Level Measurement

4

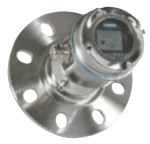
You can download all instructions, catalogs and certificates for SITRANS L free of charge: www.siemens.com/level

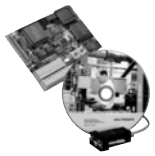
Overview

	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**		
		• CLS100: compact 2-wire inverse frequency shift capacitance switch for level detection in constricted spaces, interfaces, solids, liquids, slurries, and foam	4/12	SIMATIC PDM
		• 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	4/18	SIMATIC PDM
		• 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	4/45	SIMATIC PDM
		• 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	4/66	SIMATIC PDM
Point level measurement - Vibrating switches				
	Reliable vibrating point level switches for liquid and slurry applications across all industries	**SITRANS LVL100/LVL200**		-
		• 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	4/84	
		• 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	4/90	-
	Reliable vibrating point level switches for bulk solids in a wide variety of applications at a competitive price	**SITRANS LVS100/LVS200**	4/106 4/109	-
		• Vibrating point level switch designed to be impervious to external vibrations and to provide reliable performance in demanding bulk solids applications		
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**	4/118	-
		• 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 switch				
	Ultrasonic non-contacting switch with two switch points for level detection of bulk solids, liquids and slurries in a wide variety of industries	**Pointek ULS200** • Rugged design, no moving parts, and virtually maintenance-free • Transducer available in ETFE or PVDF copolymer and therefore inert to most chemicals	4/129	-
Continuous measurement - Ultrasonic transmitters				
	2-wire loop powered ultrasonic transmitter for level, volume, and flow monitoring of liquids in open channels, storage vessels and simple process vessels	**SITRANS Probe LU** • Continuous level measurement up to 12 m (40 ft) range • Patented Sonic Intelligence signal processing • Auto False-Echo Suppression	4/138	-
	Compact level transmitter with integrated transducer for accurate level measurement for liquid applications	**The Probe** • Simple, compact and competitively priced ultrasonic level transmitter in several versions for maximum versatility: - Three-wire system with alarm relay - Two-wire system with current loop	4/143	SIMATIC PDM
Continuous measurement - Ultrasonic controllers				
	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.	**SITRANS LUT420/430/440** 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. • 1 mm accuracy • HART communications • Next Generation Sonic Intelligence	4/146	SIMATIC PDM
	Versatile short- to medium-range ultrasonic single- and dual-vessel level controller for virtually any application in a wide range of industries	**MultiRanger 100/200** • 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	4/154	SIMATIC PDM
	Ultrasonic level controller for up to six pumps - control, differential control, and open channel flow monitoring	**HydroRanger 200** • An economical, low-maintenance solution delivering control efficiency and productivity needed to meet today's exacting standards. • Auto False-Echo Suppression of false echoes	4/158	SIMATIC PDM

	Application	Device description	Page	Programming Software
	Ultrasonic long-range level monitoring system for liquids and solids	**SITRANS LU01/LU02/LU10** • Automatic conversion of level into volume for standard or custom tank shapes • Easy to install and program • Optional fieldbus card, e.g. PROFIBUS DP	4/162 4/166	Dolphin Plus
	Output module for SITRANS LU10	**SITRANS LU AO** • SITRANS LU AO analog output module provides remote analog outputs for the measurement points of the SITRANS LU10 transceiver	4/170	-
Continuous measurement - Ultrasonic transducers				
	ST-H: ETFE or PVDF transducer for chemicals XRS-5: Standard transducer for applications to 8 m (26 ft)	**ST-H/Echomax XRS-5** • ST-H: narrow design of the ST-H allows the sensor to be mounted using a 2 inch connection • XRS-5: narrow beam angle of only 10°, measuring range maximum 8 m (26 ft) for measurement of liquids, solids, and slurries	4/173 4/176	- -
	Transducers for liquids and bulk solids XPS series: Hermetically sealed PVDF enclosure for chemical immunity	**Echomax XPS** • XPS series offers versions for various distances up to 30 m (100 ft) and up to a maximum temperature of 95 °C (203 °F)	4/179	-
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** • Uni-Construction polypropylene rod antenna standard • Patented Process Intelligence signal processing • Auto False-Echo Suppression of false echoes	4/195	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** • 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	4/199	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 and corrosive/aggressive media	**SITRANS LR250** • 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	4/216	SIMATIC PDM AMS SITRANS DTM
	4-wire, 24 GHz FMCW radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and high pressure, to a range of 50 m (164 ft); ideal for low dielectric media	**SITRANS LR400** • Minimum maintenance requirements and wear as result of non-contacting measuring principle • High long-term stability resulting from self-calibration with highly stable internal reference • High measuring accuracy and repeatability as a result of 24 GHz; narrow beam angle for tall, narrow vessels	4/245	SIMATIC PDM
	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** • 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 nozzels • Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions	4/253	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** • 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	4/258	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** • 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	4/264	SIMATIC PDM AMS SITRANS DTM

	Application	Device description	Page	Programming Software
Continuous measurement - Guided wave radar transmitters				
	Guided wave radar transmitter for short- and medium-range level, level/interface, and volume measurement of liquids and solids. It is unaffected by changes in process conditions, high temperatures and pressures, and steam.	**SITRANS LG200** • Measures accurately on materials with dielectric (dK) as low as 1.4 • Guided wave radar measurement for up to 2.5 mm (0.12 inch) accuracy • Measures level and interface on challenging applications including foam • 3 button programming for quick setup • Reliable level measurement on harsh applications with pressure up to 430 bar g (6 250 psi g) and temperatures as high as 427 °C (800 °F)	4/273	SIMATIC PDM
Continuous level – Capacitance transmitters				
	For liquids and solids applications, ideal for standard industrial applications in chemical, hydrocarbon processing, food and beverage, and mining, aggregate and cement industries	**SITRANS LC300** • 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	4/299	-
	Level and interface transmitter for extreme and critical process conditions, such as oil and liquid natural gas (LNG), toxic and aggressive chemicals and vapours	**SITRANS LC500** • 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	4/313	SIMATIC PDM
Communications				
		**SmartLinx Module, Dolphin Plus software** • 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	4/337 4/339	- -

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	◆	◆	◆	◆	■	■
Buildup	◆	◆	◆	◆	■	◆
High viscosity	■	■	◆	◆	■	◆
Dust	◆	■	■	■	■	
Solids powders	◆	■	◆	◆	■	
Solids granules/pellets < 25 mm (1 inch)	■	■	◆	◆	■	
Solids < 25 mm (1 inch)	■	■			■	
High angle of repose	◆	■	■	◆	■	

■ preferred

◆ condition dependent

Point Level				
Conditions	**Vibration**	**Capacitance**	**Paddle**	**Ultrasonic**
Measurement				
Level	■	■	■	■
Interface (liquid/liquid)		■		
Interface (liquid/solid)	◆	◆		
Volume				
Mass				
Flow (open channel)				
Level Applications				
Changing density	■	■	■	■
Changinge dielectric	■	◆	■	■
Aggressive chemicals	■	■	◆	■
Pressure/vacuum	■	■	■	
High temperature	■	■	■	
Cryogenic		■		
Turbulence	◆	◆		■
Steam	■	◆	■	
Hydrocarbon vapors/solvents	◆	◆		
Foam	◆	◆		◆
Buildup	◆	◆	■	◆
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

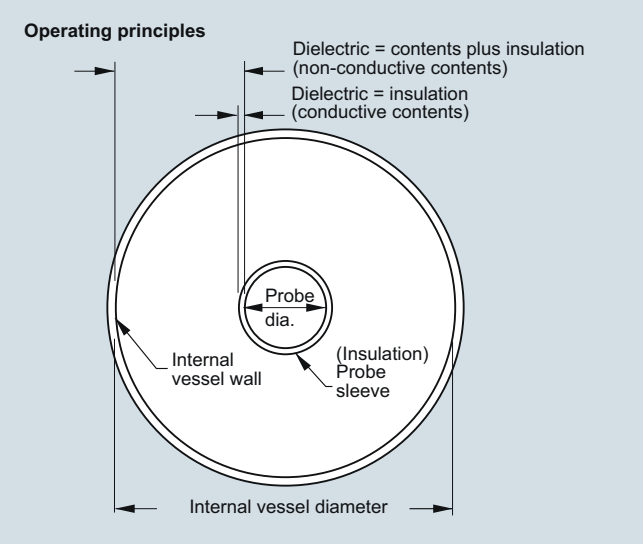
Inverse frequency shift capacitance point level switches are designed to withstand the harsh environments of high pressure and high temperature applications.

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.

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) • HP version: Up to 345 bar g (5 004 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, C-TICK, Lloyds Register, WHG Fully-synthetic version (PPS): CSA, FM	CSA, FM, CE, ATEX, C-TICK, Lloyds Register, WHG, Vlarem II	CSA, FM, CE, ATEX, C-TICK, Lloyds Register, WHG, Vlarem II	CE, CSA, FM, ATEX, C-TICK, 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 ☐

Type:
☐ Storage
☐ Process
☐ Separator
☐ FPSO (Floating Processing Storage and Offloading)

Tank construction:
☐ Metallic ☐ Non-metallic
☐ Agitated top, bottom or side

Pressure:
Normal: _____
Maximum (relief): _____

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

Mounting:
☐ Top Mount
☐ Side Mount
☐ Pipe Mount

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:

Pointek CLS100

Overview

Pointek CLS100 is a compact 2-wire inverse frequency shift capacitance switch for level detection in constricted spaces, interfaces, solids, liquids, slurries and foam.

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

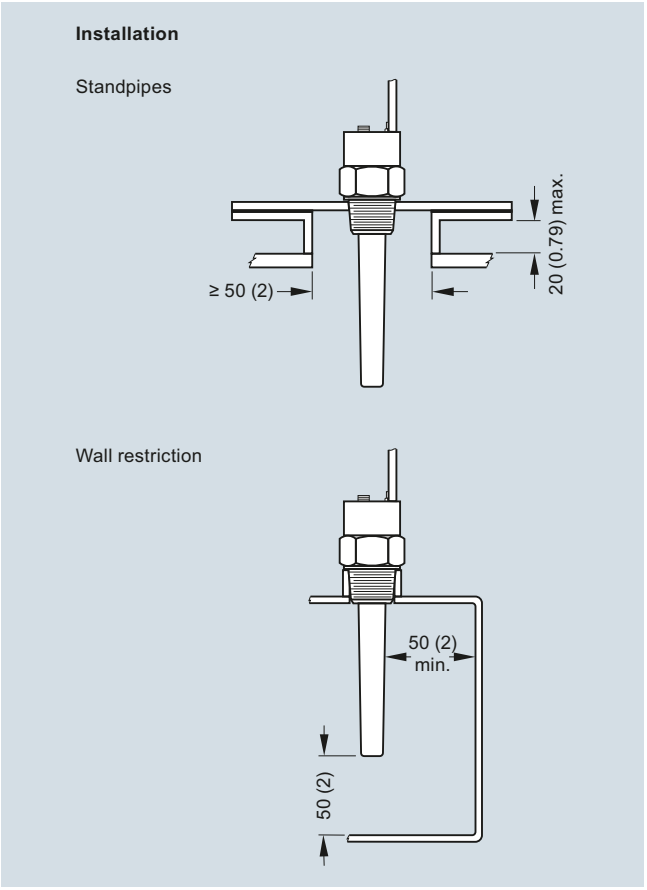
Pointek CLS100's short insertion length of 100 mm (4 inch) and versatility in various applications and in vessels or pipes makes it a good replacement for traditional capacitance sensors.

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



Pointek CLS100 installation, dimensions in mm (inch)

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 conditions [2]		
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		
	Enclosure/Integral cable version	Fully synthetic version
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
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 mm² (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	• General: CE, CSA, FM, C-TICK • 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)	• General: CSA, FM

[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).

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 detection in constricted spaces, interfaces, solids, liquids, slurries and foam		**7ML5501-** **0** ■■■■
Process connection		
¾" NPT [(Taper), ANSI/ASME B1.20.1]	⬟	**A**
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	⬟	**E**
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	⬟	**J**
Approvals		
General Purpose: CE, CSA, FM, C-TICK	⬟	**A**
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]	⬟	**C**
CSA/FM Class II and III, Div. 1, Groups E, F, G[1]	⬟	**G**
Device version		
Integral cable version (PPS probe)	⬟	**1**
Enclosure version (PPS probe), ½" NPT cable inlet	⬟	**3**
Integral cable version with PVDF probe body	⬟	**5**
Enclosure version with PVDF probe body (½" NPT cable inlet)	⬟	**6**
Enclosure version (PPS probe), M20 x 1.5 cable inlet	⬟	**7**
Enclosure version with PVDF probe body, M20 x 1.5 cable inlet	⬟	**8**
Overfill protection		
Not required	⬟	**0**
Required	⬟	**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		Article No.
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.		**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, ¾" NPT (PPS) Only available for CLS100 with ¾" NPT thread	**7ML1830-1DL**
Sensguard, R 1" (BSPT) (PPS) Only available for CLS100 with ¾" NPT thread	**7ML1830-1DM**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosures	**7ML1930-1AC**
Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia	**7NG4124-0AA00**
½" 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)	**7ML1830-1JA**
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)	**7ML1830-1JC**

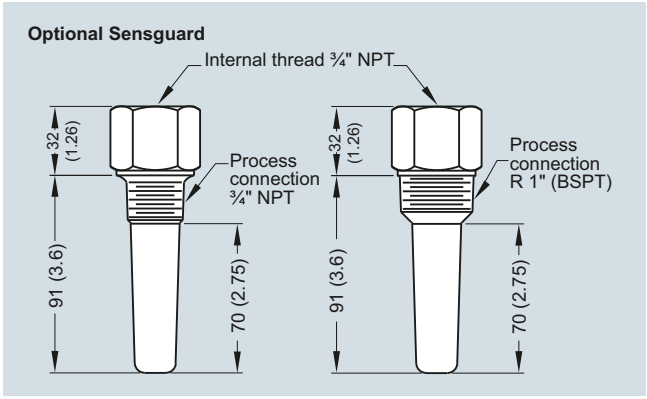
Selection and Ordering data		Article No.
Pointek CLS100, PPS process connection		**7ML5610-**
Compact 2-wire inverse frequency shift capacitance switch for level detection in constricted spaces, interfaces, solids, liquids, slurries and foam		**0** ■■■■
Process connection (PPS)		
¾" NPT [(Taper), ANSI/ASME B1.20.1] (PPS probe body)	⬟	**A**
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] (PPS probe body)	⬟	**B**
Approvals		
General Purpose: CSA, FM	⬟	**D**
Versions/Options		
Enclosure version, PPS process connection, ½" NPT cable inlet	⬟	**1**
Enclosure version, PPS process connection, M20 x 1.5	⬟	**2**
Overfill protection		
Not required	⬟	**0**
Required	⬟	**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		Article No.
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.		**A5E32146158**
Accessories		
Sensguard, ¾" NPT (PPS) Only available for CLS100 with ¾" NPT thread		**7ML1830-1DL**
Sensguard, R 1" (BSPT) (PPS) Only available for CLS100 with ¾" NPT thread		**7ML1830-1DM**
Tag, stainless steel, 12 x 45 mm, (0.47 x 1.77 inch) one text line, suitable for enclosures		**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

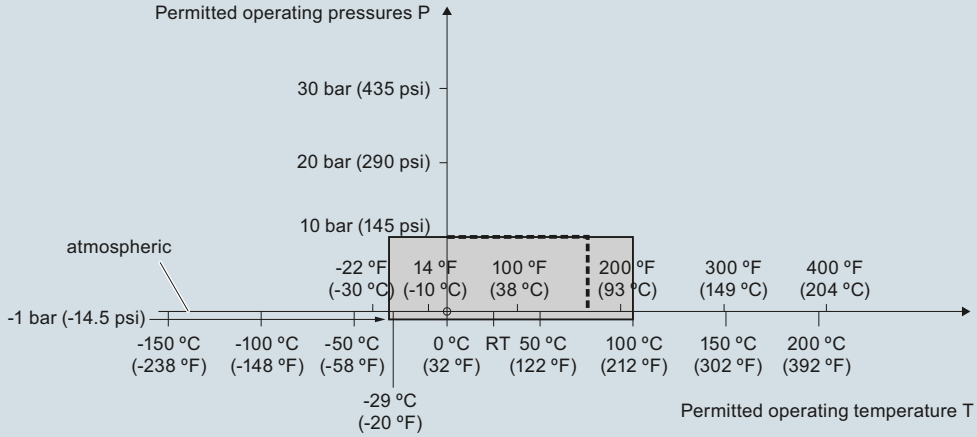


Optional Sensguard, dimensions in mm (inch)

Pointek CLS100

Characteristic curves

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

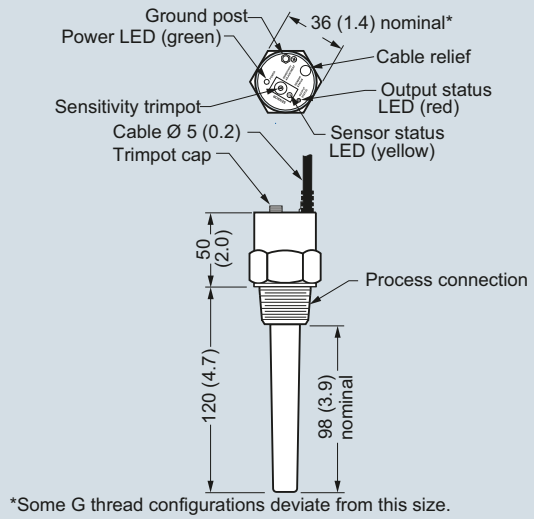


---- Example:
Permitted operating pressure = 10 bar (145 psi) at 75 °C

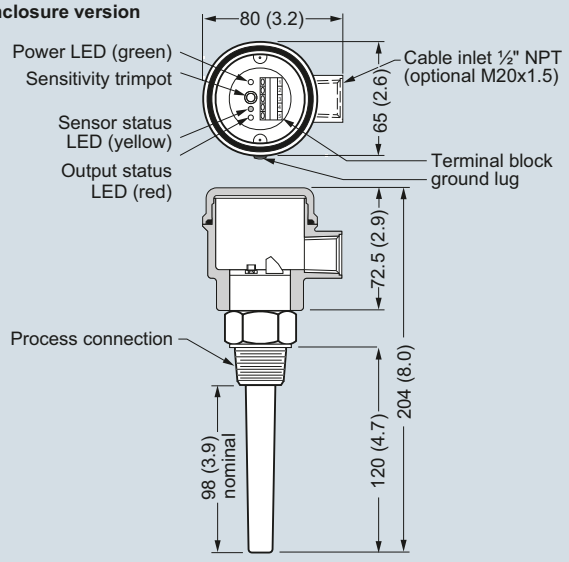
Pointek CLS100 Process Pressure/Temperature derating curves

Dimensional drawings

Integral cable version



Enclosure version

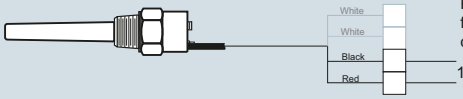


Pointek CLS100, dimensions in mm (inch)

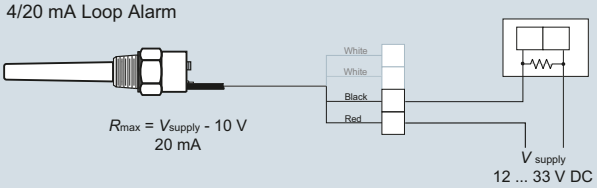
Schematics

Integral Cable Version - Non Intrinsically Safe only

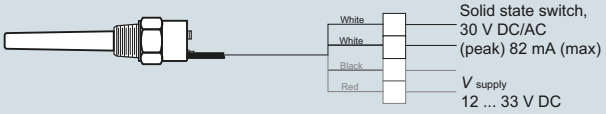
LOW/HIGH Alarm



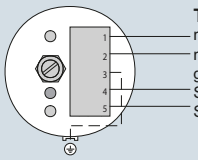
4/20 mA Loop Alarm



Solid State Switch Version



Enclosure and Fully Synthetic Version



Terminal operations	Cable equivalent
mA current loop (+V or -V)	Red wire
mA current loop (+V or -V)	Black wire
ground	Cable shield
Solid state switch/relay*	White wire
Solid state switch/relay*	White wire

* 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

Pointek CLS200 – Standard

Overview

Pointek CLS200 (standard version) is 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.

Benefits3

- 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

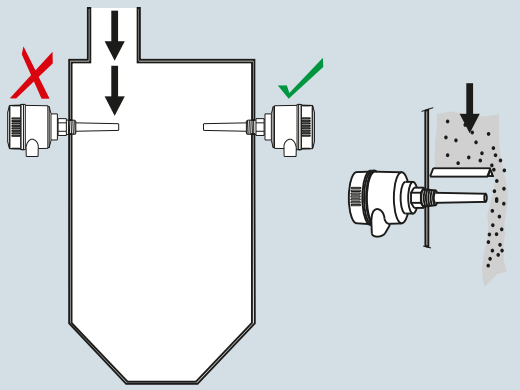
Pointek CLS200 standard version has 3 LED indicators with basic relay and solid-state switch alarms. Universal switch for solids/liquids and interface.

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

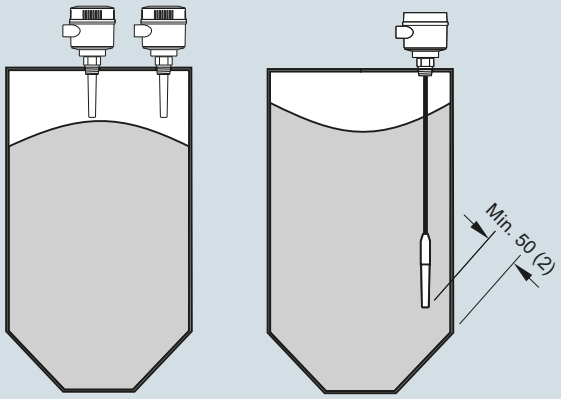
Configuration

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)

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 conditions[1]	
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	
• Enclosure	Epoxy-coated aluminum with gasket
• Optional thermal isolator	316L stainless steel
Connection	Removable terminal block, max. 2.5 mm²
Degree of protection	IP65/Type 4/NEMA 4 (optional IP68)
Cable inlet	2 x M20x1.5 thread (option: 2 x ½" 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, C-TICK
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 4/38.

[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 4/38.

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		**7ML5630-** ■■■■■ - ■■■ 0
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		
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		**7ML5630-** ■■■■■ - ■■■ 0
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		
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, C-TICK, ATEX II 1/2 D T100 °C	⬟	C
Flameproof Enclosure with IS Probe: CE, C-TICK, 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, C-TICK, 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, C-TICK)	⬟	J
General Purpose (CSA, FM, CE, C-TICK) 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.

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	**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 - Standard - Cable Version with Threaded or Flanged process connection Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		**7ML5631-** ■■■■■ - ■■■ **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**
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		
Extended cable, 3 000 mm (118.11 inch), length can be determined by customer on assembly[1)]	⬟	**A**
Extended cable, 6 000 mm (236.22 inch), length can be determined by customer on assembly[1)]	⬟	**B**
Add Order code Y01 and plain text: "Insertion length ... mm"		
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**

Selection and Ordering data		Article No.
Pointek CLS200 - Standard - Cable Version with Threaded or Flanged process connection Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		**7ML5631-** ■■■■ - ■■■ **0**
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]	⬟	**2**
With 5 m (197 inch) of cable[2]	⬟	**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		
Dust Ignition Proof: CE, C-TICK, ATEX II 1/2 D T100 °C	⬟	**C**
Flameproof Enclosure with IS Probe: CE, C-TICK, 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, C-TICK, 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, C-TICK)	⬟	**J**
General Purpose (CSA, FM, CE, C-TICK) with WHG approval	⬟	**K**
Enclosure and lid		
Aluminum epoxy coated		
2 x ½" NPT via adapter - cable inlet, IP65	⬟	**A**
2 x M20 x1.5 cable inlet, IP65	⬟	**B**
2 x ½" 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.

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.

4

Point level measurement – Capacitance switches

Pointek CLS200 – Standard

Selection and Ordering data		Article No.
Pointek CLS200 - Standard - Rod with Sanitary process connection		**7ML5632-** ■■■■■ - ■■■ **0**
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		
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, 110 ... 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 [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 - Rod with Sanitary process connection		**7ML5632-** ■■■■■ - ■■■ **0**
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		
Approvals		
Dust Ignition Proof: CE, C-TICK, ATEX II 1/2 D T100 °C	⬟	**C**
Flameproof Enclosure with IS Probe: CE, C-TICK, 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, C-TICK, 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, C-TICK)	⬟	**J**
General Purpose (CSA, FM, CE, C-TICK) 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.

Selection and Ordering data		Article No.
Pointek CLS200 - Standard - Sliding Coupling with Threaded process connection		**7ML5633-** ■■■■■ - ■■■ **0**
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		
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		**7ML5633-** ■■■■■ - ■■■ **0**
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		
Approvals		
Dust Ignition Proof: CE, C-TICK, ATEX II 1/2 D T100 °C	⬟	**C**
Flameproof Enclosure with IS Probe: CE, C-TICK, 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, C-TICK, 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, C-TICK)	⬟	**J**
General Purpose (CSA, FM, CE, C-TICK) 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.

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	**7ML5634-** ■■■■■ - ■■■ **0**
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces	
Process connection	
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 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, 200 ... 1 000 mm (7.87 ... 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**

Selection and Ordering data	Article No.
Pointek CLS200 - Standard - PFA Coated Rod with PFA Coated Flanged process connection	**7ML5634-** ■■■■■ - ■■■ **0**
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces	
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	
PFA Coated 316L stainless steel with PPS probe body	**0**
PFA Coated 316L stainless steel with PVDF probe body	**1**
Approvals	
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**
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**

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**

Overview

Pointek CLS200 (digital version) is 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. 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.

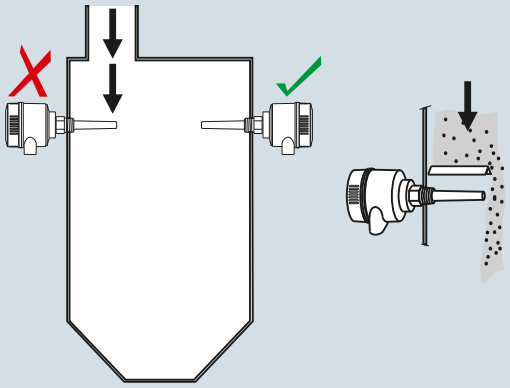
When connected to the PROFIBUS network, advanced diagnostics and set up using SIMATIC PDM are possible.

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).

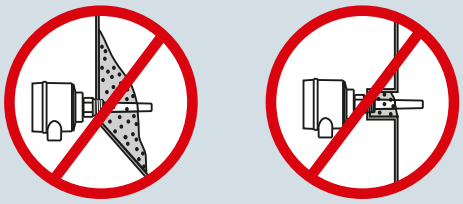
- Key Applications: liquids, slurries, powders, granules, pressurized applications, hazardous areas

Configuration

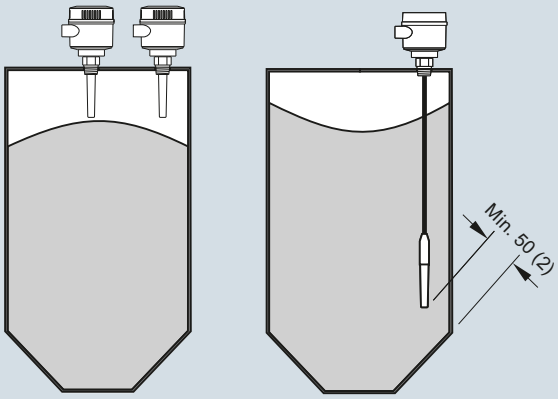
Installation



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)

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 conditions[1]	
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 mm²
• Degree of protection	IP65/Type 4/NEMA 4 (optional IP68)
• Cable inlet	2 x M20x1.5 thread (option: 2 x ½" 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, C-TICK
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
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 4/38.

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 4/38.

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

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).

Point level measurement – Capacitance switches

Pointek CLS200 – Digital

Selection and Ordering data		Article No.
Pointek CLS200 - Digital - Rod with Threaded or Flanged process connection		**7ML5640-** ■■■■■ - ■■■ 0
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		
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		**7ML5640-** ■■■■■ - ■■■ 0
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		
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	⬟	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, C-TICK, ATEX II 3 G Ex nA II T6...T4, ATEX II 2 D IP6X T100 °C	⬟	B
Dust Ignition Proof: CE, C-TICK, ATEX II 1/2 D T100 °C	⬟	C
Intrinsically Safe:[1] CE, C-TICK, ATEX II 1 G EEx ia IIC T6...T4, ATEX II 1/2 D IP6X T100 °C	⬟	D
Flameproof Enclosure with IS Probe: CE, C-TICK, 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, C-TICK)	⬟	L
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] 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		**7ML5641-** ■■■■■ - ■■■ **0**
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		
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		
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 determinded by customer on assembly	⬟	**B**
Add Order code Y01 and plain text: "Insertion length ... mm"		
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**

Pointek CLS200 – Digital

Selection and Ordering data		Article No.
Pointek CLS200 - Digital - Cable with Threaded or Flanged process connection Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		**7ML5641-** ■■■■ - ■■■ **0**
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, C-TICK, ATEX II 3 G Ex nA II T6...T4, ATEX II 2 D IP6X T100 °C	⬟	**B**
Dust Ignition Proof: CE, C-TICK, ATEX II 1/2 D T100 °C	⬟	**C**
Intrinsically Safe:[1] CE, C-TICK, ATEX II 1 G EEx ia IIC T6...T4, ATEX II 1/2 D IP6X T100 °C	⬟	**D**
Flameproof Enclosure with IS Probe: CE, C-TICK, 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, C-TICK)	⬟	**L**
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] 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 - Rod with Sanitary process connection Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		**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		**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, 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, C-TICK, ATEX II 3 G Ex nA II T6...T4, ATEX II 2 D IP6X T100 °C	⬟	**B**
Dust Ignition Proof: CE, C-TICK, ATEX II 1/2 D T100 °C	⬟	**C**
Intrinsically Safe:[1)] CE, C-TICK, ATEX II 1 G EEx ia IIC T6...T4, ATEX II 1/2 D IP6X T100 °C	⬟	**D**
Flameproof Enclosure with IS Probe: CE, C-TICK, 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 switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		**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, C-TICK)	⬟	**L**
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)] 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.

Point level measurement – Capacitance switches

Pointek CLS200 – Digital

Selection and Ordering data		Article No.
Pointek CLS200 - Digital - Rod with Sliding coupling with Threaded process connection Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		**7ML5643-** ■■■■■ - ■■■ **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 (13.82 ... 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, C-TICK, ATEX II 3 G Ex nA II T6...T4, ATEX II 2 D IP6X T100 °C	⬟	**B**
Dust Ignition Proof: CE, C-TICK, ATEX II 1/2 D T100 °C	⬟	**C**
Intrinsically Safe:[1)] CE, C-TICK, 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 switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		**7ML5643-** ■■■■■ - ■■■ **0**
Flameproof Enclosure with IS Probe: CE, C-TICK, 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, C-TICK)	⬟	**L**
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)] 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**

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - PFA Rod with PFA Flanged process connection Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces	**7ML5644-** ■■■■■ - ■■■ **0**
Process connection	
Welded flange, PFA coated, 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, PFA coated, 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 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, 200 ... 1 000 mm (7.87 ... 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**

Selection and Ordering data	Article No.
Pointek CLS200 - Digital - PFA Rod with PFA Flanged process connection Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces	**7ML5644-** ■■■■■ - ■■■ **0**
Wetted seals	
FKM	**0**
FFKM [for process temperatures above -20 °C (-4 °F)]	**1**
Probe material	
PFA Coated 316L stainless steel with PPS probe body	**0**
PFA Coated 316L stainless steel with PVDF probe body	**1**
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	**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**
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**

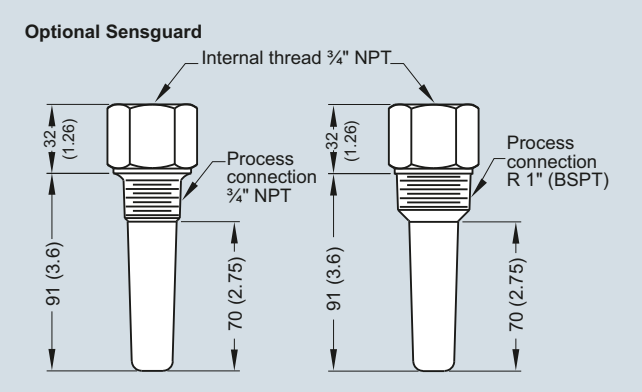
[1)] Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection

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**

Pointek CLS200 – Standard and Digital

Selection and Ordering data	Article No.
Operating Instructions - Standard	
English	**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, ¾" NPT (PPS) Only available for CLS200 with ¾" NPT thread	**7ML1830-1DL**
Sensguard, R 1" (BSPT) (PPS) Only available for CLS200 with ¾" 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 4/82**

Options

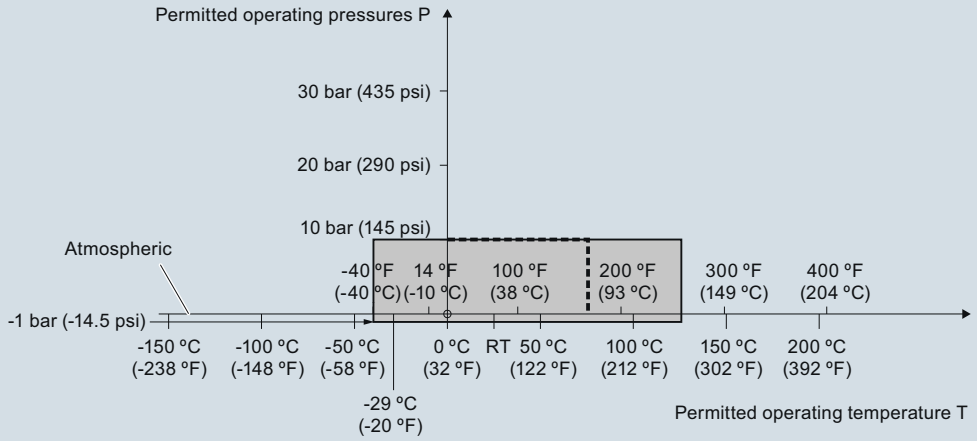


Optional Sensguard, dimensions in mm (inch)

Pointek CLS200 – Standard and Digital

Characteristic curves

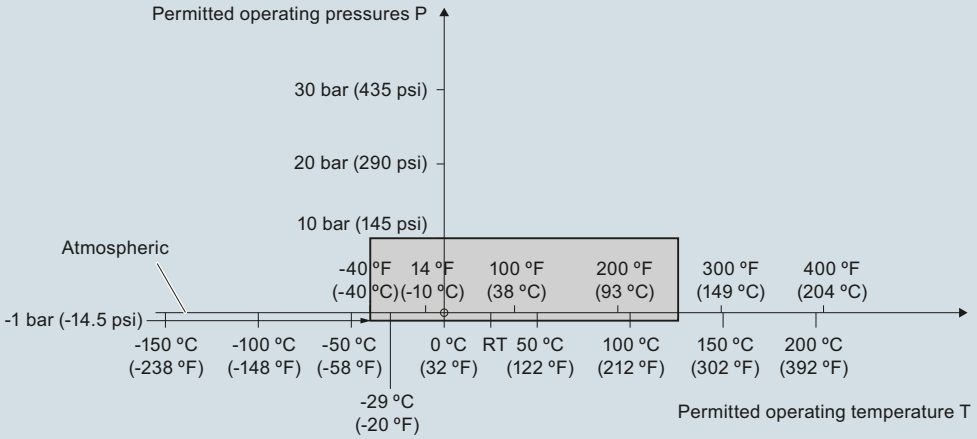
Pressure/temperature curve
CLS200 sliding coupling
threaded process connections
(7ML5633 and 7ML5643)



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

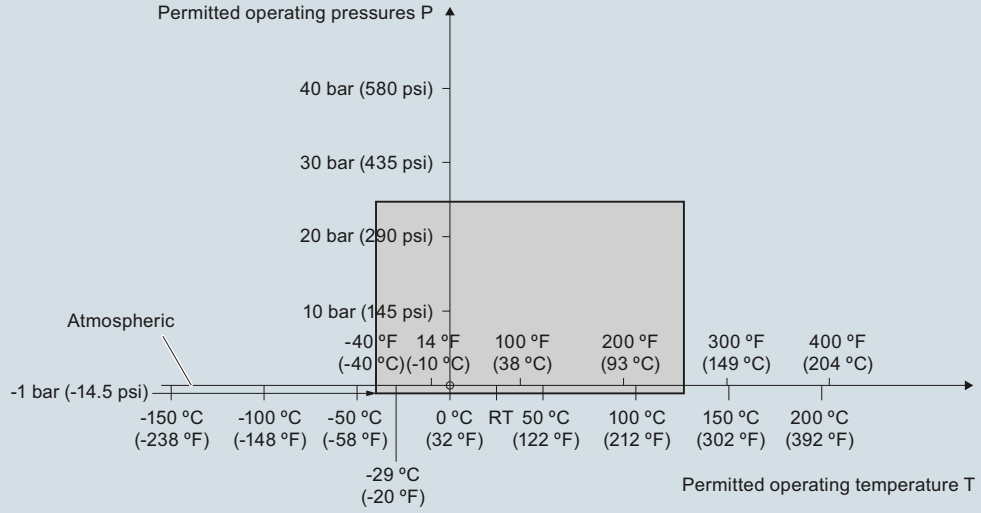
Pointek CLS200 Process Pressure/Temperature derating curves (7ML5633 and 7ML5643)

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



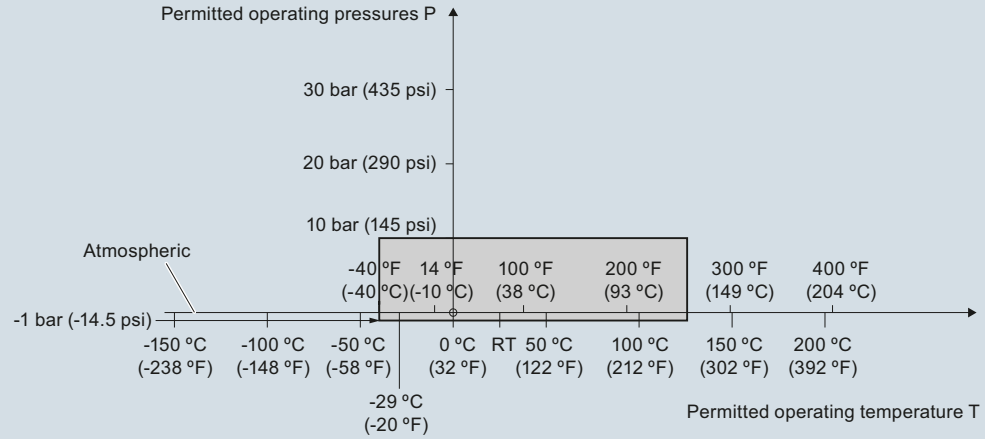
Pointek CLS200 Process Pressure/Temperature derating curves (7ML5631 and 7ML5641)

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



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

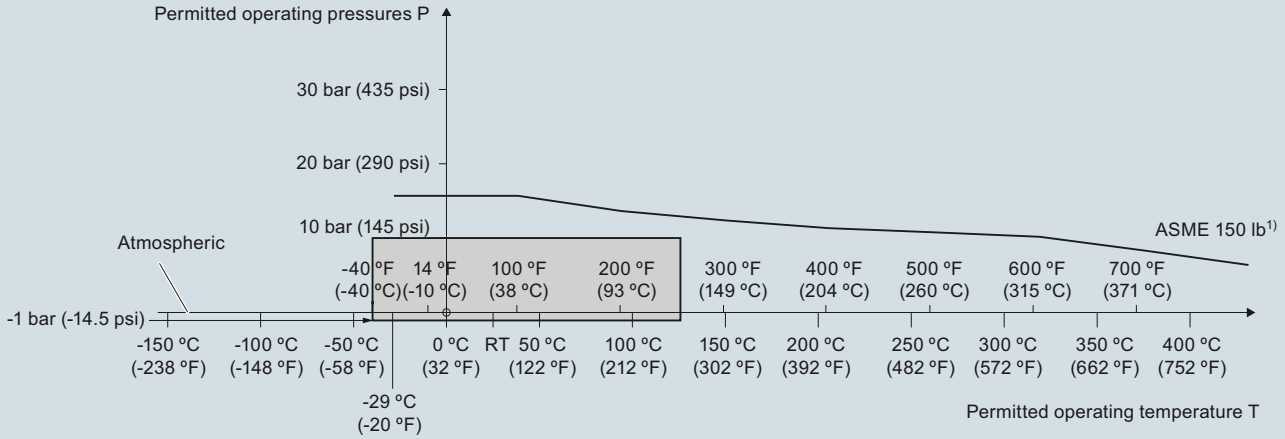
Pressure/temperature curve
CLS200 compact and extended sanitary type
Sanitary process connections
(7ML5632 and 7ML5642)



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

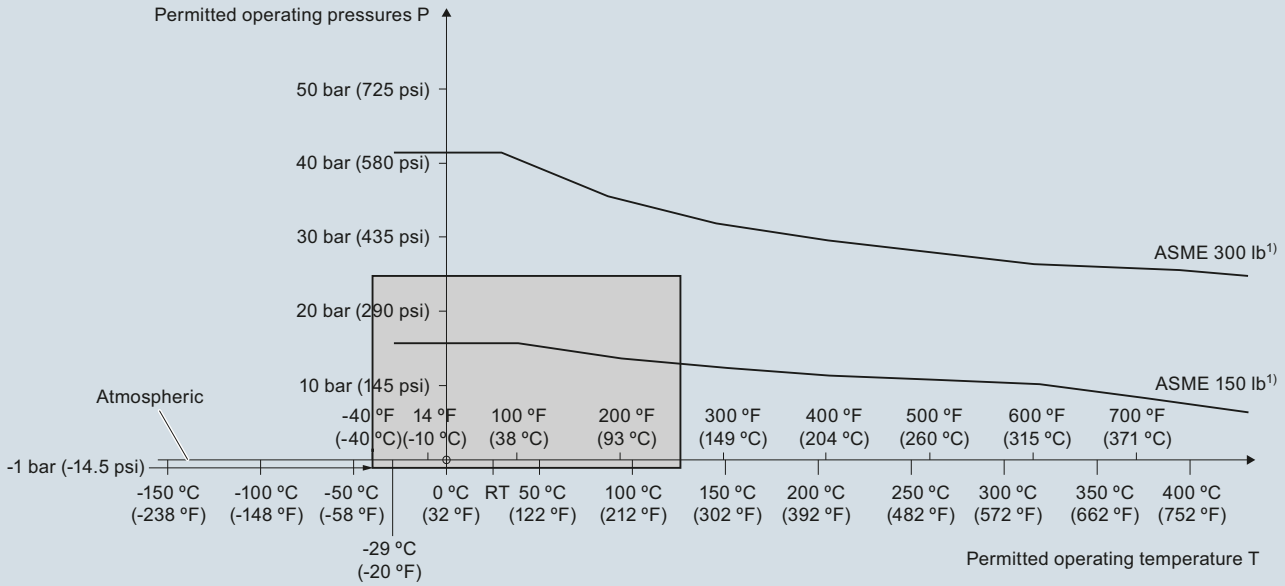
Pointek CLS200 – Standard and Digital

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



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

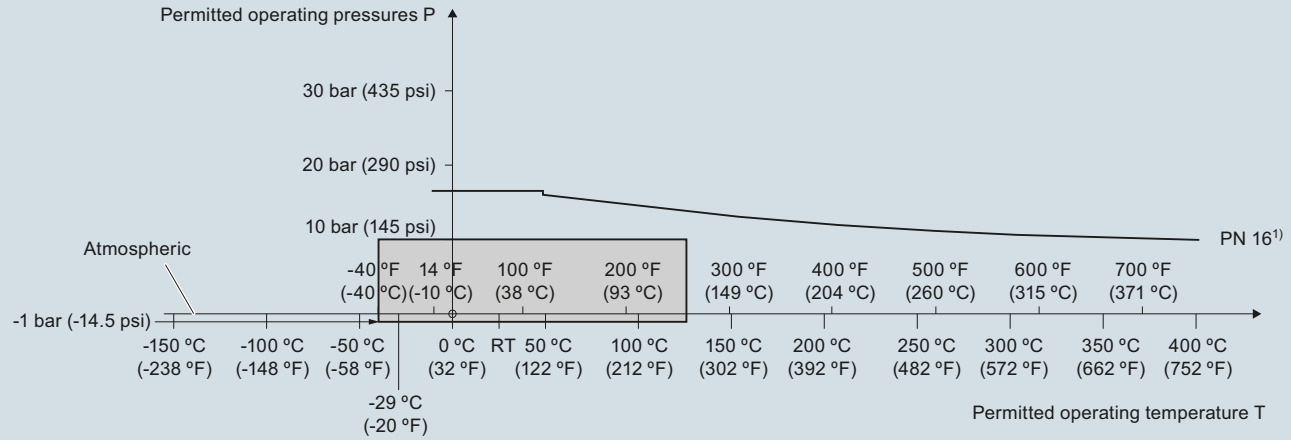
Pressure/temperature curve
CLS200 compact and extended rod
ASME flanged process connections
(7ML5630 and 7ML5640)



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

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

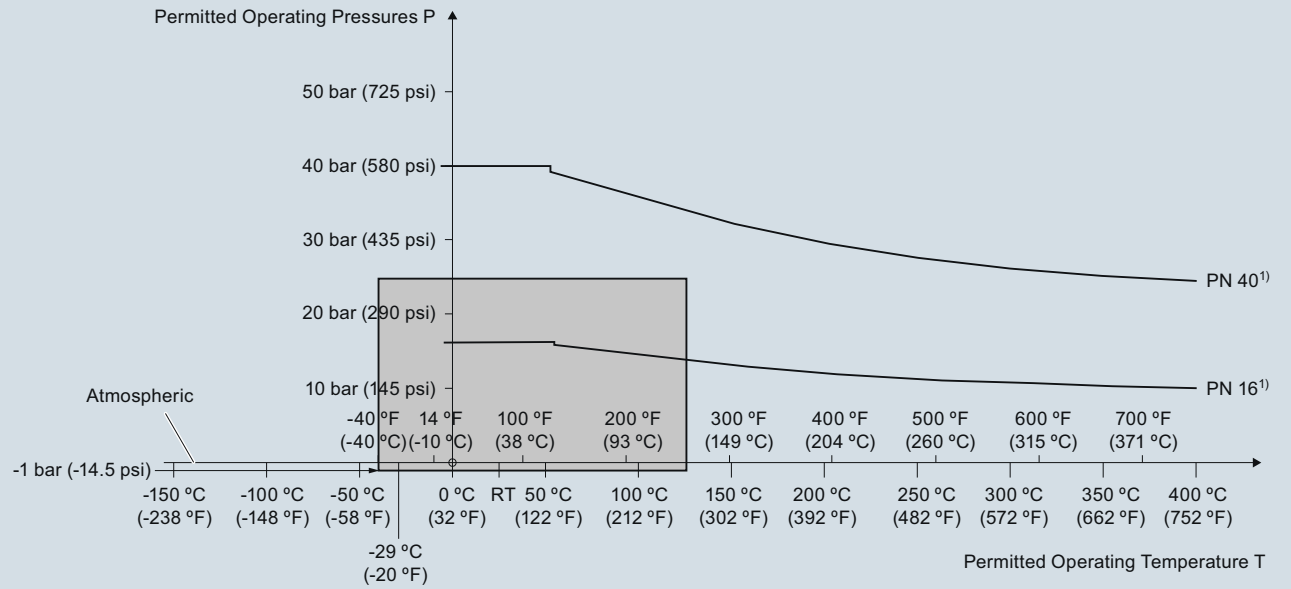
Pressure/temperature curve
CLS200 cable
EN flanged process connections
(7ML5631 and 7ML5641)



[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)

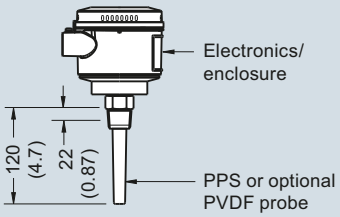


[1)] The curve denotes the minimum allowable flange class for the shaded area below.

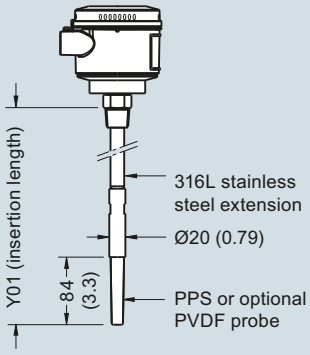
Pointek CLS200 Process Pressure/Temperature derating curves (7ML5630 and 7ML5640)

Dimensional drawings

Compact version
Threaded
(7ML5630 and 7ML5640)

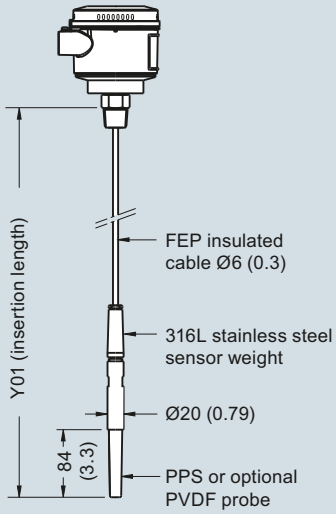


Extended rod version
Threaded
(7ML5630 and 7ML5640)



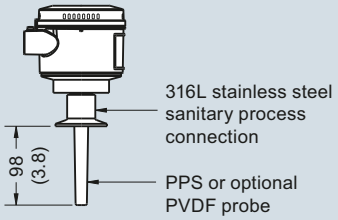
Min. insertion length = 200 (7.87)
Max. insertion length = 5 500 (216)

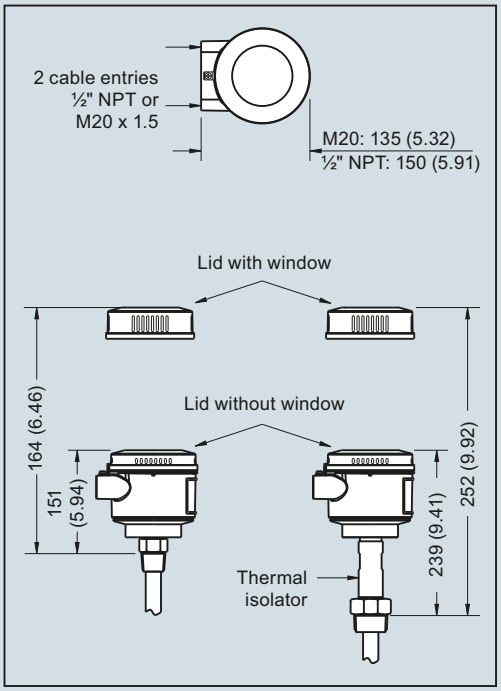
Extended cable version
Threaded
(7ML5631 and 7ML5641)



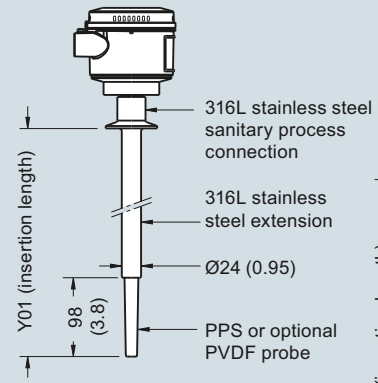
Min. insertion length = 500 (19.69)
Max. insertion length = 30 000 (1 181)
Applicable for liquids and solids applications. Cable can be shortened on site.

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



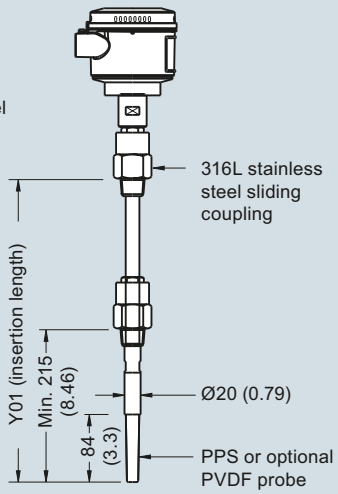


Sanitary extended version
Sanitary fitting
(7ML5632 and 7ML5642)



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

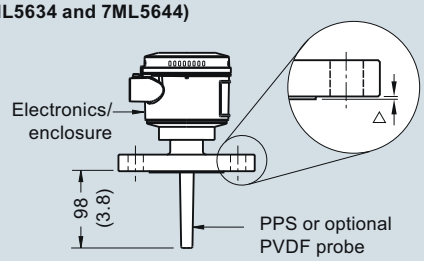
Sliding coupling version
Threaded
(7ML5633 and 7ML5643)

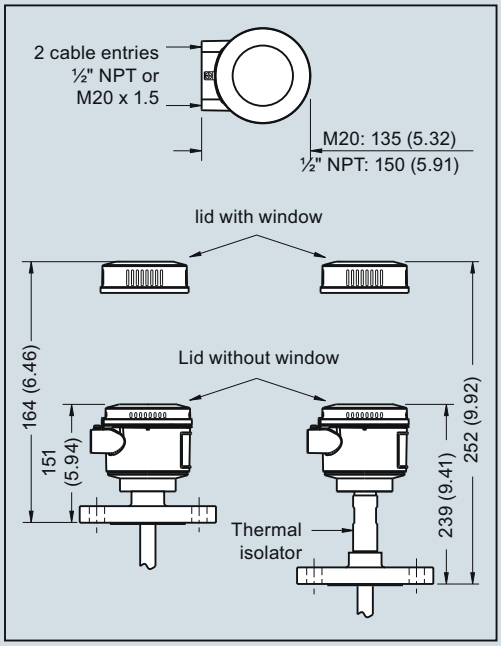


Min. insertion length = 350 (13.82)
Max. insertion length = 5 500 (216)

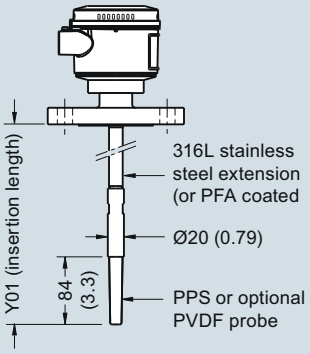
Pointek CLS200 - Threaded/sanitary process connections, dimensions in mm (inch)

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



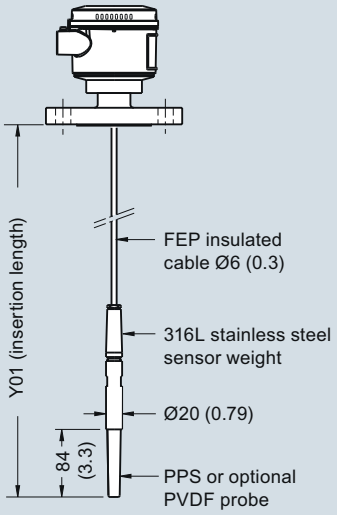


Extended rod version
Welded Flange (7ML5630 and 7ML5640)
Welded Flange, PFA coated
(7ML5634 and 7ML5644)



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)

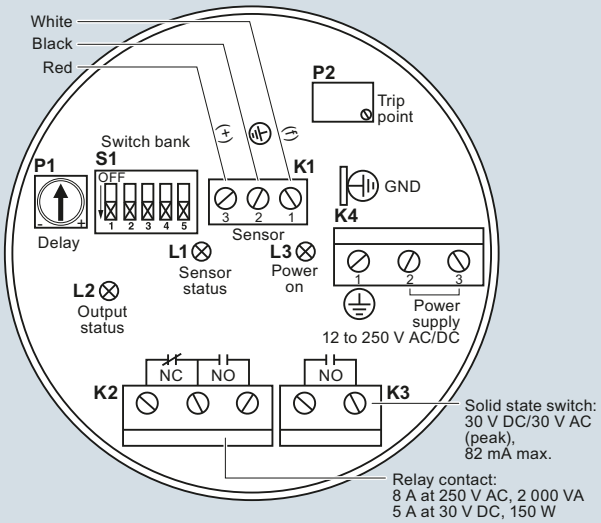
Insertion length does not include any raised face/gasket face dimension (see Flange Facing Table above)

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

Pointek CLS200 – Standard and Digital

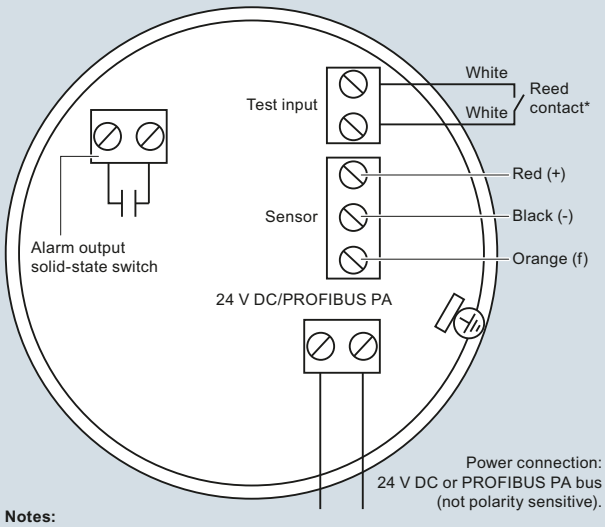
Schematics

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

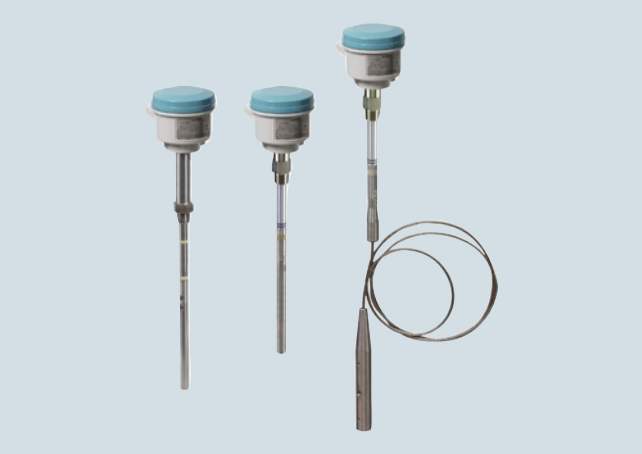


Notes:
Refer to the instruction manual or contact a Siemens representative for detailed wiring information.

***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

Overview



Pointek CLS300 (standard version) is an 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.

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)

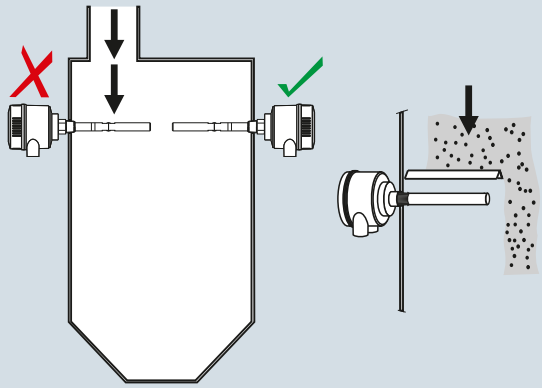
Application

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.

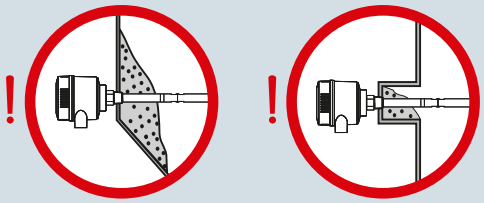
- Key Applications: liquids, slurries, bulk solids, relatively high pressure and temperature, hazardous areas, milling and mining applications

Configuration

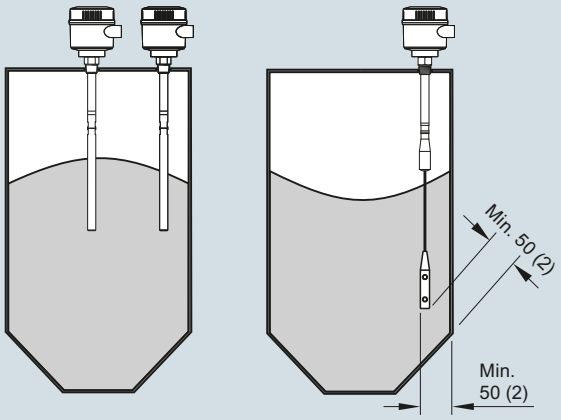
Installation



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)

4

Pointek CLS300 – 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
Accuracy	
Resolution	
• Min. sensitivity (pF)	1 % change in actual capacitance
• Max. temperature error	0.2 % of actual capacitance value
Rated operating conditions[1]	
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 ½" NPT conduit entry including 1 plugged entry)
Controls and displays	
Displays	3 LEDs, for probe status, output status and power supply
Potentiometers	2 potentiometers for time delay and sensitivity
Switches	5 DIP switches for delay on/off, fail-safe high/low, time delay test/adjust, high/low sensitivity, test delay settings
Power supply	
Supply	12 ... 250 V AC/DC, 0 ... 60 Hz, galvanically isolated, 2 W
Certificates and approvals	
General Purpose	CSA, FM, CE, C-TICK
Flameproof Enclosure with IS Probe	ATEX II 1/2 G EEx d[ia] IIC T6...T1 ATEX II 1/2 D T100 °C
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
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 (Belgium)
Others	Pattern Approval (China)

[1] When operation is in areas classified as hazardous, observe restrictions according to relevant certificate.
See also Pressure/Temperature curves starting on page 4/60.

[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 4/60.

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.

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 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.		
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 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		6 K
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 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.		
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, C-TICK, ATEX II 1/2 D T100 °C	⬟	C
Flameproof Enclosure with IS Probe: CE, C-TICK, 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, C-TICK, 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, C-TICK)	⬟	J
General Purpose with WHG approval (CSA, FM, CE, C-TICK)	⬟	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
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.

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 4/59**
Accessories		**See page 4/59**

⬟ 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 - Cable Version with Threaded or Flanged process connection 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.		**7ML5651-** ■■■■■ - ■■■■
Process connection Threaded, 316L stainless steel		
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	⬟	**0 C**
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**
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 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		**6 K**
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**
Thermal isolator		
Without thermal isolator	⬟	**0**
With thermal isolator [for process connection temperatures over 85 °C (185 °F)]	⬟	**1**

4

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 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.		■■■■■ - ■■■■
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, C-TICK, ATEX II 1/2 D T100 °C	⬟	C
Flameproof Enclosure with IS Probe: CE, C-TICK, 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, C-TICK, 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, C-TICK)	⬟	J
General Purpose with WHG approval (CSA, FM, CE, C-TICK)	⬟	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
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 4/59**
Accessories		**See page 4/59**

Selection and Ordering data		Article No.
Pointek CLS300 - Standard - High Temperature Rod Version with Threaded or Flanged process connection		**7ML5652-** **0** **-**
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.		
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		
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-** **0** **-**
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.		
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, C-TICK, ATEX II 1/2 D T100 °C	⬟	**C**
Flameproof Enclosure with IS Probe: CE, C-TICK, 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, C-TICK, 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, C-TICK)	⬟	**J**
General Purpose with WHG approval (CSA, FM, CE, C-TICK)	⬟	**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**
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.

4

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 4/59**
Accessories	**See page 4/59**

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

Overview

Pointek CLS300 (digital version) is an 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. 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.

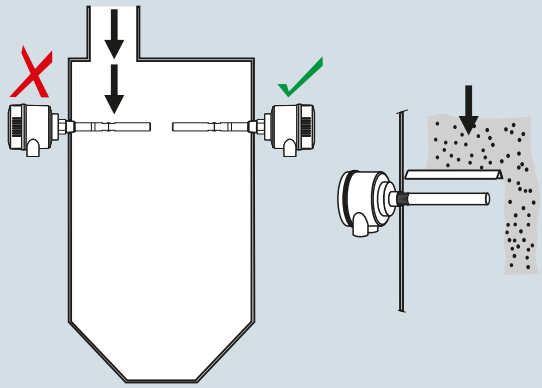
Wetted parts are made of stainless steel with a PFA shield for high chemical resistance, and of ceramic and stainless steel for high temperature version. Materials with low or high dielectric constants can be accurately detected. The unique Active Shield suppresses interference from material buildup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

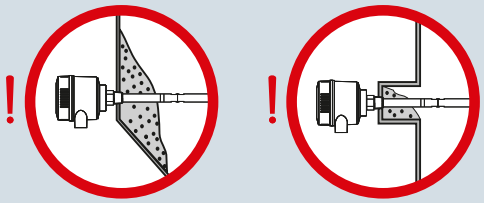
- Key Applications: liquids, slurries, bulk solids, relatively high pressure and temperature, hazardous areas, milling and mining applications

Configuration

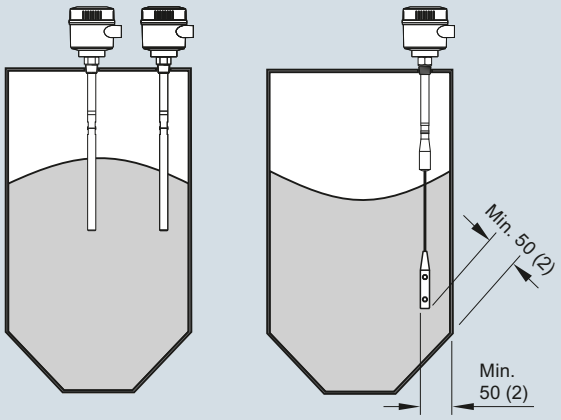
Installation



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)

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 conditions[1]	
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 ½" NPT conduit entry including 1 plugged entry)

Controls and displays	
Local display	LCD
Configuration	• Locally, using 3 button keypad (for standalone operation) • Remotely, using SIMATIC PDM (for installation on a network)
Power supply	
Bus voltage (at process connection)	• Standard: 12 ... 30 V DC • Intrinsically Safe: 12 ... 24 V DC
Current consumption	12.5 mA
Certificates and approvals	
General Purpose	CSA, FM, CE, C-TICK
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 4/60.

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 4/60.

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

Selection and Ordering data		Article No.
Pointek CLS300 - Digital - Rod with Threaded or Flanged process connection		**7ML5660-**
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.		
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		
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 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.		
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, C-TICK, ATEX II 1/2 D, 2 D IP6X T100 °C	⬟	B
Intrinsically Safe[1] CE, C-TICK, 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, C-TICK, 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, C-TICK)	⬟	J
Enclosure andLid		
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
Active shield length		
Standard length - (125 mm threaded, 105 mm flanged)	⬟	0
Extended shield - (250 mm threaded, 230 mm flanged)[2]	⬟	1
Extended shield - (400 mm threaded, 380 mm flanged)[3]	⬟	2

[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.

Pointek CLS300 – Digital

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 4/59**
Accessories	**See page 4/59**

⬟ 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 - Digital - Cable with Threaded or Flanged process connection		**7ML5661-** ■■■■■ - ■■■■
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		
Process connection		
Threaded, 316L stainless steel		
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	⬟	**0 C**
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**
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 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)		**6 K**
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**

Selection and Ordering data		Article No.
Pointek CLS300 - Digital - Cable with Threaded or Flanged process connection		**7ML5661-** ■■■■ - ■■■■
Versatile inverse frequency shift capacitance level switch with optional process connection choices and configurable output, ideal for detection of liquids, solids, slurries, foam, and interfaces		
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: CE, C-TICK, ATEX II 1/2 D, 2 D IP6X T100 °C	⬟	B
Intrinsically Safe[1] CE, C-TICK, 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, C-TICK, ATEX II 1/2 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C	⬟	D
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, C-TICK)	⬟	J
Enclosure andILid		
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
Active shield length		
Standard length - (125 mm threaded, 105 mm flanged)	⬟	0
Extended shield - 250 mm threaded, 230 mm flanged)[2]	⬟	1
Extended shield - (400 mm threaded, 380 mm flanged)[2]	⬟	2

[1] Barrier or Intrinsically Safe power supply required for Intrinsically Safe protection

[2] Available with Probe version options A, B and, 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 4/59**
Accessories	**See page 4/59**

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

Point level measurement – Capacitance switches

Pointek CLS300 – Digital

Selection and Ordering data		Article No.
Pointek CLS300 - Digital - High Temperature Rod version with Threaded or Flanged process connection		**7ML5662-**
		0 -
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.		
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		
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**
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: CE, C-TICK, ATEX II 1/2 D, 2 D IP6X T100 °C	⬟	**B**
Intrinsically Safe[1] CE, C-TICK, 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, C-TICK, ATEX II 1/2 G EEx d[ia] IIC T6...T4, ATEX II 1/2 D T100 °C	⬟	**D**
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, C-TICK)	⬟	**J**
Enclosure andlLid		
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**
Active shield length		
Standard length - (125 mm threaded, 105 mm flanged)	⬟	**0**
Extended shield - (250 mm threaded, 230 mm flanged)[2]	⬟	**1**
Extended shield - (400 mm threaded, 380 mm flanged)[3]	⬟	**2**

[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.

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 4/59**
Accessories	**See page 4/59**

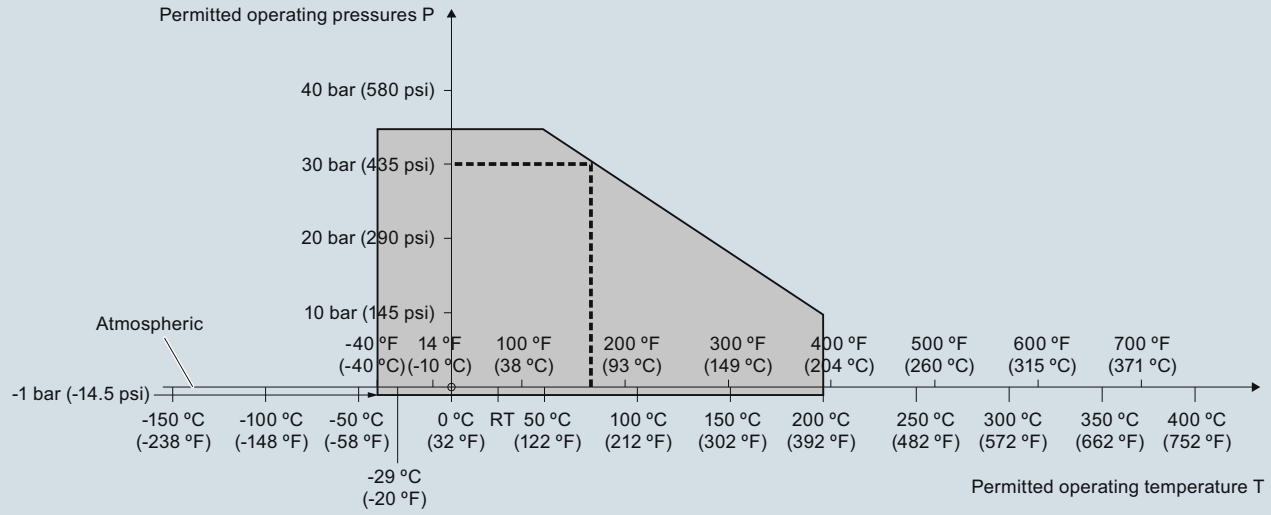
⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

Selection and Ordering data	Article No.
Operating Instructions - Standard	
English	**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**
French	**7ML1998-5JJ11**
German	**7ML1998-5JJ34**
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	
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 4/82**

4

Characteristic curves

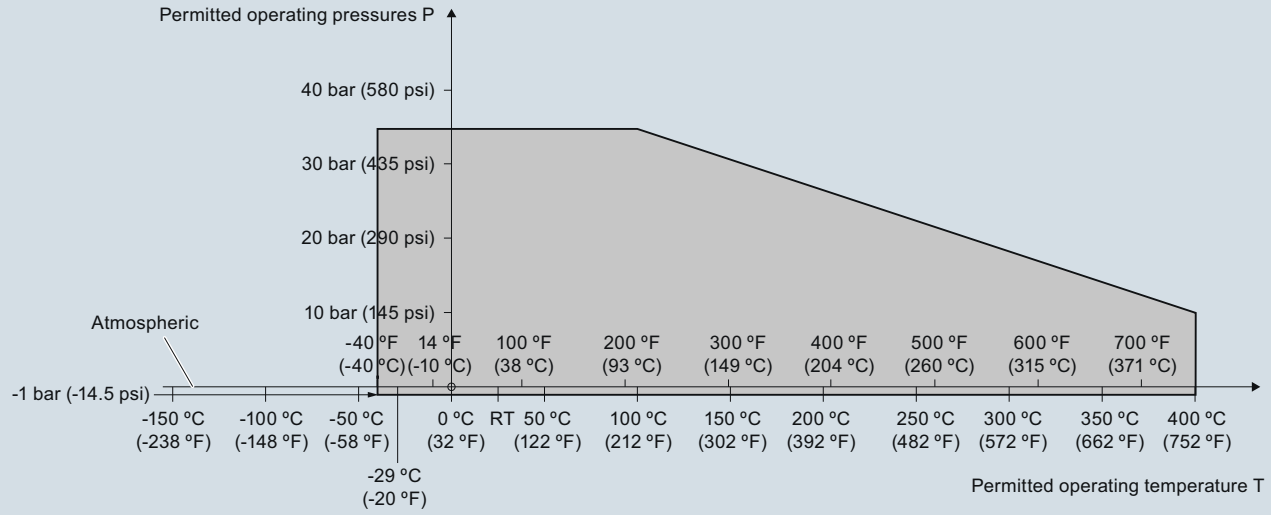
Pressure/temperature curve
CLS300 extended rod and cable probes
Threaded process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)



Example:
Permitted operating pressure = 30 bar (435 psi) at 75 °C

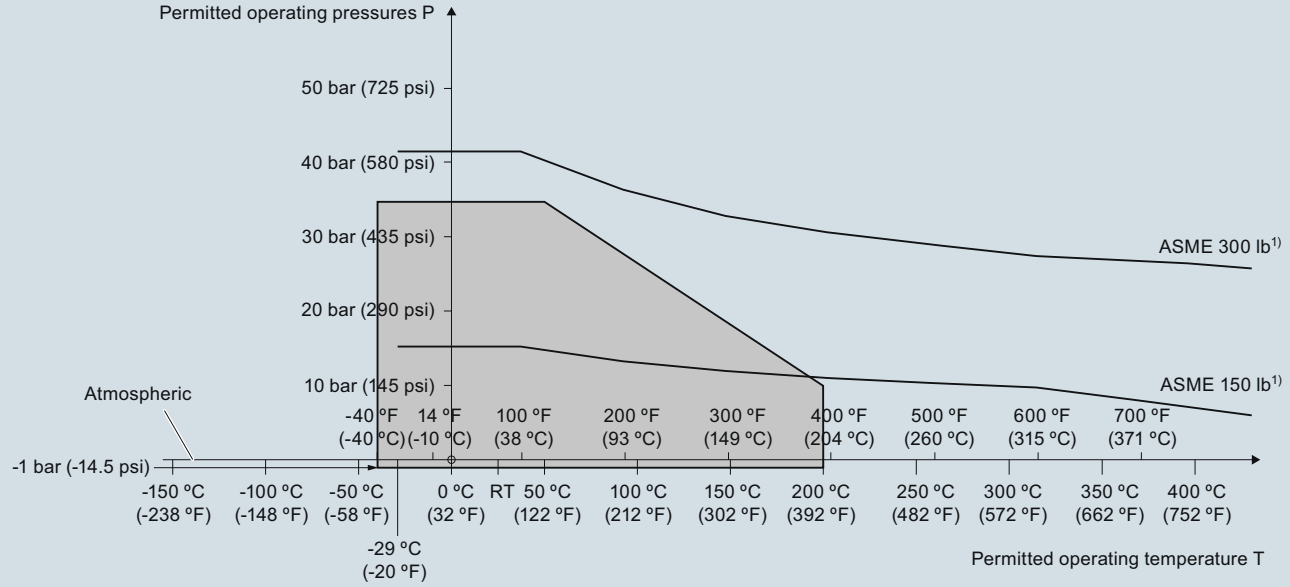
Pointek CLS300 Process Pressure/Temperature derating curves (7ML5650, 7ML5651, 7ML5660 and 7ML5661)

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



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

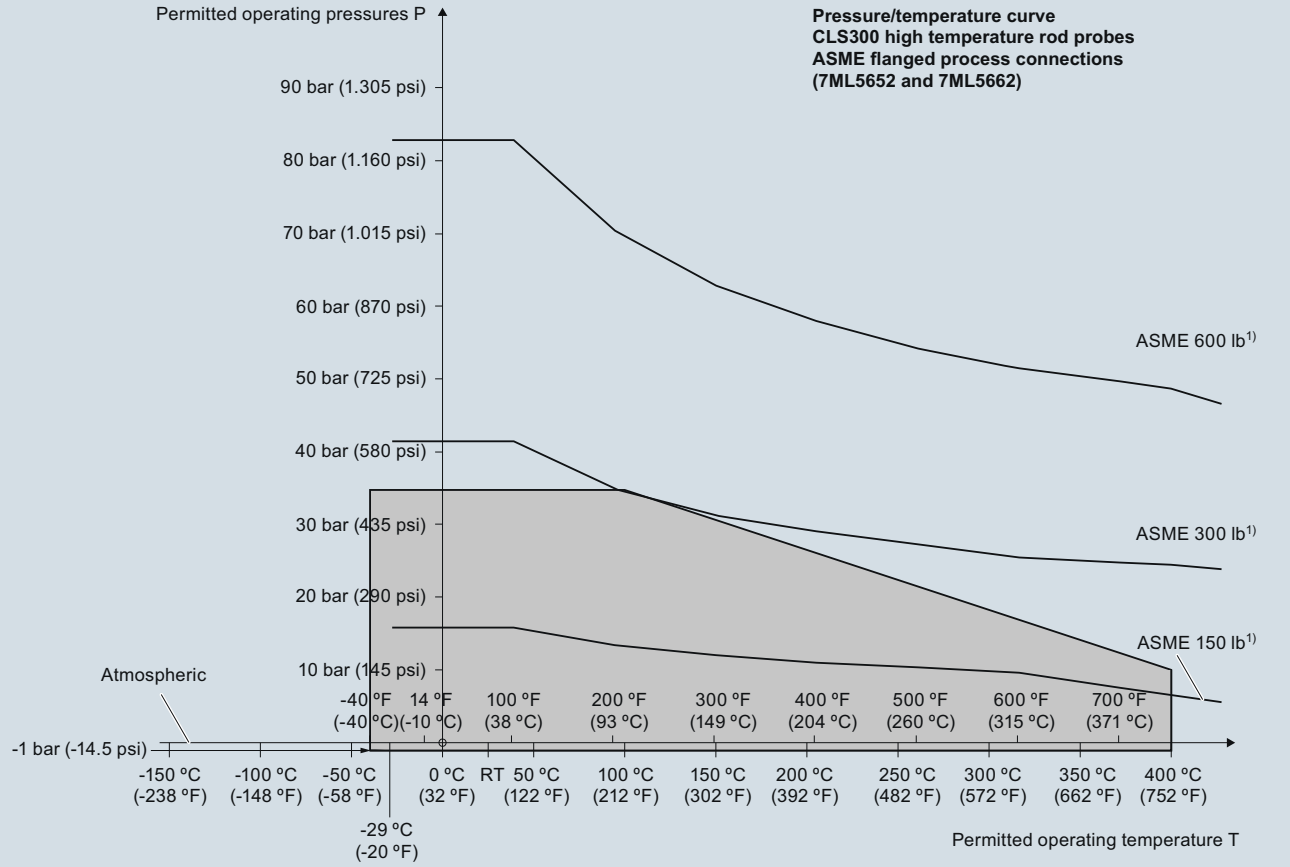
Pressure/temperature curve
CLS300 extended rod and cable probes
ASME flanged process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)



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)

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

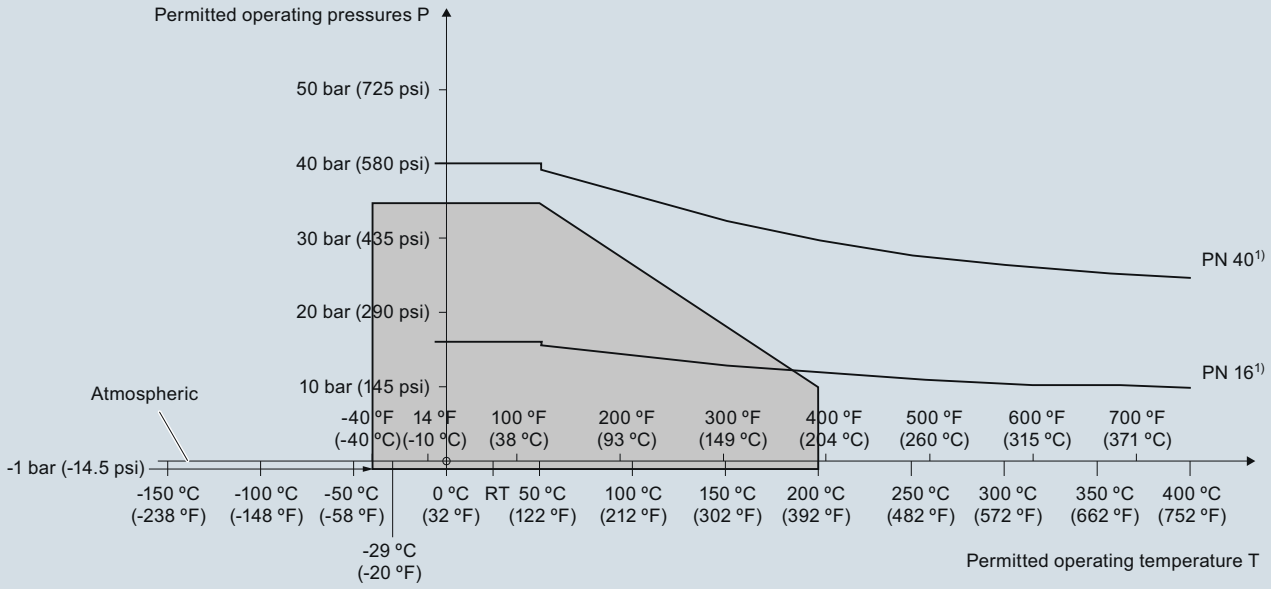


1) The curve denotes the minimum allowable flange class for the shaded area below.

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

Pointek CLS300 – Standard and Digital

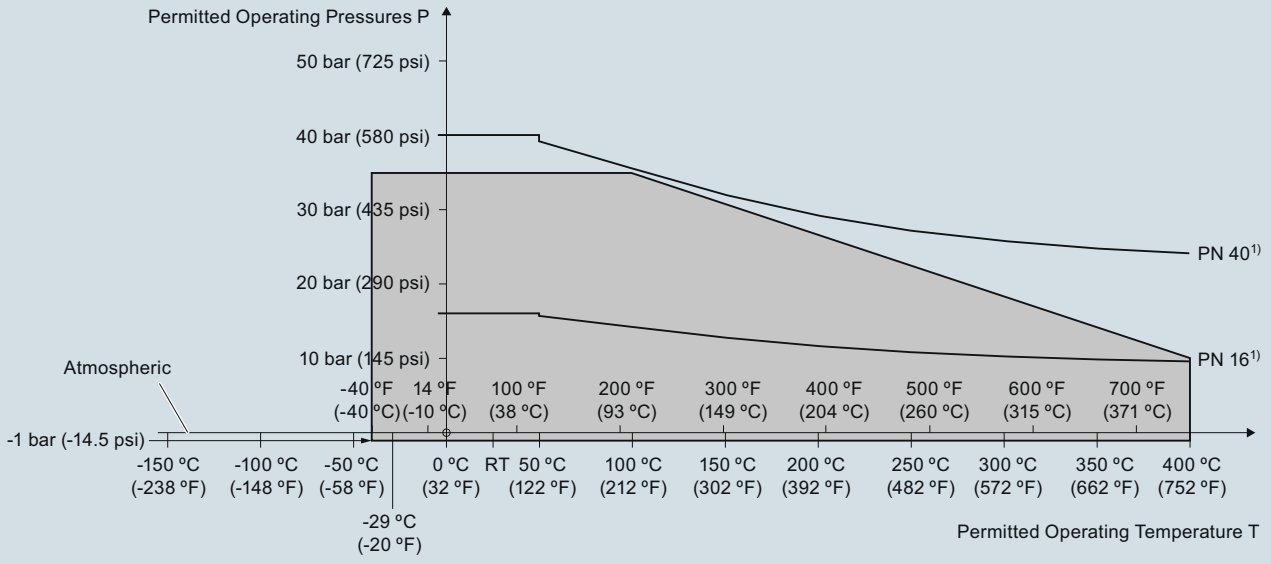
Pressure/temperature curve
CLS300 extended rod and cable probes
EN flanged process connections
(7ML5650, 7ML5651, 7ML5660 and 7ML5661)



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)

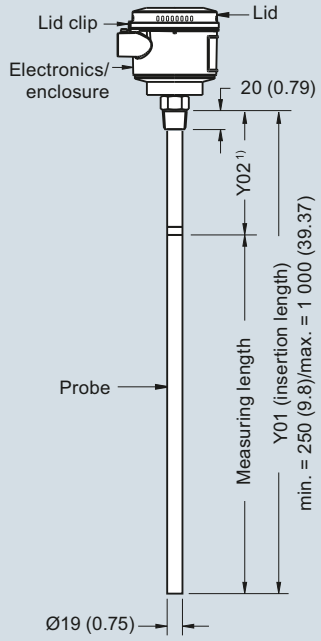


1) The curve denotes the minimum allowable flange class for the shaded area below.

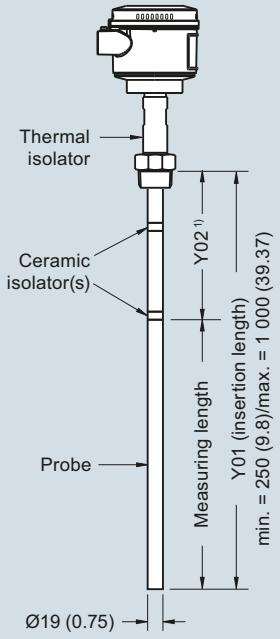
Pointek CLS300 Process Pressure/Temperature derating curves (7ML5652 and 7ML5662)

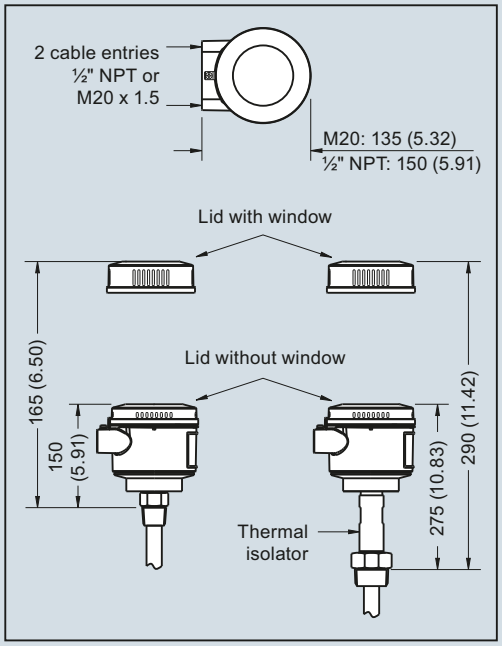
Dimensional drawings

Rod version
Threaded (7ML5650 and 7ML5660)

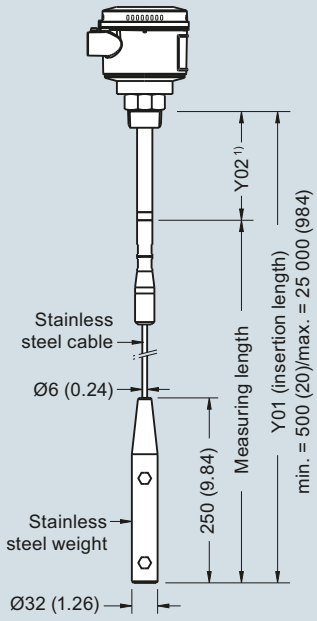


High temperature rod version
Threaded (7ML5652 and 7ML5662)

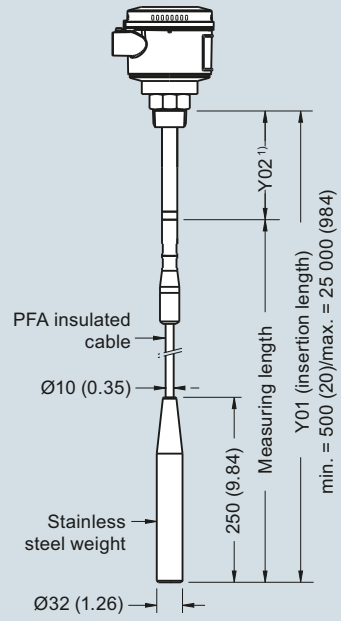




Cable version, non-insulated
Threaded (7ML5651 and 7ML5661)



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



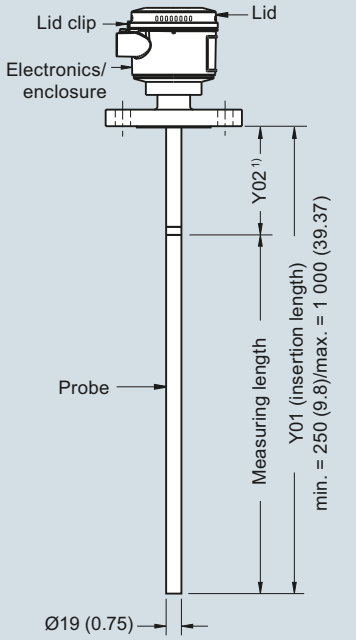
Note:

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

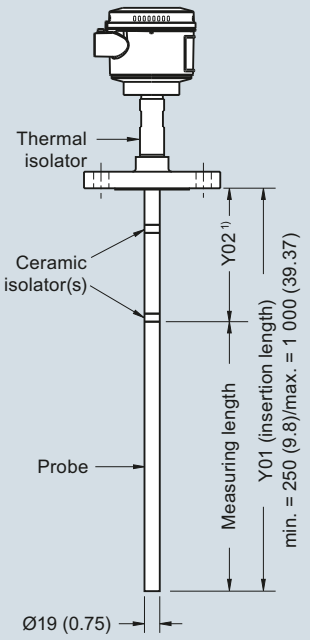
Pointek CLS300 - Threaded Process Connections, dimensions in mm (inch)

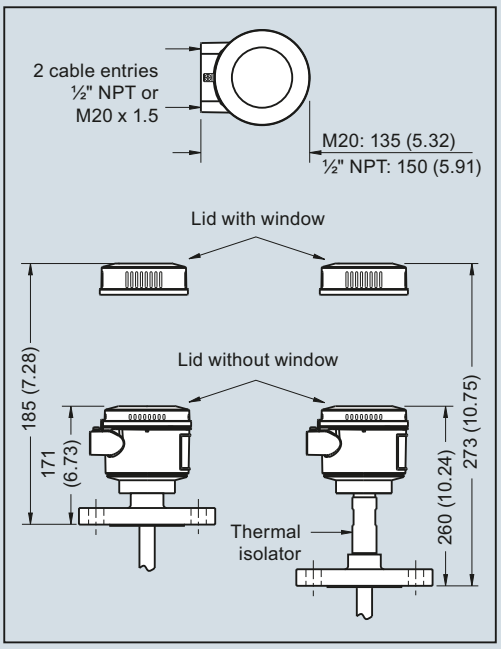
Pointek CLS300 – Standard and Digital

Rod version
Welded flange (7ML5650 and 7ML5660)

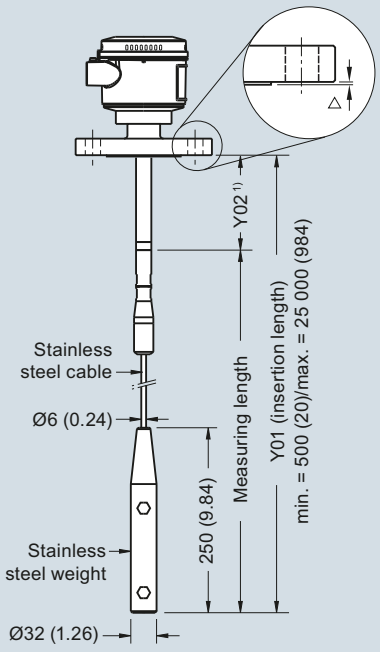


High temperature rod version
Welded flange (7ML5652 and 7ML5662)

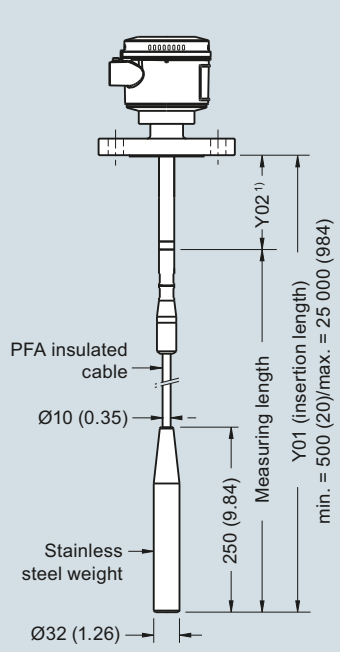




Cable version, non-insulated
Welded flange (7ML5651 and 7ML5661)



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)

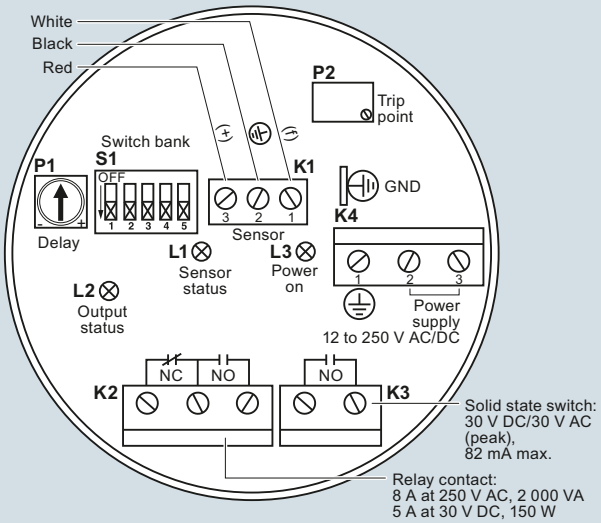
Note:

[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)

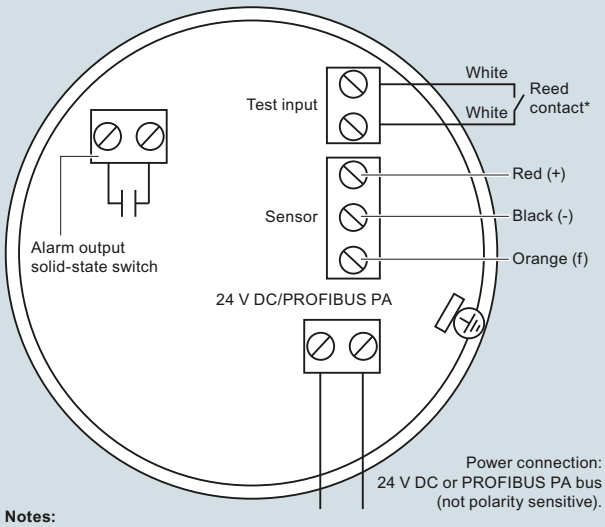
Schematics

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

Pointek CLS500

Overview

Pointek CLS500 is an inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic, and aggressive chemicals in critical conditions of high temperature and pressure.

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

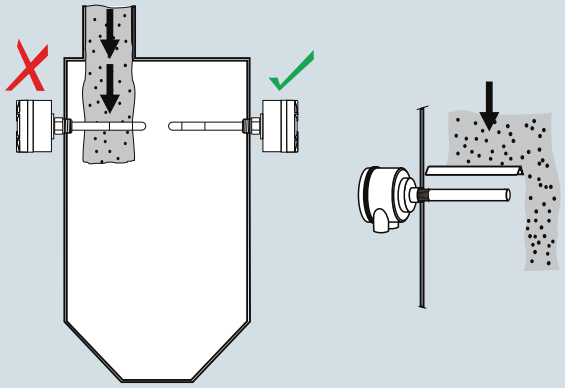
Patented Active-Shield technology ensures that measurement is unaffected by vapors, product deposits, dust and condensation. The unique mechanical probe design coupled with a high performance transmitter gives superior performance in a wide range of level detection applications.

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

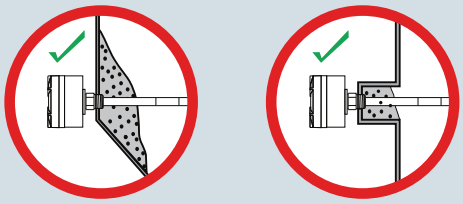
- Key Applications: foam or liquid/foam level, glycol regenerators, high-pressure coalescers, LNG applications

Configuration

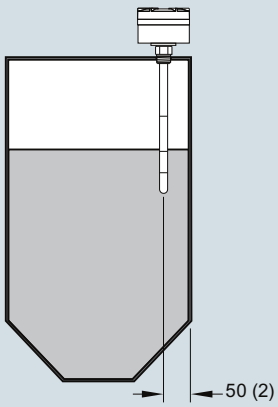
Installation



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)

Technical specifications

Input	
Measuring range	0 ... 330 pF
Span	Min. 1 pF
Output	
Solid-state switch	
• 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
Current loop	4 ... 20 mA/20 ... 4 mA
Accuracy (transmitter)	
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
Non-linearity and repeatability	0.1 % of full scale and actual measurement respectively
Accuracy	Deviation < 0.1 % of measured value
Rated operating conditions[1]	
Installation conditions	
- Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature (transmitter)	-40 ... +85 °C (-40 ... +185 °F)[2]
• Installation category	I
• Pollution degree	4
Medium conditions	
• Relative dielectric constant ε_r	Min. 1.5
• Process temperature	Temperature ratings are pressure dependent. See Pressure/Temperature curves on page 4/74.
- Standard (PFA)	-50 ... +200 °C (-58 ... +392 °F)
- High temperature stainless steel version with thermal isolator	-60 ... +400 °C (-76 ... +752 °F)
- Cryogenic version	-200 ... +200 °C (-328 ... +392 °F) Contact ceg.smpi@siemens.com for details.
Process pressure	Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 4/74.
• Standard (PFA)	-1 ... +150 bar g (-14.6 ... +2 175 psi g)
• High temperature version (stainless steel)	-1 ... +35 bar g (-14.6 ... +507.6 psi g)

Design	
Material	
• Wetted parts material	
- Standard rod	316L stainless steel
• Probe isolation (rod)	PFA
Probe diameter	
• Standard rod version (PFA)	16 mm (0.63 inch)
• High temperature rod version (stainless steel)	19 mm (0.75 inch)
Probe length	
• Standard rod version (PFA)	Max. 1 000 mm (39.4 inch) with 16 mm (0.63 inch) diameter probe
• High temperature rod version (stainless steel)	Max. measuring length 1 000 mm (39.4 inch) with 19 mm (0.75 inch) diameter probe
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 (stainless steel option available. Contact ceg.smpi@siemens.com)
• Cable inlet	2 x ½" NPT
• Degree of protection	Type 4X/NEMA4X/IP65, IP68
Power supply	Max. 33 V DC
Features	
Measurement current signaling	NAMUR NE 43
Safety	• Inputs/outputs fully galvanically isolated • Polarity-insensitive current loop • Fully potted • Integrated safety barrier
• 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
• Function rotary switch	Positions 0 ... 9, A ... F
• SMART communication	Conforming to HART Communication Foundation (HCF)
Certificates and approvals	
• General Purpose	CE, CSA/FM, C-TICK
• Non incendive/Non sparking	CSA/FM Class I, Div. 2, Groups A, B, C, D T4 ATEX II 3G 2D EEx n A [ib] IIC T6 to T4 T100 °C
• Dust Ignition Proof	CSA/FM Class II and III, Div. 1, Groups E, F, G T4 ATEX II 1/2 GD EEx d [ia] T6 to T1 T100 °C
• Explosion Proof	FM Class 1, Div. 1, Groups A, B, C, D T4 ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 T100 °C
• Marine	Lloyds Register of Shipping, Categories ENV1, ENV2, ENV3, ENV5, Bureau Veritas

[1] When operation is in areas classified as hazardous, observe restrictions according to relevant certificate.
See also Pressure/Temperature curves on page 4/74.

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

Pointek CLS500

Pointek CLS500 probe version	Standard	HT Series
Process connection types	**Standard (PFA) (7ML5601, 7ML5602, 7ML5603)**	**High Temperature (Enamel or 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 condtitions[1)]		
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 4/74. Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 4/74.

2) Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 4/74.

– Not available as standard

Selection and Ordering data	Article No.
Pointek CLS500, threaded Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	**7ML5601-** ■■■■■ - ■■ **A 0**
Electronic transmitter	
No transmitter supplied	**0**
MSP 2002-1 (330 pF)	**1**
Process connection	
¾"	**A**
1"	**B**
1¼"	**C**
1½"	**D**
2"	**E**
Threaded connection and rating	
NPT [(Taper), ANSI/ASME B1.20.1]	**A**
R [(BSPT), EN 10226/PT (JIS-T) JIS B 0203]	**B**
G [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	**D**
Probe insulation/material of process connection	
PFA insulation/316L stainless steel	**1**
Approvals	
General Purpose: CE, CSA/FM, C-TICK	**1**
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	**2**
ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 T100 °C	**4**
FM Class I, Div. 1, Groups A, B, C, D T4	**6**
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]	**1**
Thermal isolator/remote version	
Rigid thermal isolator [for process connection temperature over 85 °C (185 °F)]	**A**
No thermal isolator	**B**

[1] Add Order code Y01 and Y02 in plain text: "Insertion/active shield length to mm"

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 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 4/73**
Pointek Specials	**See page 4/82**

[1] See dimension drawings on page 4/74 for further explanation of Y02

Pointek CLS500

Selection and Ordering data	Article No.
Pointek CLS500, welded flange Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	**7ML5602-** ■■■■■ - ■■ **A 0**
Electronic transmitter	
MSP 2002-1 (330 pF)	**1**
Process connection and pressure rating	
Welded flange, 316L stainless steel, raised face	
2" ASME, 150 lb	**A A**
2" ASME, 300 lb	**A B**
3" ASME, 150 lb	**B A**
3" ASME, 300 lb[1]	**B B**
4" ASME, 150 lb[1]	**C A**
4" ASME, 300 lb[1]	**C B**
6" ASME, 150 lb[1]	**D A**
6" ASME, 300 lb[1]	**D B**
Welded flange, 316L stainless steel, Type A flat faced	
DN 50 PN 16	**E C**
DN 50 PN 40	**E D**
DN 80 PN 16	**F C**
DN 80 PN 40	**F D**
DN 100 PN 16[1]	**G C**
DN 125 PN 16[1]	**H C**
(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	**1**
Approvals	
General Purpose	**1**
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	**2**
ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 T100 °C	**4**
FM Class I, Div. 1, Groups A, B, C, D T4	**6**
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)	**1**
Thermal isolator	
Rigid thermal isolator [for process temperature over 85 °C (185 °F)]	**A**
No thermal isolator	**B**

[1] Custom shipping methods required. Contact factory 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 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 4/73**
Pointek Specials	**See page 4/82**

[1] See dimensional drawings on page 4/74 for further explanation of Y02

Selection and Ordering data	Article No.
Pointek CLS500, single piece flange	**7ML5603-**
Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	■■■■■ - ■■ **A 0**
Electronic transmitter	
MSP 2002-1 (330 pF)	**1**
Process connection and pressure rating	
Single piece flange, 316L stainless steel, raised face	
2" ASME, 150 lb	**A A**
2" ASME, 300 lb	**A B**
3" ASME, 150 lb	**B A**
3" ASME, 300 lb [1]	**B B**
4" ASME, 150 lb [1]	**C A**
4" ASME, 300 lb [1]	**C B**
6" ASME, 150 lb [1]	**D A**
6" ASME, 300 lb [1]	**D B**
Single piece flange, 316L stainless steel, Type B1 raised faced	
DN 50 PN 16	**E C**
DN 50 PN 25	**E D**
DN 80 PN 16	**F C**
DN 80 PN 25	**F D**
DN 100 PN 16 [1]	**G C**
DN 100 PN 25 [1]	**G D**
DN 125 PN 16 [1]	**H C**
DN 125 PN 25 [1]	**H D**
Probe insulation/material of process connection	
PFA insulation/316L stainless steel	**1**
Approvals	
General Purpose: CE, CSA/FM, C-TICK	**1**
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	**2**
ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 T100 °C	**4**
FM Class I, Div. 1, Groups A, B, C, D T4	**6**
Probe/electrode diameter	
16 mm (0.63 inch) rigid rod, maximum length 1 000 mm (39.4 inch) (Y01)	**1**
Thermal isolator	
Rigid thermal isolator [for process connection temperature over 85 °C (185 °F)]	**A**
No thermal isolator	**B**

[1] Custom shipping methods required. Contact factory 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	
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 4/73**
Accessories	**See page 4/82**

[1] See dimensional drawings on page 4/74 for further explanation of Y02

Point level measurement – Capacitance switches

Pointek CLS500

Selection and Ordering data	Article No.
Pointek CLS500 High temperature	**7ML5604-**
Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	A -
Electronic transmitter	
MSP 2002-1 (330 pF)	1
Process connection and pressure rating	
316L stainless steel, raised face[1]	
2" ASME, 150 lb	A 1
2" ASME, 300 lb	A 2
2" ASME, 600 lb	A 3
2" ASME, 900 lb	A 4
3" ASME, 150 lb	B 1
3" ASME, 300 lb[2]	B 2
3" ASME, 600 lb[2]	B 3
3" ASME, 900 lb[2]	B 4
4" ASME, 150 lb[2]	C 1
4" ASME, 300 lb[2]	C 2
4" ASME, 600 lb[2]	C 3
4" ASME, 900 lb[2]	C 4
6" ASME, 150 lb[2]	D 1
6" ASME, 300 lb[2]	D 2
6" ASME, 600 lb[2]	D 3
6" ASME, 900 lb[2]	D 4
316L stainless steel, Type B1 flat faced	
DN 50 PN 16	E 1
DN 50 PN 25	E 2
DN 50 PN 40	E 3
DN 50 PN 63	E 4
DN 80 PN 16	F 1
DN 80 PN 25	F 2
DN 80 PN 40[2]	F 3
DN 80 PN 63[2]	F 4
DN 100 PN 16[2]	G 1
DN 100 PN 25[2]	G 2
DN 100 PN 40[2]	G 3
DN 100 PN 64[2]	G 4
DN 125 PN 16[2]	H 1
DN 125 PN 25[2]	H 2
DN 125 PN 40[2]	H 3
DN 125 PN 64[2]	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	**7ML5604-**
Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	A -
Probe material of process connection	
No insulation/316L stainless steel[3][4]	1
Stilling well	
No stilling well	0
Approvals	
General Purpose	A
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	B
ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 T100 °C	D
FM Class I, Div. 1, Groups A, B, C, D T4	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)

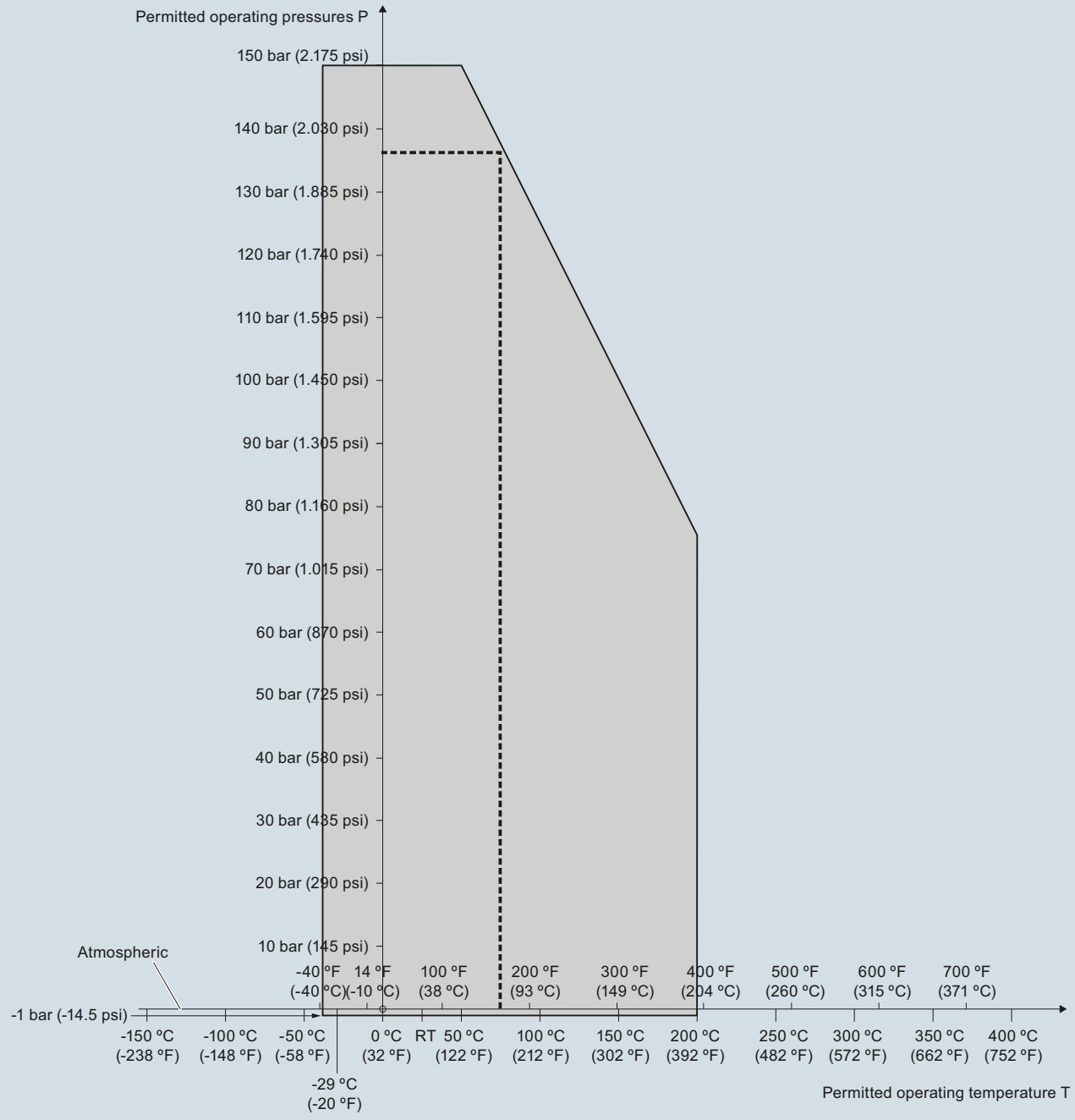
[4] Add Order code Y01 and Y02 in plain text:
"Insertion/active shield length to mm"
Minimum insertion length depends on probe version selected.
See dimensional drawings on page 4/74 for more details.

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	Article No.
English	**7ML1998-5GG03**
German	**7ML1998-5GG32**
French	**7ML1998-5GG11**
Dutch 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.	**7ML1998-5GG41**
Quick Start manual, multi-language This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	**A5E32243995**
Accessories	
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**
Transmitter, MSP 2002-1, 330 PF	**7ML1830-1JP**
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**
Pointek Specials	**See page 4/82**

[1)] See dimensional drawings on page 4/74 for further explanation of Y02

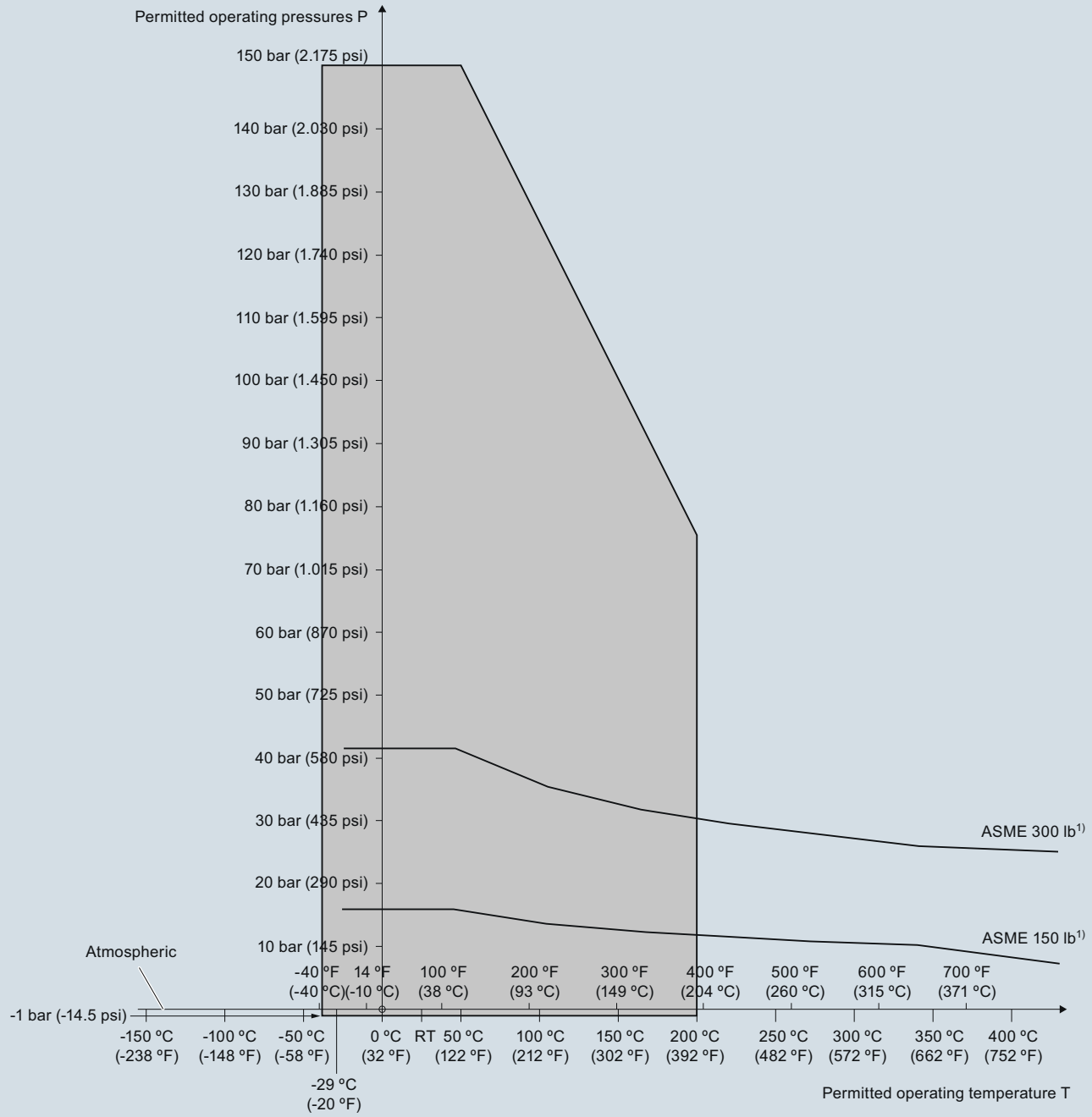
Characteristic curves

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



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

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

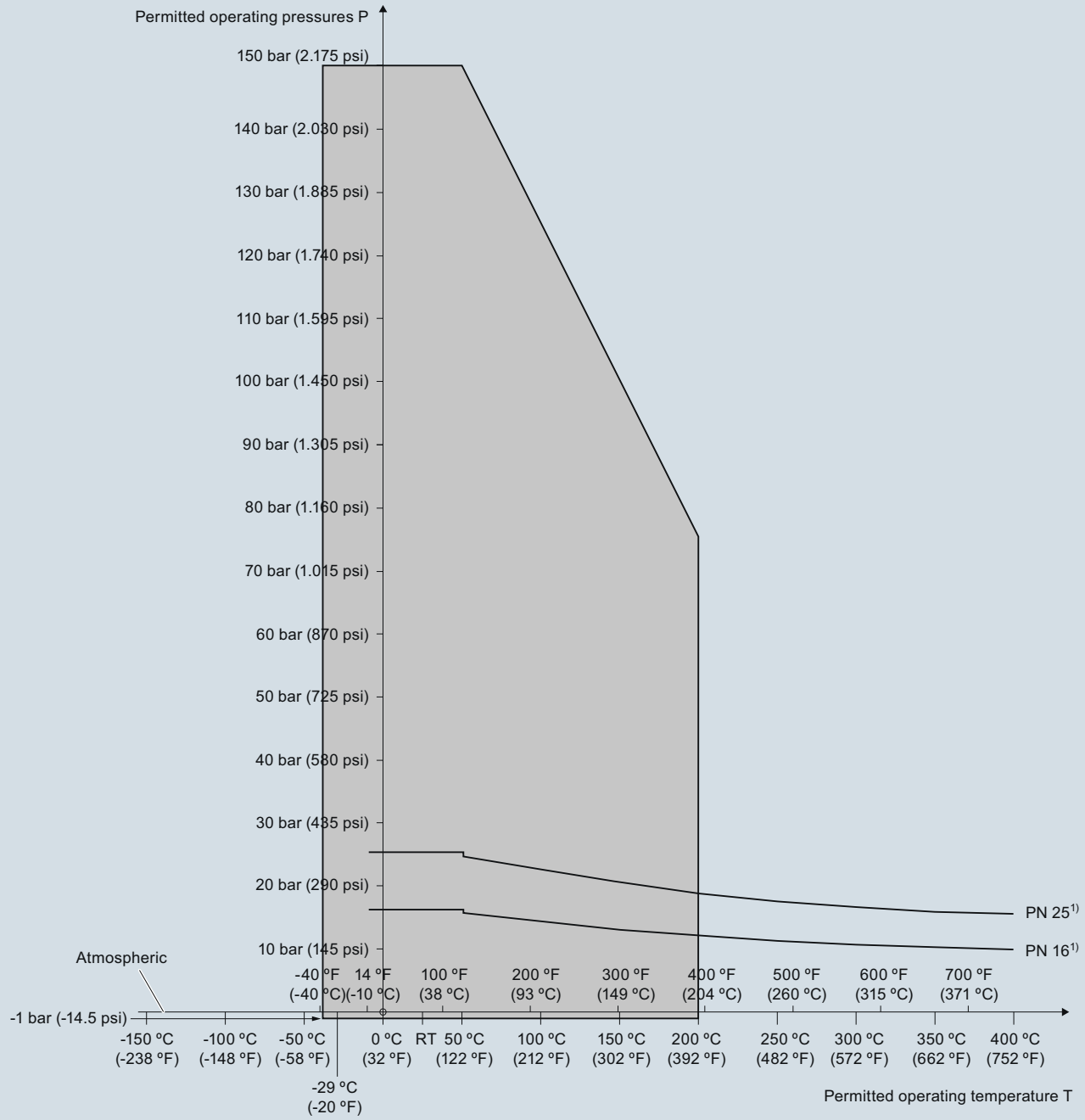


1) The curve denotes the minimum allowable flange class for the shaded area below.

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

Pointek CLS500

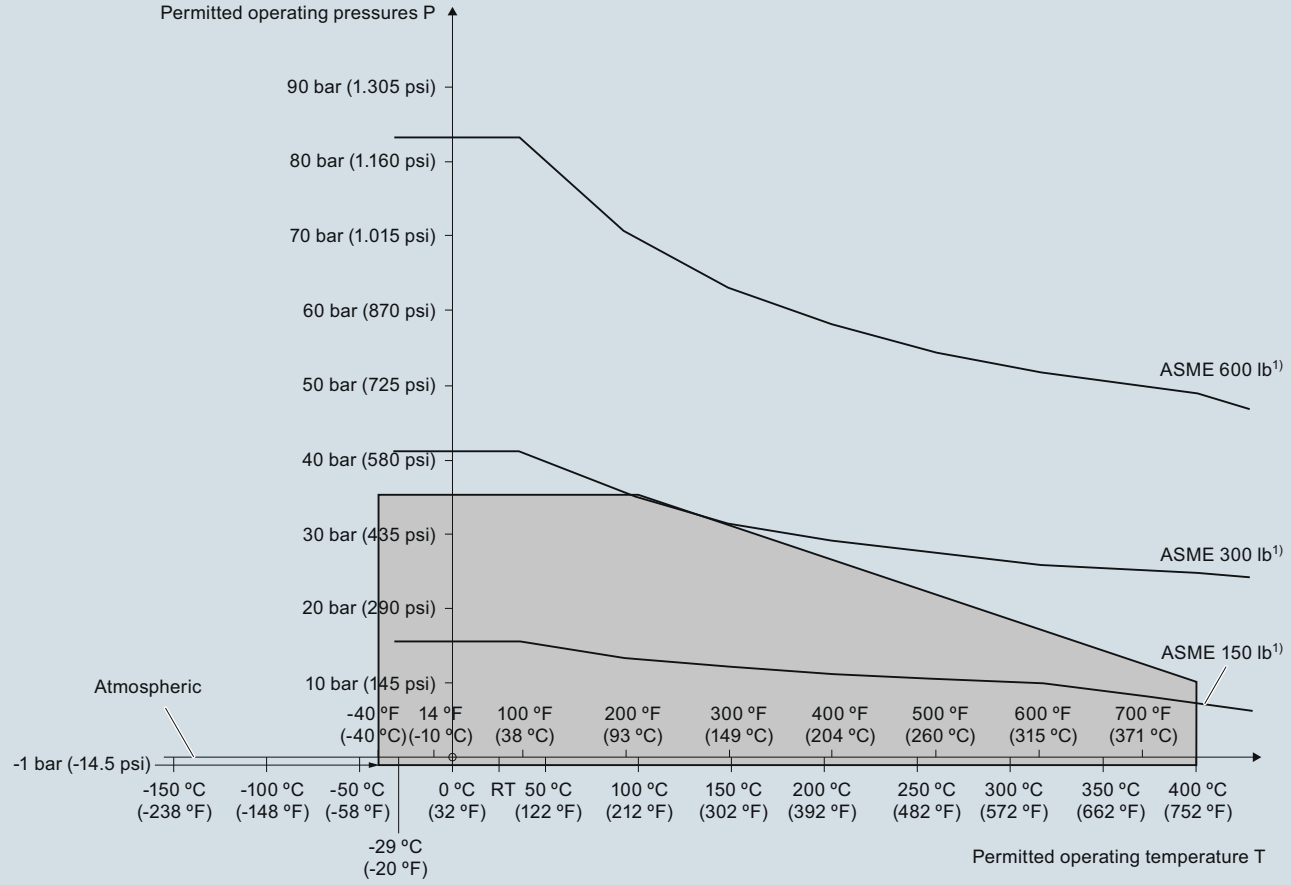
Pressure/temperature curve
CLS500 rod probes
EN flanged process connections
(7ML5602 and 7ML5603)



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

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

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

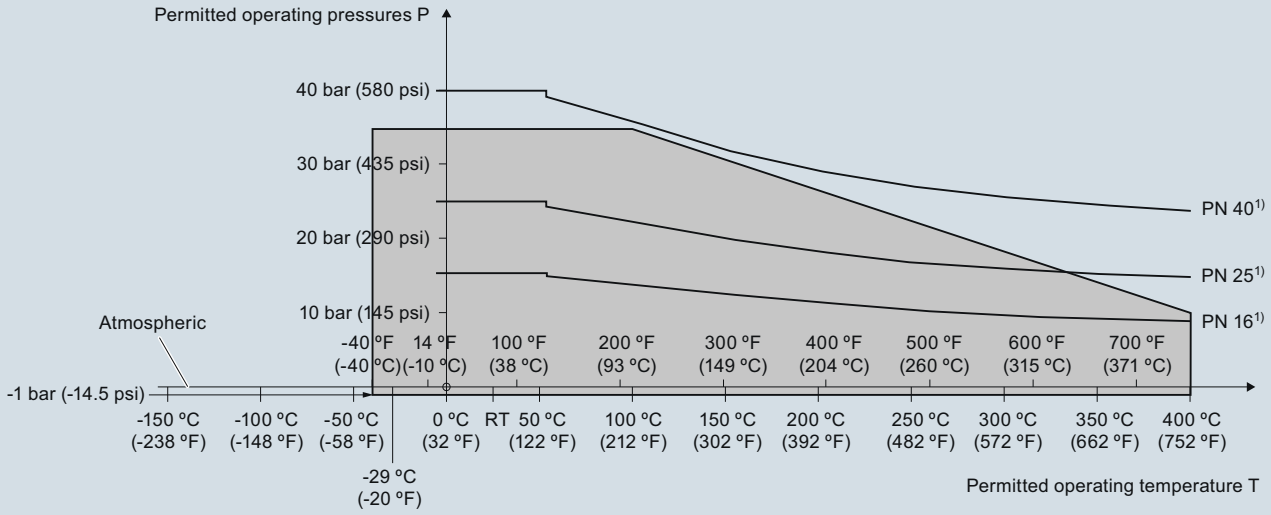


1) The curve denotes the minimum allowable flange class for the shaded area below.

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

Pointek CLS500

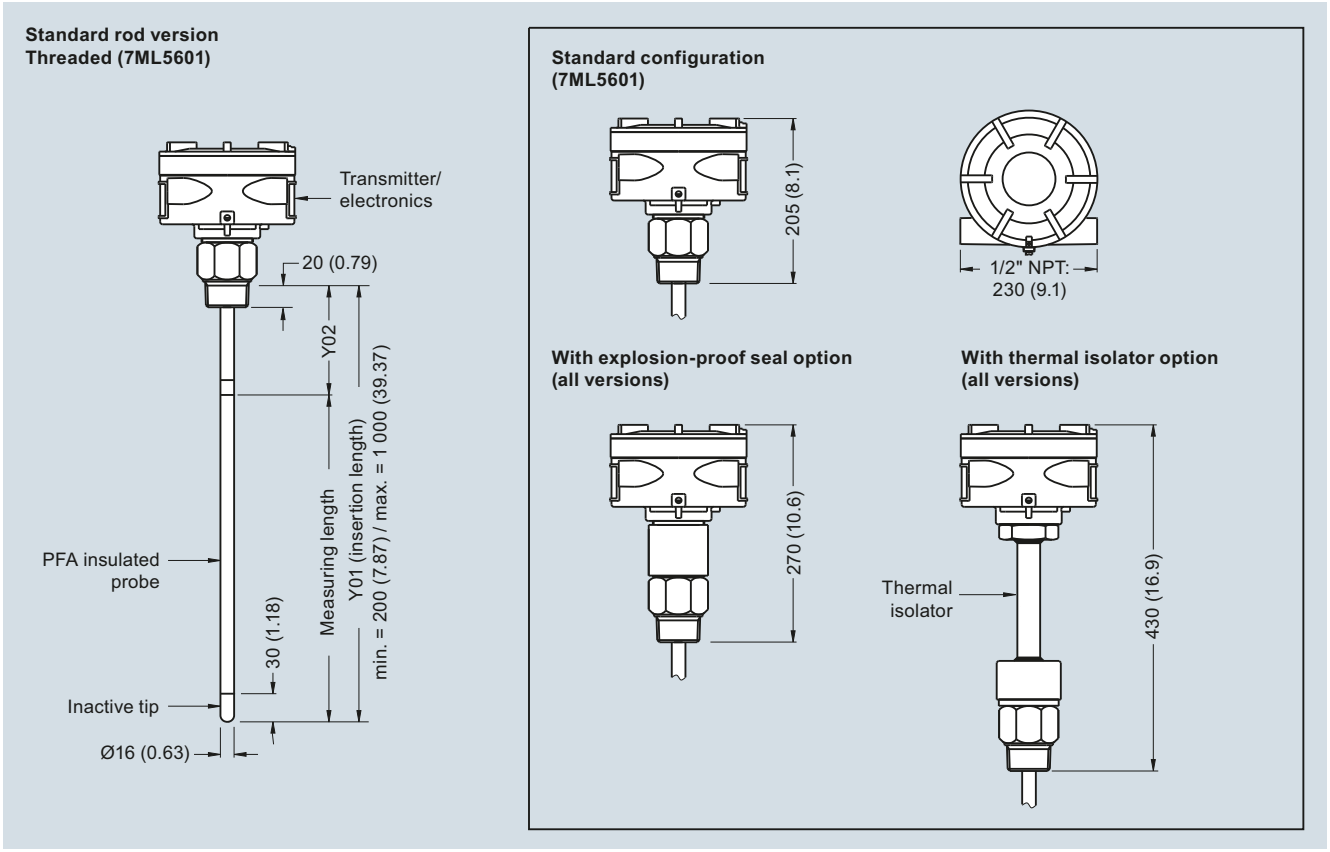
Pressure/temperature curve
CLS500 high temperature (no insulation)
EN flanged process connections
(7ML5604)



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

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

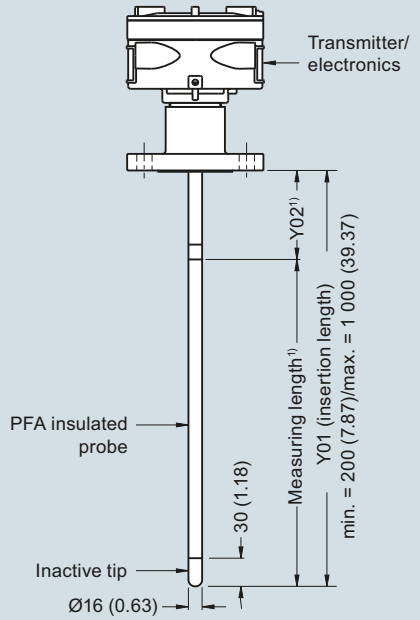
Dimensional drawings



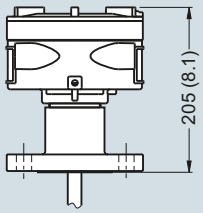
Pointek CLS500 - Threaded Process Connections, dimensions in mm (inch)

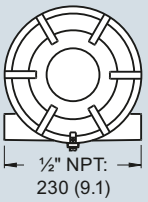
Pointek CLS500

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

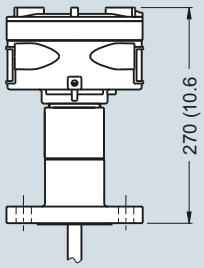


Standard configuration
(7ML5602, 7ML5603)

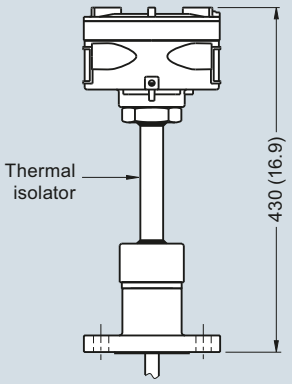




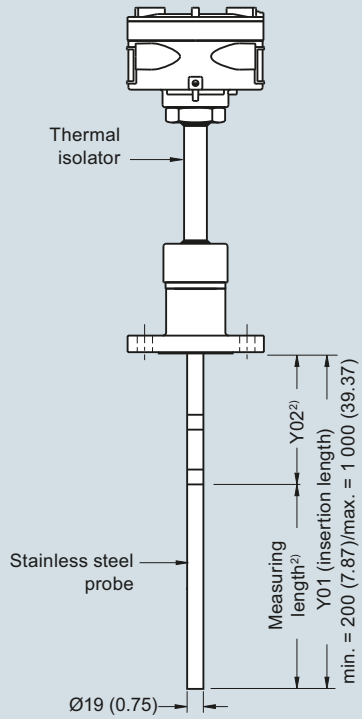
With explosion-proof seal option
(all versions)



With thermal isolator option
(all versions)



High temperature rod version
Welded Flange (7ML5604), Stainless steel rod[4]



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)

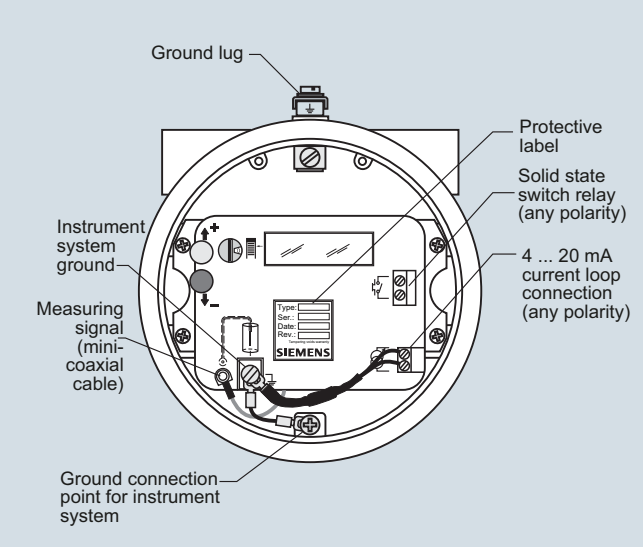
Notes:

[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)

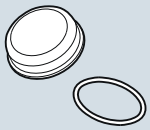
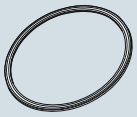
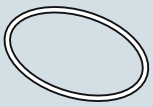
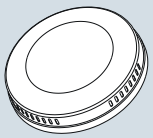
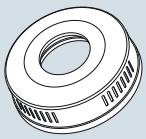
Schematics

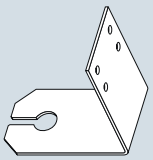


Pointek CLS500 connections

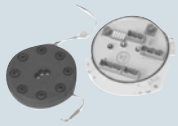
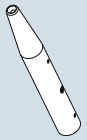
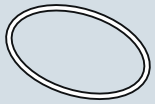
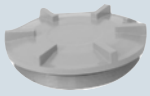
Pointek CLS Specials

Selection and ordering data

Pointek Specials[1]	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 Specials[1]	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, FKM	**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**

Pointek Specials[1]	Article No.
CLS300 Cable Extensions, 316 stainless steel with PFA coating	
Kit, PFA cable extension, 1 m, adjustable by customer	**A5E01163697**
Kit, PFA cable extension, 3 m, adjustable by customer	**A5E01163698**
Kit, PFA cable extension, 5 m, adjustable by customer	**A5E01163699**
Kit, PFA cable extension, 10 m, adjustable by customer	**A5E01163700**
Kit, PFA cable extension, 15 m, adjustable by customer	**A5E01163701**
Kit, PFA cable extension, 20 m, adjustable by customer	**A5E01163702**
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).	**A5E01163719**
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).	**A5E01163720**
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).	**A5E01163721**
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).	**A5E01163722**
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]	
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]	**A5E01163723**
Kit, Electronics with driver, digital CLS300. To be used in rod or cable versions with length less than 5 m.[3][4]	**A5E01163725**

Pointek Specials[1]	Article No.
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]	**A5E01163724**
Kit, Electronics with driver, digital CLS300. To be used in cable versions with length greater than 5 m.[3][4]	**A5E01163726**
CLS300 Electronics	
Test magnet, digital version	**7ML1830-1JE**
Amplifier/power supply kit, standard version	**A5E03251683**
Amplifier/power supply, digital version	**7ML1830-1JF**
LCD display, digital version	**7ML1830-1JK**
CLS300 Weight Kit, 316L stainless steel	
Kit, Spare stainless steel weight. To be used in any cable version of CLS300	**A5E01163727**
CLS500 Gasket (IP65), Silicone	
Spare gasket, CLS500 enclosure version, IP65	**A5E01163728**
CLS500 Blind Lid	
Spare CLS500 aluminum blind lid	**A5E01163729**
CLS500 Electronics Kit	
Transmitter, MSP 2002-1, 330 PF	**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.

SITRANS LVL100

Overview

SITRANS LVL100 is a compact vibrating level switch for use 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

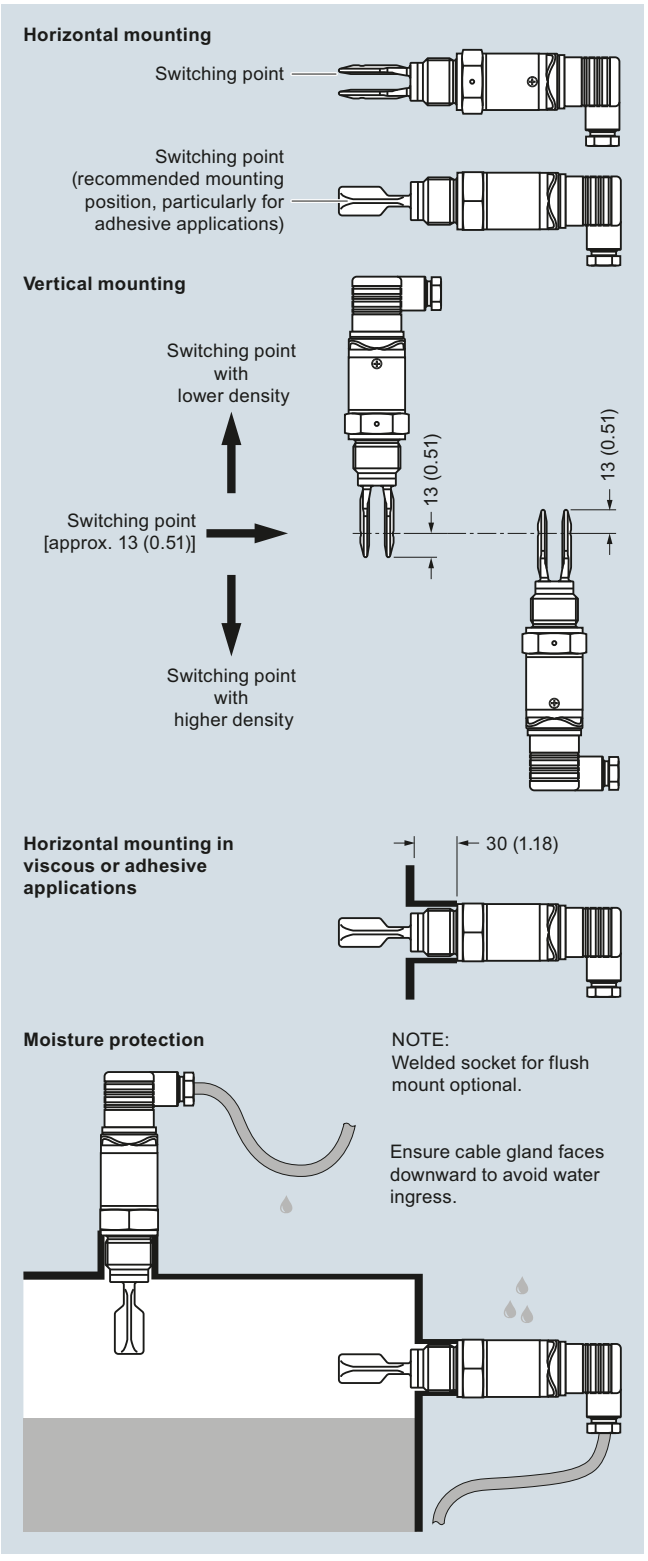
Application

SITRANS LVL100 is a compact level switch designed for industrial use in all areas of process technology and can be used 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, overfill, and dry run protection

Configuration



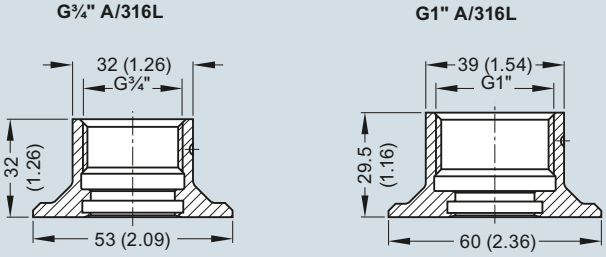
SITRANS LVL100 Installation, dimensions in mm (inch)

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/cm³ (0.025 ... 0.09 lb/in³)
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 ¾" A or G 1" A
• Pipe thread, tapered	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	1 x M12 [IP66/IP67 or IP68 (0.2 bar)]
Weight (housing)	250 g (9 oz)
Power supply	
Supply voltage	20 ... 253 V AC, 50/60 Hz 20 ... 253 V DC
Power consumption	1 ... 8 VA AC, approx. 1.3 W DC
Certificates and approvals	• Overfill protection (WHG) • Shipping approvals

Options

LVL100 threaded welded socket



SITRANS LVL100 welded socket, dimensions in mm (inch)

4

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.		**7ML5745-** ■■■■■ - ■■ **A 0**
Approvals		
Without approvals	⬟	**1**
Shipping approvals[1]	⬟	**2**
Overfill protection (WHG)[2]	⬟	**3**
Process temperature		
Standard -40 ... +100 °C (-40 ... +212 °F)[3]	⬟	**A**
Extended -40 ... +150 °C (-40 ... +302 °F)[3]	⬟	**B**
Hygienic applications -40 ... +150 °C (-40 ... +302 °F)[4]		**C**
Process connection		
Thread G¾" A PN 64/316L	⬟	**A 0**
Thread G¾" A PN 64/316L Ra< 0.8 µm		**A 1**
Thread ¾" NPT PN 64/316L	⬟	**A 2**
Thread ¾" 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**
Electronics		
Contactless electronic switch 20 ... 250 V AC/DC[5]	⬟	**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 temperature option A only
2) Available with electronics option 2 only
3) Available with process connection A0, A2, A4, and A6 only
4) Available with process connection A1, A3, A5, and A7 ... B6 only
5) Available with electrical connection/protection option B and C only

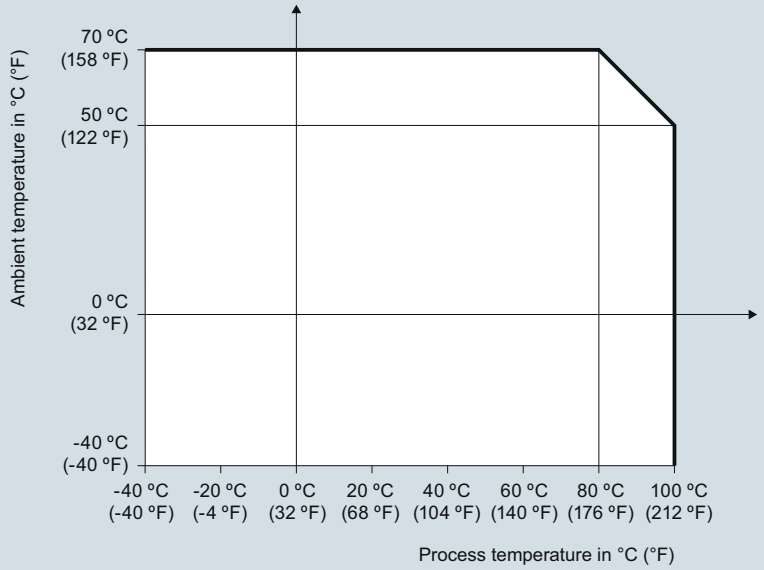
⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

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		Article No.
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 This device is shipped with the Siemens Milltronics manual DVD containing the Operating Instructions library.		**7ML1998-5KP31**
Spare Parts		
LVL100 Threaded Welded Socket		
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**

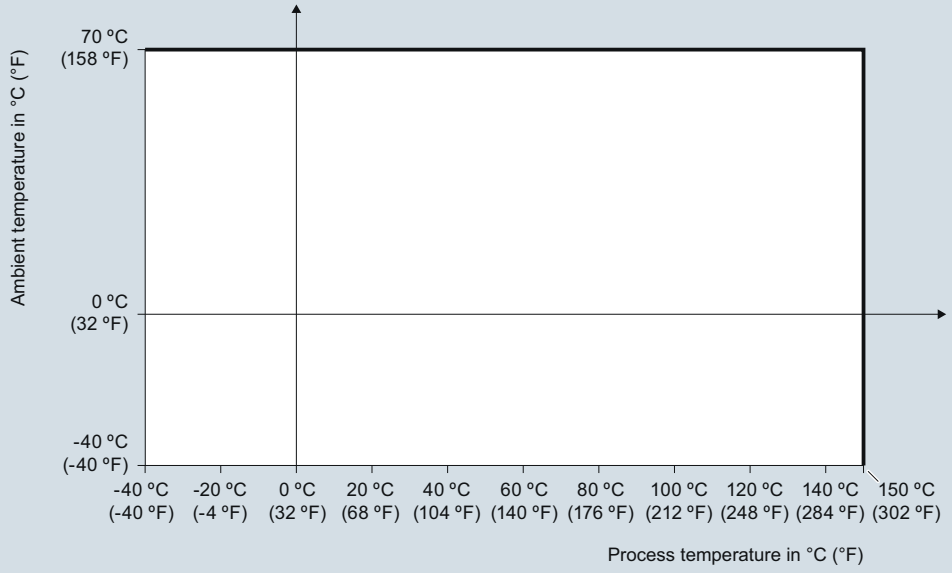
⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

Characteristic curves

Ambient temperature to process temperature dependency (standard version)



Ambient temperature to process temperature dependency (high temperature version)

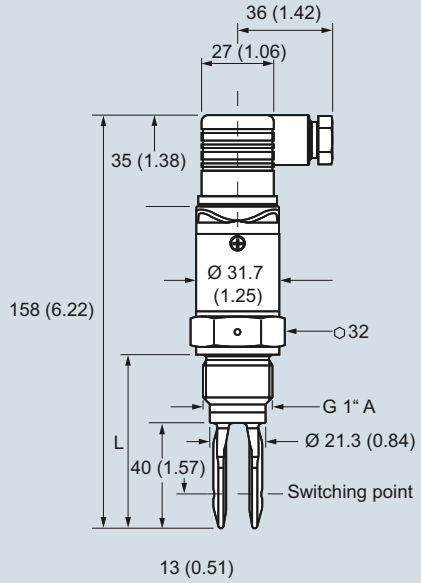


SITRANS LVL100 Ambient Temperature/Process Temperature derating curves

SITRANS LVL100

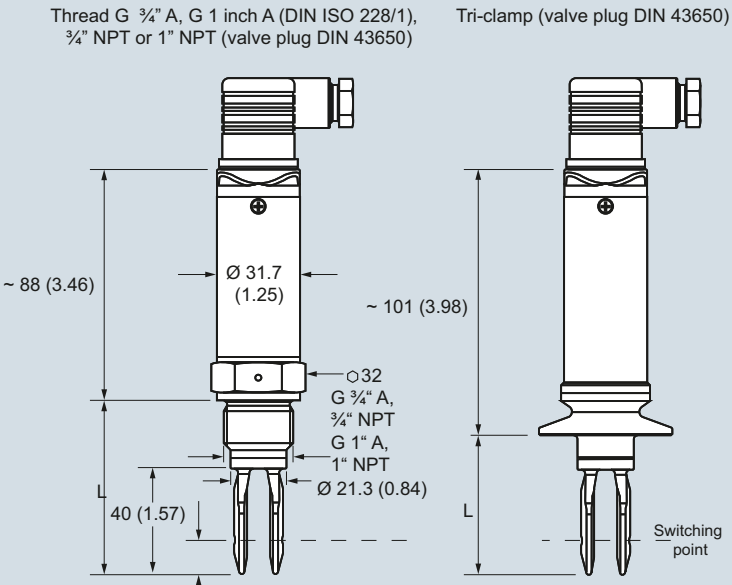
Dimensional drawings

SITRANS LVL100 (standard)



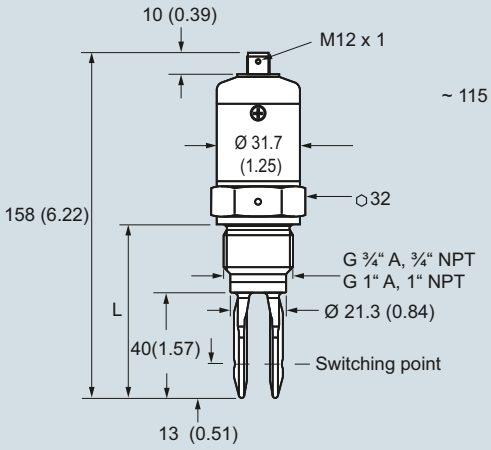
L =
Length with G ¾" A, ¾" NPT: 66 (2.6)
Length with G 1" A, 1" NPT: 69 (2.7)

SITRANS LVL100 (extended high temperature)



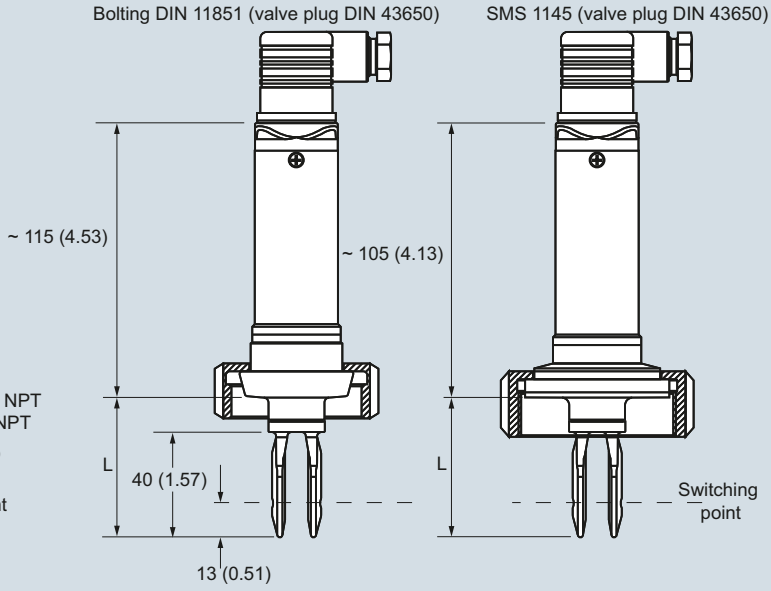
L =
Length with G ¾" A, ¾" NPT: 66 (2.6)
Length with G 1" A, 1" NPT: 69 (2.7)
Length with Tri-clamp: 53 (2.1)

SITRANS LVL100 (standard with M12 connector)



L =
Length with G ¾" A, ¾" NPT: 66 (2.6)
Length with G 1" A, 1" NPT: 69 (2.7)

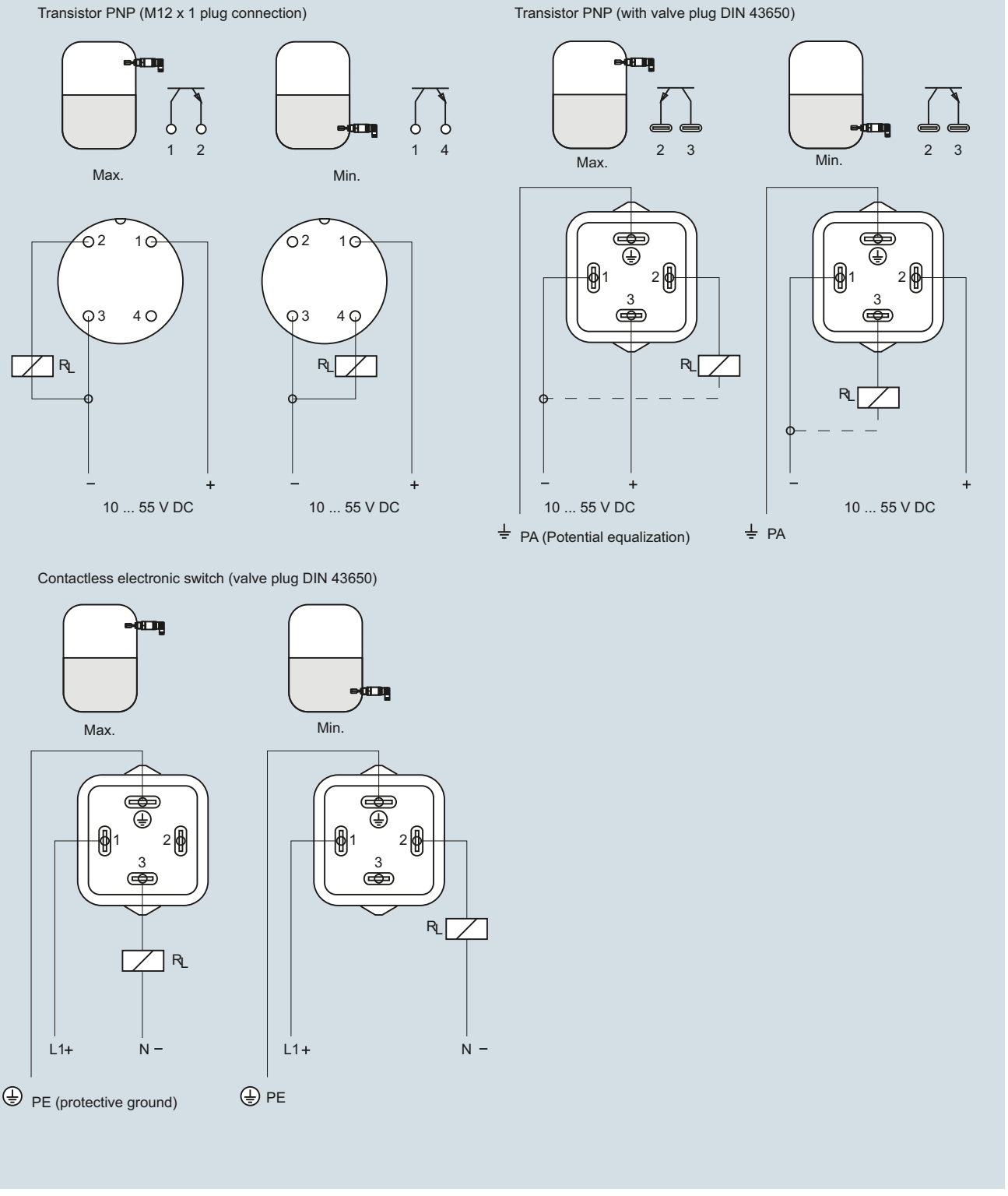
SITRANS LVL100 (extended, high temperature)



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

SITRANS LVL100, dimensions in mm (inch)

Schematics



SITRANS LVL100, connections

SITRANS LVL200

Overview

SITRANS LVL200 is a standard vibrating level switch for use 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

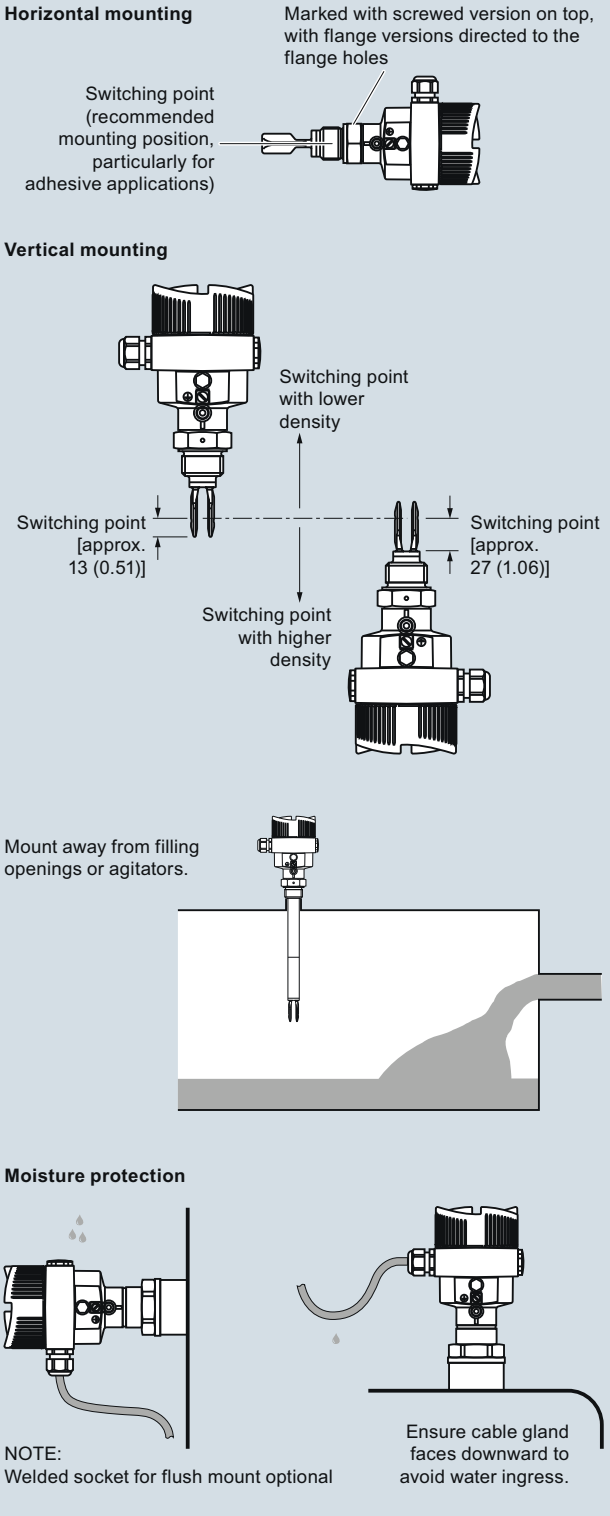
SITRANS LVL200 is a level switch designed for industrial use in all areas of process technology and can be used with liquids and slurries. With a tuning fork insertion length of only 40 mm (1.57 inch), SITRANS LVL200 can be mounted in small pipes and applications with confined space. The LVL200 can be used to measure products with a minimum density of > 0.5 g/cm³ (0.018 lb/in³). 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, overfill, and dry run protection

Configuration



SITRANS LVL200 installation, dimensions in mm (inch)

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	• 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/cm³ (0.025 ... 0.09 lb/in³); 0.5 ... 2.5 g/cm³ (0.018 ... 0.09 lb/in³) by switching over
Design	
Material	
• Enclosure	Aluminum die-cast AlSi10Mg, powder-coated, basis: Polyester stainless steel housing, electropolished 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
• Process seal	Klingersil C-4400
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 DN 25, 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	• 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 • 1x 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	• 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)]

Point level measurement – Vibrating switches

SITRANS LVL200

Selection and Ordering data	Article No.
SITRANS LVL200, Standard	**7ML5746-**
Compact vibrating level switch for use 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.	■■■■■ - ■■ A 0
Electronics	
Contactless electronic switch 20...250 V AC/DC	1
Double relay (DPDT) 20 ... 72 V DC/20 ... 250 V AC	2
NAMUR signal[1]	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 approvals[2]	E
ATEX II 1/2G, 2G EEx d IIC T6 + shipping approvals[3]	F
ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + ATEX II 1/2 D IP6X T[2]	G
IECEx Ex ia IIC T6[2]	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, D[4]	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 G¾" A, PN 64/316L	A 0 0
Thread G¾" A, PN 64/316L Ra < 0.8 µm	A 0 1
Thread ¾" NPT, PN 64/316L	A 0 2
Thread ¾" NPT, PN 64/316L Ra < 0.8 µm	A 0 3
Thread ¾" NPT, PN 64/Monel	A 0 4
Thread G¾" A, PN 64/Hastelloy	A 0 5
Thread ¾" NPT, PN 64/Hastelloy	A 0 6
Thread G1" A, PN 64/316L	A 0 7
Thread G1" A, PN 64/316L ECTFE coated MB1982[5]	A 0 8
Thread G1" A, PN 64/316L PFA coated[5]	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 coatedMB1982[5]	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 G1½" A, PN 64/316L	A 2 1
Thread G1½" A, PN 64/316L Ra<0,8µm	A 2 2
Thread G1½" A, PN 64/Hastelloy	A 2 3
Thread 1" NPT, PN 64/Hastelloy	A 2 4
Thread 1½" NPT, PN 64/316L	A 2 5
Thread 1½" NPT, PN 64/316L Ra<0,8µm	A 2 6
Thread 1½" NPT, PN 64/Hastelloy	A 2 7
Thread G2" A, PN 64/316L	A 2 8
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

Selection and Ordering data	Article No.
SITRANS LVL200, Standard	**7ML5746-**
Compact vibrating level switch for use 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.	■■■■■ - ■■ A 0
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 1½", PN 16/316L Ra < 0.3 µm	A 4 1
Tri-Clamp 1½", PN 16/Hastelloy	A 4 2
Tri-Clamp 1½", 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 2½", PN 10/316L Ra < 0.3 µm	A 4 7
Tri-Clamp 2½", 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 µm[5]	A 7 1
SMS DN 51, PN 6/316L Ra < 0.8 µm[5]	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 µm[5]	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 µm[5]	A 8 4
Hygienic fl. DN 50 PN 16 DIN11864-2-A-/316L Ra < 0.8 µm	A 8 5
Flange DN 25, PN 6 Form C, DIN 2501/316L	A 8 6
Flange DN 25, PN 6 Form C, DIN 2501/PFA[5]	A 8 7
Flange DN 25, PN 40 Form C, DIN 2501/316L	A 8 8
Flange DN 25, PN 40 Form C, DIN 2501/Hastelloy	B 0 0
Flange DN 25, PN 40 Form C, DIN 2501/ECTFE[5]	B 0 1
Flange DN 25, PN 40 Form C, DIN 2501/PFA[5]	B 0 2
Flange DN 25, PN 40 Form C, DIN 2501/Enamelled	B 0 3
Flange DN 25, PN 40 Form D, DIN 2501/316L	B 0 4
Flange DN 25, PN 40 Form F, DIN 2501/316L	B 0 5

Selection and Ordering data	Article No.
SITRANS LVL200, Standard Compact vibrating level switch for use 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 DN 25, PN 40 Form N, DIN 2501/316L	**B 0 6**
Flange DN 25, PN 40 Form N, DIN 2501/Hastelloy	**B 0 7**
Flange DN 25, PN 40 Form N, DIN 2501/Monel solid	**B 0 8**
Flange DN 25, PN 40 V13, DIN 2501/316L	**B 1 0**
Flange DN 32, PN 40 Form C, DIN 2501/316L	**B 1 1**
Flange DN 32, PN 40 Form C, DIN 2501/ECTFE[5]	**B 1 2**
Flange DN 40, PN 6 Form C, DIN 2501/316L	**B 1 3**
Flange DN 40, PN 6 Form C, DIN 2501/ECTFE[5]	**B 1 4**
Flange DN 40, PN 40 Form C, DIN 2501/316L	**B 1 5**
Flange DN 40, PN 40 Form C, DIN 2501/Hastelloy	**B 1 6**
Flange DN 40, PN 40 Form C, DIN 2501/ECTFE[5]	**B 1 7**
Flange DN 40, PN 40 Form C, DIN 2501/PFA[5]	**B 1 8**
Flange DN 40, PN 40 Form C, DIN 2501/ Enamelled[6]	**B 2 0**
Flange DN 40, PN 40 Form F, DIN 2501/316L	**B 2 1**
Flange DN 40, PN 40 Form N, DIN 2501/316L	**B 2 2**
Flange DN 40, PN 40 Form E, DIN 2501/316L	**B 2 3**
Flange DN 40, PN 40 V13, DIN 2501/316L	**B 2 4**
Flange DN 50, PN 40 Form C, DIN 2501/316L	**B 2 5**
Flange DN 50, PN 40 Form C, DIN 2501/Hastelloy	**B 2 6**
Flange DN 50, PN 40 Form C, DIN 2501/ECTFE[5]	**B 2 7**
Flange DN 50, PN 40 Form C, DIN 2501/ ECTFE (ZB3108)[5]	**B 2 8**
Flange DN 50, PN 40 Form C, DIN 2501/PFA[5]	**B 3 0**
Flange DN 50, PN 40 Form D, DIN 2501/316L	**B 3 1**
Flange DN 50, PN 40 Form D, DIN 2501/Hastelloy	**B 3 2**
Flange DN 50, PN 40 Form F, DIN 2501/316L	**B 3 3**
Flange DN 50, PN 40 Form N, DIN 2501/316L	**B 3 4**
Flange DN 50, PN 40 Form N, DIN 2501/Hastelloy	**B 3 5**
Flange DN 50, PN 40 Form E, DIN 2501/316L	**B 3 6**
Flange DN 50, PN 40 V13, DIN 2501/316L	**B 3 7**
Flange DN 50, PN 40 R13, DIN 2501/316L	**B 3 8**
Flange DN 50, PN 64 Form F, DIN 2501/316L	**B 4 0**
Flange DN 50, PN 64 Form N, DIN 2501/Hastelloy	**B 4 1**
Flange DN 50, PN 64 Form C, DIN 2501/316L	**B 4 2**
Flange DN 50, PN 64 Form L, DIN 2501/316L	**B 4 3**
Flange DN 50, PN 100 Form E, DIN 2501/316L	**B 4 4**
Flange DN 50, PN 100 Form L, DIN 2501/316L	**B 4 5**
Flange DN 65, PN 40 Form C, DIN 2501/316L	**B 4 6**
Flange DN 65, PN 40 Form C, DIN 2501/Hastelloy	**B 4 7**
Flange DN 65, PN 40 Form C, DIN 2501/ECTFE[5]	**B 4 8**
Flange DN 65, PN 40 Form C, DIN 2501/PFA[5]	**B 5 0**
Flange DN 65, PN 40 Form F, DIN 2501/316L	**B 5 1**
Flange DN 65, PN 64 Form E, DIN 2501/316L	**B 5 2**
Flange DN 80, PN 40 Form C, DIN 2501/316L	**B 5 3**
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**
Flange DN 80, PN 40 Form C, DIN 2501/PFA[5]	**B 5 6**
Flange DN 80, PN 40 Form C, DIN 2501/ Enamelled[6]	**B 5 7**
Flange DN 80, PN 40 Form F, DIN 2501/316L	**B 5 8**
Flange DN 80, PN 40 Form N, DIN 2501/316L	**B 6 0**
Flange DN 100, PN 16 Form C, DIN 2501/316L	**B 6 2**
Flange DN 100, PN 16 Form C, DIN 2501/Hastelloy	**B 6 3**
Flange DN 100, PN 16 Form C, DIN 2501/ECTFE[5]	**B 6 4**
Flange DN 100, PN 16 Form C, DIN 2501/PFA[5]	**B 6 5**
Flange DN 100, PN 16 Form C, DIN 2501/ Enamelled[6]	**B 6 6**
Flange DN 100, PN 16 Form D, DIN 2501/316L	**B 6 7**

Selection and Ordering data	Article No.
SITRANS LVL200, Standard Compact vibrating level switch for use 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 DN 100, PN 16 Form F, DIN 2501/316L	**B 6 8**
Flange DN 100, PN 16 Form N, DIN 2501/316L	**B 7 0**
Flange DN 100, PN 40 Form C, DIN 2501/316L	**B 7 1**
Flange DN 100, PN 40 Form C, DIN 2501/ECTFE[5]	**B 7 2**
Flange DN 100, PN 40 Form C, DIN 2501/PFA[5]	**B 7 3**
Flange DN 100, PN 40 Form C, DIN 2501/ Enamelled[6]	**B 7 4**
Flange DN 100, PN 40 Form F, DIN 2501/316L	**B 7 5**
Flange DN 100, PN 40 Form N, DIN 2501/316L	**B 7 6**
Flange DN 100, PN 40 V13, DIN 2501/316L	**B 7 7**
Flange DN 100, PN 64 Form E, DIN 2501/316L	**B 7 8**
Flange DN 100, PN 100 Form E, DIN 2501/316L	**B 8 0**
Flange DN 100, PN 100 Form L, DIN 2501/316L	**B 8 1**
Flange DN 125, PN 16 Form F, DIN 2501/316L	**B 8 2**
Flange DN 125, PN 40 Form C, DIN 2501/316L	**B 8 3**
Flange DN 125, PN 40 Form N, DIN 2512/ 316L	**B 8 4**
Flange DN 150, PN 16 Form C, DIN 2501/316L	**B 8 5**
Flange DN 150, PN 16 Form C, DIN 2501/Hastelloy	**B 8 6**
Flange DN 150, PN 16 Form C, DIN 2501/ECTFE[5]	**B 8 7**
Flange DN 150, PN 16 Form C, DIN 2501/PFA[5]	**B 8 8**
Flange DN 150, PN 16 Form D, DIN 2501/316L	**C 0 0**
Flange DN 150, PN 40 Form C, DIN 2501/316L	**C 0 1**
Flange DN 150, PN 40 Form C, DIN 2501/Hastelloy	**C 0 2**
Flange DN 150, PN 40 Form F, DIN 2501/316L	**C 0 3**
Flange DN 150, PN 40 Form N, DIN 2512/316L	**C 0 4**
Flange DN 200, PN 10 Form C, DIN 2501/ECTFE[5]	**C 0 5**
Flange DN 200, PN 16 Form C, DIN 2501/316L	**C 0 6**
Flange DN 25, PN 40 Form B1, EN 1092-1/316L	**C 0 7**
Flange DN 25, PN 40 Form B1, EN 1092-1/Hastelloy	**C 0 8**
Flange DN 25, PN 40 Form B1, EN/ 316L/ PFA[5]	**C 1 0**
Flange DN 25, PN 40 Form B1, EN 1092-1/ Enamelled [6]	**C 1 1**
Flange DN 25, PN 40 Form B2, EN 1092-1/316L	**C 1 2**
Flange DN 25, PN 40 Form F, EN 1092-1/316L	**C 1 3**
Flange DN 25, PN 63 Form B1, EN 1092-1/316L	**C 1 4**
Flange DN 25, PN 100 Form B2, EN 1092-1/316L	**C 1 5**
Flange DN 40, PN 40 Form B1, EN/ 316L	**C 1 6**
Flange DN 40, PN 40 Form B1, EN 1092-1/PFA[5]	**C 1 7**
Flange DN 40, PN 40 Form B2, EN/316L	**C 1 8**
Flange DN 50, PN 40 Form B1, EN/316L	**C 2 0**
Flange DN 50, PN 40 Form B1, EN 1092-1/Hastelloy	**C 2 1**
Flange DN 50, PN 40 Form B1, EN 1092-1/ Monel ZB2977	**C 2 2**
Flange DN 50, PN 40 Form B1, EN 1092-1/ECTFE[5]	**C 2 3**
Flange DN 50, PN 40 Form B1, EN/ 316L/PFA[5]	**C 2 4**
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**

SITRANS LVL200

Selection and Ordering data	Article No.
SITRANS LVL200, Standard Compact vibrating level switch for use 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 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/ECTF[5]	**C 8 0**
Flange 2" 150 lb SG (small groove), ANSI B16.5/316L	**C 8 1**
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**

Selection and Ordering data	Article No.
SITRANS LVL200, Standard Compact vibrating level switch for use 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 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**
Flange 1" BS.10 Table E/PFA[5]	**D 5 5**
Flange 1½" BS.10 Table E/316L	**D 5 6**
Flange 3½" BS.10 Table E/316L	**D 5 7**
Flange 4" BS.10 Table E/ECTFE[5]	**D 5 8**
Flange DN 40 10K, JIS/316L	**D 6 0**
Flange DN 50 10K, JIS/316L	**D 6 1**
Flange DN 80 10K, JIS/316L	**D 6 2**
Flange DN 100 10K, JIS/316L	**D 6 3**
Adapter/Process temperature	
Without adapter/-50 ... +150 °C (-58 ... +302 °F)	**1**
With adapter/-50 ... +200 °C (-58 ... +392 °F)[7]	**2**
With adapter/-50 .... +250 °C (-58 ... +482 °F)	**3**
With gas-tight leadthrough/-50 ... +150 °C (-58 ... +302 °F)	**4**
With gas-tight leadthrough/-50 ... +250 °C (-58 ... +482 °F)	**5**

Selection and Ordering data		Article No.
SITRANS LVL200, Standard Compact vibrating level switch for use 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**
Housing/ Cable entry		
Aluminium IP66/IP67/M20x1.5	⬟	**A**
Aluminium IP66/IP67/½" NPT	⬟	**B**
316L stainless steel (electropolished) IP66/IP67/M20X1.5[8)9)]		**C**
316L stainless steel (electropolished) IP66/IP67/½" NPT[8)9)]		**D**

1) Available with Approval options A ... G, and K, and Adapter/ Process temperature options 1, and 3 ... 5 only
2) Available with Electronics option 4 only
3) Available with Adapter/Process temperature options 1 and 3 only
4) Available with Housing/Cable entry option B only
5) Available with Adapter/Process temperature options 1 and 4 only
6) Available with Adapter/Process temperature options 1, 2, and 4 only
7) Available with enamelled Process connection options only
8) Available with Approval options A, B, C only
9) Not available with SIL/IEC61508 Certificate of conformity (SIL-2 min. and max. detection)

⬟ 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 (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	**D07**
Acceptance test certificate 3.1 for instrument EN10204	**C12**
Acceptance test Certificate 2.2 for material EN10204	**C15**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511	**C20**
Additional Operating Instructions	Article No.
LVL200 (DPDT Relay)	
• English	**7ML1998-5KR01**
• French	**7ML1998-5KR11**
• Spanish	**7ML1998-5KR21**
• German	**7ML1998-5KR31**
LVL200 (Contactless electronic switch)	
• English	**7ML1998-5KQ01**
• French	**7ML1998-5KQ11**
• Spanish	**7ML1998-5KQ21**
• German	**7ML1998-5KQ31**
Electronics module LVL200 Relay	
• English	**7ML1998-5LS01**
• French	**7ML1998-5LS11**
• Spanish	**7ML1998-5LS21**
• German This device is shipped with the Siemens Milltronics manual DVD containing the Operating Instructions library.	**7ML1998-5LS31**
Spare Parts and Accessories	
Electronics module SITRANS LVL200 Relay	**7ML1830-1NC**
Electronics module SITRANS LVL200 Contactless	**7ML1930-6AA**
LVL200 Threaded Welded Socket	
• 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**

SITRANS LVL200

Selection and Ordering data	Article No.
SITRANS LVL200, Rigid extension Compact vibrating level switch for use 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-**
Electronics	
Contactless electronic switch 20...250 V AC/DC	1
Double relay (DPDT) 20 ... 72 V DC/20 ... 250 V AC	2
NAMUR signal[1]	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][4]	D
ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + shipping approvals[2]	E
ATEX II 1/2G, 2G EEx d IIC T6 + shipping approvals[3][4]	F
ATEX II 1G, 1/2G, 2G EEx ia IIC T6 + ATEX II 1/2D IP6X T[2]	G
IECEx Ex ia IIC T6[2]	H
Shipping approvals	K
FM (IS) Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G[2][5]	N
FM (XP) Class I, Div. 1, Groups A, B, C, D; (DIP) Class II, III, Div. 1, Groups E, F, G[3][4][5]	P
FM (NI) Class I, Div. 2, Groups A, B, C, D[5]	Q
IECEx d IIC T6...T2 Ga/Gb[4]	R
CSA(XP)CL I,II,III Div. 1,Groups A, B, C, D, E, F, G...T2[4] Ga/Gb	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 G¾" A, PN 64/316L	A00
Thread G¾" A, PN 64/316L Ra < 0.8 µm	A01
Thread ¾" NPT, PN 64/316L	A02
Thread ¾" NPT, PN 64/316L Ra < 0.8 µm	A03
Thread ¾" NPT, PN 64/Monel	A04
Thread G¾" A, PN 64/Hastelloy	A05
Thread ¾" NPT, PN 64/Hastelloy	A06
Thread G1" A, PN 64/316L	A07
Thread G1" A, PN 64/316L ECTFE coated MB1982[6]	A08
Thread G1" A, PN 64/316L PFA coated[6]	A10
Thread G1" A, PN 64/Monel	A11
Thread G1" A, PN 64/316L Ra < 0.8 µm	A13
Thread 1" NPT, PN 64/316L	A14
Thread 1" NPT, PN 64/316L ECTFE coated MB1982[6]	A15
Thread 1" NPT, PN 64/316L PFA coated[6]	A16
Thread 1" NPT, PN 64/Monel	A17
Thread 1" NPT, PN 64/316L Ra < 0.8 µm	A18
Thread G1" A, PN 64/Hastelloy	A20
Thread G1½" A, PN 64/316L	A21
Thread G1½" A, PN 64/316L Ra <0.8 µm	A22
Thread G1½" A, PN 64/Hastelloy	A23
Thread 1" NPT, PN 64/Hastelloy	A24
Thread 1½" NPT, PN 64/316L	A25
Thread 1½" NPT, PN 64/316L Ra< 0.8 µm	A26
Thread 1½" NPT, PN 64/Hastelloy	A27
Thread G2" A, PN 64/316L	A28
Thread M27x1.5 PN 64/316L	A30
Cyl. socket/316Ti/1.4581 ECTFE coated ZB2984[6]	A31
Conus DN 25 PN 40/316L Ra < 0.3 µm	A32
Conus DN 25 PN 40/316L Ra < 0.8 µm.	A33

Selection and Ordering data	Article No.
SITRANS LVL200, Rigid extension Compact vibrating level switch for use 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-**
Conus DN 25 PN 40/ECTFE (ZB3033)[6]	A34
Conus M52 PN 40/316L	A35
Conus M52 PN 40/316L Ra < 0.3 µm	A36
Conus M52 PN 40/316L Ra < 0.8 µm	A37
Tri-Clamp 1" PN 16/316L Ra < 0.3 µm	A38
Tri-Clamp 1" PN 16/Hastelloy	A40
Tri-Clamp 1" PN 16/316L Ra < 0.8 µm	A41
Tri-Clamp 1½" PN 16/316L Ra < 0.3 µm	A42
Tri-Clamp 1½" PN 16/Hastelloy	A43
Tri-Clamp 1½" PN 16/316L Ra < 0.8 µm	A44
Tri-Clamp 2" PN 16/316L Ra < 0.3 µm	A45
Tri-Clamp 2" PN 16/Hastelloy	A46
Tri-Clamp 2" PN 16/316L Ra < 0.8 µm	A47
Tri-Clamp 2½" PN 10/316L Ra < 0.3 µm	A48
Tri-Clamp 2½" PN 10/316L Ra < 0.8 µm	A50
Tri-Clamp 3" PN 10/316L Ra < 0.3 µm	A51
Tri-Clamp 3" PN 10/316L Ra < 0.8 µm	A52
Bolting DN 32 PN 40 DIN11851/316L Ra < 0.3 µm	A53
Bolting DN 32 PN 40 DIN11851/316L Ra < 0.8 µm	A54
Bolting DN 25 PN 40 DIN11851/316L Ra < 0.3 µm	A55
Bolting DN 25 PN 40 DIN11851/316L Ra < 0.8 µm	A56
Bolting DN 40 PN 40 DIN11851/316L Ra < 0.3 µm	A57
Bolting DN 40 PN 40 DIN11851/316L Ra < 0.8 µm	A58
Bolting DN 40 PN 40 DIN11864-1 A/316L Ra < 0.8 µm ZB3052	A60
Bolting DN 50 PN 25 DIN11851/316L Ra < 0.3 µm	A61
Bolting DN 50 PN 25 DIN11851/316L Ra < 0.8 µm	A62
Bolting DN 50 PN 25 DIN11864-1 A/316L Ra < 0.8 µm ZB3052	A63
Hygienic w.compr.nut F40 PN 25/316L	A64
Hygienic w.compr.nut F40 PN 25/316L Ra < 0.3 µm	A65
Hygienic w.compr.nut F40 PN 25/316L Ra < 0.8 µm	A66
Varivent N50-40/316L Ra < 0.3 µm	A67
Varivent N50-40/316L Ra < 0.8 µm	A68
Varivent N125/100/316L Ra < 0.8 µm	A70
DRD flange PN 40/316L ZB3007	A71
SMS DN 38/316L Ra < 0.8 µm[6]	A72
SMS DN 51 PN 6/316L Ra < 0.8 µm[6]	A73
Swagelok VCR screwing ZG2579 PN 64/316L	A74
Neumo biocontrol size 25 PN 16/316L Ra < 0.8 µm	A75
Neumo biocontrol size 50 PN 16/316L Ra < 0.8 µm	A76
Neumo biocontrol size 65 PN 16/316L Ra < 0.8 µm	A77
Neumo biocontrol size 80 PN 16/316L Ra < 0.8 µm	A78
SÜDMO DN 50 PN 10/316L Ra < 0.8 µm	A80
Small flange DN 25 PN 1.5 DIN 28403/316L pol. Ra < 0.8 µm	A81
Small flange DN 40 PN 1.5 DIN 28403/316L pol. Ra < 0.8 µm	A82
Ingold connection PN 16/316L Ra < 0.8 µm	A83
Terminal DN 33.7 PN 40 DIN 11864-3-A-/316L BN2 Ra < 0.8 µm	A84
Hygienic fl. DN 50 PN 16 DIN 11864-2-A-/316L Ra < 0.8 µm	A85
Flange DN 25 PN 6 Form C, DIN 2501/316L	A86
Flange DN 25 PN 6 Form C, DIN 2501/PFA[6]	A87
Flange DN 25 PN 40 Form C, DIN 2501/316L	A88
Flange DN 25 PN 40 Form C, DIN 2501/Hastelloy	B00
Flange DN 25 PN 40 Form C, DIN 2501/ECTFE[6]	B01
Flange DN 25 PN 40 Form C, DIN 2501/PFA[6]	B02
Flange DN 25 PN 40 Form D, DIN 2501/316L	B03

Selection and Ordering data	Article No.
SITRANS LVL200, Rigid extension Compact vibrating level switch for use 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 40 Form F, DIN 2501/316L	**B 0 4**
Flange DN 25 PN 40 Form N, DIN 2501/316L	**B 0 5**
Flange DN 25 PN 40 Form N, DIN 2501/Hastelloy	**B 0 6**
Flange DN 25 PN 40 Form N, DIN 2501/Monel solid	**B 0 7**
Flange DN 25 PN 40 V13, DIN 2501/316L	**B 0 8**
Flange DN 32 PN 40 Form C, DIN 2501/316L	**B 1 0**
Flange DN 32 PN 40 Form C, DIN 2501/ECTFE[6]	**B 1 1**
Flange DN 40 PN 6 Form C, DIN 2501/316L	**B 1 2**
Flange DN 40 PN 6 Form C, DIN 2501/ECTFE[6]	**B 1 3**
Flange DN 40 PN 40 Form C, DIN 2501/316L	**B 1 4**
Flange DN 40 PN 40 Form C, DIN 2501/Hastelloy	**B 1 5**
Flange DN 40 PN 40 Form C, DIN 2501/ECTFE[6]	**B 1 6**
Flange DN 40 PN 40 Form C, DIN 2501/PFA[6]	**B 1 7**
Flange DN 40 PN 40 Form C, DIN 2501/Enamelled[7]	**B 1 8**
Flange DN 40 PN 40 Form F, DIN 2501/316L	**B 2 0**
Flange DN 40 PN 40 Form N, DIN 2501/316L	**B 2 1**
Flange DN 40 PN 40 Form E, DIN 2501/316L	**B 2 2**
Flange DN 40 PN 40 V13, DIN 2501/316L	**B 2 3**
Flange DN 50 PN 40 Form C, DIN 2501/316L	**B 2 4**
Flange DN 50 PN 40 Form C, DIN 2501/Hastelloy	**B 2 5**
Flange DN 50 PN 40 Form C, DIN 2501/ECTFE[6]	**B 2 6**
Flange DN 50 PN 40 Form C, DIN 2501/ECTFE (ZB3108)[6]	**B 2 7**
Flange DN 50 PN 40 Form C, DIN 2501/PFA[6]	**B 2 8**
Flange DN 50 PN 40 Form D, DIN 2501/316L	**B 3 0**
Flange DN 50 PN 40 Form D, DIN 2501/Hastelloy	**B 3 1**
Flange DN 50 PN 40 Form F, DIN 2501/316L	**B 3 2**
Flange DN 50 PN 40 Form N, DIN 2501/316L	**B 3 3**
Flange DN 50 PN 40 Form N, DIN 2501/Hastelloy	**B 3 4**
Flange DN 50 PN 40 Form E, DIN 2501/316L	**B 3 5**
Flange DN 50 PN 40 V13, DIN 2501/316L	**B 3 6**
Flange DN 50 PN 40 R13, DIN 2501/316L	**B 3 7**
Flange DN 50 PN 64 Form F, DIN 2501/316L	**B 3 8**
Flange DN 50 PN 64 Form N, DIN 2501/Hastelloy	**B 4 0**
Flange DN 50 PN 64 Form C, DIN 2501/316L	**B 4 1**
Flange DN 50 PN 64 Form L, DIN 2501/316L	**B 4 2**
Flange DN 50 PN 100 Form E, DIN 2501/316L	**B 4 3**
Flange DN 50 PN 100 Form L, DIN 2501/316L	**B 4 4**
Flange DN 65 PN 40 Form C, DIN 2501/316L	**B 4 5**
Flange DN 65 PN 40 Form C, DIN 2501/Hastelloy	**B 4 6**
Flange DN 65 PN 40 Form C, DIN 2501/ECTFE[6]	**B 4 7**
Flange DN 65 PN 40 Form C, DIN 2501/PFA[6]	**B 4 8**
Flange DN 65 PN 40 Form F, DIN 2501/316L	**B 5 0**
Flange DN 65 PN 64 Form E, DIN 2501/316L	**B 5 1**
Flange DN 80 PN 40 Form C, DIN 2501/316L	**B 5 2**
Flange DN 80 PN 40 Form C, DIN 2501/Hastelloy	**B 5 3**
Flange DN 80 PN 40 Form C, DIN 2501/ECTFE[6]	**B 5 4**
Flange DN 80 PN 40 Form C, DIN 2501/PFA[6]	**B 5 5**
Flange DN 80 PN 40 Form F, DIN 2501/316L	**B 5 6**
Flange DN 80 PN 40 Form N, DIN 2501/316L	**B 5 7**
Flange DN 80 PN 40 Form N, DIN 2501/Hastelloy	**B 5 8**
Flange DN 100 PN 16 Form C, DIN 2501/316L	**B 6 0**
Flange DN 100 PN 16 Form C, DIN 2501/Hastelloy	**B 6 1**
Flange DN 100 PN 16 Form C, DIN 2501/ECTFE[6]	**B 6 2**
Flange DN 100 PN 16 Form C, DIN 2501/PFA[6]	**B 6 3**
Flange DN 100 PN 16 Form D, DIN 2501/316L	**B 6 4**
Flange DN 100 PN 16 Form F, DIN 2501/316L	**B 6 5**
Flange DN 100 PN 16 Form N, DIN 2501/316L	**B 6 6**

Selection and Ordering data	Article No.
SITRANS LVL200, Rigid extension Compact vibrating level switch for use 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 100 PN 40 Form C, DIN 2501/316L	**B 6 7**
Flange DN 100 PN 40 Form C, DIN 2501/ECTFE[6]	**B 6 8**
Flange DN 100 PN 40 Form C, DIN 2501/PFA[6]	**B 7 0**
Flange DN 100 PN 40 Form C, DIN 2501/Enamelled[7]	**B 7 1**
Flange DN 100 PN 40 Form F, DIN 2501/316L	**B 7 2**
Flange DN 100 PN 40 Form N, DIN 2501/316L	**B 7 3**
Flange DN 100 PN 40 V13, DIN 2501/316L	**B 7 4**
Flange DN 100 PN 64 Form E, DIN 2501/316L	**B 7 5**
Flange DN 100 PN 100 Form E, DIN 2501/316L	**B 7 6**
Flange DN 100 PN 100 Form L, DIN 2501/316L	**B 7 7**
Flange DN 125 PN 16 Form F, DIN 2501/316L	**B 7 8**
Flange DN 125 PN 40 Form C, DIN 2501/316L	**B 8 0**
Flange DN 125 PN 40 Form N, DIN 2512/316L	**B 8 1**
Flange DN 150 PN 16 Form C, DIN 2501/316L	**B 8 2**
Flange DN 150 PN 16 Form C, DIN 2501/Hastelloy	**B 8 3**
Flange DN 150 PN 16 Form C, DIN 2501/ECTFE[6]	**B 8 4**
Flange DN 150 PN 16 Form C, DIN 2501/PFA[6]	**B 8 5**
Flange DN 150 PN 16 Form D, DIN 2501/316L	**B 8 6**
Flange DN 150 PN 40 Form C, DIN 2501/316L	**B 8 7**
Flange DN 150 PN 40 Form C, DIN 2501/Hastelloy	**B 8 8**
Flange DN 150 PN 40 Form F, DIN 2501/316L	**C 0 0**
Flange DN 150 PN 40 Form N, DIN 2512/316L	**C 0 1**
Flange DN 200 PN 10 Form C, DIN 2501/ECTFE[6]	**C 0 2**
Flange DN 200 PN 16 Form C, DIN 2501/316L	**C 0 3**
Flange DN 25 PN 40 Form B1, EN 1092-1/316L	**C 0 4**
Flange DN 25 PN 40 Form B1, EN 1092-1/Hastelloy	**C 0 5**
Flange DN 25 PN 40 Form B1, EN/316L/PFA[6]	**C 0 6**
Flange DN 25 PN 40 Form B1, EN 1092-1/Enamelled[7]	**C 0 7**
Flange DN 25 PN 40 Form B2, EN 1092-1/316L	**C 0 8**
Flange DN 25 PN 40 Form F, EN 1092-1/316L	**C 1 0**
Flange DN 25 PN 63 Form B1, EN 1092-1/316L	**C 1 1**
Flange DN 25 PN 100 Form B2, EN 1092-1/316L	**C 1 2**
Flange DN 40 PN 40 Form B1, EN/316L	**C 1 3**
Flange DN 40 PN 40 Form B1, EN 1092-1/PFA[6]	**C 1 4**
Flange DN 40 PN 40 Form B2, EN/316L	**C 1 5**
Flange DN 50 PN 40 Form B1, EN/316L	**C 1 6**
Flange DN 50 PN 40 Form B1, EN 1092-1/Hastelloy	**C 1 7**
Flange DN 50 PN 40 Form B1,EN 1092-1/Monel ZB2977	**C 1 8**
Flange DN 50 PN 40 Form B1, EN 1092-1/ECTFE[6]	**C 2 0**
Flange DN 50 PN 40 Form B1, EN/316L/PFA[6]	**C 2 1**
Flange DN 50 PN 40 Form B1, EN 1092-1/Enamelled[7]	**C 2 2**
Flange DN 50 PN 40 Form C, EN 1092-1/316L	**C 2 3**
Flange DN 50 PN 40 Form D, EN/316L	**C 2 4**
Flange DN 50 PN 40 Form D, EN 1092-1/Hastelloy	**C 2 5**
Flange DN 50 PN 40 Form B2, EN 1092-1/316L	**C 2 6**
Flange DN 50 PN 40 Form E, EN 1092-1/316L	**C 2 7**
Flange DN 80 PN 40 Form B1, EN 1092-1/316L	**C 2 8**
Flange DN 80 PN 40 Form B1, EN 1092-1/Hastelloy	**C 3 0**
Flange DN 80 PN 40 Form B1, EN 1092-1/ECTFE[6]	**C 3 1**
Flange DN 80 PN 40 Form B1, EN 1092-1/Enamelled[7]	**C 3 2**
Flange DN 80 PN 40 Form B2, EN 1092-1/316L	**C 3 3**
Flange DN 100 PN 16 Form B1, EN 1092-1/316L	**C 3 4**
Flange DN 100 PN 16 Form B1, EN 1092-1/Hastelloy	**C 3 5**
Flange DN 100 PN 16 Form B1, EN 1092-1/Enamelled[7]	**C 3 6**

SITRANS LVL200

Selection and Ordering data	Article No.
SITRANS LVL200, Rigid extension Compact vibrating level switch for use 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 100 PN 40 Form B1, EN 1092-1/316L	C37
Flange DN 100 PN 40 Form B1, EN 1092-1/ Enamelled[7]	C38
Flange DN 100 PN 40 Form C, EN 1092-1/316L	C40
Flange DN 100 PN 63 Form B2, EN 1092-1/316L	C41
Flange DN 150 PN 16 Form B1, EN 1092-1/316L	C42
Flange DN 150 PN 16 Form B1, EN 1092-1/PFA[6]	C43
Flange DN 150 PN 40 Form B1, EN 1092-1/316L	C44
Flange DN 150 PN 40 Form B1, EN 1092-1/ ECTFE[6]	C45
Flange DN 150 PN 40 Form B2, EN 1092-1/316L	C46
Flange 1" 150 lb ANSI B16.5/316L	C47
Flange 1"150 lb RF, ANSI B16.5/Hastelloy	C48
Flange 1"150 lb RF, ANSI B16.5//Monel ZB2977	C50
Flange 1" 150 lb RF, ANSI B16.5/ECTFE[6]	C51
Flange 1"150 lb RF, ANSI B16.5/PFA[6]	C52
Flange 1" 150 lb RF, ANSI B16.5/Enamelled[7]	C53
Flange 1" 300 lb RF, ANSI B16.5/316L	C54
Flange 1" 300 lb RF, ANSI B16.5/ECTFE[6]	C55
Flange 1" 600 lb RF, ANSI B16.5/316L	C56
Flange 1½" 150 lb RF, ANSI B16.5/316L	C57
Flange 1½" 150 lb RF, ANSI B16.5/Hastelloy	C58
Flange 1½" 150 lb RF, ANSI B16.5/ECTFE[6]	C60
Flange 1½" 150 lb RF, ANSI B16.5/PFA[6]	C61
Flange 1½" 150 lb RF, ANSI B16.5 Enamelled[7]	C62
Flange 1½" 150 lb FF, ANSI B16.5/ECTFE[6]	C63
Flange 1½" 300 lb RF, ANSI B16.5/316L	C64
Flange 1½" 300 lb RF, ANSI B16.5//Monel ZB2977	C65
Flange 1½" 300 lb RF, ANSI B16.5/ECTFE[6]	C66
Flange 1½" 600 lb RF, ANSI B16.5/316L	C67
Flange 2" 150 lb RF, ANSI B16.5/316L	C68
Flange 2" 150 lb RF, ANSI B16.5/Hastelloy	C70
Flange 2" 150 lb RF, ANSI B16.5//Monel ZB2977	C71
Flange 2" 150 lb RF, ANSI B16.5/ECTFE[6]	C72
Flange 2" 150 lb RF, ANSI B16.5/PFA[6]	C73
Flange 2" 150 lb RF, ANSI B16.5/Enamelled[7]	C74
Flange 2" 150 lb FF, ANSI B16.5/316L	C75
Flange 2" 150 lb FF, ANSI B16.5/ECTFE[6]	C76
Flange 2" 150 lb SG (small groove), ANSI B16.5/316L	C77
Flange 2" 300 lb RF, ANSI B16.5/316L	C78
Flange 2" 300 lb RF, ANSI B16.5/Hastelloy	C80
Flange 2" 300 lb RF, ANSI B16.5/ECTFE[6]	C82
Flange 2" 300 lb RF, ANSI B16.5/PFA[6]	C83
Flange 2" 300 lb RF, ANSI B16.5 Enamelled[7]	C84
Flange 2" 300 lb RJF, ANSI B16.5/316L	C85
Flange 2" 300 lb ST, ANSI B16.5/316L	C86
Flange 2" 300 lb LG (large groove), ANSI B16.5/316L	C87
Flange 2" 300 lb LT, ANSI B16.5/316L	C88
Flange 2" 600 lb RF, ANSI B16.5/316L	D00
Flange 2" 600 lb RF, ANSI B16.5/Monel ZB2977	D01
Flange 2" 600 lb RF, ANSI B16.5/ECTFE[6]	D02
Flange 2" 600 lb RJF, ANSI B16.5/316L	D03
Flange 2" 600 lb LG, ANSI B16.5/316L	D04
Flange 2" 900 lb RJF, ANSI B16.5/316L	D05
Flange 2½" 150 lb RF, ANSI B16.5/316L	D06
Flange 2½" 300 lb RF, ANSI B16.5/316L	D07
Flange 3" 150 lb RF, ANSI B16.5/316L	D08

Selection and Ordering data	Article No.
SITRANS LVL200, Rigid extension Compact vibrating level switch for use 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 3" 150 lb RF, ANSI B16.5/Hastelloy	D10
Flange 3" 150 lb RF, ANSI B16.5//Monel ZB2977	D11
Flange 3" 150 lb RF, ANSI B16.5/ECTFE[6]	D12
Flange 3" 150 lb RF, ANSI B16.5/PFA[6]	D13
Flange 3" 150 lb RF, ANSI B16.5/Enamelled[7]	D14
Flange 3" 150 lb FF, ANSI B16.5/316L	D15
Flange 3" 150 lb FF, ANSI B16.5/ECTFE[6]	D16
Flange 3" 150 lb FF, ANSI B16.5/PFA[6]	D17
Flange 3" 300 lb RF, ANSI B16.5/316L	D18
Flange 3" 300 lb RF, ANSI B16.5/Hastelloy	D20
Flange 3" 300 lb RF, ANSI B16.5/ECTFE[6]	D21
Flange 3" 300 lb RF, ANSI B16.5/PFA[6]	D22
Flange 3" 300 lb RF, ANSI B16.5/Enamelled[7]	D23
Flange 3" 600 lb RF, ANSI B16.5/316L	D24
Flange 3½" 150 lb RF, ANSI B16.5/316L	D25
Flange 3½" 150 lb RF, ANSI B16.5/ECTFE[6]	D26
Flange 4" 150 lb RF, ANSI B16.5/316L	D27
Flange 4" 150 lb RF, ANSI B16.5/Hastelloy	D28
Flange 4" 150 lb RF, ANSI B16.5/ECTFE[6]	D30
Flange 4" 150 lb RF, ANSI B16.5/PFA[6]	D31
Flange 4" 150 lb RF, ANSI B16.5/Enamelled[7]	D32
Flange 4" 150 lb LT, ANSI B16.5/316L	D33
Flange 4" 300 lb RF, ANSI B16.5/316L	D34
Flange 4" 300 lb RF, ANSI B16.5/Hastelloy	D35
Flange 4" 300 lb RF, ANSI B16.5/ECTFE[6]	D36
Flange 4" 300 lb RJF, ANSI B16.5/316L	D37
Flange 4" 300 lb LG, ANSI B16.5/316L	D38
Flange 4" 300 lb LT, ANSI B16.5/316L	D40
Flange 4" 600 lb RF, ANSI B16.5/316L	D41
Flange 4" 600 lb RJF, ANSI B16.5/316L	D42
Flange 5" 150 lb RF, ANSI B16.5/316L	D43
Flange 6" 150 lb RF, ANSI B16.5/316L	D44
Flange 6" 150 lb RF, ANSI B16.5/Hastelloy	D45
Flange 6" 150 lb RF, ANSI B16.5/ECTFE[6]	D46
Flange 6" 150 lb RF, ANSI B16.5/PFA[6]	D47
Flange 6" 150 lb RJF, ANSI B16.5/316L	D48
Flange 6" 300 lb RF, ANSI B16.5/316L	D50
Flange 8" 150 lb RF, ANSI B16.5/316L	D51
Flange 8" 150 lb RF, ANSI B16.5/ECTFE[6]	D52
Flange 1" BS.10 Table E/316L	D53
Flange 1" BS.10 Table E/PFA[6]	D54
Flange 1½" BS.10 Table E/316L	D55
Flange 3½" BS.10 Table E/316L	D56
Flange 4" BS.10 Table E/ECTFE[6]	D57
Flange DN 40 10K, JIS/316L	D58
Flange DN 50 10K, JIS/316L	D60
Flange DN 80 10K, JIS/316L	D61
Flange DN 100 10K, JIS/316L	D62

Selection and Ordering data	Article No.
SITRANS LVL200, Rigid extension Compact vibrating level switch for use 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-** ▢▢▢▢▢ - ▢▢▢▢
Adapter/Process temperature	
Without adapter/-50 ... +150 °C	1
With adapter/-50 ... +200 °C[8]	2
With adapter/-50... +250 °C	3
With gas-tight leadthrough/-50 ... +150 °C	4
With gas-tight leadthrough/-50 ... +250 °C	5
Housing/ Cable entry	
Aluminium IP66/IP67/M20x1.5	A
Aluminium IP66/IP67/½" NPT	B
316L stainless steel (electropolished) IP66/IP67/M20X1.5[9][10]	C
316L stainless steel (electropolished) IP66/IP67/½" NPT[9][10]	D
NOTE: **When selecting a Rigid Extension option, extension coating must match the process connection coating and the material and surface roughness type.**	
Rigid Extension 316L	
80 ... 500 mm	A 0
501 ... 1 000 mm	A 1
1 001 ... 1 500 mm	A 2
1 501 ... 2 000 mm	A 3
2 001 ... 2 500 mm	A 4
2 501 ... 3 000 mm	A 5
3 001 ... 3 500 mm	A 6
3 501 ... 4 000 mm	A 7
Rigid Extension ECTFE coated[6]	
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 coated[6]	
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
Rigid Extension 316L Ra ≤ 0.8 µm	
80 ... 500 mm	D 0
501 ... 1 000 mm	D 1
1 001 ... 1 500 mm	D 2
1 501 ... 2 000 mm	D 3
2 001 ... 2 500 mm	D 4
2 501 ... 3 000 mm	D 5
3 001 ... 3 500 mm	D 6
3 501 ... 4 000 mm	D 7
Rigid Extension 316L Ra ≤ 0.3 µm	
80 ... 500 mm	E 0
501 ... 1 000 mm	E 1
1 001 ... 1 500 mm	E 2
1 501 ... 2 000 mm	E 3
2 001 ... 2 500 mm	E 4
2 501 ... 3 000 mm	E 5
3 001 ... 3 500 mm	E 6
3 501 ... 4 000 mm	E 7

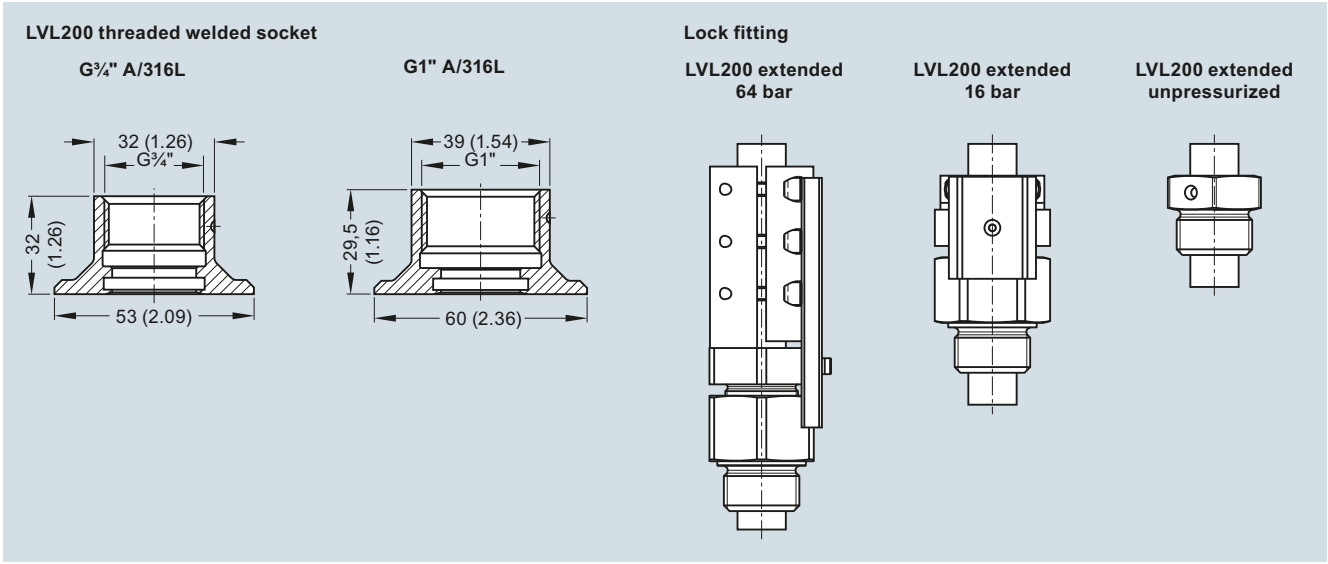
Selection and Ordering data	Article No.
SITRANS LVL200, Rigid extension Compact vibrating level switch for use in liquid applications such as overflow, high, low, and demand applications, as well as pump protection. For use in SIL-2 and hazardous applications.	**7ML5747-** ▢▢▢▢▢ - ▢▢▢▢
Rigid Extension Enamelled version[7]	
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
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 Monel	
80 ... 500 mm	H 0
501 ... 1 000 mm	H 1
1 001 ... 1 500 mm	H 2
1 501 ... 2 000 mm	H 3
2 001 ... 2 500 mm	H 4
2 501 ... 3 000 mm	H 5

1) Available with Approval options A ... G, and K, and Adapter/Process temperature options 1, and 3 ... 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)

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 EN10204	**D07**
Acceptance test certificate 3.1 for instrument EN10204	**C12**
Acceptance test Certificate 2.2 for material EN10204	**C15**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511	**C20**
Additional Operating Instructions	Article No.
LVL200 Extended (DPDT Relay)	
• English	**7ML1998-5KW01**
• French	**7ML1998-5KW11**
• Spanish	**7ML1998-5KW21**
• German	**7ML1998-5KW31**
LVL200 (Contactless electronic switch)	
• English	**7ML1998-5KV01**
• French	**7ML1998-5KV11**
• Spanish	**7ML1998-5KV21**
• German	**7ML1998-5KV31**
Electronics module LVL200 Relay	
• English	**7ML1998-5LS01**
• French	**7ML1998-5LS11**
• Spanish	**7ML1998-5LS21**
• German This device is shipped with the Siemens Milltronics manual DVD containing the Operating Instructions library.	**7ML1998-5LS31**
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**

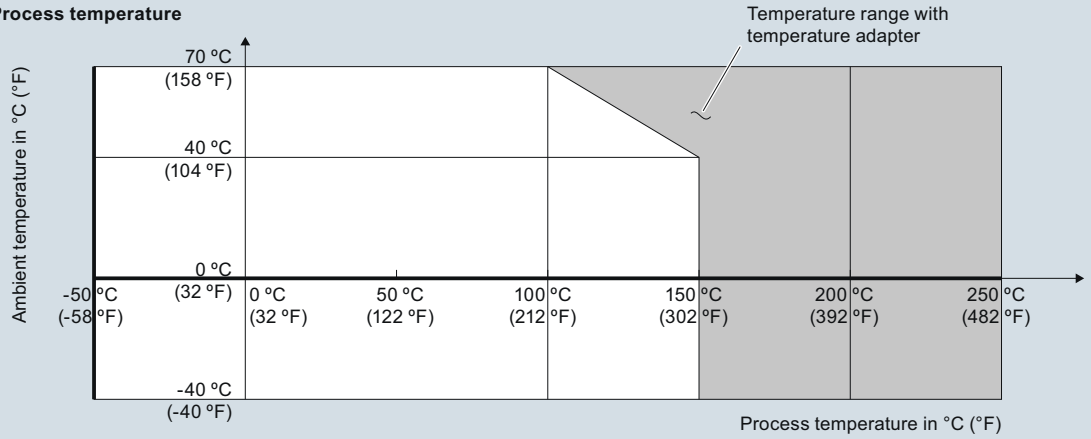
Options



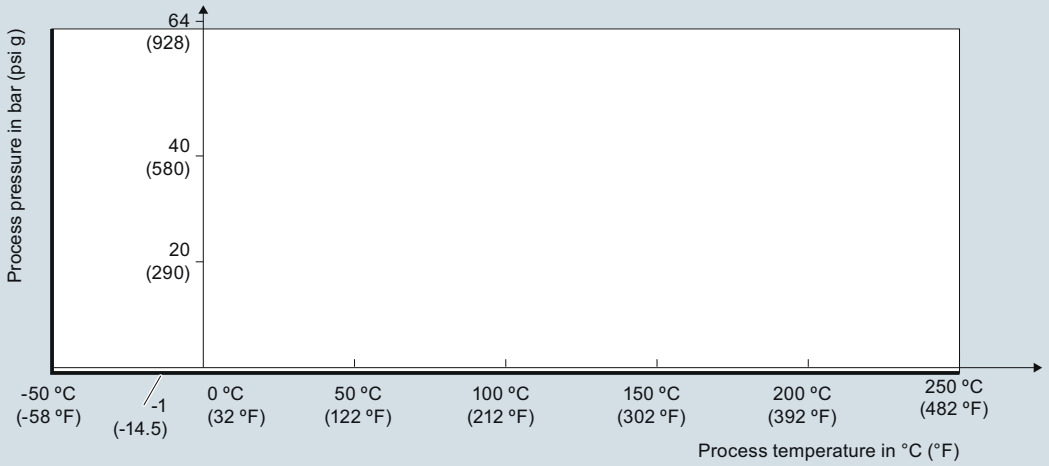
SITRANS LVL200 welded socket and lock fitting, dimensions in mm (inch)

Characteristic curves

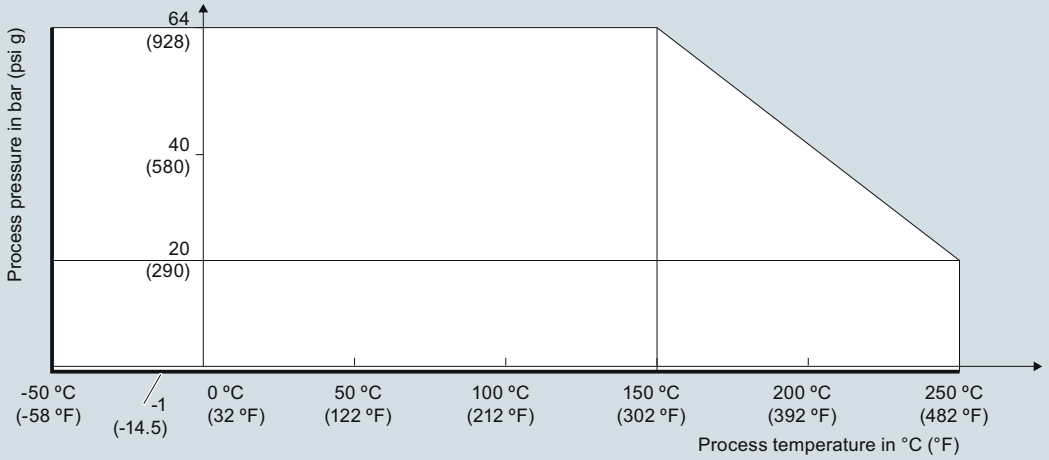
Ambient/Process temperature



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

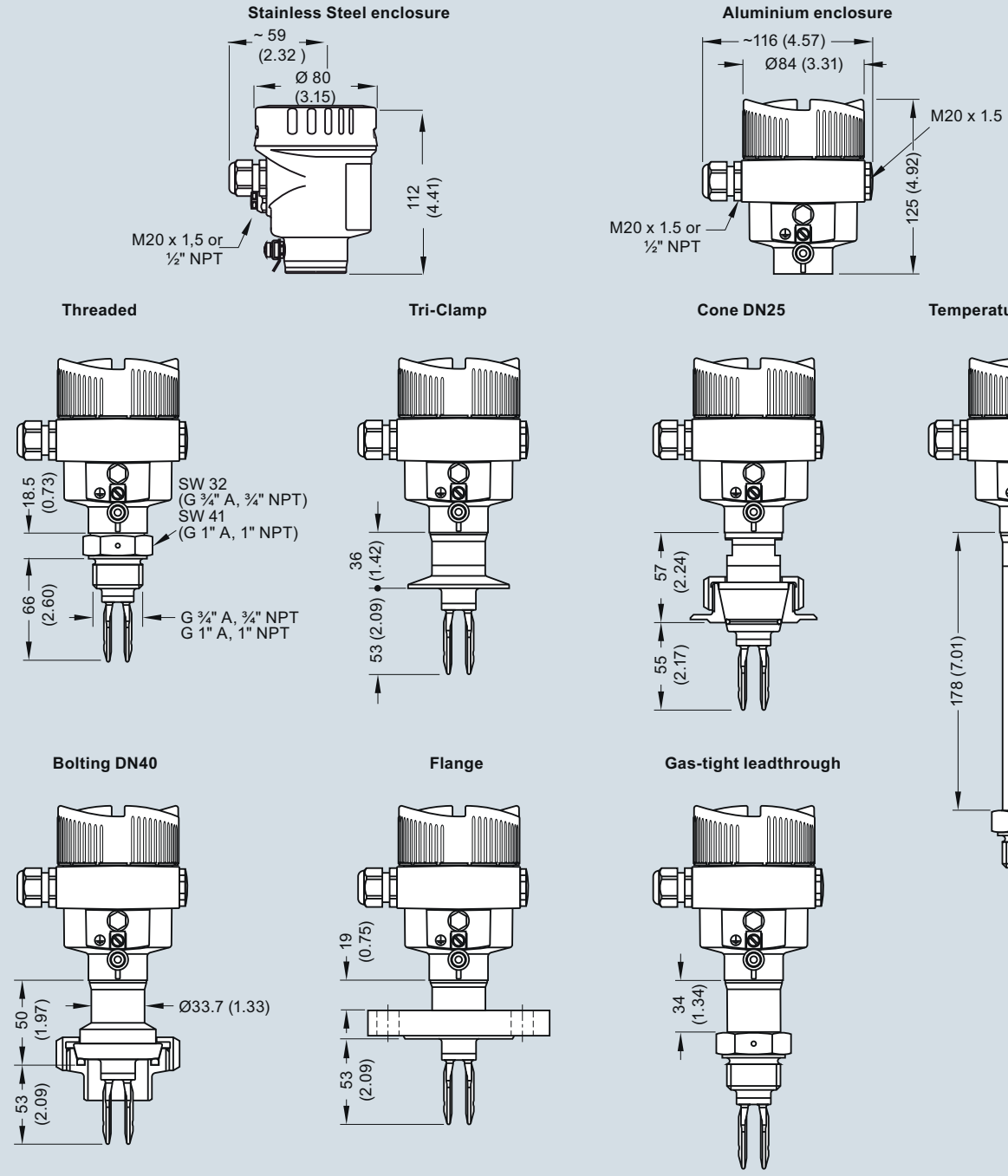


Process pressure with switch position 0.5 g/cm³ (mode switch)



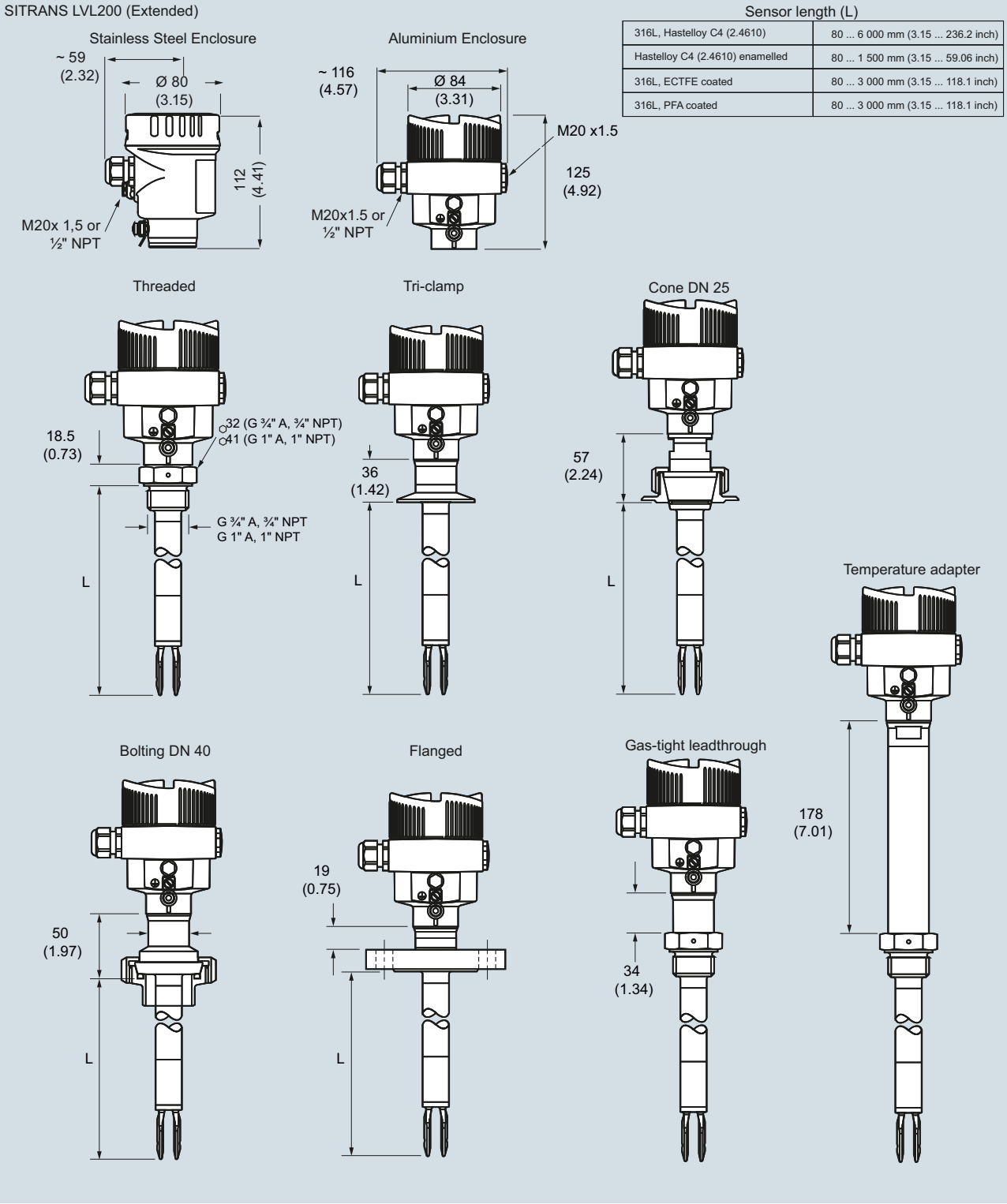
SITRANS LVL200 Process Pressure/Process Temperature/Ambient Temperature derating curves

Dimensional drawings



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

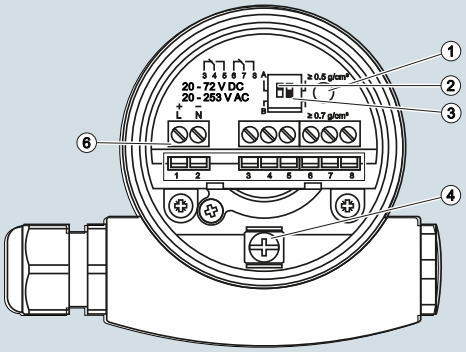
SITRANS LVL200



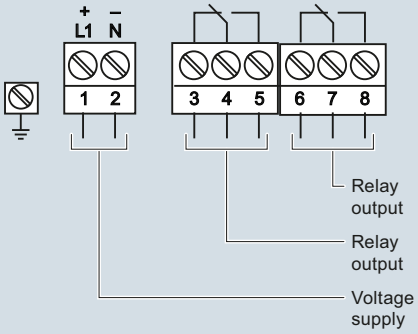
SITRANS LVL200 (Extended), dimensions in mm (inch)

Schematics

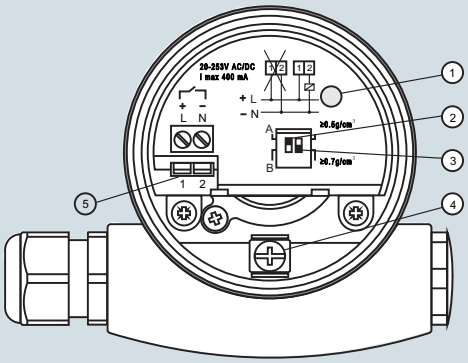
Relay (DPDT)



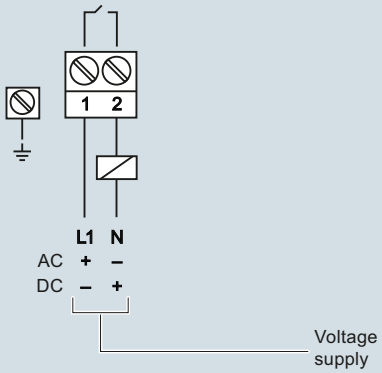
①	Control lamp
②	DIL switch for characteristics reversal
③	DIL switch for sensitivity adjustment
④	Ground terminal
⑤	Connection terminals



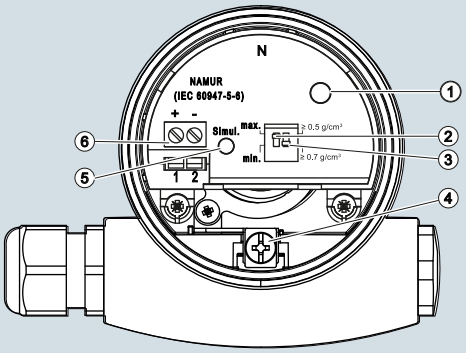
Contactless



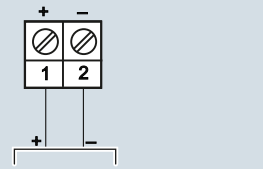
①	Control lamp
②	DIL switch for mode adjustment
③	DIL switch for switching point adaptation
④	Ground terminal
⑤	Connection terminals



NAMUR



①	Control lamp
②	DIL switch for characteristics reversal
③	DIL switch for sensitivity adjustment
④	Ground terminal
⑤	Simulation key
⑥	Connection terminals



SITRANS LVL200 connections

SITRANS LVS100

Overview

SITRANS LVS100 is a vibrating point level switch for 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/ft^3)
- 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.

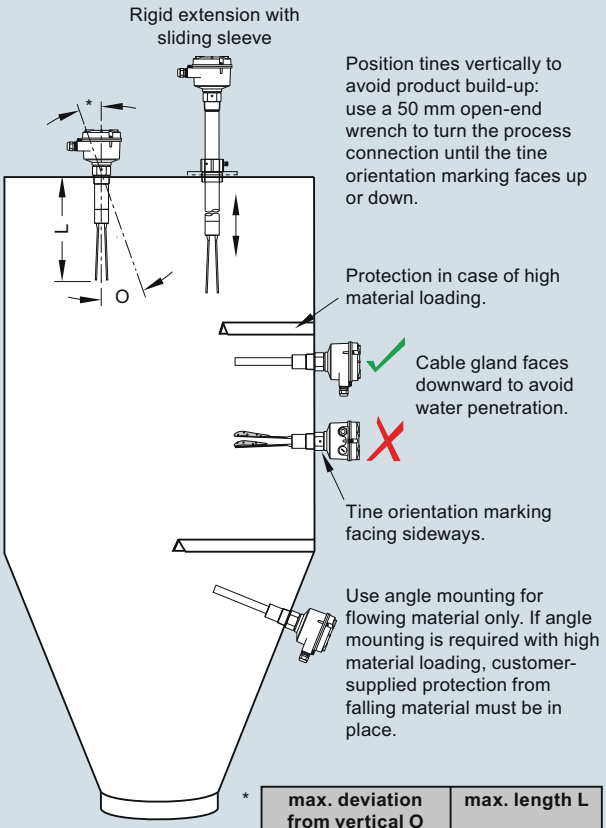
SITRANS LVS100 has a compact design and can be top, side, or angle mounted. The vibrating fork design ensures the tines are kept clean. The unique design of the fork and crystal assembly eliminates false high level readings even if tines become damaged.

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

Installation



max. deviation from vertical O	max. length L
5°	4.0 m
45°	1.2 m
> 45°	0.6 m

SITRANS LVS100 installation, dimensions in mm (inch)

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	
• Enclosure	Epoxy coated aluminum
Process connection	• Thread 1¼" NPT [(Taper), ANSI/ASME B1.20.1], R 1½" [(BSPT), EN 10226] • 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 • C-TICK • ATEX II 1/2 D • IECex

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
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)	⬟	1 1
Add Order code Y01 and plain text: "Insertion length ... mm"		
Stainless steel 304 (1.4301)		
• 300 ... 500 mm (11.81 ... 19.69 inch)	⬟	1 2
• 501 ... 1 000 mm (19.72 ... 39.37 inch)	⬟	1 3
• 1 001 ... 1 500 mm (39.41 ... 59.06 inch)	⬟	1 4
• 1 501 ... 2 000 mm (59.09 ... 78.74 inch)	⬟	1 5
• 2 001 ... 2 500 mm (78.78 ... 98.43 inch)		1 6
• 2 501 ... 3 000 mm (98.46 ... 118.11 inch)		1 7
• 3 001 ... 3 500 mm (118.15 ... 137.80 inch)		1 8
• 3 501 ... 4 000 mm (137.83 ... 157.48 inch)		2 0
Approvals		
CSA/FM General Purpose, CE, C-TICK	⬟	A
CSA/FM Class II, Div. 1, Group E, F, G, Class III, ATEX II 1/2 D, C-TICK	⬟	B
IEC-Ex t IIIC Da/Db		C

[1] Only available with the following configurations 7ML5735-2AA11-0AA0 or 7ML5735-2AB11-0AA0

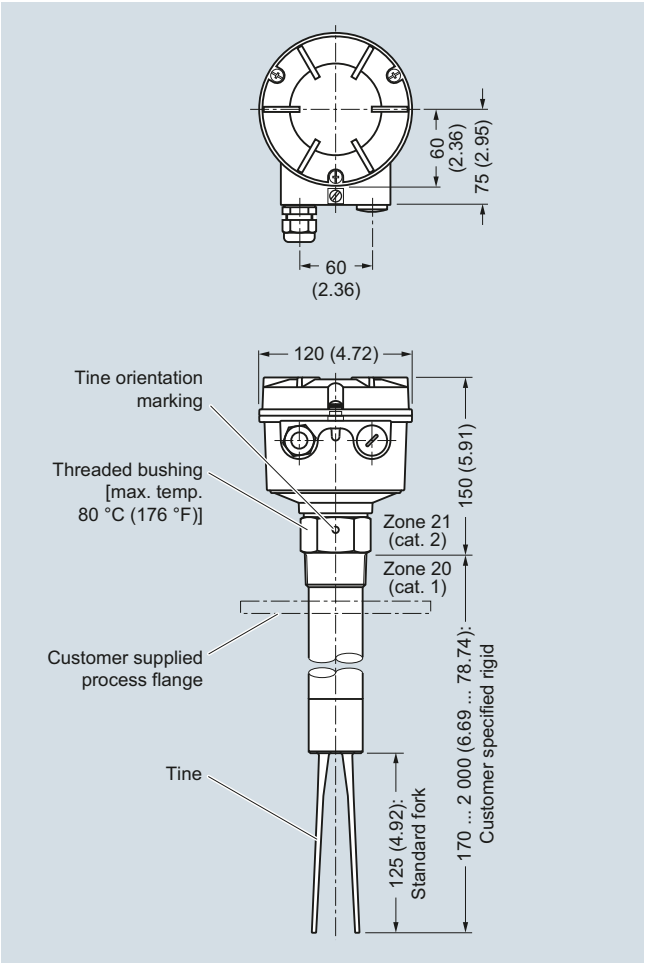
[2] Not available with extension length options 11, 12

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	**7ML1830-1NS**
Relay (19 ... 253 V AC, 19 ... 55 V DC)	
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

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

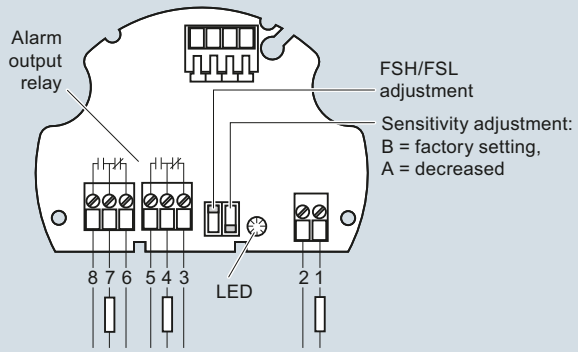
Dimensional drawings



SITRANS LVS100, dimensions in mm (inch)

Schematics

Universal voltage (DPDT relay)



AC: Terminal 1: L
Terminal 2: N
19 ... 230 V AC, +10 %, 50 ... 60 Hz, 8 VA

DC: Terminal 1: +
Terminal 2: -
19 ... 50 V DC, +10 %, 2 W

SITRANS LVS100 connections

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/ft^3); liquid/solid interface version, 50 g/l (3 lb/ft^3) and low density option min. 5 g/l (0.3 lb/ft^3)
- 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)

SITRANS LVS200

Technical specifications

Mode of operation	
Measuring principle	Vibrating point level switch
Input	
Measured variable	High, low and demand
Measuring frequency	
• Standard	125 Hz
• Liquid/solid interface and short fork version	350 Hz
Output	
PNP	Open collector: Permanent load max. 0.4 A, short-circuit and overload protected Turn-on voltage: max. 50 V (reverse protection)
2-wire without contact	Load current: • 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
Relays	
• Version with 1 relay	SPDT relay
• Version with 2 relays	DPDT relay
Relay delay	• From loss of vibration: approximately 1 second • From resumption of vibration: approximately 1 ... 2 seconds
Signal delay	• Probe uncovered to covered: approximately 1 second • Probe covered to uncovered: approximately 1 ... 2 seconds
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
mA output	8/16 mA or 4 ... 20 mA
• Resolution	4 ... 20 mA ± 0.1 mA
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	• 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
• 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	• Standard version: approx. 20 g/l (1.2 lb/ft^3) • Liquid/solid interface version: approx. 50 g/l (3 lb/ft^3) • Optional low density version: approx. 5 g/l (0.3 lb/ft^3)
Design	
Material	
• Enclosure	Epoxy coated aluminum
Process connection	• 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)
Tine material	Stainless steel 316TI (1.4571), PTFE-coated tines are available upon special request
Degree of protection	IP65/Type 4/NEMA 4
Conduit entry	2 x M20x1.5 or 2 x ½" NPT
Weight	• Standard version, no extensions: approx 2.0 kg (4.4 lb) • Solids/liquids version, no extensions: approx. 1.9 kg (4.2 lb)
Power supply	• 19 ... 230 V AC, +10 %, 50 ... 60 Hz, 8 VA • 19 ... 55 V DC, +10 %, 1.5 W
Certificates and approvals	• CSA/FM General Purpose • CE • CSA/FM Dust Ignition Proof • C-TICK • 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

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.	**7ML5731-** ■■■■■ - ■■ **A 0**
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 process150 °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) ▶⬟	**1 1**
Add Order code Y01 and plain text: "Insertion length ... mm"	
• 300 ... 500 mm (11.81 ... 19.69 inch) ⬟	**1 2**
• 501 ... 750 mm (19.72 ... 29.53 inch) ⬟	**1 3**
• 751 ... 1 000 mm (29.57 ... 39.37 inch) ⬟	**1 4**
• 1 001 ... 1 250 mm (39.41 ... 49.21 inch) ⬟	**1 5**
• 1 251 ... 1 500 mm (49.25 ... 59.06 inch) ⬟	**1 6**
• 1 501 ... 1 750 mm (59.09 ... 68.90 inch) ⬟	**1 7**
• 1 751 ... 2 000 mm (68.94 ... 78.74 inch) ⬟	**1 8**
• 2 001 ... 2 250 mm (78.78 ... 88.58 inch) ⬟	**2 1**
• 2 251 ... 2 500 mm (88.62 ... 98.43 inch) ⬟	**2 2**
• 2 501 ... 2 750 mm (98.46 ... 108.27 inch) ⬟	**2 3**
• 2 751 ... 3 000 mm (108.31 ... 118.11 inch) ⬟	**2 4**
• 3 001 ... 3 250 mm (118.15 ... 127.95 inch) ⬟	**2 5**
• 3 251 ... 3 500 mm (127.99 ... 137.80 inch) ⬟	**2 6**
• 3 501 ... 3 750 mm (137.83 ... 147.64 inch) ⬟	**2 7**
• 3 751 ... 4 000 mm (147.68 ... 157.48 inch) ⬟	**2 8**

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.	**7ML5731-** ■■■■■ - ■■ **A 0**
Stainless steel 316L (1.4404)	
Standard length, 235 mm (9.25 inch)	**3 1**
Add Order code Y01 and plain text: "Insertion length ... mm"	
300 ... 500 mm (11.81 ... 19.69 inch)	**3 2**
501 ... 750 mm (19.72 ... 29.53 inch)	**3 3**
751 ... 1 000 mm (29.57 ... 39.37 inch)	**3 4**
1 001 ... 1 250 mm (39.41 ... 49.21 inch)	**3 5**
1 251 ... 1 500 mm (49.25 ... 59.06 inch)	**3 6**
1 501 ... 1 750 mm (59.09 ... 68.90 inch)	**3 7**
1 751 ... 2 000 mm (68.94 ... 78.74 inch)	**3 8**
2 001 ... 2 250 mm (78.78 ... 88.58 inch)	**4 1**
2 251 ... 2 500 mm (88.62 ... 98.43 inch)	**4 2**
2 501 ... 2 750 mm (98.46 ... 108.27 inch)	**4 3**
2 751 ... 3 000 mm (108.31 ... 118.11 inch)	**4 4**
3 001 ... 3 250 mm (118.15 ... 127.95 inch)	**4 5**
3 251 ... 3 500 mm (127.99 ... 137.80 inch)	**4 6**
3 501 ... 3 750 mm (137.83 ... 147.64 inch)	**4 7**
3 751 ... 4 000 mm (147.68 ... 157.48 inch)	**4 8**
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, C-TICK ▶⬟	**A**
ATEX II 1/2 D, C-TICK ▶⬟	**B**
CSA/FM General Purpose, C-TICK ⬟	**C**
CE, C-TICK ⬟	**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, C-TICK	**E**
ATEX II 1G and 1/2G Eex ia IIC; ATEX II 1D and 1/2D, C-TICK	**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.

SITRANS LVS200

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**
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, 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**
NAMUR 8/16 mA switch amplifiers available, contact factory for pricing	
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 (125 Hz) [19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)]	**7ML1830-1KL**
Sliding sleeve, 2" BSP (ISO 228)	**7ML1830-1JM**
Sliding sleeve, 2" NPT (ASME B1.20.1)	**7ML1830-1JN**
Isolator switch amplifier relay output KFD2-SR2-Ex1.W	**A5E03496569**
Available ex stock	
SITRANS LVS200, standard, power supply 7, process temperature A, process connection A, extension length 11, material process connection/ extension 1, and approval B	**7ML5731-7AA11-1BA0**
SITRANS LVS200, standard, power supply 7, process temperature A, process connection B, extension length 11, material process connection/ extension 1, and approval A	**7ML5731-7AB11-1AA0**

1) Available only with power supply 1 and Approval C, D and with Process connection flange E ... J

2) Available with Approval option D only

Selection and Ordering data	Article No.
SITRANS LVS200, short fork for liquids/ solids interface Vibrating point level switch for solids or solids within liquid interface applications, and high load applications with short insertion requirements	**7ML5732-** ■■■■■ - ■■ **A 0**
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)	**2**
18 ... 50 V DC PNP	**3**
19 ... 230 V AC/DC without contact, 2-wire loop powered	**4**
8/16 mA or 4 ... 20 mA; 12.5 ... 35 V DC, 2-wire[1]	**5**
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)][2]	**C**
2" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69 inch)][2]	**D**
Flanged	
DN 100 PN 6, EN 1092-1[3]	**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, 165 mm (6.50 inch)	**1 1**
Add Order code Y01 and plain text: "Insertion length ... mm"	
200 ... 500 mm (7.87 ... 19.69 inch)	**1 2**
501 ... 750 mm (19.72 ... 29.53 inch)	**1 3**
751 ... 1 000 mm (29.57 ... 39.37 inch)	**1 4**
1 001 ... 1 250 mm (39.41 ... 49.21 inch)	**1 5**
1 251 ... 1 500 mm (49.25 ... 59.06 inch)	**1 6**
1 501 ... 1 750 mm (59.09 ... 68.90 inch)	**1 7**
1 751 ... 2 000 mm (68.94 ... 78.74 inch)	**1 8**
2 001 ... 2 250 mm (78.78 ... 88.58 inch)	**2 1**
2 251 ... 2 500 mm (88.62 ... 98.43 inch)	**2 2**
2 501 ... 2 750 mm (98.46 ... 108.27 inch)	**2 3**
2 751 ... 3 000 mm (108.31 ... 118.11 inch)	**2 4**
3 001 ... 3 250 mm (118.15 ... 127.95 inch)	**2 5**
3 251 ... 3 500 mm (127.99 ... 137.80 inch)	**2 6**
3 501 ... 3 750 mm (137.83 ... 147.64 inch)	**2 7**
3 751 ... 4 000 mm (147.68 ... 157.48 inch)	**2 8**
Stainless steel 316L (1.4404)	
Standard length, 165 mm (6.50 inch)	**3 1**
Add Order code Y01 and plain text: "Insertion length ... mm"	
200 ... 500 mm (7.87 ... 19.69 inch)	**3 2**
501 ... 750 mm (19.72 ... 29.53 inch)	**3 3**
751 ... 1 000 mm (29.57 ... 39.37 inch)	**3 4**

Selection and Ordering data		Article No.
SITRANS LVS200, short fork for liquids/ solids interface Vibrating point level switch for solids or solids within liquid interface applications, and high load applications with short insertion requirements		**7ML5732-** ■■■■■ - ■■ **A 0**
1 001 ... 1 250 mm (39.41 ... 49.21 inch)		**3 5**
1 251 ... 1 500 mm (49.25 ... 59.06 inch)		**3 6**
1 501 ... 1 750 mm (59.09 ... 68.90 inch)		**3 7**
1 751 ... 2 000 mm (68.94 ... 78.74 inch)		**3 8**
2 001 ... 2 250 mm (78.78 ... 88.58 inch)		**4 1**
2 251 ... 2 500 mm (88.62 ... 98.43 inch)		**4 2**
2 501 ... 2 750 mm (98.46 ... 108.27 inch)		**4 3**
2 751 ... 3 000 mm (108.31 ... 118.11 inch)		**4 4**
3 001 ... 3 250 mm (118.15 ... 127.95 inch)		**4 5**
3 251 ... 3 500 mm (127.99 ... 137.80 inch)		**4 6**
3 501 ... 3 750 mm (137.83 ... 147.64 inch)		**4 7**
3 751 ... 4 000 mm (147.68 ... 157.48 inch)		**4 8**
Material process connection/extension		
Stainless steel threads 304 (1.4301), flanges 321(1.4541), Tri-clamp 304 (1.4301)[4]	⬟	**1**
Stainless steel 316L (1.4404)[5]		**2**
Approvals		
CSA/FM Dust Ignition Proof, C-TICK	⬟	**A**
ATEX II 1/2 D, C-TICK	⬟	**B**
CSA/FM General Purpose, C-TICK	⬟	**C**
CE, C-TICK	⬟	**D**
IEC-Ex t IIIC Da/Db		**E**

[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

⬟ 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 (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**
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 (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 D only

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)	**7ML5733-** ■■■■■ - ■■ **A 0**
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**
Process temperature	
Up to 150 °C (302 °F)	**A**
Process connection	
Threaded	
R 1½" [(BSPT), EN 10226]	**A**
1½" NPT [(Taper), ANSI/ASME B1.20.1]	**B**
Flanged	
DN 100 PN 6, EN 1092-1 [4]	**C**
DN 100 PN 16, EN 1092-1	**D**
2" ASME 150 lb B16.5	**E**
3" ASME 150 lb B16.5	**F**
4" ASME 150 lb B16.5	**G**
2" Tri-clamp (DN 50) ISO 2852	**K**
Process connection material	
Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301)	**1**
Stainless steel 316L (1.4404)	**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)	**1**
Liquids/solids interface (350 Hz)	**2**
Approvals	
CSA/FM Dust Ignition Proof, C-TICK	**A**
ATEX II 1/2 D, C-TICK	**B**
CSA/FM General Purpose, C-TICK	**C**
CE, C-TICK	**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, C-TICK	**E**
ATEX II 1G and 1/2G Eex ia IIC; ATEX II 1D and 1/2D, C-TICK	**F**
IEC-Ex t IIIC Da/Db	**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)	**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, 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	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 (125 Hz) [19 ... 230 V AC, 19 ... 55 V DC, one relay output (SPDT)]	**7ML1830-1KL**
Replacement Electronis 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 option D only

Selection and Ordering data	Article No.
SITRANS LVS200, cable extended Vibrating point level switch for high or low level detection of bulk solids materials	**7ML5734-** ■■■■■ - ■■ **A 0**
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**
Process temperature	
Up to 80 °C (176 °F)	**A**
Process connection	
Threaded	
R 1½" [(BSPT), EN 10226] (1.4301/304)	**A**
1½" NPT [(Taper), ANSI/ASME B1.20.1] (1.4301/304)	**B**
Flanged	
DN 100 PN 6, EN 1092-1 (1.4541/321)[4]	**C**
DN 100 PN 16, EN 1092-1 (1.4541/321)	**D**
2" ASME 150 lb B16.5 (1.4541/321)	**E**
3" ASME 150 lb B16.5 (1.4541/321)	**F**
4" ASME 150 lb B16.5 (1.4541/321)	**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)]	**1 0**
Add Order code Y01 and plain text: "Insertion length ... mm"	
1 001 ... 2 000 mm (39.41 ... 78.74 inch)	**1 1**
2 001 ... 3 000 mm (78.78 ... 118.11 inch)	**1 2**
3 001 ... 4 000 mm (118.15 ... 157.48 inch)	**1 3**
4 001 ... 5 000 mm (157.52 ... 196.85 inch)	**1 4**
5 001 ... 6 000 mm (196.89 ... 236.22 inch)	**1 5**
6 001 ... 7 000 mm (236.26 ... 275.59 inch)	**1 6**
7 001 ... 8 000 mm (275.63 ... 314.96 inch)[5]	**1 7**
8 001 ... 9 000 mm (315 ... 354.33 inch)[5]	**1 8**
9 001 ... 10 000 mm (354.37 ... 393.70 inch)[5]	**2 0**
10 001 ... 11000 mm (393.74 ... 433.07 inch)[5][6]	**2 1**
11 001 ... 12 000 mm (433.11 ... 472.44 inch)[5][6]	**2 2**
12 001 ... 13 000 mm (472.48 ... 511.81 inch)[5][6]	**2 3**
13 001 ... 14 000 mm (511.85 ... 551.18 inch)[5][6]	**2 4**
14 001 ... 15 000 mm (551.22 ... 590.55 inch)[5][6]	**2 5**
15 001 ... 16 000 mm (590.59 ... 629.92 inch)[5][6]	**2 6**
16 001 ... 17 000 mm (629.96 ... 669.29 inch)[5][6]	**2 7**
17 001 ... 18 000 mm (669.33 ... 708.66 inch)[5][6]	**2 8**
18 001 ... 19 000 mm (708.70 ... 748.03 inch)[5][6]	**3 0**
19 001 ... 20 000 mm (748.07 ... 787.40 inch)[5][6]	**3 1**
Application type	
Dry bulk solids (125 Hz)	**1**
Liquid/solids interface (350 Hz)[7]	**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	**7ML5734-** ■■■■■ - ■■ **A 0**
Approvals	
CSA/FM Dust Ignition Proof, C-TICK	**A**
ATEX II 1/2 D, C-TICK	**B**
CSA/FM General Purpose, C-TICK	**C**
CE, C-TICK	**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, C-TICK	**E**
ATEX II 1G and 1/2G Eex ia IIC; ATEX II 1D and 1/2D, C-TICK[6]	**F**
IEC-Ex t IIIC Da/Db	**G**

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).

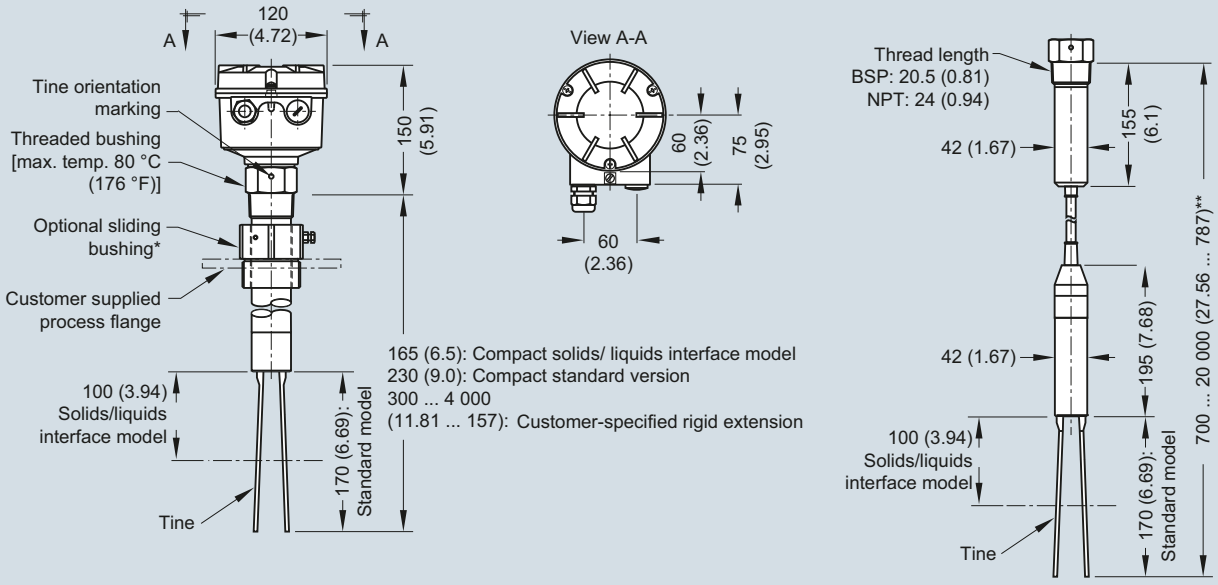
Selection and Ordering data	Order code
Further Designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description, max. 20 000 mm (787.40 inch)	**Y01**
Stainless steel tag [100 x 45 mm (3.94 x 1.77 inch)]: Measuring-point number/identification (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	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 (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

4

SITRANS LVS200

Dimensional drawings

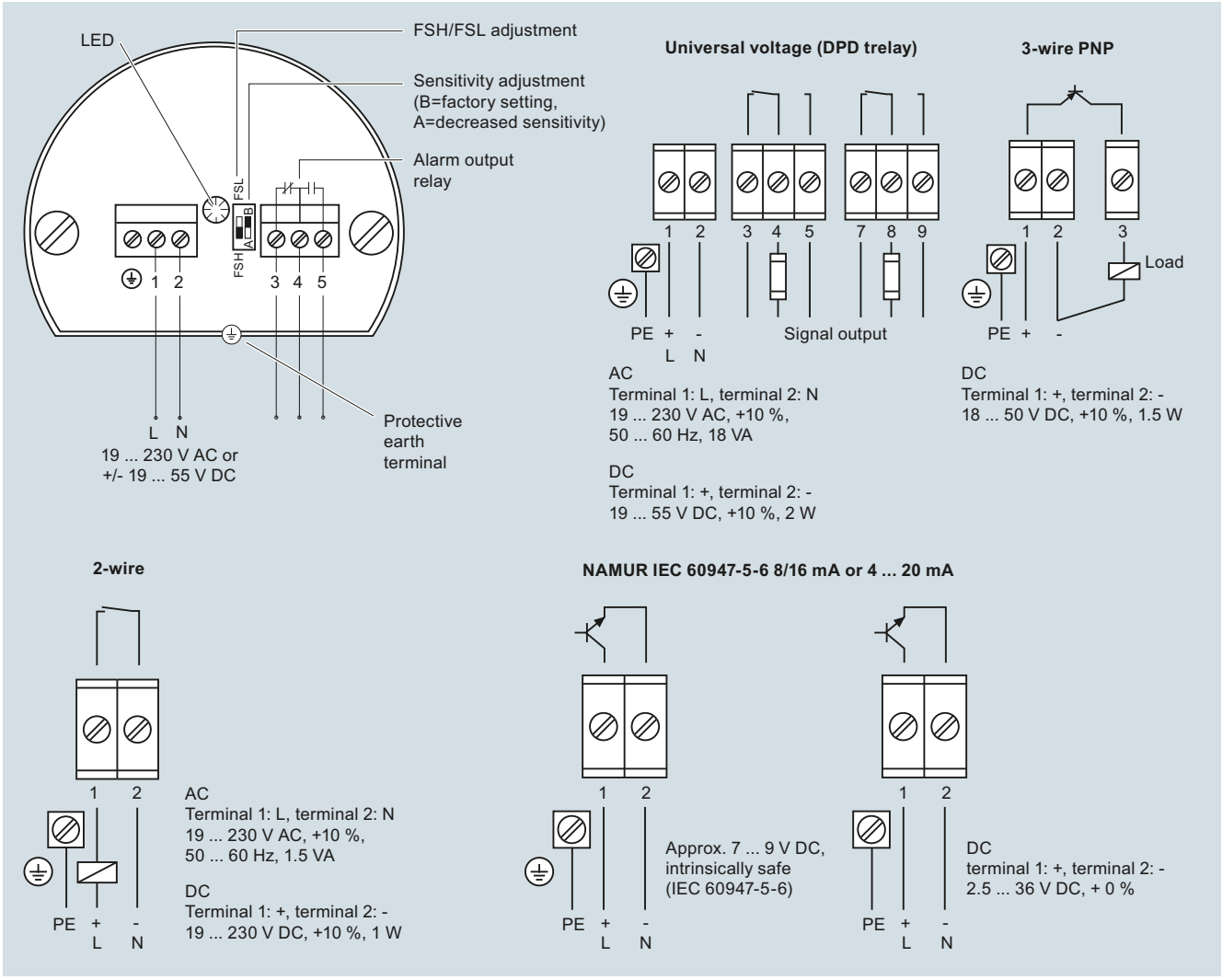


Notes:

* 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

SITRANS LPS200

Overview

SITRANS LPS200 is a rotary paddle switch for point level 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/ft^3) with the optional rectangular vane or 100 g/l (6.25 lb/ft^3) 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	
• Alarm output	Microswitch 5 A at 250 V AC, non inductive Microswitch SPDT contact 4 A at 30 V DC, non-inductive
• Pickup delay	Standard (1 rpm model): approx 1.3 seconds Optional process applications (5 rpm model): approx. 0.26 seconds
Sensitivity	Adjustable via reset force of spring or geometry of measuring vane
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-25 ... +60 °C (-13 ... +140 °F)
• Installation category	III
• Pollution degree	2
Medium conditions	Bulk solids
• Temperature	
- Standard	-25 ... +80 °C (-13 ... +176 °F)
- Optional	-25 ... +600 °C (-13 ... +1 112 °F)
• Pressure (vessel)	
- Standard	Max. 0.5 bar g (7.25 psi g)
- Optional	Max. 10 bar g (145 psi g)
• Minimum material density	
- Standard measuring vane	• Can detect down to 100 g/l (6.25 lb/ft^3)
- Optional measuring vane	• Can detect down to15 g/l (2.19 lb/ft^3)
Design	
Material	
• Enclosure	Epoxy coated aluminum
• 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
Certificates and approvals	• CSA/FM General Purpose • CE • CSA/FM Dust Ignition Proof • ATEX II 1/2 D • C-TICK • IECex

Selection and Ordering data		Article No.
SITRANS LPS200, compact Rotary paddle switch for level detection in bulk solids. Compact design for side or top mounted applications.		**7ML5725-** ■■■■■ - ■■■ **0**
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 multivoltage, 1 rev/min.	►⬟	**Q**
Switch selectable 230 V AC/115 V AC/24 V DC multivoltage, 5 rev/min.	⬟	**R**
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**
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**

Selection and Ordering data		Article No.
SITRANS LPS200, compact Rotary paddle switch for level detection in bulk solids. Compact design for side or top mounted applications.		**7ML5725-** ■■■■■ - ■■■ **0**
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)[12)11)]	⬟	**F**
Rectangular 98 x 250 mm (3.86 x 9.84 inch)[12)11)]	⬟	**G**
Rectangular 50 x 98 mm (1.97 x 3.86 inch)[12)]	⬟	**H**
Approvals		
CSA/FM Dust Ignition Proof, C-TICK	►⬟	**A**
ATEX II 1/2 D, C-TICK	►⬟	**B**
CSA/FM General Purpose , C-TICK	►⬟	**C**
CE, C-TICK	►⬟	**D**
IEC Ex ta/tb IIIC		**E**

1) Available with approval option C and D only, up to max. 0.5 bar
2) Not available with process connections A, B, D, E, G
3) Available with configurations 7ML5725-5AC11-2AD0 or 7ML5725-5EE11-2AC0 only
4) Available with configurations 7ML5725-6QC12-2AB0 or 7ML5725e6QE12-2AA0 only
5) Available with process pressure 1 and 2 only
6) Available with process temperature 1 only
7) Available with process connections A ... G, process pressure 1, and process temperature 1 and 5 only
8) Extension and Vane will also change to 316L, only for process connection C, F, H ... N and vane A
9) Available with measuring vane options A, C, D, E, H only
10) Add 16 mm (0.63 inch) to extension length
11) Available with extension length options 2 ... 5 only
12) Available with process connections H ... M 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.

4

Point level measurement – Rotation paddle switches

SITRANS LPS200

Selection and Ordering data	Order code
Further Designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Heating of enclosure[1)2)]	**A35**
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**
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	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**
Rigid extension kit	
(includes spring coupling, rigid tube extension and required pins)	
Extension: 500, 400, 300 mm (19.7, 15.8, 11.8 inch)	**7ML5711-0AA**
Extension: 1 000, 900, 800, 700, 600 (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**
Available ex stock	
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**
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**
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**
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**

1) Available with approval option D only

2) Available with power supply options A, C, E, G, J, K, L, N 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.
SITRANS LPS200, shaft protected Rotary paddle switch for level detection in bulk solids; ideal for heavy, sticky, or high impact applications. Designed with added protection tube for enhanced shaft protection		**7ML5726-** ■■■■■ - ■■■■
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 multivoltage, 1 rev/min.	▶⬟	Q
Switch selectable 230 V AC/115 V AC/24 V DC multivoltage, 5 rev/min.	⬟	R
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[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
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

Selection and Ordering data		Article No.
SITRANS LPS200, shaft protected Rotary paddle switch for level detection in bulk solids; ideal for heavy, sticky, or high impact applications. Designed with added protection tube for enhanced shaft protection		**7ML5726-** ■■■■■ - ■■■■
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)[13][12]	⬟	**F**
Rectangular 98 x 250 mm (3.86 x 9.84 inch)[13][12]	⬟	**G**
Rectangular 50 x 98 mm (1.97 x 3.86 inch)[13]	⬟	**H**
Approvals		
CSA/FM Dust Ignition Proof, C-TICK	►⬟	**1**
ATEX II 1/2 D, C-TICK	►⬟	**2**
CSA/FM General Purpose, C-TICK	⬟	**3**
CE, C-TICK	⬟	**4**
IEC Ex ta/tb IIIC		**5**

1) Available with approval options 3 and 4 only, up to max. 0.5 bar
2) Not available with process connections A, C, E
3) Available with configurations 7ML5726-5QB12-2BA2 or 7ML5726-5QC12-2BA1 only
4) Available with process pressure 1 and 2 only
5) Available with process temperature 1 only
6) Available with process connections A ... E only, process pressure 1 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 only
11) Add 16 mm (0.63 inch) to extension length
12) Available with extension length option 2 ...4 only
13) Available with process connections F ... K 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

Selection and Ordering data	Order code
Further Designs Please add "**-Z**" to Article No. and specify Order code(s).	
Heating of enclosure[1][2]	**A35**
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**
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	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**
Available ex stock	
SITRANS LPS200, extended for up to 80 °C (176 °F), power supply Q, process connection B, process pressure 1, process connection material 2, extension length 2, extension material B, measuring vane A, and approval 2	**7ML5726-5QB12-2BA2**
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	**7ML5726-5QC12-2BA1**

1) Available with approval option 4 only
2) Available with power supply options A, C, E, G, J, K, L, N
3) Available up to 250 °C (482 °F). This option does not automatically implement a food conform design.

Point level measurement – Rotation paddle switches

SITRANS LPS200

Selection and Ordering data		Article No. Ord. code
SITRANS LPS200, cable extension		**7ML5727-**
Rotary paddle switch for level detection in bulk solids Cable extension for increased length in top-mounted applications		-
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 multivoltage, 1 rev/min.	⬟	Q
Switch selectable 230 V AC/115 V AC/24 V DC multivoltage, 5 rev/min.	⬟	R
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[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
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[5)]	⬟	1
Stainless steel, threads 303 (1.4305), flanges 321 (1.4541)	⬟	2
Cable extension length		
Standard cable length, 2 000 mm (78.74 inch)	⬟	0
Add Order code Y01 and plain text: "Insertion length ... mm"		
500 ... 1 000 mm (19.69 ... 39.37 inch)	⬟	1
Cable length 1 001 ... 2 000 mm (39.41 ... 78.74 inch)	⬟	2
Cable length 2 001 ... 3 000 mm (78.78 ... 118.11 inch)	⬟	3
Cable length 3 001 ... 4 000 mm (118.15 ... 157.48 inch)	⬟	4
Cable length 4 001 ... 5 000 mm (157.52 ... 196.85 inch)	⬟	5
Cable length 5 001 ... 6 000 mm (196.89 ... 236.22 inch)	⬟	6
Cable length 6 001 ... 7 000 mm (236.26 ... 275.59 inch)	⬟	7
Cable length 7 001 ... 10 000 mm (275.63 ... 393.70 inch)	⬟	8
Without extension		9

Selection and Ordering data		Article No. Ord. code
SITRANS LPS200, cable extension		**7ML5727-**
Rotary paddle switch for level detection in bulk solids Cable extension for increased length in top-mounted applications		-
Measuring vane		
Boot shaped, 35 x 106 mm (1.38 x 4.17 inch)[6)]	⬟	A
Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)[6)]	⬟	B
Boot shaped, 28 x 98 mm (1.10 x 3.86 inch)[7)]	⬟	C
Rectangular 50 x 150 mm (1.97 x 5.91 inch)[7)]	⬟	D
Rectangular 50 x 250 mm (1.97 x 9.84 inch)[7)]	⬟	E
Rectangular 98 x 150 mm (3.86 x 5.91 inch)[7)]	⬟	F
Rectangular 50 x 98 mm (1.97 x 3.86 inch)[7)]	⬟	G
Approvals		
CSA/FM Dust Ignition Proof, C-TICK	⬟	A
ATEX II 1/2 D, C-TICK	⬟	B
CSA/FM General Purpose, C-TICK	⬟	C
CE, C-TICK	⬟	D
IEC Ex ta/tb IIIC		E

1) Available with approval option C and D only, up to max. 0.5 bar

2) Not available with process connections A, C, E

3) Only available with 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 1 and process temperature 1 only

6) Add 16 mm (0.63 inch) to extension length

7) Available with process connections F ... K 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. 10 000 mm (393.70 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**
Reinforced cable (max. 28 kN pulling force)[1]	**P01**
Heating of enclosure[2][3]	**A35**
Signal bulb inserted in M20 cable gland[2]	**A20**
Food grade materials (in contact with process), according to 1935/2004/EC, with FDA conform shaft sealing [4]	**K01**
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**
Rope extension kit, 2 m (6.56 ft)	**7ML1830-1KK**
Available ex stock	
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	**7ML5727-5QB12-0AB0**
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	**7ML5727-5QC12-0AA0**

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 only

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

Point level measurement – Rotation paddle switches

SITRANS LPS200

Selection and Ordering data	Article No.
SITRANS LPS200, angled extension	**7ML5728-**
Rotary paddle switch with robust design for level detection in bulk solids; ideal for heavy or sticky applications. Angled extension designed to avoid falling material and rotate horizontally in side mount applications	■■■■■ - ■■■ **0**
Process temperature	
Up to 80 °C (176 °F)	**1**
Up to 150 °C (302 °F)	**2**
Up to 250 °C (482 °F)	**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 multivoltage, 1 rev/min.	**Q**
Switch selectable 230 V AC/115 V AC/24 V DC multivoltage, 5 rev/min.	**R**
Process connection	
Flanged	
DN 100 PN 6, EN 1092-1[1]	**A**
DN 100 PN 16, EN 1092-1	**B**
4" ASME 150 lb B16.5	**C**
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	
Stainless steel 303/321 (1.4305/1.4541)	**1**
Extension length	
125 mm (4.92 inch)	**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	
Rectangular vane, 50 x 98 mm (1.97 x 3.86 inch)	**A**
Rectangular vane, 50 x 150 mm (1.97 x 5.91 inch)	**B**
Rectangular vane, 50 x 250 mm (1.97 x 9.84 inch)	**C**
Rectangular vane 98 x 150 mm (3.86 x 5.91 inch)	**D**
Rectangular vane 98 x 250 mm (3.86 x 9.84 inch)	**E**
Hinged vane, 65 x 200 mm (2.56 x 7.87 inch)	**F**
Approvals	
CSA/FM Dust Ignition Proof, C-TICK	**A**
ATEX II 1/2 D, C-TICK	**B**
CSA/FM General Purpose, C-TICK	**C**
CE, C-TICK	**D**
IEC Ex ta/tb IIIC	**E**

[1] Available with process pressure 1 and 2 only

Selection and Ordering data	Order code
Further Designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Heating of enclosure[1)2)]	**A35**
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**
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	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 D only

[2)] Available with power supply options A, C, E, G, J, K, L, N only

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

Selection and Ordering data	Article No. Ord. code
SITRANS LPS200, rigid extension Rotary paddle switch for top mount point level 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
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 multivoltage, 1 rev/min.	Q
Switch selectable 230 V AC/115 V AC/24 V DC multivoltage, 5 rev/min.	R
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
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[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
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 P1A
501 ... 750 mm (19.72 ... 29.53 inch)	Z P1B
751 ... 1 000 mm (29.57 ... 39.37 inch)	Z P1C
1 001 ... 1 500 mm (39.41 ... 59.05 inch)	Z P1D
1 501 ... 2 000 mm (59.09 ... 78.74 inch)	Z P1E
2 001 ... 2 500 mm (78.78 ... 98.42 inch)	Z P1F
2 501 ... 3 000 mm (98.46 ... 118.11 inch)	Z P1G
3 001 ... 4 000 mm (118.5 ... 157.48 inch)	Z P1H
Measuring vane	
Boot shaped, 35 x 106 mm (1.34 x 4.17 inch)[12)]	A
Hinged vane, 60 x 200 mm (2.36 x 7.87 inch)[12)]	B
Rectangular 50 x 150 mm (1.97 x 5.91 inch)[13)]	C
Rectangular 50 x 250 mm (1.97 x 9.84 inch)[13)]	D
Rectangular 98 x 150 mm (3.86 x 5.91 inch)[13)]	E
Rectangular 98 x 250 mm (3.86 x 9.84 inch)[13)]	F
Rectangular 50 x 98 mm (1.97 x 3.86 inch)[13)]	G
Approvals	
CSA/FM Dust Ignition Proof, C-TICK	1
ATEX II 1/2 D, C-TICK	2
CSA/FM General Purpose, C-TICK	3
CE, C-TICK	4
IEC Ex ta/tb IIIC	5

1) Available with approval options 3 and 4 only, 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, process pressure 1 and process temperature 1 only

6) Extension and vane will also change to 316L, only for process connection B, D, F ... L and vane 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) Only for process connection B, D, F ... L and vane A, process connection material 3. Available with extension length options 1 ... 8 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 ... K only

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

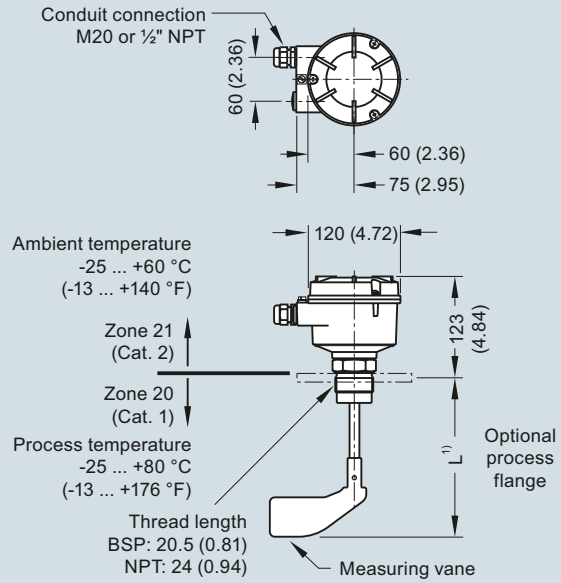
SITRANS LPS200

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 enclosure[1)2)]	**A35**
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)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**

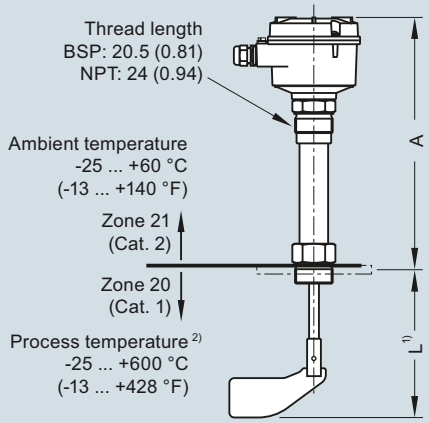
1) Available with approval option 4 only
2) Available with power supply options A, C, E, G, J, K, L, N only
3) Available when ordered with ingress protection seal P06 ... P09 only
4) Available up to 250 °C (482 °F) . This option does not automatically implement a food conform design.
5) Available with process pressure 1 only
6) Available up to 250 °C (482 °F)

Dimensional drawings

Standard model: compact version



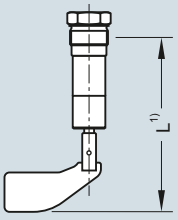
High temperature model: compact version



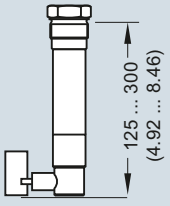
Process temperature	A
150/250 °C (302/482 °F)	200 (7.87)
600 °C (1 112 °F)	400 (15.74)

L= Length
100 (3.94)
150 (5.91)
200 (7.87)
250 (9.84)
300 (11.81)

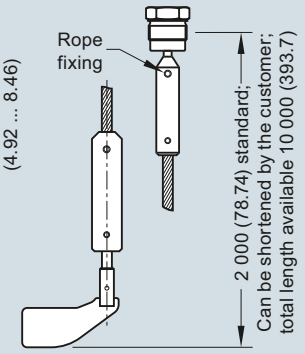
Shaft protected option



Angle option

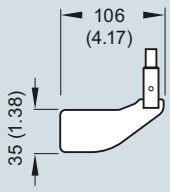


Rope option

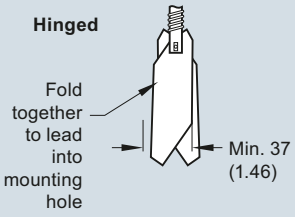


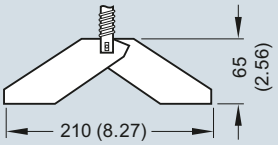
Measuring vanes

Standard

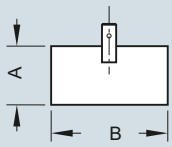


Hinged





Rectangular



Rectangular vane options

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

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/ft³)	300 g/l (18.7 lb/ft³)	100 g/l (6.2 lb/ft³)	150 g/l (9.4 lb/ft³)
boot shaped 28 x 98 mm	300 g/l (18.7 lb/ft³)	500 g/l (31.2 lb/ft³)	150 g/l (9.4 lb/ft³)	150 g/l (9.4 lb/ft³)
rectangular 50 x 98 mm	300 g/l (18.7 lb/ft³)	500 g/l (31.2 lb/ft³)	150 g/l (9.4 lb/ft³)	250 g/l (15.6 lb/ft³)
rectangular 50 x 150 mm	80 g/l (5.0 lb/ft³)	120 g/l (7.5 lb/ft³)	40 g/l (2.5 lb/ft³)	60 g/l (3.7 lb/ft³)
rectangular 50 x 250 mm	30 g/l (1.9 lb/ft³)	50 g/l (3.1 lb/ft³)	15 g/l (0.9 lb/ft³)	25 g/l (1.6 lb/ft³)
rectangular 98 x 150 mm	30 g/l (1.9 lb/ft³)	50 g/l (3.1 lb/ft³)	15 g/l (0.9 lb/ft³)	25 g/l (1.6 lb/ft³)
rectangular 98 x 250 mm	20 g/l (1.2 lb/ft³)	30 g/l (1.9 lb/ft³)	15 g/l (0.9 lb/ft³)	15 g/l (0.9 lb/ft³)
hinged 65 x 210 mm	70 g/l (4.4 lb/ft³)	100 g/l (6.2 lb/ft³)	35 g/l (2.2 lb/ft³)	50 g/l (3.1 lb/ft³)
hinged 60 x 200 mm	70 g/l (4.4 lb/ft³)	100 g/l (6.2 lb/ft³)	35 g/l (2.2 lb/ft³)	50 g/l (3.1 lb/ft³)

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

Notes

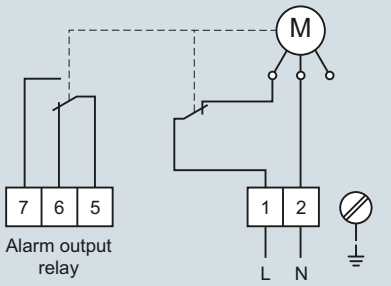
For heavy material, only top mounting of paddle switch is recommended.
Compact LPS200 is recommended for side mounting on bins for low or intermediate material levels.

SITRANS LPS200, dimensions in mm (inch)

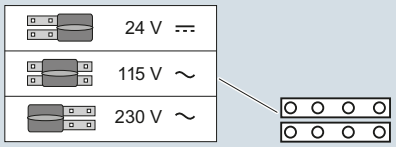
SITRANS LPS200

Schematics

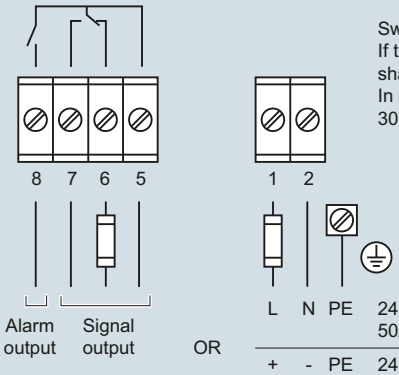
Switch selectable connection



Voltage selector



AC or DC version, SPDT relay, 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.

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 or aluminum enclosures, 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

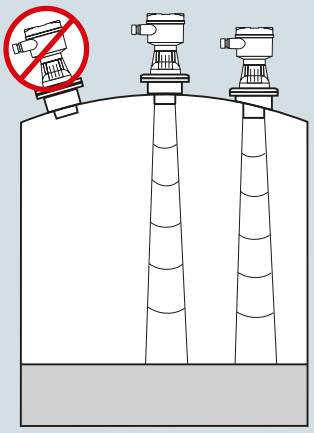
The Pointek ULS200 is available in three thread types: 2" NPT, R 2" (BSPT), EN 10226 or PF2 and can be fitted with the optional 75 mm (3 inch) flange adapter for mating to 3" ASME, DN 65, PN 10, and JIS 10K 3B sized flanges.

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

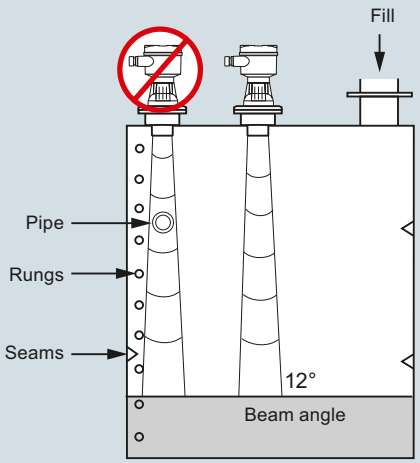
Pointek ULS200

Configuration

Parabolic mounting



Flat mounting and Beam angle



Pointek ULS200 Mounting

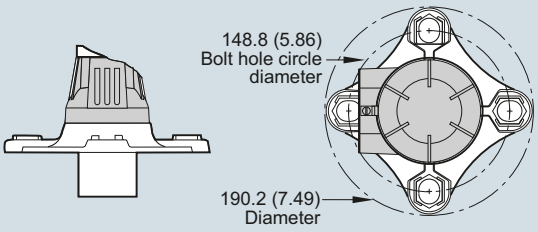
Technical specifications

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 or epoxy-coated aluminum 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 • CSA/FM Class I, II, III, Div. 1, Gr A, B, C, D, E, F, G T4 • ATEX II 2G Ex d mb IIC T5 Gb • C-TICK, ANZEx Ex ds IIC T5, DIP A21 T5, IP65/IP67 • INMETRO Ex d mb IIC T5 Gb

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)

4

Pointek ULS200

Selection and Ordering data		Article No.
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		**7ML1510-** ■■■■ **0** ■
Power supply		
24 V DC, relay output	⬟	**1**
24 V DC, transistor output	⬟	**2**
100 ... 230 V AC, relay output	⬟	**3**
Approvals		
CE, C-TICK, CSA Class I Div. 1, Class II Div. 1, Class III[1]		**F**
CE, C-TICK, FM Class I Div. 1, Class II Div. 1, Class III[1)5)]		**G**
CE, C-TICK, CSA Class I, II, Div. 2[2)]	⬟	**J**
CE, C-TICK, $CSA_{us/c}$, FM	⬟	**K**
CE, C-TICK, ATEX II 2G EEx dmb IIC T5 Gb[3)6)]	⬟	**L**
INMETRO Ex d mb IIC T5 Gb[3)6)]	⬟	**M**
C-TICK, ANZEx Ex ds IIC T5, DIP A21 T5, IP65/IP67 Class I, Zone 1[3)6)]		**N**
Transducer/Process connection		
ETFE, 2" NPT [(Taper), ANSI/ASME B1.20.1]	⬟	**A**
EFTE, R 2" [(BSPT), EN 10226]	⬟	**B**
EFTE, G 2" [(BSPP), EN ISO 228-1]	⬟	**C**
PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1]	⬟	**E**
PVDF copolymer, R 2" [(BSPT), EN 10226]	⬟	**F**
PVDF copolymer, G [(BSPP), EN ISO 228-1]	⬟	**G**
PVDF copolymer, 4" sanitary mounting[4)]		**J**
Enclosure/cable inlet		
Polycarbonate		
• Cable inlet PG 13.5	⬟	**1**
• Cable inlet ½" NPT	⬟	**2**
Aluminum		
• Cable inlet PG 13.5	⬟	**3**
• Cable inlet ½" NPT	⬟	**4**

1) Available with Enclosure/cable inlet option 4 only and process connection options A and E only

2) Available with Enclosure/cable inlet options 2 and 4 only

3) Available with Enclosure/cable inlet option 4 only

4) Available with Approvals option K only

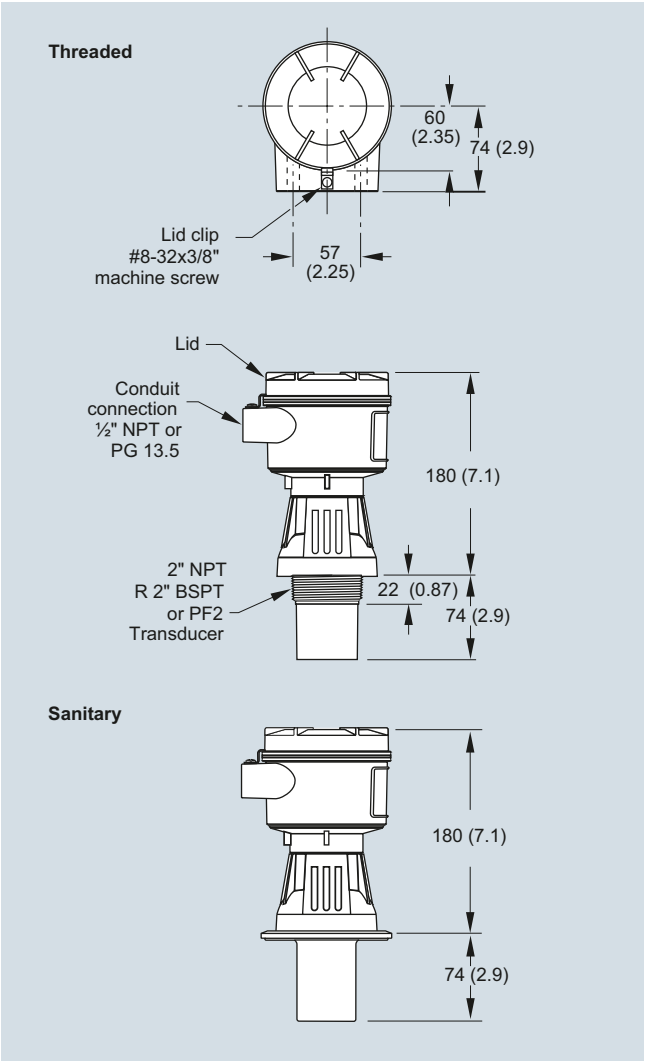
5) Not suitable in Hexane or Ethyl Acetate atmospheres

6) Lower temperature rating of these approvals options is limited to -20 °C (-5 °F)

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

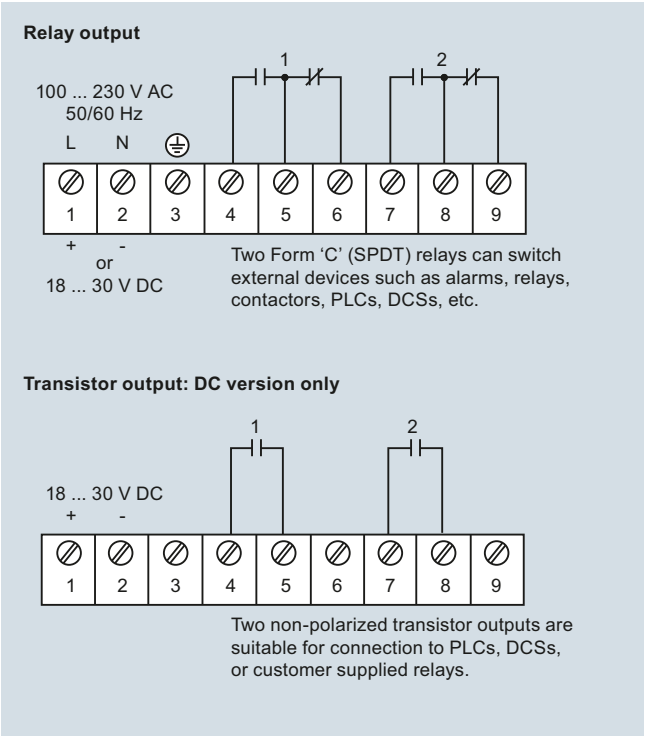
Selection and Ordering data		Order code
Further designs		
Please add "**-Z**" to Article No. and specify Order code(s)		
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	⬟	**Y15**
Operating Instructions		Article No.
Quick Start manual, multi-language		**A5E32268616**
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		**7ML1930-1AC**
Universal Box Bracket Mounting Kit		**7ML1830-1BK**
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" BSPT Locknut, plastic		**7ML1830-1DQ**
2" NPT Locknut		**7ML1830-1DT**
4" sanitary mounting clamp		**7ML1830-1BR**
Spare Parts		
Polycarbonate Lid		**7ML1830-1LG**
Aluminum Lid		**7ML1830-1LH**

Dimensional drawings



Pointek ULS200, dimensions in mm (inch)

Schematics



Pointek ULS200 connections

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, Allen-Bradley Remote I/O, DeviceNet)	Built-in Modbus RTU or ASCII via RS 485 Options: • SIMATIC PDM • SmartLinx (PROFIBUS DP, Allen-Bradley Remote I/O, DeviceNet)	Dolphin, RS 232/RS 485 (LU01, LU02)) Dolphin via infrared (LU10) Options: • SmartLinx (PROFIBUS DP, Allen-Bradley Remote I/O, DeviceNet)
Power specifications	HART: 4 ... 20 mA, 24 V DC nominal, max. 550 Ω, 30 V DC max. OPROFIBUS 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 to 230 V AC ± 15 %, 50/60 Hz, 36 VA/17 W DC version: 12 ... 30 V DC, 20 W	AC version: 100 to 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, C-TICK, ATEX, ANZEx, IECEx	CE, $CSA_{US/C}$, UL Listed, FM, C-TICK, Lloyd's Register, ABS	CE, $CSA_{US/C}$, UL Listed, FM, C-TICK	CE, $CSA_{US/C}$, UL Listed, FM, C-TICK	CE, $CSA_{US/C}$, FM, Lloyd's Register

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 (Suppy 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: (Eg. Agitator, heating coils, supports, other)
☐ No
☐ Yes Please list _____

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
☐ PROFIBUS DP
☐ PROFIBUS PA
☐ Modbus RTU/ASCII
☐ AB Remote I/O
☐ AB DeviceNet
☐ Other
☐ None

Products recommended:

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.

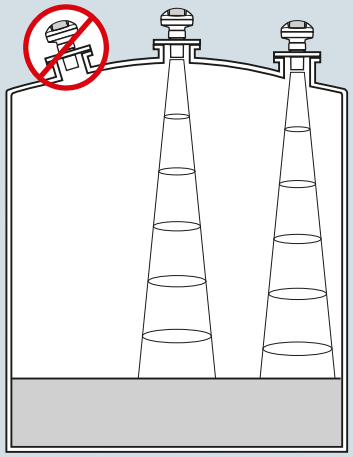
The Probe LU offers two communications options: HART or PROFIBUS PA (Profile version 3.0, Class B).

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.

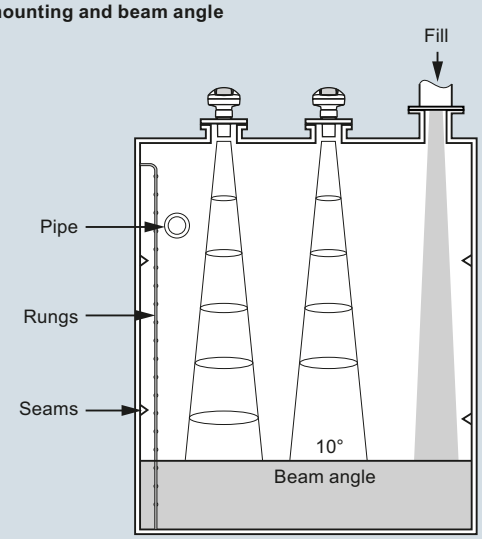
- Key Applications: chemical storage vessels, filter beds, liquid storage vessels

Configuration

Parabolic mounting



Flat mounting and beam angle



SITRANS Probe LU mounting

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 4/188) 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, C-TICK
Marine (only applies to HART communication option)	• Lloyd's Register of Shipping • ABS Type Approval
Hazardous	
• Intrinsically Safe (Europe)	ATEX II 1G EEx ia IIC T4
• Intrinsically Safe (USA/Canada)	CSA/FM T4, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
• Intrinsically Safe (Australia/ New Zealand)	ANZEx Ex ia IIC T4, Tamb = -40 ... +80 °C (-40 ... +176 °F) IP67, IP68
• Intrinsically Safe (International)	IECEx TSA 04.0020X Ex ia IIC T4
• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga
• Non-incendive (USA)	FM T5: Class I, Div. 2, Groups A, B, C, D
Handheld Programmer	
Intrinsically Safe Siemens handheld programmer	Infrared receiver
• Approvals for handheld programmer	IS model with ATEX EEx ia IIC T4 CSA/FM Class I, Div. 1, Groups A, B, C, D
Ambient temperature	-20 ... +40 °C (-5 ... +104 °F)
Interface	Proprietary infrared pulse signal
Power	3 V lithium battery (non-replaceable)

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-** ■■■■■
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, CE, C-TICK, KCC	⬟	**1**
FM, Class I, Div. 2[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[2]	⬟	**5**
Intrinsically Safe, ATEX II 1G EEx ia IIC T4, INMETRO, CE, C-TICK, KCC[2]	⬟	**6**
Intrinsically safe, ATEX II 1 G EEx ia IIC T4, ANZEx, IECEx, INMETRO, CE, C-TICK, 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.

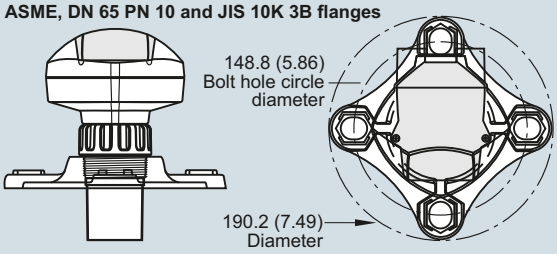
3) Available with communication option 1 only.

⬟ 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		**7ML1998-5HT02**
French		**7ML1998-5HT11**
German Note: The Operating Instructions should be ordered as a separate item on the order.		**7ML1998-5HT32**
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.		**A5E32052143**
Operating Instructions for PROFIBUS PA device		
English		**7ML1998-5JB02**
German Note: The Operating Instructions should be ordered as a separate item on the order.		**7ML1998-5JB32**
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/RS 232 (for use with PC and SIMATIC PDM)		**7MF4997-1DA**
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 Remote display - see Chapter 7		
SITRANS RD200 Remote display - see Chapter 7		
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7		**7ML5750-1AA00-0**
Spare Parts		
Plastic lid		**7ML1830-1KB**

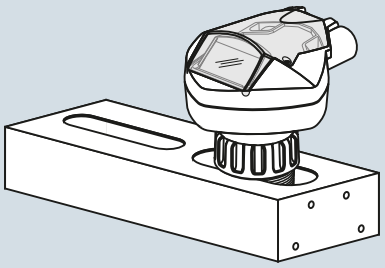
Options

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



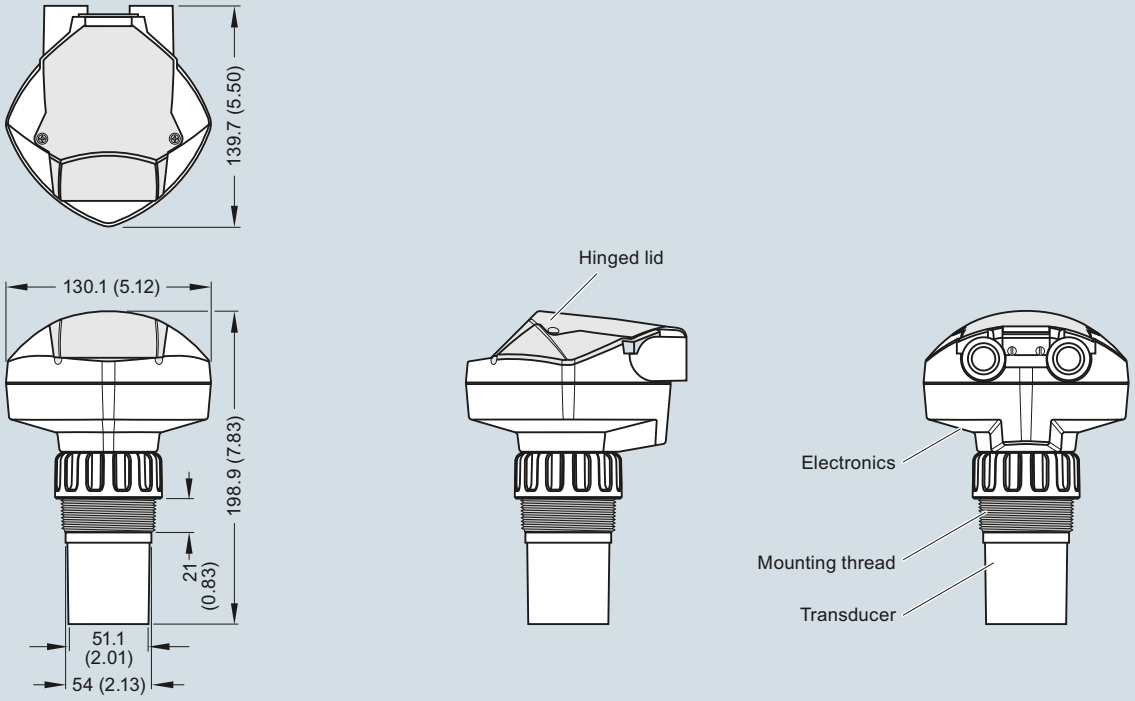
SITRANS Probe LU optional flange adapter, dimensions in mm (inch)

SITRANS Probe LU with FMS 200 mounting bracket



SITRANS Probe LU with optional mounting bracket

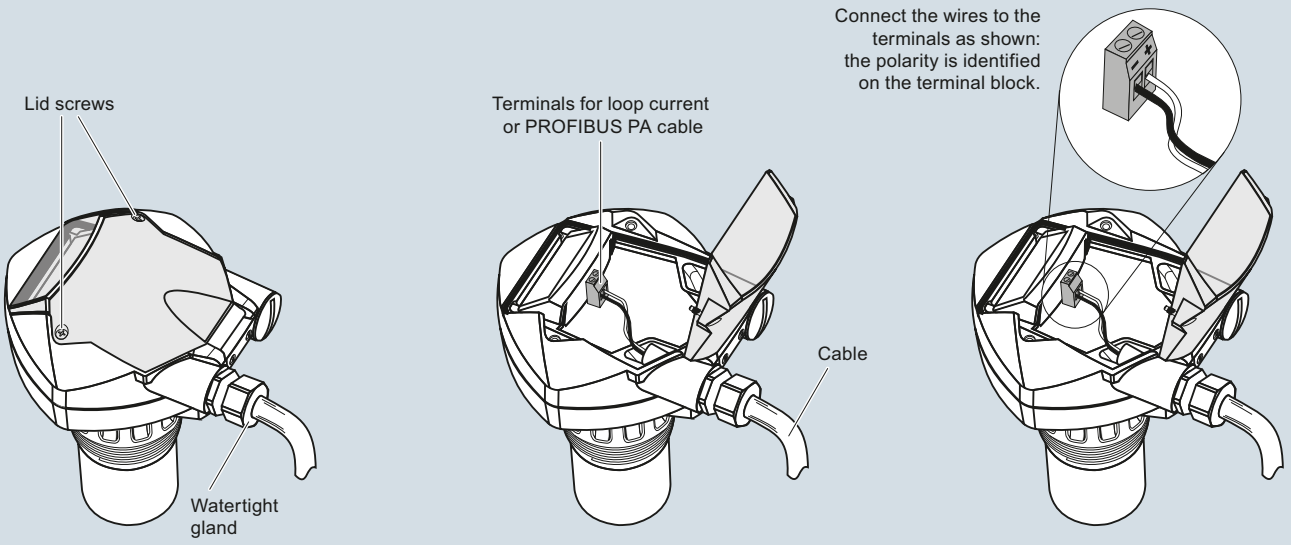
Dimensional drawings



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

SITRANS Probe LU, dimensions in mm (inch)

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

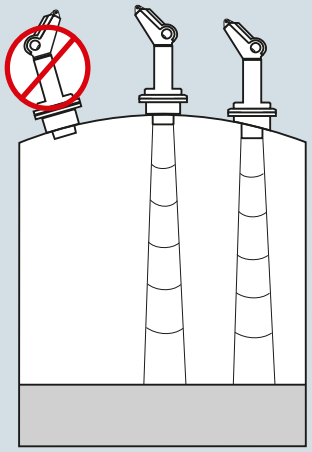
The transducer is available in PVDF copolymer, making the device suitable for use in a wide variety of applications.
The Probe is easy to install and maintain, and can be quickly removed for cleaning as required by the food, beverage and pharmaceutical industries.

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.

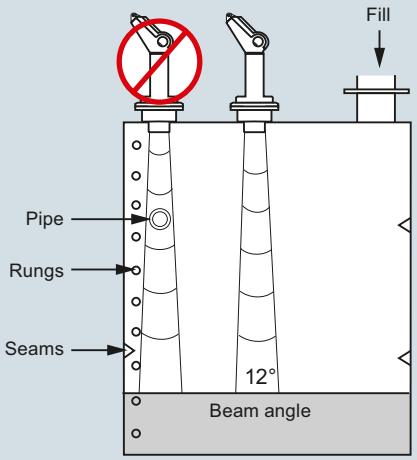
- Key Applications: chemical storage vessels, filter beds, mud pits, liquid storage vessels, food applications

Configuration

Parabolic mounting



Flat mounting and beam angle



The Probe mounting

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 ... 28 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, C-TICK, $CSA_{US/C}$, FM	CE, C-TICK, $CSA_{US/C}$
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		
- Electronics enclosure	PVC	
- 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 13.5 or ½" NPT cable glands	

Selection and Ordering data

	Article No.
The Probe	**7ML1201-**
Short-range integrated ultrasonic level transmitter, ideal for liquids and slurries in open or closed vessels	■■■ 0 0
Measuring range	
5 m (16.40 ft) ⬟	1
Transducer/Process connection	
PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1] ⬟	E
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	
3 Wire, 24 V DC, CE, C-TICK, CSA, FM ⬟	E
2 Wire, 24 V DC, CE, C-TICK, 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.

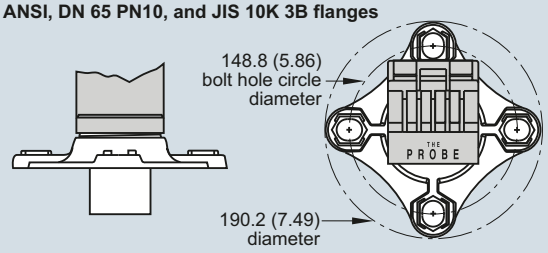
Selection and Ordering data

	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 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

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

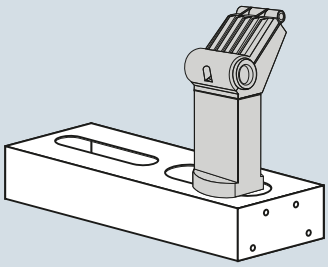
Options

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)

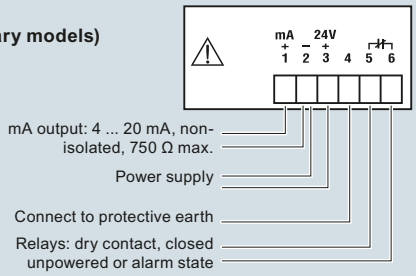
The Probe with FMS 200 mounting bracket



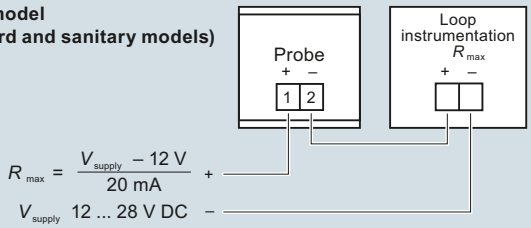
The Probe with Optional Mounting Bracket

Schematics

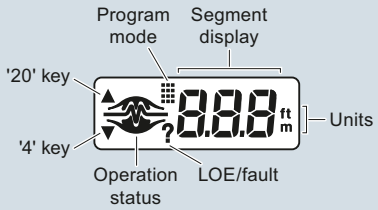
3 wire model (standard and sanitary models)



2 wire model (standard and sanitary models)



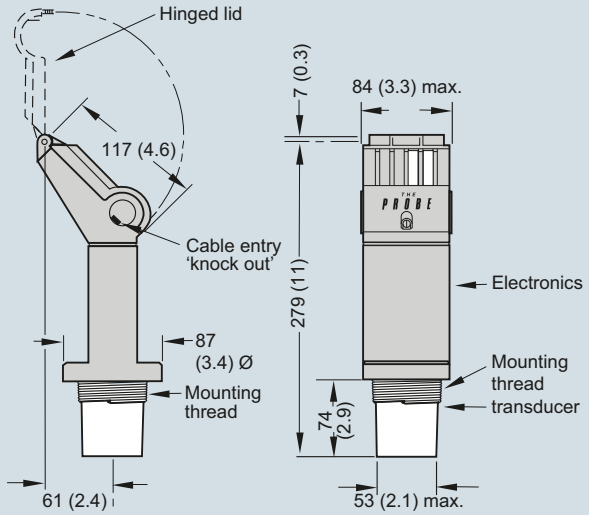
Display



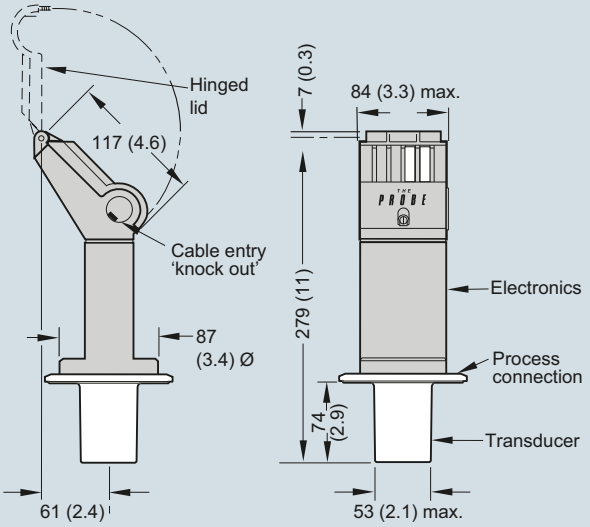
The Probe connections

Dimensional drawings

Standard model



Sanitary model



The Probe, dimensions in mm (inch)

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 LUI display with local four-button programming, menu-driven parameters, and Wizard support for key applications
- 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

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 EchoMax and ST-H series transducers
Relays	• 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	• 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	• 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	• -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	• 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) removeable LCD, 240 x 160 pixels resolution, operational up to 5 m from enclosure base
Programming	
• Primary	4 Local push buttons
• Secondary	• 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	• 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	$CSA_{US/C}$, CE, FM, UL listed, C-TICK, 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

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		✓	✓

Selection and Ordering data		Article No.
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.		**7ML5050-** **0 ■■■ - ■■■ 0**
Model		
SITRANS LUT420 - Level controller	⬟	**A**
SITRANS LUT430 - Level, Pump & Flow controller	⬟	**B**
Enclosure display options		
With display	⬟	**A**
With remote panel mount display [Includes panel mount cable extension, 2.5 m (8.2 ft)]	⬟	**B**
No display (blank lid provided)	⬟	**C**
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		
Input voltage		
100 ... 230 V AC ± 15 %	⬟	**1**
10 ... 32 V DC	⬟	**2**
Cable inlet		
3 cable inlets, cable glands not supplied	⬟	**1**
3 cable inlets, 3 M20 plastic cable glands supplied	⬟	**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, C-TICK	⬟	**A**
Hazardous locations CSA Class I, II, III, Div. 2 (Groups A, B, C, D, F, G)		**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**
Communications Manual		
English		**7ML1998-5NE01**
French		**7ML1998-5NE11**
Spanish		**7ML1998-5NE21**
German		**7ML1998-5NE31**
Italian Note: The communications manual should be ordered as a separate line item on the order.		**7ML1998-5NE51**
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 in catalog		**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/RS-232 (for use with a PC and SIMATIC PDM)		**7MF4997-1DA**
Hart modem/USB (for use with a PC and SIMATIC PDM)		**7MF4997-1DB**
Sunshield, 304 stainless steel		**7ML1930-1GE**
SITRANS RD100 Remote display - see Chapter 7		
SITRANS RD200 Remote display - see Chapter 7		
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7		**7ML5750-1AA00-0**
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**

SITRANS LUT400 series

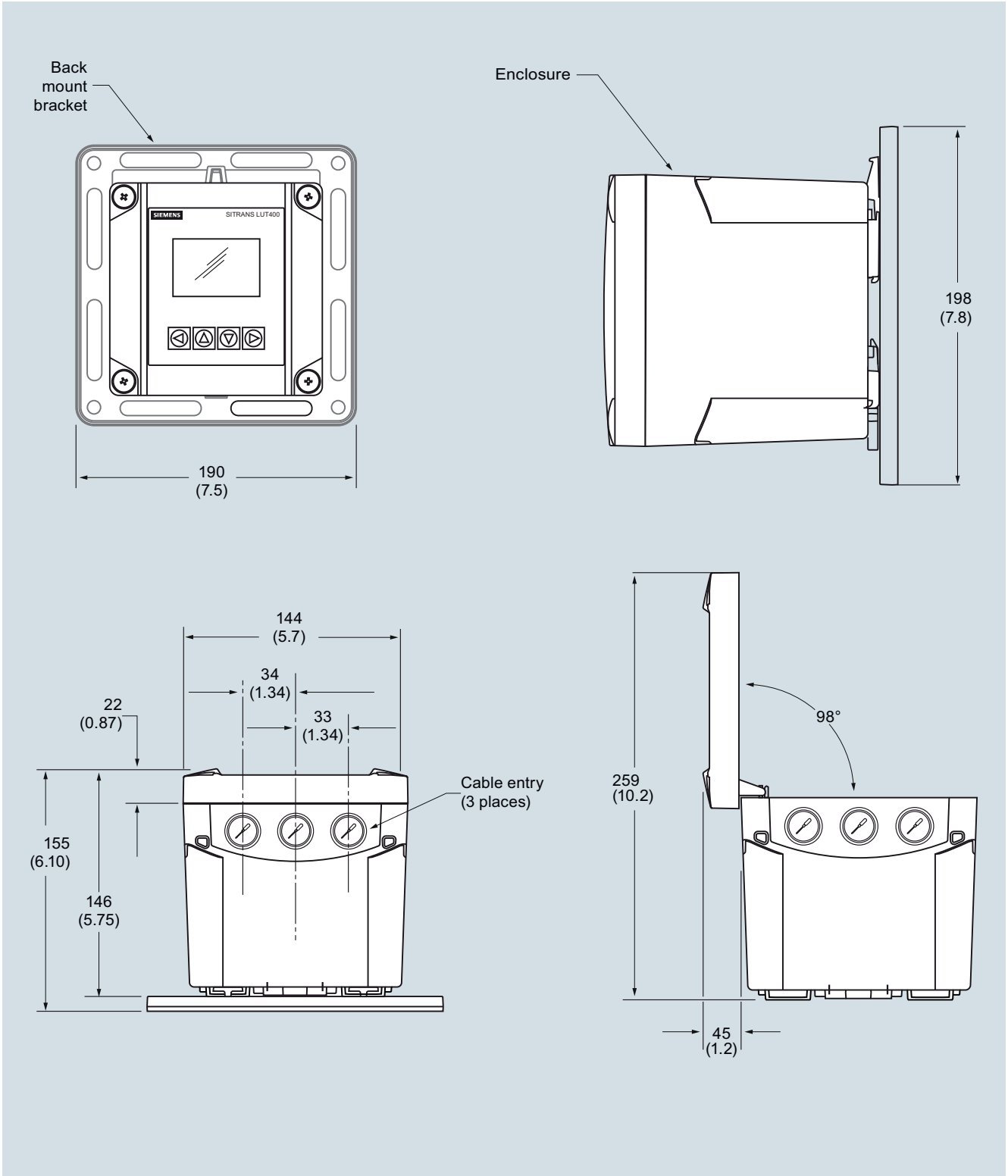
Selection and Ordering data		Article No.
SITRANS LUT440 The SITRANS LUT440 is the most accurate and featured model in the LUT400 series. It includes high accuracy open channel monitoring, relay functions for external samplers, totalizers, alarms, and enhanced data logging, as well as all pump and control functions available with other models in the LUT400 series.		**7ML5050-** 0 ■■■ - ■■■ 0
Model		
SITRANS LUT440 - High accuracy Open Channel Monitor [1]	⬟	C
Enclosure display options		
With display	⬟	A
With remote panel mount display (Includes panel mount cable extension, 2.5 m (8.2 ft)	⬟	B
No display (blank lid provided)	⬟	C
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		
Input voltage		
100 ... 230 V AC ± 15 %	⬟	1
10 ... 32 V DC	⬟	2
Cable inlet		
3 cable inlets, cable glands not supplied	⬟	1
3 cable inlets, 3 M20 plastic cable glands supplied	⬟	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, C-TICK	⬟	A
Hazardous locations CSA Class I, II, III, Div. 2, (Groups A, B, C, D, F, G)		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).

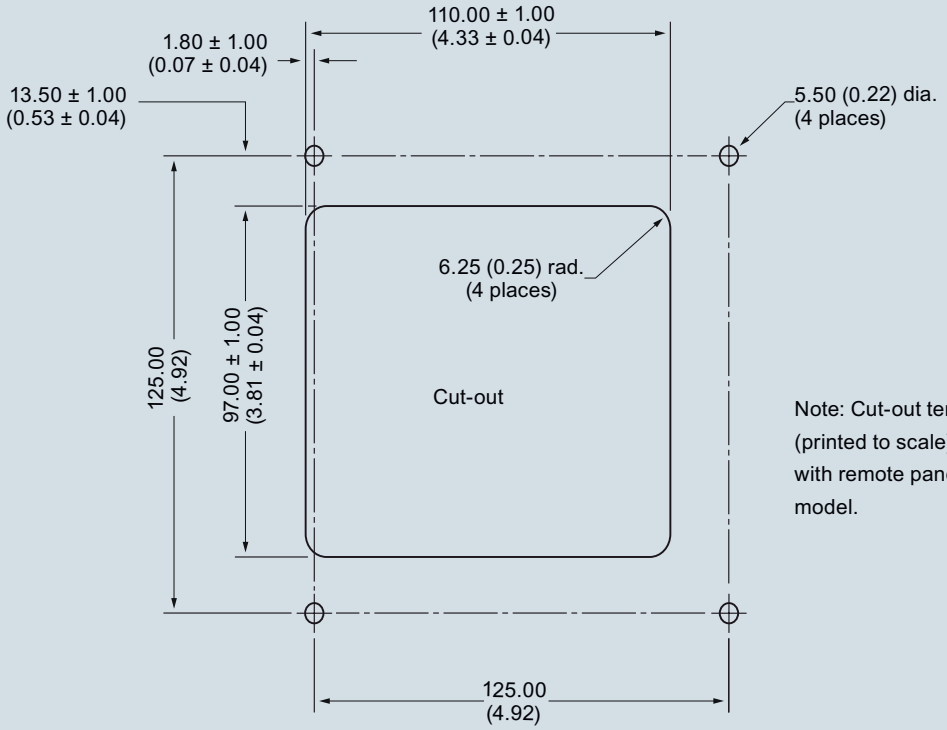
⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

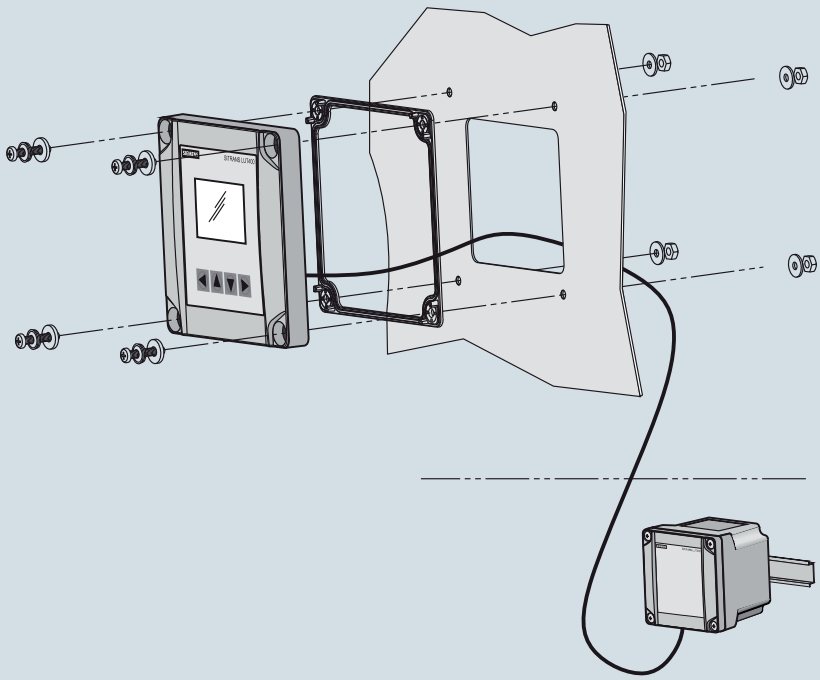
Selection and Ordering data		Order code
Further designs		
Please add "**-Z**" to Article No. and specify Order code(s).		
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	⬟	**C11**
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 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.		
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 in catalog		**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/RS-232 (for use with a PC and SIMATIC PDM)		**7MF4997-1DA**
HART modem/USB (for use with PC and SIMATIC PDM)		**7MF4997-1DB**
Sunshield, 304 stainless steel		**7ML1930-1GE**
SITRANS RD100 Remote display - see Chapter 7		
SITRANS RD200 Remote display - see Chapter 7		
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7		**7ML5750-1AA00-0**
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**

Dimensional drawings



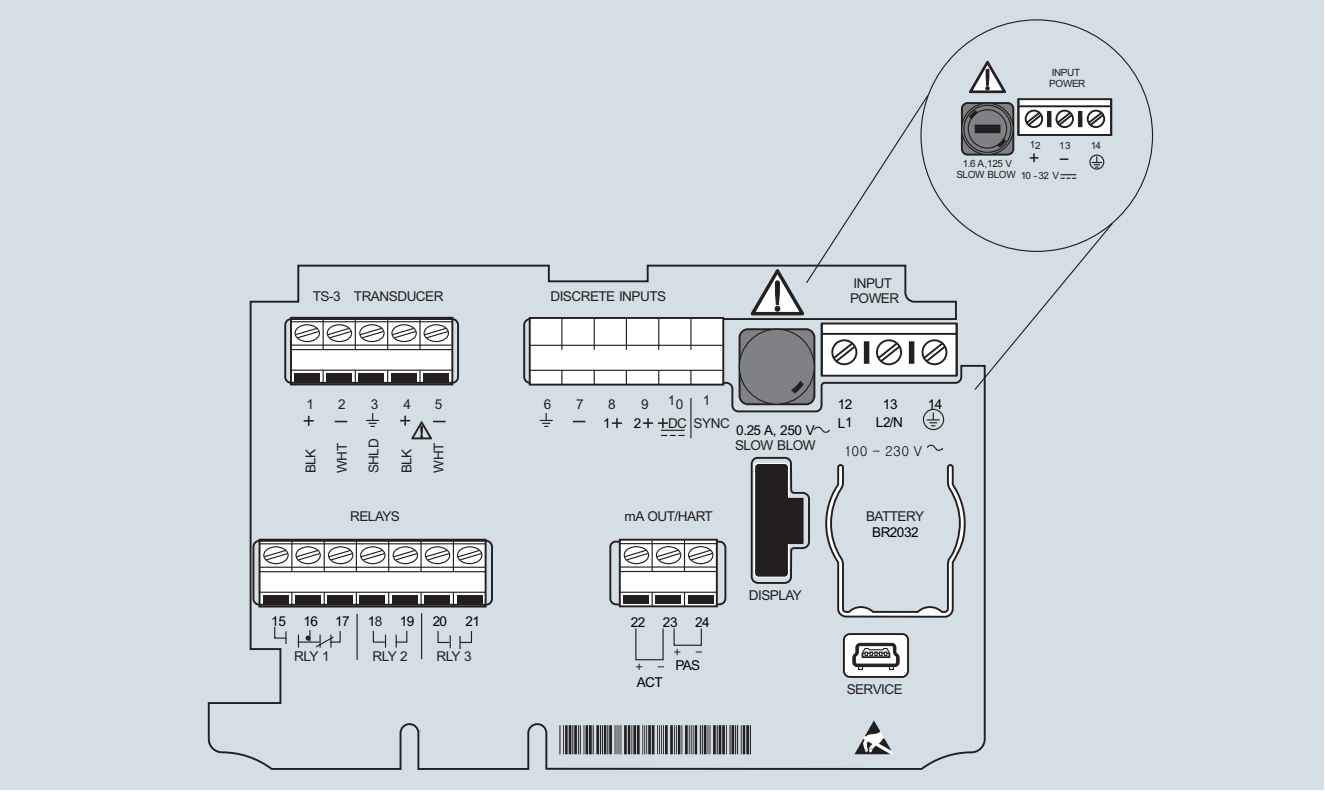
SITRANS LUT400, dimensions in mm (inch)





SITRANS LUT400, dimensions in mm (inch)

Schematics



SITRANS LUT400 connections

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.

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 15 m (1 ... 50 ft)
Measuring points	1 or 2
Input	
• Analog (MultiRanger 200 only)	0 ... 20 mA or 4 ... 20 mA, from alternate device, scaleable
• 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	Rating 5 A at 250 V AC, non-inductive
• Version with 1 relay (MultiRanger 100 only)	1 SPST Form A
• Version with 3 relays	2 SPST Form A/1 SPDT Form C
• Version 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[1] or 2 mm (0.08 inch), whichever is greater
Temperature compensation	• -50 ... +150 °C (-58 ... +302 °F) • Integral temperature sensor • 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 (housing)	-20 ... +50 °C (-4 ... +122 °F)

Design	
Weight	
• Wall mount	1.37 kg (3.02 lb)
• Panel mount	1.50 kg (3.31 lb)
Material (enclosure)	Polycarbonate
Degree of protection (enclosure)	
• Wall mount	IP65/Type 4X/NEMA 4X
• Panel mount	IP54/Type 3/NEMA 3
Electrical connection	
• Transducer and mA output signal	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm² (22 ... 18 AWG), Belden 8760 or equivalent is acceptable
• Max. separation between transducer and transceiver	365 m (1 200 ft)
Displays and controls	100 x 40 mm (4 x 1.5 inch) multi-block LCD with backlighting
Programming	Programming using hand-held programmer, SIMATIC PDM or via PC with Dolphin Plus software
Power supply	
• 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	• CE, C-TICK[2] • 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
Communication	• 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 - PROFIBUS DP - DeviceNet - Allen-BradleyRemote I/O

[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

MultiRanger 100/200

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-** ▢▢▢▢▢ - ▢▢
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, $CSA_{US/C}$, 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 Allen-Bradley Remote I/O module	⬟	**1**
SmartLinx PROFIBUS DP module	⬟	**2**
SmartLinx DeviceNet module See SmartLinx product page 4/339 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, $CSA_{US/C}$, UL listed, C-TICK	⬟	**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**

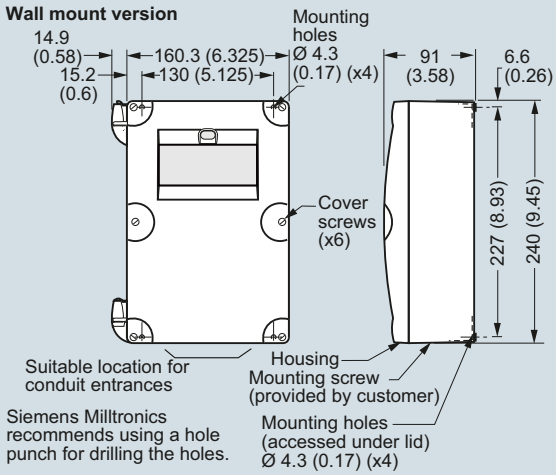
[1] For wall mount applications only

[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.

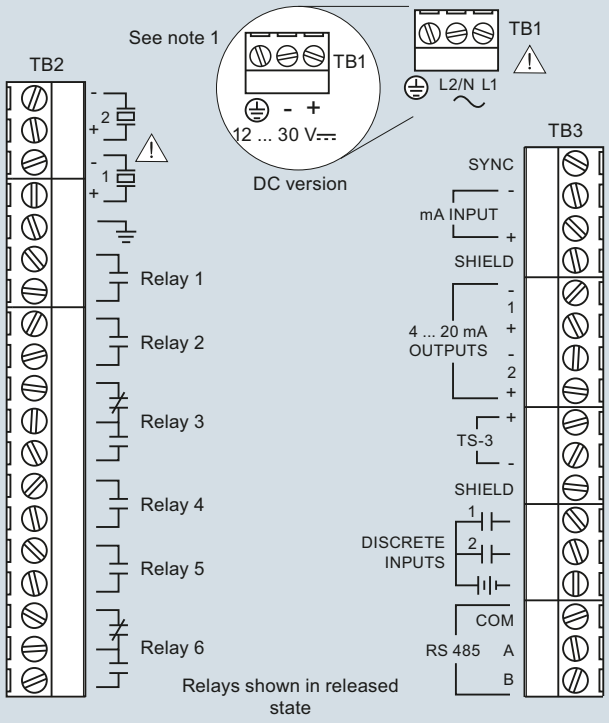
Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: ⬟ Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Operating Instructions	Article No.
English	**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 Allen-Bradley Remote I/O, English	**7ML1998-1AP03**
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 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
Spare parts	
Power Supply Board (100 ... 230 V AC)	**7ML1830-1MD**
Power Supply Board (12 ... 30 V DC)	**7ML1830-1ME**
Display Board	**7ML1830-1MF**

Dimensional drawings



MultiRanger, dimensions in mm (inch)

Schematics



Note:

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 MultiRanger 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.

MultiRanger connections

4

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

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, scaleable (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	• -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	
• Wall mount	1.37 kg (3.02 lb)
• Panel mount	1.50 kg (3.31 lb)
Material (enclosure)	Polycarbonate
Degree of protection (enclosure)	
• Wall mount	IP65/Type 4X/NEMA 4X
• Panel mount	IP54/Type 3/NEMA 3
Cable	
• 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	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 supply[4]	
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	• CE, C-TICK[5] • 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	• 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 - PROFIBUS DP - DeviceNet - Allen-Bradley Remote I/O

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

HydroRanger 200

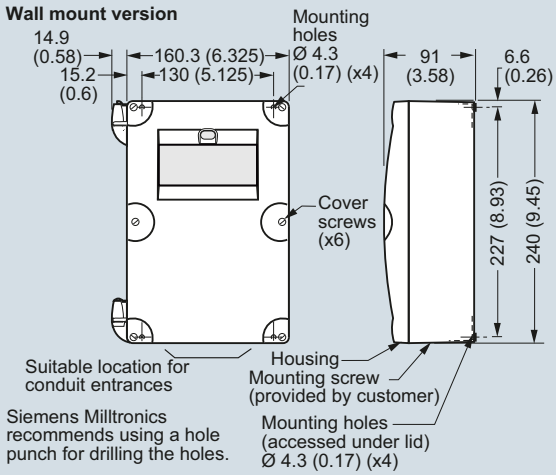
Selection and Ordering data	Article No.
Siemens HydroRanger 200 Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring. The HydroRanger 200 is also available as a level measurement controller only. Select option from number of measurement points options below.	**7ML5034-** ■■■■■
Mounting	
Wall mount, standard enclosure	**1**
Wall mount, 4 entries, 4 M20 cable glands included	**2**
Panel mount[1]	**3**
Power supply	
100 ... 230 V AC	**A**
12 ... 30 V DC	**B**
Number of measurement points	
Single point model, 6 relays	**A**
Dual point model, 6 relays	**B**
Single point model, level only, 1 relay[2]	**C**
Single point model, level only, 3 relays[2]	**D**
Communication (SmartLinx)	
Without module	**0**
SmartLinx Allen-Bradley Remote I/O module	**1**
SmartLinx PROFIBUS DP module	**2**
SmartLinx DeviceNet module See SmartLinx product page 4/339 for more information.	**3**
Approvals	
General Purpose CE, FM, $CSA_{US/C}$, UL listed, C-TICK	**1**
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)	**2**

[1] Available with approval option 1 only

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

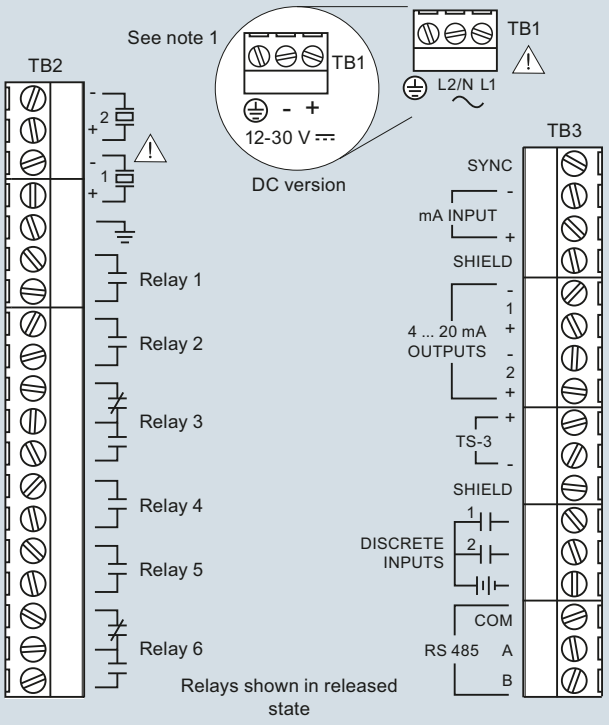
Selection and Ordering data	Order code
Further designs Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Operating Instructions	Article No.
English	**7ML1998-5FC03**
French	**7ML1998-5FC11**
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.	**7ML1998-5FC33**
Other Operating Instructions	
SmartLinx Allen-Bradley Remote I/O, English	**7ML1998-1AP03**
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**
Sunshield kit, 304 stainless steel	**7ML1930-1GA**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
Spare parts	
Power Supply Board (100 ... 230 V AC)	**7ML1830-1MD**
Power Supply Board (12 ... 30 V DC)	**7ML1830-1ME**
Display Board	**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

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 and SmartLinx 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.

An on-board communications port automatically configures for RS 232, RS 485 or bi-polar current loop. The SITRANS LU01 will connect to a DCS or PLC using Siemens SmartLinx interface modules, giving you remote 2-way communication and full parameter access.

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 and SmartLinx 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.

It features an onboard communications port that automatically configures for RS 232, RS 485 or bi-polar current loop. It will connect to a DCS or PLC using Siemens SmartLinx interface modules, giving you remote 2-way communication and full parameter access. 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, tripper car

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) • 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 mm² (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 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	51 x 127 mm (2 x 5 inch) graphics LCD with backlighting
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	• SmartLinx: protocol-specific modules as interface for popular industrial fieldbus systems • Dolphin Plus: Siemens Windows-compatible interface and ComVerter link (infrared)

Selection and Ordering data	Article No.
SITRANS LU01/LU02	**7ML5004-**
Single or dual point ultrasonic long-range level monitoring system for liquids and solids, and ranges up to 60 m (200 ft).	
Number of measuring points	
LU01 version, 1 point	1
LU02 version, 2 points	2
Input voltage	
100/115/200/230 V AC, voltage selector switch	A
18 ... 30 V DC	B
Feature software	
Standard	A
Application software	
Standard	1
Data communications	
No module (SmartLinx ready)	0
SmartLinx Allen-Bradley Remote I/O module	1
SmartLinx PROFIBUS DP module	2
SmartLinx Modbus RTU module	3
Enclosure	
Wall mount	1
Wall mount, drilled, 6 x M20 Note: Cable glands are not included and should be ordered as a separate line on the order.	3
Approvals	
CE, $CSA_{US/C}$, FM[1]	A
CE	B
ATEX II 3D[2]	C

[1] Available with enclosure option 1 only

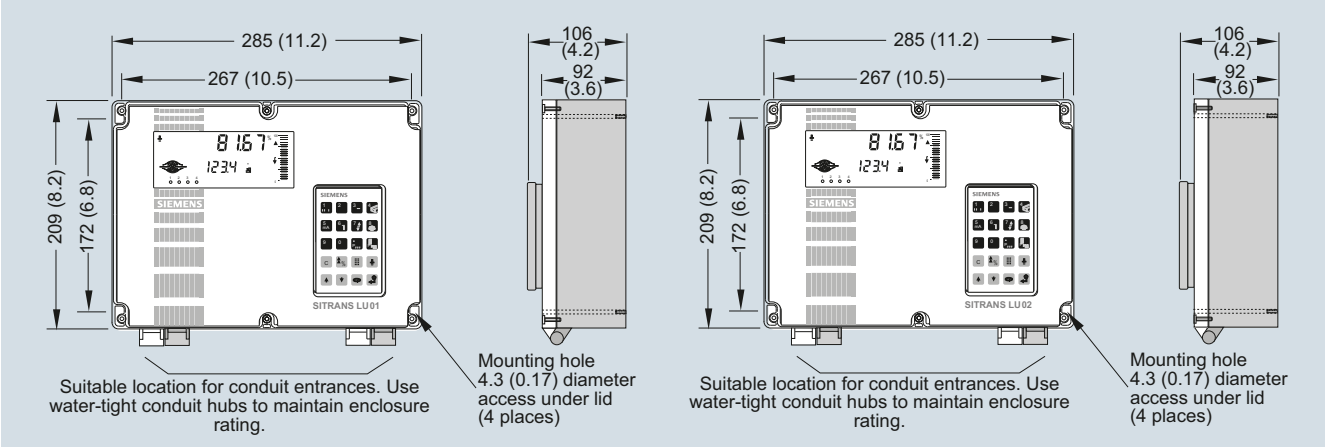
[2] Available with enclosure option 3 only

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	Article No.
SITRANS LU01	
English	**7ML1998-5BE02**
French	**7ML1998-5BE12**
German	**7ML1998-5BE32**
SITRANS LU02	
English	**7ML1998-5BD02**
French	**7ML1998-5BD12**
German	**7ML1998-5BD32**
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.	
Other Operating Instructions	
SmartLinx Allen-Bradley Remote I/O, English	**7ML1998-1AP03**
SmartLinx PROFIBUS DP, English	**7ML1998-1AQ03**
SmartLinx PROFIBUS DP, German	**7ML1998-1AQ33**
SmartLinx PROFIBUS DP, French	**7ML1998-1AQ13**
SmartLinx Modbus, English	**7ML1998-1BF01**
SmartLinx Modbus, German	**7ML1998-1BF31**
SmartLinx Modbus, French	**7ML1998-1BF11**
SmartLinx Modem, English Note: The appropriate SmartLinx Operating Instructions should be ordered as a separate line on the order.	**7ML1998-1BG01**

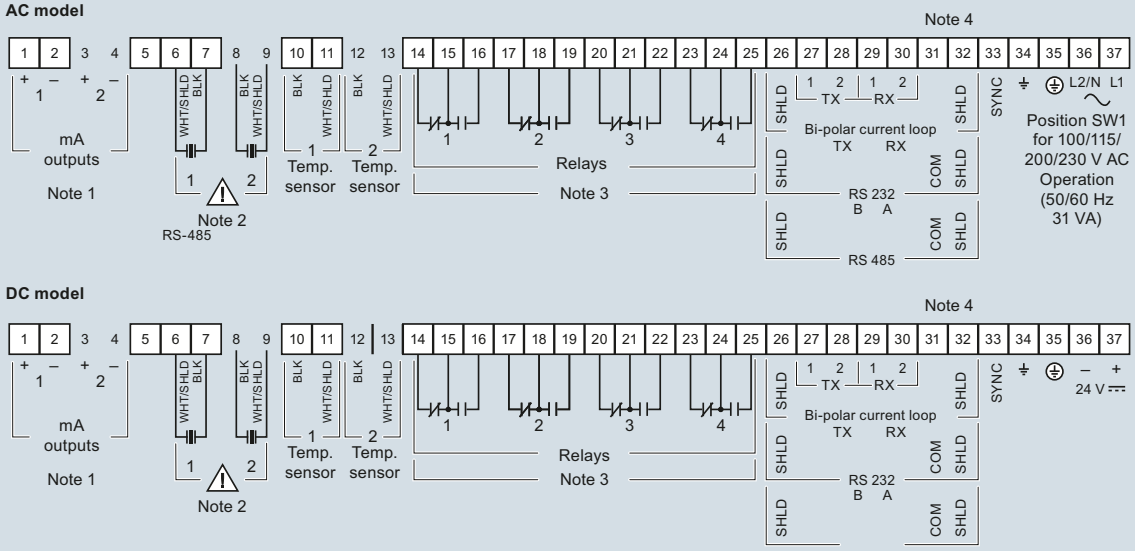
Selection and Ordering data	Article No.
Accessories	
Handheld programmer	**7ML1830-2AN**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosures	**7ML1930-1AC**
M20 cable gland kit (6 M20 cable glands, 6 M20 nuts, 3 stop plugs)	**7ML1830-1GM**
M20 cable gland kit (4 M20 cable glands, 4 M20 nuts, 4 washers)	**7ML1930-1FV**
TS-3 Temperature Sensor - see TS-3 on page 4/190	**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 4/337 for more information.	**7ML1830-1LQ**

Dimensional drawings



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

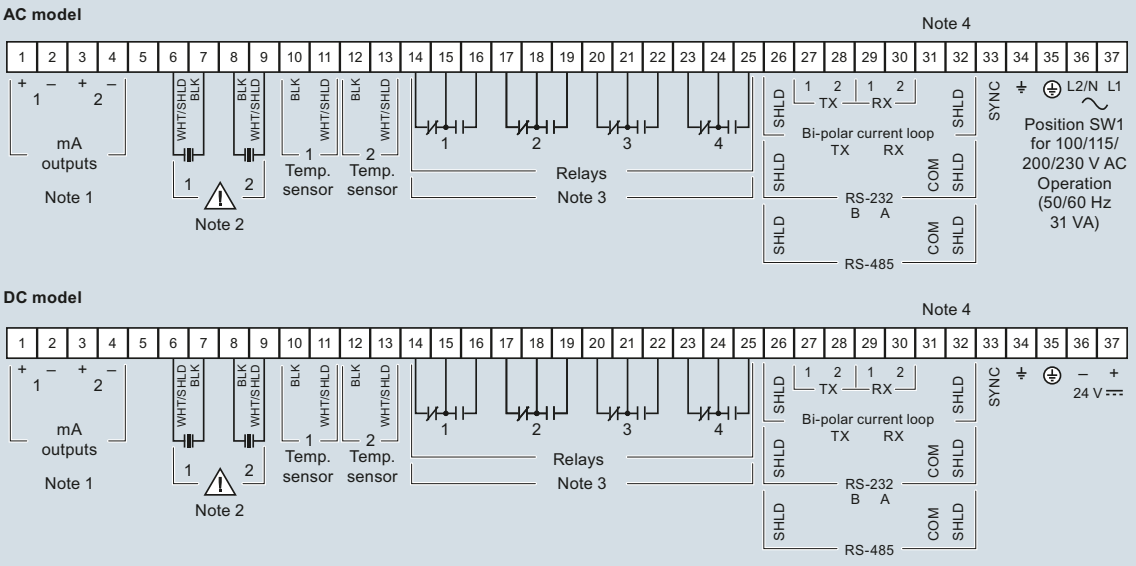
Schematics



Notes:

1. Optically isolated, 750 Ω max. load
2. Use RG62-A/U coaxial (or equivalent) for extensions up to 365 m (1 200 ft). Run in grounded metal conduit, separate from other wiring.
3. Each relay has 1 set of Form 'C' (SPDT) contacts, relay rated at 5 A 250 V AC, non-inductive, when equal or lower rated limiting fuses are installed.
4. Required if mounted adjacent to other SITRANS LU01 units or other specified Siemens Milltronics devices. Interconnect all 'SYNC' terminals with a single 18 AWG (0.5mm²) wire.

SITRANS LU01 connections



Notes:

1. Optically isolated, 750 Ω max. load
2. Use RG62-A/U coaxial (or equivalent) for extensions up to 365 m (1 200 ft). Run in grounded metal conduit, separate from other wiring.
3. Each relay has 1 set of Form 'C' (SPDT) contacts, relay rated at 5 A 250 V AC, non-inductive, when equal or lower rated limiting fuses are installed.
4. Required if mounted adjacent to other SITRANS LU01 units or other specified Siemens Milltronics devices. Interconnect all 'SYNC' terminals with a single 18 AWG (0.5 mm²) wire.

SITRANS LU02 connections

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 and SmartLinx 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.

SITRANS LU10 will connect to a DCS or PLC using Siemens SmartLinx interface modules, giving you remote 2-way communication and full parameter access. 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 (sugar, flour bins, grains, cereals), plastic pellets, tank farms

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level measurement
Measuring range	Max. 0.3 ... 60 m (1 ... 200 ft)
Measuring points	Max. 10
Output	
Ultrasonic transducer	EchoMax series, ST-H transducers
Relays	SPDT Form C relays, rated 5 A at 250 V AC, resistive load
mA output	SITRANS LU A0 module (option): 0/4 ... 20 mA, optically isolated
• 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
Temperature compensation	-50 ... +150 °C (-58 ... +302 °F) • 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

Power supply	100/115/200/230 V AC ± 15 %, 50/60 Hz, 31 VA
Displays and controls	51 x 127 mm (2 x 5 inch) graphics LCD with backlighting
Memory	EEPROM (non-volatile), no backup battery required
Programming	Using removable programmer (ordered separately) or Dolphin Plus (option)
Certificates and approvals	• CE, C-TICK, FM, $CSA_{US/C}$, ATEX II 3D • Lloyd's register of Shipping (Categories ENV1, ENV2, ENV3 and ENV5)
Options	
Expansion card	TIB-9, increases the number of TS-3 inputs from 1 ... 10
• External temperature sensor	TS-3
• Communications	• SmartLinx: protocol-specific modules as interface for popular industrial fieldbus systems • Dolphin Plus: Siemens Windows-compatible interface and ComVerter link (infrared)
• I/O devices	• Max. 3 I/O devices per SITRANS LU10 • SITRANS LU AO analog output module (max. 1)

SITRANS LU10

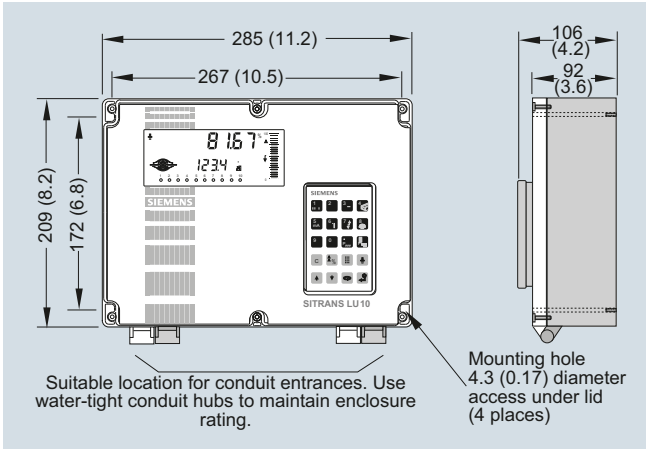
Selection and Ordering data	Article No.
SITRANS LU10 Ten point ultrasonic long-range level monitoring system for liquids and solids applications, and ranges up to 60 m (200 ft).	**7ML5007-** ■■■■■-■■
Input voltage	
100/115, 200/230 V AC, selectable	**1**
Feature software	
Standard	**A**
Application software	
Standard	**A**
Data communications	
No module (SmartLinx ready)	**0**
SmartLInx Allen-Bradley Remote I/O module	**1**
SmartLinx PROFIBUS DP module	**2**
SmartLinx Modbus RTU module	**3**
TIB-9 temperature card	
None	**0**
With TIB-9 card	**1**
Enclosure	
Wall mount	**1**
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.	**2**
Approvals	
CE, $CSA_{US/C}$, FM[1)]	**A**
ATEX II 3D[1)]	**B**
CE, C-TICK[2)]	**D**

1) Available with enclosure option 1 only

2) Available with enclosure option 2 only

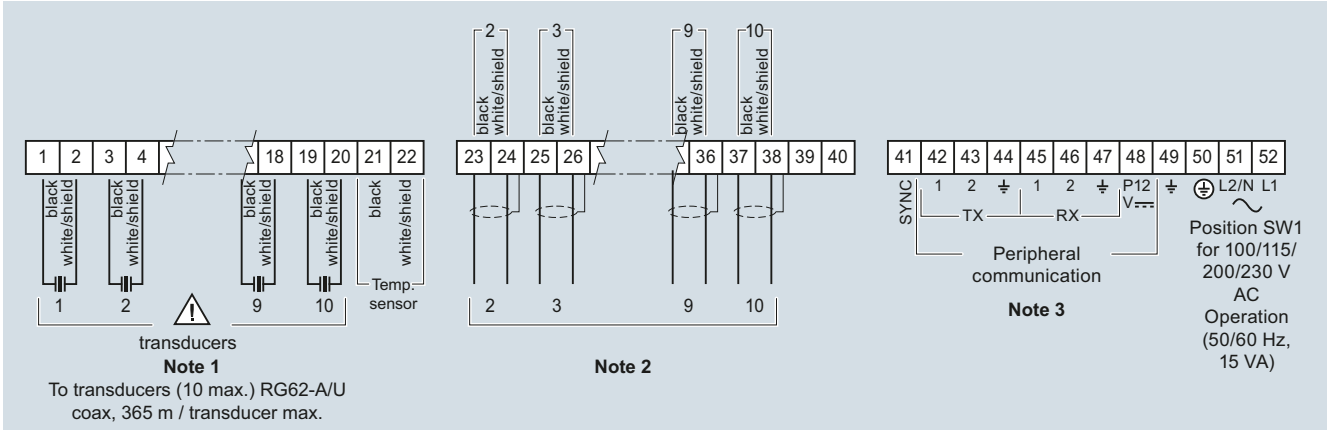
Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text	**Y15**
Operating Instructions	Article No.
English	**7ML1998-5AN02**
French	**7ML1998-5AN12**
German	**7ML1998-5AN32**
Other Operating Instructions	
SmartLinx Allen-Bradley Remote I/O, English	**7ML1998-1AP03**
SmartLinx PROFIBUS DP, English	**7ML1998-1AQ03**
SmartLinx PROFIBUS DP, German	**7ML1998-1AQ33**
SmartLinx Modbus, English	**7ML1998-1BF01**
SmartLinx Modbus, German	**7ML1998-1BF31**
SmartLinx Modbus, French	**7ML1998-1BF11**
SmartLinx Modem, English Note: The appropriate SmartLinx Operating Instructions should be ordered as a seperate line on the order.	**7ML1998-1BG01**
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**
Temperature Card TIB 9-card	**7ML1830-1CN**
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 4/337	
Sunshield kit, 304 stainless steel	**7ML1930-1GA**
Spare parts	
Card, mother main, AC, comm ready	**7ML1830-1ML**
Card, daughter, comm ready	**7ML1830-1LY**
Card, display See SmartLinx product page 4/337 for more information.	**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

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).

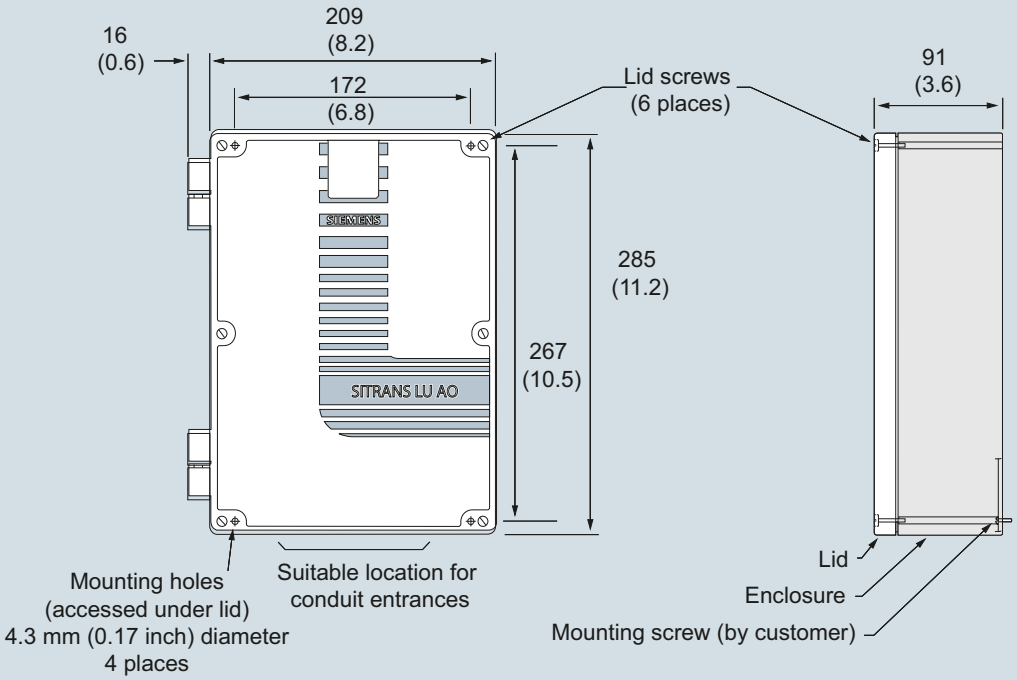
Technical specifications

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	
Analog 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, $CSA_{US/C}$, C-TICK

Selection and Ordering data

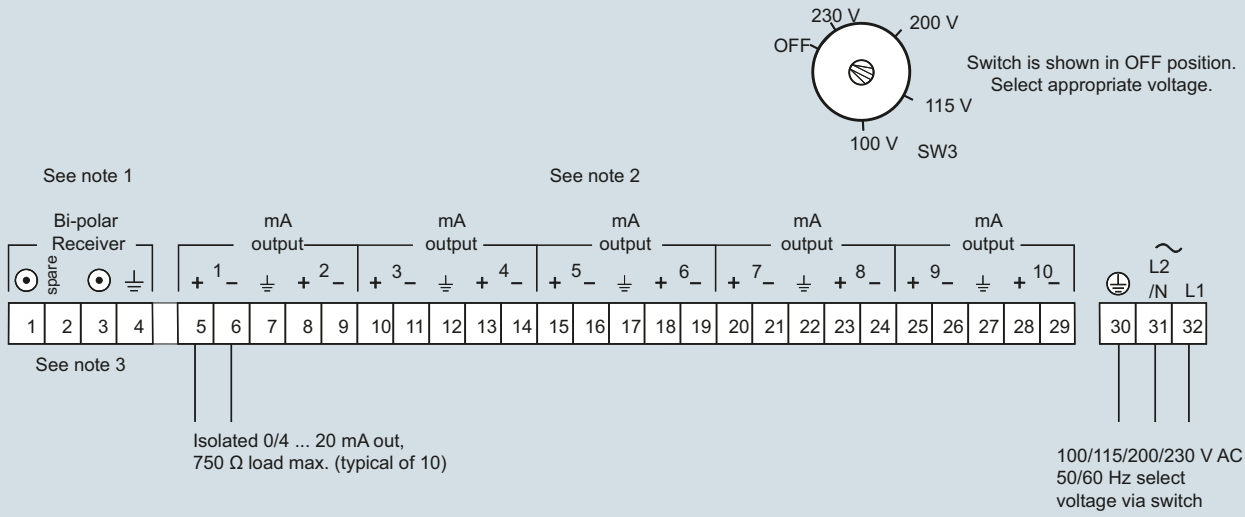
	Article No.
SITRANS LU AO Provides remote analog output for the measurement points of the SITRANS LU10 level monitor. Approvals: $CSA_{US/C}$, FM, CE, C-TICK	**7ML5810-1A**
Operating Instructions	
English	**7ML1998-5CE01**
German	**7ML1998-5CE31**
Note: Operating Instructions should be ordered as a separate 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



Notes:
1. SITRANS LU AO receiver input is non-polarized.
2. Refer to associated application device instruction manual for wiring detail. Check that the communication parameter P740 (SITRANS LU10) is ON.
3. SITRANS LU AO interconnecting cable shield should be grounded at SITRANS LU10 only. Insulate shields at junctions to prevent inadvertant grounding. Maximum individual loop length is 3 000 m (10 000 ft).

SITRANS LU AO connections

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		
			Standard		
	XRS-5	**ST-H**	**XPS-10**	**XPS-15**	**XPS-30**
Max. range[1]	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	• PVDF Copolymer • CSM • Option: Flange with PTFE facing	• ETFE • Option: PVDF	• PVDF • Option: Foam facing • Flange with PTFE facing	• PVDF • Option: Foam facing • Flange with PTFE facing	• 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.

Overview

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

Benefits

- Can be mounted on a 2 inch (50.8 mm) 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 2 inch (50.8 mm) 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[3], 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 EEx m IIC T5, C-TICK, INMETRO: Br-Ex m II T5

[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.

[3] EMC certificate available on request

ST-H

Selection and Ordering data	Article No.
EchoMax ST-H ultrasonic transducer	**7ML1100-**
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).	■■ **A** ■ **0**
Process connection	
ETFE, 2" NPT [(Taper), ANSI/ASME B1.20.1]	**0**
ETFE, R 2" [(BSPT), EN 10226]	**1**
ETFE, G 2" [(BSPP), EN ISO 228-1]	**2**
PVDF copolymer, 2" NPT [(Taper), ANSI/ASME B1.20.1]	**3**
PVDF copolymer, R 2" [(BSPT), EN 10226]	**4**
PVDF copolymer, G 2" [(BSPP), EN ISO 228-1]	**5**
Cable length	
5 m (16.40 ft)	**A**
10 m (32.81 ft)	**B**
30 m (98.43 ft)	**C**
50 m (164.04 ft)	**D**
100 m (328.08 ft)	**E**
Approvals	
FM Class I, II, Div. 1, C-TICK[3]	**2**
ATEX II 2G, CSA, C-TICK, INMETRO[1]	**3**
ATEX II 2G, C-TICK, INMETRO[2]	**4**
Operating Instructions	Article No.
Quick Start Manual, multi-language	**A5E32105880**
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.	

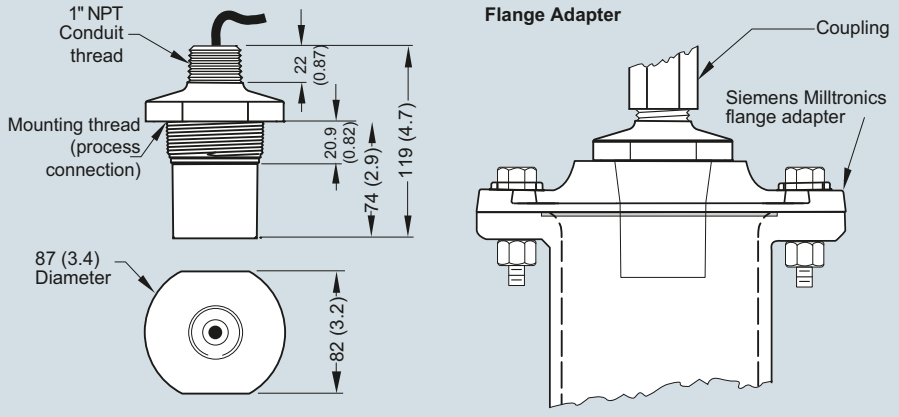
[1] Available with Process connection options 0 ... 2 only

[2] Available with Process connection options 3 ... 5 only

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

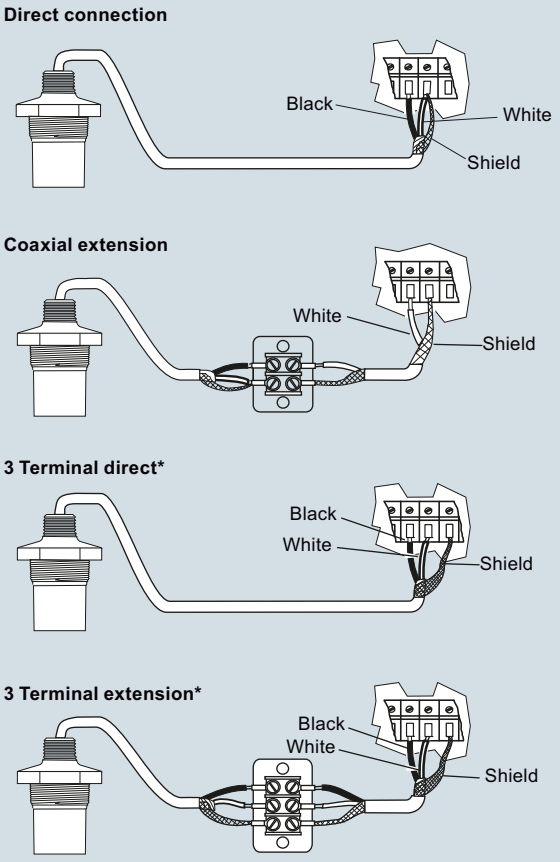
Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Acrylic coated, stainless steel tag [13 x 45 mm (0.5 x 1.75 inch)]: Measuring-point number/ identification (max. 16 characters) specify in plain text	**Y17**
Accessories	Article No.
Universal box bracket, mounting kit	**7ML1830-1BK**
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**
Easy Aimer 2, NPT with ¾" x 1" 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**

Dimensional drawings



ST-H ultrasonic transducer, dimensions in mm (inch)

Schematics



* For SITRANS LUT400, MultiRanger 100/200, HydroRanger 200

ST-H ultrasonic transducer connections

4

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)	• 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 mm^2 (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, CSA Class I Div. 2, FM Class I, ATEX II 2G, SAA Ex s Class I

Selection and Ordering data		Article No.
EchoMax XRS-5 transducer		**7ML1106-**
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)		■■■■ 0 - 0 ■
Process connection		
1" NPT [(Taper), ANSI/ASME B1.20.1]	⬟	1
R 1" [(BSPT), EN 10226]	⬟	2
Cable length		
5 m (16.40 ft)	⬟	A
10 m (32.81 ft)	⬟	B
30 m (98.43 ft)		C
Facing		
Standard (CSM rubber)	⬟	A
PTFE (flange versions)		B
Approvals		
CE, FM Class I, ATEX II 2G, CSA Class I Div. 2, SAA Class I	⬟	2
Mounting flange (flush mount)		
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
Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.		

Operating Instructions	Article No.
Quick Start Manual, multi-language	**A5E32299685**
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.	

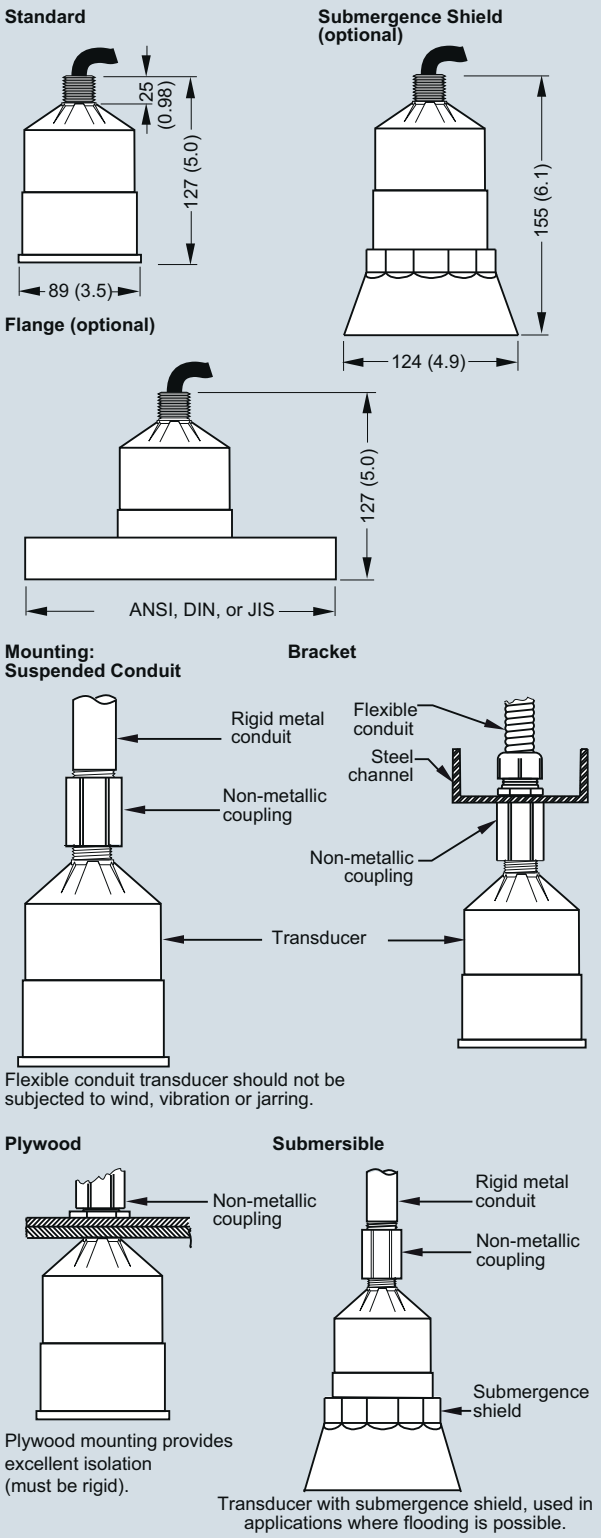
⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

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	Article No.
Tag, stainless steel with hole, 12 x 45 mm, for fastening on	**7ML1930-1BJ**
Submergence shield kit	**7ML1830-1BH**
Easy Aimer 2, NPT with ¾" x 1" 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**
FMS-200 universal box bracket, mounting kit	**7ML1830-1BK**
FMS-210 channel bracket, wall mount	**7ML1830-1BL**
FMS-220 extended channel bracket, wall mount	**7ML1830-1BM**
FMS-310 channel bracket, floor mount	**7ML1830-1BN**
FMS-320 extended channel bracket, floor mount	**7ML1830-1BP**
FMS-350 bridge channel bracket, floor mount (see Mounting Brackets on page 4/337 for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSPT locknut, plastic	**7ML1830-1DR**

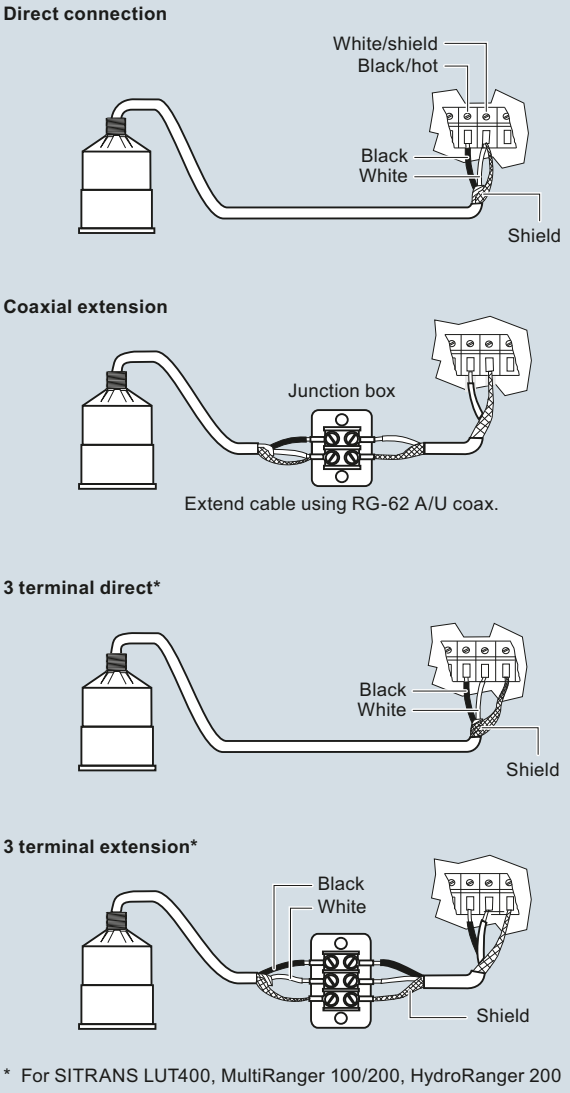
EchoMax XRS-5

Dimensional drawings



XRS-5 ultrasonic transducer, dimensions in mm (inch)

Schematics



XRS-5 ultrasonic transducer connections

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

The 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.

EchoMax XPS

Technical specifications

Input	XPS-10	XPS-15 (standard and F models)	XPS-30
Measuring range	0.3 ... 10 m (1 ... 33 ft)	Standard: 0.3 ... 15 m (1 ... 50 ft) Flanged: 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)	XPS-15F: -20 ... +95 °C (-4 ... +203 °F)	
Pollution degree	4		
Pressure	8 bar g (120 psi g) Flanged: 0.5 bar g (7.25 psi g)	8 bar g (120 psi g) Flanged: 0.5 bar g (7.25 psi g)	0.5 bar g (7.25 psi g) Flanged: 0.5 bar g (7.25 psi g)
Design			
Weight	0.8 kg (1.8 lb)	1.3 kg (2.8 lb) Flanged: 2 kg (4.4 lb)	4.3 kg (9.5 lb)
Power supply	Operation of transducer only with approved Siemens Milltronics controllers		
Material	Standard: PVDF Flanged: PVDF with CPVC flange Option: PTFE face with CPVC flange	Standard: PVDF Flanged: PVDF with CPVC flange Option: PTFE face with CPVC flange	Standard: PVDF Flanged: PVDF with CPVC flange Option: PTFE face with CPVC flange
Color	Blue	Standard: Blue XPS-15F: Gray	Blue
Process connection	1" NPT or 1" BSPT	Standard: 1" NPT or 1" BSPT XPS-15F: 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	Standard: CE[1)], CSA, FM, ATEX II 2GD	Standard: CE[1)], CSA, FM, ATEX II 2GD XPS-15F: FM Class I, Div 1, Groups A, B, C, and D, Class II Div 1, Groups E, F, and G, Class III	CE[1)], CSA, FM, ATEX II 2G 1D

1) EMC certificate available on request.

Selection and Ordering data		Article No.
EchoMax XPS-10 ultrasonic transducer		**7ML1115-**
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		■■■■ **0**
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**
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**
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 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)		**R**
Approvals		
ATEX II 2 GD, FM Class I Div. 2, SAA Class I Zone 1	⬟	**3**
CSA Class I Div. 1[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.

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	Article No.
Quick Start guide, multi-language	**A5E32282889**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
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	**7ML1830-1BH**
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**
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 4/188 for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSPT locknut, plastic	**7ML1830-1DR**

EchoMax XPS

Selection and Ordering data		Article No.
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		**7ML1118-** ■■■■ **0**
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**
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**
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.)		
Approvals		
ATEX II 2GD, FM Class I Div. 2, SAA Class I	⬟	**3**
CSA Class I Div. 1[3]	⬟	**4**

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.

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	Article No.
Quick Start guide, multi-language	**A5E32282889**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
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 4/188 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**

⬟ 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.
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	**7ML1171-** ■■■■ **0**
Mounting thread and facing	
1" NPT [(Taper), ANSI/ASME B1.20.1]	**1**
Cable length	
5 m (16.40 ft)	**B**
10 m (32.81 ft)	**C**
30 m (98.43 ft)	**D**
50 m (164.04 ft)	**E**
100 m (328.08 ft)	**F**
Mounting flange, flush mount	
None	**A**
6" ASME, 150 lb, flat faced	**B**
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.)	**C**
Approvals	
FM Class I Div. 1	**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	Article No.
Quick Start guide, multi-language	**7ML1998-1DU01**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
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 for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
Easy Aimer 2, with ¾" x 1" NPT PVC coupling	**7ML1830-1AQ**
Easy Aimer 304 with stainless steel coupling	**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)	**7ML1123 -** ■■■■ **0**
Mounting thread and facing	
1½" universal thread	**0**
1½" universal thread, foam facing[1]	**1**
1½" universal thread, PTFE facing[2]	**2**
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**
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 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1, or JIS B 2220 standard.)	**P**
Approvals	
ATEX II 2G 1D, FM Class I Div 2, SAA	**5**

[1] Not available with flanged versions

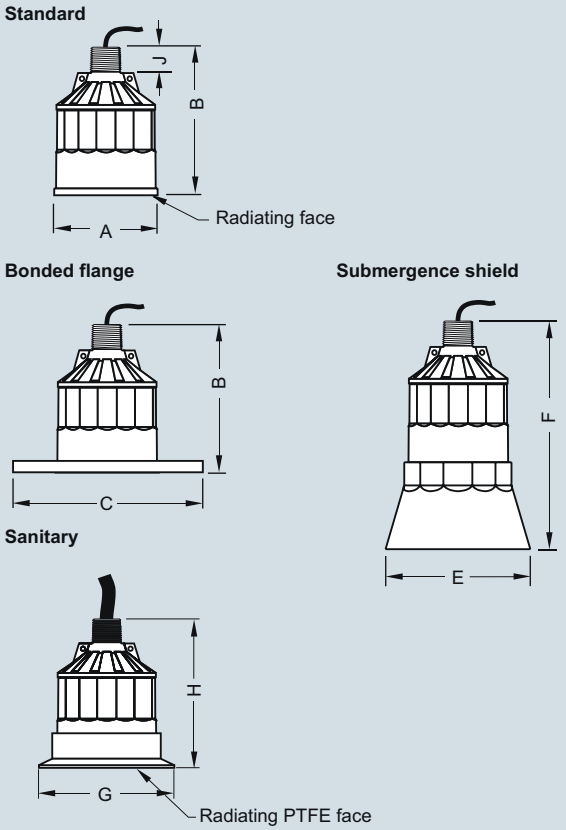
[2] Available with flanged versions only

4

EchoMax XPS

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 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	Article No.
Quick Start guide, multi-language	**A5E32282889**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	
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**
1½" BSPT locknut, plastic	**7ML1830-1DP**
Easy Aimer 2, 1½" NPT galvanized coupling	**7ML1830-1AN**
Easy Aimer 304, NPT with 1½" coupling	**7ML1830-1AT**
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**

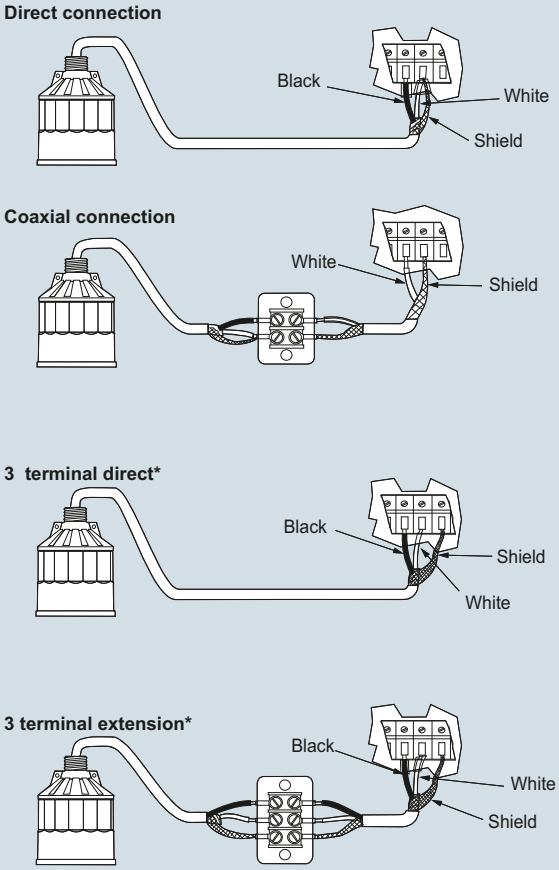
Dimensional drawings



XPS ultrasonic transducer, dimensions in mm (inch)

Version			
Dimension	**XPS-10**	**XPS-15**	**XPS-30**
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



* 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 alications, 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

EA aiming devices

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

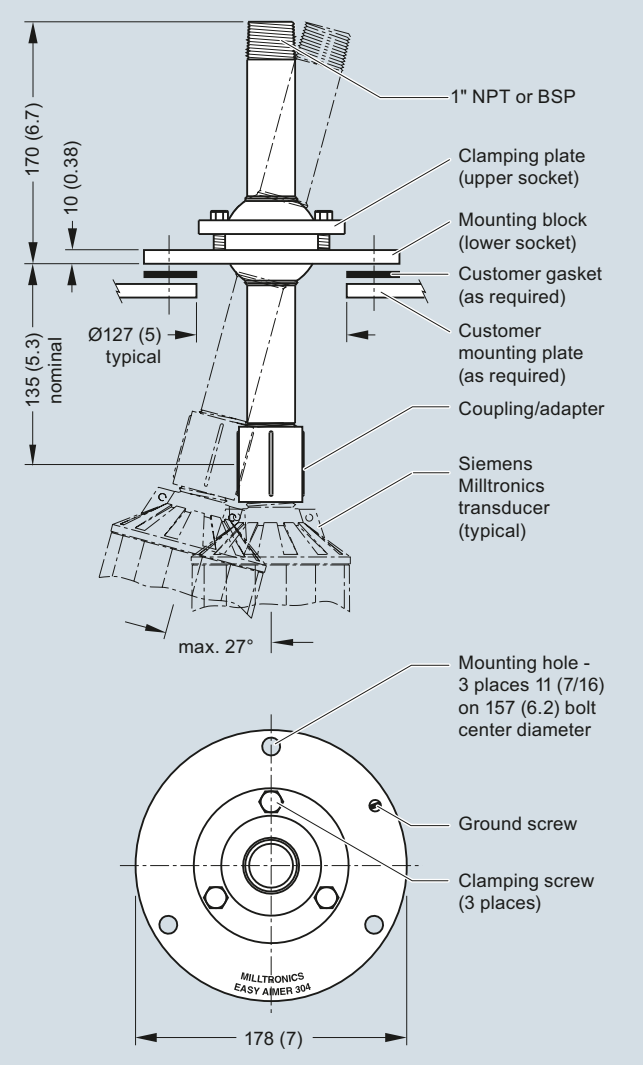
EA 2 aiming device

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.

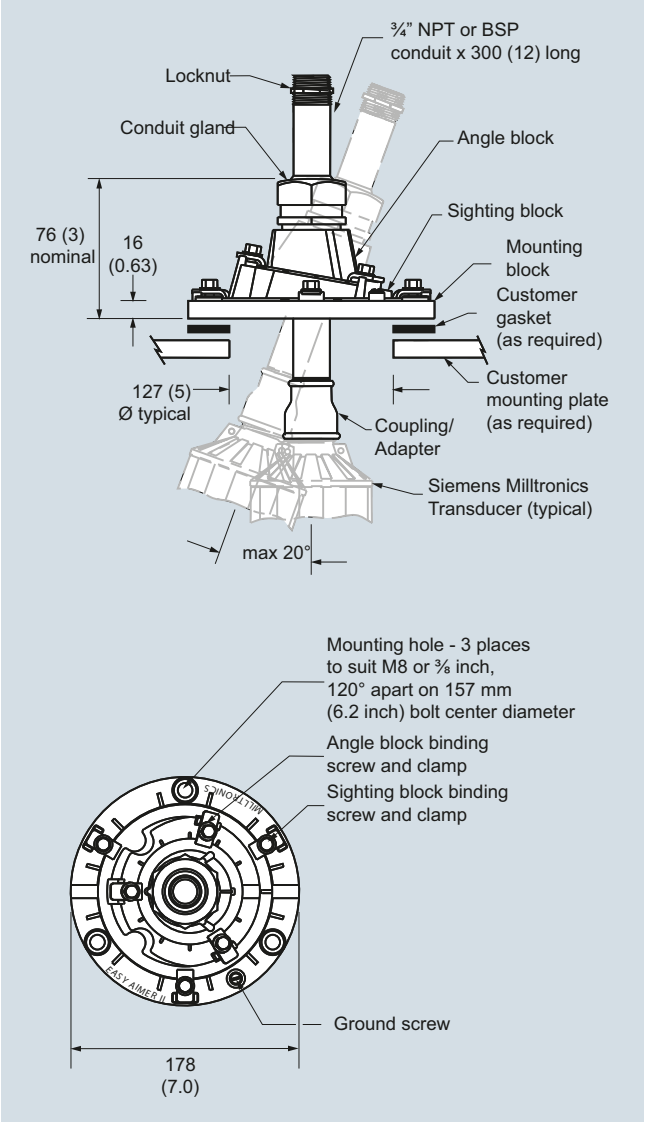
4

Dimensional drawings



EA 304 aiming device, dimensions in mm (inch)

Dimensional drawings



EA 2 aiming device, dimensions in mm (inch)

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

4

FMS mounting brackets

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)

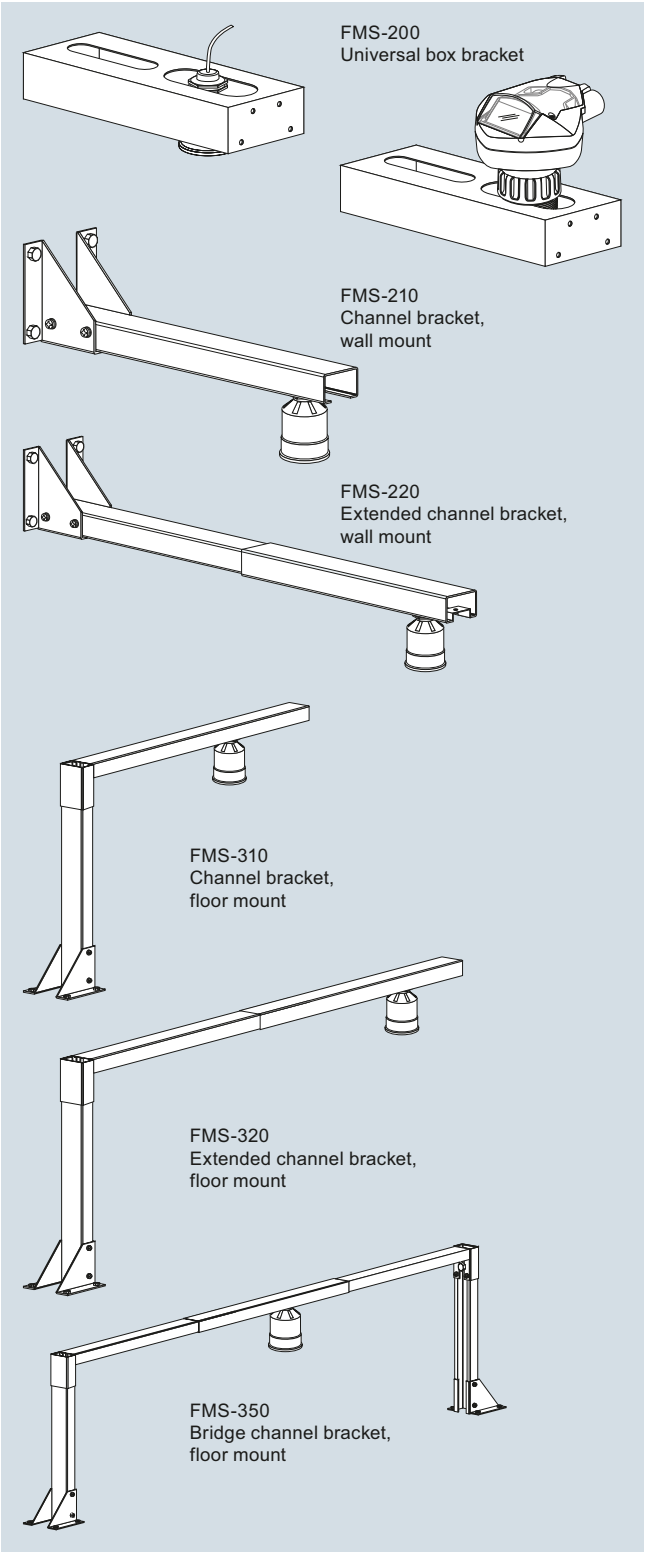
FMS-350
floor mounting set, bridge

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

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**
Additional Operating Instructions	
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.	

TS-3 temperature sensor

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.

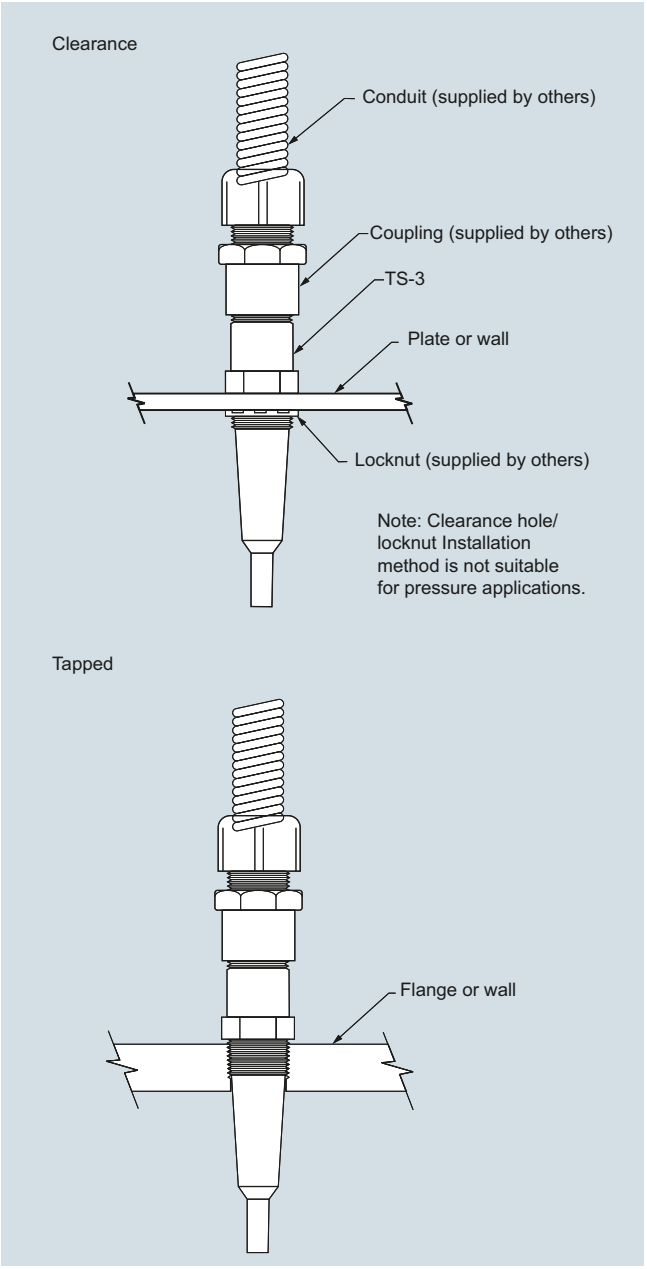
The TS-3 is used in conjunction with ultrasonic transducers that do not have an integral temperature sensor. It is also recommended in cases where the integral temperature sensor of the transducer cannot be used.

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



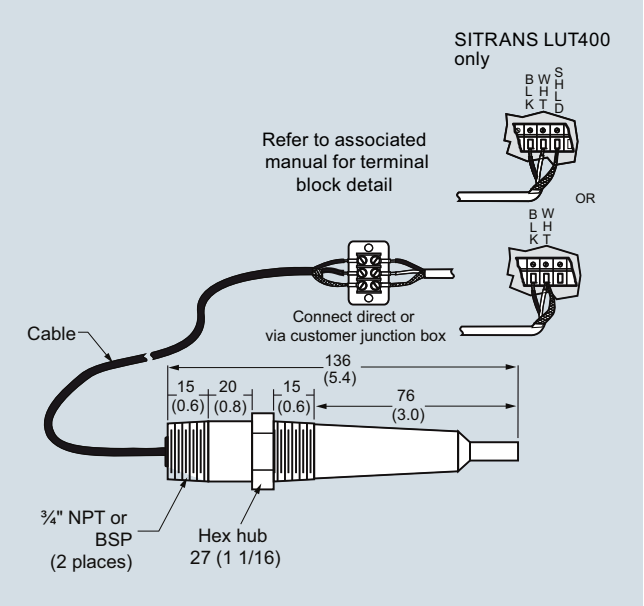
TS-3 temperature sensor

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 mm² (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	Article No.
TS-3 temperature sensor	**7ML1813-**
TS-3 provides an input signal for temperature compensation of specific Siemens ultrasonic level controllers.	■■B■
Compensation is essential in applications where variation in temperature of the sound medium is expected.	
Cable length	
1 m (3.28 ft)	**1**
5 m (16.40 ft)	**2**
10 m (32.81 ft)	**3**
30 m (98.43 ft)	**4**
50 m (164.04 ft)	**5**
70 m (229.66 ft)	**6**
90 m (295.28 ft)	**7**
Process connection	
¾" NPT [(Taper), ANSI/ASME B1.20.1]	**A**
R ¾" [(BSPT), EN 10226]	**B**
Approvals	
CSA, FM	**3**
CE, ATEX, IEC Ex[1]	**4**
Operating Instructions	
English	**7ML1998-5EM01**
German	**7ML1998-5EM31**
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 ATEX Quick Starts and Operating Instructions.	
Accessories	
¾" NPT locknut, aluminum	**7ML1930-1BE**
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77 inch) for fastening on sensors	**7ML1930-1BJ**

[1] Upper temperature rating of these approvals options is limited to 100 °C (212 °F)

Radar transmitters

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 LR400 is a 4-wire, 24 GHz FMCW radar level transmitter for long range continuous monitoring of liquids and slurries in storage and process vessels including high temperature and high pressure, to a range of 50 m (164 ft). It is ideal for 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.

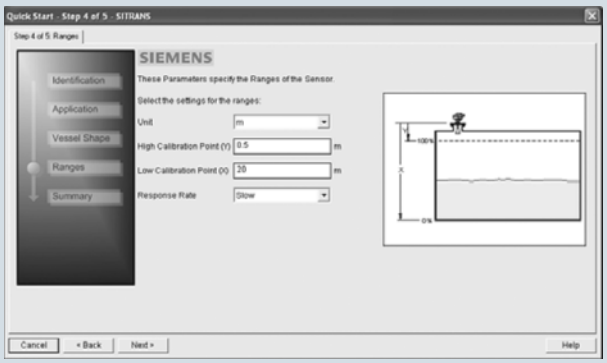
SITRANS LR560 2-wire,78 GHz FMCW radar level transmitter for coninuous monitoring of solids in silos to a range of 100 m (329 ft).

Auto False-Echo Suppression

SITRANS LR instruments offer the unique advantage of patented 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.

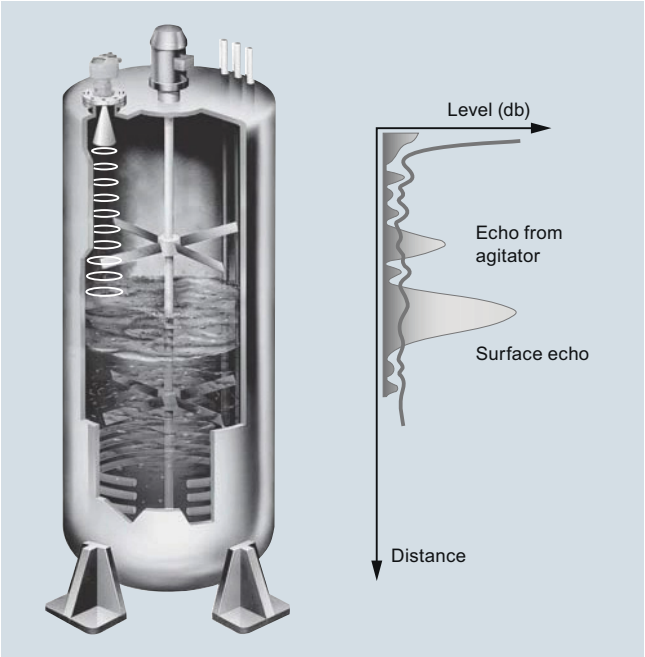
Unlike ultrasonic measurement, radar technology does not require a carrier medium and travels at the speed of light (300 000 000 m/s). Most industrial radar devices operate from 6 to 26 GHz.

Siemens offers pulse radar transmitters (SITRANS Probe LR, SITRANS LR200, SITRANS LR250, SITRANS LR260) and FMCW (Frequency Modulated Continuous Wave) radar transmitters (SITRANS LR400, 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

Technical specifications

Radar Selection Guide

Criteria	SITRANS Probe LR	SITRANS LR200	SITRANS LR250	SITRANS LR400	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	Chemicals, petrochemicals, oil, and gas	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	Liquids storage vessels, liquid petroleum gas (LPG), and other low dielectric media	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	0.35 ... 50 m (1.14 ... 164 ft)	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)	24 ... 25 GHz FMCW	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)	≤ 5 mm (0.02 inch) from 2 ... 10 m (6.6 ... 32.8 ft) ≤ 15 mm (0.6 inch) from 10 ... 50 m (32.8 ... 164 ft)	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 ... +65 °C (-40 ... +149 °F) Process: -40 ... +250 °C (-40 ... +482 °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	• 4 ... 20 mA/ HART • SIMATIC PDM	• 4 ... 20 mA/ HART • PROFIBUS PA • SIMATIC PDM • AMS • SITRANS DTM/FDT for PACTware, Fieldcare, etc.	• 4 ... 20 mA/ HART • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • AMS • SITRANS DTM/FDT for PACTware, Fieldcare, etc.	• 4 ... 20 mA/ HART • PROFIBUS PA • SIMATIC PDM	• 4 ... 20 mA/ HART • PROFIBUS PA • SIMATIC PDM	• 4 ... 20 mA/ HART • PROFIBUS PA • SIMATIC PDM	• 4 ... 20 mA/ HART • PROFIBUS PA • FOUNDATION Fieldbus • SIMATIC PDM • AMS • SITRANS DTM/FDT for PACTware, Fieldcare, etc.
Power	• 24 V DC nominal • Loop powered	• 24 V DC nominal • Loop powered	• 24 V DC nominal • Loop powered	• 120 ... 230 V AC, ±15 %, 50/60 Hz • 24 V DC, +25/-20 %, 6 W (optional)	• 24 V DC nominal • Loop powered	• 100 ... 230 V AC, ±15 %, 50/60 Hz, 6 W • 24 V DC, +25/-20 %, 6 W	• 24 V DC nominal • Loop powered
Approvals	CE, C-TICK, Lloyds Register of Shipping, ABS, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, GOST-R, IECEx, ANZEx, TIIS	CE, C-TICK, Lloyds Register of Shipping, ABS, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, GOST-R, IECEx, ANZEx, TIIS, NEPSI	CE, C-TICK, Lloyds Register of Shipping, ABS, BV, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, GOST-R, IECEx, TIIS, NEPSI Functional safety SIL-2	CE, C-TICK, Lloyds Register of Shipping, ABS, FCC, Industry Canada, R&TTE ATEX, CSA, FM, GOST-R	CE, C-TICK, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, GOST, IECEx	CE, C-TICK, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, IECEx, GOST	CE, C-TICK, FCC, Industry Canada, R&TTE ATEX, CSA, FM, INMETRO, IECEx, NEPSI, GOST

SIEMENS

Radar Application Questionnaire

Customer information

Contact: _____ Prepared By: _____

Company: _____ Date: _____

Address: _____ Notes on the Application: _____

City: _____ Country: _____

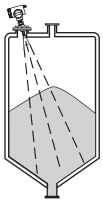
Zip/Postal Code: _____ Phone: ( ) _____

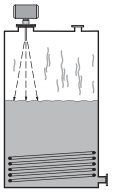
E-mail: _____ Fax: ( ) _____

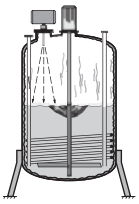
4

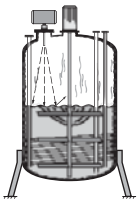
Vessel Information

☐ Sketch attached

☐ Storage Solids 

☐ Storage Liquids 

☐ Process 

☐ Reactor 

Area safety classification: (specify code required) _____

Height: _____ m/ft **Diameter:** _____ m/ft Filling method: _____

Top:
☐ Flat
☐ Parabolic
☐ Conical

Atmospere: (indicate all that apply)
☐ Foam ☐ Steam
☐ Dust ☐ Deposit (build-up)
☐ Vapor

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 ☐ Liquified gas

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

Material surface: ☐ Flat ☐ Tu ☐ Agitated ☐ Vortex Dielectric constant: ☐ $\varepsilon_r < 3$ ☐ $\varepsilon_r > 3$

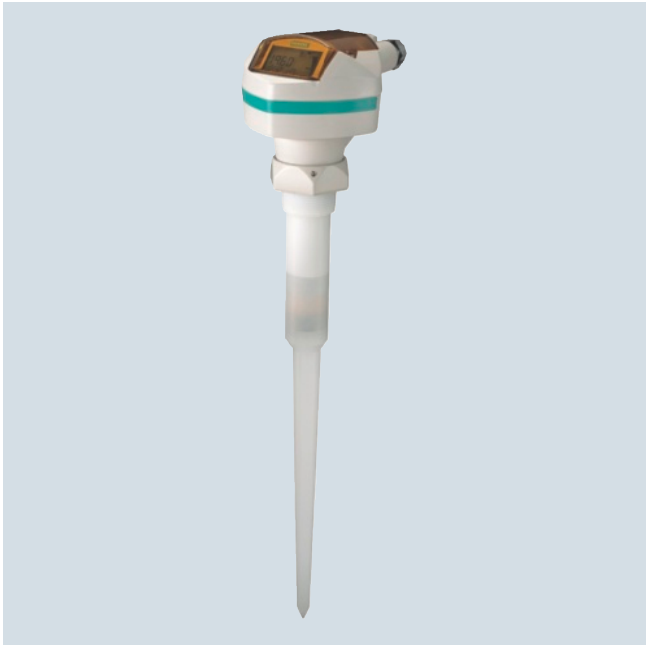
Installation

Power available: _____

Communications:
☐ HART /4 ... 20 mA
☐ PROFIBUS PA
☐ FOUNDATION Fieldbus ☐ None

Products recommended:

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 startup
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART handheld communicator
- Communication using HART
- Patented 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).

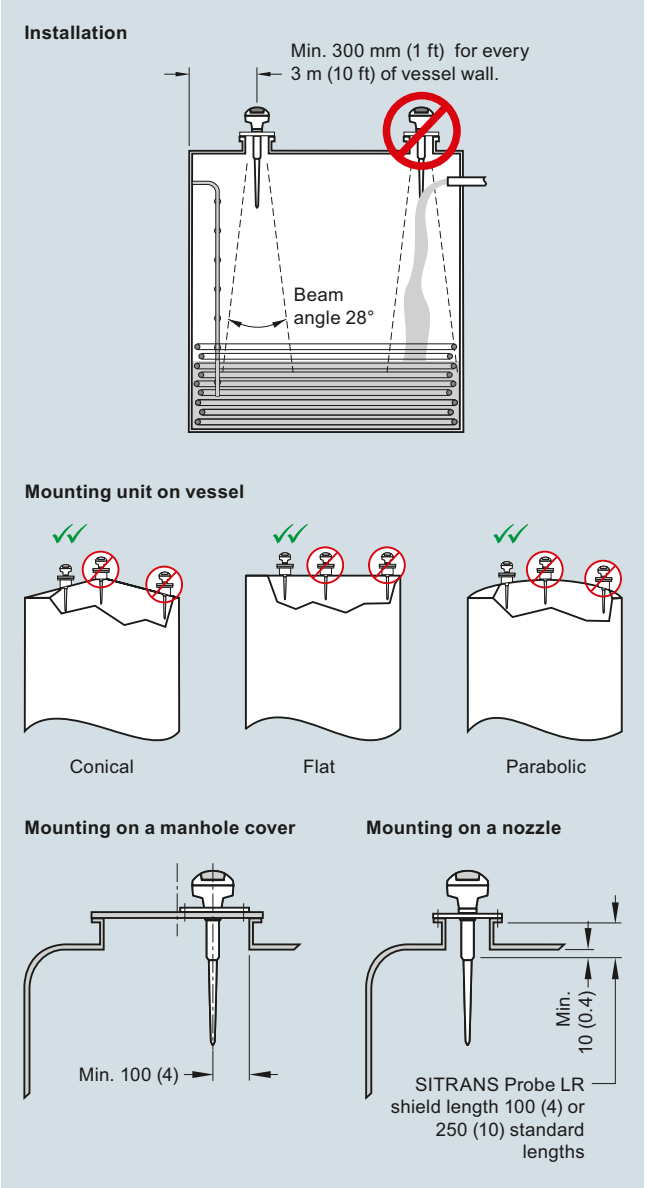
Probe LR is designed for safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna 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



SITRANS Probe LR installation, dimensions in mm (inch)

SITRANS Probe LR

Technical specifications

Mode of operation	
Measuring principle	Pulse radar level measurement
Frequency	5.8 GHz (North America 6.3 GHz)
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)
Output	
Analog output	4 ... 20 mA
Accuracy	± 0.02 mA
Span	Proportional or inversely proportional
Communications	HART
Performance (reference conditions)	
Accuracy	± the greater of 0.1 % of range or 10 mm (0.4 inch)
Influence of ambient temperature	0.003 %/K
Repeatability	± 5 mm (2 inch)
Fail-safe	mA signal programmable as high, low or hold (LOE)
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
Dielectric constant ε_r	ε_r > 1.6 (for ε_r < 3, use stillpipe)
Vessel temperature	-40 ... +80 °C (-40 ... +176 °F)
Vessel pressure	3 bar g (43.5 psi g)
Design	
Enclosure	
• Body construction	PBT (Polybutylene Terephthalate)
• Lid construction	PEI (Polyether Imide)
• Cable inlet	2 x M20x1.5 or 2 x ½" NPT with adapter
Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
Weight	1.97 kg (4.35 lb)
Antenna	
• Material	Polypropylene rod, hermetically sealed construction
• Dimensions	Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle or optional 250 mm (10 inch) long shield
Process connections	1½" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226] G 1½" [(BSPP), EN ISO 228-1]

Power supply	• Nominal 24 V DC with max. 550 Ω, maximum 30 V DC • 4 ... 20 mA
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM, C-TICK
Marine	• Lloyd's Register of Shipping • ABS Type Approval
Radio	FCC, Industry Canada and European (R&TTE), C-TICK
Hazardous	
• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga
• Intrinsically Safe (Canada)	CSA Class I, Div.1, Groups A, B, C, D; Class II, Div. 1, Group G; Class III
• Intrinsically Safe (Europe)	ATEX II 1G EEx ia IIC T4
• Intrinsically Safe (International)	IECEx Ex ia IIC T4
• Intrinsically Safe (Russia)	GOST-R Ex ia
• Intrinsically Safe (USA)	FM Class I, Div.1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
Programming	
Handheld programmer	HART communicator 375
PC	SIMATIC PDM
Intrinsically safe Siemens handheld programmer (optional)	Infrared receiver
• 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
Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages

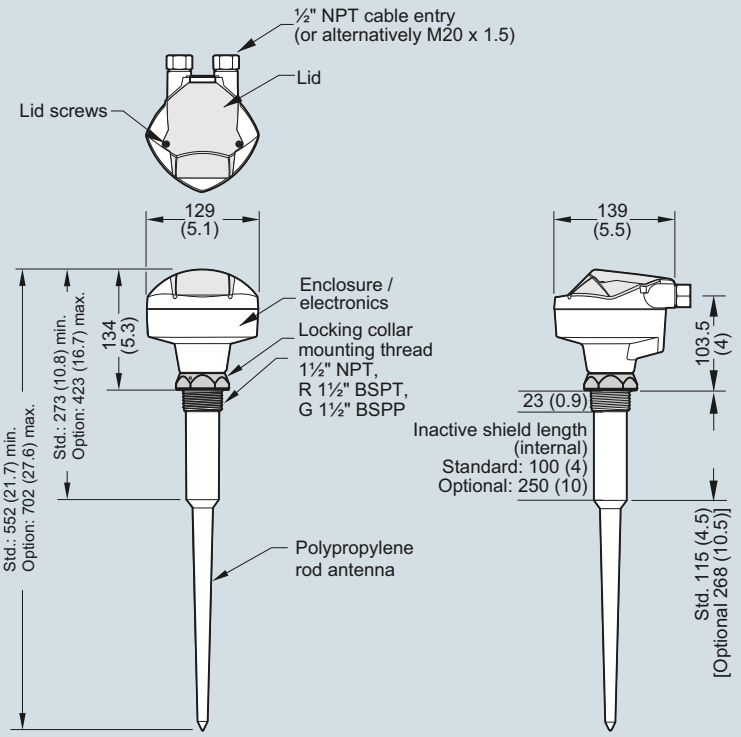
Selection and Ordering data		Article No.
SITRANS Probe LR		**7ML5430-**
2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft). Max. 3 bar g (43.5 psi g) pressure and 80 °C (176 °F)		■■■■ **0**
Enclosure/Cable inlet		
Plastic, (PBT), 2 x ½" NPT	⬟	**1**
Plastic, (PBT), 2 x M20x1.5	⬟	**2**
Antenna type/Material - (max. 3 bar and 80 °C)		
Polypropylene Antenna 1½" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 100 mm shield	⬟	**A**
R 1½" [(BSPT), EN 10226], comes with integral 100 mm shield	⬟	**B**
G 1½" [(BSPP), EN ISO 228-1], comes with integral 100 mm shield	⬟	**C**
1½" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 250 mm shield	⬟	**D**
R 1½" [(BSPT), EN 10226], comes with integral 250 mm shield	⬟	**E**
G 1½" [(BSPP), EN ISO 228-1], comes with integral 250 mm shield	⬟	**F**
Approvals		
General Purpose, CE, R&TTE, C-TICK	⬟	**A**
General Purpose, $CSA_{us/c}$, FM, FCC	⬟	**B**
CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1 Group G, Class III, FCC, Intrinsically Safe	⬟	**C**
FM, Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Intrinsically Safe	⬟	**D**
IECEx Ex ia IIC T4; ATEX II 1G EEx ia IIC T4, R&TTE, C-TICK, Intrinsically Safe; INMETRO Ex ia IIC T4 Ga; GOST-R	⬟	**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)]: 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**
Operating Instructions		Article No.
English		**7ML1998-5HR02**
French		**7ML1998-5HR11**
Spanish		**7ML1998-5HR21**
German Note: The Operating Instructions should be ordered as a separate item on the order.		**7ML1998-5HR32**
This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		
Additional Operating Instructions		
Multi-language Quick Start manual		**A5E32106153**
Accessories		
Handheld programmer, Intrinsically Safe, ATEX II 1G, Ex ia		**7ML5830-2AH**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)		**7MF4997-1DA**
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)		**7ML1930-1AP**
SITRANS RD100 Remote display - see Chapter 7		
SITRANS RD200 Remote display - see Chapter 7		
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7		**7ML5750-1AA00-0**
Spare parts		
Plastic lid		**7ML1830-1KB**
For applicable back up point level switch - see point level section on page 4/9		

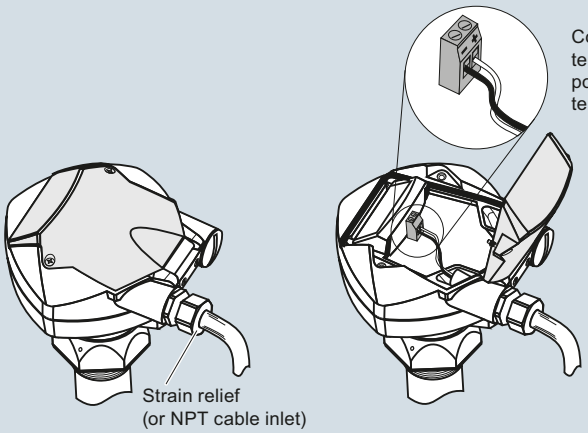
⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

Dimensional drawings



SITRANS Probe LR, dimensions in mm (inch)

Schematics



Hand Programmer

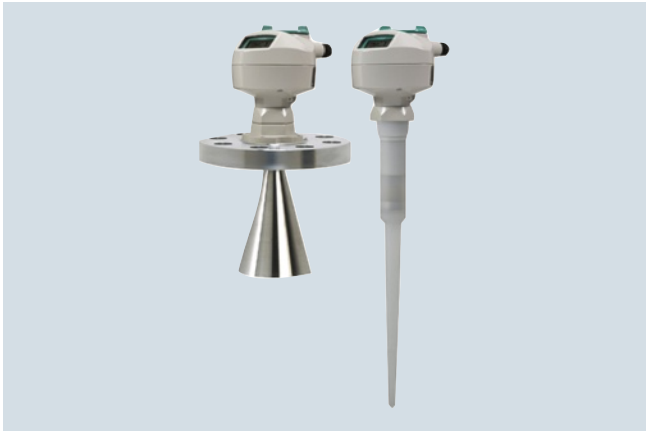
SITRANS Probe LR
Part number: 7ML5830-2AH

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

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 patented Process Intelligence signal-processing technology for superior reliability.

- Key Applications: liquid process vessels with agitators, vaporous liquids, high temperatures, asphalt, digesters

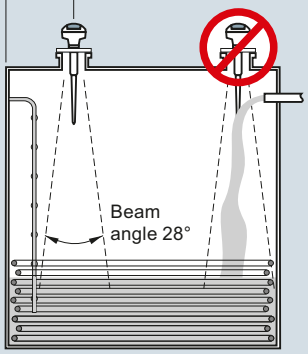
Configuration

Installation

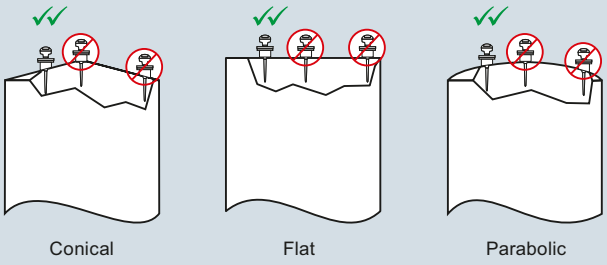
Min. 300 mm (1 ft) for every 3 m (10 ft) of vessel wall.

Note:

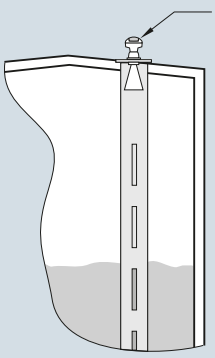
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- Beam angle for horn antenna dependent on horn size
- The peak energy density is directly in front of and in line with the rod antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



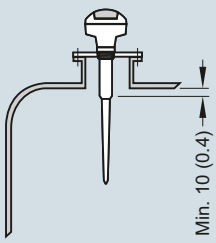
Mounting unit on vessel



Mounting unit on stilling well



Mounting on a nozzle



SITRANS LR200 installation, dimensions in mm (inch)

SITRANS LR200

Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
Frequency	5.8 GHz (North America 6.3 GHz)
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)
Output	
• Analog output	4 ... 20 mA
• Accuracy	± 0.02 mA
• Span	Proportional or inversely proportional
• Communications	HART Optional: PROFIBUS PA (Profile 3.0, Class B)
• Fail-safe	Programmable as high, low or hold (Loss of Echo)
Performance (according to reference conditions IEC60770-1)	
• From end of antenna to 600 mm:	40 mm (1.57 inch)
• Remainder of range:	10 mm (0.4 inch) or 0.1 % of span (whichever is greater)
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
• Dielectric constant ε_r	$\varepsilon_r > 1.6$ (for $\varepsilon_r < 3$, use waveguide antenna or stillpipe)
• Vessel temperature and pressure	Varies with connection type; see Pressure/Temperature curves for more information

Design	
Enclosure	
• Material	Aluminum, polyester powder coated
• Cable inlet	2 x M20x1.5 or 2 x ½" NPT with adapter
Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
Weight	< 2 kg (4.4 lb) (polypropylene rod antenna)
Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages
Antenna	
• Material	Polypropylene rod, hermetically sealed construction, optional PTFE
• Dimensions	Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle, or optional 250 mm (10 inch) long shield
• Optional rods, horn and waveguides	Refer to SITRANS LR200 Antennas for optional rods, horns and waveguides
Process connections	
• Process connection	1½" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" [(BSPT), EN 10226], or G 1½" [(BSPP), EN ISO 228-1] (polypropylene rod antenna)
• Flange connection	Refer to SITRANS LR200 Antennas for more connections
Power supply	
4 to 20 mA/HART	
• General Purpose, Non-incendive, Intrinsically Safe	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
• Flame proof, Increased safety, Explosion proof	Nominal 24 V DC (max. 30 V DC) with max. 250 Ω
PROFIBUS PA	• 10.5 mA • per IEC 61158-2

Certificates and approvals	
General	$CSA_{US/C}$, CE, FM, C-TICK
Marine	• Lloyd's Register of Shipping • ABS Type Approval
Radio	FCC, Industry Canada and European (R&TTE), C-TICK
Hazardous	
• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga
• 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
• 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
• Non-incendive (USA)	FM, Class I, Div. 2, Groups A, B, C, D, T5
• Flame Proof/Increased Safety (China)	NEPSI Ex d mb ia IIC T4/ Ex e mb ia IIC T4
• Flame Proof (Europe)	ATEX II 1/2 G Ex d mb ia IIC T4 Ga/Gb
• Increased Safety (Europe)	ATEX II 1/2 G Ex e mb ia IIC T4 Ga/Gb
• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4
• Intrinsically Safe (International)	IECEx Ex ia IIC T4
• Intrinsically Safe (Russia)	GOST-R Ex ia
Programming	
• Intrinsically Safe Siemens handheld programmer	Infrared receiver
- 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
• PC	• SIMATIC PDM • AMS
• Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages

SITRANS LR200

Selection and Ordering data	Article No.
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)	**7ML5422-** ■■■■**0**
Enclosure/Cable inlet Aluminum, epoxy painted 2 x ½" NPT 2 x M20x1.5	 **2** **3**
Polypropylene antenna type - (Max. 3 Bar pressure and 80 °C) 1½" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield R 1½" [(BSPT), EN 10226], c/w integral 100 mm shield G 1½" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield 1½" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield R 1½" [(BSPT), EN 10226], c/w integral 250 mm shield G 1½" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield	 **A** **B** **C** **D** **E** **F**
Approvals General Purpose, CE, R&TTE, C-TICK 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, C-TICK; GOST-R Non incendive, FM Class I, Div. 2, Groups A, B, C, D, FCC[1)] Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R[2)3)] Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R[3)] Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC[1)3)]	 **A** **B** **C** **D** **E** **F** **G** **H** **J**
Communication/Output PROFIBUS PA 4 ... 20 mA, HART, startup at < 3.6 mA	 **2** **3**

1) Available with enclosure option 2 only

2) Available with enclosure option 3 only

3) Available with communication option 3 only

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**
Namur NE43 compliant, device preset to failsafe < 3.6 mA[1)]	**N07**
Operating Instructions for HART/mA device	Article No.
English	**7ML1998-5JP02**
German	**7ML1998-5JP32**
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	**7ML1998-5JR02**
German	**7ML1998-5JR32**
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**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)	**7MF4997-1DA**
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[2)]	**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA[2)]	**7ML1930-1AQ**
One general purpose polymeric cable gland M20x1.5, rated -20 ... + 80 °C (-40 ... +176 °F)	**7ML1930-1AM**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
For applicable back up point level switch - see point level section on page 4/9	

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.

Selection and Ordering data	Article No.									
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version	**7ML5423-**					-				
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).										
Antenna material (uses antenna adapter)										
PTFE, uses antenna adapter and additional process connection below	1									
Process connection (refer to Pressure/ Temperature curves, page 4/212)										
Flanges (316L stainless steel)										
DN 50 PN 16, Type A, flat faced		A	A							
DN 80 PN 16, Type A, flat faced		B	A							
DN 100 PN 16, Type A, flat faced		C	A							
DN 150 PN 16, Type A, flat faced		D	A							
2" ASME 150 lb, flat faced		F	B							
3" ASME 150 lb, flat faced		G	B							
4" ASME 150 lb, flat faced		H	B							
6" ASME 150 lb, flat faced		J	B							
DN 50 PN 40, flat faced		A	C							
DN 80 PN 40, flat faced		B	C							
DN 100 PN 40, flat faced		C	C							
DN 150 PN 40, flat faced		D	C							
2" ASME 300 lb, flat faced, available with Pressure rating option 1 only due to flange hole spacing		F	D							
3" ASME 300 lb, flat faced		G	D							
4" ASME 300 lb, flat faced		H	D							
6" ASME 300 lb, flat faced		J	D							
JIS DN 50 10K		A	E							
JIS DN 80 10K		B	E							
JIS DN 100 10K		C	E							
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.)		D	E							
Threaded connection (316L stainless steel)										
1½" NPT [(Taper), ANSI/ASME B1.20.1]		L	A							
2" NPT [(Taper), ANSI/ASME B1.20.1]		M	A							
R 1½" [(BSPT), EN 10226]		L	C							
R 2" [(BSPT), EN 10226]		M	C							
G 1½" [(BSPP), EN ISO 228-1]		L	E							
G 2" [(BSPP), EN ISO 228-1]		M	E							
Antenna extensions or Inactive shield length										
No antenna extension				0						
50 mm (2 inch) extension, PTFE				1						
100 mm (4 inch) extension, PTFE				2						
100 mm (4 inch) extension, 316L stainless steel shield[1)]				3						
150 mm (6 inch) extension, 316L stainless steel shield[1)]				4						
200 mm (8 inch) extension, 316L stainless steel shield[1)]				5						
250 mm (10 inch) extension, 316L stainless steel shield[1)]				6						
Process seal/gasket										
Integral Gasket, for flat faced flange process connections only, not for Antenna extension options 3 ... 6					0					
FKM O-ring, not available for combination of flat faced flanges with Antenna extension options 0, 1 or 2					1					
Enclosure/Cable inlet										
Aluminum, Epoxy painted										
2 x ½" NPT							2			
2 x M20x1.5							3			

Selection and Ordering data	Article No.									
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version	**7ML5423-**					-				
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).										
Communication/Output										
PROFIBUS PA							B			
4 ... 20 mA, HART, startup at < 3.6 mA							C			
Approvals										
General Purpose, CE, R&TTE, C-TICK								A		
General Purpose, CSA, FM, Industry Canada, FCC								B		
Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada								C		
Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC								D		
Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, C-TICK; GOST-R								E		
Non incendive, FM Class I, Div. 2, Groups A, B, C, D, FCC[2)]								F		
Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R [3)4)]								G		
Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/ Gb, CE, R&TTE, C-TICK; GOST-R[4)]								H		
Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC[2)4)]								J		
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 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

4

SITRANS LR200

Selection and Ordering data	Article No.
SITRANS LR200, Flange Adapter, Sanitary Version	**7ML5424-**
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).	
Antenna material (uses antenna adapter)	
PTFE, one piece rod antenna	0
UHMW-PE, one piece rod antenna	1
Process connection	
Sanitary fitting clamp	A
Configuration/Connection size	
2" connection, rod antenna only	A
3" connection, rod antenna only	B
4" connection, rod antenna only	C
Antenna extension	
No extension	0
Mounting Clamp	
No mounting clamp	0
Mounting clamp included, not available with Pressure rating option 0	1
Enclosure/Cable inlet	
Aluminum, Epoxy painted	
2 x ½" NPT	2
2 x M20x1.5	3
Communication/Output	
PROFIBUS PA	B
4 ... 20 mA, HART, startup at < 3.6 mA	C
Approvals	
General Purpose, CE, R&TTE, C-TICK	A
General Purpose, CSA, FM, Industry Canada, FCC	B
Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada	C
Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC	D
Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, C-TICK; GOST-R	E
Non incendive, FM Class I, Div. 2, Groups A, B, C, D, FCC[1]	F
Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R [2)3)]	G
Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R[3)]	H
Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC[1)3)]	J
Pressure rating	
Rating per Pressure/Temperature curves in Manual 0.5 bar g (7.25 psi g) maximum	0
	1

1) Available with enclosure option 2 only

2) Available with enclosure option 3 only

3) Available with communication option C only

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[1)]	**N07**
Operating Instructions for HART/mA device	Article No.
English	**7ML1998-5JP02**
German	**7ML1998-5JP32**
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	**7ML1998-5JR02**
German	**7ML1998-5JR32**
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**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)	**7MF4997-1DA**
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[2)]	**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA[2)]	**7ML1930-1AQ**
One general purpose polymeric cable gland M20x 1.5, rated -40 ... +80 °C (-40 ... +176 °F)	**7ML1930-1AM**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
For applicable back up point level switch - see point level section on page 4/9	
Sanitary fitting clamps	
2", 304 stainless steel	**7ML1830-1HD**
3", 304 stainless steel	**7ML1830-1HE**
4", 304 stainless steel	**7ML1830-1HF**

1) Available with communication option C only

2) Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

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[1)]	**N07**
Operating Instructions for HART/mA device	Article No.
English	**7ML1998-5JP02**
German	**7ML1998-5JP32**
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	**7ML1998-5JR02**
German	**7ML1998-5JR32**
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**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)	**7MF4997-1DA**
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[2)]	**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA[2)]	**7ML1930-1AQ**
Antenna, rod, PTFE	**7ML1830-1HC**
Antenna extension, 50 mm (2 inch) PTFE	**7ML1830-1CH**
Antenna extension, 100 mm (4 inch) PTFE	**7ML1830-1CG**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

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.

SITRANS LR200

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).											
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 4/212)											
Flanges (316L stainless steel)											
DN 50 PN 16 EN 1092-1 Type A flat faced[1)]			A	A							
DN 80 PN 16 EN 1092-1 Type A flat faced			B	A							
DN 100 PN 16 EN 1092-1 Type A flat faced			C	A							
DN 150 PN 16 EN 1092-1 Type A flat faced			D	A							
DN 200 PN 16 EN 1092-1 Type A flat faced			E	A							
DN 80 PN 10/16 DIN EN 1092-1 Type B1 raised face[3)]			B	F							
DN 100 PN 10/16 DIN EN 1092-1 Type B1 raised face[3)]			C	F							
DN 150 PN 10/16 DIN EN 1092-1 Type B1 raised face[3)]			D	F							
DN 200 PN 16 DIN EN 1092-1 Type B1 raised face[3)]			E	F							
2" ASME 150 lb, flat faced[1)]			F	B							
3" ASME 150 lb, flat faced			G	B							
4" ASME 150 lb, flat faced			H	B							
6" ASME 150 lb, flat faced			J	B							
8" ASME 150 lb, flat faced			K	B							
DN 50 PN 40, flat faced[3)]			A	C							
DN 80 PN 40, flat faced[3)]			B	C							
DN 100 PN 40, flat faced[3)]			C	C							
DN 200 PN 40, flat faced[3)]			E	C							
DN 80 PN 25/40 DIN EN 1092-1 Type B1 raised face[3)]			C	G							
DN 100 PN 25/40 DIN EN 1092-1 Type B1 raised face[3)]			D	G							
DN 150 PN 25/40 DIN EN 1092-1 Type B1 raised face[3)]			E	G							
2" ASME 300 lb, flat faced[1)3)]			F	D							
3" ASME 300 lb, flat faced[3)]			G	D							
4" ASME 300 lb, flat faced[3)]			H	D							
JIS DN 50 10K[1)]			A	E							
JIS DN 80 10K			B	E							
JIS DN 100 10K			C	E							
JIS DN 150 10K			D	E							
JIS DN 200 10K			E	E							
(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, startup 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 sytems only						1					
FFKM (-35 ... +200 °C)						2					
Enclosure/Cable inlet											
Aluminum, Epoxy painted											
2 x ½" 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) wave-guide 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")											

Selection and Ordering data	Article No.
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).	**7ML5425-** ▢▢▢▢▢ - ▢▢▢▢
Approvals	
General Purpose, CE, R&TTE, C-TICK	**A**
General Purpose, CSA, FM, Industry Canada, FCC	**B**
Intrinsically Safe, CSA Class I, II, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada	**C**
Intrinsically Safe, FM Class I, II, Div. 1, Groups A, B, C, D, E, F, G, FCC	**D**
Intrinsically Safe, IECEx/ATEX II 1G Ex ia IIC T4, INMETRO Ex ia IIC T4, CE, R&TTE, C-TICK; GOST-R	**E**
Non incendive, FM Class I, Div. 2, Groups A, B, C, D, FCC[5]	**F**
Increased Safety, ATEX II 1/2G Ex e mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R[6][7]	**G**
Flame Proof, ATEX II 1/2G Ex d mb ia IIC T4 Ga/Gb, CE, R&TTE, C-TICK; GOST-R[7]	**H**
Explosion Proof, CSA/FM Class I, II, III, Groups A, B, C, D, E, F, G, Industry Canada, FCC[5][7]	**J**
Pressure rating	
Rating per Pressure/Temperature curves in manual	**0**
0.5 bar g (7.25 psi g) maximum	**1**

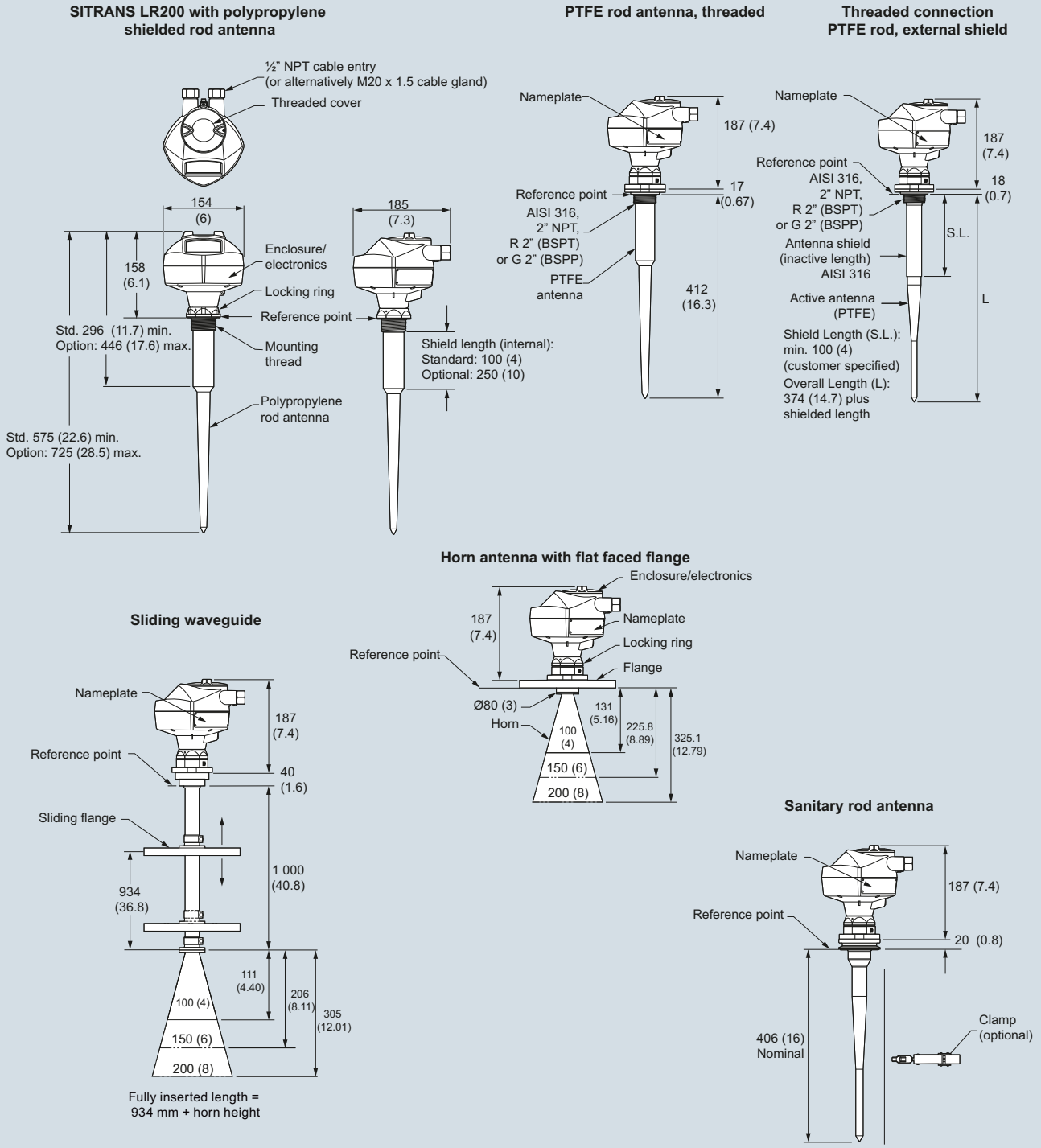
1) Available with pressure rating option 1 only
2) Maximum Process Temperature 60 °C (140 °F)
3) Available with Antenna Material option 0 and 1 only
4) For stillpipe applications only
5) Available with enclosure option 2 only
6) Available with enclosure option 3 only
7) Available with communication option 2 only

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Inactive custom shield lengths: Enter the total length of the inactive shield in plain text description (in 1 mm increments).	**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**
Namur NE43 compliant, device preset to failsafe < 3.6 mA[1]	**N07**
Operating Instructions for HART/mA device	Article No.
English	**7ML1998-5JP02**
German	**7ML1998-5JP32**
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	**7ML1998-5JR02**
German	**7ML1998-5JR32**
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**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)	**7MF4997-1DA**
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[2]	**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA[3]	**7ML1930-1AQ**
One general purpose polymeric cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F)	**7ML1930-1AM**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
For applicable back up point level switch - see point level section on page 4/9	

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

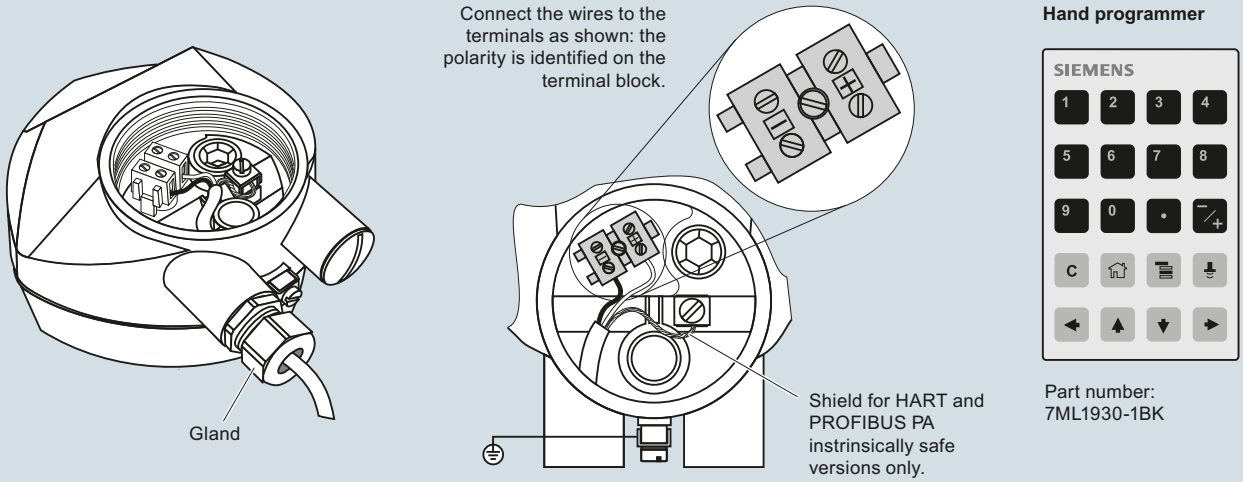
SITRANS LR200

Dimensional drawings



SITRANS LR200, dimensions in mm (inch)

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

SITRANS LR200 Antennas

Integration

Sliding waveguide antenna, typically for digester applications that include an isolation valve between the instrument and the vessel.

Horn with waveguide extension. Used for high temperature isolation, long standpipes, and clearing tank obstructions.

Flat faced flange connection with PTFE rod antenna.

Shielded rod antenna with a stainless steel shield eliminates standpipe interference. Various lengths available.

Sanitary rod connection for food applications.
2 inch, 3 inch, or 4 inch sizes available.

SITRANS LR200 with flange adapter for connection to optional antennas.

Sanitary clamps and ferrules (shown respectively) are available for sanitary connection types (only for ambient pressure applications).

Antenna configurations for SITRANS LR200

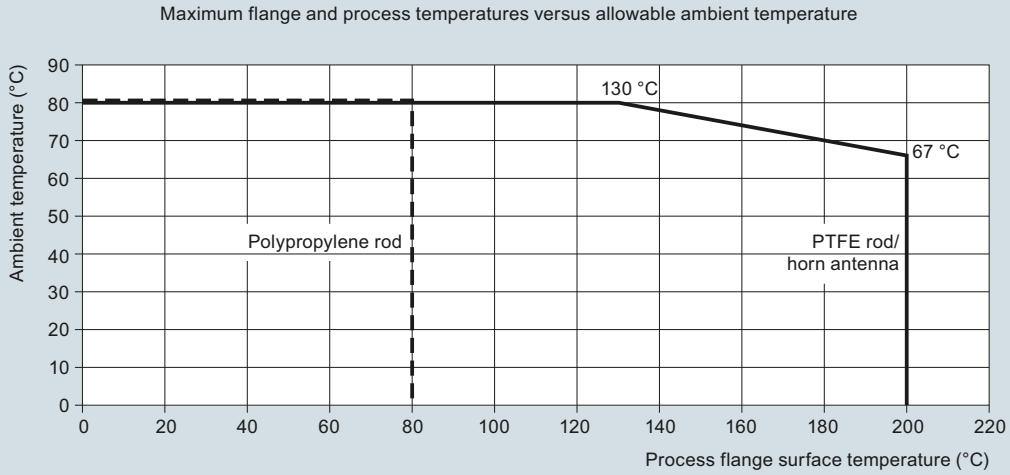
Technical specifications

Antenna Types	Flat Faced Flange with Rod	Shielded Rod	Sanitary Rod (1 piece construction)	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)	Sanitary fitting clamp 50, 80, 100 mm (2, 3, 4 inch) sizes	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	UHME-PE or PTFE	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	N/A	Use waveguide for extensions to 6 m (20 ft) long
Dielectric constant	> 3	> 3	> 3	> 3
Insertion length (max.)	41 cm (16.3 inch)	Variable	41 cm (16.3 inch)	Variable with extension
Purging option (liquid or gas)	No	No	No	Yes
Sliding waveguide option for digesters[1]	Yes	No	No	Yes
Weight[2]	6.5 kg (14.3 lb)	5.0 kg (11 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

Characteristic curves

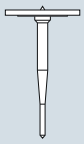


SITRANS LR200 Ambient/Process Flange Surface Temperature Curve

SITRANS LR200 Antennas

SITRANS LR200 Process Pressure/Temperature derating curves

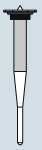
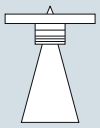
SITRANS LR200 Specials	Article No.
SITRANS LR200 PROFIBUS PA Aluminum Enclosure Kit with electronics and covers (7ML5422, 7ML5423, 7ML5424, 7ML5425), calibrated for use with standard rod antenna	
SITRANS LR200 aluminum enclosure with board stack, LUI display, 5.8 GHz, M20 cable inlet, approval option 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**
SITRANS LR200 HART aluminum enclosure kit with electronics and covers (7ML5422, 7ML5423, 7ML5424, 7ML5425), calibrated for use with standard rod antenna	
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**
SITRANS LR200 Horn Antenna Kits with mounting screws (no emitter supplied)	
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**
SITRANS LR200 Extension Kits for Horn Antenna with mounting screws	
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**
SITRANS LR200 Flanged Rod Antenna Kit with 316L stainless steel flat faced flanges	
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**

4

SITRANS LR200 Specials

SITRANS LR200 Specials	Article No.
SITRANS LR200 PTFE Rod Antenna Kit with 316L stainless steel 1½"pipe thread process connection 	
PTFE rod antenna kit, 1½" NPT 316L stainless steel process connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar.[4)]	**PBD: 51004K1AAA**
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/radar.[4)]	**PBD: 51004K2AAA**
PTFE rod antenna kit, 1½" G 316L stainless steel process connection, FKM O-ring; see drawing 51004 on http://www.siemens.com/radar.[4)]	**PBD: 51004K3AAA**
SITRANS LR200 PTFE Rod Antenna Kit with 316L stainless steel 2" pipe thread process connection 	
PTFE rod antenna kit, 2" NPT 316L stainless steel process connection, FKM O-ring; see drawing 51005 on http://www.siemens.com/radar.[4)]	**PBD: 51005K1AAA**
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/radar.[4)]	**PBD: 51005K2AAA**
PTFE rod antenna kit, 2" G 316L stainless steel process connection, FKM O-ring; see drawing 51005 on http://www.siemens.com/radar.[4)]	**PBD: 51005K3AAA**

SITRANS LR200 Specials	Article No.
SITRANS LR200 PTFE Rod Antenna Kit (100 mm shield) with 316L stainless steel 2" pipe thread process connection 	
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/radar.[3)4)]	**PBD: 51002K0100AAA**
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/radar.[3)4)]	**PBD: 51002K0100BAA**
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/radar.[3)4)]	**PBD: 51002K0100CAA**
SITRANS LR200 Horn Antenna Kit with 316L stainless steel flat faced flange, with PTFE emitter (without waveguide) 	
Horn antenna kit, 2" ASME 316L stainless steel flange 3" horn, PTFE emitter[1)4)]	**PBD: 51006K020AAAA**
Horn antenna kit, 2" ASME 316L stainless steel flange 4" horn, PTFE emitter[1)2)]	**PBD: 51006K020AABA**
Horn antenna kit, 2" ASME 316L stainless steel flange 6" horn, PTFE emitter[1)2)]	**PBD: 51006K020AACA**
Horn antenna kit, 2" ASME 316L stainless steel flange 8" horn, PTFE emitter[1)2)]	**PBD: 51006K020AADA**
Horn antenna kit, DN 50 PN 16 316L stainless steel flange 80 mm horn, PTFE emitter[1)2)]	**PBD: 51006K050AJAA**
Horn antenna kit, DN 50 PN 16 316L stainless steel flange 100 mm horn, PTFE emitter[1)2)]	**PBD: 51006K050AJBA**
Horn antenna kit, DN 50 PN 16 316L stainless steel flange 150 mm horn, PTFE emitter[1)2)]	**PBD: 51006K050AJCA**
Horn antenna kit, DN 50 PN 16 316L stainless steel flange 200 mm horn, PTFE emitter[1)2)]	**PBD: 51006K050AJDA**

SITRANS LR200 Specials	Article No.
SITRANS LR200 Sanitary Rod Antenna with Sanitary Fitting Clamp Flange mounting and bushing. **See drawing 51010 on** http://www.siemens.com/radar **(Sanitary Fitting Clamps not included)**	
PTFE sanitary rod antenna kit, 2" mounting connection.[4]	**PBD:51010K1AA**
PTFE sanitary rod antenna kit, 3" mounting connection.[4]	**PBD:51010K2AA**
PTFE sanitary rod antenna kit, 4" mounting connection.[4]	**PBD:51010K3AA**
UHMW-PE sanitary rod antenna kit, 2" mounting connection.[4]	**PBD:51010K1AB**
UHMW-PE sanitary rod antenna kit, 3" mounting connection.[4]	**PBD:51010K2AB**
UHMW-PE sanitary rod antenna kit, 4" mounting connection).[4]	**PBD:51010K3AB**
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.

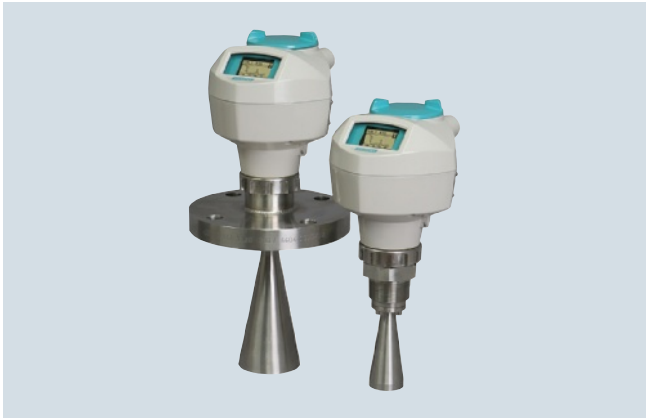
2) Available with no pressure rating

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 4/11

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 ec,ho 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 PACTware 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. Startup 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.

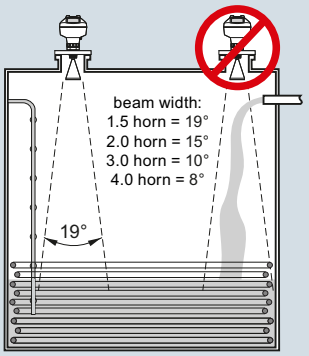
- Key Applications: liquid bulk storage tanks, process vessels, vaporous liquids, high temperatures, low dielectric media and applications with functional safety requirements

Configuration

Installation

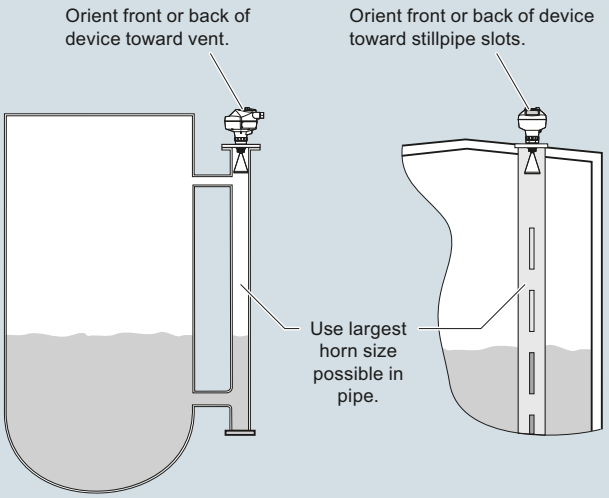
Note:

- 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.



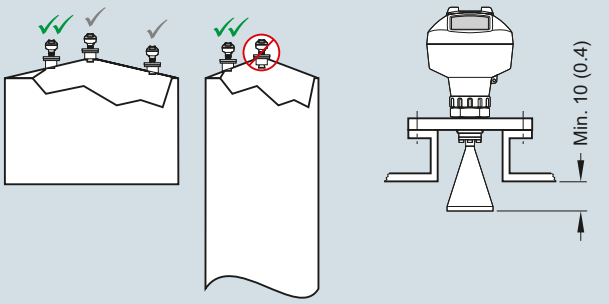
Mounting unit on bypass

Mounting unit on stilling well



Mounting unit on vessel

Mounting on a nozzle



SITRANS LR250 installation, dimensions in mm (inch)

Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
Frequency	K-band (25.0 GHz)
Minimum measuring range	50 mm (2 inch) from end of antenna
Maximum measuring range	20 m (65 ft), antenna dependent
Output	
HART:	Version 5.1
• Analog output	4 ... 20 mA
• Accuracy	± 0.02 mA
• Fail-safe	• Programmable as high low or hold (loss of echo) • NE 43 programmable
PROFIBUS PA:	Profile 3.1
• 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)	
Maximum measured error	3 mm (0.118 inch)
Influence of ambient temperature	< 0.003 %/K
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
Dielectric constant ε_r	> 1.6, antenna and application dependent
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)
Process pressure	Up to 40 bar g (580 psi g), process connection and temperature dependent. See Pressure/Temperature curves for more information
Design	
Enclosure	
• Material	Aluminum, polyester powder-coated
• Cable inlet	2 x M20x1.5 or 2 x ½" NPT
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

Process connections	
• 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]
• Flange connection	2", 3", 4" (ANSI 150, 300 lb), 50, 80, 100 mm (PN 16, 40, JIS 10K)
Power supply	
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
PROFIBUS PA	• 15 mA • per IEC 61158-2
FOUNDATION Fieldbus	• 20.0 mA • per IEC 61158-2
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM, NE 21, RCM
Radio	FCC, Industry Canada and Europe ETSI EN 302-372, RCM
Hazardous	
• Explosion Proof (Brazil)	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Increased Safety (Brazil)	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
• 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
• 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
• Non-incendive (Canada/USA)	CSA/FM Class I, Div. 2, Groups A, B, C, D T5
• 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_A90 °C
• Intrinsically Safe (China)	NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C
• Non-sparking (China)	NEPSI Ex nA IIC T4 Gc
• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia IIIC T100 °C Da
• Non-sparking (Europe)	ATEX II 3G Ex nA IIC T4 Gc
• 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
• 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
• Intrinsically Safe (International)	IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIC T100 °C Da
• Explosion Proof (Russia)	GOST-R Ex d
• Increased Safety (Russia)	GOST-R Ex e
• Intrinsically Safe (Russia)	GOST-R Ex ia

SITRANS LR250 Horn 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	• 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 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 -**
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]	⬟	**A A**
R 1½" [(BSPT), EN 10226-1] (tapered thread)[3]	⬟	**A B**
G 1½" [(BSPP), EN ISO 228-1] (parallel thread)[3]	⬟	**A C**
2" NPT (ASME B1.20.1) (tapered thread)	⬟	**A D**
R 2" [(BSPT), EN 10226-1] (tapered thread)	⬟	**A E**
G 2" [(BSPP), EN ISO 228-1] (parallel thread)	⬟	**A F**
3" NPT (ASME B1.20.1) (tapered thread)		**A G**
R 3" [(BSPT), EN 10226-1] (tapered thread)		**A H**
G 3" [(BSPP), EN ISO 228-1] (parallel thread)		**A J**
Flanged connection 316L		
2" Class 150 ASME B16.5 flat faced[4]	⬟	**B A**
3" Class 150 ASME B16.5 flat faced[4]	⬟	**B B**
4" Class 150 ASME B16.5 flat faced[4]	⬟	**B C**
2" Class 300 ASME B16.5 flat faced[4]		**C A**
3" Class 300 ASME B16.5 flat faced[4]		**C B**
4" Class 300 ASME B16.5 flat faced[4]		**C C**
DN 50 PN 16 EN 1092-1 Type A flat faced[4]	⬟	**D A**
DN 80 PN 16 EN 1092-1 Type A flat faced[4]	⬟	**D B**
DN 100 PN 16 EN 1092-1 Type A flat faced[4]	⬟	**D C**
DN 50 PN 40 EN 1092-1 Type A flat faced[4]		**E A**
DN 80 PN 40 EN 1092-1 Type A flat faced[4]		**E B**
DN 100 PN 40 EN 1092-1 Type A flat faced[4]		**E C**
50A 10K JIS B 2220 flat faced[4]	⬟	**F A**
80A 10K JIS B 2220 flat faced[4]	⬟	**F B**
100A 10K JIS B 2220 flat faced[4]	⬟	**F C**
DN 50 PN 16 DIN EN 1092-1 Type B1 raised face		**G A**
DN 80 PN 16 DIN EN 1092-1 Type B1 raised face		**G B**
DN 100 PN 16 DIN EN 1092-1 Type B1 raised face		**G C**
DN 150 PN 16 DIN EN 1092-1 Type B1 raised face		**G D**
DN 50 PN 40 DIN EN 1092-1 Type B1 raised face		**H A**
DN 80 PN 40 DIN EN 1092-1 Type B1 raised face		**H B**
DN 100 PN 40 DIN EN 1092-1 Type B1 raised face		**H C**
DN 150 PN 40 DIN EN 1092-1 Type B1 raised face		**H D**

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]		**J A**
3" Class 150 ASME B16.5 raised faced[4]		**J B**
4" Class 150 ASME B16.5 raised faced[4]		**J C**
2" Class 300 ASME B16.5 raised faced[4]		**J D**
3" Class 300 ASME B16.5 raised faced[4]		**J E**
4" Class 300 ASME B16.5 raised faced[4]		**J F**
DN 50 PN 16 EN 1092-1 Type B1 raised faced[4]		**K A**
DN 80 PN 16 EN 1092-1 Type B1 raised faced[4]		**K B**
DN 100 PN 16 EN 1092-1 Type B1 raised faced[4]		**K C**
DN 50 PN 40 EN 1092-1 Type B1 raised faced[4]		**K D**
DN 80 PN 40 EN 1092-1 Type B1 raised faced[4]		**K E**
DN 100 PN 40 EN 1092-1 Type B1 raised faced[4]		**K F**
50A 10K JIS B 2220 raised faced[4]		**L A**
80A 10K JIS B 2220 raised faced[4]		**L B**
100A 10K JIS B 2220 raised faced[4]		**L C**
DN 50 PN 16 EN 1092-1 Type B1 raised face		**M A**
DN 80 PN 16 EN 1092-1 Type B1 raised face		**M B**
DN 100 PN 16 EN 1092-1 Type B1 raised face		**M C**
DN 150 PN 16 EN 1092-1 Type B1 raised face		**M D**
DN 50 PN 40 EN 1092-1 Type B1 raised face		**M E**
DN 80 PN 40 EN 1092-1 Type B1 raised face		**M F**
DN 100 PN 40 EN 1092-1 Type B1 raised face		**M G**
DN 150 PN 40 EN 1092-1 Type B1 raised face		**M H**
Communication/Output		
PROFIBUS PA	⬟	**1**
4 ... 20 mA, HART, startup 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**

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 -**
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_A90 °C ⬟	**L**
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C[5] ⬟	**M**
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °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.

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)]	⬟	**A50**
Plug 7/8" with mating Connector[2)3)4)]	⬟	**A55**
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 3.1 of EN 10204	⬟	**C12**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511[3) 5)]	⬟	**C20**
Namur NE43 compliant, device preset to failsafe < 3.6 mA[5)]	⬟	**N07**
Operating Instructions for HART/mA device		Article No.
English		**A5E32220602**
German		**A5E32376088**
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.		**A5E31997170**
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.		
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		**A5E31997267**
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.		
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		**A5E31993945**

Selection and Ordering data	Order code
Accessories	
Handheld programmer, Intrinsically safe, EEx ia	**7ML1930-1BK**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)	**7MF4997-1DA**
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 (two are required)	**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (two are required)[6)]	**7ML1930-1AQ**
FDA approved FKM o-ring for 2" G (BSPP) process connections -28 ... +80 °C (-28 ... +176 °F)	**7ML1830-3AN**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
For applicable back up point level switch - see point level section on page 4/9	

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

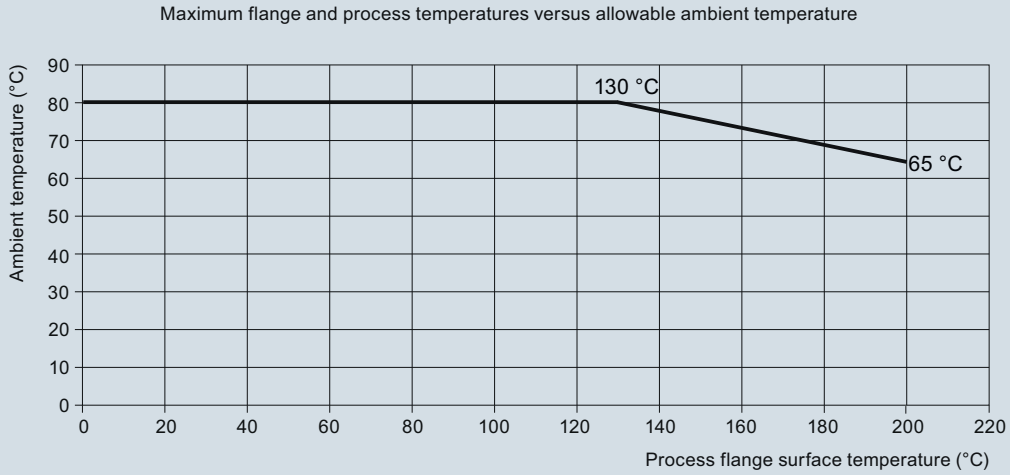
5) Applicable to communication option 2 only

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.

SITRANS LR250 Horn Antenna

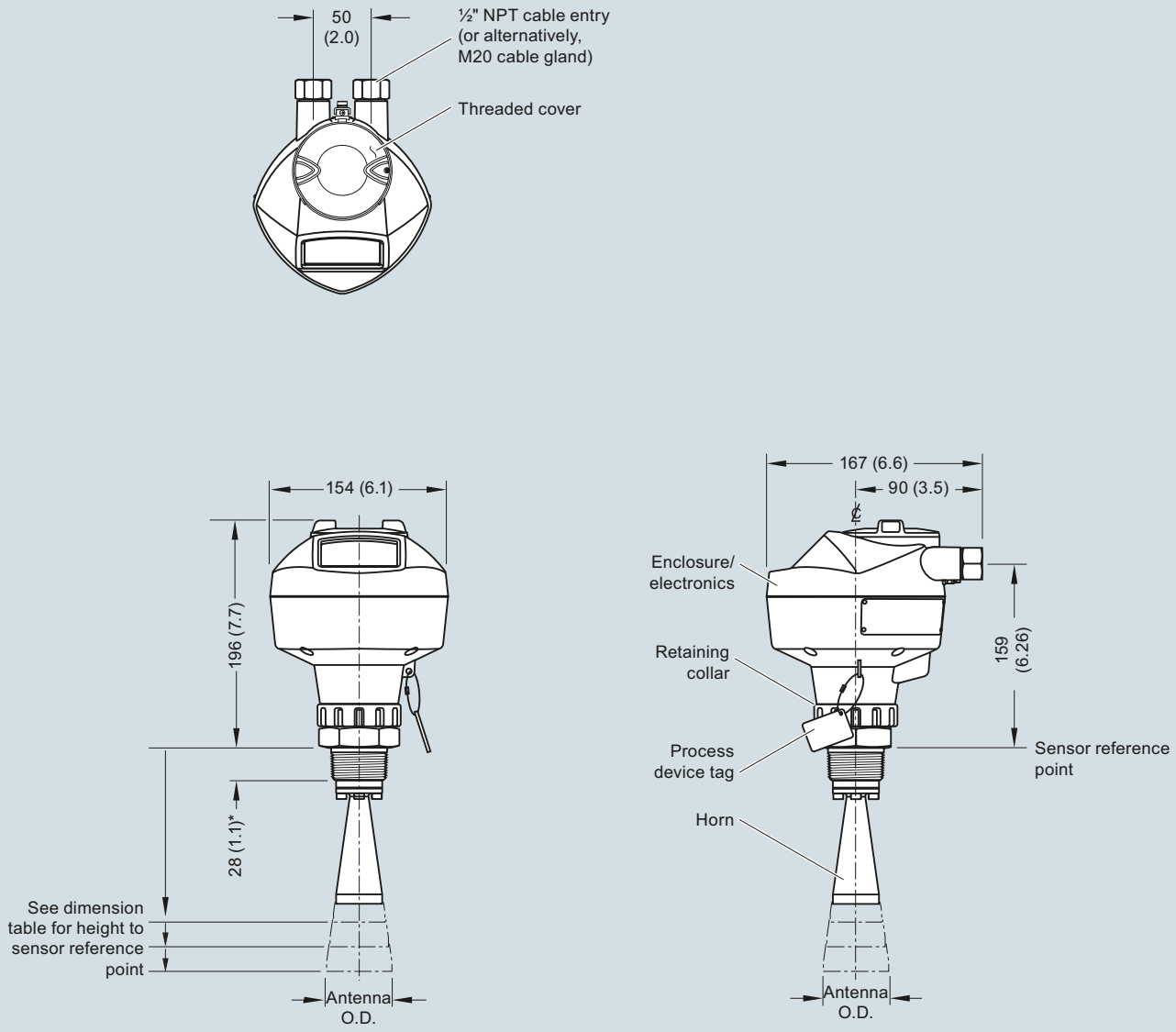
Characteristic curves



SITRANS LR250 Ambient/Process Flange Surface Temperature Curve

Dimensional drawings

Threaded Horn Antenna



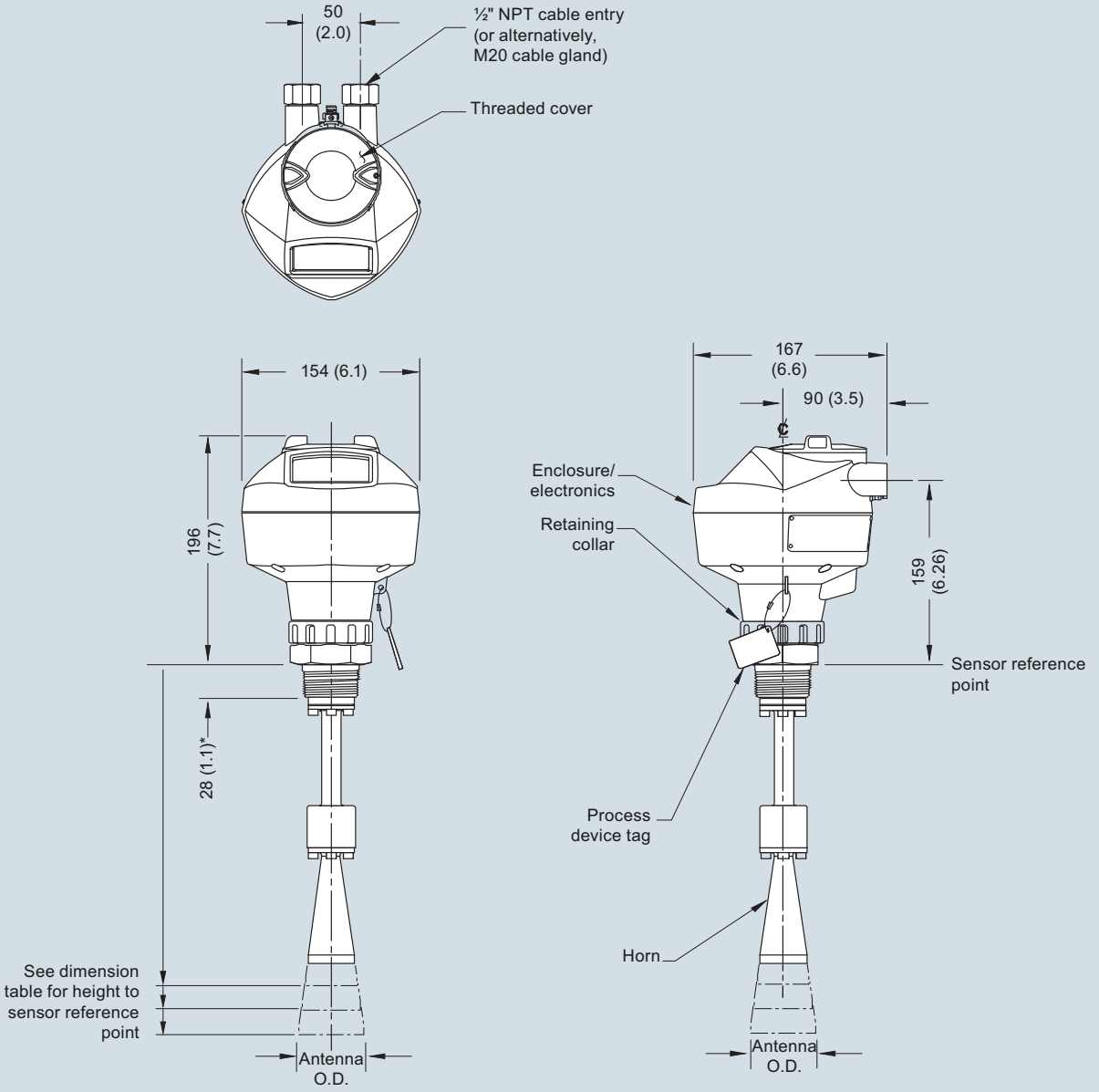
*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

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)

SITRANS LR250 Horn Antenna

Threaded Horn Antenna with Extension

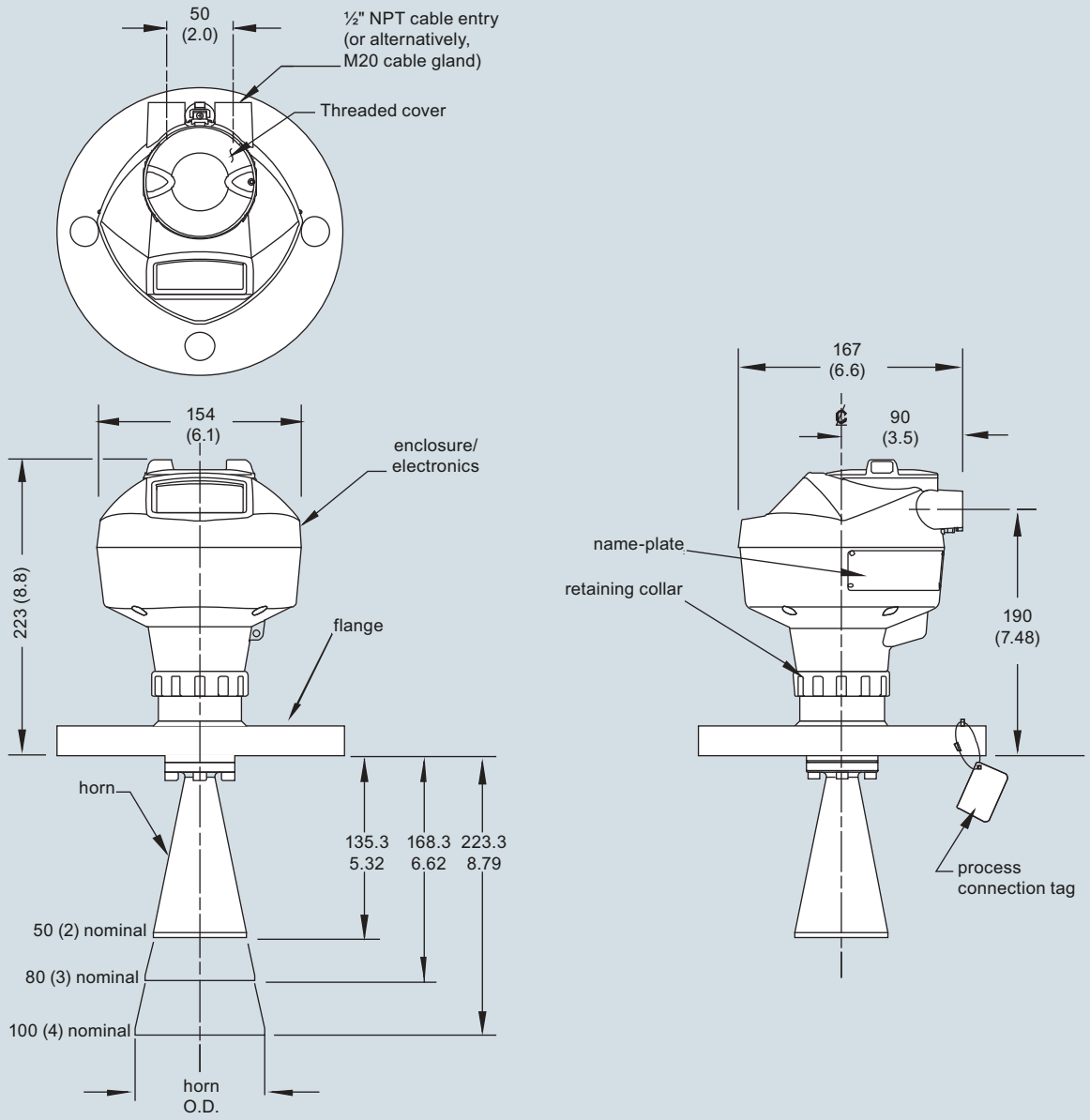


*28 mm (1.1) for 1.5 inch and 2 inch, 42 mm (1.65) for 3 inch

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)

Flanged Horn

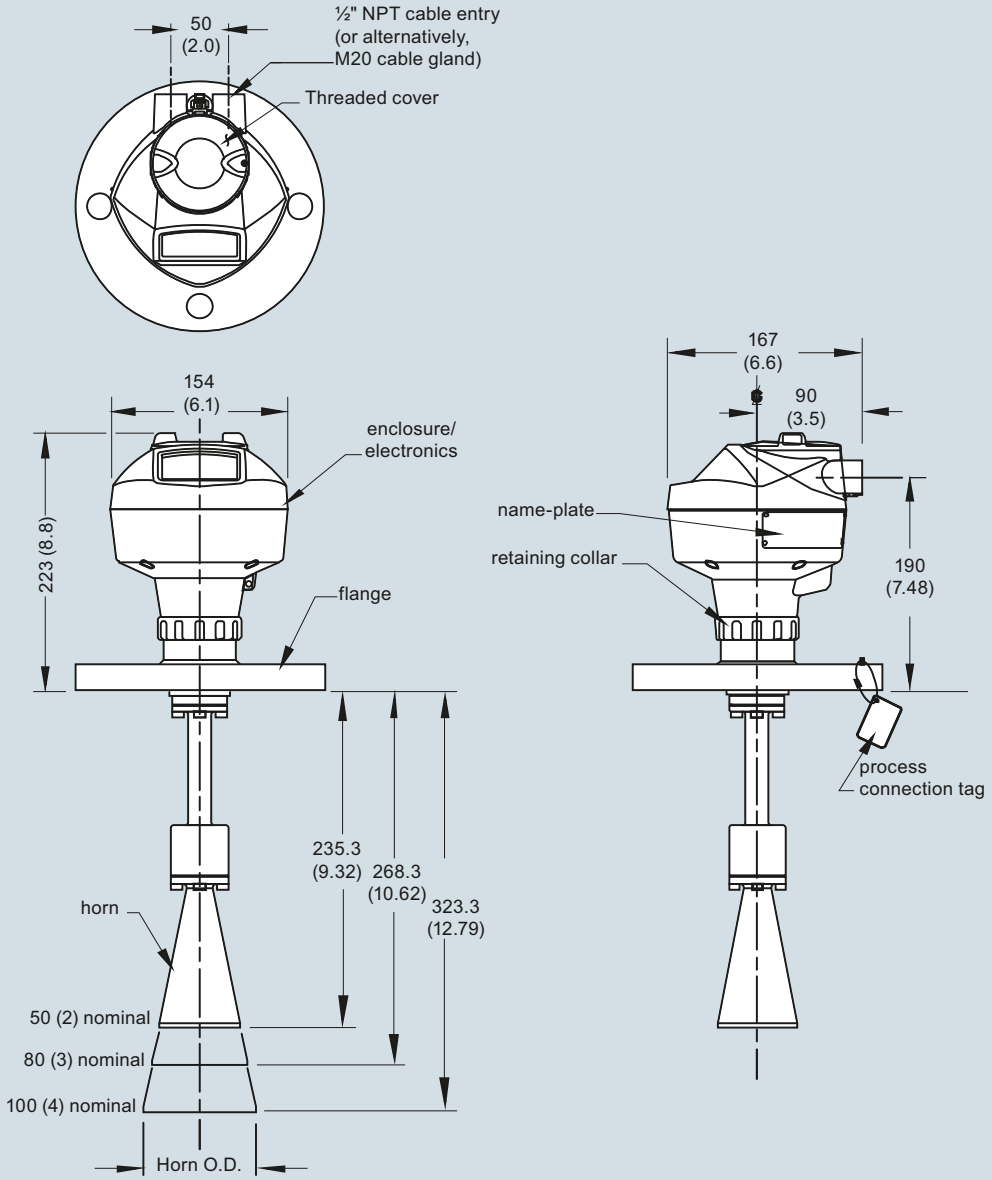


Nominal Horn Size	Horn O.D.	Height to sensor reference point		Beam angle	Measurement range
		Stainless steel flange raised or flat-faced	Optional alloy flange		
50 (2)	47.8 (1.88)	135.3 (5.32)	138.3 (5.44)	19 degrees	10 m (32.8 ft)
80 (3)	74.8 (2.94)	168.3 (6.62)	171.3 (6.74)	15 degrees	20 m (65.6 ft)
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)

SITRANS LR250 Horn Antenna

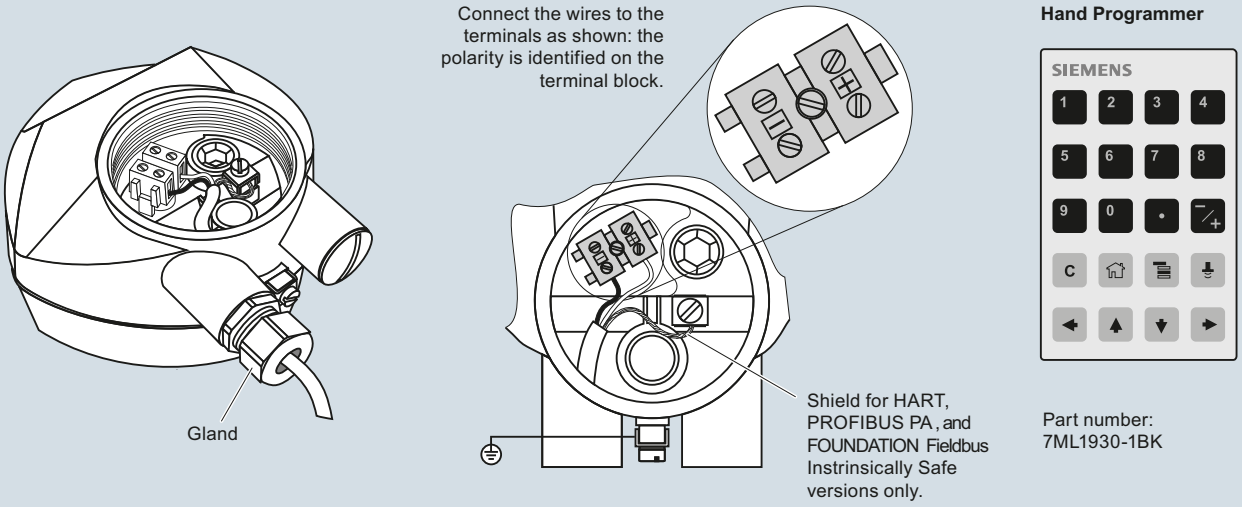
Flanged Horn with Extension



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)

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

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 2 inch (50 mm) 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 Instrinsically 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. Startup 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 Instrinsically Safe handheld programmer without having to open the instrument's lid.

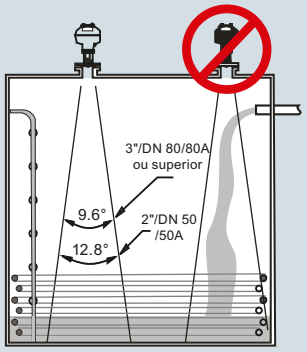
SITRANS LR250 measures superbly in small vessels and in tanks/vessels up to 20 m (66 ft) on materials with dk > 1.6.

- 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.

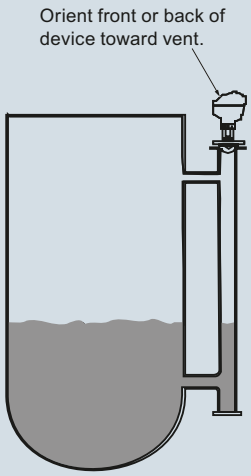
Configuration

Installation

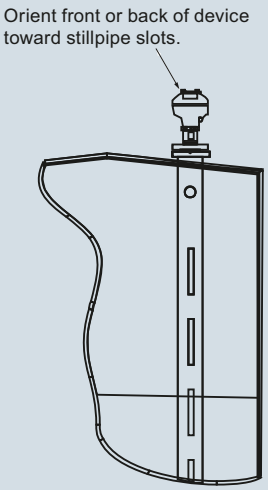
Note:
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the antenna.
- There is a signal transmitted outside of the beam angle; therefore false targets may be detected.



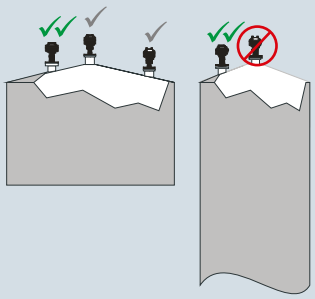
Mounting unit on bypass



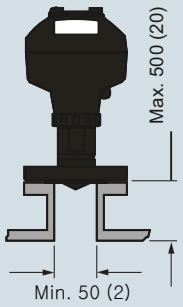
Mounting unit on stilling well



Mounting unit on vessel



Mounting on a nozzle



SITRANS LR250 flanged encapsulated antenna installation, dimensions in mm (inch)

Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
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	
HART	Version 5.1
• Analog output	4 ... 20 mA
• Accuracy	± 0.02 mA
• Fail-safe	• Programmable as high low orhold (loss of echo) • NE 43 programmable
PROFIBUS PA	Profile 3.1
• 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 toreference conditions IEC60770-1)	
Maximum measured error	• > 500 mm from sensor reference point: 3 mm (0.118 inch) • < 500 mm from sensor reference point: 25 mm (1 inch)
Influence of ambient temperature	< 0.003 %/K
Rated operating conditions	
Installation conditions	
Location	Indoor/outdoor
Ambient conditions (enclosure)	
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
Installation category	I
Pollution degree	4
Medium conditions	
Dielectric constant ε_r	≥ 1.6 (antenna dependent)
Process temperature	-40 ... +170 °C (-40 ... +338 °F) at process connection
Process pressure	See Pressure/Temperature curves for more information (page 4/232)
Design	
Enclosure	
• Material	Aluminum, polyester powder-coated
• Cable inlet	2 x M20x1.5 or 2 x ½" NPT
Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
Weight (dependent on process connection)	• 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)
Display (local)	Graphic local user interface including quick start wizard andecho profile display
Antenna	
• Material	Stainless steel 316L (1.4435 or 1.4404) and TFM 1600 PTFE Lens
• Dimensions (nominal sizes)	48 mm (2 inch), 80 mm (3 inch), 100 mm (4 inch), 150 mm (6 inch)

Process connections	
Flanged connection	Raised face • 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
Power supply	
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC)with max. 550 Ω
PROFIBUS PA	• 15 mA • per IEC 61158-2
FOUNDATION Fieldbus	• 20.0 mA • per IEC 61158-2
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM, RCM
Radio	FCC, Industry Canada and Europe ETSI EN 302-372, RCM
Hazardous	
• Explosion Proof (Brazil)	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Increased Safety (Brazil)	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
• 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
• 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
• Non-incendive (Canada/USA)	CSA/FM Class I, Div. 2, Groups A, B, C, D T5
• 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_A90 °C
• Intrinsically Safe (China)	NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C
• Non-sparking (China)	NEPSI Ex nA IIC T4 Gc
• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia ta IIIC T100 °C Da
• Non-sparking (Europe)	ATEX II 3G Ex nA IIC T4 Gc
• 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
• 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
• Intrinsically Safe (International)	IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEx/ATEX II 1D Ex ia ta IIIC T100 °C Da
• Explosion Proof (Russia)	GOST-R Ex d
• Increased Safety (Russia)	GOST-R Ex e
• Intrinsically Safe (Russia)	GOST-R Ex ia

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	• 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

4

Selection and Ordering data		Article No.
SITRANS LR250 flanged encapsulated antenna 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.		**7ML5432-** ■■■■ **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, startup 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 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]	⬟	**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_A90 °C	⬟	**L**
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C[2]	⬟	**M**
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C[2]	⬟	**N**
Pressure rating		
Rating per Pressure/Temperature curves in instruction manual	⬟	**0**

[1] Maximum range 10 m (32.8 ft), dk > 3 [20m (66ft) 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.

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)]	⬟	**A50**
Plug 7/8" with mating Connector[2)3)4)]	⬟	**A55**
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**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511[5)6)]	⬟	**C20**
Namur NE43 compliant, device preset to failsafe < 3.6 mA[5)]	⬟	**N07**
Operating Instructions for HART/mA device		Article No.
English		**A5E32220602**
German		**A5E32376088**
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.		**A5E31997170**
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.		
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		**A5E31997267**
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.		
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		**A5E31993945**

Selection and Ordering data	Order code
Accessories	
Handheld programmer, Intrinsically safe, EEx ia	**7ML1930-1BK**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)	**7MF4997-1DA**
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 (2 are required)[6)]	**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA and FOUNDATION Fieldbus (2 are required)[2)]	**7ML1930-1AQ**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
For applicable back up point level switch - see point level section on page 4/9	

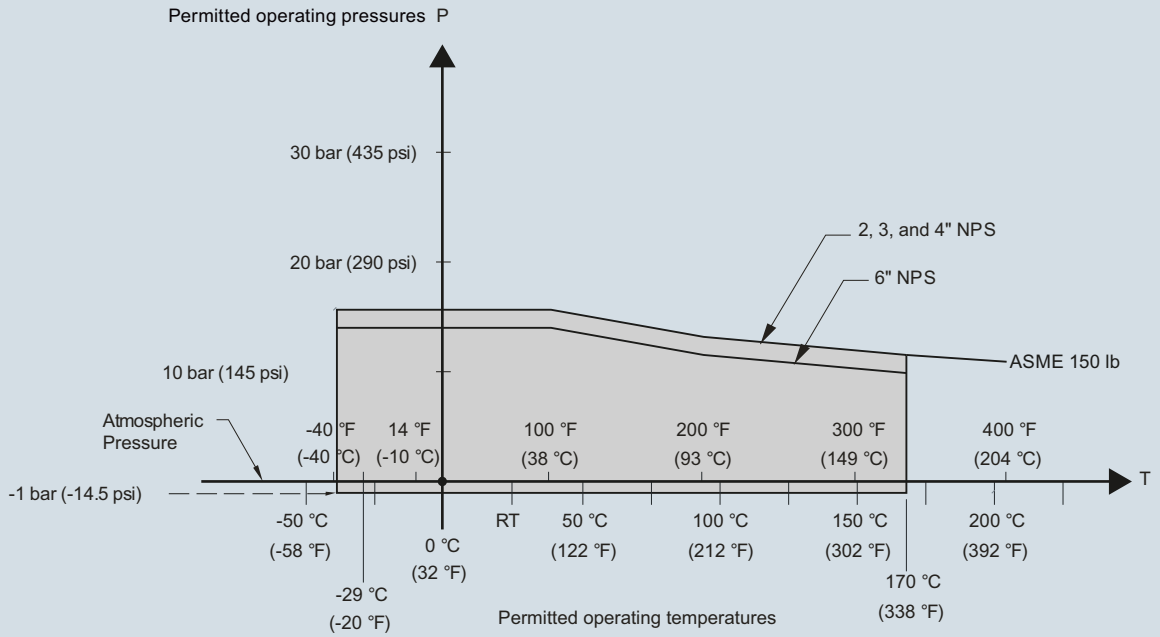
1) Available with enclosure option 1 only
2) Available with communication options 1 and 3 only
3) Available with approval options A, B, C, and L only
4) Available with enclosure option 0 only
5) Applicable with communication option 2 only
6) Available with approval options A, B, C, D, E, K, and L only

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

SITRANS LR250 Flanged Encapsulated Antenna

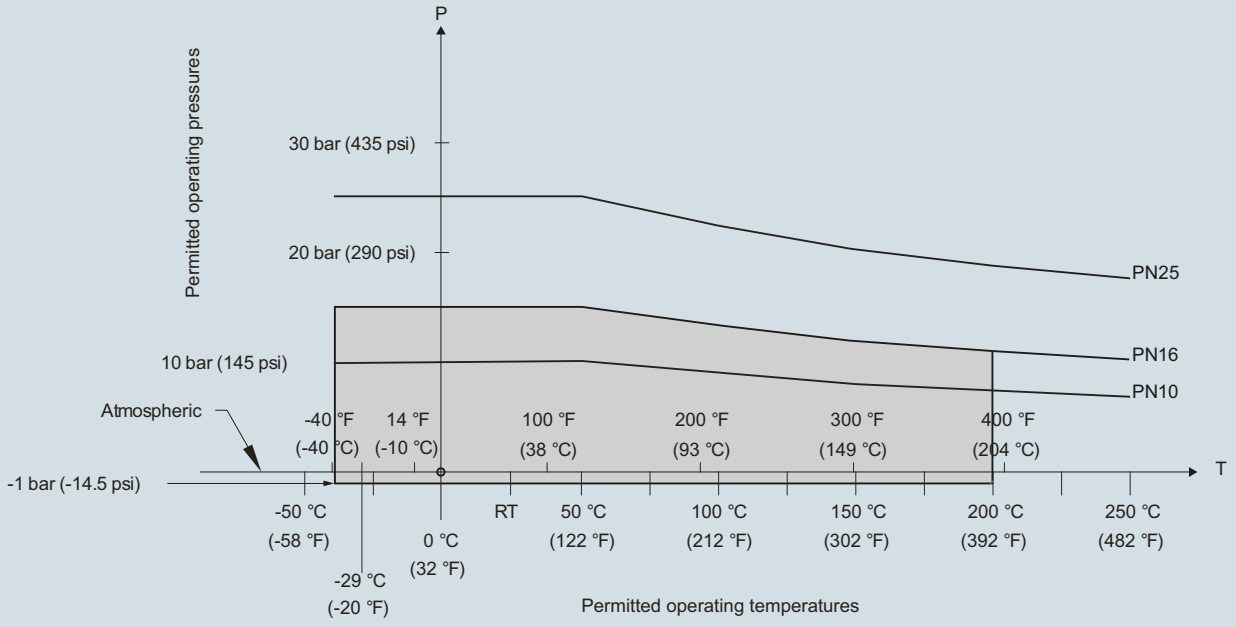
Characteristic curves

**Pressure/ temperature curve
LR250 Flanged Encapsulated Antenna
ASME flanged process connections
(7ML5432)**



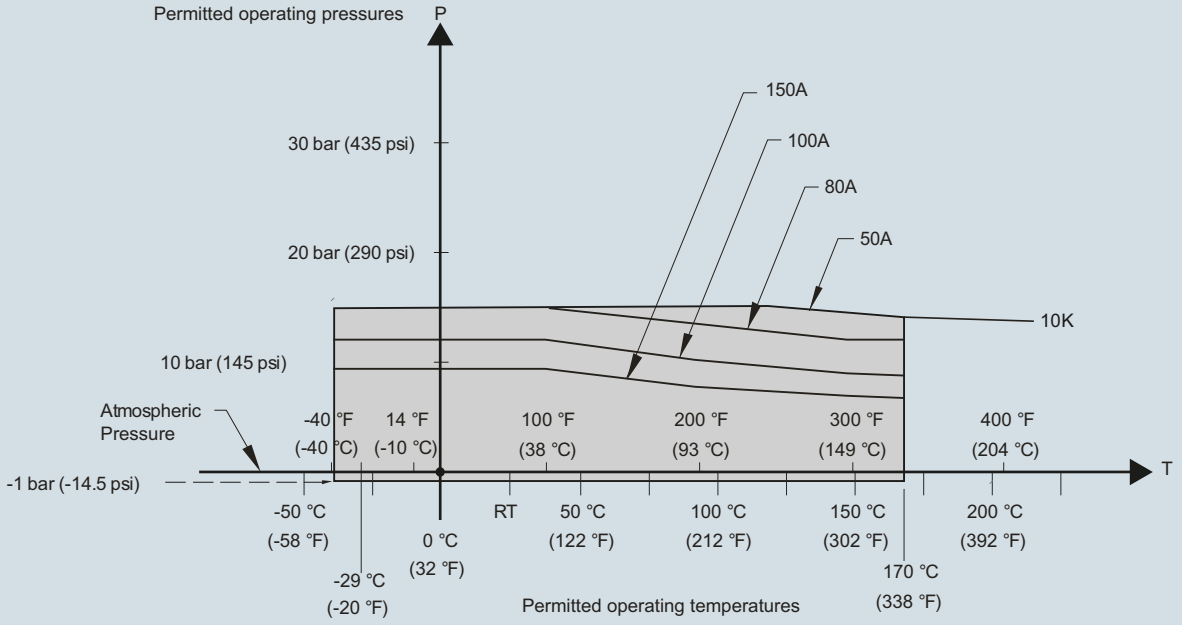
SITRANS LR250 flanged encapsulated antenna installation, dimensions in mm (inch)

**Pressure/ temperature curve
LR250 Flanged Encapsulated Antenna
EN 1092-1 flanged process connections
(7ML5432)**



SITRANS LR250 flanged encapsulated antenna pressure/temperature curve

Pressure/ temperature curve
LR250 Flanged Encapsulated Antenna
JIS B 2220 flanged process connections
(7ML5432)

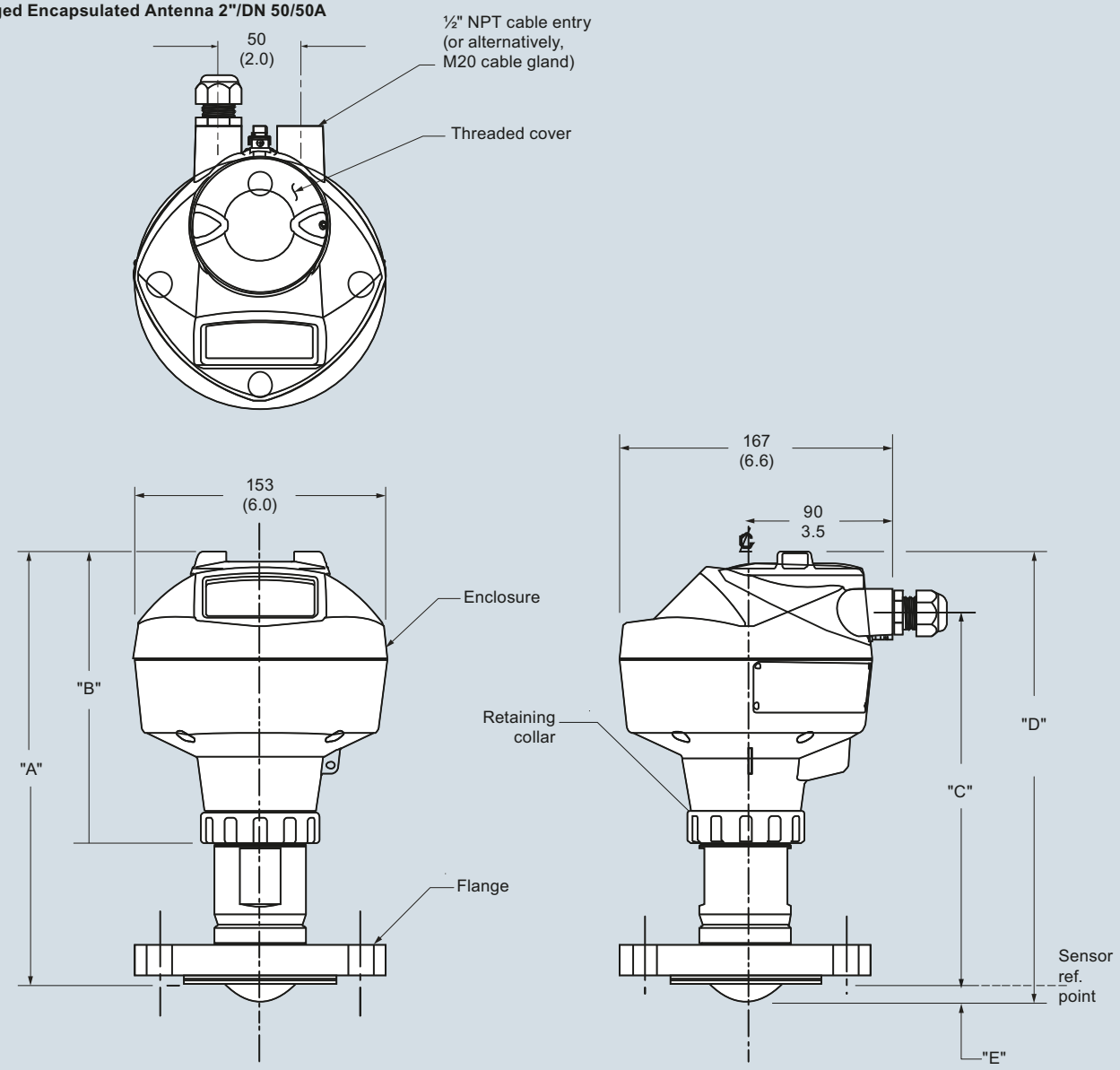


SITRANS LR250 flanged encapsulated antenna pressure/temperature curve

SITRANS LR250 Flanged Encapsulated Antenna

Dimensional drawings

Flanged Encapsulated Antenna 2"/DN 50/50A

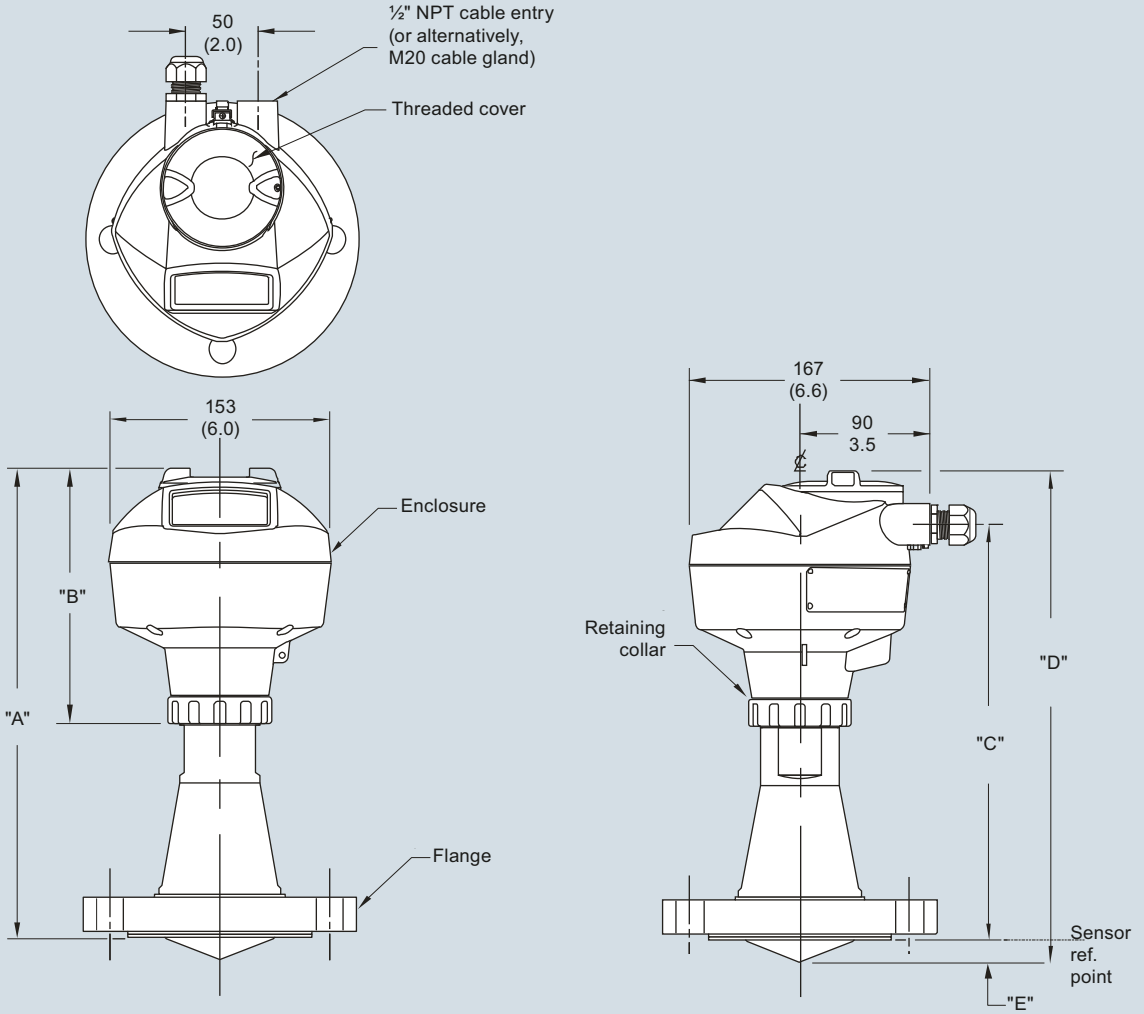


Flange Size	Flange Class	Flange O.D.	Antenna aperture size	Height to Sensor reference point dimension E[1)]	Beam angle	Measurement Range	Dimension A	Dimension B	Dimension C	Dimension D
2"	150 lb	152 (5.98)	50 (1.97)	11 (0.43)	12.8°	10 m (32.8 ft)	263 (10.35)	178 (7)	223 (8.78)	274 (10.79)
DN 50	PN 10/16	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)

Flanged Encapsulated Antenna 3"/DN50/80A or greater

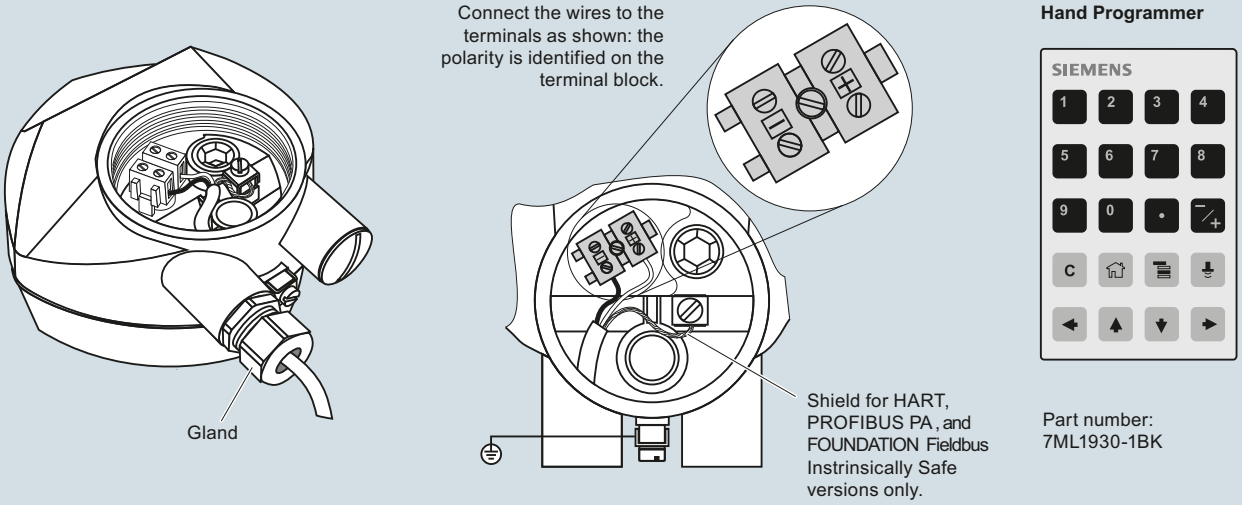


Flange Size	Flange Class	Flange O.D.	Antenna aperture size	Height to Sensor reference point dimension E[1]	Beam angle	Measurement Range	Dimension A	Dimension B	Dimension C	Dimension D
3"	150 lb	190 (7.48)	75 (2.95)	15 (0.59)	9.6°	20 m (65.6 ft)	328 (12.91)	178 (7)	288 (11.34)	343 (13.54)
DN80	PN10/16	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)
DN100	PN10/16	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)
DN150	PN10/16	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)

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

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**

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 2 inch (50 mm) 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.
- 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. Startup 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 >= 1.6.

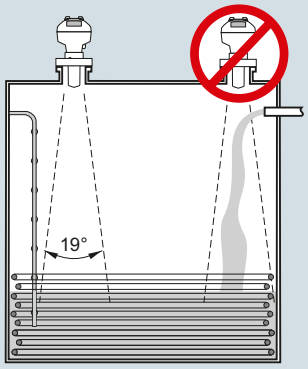
- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, temperatures to 80 °C (176 °F), corrosive and aggressive materials and applications requiring functional safety

Configuration

Installation

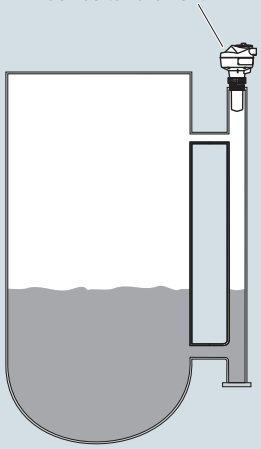
Note:

- 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.



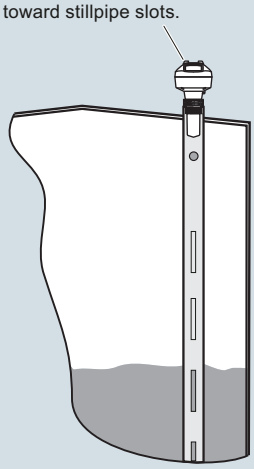
Mounting unit on bypass

Orient front or back of device toward vent.

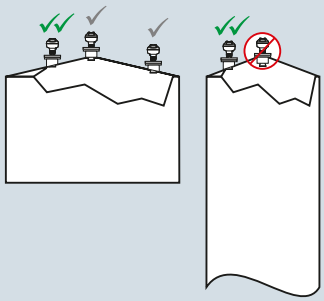


Mounting unit on stilling well

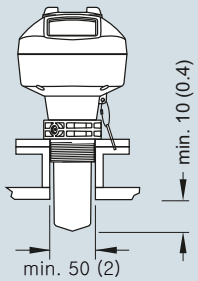
Orient front or back of device toward stillpipe slots.



Mounting unit on vessel



Mounting on a nozzle



SITRANS LR250 PVDF antenna installation, dimensions in mm (inch)

SITRANS LR250 threaded PVDF Antenna

Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
Frequency	K-band (25.0 GHz)
Minimum measuring range	50 mm (2 inch) from end of antenna
Maximum measuring range	10 m (32.8 ft) or 20 m (66 ft) when used in a stilling pipe with dk ≥ 1.6
Output	
HART	Version 5.1
• Analog output	4 ... 20 mA
• Accuracy	± 0.02 mA
• Fail-safe	• Programmable as high low or hold (loss of echo) • NE 43 programmable
PROFIBUS PA	Profile 3.1
• 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)	
Maximum measured error	• > 500 mm from sensor reference point: 3 mm (0.118 inch) • < 500 mm from sensor reference point: 25 mm (1 inch)
Influence of ambient temperature	<0.003 %/K
Rated operating conditions	
Installation conditions	
Location	Indoor/outdoor
Ambient conditions (enclosure)	
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
Installation category	I
Pollution degree	4
Medium conditions	
Dielectric constant ε_r	≥ 3 (1.6 in stillpipe)
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	
• Material	Aluminum, polyester powder-coated
• Cable inlet	2 x M20x1.5 or 2 x ½" NPT
Degree of protection	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	
• Material	PVDF (Polyvinylidene fluoride)
• Dimensions (nominal sizes)	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]

Power supply	
4 ... 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
PROFIBUS PA	• 15 mA • per IEC 61158-2
FOUNDATION Fieldbus	• 20.0 mA • per IEC 61158-2
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM, RCM
Radio	FCC, Industry Canada and Europe ETSI EN 302-372, RCM
Hazardous	
• Explosion Proof (Brazil)	INMETRO Ex d ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Increased Safety (Brazil)	INMETRO Ex e ia mb IIC T4 Ga/Gb, Ex ia ta IIIC T100 °C Da
• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga, Ex ia ta IIIC T100 °C Da
• 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
• 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
• Non-incendive (Canada/USA)	CSA/FM Class I, Div. 2, Groups A, B, C, D T5
• 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_A90 °C
• Intrinsically Safe (China)	NEPSI Ex ia IIC T4 Ga, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C
• Non-sparking (China)	NEPSI Ex nA IIC T4 Gc
• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga ATEX II 1D Ex ia ta IIC T100 °C Da
• Non-sparking/Energy Limited (Europe)	ATEX II 3G Ex nA IIC T4 Gc
• 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
• 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
• Intrinsically Safe (International)	IECEx/ATEX II 1 G Ex ia IIC T4 Ga, IECEX/ATEX II 1D Ex ia ta IIC T100 °C Da
• Explosion Proof (Russia)	GOST-R Ex d
• Increased Safety (Russia)	GOST-R Ex e
• Intrinsically Safe (Russia)	GOST-R Ex ia
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	• 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

SITRANS LR250 threaded PVDF Antenna

Selection and Ordering data		Article No.
SITRANS LR250 threaded PVDF antenna		**7ML5431-**
2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including corrosives or aggresive materials, to a range of 10 m (32.8 ft) or 20m (66ft) when used in a stilling pipe.		**0 -**
Process Connection and Antenna Material		
Threaded PVDF antenna	⬟	**4**
Process Connection Type		
Threaded connections PVDF		
2" NPT (ASME B1.20.1) (tapered thread)	⬟	**P A**
R 2" [(BSPT), EN 10226-1] (tapered thread)	⬟	**P B**
G 2" [(BSPP), EN ISO 228-1] (parallel thread)	⬟	**P C**
Communication/Output		
PROFIBUS PA	⬟	**1**
4 ... 20 mA, HART, startup 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		
2 inch(50 mm) threaded PVDF antenna	⬟	**R**
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[1)]	⬟	**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[1)]	⬟	**G**
Explosion proof: CSA/FM Class I, II and III, Div.1, Groups A, B, C, D, E, F, G, FCC, Industry Canada[1)]	⬟	**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_A90 °C	⬟	**L**
Flameproof: NEPSI Ex d ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C[1)]	⬟	**M**
Increased Safety: NEPSI Ex e ia mb IIC T4 Ga/Gb, Ex iaD 20 T90 IP67 DIP A20 T_A90 °C[1)]	⬟	**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)]	⬟	**A50**
Plug 7/8" with mating Connector[2)3)4)]	⬟	**A55**
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**
Functional Safety (SIL 2). Device suitable for use in accordance with IEC 61508 and IEC 61511[5)6)]	⬟	**C20**
Namur NE43 compliant, device preset to failsafe < 3.6 mA[5)]	⬟	**N07**
Operating Instructions for HART/mA device		Article No.
English		**A5E32220602**
German		**A5E32376088**
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.		**A5E31997170**
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.		
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		**A5E31997267**
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.		
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		**A5E31993945**

SITRANS LR250 threaded PVDF Antenna

Selection and Ordering data	Order code
Accessories	
Handheld programmer, Intrinsically safe, EEx ia	**7ML1930-1BK**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)	**7MF4997-1DA**
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 Fieldbus[2)]	**7ML1930-1AQ**
FDA approved FKM o-ring for 2" G (BSPP) process connections -28 ... +80 °C (-28 ... +176 °F)	**7ML1830-3AN**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
For applicable back up point level switch - see point level section on page 4/9	

1) Available with Enclosure option 1 only

2) To be used with Communication options 1 and 3 only. Connector has IP67 rating.

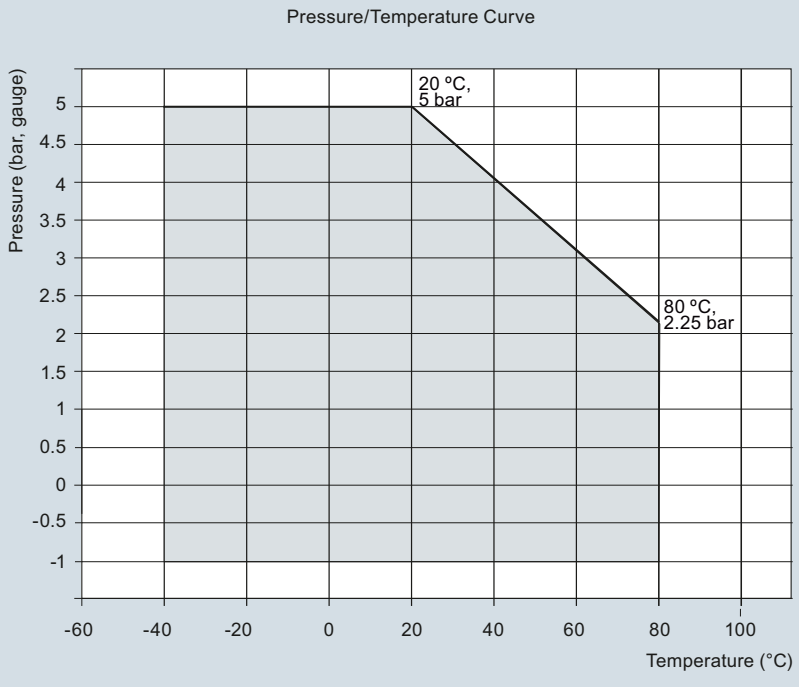
3) Available with Approval options A and B. Available with approval option C for use on intrinsically safe applications only. Not rated for dust Ex.

4) Available with Enclosure option 0 only

5) Available with communication option 2 only

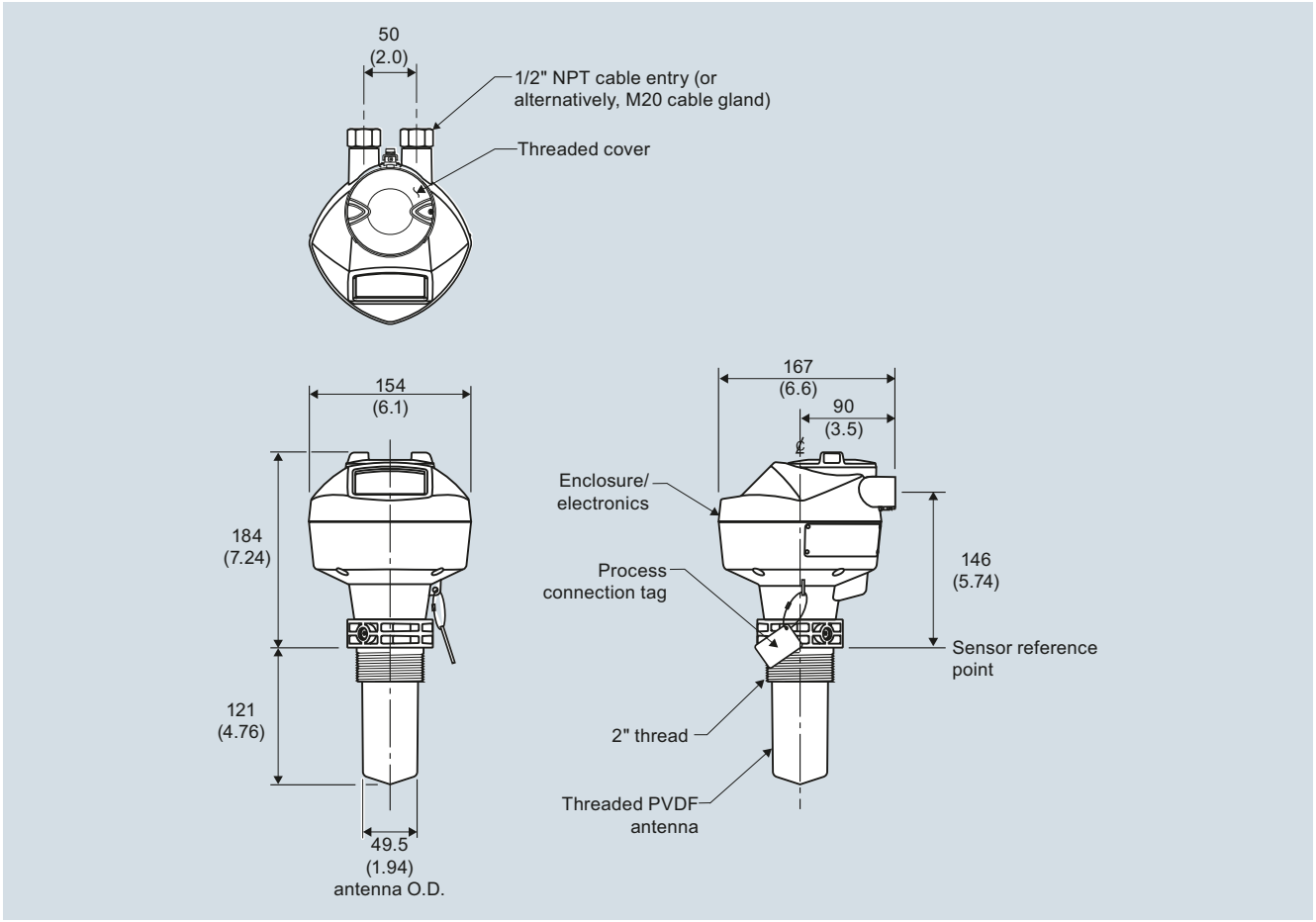
6) Available with approval options A ... E only

Characteristic curves



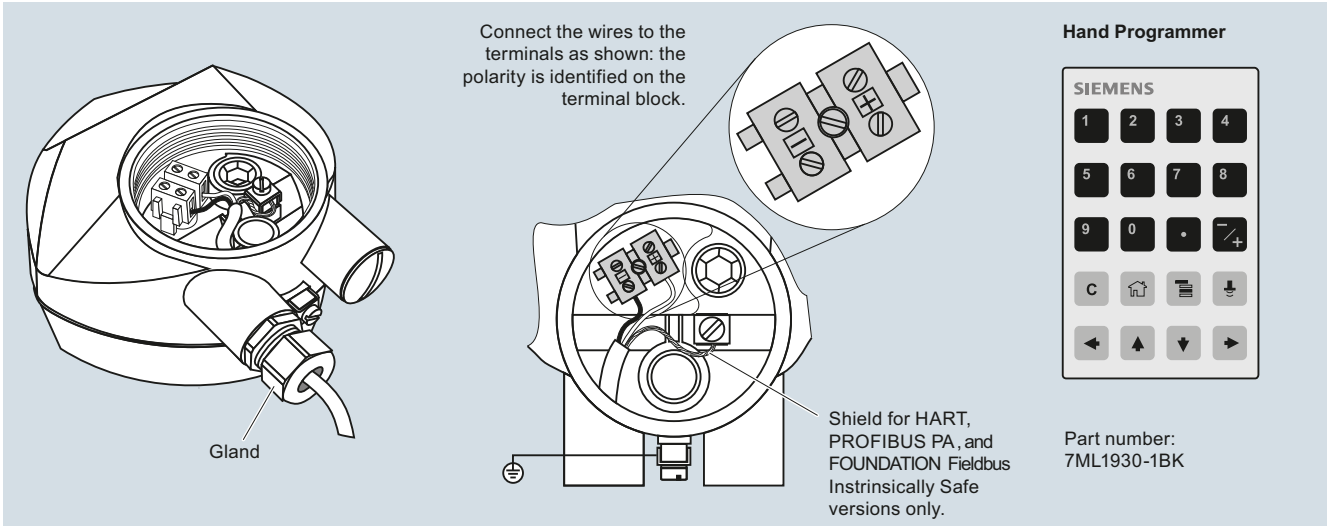
SITRANS LR250 PVDF antenna pressure/temperature curve

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.

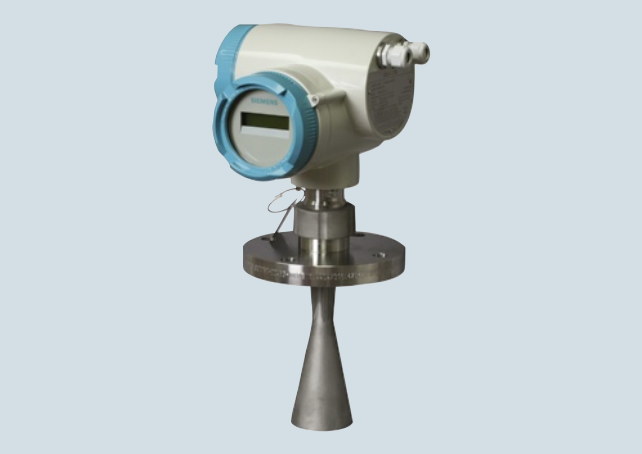
SITRANS LR250 connections

SITRANS LR250 threaded PVDF Specials

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 D, with HART communication start-up at < 3.6 mA, no process connection	**A5E03586961**
LR250 enclosure with board stack, M20 cable inlet, approval option E, with HART communication start-up at < 3.6 mA, no process connection	**A5E03587012**
LR250 enclosure with board stack, M20 cable inlet, approval option F, with HART communication start-up at < 3.6 mA, no process connection	**A5E03587132**
LR250 enclosure with board stack, M20 cable inlet, approval option G, with HART communication start-up at < 3.6 mA, no process connection	**A5E03587223**
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**

Overview



The SITRANS LR400 is a 4-wire, 24 GHz FMCW radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and high pressure, to a range of 50 m (164 ft); ideal for low dielectric media.

Benefits

- Easy installation and commissioning, low maintenance
- Self-calibration with internal reference
- Built-in diagnostics
- Auto False-Echo Suppression and advanced echo processing
- 24 GHz and high signal-to-noise ratio
- Communication using HART or PROFIBUS PA
- Programming using infrared Intrinsically Safe handheld programmer or with SIMATIC PDM or HART handheld device

Application

It provides excellent results on low dielectric media.

SITRANS LR400 is available for standard applications and for applications that require explosion proof protection.

SITRANS LR400 features robust enclosure, flange and horn components. It is virtually unaffected by atmospheric or temperature conditions within the vessel.

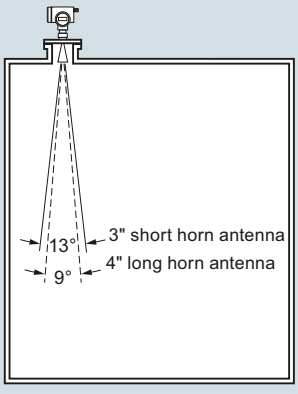
Safe on-site local programming is simple using the Intrinsically Safe handheld programmer. SIMATIC PDM can be used for easy remote programming.

The characteristics of 24 GHz and high signal-to-noise ratio contribute to exceptional signal reflection, regardless of the dielectric value of the medium.

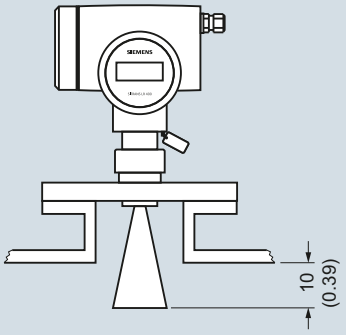
- Key Applications: long-range liquid or slurry applications, high temperature [up to 250 °C (480 °F)] or high pressure, low dielectric media, such as LPG (liquid, petroleum, gas) without the need for stilling pipes

Configuration

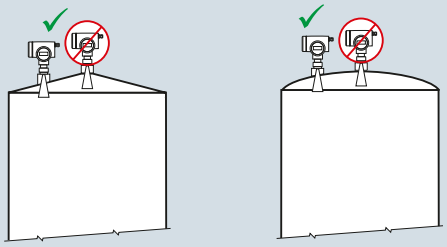
Beam angle



Installation in mounting nozzle



Mounting unit on vessel



Note: For best signal, always use largest horn size possible.

SITRANS LR400 installation, dimensions in mm (inch)

SITRANS LR400

Technical specifications

Mode of operation	
Measuring principle	FMCW radar level measurement
Frequency	24 ... 25 GHz FMCW
Measuring range	0.35 ... 50 m (1.15 ... 164 ft)
Output	
Analog output (HART)	
• Signal range	Optically isolated 4 ... 20 mA
• Load	Max. 600 Ω (330 Ω for [ia] versions, Area classification options G, L, P, S)
• Relay	NC or NO function, max. DC 50 V, max. 200 mA, rating 5 W
Communication	HART, optional PROFIBUS PA
PROFIBUS PA protocol	Layer 1 and 2, Class A, Profile 3.0
Performance (Reference conditions)	
Dead band	0 ... 350 mm from bottom edge of flange
Error in measurement at +25 °C (+77 °F)	≤ 5 mm from 2 ... 10 m ≤ 15 mm from 10 ... 50 m
• Repeatability	≤ 1 mm
• Fail-safe	mA signal programmable as high, low or hold (LOE)
Rated operating conditions	
Amb. temperature for enclosure	-40 ... +65 °C (-40 ... +149 °F)
Location	Indoor/outdoor
Installation category	II
Pollution degree	4
Medium conditions	
Dielectric constant	ε_r>1.4
Process temperature range	
• Standard	-40 ... +200 °C (-40 ... +392 °F) -20 ... +200 °C (-4 ... +392 °F) for SITRANS LR400 with ATEX rating
• With optional temperature extension	-40 ... +250 °C (-40 ... +482 °F)
Vessel Pressure	Up to 40 bar g (process connection dependent)

Design	
Weight	Approx. 12.2 kg (26.8 lb) with 3 inch 150 psi 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	
• Flat faced flanges	316L stainless steel, 80, 100, 150 mm, bolt holes matching EN 1092-1 and JIS B 2220
• Raised face flanges	316L stainless steel, 3 inch, 4 inch, 6 inch, bolt holes matching ASME B 16.5
Programming	
Intrinsically Safe Siemens handheld programmer (ordered separately)	Infrared receiver
• Approvals for handheld programmer	IS model with ATEX 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)
Handheld communicator	HART communicator 375
PC	SIMATIC PDM
Display (local)	Alphanumeric LCD for readout and entry
Power supply	100 ... 230 V AC ± 15 % (50/60 Hz), 6 W (12 VA) or 24 V DC +25/-20 %, 6 W (optional)
Certificates and approvals	
Safety	$CSA_{US/C}$, CE, FM, C-TICK
Shipping	• Lloyd's Register of Shipping • ABS
Radio	Europe (R&TTE, CETECOM), Industry Canada, FCC, C-TICK
Hazardous	
• Flame Proof/Increased Safety (Brazil)	INMETRO
• Explosion Proof (Canada/USA)	CSA/FM Class I, Div. 1, Groups B, C, D; Class II, Div. 1, Groups E, F, G; Class III T6
• Flame Proof/Increased Safety (Europe)	ATEX II 1/2 G EEx dem IIC T6
• Flame Proof/Increased Safety with Intrinsically Safe output(Europe)	ATEX II 1/2 G EEx dem [ia] IIC T6
Optional equipment	Purging (self-cleaning) system PTFE dust cover

Selection and Ordering data	Article No.
SITRANS LR400	**7ML5421-**
4-wire, 24 GHz FMCW radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and high pressure, to a range of 50 m (164 ft); ideal for low dielectric media.	-
Order handheld programmer separately	
Process temperature range	
-40 °C ... +200 °C (-40 ... +392 °F), standard	0
-40 °C ... +250 °C (-40 ... +482 °F), high temperature extension	1
Process connection	
Universal flange 3 inch/80 mm[1]	A
Universal flange 4 inch/100 mm[1]	B
Universal flange 6 inch/150 mm[1]	D
DN 80, PN 16, Type A, flat faced	S
DN 80, PN 40, Type B1, raised face	C
DN 100, PN 16, Type A, flat faced	T
DN 100, PN 40, Type B1, raised face	G
DN 150, PN 16, Type A, flat faced	U
3" ASME, 150 lb, raised face	E
3" ASME, 300 lb, raised face	F
4" ASME, 150 lb, raised face	J
4" ASME, 300 lb, raised face	K
6" ASME, 150 lb, raised face	N
JIS, DN 80 10K	Q
JIS, DN 100 10K	R
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.)	V
Antenna	
Horn antenna, long 93 mm (3.66 inch) diam. for 100 mm (4 inch) nozzles	D
Horn antenna, short 74 mm (2.91 inch) diam. for 80 mm (3 inch) nozzles	K
Antenna purging system	
None	0
Purging system Note: Available with process connections B or D, and for area classification B only	1
Process seal/gasket	
PTFE for -40 ... +250 °C (-40 ... +482 °F) flange temperatures	1
FKM for -20 ... +200 °C (-4 ... +392 °F) flange temperatures[2]	3
Output/communication	
4 ... 20 mA, HART	0
PROFIBUS PA	1
Power supply/cable inlet	
100 ... 230 V AC	
• 2 x M20x1.5	B
• 2 x ½" NPT	C
24 V DC	
• 2 x M20x1.5	E
• 2 x ½" NPT	F

Selection and Ordering data	Article No.
SITRANS LR400	**7ML5421-**
4-wire, 24 GHz FMCW radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and high pressure, to a range of 50 m (164 ft); ideal for low dielectric media.	-
Order handheld programmer separately	
Approvals	
General Purpose, $CSA_{US/C}$, Industry Canada, FCC, CE and R&TTE	B
ATEX II 2G EEx d IIC T6; CE, R&TTE; INMETRO Ex d IIC T6	E
ATEX II 2G EEx dem IIC T6; CE, R&TTE; INMETRO Ex de mb II T6	F
ATEX II 2G EEx dem [ia] IIC T6; CE, R&TTE; INMETRO Ex de [ia] mb IIC T6[3]	G
ATEX II 1/2 GD EEx d IIC T6; CE, R&TTE; INMETRO Ex d IIC T6[2]	J
ATEX II 1/2 GD EEx dem IIC T6; CE, R&TTE; INMETRO Ex de mb IIC T6[2]	K
ATEX II 1/2 GD EEx dem [ia] II T6; CE, R&TTE; INMETRO Ex de [ia] mb IIC T6[2)3]	L
FM Class I, Div. 1, Groups B, C, D; Class II/III, Div. 1, Groups E, F, G; FCC[2]	T
CSA Class I, Div. 1, Groups B, C, D; Class II/III, Div. 1, Groups E, F, G; FCC[2]	U
Local operation	
Local Display Only. Handheld programmer not included **(Order programmer separately)**	2

[1] Available with antenna purging system option 1 only, universal, 0.5 bar g (7.25 psi g) maximum

[2] Available with process temperature range option 0 only

[3] Available only with power supply option E or F

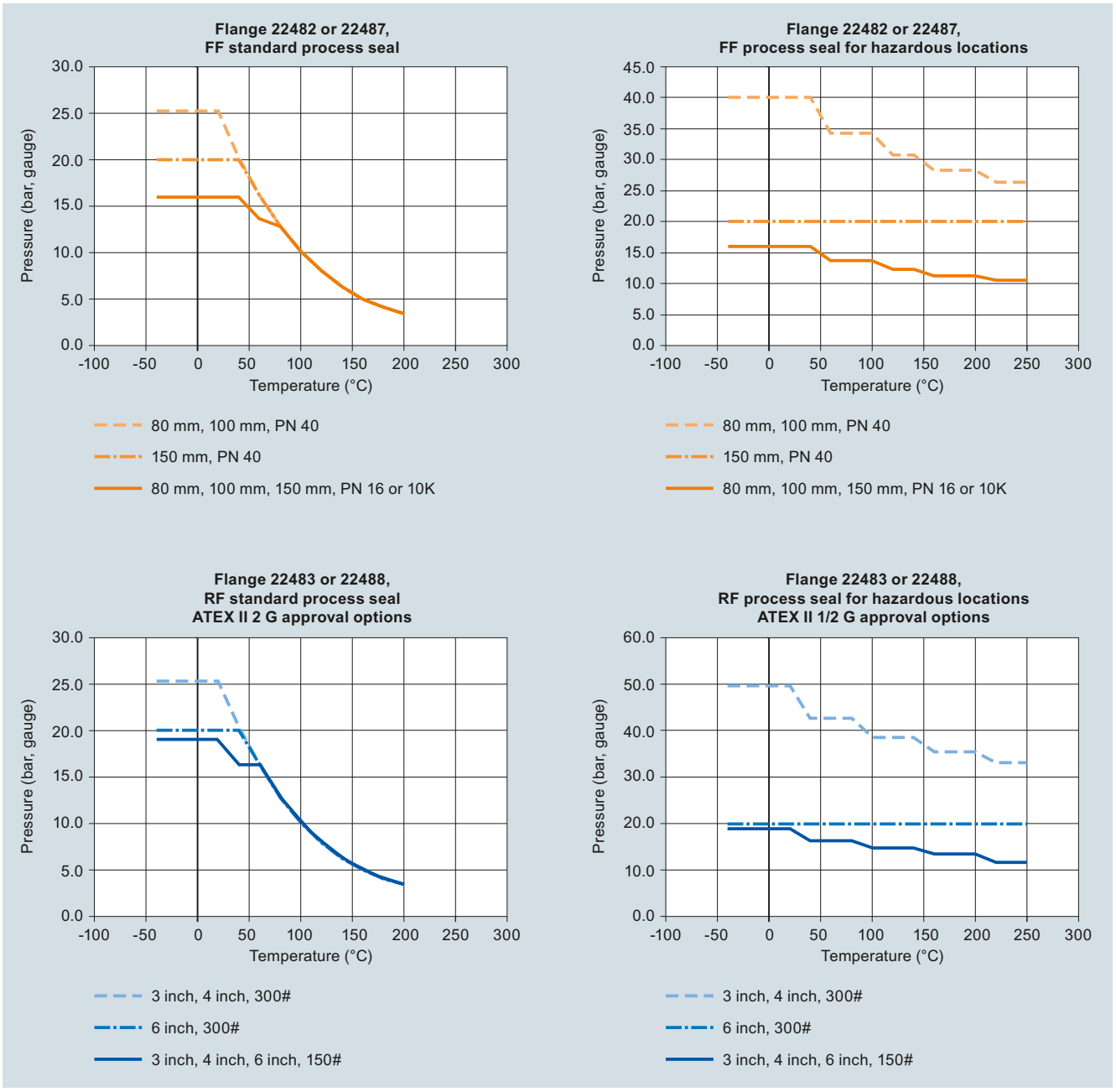
4

SITRANS LR400

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**
Operating Instructions	Article No.
English	**7ML1998-5FH06**
German	**7ML1998-5FH36**
French	**7ML1998-5FH16**
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.	**A5E32007509**
Accessories	Article No.
Handheld programmer Intrinsically Safe, EEx ia	**7ML5830-2AJ**
Long horn dust cover, PTFE	**7ML1930-1AH**
Short horn dust cover, PTFE	**7ML1930-1AJ**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)	**7MF4997-1DA**
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 (two required)[1)]	**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA (two required)[1)]	**7ML1930-1AQ**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
For applicable back up point level switch - see point level section on page 4/9	

[1)] Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

Characteristic curves

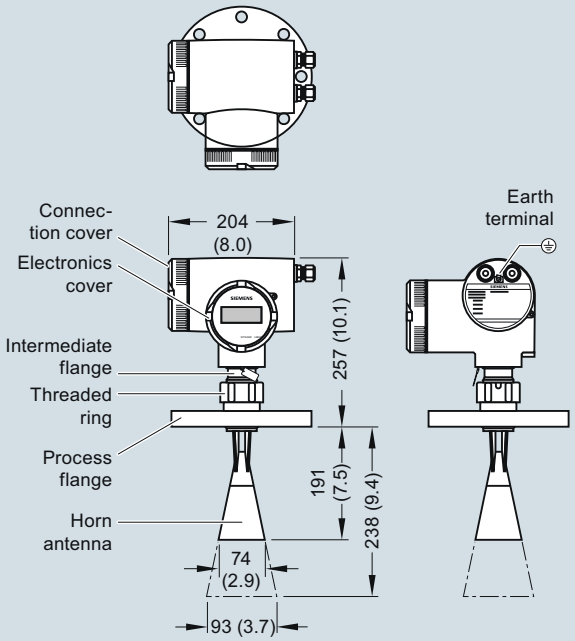


SITRANS LR400 Process Pressure/Temperature derating curves

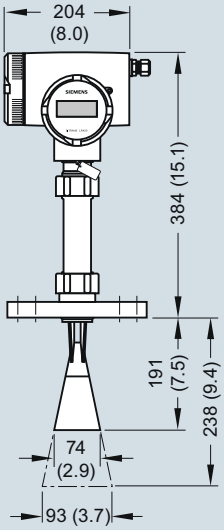
SITRANS LR400

Dimensional drawings

SITRANS LR400 (7ML5421)

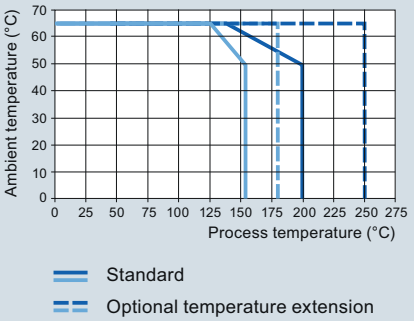


SITRANS LR400 (with temperature extension)



SITRANS LR400

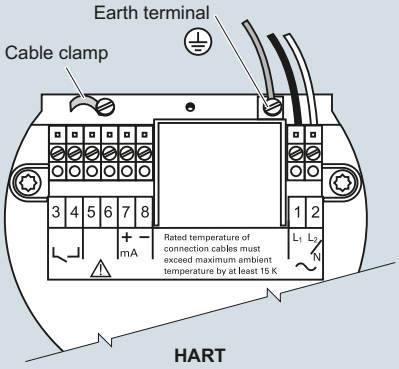
Maximum flange and process temperature versus allowable ambient temperature



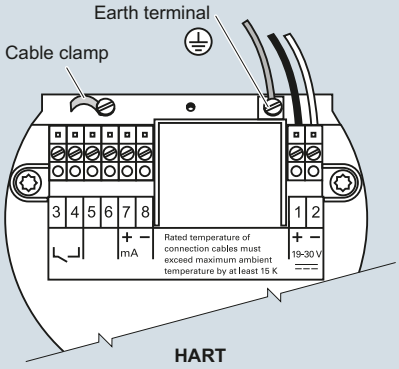
SITRANS LR400, dimensions in mm (inch)

Schematics

AC version

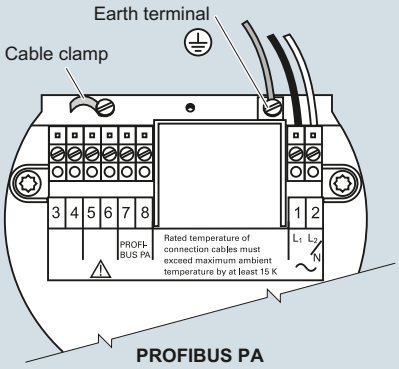


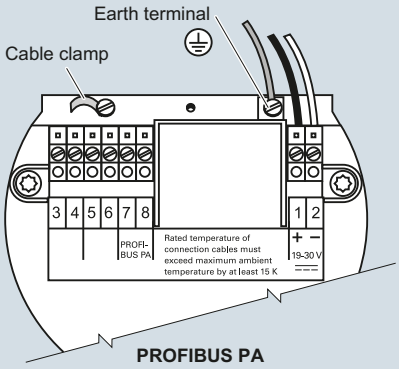
DC version



Hand programmer

SITRANS LR400
Part number:
7ML5830-2AJ



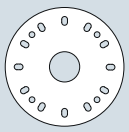
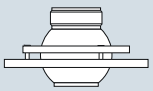
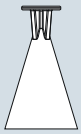
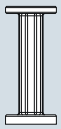


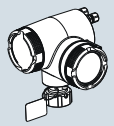
Notes

- 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 LR400 connections

SITRANS LR400 Specials

SITRANS LR400 Specials	Article No.	
3 inch/80 mm Universal Flange, without horn or hub.[1)]	**PBD: 51035813**	
4 inch/100 mm Universal Flange, without horn or hub.[1)]	**PBD: 51035814**	
6 inch/150 mm Universal Flange, without horn or hub.[1)]	**PBD: 51035815**	
8 inch/200 mm Universal Flange, without horn or hub.[1)]	**PBD: 51035816**	
Purging kit with Easy Aimer ball, no flange, no horn.[1)]	**PBD: 51036110**	
Purging kit with Easy Aimer ball with 4 inch/100 mm flange, no horn.[1)]	**PBD: 51035810**	
Purging kit with Easy Aimer ball with 6 inch/150 mm flange, no horn.[1)]	**PBD: 51035811**	
Purging Kit with Easy Aimer ball with 8 inch/200 mm flange, no horn.[1)]	**PBD: 51035812**	
Short horn antenna, no emitter supplied	**PBD: 22475K1A**	
Long horn antenna, no emitter supplied	**PBD: 22475K2A**	
Short horn antenna, purged, no emitter supplied	**PBD: 22475K3A**	
Long horn antenna, purged, no emitter supplied	**PBD: 22475K4A**	
Replacement display module, SITRANS LR400 Liquids and Solids versions	**PBD: 51035410**	
4" extension kit for horn antenna with General Purpose approvals	**PBD: 51035474**	
8" extension kit for horn antenna with General Purpose approvals	**PBD: 51035473**	
8" extension kit for horn antenna for hazardous units	**PBD: 51036180**	

SITRANS LR400 Specials	Article No.	
SITRANS LR400 Aluminum enclosure with AC power, M20 cable inlet, HART communication, and GP, CE, and CETECOM approvals.	**PBD: 51036479**	
SITRANS LR400 Aluminum enclosure with AC power, M20 cable inlet, PROFIBUS PA communication and GP, CE, and CETECOM approvals.	**PBD: 51036480**	
SITRANS LR400 Aluminum enclosure with AC power, M20 cable inlet, HART communication and GP, CE, CSA, Industry Canada, FCC and R&TTE.	**PBD: 51035867**	
SITRANS LR400 Aluminum enclosure with AC power, M20 cable inlet, PROFIBUS PA communication and GP, CE, CSA, Industry Canada, FCC and R&TTE.	**PBD: 51035871**	
SITRANS LR400 Aluminum enclosure with AC power, M20 cable inlet, PROFIBUS PA communication and ATEX II 1/2 GD EEx d IIC T6, CE and R&TTE approvals.	**PBD: 51035873**	
SITRANS LR400 Aluminum enclosure with DC power, M20 cable inlet, HART communication and and GP, CE and CETECOM approvals.	**PBD: 51036481**	
SITRANS LR400 Aluminum enclosure with DC power, M20 cable inlet, PROFIBUS PA communication and GP, CE and CETECOM approvals.	**PBD: 51036482**	
SITRANS LR400 Aluminum enclosure with DC power, M20 cable inlet, HART communication and GP, CE, CSA, Industry Canada, FCC and R&TTE	**PBD: 51036483**	
SITRANS LR400 Aluminum enclosure with DC power, M20 cable inlet, PROFIBUS PA communication and GP, CE, CSA, Industry Canada, FCC and R&TTE.	**PBD: 51036484**	
SITRANS LR400 Aluminum enclosure with DC power, M20 cable inlet, HART communication and ATEX II 1/2 GD EEx d IIC T6, CE and R&TTE approvals.	**PBD: 51036485**	
SITRANS LR400 Aluminum enclosure with DC power, M20 cable inlet, PROFIBUS PA communication and ATEX II 1/2 GD EEx d IIC T6, CE and R&TTE approvals.	**PBD: 51036486**	

[1)] Available with no pressure rating and with General Purpose approvals only

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

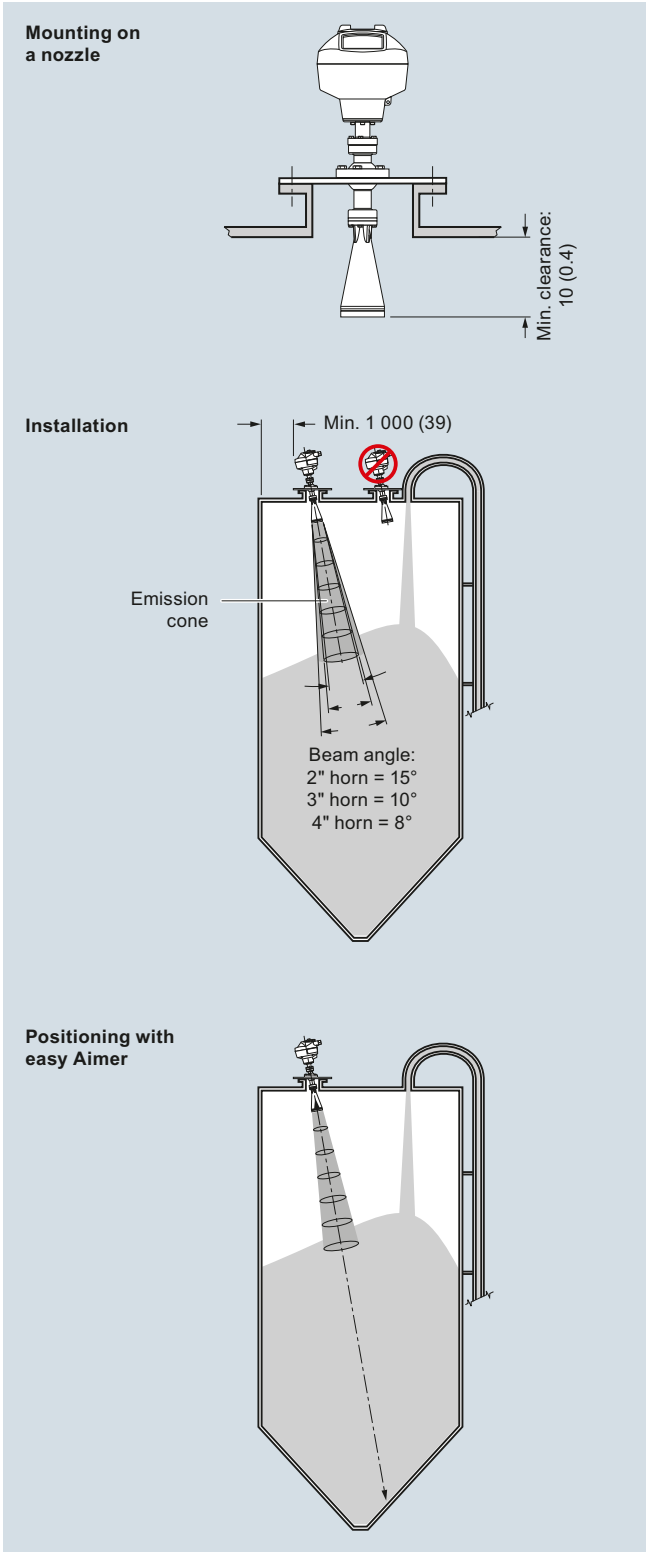
SITRANS LR260 includes a graphical local user interface (LUI) that improves setup and operation using an intuitive Quick Start Wizard, and echo profile displays for diagnostic support. Startup is easy using the Quick Start wizard with a few parameters required for basic operation.

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



SITRANS LR260 installation, dimensions in mm (inch)

SITRANS LR260

Technical specifications

Mode of operation	
Measuring principle	Pulse radar level measurement
Frequency	K-band (25.0 GHz)
Minimum detectable distance	0.05 m (2 inch) from end of horn
Maximum measuring range [1]	
• Solids	• 2" horn: 10 m (32.8 ft) • 3" horn: 20 m (65.6 ft) • 4" horn: 30 m (98.4 ft)
• Liquids	• 2" horn: 20 m (65.6 ft) • 3" horn: 30 m (98.4 ft) • 4" horn: 30 m (98.4 ft)
Output - HART	
Power	• 4 ... 20 mA (±0.02 mA accuracy) • Nominal 24 V DC (max. 30 V DC)
Fail signal	3.6 mA ... 23 mA; or last value
Load	230 ... 600 Ω
Output - PROFIBUS PA	• Per IEC 61158-2 • 15.0 mA • Profile version 3.01, Class B
Performance (according to reference conditions IEC60770-1)	
Maximum measured error (including hysteresis and non-repeatability)	• 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)
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
Dielectric constant ε_r	ε_r > 1.6, antenna and application dependent
Process temperature	-40 ... +200 °C (-40 ... +392 °F)
Process pressure	• 0.5 bar g (7.25 psi g) maximum • 3 bar g (43.5 psi g) optional with 80 °C (176 °F) temperature max

Design	
Enclosure	
• Construction	Aluminum, polyester powder-coated
• Conduit entry	2 x M20x1.5 or 2 x ½" NPT
Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
Weight	< 8.14 kg (17.9 lb) including 4" flange and standard Easy Aimer with 4" horn antenna
Display (local)	Graphic LCD, with bar graph representing level
Flange and horn (easy aimer model)	
• Material	304 stainless steel
• Horn antenna	2" horn 3" horn 4" horn
Process connections	
• Universal flanges [2]	2 inch/50 mm, 3 inch/80 mm, 4 inch/100 mm, 6 inch/150 mm
Mechanical (Threaded Connection model)	
• Threaded connection	2" NPT (ASME B1.20.1), R (BSPT, EN 10226-1) or G (BSPP, EN ISO 228-1)
• Materials	316L/1.4404 or 316L/1.4435 stainless steel PTFE emitter
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM
Radio	Europe (R&TTE), FCC, Industry Canada, C-TICK
Hazardous	CSA/FM Class II, Div. 1, Groups E, F, G, Class III
	ATEX II 1D, 1/2D, 2D Ex tD A20 IP67, IP68 T100 °C
	IECEx/ATEX II 1 GD Ex ia IIC T4
	CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G
	SABS ARP0108 Ex ia IIC T4 Ga
Programming	
Intrinsically Safe Siemens handheld programmer	Infrared receiver IS model:
• Approvals for handheld programmer	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
PC	SIMATIC PDM
Display (local)	Graphic local user interface including quick start wizard and echo profile displays

[1] From sensor reference point

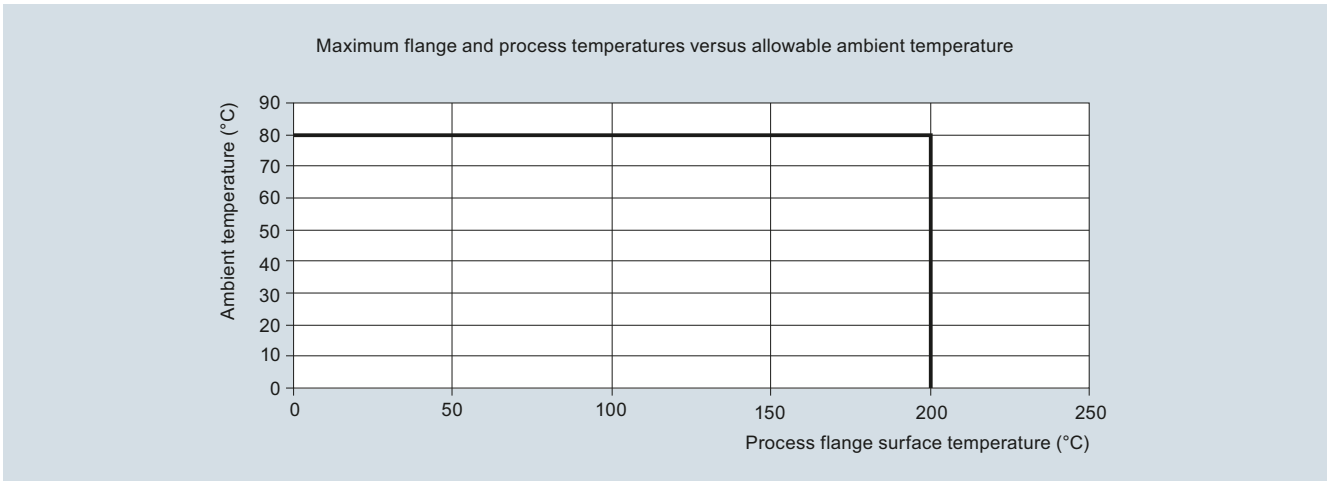
[2] Universal flange mates with EN 1092-1 (PN 16)/ASME B16.5 (150 lb)/ JIS 2220 (10K) bolt hole pattern

Selection and Ordering data	Article No.
SITRANS LR260 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of solids to a range of 30 m (98.4 ft).	**7ML5427-** **0** ■■■ **0** - ■■■■
Order handheld programmer separately **process connection** Universal flat faced flange fits ANSI/DIN/JIS flanges, Easy Aimer with integral (Easy Aimer ball)	
2 inch/50 mm	**A**
3 inch/80 mm	**B**
4 inch/100 mm	**C**
6 inch/150 mm	**D**
Threaded connection	
2" NPT (ASME B1.20.1) (tapered thread)[1)2)]	**E**
R 2" [(BSPT), EN 10226-1] (tapered thread)[1)2)]	**F**
G 2" [(BSPT), EN ISO 228-1] (parallel thread)[1)2)]	**G**
Antenna	
2" Horn antenna, fits 50 mm or 2" nozzles	**A**
2" Horn antenna with 100 mm extension	**B**
2" Horn antenna with 200 mm extension	**C**
2" Horn antenna with 500 mm extension[1)3)]	**D**
2" Horn antenna with 1 000 mm extension[1)3)]	**E**
3" Horn antenna, fits 80 mm or 3" nozzles	**F**
3" Horn antenna with 100 mm extension	**G**
3" Horn antenna with 200 mm extension	**H**
3" Horn antenna with 500 mm extension[1)3)]	**J**
3" Horn antenna with 1 000 mm extension[1)3)]	**K**
4" Horn antenna, fits 100 mm or 4" nozzles	**L**
4" Horn antenna with 100 mm extension	**M**
4" Horn antenna with 200 mm extension	**N**
4" Horn antenna with 500 mm extension[1)3)]	**P**
4" Horn antenna with 1 000 mm extension[1)3)]	**Q**
Purge (self cleaning) connection	
No purge connection	**0**
Purge connection	**1**
Output/communication	
4 ... 20 mA, HART	**0**
PROFIBUS PA	**1**
Cable inlet	
2 x M20x1.5	**A**
2 x ½" NPT	**B**
Note: Polymeric cable glands will be provided with M20 devices.	
Approvals	
General purpose, $CSA_{US/C}$, FM, Industry Canada, FCC, CE, R&TTE, C-TICK	**A**
CSA/FM Class II, Div. I, Groups E, F, G, Class III, Industry Canada, FCC, C-TICK	**B**
ATEX II 1D, 1/2D, 2D T100 °C, CE, R&TTE, C-TICK; INMETRO	**C**
Non-incendive, CSA/FM Class I, Div. 2, Groups A, B, C, D, Industry Canada, FCC, C-TICK	**D**
Intrinsically safe, IECEx/ATEX II 1 GD Ex ia IIC T4, Ex tD A20 IP67 T90C, R&TTE, C-TICK	**E**
Intrinsically safe, CSA/FM Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G, Industry Canada, FCC, C-TICK	**F**
Intrinsically safe, South Africa ARP0108 Ex ia IIC T4 Ga	**G**
Pressure rating	
Rating per Pressure/Temperature curves in manual	**0**
0.5 bar g (7.25 psi g) maximum	**1**

1) Available with purge option 0 only
2) Available with antenna options A, B, F, G, L, and M only
3) Available with pressure option 1 only

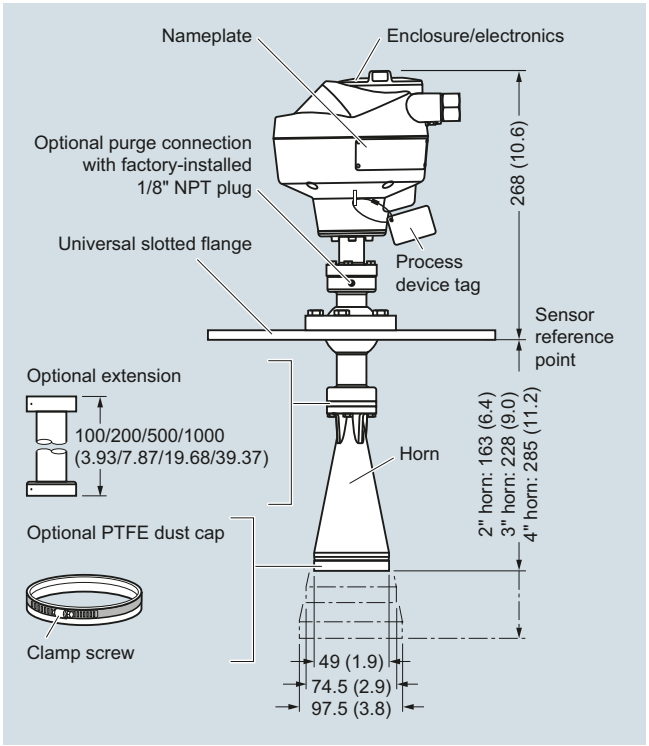
Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text	**Y15**
Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Operating Instructions for HART/mA device	Article No.
English	**7ML1998-5KE31**
German Note: The Operating Instructions should be ordered as a separate line item on the order.	**7ML1998-5KE03**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	**A5E32106122**
Operating Instructions for PROFIBUS PA device	
English	**7ML1998-5KF03**
German Note: The Operating Instructions should be ordered as a separate line item on the order.	**7ML1998-5KF31**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	**A5E32114443**
Accessories	
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**
Handheld programmer, Infrared, Intrinsically Safe	**7ML1930-1BK**
Dust cap, PTFE, for 2 inch/50 mm horn	**7ML1930-1DE**
Dust cap, PTFE, for 3 inch/75 mm horn	**7ML1930-1BL**
Dust cap, PTFE, for 4 inch/100 mm horn	**7ML1930-1BM**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	**7MF4997-1DB**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
For applicable back up point level switch - see point level section on page 4/9	
Note: Products shipped with plastic cable gland, rated to -20 °C.If -40 °C rating required, then metallic cable gland is recommended.	

Characteristic curves



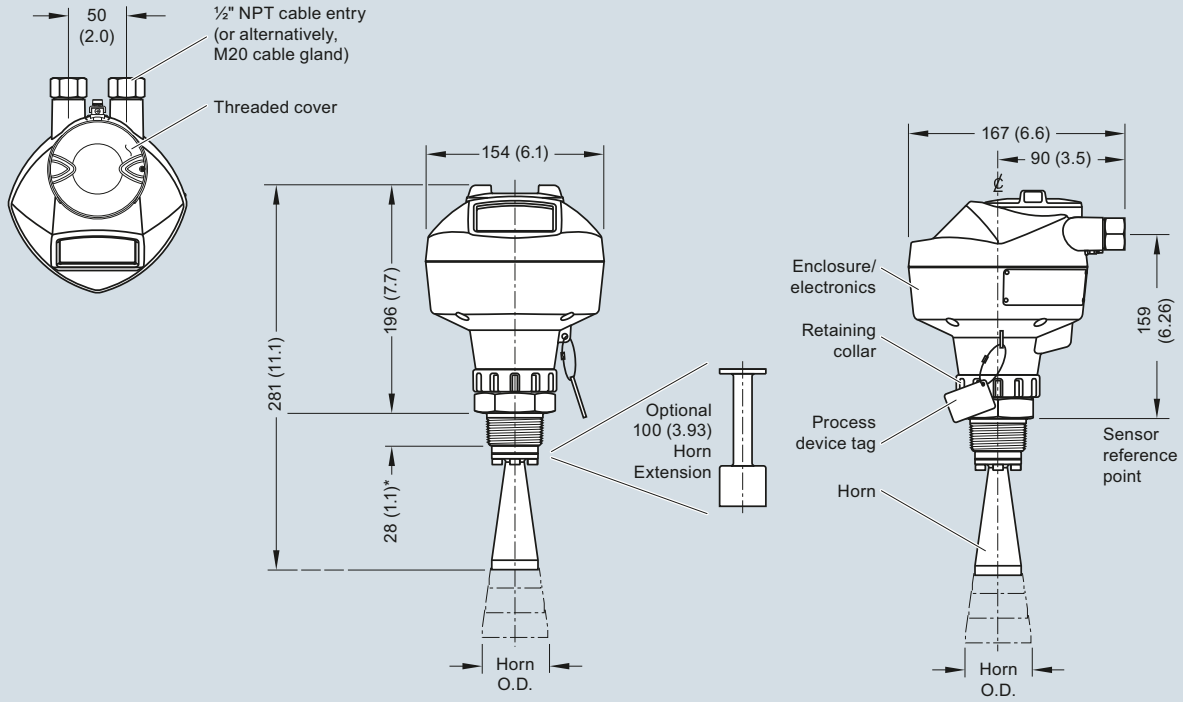
SITRANS LR260 Ambient/Process Flange Surface Temperature Curve

Dimensional drawings



SITRANS LR260, dimensions in mm (inch)

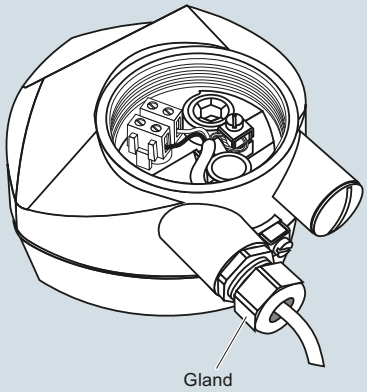
SITRANS LR260

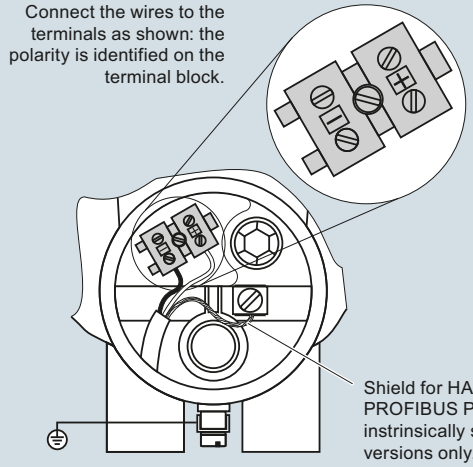


Antenna Type	Antenna O.D.	Height to sensor reference point			Beam angle	Measurement range
		1-1/2" threaded connection	2" threaded connection	3" threaded connection		
2" horn	47.8 (1.88)	N/A	166 (6.55)	180 (7.09)	15 degrees	20 m (65.6 ft)
3" horn	74.8 (2.94)	N/A	199 (7.85)	213 (8.39)	10 degrees	20 m (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





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 LR260 connections

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.

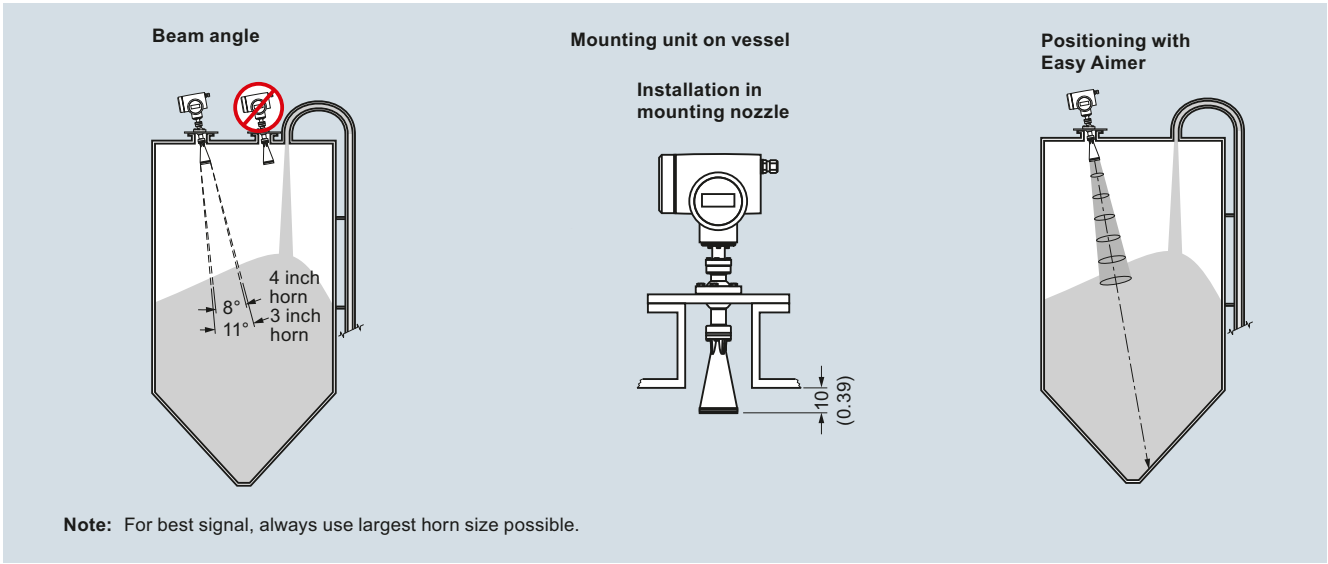
An optional dust cap is available for sticky solids. Optional air purging is also available for extremely sticky applications.

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



Note: For best signal, always use largest horn size possible.

SITRANS LR460 installation, dimensions in mm (inch)

Technical specifications

Mode of operation	
Measuring principle	FMCW radar level measurement
Frequency	24.2 ... 25.2 GHz FMCW
Measuring range	0.35 ... 100 m (1.15 ... 328.08 ft)
Output	
Analog output (HART)	
• Signal range	Optically isolated
• Load	Max. 600 Ω
• Fail-safe	mA signal programmable as high, low or hold (LOE)
Communication	HART, optional PROFIBUS PA
Digital output	Relay, NC or NO function, max. 50 V DC, max. 200 mA, rating 5 W
PROFIBUS PA protocol	Layer 1 and 2, Class A, Profile 3.01
Performance (Reference conditions according to IEC 60770-1)	
• Non-linearity	Greater of 25 mm (1 inch) or 0.25 % of span (including hysteresis and non-repeatability), over the full ambient temperature range
• Non-repeatability	≤ 10 mm (0.4 inch)
Rated operating conditions	
• Amb. temperature for enclosure	-40 ... +65 °C (-40 ... +149 °F)
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Medium conditions	
Dielectric constant	$\varepsilon_r > 1.4$
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

Programming	
Intrinsically Safe Siemens handheld programmer (ordered separately)	Infrared receiver
• 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)
Handheld communicator	HART Communicator 375
PC	SIMATIC PDM
Display (local)	Alphanumeric LCD for readout and entry
Power supply	100 ... 230 V AC ± 15 % (50/60 Hz), 6 W (12 VA) or 24 V DC +25/-20 %, 6 W (optional)
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM, C-TICK
Radio	European Radio (R&TTE), Industry Canada, FCC, C-TICK
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
Optional equipment	
Dust cap	PTFE
Air purge connection	1/8" NPT

SITRANS LR460

Selection and Ordering data	Article No.
SITRANS LR460	**7ML5426-**
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.	0 ■ ■ ■ 0 - ■ ■ ■ 0
Order handheld programmer separately	
Process connection	
Universal, flat faced, 0.5 bar g (7.25 psi g) maximum with integral Easy Aimer ball	
3 inch (80 mm)	A
4 inch (100 mm)	B
6 inch (150 mm)	C
Antenna	
3" horn antenna, fits 80 mm (3 inch) nozzles	A
3" horn antenna, fits 80 mm (3 inch) nozzles with 100 mm extension	B
3" horn antenna, fits 80 mm (3 inch) nozzles with 200 mm extension	C
3" horn antenna, fits 80 mm (3 inch) nozzles with 500 mm extension[1]	D
3" horn antenna, fits 80 mm (3 inch) nozzles with 1 000 mm extension[1]	E
4" horn antenna, fits 100 mm (4 inch) nozzles	F
4" horn antenna, fits 100 mm (4 inch) nozzles with 100 mm extension	G
4" horn antenna, fits 100 mm (4 inch) nozzles with 200 mm extension	H
4" horn antenna, fits 100 mm (4 inch) nozzles with 500 mm extension[1]	J
4" horn antenna, fits 100 mm (4 inch) nozzles with 1 000 mm extension[1]	K
Purge (self-cleaning) connection	
No purge connection	0
Purge connection	1
Output/Communication	
4 ... 20 mA, HART	0
PROFIBUS PA	1
Power supply/cable inlet	
100 ... 230 V AC	
• 2 x M20x1.5	A
• 2 x ½" NPT	B
24 V DC	
• 2 x M20x1.5	C
• 2 x ½" NPT	D
Approvals	
General Purpose, CSA$_{US/C}$, Industry Canada, FM, FCC, CE and R&TTE, C-TICK	A
CSA/FM Class II, Div. 1, Groups E, F, and G, Class III	B
ATEX II 1/2 D T6, CE, R&TTE	C

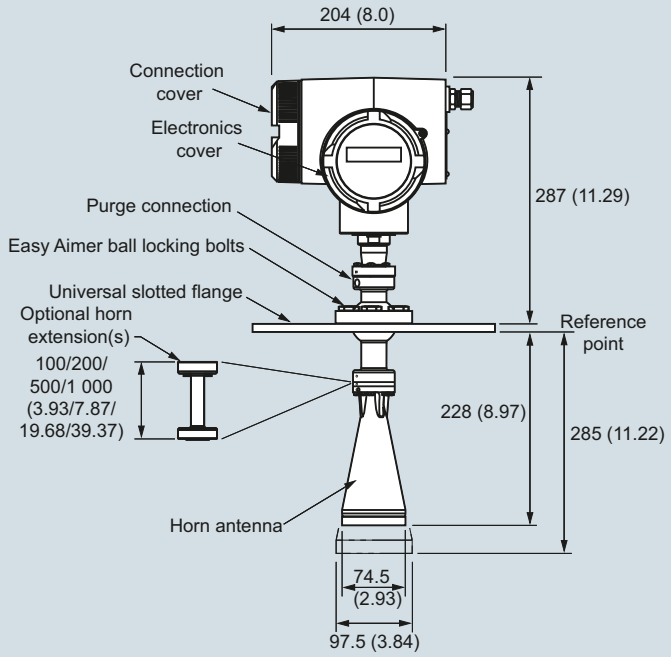
[1] Available with Purge option 0 only

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**
Operating Instructions	Article No.
English	**7ML1998-5JM02**
French	**7ML1998-5JM11**
German	**7ML1998-5JM32**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	**A5E32007360**
Accessories	
Handheld programmer, Infra-red, Intrinsically Safe, EEx ia	**7ML5830-2AJ**
Dust cap, PTFE, for 3 inch/80 mm horn	**7ML1930-1BL**
Dust cap, PTFE, for 4 inch/100 mm horn	**7ML1930-1BM**
HART modem/RS 232 (for use with a PC and SIMATIC PDM)	**7MF4997-1DA**
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[1]	**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA[1]	**7ML1930-1AQ**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

[1] Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

Dimensional drawings

SITRANS LR460 (7ML5426)

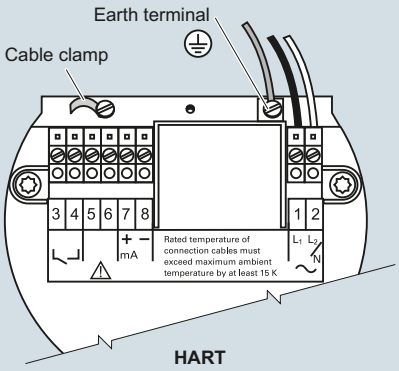


SITRANS LR460, dimensions in mm (inch)

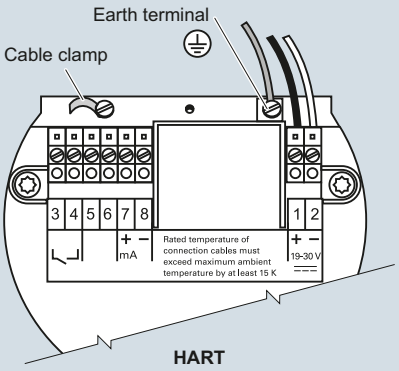
SITRANS LR460

Schematics

AC version

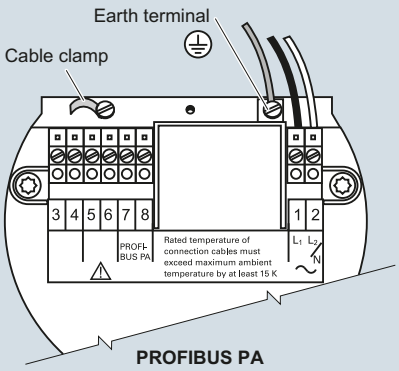


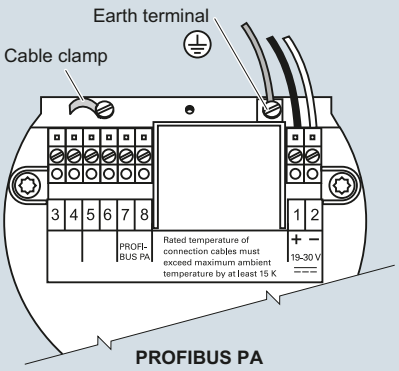
DC version



Hand programmer

SITRANS LR460
Part number:
7ML5830-2AJ



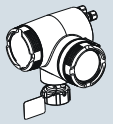


Notes

- 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

SITRANS LR260/LR460 Specials	Article No.
Process connection part kits - non-pressure-rated	
LR260/LR46,0,100 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**
Sitrans LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option F, no process connection	**A5E03934191**

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.

4

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. Startup 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).

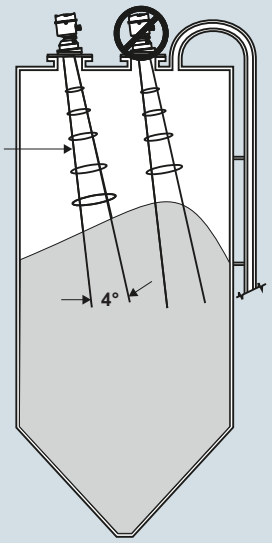
- Key Applications: cement powder, plastic powder/pellets, grain, coal, wood powder, fly ash

Configuration

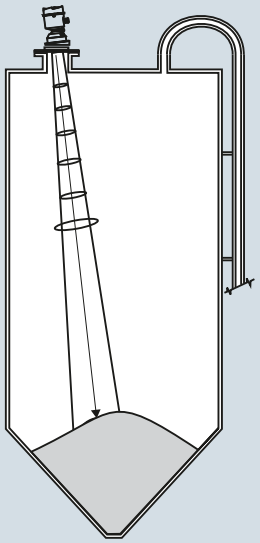
Installation

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

1) From sensor reference point

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)]	• 40 m (131 ft) version • 100 m (328 ft) version
Output	
• Analog output	4 ... 20 mA
• Communications	• HART • Optional: PROFIBUS PA • Optional: Foundation Fieldbus
• Fail-safe	• Programmable as high, low or hold (Loss of Echo) • NE43 programmable
Performance (according to reference conditions IEC60770-1)	
• Maximum measured error (including hysteresis and non-repeatability)	• Greater of 25 mm (1 inch) or 0.25 % of range from minimum detectable distance to full range
Rated operating conditions (according to reference conditions IEC60770-1)	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• installation category	I
• pollution degree	4
Medium conditions	
• Dielectric constant ε_r	> 1.6
Process temperature and pressure	See chart below
Design	
Enclosure	
• Construction	316L/1.4404 stainless steel
• Conduit entry	M20x1.5, or ½" NPT via adapter
• Purge inlet	1/8" NPT, 30 cfm at max. 100 psi
• Lens material	• 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
• Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP68 with lid closed
• Weight	3.15 kg (6.94 lb) including 3 inch flange
• Optional local display interface	Graphic LCD, with bar graph representing level
Process connections	
Universal flat-faced flanges[2)]	• 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[2)]	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, C-TICK
Hazardous	
• 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
• 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
• China	NEPSI Ex nA II T4 Ex nL IIC T4 DIP A20 TA, T139 °C, IP68
• Brazil	INMETRO BR-Ex nA/nL II T4 IP68
Programming	
Intrinsically Safe Siemens handheld programmer	Infrared receiver
• 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 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

2) Universal flange mates with EN 1092-1 (PN 16)/ASME B16.5 (150 lb)/ JIS 2220 (10K) bolt hole pattern.

Process temperature and pressure

Version	Stainless steel	Aimer flange: -1 to 0.5 bar	Aimer flange: -1 to 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)

SITRANS LR560

Selection and Ordering data		Article No.
SITRANS LR560		**7ML5440-**
2-wire, 78 GHz FMCW radar level transmitter for continuous monitoring of solids in silos to a range of 100 m (329 ft).		0 0 -
Order handheld programmer separately		
Measurement and process temperature range		
40 m (131 ft) max range, -40 ... +100 °C	⬟	0
100 m (329 ft) max range, -40 ... +200 °C	⬟	1
Process connection		
Universal flat-faced flange fits ANSI/DIN/JIS flanges		
3 inch/80 mm, 304 stainless steel	⬟	A
4 inch/100 mm, 304 stainless steel	⬟	B
6 inch/150 mm, 304 stainless steel	⬟	C
3 inch/80 mm, 316L stainless steel	⬟	D
4 inch/100 mm, 316L stainless steel	⬟	E
6 inch/150 mm, 316L stainless steel	⬟	F
3 inch/80 mm, painted aluminum, with integral aimer[1]	⬟	G
4 inch/100 mm, painted aluminum, with integral aimer[1]	⬟	H
6 inch/150 mm, painted aluminum, with integral aimer[1]	⬟	J
Enclosure (with cable inlet)		
Stainless steel, 1 X ½" NPT	⬟	A
Stainless steel, 1 X M20 x 1.5 (plastic gland included)	⬟	B
Pressure rating		
0.5 bar g (7.5 psi g) maximum	⬟	0
3 bar g (40 psi g) maximum	⬟	1
Output/communication		
4 ... 20 mA, HART	⬟	A
PROFIBUS PA	⬟	B
Foundation Fieldbus	⬟	C
Approvals		
General Purpose, $CSA_{US/C}$, Industry Canada, FCC, CE, R&TTE, C-TICK	⬟	A
CSA/FM Class I, Div. 2, Groups A, B, C, D, Class II, Div.1, Groups E, F, G, Class III	⬟	B
ATEX II 1 D, ½ D, 2 D, 3G Ex nA/nL, CE, R&TTE, C-TICK	⬟	C
Local display interface		
Without LDI (local display interface)	⬟	1
With LDI (local display interface)	⬟	2

[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.

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)]	⬟	**A50**
Plug 7/8" with mating connector[1)3)4)]	⬟	**A55**
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[4)]	⬟	**C12**
NAMUR NE43 compliant, device preset to failsafe < 3.6 mA[5)]	⬟	**N07**
Operating Instructions for HART device		Article No.
English		**7ML1998-5KB02**
German		**7ML1998-5KB32**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		**A5E32052143**
Operating Instructions for PROFIBUS PA device		
English		**7ML1998-5LT02**
German		**7ML1998-5LT32**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		**A5E32043113**
Operating Instructions for Foundation Fieldbus device		
English		**7ML1998-5LY02**
German		**7ML1998-5LY32**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.		**A5E32034712**
Accessories		
Hand Programmer, Intrinsically safe		**7ML1930-1BK**
Local display interface		**7ML1930-1FJ**
Sun Shield Cover		**7ML1930-1FK**
Housing lid with window		**7ML1930-1FL**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART[6)]		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA[6)]		**7ML1930-1AQ**
SITRANS RD100 Remote display - see Chapter 7		
SITRANS RD200 Remote display - see Chapter 7		
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7		**7ML5750-1AA00-0**

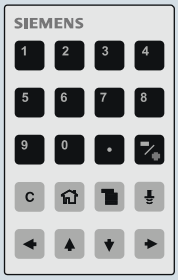
[1)] Available with Approval option A only
[2)] Available with Enclosure option B only
[3)] Available with Output/communication options B and C only
[4)] Available with Pressure rating option 1 only
[5)] Available with Output/communication option A only
[6)] Product shipped with plastic cable gland, 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.

Options

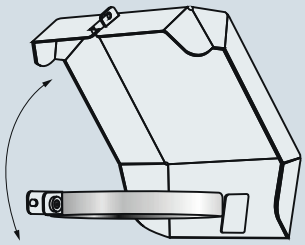
Handheld programmer

Part number:
7ML1930-1BK



Sun shield cover

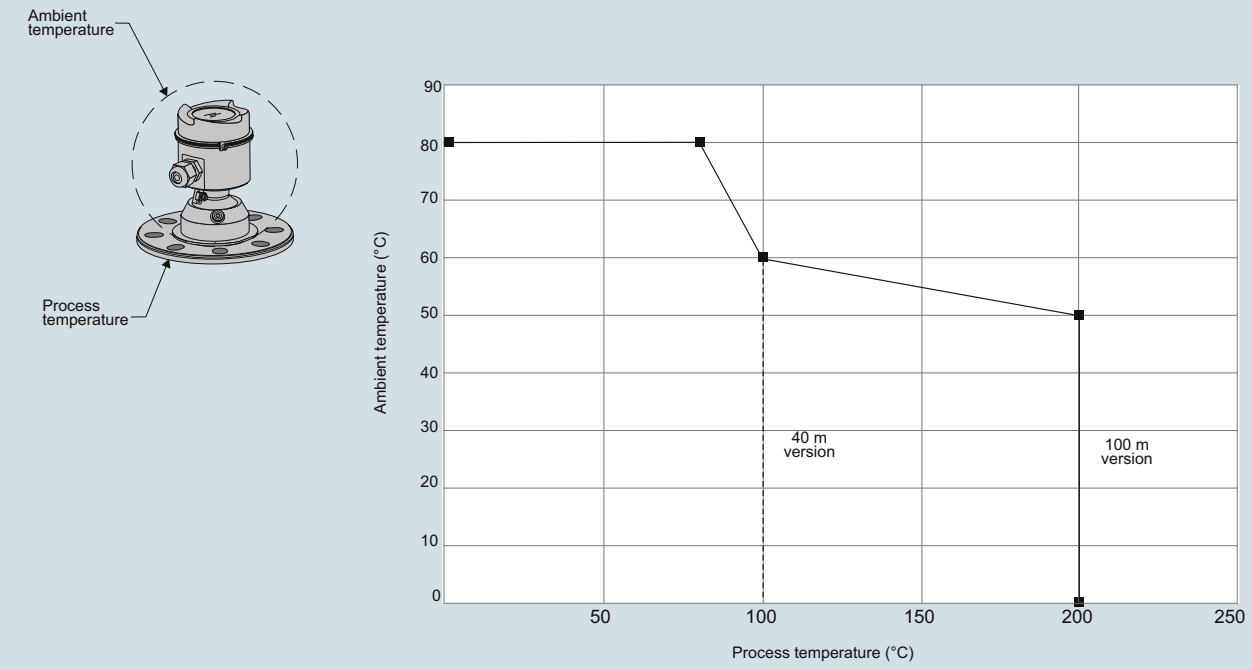
Part number:
7ML1930-1FK



SITRANS LR560 handheld programmer and sun shield cover

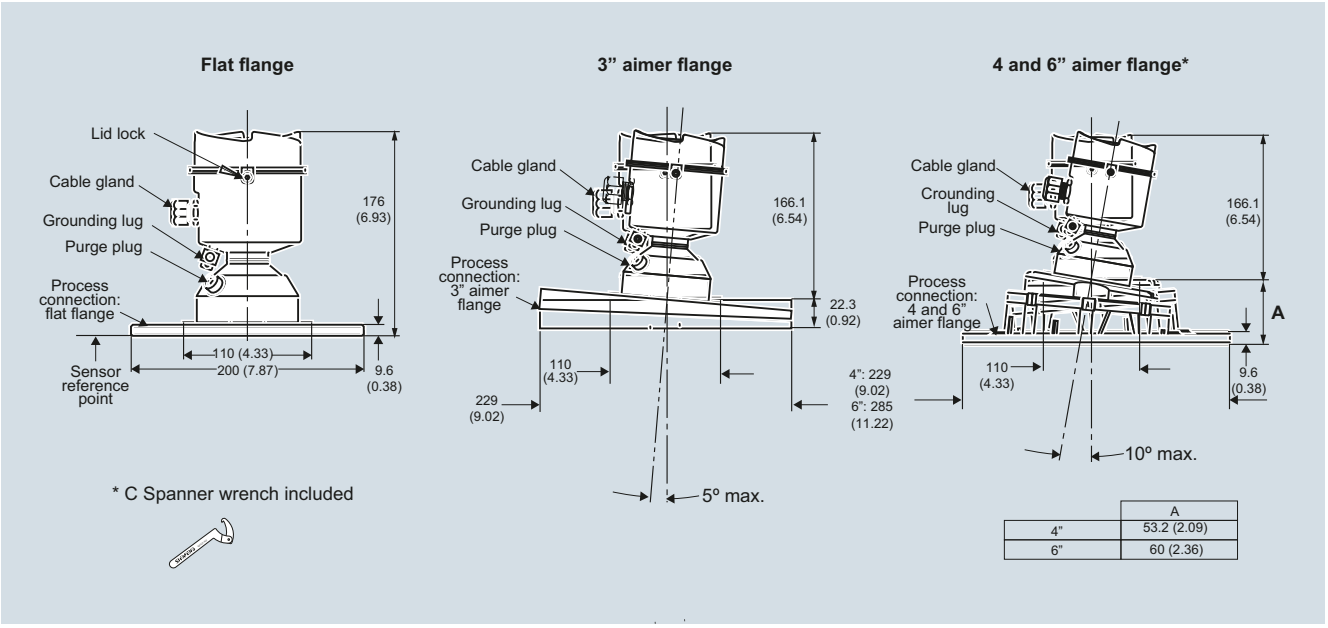
Characteristic curves

Temperature derating curve



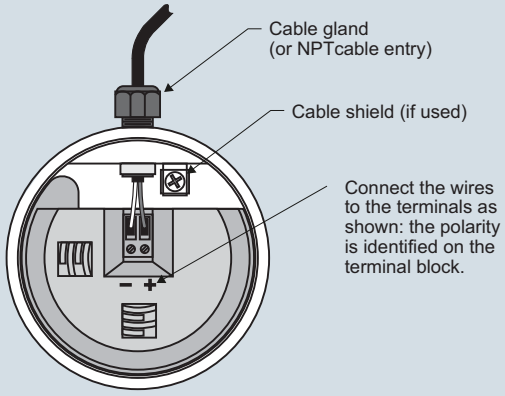
SITRANS LR560 temperature derating curve

Dimensional drawings



SITRANS LR560, dimensions in mm (inch)

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 to 22 AWG) for HARTversion.
5. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS LR560 connections

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.

Overview

Introduction

Guided Wave Radar transmitters combine TDR (time domain reflectometry), ETS (equivalent time sampling) and modern low power circuitry.

Time Domain Reflectometry (TDR)

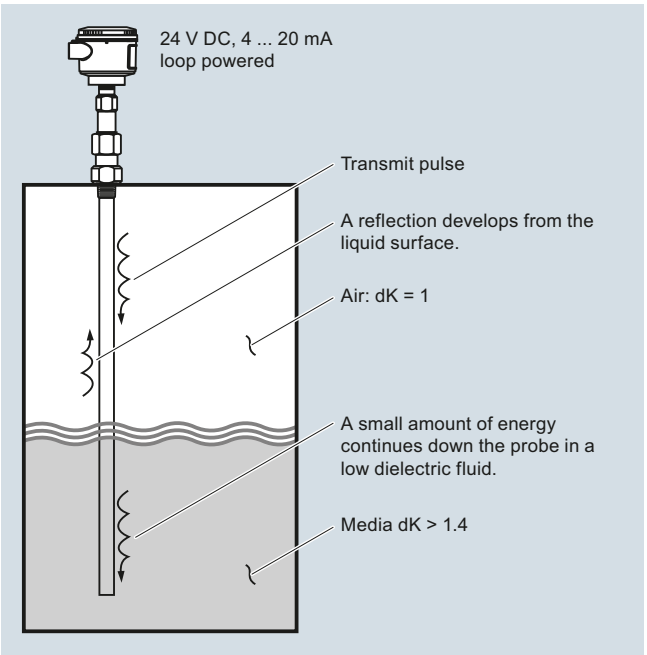
TDR uses pulses of electromagnetic (EM) energy to measure distances or levels. When a pulse reaches a dielectric discontinuity (created by media surface), part of the energy is reflected. The greater the dielectric difference, the greater the amplitude (strength) of the reflection.

In the SITRANS LG200 transmitter, a waveguide with a characteristic impedance in air 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.

Equivalent Time Sampling (ETS)

ETS (Equivalent Time Sampling) is used to measure the high speed, low power EM energy. ETS is critical in the application of TDR to vessel level measurement technology. The high speed EM energy (1 000 ft/µs) is difficult to measure over short distances and at the resolution required in the process industry. ETS captures the EM signals in real time (nanoseconds) and reconstructs them in equivalent time (milliseconds), which is much easier to measure with today's technology.

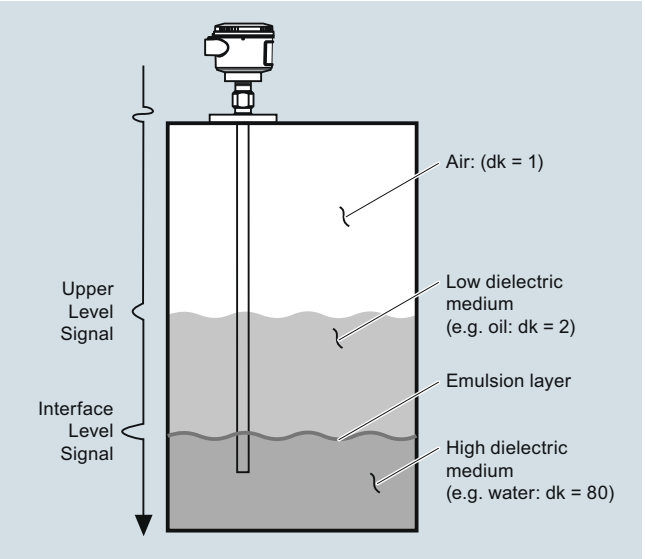
ETS is accomplished by scanning the waveguide to collect thousands of samples. Approximately 8 scans are taken per second; each scan gathers more than 30 000 samples.



Mode of operation

Interface Detection

The SITRANS LG200, when used with the Model 7ML1301-6 coaxial probe, is a transmitter capable of measuring both an upper level and an interface level. The upper liquid must have a dielectric constant between 1.4 and 5 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.



Application

SIEMENS

Guided Wave Radar (Level) Application Questionnaire

Customer information

Contact: _____ Prepared By: _____

Company: _____ Date: _____

Address: _____ Notes on the Application: _____

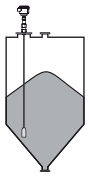
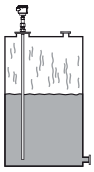
City: _____ Country: _____

Zip/Postal Code: _____ Phone: ( ) _____

E-mail: _____ Fax: ( ) _____

Tank/Vessel Information

(supply sketch where possible) ☐ Sketch attached

☐ Solids  ☐ Liquids 

Tank 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): _____

Material

Material being measured: _____ ☐ Liquid ☐ Solid ☐ Slurry

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/m^3

Kinematic Viscosity (cSt) = Dynamic Viscosity (cP) / Density (kg/m^3)

- ☐ 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)

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:

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: ( ) _____

4

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

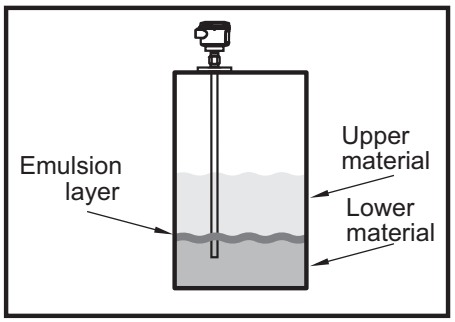
Material being measured: _____ ☐ Liquid ☐ Slurry

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: _____

Communications: ☐ HART/ 4 ... 20 mA

Outputs required: ☐ 4 ...20 mA
☐ Other (please specify) _____

Products recommended:

www.siemens.com/processautomation

Form# 2-938R0

Overview

SITRANS LG200 is a guided wave radar transmitter for short and medium range level, level/interface, and volume measurement of liquids and solids. It is unaffected by changes in process conditions, high temperatures and pressures, and steam.

Benefits

- Coaxial, rigid, and flexible single or twin rods for many applications
- Measures accurately on materials with dielectric (dK) as low as 1.4 (including LNG at -196 °C (-320.8 °F)
- Guided wave radar measurement for up to 2.5 mm (0.12 inch) accuracy
- Measures level and interface on challenging applications including foam
- 3 button programming for quick setup
- Reliable level measurement on harsh applications with pressure up to 430 bar g (6 250 psi g) and temperatures as high as 427 °C (800 °F).
- Functional Safety (SIL-1 and SIL-2). Device suitable for use in accordance with IEC 61508 and IEC 61511.

Application

SITRANS LG200 provides accurate measurement in level, volume, and interface applications. For short and extended applications, LG200 offers coaxial, single or twin rod probes, and single or twin cable probes up to 22.5 m (75 ft).

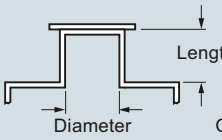
SITRANS LG200 measures accurately in liquid or slurry applications of corrosive vapors, foam, saturated steam, high viscosity, quick fill/empty rates, low levels and varying dielectrics and product densities.

Ideal for retrofitting torque tube applications, SITRANS LG200 chamber replacement probe can be mounted in existing chambers or cages for optimal measurement.

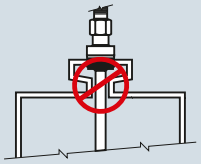
- Key Applications: hydrocarbon processing, interface/level measurement, low dielectric liquids, high temperature/ pressure applications, powdered solids with high angle of repose.
  Applications on ammonia are also possible with the HT/HP coaxial probe design which incorporates a glass seal that is not susceptible to the vapors seen in this application.

Configuration

Mounting on a nozzle



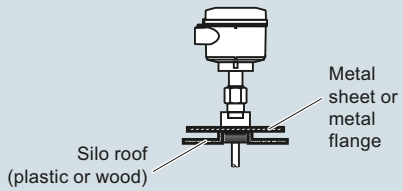
Optimal 1:1 ratio



Do not use reducers.

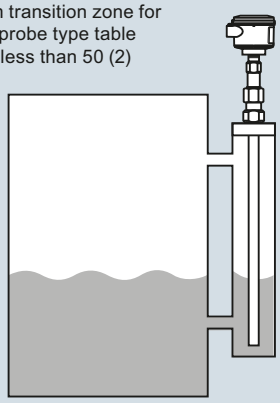
Installation in non-metallic silos [1]

For installation in vessels of a non-metallic construction or possibly open vessels, a suitable launch plate is required to optimize the impedance of the transmitted signal as it travels along the probe. Optimal performance cannot be guaranteed if a suitable transition is not available at the process connection.
When using single rod versions (flexible or solid) and a threaded process connection, a metal sheet or flange will greatly improve conditions as this provides a suitable launch plate.
A flanged process connection is generally accepted to be provision of this launch plate.



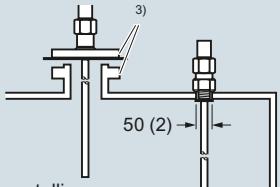
Bypass pipe

1. Minimum pipe diameter 50 (2)
2. Minimum 25 (1) from bottom of the bypass pipe
3. Take note of bottom transition zone for chosen probe, see probe type table
4. For pipe diameters less than 50 (2) consult factory



Single rod mounting

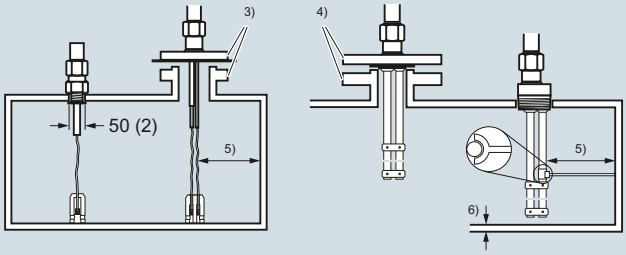
1. Do not mount in nozzles <50 (2) in diameter.
2. Mount in applications where ratio of diameter to length is 1:1 or greater. Any ratio less than 1:1 (i.e. 2" x 6" nozzle = 1:3) may require a blanking distance and/or dielectric adjustment.
3. Do not use pipe reducers.
4. Keep conductive objects away from probe to ensure proper performance.



Probe can be stabilized at the bottom with a non-metallic cup or bracket. When mounting into a metallic cup or bracket, use optional TFE bottom spacer (7ML1930-1DJ).

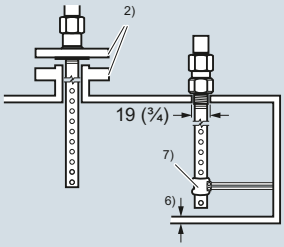
Twin rod mounting 7ML1302-x

1. Active rod must be mounted at least 25 (1) away from any obstructions.
2. Minimum stillwell or nozzle diameter for probe is 76 (3), inactive part needs to be flush with inside tank wall.



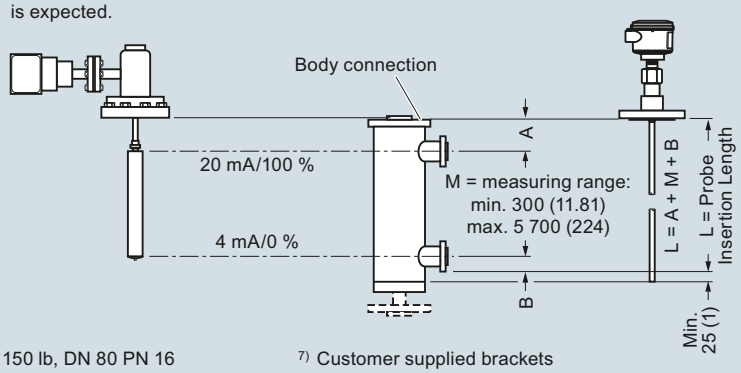
Coaxial 7ML1301-x/coaxial-interface 7ML1301-6

1. Minimum 25 (1) from tank bottom
2. Minimum 2" process connection for enlarged coaxial probe
3. Distance to obstructions not important due to enclosed design



Displacer/torque tube replacement

1. With Coaxial Probe 7ML1301-4 there is no top transition zone allowing measurement to the process connection.
2. Minimum pipe size: coaxial probes 2 inch/DN 50, twin rod 3 inch/DN 80, single rod 2 inch/DN 50
3. 22 (0.875) Coaxial probes should be used where limited build up is expected.



[1] See electromagnetic compatibility
[2] Min. 1 inch - 150 lb, DN 25 PN 16
[3] Min. 2 inch - 150 lb, DN 25 PN 16
[4] Min. 3 inch - 150 lb, DN 80 PN 16
[5] Min. 25 (1) from any metal object
[6] Min. 25 (1) from tank bottom
[7] Customer supplied brackets
Recommended:
1 bracket per 3 m length

SITRANS LG200 installation, dimensions in mm (inch)

Technical specifications

Mode of operation	
Measuring principle	Guided wave radar measurement
Measuring range	0.15 ... 22.5 m (0.5 ... 75 ft)
Output	
mA analog output with HART digital signal	Optically isolated 4 ... 20 mA, 620 Ω max.
Output range	
• Analog	3.8 ... 20.5 mA usable
• Start-up current	4.0 mA
Diagnostic alarm	Adjustable 3.6 mA, 22 mA, HOLD
Digital communication	HART Version 5.x and multidrop compatible
Performance	Reference Conditions 1.82m (72 inch) Coaxial Probe with water at 20 °C (70 °F) and CFD Threshold
Non-linearity	
• Coaxial/twin rod probes	< 0.1% of probe length or 2.5 mm (0.1 inch), whichever is greater [(top 60 cm (24 inch) of twin rod probes 30 mm (1.2 inch)]
• Single rod probes	< 0.3 % or 0.3 inch (8 mm), whichever is greater
• Interface models	Upper layer: ± 25.4 mm (1 inch) Interface layer: ± 25.4 mm (1 inch) (distinct interface surface required)
Resolution and repeatability	≤ 2.5 mm (0.1 inch)
Accuracy	
• Coaxial/twin rod probes	< 0.1 % of probe length or 0.1 inch (2.5 mm), whichever is greater [Top 60 cm (24 inch) of twin rod probes 30 mm (1.2 inch)]
• Single rod probes	± 0.5 % of probe length or 0.5 inch (13 mm), whichever is greater
• Interface models	± 1 inch (25 mm) (distinct Interface required)
Electromagnetic compatibility	Meets CE requirements (EN 61326-1/2006) (Single and Twin Rod probes must be used in metallic vessel or stilling well to maintain CE compliance.)
• Response time	< 1 s
• Warm up time	< 5 s
• Temperature Effects	+ 0.02 % of actual probe length/°C for probes ≥ 2.5 m (8 ft)
Rated operating conditions[1]	
• Ambient temperature for enclosure	-40 ... +80 °C (-40 ... +176 °F)
• LCD readable temperature range	-20 ... +70 °C (-5 ... +160 °F)
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	2
• Humidity	0 ... 99 % (non condensing)
Medium conditions[1]	
Dielectric constant	dK ≥ 1.4
Process temperature range[2]	-196 ... +427 °C (-321 ... +800 °F)
Vessel pressure[3]	Full vacuum to 431 bar g (6 250 psi g), probe dependent

Design	
Weight of transmitter with solid lid	1.28 kg (2.83 lb)
Weight of transmitter with glass window lid	1.60 kg (3.52 lb)
Materials	
• Enclosure	Aluminum, epoxy-coated
• Degree of protection	Type 4/NEMA 4, IP65
• Cable inlet	2x M20x1.5 or 2 x ½" NPT
Process connections	
• Threaded	G ¾" [(BSPP), EN ISO 228-1], 1", 1½", 2" NPT [(Taper), ANSI/ASME B1.20.1] and G 2" [(BSPP), EN ISO 228-1]
• Flanged	3/4 ... 4", ASME, DIN flanges
• Hygenic	3/4 ... 4", Triclover
Programming	
Local	Three button, menu-driven data entry with security passwords
Remote	SIMATIC PDM via HART
Power	11 ... 36 V DC
Certificates and approvals	
General Purpose	CSA/FM, CE, C-TICK
Intrinsically Safe	FM Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G T4, Class III, Type 4, IP65 CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Groups E, F, G T4, Class III, Type 4, IP65 ATEX II 1G EEx ia IIC T4
Intrinsically Safe (International)	IECEx Ex ia IIc Ga IECEX DEK 11.00067X
Explosion Proof/Flame Proof	FM Class I, Div. 1, Groups B, C, D, Class II, Div. 1, Groups E, F, G T4, Class III, Type 4, IP65 CSA Class I, Div. 1, Groups B, C, D, Class II, Div. 1, Groups E, F, G T4, Class III, Type 4, IP65 ATEX II 1/2 G EEx d [ia] IIC T6 ATEX II 1/2 D IP65 T85 °C
Non-Incendive	FM Class I, Div. 2, Groups A, B, C, D, Class II, Div. 2, Groups F, G T4, Class III, Type 4, IP65 CSA Class I, Div. 2, Groups A, B, C, D, Class II, Div. 2, Groups E, F, G T4, Class III, Type 4, IP65
Non-Sparking	ATEX II 3G EEx nA (nL) IIC T4 ... T6 ATEX II 3G EEx nA II T4 to T6
Others	• Functional Safety to SIL-1 in accordance with IEC 61508 Safe Failure Fraction (SFF) of 85.5 % (Third party FMEDA Analysis - hardware only) • Functional Safety to SIL-2 in accordance with IEC 61508 Safe Failure Fraction (SFF) of 91 % (Third party FMEDA Analysis - hardware only) • Lloyds Steam Vessel Approval conforming to EN12952-11 & EN12953-9 • GOST R

[1] If installation is in areas classified as hazardous, please observe relevant certificates

[2] Temperature rating is pressure dependent

[3] Pressure rating is temperature dependent

Continuous level measurement – Guided wave radar transmitters

SITRANS LG200

Model reference number	Coaxial Probe (7ML1301-1) 7xA-x	Coaxial HT/HP Probe (7ML1301-2) 7xD-x	Coaxial HP Probe (7ML1301-3) 7xP-x	Coaxial Overfill/Flooded Cage Probe (7ML1301-4) 7xR-x
Recommended applications	General purpose: clean, low viscosity liquids < 150 °C (300 °F)	Clean, high temperature/ high pressure liquids > 200 °C(400 °F), ammonia, chlorine, LNG[1], LPG[1]	Clean, high pressure liquids < 200 °C (400 °F), ammonia, chlorine, LNG, LPG	General applications, overfill, temperatures to 200 °C (400 °F), clean, low viscosity liquids, displacer/torque-tube replacement
Not recommended for:	Coating and buildup, foam	Coating and buildup, foam, steam	Coating and buildup, foam, steam	Coating and buildup, foam
Materials/wetted parts	316 L stainless steel, TFE spacers, O-ring[2]	316L stainless steel, Alumina spacers[3] (option PEEK[4] or TFE[5]), Borosilicate	316L stainless steel, TFE spacers, Borosilicate	316L stainless steel, TFE spacers, O-ring[2]
Process seal	O-ring[2]	Borosilicate (no O-ring)	Borosilicate (no O-ring)	O-ring[2]
Rod/tube diameter				
Standard	ø 8 mm (0.3125 inch) rod ø 22 mm (0.875 inch) tube	ø 8 mm (0.3125 inch) rod ø 22 mm (0.875 inch) tube	ø 8 mm (0.3125 inch) rod ø 22 mm (0.875 inch) tube	ø 8 mm (0.3125 inch) rod ø 22 mm (0.875 inch) tube
Enlarged	ø 15 mm (0.63 inch) rod ø 45 mm (1.75 inch) tube	ø 15 mm (0.63 inch) rod ø 45 mm (1.75 inch) tube	ø 15 mm (0.63 inch) rod ø 45 mm (1.75 inch) tube	ø 15 mm (0.63 inch) rod ø 45 mm (1.75 inch) tube
Process connection thread				
Standard	¾" NPT [(Taper), ANSI/ASME B1.20.1], G 1" [(BSPP), EN ISO 228-1]	¾" NPT [(Taper), ANSI/ASME B1.20.1], G 1" [(BSPP), EN ISO 228-1]	¾" NPT [(Taper), ANSI/ASME B1.20.1], G 1" [(BSPP), EN ISO 228-1]	¾" NPT [(Taper), ANSI/ASME B1.20.1], G 1" [(BSPP), EN ISO 228-1]
Enlarged	2" NPT [(Taper), ANSI/ASME B1.20.1]	2" NPT [(Taper), ANSI/ASME B1.20.1]	2" NPT [(Taper), ANSI/ASME B1.20.1]	2" NPT [(Taper), ANSI/ASME B1.20.1]
Flange ASME (EN/DIN)				
Standard	1 ... 4" (DN 25 ... 100)	1 ... 4" (DN 25 ... 100)	1 ... 4" (DN 25 ... 100)	1 ... 4" (DN 25 ... 100)
Enlarged	2 ... 4" (DN 50 ... 100)	2 ... 4" (DN 50 ... 100)	2 ... 4" (DN 50 ... 100)	2 ... 4" (DN 50 ... 100)
Length	60 ... 610 cm (24 ... 240 inch)	60 ... 610 cm (24 ... 240 inch)	60 ... 610 cm (24 ... 240 inch)	60 ... 610 cm (24 ... 240 inch)
Transition Zone[6]				
Top	25 mm (1 inch) at dk = 1.4 150 mm (6 inch) at dk = 80	None	25 mm (1 inch) at dk = 1.4 150 mm (6 inch) at dk = 80	None
Bottom	150 mm (6 inch) at dk = 1.4 25 mm (1 inch) at dk = 80	150 mm (6 inch) at dk = 1.4 25 mm (1 inch) at dk = 80	150 mm (6 inch) at dk = 1.4 25 mm (1 inch) at dk = 80	150 mm (6 inch) at dk = 1.4 25 mm (1 inch) at dk = 80
Process temperature maximum	150 °C at 27 bar g (300 °F at 400 psi g)	427 °C at 133 bar g (800 °F at 2 000 psi g)[7]	200 °C at 379 bar g (400 °F at 5 500 psi g)	200 °C at 18 bar g (400 °F at 270 psi g)
Process temperature minimum	-40 °C at 70 bar g (-40 °F at 1 000 psi g)	-196 °C at 430 bar g (-321 °F at 6 250 psi g)	-196 °C at 430 bar g (-321 °F at 6 250 psi g)	-40 °C at 70 bar g (-40 °F at 1 000 psi g)
Process pressure				
Process pressure maximum	70 bar g at 20 °C (1 000 psi g at 70 °F)	431 bar g at 20 °C (6 250 psi g at 70 °F)	431 bar g at 20 °C (6 250 psi g at 70 °F)	70 bar g at 20 °C (1 000 psi g at 70 °F)
Process pressure minimum/vacuum service	Yes, not hermetic[8]	Yes, hermetic ($<10^{-8}$ cc/sec at 1 atmosphere)	Yes, hermetic ($<10^{-8}$ cc/sec at 1 atmosphere)	Yes, not hermetic
Dielectric range (dk)	1.4 ... 100	1.4 ... 100[1]	1.4 ... 100	1.4 ... 100
Maximum viscosity (cP)				
Standard	500	500	500	500
Enlarged	1 500	1 500	1 500	1 500
Coating/buildup	No	No	No	No
Foam	No	No	No	No
Corrosives	Yes	Yes	Yes	Yes
Sanitary	No	No	No	No
Overfill	No	Yes	No	Yes

1) Dependent on spacer option
2) See O-Ring Selection Guide for guidance
3) For dk ≥ 2, maximum temperature 427 °C (800 °F)
4) For dk ≥ 1.4, maximum temperature 343 °C (650 °F), PEEK spacers standard on enlarged coaxial design
5) For dk 1.4, maximum temperature 288 °C (550 °F)
6) Transition zone is dielectric dependent: dK = dielectric permittivity. Unit will function but accuracy will decrease in Transition Zone
7) 345 °C (650 °F) with PEEK spacers
8) Not hermetic: sealing by means of O-ring. Hermetic: sealing by means of borosilicate glass window

	Coaxial Steam Probe (7ML1301-5)	Coaxial Interface Probe (7ML1301-6)	Single Rigid Rod Probe (7ML1303-1)	Single Rigid Rod HT/HP Probe (7ML1303-2)	Single Rigid Rod Probe, PFA rod insulation (7ML1303-1J)
Model reference number	**7xS-x**	**7xT-x**	**7xF-x**	**7xJ-x**	**7xF-4**
Recommended applications	Hot water (steam) >200 °C (400 °F) (external chamber is required for use in boilers)	Liquid/liquid-interface, temperatures to 200 °C (400 °F); clean, low-viscosity liquids	Coating and buildup, foam	Coating and buildup, foam	Excessive coating and buildup, foam
Not recommended for	General purpose, coating and buildup, foam	Coating and buildup, foam	Low dielectric media (dK < 10)[1]	Low dielectric media (dK < 10)[1]	Low dielectric media (dK < 10)[1]
Materials/wetted parts	316L stainless steel, PEEK spacers, Aegis PF128 O-ring[2]	316L stainless steel, TFE spacers, O-ring[2]	316L stainless steel, TFE, O-ring[2]	316L stainless steel, TFE, O-ring[2]	316L stainless steel, PFA, TFE, O-ring[2]
Process seal	Aegis PF128 O-ring[2], PEEK only	O-ring[2]	O-ring[2]	Aegis PF128 O-ring only[2]	O-ring[2]
Rod/Tube diameter:					
Standard	ø 8 mm (0.3125 inch) rod ø 22 mm (0.875 inch) tube	ø 8 mm (0.3125 inch) rod ø 22 mm (0.875 inch) tube	ø 12 mm (0.5 inch) rod	ø 12 mm (0.5 inch) rod	ø 12 mm (0.5 inch) rod ø 16 mm (0.625 inch) insulation
Enlarged	N/A	ø 15 mm (0.63 inch) rod ø 45 mm (1.75 inch) tube	N/A	N/A	N/A
Process connection thread					
Standard	¾" NPT [(Taper), ANSI/ASME B1.20.1], G 1" [(BSPP), EN ISO 228-1]	¾" NPT [(Taper), ANSI/ASME B1.20.1], G 1" [(BSPP), EN ISO 228-1]	¾" NPT [(Taper), ANSI/ASME B1.20.1], G 1" [(BSPP), EN ISO 228-1]	¾" NPT [(Taper), ANSI/ASME B1.20.1], G 1" [(BSPP), EN ISO 228-1]	2" NPT [(Taper), ANSI/ASME B1.20.1], G 2" [(BSPP), EN ISO 228-1]
Enlarged	N/A	2" NPT [(Taper), ANSI/ASME B1.20.1]	N/A	N/A	N/A
Flange ASME (EN/DIN)					
Standard	1 ... 4" (DN 25 ... 100)	1 ... 4" (DN 25 ... 100)	2 ... 4" (DN 50 ... 100)	2 ... 4" (DN 50 ... 100)	2 ... 4" (DN 50 ... 100)
Enlarged	N/A	2 ... 4" (DN 50 ... 100)	N/A	N/A	N/A
Length	60 ... 455 cm (24 ... 180 inch)	60 ... 610 cm (24 ... 240 inch)	60 ... 610 cm (24 ... 240 inch)	60 ... 610 cm (24 ... 240 inch)	60 ... 610 cm (24 ... 240 inch)
Transition Zone[3]					
Top	25 mm (1 inch) at dk ≥ 10	none	Application, installation, and dielectric dependent	Application, installation, and dielectric dependent	Application, installation, and dielectric dependent
Bottom	25 mm (1 inch) at dk ≥ 10	150 mm (6 inch) at dk = 1.4 25 mm (1 inch) at dk = 80	25 mm (1 inch) at dk >10	25 mm (1 inch) at dk >10	25 mm (1 inch) at dk >10
Process temperature maximum	343 °C at 165 bar g (650 °F at 2 400 psi g) (saturated steam)	200 °C at 18 bar g (400 °F at 270 psi g)	150 °C at 27 bar g (300 °F at 400 psi g)	316 °C at 165 bar g (605 °F at 2 400 psi g)	150 °C at 27 bar g (300 °F at 400 psi g)
Process temperature minimum	-40 °C at 207 bar g (-40 °F at 3 000 psi g)	-40 °C at 70 bar g (-40 °F at 1 000 psi g)	-40 °C at 70 bar g (-40 °F at 1 000 psi g)	-40 °C at 70 bar g (-40 °F at 1 000 psi g)	-40 °C at 50 bar g (-40 °F at 750 psi g)
Process pressure maximum	165 bar g at 343 °C (2 400 psi g at 650 °F)	70 bar g at 20 °C (1 000 psi g at 70 °F)	70 bar g at 20 °C (1 000 psi g at 70 °F)	207 bar g at 20 °C (3 000 psi g at 70 °F)	70 bar g at 20 °C (1 000 psi g at 70 °F)
Process pressure min. vacuum service	Yes, not hermetic	Yes, not hermetic	Not suitable	Not suitable	Not suitable
Dielectric range	10 ... 100	Upper liquid layer 1.4 ... 5 Interface liquid layer 15 ... 100	1.9 ... 100[1]	1.9 ... 100[1]	1.9 ... 100[1]
Maximum viscosity					
Standard	500 cP	500 cP	10 000 cP (consult factory if severe agitation/turbulence)		
Enlarged	N/A	1 500 cP			
Coating/buildup	No	No	Yes, maximum error 10 % of coated length;% error related to dielectric of media, thickness of coating and coated probe length above media		
Foam	No	No	Yes	Yes	Yes
Corrosives	Yes	Yes	Yes	Yes	Yes
Sanitary	No	No	No	No	No
Overfill	Yes	Yes	No	No	No

1) With dK of 1.9 ... 10, the device must be mounted between 50 and 150 mm (2 ... 6 inch) of metal tank wall or in chamber/bridle
2) See O-ring Selection Guide for guidance
3) Transition zone is dielectric dependent: dK = dielectric permittivity. Unit will function but accuracy will decrease in Transition Zone

SITRANS LG200

	Single Rigid Rod Probe, Sanitary (7ML1303-1D)	Single Rigid Rod Probe, PFA faced flange(7ML1303-1E)	Single Flexible Rod Probe (7ML1304-1)	Single Flexible Rod Probe for Bulk Solids (7ML1304-2)
Model reference number	**7xF-E**	**7xF-F**	**7x1-x**	**7x2-x**
Recommended applications:	Applications demanding sanitary specifications	Extreme corrosives, coating/buildup, foam	Coating and buildup, foam; lengths > 6 m (20 ft) headroom	Granular bulk solids applications (powders, grain, dust) 3 000 lb pull down force
Not recommended for	Low dielectric media (dK < 10)[1]	Low dielectric media (dK < 10)[1]	Low dielectric media (dK < 4)	Solids with dK < 4
Materials/wetted parts	316L stainless steel, TFE, 15 µ-inch (<0.4 µm) R_a	All PFA - wetted surfaces	316L stainless steel, TFE, O-ring[2]	316L stainless steel, TFE, O-ring[2]
Optional	AL6XN stainless steel	N/A	N/A	N/A
Process seal	316L stainless steel, TFE, O-ring[2]	PFA, no O-ring	O-ring[2]	Sealant
Rod/tube diameter	ø 12 mm (0.5 inch) rod	ø 12 mm (0.5 inch) rod ø 16 mm (0.625 inch) insulation	ø 5 mm (0.188 inch) cable	ø 6 mm (0.25 inch) cable
Process connection thread	N/A	N/A	2" NPT [(Taper), ANSI/ASME B1.20.1], G 2" [(BSPP), EN ISO 228-1]	2" NPT [(Taper), ANSI/ASME B1.20.1], G 2" [(BSPP), EN ISO 228-1]
Flange ASME (DIN)	19 ... 100 mm (¾ ... 4 inch) Triclover-style 16 amp fitting	2 ... 4 inch (DN 50 ... 100)	2 ... 4 inch (DN 50 ... 100)	2 ... 4 inch (DN 50 ... 100)
Length	60 ... 610 cm (24 ... 240 inch)	60 ... 610 cm (24 ... 240 inch)	1 ... 22.5 m (3 ... 75 ft)	1 ... 22.5 m (3 ... 75 ft)
Transition Zone[3]				
Top	Application, installation, and dielectric dependent	Application, installation, and dielectric dependent	Application, installation, and dielectric dependent	Application, installation, and dielectric dependent
Bottom	25 mm (1 inch) at dk >10	25 mm (1 inch) at dk >10	305 mm (12 inch)	305 mm (12 inch)
Process temperature maximum	150 °C at 5.1 bar g (300 °F at 75 psi g)	150 °C at 27 bar g (300 °F at 400 psi g)	150 °C at 27 bar g (300 °F at 400 psi g)	66 °C at 3.4 bar g (150 °F at 50 psi g)
Process temperature minimum	0 °C at 5.1 bar g (32 °F at 75 psi g)	-40 °C at 13.7 bar g (-40 °F at 200 psi g)	-40 °C at 70 bar g (-40 °F at 1 000 psi g)	-40 °C at 3.4 bar g (-40 °F at 50 psi g)
Process pressure:				
Process pressure maximum	5.1 bar g at 150 °C (75 psi g at 300 °F)	70 bar g at 20 °C (1 000 psi g at 70°F)	70 bar g at 20 °C (1 000 psi g at 70 °F)	3.4 bar g at 66 °C (50 psi g at 150 °F)
Process pressure minimum/ vacuum service	Not suitable for vacuum applications			
Dielectric range	1.9 ... 100[1]	1.9 ... 100[1]	4 ... 100[1]	4 ... 100
Maximum viscosity (cP)	10 000 (consult factory if severe agitation/turbulence)			N/A
Coating/buildup	Yes, maximum error 10 % of coated length; % error related to dielectric of media, thickness of coating and coated probe length above media			
Foam	Yes	Yes	Yes	Yes
Corrosives	No	Yes	No	No
Sanitary	Yes	No	No	No
Overfill	No	No	No	No

1) With dK of 1.9 ... 10, the device must be mounted between 50 and 150 mm (2 ... 6 inch) of metal tank wall or in chamber/bridle

2) See O-ring Selection Guide for guidance

3) Transition zone is dielectric dependent: dK = dielectric permittivity. Unit will function but accuracy will decrease in Transition Zone

	Twin Rod Probe (7ML1302-1)	Flexible Twin Rod Probe (7ML1302-3)	Flexible Twin Rod Bulk Solids Probe (7ML1302-2)
Model reference number	**7xB-x**	**7x7-x**	**7x5-x**
Recommended applications:	General purpose, foam, minor film coating	Low dielectric media (1.9 ... 10) with lengths > 6 m (20 ft)	Granular light bulk solids applications (powders, grains, dust), 3 000 lb pull-down force
Not recommended for:	Media bridging between rods or building up on spacers	Dielectric > 10: media bridging on flexible elements, dielectrics < 5 with lengths > 10 m (30 ft)	Media bridging flexible elements
Materials/wetted parts	316L stainless steel, TFE spacers, O-ring[1)]	316L stainless steel, FEP web-bing, O-ring[1)]	316L stainless steel, FEP web-bing, O-ring[1)]
Process seal	O-ring[1)]	O-ring[1)]	Sealant
Rod/tube diameter	Two, ø 12 mm (0.5 inch) rod; 22 mm (0.875 inch) C_L ... C_L	Two, ø 6 mm (0.25 inch) cables; 22 mm (0.875 inch) C_L ... C_L	Two, ø 6 mm (0.25 inch) cables; 22 mm (0.875 inch) C_L ... C_L
Process connection thread	2" NPT [(Taper), ANSI/ASME B1.20.1], G " [(BSPP), EN ISO 228-1]	2" NPT [(Taper), ANSI/ASME B1.20.1], G 2" [(BSPP), EN ISO 228-1]	2" NPT [(Taper), ANSI/ASME B1.20.1], G 2" [(BSPP), EN ISO 228-1]
Flange ASME (EN/DIN)	2 ... 4" (DN 50 ... 100)	2 ... 4" (DN 50 ... 100)	2 ... 4" (DN 50 ... 100)
Length	60 ... 610 cm (24 ... 240 inch)	1 ... 22.5 m (3 ... 75 ft)	1 ... 22.5 m (3 ... 75 ft)
Transition Zone[2)]:			
Top	150 mm (6 inch) at dK > 1.9 Blocking distance: none	150 mm (6 inch) at dK > 1.9 Blocking distance: 12 ... 50 cm (4.8 ... 20 inch)	150 mm (6 inch) at dK > 1.9 Blocking distance: 12 ... 50 cm (4.8 ... 20 inch)
Bottom	150 mm (6 inch) at dK = 1.9 25 mm (1 inch) at dK = 80	305 mm (12 inch)	305 mm (12 inch)
Process temperature max.[3)]	200 °C at 19 bar g (400 °F at 275 psi g)		66 °C at 3.4 bar g (150 °F at 50 psi g)
Process temperature min.	-40 °C at 70 bar g (-40 °F at 1 000 psi g)		-40 °C at 3.4 bar g (-40 °F at 50 psi g)
Process pressure max.	70 bar g at 20 °C (1 000 psi g at 70 °F)		3.4 bar g at 66 °C (50 psi g at 150 °F)
Process pressure min./ vacuum service	Yes, not hermetic		Not suitable
Dielectric range	1.9 ...100	1.9 ... 100	1.9 ... 100
Maximum viscosity (cP)	1 500	1 500	Not suitable
Coating/buildup	Yes, maximum error 3 % of coated length with conductive media Bridging not recommended.[4)]		
Foam	Yes	Yes	Yes
Corrosives	Yes	No	Yes
Sanitary	No	No	No
Overfill	No	No	No

1) See O-ring Selection Guide for guidance

2) Transition zone is dielectric dependent: dK = dielectric permittivity. Unit will function but accuracy will decrease in Transition Zone

3) Refer to Ambient Temperature vs Process Temperature graphs or instruction manual

4) Bridging is defined as continuous accumulation of material between the probe elements

O-ring and Seal Selection Guide

Material	Recommended for Use in:	Not Recommended for Use In:
Viton GFLT	General purpose, steam, ethylene	Ketones (MEK, acetone), skydrol fluids, amines, anhydrous ammonia, low molecular weight esters and ethers, hot hydrofluoric or chlorosulfuric acids, sour HCs
EPDM	Acetone, MEK, skydrol fluids	Petroleum oils, di-ester base lubricants, propane, steam, anhydrous ammonia
Kalrez (4079)	Inorganic and organic acids (including HF and nitric) aldehydes, ethylene, glycols, organic oils, silicone oils, vinegar, sour HCs	Black liquor, hot water/steam, hot aliphatic amines, ethylene oxide, propylene oxide, molten sodium, molten potassium, anhydrous ammonia
Aegis PF128	Inorganic and organic acids (including HF and nitric) aldehydes, ethylene, glycols, organic oils, silicone oils, vinegar, sour HCs, steam, amines, ethylene oxide, propylene oxide	Black liquor, Freon 43, Freon 75, Galden, KEL-F liquid, molten sodium, molten potassium, anhydrous ammonia
Borosilicate (HT/HP probes only)	General high temperature/high pressure applications, hydrocarbons, full vacuum (hermetic), anhydrous ammonia	Steam, hot alkaline solutions, HF acid, media with pH>12, condensate

SITRANS LG200

Selection and Ordering data	Article No.
SITRANS LG200 Transmitter	**7ML1300-**
A guided wave radar transmitter for short and medium range level, level/interface, and volume measurement of liquids and solids, including high temperature and pressure applications, and steam.	■■■ 1 ■ - ■■ A 0
Note: **In addition to the transmitter, please select a probe configuration to complete the SITRANS LG200 (ordered separately).** **For orders of 10 or more, please consult factory.**	
Power	
24 V DC, 2-wire	1
Signal Output	
4 ... 20 mA HART	A
Options	
SIL-1 Approved (FMEDA analysis) SFF = 85.5 %	A
SIL-2 Approved (FMEDA analysis) SFF = 91 %	B
Enclosure/lid	
Aluminum	1
Aluminum with glass window	2
Cable inlet	
2 x ½" NPT, IP65	0
2 x M20x1.5, IP65	1
Approvals (Please select for your region)	
North America	
General Purpose and Intrinsically Safe (CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G T4, Class III); Non-incendive (CSA Class I, Div. 2, Groups A, B, C, D, Class II, Div. 2, Groups E, F, G; FM Class I, Div. 2, Groups A, B, C, D, Class II, Div. 2, Groups F, G)	A
Explosion Proof (CSA/FM Class I, Div. 1, Groups B, C, and D; Class II, Div. 1, Groups E, F, G, T4; Class III); Non-incendive (CSA Class I, Div. 2, Groups A, B, C, D, Class II, Div. 2, Groups E, F, G; FM Class I, Div. 2, Groups A, B, C, D, Class II, Div. 2, Groups F, G)	B
Europe	
General Purpose and Intrinsically Safe (ATEX II 1G EEx ia IIC T4); IECEx Ex ia IIC T4 Ga	C
Explosion Proof (ATEX II 1/2 GD EEx d [ia] IIC T6)	D
Non-sparking [ATEX II 3G EEx nA II/EEx nA (nL) IIC T4 to T6]	E

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 [Available only when ordered in conjunction with a probe (7ML130x-x). Testing requires transmitter with probe.]	**C11**
Operating Instructions	Article No.
English	**7ML1998-5KA02**
French	**7ML1998-5KA11**
German	**7ML1998-5KA32**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	**7ML1998-5XG81**
Accessories	
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**
For applicable back up point level switch - see point level section on page 4/9	

Selection and Ordering data	Article No.
SITRANS LG200 Coaxial Probes	**7ML1301-**
SITRANS LG200 coaxial probes are used in most standard applications. Coaxial probes yield robust signal strength even in extremely low dielectric applications (dK 1.4 ... 100).	■■■■■ - ■■■ 0
Note: **In addition to the probe, please select a transmitter configuration to complete the SITRANS LG200 (ordered separately).** **For orders of 10 or more, please consult factory.**	
Model	
Coaxial[1) 2)]	1
Coaxial, High Temperature/High Pressure[2)3)]	2
Coaxial, High Pressure[2)3)]	3
Coaxial, Overfill/Flooded Cage[1)2)]	4
Coaxial Steam[4)5)]	5
Coaxial, Interface[1)2)]	6
Material of Construction	
316/316L (1.4401/1.4404) stainless steel probe and process connection	A
316/316L (1.4401/1.4404) stainless steel probe ASME B31.1 specifications[6)]	D
Enlarged Coaxial, 316/316L (1.4401/1.4404) stainless steel probe and process connection with PEEK Spacers[7)]	E
316/316L (1.4401/1.4404) stainless steel probe and process connection with PEEK HT spacers dk ≥ 1.4[8)]	H
316/316L (1.4401/1.4404) stainless steel probe and process connection with Teflon spacers dk ≥ 2[8)9)]	J
Probe Insertion Length	
Add Order code Y01 and plain text: "Insertion length ... mm"	
Model option 1, 4 and Material of Construction option A, E: 60 ... 100 cm (23.6 ... 39.4 inch)	A 1
Model option 1, 4 and Material of Construction option A, E: 101 ... 200 cm (39.8 ... 78.7 inch)	A 2
Model option 1, 4 and Material of Construction option A, E: 201 ... 300 cm (79.1 ... 118.1 inch)	A 3
Model option 1, 4 and Material of Construction option A, E: 301 ... 400 cm (118.5 ... 157.5 inch)	A 4
Model option 1, 4 and Material of Construction option A, E: 401 ... 500 cm (157.9 ... 196.9 inch)	A 5
Model option 1, 4 and Material of Construction option A,E: 501 ... 610 cm (197.2 ... 240.2 inch)	A 6
Add Order code Y01 and plain text: "Insertion length ... cm"	
Model options 3, 6 with Material of Construction option A: 60 ... 100 cm (23.6 ... 39.4 inch)	B 1
Model options 3, 6 with Material of Construction option A: 101 ... 200 cm (39.8 ... 78.7 inch)	B 2
Model options 3, 6 with Material of Construction option A: 201 ... 300 cm (79.1 ... 118.1 inch)	B 3
Model options 3, 6 with Material of Construction option A: 301 ... 400 cm (118.5 ... 157.5 inch)	B 4
Model options 3, 6 with Material of Construction option A: 401 ... 500 cm (157.9 ... 196.9 inch)	B 5
Model options 3, 6 with Material of Construction option A: 501 ... 610 cm (197.2 ... 240.2 inch)	B 6

Selection and Ordering data	Article No.
SITRANS LG200 Coaxial Probes	**7ML1301-**
SITRANS LG200 coaxial probes are used in most standard applications. Coaxial probes yield robust signal strength even in extremely low dielectric applications (dK 1.4 ... 100).	■■■■■ - ■■■ 0
Add Order code Y01 and plain text: "Insertion length ... cm"	
Model options 3, 6 with Material of Construction option E: 60 ... 100 cm (23.6 ... 39.4 inch)	C 1
Model options 3, 6 with Material of Construction option E: 101 ... 200 cm (39.8 ... 78.7 inch)	C 2
Model options 3, 6 with Material of Construction option E: 201 ... 300 cm (79.1 ... 118.1 inch)	C 3
Model options 3, 6 with Material of Construction option E: 301 ... 400 cm (118.5 ... 157.5 inch)	C 4
Model options 3, 6 with Material of Construction option E: 401 ... 500 cm (157.9 ... 196.9 inch)	C 5
Model options 3, 6 with Material of Construction option E: 501 ... 610 cm (197.2 ... 240.2 inch)	C 6
Add Order code Y01 and plain text: "Insertion length ... cm"	
Model option 2 with Material of Construction options A, E, H, J: 60 ... 100 cm (23.6 ... 39.4 inch)	E 1
Model option 2 with Material of Construction options A, E, H, J: 101 ... 200 cm (39.8 ... 78.7 inch)	E 2
Model option 2 with Material of Construction options A, E, H, J: 201 ... 300 cm (79.1 ... 118.1 inch)	E 3
Model option 2 with Material of Construction options A, E, H, J: 301 ... 400 cm (118.5 ... 157.5 inch)	E 4
Model option 2 with Material of Construction options A, E, H, J: 401 ... 500 cm (157.9 ... 196.9 inch)	E 5
Model option 2 with Material of Construction options A, E, H, J: 501 ... 610 cm (197.2 ... 240.2 inch)	E 6
Add Order code Y01 and plain text: "Insertion length ... cm"	
Model option 5 with Material of Construction options A, D: 60 ... 100 cm (23.6 ... 39.4 inch)	F 1
Model option 5 with Material of Construction options A, D: 101 ... 200 cm (39.8 ... 78.7 inch)	F 2
Model option 5 with Material of Construction options A, D: 201 ... 300 cm (79.1 ... 118.1 inch)	F 3
Model option 5 with Material of Construction options A, D: 301 ... 400 cm (118.5 ... 157.5 inch)	F 4
Model option 5 with Material of Construction options A, D: 401 ... 455 cm (157.9 ... 180 inch)	F 5
O-rings	
Viton	1 1
EPDM (Ethylene Propylene Rubber)	1 2
Kalrez 4079	1 3
HSN (Nitrile)	1 4
Buna-N	1 5
Neoprene	1 6
Chemraz	1 7
Polyurethane	1 8
Aegis PF128 (can be used on steam applications)	2 1
Kalrez 2035	2 2
None (Borosilicate glass seal, not for steam applications)[10)]	2 3

SITRANS LG200

Selection and Ordering data	Article No.
SITRANS LG200 Coaxial Probes	**7ML1301-**
SITRANS LG200 coaxial probes are used in most standard applications. Coaxial probes yield robust signal strength even in extremely low dielectric applications (dK 1.4 ... 100).	■■■■■ - ■■■ 0
Process Connection (Size/Type)	
Threaded	
¾" NPT [(Taper), ANSI/ASME B1.20.1]	A A
G 1" [(BSPP), EN ISO 228-1]	A B
G 2" [(BSPP), EN ISO 228-1][11)]	A C
2" NPT [(Taper), ANSI/ASME B1.20.1][1)]	A D
ASME flanges	
1" 150 lb ASME raised face flange	B A
1" 300 lb ASME raised face flange	B B
1" 600 lb ASME raised face flange	B C
1" 900/1 500 lb ASME raised face flange[10)]	B D
1" 2 500 lb ASME raised face flange[10)]	B E
1" 900/1 500 lb ASME ring joint flange[10)]	B F
1" 2 500 lb ASME ring joint flange[10)]	B G
1½" 150 lb ASME raised face flange	C A
1½" 300 lb ASME raised face flange	C B
1½" 600 lb ASME raised face flange	C C
1½" 900/1 500 lb ASME raised face flange[10)]	C D
1½" 2 500 lb ASME raised face flange[10)]	C E
1½" 600 lb ASME ring joint flange	C F
1½" 900/1 500 lb ASME ring joint flange[10)]	C G
1½" 2 500 lb ASME ring joint flange[10)]	C H
2" 150 lb ASME raised face flange	D A
2" 300 lb ASME raised face flange	D B
2" 600 lb ASME raised face flange	D C
2" 900/1 500 lb ASME raised face flange[10)]	D D
2" 2 500 lb ASME raised face flange[10)]	D E
2" 600 lb ASME ring joint flange	D F
2" 900/1 500 lb ASME ring joint flange[10)]	D G
2" 2 500 lb ASME ring joint flange[10)]	D H
3" 150 lb ASME raised face flange	E A
3" 300 lb ASME raised face flange	E B
3" 600 lb ASME raised face flange	E C
3" 900 lb ASME raised face flange[10)]	E D
3" 1 500 lb ASME raised face flange[10)]	E E
3" 2 500 lb ASME raised face flange[10)]	E F
3" 600 lb ASME ring joint flange	E G
3" 900 lb ASME ring joint flange[10)]	E H
3" 1 500 lb ASME ring joint flange[10)]	E J
3" 2 500 lb ASME ring joint flange[10)]	E K
4" 150 lb ASME raised face flange	F A
4" 300 lb ASME raised face flange	F B
4" 600 lb ASME raised face flange	F C
4" 900 lb ASME raised face flange[10)]	F D
4" 1 500 lb ASME raised face flange[10)]	F E
4" 2 500 lb ASME raised face flange[10)]	F F
4" 600 lb ASME ring type joint flange	F G
4" 900 lb ASME ring type joint flange[10)]	F H
4" 1 500 lb ASME ring type joint flange[10)]	F J
4" 2 500 lb ASME ring type joint flange[10)]	F K

Selection and Ordering data	Article No.
SITRANS LG200 Coaxial Probes	**7ML1301-**
SITRANS LG200 coaxial probes are used in most standard applications. Coaxial probes yield robust signal strength even in extremely low dielectric applications (dK 1.4 ... 100).	■■■■■ - ■■■ 0
EN flanges	
DN 25 PN 16 EN 1092-1 Type A flat faced flange	G A
DN 25 PN 25/40 EN 1092-1 Type A flat faced flange	G B
DN 25 PN 64/100 EN 1092-1 Type B2 raised faced flange	G C
DN 25 PN 160 EN 1092-1 Type B2 raised faced flange[10)]	G D
DN 25 PN 250 EN 1092-1 Type B2 raised faced flange[10)]	G E
DN 25 PN 320 EN 1092-1 Type B2 raised faced flange[10)]	G F
DN 25 PN 400 EN 1092-1 Type B2 raised faced flange[10)]	G G
DN 40 PN 16 EN 1092-1 Type A flat faced flange	H A
DN 40 PN 25/40 EN 1092-1 Type A flat faced flange	H B
DN 40 PN 64/100 EN 1092-1 Type B2 raised faced flange	H C
DN 40 PN 160 EN 1092-1 Type B2 raised faced flange[10)]	H D
DN 40 PN 250 EN 1092-1 Type B2 raised faced flange[10)]	H E
DN 40 PN 320 EN 1092-1 Type B2 raised faced flange[10)]	H F
DN 40 PN 400 EN 1092-1 Type B2 raised faced flange[10)]	H G
DN 50 PN 16 EN 1092-1 Type A flat faced flange	J A
DN 50 PN 25/40 EN 1092-1 Type A flat faced flange	J B
DN 50 PN 64 EN 1092-1 Type B2 raised faced flange	J C
DN 50 PN 100 EN 1092-1 Type B2 raised faced flange	J D
DN 50 PN 160 EN 1092-1 Type B2 raised faced flange[10)]	J E
DN 50 PN 250 EN 1092-1 Type B2 raised faced flange[10)]	J F
DN 50 PN 320 EN 1092-1 Type B2 raised faced flange[10)]	J G
DN 50 PN 400 EN 1092-1 Type B2 raised faced flange[10)]	J H
DN 80 PN 16 EN 1092-1 Type A flat faced flange	K A
DN 80 PN 25/40 EN 1092-1 Type A flat faced flange	K B
DN 80 PN 64 EN 1092-1 Type B2 raised faced flange	K C
DN 80 PN 100 EN 1092-1 Type B2 raised faced flange	K D
DN 80 PN 160 EN 1092-1 Type B2 raised faced flange[10)]	K E
DN 80 PN 250 EN 1092-1 Type B2 raised faced flange[10)]	K F
DN 80 PN 320 EN 1092-1 Type B2 raised faced flange[10)]	K G
DN 80 PN 400 EN 1092-1 Type B2 raised faced flange[10)]	K H

Selection and Ordering data	Article No.
SITRANS LG200 Coaxial Probes	**7ML1301-**
SITRANS LG200 coaxial probes are used in most standard applications. Coaxial probes yield robust signal strength even in extremely low dielectric applications (dK 1.4 ... 100).	■■■■■ - ■■■ **0**
DN 100 PN 16 EN 1092-1 Type A flat faced flange	**L A**
DN 100 PN 25/40 EN 1092-1 Type A flat faced flange	**L B**
DN 100 PN 64 EN 1092-1 Type B2 raised faced flange	**L C**
DN 100 PN 100 EN 1092-1 Type B2 raised faced flange	**L D**
DN 100 PN 160 EN 1092-1 Type B2 raised faced flange[10)]	**L E**
DN 100 PN 250 EN 1092-1 Type B2 raised faced flange[10)]	**L F**
DN 100 PN 320 EN 1092-1 Type B2 raised faced flange[10)]	**L G**
DN 100 PN 400 EN 1092-1 Type B2 raised faced flange[10)]	**L H**
Fisher torque tube flange, carbon steel (249B)	**M A**
Fisher torque tube flange, 316 stainless steel (249C)	**M B**
Masoneilan torque tube flange, carbon steel	**M C**
Masoneilan torque tube flange, 316 stainless steel	**M D**

1) Not available with O-ring option 21 (type Aegis PF128)

2) Consult factory for these options in Hastelloy C or Monel

3) Available with O-ring option 23 only (none)

4) Coaxial steam probe must be used with O-ring option 21 only (type Aegis PF128)

5) Available with Material of Construction option A and D only [316/316L (1.4401/1.4404) stainless steel]

6) Available with Model option 5 only (coaxial steam probe)

7) 2" or DN 50 minimum Process Connection and available with PEEK Spacers for temperature maximum 345 °C (650 °F)

8) Used with Model option 2 only (coaxial High Temperature/High Pressure probe)

9) Process temperature maximum 345 °C (650 °F)

10) Available with model options 2, 3, and 5 only (High Temperature/ High Pressure, High Pressure, and Steam probes only)

11) Available with Material of Construction option E only (enlarged coaxial probe)

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. 610 cm (240.2 inch)	**Y01**
Stainless steel tag. Measuring-point number/ identification (max. 27 characters); specify in plain text	**Y15**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Manufacturer's test report (Hydrostatic Test)	**C18**
NACE MR-0175 materials traceability	**D07**
Operating Instructions	Article No.
English	**7ML1998-5KA02**
French	**7ML1998-5KA11**
German	**7ML1998-5KA32**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	**7ML1998-5XG81**
Accessories	
Kit, spacer coax probe with parts	**A5E03523523**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

Continuous level measurement – Guided wave radar transmitters

SITRANS LG200

Selection and Ordering data	Article No.
SITRANS LG200 Twin Rod Probes	**7ML1302-**
SITRANS LG200 twin rod probes are used in applications where coating and buildup are possible. Used in application with dielectric constant ≥1.9.	■■■■■ - ■■■ 0
Note: **In addition to the probe, please select a transmitter configuration to complete the SITRANS LG200 (ordered separately).** **For orders of 10 or more, please consult factory.**	
Model	
Twin rigid rod	1
Flexible twin rod bulk solids probe[1]	2
Flexible twin rod probe[2]	3
Material of Construction	
316/316L (1.4401/1.4404) stainless steel probe and process connection	A
Process Connection (size/type)	
2" NPT [(Taper), ANSI/ASME B1.20.1]	A 1
G 2" [(BSPP), EN ISO 228-1]	A 2
2" 150 lb ASME raised face flange[3]	A 3
2" 300 lb ASME raised face flange[3]	B 1
3" 150 lb ASME raised face flange	B 2
2" 600 lb ASME raised face flange	B 3
3" 300 lb ASME raised face flange	C 1
4" 150 lb ASME raised face flange	C 2
3" 600 lb ASME raised face flange	C 3
4" 300 lb ASME raised face flange	D 1
DN 50 PN 16 EN 1092-1 Type A flat faced flange	D 2
4" 600 lb ASME raised face flange	D 3
DN 50 PN 25/40 EN 1092-1 Type A flat faced flange	E 1
DN 80 PN 16 EN 1092-1 Type A flat faced flange	E 2
DN 80 PN 25/40 EN 1092-1 Type A flat faced flange	E 3
DN 100 PN 16 EN 1092-1 Type A flat faced flange	E 4
DN 100 PN 25/40 EN 1092-1 Type A flat faced flange	E 5
Fisher Torque Tube flange, 316 stainless steel (249C)	F 1
Masoneilan Torque Tube flange, 316 stainless steel	G 1
Carbon steel	
Fisher Torque Tube flange, Carbon steel (249B)	K 1
Masoneilan Torque Tube flange, Carbon steel	L 1
O-ring	
Viton	1 1
EPDM (Ethylene Propylene Rubber)	1 2
Kalrez 4079	1 3
HSN (Nitrile)	1 4
Buna-N	1 5
Neoprene	1 6
Chemraz	1 7
Polyurethane	1 8
Aegis PF128	2 1
Kalrez 2035	2 2
Probe Insertion Length	
Add Order code Y01 and plain text: "Insertion length ... cm"	
Model option 1 and Material of Construction option A: 60 ... 100 cm (23.6 ... 39.4 inch)	A A
Model option 1 and Material of Construction option A: 101 ... 200 cm (39.8 ... 78.7 inch)	A B
Model option 1 and Material of Construction option A: 201 ... 300 cm (79.1 ... 118.1 inch)	A C

Selection and Ordering data	Article No.
SITRANS LG200 Twin Rod Probes	**7ML1302-**
SITRANS LG200 twin rod probes are used in applications where coating and buildup are possible. Used in application with dielectric constant ≥1.9.	■■■■■ - ■■■ 0
Model option 1 and Material of Construction option A: 301 ... 400 cm (118.5 ... 157.5 inch)	A D
Model option 1 and Material of Construction option A: 401 ... 500 cm (157.9 ... 196.9 inch)	A E
Model option 1 and Material of Construction option A: 501 ... 610 cm (197.2 ... 240.2 inch)	A F
Standard lengths[4]	
Model option 2,3 and Material of Construction option A: 1 m (39.4 inch)	E A
Model option 2,3 and Material of Construction option A: 2 m (78.7 inch)	E B
Model option 2,3 and Material of Construction option A: 3 m (118.1 inch)	E C
Model option 2,3 and Material of Construction option A: 4 m (157.5 inch)	E D
Model option 2,3 and Material of Construction option A: 5 m (196.9 inch)	E E
Model option 2,3 and Material of Construction option A: 6 m (236.2 inch)	E F
Model option 2,3 and Material of Construction option A: 7 m (275.6 inch)	E G
Model option 2,3 and Material of Construction option A: 8 m (315.0 inch)	E H
Model option 2,3 and Material of Construction option A: 9 m (354.3 inch)	E J
Model option 2,3 and Material of Construction option A: 10 m (393.7 inch)[2,3]	E K
Model option 2,3 and Material of Construction option A: 11 m (433.1 inch)[2,3]	E L
Model option 2,3 and Material of Construction option A: 12 m (472.4 inch)[2,3]	E M
Model option 2,3 and Material of Construction option A: 13 m (511.8 inch)[2,3]	E N
Model option 2,3 and Material of Construction option A: 14 m (551.2 inch)[2,3]	E P
Model option 2,3 and Material of Construction option A: 15 m (590.6 inch)[2,3]	E Q
Model option 2,3 and Material of Construction option A: 16 m (629.9 inch)[2,3]	E R
Model option 2,3 and Material of Construction option A: 17 m (669.3 inch)[2,3]	E S
Model option 2,3 and Material of Construction option A: 18 m (708.7 inch)[2,3]	E T
Model option 2,3 and Material of Construction option A: 19 m (748.0 inch)[2,3]	E U
Model option 2,3 and Material of Construction option A: 20 m (787.4 inch)[2,3]	E V
Model option 2,3 and Material of Construction option A: 21 m (826.8 inch)[2,3]	E W
Model option 2,3 and Material of Construction option A: 22.5 m (885.8 inch)[2,3]	E X

1) Available with O-ring 11 only

2) When used with model option 3, not suitable for dk<5

3) Available with model option 1 only

4) No Y01 needed in Order code

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. 610 cm (240.2 inch)	**Y01**
Stainless steel tag. Measuring-point number/ identification (max. 27 characters); specify in plain text	**Y15**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Manufacturer's test report (Hydrostatic Test)	**C18**
NACE MR-0175 materials traceability	**D07**
Operating Instructions	Article No.
English	**7ML1998-5KA02**
French	**7ML1998-5KA11**
German	**7ML1998-5KA32**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	**7ML1998-5XG81**
Accessories	
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

SITRANS LG200

Selection and Ordering data	Article No.
SITRANS LG200 Single Rod Rigid Probes	**7ML1303-**
SITRANS LG200 single rod rigid probes are used in applications where coating and buildup are likely. Used in applications with dielectric constant ≥10, or dk >1.9 when installed within 2 ... 6 inch of a metal tank wall or in cage or bridle.	■■■■■ - ■■■ 0
Note: **In addition to the probe, please select a transmitter configuration to complete the SITRANS LG200 (ordered separately).** **For orders of 10 or more, please consult factory.**	
Model	
Single rod rigid probe[1)]	1
High Temperature/High Pressure Single rod[2)3)]	2
Material of Construction	
316/316L (1.4401/1.4404) stainless steel probe and process connection	A
316/316L (1.4401/1.4404) stainless steel sanitary probe and process connection[1)4)]	D
PFA faced-flange and rod insulation, all PFA wetted parts (316 stainless steel rod)[1)5)]	E
316 AL6XN stainless steel sanitary probe and process connection[1)6)]	F
PFA rod insulation (316 stainless steel rod and process connection)	J
Process Connection (size/type)	
1 or 1½" Tri-Clover 16 amp sanitary fitting[7)]	A 1
2" NPT [(Taper), ANSI/ASME B1.20.1][8)]	A 2
G 2" [(BSPP), EN ISO 228-1][8)]	A 3
2" 150 lb ASME raised face flange[8)]	A 4
2" 300 lb ASME raised face flange[8)]	A 5
2" Tri-Clover 16 amp sanitary fitting[7)]	A 6
¾" Tri-Clover 16 amp sanitary fitting[7) 9)]	A 7
2½" Tri-Clover 16 amp sanitary fitting[7)]	B 0
3" 150 lb ASME raised face flange[8)]	B 1
3" 300 lb ASME raised face flange[8)]	B 2
3" Tri-Clover 16 amp sanitary fitting[7)]	B 3
4" 150 lb ASME raised face flange[8)]	C 1
4" 300 lb ASME raised face flange[8)]	C 2
4" Tri-Clover 16 amp sanitary fitting[7)]	C 3
DN 50, PN 16, EN 1092-1 Type A flat faced flange[8)]	D 1
DN 50, PN 25/40, EN 1092-1 Type A flat faced flange[8)]	D 2
DN 80, PN 16, EN 1092-1 Type A flat faced flange[8)]	D 3
DN 80, PN 25/40, EN 1092-1 Type A flat faced flange[8)]	D 4
DN 100, PN 16, EN 1092-1 Type A flat faced flange[8)]	D 5
DN 100, PN 25/40, EN 1092-1 Type A flat faced flange[8)]	D 6

Selection and Ordering data	Article No.
SITRANS LG200 Single Rod Rigid Probes	**7ML1303-**
SITRANS LG200 single rod rigid probes are used in applications where coating and buildup are likely. Used in applications with dielectric constant ≥10, or dk >1.9 when installed within 2 ... 6 inch of a metal tank wall or in cage or bridle.	■■■■■ - ■■■ 0
AL6XN[10)]	
¾" Tri-Clover 16 amp sanitary fitting[9)10)]	E 0
1½" Tri-Clover 16 amp sanitary fitting[10)]	E 1
2" Tri-Clover 16 amp sanitary fitting[10)]	E 2
2½" Tri-Clover 16 amp sanitary fitting[10)]	E 3
3" Tri-Clover 16 amp sanitary fitting[10)]	F 1
4" Tri-Clover 16 amp sanitary fitting[10)]	G 1
PFA Coated 316 stainless steel flange[11)]	
2" 150 lb ASME raised face flange[11)]	H 1
2" 300 lb ASME raised face flange[11)]	H 2
3" 150 lb ASME raised face flange[11)]	J 1
3" 300 lb ASME raised face flange[11)]	J 2
4" 150 lb ASME raised face flange[11)]	K 1
4" 300 lb ASME raised face flange[11)]	K 2
DN 50, PN 16, EN 1092-1 Type A flat faced flange[11)]	L 1
DN 50, PN 25/40, EN 1092-1 Type A flat faced flange[11)]	L 2
DN 80, PN 16, EN 1092-1 Type A flat faced flange[11)]	L 3
DN 80, PN 25/40, EN 1092-1 Type A flat faced flange[11)]	L 4
DN 100, PN 16, EN 1092-1 Type A flat faced flange[11)]	L 5
DN 100, PN 25/40, EN 1092-1 Type A flat faced flange[11)]	L 6

Selection and Ordering data	Article No.
SITRANS LG200 Single Rod Rigid Probes	**7ML1303-**
SITRANS LG200 single rod rigid probes are used in applications where coating and buildup are likely. Used in applications with dielectric constant ≥10, or dk >1.9 when installed within 2 ... 6 inch of a metal tank wall or in cage or bridle.	■■■■■ - ■■■ **0**
Higher Pressure rated flanges	
ANSI/ASME	
2" 600 lb ASME raised face flange[8)]	**M 0**
2" 900/1 500 lb ASME raised face flange[12)]	**M 1**
2" 2 500 lb ASME raised face flange[12)]	**M 2**
3" 600 lb ASME raised face flange[8)]	**N 0**
3" 900 lb ASME raised face flange[12)]	**N 3**
3" 1 500 lb ASME raised face flange[12)]	**N 4**
3" 2 500 lb ASME raised face flange[12)]	**N 5**
4" 600 lb ASME raised face flange[8)]	**P 0**
4" 900 lb ASME raised face flange[12)]	**P 3**
4" 1 500 lb ASME raised face flange[12)]	**P 4**
4" 2 500 lb ASME raised face flange[12)]	**P 5**
2" 600 lb ASME ring type joint flange[8)]	**Q 0**
2" 900/1 500 lb ASME ring type joint flange[12)]	**Q 1**
2" 2 500 lb ASME ring type joint flange[12)]	**Q 2**
3" 600 lb ASME ring type joint flange[8)]	**R 0**
3" 900 lb ASME ring type joint flange[12)]	**R 3**
3" 1 500 lb ASME ring type joint flange[12)]	**R 4**
3" 2 500 lb ASME ring type joint flange[12)]	**R 5**
4" 600 lb ASME ring type joint flange[8)]	**S 0**
4" 900 lb ASME ring type joint flange[12)]	**S 3**
4" 1 500 lb ASME ring type joint flange[12)]	**S 4**
4" 2 500 lb ASME ring type joint flange[12)]	**S 5**

Selection and Ordering data	Article No.
SITRANS LG200 Single Rod Rigid Probes	**7ML1303-**
SITRANS LG200 single rod rigid probes are used in applications where coating and buildup are likely. Used in applications with dielectric constant ≥10, or dk >1.9 when installed within 2 ... 6 inch of a metal tank wall or in cage or bridle.	■■■■■ - ■■■ **0**
EN flanges	
DN 50, PN 64, EN 1092-1 Type B2 raised faced flange[8)]	**T 0**
DN 50, PN 100, EN 1092-1 Type B2 raised faced flange[8)]	**T 1**
DN 50, PN 160, EN 1092-1 Type B2 raised faced flange[12)]	**T 2**
DN 50, PN 250, EN 1092-1 Type B2 raised faced flange[12)]	**T 3**
DN 80, PN 64, EN 1092-1 Type B2 raised faced flange[8)]	**U 0**
DN 80, PN 100, EN 1092-1 Type B2 raised faced flange[8)]	**U 1**
DN 80, PN 160, EN 1092-1 Type B2 raised faced flange[12)]	**U 2**
DN 80, PN 250, EN 1092-1 Type B2 raised faced flange[12)]	**U 3**
DN 100, PN 64, EN 1092-1 Type B2 raised faced flange[8)]	**V 0**
DN 100, PN 100, EN 1092-1 Type B2 raised faced lange[8)]	**V 1**
DN 100, PN 160, EN 1092-1 Type B2 raised faced flange[12)]	**V 2**
DN 100, PN 250, EN 1092-1 Type B2 raised faced flange[12)]	**V 3**

SITRANS LG200

Selection and Ordering data	Article No.
SITRANS LG200 Single Rod Rigid Probes	**7ML1303-**
SITRANS LG200 single rod rigid probes are used in applications where coating and buildup are likely. Used in applications with dielectric constant ≥10, or dk >1.9 when installed within 2 ... 6 inch of a metal tank wall or in cage or bridle.	■■■■■ - ■■■ 0
O-ring	
Viton	1 1
EPDM (Ethylene Propylene Rubber)	1 2
Kalrez 4079	1 3
HSN (Nitrile)	1 4
Buna-N	1 5
Neoprene	1 6
Chemraz	1 7
Polyurethane	1 8
Aegis PF128	2 1
Kalrez 2035	2 2
None[1]	2 3
Probe Insertion Length	
Add Order code Y01 and plain text: "Insertion length ... cm"	
Model option 1, 2 and Material of Construction option A: 60 ... 100 cm (23.6 ... 39.4 inch)	A A
Model option 1, 2 and Material of Construction option A: 101 ... 200 cm (39.8 ... 78.7 inch)	A B
Model option 1, 2 and Material of Construction option A: 201 ... 300 cm (79.1 ... 118.1 inch)	A C
Model option 1, 2 and Material of Construction option A: 301 ... 400 cm (118.5 ... 157.5 inch)	A D
Model option 1, 2 and Material of Construction option A: 401 ... 500 cm (157.9 ... 196.9 inch)	A E
Model option 1, 2 and Material of Construction option A: 501 ... 610 cm (197.2 ... 240.2 inch)	A F
Add Order code Y01 and plain text: "Insertion length ... cm"	
Model option 1 and Material of Construction option D: 60 ... 100 cm (23.6 ... 39.4 inch)	B A
Model option 1 and Material of Construction option D: 101 ... 200 cm (39.8 ... 78.7 inch)	B B
Model option 1 and Material of Construction option D: 201 ... 300 cm (79.1 ... 118.1 inch)	B C
Model option 1 and Material of Construction option D: 301 ... 400 cm (118.5 ... 157.5 inch)	B D
Model option 1 and Material of Construction option D: 401 ... 500 cm (157.9 ... 196.9 inch)	B E
Model option 1 and Material of Construction option D: 501 ... 610 cm (197.2 ... 240.2 inch)	B F
Add Order code Y01 and plain text: "Insertion length ... cm"	
Model option 1 and Material of Construction option F: 60 ... 100 cm (23.6 ... 39.4 inch)	C A
Model option 1 and Material of Construction option F: 101 ... 200 cm (39.8 ... 78.7 inch)	C B
Model option 1 and Material of Construction option F: 201 ... 300 cm (79.1 ... 118.1 inch)	C C
Model option 1 and Material of Construction option F: 301 ... 400 cm (118.5 ... 157.5 inch)	C D
Model option 1 and Material of Construction option F: 401 ... 500 cm (157.9 ... 196.9 inch)	C E
Model option 1 and Material of Construction option F: 501 ... 610 cm (197.2 ... 240.2 inch)	C F
Add Order code Y01 and plain text: "Insertion length ... cm"	
Model option 1 and Material of Construction option E: 60 ... 100 cm (23.6 ... 39.4 inch)	D A
Model option 1 and Material of Construction option E: 101 ... 200 cm (39.8 ... 78.7 inch)	D B
Model option 1 and Material of Construction option E: 201 ... 300 cm (79.1 ... 118.1 inch)	D C
Model option 1 and Material of Construction option E: 301 ... 400 cm (118.5 ... 157.5 inch)	D D
Model option 1 and Material of Construction option E: 401 ... 500 cm (157.9 ... 196.9 inch)	D E
Model option 1 and Material of Construction option E: 501 ... 610 cm (197.2 ... 240.2 inch)	D F
Add Order code Y01 and plain text: "Insertion length ... cm"	
Model option 1 and Material of Construction option J: 60 ... 100 cm (23.6 ... 39.4 inch)	E A
Model option 1 and Material of Construction option J: 101 ... 200 cm (39.8 ... 78.7 inch)	E B
Model option 1 and Material of Construction option J: 201 ... 300 cm (79.1 ... 118.1 inch)	E C
Model option 1 and Material of Construction option J: 301 ... 400 cm (118.5 ... 157.5 inch)	E D
Model option 1 and Material of Construction option J: 401 ... 500 cm (157.9 ... 196.9 inch)	E E
Model option 1 and Material of Construction option J: 501 ... 610 cm (197.2 ... 240.2 inch)	E F
Add Order code Y01 and plain text: "Insertion length ... cm" (¾" process connection only)	
Model option 1 and Material of Construction option D and F: 60 ... 100 cm (23.6 ... 39.4 inch)[13]	F A
Model option 1 and Material of Construction option D and F: 101 ... 180 cm (39.8 ... 72 inch)[13]	F B

1) Model option 1 with Material of construction options D, E, F, available with O-ring option 23 only
2) Available with O-ring option 21 only
3) Available with Material of construction option A only
4) Available with Process connection options A1, A6, A7, B0, B3, C3 only
5) Available with Process connection options H1, H2, J1, J2, K1, K2, L1, L2, L3, L4, L5, L6 only.
6) Available with Process connection options E0, E1, E2, E3, F1, G1 only
7) Available with Material of construction option D only
8) Available with Material of construction options A and J only
9) Available with Probe Insertion Length options FA and FB only
10) Available with Material of construction option F only
11) Available with Material of construction option E only
12) Available with Model option 2 only
13) Available with Process connection options A7 and E0 only (¾")

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. 610 cm (240.2 inch)	**Y01**
Stainless steel tag. Measuring-point number/ identification (max. 27 characters); specify in plain text	**Y15**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Manufacturer's test report (Hydrostatic Test)	**C18**
NACE MR-0175 materials traceability	**D07**
Operating Instructions	Article No.
English	**7ML1998-5KA02**
French	**7ML1998-5KA11**
German	**7ML1998-5KA32**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	**7ML1998-5XG81**
Accessories	
TFE bottom spacer/endplate	**7ML1930-1DJ**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

SITRANS LG200

Selection and Ordering data	Article No.
SITRANS LG200 Single Rod Flexible Probes	**7ML1304-**
SITRANS LG200 single rod flexible probes are used in applications where coating and buildup are possible. Used in applications with dielectric constant ≥10 or dk >1.9 when installed within 2 ... 6" of a metal tank wall or in cage or bridle. For solids version only, dk>4.	■■■■■ - ■■■ 0
Note: **In addition to the probe, please select a transmitter configuration to complete the SITRANS LG200 (ordered separately).** **For orders of 10 or more, please consult factory.**	
Model	
Single rod flexible probe	1
Single rod bulk solids flexible probe[1)]	2
Material of Construction	
316/316L (1.4401/1.4404) stainless steel probe and process connection	A
Process Connection (size/type)	
316/316L (1.4401/1.4404)	
2" NPT [(Taper), ANSI/ASME B1.20.1]	A 0
G 2" [(BSPP), EN ISO 228-1]	A 1
2" 150 lb ASME raised face flange	A 2
2" 300 lb ASME raised face flange	A 3
3" 150 lb ASME raised face flange	B 1
3" 300 lb ASME raised face flange	B 2
4" 150 lb ASME raised face flange	C 1
4" 300 lb ASME raised face flange	C 2
DN 50 PN 16 EN 1092-1 Type A flat faced flange	D 1
DN 50 PN 25/40 EN 1092-1 Type A flat faced flange	D 2
DN 80 PN 16 EN 1092-1 Type A flat faced flange	E 1
DN 80 PN 25/40 EN 1092-1 Type A flat faced flange	E 2
DN 100 PN 16 EN 1092-1 Type A flat faced flange	F 1
DN 100 PN 25/40 EN 1092-1 Type A flat faced flange	F 2
O-ring	
Viton	1 1
EPDM (Ethylene Propylene Rubber)	1 2
Kalrez 4079	1 3
HSN (Nitrile)	1 4
Buna-N	1 5
Neoprene	1 6
Chemraz	1 7
Polyurethane	1 8
Aegis PF128	2 1
Kalrez 2035	2 2

Selection and Ordering data	Article No.
SITRANS LG200 Single Rod Flexible Probes	**7ML1304-**
SITRANS LG200 single rod flexible probes are used in applications where coating and buildup are possible. Used in applications with dielectric constant ≥10 or dk >1.9 when installed within 2 ... 6" of a metal tank wall or in cage or bridle. For solids version only, dk>4.	■■■■■ - ■■■ 0
Flexible Rod Length **(To be shortened by customer as required)**	
1 m (39.4 inch)	A A
2 m (78.7 inch)	A B
3 m (118.1 inch)	A C
4 m (157.5 inch)	A D
5 m (196.9 inch)	A E
6 m (236.2 inch)	A F
7 m (275.6 inch)	A G
8 m (315.0 inch)	A H
9 m (354.3 inch)	A J
10 m (393.7 inch)	A K
11 m (433.1 inch)	A L
12 m (472.4 inch)	A M
13 m (511.8 inch)	A N
14 m (551.2 inch)	A P
15 m (590.6 inch)	A Q
16 m (629.9 inch)	A R
17 m (669.3 inch)	A S
18 m (708.7 inch)	A T
19 m (748.0 inch)	A U
20 m (787.4 inch)	A V
21 m (826.8 inch)	A W
22.5 m (885.8 inch)	A X

[1)] Available with O-ring option 1 1 only (others on request)

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag. Measuring-point number/ identification (max. 27 characters); specify in plain text	**Y15**
Operating Instructions	Article No.
English	**7ML1998-5KA02**
French	**7ML1998-5KA11**
German	**7ML1998-5KA32**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	**7ML1998-5XG81**
Accessories	
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

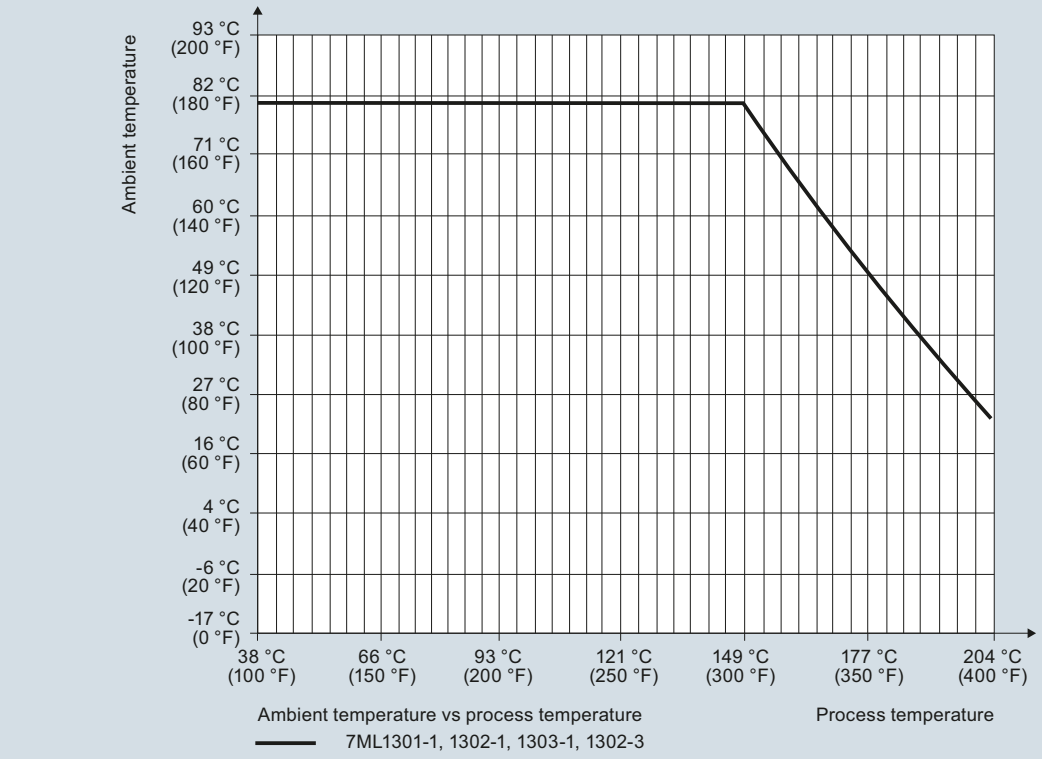
Selection and Ordering data	Article No.
SITRANS LG200 Chamber Replacement Probe Replaces existing aging torque tube transmitters. Proprietary flanges can be used with existing chambers and cages.	**7ML1305-** ■■■■■ - ■■■ 0
Note: **In addition to the probe, please select a transmitter configuration to complete the SITRANS LG200 (ordered separately).** **For this option, please consult factory**	
Model	
Chamber Replacement Probe[1]	**1**
Chamber/Process Connection Material of Construction	
316/316L stainless steel (B31.1 construction)	**A**
Carbon steel (106 Grade B)[2]	**B**
Carbon steel (B31.1 construction)	**C**
Process Connection (size/type)	
1½" NPT [(Taper), ANSI/ASME B1.20.1] thread	**A 0**
1½", 150 lb ASME raised face flange	**A 1**
1½", 300 lb ASME raised face flange	**A 2**
1½", 600 lb ASME raised face flange	**A 3**
1½" Socket weld	**B 1**
2" NPT [(Taper), ANSI/ASME B1.20.1] thread	**B 2**
2", 150 lb ASME raised face flange	**C 1**
2", 300 lb ASME raised face flange	**C 2**
2", 600 lb ASME raised face flange	**D 1**
2" Socket weld	**D 2**
Other flange sizes available. Please consult factory.	
Level Range	
14 inch (0.356 meters)	**1**
Other level ranges available. Please consult factory.	
Process Connection Configuration	
Top In, Bottom Out	**1**
Top In, Bottom Out, with Sight Glass Connections	**2**
Other configurations available. Please consult factory.	
Temperature Range	
316 °C (600 °F) (Dielectric constant ≥ 10)	**A**
260 °C (500 °F) (Dielectric constant ≥ 1.4)	**B**
Chamber Type	
Fisher 249B	**A**
Fisher 259B	**B**
Fisher 249	**C**

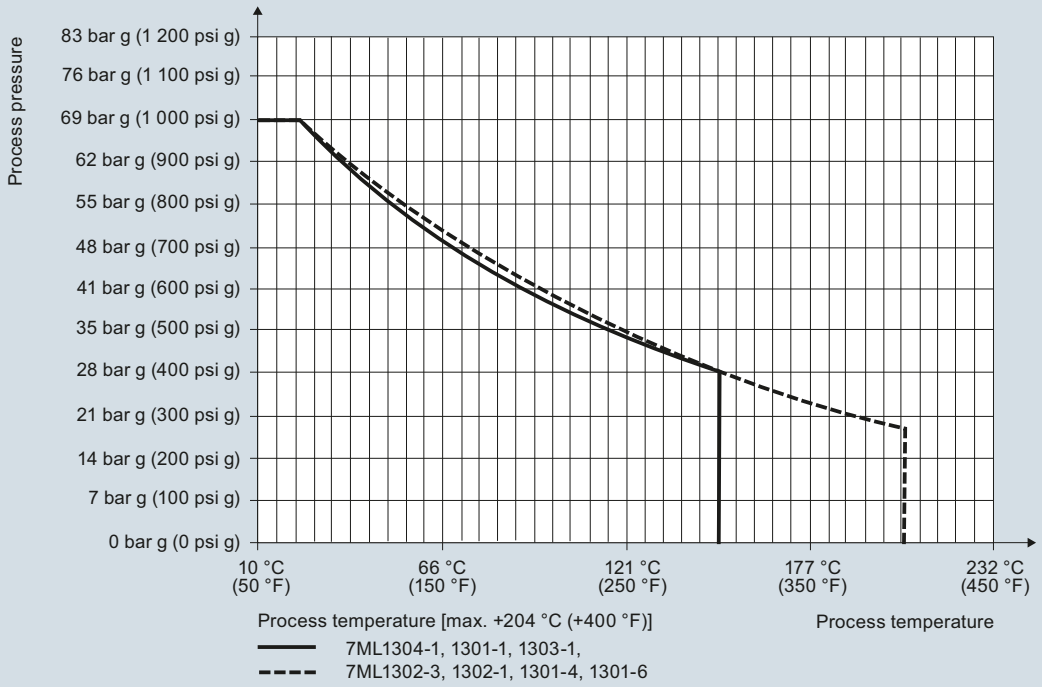
[1] Probe is always 316/316L (1.4401/1.4404) stainless steel construction regardless of chamber and process connection materials.

[2] Available Process Connection Configuration option 1 only

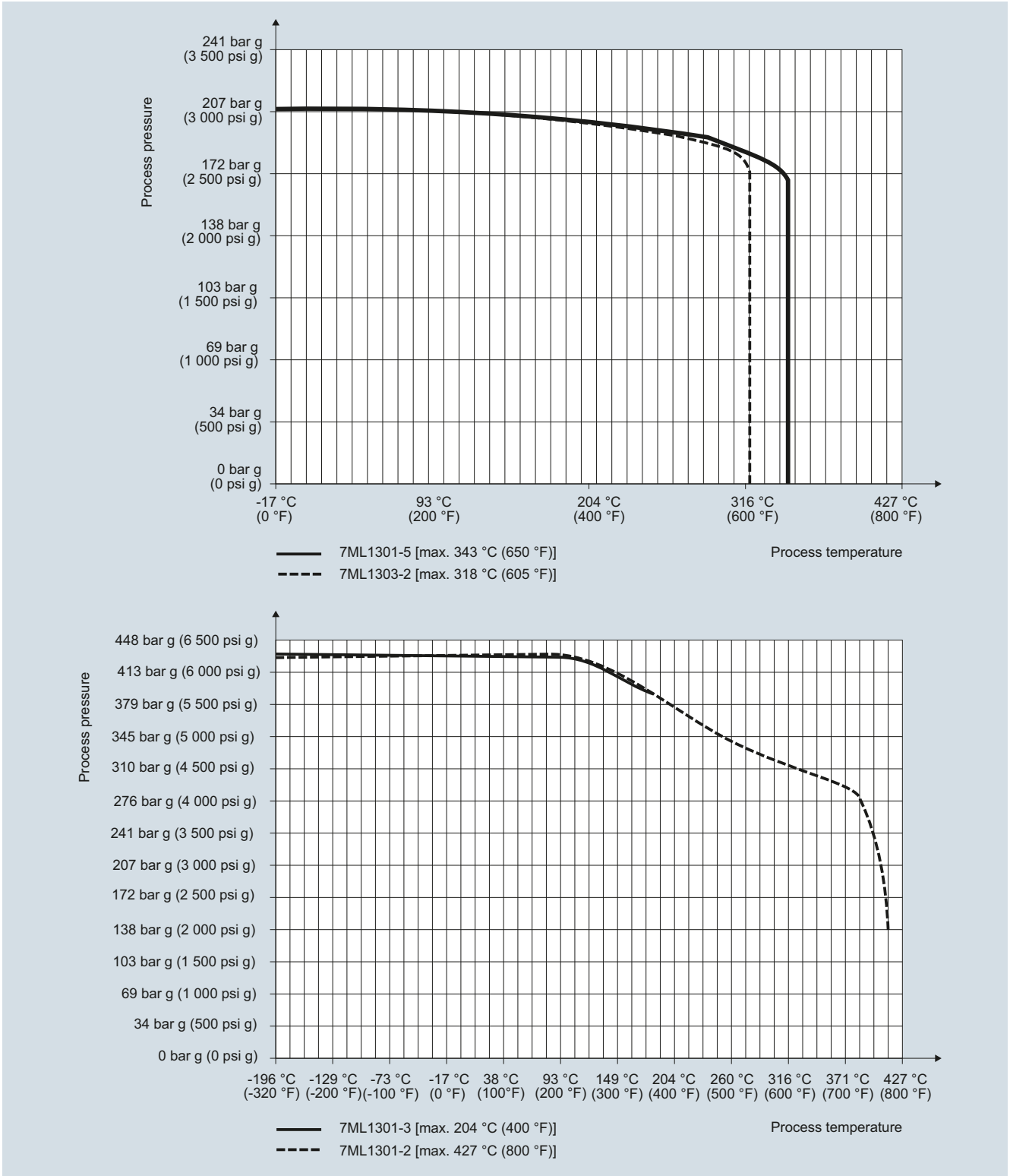
Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Stainless steel tag. Measuring-point number/ identification (max. 27 characters); specify in plain text	**Y15**
Inspection Certificate Type 3.1 per EN 10204	**C12**
NACE MR-0175 materials traceability	**D07**
Operating Instructions	Article No.
English	**7ML1998-5KA02**
French	**7ML1998-5KA11**
German	**7ML1998-5KA32**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	**7ML1998-5XG81**
Accessories	
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

Characteristic curves





SITRANS LG200 Process Pressure/Temperature derating curves

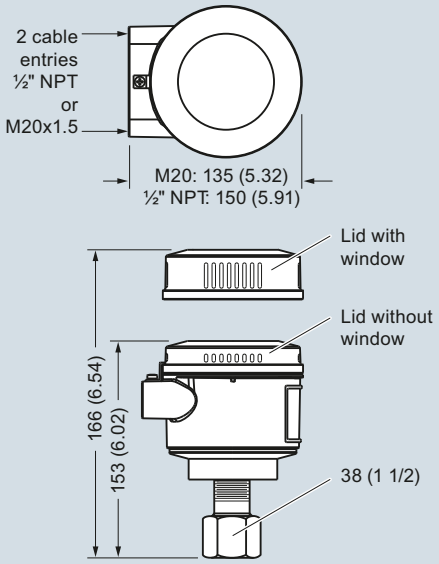


SITRANS LG200 Process Pressure/Temperature derating curves

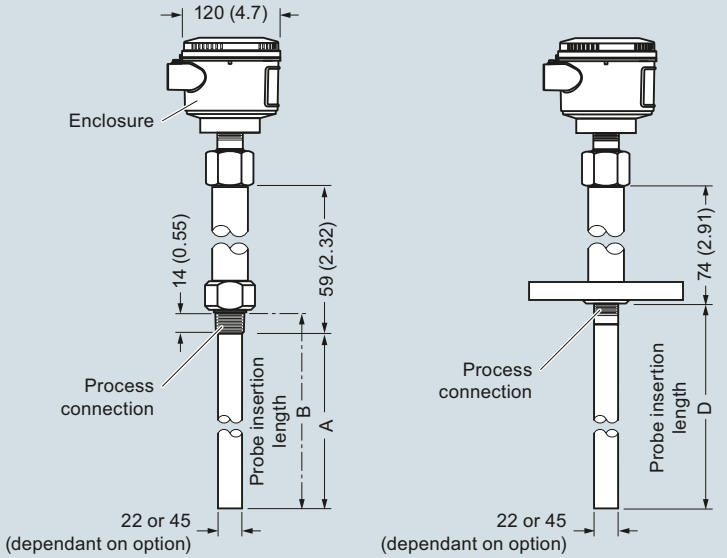
4

Dimensional drawings

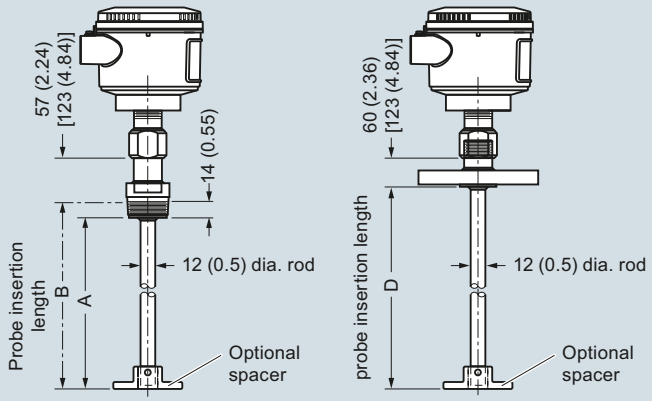
SITRANS LG200 enclosure 7ML1300



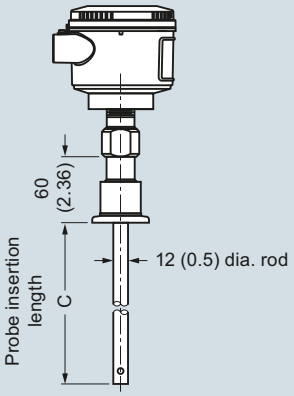
7ML1301-1 (7xA-x) probe, threaded and flanged connection



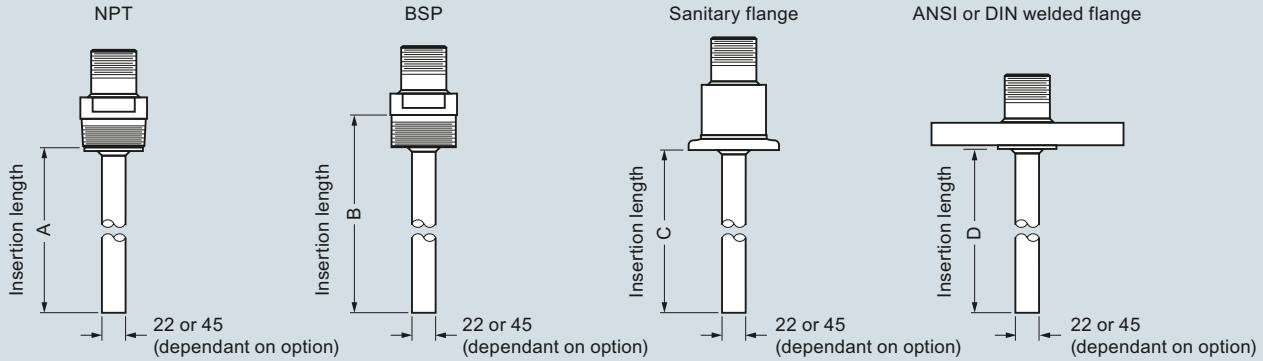
7ML1303-1 (7xF-x) probe, threaded and flanged connection [7ML1303-2 HT Probe (7xJ-x)]



7ML1303-1D (7xF-E) probe, sanitary connection

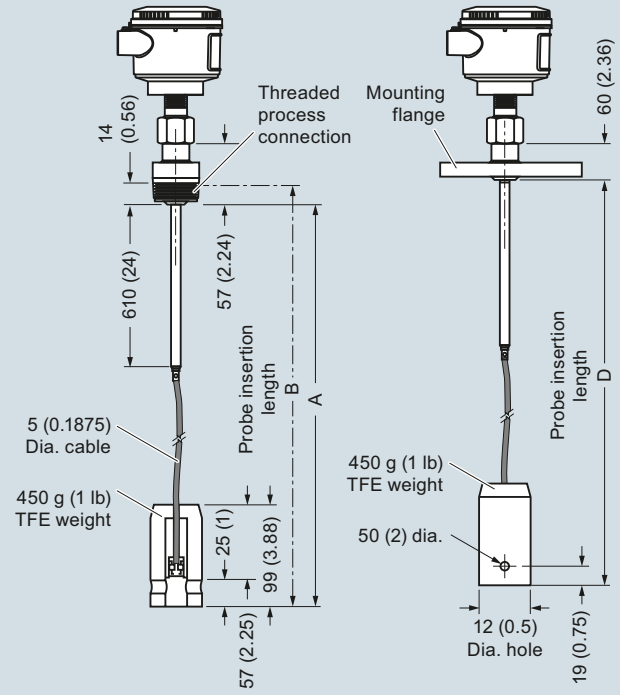


Probe connections and insertion lengths (Note: BSP connections differ from NPT)

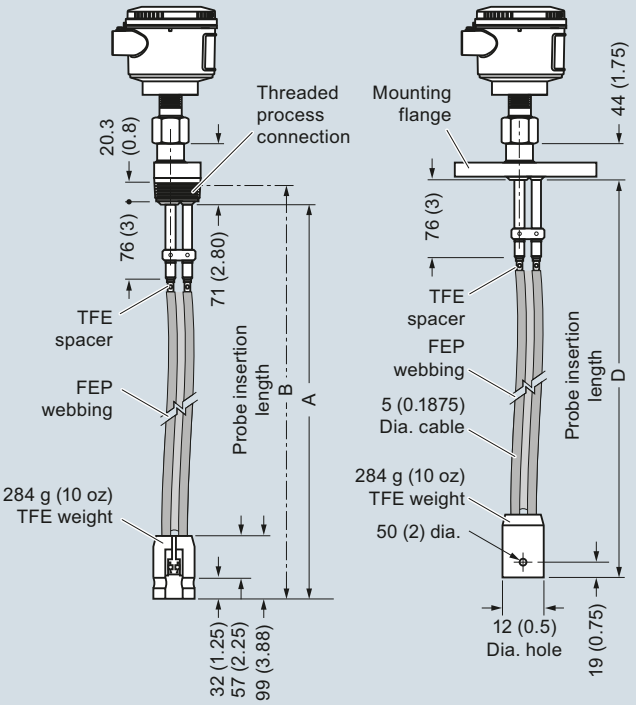


SITRANS LG200 (threaded process connection dimensions shown are NPT connections unless stated otherwise), dimensions in mm (inch)

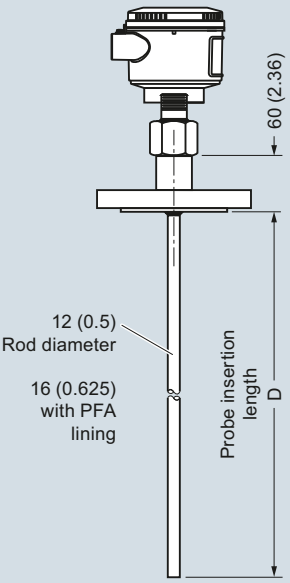
SITRANS LG200
7ML1304-1 (7x1-x) flexible probe, Threaded or flanged connection



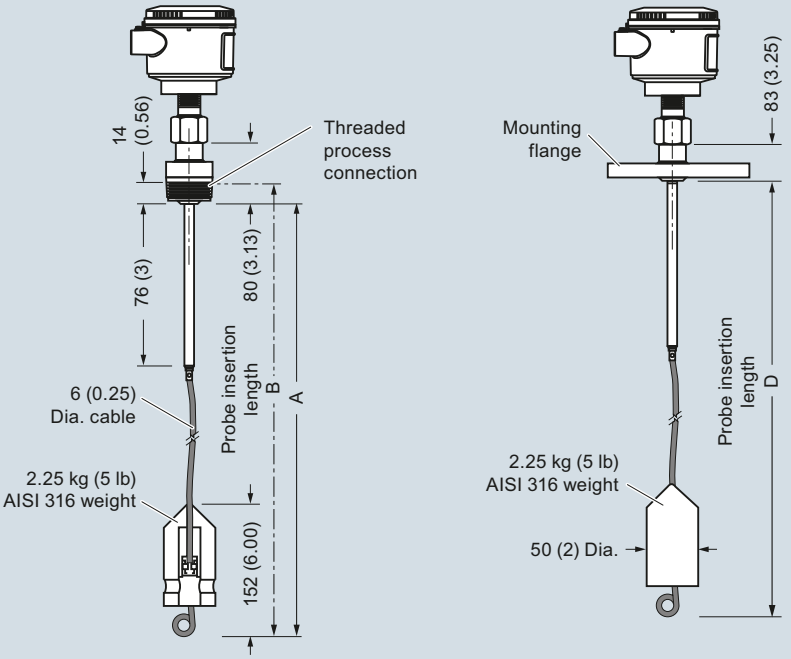
7ML1302-3 (7x7-x) twin rod flexible probe, Threaded or flanged connection



7ML1303-1E (7xF - F) porobe, Flat-faced flanged connection

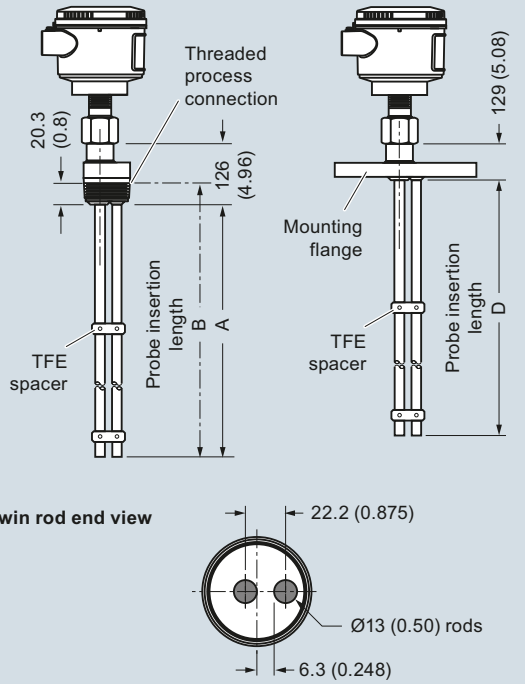


7ML1304-2 (7x2-x) bulk solids flexible probe, Threaded or flanged connection



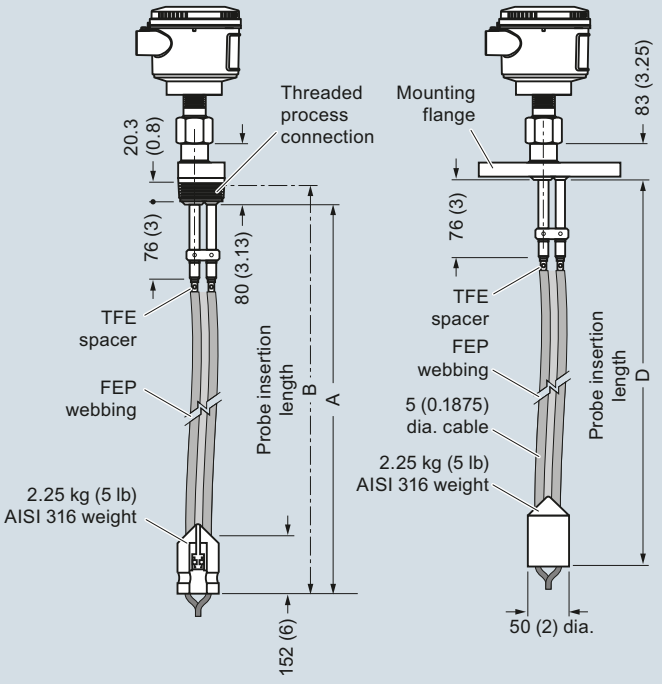
SITRANS LG200 (threaded process connection dimensions shown are NPT connections unless stated otherwise), dimensions in mm (inch)

SITRANS LG200
7ML1302-1 (7xB-x) twin rod probe, threaded and flanged connection

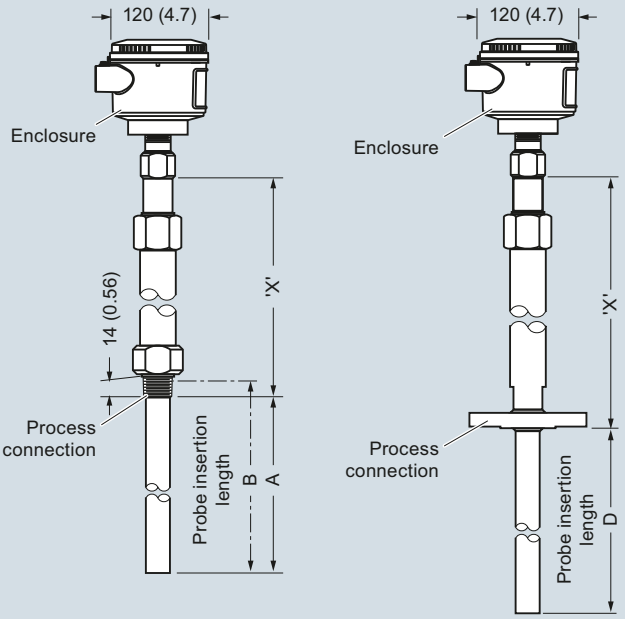


Twin rod end view

7ML1302-2 (7x5-x) twin rod bulk solids flexible probe threaded or flanged connection

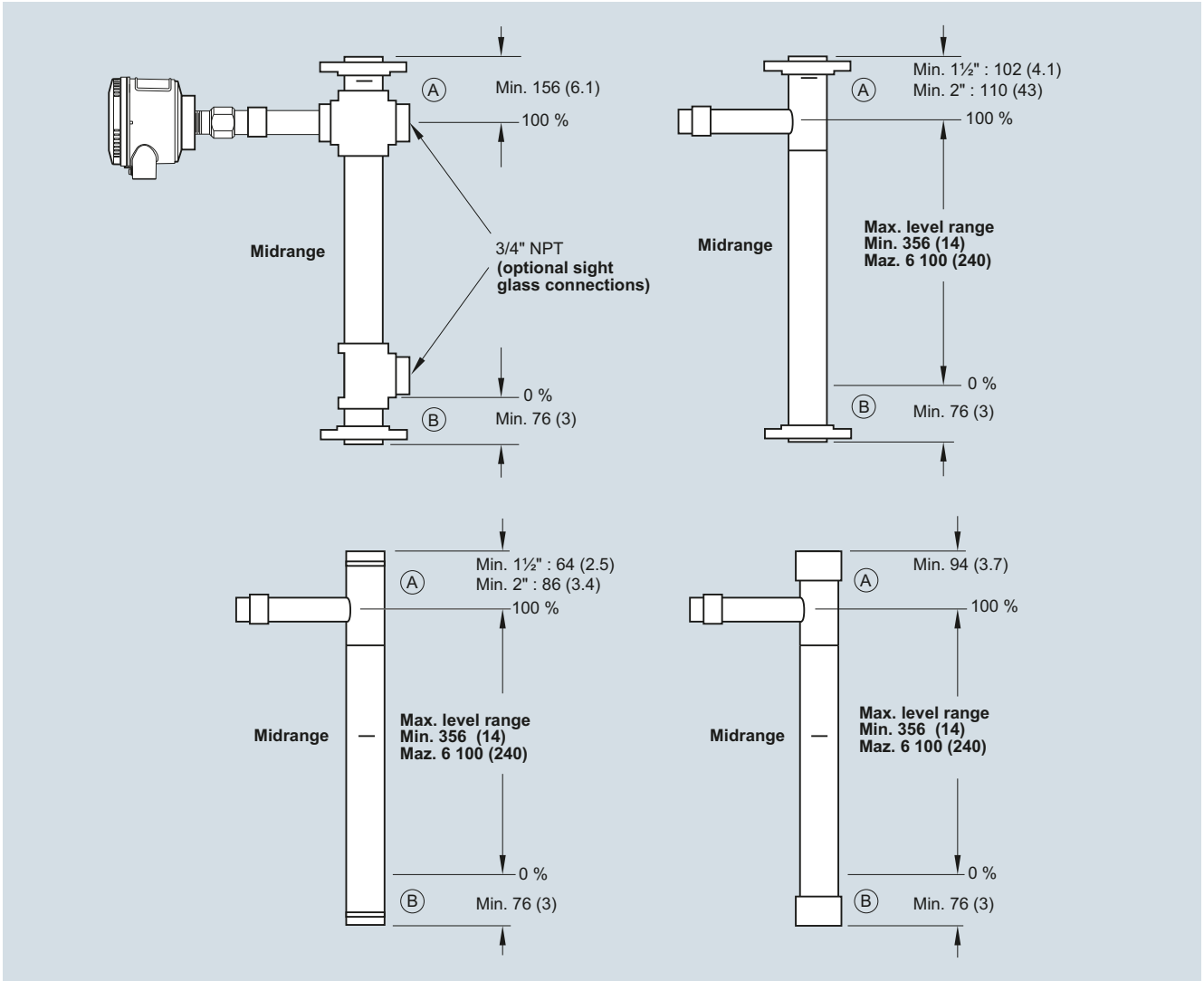


7ML1301-2 (7xD-x), 7ML1301-3 (7xP-x), 7ML1301-4 (7xR-x), 7ML1301-6 (7xT-x), threaded or flanged connection



Probes	'X' Dimension (NPT)	'X' Dimension (flanged)
7ML1301-2 (coaxial HT/HP probe)	217 (8.55)	277 (10.91)
7ML1301-3 (coaxial HP probe)	106 (4.18)	166 (6.54)
7ML1301-4 (coaxial overfill/ flooded cage probe), 7ML1301-6 (coaxial interface probe)	150 (5.89)	167 (6.57)
7ML1301-5 (coaxial HT/ HP steam probe)	180 (7.10)	242 (9.52)

SITRANS LG200 (threaded process connection dimensions shown are NPT connections unless stated otherwise), dimensions in mm (inch)

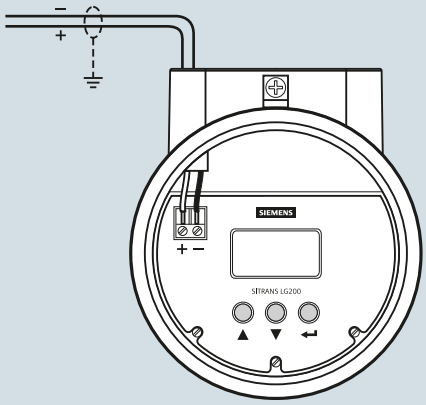


SITRANS LG200 - Model 7ML1305-1 Chamber Replacement Probe, dimensions in mm (inch)

SITRANS LG200

Schematics

SITRANS LG200 general purpose wiring

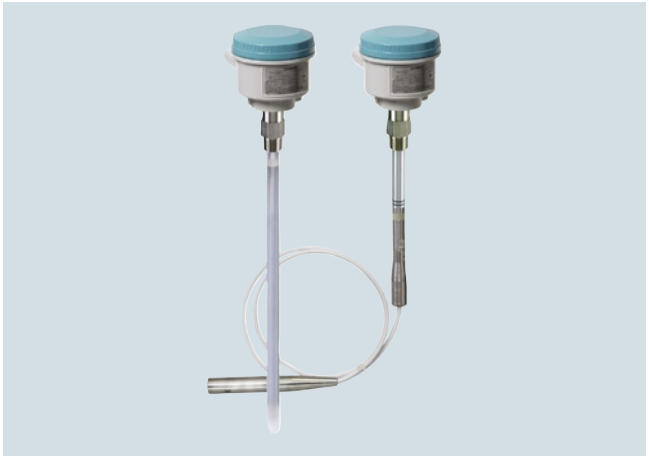


Intrinsically safe wiring
When connecting SITRANS LG200 in Intrinsically safe applications, install an approved IS barrier in the non-hazardous (safe) area.

Explosion proof wiring
When connecting SITRANS LG200 in hazardous areas with explosion hazard, the wiring for the transmitter must be contained in explosion proof conduit extending into the safe area. An explosion proof conduit fitting is not required within 457 mm (18 inch) of the transmitter. An explosion proof conduit fitting is required between the hazardous and safe areas.

SITRANS LG200 connections

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

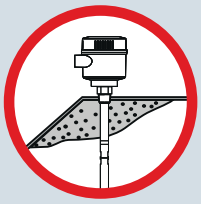
SITRANS LC300 is a 2-wire level measurement instrument combining a sophisticated, yet easy-to-adjust microprocessor with field-proven probes. It is available in four versions: rod, rod with stilling well, cable with PFA insulation, and cable without PFA insulation.

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.

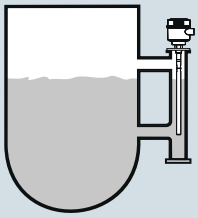
- Key Applications: Conductive and non-conductive media including: liquids and solids in standard industrial processes, bulk solids applications involving dust, and chemical processes involving vapor

Configuration

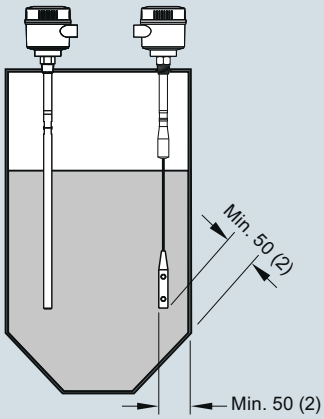
Installation



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



Mounting on a bypass



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

SITRANS LC300 installation, dimensions in mm (inch)

4

SITRANS LC300

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 conditions[1]	
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	¾",1",1¼", 1½" NPT [(Taper), ANSI/ASME B1.20.1] R ¾",1", 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G ¾",1", 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]
• Threaded cable mounting	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]
• Flange mounting	1 ... 4" ASME, DN 25 ... 100
Enclosure cable inlet	2 x ½" 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 ≤ 3.6 or ≥ 21 mA (22 mA)
Certificates and approvals	
General	CE, $CSA_{US/C}$, FM, C-TICK
Dust Ignition Proof (Intrinsically Safe probe circuit)	
• Canada/USA	FM/CSA: Class II, Div. 1, Groups E, F, G Class III T4
• Europe	ATEX 1/2 D T100 °C
Flame Proof (Intrinsically Safe probe circuit)	
• Europe	ATEX II 1/2 G EEx d [ia] IIC T6...T1 ATEX II 1/2 D T100 °C
Explosion Proof (Intrinsically Safe probe circuit)	
• Canada/USA	Class I, Div. 1, Groups A, B, C, D Class II, Div. 1, Groups E, F, G Class III T4
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 4/308.

[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

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**
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]	
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[1]	
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, C-TICK)	**A**
Dust Ignition Proof With IS Probe CE, C-TICK, ATEX II 1/2 D T100 °C	**B**
Flame Proof Enclosure With IS Probe CE, C-TICK, ATEX II 1/2 G EEx d [ia] IIC T6...T1, ATEX II 1/2 D T100 °C	**C**
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.

4

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	Article No.
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 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

Selection and Ordering data	Article No.
SITRANS LC300, stilling well version	**7ML5671-**
An inverse frequency shift capacitance continuous level transmitter for liquid applications.	■■■■■ - ■■■ **0**
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**
Welded flange, 316L stainless steel, raised face[1]	
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[1]	
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, C-TICK)	**A**
Dust Ignition Proof With IS Probe CE, C-TICK, ATEX II 1/2 D T100 °C	**B**
Flame Proof Enclosure With IS Probe CE, C-TICK, ATEX II 1/2 G EEx d [ia] IIC T6 ... T1, ATEX II 1/2 D T100 °C	**C**
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**

Selection and Ordering data	Article No.
SITRANS LC300, stilling well version	**7ML5671-**
An inverse frequency shift capacitance continuous level transmitter for liquid applications.	■■■■■ - ■■■ **0**
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 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

4

Continuous level measurement – Capacitance transmitters

SITRANS LC300

Selection and Ordering data	Article No.
SITRANS LC300, cable version	**7ML5672-**
An inverse frequency shift capacitance continuous level transmitter for non-conductive liquids and solids applications.	■■■■■ - ■■■ 0
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
Welded flange, 316L stainless steel, raised face[1]	
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[1]	
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"	
1 000 ... 2 000 mm (39.37 ... 78.74 inch)	A
2 001 ... 4 000 mm (78.78 ... 157.48 inch)	B
4 001 ... 6 000 mm (157.52 ... 236.22 inch)	C
6 001 ... 8 000 mm (236.26 ... 314.96 inch)	D
8 001 ... 10 000 mm (315.00 ... 393.70 inch)	E
10 001 ... 12 000 mm (393.74 ... 472.44 inch)	F
12 001 ... 14 000 mm (472.48 ... 551.18 inch)	G
14 001 ... 16 000 mm (551.22 ... 629.92 inch)[2]	H
16 001 ... 18 000 mm (629.96 ... 708.66 inch)[2]	J
18 001 ... 20 000 mm (708.70 ... 787.40 inch)[2]	K
20 001 ... 22 000 mm (787.44 ... 866.14 inch)[2]	L
22 001 ... 24 000 mm (866.18 ... 944.88 inch)[2]	M
24 001 ... 25 000 mm (944.92 ... 984.25 inch)[2]	N
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 and 316L stainless steel cable weight, tinned copper crimp, PTFE backing ring, PEEK isolator and PFA lined active shield	0

Selection and Ordering data	Article No.
SITRANS LC300, cable version	**7ML5672-**
An inverse frequency shift capacitance continuous level transmitter for non-conductive liquids and solids applications.	■■■■■ - ■■■ 0
Approvals	
General Safety (CSA, FM, CE, C-TICK)	A
Dust Ignition Proof With IS Probe CE, C-TICK, ATEX II 1/2 D T100 °C	B
Flame Proof Enclosure With IS Probe CE, C-TICK, ATEX II 1/2 G EEx d [ia] IIC T6...T1, ATEX II 1/2 D T100 °C	C
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.

[2] Cable lengths from 15 000 (590.55 inch) to 25 000 mm (984.25 inch) can be used in non-conductive media. Contact Factory for assistance.

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 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 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

SITRANS LC300

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.	■■■■■ - ■■■■
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
Welded flange, 316L stainless steel, raised face[1]	
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[1]	
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"	
1 000 ... 2 000 mm (39.37 ... 78.74 inch)	A
2 001 ... 4 000 mm (78.78 ... 157.48 inch)	B
4 001 ... 6 000 mm (157.52 ... 236.22 inch)	C
6 001 ... 8 000 mm (236.26 ... 314.96 inch)	D
8 001 ... 10 000 mm (315.00 ... 393.70 inch)	E
10 001 ... 12 000 mm (393.74 ... 472.44 inch)	F
12 001 ... 14 000 mm (472.48 ... 551.18 inch)	G
14 001 ... 16 000 mm (551.22 ... 629.92 inch)[2]	H
16 001 ... 18 000 mm (629.96 ... 708.66 inch)[2]	J
18 001 ... 20 000 mm (708.70 ... 787.40 inch)[2]	K
20 001 ... 22 000 mm (787.44 ... 866.14 inch)[2]	L
22 001 ... 24 000 mm (866.18 ... 944.88 inch)[2]	M
24 001 ... 25 000 mm (944.92 ... 984.25 inch)[2]	N
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

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.	■■■■■ - ■■■■
Probe material	
PFA coated cable and 316L stainless steel cable weight, PEEK isolator and PFA lined active shield	1
Approvals	
General Safety (CSA, FM, CE, C-TICK)	A
Dust Ignition Proof With IS Probe CE, C-TICK, ATEX II 1/2 D T100 °C	B
Flame Proof Enclosure With IS Probe CE, C-TICK, ATEX II 1/2 G EEx d [ia] IIC T6...T1, ATEX II 1/2 D T100 °C	C
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
Mounting eye	
Without Mounting eye	0
With mounting eye	1

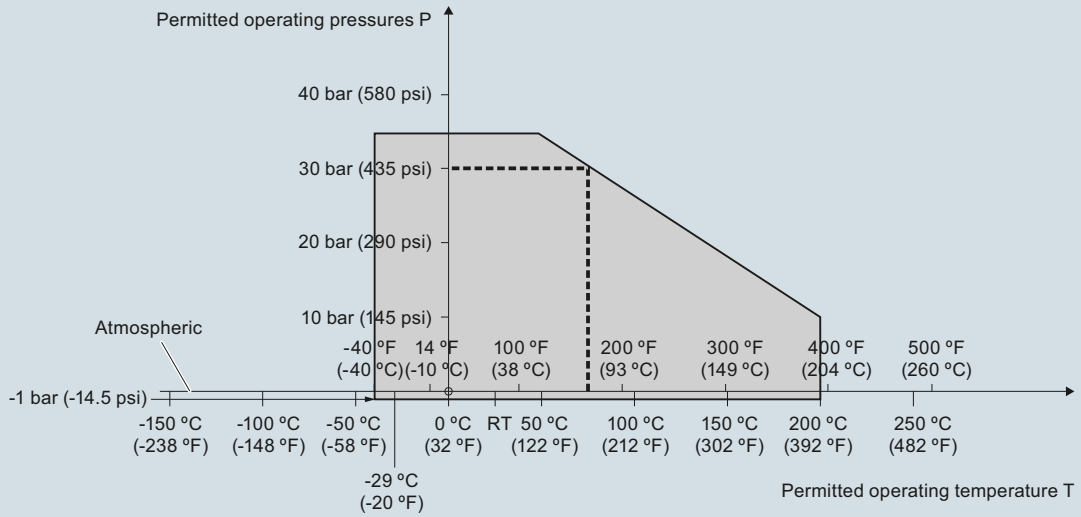
[1] Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.

[2] Cable lengths from 15 000 (590.55 inch) to 25 000 mm (984.25 inch) can be used in non-conductive media. Contact Factory for assistance.

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 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

Characteristic curves

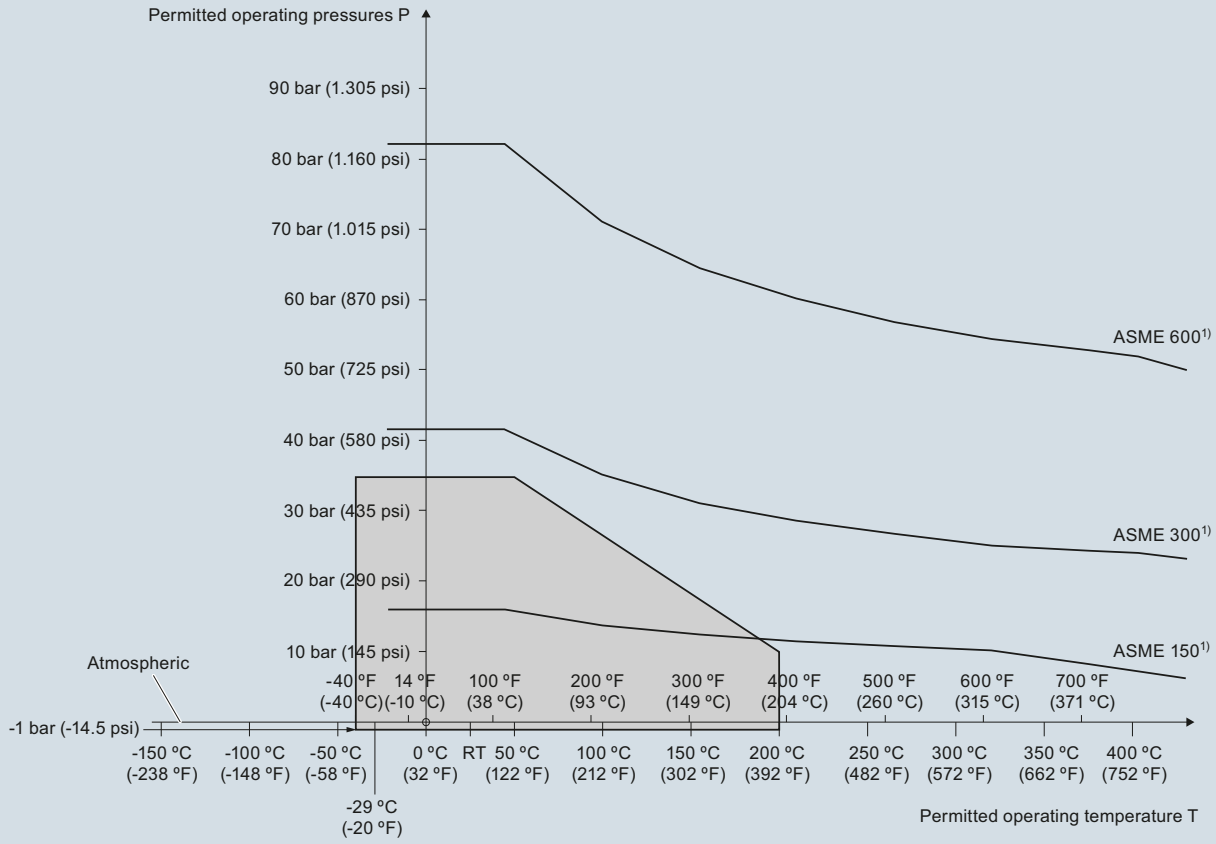
Pressure/temperature curve
LC300 standard, extended rod and cable probes
Threaded process connections
(7ML5670, 7ML5671, 7ML5672 and 7ML5673)



---- Example:
ermitted operating pressure = 30 bar (435 psi) at 75 °C

SITRANS LC300 Process Pressure/Temperature derating curves (7ML5625)

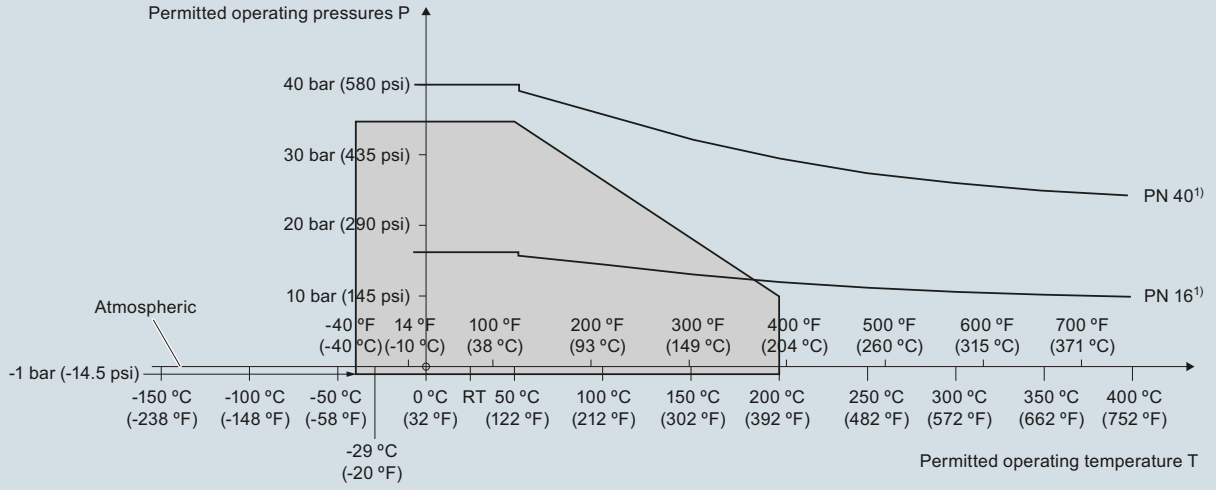
Pressure/temperature curve
LC300 standard, extended rod and cable probes
ASME flanged process connections
(7ML5670, 7ML5671, 7ML5672 and 7ML5673)



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)

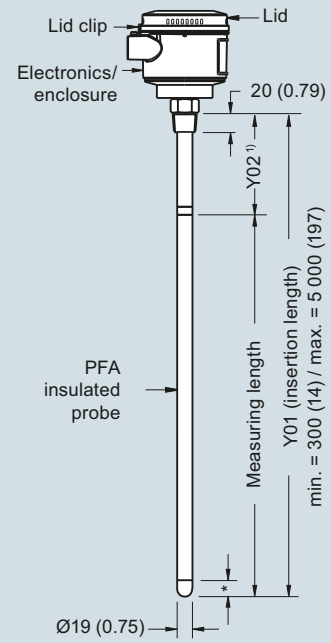


1) The curve denotes the minimum allowable flange class for the shaded area below.

SITRANS LC300 Process Pressure/Temperature derating curves (7ML5626)

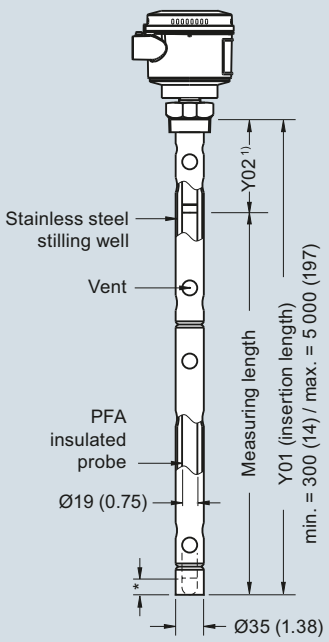
Dimensional drawings

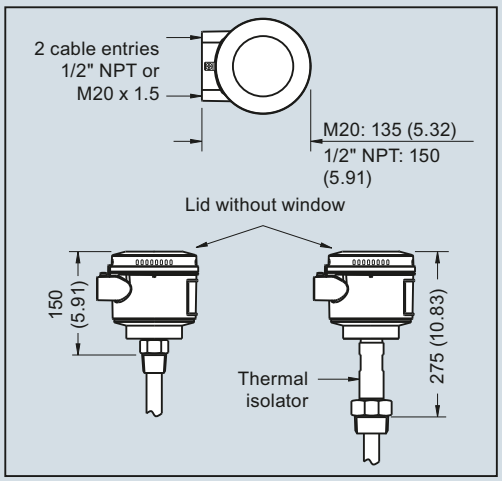
Threaded (7ML5670)



* = 30 (1.18) Inactive tip

Threaded (7ML5671)

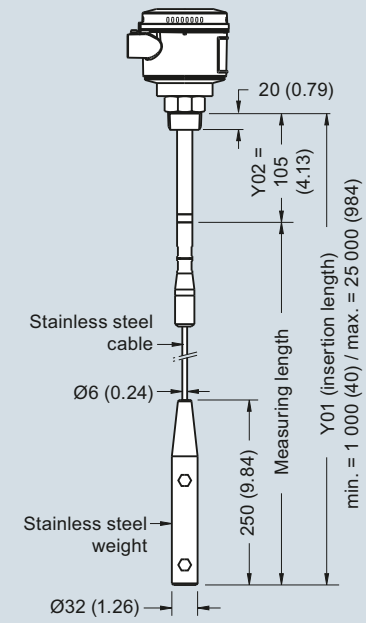




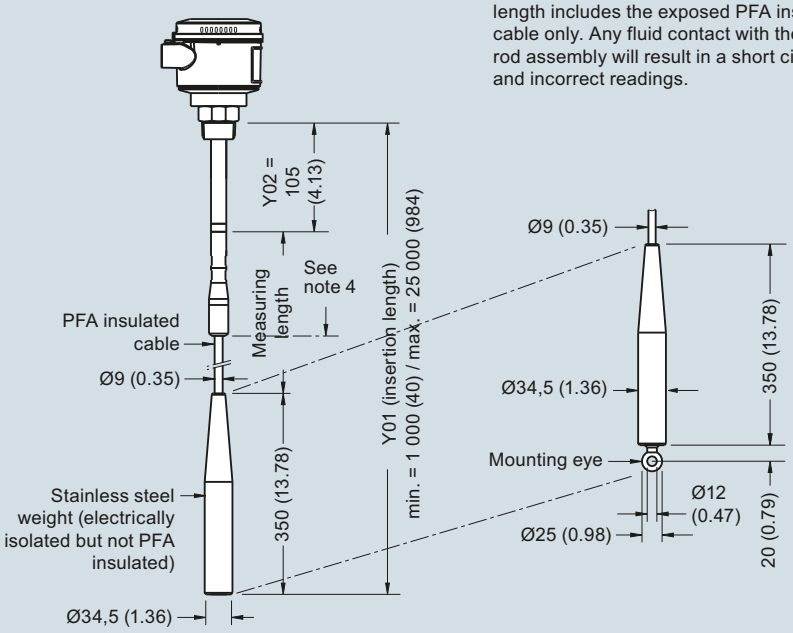
Note:

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-insulated [2]
Threaded (7ML5672)

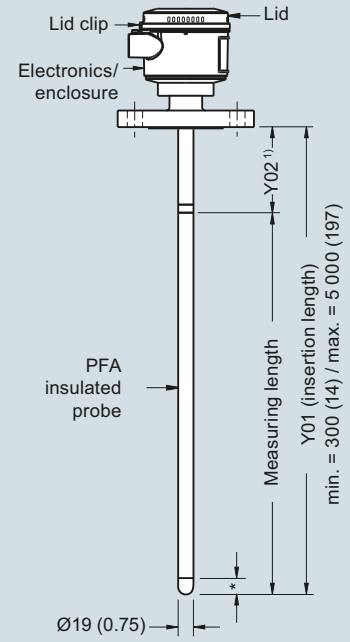


Cable version, insulated [3]
Threaded (7ML5673)



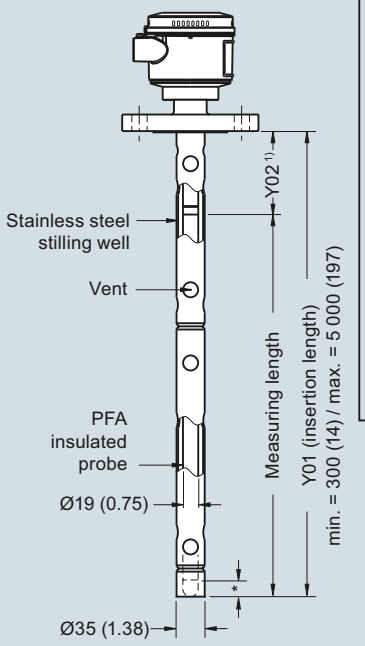
SITRANS LC300 - Threaded Process Connections, dimensions in mm (inch)

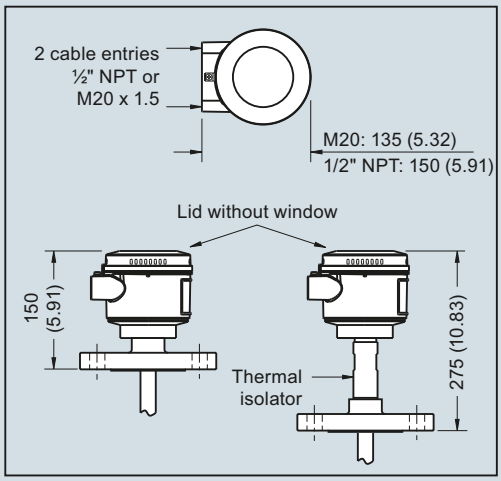
Welded Flange (7ML5670)



* = 30 (1.18) inactive tip

Welded Flange (7ML5671)



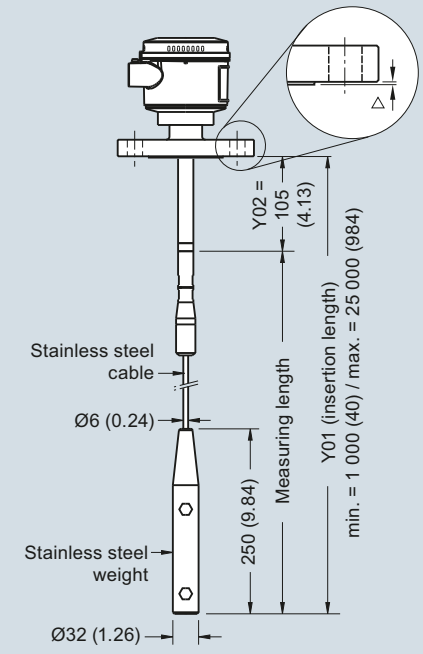


Flange Facing (raised face)	
Flange Class	**Facing thickness**
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/40	2 (0.08)

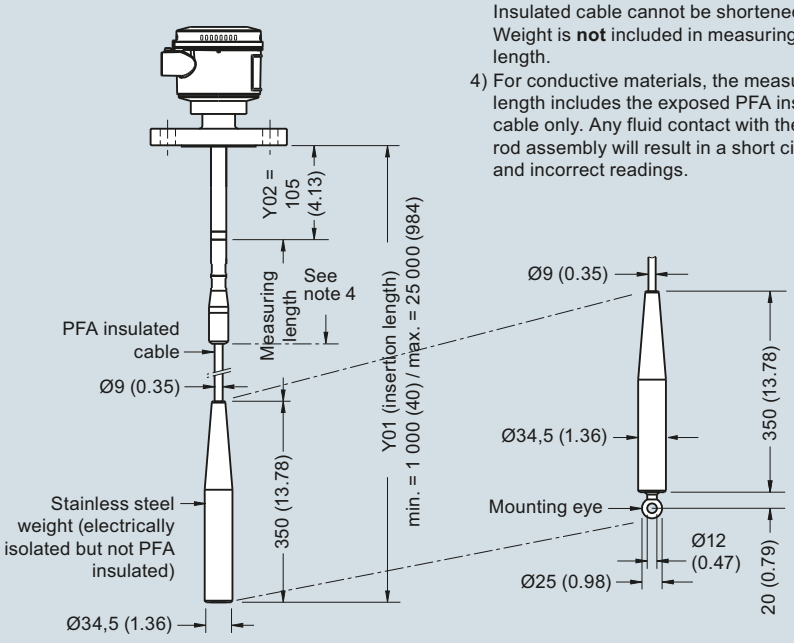
Notes:

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-insulated [2]
Welded Flange (7ML5672)



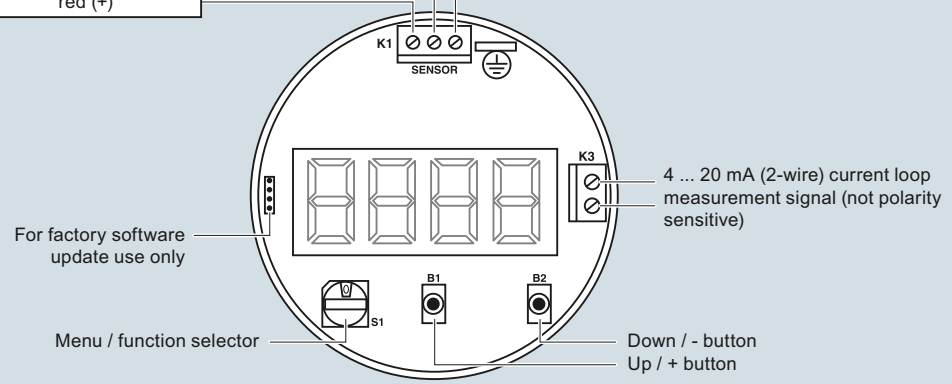
Cable version, insulated [3]
Welded Flange (7ML5673)



SITRANS LC300 - Flanged Process Connections, dimensions in mm (inch)

Schematics

With safety barrier	Without safety barrier
white (S)	orange (S)
black (O)	black (O)
red (+)	red (+)



SITRANS LC300 connections

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.

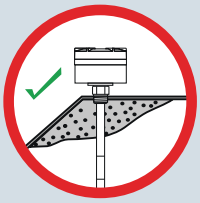
The unique mechanical probe design coupled with a high performance transmitter gives superior performance in toxic and aggressive chemicals, acids, caustics, adhesives and in viscous conductive and non-conductive materials.

The SMART 2-wire transmitter has HART communications for remote commissioning and inspection.

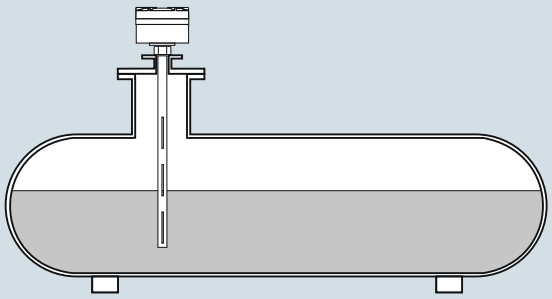
- Key Applications: Oil/water or foam/liquid interface measurement in separators or coalescers, cryogenic applications including $C0_2$ and liquified natural gas (LNG), distillation/regeneration tanks with high temperatures

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	• 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

SITRANS LC500

Rated operating conditions[1]	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature (transmitter)	-40 ... +85 °C (-40 ... +185 °F)[2]
• Installation category	II
• Pollution degree	4
Medium conditions	
• Relative dielectric constant ε_r	Min. 1.5
• Process temperature	Temperature rating of process seal is pressure dependent. See Pressure/Temperature curves on page 4/323.
- Standard (PFA) [3]	-50 ... +200 °C (-58 ... +392 °F)
- Cryogenic version	-200 ... +200 °C (-328 ... +392 °F) Contact ceg.smpi@siemens.com for details.
• Process pressure	Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 4/323.
• Standard (PFA)	-1 ... 150 bar g (2175 psi g)
Design	
Material	
• Wetted parts material	
- Standard rod	316L stainless steel
• 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 code 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" NPT (2 x M20x1.5, IP68 adapter, optional)
• Degree of protection	Type 4X/NEMA4X/IP65, IP68

Power supply	12 ... 33 V DC
User Interface	
Display	Local LCD, 4 digit, each 0 ... 9 and limited alpha characters
Rotary function switch	For selecting programmable menu items
Push buttons	Red +, blue -, used in conjunction with rotary switch for programming
Features	
Measurement current signaling	According to NAMUR NE 43, signal 3.8 ... 20.5 mA, fault ≤ 3.6 or ≥ 21 mA (22 mA)
Safety	• Inputs/outputs fully galvanically isolated • Polarity-insensitive current loop • Fully potted • Integrated safety barrier
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
Function rotary switch	Positions 0 ... 9, A ... F
SMART communication	Conforming to HART Communication Foundation (HCF)
Certificates and approvals	
General Purpose	CE, CSA, FM, C-TICK
Non-incendive/Non-sparking	• CSA/FM Class 1, Div. 2, Groups A, B, C, D T4 ATEX II 3G 2D EEx nA [ib] IIC • T6 ... T4 T100 °C
Dust Ignition Proof (Intrinsically Safe Probe Circuit)	• 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
Explosion Proof (Intrinsically Safe Probe Circuit)	• FM Class 1, Div. 1, Groups A, B, C, D T4 • ATEX II 1/2 GD EEx d [ia] IIC T6 to T1
Marine	Lloyds Register of Shipping, Categories ENV1, ENV2, ENV3 and ENV5, Bureau Veritas

[1] When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 4/323.

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

[3] Not recommended for steam environments

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 parameters[1)]			
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 4/331 for further explanation - Not available as standard

SITRANS LC500

Selection and Ordering data	Article No.
SITRANS LC500, Threaded or Welded Flange with Cable Sensor	**7ML5513-**
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.	■■■■■ - ■■■■
Version[1]	
Cable, 9 mm (0.35 inch) diameter, 316 stainless steel with PFA insulation, weighted	
Add Order code Y01 and plain text: "Insertion length ... mm"	
1 000 ... 2 000 mm (39.37 ... 78.74 inch)	0 E
2 001 ... 4 000 mm (78.78 ... 157.48 inch)	1 E
4 001 ... 6 000 mm (157.52 ... 236.22 inch)	2 E
6 001 ... 8 000 mm (236.26 ... 314.96 inch)	3 E
8 001 ... 10 000 mm (315 ... 393.70 inch)	4 E
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: "Insertion length ... mm"	
1 000 ... 2 000 mm (39.37 ... 78.74 inch)[2]	0 F
2 001 ... 4 000 mm (78.78 ... 157.48 inch)[2][3]	1 F
4 001 ... 6 000 mm (157.52 ... 236.22 inch)[2][3]	2 F
6 001 ... 8 000 mm (236.26 ... 314.96 inch)[2][3]	3 F
8 001 ... 10 000 mm (315 ... 393.70 inch)[2][3]	4 F
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.	
Process connection (316L stainless steel)	
Threaded connection	
1½" NPT [(Taper), ANSI/ASME B1.20.1]	C 0
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	F 0
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	K 0
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	L 0
Welded flange, raised face	
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[3]	D 1
3", ASME, 300 lb[3]	D 2
3", ASME, 600 lb[3]	D 3
4", ASME, 150 lb[3]	E 1
4", ASME, 300 lb[3]	E 2
4", ASME, 600 lb[3]	E 3
6", ASME, 150 lb[3]	F 1
6", ASME, 300 lb[3]	F 2
6", ASME, 600 lb[3]	F 3
Welded flange, Type A flat faced	
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[3]	M 5
DN 100, PN 16[3]	N 4
DN 100, PN 40[3]	N 5
DN 125, PN 16[3]	P 4
DN 125, PN 40[3]	P 5
(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.
SITRANS LC500, Threaded or Welded Flange with Cable Sensor	**7ML5513-**
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.	■■■■■ - ■■■■
Approvals	
General Purpose: CE, CSA, FM, C-TICK, KC	1
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	2
ATEX II 1/2 GD EEx d [ia] IIC T6 ... T1 T 100 °C	4
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 M20x1.5 (IP68, adapter)	2
Options	
No additional options	A
With mounting eye[4]	B
Thermal isolator	
Without thermal isolator	A
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
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) Available with non-conductive media only

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

4) Available in PFA insulated version only

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 4/322**
Accessories	**See page 4/322**

Selection and Ordering data	Article No.
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-** ■■■■■ - ■■■■
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"	
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: "Insertion length ... mm and active shield length ... mm"	
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: "Insertion length ... mm and active shield length ... mm"	
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: "Insertion length ... mm and active shield length ... mm"	
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 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-** ■■■■■ - ■■■■
Welded flange, raised face	
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
Welded flange, Type A flat faced	
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, C-TICK, KC	1
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	2
ATEX II 1/2 GD EEx d [ia] IIC T6 ... T1 T 100 °C	4
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	A
Slotted holes instead of standard vent holes in stilling well (refer to Operating Instructions for dimensions.)[6]	B
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

SITRANS LC500

Selection and Ordering data	Article No.
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-** ■■■■ - ■■■■
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 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

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**
Active shield length, specify in plain text [min. length is 50 mm (2 inch)]: Y02: ... mm	**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**
Manufacturing Test Report (Electrode Test)	**C18**
Operating Instructions	**See page 4/322**
Accessories	**See page 4/322**

Selection and Ordering data	Article No.	
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-**	■■■■■ - ■■■■
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]		**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 (1.34 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)		**0 B**
1 001 ... 2 000 mm (39.41 ... 78.74 inch)		**1 B**
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[2]		**2 B**
3 001 ... 3 500 mm (118.15 ... 137.80 inch)[2]		**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)		**0 C**
1 001 ... 2 000 mm (39.41 ... 78.74 inch)		**1 C**
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[2]		**2 C**
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[2]		**3 C**
4 001 ... 5 000 mm (173.26 ... 196.88 inch)[2]		**4 C**
5 001 ... 5 500 mm (196.89 ... 216.54 inch)[2]		**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)		**0 D**
1 001 ... 2 000 mm (39.41 ... 78.74 inch)[2][3]		**1 D**
2 001 ... 3 000 mm (78.78 ... 118.11 inch)[2][3]		**2 D**
3 001 ... 4 000 mm (118.15 ... 157.48 inch)[2][3]		**3 D**
4 001 ... 5 000 mm (173.26 ... 196.88 inch)[2][3]		**4 D**
5 001 ... 5 500 mm (196.89 ... 216.54 inch)[2][3]		**5 D**
Process connection (316L stainless steel)		
Single piece flange, raised face		
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**	

Selection and Ordering data	Article No.	
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-**	■■■■■ - ■■■■
Single piece flange, Type B1 raised face		
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**
Single piece flange with PTFE flange facing (applicable with versions 0A ... 3A and 0C ... 5C)[4]		
1½" ASME, 150 lb		**B 4**
1½", ASME, 300 lb		**B 5**
1½", ASME, 600 lb		**B 6**
2", ASME, 150 lb		**C 4**
2", ASME, 300 lb		**C 5**
2", ASME, 600 lb		**C 6**
3", ASME, 150 lb[2]		**D 4**
3", ASME, 300 lb[2]		**D 5**
3", ASME, 600 lb[2]		**D 6**
4", ASME, 150 lb[2]		**E 4**
4", ASME, 300 lb[2]		**E 5**
4", ASME, 600 lb[2]		**E 6**
6", ASME, 150 lb[2]		**F 4**
6", ASME, 300 lb[2]		**F 5**
6", ASME, 600 lb[2]		**F 6**
Single piece flange with PTFE flange facing (applicable with versions 0A ... 3A, 0C ... 5C)[4]		
DN 40, PN 16		**K 6**
DN 40, PN 40		**K 7**
DN 50, PN 16		**L 6**
DN 50, PN 40		**L 7**
DN 80, PN 16		**M 6**
DN 80, PN 40[2]		**M 7**
DN 100, PN 16[2]		**N 6**
DN 100, PN 40[2]		**N 7**
DN 125, PN 16[2]		**P 6**
DN 125, PN 40[2]		**P 7**
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.)		

SITRANS LC500

Selection and Ordering data	Article No.
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-** ■■■■ - ■■■■
Approvals	
General Purpose: CE, CSA, FM, C-TICK, KC	**1**
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	**2**
ATEX II 1/2 GD EEx d [ia] IIC T6 ... T1 T 100 °C	**4**
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	
None	**A**
Slotted holes instead of standard vent holes in stilling well (Refer to manual for dimensions)[5]	**B**
Thermal isolator/remote version	
Without thermal isolator	**A**
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[6]	
• Length: 2 m (79 inch)	**C**
• Length: 3 m (118 inch)	**D**
• Length: 4 m (158 inch)	**E**
• Length: 5 m (197 inch)	**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

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**
Active shield length, specify in plain text [min. length is 50 mm (2 inch)]: Y02: ... mm	**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**
Manufacturing Test Report (Electrode Test)	**C18**
Operating Instructions	**See page 4/322**
Accessories	**See page 4/322**

Selection and Ordering data	Article No.
SITRANS LC500, Extended Cable version with Rod Sensor, threaded connection or welded flange[1]	**7ML5523-** ■■■■■ - ■■■■
Inverse frequency shift capacitance level and interface transmitter for short range continuous measurement in large storage vessels.	
Version[2]	
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]	**0 A** ■■■■■ - ■■■■
• 10 001 ... 15 000 mm (393.74 ... 590.55 inch)[1]	**1 A** ■■■■■ - ■■■■
• 15 001 ... 20 000 mm (590.59 ... 787.40 inch)[1]	**2 A** ■■■■■ - ■■■■
• 20 001 ... 25 000 mm (787.44 ... 984.25 inch)[1]	**3 A** ■■■■■ - ■■■■
• 25 001 ... 30 000 mm (984.29 ... 1181.10 inch)[1]	**4 A** ■■■■■ - ■■■■
• 30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)[1]	**5 A** ■■■■■ - ■■■■
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]	**0 B** ■■■■■ - ■■■■
• 10 001 ... 15 000 mm (393.74 ... 590.55 inch)[1]	**1 B** ■■■■■ - ■■■■
• 15 001 ... 20 000 mm (590.59 ... 787.40 inch)[1]	**2 B** ■■■■■ - ■■■■
• 20 001 ... 25 000 mm (787.44 ... 984.25 inch)[1]	**3 B** ■■■■■ - ■■■■
• 25 001 ... 30 000 mm (984.29 ... 1 181.10 inch)[1]	**4 B** ■■■■■ - ■■■■
• 30 001 ... 35 000 mm (1 181.14 ... 1 377.95 inch)[1]	**5 B** ■■■■■ - ■■■■
Process connection (316L stainless steel)	
Threaded connection	
2" NPT [(Taper), ANSI/ASME B1.20.1]	**A 0**
R 2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	**B 0**
G 2" [(BSPP), EN ISO 228-1/PF (JIS-P) JIS B 0202]	**D 0**
Welded flange, raised face	
2", ASME, 150 lb	**C 1**
2", ASME, 300 lb	**C 2**
3", ASME, 150 lb[1]	**D 1**
3", ASME, 300 lb[1]	**D 2**
4", ASME, 150 lb[1]	**E 1**
4", ASME, 300 lb[1]	**E 2**
6", ASME, 150 lb[1]	**F 1**
6", ASME, 300 lb[1]	**F 2**
Welded flange, Type A flat faced	
DN 50, PN 16	**L 4**
DN 50, PN 40	**L 5**
DN 80, PN 16	**M 4**
DN 80, PN 40[1]	**M 5**
DN 100, PN 16[1]	**N 4**
DN 100, PN 40[1]	**N 5**
DN 125, PN 16[1]	**P 4**
DN 125, PN 40[1]	**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, C-TICK, KC	**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	
ATEX II 1/2 GD EEx d [ia] IIC T6 ... T1 T 100 °C	**4**
FM Class I, Div. 1, Groups A, B, C, D T4	**6**

Selection and Ordering data	Article No.
SITRANS LC500, Extended Cable version with Rod Sensor, threaded connection or welded flange[1]	**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 ½" NPT, IP68	**1**
2 x M20x1.5 (IP68, adapter)	**2**
Options	
No additional options	**A**
With mounting eye	**B**
Thermal isolator	
Without thermal isolator	**A**
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**
Electronic output	
2-wire loop current 4 ... 20 mA (transmitter MSP 2002-2 _3300 pF)	**1**

[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 4/331 for further explanation of Y01.

[4] Inactive length is equal to the flexible extension plus transition. See dimension drawings on page 4/331 for further explanation of Y02.

SITRANS LC500

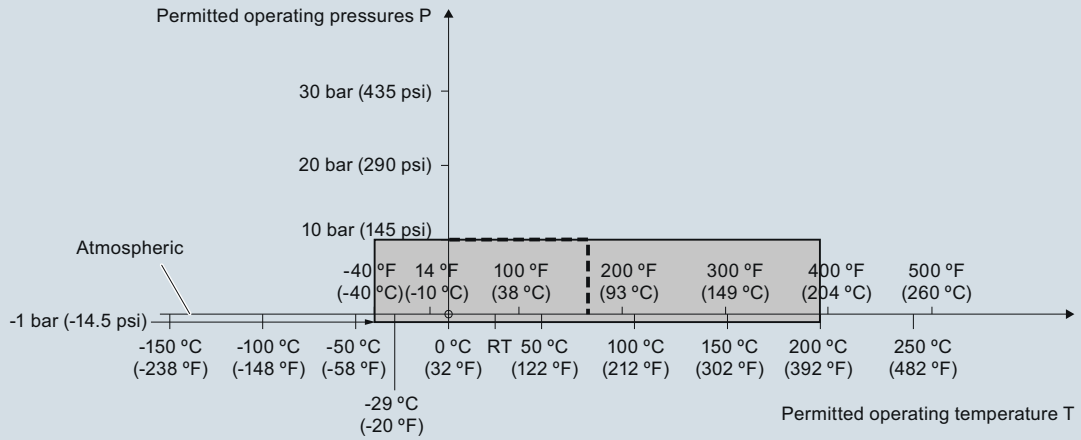
Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: to mm	**Y01**
Active shield length, specify in plain text [min. length is 50 mm (2 inch)]: Y02: to mm	**Y02**
Stainless steel tag [69 x 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	Article No.
English	**7ML1998-5GE04**
French	**7ML1998-5GE12**
Spanish	**7ML1998-5GE21**
German	**7ML1998-5GE33**
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	
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**
Transmitter, MSP 2002-1, 330 PF[1)]	**7ML1830-1JP**
Transmitter, MSP 2002-2, 3 300 PF[1)]	**7ML1830-1JQ**
Transmitter, MSP 2002-3, 6 600 PF (used with conductive fluids and probe lengths >10 000 mm)[1)]	**7ML1830-1JR**
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	**7ML5750-1AA00-0**

[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.

Characteristic curves

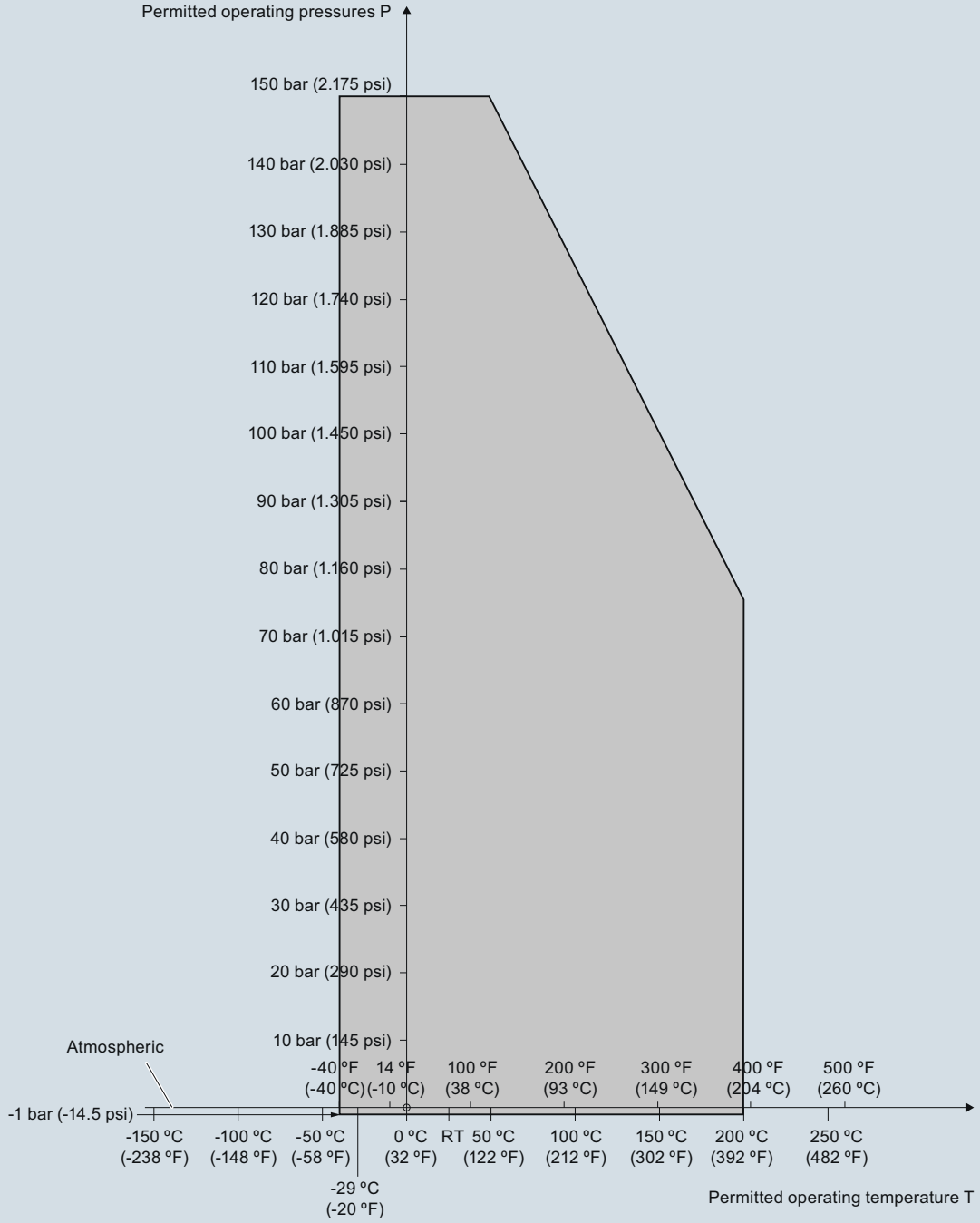
**Pressure/temperature curve
LC500 cable probes
threaded process connections
(7ML5513)**



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

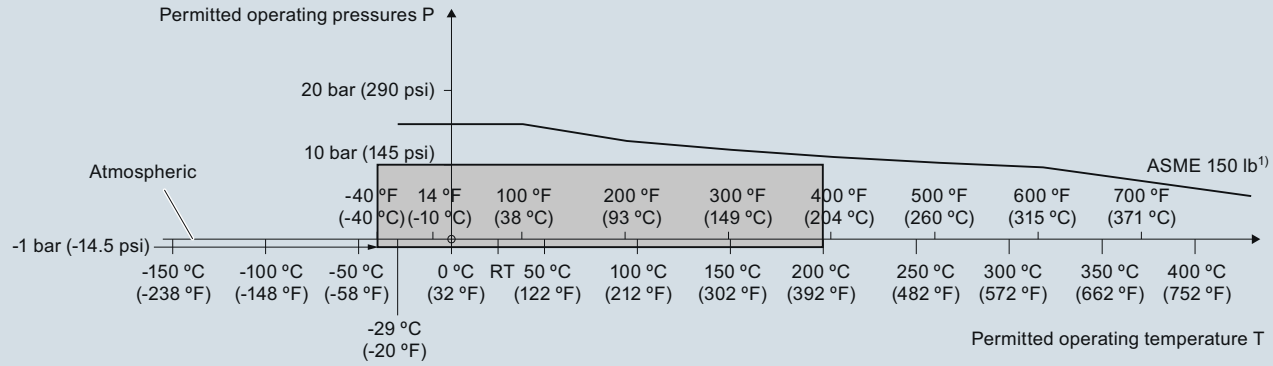
SITRANS LC500 Process Pressure/Temperature derating curves (7ML5513)

Pressure/temperature curve
LC500 PFA rod probes
Threaded process connections
(7ML5515)



SITRANS LC500 Process Pressure/Temperature derating curves (7ML5515)

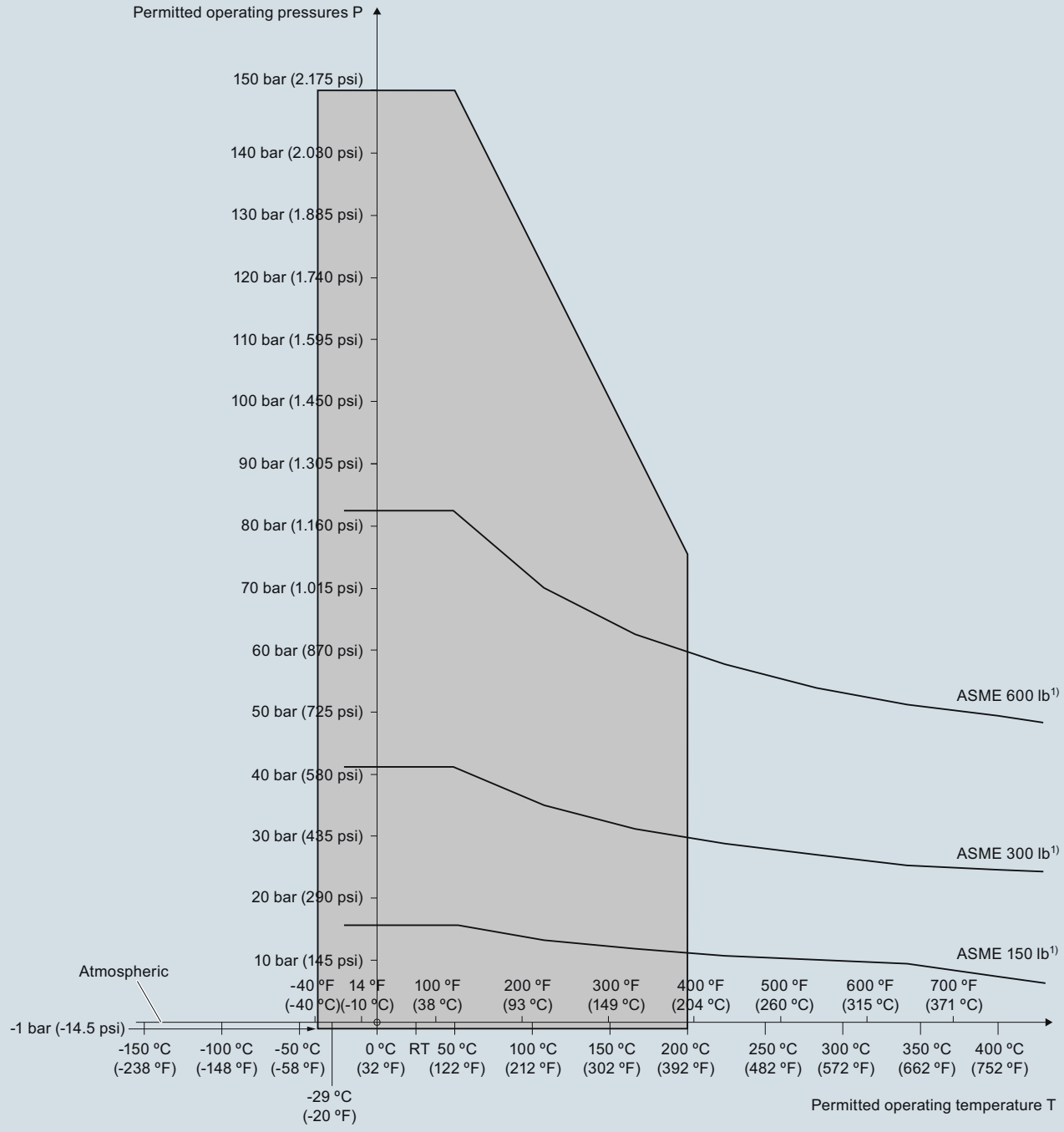
Pressure/temperature curve
LC500 cable probes
ASME flanged process connections
(7ML5513)



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

SITRANS LC500 Process Pressure/Temperature derating curves (7ML5513)

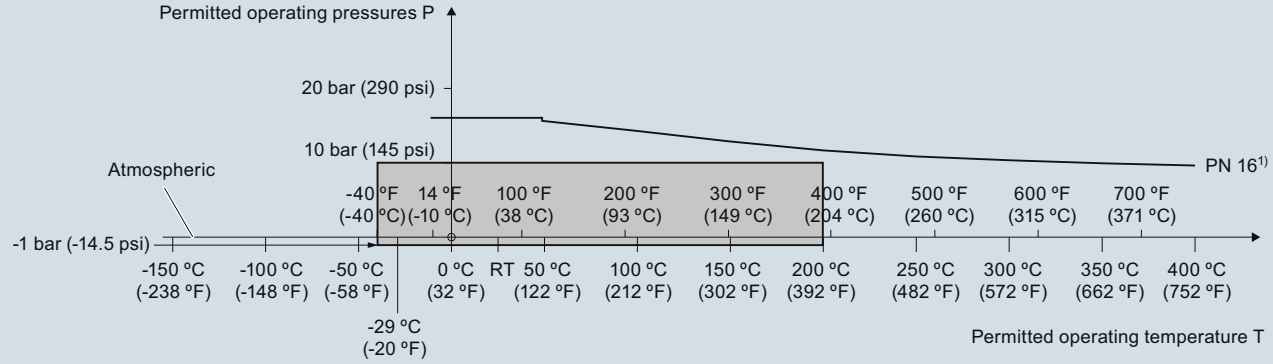
Pressure/temperature curve
LC500 PFA rod probes
ASME flanged process connections
(7ML5515 and 7ML5517)



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

SITRANS LC500 Process Pressure/Temperature derating curves (7ML5515 and 7ML5517)

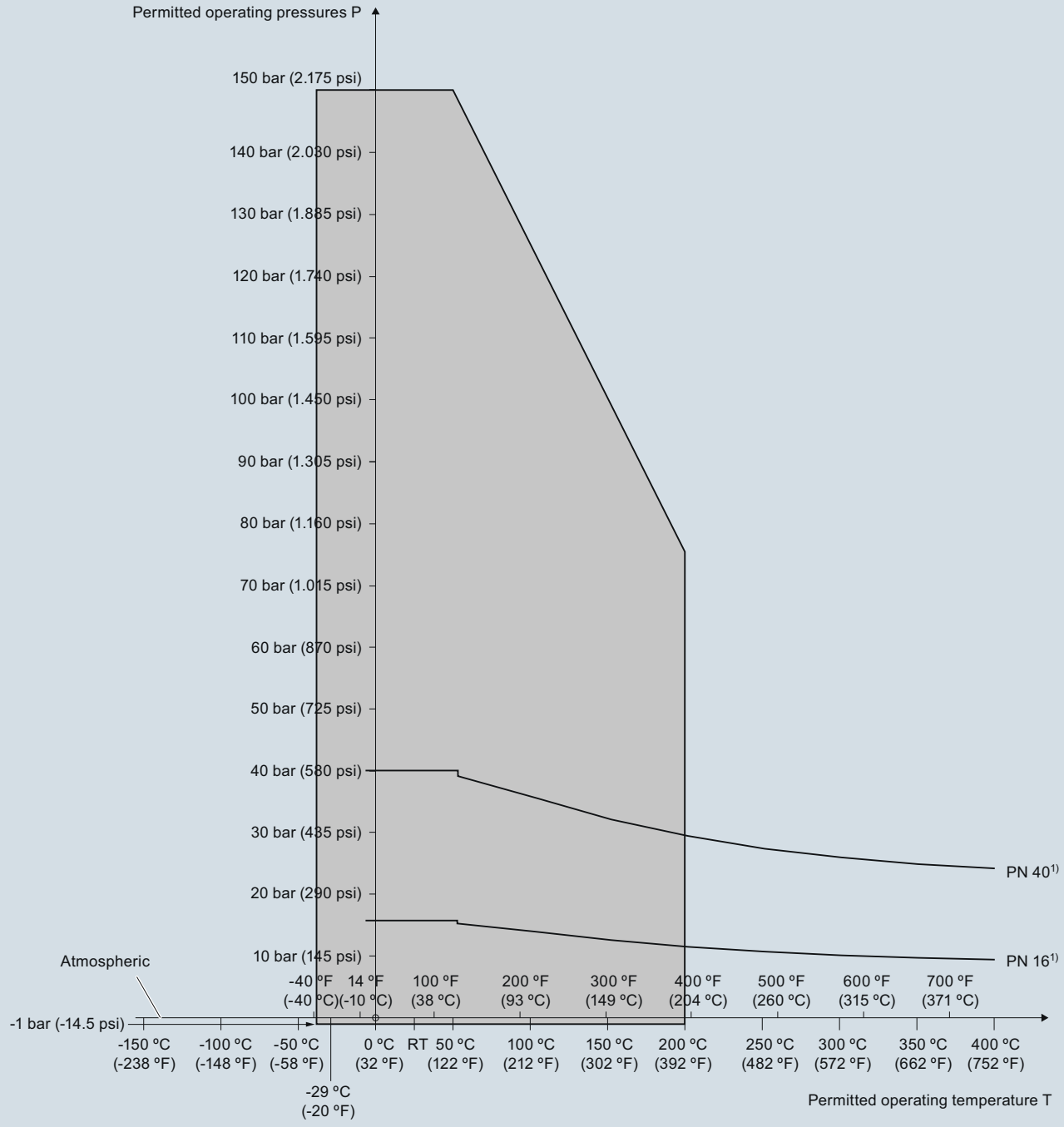
Pressure/temperature curve
LC500 cable probes
EN flanged process connections
(7ML5513)



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

SITRANS LC500 Process Pressure/Temperature derating curves (7ML5513)

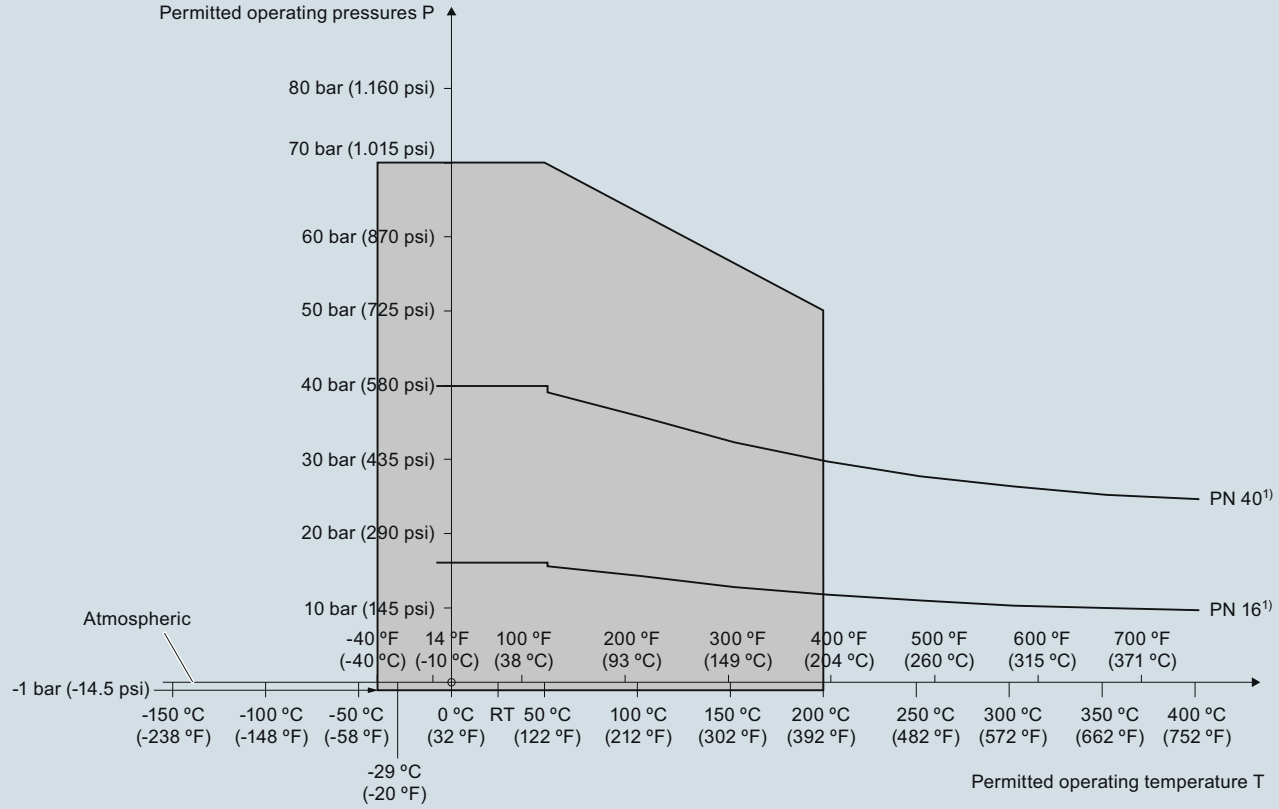
Pressure/temperature curve
LC500 PFA rod probes
EN flanged process connections
(7ML5515 and 7ML5517)



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

SITRANS LC500 Process Pressure/Temperature derating curves (7ML5515 and 7ML5517)

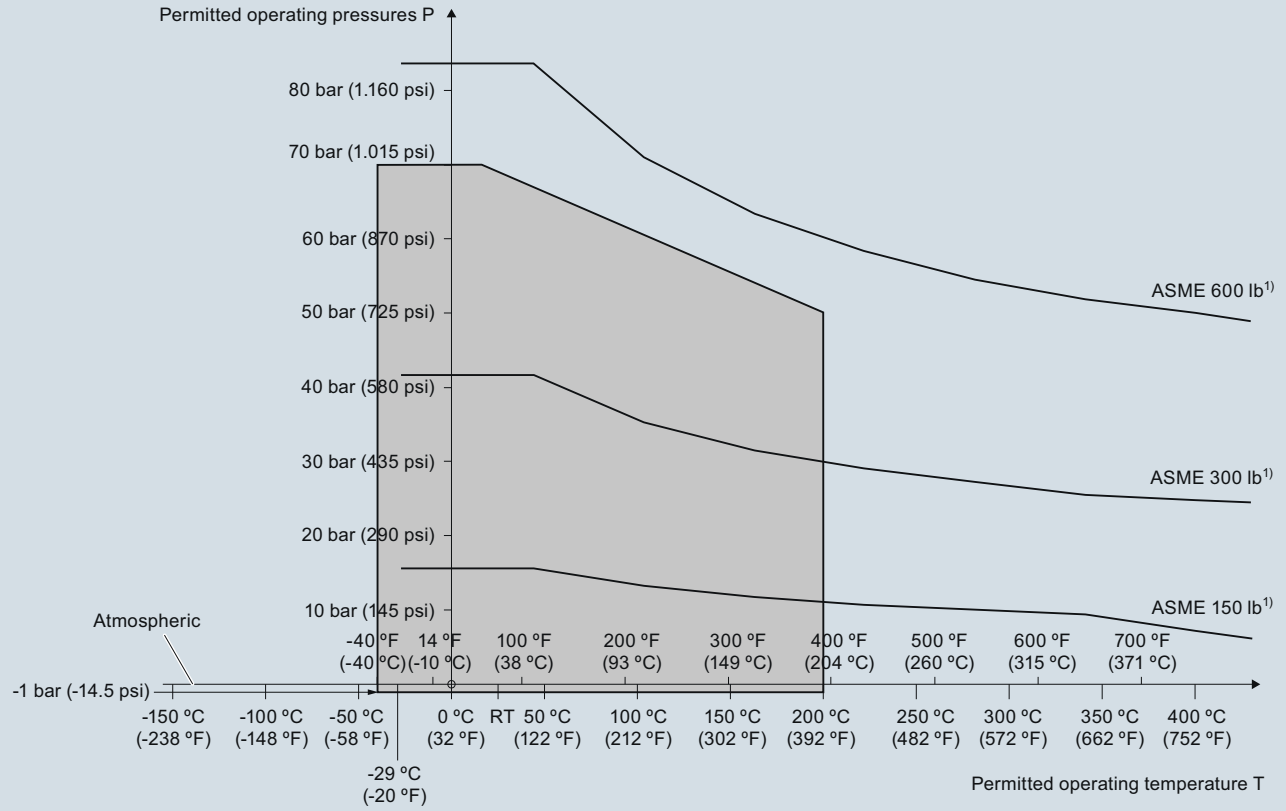
Pressure/temperature curve
LC500 single piece flanged rod probes with PTFE facing
EN flanged process connections
(7ML5517)



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)

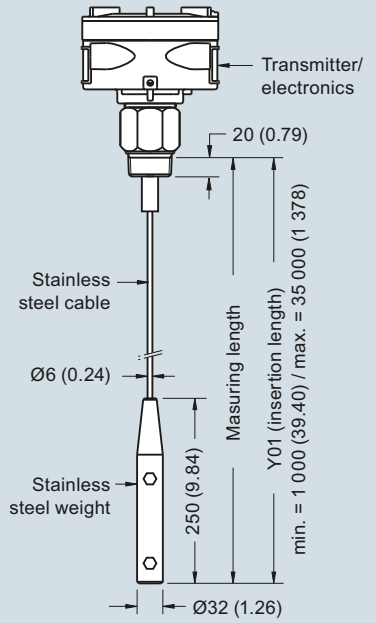


1) The curve denotes the minimum allowable flange class for the shaded area below.

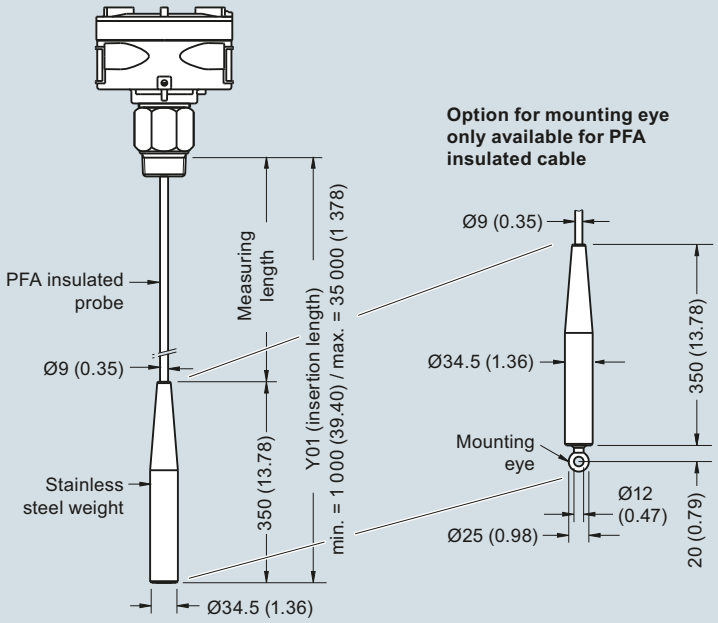
SITRANS LC500 Process Pressure/Temperature derating curves (7ML5517)

Dimensional drawings

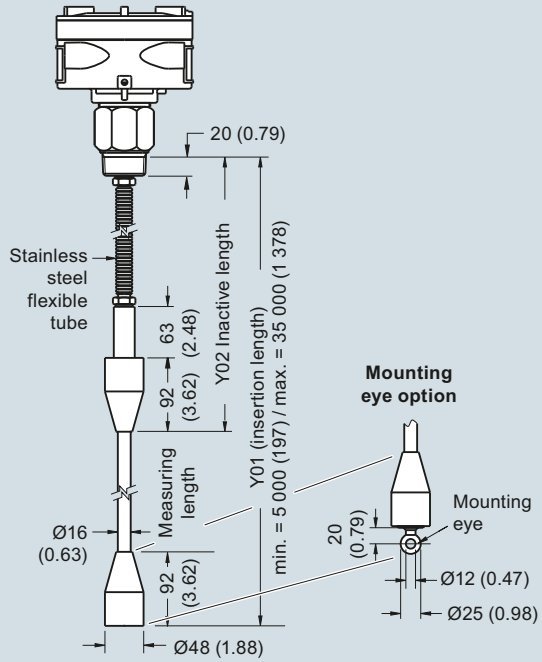
Cable version, non-insulated welded flange (7ML5513)



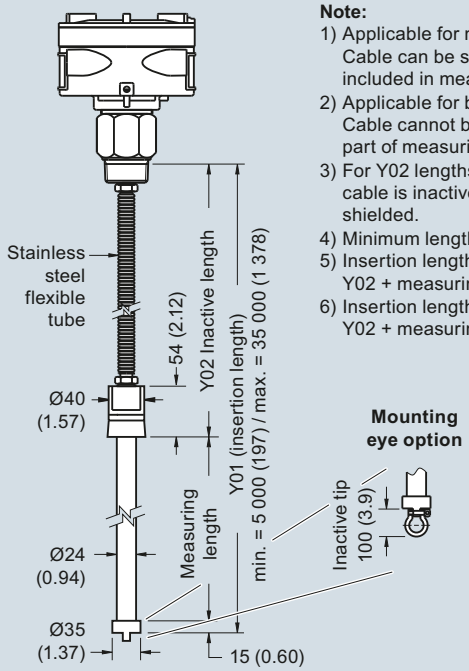
Cable version, insulated welded flange (7ML5513)



Extended cable version with rod sensor welded flange (7ML5523)



Extended cable version with rod sensor welded flange (7ML5523)

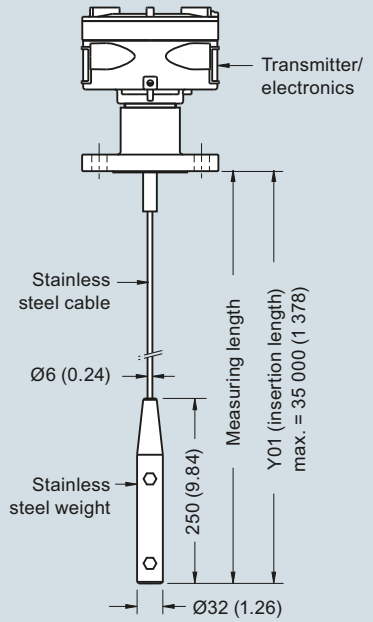


Note:

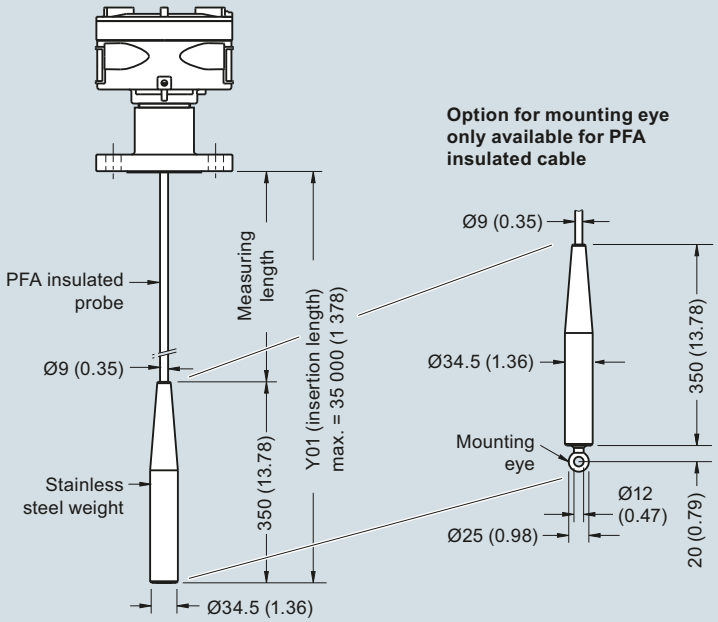
1) Applicable for non-conductive media only. Cable can be shortened on site. Weight is included in measuring length.
2) Applicable for both liquids and solids. Cable cannot be shortened. Weight is **not** part of measuring length.
3) For Y02 lengths greater than 5 000 (197), cable is inactive and is **not** actively shielded.
4) Minimum length = 200 (7.87)
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)

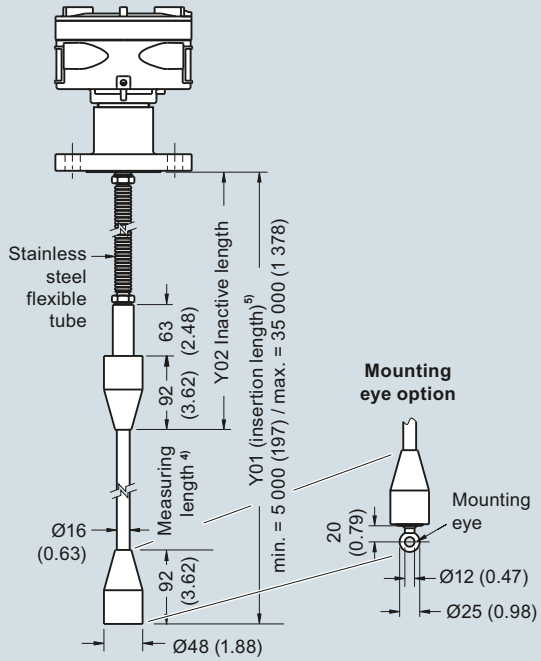
Cable version, non-insulated [1]
Welded flange (7ML5513)



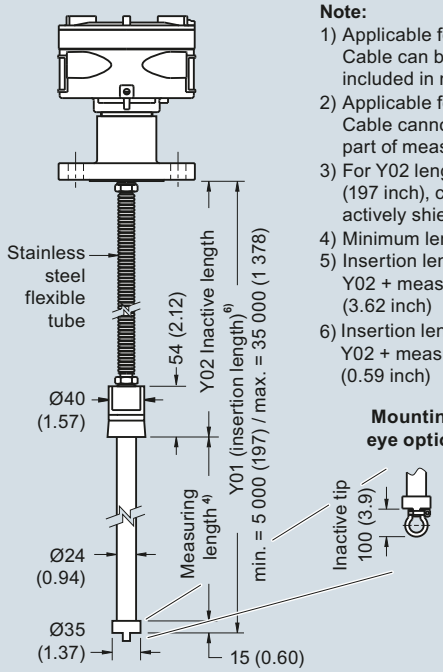
Cable version, insulated [2]
Welded flange (7ML5513)



Extended cable version with rod sensor [3]
Welded flange (7ML5523)



Extended cable version with rod sensor [3]
Welded flange (7ML5523)

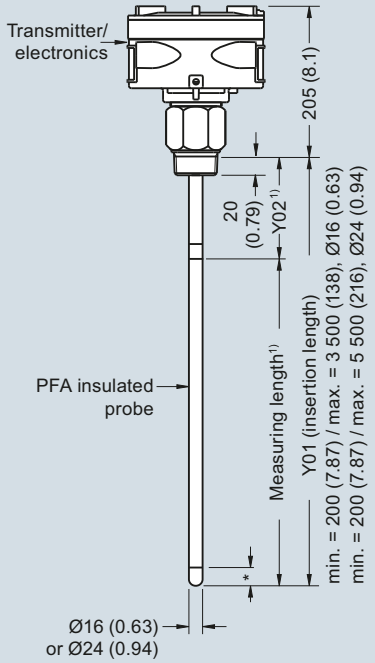


Note:

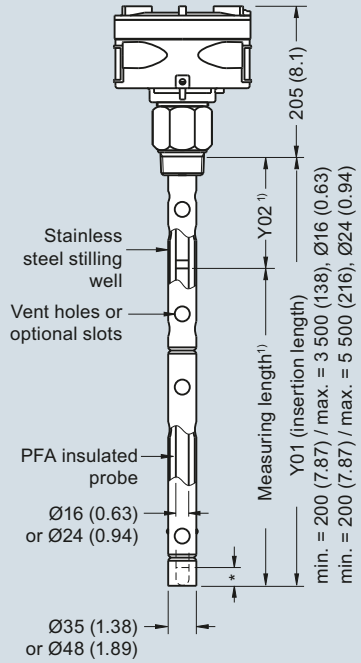
1) Applicable for non-conductive media only. Cable can be shortened on site. Weight is included in measuring length.
2) Applicable for both liquids and solids. Cable cannot be shortened. Weight is **not** part of measuring length.
3) For Y02 lengths greater than 5 000 mm (197 inch), cable is inactive and is **not** actively shielded.
4) Minimum length = 200 mm (7.87 inch)
5) Insertion length Y01 = Y02 + measuring length + 92 mm (3.62 inch)
6) Insertion length Y01 = Y02 + measuring length + 15 mm (0.59 inch)

SITRANS LC500 - Cable Versions, dimensions in mm (inch)

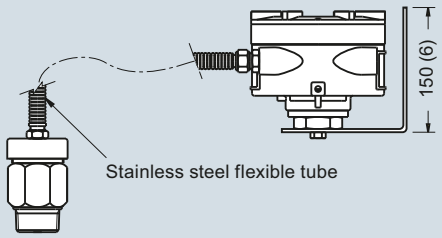
Rod version threaded (7ML5515)



Rod version with stilling well threaded (7ML5515)

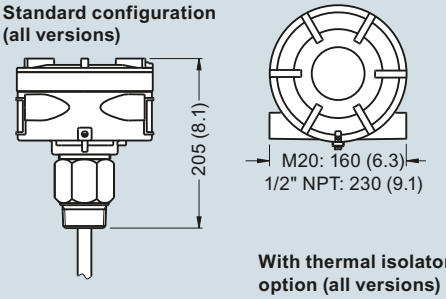


Remote electronics with mounting bracket option threaded (7ML5515)



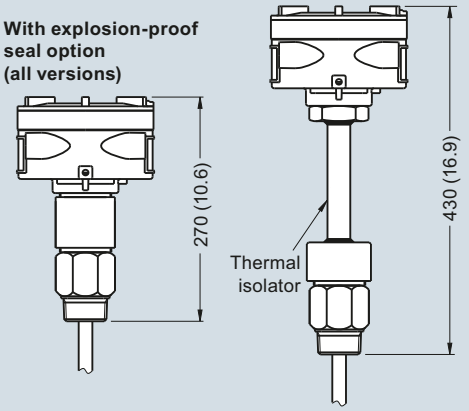
General purpose approval only.

Standard configuration (all versions)



With thermal isolator option (all versions)

With explosion-proof seal option (all versions)



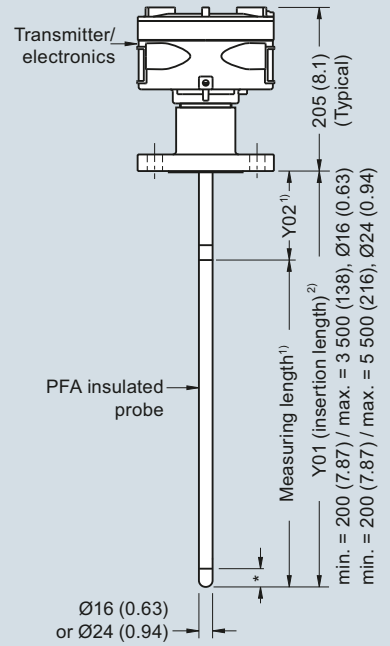
* = 30 (1.18) inactive tip

Note:
1) Minimum Y02 (active shield length) = 50 (1.96), minimum measuring length = 200 (7.87)

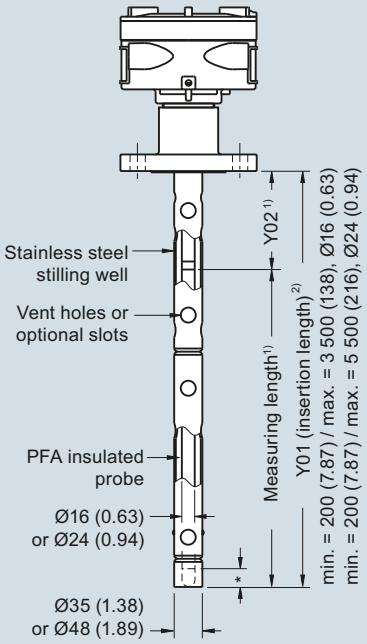
SITRANS LC500 - Rod Versions, dimensions in mm (inch)

SITRANS LC500

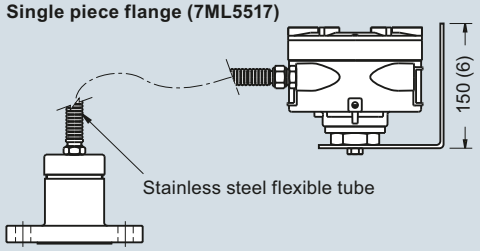
Rod version
Welded flange (7ML5515)
Single piece flange (7ML5517)



Rod version with stilling well
Welded flange (7ML5515)
Single piece flange (7ML5517)

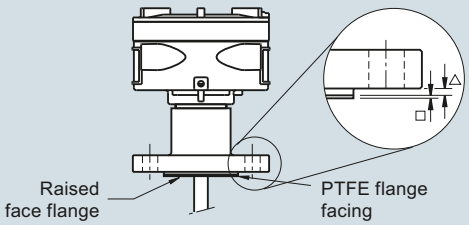


Remote electronics with mounting bracket option
Welded flange (7ML5515)
Single piece flange (7ML5517)



General purpose approval only.

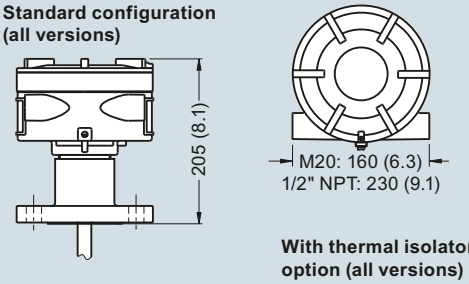
PTFE flange facing option
single piece flange only (7ML5517)



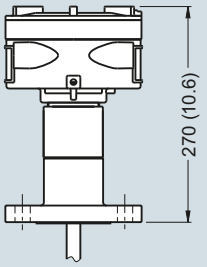
No stilling well or enamel probe available with this option.

* = 30 (1.18) inactive tip

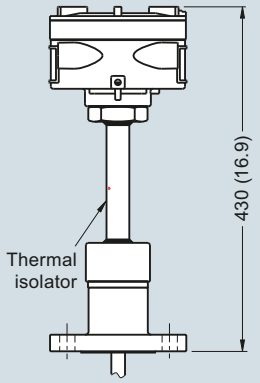
Standard configuration (all versions)



With explosion-proof seal option (all versions)



With thermal isolator option (all versions)

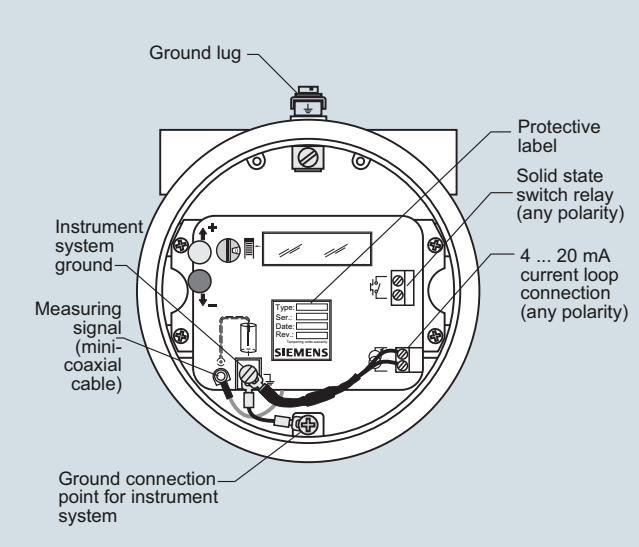


Flange facing (raised face)	
Flange class	**Facing thickness**
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/25/40/64	2 (0.08)
□ PTFE facing (additional)	2 (0.08)

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)

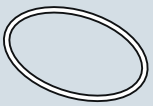
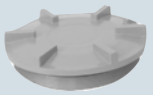
Schematics



SITRANS LC500 connections

Selection and ordering data

LC300 and LC500 Specials[1]	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**

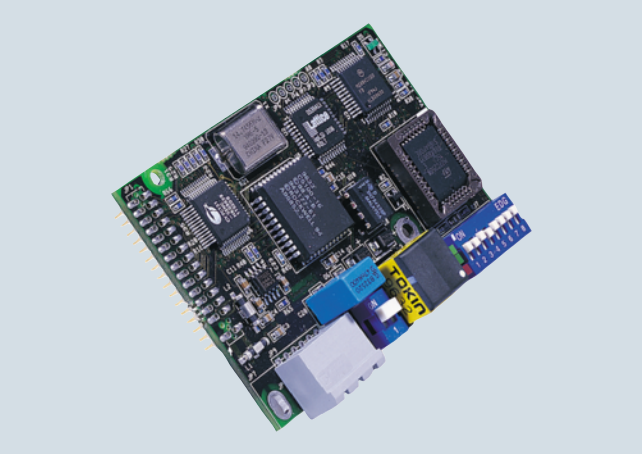
LC300 and LC500 Specials[1]	Article No.
LC300 Mounting Eye	
Spare mounting eye (LC300 PFA versions only)	**A5E01163717**
LC300 Weight Kit, 316L stainless steel	
Kit, Spare stainless steel weight. To be used in any cable version of CLS300, or stainless steel cable version of LC300	**A5E01163727**
LC500 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 Versions[2]	

[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.

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
- Scaleable application layer allows for optimized network bandwidth and memory requirements
- Modules available for PROFIBUS DP, Allen-Bradley Remote I/O and DeviceNet™, Modbus RTU

Modbus is a registered trademark of Schneider Electric.
Allen-Bradley is a registered trademark of Rockwell Automation
™DeviceNet is a trademark of Open DeviceNet Vendor Association

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	Allen Bradley Remote I/O
• Interface	RIO
• Transmission rate	57.6, 115.2 or 230.4 Kbaud
• Rack address	1 ... 73, ¼ to full rack
• Connection	RIO slave
• SmartLinx module compatibility	• SITRANS LU01 • SITRANS LU02 • SITRANS LU10 • MultiRanger 100/200 • HydroRanger 200

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	• SITRANS LU01 • SITRANS LU02 • SITRANS LU10 • MultiRanger 100/200 • HydroRanger 200

Module type	Modbus RTU
• Interface	RS 232 or RS 485
• Transmission rate in bps	1 200, 2 400, 4 800, 9 600, 19 200, 38 400
• Rack address	1 ... 247
• Connection	Slave
• SmartLinx module compatibility	• SITRANS LU01 • SITRANS LU02 • SITRANS LU10 Included with product: • 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	• MultiRanger 100/200 • HydroRanger 200

SmartLinx module

Selection and Ordering data	Article No.
SmartLinx module for SITRANS LU01, LU02, LU10	
Allen-Bradley Remote I/O module	**7ML1830-1CP**
PROFIBUS DP module	**7ML1830-1CQ**
Modbus RTU module	**7ML1830-1CR**
SmartLinx module for MultiRanger 100/200 and HydroRanger 200	
Allen-Bradley Remote I/O module	**7ML1830-1HS**
PROFIBUS DP module	**7ML1830-1HR**
DeviceNet module	**7ML1830-1HT**
Operating Instructions	
Allen-Bradley Remote I/O communications module, English	**7ML1998-1AP03**
PROFIBUS communications module	
• English	**7ML1998-1AQ03**
• French	**7ML1998-1AQ13**
• German	**7ML1998-1AQ33**
Modbus RTU communications module, English	**7ML1998-1BF01**
Modbus RTU communications module, French	**7ML1998-1BF11**
Modbus RTU communications module, German	**7ML1998-1BF31**
SmartLinx modem, English	**7ML1998-1BG01**
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	
Allen-Bradley data diskette	**7ML1830-1CK**
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.	**A A 0**
RS 485 to RS 232 converter	
No	**0**
Yes	**1**
ComVerter	
No	**0**
Yes	**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**

Notes