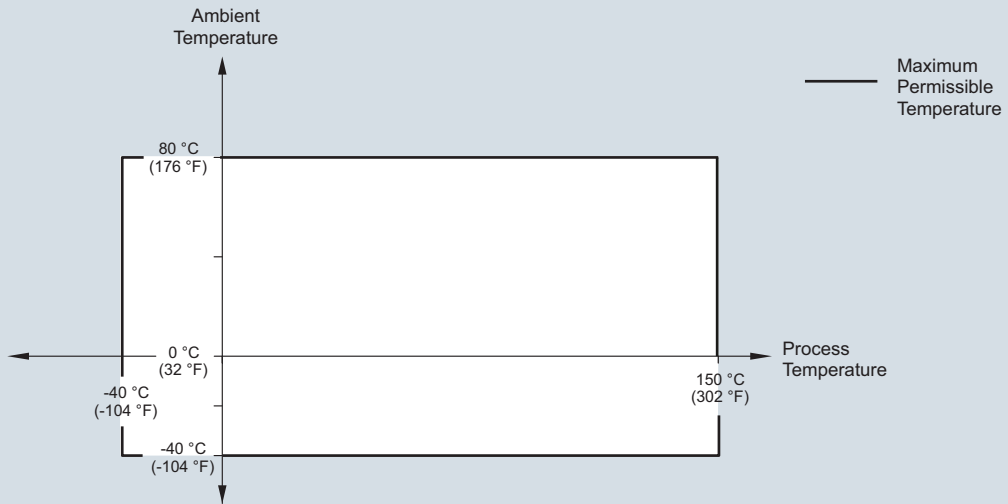
SITRANS LG260, Ambient temperature/process temperature curves

Level Measurement

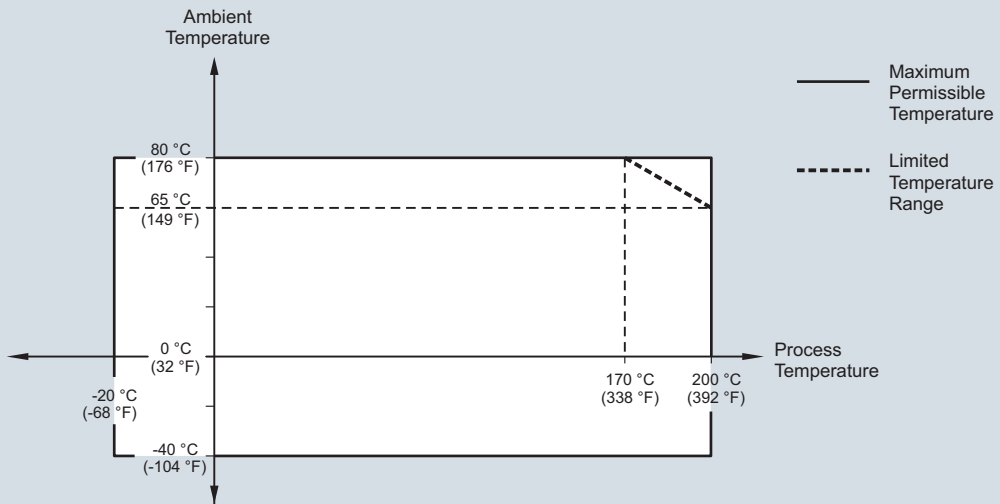
Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

SITRANS LG260, Ambient temperature/process temperature, standard version
Cable version with \varnothing 6 mm (0.236 inch)
Cable version, PA coated with \varnothing 11 mm (0.433 inch)

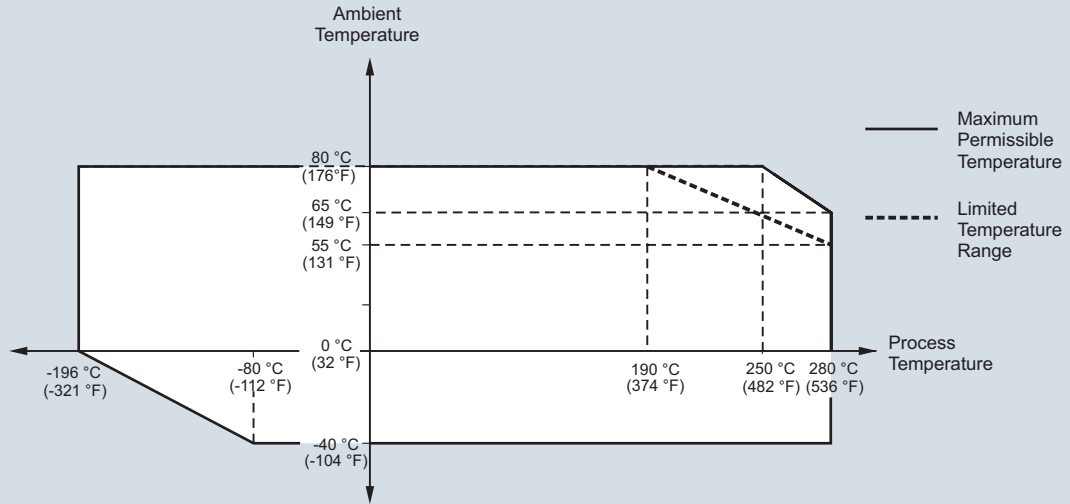


SITRANS LG260, Ambient temperature/process temperature, temperature adapter version
Cable version with \varnothing 6 mm (0.236 inch)
Cable version, PA coated with \varnothing 11 mm (0.433 inch)

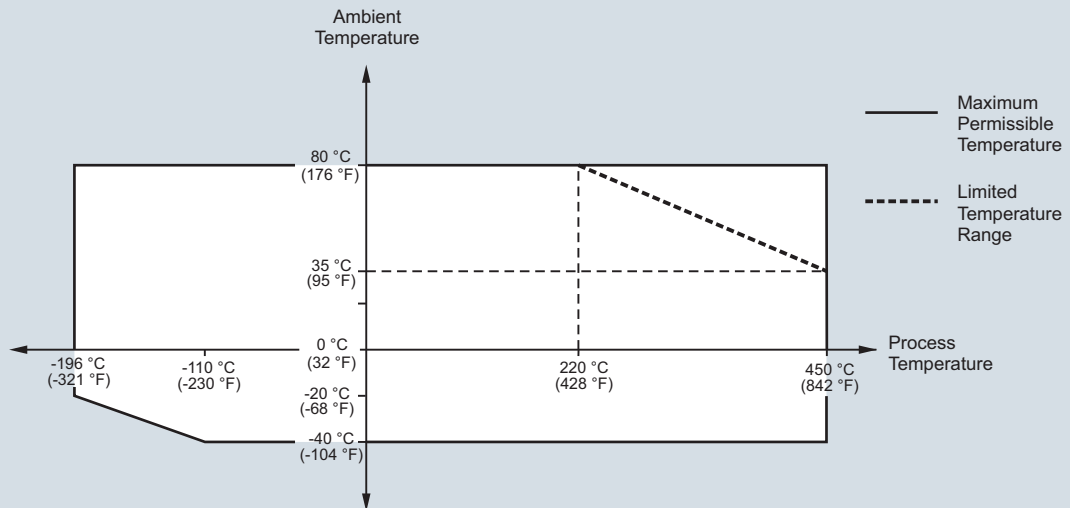


SITRANS LG260, Ambient temperature/process temperature curves

SITRANS LG270, Ambient temperature /process temperature (-196 ... +280 °C/-321 ... +536 °F version)



SITRANS LG270, Ambient temperature/process temperature (-196 ... +450 °C/-321 ... +842 °F version)



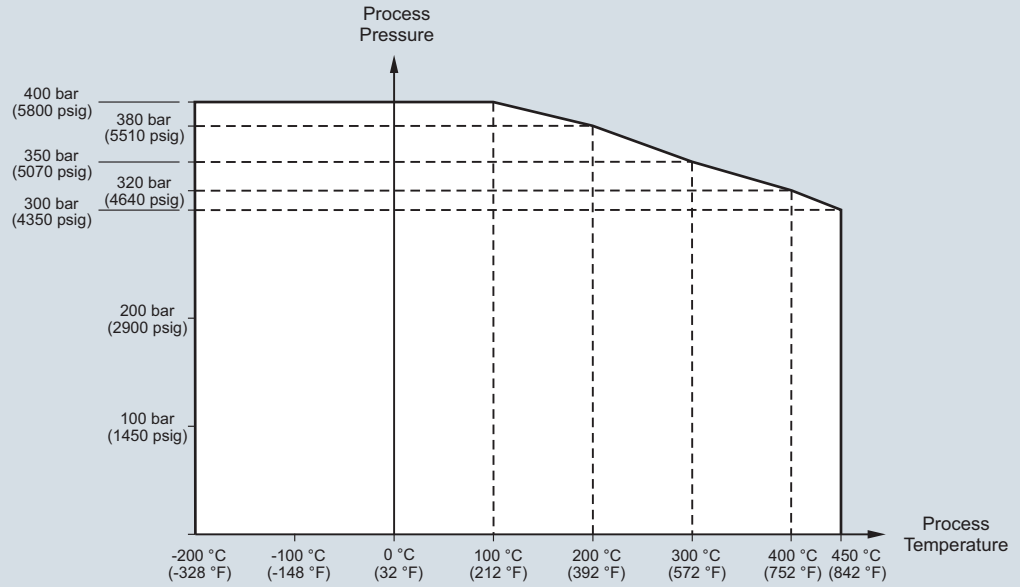
SITRANS LG270, Ambient temperature/process temperature curves

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

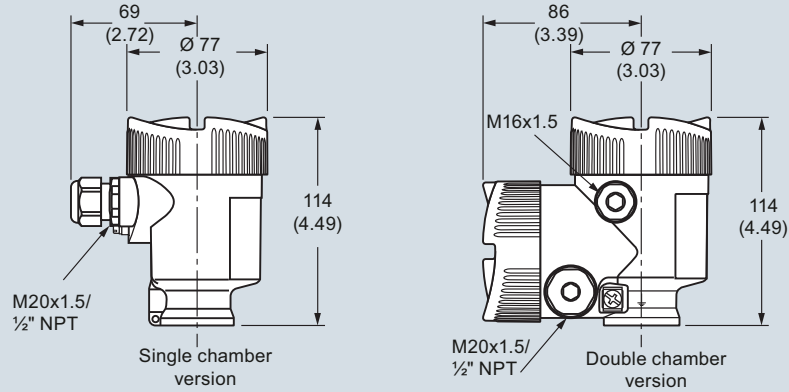
SITRANS LG270, Process pressure/process temperature (-196 ... +450 °C/-321 ... +842 °F version)



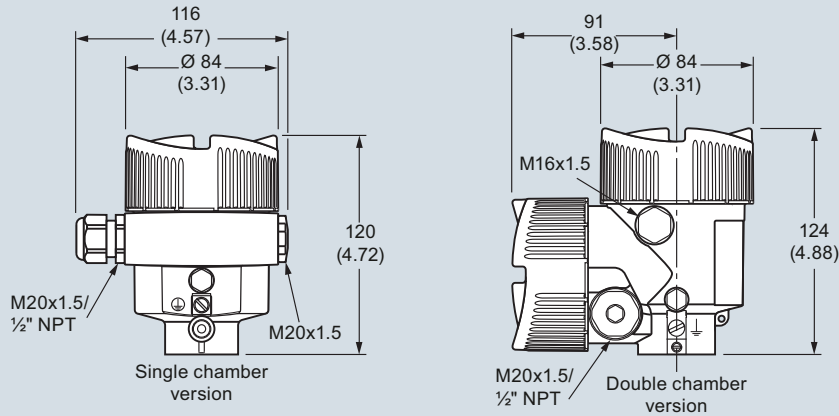
SITRANS LG270, Process pressure/process temperature curve

Dimensional drawings

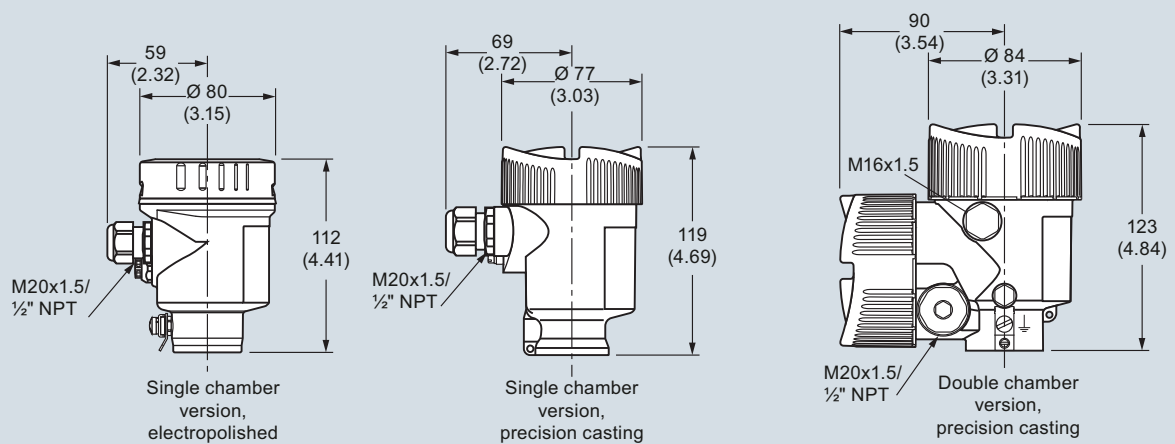
LG Series plastic housing



LG Series aluminum housing



LG Series stainless steel housing



Note: For integrated display and adjustment module the housing is 9 (0.35) higher for all housing options

SITRANS LG series, dimensions in mm (inch)

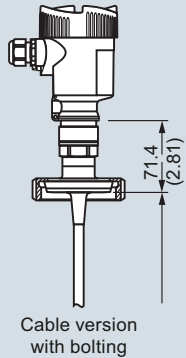
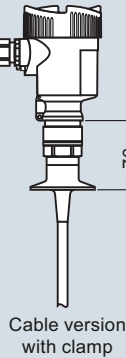
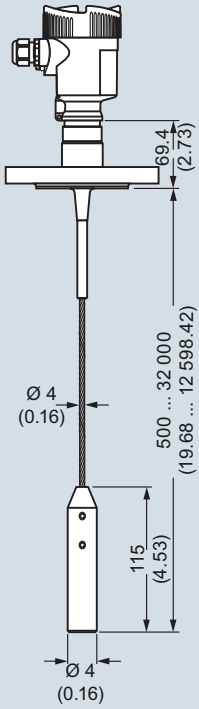
Level Measurement

Continuous level measurement - Guided wave radar transmitters

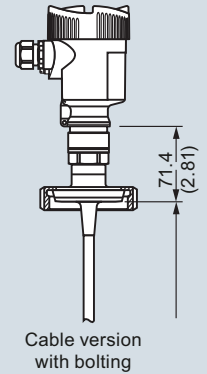
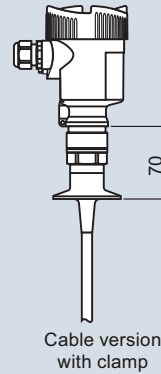
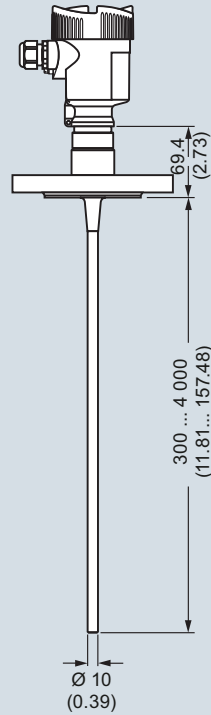
SITRANS LG series

SITRANS LG240

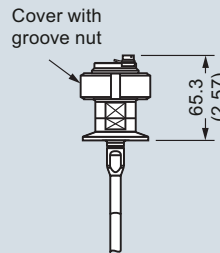
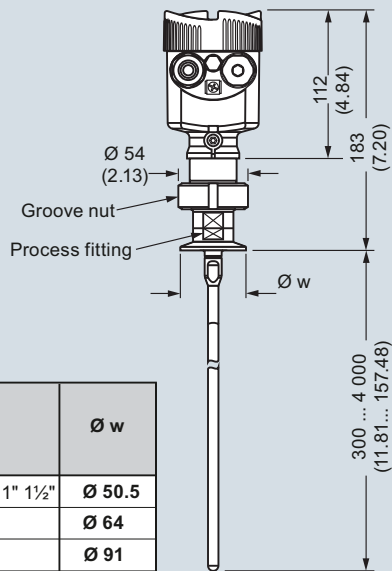
Cable version Ø 4 (0.157), PFA coated



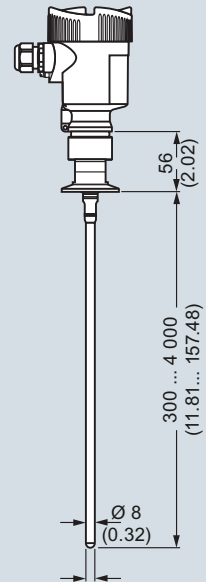
Rod version Ø 10 (0.394), PFA coated



Autoclaved version



Rod version Ø 8 (0.315), polished

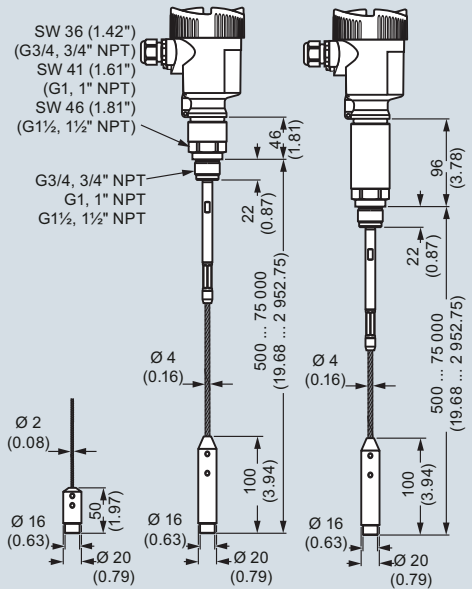


	Ø w
DIN DN 25 DN 32 DN 40/ 1" 1/2"	Ø 50.5
DIN DN 50/ 2"	Ø 64
DIN DN 65/ 3"	Ø 91

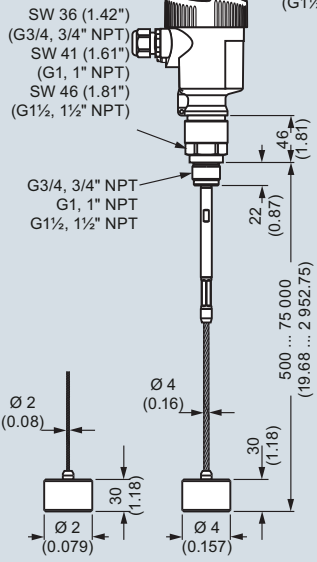
SITRANS LG240, dimensions in mm (inch)

SITRANS LG250

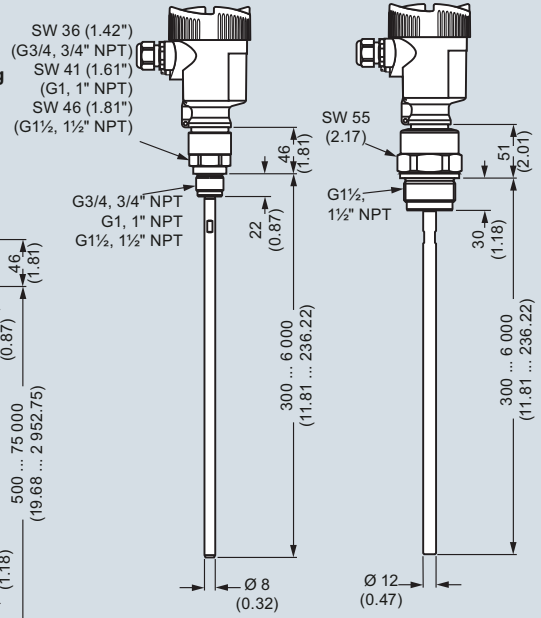
Cable version with gravity weight



Cable version with centering weight



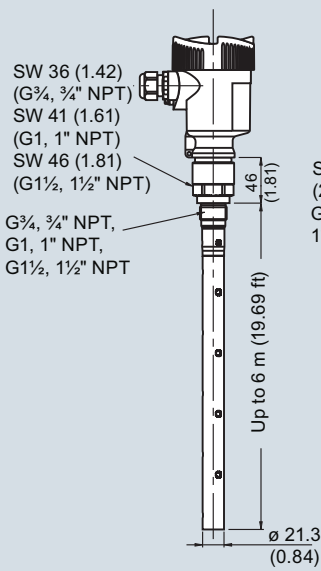
Rod version



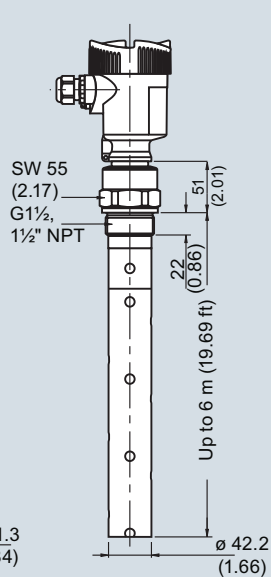
SITRANS LG250, dimensions in mm (inch)

SITRANS LG250, coax version

**Coaxial version
ø 21.3 (0.839)**



**Coaxial version
ø 42.2 (1.661)**



SITRANS LG250, dimensions in mm (inch)

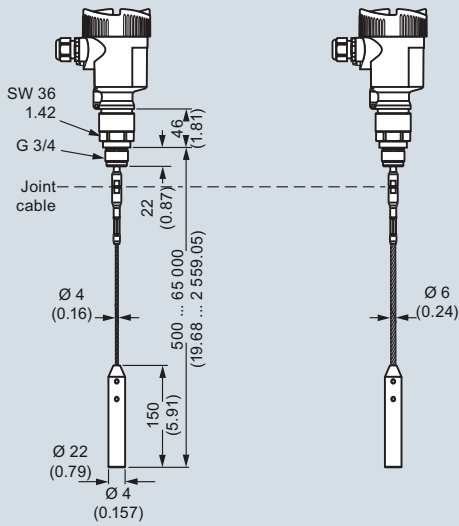
Level Measurement

Continuous level measurement - Guided wave radar transmitters

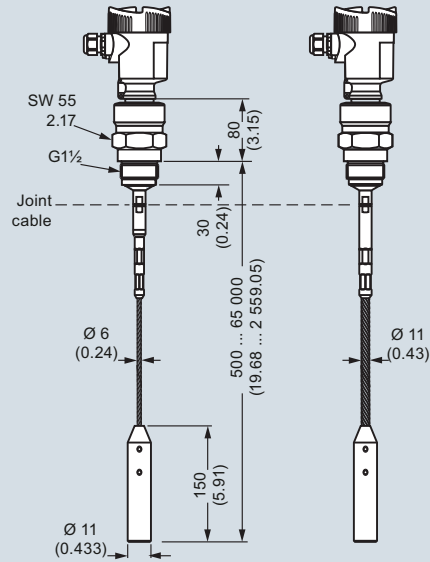
SITRANS LG series

SITRANS LG260

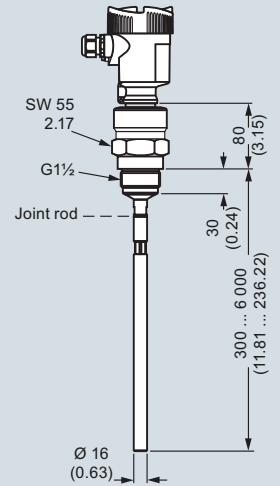
Cable version Ø 4 (0.157) / Ø 6 (0.236) - PA coated



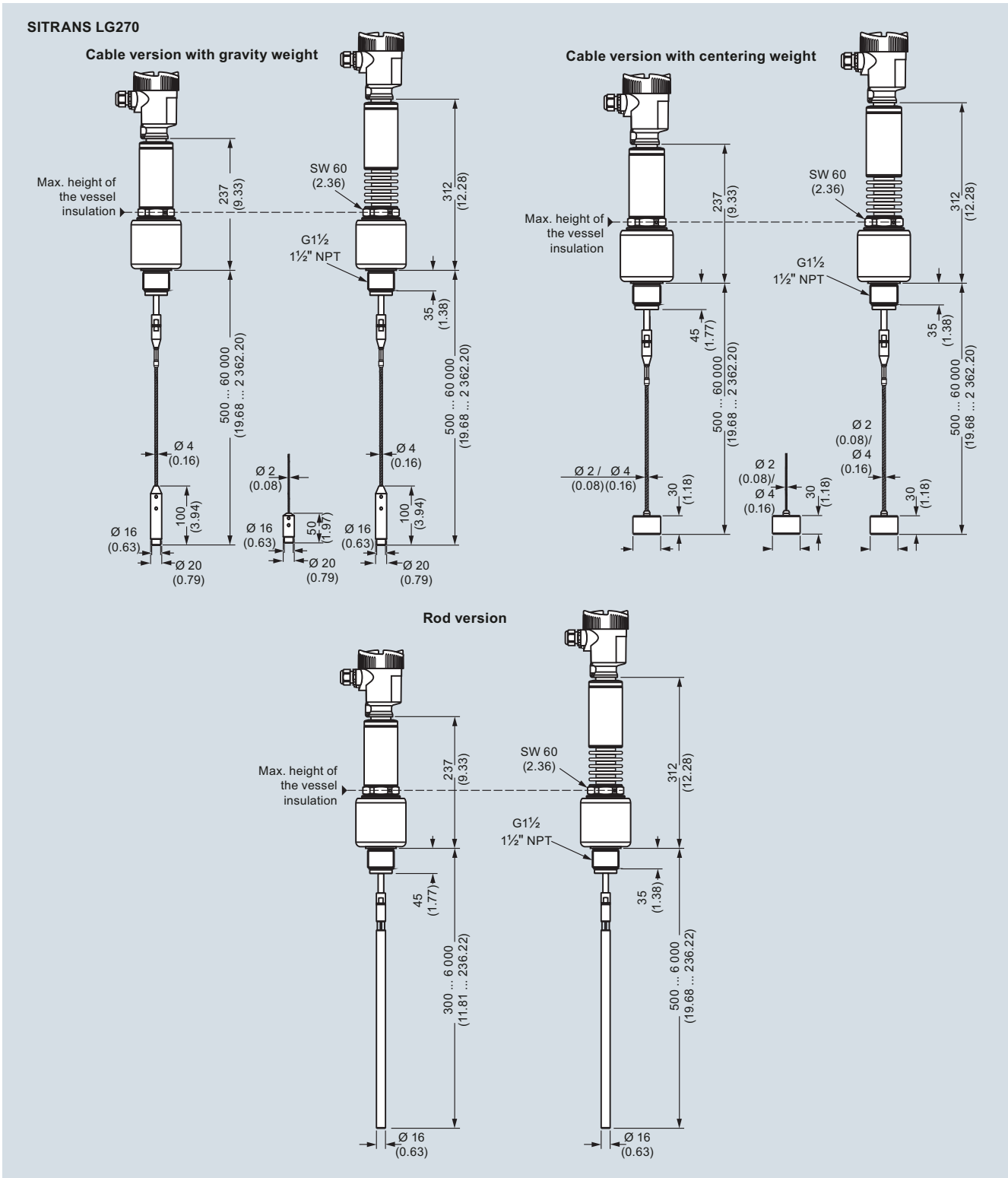
Cable version Ø 6 (0.236) / Ø 11 (0.433) - PA coated



Rod version Ø 16 (0.63)



SITRANS LG260, dimensions in mm (inch)



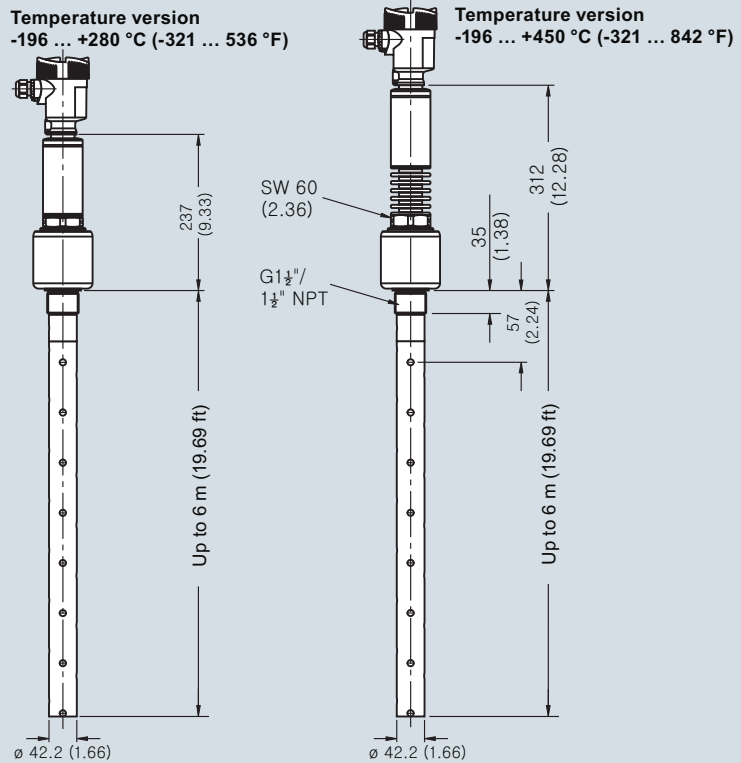
SITRANS LG270, dimensions in mm (inch)

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

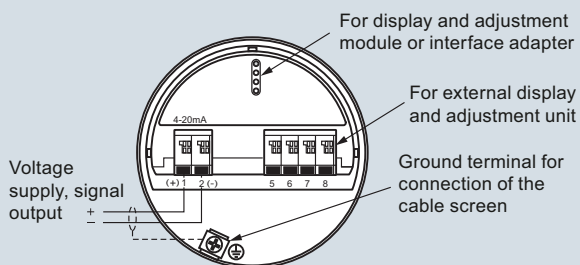
SITRANS LG270, coax version



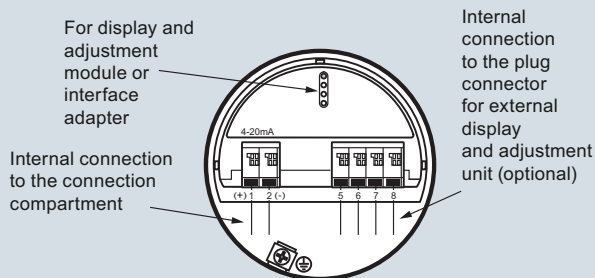
SITRANS LG270, dimensions in mm (inch)

Schematics

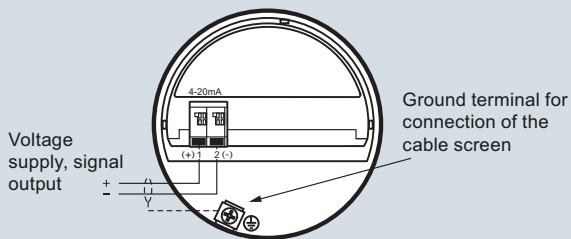
2-wire HART electronic option, electronics and connection compartment, single chamber housing



2-wire HART electronic option, electronics compartment, double chamber housing



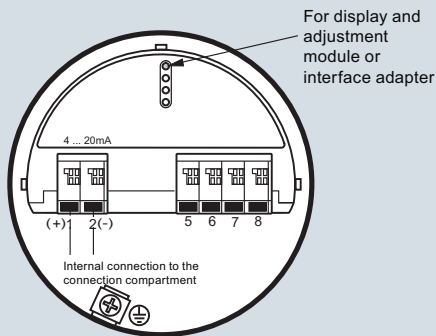
2-wire HART electronic option, connection compartment, Ex-d-ia double chamber housing



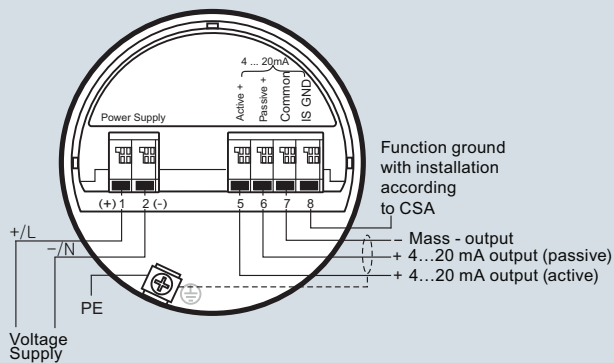
Note: All 2-wire HART connections and electronics are also available with SIL

SITRANS LG series, connections

4-wire HART electronic option, electronics compartment, double chamber housing



4-wire electronic option, connection compartment with double chamber housing with mains voltage



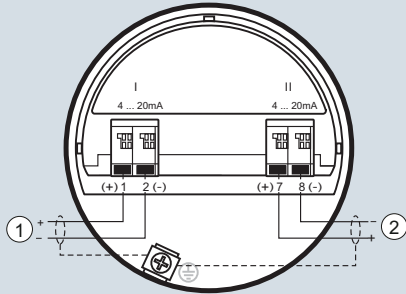
SITRANS LG series, connections

Level Measurement

Continuous level measurement - Guided wave radar transmitters

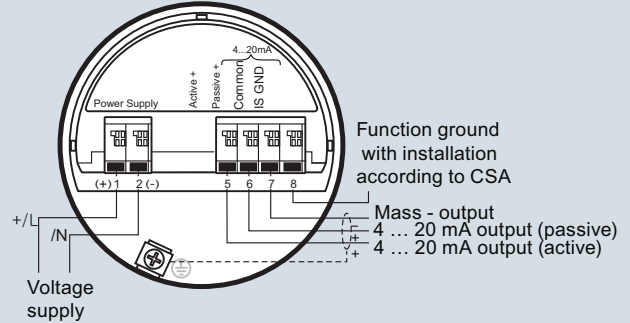
SITRANS LG series

Supplementary electronics



- ① First current output (I) - Voltage supply and signal output (HART)
- ② Second current output (II) - Voltage supply and signal output (without HART)

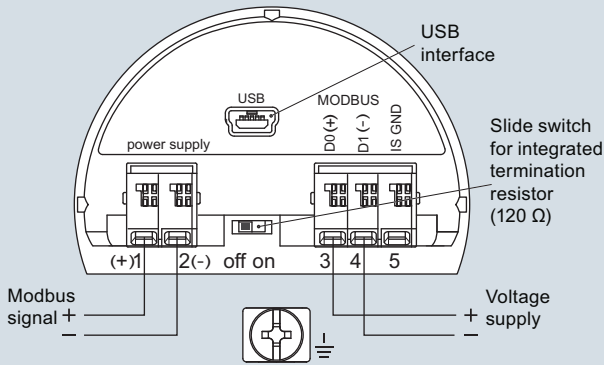
Connection compartment with low voltage



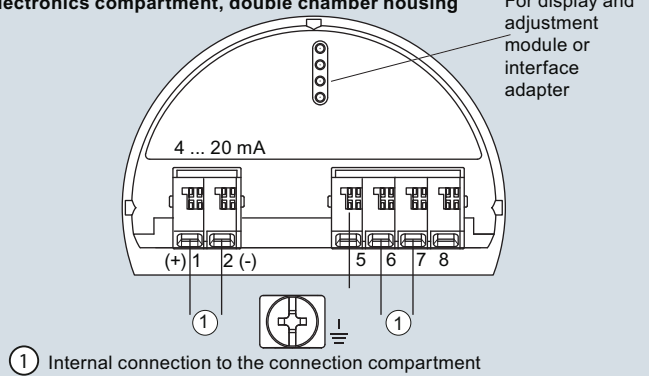
4

SITRANS LG series, connections

Modbus electronic option, connection compartment

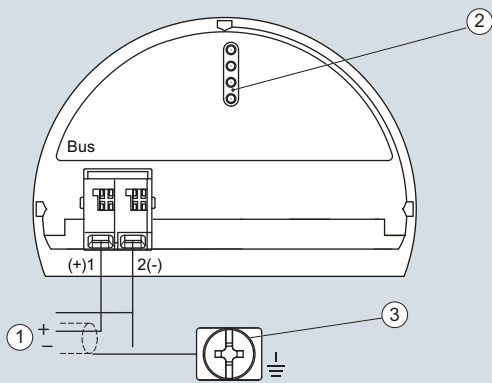


Modbus electronic option, electronics compartment, double chamber housing



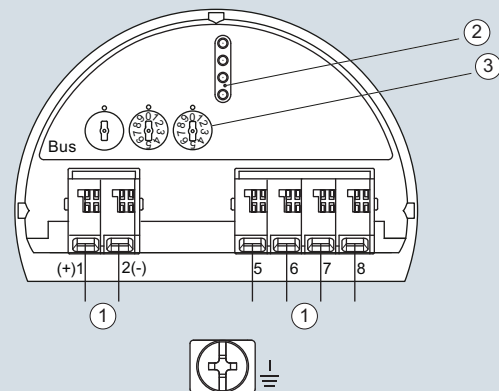
SITRANS LG series, connection

Profibus electronic option, connection compartment, double chamber housing



- ① Voltage supply, signal output
- ② For display and adjustment module or interface adapter
- ③ Ground terminal for connection of the cable screen

Profibus electronic option, electronics compartment, double chamber housing



- ① Internal connection to the connection compartment
- ② Contact pins for the display and adjustment module or interface adapter
- ③ Selection switch for bus address

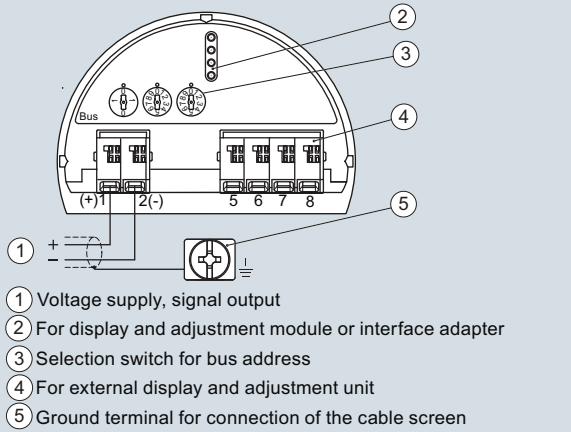
LG series, connection

Level Measurement

Continuous level measurement - Guided wave radar transmitters

SITRANS LG series

Profibus electronic option, electronics and connection compartment, single chamber housing



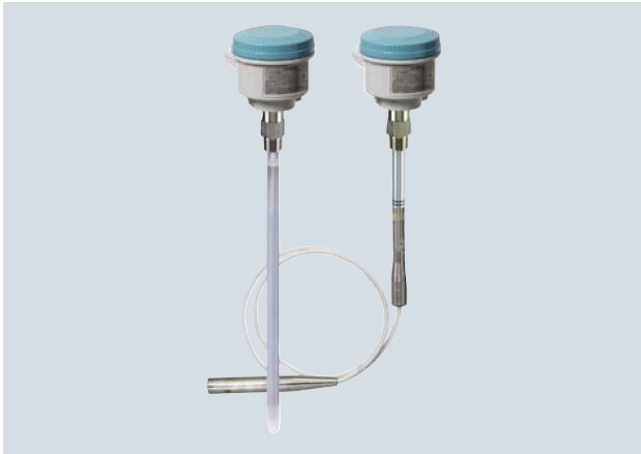
LG series, connection

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC300

Overview



SITRANS LC300 is an inverse frequency shift capacitance continuous level transmitter for liquids and solids applications. It is ideal for standard industrial applications in chemical, hydrocarbon processing, food and beverage, water, wastewater, and mining, aggregate, and cement industries.

Benefits

- Patented Active-Shield technology so measurement is unaffected by material buildup in active shield section
- Highly accurate and reliable PFA-lined probes
- Integrated local LCD display
- 2-wire (4 to 20 mA) current loop design
- Current signaling according to NAMUR NE 43
- Push-button calibration and programming
- Stilling well (ground tube) version for low dielectric media and non-metallic vessels

Application

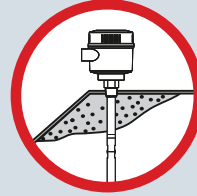
SITRANS LC300 is a 2-wire level measurement instrument combining a sophisticated, yet easy-to-adjust microprocessor with field-proven probes. It is available in four versions: rod, rod with stilling well, cable with PFA insulation, and cable without PFA insulation.

Materials with low or high dielectric properties are accurately measured and patented Active-Shield technology helps in ignoring the effects of buildup or condensation near vessel nozzle.

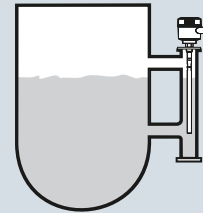
- Key Applications: Conductive and non-conductive media including: liquids and solids in standard industrial processes, bulk solids applications involving dust, and chemical processes involving vapor

Configuration

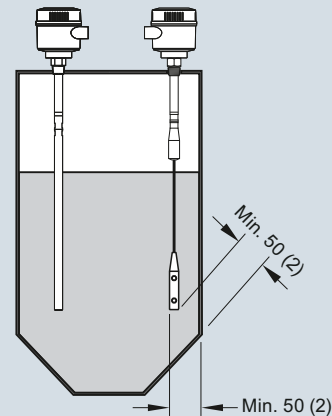
Installation



Build up of material in active shield area does not affect switch operation.



Mounting on a bypass area.



Install probe at least 50 (2) from tank wall.
Note angle of repose and adjust accordingly.

SITRANS LC300 installation, dimensions in mm (inch)

Technical specifications

Input	
Measuring range	1.66 ... 3 300 pF
Span	Min. 3.3 pF
Output	
Loop current	Continuous signal 4 ... 20 mA/ 20 ... 4 mA according to NAMUR 43
Accuracy (transmitter)	
Temperature stability	0.25 % of actual capacitance value
Non-linearity and repeatability	< 0.4 % of full scale and actual measurement value
Accuracy	Deviation < 0.5 % of actual measurement value
Rated operating conditions¹⁾	
Ambient conditions	
• Ambient temperature	-40 ... +85 °C (-40 ... +185 °F) ²⁾
• Installation category	I
• Pollution degree	4
• Ingress protection	Type 4/NEMA 4/IP65 (optional IP68)
Installation conditions	
• Location	Indoor/outdoor
Process pressure	-1 ... +35 bar g (-14.6 ... +511 psi g)
Process temperature	-40 ... +200 °C (-40 ... +392 °F) ³⁾
Min. dielectric constant ϵ_r	1.5
Design	
Material	
• Enclosure	Aluminum, epoxy-coated
Probe diameter	
• Rod version	19 mm (0.75 inch) with PFA jacket
• Cable version	9 mm (0.35 inch) with PFA jacket, 6 mm (0.24 inch) without PFA jacket
Active shield length	
• Rod version	Threaded: 120 mm (4.72 inch) Flanged: 100 mm (3.94 inch)
• Cable version	Threaded: 125 mm (4.92 inch) Flanged: 105 mm (4.13 inch)
Process connection of probe	
• Threaded rod mounting	$\frac{3}{4}$ ", 1", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ " NPT [(Taper), ANSI/ASME B1.20.1] R $\frac{3}{4}$ ", 1", 1 $\frac{1}{2}$ " [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G $\frac{3}{4}$ ", 1", 1 $\frac{1}{2}$ " [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
• Threaded cable mounting	1 $\frac{1}{2}$ " NPT [(Taper), ANSI/ASME B1.20.1] R 1 $\frac{1}{2}$ " [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G 1 $\frac{1}{2}$ " [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
• Flange mounting	1 ... 4" ASME, DN 25 ... 100
Enclosure cable inlet	2 x $\frac{1}{2}$ " NPT or 2 x M20x1.5
Power supply	12 ... 30 V DC any polarity, 2-wire current loop circuit
User Interface	
Display	Local LCD, 4 digit, each 0 ... 9 and limited alpha characters

Safety	
Measurement current signaling	According to NAMUR NE 43, signal 3.8 ... 20.5 mA, fault \leq 3.6 or \geq 21 mA (22 mA)
Certificates and approvals	
General	CE, CSA _{US/C} , FM, RCM
Dust Ignition Proof (Intrinsically Safe probe circuit)	FM/CSA: Class II, Div. 1, Groups E,F,G Class III T4 ATEX 1/2 D T100 °C
• Canada/USA	
• Europe	
Flame Proof (Intrinsically Safe probe circuit)	ATEX II 1/2 G EEx d [ia] IIC T6 ... T1 ATEX II 1/2 D T100 °C
• Europe	
Explosion Proof (Intrinsically Safe probe circuit)	Class I, Div. 1, Groups A,B,C,D Class II, Div. 1, Groups E,F,G Class III T4
• Canada/USA	
Marine	Bureau Veritas Type Approval ABS Type Approval
Overfill Protection	AIB-Vincotte
Other	Pattern Approval (China)

¹⁾ When operation is in areas classified as hazardous, observe restrictions according to relevant certificate.
See also Pressure/Temperature curves on page 4/331.

²⁾ Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F)

³⁾ Not suitable for steam environments

Design: Probe	Rod version	Stilling well version	Cable version
Length	Min. 300 mm (12 inch), max. 5 000 mm (197 inch)	Min. 300 mm (12 inch), max. 5 000 mm (197 inch)	Min. 1 000 mm (40 inch), max. 25 000 mm (984 inch)
Sensor wetted parts	PFA, 316L stainless steel	PFA, 316L stainless steel	316L stainless steel or 316L stainless steel with PFA insulation
O-ring seal material	FKM or FFKM	FKM or FFKM	FKM or FFKM
Thermal isolator	Optional	Optional	Optional
Options	N/A	N/A	Mounting eye for PFA insulated cable version

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC300

Selection and Ordering data	Article No.
SITRANS LC300, rod version	7ML5670-
An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications.	0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection	
Threaded, 316L stainless steel	
¾" NPT [(Taper), ANSI/ASME B1.20.1]	0 A
1" NPT [(Taper), ANSI/ASME B1.20.1]	0 B
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	0 C
1½" NPT [(Taper), ANSI/ASME B1.20.1]	0 D
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 A
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 B
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 A
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 B
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
<u>Welded flange, 316L stainless steel, raised face¹⁾</u>	
1" ASME, 150 lb	5 A
1" ASME, 300 lb	5 B
1" ASME, 600 lb	5 C
1½" ASME, 150 lb	5 D
1½" ASME, 300 lb	5 E
1½" ASME, 600 lb	5 F
2" ASME, 150 lb	5 G
2" ASME, 300 lb	5 H
2" ASME, 600 lb	5 J
3" ASME, 150 lb	5 K
3" ASME, 300 lb	5 L
3" ASME, 600 lb	5 M
4" ASME, 150 lb	5 N
4" ASME, 300 lb	5 P
4" ASME, 600 lb	5 Q
<u>Welded flange, 316L stainless steel, Type A flat faced¹⁾</u>	
DN 25, PN 16	6 A
DN 25, PN 40	6 B
DN 40, PN 16	6 C
DN 40, PN 40	6 D
DN 50, PN 16	6 E
DN 50, PN 40	6 F
DN 80, PN 16	6 G
DN 80, PN 40	6 H
DN 100, PN 16	6 J
DN 100, PN 40	6 K
Probe Length (from flange face or including process thread)	
Add Order code Y01 and plain text: "Insertion length ... mm"	
300 ... 1 000 mm (11.81 ... 39.37 inch)	A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)	B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)	C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)	D
4 001 ... 5 000 mm (157.52 ... 196.85 inch)	E
Thermal isolator	
Without thermal isolator	0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	1

Selection and Ordering data	Article No.
SITRANS LC300, rod version	7ML5670-
An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications.	0
Wetted seals	
FKM	0
FFKM [for process temperatures above -20 °C (-4 °F)]	1
Probe material	
19 mm (0.75 inch) diameter 316L stainless steel, PFA lined rod	0
Approvals	
General Safety (CSA, FM, CE, RCM)	
Dust Ignition Proof With IS Probe	A
CE, RCM, ATEX II 1/2 D T100 °C	B
Flame Proof Enclosure With IS Probe	C
CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6...T1, ATEX II 1/2 D T100 °C	
Dust Ignition Proof With IS Probe	D
CSA/FM Class II, Div. 1, Groups E, F, G	
CSA/FM Class III T4	
Explosion Proof Enclosure With IS Probe	E
CSA/FM Class I, Div. 1, Groups A, B, C, D	
CSA/FM Class II, Div. 1, Groups E, F, G	
CSA/FM Class III T4	
Enclosure	
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65	A
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65	B
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68	C
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68	D
¹⁾ Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.	

Selection and Ordering data	Order code
Further designs	
Please add *-Z to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	
English	7ML1998-5HE03
French	7ML1998-5HE11
German	7ML1998-5HE33
Spanish	7ML1998-5HE21
Multi-language Quick Start manual Note: The Operating Instructions should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	A5E32268590
Accessories	
Electronic transmitter kit (includes transmitter and driver)	7ML1830-1KN
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC300

Selection and Ordering data	Article No.
SITRANS LC300, stilling well version	7ML5671-
An inverse frequency shift capacitance continuous level transmitter for liquid applications.	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Process connection	
Threaded, 316L stainless steel	
1½" NPT [(Taper), ANSI/ASME B1.20.1]	0 D
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	1 D
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	3 D
<u>Welded flange, 316L stainless steel, raised face¹⁾</u>	
1½" ASME, 150 lb	5 D
1½" ASME, 300 lb	5 E
1½" ASME, 600 lb	5 F
2" ASME, 150 lb	5 G
2" ASME, 300 lb	5 H
2" ASME, 600 lb	5 J
3" ASME, 150 lb	5 K
3" ASME, 300 lb	5 L
3" ASME, 600 lb	5 M
4" ASME, 150 lb	5 N
4" ASME, 300 lb	5 P
4" ASME, 600 lb	5 Q
<u>Welded flange, 316L stainless steel, Type A flat faced¹⁾</u>	
DN 40, PN 16	6 C
DN 40, PN 40	6 D
DN 50, PN 16	6 E
DN 50, PN 40	6 F
DN 80, PN 16	6 G
DN 80, PN 40	6 H
DN 100, PN 16	6 J
DN 100, PN 40	6 K
Probe Length (from flange face or including process thread)	
Add Order code Y01 and plain text: "Insertion length ... mm"	
300 ... 1 000 mm (11.81 ... 39.37 inch)	A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)	B
2 001 ... 3 000 mm (78.78 ... 118.11 inch)	C
3 001 ... 4 000 mm (118.15 ... 157.48 inch)	D
4 001 ... 5 000 mm (157.52 ... 196.85 inch)	E
Thermal isolator	
Without thermal isolator	0
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	1
Wetted seals	
FKM	0
FFKM [for process temperatures above -20 °C (-4 °F)]	1
Probe material	
35 mm (1.38 inch) diameter stilling well, with 19 mm (0.75 inch) diameter 316L stainless steel, PFA lined rod with PTFE spacers	1
Approvals	
General Safety (CSA, FM, CE, RCM)	A
Dust Ignition Proof With IS Probe CE, RCM, ATEX II 1/2 D T100 °C	B
Flame Proof Enclosure With IS Probe CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C	C

Selection and Ordering data	Article No.
SITRANS LC300, stilling well version	7ML5671-
An inverse frequency shift capacitance continuous level transmitter for liquid applications.	
Dust Ignition Proof With IS Probe CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	D
Explosion Proof Enclosure With IS Probe CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4	E
Enclosure	
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65	A
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65	B
Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68	C
Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68	D

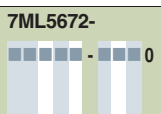
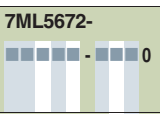
¹⁾ Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	Article No.
English	7ML1998-5HE03
French	7ML1998-5HE11
German	7ML1998-5HE33
Spanish	7ML1998-5HE21
Multi-language Quick Start manual	7ML1998-5QH81
Note: The Operating Instructions should be ordered as a separate line item on the order.	
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
Accessories	
Electronic transmitter kit (includes transmitter and driver)	7ML1830-1KN
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC300



Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LC300, cable version An inverse frequency shift capacitance continuous level transmitter for non-conductive liquids and solids applications. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5672- 	SITRANS LC300, cable version An inverse frequency shift capacitance continuous level transmitter for non-conductive liquids and solids applications.	7ML5672- 
Process connection Threaded, 316L stainless steel 1½" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] <u>Welded flange, 316L stainless steel, raised face¹⁾</u> 1½" ASME, 150 lb 1½" ASME, 300 lb 1½" ASME, 600 lb 2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb 3" ASME, 150 lb 3" ASME, 300 lb 3" ASME, 600 lb 4" ASME, 150 lb 4" ASME, 300 lb 4" ASME, 600 lb <u>Welded flange, 316L stainless steel, Type A flat faced¹⁾</u> DN 40, PN 16 DN 40, PN 40 DN 50, PN 16 DN 50, PN 40 DN 80, PN 16 DN 80, PN 40 DN 100, PN 16 DN 100, PN 40	0 D 1 D 3 D 5 D 5 E 5 F 5 G 5 H 5 J 5 K 5 L 5 M 5 N 5 P 5 Q 6 C 6 D 6 E 6 F 6 G 6 H 6 J 6 K	Approvals General Safety (CSA, FM, CE, RCM) Dust Ignition Proof With IS Probe CE, RCM, ATEX II 1/2 D T100 °C Flame Proof Enclosure With IS Probe CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6...T1, ATEX II 1/2 D T100 °C Dust Ignition Proof With IS Probe CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 Explosion Proof Enclosure With IS Probe CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 Enclosure Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65 Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65 Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68 Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68	0 A B C D E A B C D
Probe Length (from flange face or including process thread) Add Order code Y01 and plain text: <u>"Insertion length ... mm"</u> 1 000 ... 2 000 mm (39.37 ... 78.74 inch) 2 001 ... 4 000 mm (78.78 ... 157.48 inch) 4 001 ... 6 000 mm (157.52 ... 236.22 inch) 6 001 ... 8 000 mm (236.26 ... 314.96 inch) 8 001 ... 10 000 mm (315.00 ... 393.70 inch) 10 001 ... 12 000 mm (393.74 ... 472.44 inch) 12 001 ... 14 000 mm (472.48 ... 551.18 inch) 14 001 ... 16 000 mm (551.22 ... 629.92 inch) ²⁾ 16 001 ... 18 000 mm (629.96 ... 708.66 inch) ²⁾ 18 001 ... 20 000 mm (708.70 ... 787.40 inch) ²⁾ 20 001 ... 22 000 mm (787.44 ... 866.14 inch) ²⁾ 22 001 ... 24 000 mm (866.18 ... 944.88 inch) ²⁾ 24 001 ... 25 000 mm (944.92 ... 984.25 inch) ²⁾	A B C D E F G H J K L M N	¹⁾ Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard. ²⁾ Cable lengths from 15 000 mm (590.55 inch) to 25 000 mm (984.25 inch) can be used in non-conductive media. Contact Factory for assistance.	
Thermal isolator Without thermal isolator With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	0 1		
Wetted seals FKM FFKM [for process temperatures above -20 °C (-4 °F)]	0 1		
Probe material Bare 316L stainless steel cable and 316L stainless steel cable weight, tinned copper crimp, PTFE backing ring, PEEK isolator and PFA lined active shield	0		

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC300

Selection and Ordering data	Order code
Further designs	
Please add *-Z to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	
English	7ML1998-5HE03
French	7ML1998-5HE11
German	7ML1998-5HE33
Spanish	7ML1998-5HE21
Multi-language Quick Start manual Note: The Operating Instructions should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	7ML1998-5QH81
Accessories	
Electronic transmitter kit (includes transmitter and driver)	7ML1830-1KN
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
SITRANS LC300, PFA coated cable version  7ML5673- An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		SITRANS LC300, PFA coated cable version  7ML5673- An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications.	
Process connection Threaded, 316L stainless steel 1½" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] <u>Welded flange, 316L stainless steel, raised face¹⁾</u> 1½" ASME, 150 lb 1½" ASME, 300 lb 1½" ASME, 600 lb 2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb 3" ASME, 150 lb 3" ASME, 300 lb 3" ASME, 600 lb 4" ASME, 150 lb 4" ASME, 300 lb 4" ASME, 600 lb <u>Welded flange, 316L stainless steel, Type A flat faced¹⁾</u> DN 40, PN 16 DN 40, PN 40 DN 50, PN 16 DN 50, PN 40 DN 80, PN 16 DN 80, PN 40 DN 100, PN 16 DN 100, PN 40	0 D 1 D 3 D 5 D 5 E 5 F 5 G 5 H 5 J 5 K 5 L 5 M 5 N 5 P 5 Q 6 C 6 D 6 E 6 F 6 G 6 H 6 J 6 K	Probe material PFA coated cable and 316L stainless steel cable weight, PEEK isolator and PFA lined active shield Approvals General Safety (CSA, FM, CE, RCM) Dust Ignition Proof With IS Probe CE, RCM, ATEX II 1/2 D T100 °C Flame Proof Enclosure With IS Probe CE, RCM, ATEX II 1/2 G EEx d [ia] IIC T6...T1, ATEX II 1/2 D T100 °C Dust Ignition Proof With IS Probe CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 Explosion Proof Enclosure With IS Probe CSA/FM Class I, Div. 1, Groups A, B, C, D CSA/FM Class II, Div. 1, Groups E, F, G CSA/FM Class III T4 Enclosure Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP65 Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP65 Aluminum epoxy coated 2 x ½" NPT via adapter - cable inlet, IP68 Aluminum epoxy coated 2 x M20 x 1.5 cable inlet, IP68 Mounting eye Without Mounting eye With mounting eye	1 A B C D E A B C D 0 1
Probe Length (from flange face or including process thread) Add Order code Y01 and plain text: "Insertion length ... mm" 1 000 ... 2 000 mm (39.37 ... 78.74 inch) 2 001 ... 4 000 mm (78.78 ... 157.48 inch) 4 001 ... 6 000 mm (157.52 ... 236.22 inch) 6 001 ... 8 000 mm (236.26 ... 314.96 inch) 8 001 ... 10 000 mm (315.00 ... 393.70 inch) 10 001 ... 12 000 mm (393.74 ... 472.44 inch) 12 001 ... 14 000 mm (472.48 ... 551.18 inch) 14 001 ... 16 000 mm (551.22 ... 629.92 inch) ²⁾ 16 001 ... 18 000 mm (629.96 ... 708.66 inch) ²⁾ 18 001 ... 20 000 mm (708.70 ... 787.40 inch) ²⁾ 20 001 ... 22 000 mm (787.44 ... 866.14 inch) ²⁾ 22 001 ... 24 000 mm (866.18 ... 944.88 inch) ²⁾ 24 001 ... 25 000 mm (944.92 ... 984.25 inch) ²⁾	A B C D E F G H J K L M N		
Thermal isolator Without thermal isolator With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	0 1		
Wetted seals FKM FFKM [for process temperatures above -20 °C (-4 °F)]	0 1		

¹⁾ Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.
²⁾ Cable lengths from 15 000 mm (590.55 inch) to 25 000 mm (984.25 inch) can be used in non-conductive media. Contact Factory for assistance.

Level Measurement

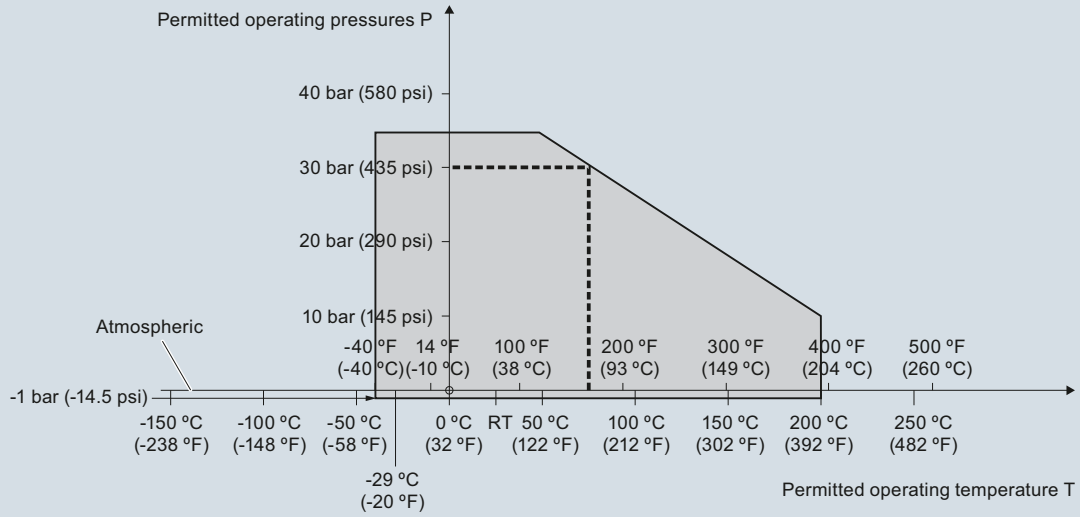
Continuous level measurement – Capacitance transmitters

SITRANS LC300

Selection and Ordering data	Order code
Further designs	
Please add *-Z to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's Test Certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	
English	7ML1998-5HE03
French	7ML1998-5HE11
German	7ML1998-5HE33
Spanish	7ML1998-5HE21
Multi-language Quick Start manual	7ML1998-5QH81
Note: The Operating Instructions should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
Accessories	
Electronic transmitter kit (includes transmitter and driver)	7ML1830-1KN
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
For applicable back up point level switch - see point level measurement section	

Characteristic curves

Pressure/temperature curve
LC300 standard, extended rod and cable probes
Threaded process connections
(7ML5670, 7ML5671, 7ML5672 and 7ML5673)



----- Example:
 ermitted operating pressure = 30 bar (435 psi) at 75 °C

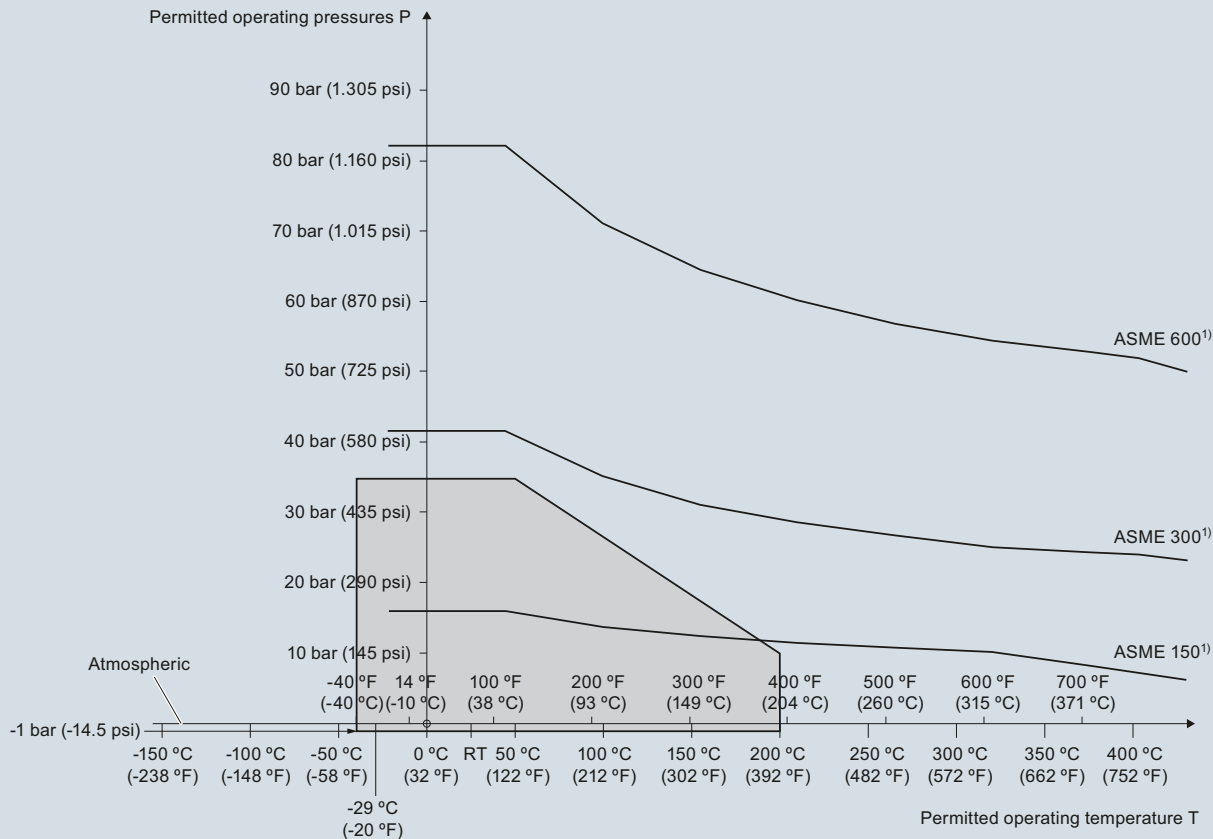
SITRANS LC300 Process Pressure/Temperature derating curves (7ML5625)

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC300

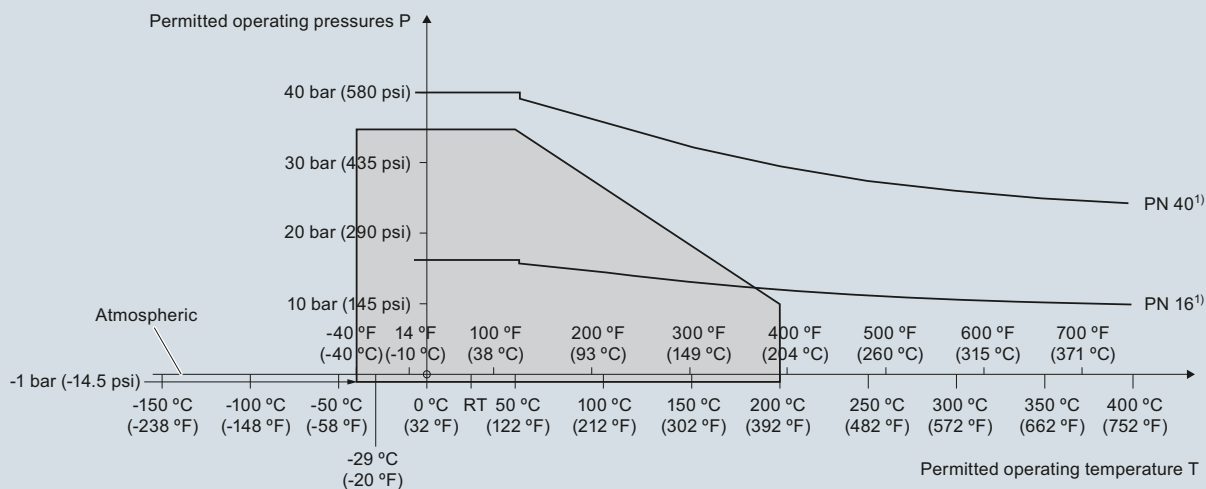
Pressure/temperature curve
LC300 standard, extended rod and cable probes
ASME flanged process connections
(7ML5670, 7ML5671, 7ML5672 and 7ML5673)



1) The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC300 Process Pressure/Temperature derating curves (7ML5626)

Pressure/temperature curve
LC300 standard, extended rod and cable probes
EN flanged process connections
(7ML5670, 7ML5671, 7ML5672 and 7ML5673)

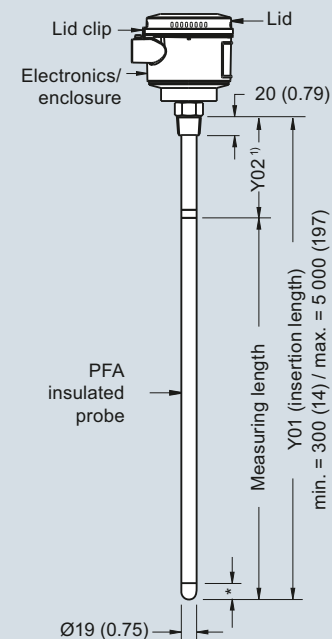


1) The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC300 Process Pressure/Temperature derating curves (7ML5626)

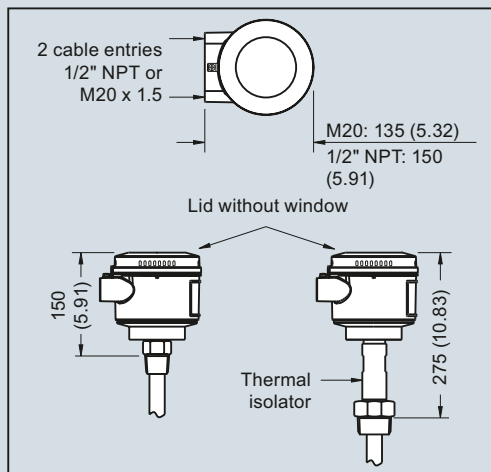
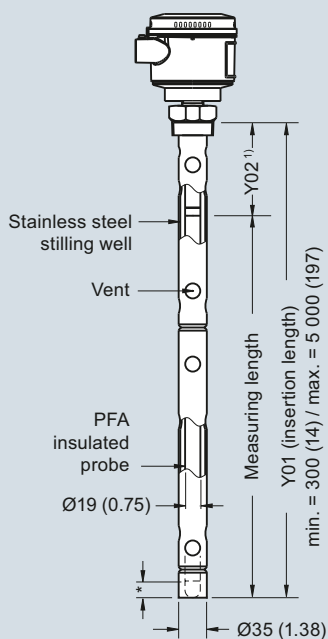
Dimensional drawings

Threaded (7ML5670)



* = 30 (1.18) Inactive tip

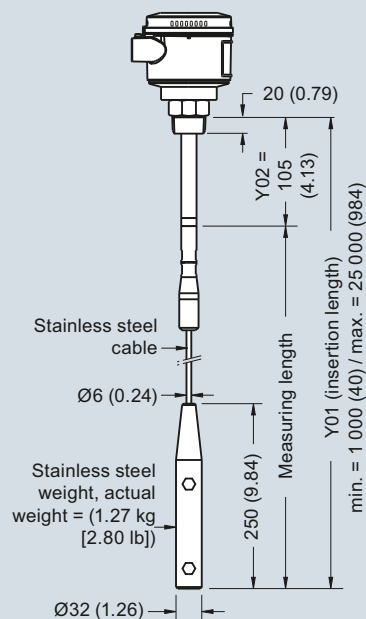
Threaded (7ML5671)



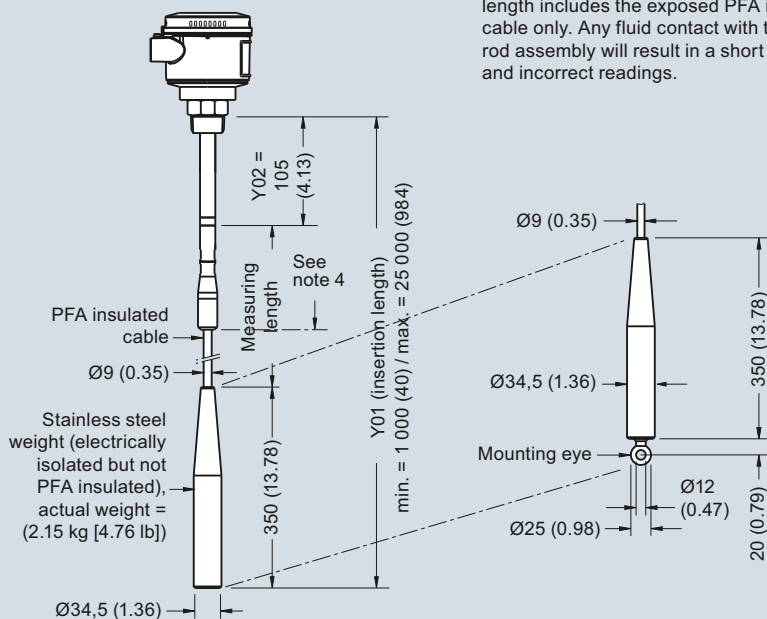
Note:

- 1) Rod version Y02: Shield length = 100 mm (3.9 inch) for threaded including process connection thread length, 100 mm (3.9 inch) for welded flange
- 2) For non-conductive applications only. Non-insulated cable can be shortened on site. Weight is included in measuring length.
- 3) For liquids and solids applications. Insulated cable cannot be shortened. Weight is **not** included in measuring length.
- 4) For conductive materials, the measuring length includes the exposed PFA insulated cable only. Any fluid contact with the upper rod assembly will result in a short circuit and incorrect readings.

Cable version, non-insulated²⁾
Threaded (7ML5672)



Cable version, insulated³⁾
Threaded (7ML5673)



SITRANS LC300 - Threaded Process Connections, dimensions in mm (inch)

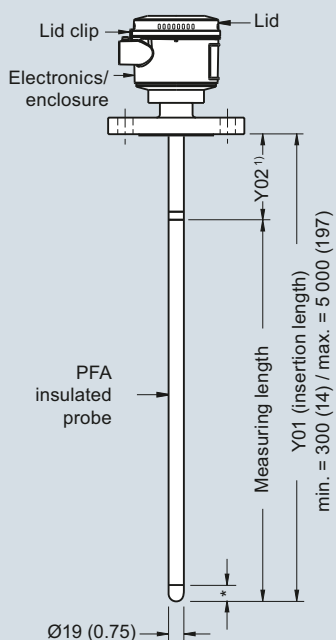
Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC300

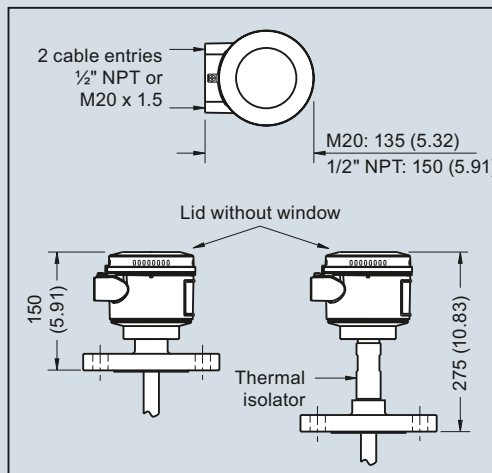
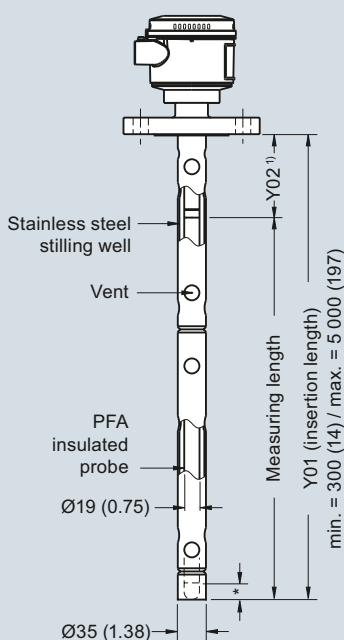
4

Welded Flange (7ML5670)



* = 30 (1.18) inactive tip

Welded Flange (7ML5671)

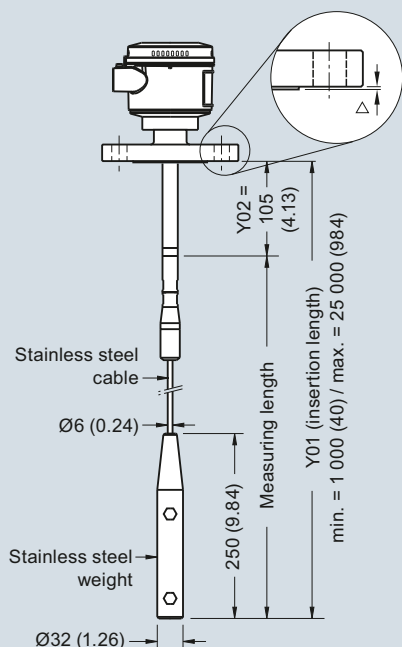


Flange Facing (raised face)	
Flange Class	Facing thickness
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/40	2 (0.08)

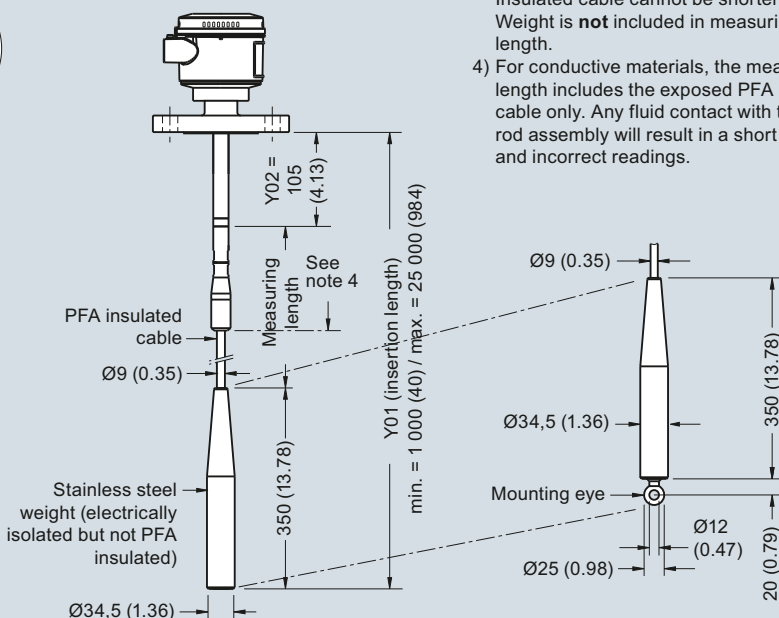
Notes:

- 1) Rod version Y02: Shield length = 100 mm (3.9 inch) for threaded including process connection thread length, 100 mm (3.9 inch) for welded flange.
- 2) For non-conductive applications only. Non-insulated cable can be shortened on site. Weight is included in measuring length.
- 3) For liquids and solids applications. Insulated cable cannot be shortened. Weight is **not** included in measuring length.
- 4) For conductive materials, the measuring length includes the exposed PFA insulated cable only. Any fluid contact with the upper rod assembly will result in a short circuit and incorrect readings.

Cable version, non-insulated²⁾ Welded Flange (7ML5672)

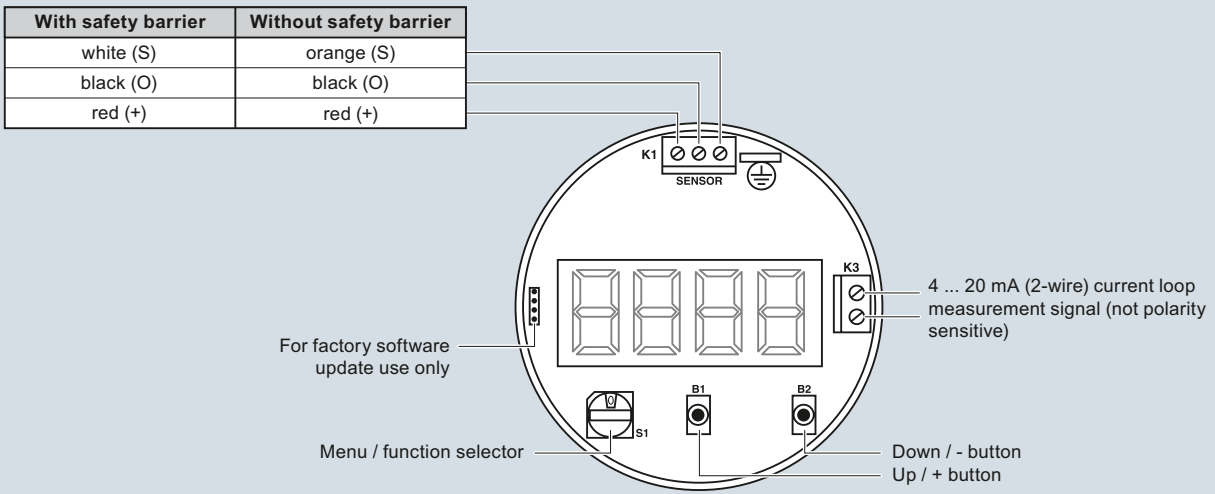


Cable version, insulated³⁾ Welded Flange (7ML5673)



SITRANS LC300 - Flanged Process Connections, dimensions in mm (inch)

Schematics



SITRANS LC300 connections

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

Overview



SITRANS LC500 is an inverse frequency shift capacitance level or interface transmitter for extreme and critical process conditions, such as oil and liquified natural gas (LNG) as well as toxic and aggressive chemicals and vapors.

Benefits

- Patented Active-Shield technology so measurement is unaffected by material buildup in active shield section
- Simple push-button calibration and integrated local display
- Inverse frequency approach provides high resolution
- 2-wire loop powered 4 to 20/20 to 4 mA measurement signal
- Pre-detection alarm and full function diagnostics
- High temperature and pressure resistant (optional)
- Full-function diagnostics comply with NAMUR NE 43
- Easy calibration locally or via HART (using SIMATIC PDM software)

Application

SITRANS LC500's advanced electronics provide one-step, push-button calibration and local display for easy on-site installation and setup.

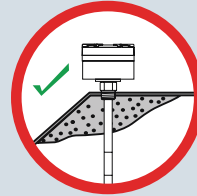
The unique mechanical probe design coupled with a high performance transmitter gives superior performance in toxic and aggressive chemicals, acids, caustics, adhesives and in viscous conductive and non-conductive materials.

The SMART 2-wire transmitter has HART communications for remote commissioning and inspection.

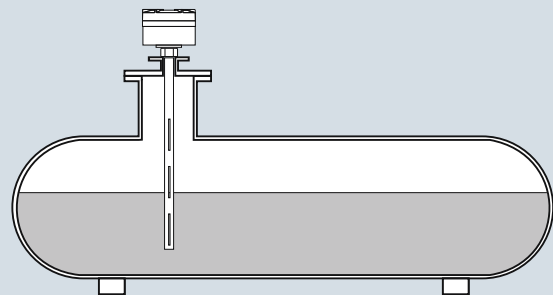
- Key Applications: Oil/water or foam/liquid interface measurement in separators or coalescers, cryogenic applications including CO₂ and liquified natural gas (LNG), distillation/regeneration tanks with high temperatures

Configuration

Installation



Build up of material or condensation in active shield area does not affect switch operation.



Mounting on non-linear vessels in non-conductive fluids using stilling well.

SITRANS LC500 installation, dimensions in mm (inch)

Technical specifications

Input	
Measuring range	1 ... 3 300 pF
Span	Min. 3.3 pF
Output	
Solid-state switch	
• Output	Galvanically isolated
• Protection	Bipolar
• Max. switching voltage	<ul style="list-style-type: none"> • 30 V (DC) • 30 V peak (AC)
• Max. load current	82 mA
• Voltage drop	< 1 V, typical at 50 mA
• Time delay (pre or post switching)	1 ... 60 s
Loop current	3.6 ... 22 mA/22 ... 3.6 mA (2-wire current loop)
Accuracy (transmitter)	
Temperature stability	0.15 pF (0 pF) or < 0.25 % (typically < 0.1 %) of actual measured value, whichever is greater over the full temperature range
Non-linearity and repeatability	< 0.1 % of range and actual measured value respectively
Accuracy	Deviation < 0.1 % of measured value

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

Rated operating conditions¹⁾		Power supply	12 ... 33 V DC
Installation conditions		User Interface	
• Location	Indoor/outdoor	Display	Local LCD, 4 digit, each 0 ... 9 and limited alpha characters
Ambient conditions		Rotary function switch	For selecting programmable menu items
• Ambient temperature (transmitter)	-40 ... +85 °C (-40 ... +185 °F) ²⁾	Push buttons	Red +, blue -, used in conjunction with rotary switch for programming
• Installation category	II		
• Pollution degree	4	Features	
Medium conditions		Measurement current signaling	According to NAMUR NE 43, signal 3.8 ... 20.5 mA, fault ≤ 3.6 or ≥ 21 mA (22 mA)
• Relative dielectric constant ϵ_r	Min. 1.5	Safety	<ul style="list-style-type: none"> • Inputs/outputs fully galvanically isolated • Polarity-insensitive current loop • Fully potted • Integrated safety barrier
• Process temperature	Temperature rating of process seal is pressure dependent. See Pressure/Temperature curves on page 4/346.	Diagnostics with fault alarm when:	Primary variable (PV) out of limits, system failure in measurement circuit, deviation between A/D and D/A converter, check sum, watch dog and self-checking facility
- Standard (PFA) ³⁾	-50 ... +200 °C (-58 ... +392 °F)	Function rotary switch	Positions 0 ... 9, A ... F
- Cryogenic version	-200 ... +200 °C (-328 ... +392 °F) Contact ceg.smpi@siemens.com for details.	SMART communication	Conforming to HART Communication Foundation (HCF)
• Process pressure	Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 4/346.	Certificates and approvals	
• Standard (PFA)	-1 ... 150 bar g (2175 psi g)	General Purpose	CE, CSA, FM, RCM
Design		Non-incendive/Non-sparking	<ul style="list-style-type: none"> • CSA/FM Class 1, Div. 2, Groups A, B, C, D T4 ATEX II 3G 2D EEx nA [ib] IIC • T6 ... T4 T100 °C
Material		Dust Ignition Proof (Intrinsically Safe Probe Circuit)	<ul style="list-style-type: none"> • CSA/FM Class II and III, Div. 1, Groups E, F, G • ATEX II 1/2 GD EEx d [ia] T6 to T1 T100 °C
• Wetted parts material		Explosion Proof (Intrinsically Safe Probe Circuit)	<ul style="list-style-type: none"> • FM Class 1, Div. 1, Groups A, B, C, D T4 • ATEX II 1/2 GD EEx d [ia] IIC T6 to T1
- Standard rod	316L stainless steel	Marine	Lloyds Register of Shipping, Categories ENV1, ENV2, ENV3 and ENV5, Bureau Veritas
• Probe insulation (rod)	PFA		
• Cable	316 stainless steel/ 316 stainless steel PFA		
Probe diameter			
• Rod version	16 mm (0.63 inch) or 24 mm (0.95 inch)		
• Cable version	9 mm (0.35 inch) with PFA jacket, 6 mm (0.24 inch) without PFA jacket		
Active shield length			
• Minimum (rod version)	50 mm (1.97 inch), customer selectable (order number Y02)		
Probe length			
• Rod version	Max. 3.5 m (138 inch) with 16 mm rod, PFA Max. 5.5 m (216 inch) with 24 mm rod, PFA		
• Cable version	Max. 35 m (1 378 inch)		
Process connection of probe			
• Threaded mounting	NPT [(Taper), ANSI/ASME B1.20.1] R [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G [(BSPP), EN ISO 228-1/ PF (JIS-P), JIS B 0202]		
• Flange mounting	ASME, EN 1092-1		
Enclosure			
• Material	Aluminum, epoxy-coated		
• Cable inlet	2 x ½ inch NPT (2 x M20x1.5, IP68 adapter, optional)		
• Degree of protection	Type 4X/NEMA4X/IP65, IP68		

¹⁾ When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 4/346.

²⁾ Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F).

³⁾ Not recommended for steam environments

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

SITRANS LC500 probe version	Standard		Extended Cable version with Rod Sensor
Process connection types	Threaded or welded flange	Single piece flanged	Threaded or welded flange
Threaded	Available as standard	–	Available as standard
Flange	Available as standard	Available as standard	Available as standard
Process connection materials			
Stainless steel 316L	Available as standard	Available as standard	Available as standard
Probe insulation			
PFA	Available as standard	Available as standard	Available as standard
Length and Process parameters¹⁾			
Rod length for PFA 16 mm version	Min. 200 mm (7.87 inch) Max. 3 500 mm (137.80 inch)	Min. 200 mm (7.87 inch) Max. 3 500 mm (137.80 inch)	Min. 200 mm (7.87 inch) Max. 3 500 mm (137.80 inch)
Rod length for PFA 24 mm version	Min. 200 mm (7.87 inch) Max. 5 500 mm (216.54 inch)	Min. 200 mm (7.87 inch) Max. 5 500 mm (216.54 inch)	Min. 200 mm (7.87 inch) Max. 5 500 mm (216.54 inch)
Cable length	Min. 1 000 mm (39.37 inch) Max. 35 000 mm (1 377.95 inch)	Min. 1 000 mm (39.37 inch) Max. 35 000 mm (1 377.95 inch)	Min. 5 000 mm (196.85 inch) ²⁾ Max. 35 000 mm (1 377.95 inch) ²⁾
Maximum process pressure	See Pressure/Temperature curves for specific probe type		5 bar g (73 psi g)
Maximum process temperature			100 °C (212 °F)

¹⁾ See Pressure/Temperature curves for specific probe type

²⁾ Refers to total insertion length. See dimension drawing on page 4/354 for further explanation - Not available as standard

Selection and Ordering data	Article No.
<p>SITRANS LC500, Threaded or Welded Flange with Cable Sensor</p> <p>Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.</p> <p>➔ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p> <p>Version¹⁾ Cable, 9 mm (0.35 inch) diameter, 316 stainless steel with PFA insulation, weighted Add Order code Y01 and plain text: <u>"Insertion length ... mm"</u> 1 000 ... 2 000 mm (39.37 ... 78.74 inch) 2 001 ... 4 000 mm (78.78 ... 157.48 inch) 4 001 ... 6 000 mm (157.52 ... 236.22 inch) 6 001 ... 8 000 mm (236.26 ... 314.96 inch) 8 001 ... 10 000 mm (315 ... 393.70 inch) Longer lengths possible to a max. of 35 000 mm (114.83 ft). Contact ceg.smpi@siemens.com for details. Cable, 6 mm (0.24 inch) diameter, 316L stainless steel, non-insulated, weighted (non-conductive media only) Add Order code Y01 and plain text: <u>"Insertion length ... mm"</u> 1 000 ... 2 000 mm (39.37 ... 78.74 inch)²⁾ 2 001 ... 4 000 mm (78.78 ... 157.48 inch)²⁾³⁾ 4 001 ... 6 000 mm (157.52 ... 236.22 inch)²⁾³⁾ 6 001 ... 8 000 mm (236.26 ... 314.96 inch)²⁾³⁾ 8 001 ... 10 000 mm (315 ... 393.70 inch)²⁾³⁾ Cable lengths up to 25 000 mm (984.25 inch) are possible for non-conductive media. Cable lengths up to 15 000 mm (590.55 inch) are possible for conductive media. Contact ceg.smpi@siemens.com for details.</p> <p>Process connection (316L stainless steel) Threaded connection 1½" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] 1¼" NPT [(Taper), ANSI/ASME B1.20.1] G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202] Welded flange, raised face 1½", ASME, 150 lb 1½", ASME, 300 lb 1½", ASME, 600 lb 2", ASME, 150 lb 2", ASME, 300 lb 2", ASME, 600 lb 3", ASME, 150 lb³⁾ 3", ASME, 300 lb³⁾ 3", ASME, 600 lb³⁾ 4", ASME, 150 lb³⁾ 4", ASME, 300 lb³⁾ 4", ASME, 600 lb³⁾ 6", ASME, 150 lb³⁾ 6", ASME, 300 lb³⁾ 6", ASME, 600 lb³⁾ Welded flange, Type A flat faced DN 40, PN 16 DN 40, PN 40 DN 50, PN 16 DN 50, PN 40 DN 80, PN 16 DN 80, PN 40³⁾ DN 100, PN 16³⁾ DN 100, PN 40³⁾ DN 125, PN 16³⁾ DN 125, PN 40³⁾ (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.)</p>	<p>7ML5513-</p> <p>0 E 1 E 2 E 3 E 4 E</p> <p>0 F 1 F 2 F 3 F 4 F</p> <p>C 0 F 0</p> <p>K 0 L 0</p> <p>B 1 B 2 B 3</p> <p>C 1 C 2 C 3</p> <p>D 1 D 2 D 3</p> <p>E 1 E 2 E 3</p> <p>F 1 F 2 F 3</p> <p>K 4 K 5</p> <p>L 4 L 5</p> <p>M 4 M 5</p> <p>N 4 N 5</p> <p>P 4 P 5</p>

Selection and Ordering data	Article No.
<p>SITRANS LC500, Threaded or Welded Flange with Cable Sensor</p> <p>Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.</p> <p>Approvals General Purpose: CE, CSA, FM, RCM CSA / FM Class I, Div. 2, Groups A, B, C, D CSA / FM Class II, III, Div. 1, Groups E, F, G T4 ATEX II 3G 2D EEx nA [ib] IIC T6 ... T4 T 100 °C ATEX II 1/2 GD EEx d [ia] IIC T6 ... T1 T 100 °C FM Class I, Div.1, Groups A, B, C, D, T4</p> <p>Enclosure/Cable inlet Aluminum epoxy coated 2 x ½" NPT, IP68 2 x M20x1.5 (IP68, adapter)</p> <p>Options No additional options With mounting eye⁴⁾</p> <p>Thermal isolator Without thermal isolator Isolator, only for use when temperature range is outside of -40 ... +85 °C (-40 ... +185 °F), explosion proof approval -40 ... +70 °C (-40 ... +158 °F)</p> <p>Electronic output 2-wire loop current 4 ... 20 mA (transmitter MSP 2002-2 _3300 pF)</p> <p>1) A minimum span of 3 pF must be maintained 2) Available with non-conductive media only 3) Custom shipping methods required. Contact factory for more details. 4) Available in PFA insulated version only</p>	<p>7ML5513-</p> <p>1 2 4 6</p> <p>1 2</p> <p>A B</p> <p>A B</p> <p>1</p>

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	Y01
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Operating Instructions	See page 4/345
Accessories	See page 4/345

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

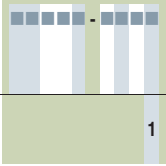
Selection and Ordering data	Article No.
SITRANS LC500, Threaded or Welded Flange, with Rod Sensor	7ML5515-
Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Version	
Rod, 16 mm (0.63 inch), PFA insulated	
Add Order code Y01 and Y02 and plain text:	
<u>Insertion length ... mm and active shield length ... mm</u>	
200 ... 1 000 mm (7.87 ... 39.37 inch) ¹⁾	0 A
1 001 ... 2 000 mm (39.41 ... 78.74 inch)	1 A
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²⁾	2 A
3 001 ... 3 500 mm (118.15 ... 137.80 inch) ²⁾	3 A
Rod, 16 mm (0.63 inch), PFA insulated with 35 mm (1.38 inch) stilling well in 316L stainless steel	
Add Order code Y01 and Y02 and plain text:	
<u>Insertion length ... mm and active shield length ... mm</u>	
200 ... 1 000 mm (7.87 ... 39.37 inch) ¹⁾³⁾	0 B
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ³⁾	1 B
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²⁾³⁾	2 B
3 001 ... 3 500 mm (118.15 ... 137.80 inch) ²⁾³⁾	3 B
Rod, 24 mm (0.94 inch), PFA insulated	
Add Order code Y01 and Y02 and plain text:	
<u>Insertion length ... mm and active shield length ... mm</u>	
200 ... 1 000 mm (7.87 ... 39.37 inch) ⁴⁾	0 C
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ⁴⁾	1 C
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²⁾⁴⁾	2 C
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ²⁾⁴⁾	3 C
4 001 ... 5 000 mm (173.26 ... 196.88 inch) ²⁾⁴⁾	4 C
5 001 ... 5 500 mm (196.89 ... 216.54 inch) ²⁾⁴⁾	5 C
Rod, 24 mm (0.94 inch), PFA insulated with 48 mm (1.89 inch) stilling well in 316L stainless steel	
Add Order code Y01 and Y02 and plain text:	
<u>Insertion length ... mm and active shield length ... mm</u>	
200 ... 1 000 mm (7.87 ... 39.37 inch) ⁵⁾	0 D
1 001 ... 2 000 mm (39.41 ... 78.74 inch) ⁵⁾	1 D
2 001 ... 3 000 mm (78.78 ... 118.11 inch) ²⁾⁵⁾	2 D
3 001 ... 4 000 mm (118.15 ... 157.48 inch) ²⁾⁵⁾	3 D
4 001 ... 5 000 mm (173.26 ... 196.88 inch) ²⁾⁵⁾	4 D
5 001 ... 5 500 mm (196.89 ... 216.54 inch) ²⁾⁵⁾	5 D
Process connection (316L stainless steel)	
Threaded connection	
¾" NPT [(Taper), ANSI/ASME B1.20.1]	A 0
1" NPT [(Taper), ANSI/ASME B1.20.1]	B 0
1½" NPT [(Taper), ANSI/ASME B1.20.1]	C 0
2" NPT [(Taper), ANSI/ASME B1.20.1]	D 0
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	E 0
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	F 0
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	J 0
R 2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	K 0
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	N 0
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	P 0
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	R 0
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	S 0
G 2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	T 0

Selection and Ordering data	Article No.
SITRANS LC500, Threaded or Welded Flange, with Rod Sensor	7ML5515-
Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.	
<u>Welded flange, raised face</u>	
1½", ASME, 150 lb	B 1
1½", ASME, 300 lb	B 2
1½", ASME, 600 lb	B 3
2", ASME, 150 lb	C 1
2", ASME, 300 lb	C 2
2", ASME, 600 lb	C 3
3", ASME, 150 lb ²⁾	D 1
3", ASME, 300 lb ²⁾	D 2
3", ASME, 600 lb ²⁾	D 3
4", ASME, 150 lb ²⁾	E 1
4", ASME, 300 lb ²⁾	E 2
4", ASME, 600 lb ²⁾	E 3
6", ASME, 150 lb ²⁾	F 1
6", ASME, 300 lb ²⁾	F 2
6", ASME, 600 lb ²⁾	F 3
<u>Welded flange, Type A flat faced</u>	
DN 40, PN 16	K 4
DN 40, PN 40	K 5
DN 50, PN 16	L 4
DN 50, PN 40	L 5
DN 80, PN 16	M 4
DN 80, PN 40 ²⁾	M 5
DN 100, PN 16 ²⁾	N 4
DN 100, PN 40 ²⁾	N 5
DN 125, PN 16 ²⁾	P 4
DN 125, PN 40 ²⁾	P 5
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.)	
Approvals	
General Purpose: CE, CSA, FM, RCM	1
CSA / FM Class I, Div. 2, Groups A, B, C, D	2
CSA / FM Class II, III, Div. 1, Groups E, F, G T4	
ATEX II 3G 2D EEx nA [ib] IIC T6 ... T4 T 100 °C	4
ATEX II 1/2 GD EEx d [ia] IIC T6 ... T1 T 100 °C	
FM Class I, Div.1, Groups A, B, C, D, T4	6
Enclosure/Cable inlet	
Aluminum epoxy coated	
2 x ½" NPT, IP68	1
2 x M20 x1.5 (IP68, adapter)	2
Options	
No additional options	
Slotted holes instead of standard vent holes in stilling well (refer to Operating Instructions for dimensions.) ⁶⁾	A
Thermal isolator/remote version	
Without thermal isolator or remote electronics	A
Thermal isolator, only for use when temperature range is outside of -40 ... +85 °C (-40 ... +185 °F), explosion proof approval -40 ... +70 °C (-40 ... +158 °F)	B
Remote electronics with mounting bracket and cable ⁷⁾	
• Length: 2 m (79 inch)	C
• Length: 3 m (118 inch)	D
• Length: 4 m (158 inch)	E
• Length: 5 m (197 inch)	F

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS LC500, Threaded or Welded Flange, with Rod Sensor Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.	7ML5515- 	Further designs Please add "-Z" to Article No. and specify Order code(s). Insertion length, specify in plain text: Y01: ... mm Active shield length, specify in plain text [min. length is 50 mm (2 inch)]: Y02: ... mm Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 Inspection Certificate Type 3.1 per EN 10204 Manufacturing Test Report (Electrode Test)	
Electronic output 2-wire loop current 4 ... 20 mA (transmitter MSP 2002-2_3300 pF)	1	Operating Instructions Accessories	Y01 Y02 Y15 C11 C12 C18 See page 4/345 See page 4/345
1) A minimum span of 3 pF must be maintained 2) Custom shipping methods required. Contact factory for more details. 3) Available with process connection 1½" or larger 4) Available with process connection 1" or larger 5) Available with process connection 2" or larger 6) Available with version 0B ... 3B, 0D ... 5D and 0F only 7) Available with approval option 1 only			

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

Selection and Ordering data

Article No.

SITRANS LC500, Single Piece Flanged with Rod Sensor

➔ **7ML5517-**

Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.

➔ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Version

Rod, 16 mm (0.63 inch), PFA insulated
Add Order code Y01 and Y02 and plain text:
"Insertion length ... mm and active shield length ... mm"

250 ... 1 000 mm (9.84 ... 39.37 inch)¹⁾

1 001 ... 2 000 mm (39.41 ... 78.74 inch)

2 001 ... 3 000 mm (78.78 ... 118.11 inch)²⁾

3 001 ... 3 500 mm (118.15 ... 137.80 inch)²⁾

0 A**1 A****2 A****3 A**

Rod, 16 mm (0.63 inch), PFA insulated with 35 mm (1.34 inch) stilling well in 316L stainless steel
Add Order code Y01 and Y02 and plain text:

"Insertion length ... mm and active shield length ... mm"

250 ... 1 000 mm (9.84 ... 39.37 inch)

1 001 ... 2 000 mm (39.41 ... 78.74 inch)

2 001 ... 3 000 mm (78.78 ... 118.11 inch)²⁾

3 001 ... 3 500 mm (118.15 ... 137.80 inch)²⁾

0 B**1 B****2 B****3 B**

Rod, 24 mm (0.94 inch), PFA insulated
Add Order code Y01 and Y02 and plain text:
"Insertion length ... mm and active shield length ... mm"

250 ... 1 000 mm (9.84 ... 39.37 inch)

1 001 ... 2 000 mm (39.41 ... 78.74 inch)

2 001 ... 3 000 mm (78.78 ... 118.11 inch)²⁾

3 001 ... 4 000 mm (118.15 ... 157.48 inch)²⁾

4 001 ... 5 000 mm (173.26 ... 196.88 inch)²⁾

5 001 ... 5 500 mm (196.89 ... 216.54 inch)²⁾

0 C**1 C****2 C****3 C****4 C****5 C**

Rod, 24 mm (0.94 inch), PFA insulated with 48 mm (1.89 inch) stilling well in 316L stainless steel
Add Order code Y01 and Y02 and plain text:

"Insertion length ... mm and active shield length ... mm"

250 ... 1 000 mm (9.84 ... 39.37 inch)

1 001 ... 2 000 mm (39.41 ... 78.74 inch)²⁾³⁾

2 001 ... 3 000 mm (78.78 ... 118.11 inch)²⁾³⁾

3 001 ... 4 000 mm (118.15 ... 157.48 inch)²⁾³⁾

4 001 ... 5 000 mm (173.26 ... 196.88 inch)²⁾³⁾

5 001 ... 5 500 mm (196.89 ... 216.54 inch)²⁾³⁾

0 D**1 D****2 D****3 D****4 D****5 D**

Process connection (316L stainless steel)

Single piece flange, raised face

1½", ASME, 150 lb

1½", ASME, 300 lb

1½", ASME, 600 lb

2", ASME, 150 lb

2", ASME, 300 lb

2", ASME, 600 lb

3", ASME, 150 lb²⁾

3", ASME, 300 lb²⁾

3", ASME, 600 lb²⁾

4", ASME, 150 lb²⁾

4", ASME, 300 lb²⁾

4", ASME, 600 lb²⁾

6", ASME, 150 lb²⁾

6", ASME, 300 lb²⁾

6", ASME, 600 lb²⁾

B 1**B 2****B 3****C 1****C 2****C 3****D 1****D 2****D 3****E 1****E 2****E 3****F 1****F 2****F 3**

Selection and Ordering data

Article No.

SITRANS LC500, Single Piece Flanged with Rod Sensor

7ML5517-

Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.

Single piece flange, Type B1 raised face

DN 40, PN 16

DN 40, PN 40

DN 50, PN 16

DN 50, PN 40

DN 80, PN 16

DN 80, PN 40²⁾

DN 100, PN 16²⁾

DN 100, PN 40²⁾

DN 125, PN 16²⁾

DN 125, PN 40²⁾

K 4**K 5****L 4****L 5****M 4****M 5****N 4****N 5****P 4****P 5**

Single piece flange with PTFE flange facing

(applicable with versions 0A ... 3A and 0C ... 5C)⁴⁾

1½", ASME, 150 lb

1½", ASME, 300 lb

1½", ASME, 600 lb

2", ASME, 150 lb

2", ASME, 300 lb

2", ASME, 600 lb

3", ASME, 150 lb²⁾

3", ASME, 300 lb²⁾

3", ASME, 600 lb²⁾

4", ASME, 150 lb²⁾

4", ASME, 300 lb²⁾

4", ASME, 600 lb²⁾

6", ASME, 150 lb²⁾

6", ASME, 300 lb²⁾

6", ASME, 600 lb²⁾

B 4**B 5****B 6****C 4****C 5****C 6****D 4****D 5****D 6****E 4****E 5****E 6****F 4****F 5****F 6**

Single piece flange with PTFE flange facing
(applicable with versions 0A ... 3A, 0C ... 5C)⁴⁾

DN 40, PN 16

DN 40, PN 40

DN 50, PN 16

DN 50, PN 40

DN 80, PN 16

DN 80, PN 40²⁾

DN 100, PN 16²⁾

DN 100, PN 40²⁾

DN 125, PN 16²⁾

DN 125, PN 40²⁾

K 6**K 7****L 6****L 7****M 6****M 7****N 6****N 7****P 6****P 7**

(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.)

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS LC500, Single Piece Flanged with Rod Sensor Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.	7ML5517- 	Further designs Please add "-Z" to Article No. and specify Order code(s). Insertion length, specify in plain text: Y01: ... mm Active shield length, specify in plain text [min. length is 50 mm (2 inch)]: Y02: ... mm Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000 Inspection Certificate Type 3.1 per EN 10204 Manufacturing Test Report (Electrode Test)	 Y01 Y02 Y15 C11 C12 C18
Approvals General Purpose: CE, CSA, FM, RCM CSA / FM Class I, Div. 2, Groups A, B, C, D CSA / FM Class II, III, Div. 1, Groups E, F, G T4 ATEX II 3G 2D EEx nA [ib] IIC T6 ... T4 T 100 °C ATEX II 1/2 GD EEx d [ia] IIC T6 ... T1 T 100 °C FM Class I, Div.1, Groups A, B, C, D, T4	1 2 4 6	Operating Instructions Accessories	See page 4/345 See page 4/345
Enclosure/Cable inlet Aluminum epoxy coated 2 x ½" NPT, IP68 2 x M20 x1.5 (IP68, adapter)	1 2		
Options None Slotted holes instead of standard vent holes in stilling well (Refer to manual for dimensions) ⁵⁾	A B		
Thermal isolator/remote version Without thermal isolator Isolator, only for use when temperature range is outside of -40 ... +85 °C (-40 ... +185 °F), explosion proof approval -40 ... +70 °C (-40 ... +158 °F) Remote electronics with mounting bracket and cable ⁶⁾ <ul style="list-style-type: none"> • Length: 2 m (79 inch) • Length: 3 m (118 inch) • Length: 4 m (158 inch) • Length: 5 m (197 inch) 	A B C D E F		
Electronic output 2-wire loop current 4 ... 20 mA (transmitter MSP 2002-2_3300 pF)	1		

1) A minimum span of 3 pF must be maintained

2) Custom shipping methods required. Contact factory for more details.

3) Available with process connection 2" or larger, and only available with process connection options C1 ... F3, L4 ... P5

4) Not available with versions 0E and 0F

5) Available with version 0B ... 3B, 0D ... 5D and 0F only

6) Available with approval option 1 only

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

Selection and Ordering data

Article No.

SITRANS LC500, Extended Cable version with Rod Sensor, threaded connection or welded flange¹⁾

7ML5523-

Inverse frequency shift capacitance level and interface transmitter for short range continuous measurement in large storage vessels.

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Version²⁾

Rod, 16 mm (0.63 inch), PFA insulated and 316L stainless steel flexible extension tube

Total insertion length:
Add Order code Y01 and plain text: "Total insertion length ... mm and Y02 and plain text: Active shield length ... mm"³⁾⁴⁾

- 5 000 ... 10 000 mm (196.85 ... 393.70 inch)¹⁾
- 10 001 ... 15 000 mm (393.74 ... 590.55 inch)¹⁾
- 15 001 ... 20 000 mm (590.59 ... 787.40 inch)¹⁾
- 20 001 ... 25 000 mm (787.44 ... 984.25 inch)¹⁾
- 25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)¹⁾
- 30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)¹⁾

Rod, 24 mm (0.94 inch), PFA insulated and 316L stainless steel flexible extension tube

Total insertion length:
Add Order code Y01 and plain text: "Total insertion length ... mm and Y02 and plain text: Active shield length ... mm"³⁾⁴⁾

- 5 000 ... 10 000 mm (196.85 ... 393.70 inch)¹⁾
- 10 001 ... 15 000 mm (393.74 ... 590.55 inch)¹⁾
- 15 001 ... 20 000 mm (590.59 ... 787.40 inch)¹⁾
- 20 001 ... 25 000 mm (787.44 ... 984.25 inch)¹⁾
- 25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)¹⁾
- 30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)¹⁾

Process connection (316L stainless steel)

Threaded connection

- 2" NPT [(Taper), ANSI/ASME B1.20.1]
- R 2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]
- G 2" [(BSPP), EN ISO 228-1/PF (JIS-P) JIS B 0202]

Welded flange, raised face

- 2", ASME, 150 lb
- 2", ASME, 300 lb
- 3", ASME, 150 lb¹⁾
- 3", ASME, 300 lb¹⁾
- 4", ASME, 150 lb¹⁾
- 4", ASME, 300 lb¹⁾
- 6", ASME, 150 lb¹⁾
- 6", ASME, 300 lb¹⁾

Welded flange, Type A flat faced

- DN 50, PN 16
- DN 50, PN 40
- DN 80, PN 16
- DN 80, PN 40¹⁾
- DN 100, PN 16¹⁾
- DN 100, PN 40¹⁾
- DN 125, PN 16¹⁾
- DN 125, PN 40¹⁾

(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.)

Approvals

- General Purpose: CE, CSA, FM, RCM
- CSA / FM Class I, Div. 2, Groups A, B, C, D
- CSA / FM Class II, III, Div. 1, Groups E, F, G T4
- ATEX II 3G 2D EEx nA [ib] IIC T6 ... T4 T 100 °C
- ATEX II 1/2 GD EEx d [ia] IIC T6 ... T1 T 100 °C
- FM Class I, Div. 1, Groups A, B, C, D T4

Selection and Ordering data

Article No.

SITRANS LC500, Extended Cable version with Rod Sensor, threaded connection or welded flange¹⁾

7ML5523-

Inverse frequency shift capacitance level and interface transmitter for short range continuous measurement in large storage vessels.

Enclosure/Cable inlet

- Aluminum epoxy coated
- 2 x 1/2" NPT, IP68
- 2 x M20x1.5 (IP68, adapter)

Options

- No additional options
- With mounting eye

Thermal isolator

- Without thermal isolator
- Isolator, only for use when temperature range is outside of -40 ... +85 °C (-40 ... +185 °F), explosion proof approval -40 ... +70 °C (-40 ... +158 °F)

Electronic output

- 2-wire loop current 4 ... 20 mA
- (transmitter MSP 2002-2 _3300 pF)

- ¹⁾ Custom shipping methods required. Contact factory for more details.
- ²⁾ A minimum span of 3 pF must be maintained.
- ³⁾ See dimension drawings on page 4/354 for further explanation of Y01.
- ⁴⁾ Inactive length is equal to the flexible extension plus transition. See dimension drawings on page 4/354 for further explanation of Y02.

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Accessories	
Please add "-Z" to Article No. and specify Order code(s).		General Purpose	
Insertion length, specify in plain text: Y01: to mm (Includes measuring range plus cable extension) - see dimensional information on page 4/354	Y01	1/2" NPT General Purpose Cable Entry IP68/IP69K NEMA6, -40 ... -100 °C (-40 ... -212 °F), cable size 6 ... 12 mm (0.236 ... 0.472 inch)	7ML1830-1JA
Active shield/cable extension length, specify in plain text [min. length is 50 mm (2 inch)]: Y02: to mm (see dimensional information on page 4/354)	Y02	M20x1.5 General Purpose Cable Entry IP68/IP69K NEMA6, -40 ... -100 °C (-40 ... -212 °F), cable size 7 ... 12 mm (0.275 ... 0.472 inch)	7ML1830-1JC
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	Y15	Hazardous Locations	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11	1/2" NPT EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22, and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)	7ML1830-1JB
Inspection Certificate Type 3.1 per EN 10204	C12	M20 EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX II 2 GD ExtD A21 (Zone 1, Zone 2, Zone 21, Zone 22 and in Gas Groups IIA, IIB and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)	7ML1830-1JD
Operating Instructions	Article No.	Transmitter, MSP 2002-1, 330 PF ¹⁾	7ML1830-1JP
English	7ML1998-5GE04	Transmitter, MSP 2002-2, 3 300 PF ¹⁾	7ML1830-1JQ
French	7ML1998-5GE12	Transmitter, MSP 2002-3, 6 600 PF (used with conductive fluids and probe lengths >10 000 mm) ¹⁾	7ML1830-1JR
Spanish	7ML1998-5GE21	SITRANS RD100, loop powered display - see Chapter 7	7ML5741-...
German	7ML1998-5GE33	SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	7ML5740-...
Note: The Operating Instructions should be ordered as a separate line item on the order.		SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	7ML5744-...
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7	7ML5750-...
		For applicable back up point level switch - see point level measurement section	
		¹⁾ Transmitters not suitable for Intrinsically Safe application (ATEX II 1G EEx ia IIC T4 or CSA/FM Class 1 Div. 1 Groups A, B, C and D)	
		Please contact ceg.smpi@siemens.com for special requests.	

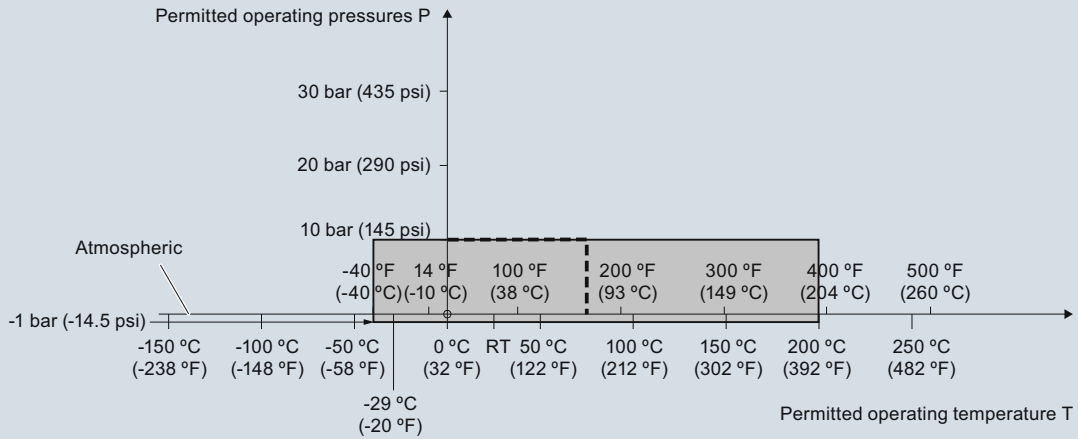
Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

Characteristic curves

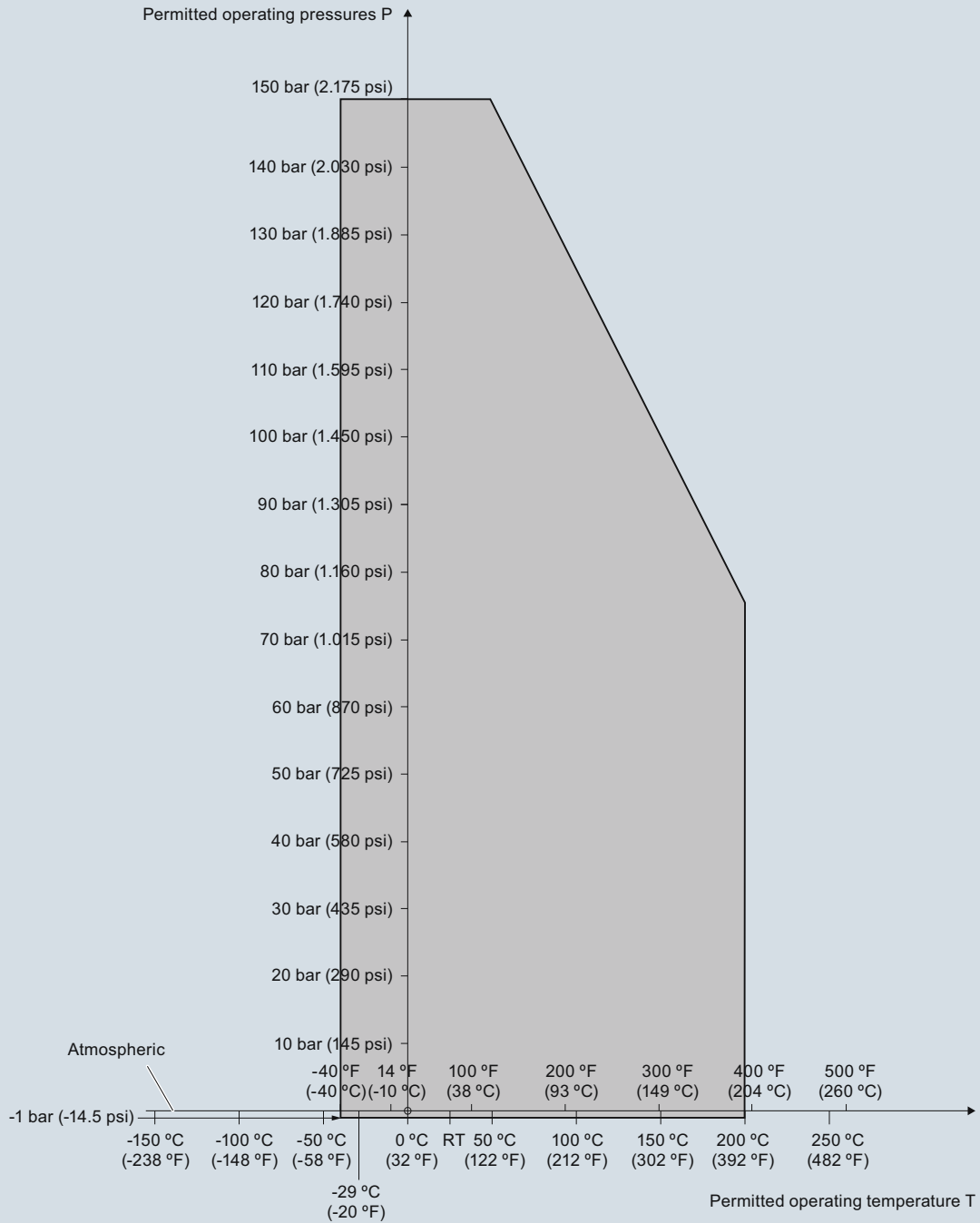
Pressure/temperature curve
LC500 cable probes
threaded process connections
(7ML5513)



----- Example:
permitted operating pressure = 10 bar (145 psi) at 75 °C

SITRANS LC500 Process Pressure/Temperature derating curves (7ML5513)

**Pressure/temperature curve
LC500 PFA rod probes
Threaded process connections
(7ML5515)**



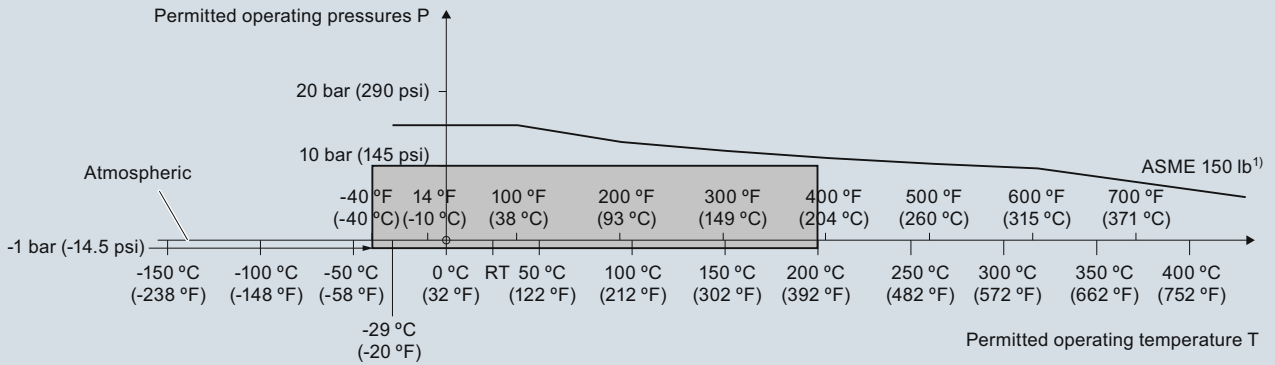
SITRANS LC500 Process Pressure/Temperature derating curves (7ML5515)

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

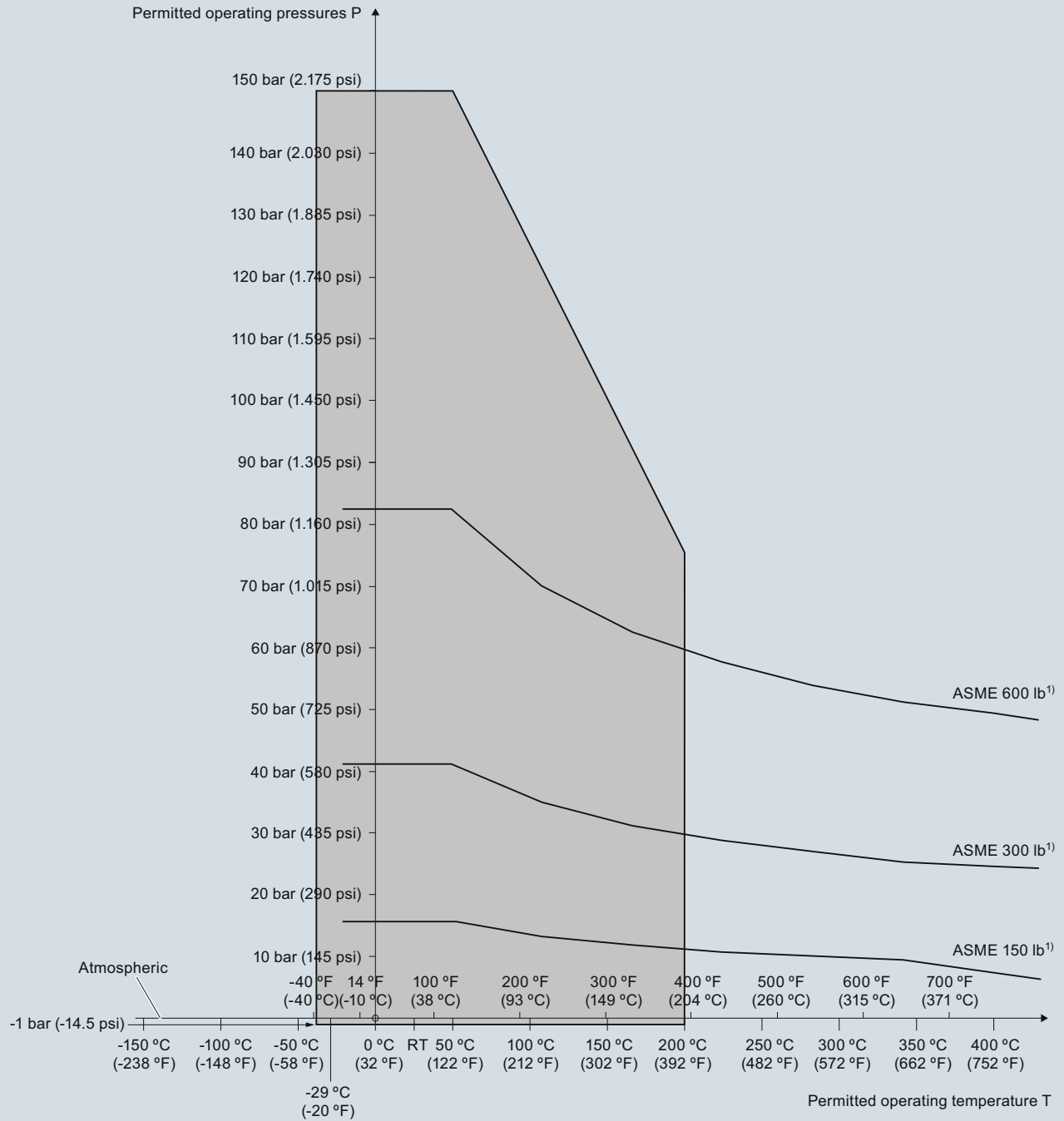
Pressure/temperature curve
LC500 cable probes
ASME flanged process connections
(7ML5513)



1) The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC500 Process Pressure/Temperature derating curves (7ML5513)

Pressure/temperature curve
LC500 PFA rod probes
ASME flanged process connections
(7ML5515 and 7ML5517)



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

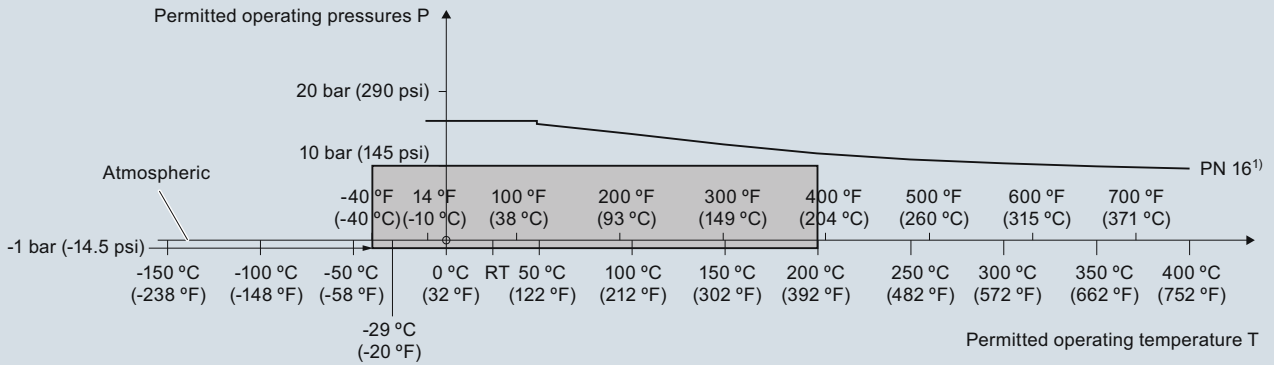
SITRANS LC500 Process Pressure/Temperature derating curves (7ML5515 and 7ML5517)

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

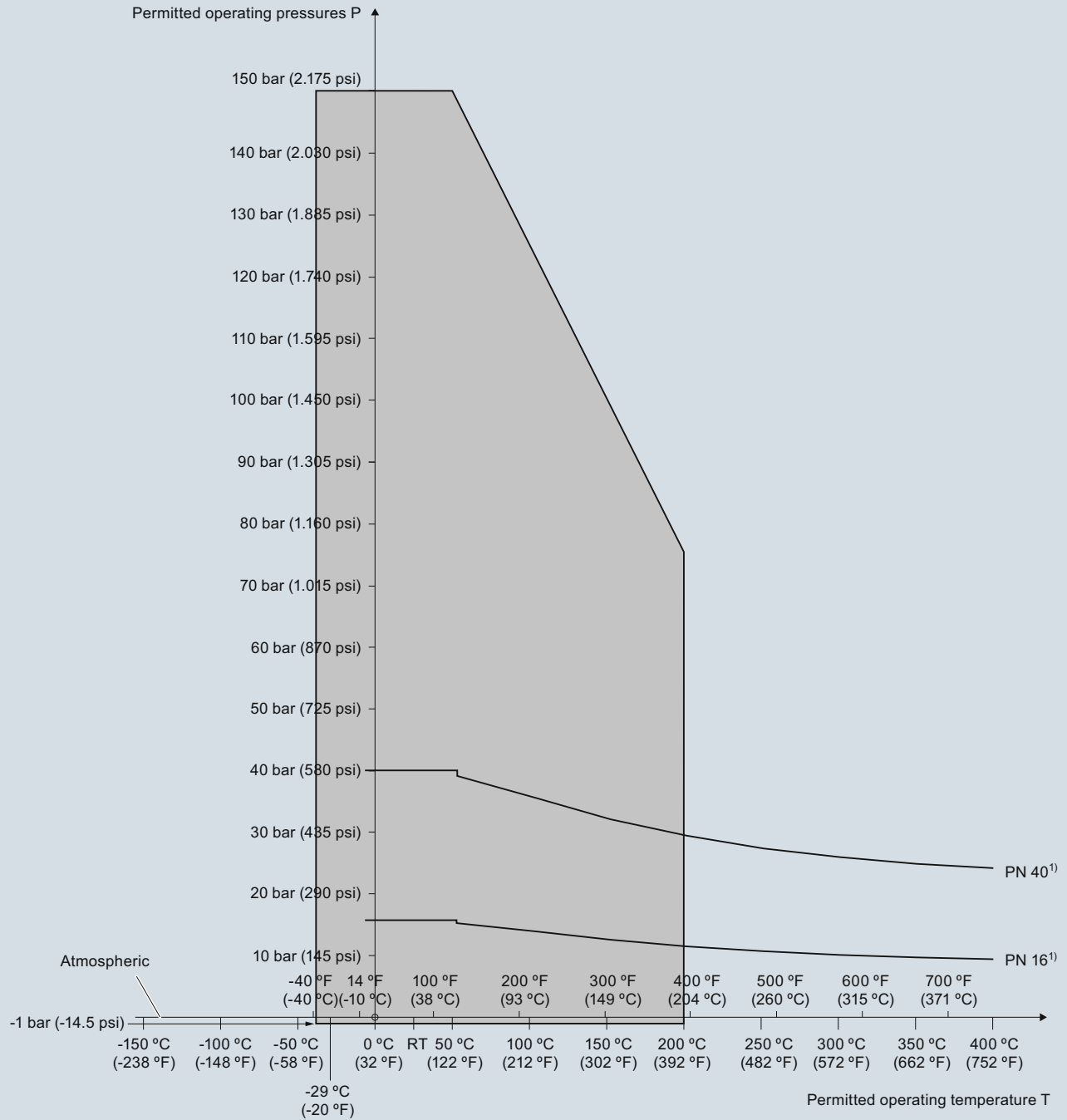
Pressure/temperature curve
LC500 cable probes
EN flanged process connections
(7ML5513)



1) The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC500 Process Pressure/Temperature derating curves (7ML5513)

**Pressure/temperature curve
LC500 PFA rod probes
EN flanged process connections
(7ML5515 and 7ML5517)**



¹⁾ The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC500 Process Pressure/Temperature derating curves (7ML5515 and 7ML5517)

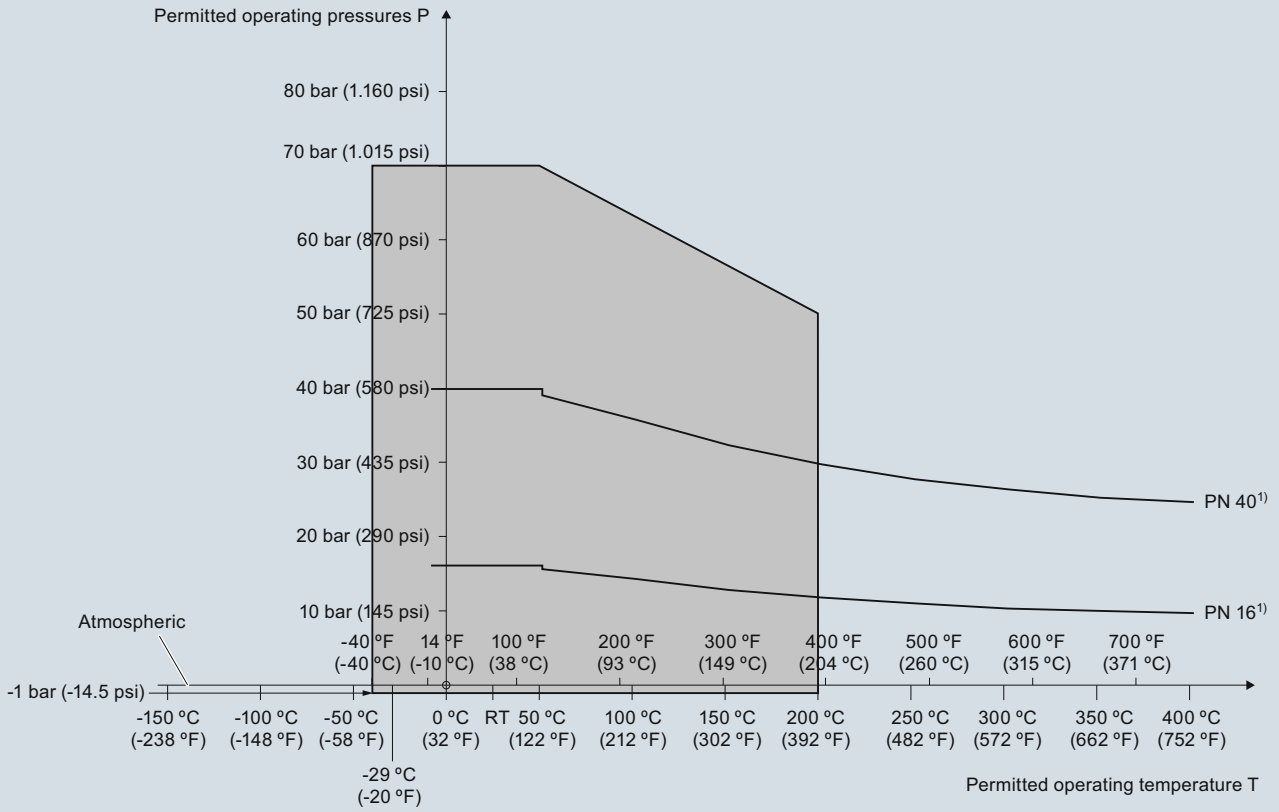
4

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

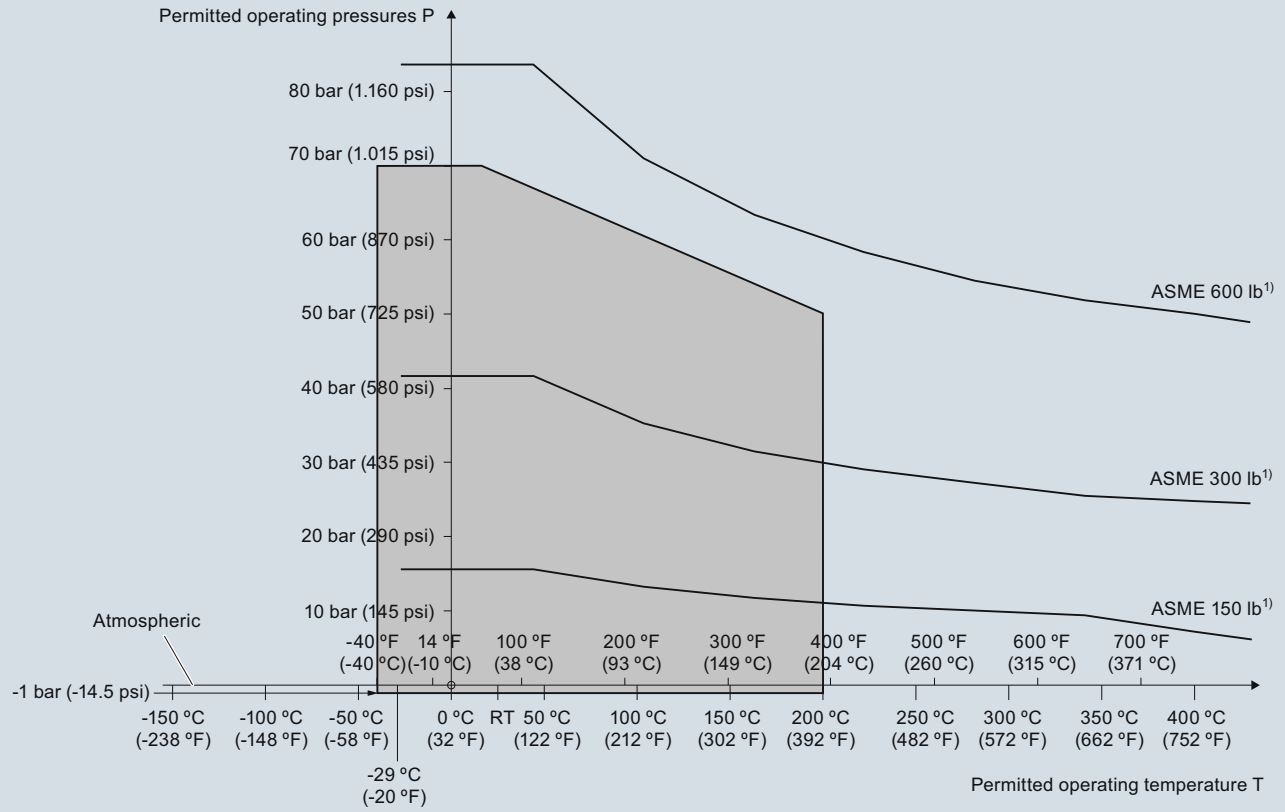
Pressure/temperature curve
LC500 single piece flanged rod probes with PTFE facing
EN flanged process connections
(7ML5517)



1) The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC500 Process Pressure/Temperature derating curves (7ML5517)

Pressure/temperature curve
LC500 single piece flanged rod probes with PTFE facing
ASME flanged process connections
(7ML5517)



1) The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC500 Process Pressure/Temperature derating curves (7ML5517)

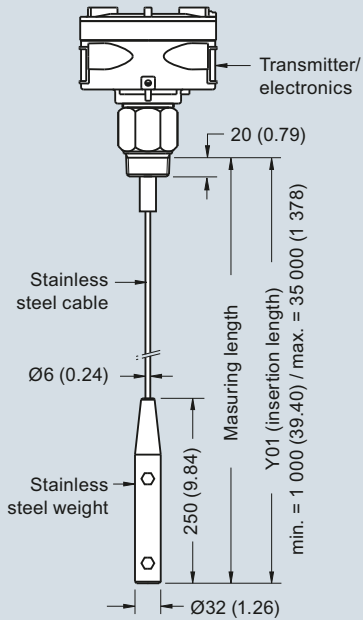
Level Measurement

Continuous level measurement – Capacitance transmitters

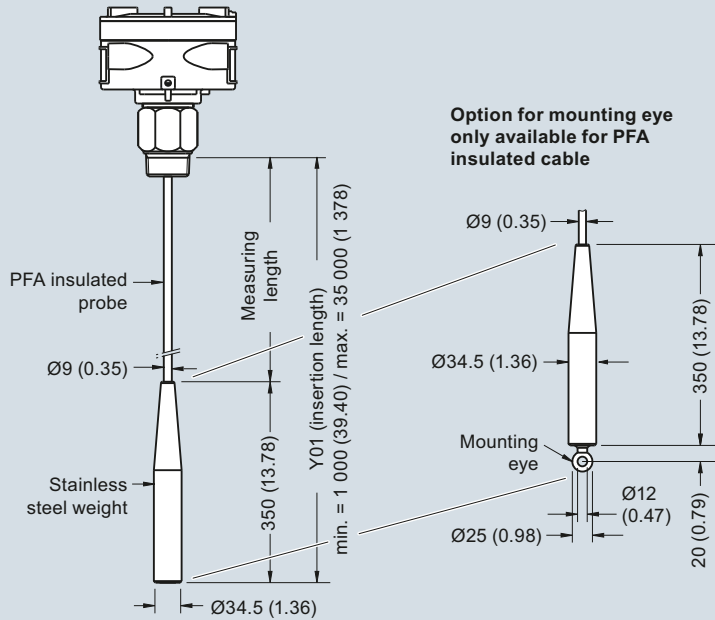
SITRANS LC500

Dimensional drawings

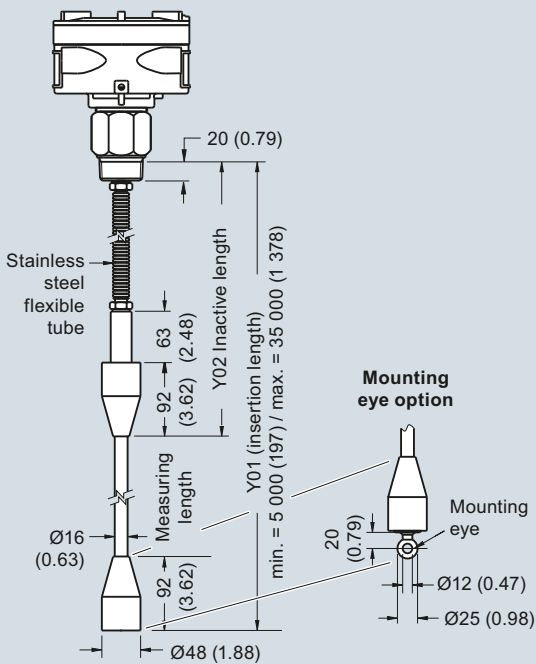
Cable version, non-insulated welded flange (7ML5513)



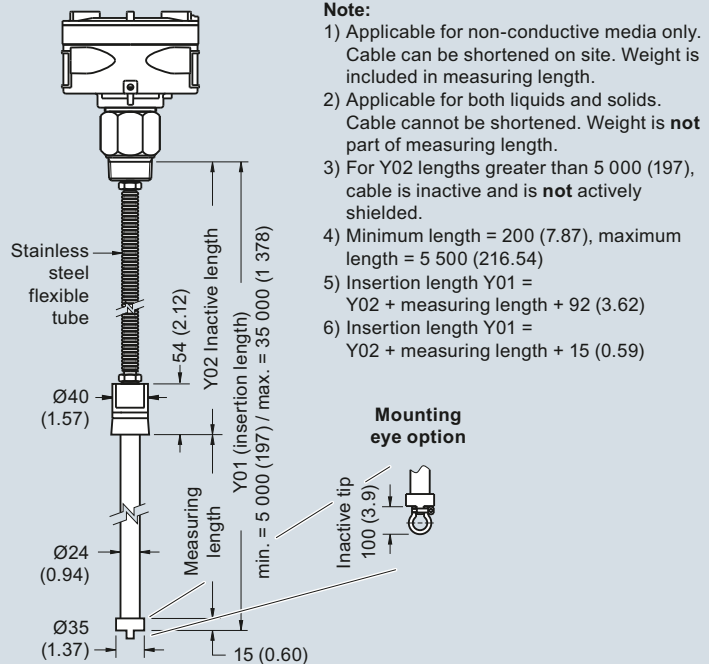
Cable version, insulated welded flange (7ML5513)



Extended cable version with rod sensor welded flange (7ML5523)



Extended cable version with rod sensor welded flange (7ML5523)

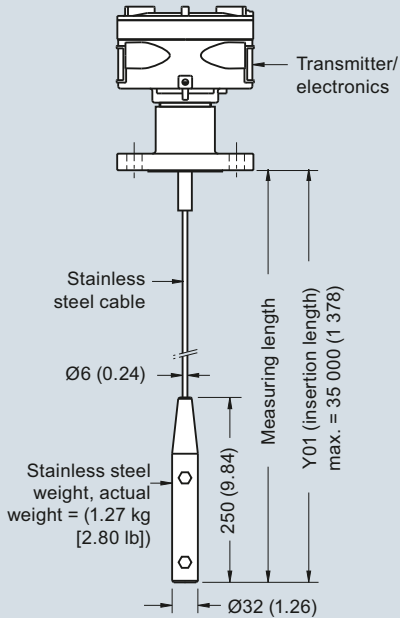


Note:

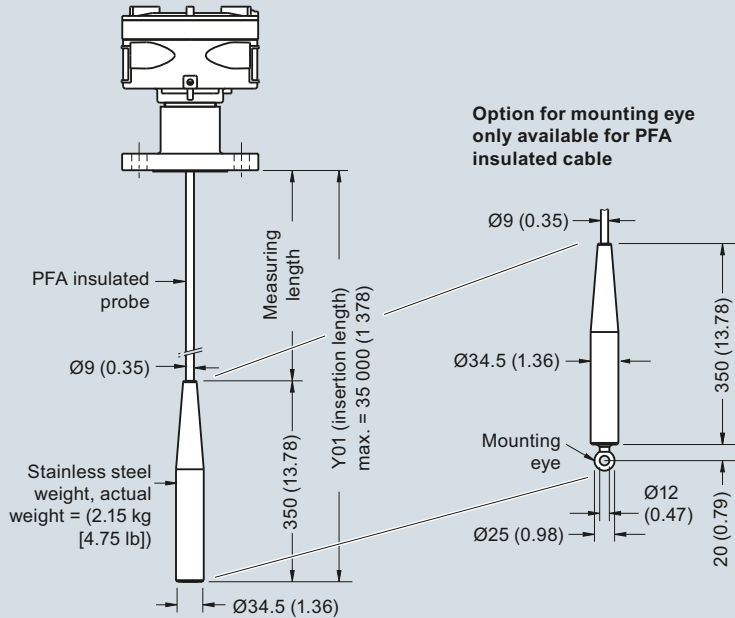
- 1) Applicable for non-conductive media only. Cable can be shortened on site. Weight is included in measuring length.
- 2) Applicable for both liquids and solids. Cable cannot be shortened. Weight is **not** part of measuring length.
- 3) For Y02 lengths greater than 5 000 (197), cable is inactive and is **not** actively shielded.
- 4) Minimum length = 200 (7.87), maximum length = 5 500 (216.54)
- 5) Insertion length Y01 = Y02 + measuring length + 92 (3.62)
- 6) Insertion length Y01 = Y02 + measuring length + 15 (0.59)

SITRANS LC500 - Cable Versions, dimensions in mm (inch)

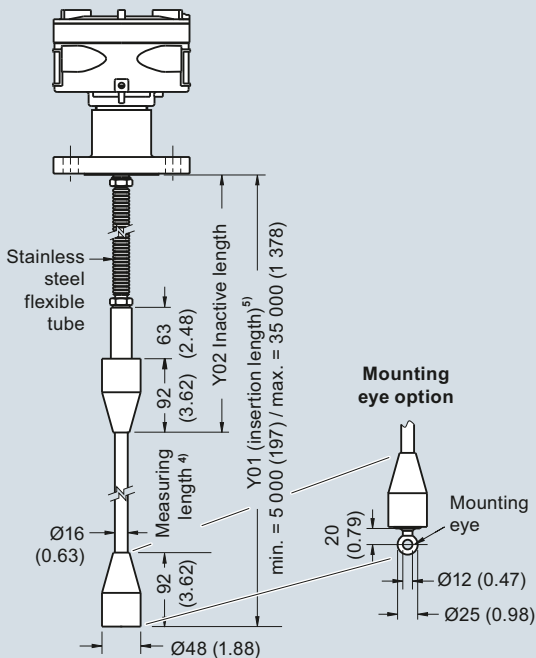
Cable version, non-insulated¹⁾
Welded flange (7ML5513)



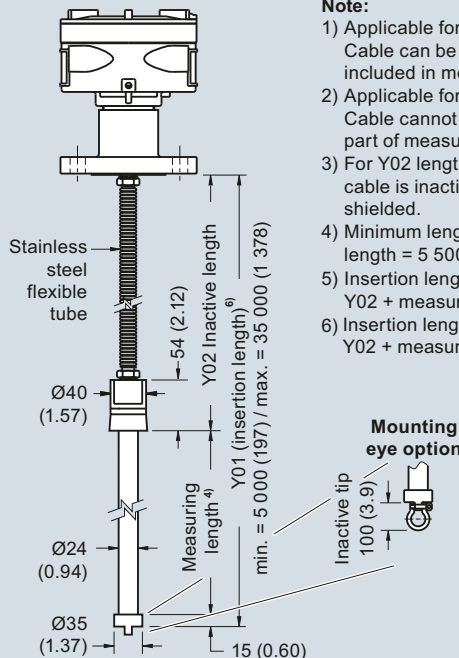
Cable version, insulated²⁾
Welded flange (7ML5513)



Extended cable version with rod sensor³⁾
Welded flange (7ML5523)



Extended cable version with rod sensor³⁾
Welded flange (7ML5523)



Note:

- 1) Applicable for non-conductive media only. Cable can be shortened on site. Weight is included in measuring length.
- 2) Applicable for both liquids and solids. Cable cannot be shortened. Weight is **not** part of measuring length.
- 3) For Y02 lengths greater than 5 000 (197), cable is inactive and is **not** actively shielded.
- 4) Minimum length = 200 (7.87), maximum length = 5 500 (216.54)
- 5) Insertion length Y01 = Y02 + measuring length + 92 (3.62)
- 6) Insertion length Y01 = Y02 + measuring length + 15 (0.59)

SITRANS LC500 - Cable Versions, dimensions in mm (inch)

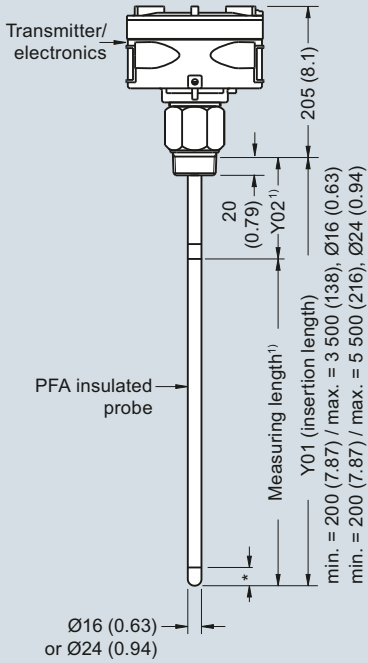
Level Measurement

Continuous level measurement – Capacitance transmitters

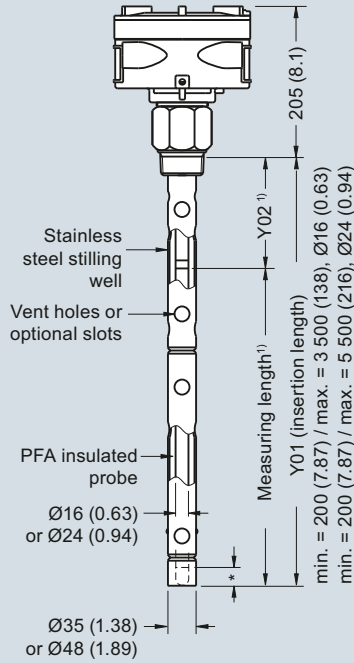
SITRANS LC500

4

Rod version threaded (7ML5515)



Rod version with stilling well threaded (7ML5515)

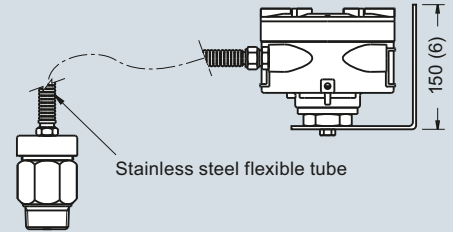


* = 30 (1.18) inactive tip

Note:

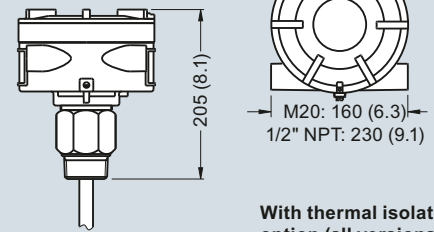
- 1) Minimum Y02 (active shield length) = 50 (1.96), minimum measuring length = 200 (7.87)

Remote electronics with mounting bracket option threaded (7ML5515)

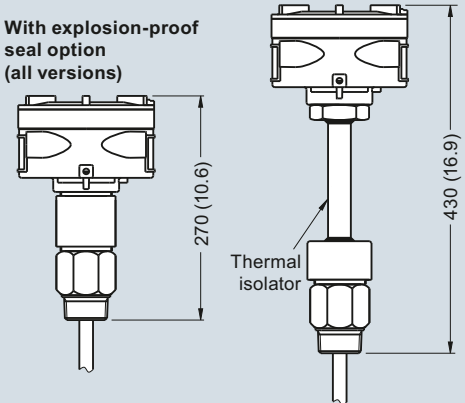


General purpose approval only.

Standard configuration (all versions)

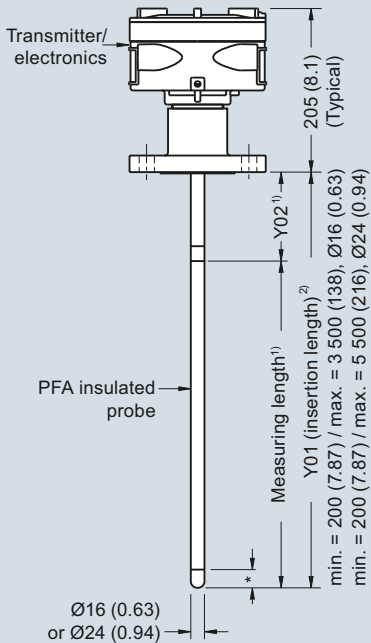


With thermal isolator option (all versions)

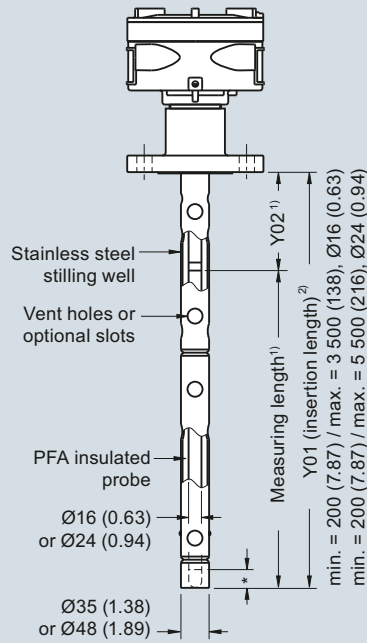


SITRANS LC500 - Rod Versions, dimensions in mm (inch)

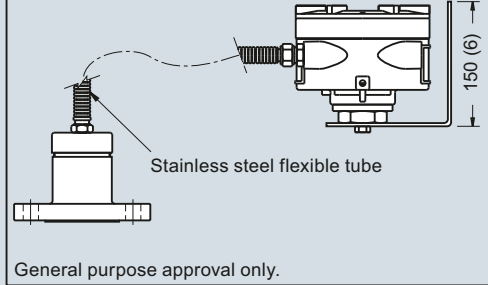
**Rod version
Welded flange (7ML5515)
Single piece flange (7ML5517)**



**Rod version with stilling well
Welded flange (7ML5515)
Single piece flange (7ML5517)**

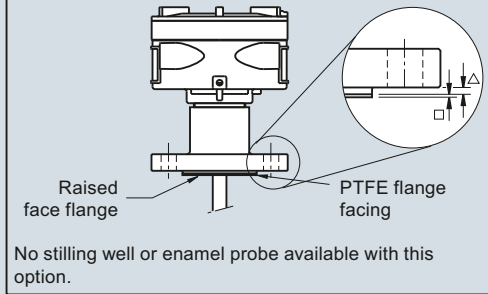


**Remote electronics with mounting bracket option
Welded flange (7ML5515)
Single piece flange (7ML5517)**



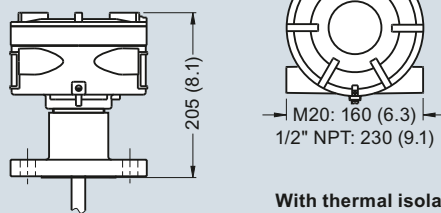
General purpose approval only.

**PTFE flange facing option
single piece flange only (7ML5517)**

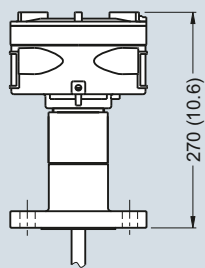


* = 30 (1.18) inactive tip

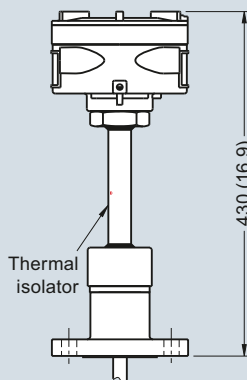
**Standard configuration
(all versions)**



**With explosion-proof
seal option (all
versions)**



**With thermal isolator
option (all versions)**



Flange facing (raised face)	
Flange class	Facing thickness
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/25/40/64	2 (0.08)
□ PTFE facing (additional)	2 (0.08)

Notes:

- 1) Minimum Y02 (active shield length) = 50 (1.96), minimum measuring length = 200 (7.87)
- 2) Insertion length does not include any raised face/gasket face dimension (see Flange Facing table above).

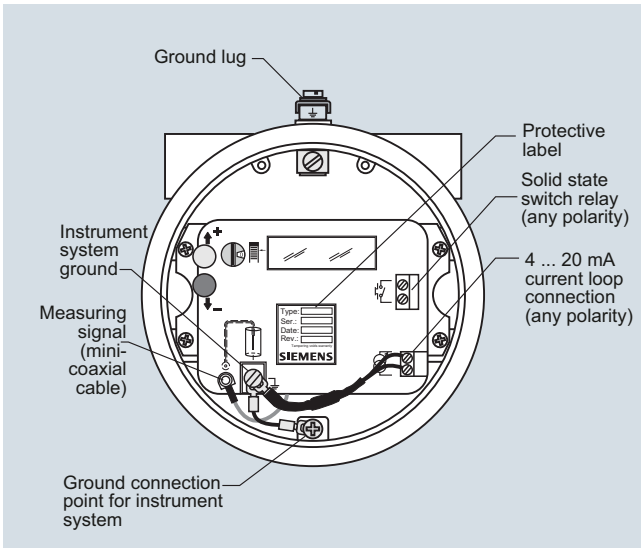
SITRANS LC500 - Rod Versions, dimensions in mm (inch)

Level Measurement

Continuous level measurement – Capacitance transmitters

SITRANS LC500

Schematics



SITRANS LC500 connections



Level Measurement

Continuous level measurement – Capacitance transmitters



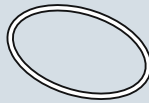
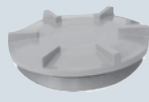



SITRANS LC300 and LC500 Specials

Selection and ordering data

LC300 and LC500 Specials¹⁾

	Article No.
LC300 Cable Extensions, 316L stainless steel	
Kit, stainless steel cable extension, 1 m, adjustable by customer	A5E01163688
Kit, stainless steel cable extension, 3 m, adjustable by customer	A5E01163689
Kit, stainless steel cable extension, 5 m, adjustable by customer	A5E01163690
Kit, stainless steel cable extension, 10 m, adjustable by customer	A5E01163691
Kit, stainless steel cable extension, 15 m, adjustable by customer	A5E01163693
Kit, stainless steel cable extension, 20 m, adjustable by customer	A5E01163695
LC300 Cable Extensions, 316 stainless steel with PFA coating	
Kit, PFA cable extension, 1 m	A5E01163709
Kit, PFA cable extension, 3 m	A5E01163710
Kit, PFA cable extension, 5 m	A5E01163711
Kit, PFA cable extension, 10 m	A5E01163712
Kit, PFA cable extension, 15 m	A5E01163713
Kit, PFA cable extension, 20 m	A5E01163714

LC300 and LC500 Specials¹⁾

	Article No.
LC300 Mounting Eye	
Spare mounting eye (LC300 PFA versions only)	A5E01163717
LC300 Weight Kit, 316L stainless steel	
Kit, Spare stainless steel weight. To be used in any cable version of CLS300, or stainless steel cable version of LC300	A5E01163727
LC500 Gasket (IP65), Silicone	
Spare gasket, LC500 enclosure version, IP65	A5E01163728
LC500 Blind Lid	
Spare LC500 aluminum blind lid	A5E01163729
LC500 Mounting Eye	
Spare mounting eye (PFA cable version only)	A5E01163717
LC500 Mounting Bracket	
Spare mounting bracket	A5E01163730
LC500 Sanitary Versions²⁾	

¹⁾ Special flange sizes and facings are available. Please contact ceg.smpi@siemens.com for part number and pricing. Submit Application Questionnaire found on page 4/11.

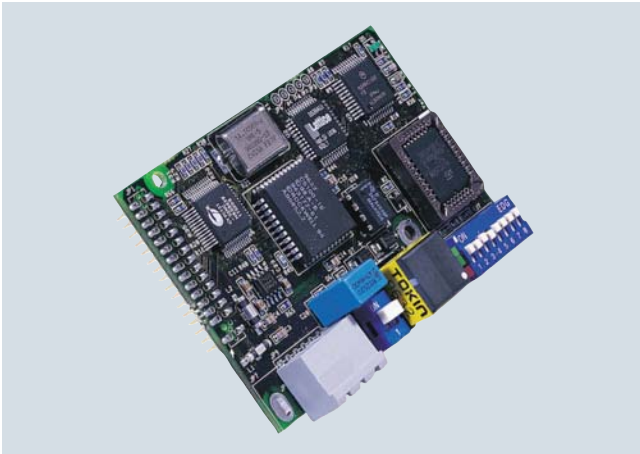
²⁾ Please contact ceg.smpi@siemens.com for part number and pricing. Submit Application Questionnaire found on page 4/11.

Please contact ceg.smpi@siemens.com for special requests.

Level Measurement Communication

SmartLinX module

Overview



SmartLinX modules provide direct digital connection to popular industrial communications buses with true plug-and-play compatibility with products manufactured by Siemens.

Benefits

- Fast, easy installation
- Direct connection: no additional installation required
- Scalable application layer allows for optimized network bandwidth and memory requirements
- Modules available for PROFIBUS DP and DeviceNet

Application

Many Siemens products include HART, PROFIBUS PA and Modbus communications. For additional communication modules, SmartLinX cards are the answer.

They're fast and easy to install, and can be added at any time. The module simply plugs into the socket on any SmartLinX-enabled product. They require no secondary private buses or gateways and no separate wiring. There are no extra boxes to connect to your network so there's a minimum load on engineering and maintenance staff.

SmartLinX provides all data from the instrument, including measurement and status, and allows changes to operation parameters to be done over the bus or telemetry link. The user can select which data in the application layer to transfer over the bus. This selection saves bandwidth and memory and optimizes data throughput and speeds up the network, enabling you to connect more instruments to your network.

Technical specifications

Module type	PROFIBUS DP
• Interface	RS 485 (PROFIBUS standard)
• Transmission rate	All valid PROFIBUS DP rates from 9 600 Kbps to 12 Mbps
• Rack address	0 ... 99
• Connection	Slave
• SmartLinX module compatibility	<ul style="list-style-type: none"> • MultiRanger 100/200 • HydroRanger 200

Module type	DeviceNet
• Interface	DeviceNet physical layer
• Transmission rate in kbps	125, 250, 500
• Rack address	0 ... 63
• Connection	Slave (group 2)
• SmartLinX module compatibility	<ul style="list-style-type: none"> • MultiRanger 100/200 • HydroRanger 200

Selection and Ordering data

	Article No.
SmartLinX module for MultiRanger 100/200 and HydroRanger 200	
PROFIBUS DP module	7ML1830-1HR
DeviceNet module	7ML1830-1HT
Operating Instructions	
PROFIBUS communications module	
• English	7ML1998-1AQ03
• French	7ML1998-1AQ13
• German	7ML1998-1AQ33
DeviceNet	
This device is shipped with the Siemens Milltronics manual DVD containing Quick Starts and Operating Instructions.	7ML1998-1BH02
• English	7ML1998-1BH02
• French	7ML1998-1BH12
Spare SmartLinX software	
PROFIBUS DP data diskette	7ML1830-1CL
DeviceNet data diskette	7ML1830-1CM

Overview



Dolphin Plus is instrument configuration software that allows you to quickly and easily configure, monitor, tune and diagnose several Siemens level devices remotely (see list below). Remote access is available using your desktop PC or connected directly in the field using a laptop.

Benefits

- Real-time monitoring and adjustment of parameters
- On-screen visualization of process values
- Saving and visualization of echo profiles for a wide range of Siemens level meters
- Copying of data for programming several devices
- Quick setup and commissioning of device
- Generation of configuration reports within seconds

Note:

The Dolphin Plus software is only available in English.

Application

Dolphin Plus is easy to install and use. Just load the software from the DVD. In minutes, you're ready to set up or modify complete parameter configurations for one or more devices.

Following configuration, you can alter parameters, upload and download parameter sets to and from disk, and use parameter sets saved from other instruments. Reading of echo profiles permits fine tuning without the need for special instruments. Built-in quick start wizards and help functions guide you through the entire process.

Compatibility

Dolphin Plus is compatible with Microsoft Windows 95/98/NT4/Me/2000/XP and works with a wide range of Siemens products, including:

- SITRANS LU10
- SITRANS LU02
- SITRANS LU01

Connection to a Siemens instrument may be a direct RS 232 serial connection or via an RS 485 converter or Siemens infrared ComVerter, depending on the instrument being configured.

Meets VDE 2187 user interface requirements.

(Most other Siemens level devices use Simatic PDM configuration software.)

Selection and Ordering data

Article No.

Dolphin Plus

7ML1841-

Instrument configuration software to quickly and easily configure, monitor, tune and diagnose most Siemens devices remotely, from your desktop PC or connected directly in the field using a laptop.

Dolphin Plus Software includes a software DVD, and a nine pin adapter with a 2.1 m (82.7 inch) cable for connection to a PC serial port.

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

RS 485 to RS 232 converter

No
Yes

0
1

ComVerter

No
Yes

0
1

Selection and Ordering data

Article No.

Operating Instructions

Connection manual, English:
Included on Dolphin Plus DVD and available at www.siemens.com/processautomation

Spare parts

Converter, RS 485 to RS 232 (D-Sub)

7ML1830-1HA

Kit containing one 9-pin D-Sub to RJ11 Adapter and one 2.1 meter telephone cable with two male jacks

7ML1830-1MC

ComVerter, Infrared link

7ML1830-1MM

Level Measurement

Notes