SITRANS L
Level instruments

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Product overview

Overview

	Application	Device description	Page	Programming Software
Point level measurement - Capacitance switches				
	Powerful range of level switches suitable for a variety of industries	**Pointek CLS100/CLS200/CLS300/CLS500**		
		• CLS100: compact 2-wire inverse frequency shift capacitance switch for level detection in constricted spaces, interfaces, solids, liquids, slurries and foam	5/9	–
		• 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	5/15	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	5/31	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	5/47	SIMATIC PDM
Point level measurement - Electro-mechanical switches				
	Reliable rotating and vibrating point level switches for bulk solids at a competitive price	**SITRANS LPS200/LVS200**		
		• LPS200: rotating switch that detects high, low and demand conditions for bulk solids	5/64	–
		• LVS200: vibrating point level switch with unique robust tine design, for use on bulk solids	5/72	–
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**	5/83	–
		• Rugged design, no moving parts and virtually maintenance-free		
		• Transducer available in ETFE or PVDF copolymer and therefore inert to most chemicals		
Continuous measurement - Ultrasonic transmitters				
	Compact level transmitter with integrated transducer for accurate level measurement for liquid applications	**The Probe**	5/86	–
		• Simple, compact and competitively priced ultrasonic level transmitter in several versions for maximum versatility: - Three-wire system with 5 m model 24 V DC - Two-wire system with current loop		
	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**	5/89	SIMATIC PDM
		• Continuous level measurement up to 12 m (40 ft) range		
		• Patented Sonic Intelligence signal processing		
		• Extremely high signal-to-noise ratio		
		• Auto False-Echo Suppression of false echoes		

	Application	Device description	Page	Programming Software
Continuous measurement - Ultrasonic controllers				
	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	5/93	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	5/98	SIMATIC PDM
	Non-contacting, cost-effective solution for reliable control of level and flow measurements in water and wastewater applications	**HydroRanger Plus** • Available as 19" rack, for panel mounting or in wall enclosure • Compatible with Echomax® ultrasonic transducers	5/102	Dolphin Plus
	Complete ultrasonic level controller for monitoring and control of water distribution and wastewater collection systems, with energy-saving algorithms	**SITRANS LUC500** • Monitoring and control in one device Integral telemetry interface (Modbus® RTU/ASCII) • Solves a wide range of applications as result of medium-independent level measurement	5/106	Dolphin Plus
	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	5/110, 5/115	Dolphin Plus
	Output modules for SITRANS LU10	**SITRANS LU SAM/SITRANS LU AO** • SITRANS LU SAM satellite alarm module provides up to 20 relay contacts for the measurement points connected to a SITRANS LU10 • SITRANS LU AO analog output module provides remote analog outputs for the measurement points of the SITRANS LU10 transceiver	5/118 5/120	– –
Continuous measurement - Ultrasonic transducers				
	ST-H: ETFE transducer for chemicals XRS-5: Standard transducer for applications to 8 m (26 ft)	**ST-H/Echomax XRS-5** • The narrow design of the ST-H allows the sensor to be mounted using a 2" connection • XRS-5: narrow beam angle of only 10°, measuring range maximum 8 m (26 ft) for measurement of liquids, solids and slurries	5/123 5/125	– –
	Transducers for liquids and bulk solids XPS and XCT series: Hermetically sealed PVDF enclosure for chemical immunity XLT: Designed for high temperature and long range applications	**Echomax XPS and XCT/XLT** • XPS series offers versions for various distances up to 40 m (130 ft) and up to a max. temperature of +95 °C (+203 °F) • XCT series for applications at high temperatures, for measurement of levels at distances up to 12 m (40 ft) and temperatures of max. +145 °C (+293 °F) • XLT: measuring ranges from 0.9 to 60 m (1.8 to 200 ft) and temperatures up to +150 °C (+302 °F). Beam angle of just 5° provides accurate readings in solids storage bunkers	5/128 5/138	– – –

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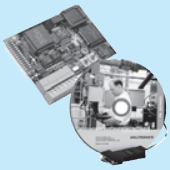
Product overview

	Application	Device description	Page	Programming Software
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 Sonic Intelligence signal processing • Auto False-Echo Suppression of false echoes	5/150	SIMATIC PDM
	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	5/154	SIMATIC PDM
	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); ideal for small vessels and low dielectric 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 nozzels • Process Intelligence signal processing for improved measurement reliability and Auto False-Echo Suppression of fixed obstructions • Communication using HART® or PROFIBUS PA	5/165	SIMATIC PDM
	4-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 LR300** • Cost-effective level measurements with powerful radar measuring system for process and tank control in extremely difficult processes and atmospheres • Reliable level measurements in liquids and slurries up to 20 m (65 ft)	5/171	SIMATIC PDM
	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 result of 24 GHz; narrow beam angle for tall, narrow vessels	5/185	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	5/192	SIMATIC PDM
Continuous measurement - Guided wave radar transmitters				
	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	**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") 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 (6250 psi g) and temperatures as high as +427 °C (+800 °F)	5/197	–

	Application	Device description	Page	Programming Software
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	5/214	–
	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	5/223	SIMATIC PDM
Continuous level - Open channel flow - Ultrasonic controller				
	High accuracy ultrasonic flow monitor for open channels	**OCM III** • Compatible with most standard open channel weirs and flumes • AC and DC operation • Automatically switches to battery operation for uninterrupted power • MCERTS approved device	5/247	–
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 Milltronics devices	5/250 5/252	– –
	2-wire loop powered, NEMA 4X enclosed remote digital display for process instrumentation	**SITRANS RD100** • Versatile loop-powered meter that displays process variables in level, flow, pressure, temperature and weighing applications • FM and CSA approved device that can be installed in range of environments, including hazardous areas • Large, easy-to-read display • Easy to install and set up using quick two-step process	5/253	–
	A universal input, panel mount remote digital display for process instrumentation	**SITRANS RD200** • Universal remote display that accepts various inputs, making it an ideal fit for use with most field instruments • Standard panel mount display with optional enclosures • Two optional relays for alarm indication or process control applications • Meter Copy feature to reduce setup time, cost and errors • RD Software supporting remote configuration, monitoring and logging for up to 100 displays	5/255	–

Capacitance

Overview

Introduction

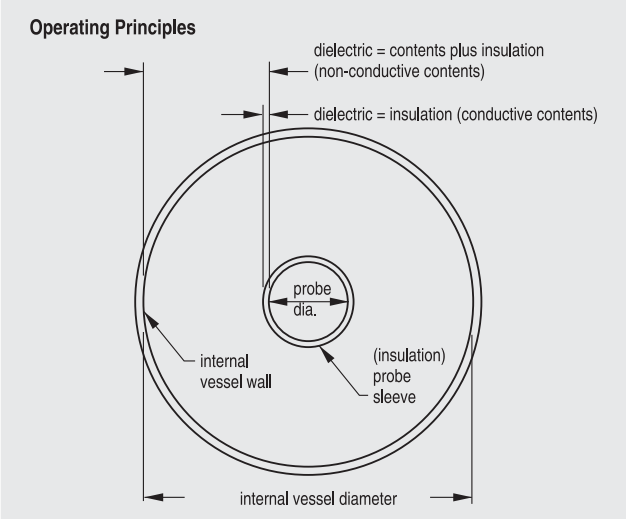
Inverse frequency shift capacitance point level switches and continuous level transmitters are designed to withstand the harsh environments of high pressure and high temperature applications.

Inverse Frequency Technology

Siemens Milltronics 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 2 conductors or electrodes separated by a layer of a nonconducting material called a dielectric. With the conductors on opposite sites 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 vapour concentration, material buildup, dust or condensation.

Technical specifications

	Point Level Measurement				Continuous Level/Interface Measurement	
Criteria	**Pointek CLS100**	**Pointek CLS200**	**Pointek CLS300**	**Pointek CLS500**	**SITRANS LC300**	**SITRANS LC500**
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	Conductive or non-conductive liquids, foam or liquid/foam levels, water in oil levels	Water in oil, foam or liquid/foam level, high-pressure coalescers, LNG (Liquified Natural Gas)
Max. length including sensor	100 mm (4")	Rod: 5.5 m (18 ft) Cable: up to 30 m (98 ft)	Rod: 1 m (40") Cable: 25 m (82 ft)	Rod: 1 m (40")	Rod: 5.5 m (18 ft) Cable: 25 m (82 ft)	Rod: 5.5 m (18 ft) Cable: 35 m (115 ft)
Process Temperature (Temperature ratings are pressure dependent. See Pressure/Temperature curves for respective product.)	• Stainless steel process connection: -40 to +100 °C (-40 to +212 °F) • PPS process connection: -20 to +100 °C (-4 to +212 °F)	• -40 to +85 °C (-40 to +185 °F) • With temp. ext.: -40 to +125 °C (-40 to +257 °F)	• -40 to +200 °C (-40 to +392 °F) • HT version: -40 to +400 °C (-40 to +752 °F)	• -50 to +200 °C (-58 to +392 °F) • HT version: -60 to +400 °C (-76 to +752 °F)	-20 to +200 °C (-4 to +392 °F)	• -50 to +200 °C (-58 to +392 °F) • Option: -60 to +400°C (-76 to +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 and ext. 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 (2175 psi g) • HP version: Up to 345 bar g (5004 psi g)	Up to 35 bar g (511 psi g)	• Up to 150 bar g (2175 psi g) • Option: Up to 345 bar g (5004 psi g)
Output	• 4 or 20/20 or 4 mA 2-wire current loop • Solid-state output (stainless steel cable or enclosure version) • Relay output (fully-synthetic version)	CLS200 Standard: 1 SPDT Form C relay, solid-state switch CLS200 Digital: solid-state switch included	CLS300 Standard: 1 SPDT Form C relay, solid-state switch CLS300 Digital: solid-state switch included	• 4 to 20/20 to 4 mA 2-wire current loop • Solid-state switch	4 to 20/20 to 4 mA 2-wire current loop	• 4 to 20/20 to 4 mA 2-wire current loop • Solid-state switch
Communications		• CLS200 Standard: 3 LED indicators • CLS200 Digital: PROFIBUS PA; SIMATIC PDM compatible	• CLS300 Standard: 3 LED indicators • CLS300 Digital: PROFIBUS PA; SIMATIC PDM compatible	HART, SIMATIC PDM compatible		HART, SIMATIC PDM compatible
Power Specifications	• Standard: 12 to 33 V DC • Intrinsically Safe: 10 to 30 V DC	• CLS200 Standard: 12 to 250 V AC/DC, 50/60 Hz, 2 VA/2 W max. • CLS200 Digital: - bus voltage: 9 to 32 V DC, IS version 9 to 24 V DC - current consumption: 12.5 mA	• CLS300 Standard: 12 to 250 V AC/DC, 50/60 Hz, 2 VA/2 W max. • CLS300 Digital: - bus voltage: 9 to 32 V DC, IS version 9 to 24 V DC - current consumption: 12.5 mA	• 12 to 33 V DC (30 V DC for IS) at 3.6 mA, 9.5 to 33 V DC, (30 V DC for IS) at 22 mA • 3.6 to 22 mA/ 22 to 3.6 mA (2-wire current loop)	9 to 32 V DC any polarity, 2-wire current loop circuit (9 V at 22 mA)	• 12 to 33 V DC (30 V DC for IS) at 3.6 mA, 9.5 to 33 V DC (30 V DC) at 22 mA • 3.6 to 22 mA/ 22 to 3.6 mA (2-wire current loop)
Approvals	CE, CSA, FM, ATEX, C-TICK, Lloyd's Register, WHG	CE, CSA, FM, ATEX, C-TICK, Lloyd's Register, WHG	CE, CSA, FM, ATEX, C-TICK, Lloyd's Register, WHG	CE, CSA, FM, ATEX, C-TICK, Lloyd's Register Current Signalling according to NAMUR NE 43	CE, CSA, FM, ATEX, C-TICK, Lloyd's Register Current Signalling according to NAMUR NE 43	CE, CSA, FM, ATEX, C-TICK, Lloyd's Register Current Signalling according to NAMUR NE 43

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: ( ) _____

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Tank/Vessel Information

(Supply sketch where possible) Sketch attached ☐

Type:
☐ Storage
☐ Process
☐ Separator
☐ FPSO

Tank construction:
☐ Metallic ☐ Non-metallic

Pressure:
Normal: _____
Relief: _____

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

Critical Information
Nozzle Length: _____ cm/in
Nozzle Diameter: _____ cm/in

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: ☐ Yes ☐ No **Process pressure:** _____ Min. _____ Max.

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

Installation

(indicate all that apply)

Power available: _____

Outputs required:
☐ 4-20 mA
☐ Solid state
☐ Relay

Communications
☐ HART ®
☐ PROFIBUS PA

Products recommended:

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

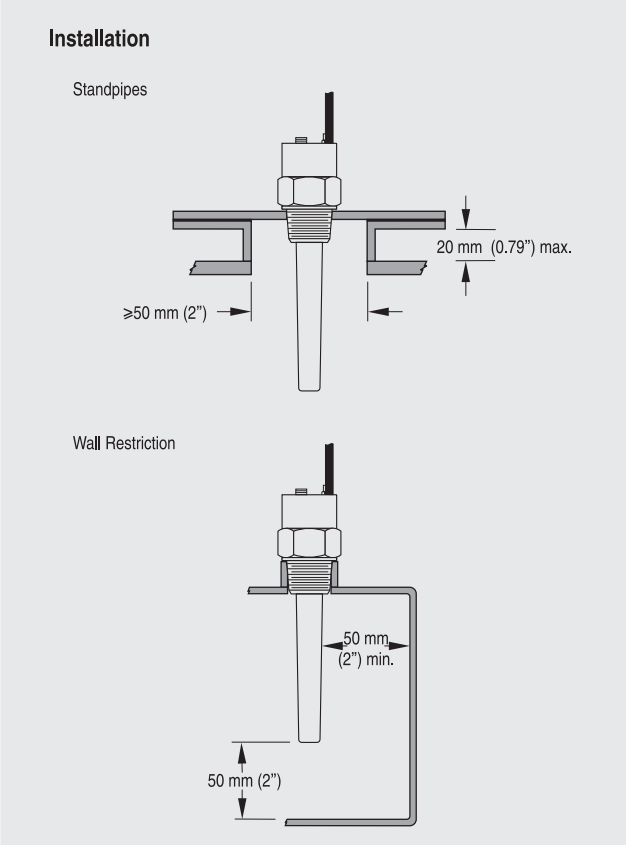
Pointek CLS100's short insertion length of 100 mm (4") and versatility in various applications and in vessels or pipes makes it a good replacement for traditional capacitance sensors.

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 -40 to +100 °C (-40 to +212 °F) (7ML5501), and -20 to +100 °C (-4 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

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Pointek CLS100

Technical specifications

	Stainless steel process connection (integral cable or enclosure version) (7ML5501)	Synthetic process connection (fully synthetic 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 or 20/20 or 4 mA 2-wire loop	4 or 20/20 or 4 mA 2-wire loop
• Switch output	Solid-state: 30 V DC/30 V AC (peak), max. 82 mA	Max. switching voltage: 220 V DC/AC (peak) Max. switching current: 2 A Max. switching power: 60 W
Intrinsically Safe	30 V DC	Not applicable
• Fail-safe mode	Min. or max.	Min. or max.
Accuracy		
Repeatability	2 mm (0.08")	2 mm (0.08")
Rated operating conditions[1]		
Installation conditions		
• Location	Indoor/outdoor	Indoor/outdoor
Ambient conditions		
• Ambient temperature	-40 to +85 °C (-40 to +185 °F)	-20 to +85 °C (-4 to +185 °F)
• Installation category	II	II
• Pollution degree	4	4
Medium conditions		
• Dielectric contant εr	Min. 1.5	Min. 1.5
• Temperature	-40 to +100 °C (-40 to +212 °F)	-20 to +100 °C (-4 to +212 °F)
• Pressure (vessel)	-1 to 10 bar g (146 psi g), nominal	-1 to 10 bar g (146 psi g), nominal
• Degree of protection		
- Enclosure version	IP68/Type 4X/NEMA 4X	IP68/Type 4X/NEMA 4X
- Integral cable version	IP65/Type 4X/NEMA 4X	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	100 mm (4")	100 mm (4")
• Process connection material of probe/wetted parts	Connection: 316L stainless steel; Process seal: FKM (optional FFKM); Sensor: PPS (optional PVDF)	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 to 33 V DC	12 to 33 V DC
• Intrinsically Safe	10 to 30 V DC (Intrinsically Safe barrier required)	Not applicable

[1] When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 5/13.

	Stainless steel process connection (integral cable or enclosure version) (7ML5501)	Synthetic process connection (fully synthetic enclosure version only) (7ML5610)
Certificates and approvals	• General: CE • Marine: Lloyd's 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 • 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) • C-TICK (Australia)	• General: CE • Marine: Lloyd's Register of Shipping, categories ENV1, ENV2, and ENV5 • Dust Ignition Proof: ATEX II 1D 1/3D T107 °C • Overfill protection: WHG (Germany) • C-TICK (Australia)

[1] When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 5/13.

Pointek CLS100

Selection and Ordering data — Order No.

Pointek CLS100, stainless steel process connection — 7ML5501-0 ■■■■

Compact 2-wire inverse frequency shift capacitance switch for level detection in constricted spaces, interfaces, solids, liquids, slurries and foam

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	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	C
CSA/FM Class II and III, Div. 1, Groups E, F, G	G

Device version

Integral cable version (PPS probe)	1
Enclosure version (PPS probe), ½" NPT cable inlet	3
Integral version with PVDF probe body	5
Enclosure version with PVDF probe body (½" NPT cable inlet)	6
Enclosure version (PPS probe), M20x1.5 cable inlet (adapter)	7
Enclosure version with PVDF probe body, M20x1.5 cable inlet (adapter)	8

WHG approval, German overfill protection

Not required	0
Required	1

Further designs — Order code

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

FFKM seal O-ring	A22
Inspection Certificate Type 3.1 per EN 10204	C12

Instruction manual — Order 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 CD containing ATEX Quick Starts and instruction manuals. — **7ML1998-5QJ81**

Optional equipment

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"), one text line, suitable for enclosure	7ML1930-1AC
Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia	7NG4122-1AA10
½" NPT cable gland, nickel plated brass, fits cable diameter 6 to 12 mm (0.24 to 0.47") -40 to +100 °C (-40 to +212 °F), IP68 (General Purpose) F)	7ML1830-1JA
M20x1.5 cable gland, PA polyamide, ATEX II 2G EEx e II, fits cable diameter 7 to 12 mm (0.28 to 0.47"), -20 to +70 °C (-4 to +158 °F), IP68 (General Purpose) F)	7ML1830-1JC

F) Subject to export regulations AL: 9I999, ECCN: N.

Selection and Ordering data — Order No.

Pointek CLS100, PPS process connection — 7ML5610-0 ■■■■

Compact 2-wire inverse frequency shift capacitance switch for level detection in constricted spaces, interfaces, solids, liquids, slurries and foam

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	A
ATEX II 1D 1/3D T107 °C	C

Versions/Options

Enclosure version, PPS process connection, ½" NPT cable inlet	1
Enclosure version, PPS process connection, M20x1.5 adapter	2

WHG approval, German overfill protection

Not required	0
Required	1

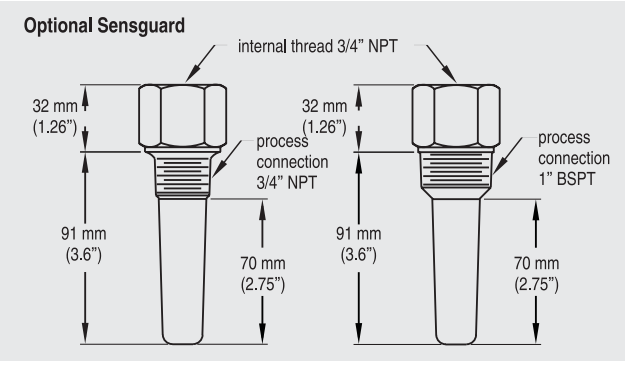
Instruction manual

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 CD containing ATEX Quick Starts and instruction manuals. — **7ML1998-5QJ81**

Accessories

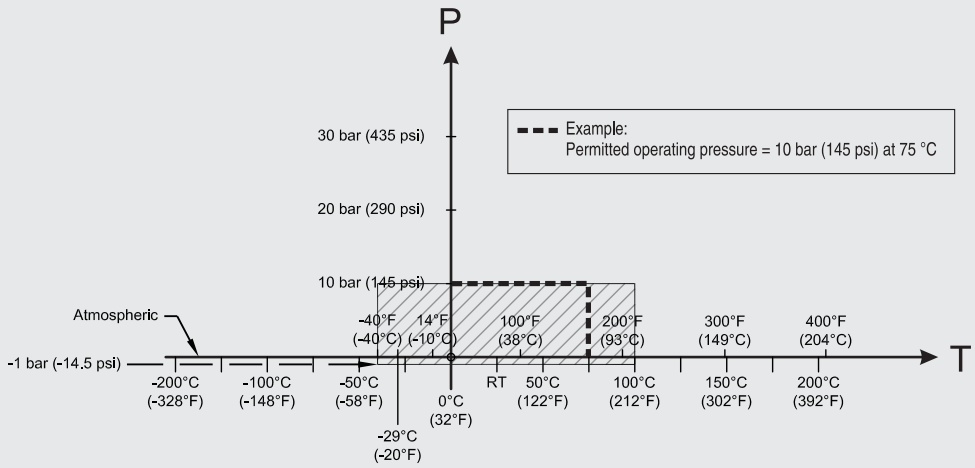
Sensguard, ¾" NPT (PPS) Only available for CLS100 with ¾" NPT thread	7ML1830-1DL
Sensguard, R 1" (BSPT) (PPS) Only available for CLS100 with ¾" NPT thread	7ML1830-1DM
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosures	7ML1930-1AC

Options



Optional Sensguard dimensions

Characteristic curves



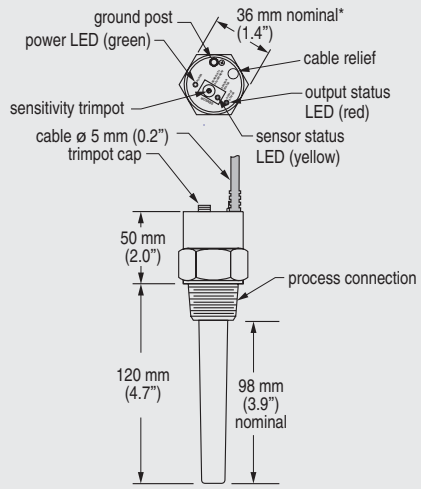
Pressure/Temperature Curve
CLS100 (7ML5501)
Threaded Process Connections

P = Permitted Operating Pressures
T = Permitted Operating Temperature

Pointek CLS100 Process Pressure/Temperature derating curves

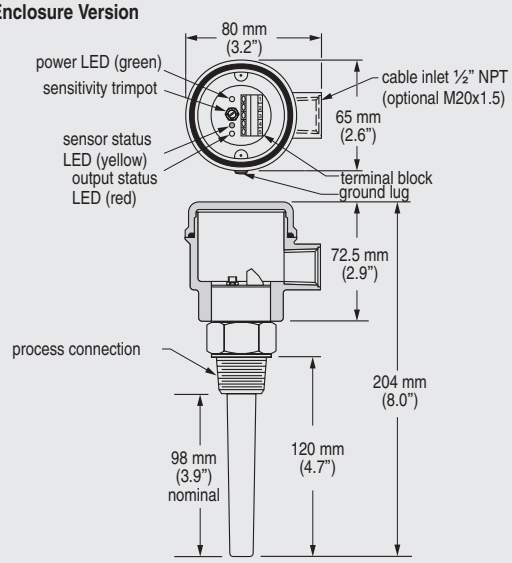
Dimensional drawings

Integral Cable Version



*Some G thread configurations deviate from this size.

Enclosure Version



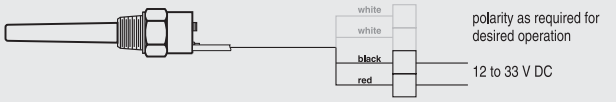
Pointek CLS100 dimensions

Pointek CLS100

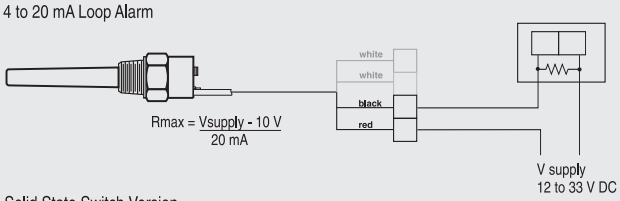
Schematics

Integral Cable Version - Non Intrinsically Safe only

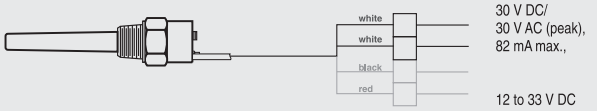
LOW/HIGH Alarm



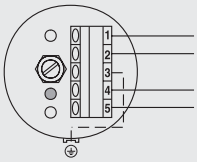
4 to 20 mA Loop Alarm



Solid State Switch Version



Enclosure and Fully Synthetic Version



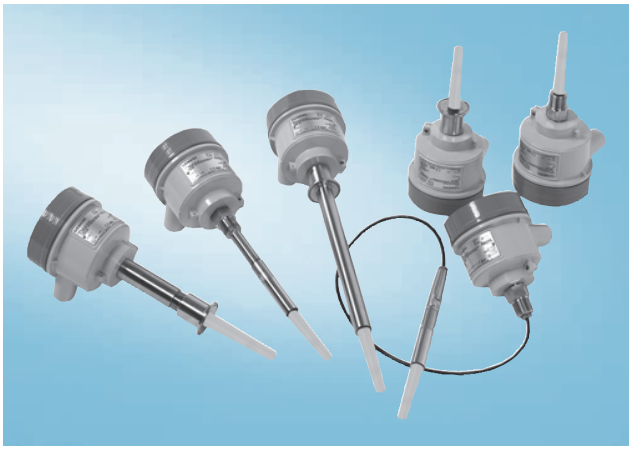
terminal operations	cable equivalent
mA current loop (+V or -V)	red wire
mA current loop (+V or -V)	black wire
ground	cable shield
solid state switch / relay*	white wire
solid state switch / relay*	white wire

* 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

Overview



Pointek CLS200 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 (with PROFIBUS PA) includes a display and provides additional 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 setup of CLS200 when you can configure switching threshold, even under the most demanding process conditions (digital version only)
- Extended rod, cable and sanitary versions available
- Standard version: 3 LED indicators for sensor status, output status and power
- SIL/IEC61508 compliant for use in safety integrated level applications for overfill protection (SIL 2)
- Digital version: integral LCD display, and PROFIBUS PA communication

Application

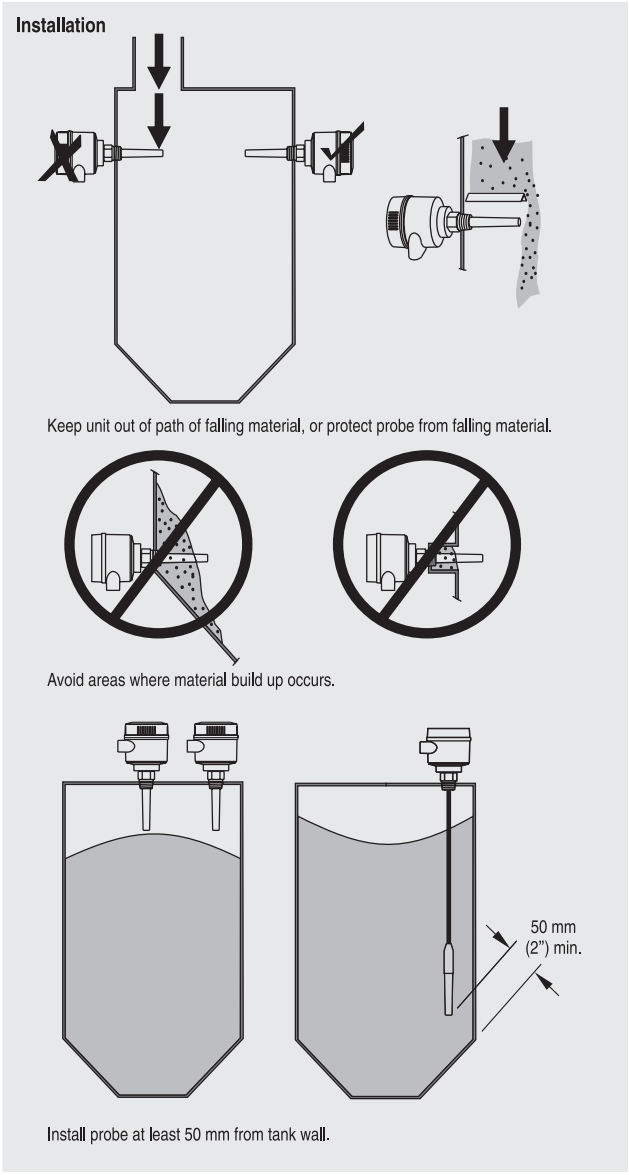
The Pointek CLS200 is offered in standard and digital versions.

The standard version has 3 LED indicators with basic relay and solid-state switch alarms.

The digital version provides an integral LCD display for standalone 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 250 V AC/DC for standard version and 12 to 30 V DC for digital version). The stainless steel and PPS (PVDF optional) materials used in the probe construction provides 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.

Configuration



Pointek CLS200 installation

5

Pointek CLS200

Technical specifications

(Note: all specifications listed below apply to Standard and Digital versions unless otherwise noted)

Mode of operation	
Measuring principle	Inverse frequency shift capacitive level detection
Input	
Measured variable	Change in picoFarad (pF)
Output	
Output signal (CLS200 Standard)	
• 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)
- Max. switching capacity	2000 VA (AC)
- Time delay (ON and/or OFF)	1 to 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 to 60 s
Output signal (CLS200 Digital)	
• Solid-state output (CLS200 Digital)	
- 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 to 100s)
• Fail-safe mode	Min. or max.
• Connection	Removable terminal block, max. 2.5 mm² (0.09")
Rated operating conditions[1]	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 to +85 °C (-40 to +185 °F)
• Installation category	II
• Pollution degree	4
Medium conditions	Liquids, bulk solids, slurries and interfaces
• Relative dielectric constant ε_r	Min. 1.5
• Temperature at process connection	
- Standard	-40 to +85 °C (-40 to +185 °F)
- Standard with thermal isolator	-40 to +125 °C (-40 to +257 °F)
• Pressure (standard version and versions with extension)[2]	-1 to 25 bar g/365 psi g (nominal)
• Pressure (cable version)	-1 to 10 bar g/150 psi g (nominal)
• Pressure (optional sliding coupling version)	-1 to 10 bar g/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), digital version has optional PROFIBUS connector
Power supply (CLS200 Standard)	12 to 250 V AC/DC, 0 to 60 Hz max. 2 W
Power supply (CLS200 Digital)	
• Bus voltage	Standard: 12 to 30 V DC Intrinsically Safe: 12 to 24 V DC
• Current consumption	12.5 mA
Certificates and approvals (CLS200 Standard)	
• General Purpose	CE, CSA, FM
• Dust Ignition Proof (Intrinsically Safe probe circuit)	CSA/FM Class II and III, Div. 1, Groups E, F, G ATEX II 1/2 D T100 °C
• Explosion Proof (Intrinsically Safe probe circuit)	• CSA/FM Class I, Div. 1, Groups A, B, C, D T4 • ATEX II 1/2 G EExd [ia] IIC T6 to T4
• Marine	Lloyd's Register of Shipping, Categories ENV1, ENV2 and ENV5
• Overfill Protection	WHG (Germany)
• Others	• SIL/IEC61508 Declaration of Conformity [SIL 2 (overspill)] • Pattern Approval (China) • C-TICK (Australia)
Certificates and approvals (CLS200 Digital)	
• General Purpose	CE, CSA, FM
• Intrinsically Safe	• CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G T4 or T6[3] • ATEX II 1G 1/2D EEx ia IIC T6 to T4 T100 °C[3]
• Explosion Proof/Dust Ignition Proof (Intrinsically Safe probe circuit)	• CSA/FM Class I, II, and III, Div. 1, Groups A, B, C, D, E, F, G T4 • ATEX II 1/2G EExd [ia] IIC T6 to T4 • ATEX II 1/2D T100 °C
• Non-incendive/Non-sparking	• CSA/FM Class I, Div. 2, Groups A, B, C, D T4 or T6 • CSA/FM Class II and III, Div. 2, Groups F, G • ATEX II 3G 2D EEx nA II T6 to T4 T100 °C
• Marine	Lloyd's Register of Shipping, Categories ENV1, ENV2 and ENV5

• Others	• Pattern Approval (China) • C-TICK (Australia)
Communication (CLS200 Digital)	• 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 5/24.

2) Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 5/24.

3) Barrier required for Intrinsically Safe protection.

	Standard version	**Sanitary version**	**Cable version**
Max. length	5.5 m (18 ft)	5.5 m (18 ft)	30 m (98.4 ft) liquids and slurries 5 m (16.4 ft) solids (under loads)
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
Extension material	316L stainless steel optional PFA coated[1)]	316L stainless steel	Fluoroethylene propylene (FEP) cable with stainless steel core
Sensor wetted parts	PPS (optional PVDF)	PPS (optional PVDF)	PPS (optional PVDF)
O-ring seal material[2)]	FKM	FKM	FKM
Thermal isolator	Optional	Optional	Optional
Extension	User selected length	User selected length	Cable extension

1) PFA coating (7ML5505) has 120 micron thickness.

2) FFKM available as special option. Contact nacc.smpi@siemens.com for details.

Pointek CLS200

Selection and Ordering data	Order No.
Pointek CLS200, threaded/sanitary version 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	7ML5502 - - 0
Note: To select Standard or Digital CLS200 (with PROFIBUS PA), see final place holder under Electronics/output.	
Probe version	
(Threaded lengths include process thread.)	
Compact,120 mm (4.72")[1]	0 X
Extended rod, 250 mm (9.84")[1]	1 A
Extended rod, 350 mm (13.78")[2]	1 B
Extended rod, 500 mm (19.69")[2]	1 C
Extended rod, 750 mm (29.53")[2]	1 D
Extended rod, 1000 mm (39.37")[2]	1 E
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended rod, 200 to 999 mm (7.87 to 39.33")[3]	1 F
- Extended rod, 1001 to 2000 mm (39.41 to 78.74")[2]	1 G
- Extended rod, 2001 to 3000 mm (78.78 to 118.11")[2] and 4)	1 H
- Extended rod, 3001 to 4000 mm (118.15 to 157.48")[2] and 4)	1 J
- Extended rod, 4001 to 5000 mm (157.52 to 196.85")[2] and 4)	1 K
- Extended rod, 5001 to 5500 mm (196.89 to 216.53")[2] and 4)	1 L
Extended cable, 3000 mm (118.11"), length adjustable by customer[1]	2 A
Extended cable, 6000 mm (236.22"), length adjustable by customer[1]	2 B
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended cable, 500 to 4999 mm (19.69 to 196.81")[1]	2 C
- Extended cable, 5000 to 9999 mm (196.85 to 393.66")[1]	2 D
- Extended cable, 10000 to 14999 mm (393.7 to 590.5")[1]	2 E
- Extended cable, 15000 to 19999 mm (590.6 to 787.4")[1]	2 F
- Extended cable, 20000 to 24999 mm (787.4 to 894.3")[1]	2 G
- Extended cable, 25000 to 29999 mm (984.3 to 1181.1")[1]	2 H
Sanitary compact, 98 mm (3.8")[1] and 5)	3 A
Add order code Y01 and plain text: "Insertion length ... mm"	
- Sanitary extended, 110 to 999 mm (4.3 to 39.3")[1] and 5)	3 B
- Sanitary extended, 1001 to 2000 mm (39.4 to 78.7")[1] and 5)	3 C
- Sanitary extended, 2001 to 3000 mm (78.8 to 118.1")[1] 4) and 5)	3 D
- Sanitary extended, 3001 to 4000 mm (118.1 to 157.5")[1] 4) and 5)	3 E
- Sanitary extended, 4001 to 5000 mm (157.5 to 196.9")[1] 4) and 5)	3 F
- Sanitary extended, 5001 to 5500 mm (196.9 to 216.5")[1] 4) and 5)	3 G

Selection and Ordering data	Order No.
Pointek CLS200, threaded/sanitary version 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	7ML5502 - - 0
Process connection	
¾" NPT [(Taper), ANSI/ASME B1.20.1]	A
1" NPT [(Taper), ANSI/ASME B1.20.1]	B
1½" NPT [(Taper), ANSI/ASME B1.20.1]	C
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	D
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	E
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	F
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	K
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	L
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	M
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	N
1" sanitary fitting clamp[6] and 7)	R
1½" sanitary fitting clamp[6] and 7)	S
2" sanitary fitting clamp[6] and 7)	T
2½" sanitary fitting clamp[6] and 7)	V
3" sanitary fitting clamp[6] and 7)	W
Approvals	
General Purpose	1
CSA/FM Class II and III Div. 1, Groups E, F, G[8]	2
FM Class I Div. 1, Groups A, B, C, D T4[8]	3
CSA Class I, Div. 1, Groups A, B, C, D T4[8]	4
ATEX II 1/2 D T 100 °C [8]	5
ATEX II 1/2 G EEx d [ia] IIC T6 to T4[8]	6
CSA/FM Class I, Div 2, Groups A, B, C, D T4 or T6; CSA/FM Class II and III, Div. 2, Groups F, G; ATEX II 3G 2D EEx nA II T6 to T4 T100 °C[9]	7
CSA/FM Class I, II and III, Div 1, Groups A, B, C, D, E, F, G T4 or T6; ATEX II 1G 1/2D EEx ia IIC T6 to T4 T100 °C[9] and 10)	8
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G T4; ATEX II 1/2 GD EEx d [ia] IIC T6 to T4 T100 °C[9]	0
Enclosure (see also option A01)	
Aluminum epoxy coated	
• 2 x ½" NPT via adapter, cable inlet, IP65	0
• 2 x M20x1.5 cable inlet, IP65	1
• 2 x ½" NPT via adapter, cable inlet, IP68	2
• 2 x M20x1.5 cable inlet, IP68	3
Additional options	
Standard version (PPS probe body)	A
With thermal isolator (PPS probe body)	B
With PVDF probe body	C
With thermal isolator and PVDF probe body	D
With sliding coupling (PPS probe body)	E
With thermal isolator and sliding coupling	F
With sliding coupling and PVDF probe body	G
With thermal isolator, sliding coupling and PVDF probe body	H
WHG approval, German overfill protection	
Not required	A
Required[8]	B
Electronics/output	
Standard version without display, 12 to 230 V AC/DC, solid-state and relay output[11]	0
Digital version with display, 24 V DC, solid-state output and PROFIBUS PA[11] and 12)	1

Selection and Ordering data	Order No.
Pointek CLS200, threaded/sanitary version 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	**7ML5502 -** **- 0**
Further designs Please add "**-Z**" to Order No. and specify Order code(s).	Order code
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters); specify in plain text	**Y15**
Electrical connection/cable inlet: PROFIBUS connector M12[9) 13) and 14)]	**A01**
Optional enclosure lid: Lid with glass window instead of closed lid without window[8) and 11)]	**A04**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
SIL/IEC61508 Declaration of Conformity [SIL 2 (overspill)][8)]	**C20**
Remote Electronics • Remote mounted electronics with 2 m (79") cable • Remote mounted electronics with 5 m (197") cable • Mounting bracket (including mounting kit) for remote electronics	 **A05** **A06** **A09**
Instruction manual Note: The instruction manual should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	**See page 5/23**
Accessories	**See page 5/23**

1) Available with additional options A to D only
2) Available with additional options A to H
3) Lengths <350 mm available with additional options A to D only
4) Custom shipping methods required. Contact factory for more details.
5) Available with process connection R to W only
6) Available with version 3A to 3G only
7) Sanitary connection dimensionally corresponds to the applicable ISO 2852 standard
8) Available with electronics option 0 only
9) Available with electronics option 1 only
10) Barrier required for Intrinsically Safe protection
11) Version with electronics option 0 has a closed lid without window as default; version with electronics option 1 has a lid with glass window as default.
12) An M12 PROFIBUS connector can be selected separately with wildcard option (A01).
13) Available with enclosure option 1 only
14) Available with approval option 1, 7, and 8 only

Pointek CLS200

Selection and Ordering data	Order No.
Pointek CLS200, welded flange 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.	7ML5504 -
Note: To select Standard or Digital CLS200 (with PROFIBUS PA), see final place holder under Electronics/output.	
Probe version (length from flange face)	
Compact, 98 mm (3.86")	0X
Extended rod, 250 mm (9.84")	1A
Extended rod, 350 mm (13.78")	1B
Extended rod, 500 mm (19.69")	1C
Extended rod, 750 mm (29.53")	1D
Extended rod, 1000 mm (39.37")	1E
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended rod, 200 to 999 mm (7.87 to 39.33")	1F
- Extended rod, 1001 to 2000 mm (39.41 to 78.74")	1G
- Extended rod, 2001 to 3000 mm (78.78 to 118.11")[1]	1H
- Extended rod, 3001 to 4000 mm (118.15 to 157.48")[1]	1J
- Extended rod, 4001 to 5000 mm (157.52 to 196.85")[1]	1K
- Extended rod, 5001 to 5500 mm (196.89 to 216.53")[1]	1L
Extended cable, 3000 mm (118.1"), length adjustable by customer	2A
Extended cable, 6000 mm (236.2"), length adjustable by customer	2B
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended cable, 500 to 4999 mm (19.69 to 196.81")	2C
- Extended cable, 5000 to 9999 mm (196.85 to 393.66")	2D
- Extended cable, 10000 to 14999 mm (393.7 to 590.5")	2E
- Extended cable, 15000 to 19999 mm (590.6 to 787.4")	2F
- Extended cable, 20000 to 24999 mm (787.4 to 894.3")	2G
- Extended cable, 25000 to 29999 mm (984.3 to 1181.1")	2H
Process connection	
Welded flange, 316L stainless steel, raised face	
1" ASME, 150 lb	A1
1" ASME, 300 lb	A2
1" ASME, 600 lb	A3
1½" ASME, 150 lb	B1
1½" ASME, 300 lb	B2
1½" ASME, 600 lb	B3
2" ASME, 150 lb	C1
2" ASME, 300 lb	C2
2" ASME, 600 lb	C3
3" ASME, 150 lb	D1
3" ASME, 300 lb[1]	D2
3" ASME, 600 lb[1]	D3
4" ASME, 150 lb[1]	E1
4" ASME, 300 lb[1]	E2
4" ASME, 600 lb[1]	E3

Selection and Ordering data	Order No.
Pointek CLS200, welded flange 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.	7ML5504 -
Welded flange, 316L stainless steel, Type A flat faced	
DN 25, PN 16	J4
DN 25, PN 40	J6
DN 40, PN 16	K4
DN 40, PN 40	K6
DN 50, PN 16	L4
DN 50, PN 40	L6
DN 80, PN 16	M4
DN 80, PN 40[1]	M6
DN 100, PN 16[1]	N4
DN 100, PN 40[1]	N6
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.)	
Approvals	
General Purpose	1
CSA/FM Class II and III Div. 1, Groups E, F, G[2]	2
FM Class I Div. 1, Groups A, B, C, D T4[2]	3
CSA Class I, Div. 1, Groups A, B, C, D T4[2]	4
ATEX II 1/2 D T100 °C[2]	5
ATEX II 1/2 G EEx d [ia] IIC T6 to T4[2]	6
CSA/FM Class I, Div 2, Groups A, B, C, D T4 or T6; CSA/FM Class II and III, Div 2, Groups F, G; ATEX II 3G 2D EEx nA II T6 to T4 T100 °C[3]	7
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G T4 or T6; ATEX II 1G 1/2D EEx ia IIC T6 to T4 T100 °C[3] and 4)	8
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, T4; ATEX II 1/2 GD EEx d [ia] IIC T6 to T4 T100 °C[3]	0
Enclosure (see also option A01)	
Aluminum epoxy coated	
• 2 x ½" NPT via adapter - cable inlet, IP65	0
• 2 x M20x1.5 cable inlet, IP65	1
• 2 x ½" NPT via adapter - cable inlet, IP68	2
• 2 x M20x1.5 cable inlet, IP68	3
Additional options	
Standard version (PPS probe body)	A
With thermal isolator (PPS probe body)	B
With PVDF probe body	C
With thermal isolator and PVDF probe body	D
WHG approval, German overfill protection	
Not required	A
Required[2]	B
Electronics/output	
Standard version without display, 12 to 230 V AC/DC, solid-state and relay output[5]	0
Digital version with display, 24 V DC, solid-state output and PROFIBUS PA[5] and 6)	1

Selection and Ordering data	Order No.
Pointek CLS200, welded flange 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.	**7ML5504-** ▢▢▢▢▢-▢▢▢▢
Further designs Please add "**-Z**" to Order No. and specify Order code(s).	Order code
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [69 x 38 mm (2.7 x 1.5"]: Measuring-point number/identification (max. 20 characters); specify in plain text	**Y15**
Electrical connection/cable inlet: PROFIBUS connector M12[3) 7) and 8)]	**A01**
Optional enclosure lid: Lid with glass window instead of closed lid without window[5)]	**A04**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
SIL/IEC61508 Declaration of Conformity [SIL 2 (overspill)][2)]	**C20**
Remote Electronics	
• Remote mounted electronics with 2 m (79") cable	**A05**
• Remote mounted electronics with 5 m (197") cable	**A06**
• Mounting bracket (including mounting kit) for remote electronics	**A09**
Instruction manual Note: The instruction manual should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	**See page 5/23**
Accessories	**See page 5/23**

1) Custom shipping methods required. Contact factory for more details.
2) Available with electronics option 0 only
3) Available with electronics option 1 only
4) Barrier required for Intrinsically Safe protection
5) Version with electronics option 0 has a standard closed lid without window as default; version with electronics option 1 has a standard lid with glass window as default.
6) An M12 PROFIBUS connector can be selected separately with wildcard option (A01).
7) Available with enclosure option 1 only
8) Available with approval option 1, 7, and 8 only

Pointek CLS200

Selection and Ordering data	Order No.
Pointek CLS200, welded flange, PFA coated 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.	**7ML5505 -**
Note: To select Standard or Digital CLS200 (with PROFIBUS PA), see final place holder under Electronics/output.	
Probe version (length from flange face)	
Compact, 98 mm (3.86")	**0 X**
Extended rod, 250 mm (9.84")	**1 A**
Extended rod, 350 mm (13.78")	**1 B**
Extended rod, 500 mm (19.69")	**1 C**
Extended rod, 750 mm (29.53")	**1 D**
Extended rod, 1000 mm (39.37")	**1 E**
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended rod, 200 to 999 mm (7.87 to 39.33")	**1 F**
- Extended rod, 1001 to 2000 mm (39.41 to 78.74")	**1 G**
- Extended rod, 2001 to 3000 mm (78.78 to 118.11")[1]	**1 H**
- Extended rod, 3001 to 4000 mm (118.15 to 157.48")[1]	**1 J**
- Extended rod, 4001 to 5000 mm (157.52 to 196.85")[1]	**1 K**
- Extended rod, 5001 to 5500 mm (196.89 to 216.53")[1]	**1 L**
Process connection	
Welded flange, 316L stainless steel, raised face, PFA coated	
1" ASME, 150 lb	**A 1**
1" ASME, 300 lb	**A 2**
1" ASME, 600 lb	**A 3**
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	**D 1**
3" ASME, 300 lb[1]	**D 2**
3" ASME, 600 lb[1]	**D 3**
4" ASME, 150 lb[1]	**E 1**
4" ASME, 300 lb[1]	**E 2**
4" ASME, 600 lb[1]	**E 3**
Welded flange, 316L stainless steel, Type A flat faced, PFA coated	
DN 25, PN 16	**J 4**
DN 25, PN 40	**J 6**
DN 40, PN 16	**K 4**
DN 40, PN 40	**K 6**
DN 50, PN 16	**L 4**
DN 50, PN 40	**L 6**
DN 80, PN 16	**M 4**
DN 80, PN 40[1]	**M 6**
DN 100, PN 16[1]	**N 4**
DN 100, PN 40[1]	**N 6**
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	

Selection and Ordering data	Order No.
Pointek CLS200, welded flange, PFA coated 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.	**7ML5505 -**
Approvals	
General Purpose	**1**
CSA/FM Class II and III Div. 1, Groups E, F, G[2]	**2**
FM Class I Div. 1, Groups A, B, C, D T4[2]	**3**
CSA Class I, Div. 1, Groups A, B, C, D T4[2]	**4**
ATEX II 1/2 D T100 °C[2]	**5**
ATEX II 1/2 G EEx d [ia] IIC T6 to T4[2]	**6**
CSA/FM Class I, Div 2, Groups A, B, C, D T4; CSA/FM Class II and III, Div 2, Groups F, G; ATEX II 3G 2D EEx n A IIC T6 to T4 T100 °C[3]	**7**
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G T4; ATEX II 1G 1/2D EEx ia IIC T6 to T4 T100 °C[3] and 4)	**8**
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, T4; ATEX II 1/2 GD EEx d [ia] IIC T6 to T4 T100 °C[3]	**0**
Enclosure (see also option A01)	
Aluminum epoxy coated	
• 2 x ½" NPT via adapter - cable inlet, IP65	**0**
• 2 x M20x1.5 cable inlet, IP65	**1**
• 2 x ½" NPT via adapter - cable inlet, IP68	**2**
• 2 x M20x1.5 cable inlet, IP68	**3**
Additional options	
Standard version (PPS Probe body)	**A**
With thermal isolator (PPS Probe body)	**B**
With PVDF probe body	**C**
With thermal isolator and PVDF probe body	**D**
WHG approval, German overfill protection	
Not required	**A**
Required[2]	**B**
Electronics/output	
Standard version without display, 12 to 230 V AC/DC, solid-state and relay output[5]	**0**
Digital version with display, 24 V DC, solid-state output and PROFIBUS PA[5] and 6)	**1**

Further designs	Order code
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters); specify in plain text	**Y15**
Electrical connection/cable inlet: PROFIBUS connector M12[3] 7) and 8)	**A01**
Optional enclosure lid: Lid with glass window instead of closed lid without window[5]	**A04**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
SIL/IEC61508 Declaration of Conformity [SIL 2 (overspill)][2]	**C20**
Remote Electronics	
• Remote mounted electronics with 2 m (79") cable	**A05**
• Remote mounted electronics with 5 m (197") cable	**A06**
• Mounting bracket (including mounting kit) for remote electronics	**A09**
Total insertion length: enter the total insertion length in plain text description	**Y01**

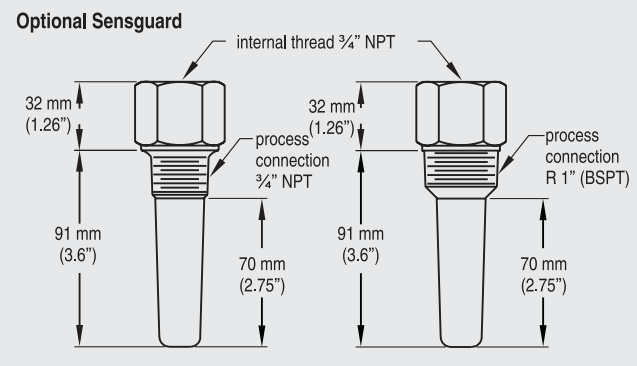
Selection and Ordering data	Order No.
Pointek CLS200, welded flange, PFA coated Versatile inverse frequency shift capacitance level switch with optional rod/cable choices and configurable output, ideal for detection of liquids, solids, slurries, foam and interfaces.	**7ML5505 -** ■■■■ - ■■■■
Instruction manual Note: The instruction manual should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	**See page 5/23**
Accessories	**See page 5/23**

1) Custom shipping methods required. Contact factory for more details.
2) Available with electronics option 0 only
3) Available with electronics option 1 only
4) Barrier required for Intrinsically Safe protection.
5) Version with electronics option 0 has a standard closed lid without window as default; version with electronics option 1 has a standard lid with glass window as default.
6) An M12 PROFIBUS connector can be selected separately with wildcard option (A01).
7) Available only with enclosure option 1

Selection and Ordering data		Order No.
Instruction manual		
English		**7ML1998-5AR02**
French		**7ML1998-5AR12**
German Note: The instruction manual should be ordered as a separate line on the order.		**7ML1998-5AR32**
Additional instruction manual		
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 CD containing the complete ATEX Quick Start and instruction manual library.		**7ML1998-5QE81**
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**
½" NPT cable gland, nickel plated brass, fits cable diameter 6 to 12 mm (0.24 to 0.47") -40 to +100 °C (-40 to +212 °F), IP68 (General Purpose)	F)	**7ML1830-1JA**
½" NPT cable gland, brass, ATEX II 2GD EEx d IIC and EEx e II, fits cable diameter 6.5 to 14 mm (0.26 to 0.55"), -60 to +130 °C (-76 to +266 °F), IP68 (Explosion Proof)	F)	**7ML1830-1JB**
M20x1.5 cable gland, PA polyamide, ATEX II 2G EEx e II, fits cable diameter 7 to 12 mm (0.28 to 0.47"), -20 to +70 °C (-4 to +158 °F), IP68 (General Purpose)	F)	**7ML1830-1JC**
M20x1.5 cable gland, brass, ATEX II 2GD EEx d IIC and EEx e II, fits cable diameter 10.5 to 15.9 mm (0.41 to 0.63"), under armour cable diameter 6.1 to 11.5 mm (0.24 to 0.45"), -60 to +130 °C (-76 to +266 °F), IP68 (Explosion Proof)	F)	**7ML1830-1JD**
One metallic cable gland M20x1.5, -40 to +80 °C (-40 to +176 °F)		**7ML1930-1AP**
One metallic cable gland M20x1.5, -40 to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**
Blind threaded flanges are available. Please contact nacc.smpi@siemens.com with a completed application data sheet on page 5/8.		
Spare parts		
Test magnet (digital version)		**7ML1830-1JE**
Amplifier/power supply, standard version	C)	**7ML1830-1DJ**
Amplifier/power supply, digital version		**7ML1830-1JF**
LCD display (digital version)		**7ML1830-1JK**

C) Subject to export regulations AL: N, ECCN: EAR99
F) Subject to export regulations AL: 9I999, ECCN: N

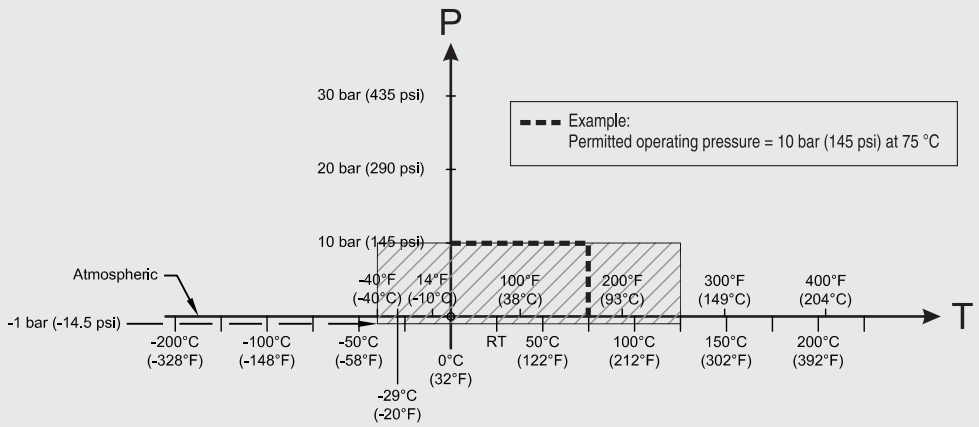
Options



Optional Sensguard dimensions

Pointek CLS200

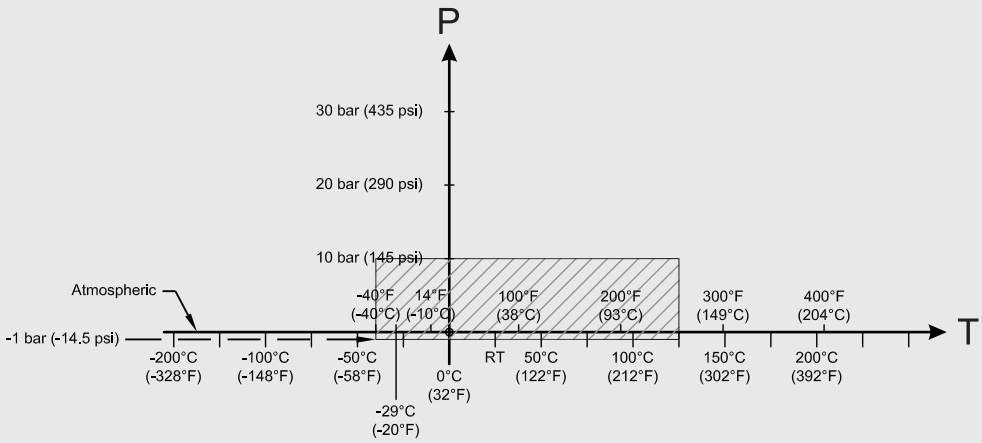
Characteristic curves



Pressure/Temperature Curve
CLS200 Sliding Coupling
Threaded Process Connections (7ML5502)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

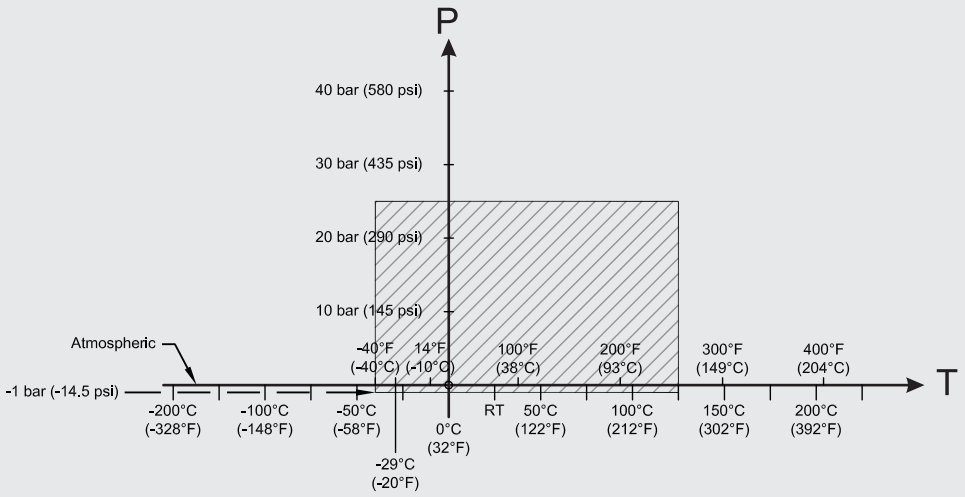
Pointek CLS200 Process Pressure/Temperature derating curves (7ML5502)



Pressure/Temperature Curve
CLS200 Cable
Threaded Process Connections (7ML5502)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

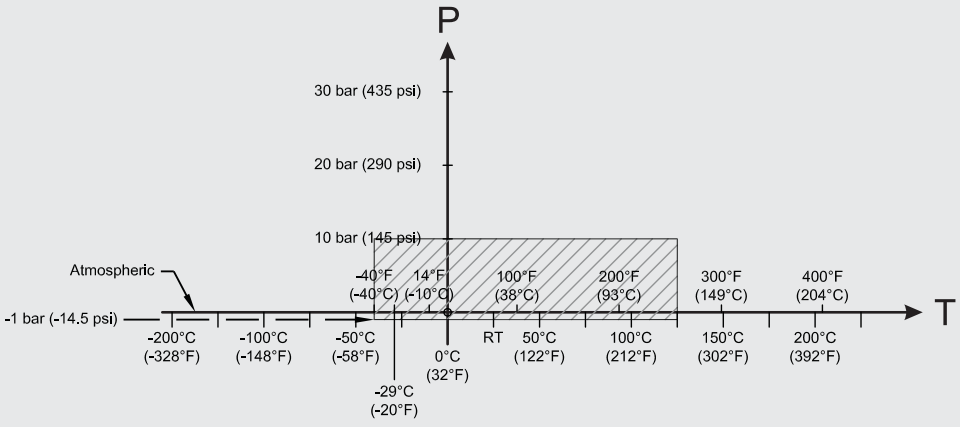
Pointek CLS200 Process Pressure/Temperature derating curves (7ML5502)



Pressure/Temperature Curve
CLS200 Compact and Extended Rod
Threaded Process Connections (7ML5502)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

Pointek CLS200 Process Pressure/Temperature derating curves (7ML5502)

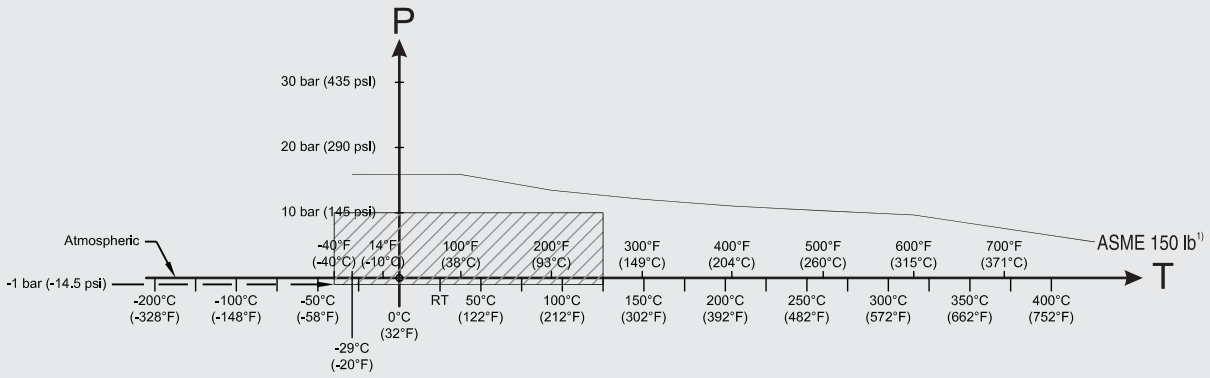


Pressure/Temperature Curve
CLS200 Compact and Extended Sanitary Type
Sanitary Process Connections (7ML5502)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

Pointek CLS200 Process Pressure/Temperature derating curves (7ML5502)

Pointek CLS200

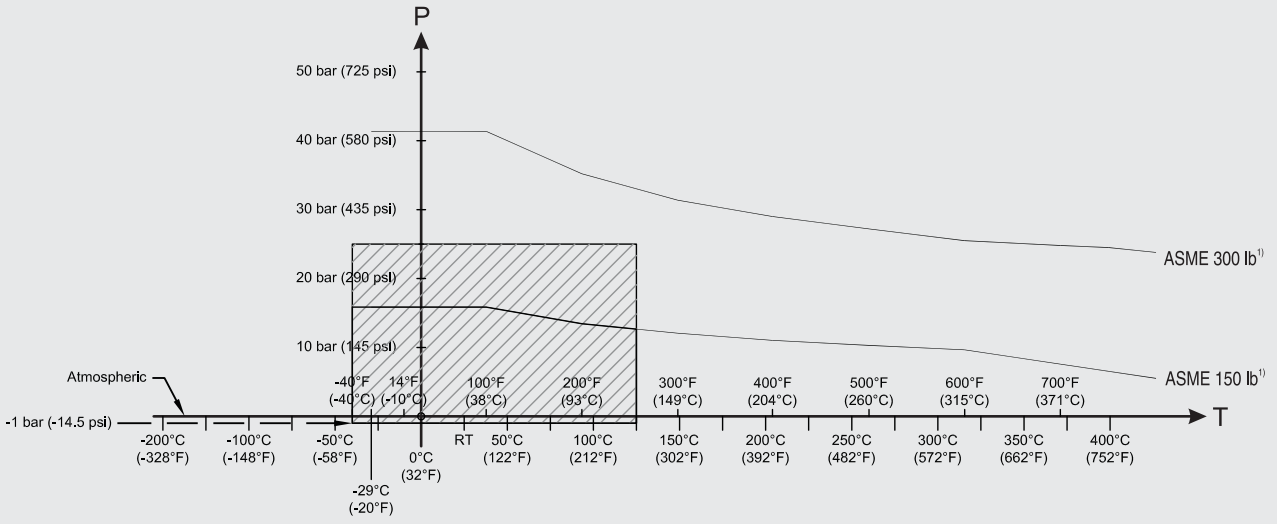


Pressure/Temperature Curve
CLS200 Cable
ASME Flanged Process Connections (7ML5504)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

Pointek CLS200 Process Pressure/Temperature derating curves (7ML5504)

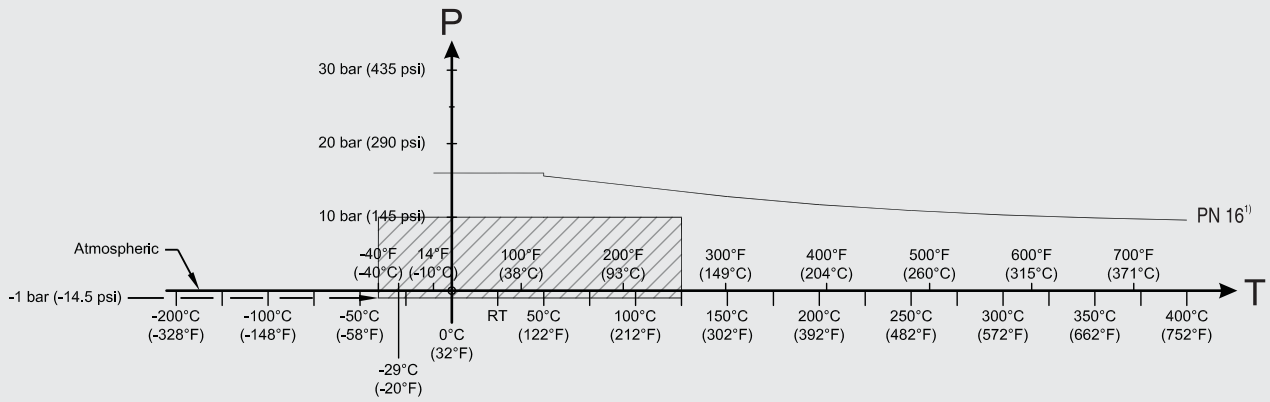


Pressure/Temperature Curve
CLS200 Compact and Extended Rod
ASME Flanged Process Connections (7ML5504 and 7ML5505)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

Pointek CLS200 Process Pressure/Temperature derating curves (7ML5504 and 7ML5505)

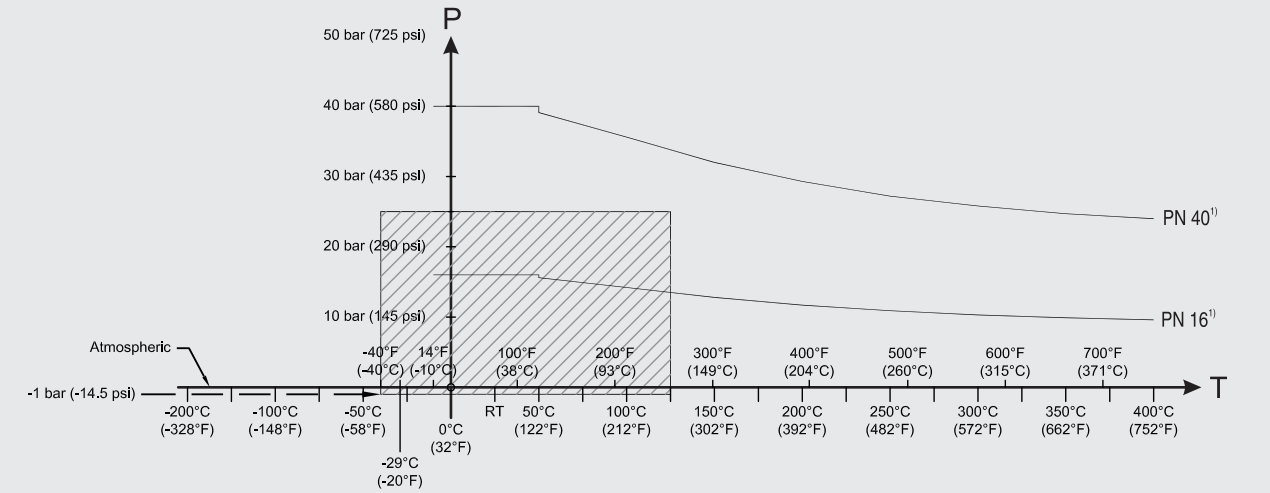


Pressure/Temperature Curve
CLS200 Cable
EN Flanged Process Connections (7ML5504)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

Pointek CLS200 Process Pressure/Temperature derating curves (7ML5504)



Pressure/Temperature Curve
CLS200 Compact and Extended Rod
EN Flanged Process Connections (7ML5504 and 7ML5505)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

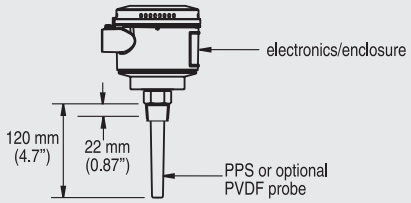
1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS200 Process Pressure/Temperature derating curves (7ML5504 and 7ML5505)

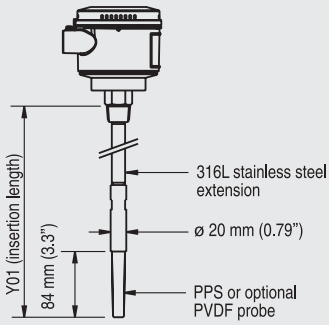
Pointek CLS200

Dimensional drawings

Compact version
Threaded (7ML5502)

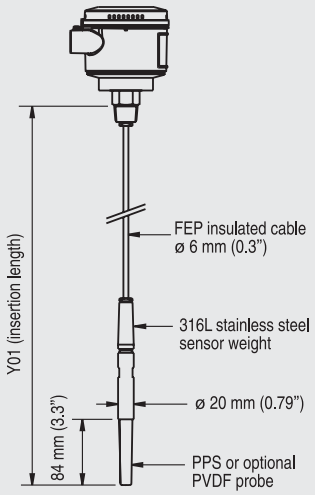


Extended rod version
Threaded (7ML5502)



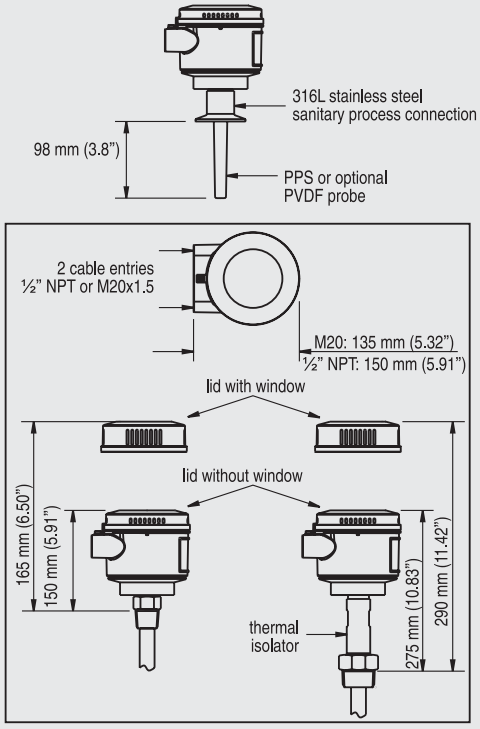
Max. insertion length = 5500 mm (216")

Extended cable version
Threaded (7ML5502)

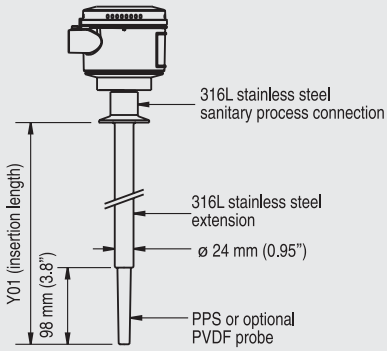


Max. insertion length = 30000 mm (1181")
Applicable for liquids and solids applications.
Cable can be shortened on site.

Sanitary compact version
Sanitary fitting (7ML5502)

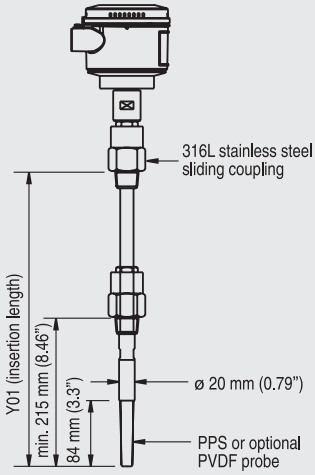


Sanitary extended version
Sanitary fitting (7ML5502)



Max. insertion length = 5500 mm (216")

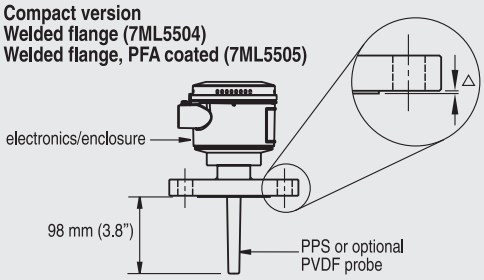
Sliding coupling version
Threaded (7ML5502)

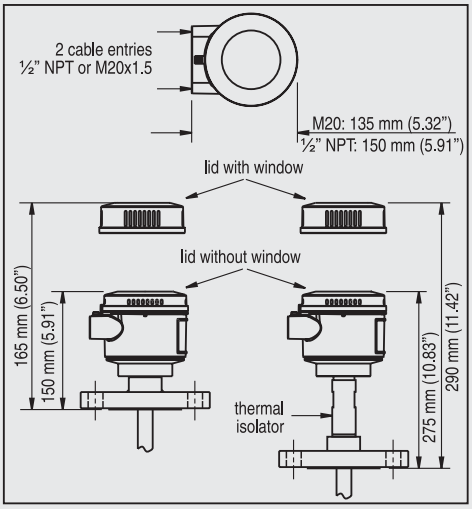


Max. insertion length = 5500 mm (216")

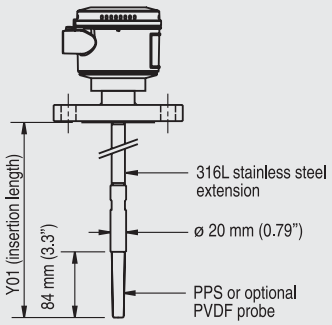
Pointek CLS200 dimensions - Threaded/Sanitary Process Connections

Compact version
Welded flange (7ML5504)
Welded flange, PFA coated (7ML5505)



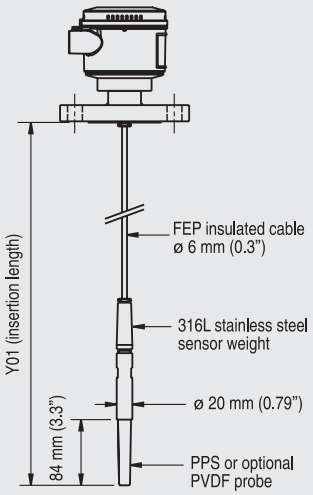


Extended rod version
Welded flange (7ML5504)
Welded flange, PFA coated (7ML5505)



Min. insertion length = 200 mm (7.87")
Max. insertion length = 5500 mm (216.53")

Extended cable version
Welded flange (7ML5504)



Min. insertion length = 500 mm (19.69")
Max. insertion length = 30000 mm (1181")
Applicable for liquids and solids applications.
Cable can be shortened on site.

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

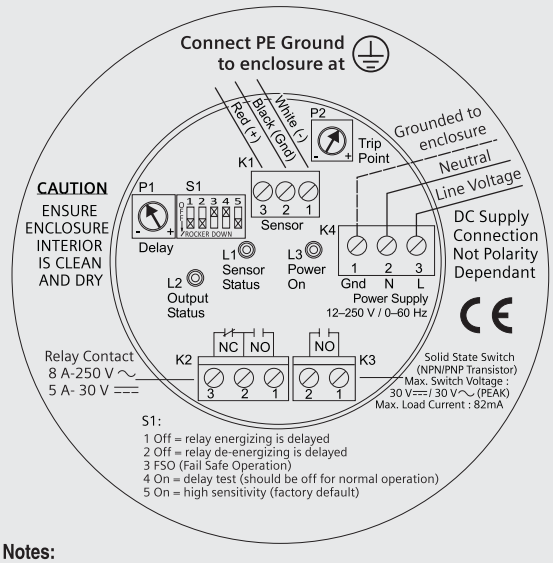
Insertion length does not include any raised face/gasket face dimension (see Flange Facing table above).

Pointek CLS200 dimensions - Flanged Process Connections

Pointek CLS200

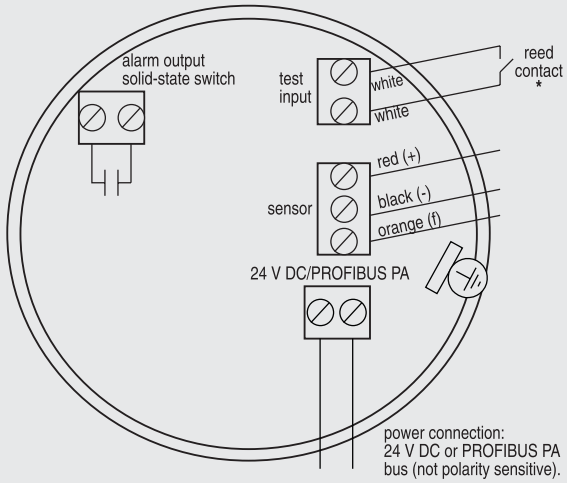
Schematics

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 a 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

Pointek CLS300

Overview

Pointek CLS300 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 (with PROFIBUS PA) includes a display and provides additional diagnostic features.

Benefits

- Patented Active-Shield technology so measurement is unaffected by material buildup in active shield section
- Performs in extremely abrasive conditions because of solid rod construction
- Standard version: 3 LED indicators for adjustment control, output status and power
- Digital version: integral LCD display, and PROFIBUS PA communication
- Push-button calibration, full-function diagnostics
- Multiple output options
- SIL/IEC61508 compliant for use in safety integrated level applications for overfill protection (SIL 2)

Application

The Pointek CLS300 is offered in standard and digital versions.

The standard version has 3 LED indicators with basic relay and solid-state switch alarms.

The digital version provides an integral LCD display for standalone 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 like the mining industry.

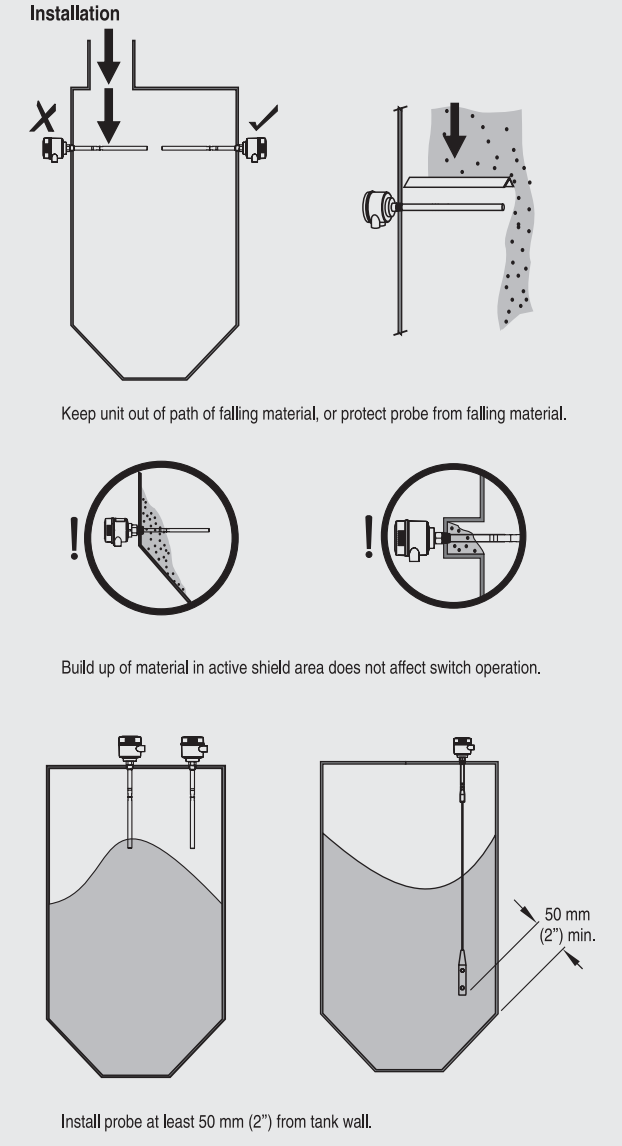
The fully potted electronics are unaffected by condensation, dust or vibration.

Wetted parts are made of stainless steel or stainless steel with a PFA shield for high chemical resistance. Ceramic inserts are supplied with high temperature CLS300 devices. Materials with low or high dielectric constants can be accurately detected. The unique active shield suppresses interference from material buildup.

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



Pointek CLS300 installation

5

Pointek CLS300

Technical specifications

(Note: all specifications listed below apply to Standard and Digital versions unless otherwise noted)

Mode of operation	
Measuring principle	Inverse frequency shift capacitive level detection
Input	
Measured variable	Change in picoFarad (pF)
Output	
Output signal (CLS300 Standard)	
• 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) • 2000 VA (AC)
- Time delay (ON and/or OFF)	1 to 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 to 60 s
Output signal (CLS300 Digital)	
• Solid-state output (CLS300 Digital)	
- 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 to 100s)
• Fail-safe mode	Min. or max.
• Connection	Removable terminal block, max. 2.5 mm² (0.09")
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 to +85 °C (-40 to +185 °F)
• Pressure range[2]	-1 to 35 bar g (-14.6 to 511 psi g)
Medium conditions	Liquids, bulk solids, slurries and interfaces, and applications with viscous materials
• Relative dielectric constant ε_r	Min. 1.5
• Temperature range (probe)	
- Standard version	-40 to +200 °C (-40 to +392 °F)
- High-temperature version	-40 to +400 °C (-40 to +752 °F)
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), digital version has optional PROFIBUS connector
Controls and displays (CLS300 Standard)	
• Displays	3 LEDs, for adjustment control, 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
Controls and displays (CLS300 Digital)	
• Local display	LCD
• Configuration	• Locally, using 3 button keypad (for standalone operation) • Remotely, using SIMATIC PDM (for installation on a network)
Power supply (CLS300 Standard)	
• Supply	12 to 250 V AC/DC, 0 to 60 Hz, galvanically isolated
• Current consumption	2 W
Power supply (CLS300 Digital)	
• Bus voltage	• Standard: 12 to 30 V DC • Intrinsically Safe: 12 to 24 V DC
• Current consumption	12.5 mA
Certificates and approvals (CLS300 Standard)	
• General Purpose	CE, CSA, FM
• Dust Ignition Proof (Intrinsically Safe probe circuit)	• CSA/FM Class II and III, Div. 1, Groups E, F, G T4 • ATEX II 1/2D T 100 °C
• Explosion Proof (Intrinsically Safe probe circuit)	• CSA/FM Class I, Div. 1, Groups A, B, C, D T4 • ATEX II 1/2G EEx d [ia] IIC T6 to T1
• Marine	Lloyd's Register of Shipping, Categories ENV1, ENV2, and ENV5
• Overfill Protection	WHG (Germany)
• Others	• SIL/IEC61508 Declaration of Conformity [SIL 2 (overspill)] • Pattern Approval (China) • C-TICK (Australia)
Certificates and approvals (CLS300 Digital)	
• General Purpose	CE, CSA, FM
• Dust Ignition Proof	• CSA/FM Class II and III, Div. 1, Groups E, F, G T4 or T6[3] • ATEX II 1/2D 2D T100 °C
• Explosion Proof/Dust Ignition Proof (Intrinsically Safe probe circuit)	• CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G T4 • ATEX II 1/2GD EEx d [ia] IIC T6 to T1 T100 °C
• Intrinsically Safe	• CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G T4 or T6[3] • ATEX II 1G 1/2D EEx ia IIC T6 to T4 T100 °C[3]
• Marine	Lloyd's Register of Shipping, Categories ENV1, ENV2, and ENV5

• Others	• Pattern Approval (China) • C-TICK (Australia)
Communication (CLS300 Digital)	• 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
Mode of operation	

1) When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves starting on page 5/41.

2) Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves starting on page 5/41.

3) Barrier required for Intrinsically Safe protection.

Design: Probe

	Standard version	High Temperature version	Cable version
Length	Min. 350 mm (14"), max. 1000 mm (40")	Min. 350 mm (14"), max. 1000 mm (40")	Min. 1000 mm (40"), max. 25000 mm (984")
Sensor wetted parts	PFA (no insulation on active probe), 316L stainless steel	Ceramic (no insulation on active probe), 316L stainless steel	316 stainless steel, optional PFA
O-ring seal material[1)]	FKM	FKM	FKM
Thermal isolator	Optional	Standard	Optional
Extension	User selectable length	User selectable length	User selectable cable length

1) FFKM available as special option. Contact nacc.smpi@siemens.com for details.

Pointek CLS300

Selection and Ordering data — Order No.

Pointek CLS300, threaded version — 7ML5510-

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.

Note: To select Standard or Digital CLS300 (with PROFIBUS PA), see final place holder under Electronics/output.

Probe version
(Threaded lengths include process thread.)

Standard version, rod 350 mm (13.78")	0 X
Extended rod, length 500 mm (19.69")	1 A
Extended rod, length 750 mm (29.53")	1 B
Extended rod, length 1000 mm (39.37")	1 C
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended rod, factory adjusted length 250 to 999 mm (9.8 to 39.3")	1 D
- Extended cable, length 3000 mm (118.1"), length adjustable by customer[1)]	2 A
- Extended cable, length 6000 mm (236.2"), length adjustable by customer[1)]	2 B
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended cable, factory adjusted length 1000 to 4999 mm (39.4 to 196.8")[1)]	2 C
- Extended cable, factory adjusted length 5000 to 9999 mm (196.9 to 393.7")[1)]	2 D
- Extended cable, factory adjusted length 10000 to 14999 mm (393.7 to 590.5")[1)]	2 E
- Extended cable, factory adjusted length 15000 to 19999 mm (590.6 to 787.4")[1)]	2 F
- Extended cable, factory adjusted length 20000 to 25000 mm (787.4 to 984.3")[1)]	2 G
- Extended PFA cable, length 3000 mm (118.1"), length adjustable by customer[1) and 2)]	3 A
- Extended PFA cable, length 6000 mm (236.2"), length adjustable by customer[1) and 2)]	3 B
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended PFA cable, length 1000 to 4999 mm (39.4 to 196.8")[1) and 2)]	3 C
- Extended PFA cable, length 5000 to 9999 mm (196.9 to 393.7")[1) and 2)]	3 D
- Extended PFA cable, length 10000 to 14999 mm (393.7 to 590.5")[1) and 2)]	3 E
- Extended PFA cable, length 15000 to 19999 mm (590.6 to 787.4")[1) and 2)]	3 F
- Extended PFA cable, length 20000 to 25000 mm (787.4 to 984.3")[1) and 2)]	3 G

Note: Verify that shield length selected in A07 and A08 is appropriate for the version selected.

Process connection

¾" NPT [(Taper), ANSI/ASME B1.20.1][3)]	A
1" NPT [(Taper), ANSI/ASME B1.20.1][3)]	B
1½" NPT [(Taper), ANSI/ASME B1.20.1]	C
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203][3)]	D
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203][3)]	E
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	F
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	K
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202][3)]	L
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202][3)]	M
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	N

Selection and Ordering data — Order No.

Pointek CLS300, threaded version — 7ML5510-

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.

Approvals

General Purpose	1
CSA/FM Class II and III Div. 1, Groups E, F, G T4[4)]	2
CSA/FM Class I Div. 1, Groups A, B, C, D T4[4)]	3
ATEX II 1/2 D T 100 °C [4)]	4
ATEX II 1/2 G EEx d [ia] IIC T6 to T1[4)]	5
CSA/FM Class II and III, Div 1, Groups E, F, G T4 or T6;[5)] ATEX II 1/2D 2D T100 °C[6)]	6
CSA/FM Class I, II and III, Div 1, Groups A, B, C, D, E, F, G T4 or T6; ATEX II 1G 1/2D EEx ia IIC T6 to T4 T100 °C[5) and 6)]	7
CSA/FM Class I, II and III, Div 1, Groups A, B, C, D, E, F, G T4; ATEX II 1/2GD EEx d [ia] IIC T6 to T1 T100 °C[6)]	8

WHG approval, German overfill protection

Not required	0
Required [4)]	1

Enclosure (see also option A01)

Aluminum epoxy coated	
• 2 x ½" NPT via adapter, cable inlet, IP65	1
• 2 x M20x1.5 cable inlet, IP65	2
• 2 x ½" NPT via adapter, cable inlet, IP68	3
• 2 x M20x1.5 cable inlet, IP68	4

Additional options

Standard version	A
With thermal isolator [for process temperature over +85 °C (+185 °F)]	B

Electronics/output

Standard version without display, 12 to 250 V AC/DC, solid-state and relay output	0
Digital version with display, 24 V DC, solid-state output and PROFIBUS PA[7)]	1

Further designs — Order code

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

Total insertion length: enter the total insertion length in plain text description	Y01
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters); specify in plain text	Y15
Electrical connection/cable inlet: PROFIBUS connector M12[6) 8) and 9)]	A01
Optional enclosure lid: Lid with glass window instead of closed lid without window[10)]	A04
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
SIL/IEC61508 Declaration of Conformity [SIL 2 (overspill)][4)]	C20
Extended Active Shield (Y02) (standard length is 125 mm, not including threaded process connection length)[11)]	
• Active Shield length (Y02): 250 mm (min. insertion length: rod, 475 mm, cable, 1000 mm)	A07
• Active Shield length (Y02): 400 mm (min. insertion length: rod, 625 mm, cable, 1000 mm)	A08

Selection and Ordering data	Order No.
Pointek CLS300, threaded version 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.	**7ML5510 -** ■■■■■ - ■■ **A** ■
Instruction manual Note: The instruction manual should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	**See page 5/40**
Accessories	**See page 5/40**

1) Available with process connection C, F, N only

2) Do not select PFA cable version if process temperature exceeds +200 °C (+392 °F).

3) Available with Probe versions 0X, 1A to 1D only

4) Available with electronics option 0 only

5) Barrier required for Intrinsically Safe protection

6) Available with electronics option 1 only

7) An M12 PROFIBUS connector can be selected separately with wildcard option A01.

8) Available with enclosure option 2 only

9) Available with approval option 1, 6, and 7 only

10) Version with electronics option 0 has a standard closed lid without window as default; version with electronics option 1 has a standard lid with glass window as default.

11) See dimension drawings on page 5/44 for further explanation of Y02.

Pointek CLS300

Selection and Ordering data	Order No.
Pointek CLS300, welded flange	**7ML5506-**
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.	
Note: To select Standard or Digital CLS300 (with PROFIBUS PA), see final place holder under Electronics/output.	
Probe version (length from flange face)	
Standard version, rod 350 mm (13.78")	0 X
Extended rod, length 500 mm (19.69")	1 A
Extended rod, length 750 mm (29.53")	1 B
Extended rod, length 1000 mm (39.37")	1 C
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended rod, length 250 to 999 mm (9.8 to 39.3")	1 D
- Extended cable, length 3000 mm (118.1"), length adjustable by customer	2 A
- Extended cable, length 6000 mm (236.2"), length adjustable by customer	2 B
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended cable, length 1000 to 4999 mm (39.4 to 196.8")	2 C
- Extended cable, length 5000 to 9999 mm (196.9 to 393.7")	2 D
- Extended cable, length 10000 to 14999 mm (393.7 to 590.5")	2 E
- Extended cable, length 15000 to 19999 mm (590.6 to 787.4")	2 F
- Extended cable, length 20000 to 25000 mm (787.4 to 984.3")	2 G
- Extended PFA cable, length 3000 mm (118.1"), length adjustable by customer[1]	3 A
- Extended PFA cable, length 6000 mm (236.2"), length adjustable by customer[1]	3 B
Add order code Y01 and plain text: "Insertion length ... mm"	
- Extended PFA cable, length 1000 to 4999 mm (39.4 to 196.8")[1]	3 C
- Extended PFA cable, length 5000 to 9999 mm (196.9 to 393.7")[1]	3 D
- Extended PFA cable, length 10000 to 14999 mm (393.7 to 590.5")[1]	3 E
- Extended PFA cable, length 15000 to 19999 mm (590.6 to 787.4")[1]	3 F
- Extended PFA cable, length 20000 to 25000 mm (787.4 to 984.3")[1]	3 G
Process connection	
Welded flange, 316L stainless steel, raised face	
1" ASME, 150 lb[2]	A 1
1" ASME, 300 lb[2]	A 2
1" ASME, 600 lb[2 and 3]	A 3
1½" ASME, 150 lb	B 1
1½" ASME, 300 lb	B 2
1½" ASME, 600 lb[3]	B 3
2" ASME, 150 lb	C 1
2" ASME, 300 lb	C 2
2" ASME, 600 lb[3]	C 3
3" ASME, 150 lb	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

Selection and Ordering data	Order No.
Pointek CLS300, welded flange	**7ML5506-**
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.	
Welded flange, 316L stainless steel, Type A flat faced	
DN 25, PN 16[2]	J 4
DN 25, PN 40[2]	J 6
DN 40, PN 16	K 4
DN 40, PN 40	K 6
DN 50, PN 16	L 4
DN 50, PN 40	L 6
DN 80, PN 16	M 4
DN 80, PN 40[3]	M 6
DN 100, PN 16[3]	N 4
DN 100, PN 40[3]	N 6
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	
Approvals	
General Purpose	1
CSA/FM Class II and III Div. 1, Groups E, F, G T4[4]	2
CSA/FM Class I Div. 1, Groups A, B, C, D T4[4]	3
ATEX II 1/2 D T100 °C[4]	4
ATEX II 1/2 G EEx d [ia] IIC T6 to T1[4]	5
CSA/FM Class II and III, Div 1, Groups E, F, G T4 or T6;[5] ATEX II 1/2D 2D T100 °C[6]	6
CSA/FM Class I, II and III, Div 1, Groups A, B, C, D, E, F, G T4 or T6; ATEX II 1G 1/2D EEx ia IIC T6 to T4 T100 °C[5 and 6]	7
CSA/FM Class I, II and III, Div 1, Groups A, B, C, D, E, F, G T4; ATEX II 1/2GD EEx d [ia] IIC T6 to T1 T100 °C[6]	8
WHG approval, German overfill protection	
Not required	0
Required [4]	1
Additional options	
Standard version	A
With thermal isolator [for process temperature over +85 °C (+185 °F)]	B
Enclosure (see also option A01)	
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
Electronics/output	
Standard version without display, 12 to 250 V AC/DC, solid-state and relay output	0
Digital version with display, 24 V DC, solid-state output and PROFIBUS PA[7]	1

Further designs Please add "**-Z**" to Order No. and specify Order code(s).	Order code
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters); specify in plain text	**Y15**
Electrical connection/cable inlet: PROFIBUS connector M12[6 8) and 9]	**A01**
Optional enclosure lid: Lid with glass window instead of closed lid without window[10]	**A04**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
SIL/IEC61508 Declaration of Conformity [SIL 2 (overspill)][4]	**C20**
Extended Active Shield (Y02) (standard length is 105 mm)[11]	
• Active Shield length (Y02): 230 mm (min. insertion length: rod, 475 mm, cable, 1000 mm)	**A07**
• Active Shield length (Y02): 380 mm (min. insertion length: rod, 625 mm, cable, 1000 mm)	**A08**

Selection and Ordering data	Order No.
Pointek CLS300, welded flange 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.	**7 M L 5 5 0 6 -** ▢▢▢▢▢ - ▢▢▢▢
Instruction manual Note: The instruction manual should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	**See page 5/40**
Accessories	**See page 5/40**

1) Do not select PFA cable version if process temperature exceeds +200 °C (+392 °F).

2) Available with Probe versions 0X, 1A to 1D only

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

4) Available with electronics option 0 only

5) Barrier required for Intrinsically Safe protection

6) Available with electronics option 1 only

7) An M12 PROFIBUS connector can be selected separately with wildcard option A01.

8) Available with enclosure option B only

9) Available with approval option 1, 6, and 7 only

10) Version with electronics option 0 has a standard closed lid without window as default; version with electronics option 1 has a standard lid with glass window as default.

11) See dimension drawings on page 5/45 for further explanation of Y02.

Pointek CLS300

Selection and Ordering data	Order No.
Pointek CLS300, high temperature, threaded 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.	7ML5507 - A
Note: To select Standard or Digital CLS300 (with PROFIBUS PA), see final place holder under Electronics/output.	
Version (Threaded lengths include process thread.)	
Standard version, rod 350 mm (13.78")	0 X
Extended rod, length 500 mm (19.69")	1 A
Extended rod, length 750 mm (29.53")	1 B
Extended rod, length 1000 mm (39.37")	1 C
Extended rod, customer specified length (min. 250 mm (9.8") length, max. 999 mm (39.3") length) Add order code Y01 and plain text: "Insertion length ...mm" Note: Verify that shield length selected in A07 or A08 is appropriate for the version selected.	1 D
Process connection	
316L stainless steel	
¾" NPT [(Taper), ANSI/ASME B1.20.1]	A
1" NPT [(Taper), ANSI/ASME B1.20.1]	B
1½" NPT [(Taper), ANSI/ASME B1.20.1]	C
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	D
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	E
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	F
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	K
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	L
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	M
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	N
Approvals	
General Purpose	1
CSA/FM Class II and III Div. 1, Groups E, F, G T4[1)]	2
CSA/FM Class I Div. 1, Groups A, B, C, D T4[1)]	3
ATEX II 1/2 D T100 °C[1)]	4
ATEX II 1/2 G EEx d [ia] IIC T6 to T1[1)]	5
CSA/FM Class II and III, Div 1, Groups E, F, G T4 or T6;[2)] ATEX II 1/2D 2D T100 °C[3)]	6
CSA/FM Class I, II and III, Div 1, Groups A, B, C, D, E, F, G T4 or T6; ATEX II 1G 1/2D EEx ia IIC T6 to T4 T100 °C[2) and 3)]	7
CSA/FM Class I, II and III, Div 1, Groups A, B, C, D, E, F, G T4; ATEX II 1/2GD EEx d [ia] IIC T6 to T1 T100 °C[3)]	8
WHG approval, German overfill protection	
Not required	0
Required [1)]	1
Enclosure (see also option A01)	
Aluminum epoxy coated	
• 2 x ½" NPT via adapter, cable inlet, IP65	0
• 2 x M20x1.5 cable inlet, IP65	1
• 2 x ½" NPT via adapter, cable inlet, IP68	2
• 2 x M20x1.5 cable inlet, IP68	3
Additional options	
With thermal isolator [for process temperature over +85 °C (+185 °F)]	B

Selection and Ordering data	Order No.
Pointek CLS300, high temperature, threaded 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.	7ML5507 - A
Electronics/output	
Standard version without display, 12 to 250 V AC/DC, solid-state and relay output	0
Digital version with display, 24 V DC, solid-state output and PROFIBUS PA[4)]	1
Further designs Please add "**-Z**" to Order No. and specify Order code(s).	Order code
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters); specify in plain text	**Y15**
Electrical connection/cable inlet: PROFIBUS connector M12[3) 5)and 6)]	**A01**
Optional enclosure lid: Lid with glass window instead of closed lid without window[7)]	**A04**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
SIL/IEC61508 Declaration of Conformity [SIL 2 (overspill)][1)]	**C20**
Extended Active Shield (Y02) [standard length is 125 mm (4.92"), not including threaded process connection length][8)]	
• Active Shield length (Y02): 250 mm (9.84"), [min. insertion length: rod 475 mm (18.70"), cable 1000 mm (39.37")]	**A07**
• Active Shield length (Y02): 400 mm (15.75"). [min. insertion length: rod 625 mm (24.61"), cable 1000 mm (39.37")]	**A08**
Instruction manual Note: The instruction manual should be ordered as a separate line on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	**See page 5/40**
Accessories	**See page 5/40**

1) Available with electronics option 0 only
2) Barrier required for Intrinsically Safe protection
3) Available with electronics option 1 only
4) An M12 PROFIBUS connector can be selected separately with wildcard option A01.
5) Available with enclosure option 1 only
6) Available with approval option 1, 6, and 7 only
7) Version with electronics option 0 has a standard closed lid without window as default; version with electronics option 1 has a standard lid with glass window as default.
8) See dimension drawings on page 5/44 for further explanation of Y02.

Selection and Ordering data	Order No.
Pointek CLS300, high temperature, welded flange	**7ML5508 -**
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.	
Note: To select Standard or Digital CLS300 (with PROFIBUS PA), see final place holder under Electronics/output.	
Version (length from flange face)	
Standard version, rod 350 mm (13.78")	0 X
Extended rod, length 500 mm (19.69")	1 A
Extended rod, length 750 mm (29.53")	1 B
Extended rod, length 1000 mm (39.37")	1 C
Extended rod, customer specified length [min. 250 mm (9.8") length, max. 999 mm (39.3")length] Add order code Y01 and plain text: "Insertion length ...mm" Note: Verify that shield length selected in A07 and A08 is appropriate for the version selected.	1 D
Process connection	
Welded flange, 316L stainless steel, raised face	
1" ASME, 150 lb	A 1
1" ASME, 300 lb	A 2
1" ASME, 600 lb[1]	A 3
1½" ASME, 150 lb	B 1
1½" ASME, 300 lb	B 2
1½" ASME, 600 lb[1]	B 3
2" ASME, 150 lb	C 1
2" ASME, 300 lb	C 2
2" ASME, 600 lb[1]	C 3
3" ASME, 150 lb	D 1
3" ASME, 300 lb[1]	D 2
3" ASME, 600 lb[1]	D 3
4" ASME, 150 lb[1]	E 1
4" ASME, 300 lb[1]	E 2
4" ASME, 600 lb[1]	E 3
Welded flange, 316L stainless steel, Type A flat faced	
DN 25, PN 16	J 4
DN 25, PN 40	J 6
DN 40, PN 16	K 4
DN 40, PN 40	K 6
DN 50, PN 16	L 4
DN 50, PN 40	L 6
DN 80, PN 16	M 4
DN 80, PN 40[1]	M 6
DN 100, PN 16[1]	N 4
DN 100, PN 40[1]	N 6
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 standard.)	
Approvals	
General Purpose	1
CSA/FM Class II and III Div. 1, Groups E, F, G T4[2]	2
CSA/FM Class I Div. 1, Groups A, B, C, D T4[2]	3
ATEX II 1/2 D T100 °C[2]	4
ATEX II ½G EEx d [ia] IIC T6 to T1[2]	5
CSA/FM Class II and III, Div 1, Groups E, F, G T4 or T6;[3] ATEX II 1/2D 2D T100 °C[4]	6
CSA/FM Class I, II and III, Div 1, Groups A, B, C, D, E, F, G T4 or T6; ATEX II 1G 1/2D EEx ia IIC T6 to T4 T100 °C[3] and 4)	7
CSA/FM Class I, II and III, Div 1, Groups A, B, C, D, E, F, G T4; ATEX II 1/2GD EEx d [ia] IIC T6 to T1 T100 °C[4]	8

Selection and Ordering data	Order No.
Pointek CLS300, high temperature, welded flange	**7ML5508 -**
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.	
WHG approval, German overfill protection	
Not required	0
Required [2]	1
Additional options	
With thermal isolator [for process temperature over +85 °C (+185 °F)]	B
Enclosure (see also option A01)	
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
Electronics/output	
Standard version without display, 12 to 250 V AC/DC, solid-state and relay output	0
Digital version with display, 24 V DC, solid-state output and PROFIBUS PA[5]	1
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Total insertion length: enter the total insertion length in plain text description	**Y01**
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters); specify in plain text	**Y15**
Electrical connection/cable inlet: PROFIBUS connector M12[4) 6) and 7)]	**A01**
Optional enclosure lid: Lid with glass window instead of closed lid without window[8]	**A04**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
SIL/IEC61508 Declaration of Conformity [SIL 2 (overspill)][2]	**C20**
Extended Active Shield (Y02) [standard length is 105 mm (4.13")][9]	
• Active Shield length (Y02): 230 mm (9.06") [min. insertion length: rod 475 mm (18.70"), cable 1000 mm (39.37")]	**A07**
• Active Shield length (Y02): 380 mm (14.96") [min. insertion length: rod 625 mm (24.61"), cable 1000 mm (39.37")]	**A08**
Instruction manual	**See page 5/40**
Note: The instruction manual should be ordered as a separate line on the order.	
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
Accessories	**See page 5/40**

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

2) Available with electronics option 0 only

3) Barrier required for Intrinsically Safe protection

4) Available with electronics option 1 only

5) An M12 PROFIBUS connector can be selected separately with wildcard option (A01).

6) Available with enclosure option B only

7) Available with approval option 1, 6, and 7 only

8) Version with electronics option 0 has a standard closed lid without window as default; version with electronics option 1 has a standard lid with glass window as default.

9) See dimension drawings on page 5/45 for further explanation of Y02.

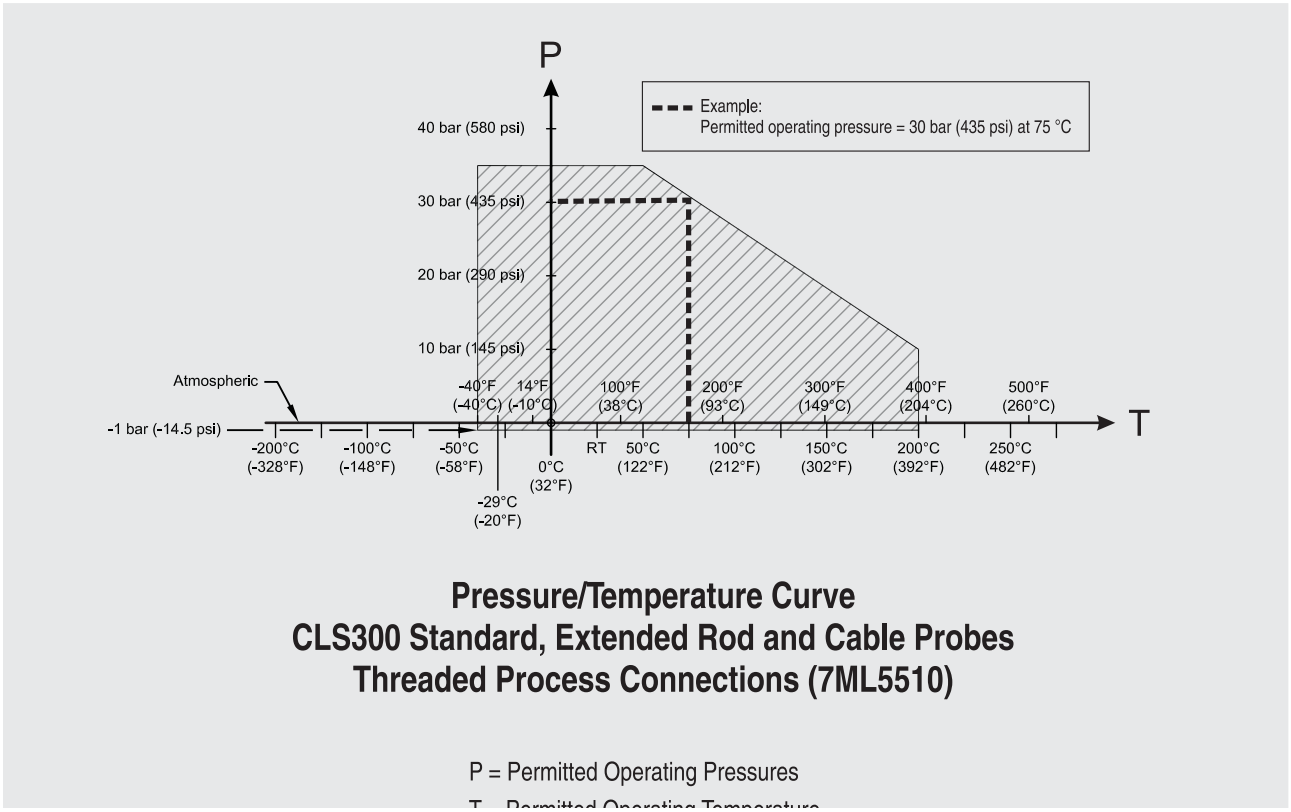
Pointek CLS300

Selection and Ordering data		Order No.
Instruction manual		
English		**7ML1998-5CK04**
German		**7ML1998-5CK34**
French Note: The instruction manual should be ordered as a separate line on the order.		**7ML1998-5CK14**
Quick Start manual, multi-language	C)	**7ML1998-5QF81**
Note: Due to ATEX regulations, one Quick Start manual is included with every product. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
½" NPT cable gland, nickel plated brass, fits cable diameter 6 to 12 mm (0.24 to 0.47") -40 to +100 °C (-40 to +212 °F), IP68 (General Purpose)	F)	**7ML1830-1JA**
½" NPT cable gland, brass, ATEX II 2GD EEx d IIC and EEx e II, fits cable diameter 6.5 to 14 mm (0.26 to 0.55"), -60 to +130 °C (-76 to +266 °F), IP68 (Explosion Proof)	F)	**7ML1830-1JB**
M20x1.5 cable gland, PA polyamide, ATEX II 2G EEx e II, fits cable diameter 7 to 12 mm (0.28 to 0.47"), -20 to +70 °C (-4 to +158 °F), IP68 (General Purpose)	F)	**7ML1830-1JC**
M20x1.5 cable gland, brass, ATEX II 2GD EEx d IIC and EEx e II, fits cable diameter 10.5 to 15.9 mm (0.41 to 0.63"), under armour cable diameter 6.1 to 11.5 mm (0.24 to 0.45"), -60 to +130 °C (-76 to +266 °F), IP68 (Explosion Proof)	F)	**7ML1830-1JD**
One metallic cable gland M20x1.5, -40 to +80 °C (-40 to +176 °F)	F)	**7ML1930-1AP**
One metallic cable gland M20x1.5, -40 to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)	F)	**7ML1930-1AQ**
Blind threaded flanges are available. Please contact nacc.smpi@siemens.com with a completed application data sheet found on page 5/8.		
Spare parts		
Test magnet (digital version)		**7ML1830-1JE**
Amplifier/power supply, standard version	C)	**7ML1830-1DJ**
Amplifier/power supply, digital version		**7ML1830-1JF**
LCD display (digital version)		**7ML1830-1JK**

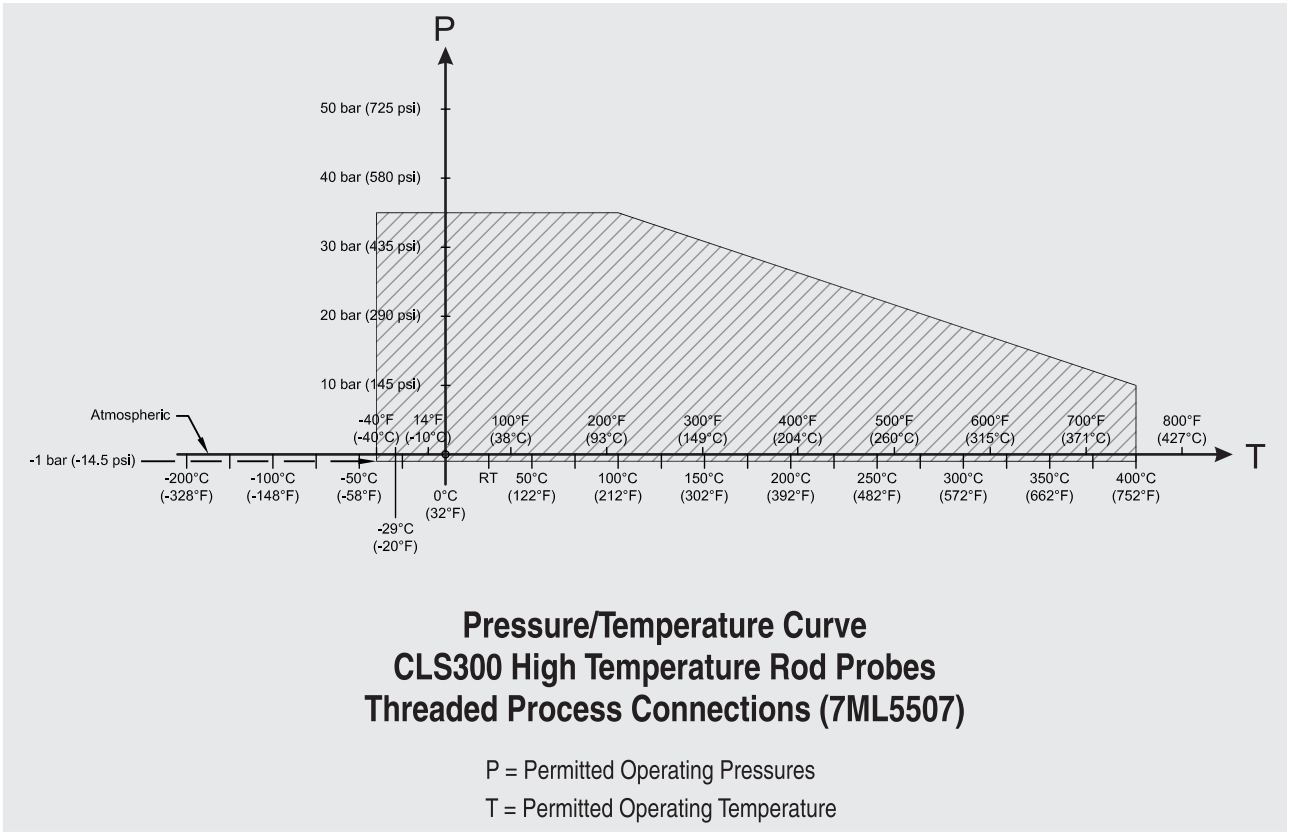
C) Subject to export regulations AL: N, ECCN: EAR99

F) Subject to export regulations AL: 9I999, ECCN: N

Characteristic curves

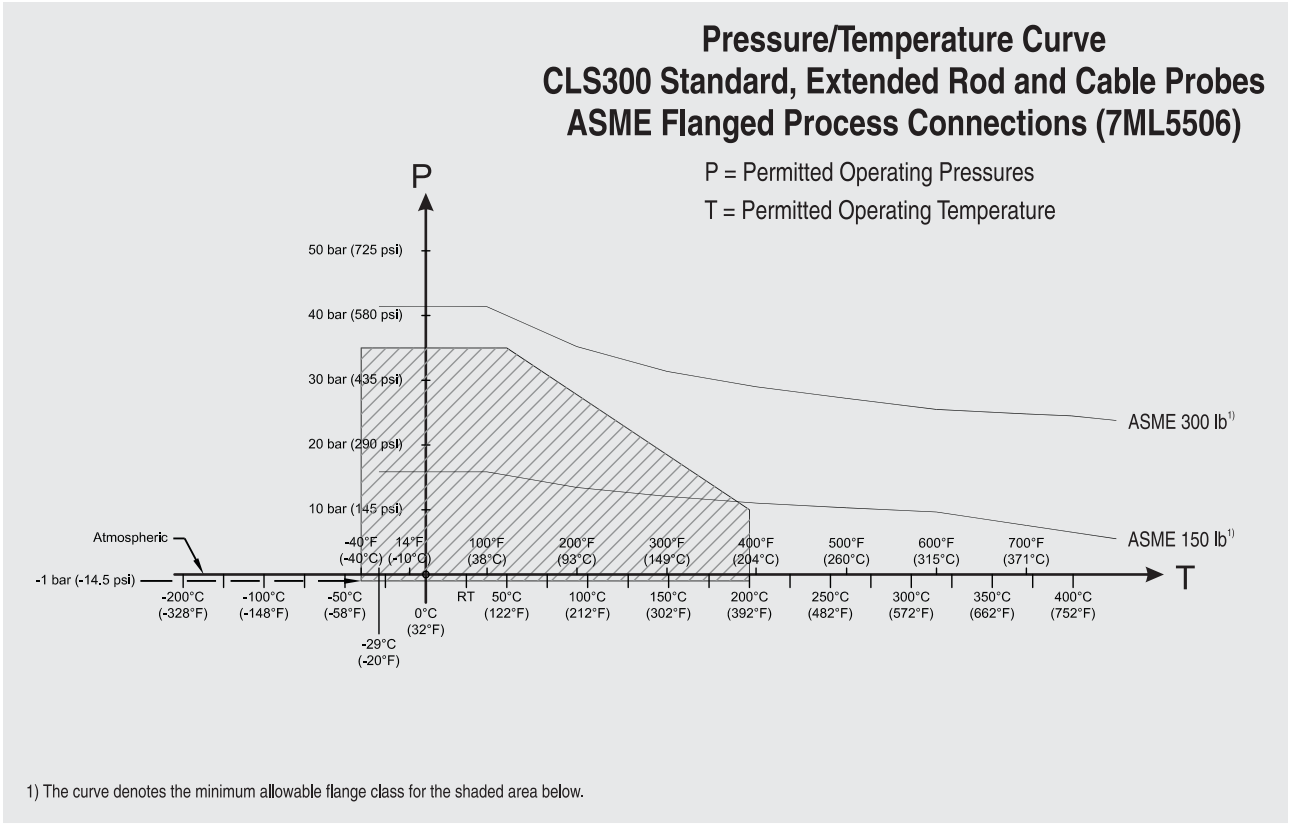


Pointek CLS300 Process Pressure/Temperature derating curves (7ML5510)

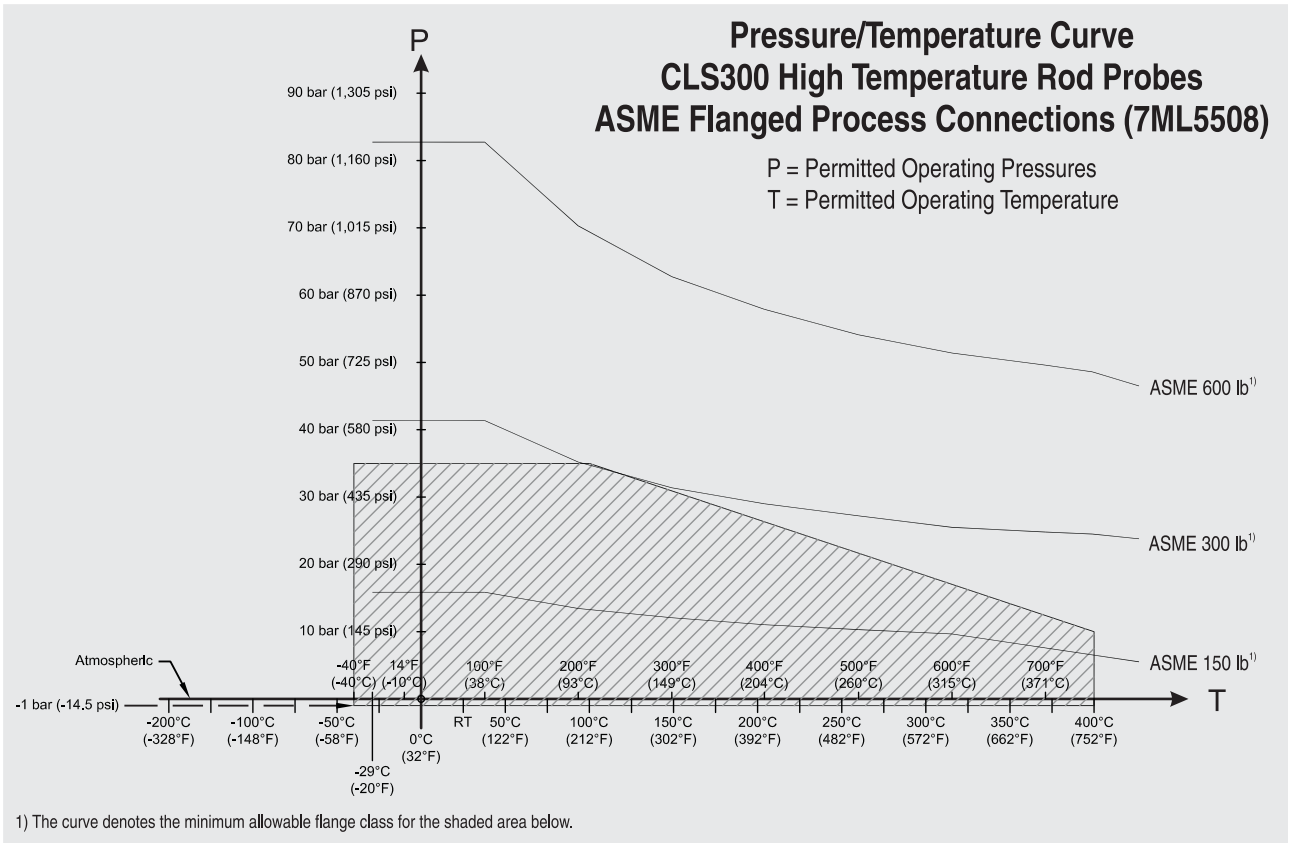


Pointek CLS300 Process Pressure/Temperature derating curves (7ML5507)

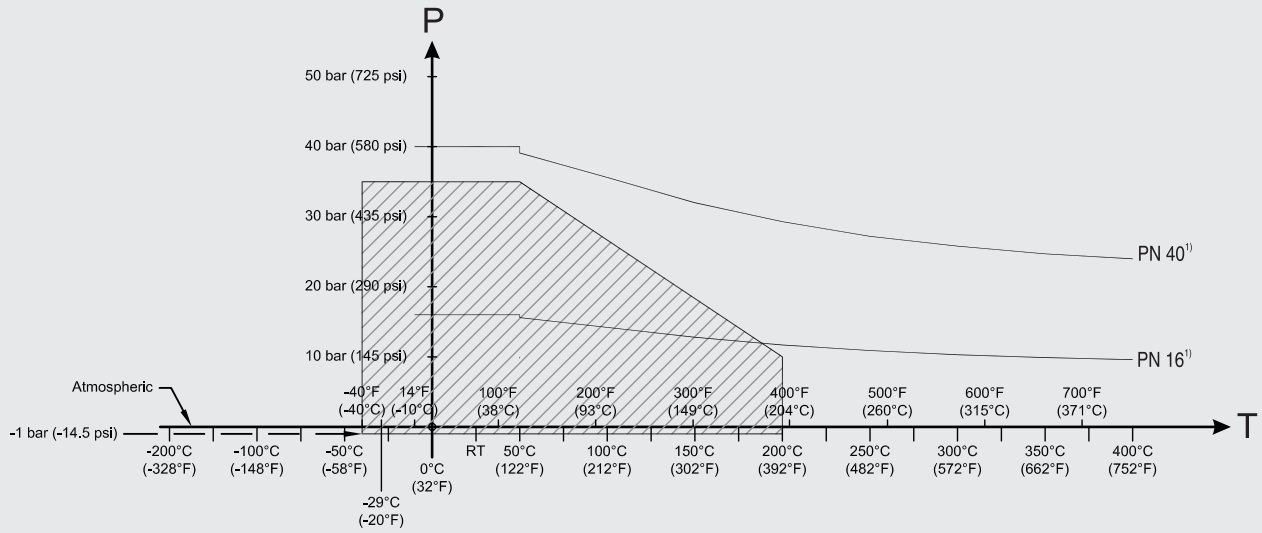
Pointek CLS300



Pointek CLS300 Process Pressure/Temperature derating curves (7ML5506)



Pointek CLS300 Process Pressure/Temperature derating curves (7ML5508)

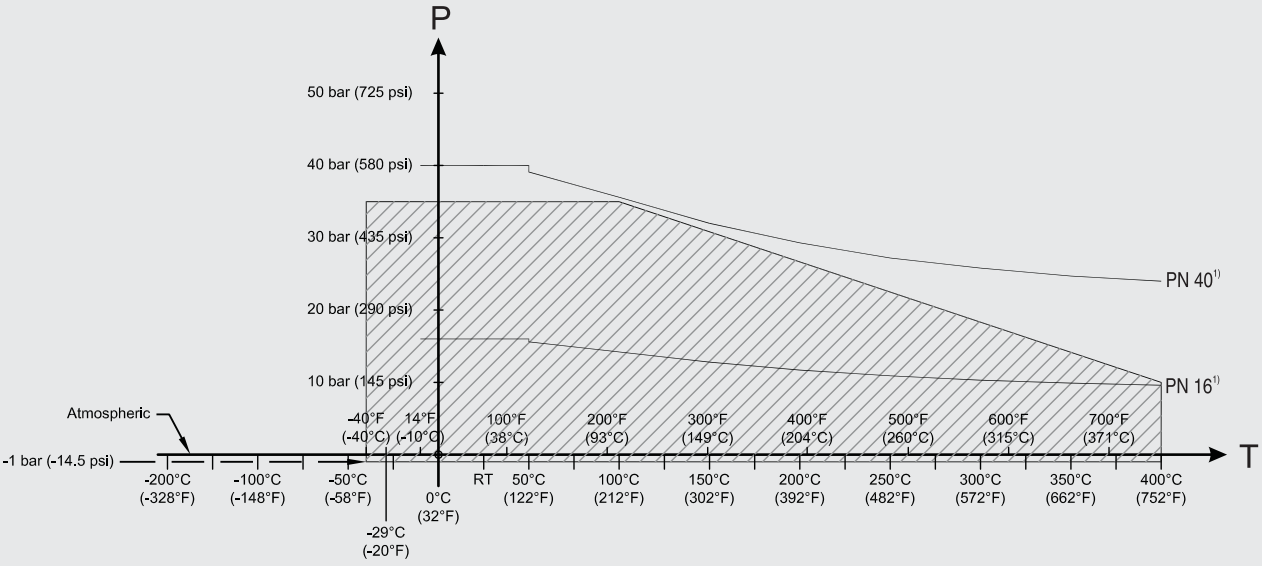


Pressure/Temperature Curve
CLS300 Standard, Extended Rod and Cable Probes
EN Flanged Process Connections (7ML5506)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

Pointek CLS300 Process Pressure/Temperature derating curves (7ML5506)



Pressure/Temperature Curve
CLS300 High Temperature Rod Probes
EN Flanged Process Connections (7ML5508)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

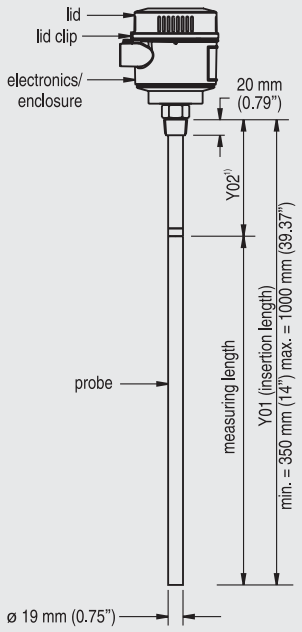
1) The curve denotes the minimum allowable flange class for the shaded area below.

Pointek CLS300 Process Pressure/Temperature derating curves (7ML5508)

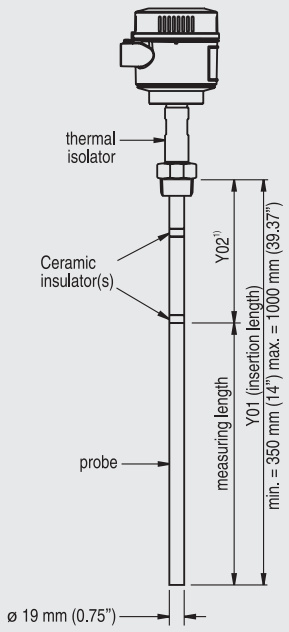
Pointek CLS300

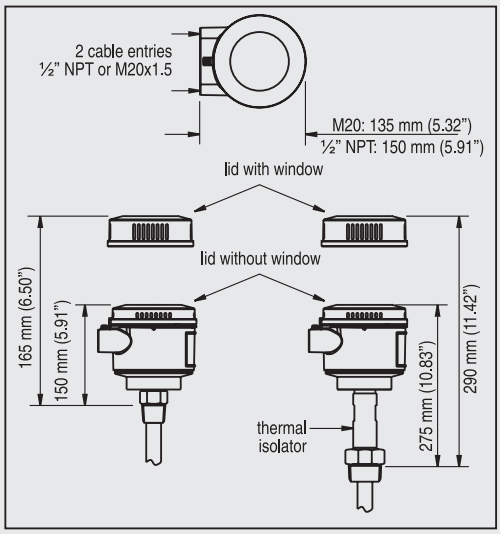
Dimensional drawings

Rod version
Threaded (7ML5510)

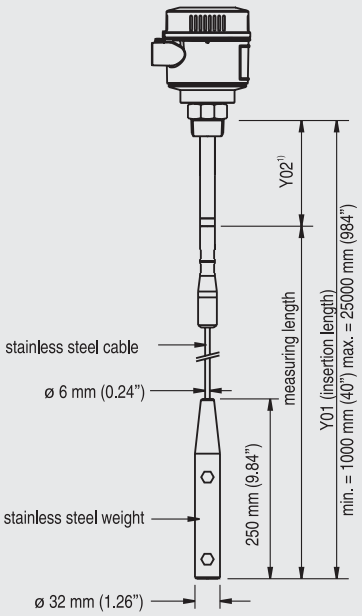


High temperature rod version
Threaded (7ML5507)

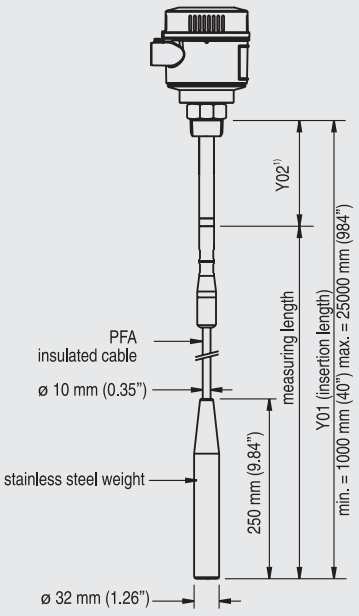




Cable version, non-insulated
Threaded (7ML5510)



Cable version, insulated
Threaded (7ML5510)

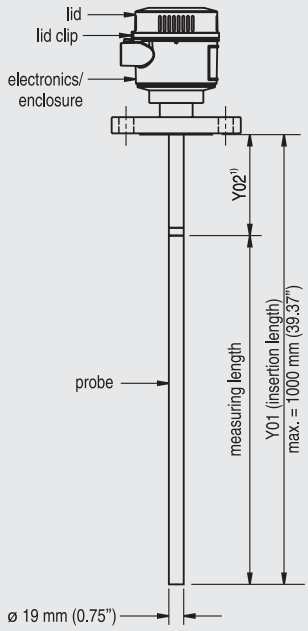


Notes:

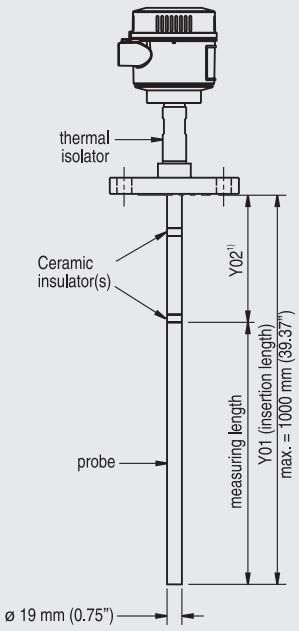
1) Extended Active Shield (Y02): standard length 125 mm (4.92").
Optional active shield lengths: 250 mm (9.84") or 400 mm (15.75").

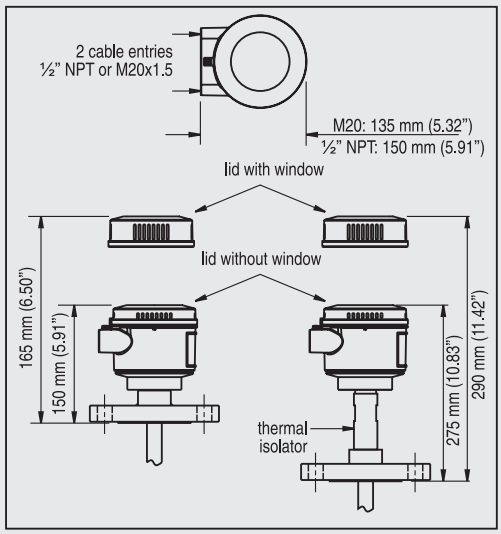
Pointek CLS300 dimensions - Threaded Process Connections

Rod version
Welded flange (7ML5506)



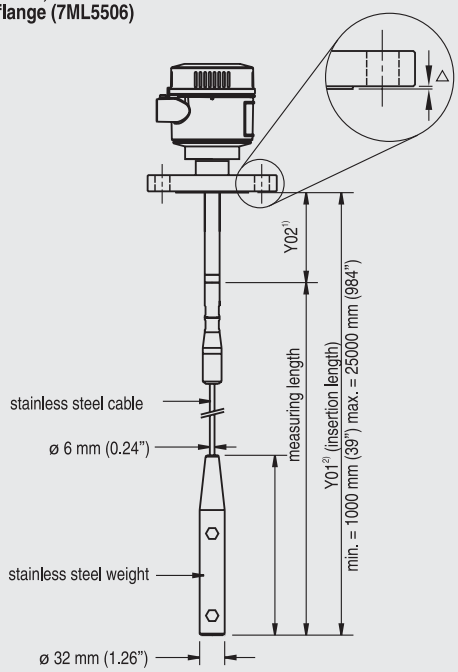
High temperature rod version
Welded flange (7ML5508)



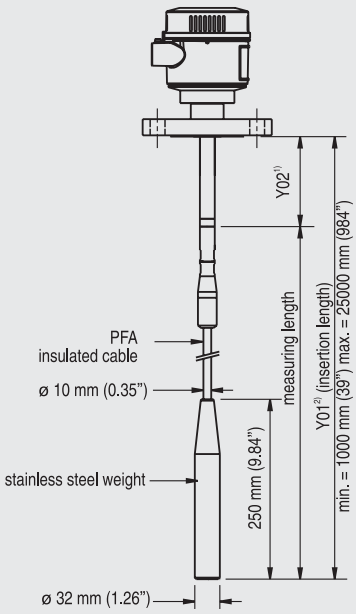


Flange Facing (raised face)	
Flange class	Facing thickness
△ ASME 150/300	2 mm (0.08")
△ ASME 600/900	7 mm (0.28")
△ PN 16/40	2 mm (0.08")

Cable version, non-insulated
Welded flange (7ML5506)



Cable version, insulated
Welded flange (7ML5506)



Notes:

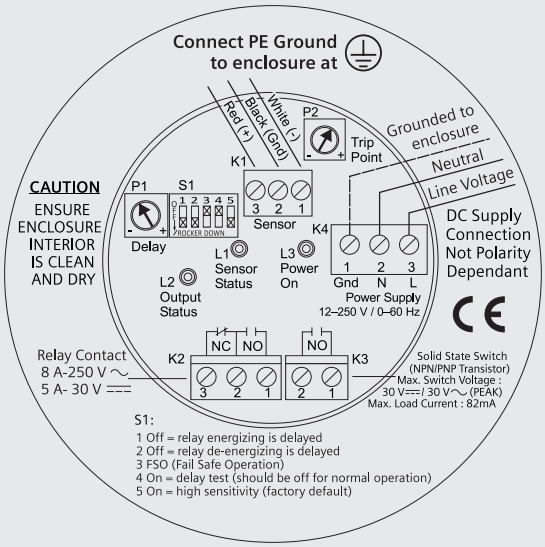
1) Extended Active Shield (Y02): standard length 105 mm (4.13").
Optional active shield lengths: 230 mm (9.06") or 380 mm (14.96").
2) Insertion length does not include any raised face/gasket face dimension (see Flange Facing table above).

Pointek CLS300 dimensions - Flanged Process Connections

Pointek CLS300

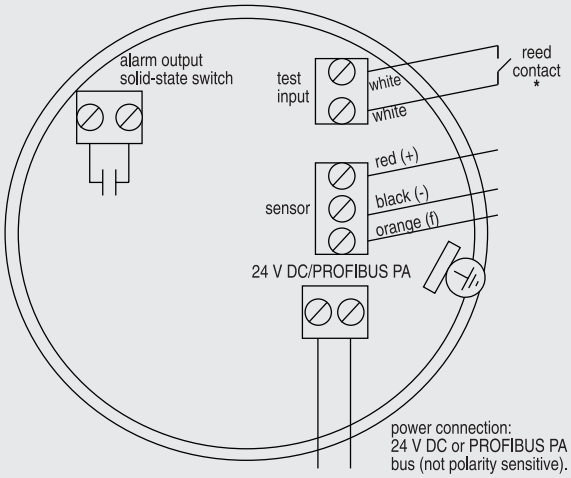
Schematics

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 a Siemens representative for detailed wiring information.

Wiring: Pointek CLS300 Digital



Note:
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 connections

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

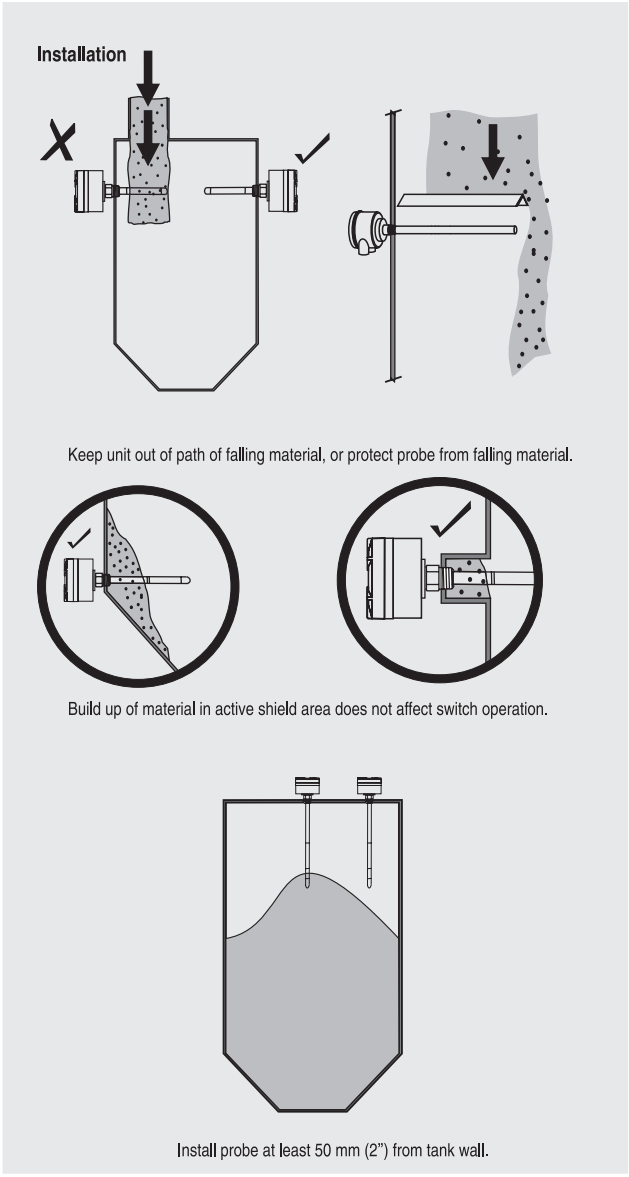
Application

Patented Active-Shield technology ensures that measurement is unaffected by vapours, 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



Pointek CLS500 installation

5

Pointek CLS500

Technical specifications

Input	
Measuring range	1 to 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 to 60 s
Current loop	4 to 20 mA/20 to 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 to +85 °C (-40 to +185°F)
• Installation category	II
• Pollution degree	4
Medium conditions	
• Dielectric constant ε_r	Min. 1.5
• Process temperature (probe)	Temperature ratings are pressure dependent. See Pressure/Temperature curves on page 5/56.
- Standard (PFA)	-50 to +200 °C (-58 to +392 °F)
- High temperature stainless steel version with enamel insulation and thermal isolator	-60 to +400 °C (-76 to +752°F)
- High temperature stainless steel version with thermal isolator	-60 to +400 °C (-76 to +752 °F)
Pressure range	Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 5/56.
• Standard (PFA)	-1 to 150 bar g (2175 psi g)
• High temperature version (Enamel)	-1 to 345 bar g (5004 psi g)
• High temperature version (Stainless steel)	Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 5/56.

Design	
Material	
• Wetted parts material	
- Standard rod	316L stainless steel
• Probe isolation (rod)	PFA, enamel
Probe diameter	
• Standard rod version (PFA)	16 mm (0.63")
• High temperature rod version (Enamel)	16 mm (0.63")
• High temperature rod version (Stainless steel)	19 mm (0.75")
Probe length	
• Standard rod version (PFA)	Max. 1000 mm (39.4") with 16 mm (0.63") diameter probe
• High temperature rod version (Enamel)	Max. measuring length 1000 mm (39.4") with 16 mm (0.63") diameter probe
• High temperature rod version (Stainless steel)	Max. measuring length 1000 mm (39.4") with 19 mm (0.75") 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	Aluminium, epoxy-coated (Stainless steel option available. Contact nacc.smpi@siemens.com.)
• Cable inlet	2 x ½" NPT
• Degree of protection	Type 4X/NEMA4X/IP68
Power supply	Max. 33 V DC (30 V DC with Intrinsically Safe operation), Min. 12 V DC @ 3.6 mA, Min. 9.5 V DC @ 22 mA
Features	
Measurement current signalling	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 to 9, A to F
• SMART communication	Conforming to HART Communication Foundation (HCF)

Certificates and approvals	
General Purpose	CE (complies with E.C.C. requirements of EN 55011 and EN 61326)
Non incendive/Non sparking	• FM/CSA Class 1, 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	• FM/CSA Class II and III, Div. 1, Groups E, F, G • ATEX II 1/2 GD EEx d [ia] T6 to T1 T100 °C
Intrinsically Safe[2)]	• FM/CSA Class 1, Div. 1, Groups A, B, C, D T4 • ATEX II 1G EEx ia IIC T6 to T4
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	Lloyd's Register of Shipping, Categories ENV1, ENV2, ENV3, ENV5
Pressure	PED 97/23/EC, CSA B51
Other	C-TICK (Australia)

1) When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 5/53.

2) Barrier required for Intrinsically Safe protection

Standard Combinations

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	–
Enamel		HT Enamel: Available as Standard
Length parameters		
Max. rod length	1000 mm (40")	1000 mm (40")
Process condtitions[1)]		
Max. pressure	150 bar g (2175 psi g)	Stainless steel:[2)] 35 bar g (507 psi g) Enamel:[2)] 345 bar g (5004 psi g)
Max. 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 5/53.

2) Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 5/53.

– Not available as standard

Pointek CLS500

Selection and Ordering data	Order No.
Pointek CLS500, threaded	**7ML5601 -**
Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	- A0
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	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; ATEX II 1/2 GD EEx d [ia] T6 to T1	2
CSA/FM Class I, Div. 1, Groups A, B, C, D, T4; ATEX II 1G EEx [ia] IIC T6 to T4[1]	3
ATEX II 1/2 GD EEx d [ia] IIC T6 to T1	4
FM Class I, Div. 1, Groups A, B, C, D, T4	6
Probe/electrode diameter	
16 mm (0.63") rigid rod, minimum insertion length 200 mm (7.9"), maximum insertion length 1000 mm (39.4")[2]	1
Thermal isolator/remote version	
Rigid thermal isolator [for process temperature over +85 °C (+185 °F)]	A
No thermal isolator	B
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Insertion length, specify in plain text: **Y01: ... mm [minimum 200 mm (7.87")]**	**Y01**
Active Shield length - minimum length is 50 mm. **Y02: ... mm**	**Y02**
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters); specify in plain text	**Y15**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Instruction manual	**See page 5/52**
Accessories	**See page 5/52**

[1] Barrier required for Intrinsically Safe protection

[2] Add order code Y01 and Y02 in plain text: "Insertion/active shield length ... mm"

Selection and Ordering data	Order No.
Pointek CLS500, welded flange	**7ML5602 -**
Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	- A0
Electronic transmitter	
No transmitter supplied	0
MSP 2002-1 (330 pF)	1
Process connection and pressure rating	
Welded flange, 316L stainless steel, raised face	
2" ASME, 150 lb	AA
2" ASME, 300 lb	AB
3" ASME, 150 lb	BA
3" ASME, 300 lb[1]	BB
4" ASME, 150 lb[1]	CA
4" ASME, 300 lb[1]	CB
6" ASME, 150 lb[1]	DA
6" ASME, 300 lb[1]	DB
Welded flange, 316L stainless steel, Type A flat faced	
DN 50 PN 16	EC
DN 50 PN 25	ED
DN 80 PN 16	FC
DN 80 PN 25	FD
DN 100 PN 16[1]	GC
DN 125 PN 16[1]	HC
(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 3G 2D EEx nA [ib] IIC T6 to T4 T100 °C; CSA/FM Class II and III Div. 1, Groups E, F, G;	2
CSA/FM Class I, Div. 1, Groups A, B, C, D, T4; ATEX II 1G EEx ia IIC T6 to T4[2]	3
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") rigid rod, min. length 200 mm (7.9"), max. length 1000 mm (39.4")	1
Thermal isolator/remote version	
Rigid thermal isolator [for process temperature over +85 °C (+185 °F)]	A
No thermal isolator	B
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Insertion length, specify in plain text: **Y01: ... mm [minimum 200 mm (7.87")]**	**Y01**
Active Shield length - minimum length is 50 mm. **Y02: ... mm**[3]	**Y02**
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters); specify in plain text	**Y15**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Instruction manual	**See page 5/52**
Accessories	**See page 5/52**

[1] Custom shipping methods required. Contact factory for more details.

[2] Barrier required for Intrinsically Safe protection

[3] See dimension drawings on page 5/59 for further explanation of Y02.

Selection and Ordering data	Order 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.	-A0
Electronic transmitter	
No transmitter supplied	0
MSP 2002-1 (330 pF)	1
Process connection and pressure rating	
Single piece flange, 316L stainless steel, raised face	
2" ASME, 150 lb	AA
2" ASME, 300 lb	AB
3" ASME, 150 lb	BA
3" ASME, 300 lb[1]	BB
4" ASME, 150 lb[1]	CA
4" ASME, 300 lb[1]	CB
6" ASME, 150 lb[1]	DA
6" ASME, 300 lb[1]	DB
Single piece flange, 316L stainless steel, Type B1 raised faced	
DN 50 PN 16	EC
DN 50 PN 25	ED
DN 80 PN 16	FC
DN 80 PN 25	FD
DN 100 PN 16[1]	GC
DN 100 PN 25[1]	GD
DN 125 PN 16[1]	HC
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 3G 2D EEx nA [ib] IIC T6 to T4 T100 °C; CSA/FM Class II and III Div. 1, Groups E, F, G;	2
CSA/FM Class I, Div. 1, Groups A, B, C, D, T4; ATEX II 1G EEx ia IIC T6 to T4[2]	3
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") rigid rod, maximum length 1000 mm (39.4") (Y01)	1
Thermal isolator/remote version	
Rigid thermal isolator [for process temperature over +85 °C (+185 °F)]	A
No thermal isolator	B

Selection and Ordering data	Order 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.	-A0
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Insertion length, specify in plain text: **Y01: ... mm [minimum 200 mm (7.87")]**	**Y01**
Active Shield length - minimum length is 50 mm. **Y02: ... mm**[3]	**Y02**
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters); specify in plain text	**Y15**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Instruction manual	**See page 5/52**
Accessories	**See page 5/52**

[1] Custom shipping methods required. Contact factory for more details.

[2] Barrier required for Intrinsically Safe protection

[3] See dimension drawings on page 5/59 for further explanation of Y02.

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Pointek CLS500

Selection and Ordering data — Order 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

No transmitter supplied	0
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 raised face[3]

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 63[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 63[2]	H 4

(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

No insulation/316L stainless steel[4] and 8)	1
Enamel insulation/316L stainless steel[5] 6) and 8)	2

Stilling well

No stilling well	0

Selection and Ordering data — Order 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

Approvals

General Purpose	A
CSA/FM Class I, Div. 2, Groups A, B, C, D T4; ATEX II 3G 2D EEx nA [ib] IIC T6 to T4 T100 °C; CSA/FM Class II and III Div. 1, Groups E, F, G;	B
CSA/FM Class I, Div. 1, Groups A, B, C, D, T4; ATEX II 1G EEx ia IIC T6 to T4[7]	C
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 1000 mm (39.37")[8]	A

Thermal isolator/remote version

Rigid thermal isolator [for process temperature over +85 °C (+185 °F)]	1

Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Insertion length, specify in plain text: **Y01: ... mm** Y01 for probe insulation option 1: min. = 200 mm (7.87") Y01 for probe insulation option 2: min. = 200 mm (7.87")	**Y01**
Active Shield length, specify in plain text: **Y02: ... mm** Y02 for probe insulation option 1: min. = 105 mm (4.13") Y02 for probe insulation option 2: min. = 100 mm (3.94")	**Y02**
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters); specify in plain text	**Y15**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Instruction manual	**See page 5/52**
Accessories	**See page 5/52**

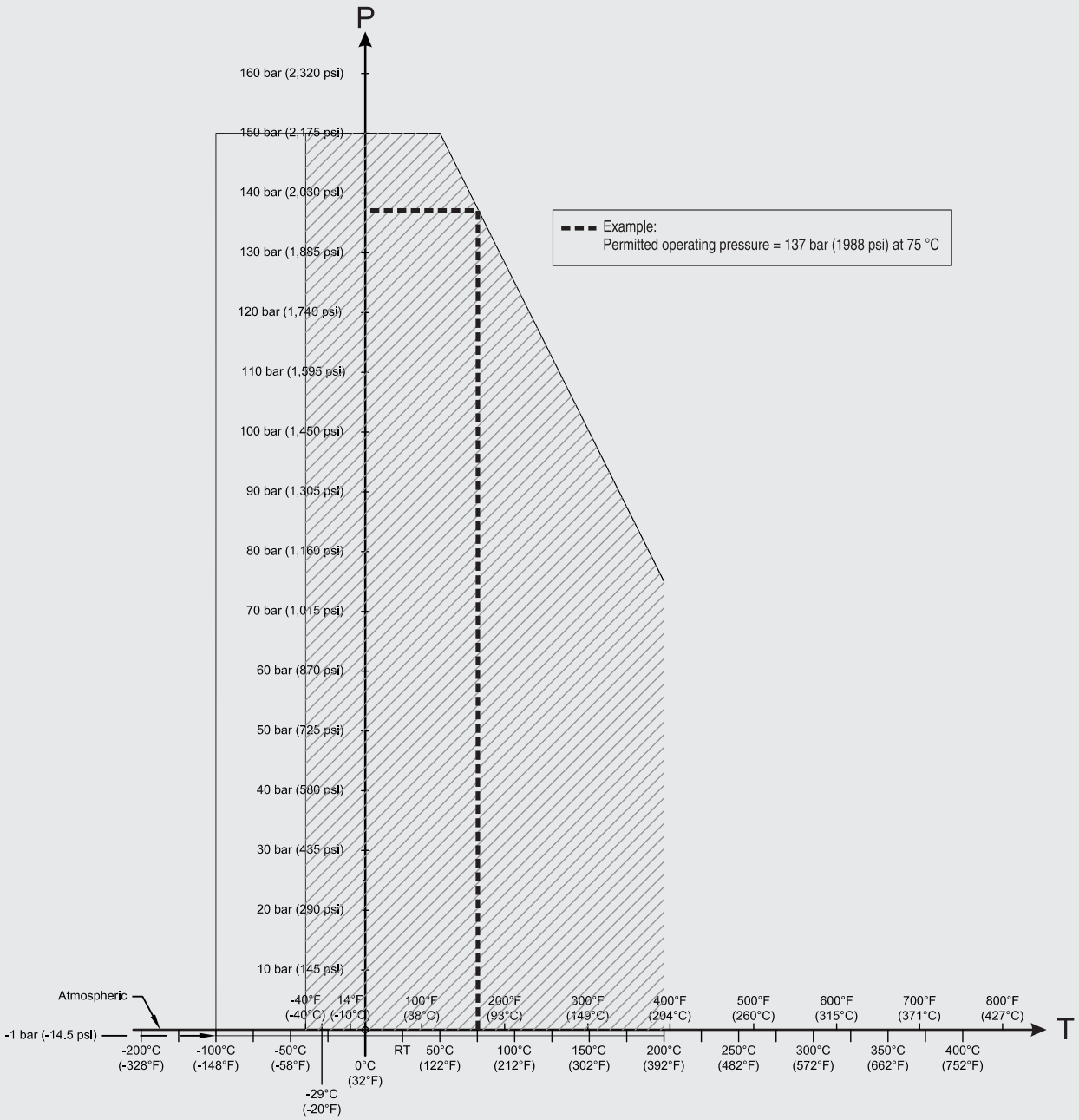
1) Welded flange for no insulation option only.
2) Custom shipping methods required. Contact factory for more details.
3) Flat faced flange for no insulation option only.
4) Non-conductive material only, stainless steel non-insulated probe diameter 19 mm (0.75")
5) Enamel insulated probe diameter 16 mm (0.63")
6) Single piece construction for enamel option only.
7) Barrier required for Intrinsically Safe protection
8) Add order code Y01 and Y02 in plain text:
"Insertion/active shield length ... mm"
Minimum insertion length depends on probe version selected. See dimension drawings on page 5/59 for more details.

Selection and Ordering data — Order No.

Instruction manual	
English	**7ML1998-5GG01**
German	**7ML1998-5GG31**
French	**7ML1998-5GG11**
Dutch Note: The instruction manual should be ordered as a separate line on the order.	**7ML1998-5GG41**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
Accessories	
Transmitter, MSP 2002-1, 330 PF E)	**7ML1830-1JP**

E) Subject to export regulations AL: N, ECCN: 3A991

Characteristic curves

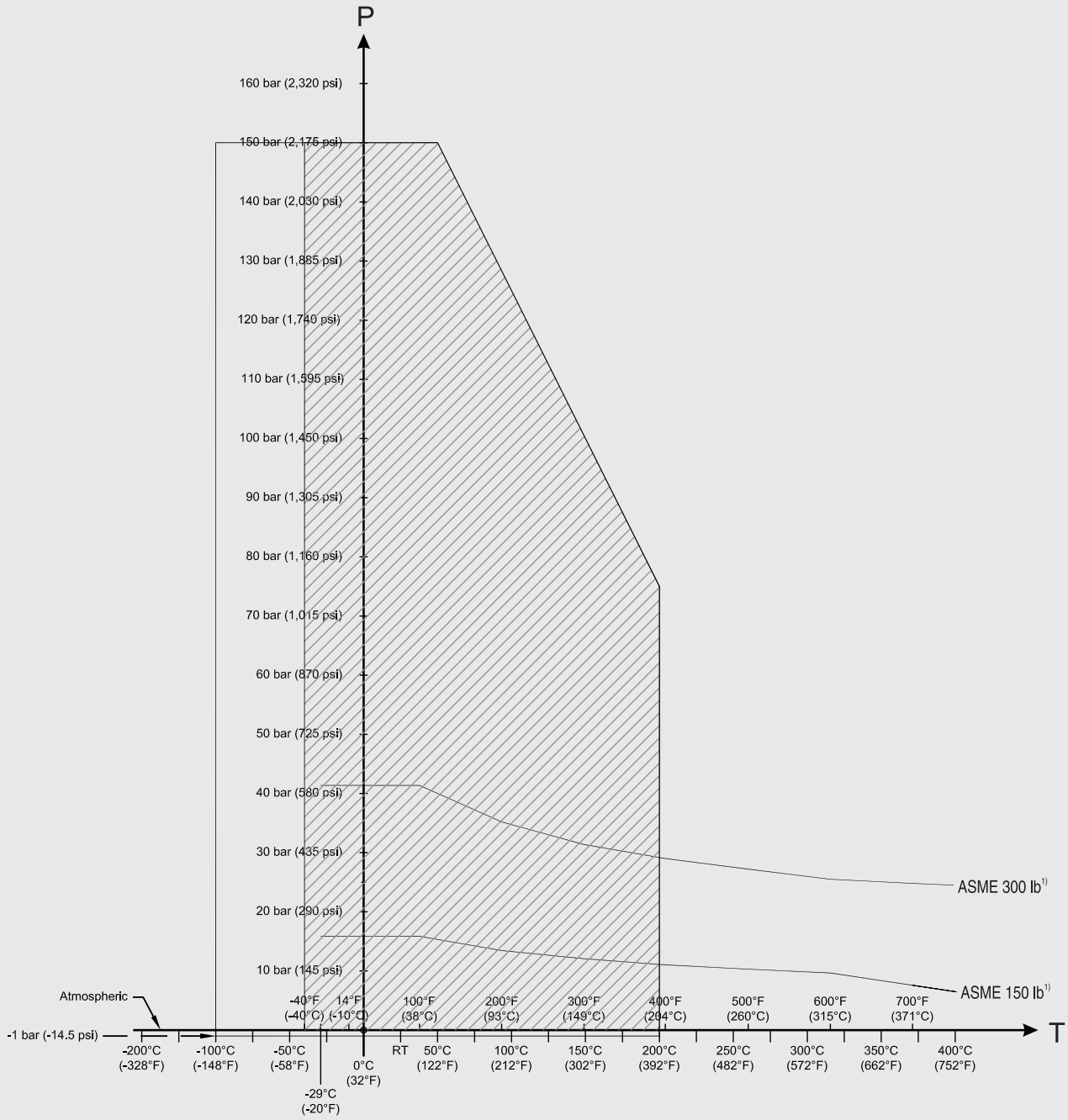


Pressure/Temperature Curve
CLS500 Rod Probes
Threaded Process Connections (7ML5601)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

Pointek CLS500



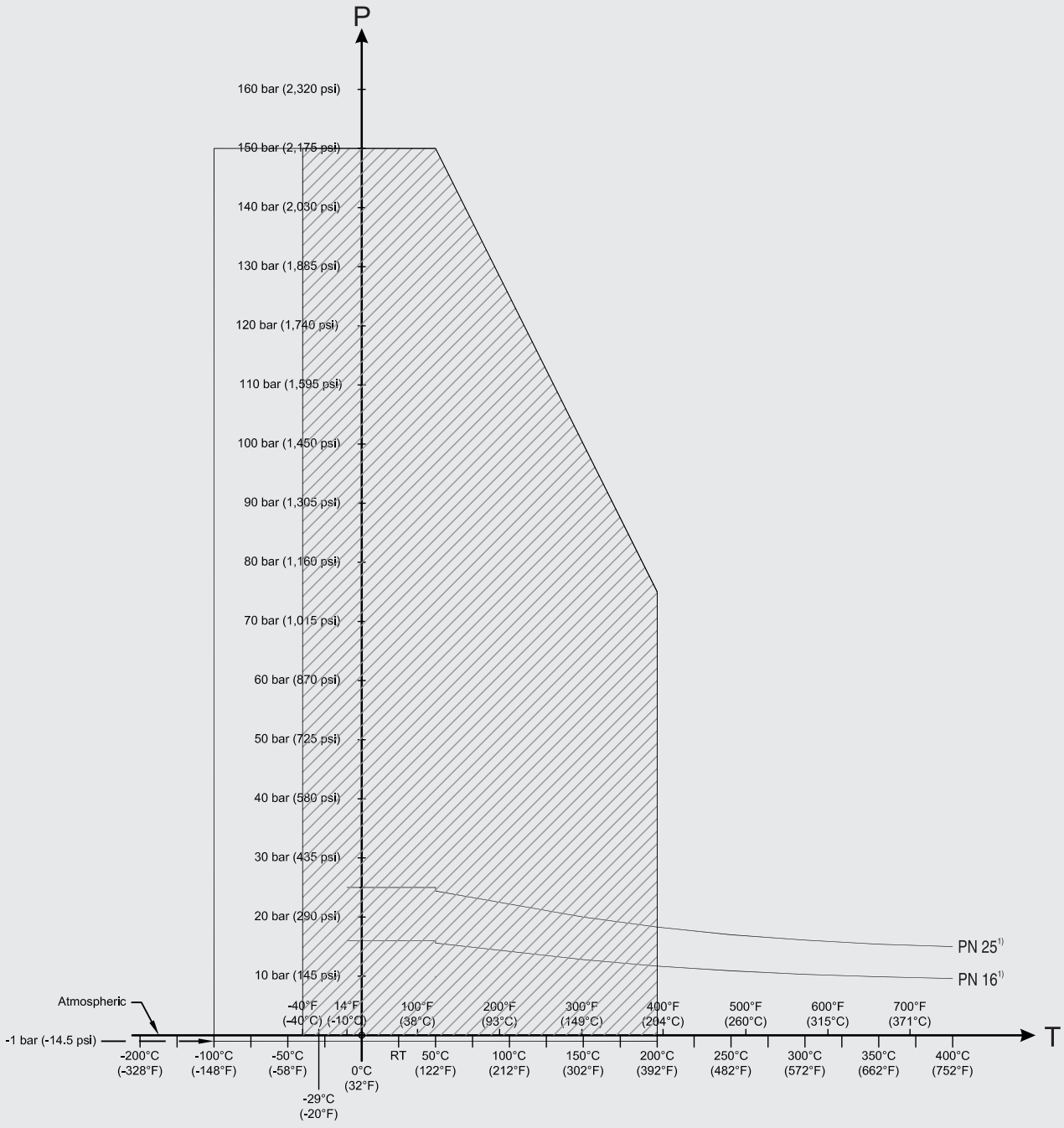
Pressure/Temperature Curve
CLS500 Rod Probes
ASME Flanged Process Connections (7ML5602 and 7ML5603)

P = Permitted Operating Pressures

T = Permitted Operating Temperature

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

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



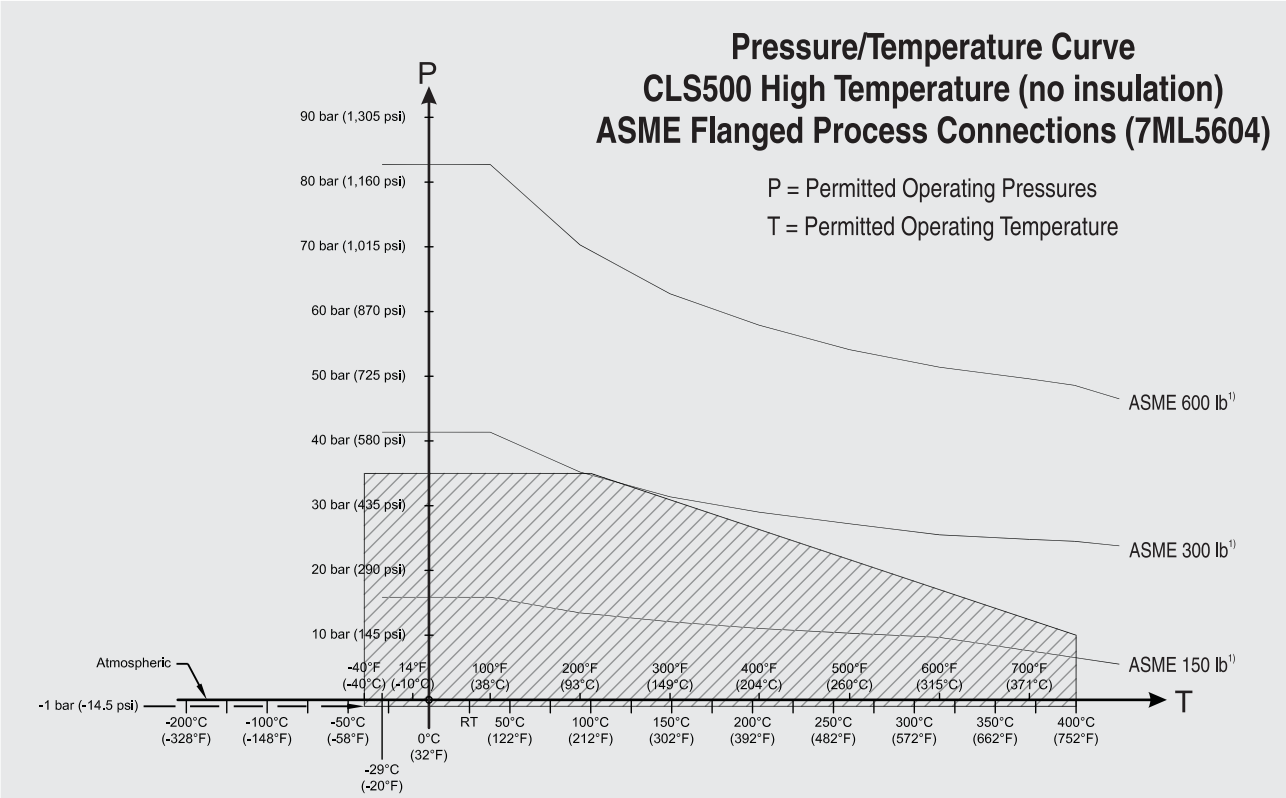
Pressure/Temperature Curve
CLS500 Rod Probes
EN Flanged Process Connections (7ML5602 and 7ML5603)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

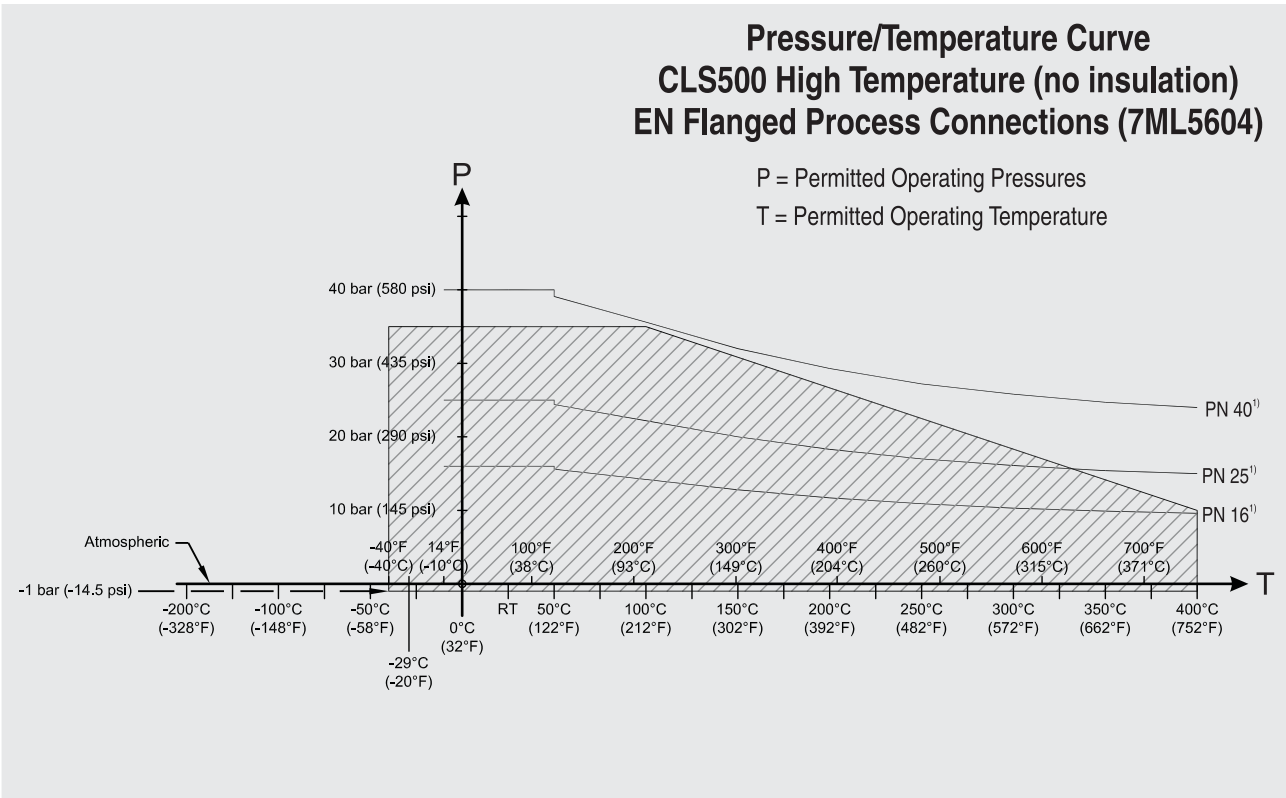
Pointek CLS500 Process Pressure/Temperature derating curves (7ML5602 and 7ML5603)

Pointek CLS500



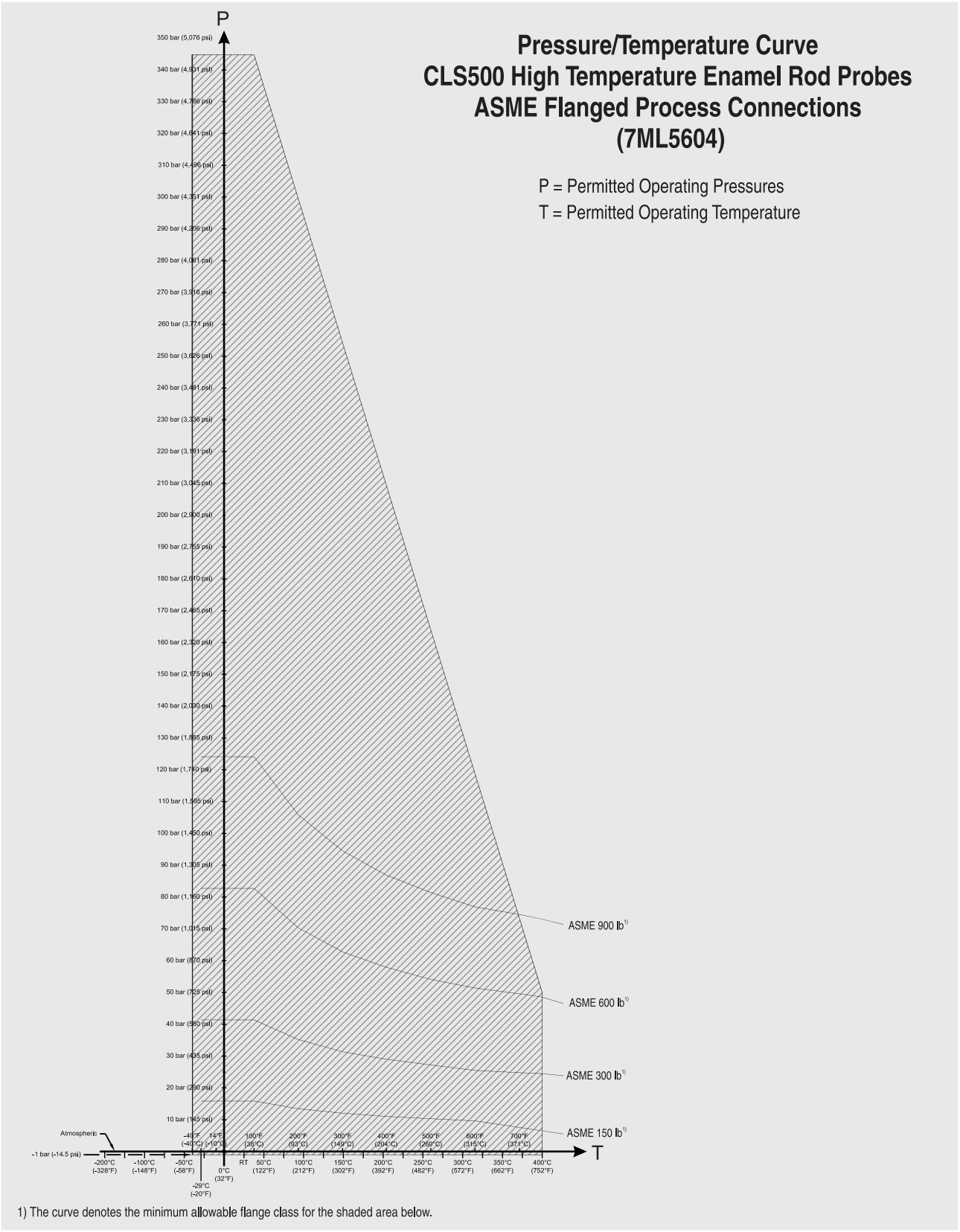
1) The curve denotes the minimum allowable flange class for the shaded area below.

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



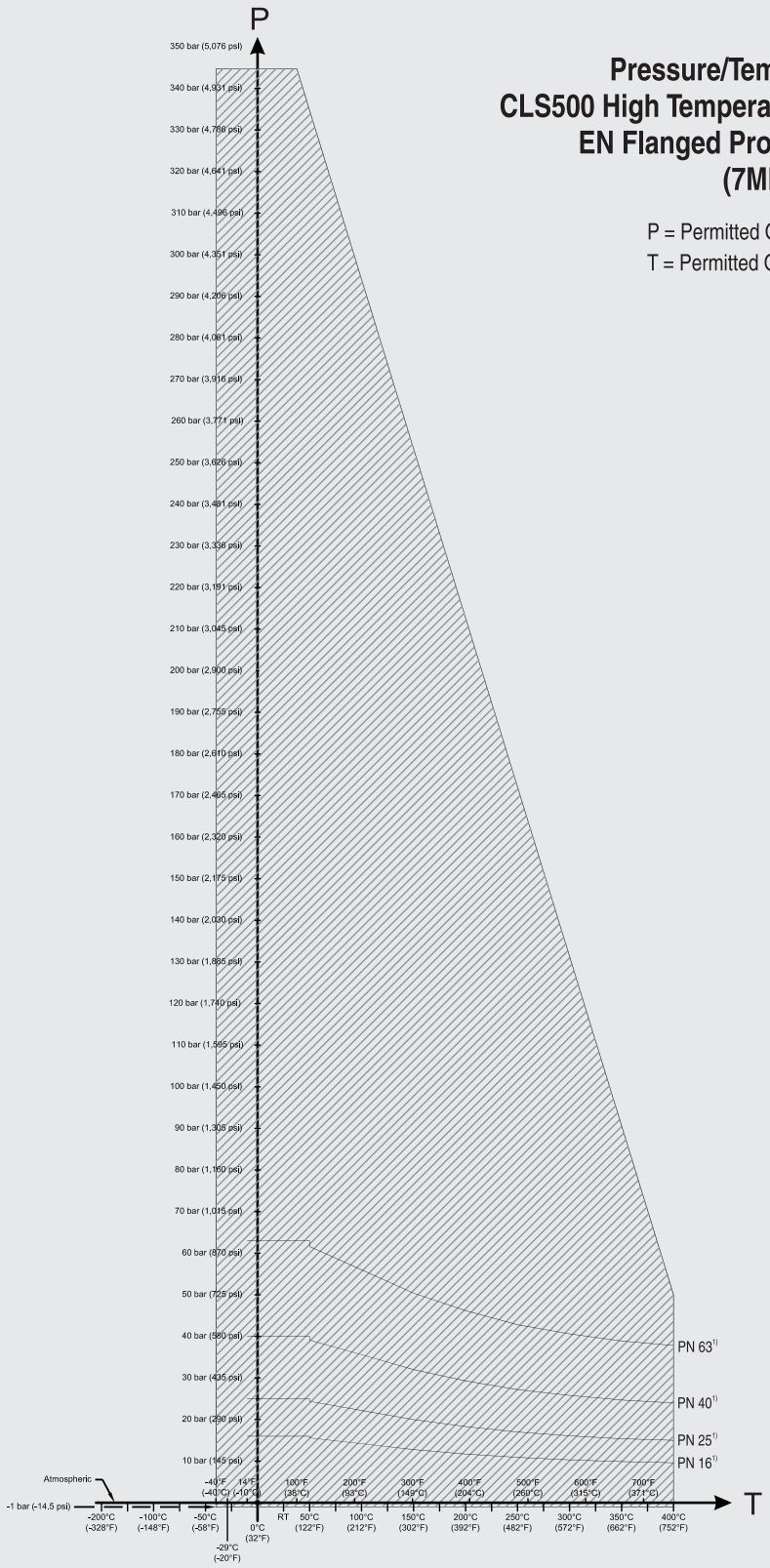
1) The curve denotes the minimum allowable flange class for the shaded area below.

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



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

Pointek CLS500



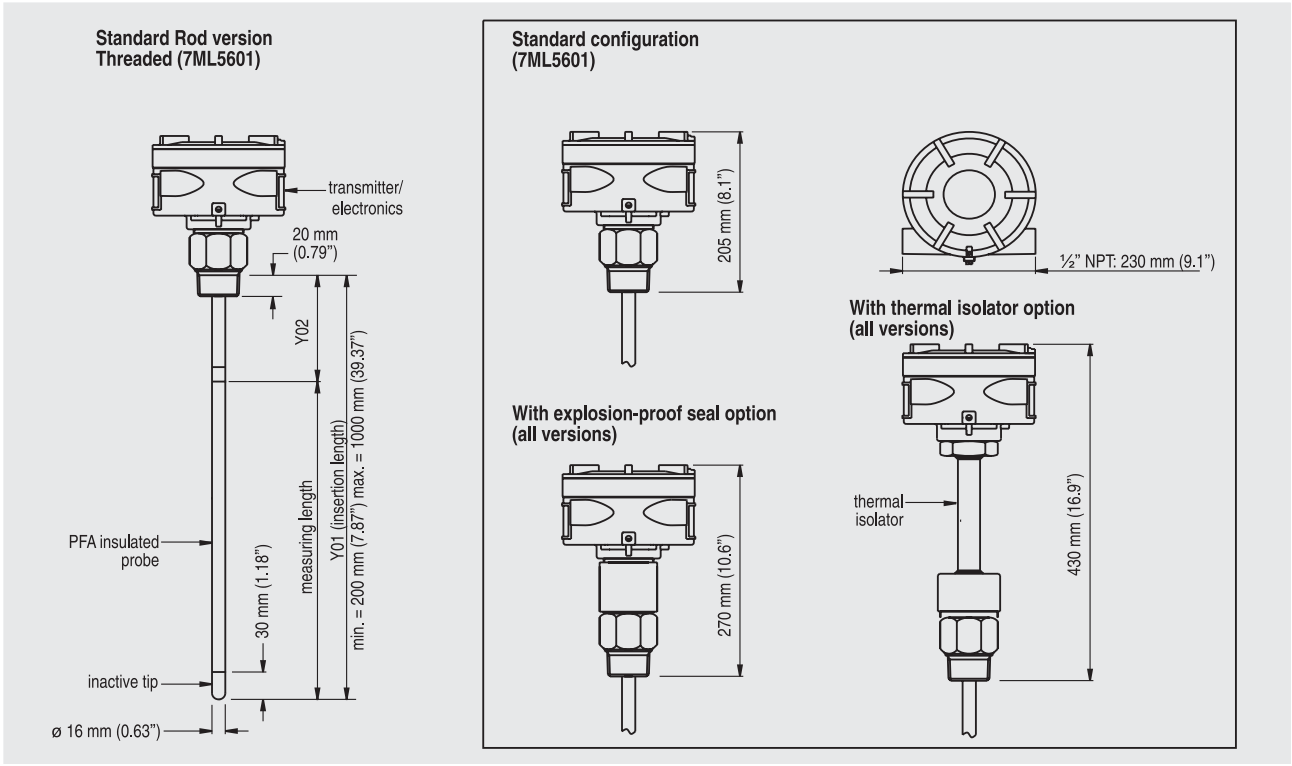
Pressure/Temperature Curve
CLS500 High Temperature Enamel Rod Probes
EN Flanged Process Connections
(7ML5604)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

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

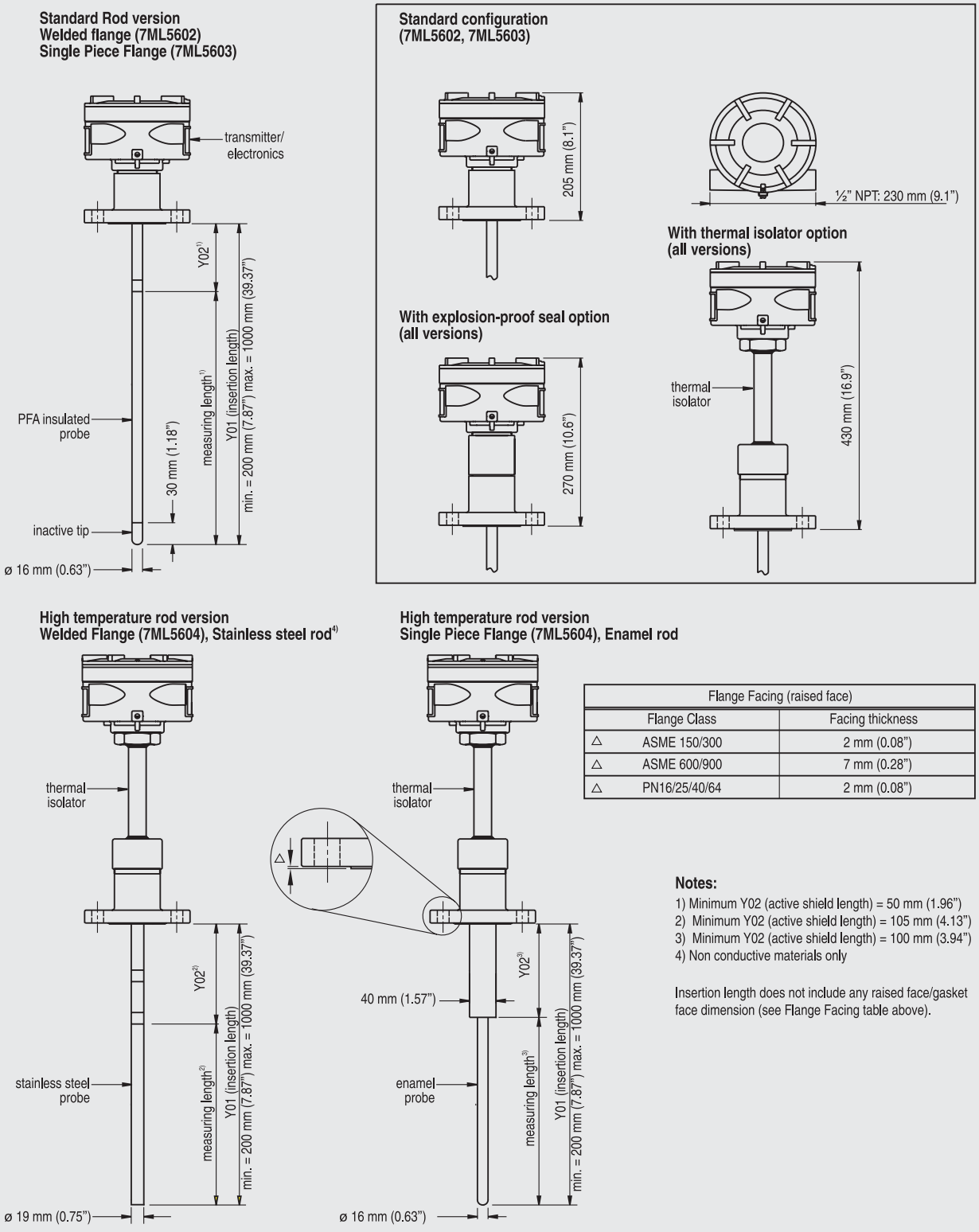
Dimensional drawings



Pointek CLS500 dimensions - Threaded Process Connections

5

Pointek CLS500



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

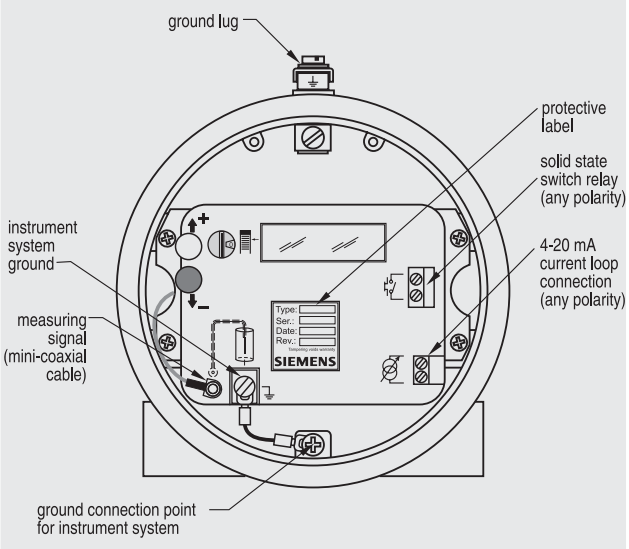
Notes:

1) Minimum Y02 (active shield length) = 50 mm (1.96")
2) Minimum Y02 (active shield length) = 105 mm (4.13")
3) Minimum Y02 (active shield length) = 100 mm (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 dimensions - Flanged Process Connections

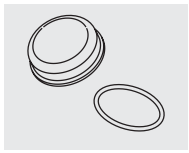
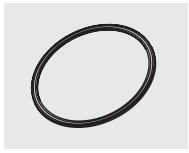
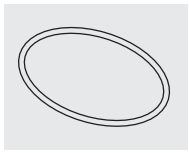
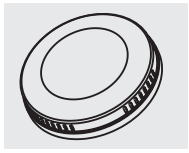
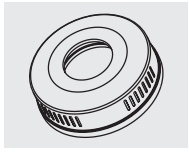
Schematics

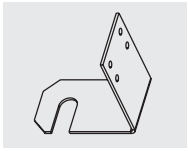


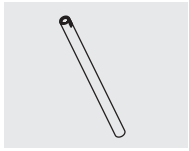
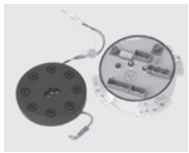
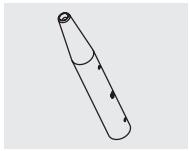
Pointek CLS500 connections

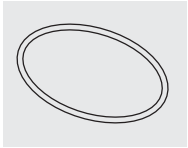
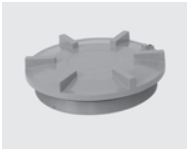
Pointek Specials

Selection and Ordering data

Pointek Specials. See note 1.	
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	**See note 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**
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)	**See note 2.**
CLS300 Cable Extensions, 316L stainless steel	
Kit, Stainless steel cable extension, 1 m (3.28 ft), adjustable by customer	**A5E01163688**
Kit, Stainless steel cable extension, 3 m (9.8 ft), adjustable by customer	**A5E01163689**
Kit, Stainless steel cable extension, 5 m (16.4 ft), adjustable by customer	**A5E01163690**
Kit, Stainless steel cable extension, 10 m (32.8 ft), adjustable by customer	**A5E01163691**
Kit, Stainless steel cable extension, 15 m (49.2 ft), adjustable by customer	**A5E01163693**
Kit, Stainless steel cable extension, 20 m (65.6 ft), adjustable by customer	**A5E01163695**
CLS300 Cable Extensions, 316 stainless steel with PFA coating	
Kit, PFA cable extension, 1 m (3.28 ft), adjustable by customer	**A5E01163697**
Kit, PFA cable extension, 3 m (9.8 ft), adjustable by customer	**A5E01163698**
Kit, PFA cable extension, 5 m (16.4 ft), adjustable by customer	**A5E01163699**
Kit, PFA cable extension, 10 m (32.8 ft), adjustable by customer	**A5E01163700**
Kit, PFA cable extension, 15 m (49.2 ft), adjustable by customer	**A5E01163701**
Kit, PFA cable extension, 20 m (65.6 ft), adjustable by customer	**A5E01163702**

CLS300 Rod Kits, 316L stainless steel	
Kit, Stainless steel rod 180 mm (7.09") to be used with CLS300 units only (with standard active shield). Insertion length after installation is 350 mm (13.78").	**A5E01163719**
Kit, Stainless steel rod 330 mm (12.99") to be used with CLS300 units only (with standard active shield). Insertion length after installation is 500 mm (19.69").	**A5E01163720**
Kit, Stainless steel rod 580 mm (22.83") to be used with CLS300 units only (with standard active shield). Insertion length after installation is 750 mm (29.53").	**A5E01163721**
Kit, Stainless steel rod 830 mm (32.68") to be used with CLS300 units only (with standard active shield). Insertion length after installation is 1000 mm (39.37").	**A5E01163722**
Kit, Stainless steel rod 1330 mm (52.36") to be used with CLS300 units only (with standard active shield). Insertion length after installation is 1500 mm (59.06").	**See note 2.**
Kit, Stainless steel rod 1830 mm (72.05") to be used with CLS300 units only (with standard active shield). Insertion length after installation is 2000 mm (78.74").	**See note 2.**
Kit, Stainless steel rod customized length up to 1 m	**See note 2.**
Kit, Stainless steel rod customized length up to 2 m	**See note 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. See note 3 and 4.	**A5E01163723**
Kit, Electronics with driver, digital CLS300. To be used in rod or cable versions with length less than 5 m. See note 3 and 4.	**A5E01163725**
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. See note 3 and 4.	**A5E01163724**
Kit, Electronics with driver, digital CLS300. To be used in cable versions with length greater than 5 m. See note 3 and 4.	**A5E01163726**
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**

Note 1: Special flange sizes and facings are available. Please contact nacc.smpi@siemens.com for part number and pricing. Submit Application Questionnaire found on page 5/8.

Note 2: Please contact nacc.smpi@siemens.com for part number and pricing.

Note 3: For General Purpose approvals only.

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

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

SITRANS LPS200

Overview

SITRANS LPS200 is a rotary paddle switch for 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
- Rotatable enclosure
- Optional paddle for use with low density materials
- Simple installation through process connection
- High temperature model and optional extension kit available
- Optional fail-safe configuration

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 hinged 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	-20 to +60 °C (-4 to +140 °F)
• Installation catagory	III
• Pollution degree	2
Medium conditions	Bulk solids
• Temperature	
- Standard	-20 to +80 °C (-4 to +176 °F)
- Optional	-20 to +350 °C (-4 to +662 °F)
• Pressure (vessel)	
- Standard	Max. 0.5 bar (7.25 psi)
- Optional	Max. 10 bar (145 psi)
• Minimum material density	
- Standard measuring vane	• 100 g/l (6.25 lb/ft^3) when vane and shaft covered by 10 cm (4") of material • 200 g/l (12.4 lb/ft^3) when vane and shaft covered by more than 10 cm (4") of material
- Optional measuring vane	• 15 g/l (2.19 lb/ft^3) when vane and shaft covered by 10 cm (4") of material • 20 g/l (4.69 lb/ft^3) when vane and shaft covered by more than 10 cm (4") of material
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 to 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

Selection and Ordering data	Order 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 +350 °C (+662 °F)[1]	4
▶ Up to +80 °C (+176 °F) basic version aluminum[2) and 3)]	5
▶ Up to +80 °C (+176 °F) basic version stainless steel[2) and 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	J
24 V AC	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	
DN32 PN 6, EN1092-1 (1.4541/321)	G
DN100 PN 6, EN1092-1 (1.4541/321)	H
DN100 PN 16, EN1092-1 (1.4541/321)	J
2" ASME 150 lbs B16.5 (1.4541/321)	K
3" ASME 150 lbs B16.5 (1.4541/321)	L
4" ASME 150 lbs B16.5 (1.4541/321)	M
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) and 6)]	1
Stainless steel 303 (1.4305)	2
Extension length	
100 mm (3.94")	1
150 mm (5.91")	2
200 mm (7.87")	3
250 mm (9.84")	4
300 mm (11.81")	5
Measuring vane	
Boot shaped, 35 x 106 mm (1.38 x 4.17")	A
Hinged vane, 65 x 210 mm (2.56 x 8.27")	B
Boot shaped, 28 x 98 mm (1.10 x 3.86")	C
Rectangular 50 x 150 mm (1.97 x 5.91")[7]	D

Selection and Ordering data	Order No.
SITRANS LPS200, compact Rotary paddle switch for level detection in bulk solids • Compact design for side or top mounted applications	**7ML5725 - ■■■■■ - ■■■ 0**
Rectangular 50 x 250 mm (1.97 x 9.84")[7]	E
Rectangular 98 x 150 mm (3.86 x 5.91")[7]	F
Rectangular 98 x 250 mm (3.86 x 9.84")[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
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Heating of enclosure[8) and 9)]	**A35**
Signal bulb inserted in M20 cable gland[8]	**A20**
SITRANS LPS200 designed for food applications with shaft seal conforming to FDA standards	**K01**
Additional instruction manual	Order No.
Multi-language	**7ML1998-5FS62**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
Spare parts	
Motor gear /PLC, multi-voltage	**7ML1830-1KG**
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17")	**7ML1830-1KH**
Hinged vane, 65 x 210 mm (2.56 x 8.27")	**7ML1830-1KJ**
Rigid extension kit (includes spring coupling, rigid tube extension and required pins)	
Extension: 500 mm, 400 mm, 300 mm (19.7", 15.8", 11.8")	**7ML5711-0AA**
Extension: 1000 mm, 900 mm, 800 mm, 700 mm, 600 mm (39.4", 35.4", 31.5", 27.6", 23.6")	**7ML5711-1AA**
Extension: 1500 mm, 1400 mm, 1300 mm, 1200 mm, 1100 mm (59.1", 55.1", 51.2", 47.2", 43.3")	**7ML5711-2AA**

1) Available with approval option C and D only, up to max. 0.8 bar
2) Basic version is cost effective and offers fast delivery.
3) Available only with power supply option A and with process connection C, or power supply E with process connection E, and then process pressure 1, process connection material 1, extension length 2, measuring vane A and approvals C or D
4) Available only with power supply option Q, process connection C with approval B or process connection E with approval A, process pressure 1, process connection material 2, extension length 2 and measuring vane A
5) Available with process connections A to F only
6) Available with process pressure option 1 only
7) Available with process connections G, H, J, K, L, M only
8) Available with approval options C, D only
9) Available with power supply options A to H, J to N, P only

▶ Available ex stock.

Point level measurement - Electro-mechanical switches

SITRANS LPS200

Selection and Ordering data — Order No.

SITRANS LPS200, Extended
Rotary paddle switch for level detection in bulk solids
Extended design with protection tube for added shaft protection

Order No.: 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 +350 °C (+662 °F)[1]	4
Up to +80 °C (+176 °F) basic version[2) and 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	J
24 V AC	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

DN32 PN 6, EN1092-1 (1.4541/321)	E
DN100 PN 6, EN1092-1 (1.4541/321)	F
DN100 PN 16, EN1092-1 (1.4541/321)	G
2" ASME 150 lbs B16.5 (1.4541/321)	H
3" ASME 150 lbs B16.5 (1.4541/321)	J
4" ASME 150 lbs B16.5 (1.4541/321)	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[4) 5) and 6)]	1
Stainless steel 303 (1.4305)	2

Extension length

150 mm (5.91")	1
200 mm (7.87")	2
250 mm (9.84")	3
300 mm (11.81")	4

Extension material (protection tube)

Aluminum[4) and 6)]	A
Stainless steel 303 (1.4305)	B

Selection and Ordering data — Order No.

SITRANS LPS200, Extended
Rotary paddle switch for level detection in bulk solids
Extended design with protection tube for added shaft protection

Order No.: 7ML5726-

Measuring vane

Boot shaped, 35 x 106 mm (1.38 x 4.17")	A
Hinged vane, 65 x 210 mm (2.56 x 8.27")	B
Rectangular 50 x 150 mm (1.97 x 5.91")[7)]	D
Rectangular 50 x 250 mm (1.97 x 9.84")[7)]	E
Rectangular 98 x 150 mm (3.86 x 5.91")[7)]	F
Rectangular 98 x 250 mm (3.86 x 9.84")[7)]	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

Further designs — Order code

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

Heating of enclosure[8) and 9)]	**A35**
Signal bulb inserted in M20 cable gland[8)]	**A20**
SITRANS LPS200 designed for food applications with shaft seal conforming to FDA standards	**K01**

Additional instruction manual — Order No.

Multi-language	**7ML1998-5FS62**

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

Spare parts

Motor gear /PLC, multi-voltage	**7ML1830-1KG**
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17")	**7ML1830-1KH**
Hinged vane, 65 x 210 mm (2.56 x 8.27")	**7ML1830-1KJ**

1) Available with approval option 3 and 4 only, up to max. 0.8 bar
2) Available only with power supply option Q (process connection B with approval 2 or process connection C with approval 1), process pressure 1, process connection material 2, extension length 2, protection tube B and measuring vane A
3) Basic version is cost effective and offers fast delivery.
4) Available with process connections A to F only
5) Available with process pressure option 1 only
6) Available with process temperature option 1 only
7) Available with process connections E, F, G, H, J, K only
8) Available with approval options 3, 4 only
9) Available with power supply options A to H, J to N, P only

▶ Available ex stock.

Selection and Ordering data

Order No.

SITRANS LPS200, cable extension
Rotary paddle switch for level detection in bulk solids
Cable extension for increased length in top-mounted applications

7ML5727 - ■■■■ - ■■■ 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 +350 °C (+662 °F)[1]	4
Up to +80 °C (+176 °F) basic version[2) and 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	J
24 V AC	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

DN32 PN 6, EN1092-1 (1.4541/321)	E
DN100 PN 6, EN1092-1 (1.4541/321)	F
DN100 PN 16, EN1092-1 (1.4541/321)	G
2" ASME 150 lbs B16.5 (1.4541/321)	H
3" ASME 150 lbs B16.5 (1.4541/321)	J
4" ASME 150 lbs B16.5 (1.4541/321)	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[4) and 5)]	1
Stainless steel 303 (1.4305)	2

Cable extension length

Standard cable length, 2000 mm (78.74")	0
Add order code Y01 and plain text: "Insertion length ... mm"	
500 to 1000 mm (19.69 to 39.37")	1
Cable length 1001 to 2000 mm (39.41 to 78.74")	2
Cable length 2001 to 3000 mm (78.78 to 118.11")	3
Cable length 3001 to 4000 mm (118.15 to 157.48")	4
Cable length 4001 to 5000 mm (157.52 to 196.85")	5
Cable length 5001 to 6000 mm (196.89 to 236.22")	6
Cable length 6001 to 7000 mm (236.26 to 275.59")	7
Cable length 7001 to 10000 mm (275.63 to 393.70")	8

Selection and Ordering data

Order No.

SITRANS LPS200, cable extension
Rotary paddle switch for level detection in bulk solids
Cable extension for increased length in top-mounted applications

7ML5727 - ■■■■ - ■■■ 0

Measuring vane

Boot shaped, 35 x 106 mm (1.38 x 4.17")	A
Hinged vane, 65 x 210 mm (2.56 x 8.27")	B
Boot shaped, 28 x 98 mm (1.10 x 3.86")	C
Rectangular 50 x 150 mm (1.97 x 5.91")[6)]	D
Rectangular 50 x 250 mm (1.97 x 9.84")[6)]	E
Rectangular 98 x 150 mm (3.86 x 5.91")[6)]	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

Further designs

Order code

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

Total insertion length: Enter the total insertion length in plain text description, max. 10000 mm (393.70")	**Y01**
Reinforced cable (max. 28 kN pulling force)	**P01**
Heating of enclosure[7) and 8)]	**A35**
Signal bulb inserted in M20 cable gland[7)]	**A20**

Additional instruction manual

Order No.

Multi-language	**7ML1998-5FS62**

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

Spare parts

Motor gear /PLC, multi-voltage	**7ML1830-1KG**
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17")	**7ML1830-1KH**
Hinged vane, 65 x 210 mm (2.56 x 8.27")	**7ML1830-1KJ**
Rope extension kit, 2 m (6.56 ft)	**7ML1830-1KK**

1) Available with approval option C and D only, up to max. 0.8 bar

2) Basic version is cost effective and offers fast delivery.

3) Available only with power supply option Q (process connection B with approval B or process connection C with approval A), process pressure 1, process connection material 2, cable extension length 0 and measuring vane A

4) Available with process connections A, B, C, D, E, F only

5) Available with process pressure option 1 only

6) Available with process connections E, F, G, H, J, K only

7) Available with approval options C, D only

8) Not available with power supply options Q and R

▶ Available ex stock.

5

Point level measurement - Electro-mechanical switches

SITRANS LPS200

Selection and Ordering data — Order No.

SITRANS LPS200, angled extension — 7ML5728-
Rotary paddle switch with robust design for level detection in bulk solids
Angled extension designed to avoid falling material 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 — J
24 V AC — 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
DN100 PN 6, EN1092-1 (1.4541/321) — A
DN100 PN 16, EN1092-1 (1.4541/321) — B
4" ASME 150 lbs B16.5 (1.4541/321) — 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 (1.4305) — 1

Extension length
125 mm (4.92") — 1
150 mm (5.91") — 2
200 mm (7.87") — 3
250 mm (9.84") — 4
300 mm (11.81") — 5

Measuring vane
Rectangular vane, 50 x 98 mm (1.97 x 3.86") — A
Rectangular vane, 50 x 150 mm (1.97 x 5.91") — B
Rectangular vane, 50 x 250 mm (1.97 x 9.84") — C
Rectangular vane 98 x 150 mm (3.86 x 5.91") — D
Rectangular vane 98 x 250 mm (3.86 x 9.84") — E
Hinged vane, 65 x 210 mm (2.56 x 8.27") — F

Approvals
CSA/FM Dust Ignition Proof — A
ATEX II 1/2 D — B
CSA/FM General Purpose — C
CE — D

Selection and Ordering data — Order No.

SITRANS LPS200, angled extension — 7ML5728-
Rotary paddle switch with robust design for level detection in bulk solids
Angled extension designed to avoid falling material in side mount applications — -0

Further designs — Order code

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

Heating of enclosure[1) and 2)] — **A35**
Signal bulb inserted in M20 cable gland[1)] — **A20**

Additional instruction manual — Order No.
Multi-language — **7ML1998-5FS62**

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

Spare parts
Motor gear /PLC, multi-voltage — **7ML1830-1KG**
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17") — **7ML1830-1KH**
Hinged vane, 65 x 210 mm (2.56 x 8.27") — **7ML1830-1KJ**

[1)] Available with approval options C, D only
[2)] Available with power supply options A to H, J to N, P only

Selection and Ordering data	Order No.
SITRANS LPS200, rigid extension Rotary paddle switch for 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 +350 °C (+662 °F)[1]	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	J
24 V AC	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	
DN32 PN 6, EN1092-1 (1.4541/321)	E
DN100 PN 6, EN1092-1 (1.4541/321)	F
DN100 PN 16, EN1092-1 (1.4541/321)	G
2" ASME 150 lbs B16.5 (1.4541/321)	H
3" ASME 150 lbs B16.5 (1.4541/321)	J
4" ASME 150 lbs B16.5 (1.4541/321)	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[2) and 3)]	1
Stainless steel 303 (1.4305)	2
Extension material (protection tube)	
Aluminum[2) and 4)]	0
Stainless steel 303 (1.4305)	1
Extension length	
165 to 500 mm (6.50 to 9.69")	A
501 to 750 mm (19.72 to 29.53")	B
751 to 1000 mm (29.57 to 39.37")	C
1001 to 1250 mm (39.41 to 42.21")	D
1251 to 1500 mm (49.25 to 59.06")	E
1501 to 1750 mm (59.09 to 68.90")	F
1751 to 2000 mm (68.94 to 78.74")	G
2001 to 2250 mm (78.78 to 88.58")	H
2251 to 2500 mm (88.62 to 98.43")	J
2501 to 2750 mm (98.46 to 108.27")	K
2751 to 3000 mm (108.31 to 118.11")	L
3001 to 3250 mm (118.15 to 127.95")	M
3251 to 3500 mm (127.99 to 137.80")	N
3501 to 3750 mm (137.83 to 147.64")	P
3751 to 4000 mm (147.67 to 157.48")	Q

Selection and Ordering data	Order No.
SITRANS LPS200, rigid extension Rotary paddle switch for level detection in bulk solids	**7ML5730-** ☐☐☐☐-☐☐☐
Measuring vane	
Boot shaped, 35 x 106 mm (1.34 x 4.17")	A
Hinged vane, 60 x 200 mm (2.36 x 7.87")	B
Rectangular 50 x 150 mm (1.97 x 5.91")[5)]	C
Rectangular 50 x 250 mm (1.97 x 9.84")[5)]	D
Rectangular 98 x 150 mm (3.86 x 5.91")[5)]	E
Rectangular 98 x 250 mm (3.86 x 9.84")[5)]	F
Approvals	
CSA/FM Dust Ignition Proof	1
ATEX II 1/2 D	2
CSA/FM General Purpose	3
CE	4
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Total insertion length: Enter the total insertion length in plain text description, max. 4000 mm (157.48")	**Y01**
Heating of enclosure[6) and 7)]	**A35**
Signal bulb inserted in M20 cable gland[6)]	**A20**
SITRANS LPS200 designed for food applications with shaft seal conforming to FDA standards	**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 +350 °C (+662 °F)	**P09**
Sliding sleeve (standard, max. pressure 0.8 bar)	**P12**
Sliding sleeve (pressure tight, for over-pressure application starting from 1 bar max., dependent on pressure option ordered)	**P13**
Additional instruction manual	Order No.
Multi-language	**7ML1998-5FS62**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
Spare parts	
Motor gear /PLC, multi-voltage	**7ML1830-1KG**
Replacement vane, boot shape, 35 x 106 mm (1.38 x 4.17")	**7ML1830-1KH**
Hinged vane, 65 x 210 mm (2.56 x 8.27")	**7ML1830-1KJ**

[1)] Available with approval option 3 and 4 only, up to max. 0.8 bar
[2)] Available with process connections A to D only
[3)] Available with process pressure option 1 only
[4)] Available with process connection material option 1 only
[5)] Available with process connections E to H, J, K only
[6)] Available with approval options 3, 4 only
[7)] Available with power supply options A to H, J to N, P only

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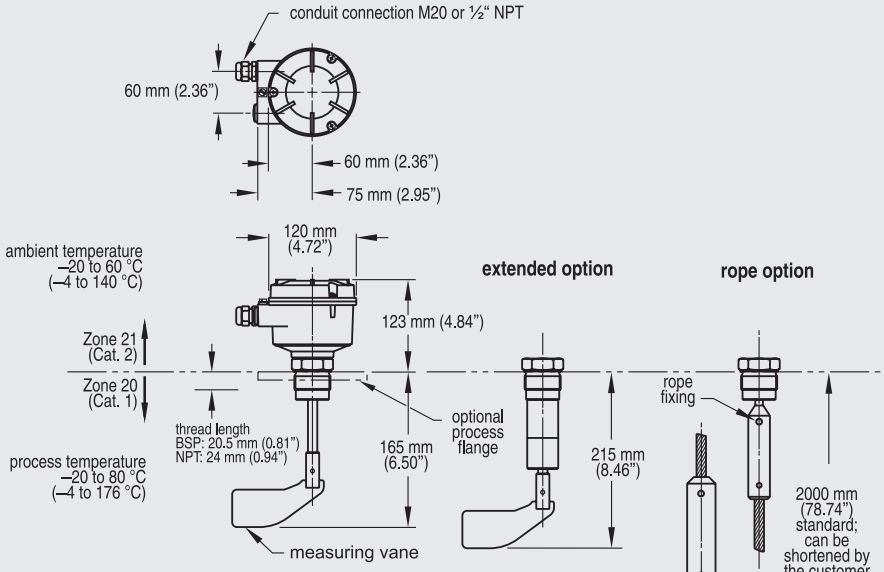
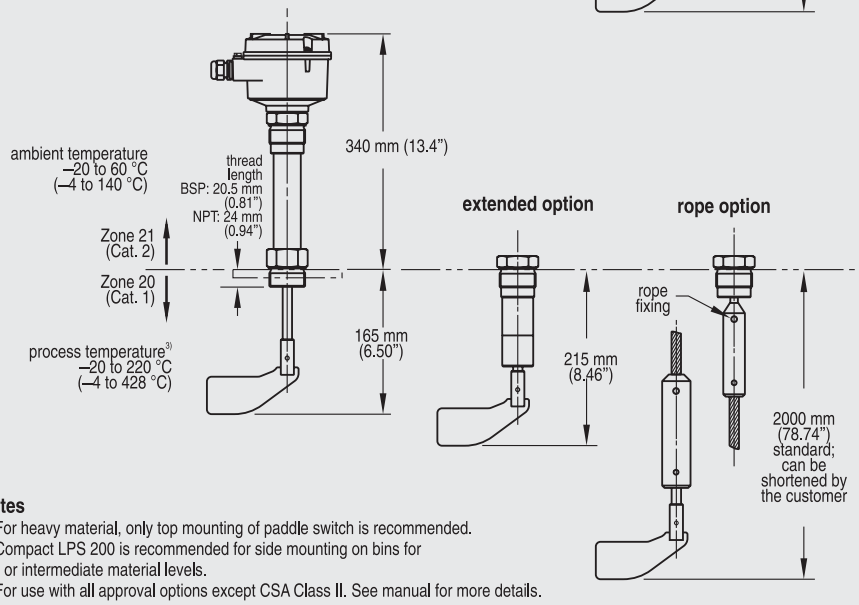
SITRANS LPS200

Dimensional drawings

Standard model: compact version

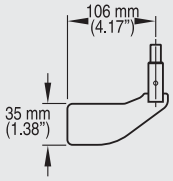


High Temperature Model: compact version

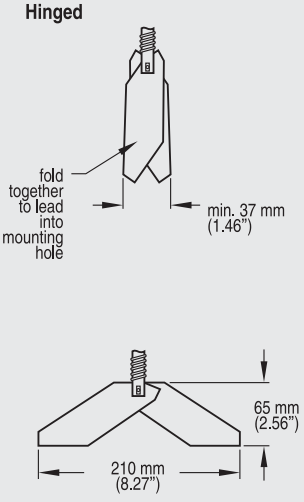


Measuring Vanes

Standard



Hinged



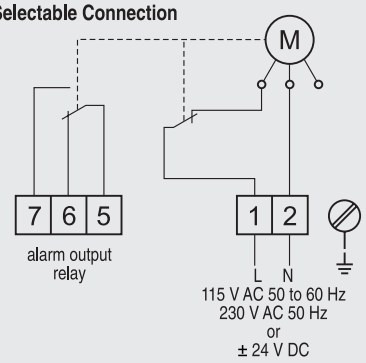
Notes

1. For heavy material, only top mounting of paddle switch is recommended.
2. Compact LPS 200 is recommended for side mounting on bins for low or intermediate material levels.
3. For use with all approval options except CSA Class II. See manual for more details.

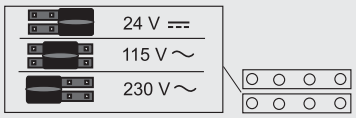
Note: Please consult instruction manual for dimensions of other measuring vane versions.

Schematics

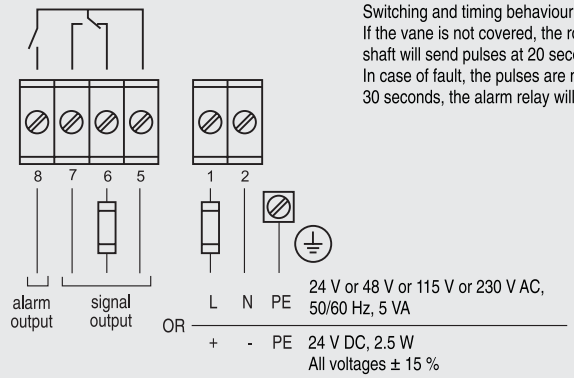
Switch Selectable Connection



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.

Note: Please consult instruction manual for wiring diagrams for other connection types.

SITRANS LPS200 connections

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SITRANS LVS200

Overview

SITRANS LVS200 is a vibrating point level switch for high or low levels of bulk solids

Benefits

- High resistance to mechanical forces
- Strong vibration resistance to high bulk material loads
- Rotatable enclosure
- 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 20000 mm (787")
- Optional detection of solids within liquid
- Durable short fork option with 165 mm (6.5") 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" pipe.

SITRANS LVS200 has an optional 4 to 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)

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 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. 2 A < 200 ms • max. 5 A < 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 to 2 seconds
• Signal delay	• Probe uncovered to covered: approximately 1 second • Probe covered to uncovered: approximately 1 to 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 to 20 mA
- Resolution	4 to 20 mA ± 0.1 mA
Sensitivity	High or low, switch selectable
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature	-40 to +60 °C (-40 to +140 °F)
• Installation catagory	III
• Pollution degree	2

Medium conditions	
• Process temperature	• All except CSA Class II, Group G: -40 to +150 °C (-40 to +302 °F) • CSA Class II, Group G: -40 to +140 °C (-40 to +284 °F), CSA temperature code T3B
• Max. threaded bushing temperature	+80 °C (+176 °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 (145 psi) 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 1½" [(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 lbs) • Solids/liquids version, no extensions: approx. 1.9 kg (4.2 lbs)
Power supply	• 19 to 230 V AC, +10%, 50 to 60 Hz, 8 VA • 19 to 55 V DC, +10%, 1.5 W
Certificates and approvals	
	• CSA/FM General Purpose • CE • CSA/FM Dust Ignition Proof • 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 • ATEX II 1G and 1/2 G Eex ia IIC; ATEX II 1D and 1/2 D, available only with power supply option 5

SITRANS LVS200

Selection and Ordering data	Order No.
SITRANS LVS200, standard Vibrating point level switch for high or low levels of bulk solids	**7ML5731-** ■■■■■-■■A0
Power supply	
19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT)	1
19 to 230 V AC, 19 to 55 V DC, two relay outputs (DPDT)	2
18 to 50 V DC PNP	3
19 to 230 V AC/DC without contact, 2-wire loop powered[1]	4
7 to 9 V DC (requires NAMUR switch amplifier) NAMUR IEC 60947-5-6, 2-wire[2]	5
8/16 mA or 4 to 20 mA; 12.5 to 35 V DC, 2-wire[3]	6
19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT) basic version[4] and [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 +180 °C (+356 °F)/max. temperature electronics +80 °C (+176 °F)]	C
Separated enclosure - cable length 4.0 m (13.12 ft) [max. temperature process +180 °C (+356 °F)/max. temperature electronics +80 °C (+176 °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")][6]	C
2" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69")][6]	D
Flanged	
DN100 PN 6, EN1092-1 (1.4541/321)	E
DN100 PN 16, EN1092-1 (1.4541/321)	F
2" ASME 150 lbs B16.5 (1.4541/321)	G
3" ASME 150 lbs B16.5 (1.4541/321)	H
4" ASME 150 lbs B16.5 (1.4541/321)	J
Extension length	
Stainless steel 304 (1.4301)	
Standard length, 230 mm (9.06")[7]	1 1
Add order code Y01 and plain text: "Insertion length ... mm"	
• 300 to 500 mm (11.81 to 19.69")[7]	1 2
• 501 to 750 mm (19.72 to 29.53")[7]	1 3
• 751 to 1000 mm (29.57 to 39.37")[7]	1 4
• 1001 to 1250 mm (39.41 to 49.21")[7]	1 5
• 1251 to 1500 mm (49.25 to 59.06")[7]	1 6
• 1501 to 1750 mm (59.09 to 68.90")[7]	1 7
• 1751 to 2000 mm (68.94 to 78.74")[7]	1 8
• 2001 to 2250 mm (78.78 to 88.58")[7]	2 1
• 2251 to 2500 mm (88.62 to 98.43"[7]	2 2
• 2501 to 2750 mm (98.46 to 108.27")[7]	2 3
• 2751 to 3000 mm (108.31 to 118.11")[7]	2 4
• 3001 to 3250 mm (118.15 to 127.95")[7]	2 5
• 3251 to 3500 mm (127.99 to 137.80")[7]	2 6
• 3501 to 3750 mm (137.83 to 147.64")[7]	2 7
• 3751 to 4000 mm (147.68 to 157.48")[7]	2 8
Stainless Steel 316TI (1.4571)	
Standard length, 230 mm (9.06")[8]	3 1
Add order code Y01 and plain text: "Insertion length ...mm"	
• 300 to 500 mm (11.81 to 19.69")[8]	3 2
• 501 to 750 mm (19.72 to 29.53")[8]	3 3
• 751 to 1000 mm (29.57 to 39.37")[8]	3 4
• 1001 to 1250 mm (39.41 to 49.21")[8]	3 5

Selection and Ordering data	Order No.
SITRANS LVS200, standard Vibrating point level switch for high or low levels of bulk solids	**7ML5731-** ■■■■■-■■A0
• 1251 to 1500 mm (49.25 to 59.06")[8]	3 6
• 1501 to 1750 mm (59.09 to 68.90")[8]	3 7
• 1751 to 2000 mm (68.94 to 78.74")[8]	3 8
• 2001 to 2250 mm (78.78 to 88.58")[8]	4 1
• 2251 to 2500 mm (88.62 to 98.43")[8]	4 2
• 2501 to 2750 mm (98.46 to 108.27")[8]	4 3
• 2751 to 3000 mm (108.31 to 118.11")[8]	4 4
• 3001 to 3250 mm (118.15 to 127.95")[8]	4 5
• 3251 to 3500 mm (127.99 to 137.80")[8]	4 6
• 3501 to 3750 mm (137.83 to 147.64")[8]	4 7
• 3751 to 4000 mm (147.68 to 157.48")[8]	4 8
Material process connection/extension	
Stainless steel 304 (1.4301)	1
Stainless steel 316 TI (1.4571)	2
Approvals	
CSA/FM Dust Ignition Proof	A
ATEX II 1/2 D	B
CSA/FM General Purpose	C
CE	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[9]	E
ATEX II 1G and 1/2G Eex ia IIC; ATEX II 1D and 1/2D[9]	F
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Total insertion length: Enter the total insertion length in plain text description, max. 4000 mm (157.48")	**Y01**
Enhanced sensitivity > 5 g/l via electronics and increased fork length to 195 mm (7.68")	**K05**
Enhanced sensitivity < 5 g/l via electronics, increased fork length to 195 mm (7.68"), and increased aluminum fork width (available only with universal voltage, SPDT, CE/FM and CSA General Purpose approvals)	**G01**
Signal bulb inserted in M20 cable gland[10]	**A20**
NAMUR 8/16 mA switch amplifiers	**A15**
Instruction manual	Order No.
Multi-language	**7ML1998-5FT62**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
Spare parts	
Replacement Electronics Module (125 Hz) [19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT)]	**7ML1830-1KL**
Sliding sleeve, 2" BSP (ISO 228)	**7ML1830-1JM**
Sliding sleeve, 2" NPT [(Taper), ANSI/ASME B1.20.1]	**7ML1830-1JN**

[1] Available with approval options A, B, C, D, E only
[2] Available with approval options E, F only
[3] Available with approval option D only
[4] Available only with process temperature option A (process connection A with approval option B, or process connection B with approval option A), extension length 11 and material process connection 1
[5] Basic version is cost effective and offers fast delivery.
[6] Not available with extension length options 11 and 12
[7] Available with Material process connection/extension option 1 only
[8] Available with Material process connection/extension option 2 only
[9] Available with power supply option 5 only
[10] Available with approval options C, D only
▶ Available ex stock.

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Selection and Ordering data	Order No.
SITRANS LVS200, liquids/solids interface Vibrating point level switch for interface applications, and high load applications with short insertion requirements	7 M L 5 7 3 2 - ■ ■ A 0
Power supply	
19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT)	1
19 to 230 V AC, 19 to 55 V DC, two relay outputs (DPDT)	2
18 to 50 V DC PNP	3
19 to 230 V AC/DC without contact, 2-wire loop powered[1]	4
8/16 mA or 4 to 20 mA; 12.5 to 35 V DC, 2-wire[2]	5
Process temperature	
Without temperature isolator	A
With temperature isolator	B
Separated enclosure - cable length 1.5 m (4.92 ft) [max. temperature process +180 °C (+356 °F)/max. temperature electronics +80 °C (+176 °F)]	C
Separated enclosure - cable length 4.0 m (13.12 ft) [max. temperature process +180 °C (+356 °F)/max. temperature electronics +80 °C (+176 °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")]	C
2" NPT [(Taper), ANSI/ASME B1.20.1], sliding sleeve [min. length 500 mm (19.69")]	D
Flanged	
DN100 PN 6, EN1092-1 (1.4541/321)	E
DN100 PN 16, EN1092-1 (1.4541/321)	F
2" ASME 150 lbs B16.5 (1.4541/321)	G
3" ASME 150 lbs B16.5 (1.4541/321)	H
4" ASME 150 lbs B16.5 (1.4541/321)	J
Extension length	
Stainless steel 304 (1.4301)[3]	
Standard length, 165 mm (6.50")	1 1
Add order code Y01 and plain text: "Insertion length ... mm"	
200 to 500 mm (7.87 to 19.69")[3]	1 2
501 to 750 mm (19.72 to 29.53")[3]	1 3
751 to 1000 mm (29.57 to 39.37")[3]	1 4
1001 to 1250 mm (39.41 to 49.21")[3]	1 5
1251 to 1500 mm (49.25 to 59.06")[3]	1 6
1501 to 1750 mm (59.09 to 68.90")[3]	1 7
1751 to 2000 mm (68.94 to 78.74")[3]	1 8
2001 to 2250 mm (78.78 to 88.58")[3]	2 1
2251 to 2500 mm (88.62 to 98.43")[3]	2 2
2501 to 2750 mm (98.46 to 108.27")[3]	2 3
2751 to 3000 mm (108.31 to 118.11")[3]	2 4
3001 to 3250 mm (118.15 to 127.95")[3]	2 5
3251 to 3500 mm (127.99 to 137.80")[3]	2 6
3501 to 3750 mm (137.83 to 147.64")[3]	2 7
3751 to 4000 mm (147.68 to 157.48")[3]	2 8
Stainless Steel 316TI (1.4571)	
Standard length, 165 mm (6.50")[4]	3 1
Add order code Y01 and plain text: "Insertion length ...mm"	
200 to 500 mm (7.87 to 19.69")[4]	3 2
501 to 750 mm (19.72 to 29.53")[4]	3 3
751 to 1000 mm (29.57 to 39.37")[4]	3 4
1001 to 1250 mm (39.41 to 49.21")[4]	3 5

Selection and Ordering data	Order No.
SITRANS LVS200, liquids/solids interface Vibrating point level switch for interface applications, and high load applications with short insertion requirements	7 M L 5 7 3 2 - ■ ■ A 0
1251 to 1500 mm (49.25 to 59.06")[4]	3 6
1501 to 1750 mm (59.09 to 68.90")[4]	3 7
1751 to 2000 mm (68.94 to 78.74")[4]	3 8
2001 to 2250 mm (78.78 to 88.58")[4]	4 1
2251 to 2500 mm (88.62 to 98.43")[4]	4 2
2501 to 2750 mm (98.46 to 108.27")[4]	4 3
2751 to 3000 mm (108.31 to 118.11")[4]	4 4
3001 to 3250 mm (118.15 to 127.95")[4]	4 5
3251 to 3500 mm (127.99 to 137.80")[4]	4 6
3501 to 3750 mm (137.83 to 147.64")[4]	4 7
3751 to 4000 mm (147.68 to 157.48")[4]	4 8
Material process connection/extension	
Stainless steel 304 (1.4301)	1
Stainless steel 316 TI (1.4571)	2
Approvals	
CSA/FM Dust Ignition Proof	A
ATEX II 1/2 D	B
CSA/FM General Purpose	C
CE	D
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Total insertion length: Enter the total insertion length in plain text description, max. 4000 mm (157.48")	**Y01**
Signal bulb inserted in M20 cable gland[5]	**A20**
Instruction manual	Order No.
Multi-language	**7ML1998-5FT62**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
Spare parts	
Replacement Electronics Module (350 Hz) [19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT)]	**7ML1830-1KM**
Sliding sleeve, 2" [(BSPP), EN ISO 228-1]	**7ML1830-1JM**
Sliding sleeve, 2" NPT [(Taper), ANSI/ASME B1.20.1]	**7ML1830-1JN**

[1] Available with approval options B, C, D only
[2] Available only with approval option D only
[3] Available with material process connection/extension option 1 only
[4] Available with material process connection/extension option 2 only
[5] Available with approval options C, D only

Point level measurement - Electro-mechanical switches

SITRANS LVS200

Selection and Ordering data	Order 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-** ▢▢▢▢▢-▢▢**A0**
Power supply	
19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT)	**1**
19 to 230 V AC, 19 to 55 V DC, two relay outputs (DPDT)	**2**
18 to 50 V DC PNP	**3**
19 to 230 V AC/DC without contact, 2-wire loop powered[1]	**4**
7 to 9 V DC (requires NAMUR switch amplifier) NAMUR IEC 60947-5-6, 2-wire[2]	**5**
8/16 mA or 4 to 20 mA; 12.5 to 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	
DN100 PN 6, EN1092-1 (1.4541/321)	**C**
DN100 PN 16, EN1092-1 (1.4541/321)	**D**
2" ASME 150 lbs B16.5 (1.4541/321)	**E**
3" ASME 150 lbs B16.5 (1.4541/321)	**F**
4" ASME 150 lbs B16.5 (1.4541/321)	**G**
Process connection material	
Stainless steel 304 (1.4301)	**1**
Stainless steel 316 TI (1.4571)	**2**
Extension length	
Customer supplied 1" pipe extension Length: 300 to 3800 mm (11.81 to 149.61")	**1**
Application type	
Dry bulk solids (125 Hz)	**1**
Liquids/solids interface (350 Hz)	**2**
Approvals	
CSA/FM Dust Ignition Proof	**A**
ATEX II 1/2 D	**B**
CSA/FM General Purpose	**C**
CE	**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[4]	**E**
ATEX II 1G and 1/2G Eex ia IIC; ATEX II 1D and 1/2D[4]	**F**
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Enter the total insertion length in plain text description, min. 300 mm (11.81") max. 3800 mm (149.61")	**Y01**
Enhanced sensitivity > 5 g/l via electronics and increased fork length to 195 mm (7.68 ")	**K05**
Signal bulb inserted in M20 cable gland[5]	**A20**
NAMUR 8 to 16 mA switch amplifiers	**A15**

Selection and Ordering data	Order 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-** ▢▢▢▢▢-▢▢**A0**
Instruction manual	
Multi-language Note: One instruction manual is shipped with this product. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	**7ML1998-5FT62**
Spare parts	
Replacement Electronics Module (125 Hz) [19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT)]	**7ML1830-1KL**
Replacement Electronics Module (350 Hz) [19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT)]	**7ML1830-1KM**

[1] Available with approval options A, B, C, D, E only
[2] Available with approval options C, D, E and F only
[3] Available with approval option D only
[4] Available with power supply option 5 only
[5] Available with approval options C, D only

Selection and Ordering data	Order No.
SITRANS LVS200, cable extended Vibrating point level switch for high or low levels of bulk solids	**7 M L 5 7 3 4 -** ▢▢▢▢▢ - ▢▢ **A 0**
Power supply	
19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT)	**1**
19 to 230 V AC, 19 to 55 V DC, two relay outputs (DPDT)	**2**
18 to 50 V DC PNP	**3**
19 to 230 V AC/DC without contact, 2-wire loop powered[1]	**4**
7 to 9 V DC (requires NAMUR switch amplifier) NAMUR IEC 60947-5-6, 2-wire[2] and 3]	**5**
8/16 mA or 4 to 20 mA; 12.5 to 35 V DC, 2-wire[4]	**6**
Process temperature	
Up to +80 °C (+176 °F)	**A**
Process connection	
Threaded	
R 1½" [(BSPT), EN 10226]	**A**
1½" NPT [(Taper), ANSI/ASME B1.20.1]	**B**
Flanged	
DN100 PN 6, EN1092-1 (1.4541/321)	**C**
DN100 PN 16, EN1092-1 (1.4541/321)	**D**
2" ASME 150 lbs B16.5 (1.4541/321)	**E**
3" ASME 150 lbs B16.5 (1.4541/321)	**F**
4" ASME 150 lbs B16.5 (1.4541/321)	**G**
Extension length	
500 to 1000 mm (19.7 to 39.4") [max. length 20000 mm (787.4"), not with Power supply option 5 (max. 10000 mm, 393.7")]	**1 0**
Add order code Y01 and plain text: "Insertion length ... mm"	
1001 to 2000 mm (39.41 to 78.74")	**1 1**
2001 to 3000 mm (78.78 to 118.11")	**1 2**
3001 to 4000 mm (118.15 to 157.48")	**1 3**
4001 to 5000 mm (157.52 to 196.85")	**1 4**
5001 to 6000 mm (196.89 to 236.22")	**1 5**
6001 to 7000 mm (236.26 to 275.59")	**1 6**
7001 to 8000 mm (275.63 to 314.96")	**1 7**
8001 to 9000 mm (315 to 354.33")	**1 8**
9001 to 10000 mm (354.37 to 393.70")	**2 0**
10001 to 11000 mm (393.74 to 433.07")	**2 1**
11001 to 12000 mm (433.11 to 472.44")	**2 2**
12001 to 13000 mm (472.48 to 511.81")	**2 3**
13001 to 14000 mm (511.85 to 551.18")	**2 4**
14001 to 15000 mm (551.22 to 590.55")	**2 5**
15001 to 16000 mm (590.59 to 629.92")	**2 6**
16001 to 17000 mm (629.96 to 669.29")	**2 7**
17001 to 18000 mm (669.33 to 708.66")	**2 8**
18001 to 19000 mm (708.70 to 748.03")	**3 0**
19001 to 20000 mm (748.07 to 787.40")	**3 1**
Application type	
Dry bulk solids (125 Hz)	**1**
Liquid/solids interface (350 Hz)[5]	**2**

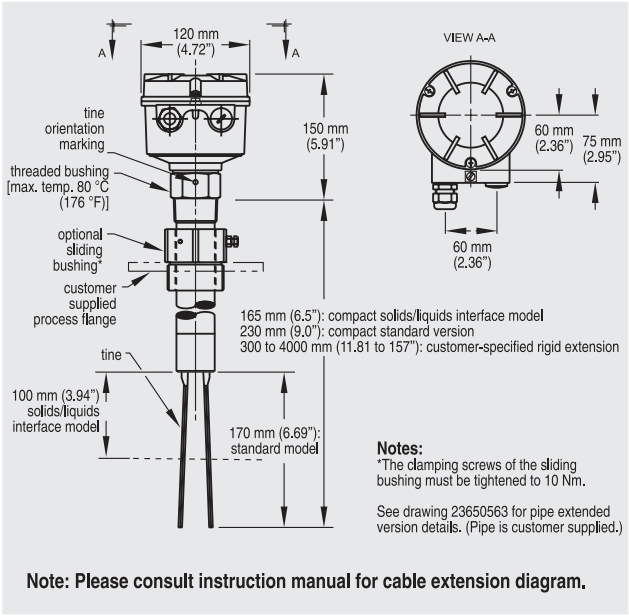
Selection and Ordering data	Order No.
SITRANS LVS200, cable extended Vibrating point level switch for high or low levels of bulk solids	**7 M L 5 7 3 4 -** ▢▢▢▢▢ - ▢▢ **A 0**
Approvals	
CSA/FM Dust Ignition Proof	**A**
ATEX II 1/2 D	**B**
CSA/FM General Purpose	**C**
CE	**D**
CSA/FM IS Class I, II, III Div. 1, Groups A, B, C, D, E, F, G, FM Class 1, Aex ia IIC, CSA Class 1, Ex ia IIC[6] and 7]	**E**
ATEX II 1G and 1/2G Eex ia IIC; ATEX II 1D and 1/2D[5] and 5]	**F**
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Enter the total insertion length in plain text description, max. 20000 mm (787.40")	**Y01**
Enhanced sensitivity > 5 g/l via electronics and increased fork length to 195 mm (7.68")	**K05**
Signal bulb inserted in M20 cable gland[4]	**A20**
NAMUR 8 to 16 mA switch amplifiers	**A15**
Instruction manual	Order No.
Multi-language This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	**7ML1998-5FT62**
Spare parts	
Replacement Electronics Module (125 Hz) [19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT)]	**7ML1830-1KL**
Replacement Electronics Module (350 Hz) [19 to 230 V AC, 19 to 55 V DC, one relay output (SPDT)]	**7ML1830-1KM**

[1] Available with approval options A, B, C, D, E only
[2] Available with approval options C, D, E and F only
[3] Cable length is limited to 10000 mm (393.70")
[4] Available with approval options C, D only
[5] Cable length is limited to 7000 mm (275.59")
[6] Available with power supply option 5 only
[7] Available with application type 1 only

5

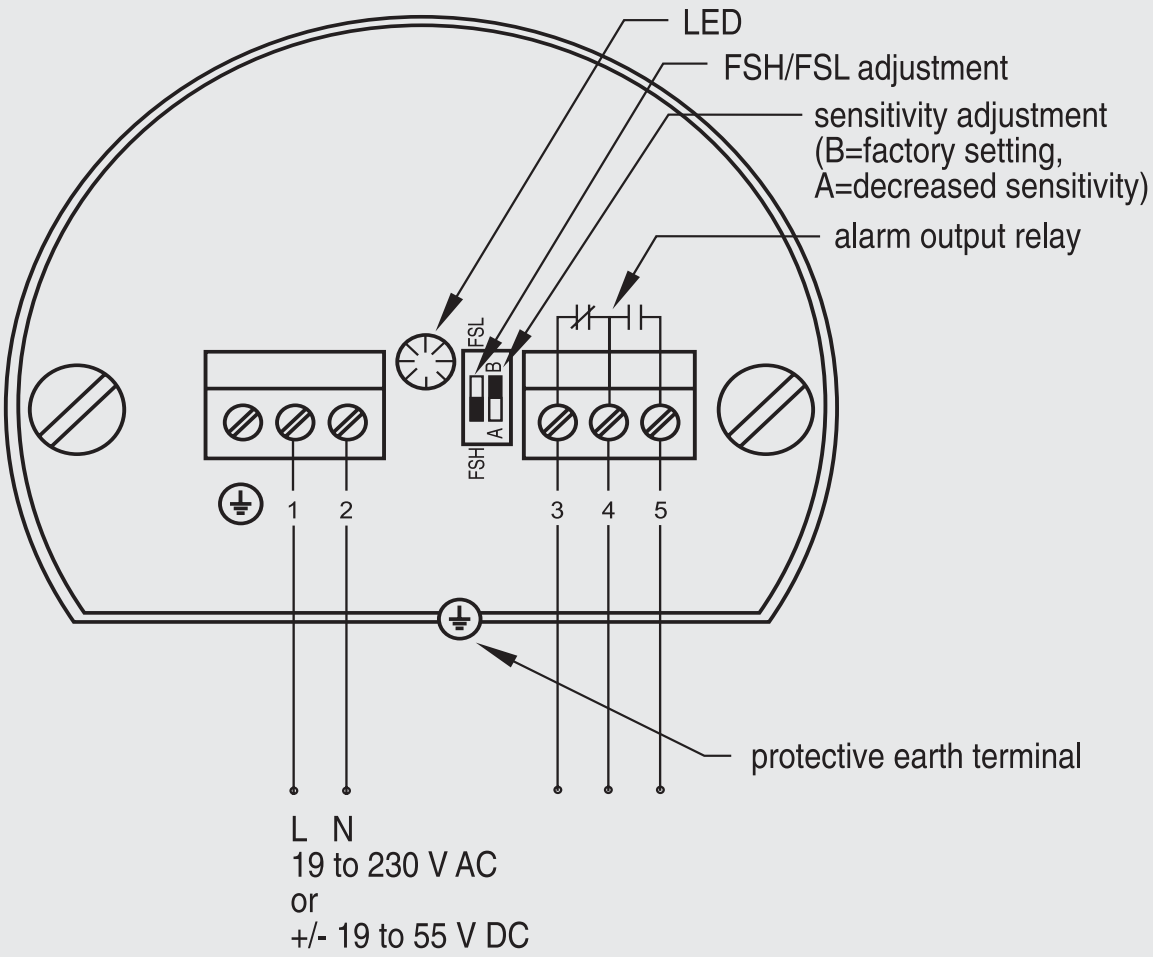
SITRANS LVS200

Dimensional drawings



SITRANS LVS200 dimensions

Schematics



Note: Power supply option 1 shown. Please consult instruction manual for wiring diagrams of other connection types.

SITRANS LVS200 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 20000 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 Milltronics 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

Ultrasonics Transmitter/Controller Selection Guide

Criteria	SITRANS Probe LU	HydroRanger 200	MultiRanger 100/200	SITRANS LUC500	SITRANS LU	OCM III
Range	6 m (20 ft) or 12 m (40 ft)	15 m (50 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	3 m (10 ft)
Typical applications	Chemical storage vessels, filter beds, liquid storage vessels	Wet wells, flumes/weirs, bar screen control	Wet wells, flumes/weirs, bar screen control, hoppers, chemical storage, liquid storage, crusher bins, dry solids storage	Wet well/lift station control, weirs/flumes, open channels	Chemical storage, liquid storage, bulk solids storage (sugar, flour bins, grains, cereals), plastic pellets	Open channel measurement
Output	HART model: 4 to 20 mA/HART PROFIBUS PA model: PROFIBUS	6 relays standard, two 4 to 20 mA outputs (isolated)	1 relay (option on MultiRanger 100) 3 relays standard 6 relays (option) Two 4 to 20 mA outputs (isolated)	5 relays, 4 to 20 mA (option)	4 relays (LU01, LU02) Up to 40 relays (LU10) 4 to 20 mA isolated	3 relays, 4 to 20 mA
Communications	HART or PROFIBUS PA Options: • SIMATIC PDM for remote configuration and diagnostics	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)	Telemetry capability with Modbus RTU/ASCII via RS-232/RS-485 Options: • SIMATIC PDM • SmartLinx (PROFIBUS DP, Allen-Bradley Remote I/O, DeviceNet) • ECT EnviroRanger Tool software	Dolphin, RS-232/RS-485 (LU01, LU02) Dolphin via infrared (LU10) Options: • SmartLinx (PROFIBUS DP, Allen-Bradley Remote I/O, DeviceNet)	Via RS-232 Options: • Flow Reporter software
Power specifications	HART: 4 to 20 mA, 24 V DC nominal, max. 550 Ω, 30 V DC max. PROFIBUS PA: 12, 13, 15, or 20 mA, dependent on programming	AC version: 100 to 230 V AC ±15%, 50/60 Hz, 36 VA/17 W DC version: 12 to 30 V DC, 20 W	AC version: 100 to 230 V AC ±15%, 50/60 Hz, 36 VA/17 W DC version: 12 to 30 V DC, 20 W	AC version: 100 to 230 V AC ±15%, 50/60 Hz, 30 VA/17 W DC version: 12 to 30 V DC, 20 W	LU01, LU02: AC version: 100/115/200/230 V AC DC version: 18 to 30 V DC, 25 W LU10: 100/115/200/230 V AC	100/115/200/230 V AC, ±15%, 50/60 Hz, 15 VA and/or 9 to 30 V DC, 8 W
Approvals	CE, CSA$_{NRTL/C}$, FM, ATEX, ANZEx, IECEx	CE, CSA$_{NRTL/C}$, UL Listed, FM	CE, CSA$_{NRTL/C}$, UL Listed, FM	CE, CSA$_{NRTL/C}$, UL Listed	CE, CSA$_{NRTL/C}$, FM, Lloyd's Register	CE, CSA$_{NRTL/C}$, FM

7ML1830-2AN

SITRANS Probe LU HART*
SITRANS LU

7ML5830-2AJ

SITRANS Probe LU PROFIBUS

7ML1830-2AA

OCM III

7ML1830-2AK

MultiRanger 100/200
HydroRanger 200
HydroRanger Plus
SITRANS LUC500

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

Handheld Programmer Selection Guide

SIEMENS

Ultrasonic Level Application Questionnaire

Customer information

Contact: _____ Prepared By: _____

Company: _____ Date: _____

Address: _____ Notes on the Application: _____

City: _____ Country: _____

Zip/Postal Code: _____ Phone: ( )

E-mail: _____ Fax: ( )

Tanks/Vessel information

(Supply sketch where possible) Sketch attached ☐

Type:
☐ Storage
☐ Process
☐ Pump station
☐ Open channel

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

Critical Information
Nozzle Length: _____ cm/in
Nozzle Diameter: _____ cm/in

Tank top: ☐ Open ☐ Flat ☐ Conical ☐ Parabolic

Tank bottom: ☐ Sloped ☐ Flat ☐ Conical ☐ Parabolic

Internal equipment and/or obstructions: ☐ No ☐ Yes *Please list* _____

Measurement type: ☐ Point Level ☐ Continuous Level ☐ Volume ☐ Flow

Area safety classification: _____

Material

Material being measured: _____ ☐ 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 ®
☐ PROFIBUS PA
☐ PROFIBUS DP
☐ Modbus RTU/ASCII
☐ AB Remote I/O
☐ DeviceNet
☐ None

Products recommended:

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 3A approved 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.

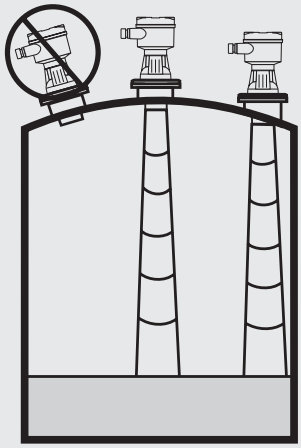
Mounting and Interconnection

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") flange adapter for mating to 3" ASME, DN 65, PN 10 and JIS 10K 3B sized flanges.

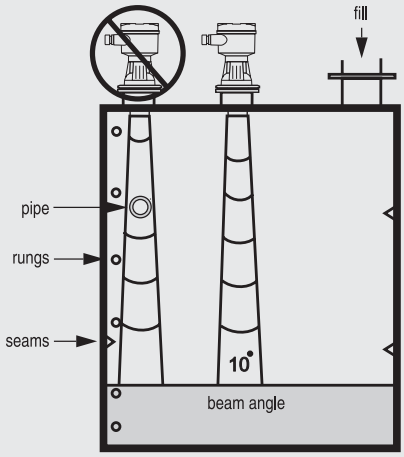
Separate cables and conduit may be required to conform to standard instrumentation wiring or electrical codes.

Configuration

Parabolic Mounting



Flat Mounting and Beam Angle



Pointek ULS200 Mounting

5

Point level measurement - Ultrasonic switch

Pointek ULS200

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level switch
Measuring range	
Measuring range in liquids	0.25 to 5 m (0.8 to 16.4 ft)
Measuring range in bulk solids	0.25 to 3 m (0.8 to 9.8 ft)
Output	
AC Version (relay)	2 SPDT Form C contacts rated 5 A at 250 V AC, resistive load
DC Version (relay)	2 SPDT Form C contacts rated 5 A at 48 V DC
DC Version (transistor)	2 switches, rated max. 100 mA, 48 V DC
Accuracy	
AC/DC version	
• Resolution	3 mm (0.1“)
• Repeatability	0.25% of measuring range
Rated operation conditions	
Installation conditions	
• Location	Indoors/outdoors
• Beam angle	12°
Ambient conditions	
• Ambient temperature	-40 to +60 °C (-40 to +140 °F)
• If mounted in metal threads	-20 to +60 °C (-5 to +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 lbs)
Transducer material	PVDF 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, PN10 and JIS 10 K3B
Sanitary mounting	4” sanitary fitting clamp according to 3A guidelines
Power supply	
AC version	100 to 230 V AC, ± 15%, 50/60 Hz, max. 12 VA, 5 W
DC version	18 to 30 V DC, 3 W
Displays and controls	
Display	LCD, three digits, 9 mm (0.35“) high, for display of distance between sensor face and material, multisegment 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), $CSA_{NRTL/C}$, FM • CSA/FM Class I, Div. 1, Groups A, B, C, D; Class II; Groups E, F, G; Class III • ATEX II 2G EEx md II C T5 • 3A Approval

Selection and Ordering data

		Order 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	C)	**7ML1510-** **0**
Power supply		
24 V DC, relay output		**1**
24 V DC, transistor output		**2**
100 to 230 V AC, relay output		**3**
Approvals		
CE, ATEX II 2G EEx md IIC T5, SAA[1] (Note: Due to ATEX regulations, one manual is shipped with approval option C.)		**C**
CE, CSA Class I Div. 1, Class II Div. 1, Class III[2]		**F**
CE, FM Class I Div. 1, Class II Div. 1, Class III[2]		**G**
CE, $CSA_{NRTL/C}$, FM, 3A		**H**
CE, CSA Class I Div. 2, Class II Div. 2[3]		**J**
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, 3A approved[4]		**H**
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**
Instruction manual		
Additional Multi-language Quick Start manual	C)	**7ML1998-1XB81**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), 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**

[1] Available with enclosure/cable inlet option 4 only

[2] Available with enclosure/cable inlet option 4 only and process connection options A and E only

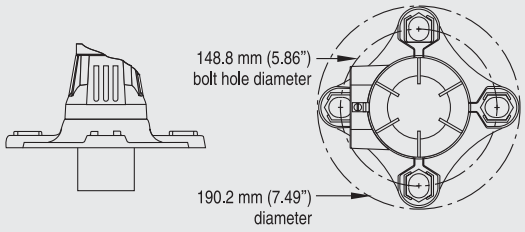
[3] Available with enclosure/cable inlet options 2 and 4 only

[4] Available with approval option H only

C) Subject to export regulations AL: N, ECCN: EAR99

Options

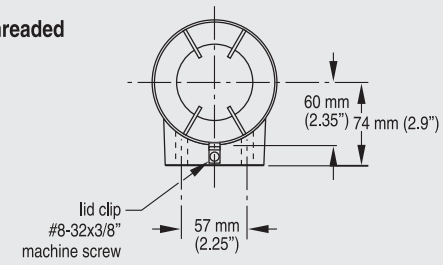
Flange adapter for mating 2" NPT or 2" BSP process connections to 3" ANSI, DIN 65 PN10, and JIS 10K 3B flanges

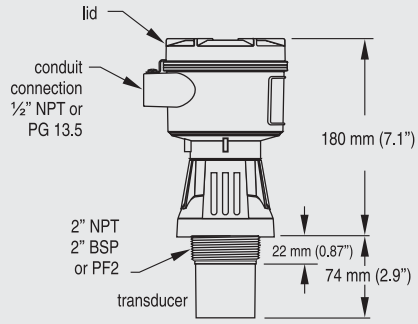


Pointek ULS200 Optional Flange Adapter

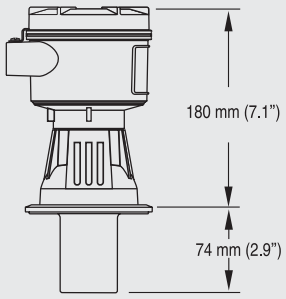
Dimensional drawings

Threaded





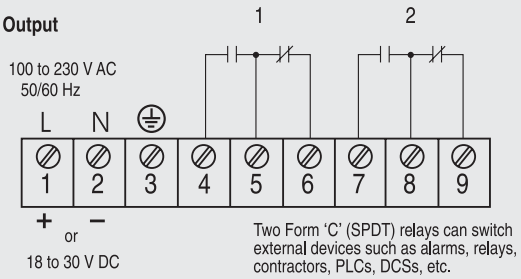
Sanitary



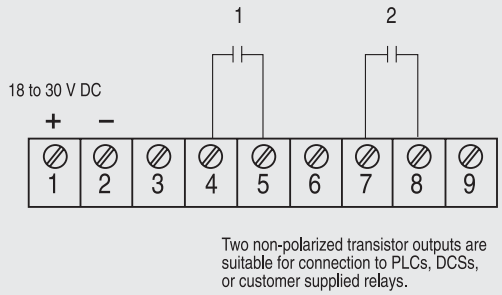
Pointek ULS200 dimensions

Schematics

Relay Output



Transistor Output: DC version only



Pointek ULS200 connections

5

The Probe

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

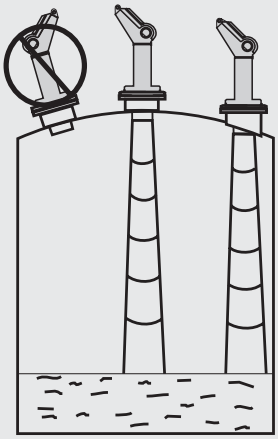
The transducer is available in PVDF copolymer, making the device suitable for use in a wide variety of applications. The Probe is easy to install and maintain, and can be quickly removed for cleaning as required by the food, beverage and pharmaceutical industries.

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.

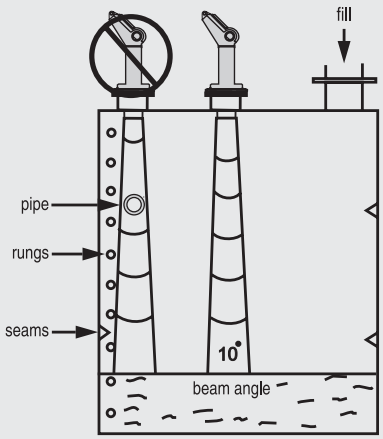
- Key Applications: chemical storage vessels, filter beds, mud pits, liquid storage vessels, food applications

Configuration

Parabolic Mounting



Flat Mounting and Beam Angle



The Probe mounting

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 to 5 m (0.8 to 16.4 ft)	0.25 to 5 m (0.8 to 16.4 ft)
Output		
• mA	4 to 20 mA	4 to 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 to 30 V DC, max. 0.2 A	12 to 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; $CSA_{NRTL/C}$, FM, 3A	CE; $CSA_{NRTL/C}$, FM, 3A

Accuracy	
• Error in measurement	0.25% of measuring range (in air)
• Resolution	3 mm (0.125")
• Temperature compensation	Built in
• Echo processing	Sonic Intelligence
Rated operation conditions	
• Beam angle	12°
• Ambient temperature	
- Standard	-40 to +60 °C (-40 to +140 °F)
- Metallic mounting	-20 to +60 °C (-4 to +140 °F)
• Max. static operating pressure	Normal atmospheric pressure
• Degree of protection	IP65
Design	
• Weight	
- Without flange adapter	1.5 kg (3.3 lbs)
- With flange adapter	1.7 kg (3.7 lbs)
• 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

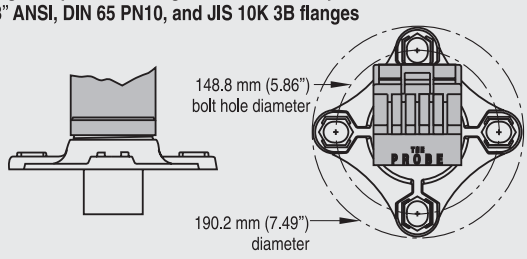
Selection and Ordering data

		Order No.
The Probe	C)	**7ML1201-**
Short-range integrated ultrasonic level transmitter, ideal for liquids and slurries in open or closed vessels		**00**
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, 3A approved		**H**
Model/Approval		
3 Wire, 24 V DC, CSA, CE, FM		**E**
2 Wire, 24 V DC, CE		**F**
Additional instruction manual		
3 Wire, 24 V model, Multi-language manual	C)	**7ML1998-1GD62**
2 Wire model, Multi-language manual	C)	**7ML1998-1GC62**
This device is shipped with the Siemens Milltronics manual CD containing ATEX Quick Starts and instruction manuals.		
Accessories		
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line suitable for enclosures		**7ML1930-1AC**
Universal Box Bracket Mounting kit		**7ML1830-1BK**
Sanitary 4" mounting clamp		**7ML1830-1BR**
Power Supply, 24 V DC, 200 mA for 2 probes (105 to 125 V AC input)	C)	**7ML1930-1AA**
Power Supply, 24 V DC, 100 mA for 1 probe (105 to 125 V AC input)	C)	**7ML1930-1AB**
2" NPT locknut, plastic		**7ML1830-1DT**
2" BSPT locknut, plastic		**7ML1830-1DQ**
Plastic M20 cable gland with metal locknut		**7ML1930-1DB**

C) Subject to export regulations AL: N, ECCN: EAR99

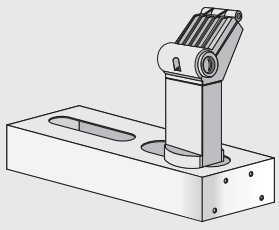
Options

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



The Probe Optional Flange Adapter

The Probe with FMS 200 Mounting Bracket

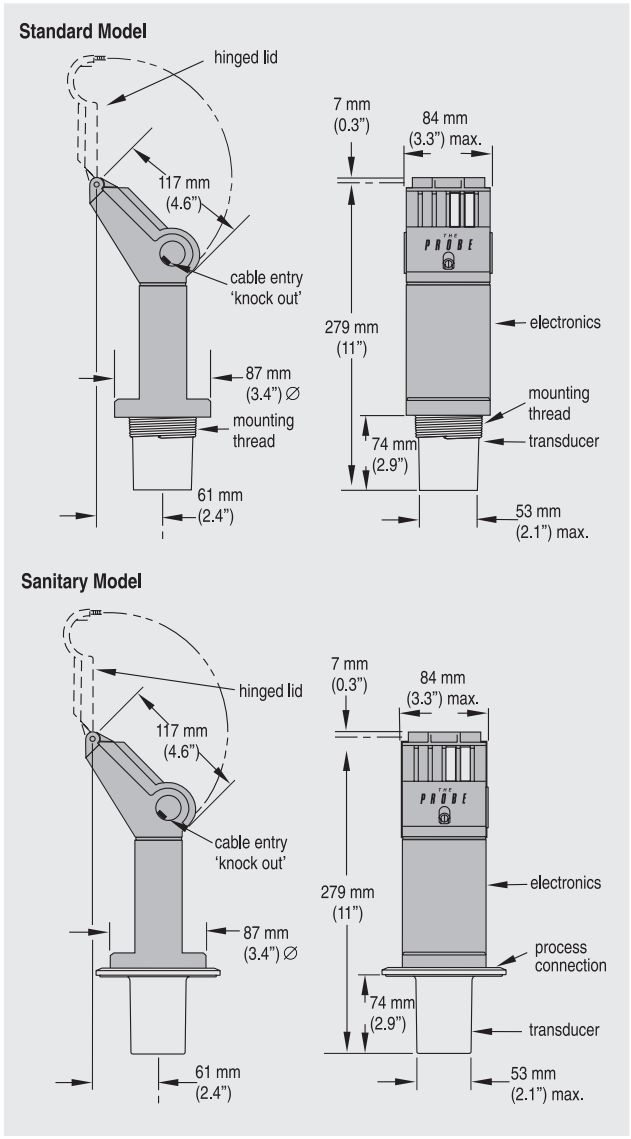


The Probe with Optional Mounting Bracket

5

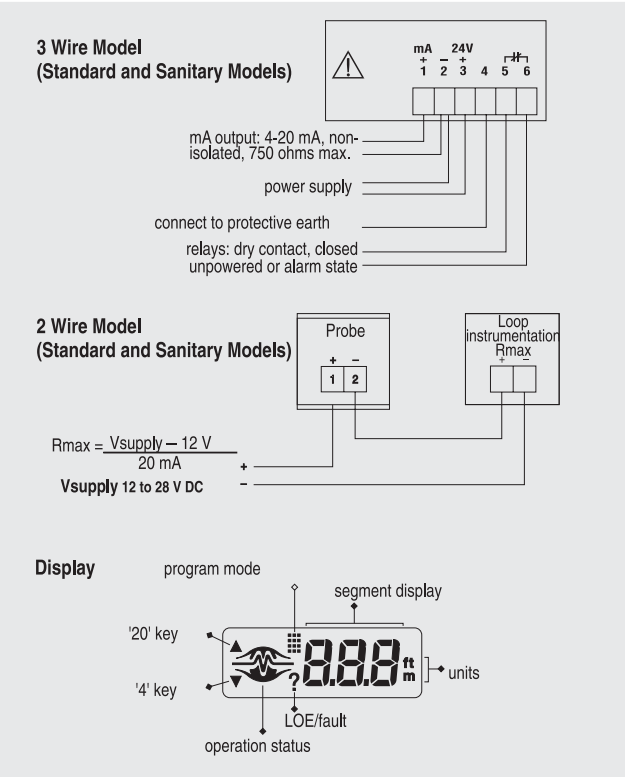
The Probe

Dimensional drawings



The Probe dimensions

Schematics



The Probe connections

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
- Extremely high signal-to-noise ratio
- 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 and chemical storage vessels.

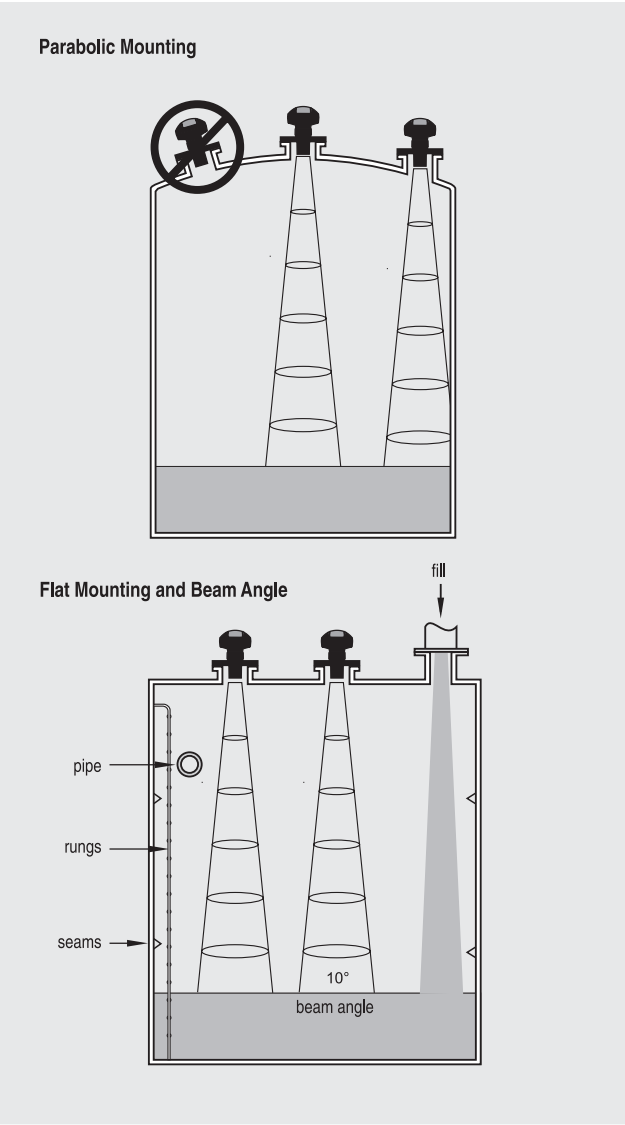
The range of SITRANS Probe LU is 6 or 12 meters (20 or 40 feet). Using Auto False-Echo Suppression for fixed obstruction avoidance, as well as an improved signal-to-noise ratio and improved accuracy of 0.15% of range or 6 mm (0.25”), the Probe LU provides unmatched reliability.

SITRANS Probe LU includes Sonic Intelligence® signal processing from the field-proven Milltronics Probe and incorporates new echo processing features and the latest micro-processor and communications technology. 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



SITRANS Probe LU mounting

5

SITRANS Probe LU

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level measurement
Typical application	Level measurement in storage vessels and simple process vessels
Inputs	
Measuring range	
• 6 m (20 ft) model	0.25 to 6 m (10" to 20 ft)
• 12 m (40 ft) model	0.25 to 12 m (10" to 40 ft)
Frequency	54 kHz
Outputs	
mA/HART®	
• Range	4 to 20 mA
• Accuracy	± 0.02 mA
PROFIBUS PA	Profile 3, Class B
Performance	
Resolution	≤ 3 mm (0.12")
Accuracy	± the greater of 0.15% of range or 6 mm (0.24")
Repeatability	≤ 3 mm (0.12")
Blanking distance	0.25 m (10")
Update time	≤ 5 seconds
• 4 to 20 mA/HART version	≤ 5 seconds at 4 mA
• PROFIBUS version	≤ 4 seconds 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 to +80 °C (-40 to +176 °F)
- Relative humidity/ingress protection	Suitable for outdoor
- Installation category	I
- Pollution degree	4
• Medium conditions	
- Temperature at flange or threads	-40 to +85 °C (-40 to +185 °F)
- Pressure (vessel)	0.5 bar (7.25 psi)
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 lbs)
Cable inlet	2 x M20x1.5 cable gland or 2 x ½" NPT thread
Transducer (2 options)	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" (80 mm) universal flange
• Other connection	FMS 200 mounting bracket (see page 5/142) or customer supplied mount

Display and Controls	
Interface	Local: LCD display with bar graph Remote: Available via HART on PROFIBUS PA
Configuration	Using Siemens SIMATIC PDM (PC) or HART handheld communicator or Siemens Milltronics infrared handheld programmer
Memory	Non-volatile EEPROM
Power supply	
4 to 20 mA/HART	Nominal 24 V DC with 550 Ω maximum; maximum 30 V DC 4 to 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
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 (barrier required) 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 to +80 °C (-40 to 176 °F) IP67, IP68
• Intrinsically Safe (International)	IECEx TSA 04.0020X Ex ia IIC T4
• Non-incendive (USA)	FM (no barrier required) T5: Class I, Div. 2, Groups A,B,C, D
Handheld Programmer	
• Intrinsically Safe Siemens Milltronics 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 to +40 °C (-5 to +104 °F)
• Interface	Proprietary infrared pulse signal
• Power	3 V lithium battery (non-replaceable)

Selection and Ordering data

		Order No.
SITRANS Probe LU	C)	**7ML5221-**
2-wire, loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels and simple process vessels.		
Enclosure/Cable Inlet		
Plastic (PBT), 2 x M20x1.5 (check Approvals for cable gland details)		**1**
Plastic (PBT), 2 x ½" NPT (no cable glands supplied)		**2**
Range/Transducer material		
6 meter (20 ft), ETFE		**A**
6 meter (20 ft), PVDF Copolymer		**B**
12 meter (40 ft), ETFE		**C**
12 meter (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 to 20 mA, HART®		**1**
PROFIBUS PA		**2**
Approvals		
General Purpose, FM, CSA, CE		**1**
Intrinsically Safe, FM Class I, Div. 1, Groups A, B, C, D (barrier required); Class II, Div. 1, Groups E, F, G; Class III; ATEX II 1G EEx ia IIC T4, ANZEx, IECEx (HART model only)		**2**
Intrinsically Safe, CSA Class I, Div. 1, Groups A, B, C, D (barrier required); Class II, Div. 1, Group G; Class III (HART model only)		**3**
FM, Class I, Div. 2 (Enclosure option 2 only)		**4**
Intrinsically Safe, CSA/FM Class I, Div. 1, Groups A, B, C, D (barrier required); Class II, Div. 1, Groups E, F, G; Class III (PROFIBUS PA model only)		**5**
Intrinsically Safe, ATEX II 1G EEx ia IIC T4 (PROFIBUS PA model only)		**6**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**

Selection and Ordering data

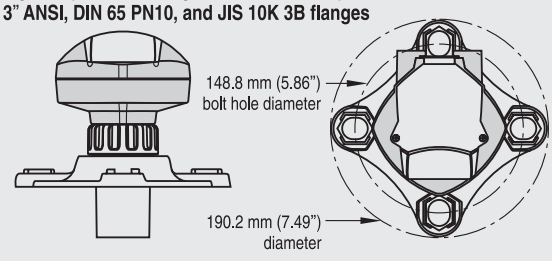
		Order No.
SITRANS Probe LU	C)	**7ML5221-**
2-wire, loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels and simple process vessels.		
Instruction manual for HART/mA device		
English	C)	**7ML1998-5HT02**
French	C)	**7ML1998-5HT11**
German	C)	**7ML1998-5HT32**
Note: The instruction manual should be ordered as a separate item on the order.		
Additional Multi-language Quick Start manual	C)	**7ML1998-5QR81**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Instruction manual for PROFIBUS PA device		
English	C)	**7ML1998-5JB02**
German	C)	**7ML1998-5JB32**
Note: The instruction manual should be ordered as a separate item on the order.		
Additional Multi-language Quick Start manual	C)	**7ML1998-5QV81**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Optional equipment		
Handheld programmer, Intrinsically Safe, EEx ia		**7ML5830-2AH**
Handheld programmer, General Purpose approvals		**7ML1830-2AN**
Handheld programmer, Infrared, Intrinsically Safe, PROFIBUS PA	C)	**7ML5830-2AJ**
HART modem/RS-232 (for use with PC and SIMATIC PDM)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DB**
2" NPT locknut, plastic		**7ML1830-1DT**
2" BSPT locknut, plastic		**7ML1830-1DQ**
3" ASME, DIN 65 PN 10, JIS 10K 3B ETFE Flange adapter for 2" NPT		**7ML1830-1BT**
3" ASME, DIN 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 to +80 °C (-4 to +176 °F)		**7ML1930-1AM**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only)		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**
Spare Parts		
Plastic lid	C)	**7ML1830-1KB**

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

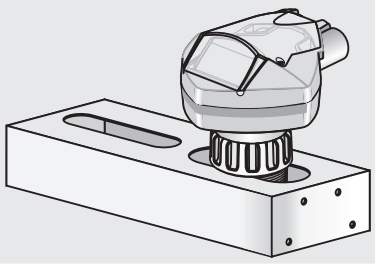
Options

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



SITRANS Probe LU optional flange adapter

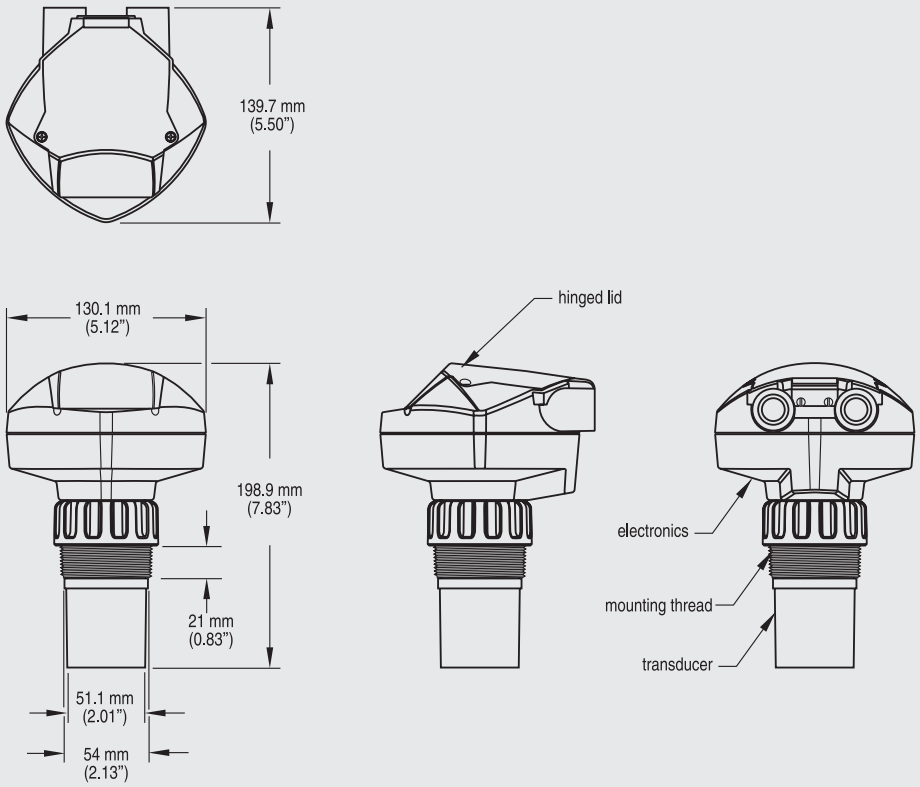
SITRANS Probe LU with FMS 200 Mounting Bracket



SITRANS Probe LU with optional mounting bracket

SITRANS Probe LU

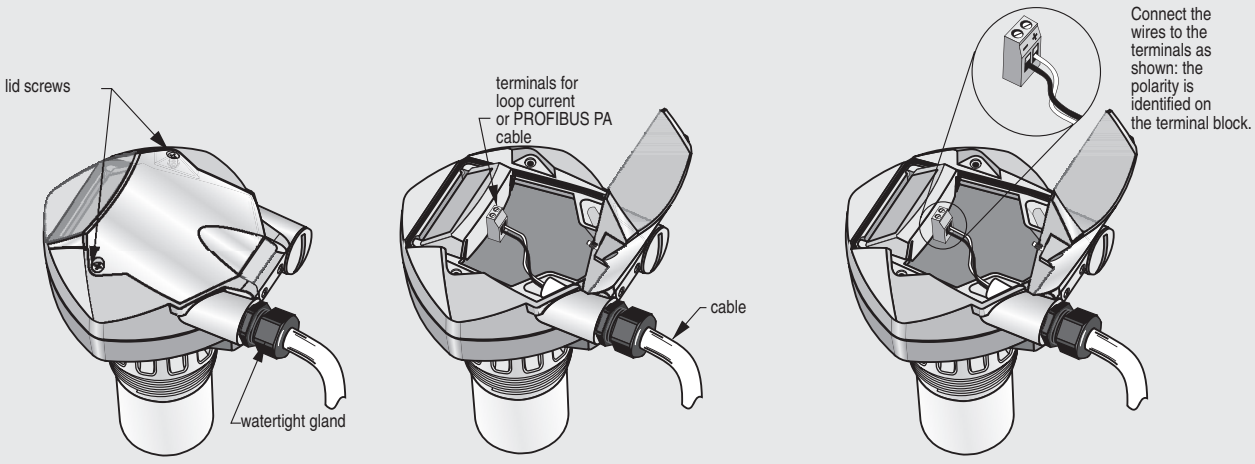
Dimensional drawings



Note: Above model is shown without M20 cable glands or ½" NPT conduit connectors.

SITRANS Probe LU dimensions

Schematics



Notes:
- HART model above is shown with M20 cable glands. ½" 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

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 to 15 m (1 to 50 ft), transducer dependent
Measuring points	1 or 2
Input	
Analog	0 to 20 mA or 4 to 20 mA, from alternate device, scaleable (6 relay model)
Discrete	10 to 50 V DC switching level Logical 0 = < 0.5 V DC Logical 1 = 10 to 50 V DC Max. 3 mA
Output	
Echomax® Transducer	44 kHz
Ultrasonic transducer	Compatible transducers: ST-H and Echomax series XPS-10/10F, XPS 15/15F, XCT-8, XCT-12 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 to 20 mA or 4 to 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"), whichever is greater
Resolution	0.1% of measuring rang[3)] or 2 mm (0.08"), whichever is greater
Temperature compensation	• -50 to +150 °C (-58 to +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 to +50 °C (-4 to +122 °F)
Design	
Weight	
• Wall mount	1.37 kg (3.02 lbs)
• Panel mount	1.50 kg (3.31 lbs)
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® 8760 or equivalent is acceptable
Max. separation between transducer and transceiver	365 m (1200 ft)

HydroRanger 200

Displays and controls	100 x 40 mm (4 x 1.5") multi-block LCD with backlighting
Programming	Programming using handheld programmer or via PC with SIMATIC PDM software
Power supply[4]	
AC version	100 to 230 V AC ± 15%, 50/60 Hz, 36 VA (17 W)
DC version	12 to 30 V DC (20 W)
Certificates and approvals	• CE[5] • Lloyd's Register of Shipping • ABS Type Approval • FM, $CSA_{NRTL/C}$, 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) • MCERTS Class 1 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.

Selection and Ordering data		Order No.
Siemens HydroRanger 200 Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring	C)	**7ML5034-**
Mounting		
Wall mount, standard enclosure		**1**
Wall mount, 4 entries, 4 M20 cable glands included		**2**
Panel mount[1]		**3**
Power supply		
100 to 230 V AC		**A**
12 to 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 relay[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 5/250 for more information.		**3**
Approvals		
General Purpose CE, FM, CSA$_{US/C}$, UL listed		**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**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**
Instruction manual		Order No.
English	C)	**7ML1998-5FC02**
French	C)	**7ML1998-5FC11**
German Note: The instruction manual should be ordered as a separate line on the order.	C)	**7ML1998-5FC31**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Other instruction manuals		
SmartLinx Allen-Bradley Remote I/O, English	C)	**7ML1998-1AP03**
SmartLinx PROFIBUS DP, English	C)	**7ML1998-1AQ03**
SmartLinx PROFIBUS DP, German	C)	**7ML1998-1AQ33**
SmartLinx PROFIBUS DP, French	C)	**7ML1998-1AQ12**
SmartLinx DeviceNet, English Note: The appropriate SmartLinx instruction manual should be ordered as a separate line on the order.	C)	**7ML1998-1BH02**

Selection and Ordering data		Order No.
Siemens HydroRanger 200 Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring	C)	**7ML5034-**
Accessories		
Handheld programmer		**7ML1830-2AK**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosure		**7ML1930-1AC**
TS-3 Temperature Sensor - see TS-3 on page 5/144		
Spare parts		
Power Supply Board (100 to 230 V AC)	C)	**7ML1830-1MD**
Power Supply Board (12 to 30 V DC)	C)	**7ML1830-1ME**
Display Board	C)	**7ML1830-1MF**
See SmartLinx product page 5/250 for more information.		

[1] Available with approval option 1 only.

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

C) Subject to export regulations AL: N, ECCN: EAR99

5

HydroRanger 200

Selection and Ordering data

		Order No.
Milltronics HydroRanger 200 Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring	C)	**7ML1034-**
Mounting		
Wall mount, standard enclosure		**1**
Wall mount, 4 entries, 4 M20 cable glands included		**2**
Panel mount[1]		**3**
Power supply		
100 to 230 V AC		**A**
12 to 30 V DC		**B**
Communication (SmartLinx)		
Without module		**A**
SmartLinx® Allen-Bradley® Remote I/O module		**B**
SmartLinx PROFIBUS DP module		**C**
SmartLinx DeviceNet™ module See SmartLinx product page 5/233 for more information.		**D**
Approvals		
General Purpose CE, FM, CSA$_{US/C}$, UL listed		**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**
Number of measurement points		
Single point model, 6 relays		**1**
Dual point model, 6 relays		**2**
Single point model, level only, 1 relay[2]		**3**
Single point model, level only, 3 relays[2]		**4**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**
Instruction manual		Order No.
English	C)	**7ML1998-1FC05**
French	C)	**7ML1998-1FC14**
German Note: The instruction manual should be ordered as a separate line on the order.	C)	**7ML1998-1FC34**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Other instruction manuals		
SmartLinx Allen-Bradley Remote I/O, English	C)	**7ML1998-1AP03**
SmartLinx PROFIBUS DP, English	C)	**7ML1998-1AQ03**
SmartLinx PROFIBUS DP, German	C)	**7ML1998-1AQ33**
SmartLinx PROFIBUS DP, French	C)	**7ML1998-1AQ12**
SmartLinx DeviceNet, English Note: The appropriate SmartLinx instruction manual should be ordered as a separate line on the order.	C)	**7ML1998-1BH02**

Selection and Ordering data

		Order No.
Milltronics HydroRanger 200 Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring	C)	**7ML1034-**
Accessories		
Handheld programmer		**7ML1830-2AK**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosure		**7ML1930-1AC**
TS-3 Temperature Sensor - see TS-3 on page 5/144		
Spare parts		
Power Supply Board (100 to 230 V AC)	C)	**7ML1830-1MD**
Power Supply Board (12 to 30 V DC)	C)	**7ML1830-1ME**
Display Board	C)	**7ML1830-1MF**
See SmartLinx product page 5/233 for more information.		

[1] Available with approval option 1 only.

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

C) Subject to export regulations AL: N, ECCN: EAR99

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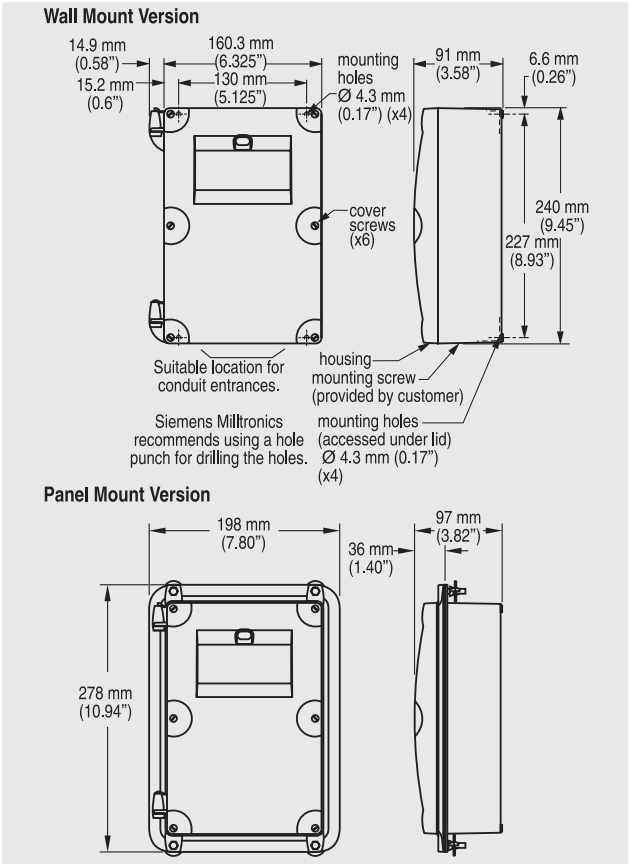
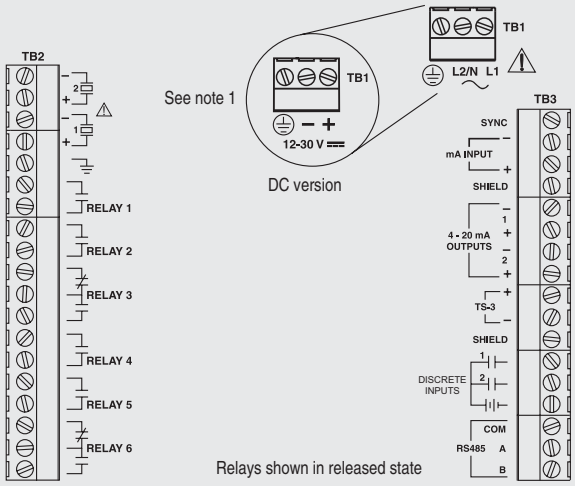
®Allen-Bradley is a registered trademark of Rockwell Automation.
™DeviceNet is a trademark of Open DeviceNet Vendor Association (ODVA)

Dimensional drawings



HydroRanger 200 dimensions

Schematics



Notes

1. Use 2-core copper wire, twisted, with shield, for expansion up to 365 m (1200 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

5

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 overide 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 to 15 m (1 to 50 ft)
Measuring points	1 or 2
Input	
• Analog (only MultiRanger 200)	0 to 20 mA or 4 to 20 mA, from alternate device, scaleable
• Discrete	10 to 50 V DC switching level Logical 0 =< 0.5 V DC Logical 1 = 10 to 50 V DC Max. 3 mA
Output	
• Echomax® transducer	44 kHz
• Ultrasonic transducer	Compatible transducers: ST-H and Echomax series XPS-10/10F, XPS 15/15F, XCT-8, XCT-12 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 to 20 mA or 4 to 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"), whichever is greater
• Resolution	0.1% of measuring range[1)] or 2 mm (0.08"), whichever is greater
• Temperature compensation	• -50 to +150 °C (-58 to +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 to +50 °C (-4 to +122 °F)
Design	
• Weight	
- Wall mount	1.37 kg (3.02 lbs)
- Panel mount	1.50 kg (3.31 lbs)
• 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 to 0.75 mm² (22 to 18 AWG), Belden® 8760 or equivalent is acceptable
• Max. separation between transducer and transceiver	365 m (1200 ft)

Displays and controls	100 x 40 mm (4 x 1.5") 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 to 230 V AC ± 15%, 50/60 Hz, 36 VA (17 W)
• DC version	12 to 30 V DC (20 W)
Certificates and approvals	• CE[2)] • Lloyd's Register of Shipping • ABS Type Approval • FM, $CSA_{NRTL/C}$, 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-Bradley® Remote 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

Order No.

MultiRanger 100/200 C) **7ML5033-**
Versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries

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 to 230 V AC		**A**
12 to 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 5/250 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		**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**
Further designs	Order code	
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	**Y15**	

Selection and Ordering data

Order No.

MultiRanger 100/200 C) **7ML5033-**
Versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries

Instruction manual		
English	C)	**7ML1998-5FB05**
French	C)	**7ML1998-5FB13**
Spanish	C)	**7ML1998-5FB23**
German Note: The instruction manual should be ordered as a separate line on the order.	C)	**7ML1998-5FB34**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Other instruction manuals		
SmartLinx Allen-Bradley Remote I/O, English	C)	**7ML1998-1AP03**
SmartLinx PROFIBUS DP, English	C)	**7ML1998-1AQ03**
SmartLinx PROFIBUS DP, German	C)	**7ML1998-1AQ33**
SmartLinx PROFIBUS DP, French	C)	**7ML1998-1AQ12**
SmartLinx DeviceNet, English Note: The appropriate SmartLinx instruction manual should be ordered as a separate line on the order.	C)	**7ML1998-1BH02**
Accessories		
Handheld programmer		**7ML1830-2AK**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosure		**7ML1930-1AC**
TS-3 Temperature Sensor - see TS-3 on page 5/144		
Spare parts		
Power Supply Board (100 to 230 V AC)	C)	**7ML1830-1MD**
Power Supply Board (12 to 30 V DC)	C)	**7ML1830-1ME**
Display Board	C)	**7ML1830-1MF**
See SmartLinx product page 5/250 for more information.		

[1] For wall mount applications only

[2] For standard enclosure wall mount, option A only

C) Subject to export regulations AL: N, ECCN: EAR99

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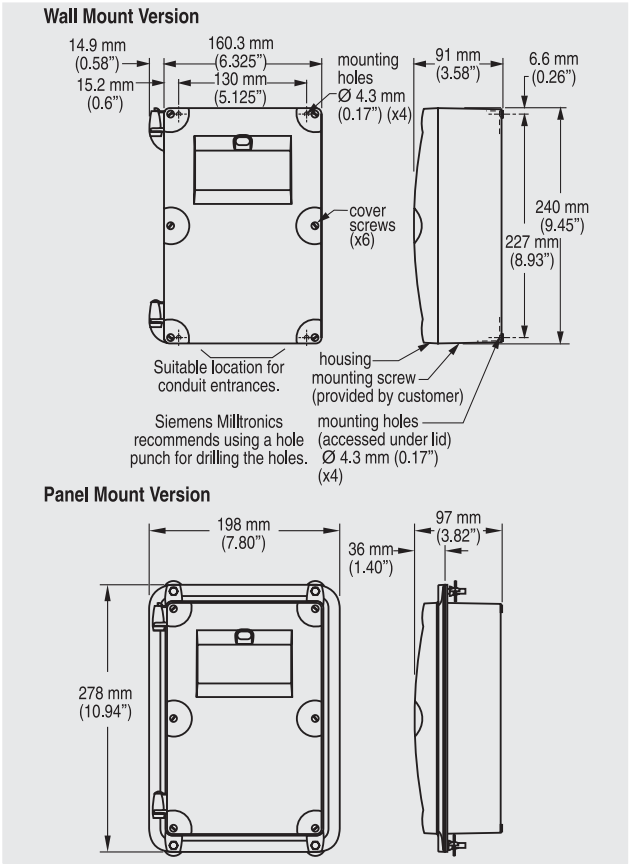
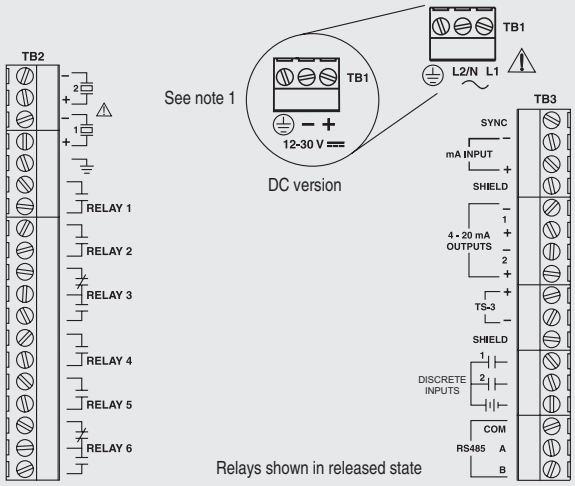
™ DeviceNet is a trademark of Open DeviceNet Vendor Association (ODVA)

Dimensional drawings



MultiRanger dimensions

Schematics



Notes

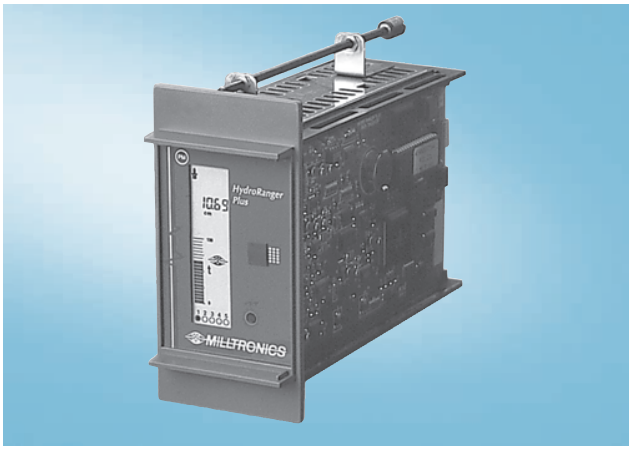
1. Use 2-core copper wire, twisted, with shield, for expansion up to 365 m (1200 ft.). Route cable in grounded metal conduit, separate from other cables.
2. Verify that all system components are installed in accordance with instructions.
3. Connect all cable shields to the MultiRanger Shield Connections. 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

5

HydroRanger Plus

Overview



HydroRanger Plus is an ultrasonic level controller for control of wet wells and reservoir pump operations, differential control and open channel flow monitoring, using energy-saving algorithms.

Benefits

- Outputs for alarms, chart recorders, controllers and integration of existing systems
- Monitors wet wells, weirs and flumes
- Energy-saving function with built-in real-time clock
- Special control mode to reduce grease rings and other deposits
- Integral temperature compensation
- Pump performance monitoring
- System monitoring and network analysis

Application

The system is effective in wet wells, weirs and flumes where foam and turbulence are typical operating conditions. It can be customized to meet your specific application needs – from measuring flow rate in a narrow flume to volume in a ferric chloride storage bank.

The system consists of the electronics housed in a wall-mounted enclosure and a hermetically sealed, corrosion-resistant Echomax® transducer. These components can be separated by up to 365 m (1200 ft).

Optional submergence shields ensure consistent operation in wet wells where the transducer may be submerged during flooding from rainfall or a power outage. Siemens Milltronics patented detection software can differentiate between a submerged condition and a high level.

- Key Applications: wet wells, weirs, flumes

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 to 15 m (1 to 50 ft)
Measuring points	1 or 2
Output	
• Ultrasonic transducer	44 kHz
• Relays	5 alarm/control relays, 1 SPDT Form C per relay, rated 5 A at 250 V AC, resistive load
• mA output	0/4 to 20 mA, optically isolated
- Max. load	1 kΩ
- Resolution	0.1% of 20 mA
Accuracy	
• Error in measurement	0.25% of range or 6 mm (0.24"), whichever is greater
• Resolution	0.1% of measuring range[1] or 2 mm (0.08"), whichever is greater
• Temperature compensation	-50 to +150 °C (-58 to +302 °F) • Integral temperature sensor • External TS-3 temperature sensor (optional) • Programmable fixed temperature
Rated operating conditions	
Ambient conditions	
• Ambient temperature for enclosure	-20 to +50 °C (-4 to +122 °F)
Design	
• Rack mount	DIN 3 HU/14 pitch, 4 rail plug-in unit suitable for standard 84 pitch (19") rack
• Panel mount	Suitable for standard panel cutout DIN 43700, 72 x 144 mm, 100 mm center height
• Degree of protection (wall mount)	IP65/NEMA 4X/Type 4X
• Weight (rack and panel mount)	0.87 kg (1.9 lbs)
• Weight (wall mount)	1.5 kg (3.3 lbs)
• Material (enclosure)	Polyester/polycarbonate alloy
Electrical connection	Commercially available copper conductor according to local requirements, rated 250 V/5 A
• Ultrasonic transducer cable extension	RG 62-A/U coaxial cable with low capacitance
• mA output signal	2-core copper conductor, twisted, shielded, 0.5 to 0.75 mm² (22 to 18 AWG), Belden® 8760 or equivalent is acceptable
Power supply	100/115/200/230 V AC, ± 15%, 50/60 Hz, 15 VA and/or 9 to 30 V DC, 8 W
• Ultrasonic transducer	Compatible transducers: ST-H and Echomax series XPS-10/10F, XPS 15/15F, XCT-8, XCT-12 and XRS-5
Displays and controls	
Rack and panel mount	75 x 20 mm (3 x 0.8") LCD (selectable backlighting)
Wall mount	100 x 40 mm (4 x 1.5") multifield LCD, backlit
Programming	Removable programmer or optional Dolphin Plus
Memory	EEPROM (non-volatile), no backup battery required
Certificates and approvals	CE[2], FM, $CSA_{NRTL/C}$

[1] The measuring range corresponds to the distance from the zero point to the sensor face, plus any range extension.

[2] EMC certificate available on request

®Belden is a registered trademark of Belden Wire and Cable Company.

Selection and Ordering data		Order No.
HydroRanger Plus, rack and panel mount	C)	**7ML1025-**
Non-contacting ultrasonic echo ranging technology monitor that comes standard with a backlit display		**01**
Measuring range: 0.3 m to 15 m (1 to 50 ft)		
Mounting/device version		
Version for 19" rack (requires terminal block; see accessories)		**1**
Version for panel		**2**
Approvals		
CE (EN 61326), $CSA_{NRTL/C}$, FM		**C**
Input voltage		
100 V AC, 9 to 30 V DC		**A**
115 V AC, 9 to 30 V DC		**B**
200 V AC, 9 to 30 V DC		**C**
230 V AC, 9 to 30 V DC		**D**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**
Instruction manual		Order No.
English	C)	**7ML1998-1AC02**
French	C)	**7ML1998-1AC12**
German	C)	**7ML1998-1AC32**
Note: The instruction manual should be ordered as a separate line item on the order.		
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
Handheld programmer		**7ML1830-2AC**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line suitable for enclosures		**7ML1930-1AC**
Terminal block for rack mount		**7ML1830-1JL**
TS-3 Temperature Sensor - see TS-3 on page 5/144		
Spare parts		
Card, Analog HydroRanger Plus Rack/Panel	C)	**7ML1830-1LR**
Card, daughter	C)	**7ML1830-1LS**
Card, display, backlit	C)	**7ML1830-1LX**

C) Subject to export regulations AL: N, ECCN: EAR99

Selection and Ordering data		Order No.
HydroRanger Plus, wall mount	C)	**7ML1028-**
Non-contacting ultrasonic echo ranging technology monitor that comes standard with a backlit display		**A0**
Measuring range: 0.3 m to 15 m (1 to 50 ft)		
Input voltage		
100 V AC, 9 to 30 V DC		**1**
115 V AC, 9 to 30 V DC		**2**
200 V AC, 9 to 30 V DC		**3**
230 V AC, 9 to 30 V DC		**4**
Approvals		
CE; FM General Purpose; CSA Class I, Div. 2		**C**
Mounting/enclosure version		
Standard enclosure (NEMA 4X)		**1**
Standard enclosure prepared for five M20 cable glands		**3**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**
Instruction manual		Order No.
English	C)	**7ML1998-1AC02**
French	C)	**7ML1998-1AC12**
German	C)	**7ML1998-1AC32**
Note: The instruction manual should be ordered as a separate line item on the order.		
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
Handheld programmer		**7ML1830-2AC**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line suitable for enclosures		**7ML1930-1AC**
M20 cable gland kit (6 M20 cable glands, 6 M20 nuts, 3 stop plugs)		**7ML1830-1GM**
TS-3 Temperature Sensor - see TS-3 on page 5/144		
Spare parts		
Card, mother main	C)	**7ML1830-1LV**
Card, daughter	C)	**7ML1830-1LW**
Card, display	C)	**7ML1830-1LU**

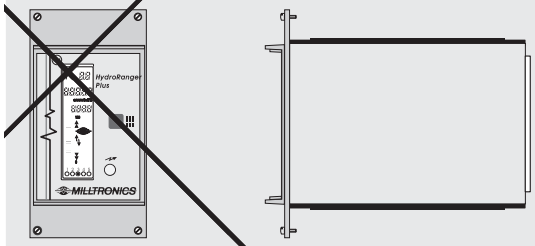
C) Subject to export regulations AL: N, ECCN: EAR99

HydroRanger Plus

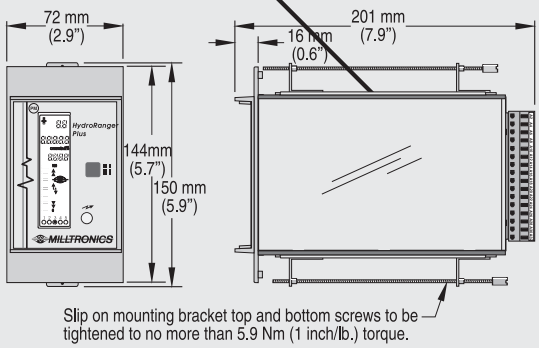
Dimensional drawings

Rack Mount

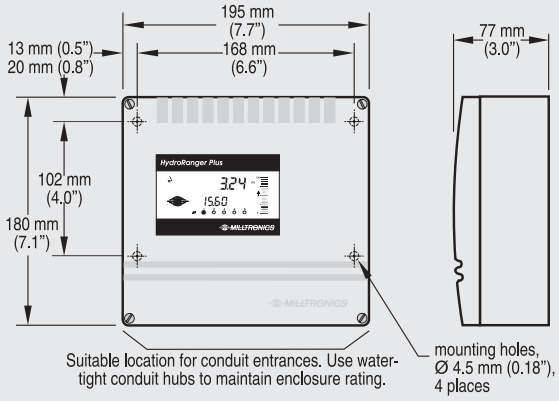
DIN 3U/14HP, 4 rail plug-in unit suitable for standard 84 HP (19") subrack.
(Terminal is customer supplied or available as optional accessory.)



Panel Mount

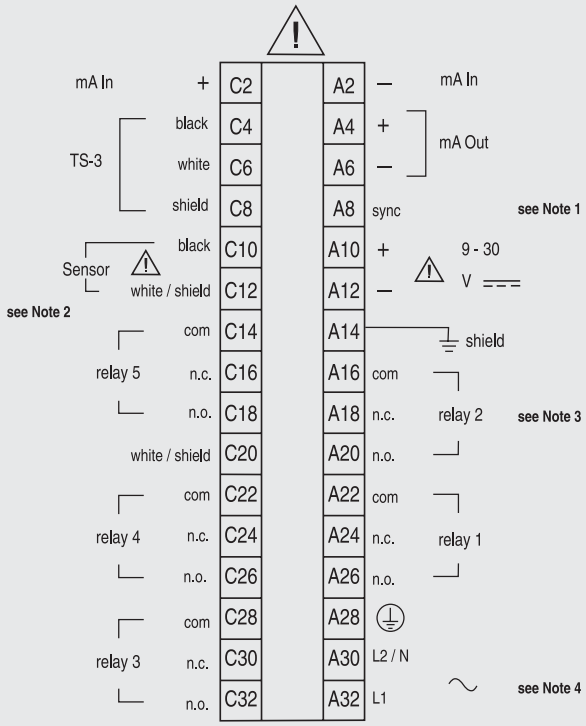


Wall Mount



HydroRanger Plus dimensions

Schematics



Notes

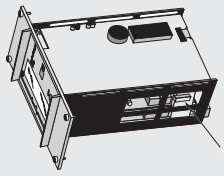
1. Required only if mounted adjacent to other Siemens Milltronics equipment. Interconnect all 'SYNC' terminals with a single 18 AWG (0.5 mm^2) wire.

2. Use RG-62 A/U coaxial (or equivalent) for extensions up to 365 m (1200 ft). Run in grounded metal conduit, separate from other wiring.

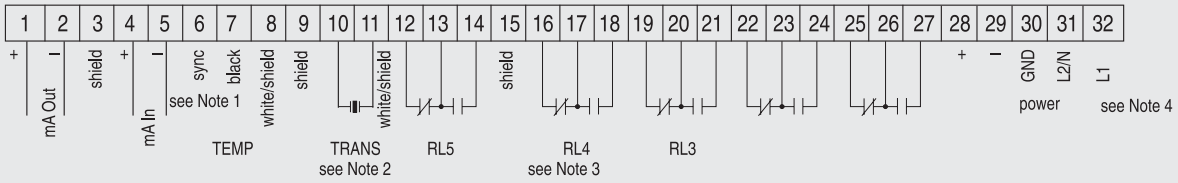
3. Each relay has 1 set of Form 'C' (SPDT) contacts relay rated at 5 A 250 V AC, non-inductive, when equal or lower rated limiting fuses are installed. Relay de-energized when in alarm conditions and energized for pump control.

4. Before applying AC power (mains), ensure the correct voltage is selected. Never operate the HydroRanger Plus withteh ground (earth) wire disconnected.

Voltage Selection



HydroRanger Plus connections, rack and panel mount



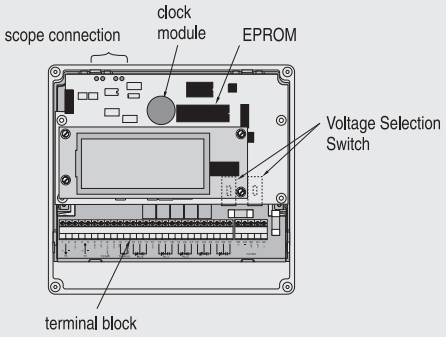
Notes

1. Required only if mounted adjacent to other Siemens Milltronics equipment. Interconnect all 'SYNC' terminals with a single 18 AWG (0.5 mm^2) wire.

2. Use RG-62 A/U coaxial (or equivalent) for extensions up to 365 m (1200 ft). Run in grounded metal conduit, separate from other wiring.

3. Each realy has 1 set of Form 'C' (SPDT) contacts, relay rated at 5A 250 V AC, non-inductive, when equal or lower rating limiting fuses are installed. Relay de-energized when in alarm conditions and energized for pump control.

4. Before applying AC power (mains), ensure the correct volage is selected. Never operate the HydroRanger Plus with the enclosure lid open, or with the ground (earth) wire disconnected.



HydroRanger Plus connections, wall mount

5

SITRANS LUC500

Overview

The SITRANS LUC500 is a complete ultrasonic level controller for monitoring and control of water distribution and wastewater collection systems, with energy-saving algorithms.

Benefits

- Monitoring and control in one device
- Integral telemetry interface (Modbus RTU/ASCII)
- Patented algorithm for calculation of pumped volume within 5% accuracy
- Logging of pump runtime and number of pump starts
- Expandable with I/Os, RAM for data logging, dual point, SmartLinx communications and RS-485 interface
- Simple system configuration and diagnostics with Siemens Milltronics Dolphin Plus Windows®-based software
- AC or DC power supply
- SITRANS LUC500 is available for rack mount, panel mount or wall mount

Application

It combines non-contacting ultrasonic technology, patented echo-processing techniques and proven application software to provide accurate level monitoring in liquids up to 15 m (50 ft). It also effectively monitors flow in flumes, weirs and open channels. Five relays control any combination of pumps, gate valves and alarms. Further advantages include fault signalling and data logging for trend analysis. It can log the time, date and volume of up to 20 occurrences of combined sewer overflows (CSO).

The basic device has 8 digital inputs, 5 digital outputs, 1 analog input, 1 ultrasonic level point, differential/average capability and one RS-232 interface with Modbus® RTU/ASCII protocol. The device can be expanded by additional I/Os, more RAM, two channels, RS-485 or SmartLinx communications models as your needs grow.

It integrates seamlessly with SCADA or DCS systems or a PLC system to provide remote access to all system parameters (pumped volume, pump runtime, pump status). The integral telemetry interface (Modbus RTU/ASCII) allows remote control in real time.

- Key Applications: wet well/lift station control, weirs/flumes, open channels

Application of accessories

The SITRANS LUC500 can be expanded to meet the requirements of a variety of applications.

Auxiliary I/O cards, RAM and data logging, dual-channel function and SmartLinx communications.

- Input/output cards
  A single auxiliary I/O card can be installed in the SITRANS LUC500. The following I/O cards are available:
  - 2 analog inputs/2 analog outputs
  - 4 analog inputs
  - 4 analog outputs
  - 8 digital inputs
  - 8 digital inputs/2 analog inputs/2 analog outputs (wall mount only)
- Expanded memory card
  The available RAM can be increased using this card. The data logging function is then available.
- Two-channel function
  A second measuring point is provided on the SITRANS LUC500 to permit dual-channel measurements. This function is made available by ordering a software access code. Please contact your Siemens Milltronics representative for details.
- Communications
  The SITRANS LUC500 is offered with MODBUS RTU/ASCII as a standard feature. Further industrial communications protocols are available with the addition of an optional SmartLinx card. The following protocols are currently available:
  - PROFIBUS DP
  - Allen Bradley® Remote I/O
  - DeviceNet™

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 to 15 m (1 to 50 ft)
Measuring points	1 or 2
Output	
Ultrasonic transducer	44 kHz
Relays	5 relays, rated 5 A at 250 V AC, non-inductive • Wall Mount version: 4 SPST Form A relays, 1 SPDT Form C relay • Rack and Panel Mount version: 4 SPST Form A relays, 1 SPST Form B relay
Accuracy	
Error in measurement	0.25% of range or 6 mm (0.24"), whichever is greater
Resolution	0.1% of measuring range[1] or 2 mm (0.08"), whichever is greater
Temperature compensation	-50 to +150 °C (-58 to +302 °F) • Integral temperature sensor • External TS-3 temperature sensor (optional) • Programmable fixed temperature
Rated operating conditions	
Ambient conditions	
Ambient temperature for enclosure	-20 to +50°C (-4 to +122 °F)
Design	
• Rack mount	DIN 3 HU/21 pitch, 4-rail plug-in unit suitable for standard 3 HU/ 84 pitch (19") rack
• Panel mount	Suitable for standard panel cutout DIN 43700 72 x 144 mm, 110 mm (4.33") center height
Weight (rack and panel mount)	1.5 kg (3.3 lbs)
Weight (wall mount)	2.5 kg (5.5 lbs)
Communications	
• RS-232	Siemens Milltronics Dolphin protocol, MODBUS RTU and ASCII
• Option	SmartLinx compatible, RS-485
Power supply	100 to 230 V AC ± 15%, 50/60 Hz, 36 VA (17 W) or 12 to 30 V DC, 20 W
Ultrasonic transducer	Compatible transducers: ST-H and Echomax® series XPS-10/10F, XPS 15/15F, XCT-8, XCT-12 and XRS-5
mA output signal	2-core copper conductor, twisted, shielded, 0.5 to 0.75 mm² (22 to 18 AWG), Belden® 8760 or equivalent is acceptable
Displays and controls	
• Rack and panel mount	75 x 20 mm (3 x 0.8") LCD (selectable backlighting)
• Wall mount	100 x 40 mm (4 x 1.5") multfield LCD, backlit
Programming	Using removable handheld programmer (ordered separately) or Dolphin Plus software (option)
Memory	1 Mbyte RAM (static) with battery, 1 Mbyte flash EPROM
Certificates and approvals	CE, FM, CSA

[1] The measuring range corresponds to the distance from the zero point to the sensor face, plus any range extension (P801).

Selection and Ordering data

		Order No.
SITRANS LUC500 The SITRANS LUC500 is a complete ultrasonic level controller for monitoring and control of water distribution and wastewater collection systems, with energy-saving algorithms.	C)	**7ML5001 - ■■■■■ - ■■ A ■**
Mounting		
Panel mount version		1
Rack mount version for 19" rack		2
Wall mount, standard enclosure		3
Wall, 4 entry, M20 (valid with approval option 3 only)		5
Input voltage		
100 to 230 V AC		A
12 to 30 V DC		B
Number of measurement points		
Single point version		A
Dual point version		B
Data communications		
SmartLinx ready, no module		0
SmartLinx PROFIBUS DP module		1
SmartLinx Allen-Bradley Remote I/0 module		2
SmartLinx DeviceNet module		3
Protocol		
Modbus RTU/ASCII		1
Auxilliary memory		
None		0
1 Mbyte static RAM, including data logging module		1
Auxilliary I/O		
None		A
2 analog inputs and 2 analog outputs		B
4 analog inputs		C
4 analog outputs		D
8 digital inputs		E
8 digital inputs, 2 analog inputs and 2 analog outputs (only for wall mount)		F
Approvals		
CSA, CE, UL (not available with mounting option 5)		2
CE		3
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**
Instruction manual		Order No.
English	C)	**7ML1998-5GL01**
French	C)	**7ML1998-5GL11**
German	C)	**7ML1998-5GL31**
Note: The instruction manual should be ordered as a separate line on the order		
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Other Instruction manual		
Smartlinx Allen-Bradley Remote I/O, English	C)	**7ML1998-1AP03**
Smartlinx PROFIBUS DP, English	C)	**7ML1998-1AQ03**
Smartlinx PROFIBUS DP, German	C)	**7ML1998-1AQ33**
Smartlinx PROFIBUS DP, French	C)	**7ML1998-1AQ12**
Smartlinx Devicenet, English	C)	**7ML1998-1BH02**
Note: The appropriate Smartlinx instruction manual should be ordered as a separate line on the order		

C) Subject to export regulations AL: N, ECCN: EAR99.

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SITRANS LUC500

Selection and Ordering data

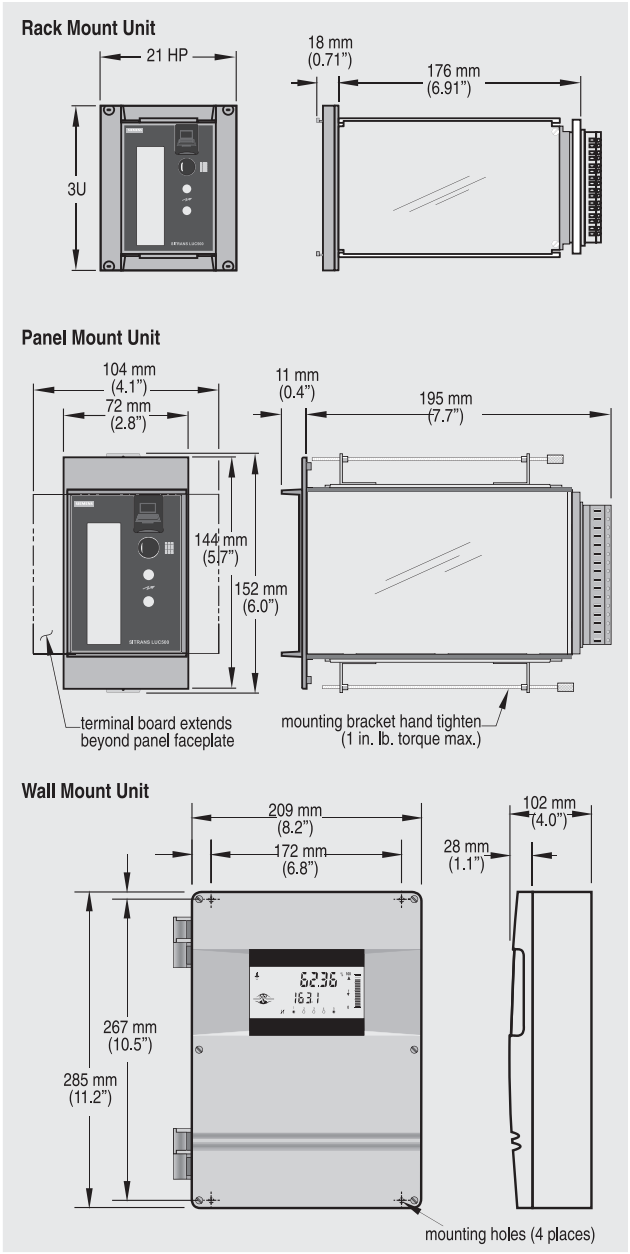
		Order No.
SITRANS LUC500 The SITRANS LUC500 is a complete ultrasonic level controller for monitoring and control of water distribution and wastewater collection systems, with energy-saving algorithms.	C)	**7ML5001 - ■■■■ - ■■A**
Optional Equipment		
Handheld programmer		**7ML1830-2AG**
ERS 500 Configuration Tool software, CD, cable kit, and License	B)	**7ML1930-1AE**
ERS 500 Configuration Tool software, License only	B)	**7ML1930-1AF**
ERS500 Configuration Tool software, demo CD only	B)	**7ML1930-1AG**
See SmartLinx product page 5/250 for more information.		
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosures		**7ML1930-1AC**
Auxiliary Cards. Access code required [1]		
1 MB static RAM extended memory	C)	**PBD-51034040**
2 analog input / 2 analog output for rack and panel mount version	C)	**PBD-51034039**
2 analog input / 2 analog output for wall mount version	C)	**PBD-51034044**
8 digital input for rack and panel mount version	C)	**PBD-51034042**
8 digital input for wall mount version	C)	**PBD-51034043**
4 analog input for rack and panel mount version	C)	**PBD-51034045**
4 analog input for wall mount version	C)	**PBD-51034046**
4 analog output for rack and panel mount version	C)	**PBD-51034047**
4 analog output for wall mount version	C)	**PBD-51034048**
8 digital inputs, 2 analog inputs, 2 analog outputs, wall mount	C)	**PBD-51034272**
Access code, dual point capability	C)	**7ML1830-1KA**
Auxiliary Cards[2]		
1 MB static RAM extended memory	C)	**7ML1830-1KR**
2 analog input / 2 analog output for rack and panel mount version	C)	**7ML1830-1KS**
2 analog input / 2 analog output for wall mount version	C)	**7ML1830-1KT**
8 digital input for rack and panel mount version	C)	**7ML1830-1KU**
8 digital input for wall mount version	C)	**7ML1830-1LA**
4 analog input for rack and panel mount version	C)	**7ML1830-1LB**
4 analog input for wall mount version	C)	**7ML1830-1LC**
4 analog output for rack and panel mount version	C)	**7ML1830-1LD**
4 analog output for wall mount version	C)	**7ML1830-1LE**
8 digital inputs, 2 analog inputs, 2 analog outputs, wall mount	C)	**7ML1830-1LF**

[1] Values of parameters P345 and P346 must be obtained from the customer in order to generate the order for the access code.

[2] For replacement of auxiliary card or spare auxiliary card. Access code not required. Must be used only as replacement cards.

B) Subject to export regulations AL: N, ECCN: EAR99S
C) Subject to export regulations AL: N, ECCN: EAR99

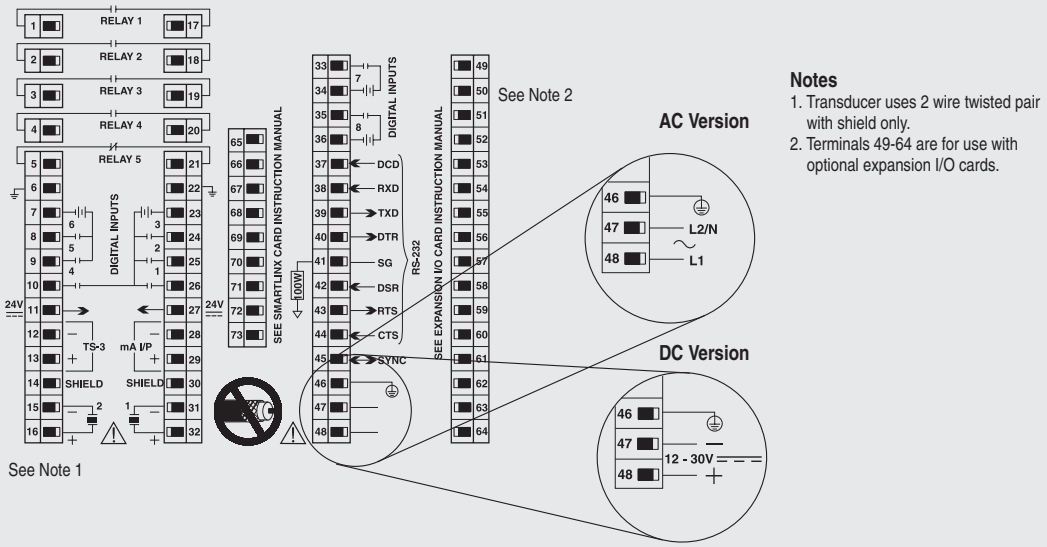
Dimensional drawings



SITRANS LUC500 dimensions

Schematics

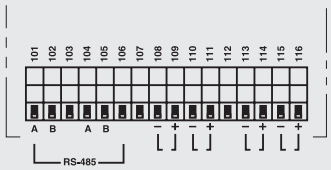
Rack and Panel Mount



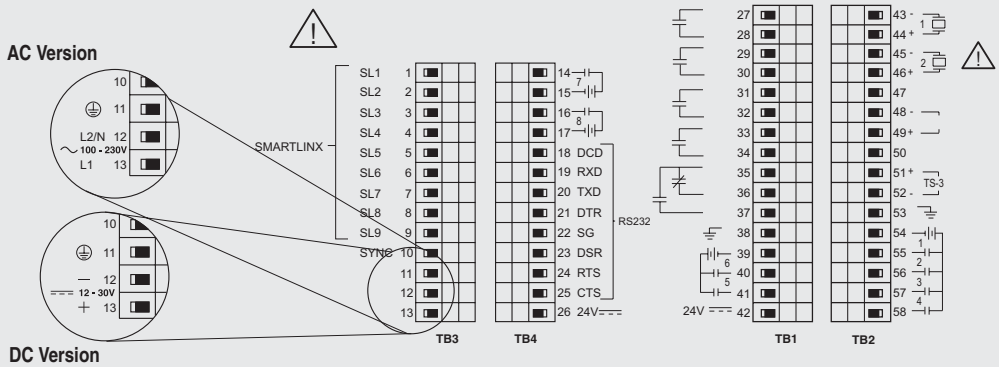
Notes

1. Transducer uses 2 wire twisted pair with shield only.
2. Terminals 49-64 are for use with optional expansion I/O cards.

Wall Mount



Optional mA Input card shown. Other expansion cards I/O available - see SITRANS LUC500 options list.



SITRANS LUC500 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).

Hand Programmer shown is an accessory and must be ordered separately.

Benefits

- Single point, long-range level monitoring
- Easy to install and 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 (1200 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 Milltronics 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).

Hand 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 (1200 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 Milltronics 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 to 60 m (1 to 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 to 20 mA, optically isolated
- Max. load	750 Ω, isolated, 30 V
- Resolution	0.1% of range
- Outputs LU01	Max. one mA output
- Outputs LU02	Max. two mA outputs
Accuracy	
• Error in measurement	0.25% of range or 6 mm (0.24"), whichever is greater
• Resolution	0.1% of measuring range or 2 mm (0.8"), whichever is greater
• Temperature compensation	-50 to +150 °C (-58 to +302 °F) • Integral temperature sensor • External TS-3 temperature sensor (optional) • Programmable fixed temperature
Rated operating conditions	
Ambient conditions	
Ambient temperature for enclosure	-20 to +50 °C (-4 to +122 °F)
Design	
Weight	2.7 kg (6 lbs)
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 to 0.75 mm² (22 to 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 to 30 V DC, 25 W
Displays and controls	51 x 127 mm (2 x 5") 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, $CSA_{NRTL/C}$, FM, ATEX II 3D SITRANS LU02 only: 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 Milltronics Windows®-compatible interface and ComVerter link (infrared)

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SITRANS LU01 and LU02

Selection and Ordering data		Order No.
SITRANS LU01/LU02	C)	**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 to 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 M20x1.5		**3**
Approvals		
CE, CSA$_{NRTL/C}$, FM[1]		**A**
CE[2]		**B**
ATEX II 3D[1]		**C**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**

Selection and Ordering data		Order No.
SITRANS LU01/LU02	C)	**7ML5004-**
Single or dual point ultrasonic long-range level monitoring system for liquids and solids, and ranges up to 60 m (200 ft).		
Instruction manual		
SITRANS LU02, English	C)	**7ML1998-5BD02**
SITRANS LU02, French	C)	**7ML1998-5BD12**
SITRANS LU02, German	C)	**7ML1998-5BD32**
SITRANS LU01, English	C)	**7ML1998-5BE02**
SITRANS LU01, French	C)	**7ML1998-5BE12**
SITRANS LU01, German	C)	**7ML1998-5BE32**
Note: The instruction manual should be ordered as a separate line item.		
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Other Instruction manuals		
SmartLinx Allen-Bradley Remote I/O, English	C)	**7ML1998-1AP03**
SmartLinx PROFIBUS DP, English	C)	**7ML1998-1AQ03**
SmartLinx PROFIBUS DP, German	C)	**7ML1998-1AQ33**
SmartLinx PROFIBUS DP, French	C)	**7ML1998-1AQ12**
SmartLinx Modbus, English	C)	**7ML1998-1BF01**
SmartLinx Modbus, German	C)	**7ML1998-1BF31**
Note: The appropriate SmartLinx instruction manual should be ordered as a seperate line on the order.		
Accessories		
Handheld programmer		**7ML1830-2AN**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosures		**7ML1930-1AC**
M20 cable gland kit (6 M20 cable glands, 6 M20 nuts, 3 stop plugs)		**7ML1830-1GM**
TS-3 Temperature Sensor - see TS-3 on page 5/144		
Spare parts		
Card, LU01 mother main, comm ready	C)	**7ML1830-1KX**
Card, LU02 mother main, comm ready	C)	**7ML1830-1MA**
Card, LU02 daughter, comm ready	C)	**7ML1830-1LP**
Card, LU01 daughter, comm ready	C)	**7ML1830-1LN**
Card, display		**7ML1830-1LQ**
See SmartLinx product page 5/250 for more information.		

[1] Available with enclosure option 1 only

[2] Available with enclosure option 3 only

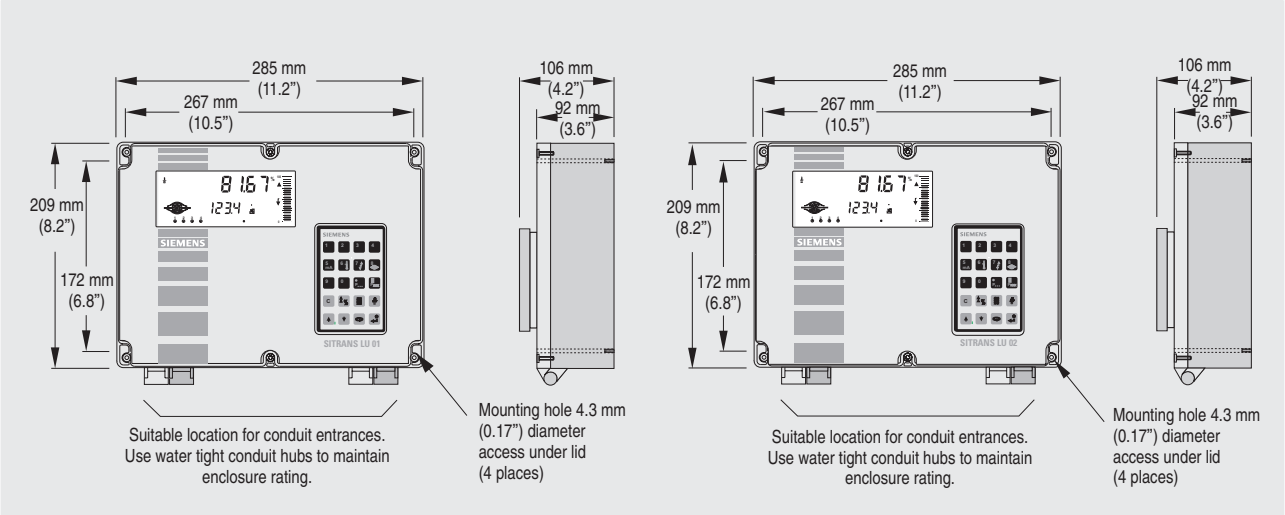
C) Subject to export regulations AL: N, ECCN: EAR99

®Modbus is a registered trademark of Schneider Electric.

®Allen-Bradley is a registered trademark of Rockwell Automation.

TMDeviceNet is a trademark of Open DeviceNet Vendor Association (ODVA).

Dimensional drawings



Dimensional drawings for SITRANS LU01 (left) and SITRANS LU02 (right)

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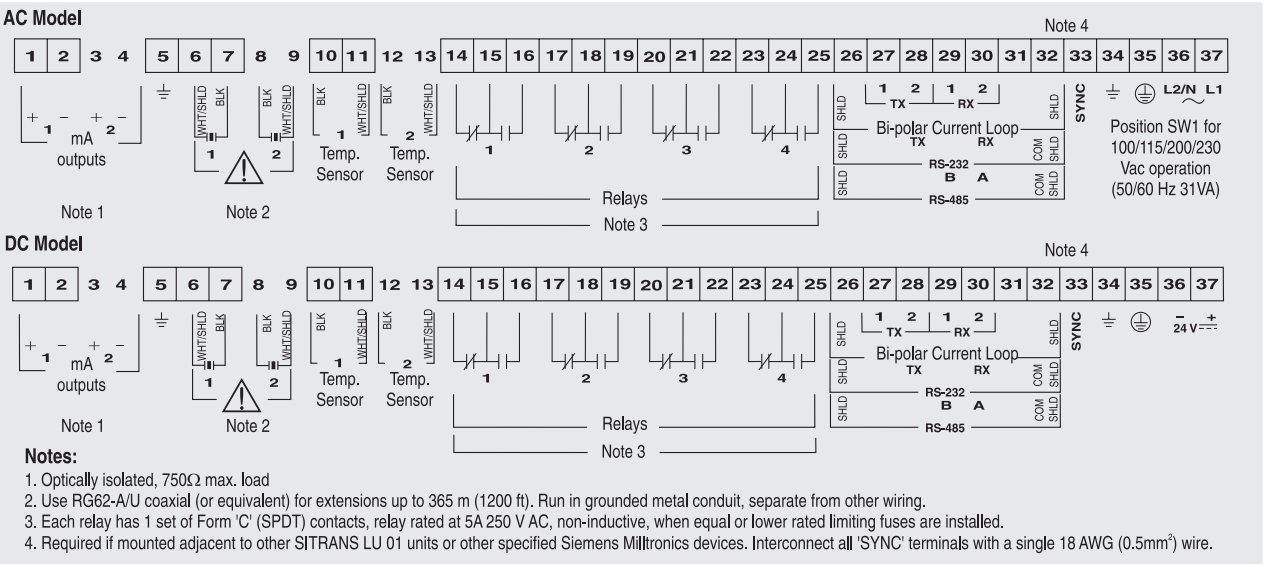
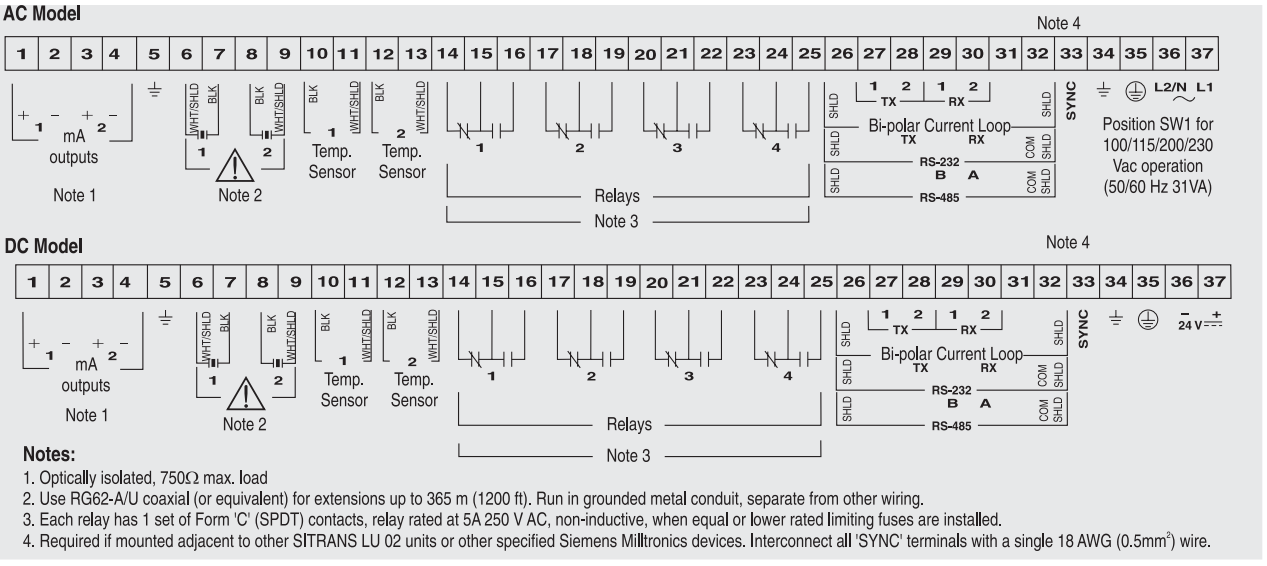
SITRANS LU01 and LU02

Schematics



SITRANS LU01 connections



SITRANS LU02 connections

Overview

SITRANS LU10 is an ultrasonic long-range level monitor for liquids and solids, offering 10-point monitoring in a single unit.

Hand 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).

The SITRANS LU10 uses ultrasonic technology to measure level, space, distance, volume or average/differential. Transducers can be mounted up to 365 m (1200 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 Milltronics 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 to 60 m (1 to 200 ft)
Measuring points	Max. 10
Output signal	
• Ultrasonic transducer	Echomax® series, ST-H transducers
• Relays	• SITRANS LU SAM module (option): 20 alarm/control relays • SPDT Form C relays, rated 5 A at 250 V AC, resistive load
• mA output	SITRANS LU A0 module (option): 0/4 to 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"), whichever is greater
• Resolution	0.1% of measuring range or 2 mm (0.08"), whichever is greater
• Temperature compensation	-50 to +150 °C (-58 to +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 to +50 °C (-4 to +122 °F)
Design	
• Weight	2.7 kg (6 lbs)
• 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 to 0.75 mm² (22 to 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, 15 VA
Displays and controls	51 x 127 mm (2 x 5") 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, FM, $CSA_{NRTL/C}$, ATEX II 3D • Lloyd's Register of Shipping (Categories ENV1, ENV2, ENV3 and ENV5)

5

SITRANS LU10

Options

• Expansion card	TIB-9, increases the number of TS-3 inputs from 1 to 10
• External temperature sensor	TS-3
• Communications	• SmartLinx: protocol-specific modules as interface for popular industrial fieldbus systems • Dolphin Plus: Siemens Milltronics 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 LU SAM, satellite alarm module (max. 2)

®Windows is a registered trademark of Microsoft Corporation.

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Selection and Ordering data		Order No.
SITRANS LU10 Ten point ultrasonic long-range level monitoring system for liquids and solids applications, and ranges up to 60 m (200 ft).	C)	**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) SmartLInx Allen-Bradley® Remote I/O module SmartLinx PROFIBUS DP module SmartLinx Modbus® RTU module		**0** **1** **2** **3**
TIB-9 temperature card None With TIB-9 card		**0** **1**
Enclosure Wall mount Wall mount, drilled (12 x M20x1.5 for cable glands)		**1** **2**
Approvals CE, CSANRTL/C, FM ATEX II 3D		**A** **B**
Further designs Please add "**-Z**" to Order No. and specify Order code(s).		Order code
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**
Instruction manual		Order No.
English	C)	**7ML1998-5AN02**
French	C)	**7ML1998-5AN12**
German	C)	**7ML1998-5AN32**
Note: The instruction manual should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Other Instruction manuals		
SmartLinx Allen-Bradley Remote I/O, English	C)	**7ML1998-1AP03**
SmartLinx PROFIBUS DP, English	C)	**7ML1998-1AQ03**
SmartLinx PROFIBUS DP, German	C)	**7ML1998-1AQ33**
SmartLinx PROFIBUS DP, French	C)	**7ML1998-1AQ12**
SmartLinx Modbus, English	C)	**7ML1998-1BF01**
SmartLinx Modbus, German Note: The appropriate SmartLinx instruction manual should be ordered as a seperate line on the order.	C)	**7ML1998-1BF31**
Accessories		
Handheld programmer		**7ML1830-2AN**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosures		**7ML1930-1AC**
Temperature Card (TIB-9)	C)	**7ML1830-1CN**
M20 cable gland kit (6 M20 cable glands, 6 M20 nuts, 3 stop plugs)		**7ML1830-1GM**
TS-3 Temperature Sensor - see TS-3 on page 5/144		
Spare parts		
Card, mother main, comm ready	C)	**7ML1830-1ML**
Card, daughter, comm ready	C)	**7ML1830-1LY**
Card, display		**7ML1830-1LQ**
See SmartLinx product page 5/250 for more information.		

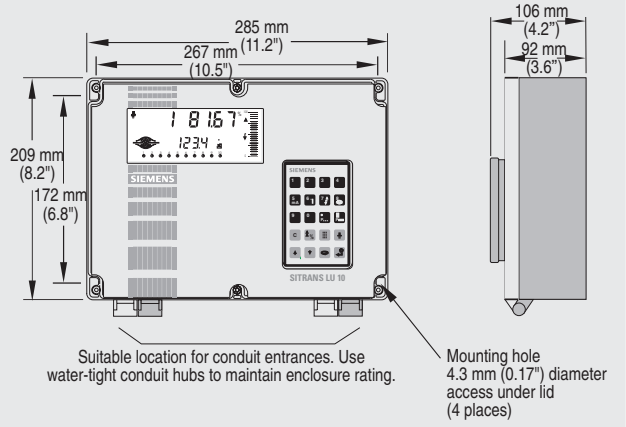
C) Subject to export regulations AL: N, ECCN: EAR99

®Modbus is a registered trademark of Schneider Electric.

®Allen-Bradley is a registered trademark of Rockwell Automation.

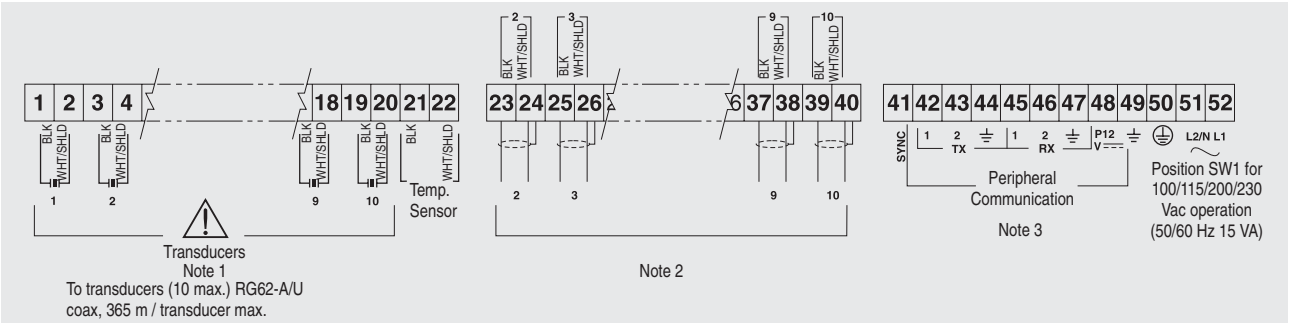
TMDeviceNet is a trademark of Open DeviceNet Vendor Association (ODVA).

Dimensional drawings



SITRANS LU10 dimensions

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 LU 10 is compatible with the following Siemens Milltronics peripherals:
   - SITRANS LU SAM - relay satellite alarm module
   - SITRANS LU AO - analog output module

SITRANS LU10 connections

SITRANS LU SAM

Overview

SITRANS LU SAM Satellite Alarm Module provides up to 20 relay outputs for the measurement points of the SITRANS LU10 level monitor.

Benefits

- The SITRANS LU SAM can be located up to 1500 m (5000 ft) from the SITRANS LU10
- Relay outputs can be assigned to any point on the SITRANS LU10

Application

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

Using a SITRANS LU SAM, you can have two relay outputs for all ten measurement points, all 20 for a single measurement point or any combination between the two.

All relays are Form C to allow NO or NC wiring.

Technical specifications

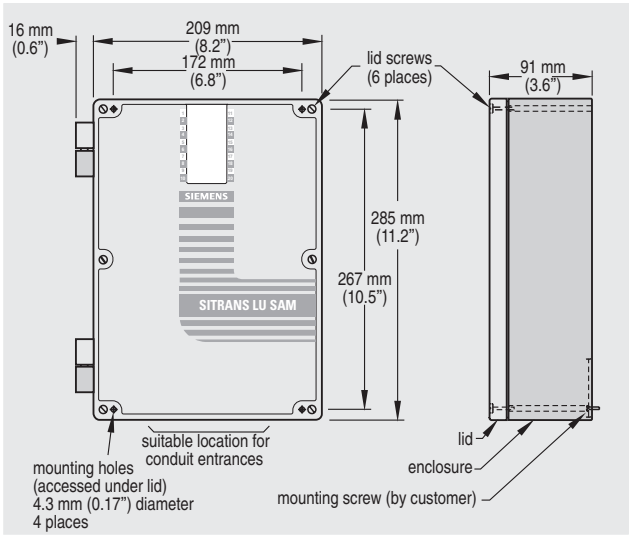
Mode of operation	**Satellite alarm module**
Input	
Communications	Data from SITRANS LU10
• Transmission rate	4800 bits/s
• Voltage	± 20 mA bipolar current loop
Output	
• Relays	20 multi-purpose relays, programmable from SITRANS LU10 SPDT Form C relays, rated 5 A at 250 V AC, resistive load
• ± 20 mA bipolar current loop	Input and transmission
- Max. load	1 receiving unit
Rated operation conditions	
Ambient conditions	
• Ambient temperature	-20 to +50 °C (-5 to +122 °F)
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Design	
• Weight	3 kg (6.6 lbs)
• 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 to 0.75 mm² (22 to 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, 20 VA
Displays and controls	1 LED for display of voltage/communications state, 20 LEDs for display of relay states
Certificates and approvals	CE, FM, $CSA_{NRTL/C}$

Selection and Ordering data

		Order No.
SITRANS LU SAM	C)	**7ML5811-1A**
Satellite alarm module provides up to 20 relay outputs for the measurement points of the SITRANS LU10 level monitor. Approvals: $CSA_{NRTL/C}$, FM, CE		
Instruction manual		
English	C)	**7ML1998-5CF02**
German	C)	**7ML1998-5CF32**
Note: Instruction manuals should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		

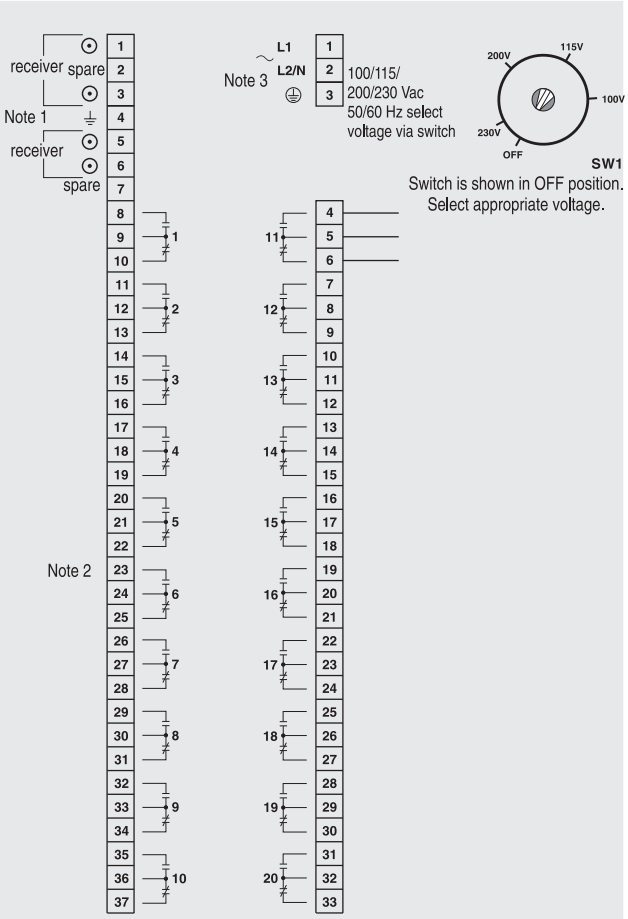
C) Subject to export regulations AL: N, ECCN: EAR99

Dimensional drawings



SITRANS LU SAM dimensions

Schematics



Notes:
1. SITRANS LU SAM receiver is polarized.
2. Refer to associated application device instruction manual for wiring detail. Check that the communication parameter P740 (SITRANS LU 10) is 'ON'.
3. If SITRANS LU SAM is unpowered, transmitter ceases communication to all downstream peripherals.
4. Relay contact Form 'C' SPDT, 5A at 250 V AC non-inductive (typical of up to 20 per SITRANS LU SAM).

SITRANS LU SAM 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 1500 m (5000 ft) from the SITRANS LU10
- 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

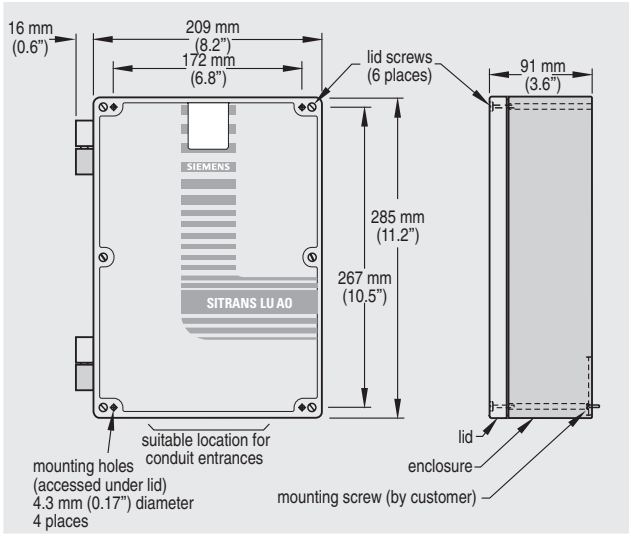
Mode of operation	**Output module**
Input	
Communications	Data from SITRANS LU10
• Transmission rate	4800 bits/s
• Voltage	± 20 mA bipolar current loop
• Polarization	Non-polarized
• Max. load	1 receiving unit
Output	
• Analog outputs	10 analog outputs, programmable from SITRANS LU10 0 or 4 to 20 mA, 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 to +50 °C (-5 to +122 °F)
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Design	
Weight	2 kg (4.4 lbs)
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 to 0.75 mm² (22 to 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, $CSA_{NRTL/C}$

Selection and Ordering data

		Order No.
SITRANS LU AO Provides remote analog output for the measurement points of the SITRANS LU10 level monitor. Approvals: $CSA_{NRTL/C}$, FM, CE	C)	**7ML5810-1A**
Instruction manual		
English	C)	**7ML1998-5CE01**
German	C)	**7ML1998-5CE31**
Note: Instruction manuals should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		

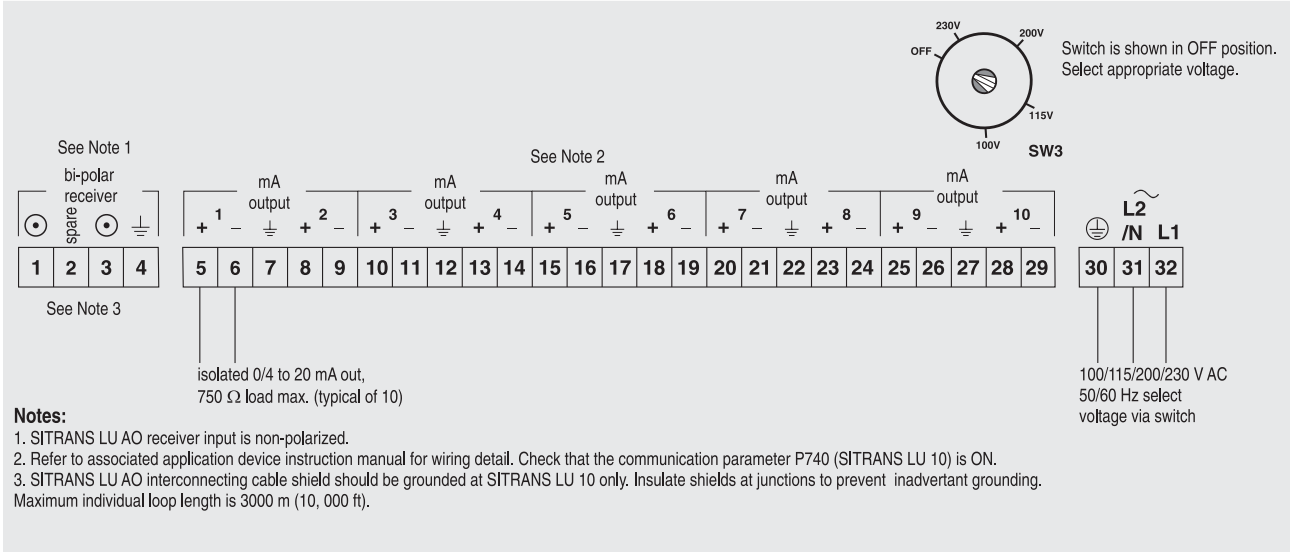
C) Subject to export regulations AL: N, ECCN: EAR99

Dimensional drawings



SITRANS LU AO dimensions

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 LU 10) is ON.
3. SITRANS LU AO interconnecting cable shield should be grounded at SITRANS LU 10 only. Insulate shields at junctions to prevent inadvertant grounding. Maximum individual loop length is 3000 m (10, 000 ft).

SITRANS LU AO connections

Overview 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**						**Solids**	
			Standard				**High Temperature**		**High Temperature**	
	XRS-5	**ST-H**	**XPS-10**	**XPS-15**	**XPS-30**	**XPS-40**	**XCT-8**	**XCT-12**	**XLT-30**	**XLT-60**
Max. range	8 m (26 ft)	10 m (33 ft)	10 m (33 ft)	15 m (50 ft)	30 m (100 ft)	40 m (130 ft)	8 m (26 ft)	12 m (40 ft)	30 m (100 ft)	60 m (200 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)	0.9 m (3 ft)	0.6 m (2 ft)	0.6 m (2 ft)	0.9 m (3 ft)	1.8 m (6 ft)
Max. temperature	+65 °C (+149 °F)	+73 °C (+164 °F)	+95 °C (+203 °F)	+95 °C (+203 °F)	+95 °C (+203 °F)	+95 °C (+203 °F)	+145 °C (+293 °F)	+145 °C (+293 °F)	+150 °C (+300 °F)	+150 °C (+300 °F)
Min. temperature	-20 °C (-4 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)	-40 °C (-40 °F)	-40 °C (-40 °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	Powders, pellets and solids	Hot acids and slurries, food	Hot acids and slurries	Clinker and coal bunkers	Clinker and coal bunkers
Frequency	44 kHz	44 kHz	44 kHz	44 kHz	30 kHz	22 kHz	44 kHz	44 kHz	22 kHz	13 kHz
Beam angle (-3dB)	10°	12°	12°	6°	6°	6°	12°	6°	5°	5°
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	R 1.5" [(BSPT), EN 10226] Universal thread 1.5" NPT	R 1" [(BSPT), EN 10226] 1" NPT	R 1" [(BSPT), EN 10226] 1" NPT	1" NPT	1" NPT
Enclosure	• PVDF Copolymer • CSM • Option: Flange with PTFE facing	• ETFE	• PVDF • Option: Foam facing • Flange with PTFE facing	• PVDF • Option: Foam facing • Flange with PTFE facing	• PVDF • Option: Foam facing • Flange with PTFE facing	• PVDF • Option: Foam facing	• PVDF • Option: Flange with PTFE facing • Sanitary version	• PVDF • Option: Flange with PTFE facing	• Aluminum • 304 Stainless steel • Polyester • Silicone	• Aluminum • 304 Stainless steel • Polyester • Silicone
Compatible with:										
SITRANS LU	•	•	•	•	•	•	•	•	•	•
SITRANS LUC500	•	•	•	•			•	•		
HydroRanger 200	•	•	•	•			•	•		
MultiRanger 100/200	•	•	•	•			•	•		
OCM III	•									

ST-H

Overview

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

Benefits

- Can be mounted on a 2" (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" (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 to 10 m (1 to 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 to +60 °C (-5 to +140 °F) (ATEX approved model) -40 to +73 °C (-40 to +163 °F) (CSA/FM approved model)
Design	
Weight[1]	1.4 kg (3 lbs)
Material (enclosure)	Base and lid made of ETFE (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, 0.5 mm² (20 AWG), PVC sheath
Cable (max. length)	365 m (1200 ft) with RG 62 A/U coaxial cable
Options	
• Flange adapter	3" Universal (fits DN 65, PN 10 and 3" ASME)
• Submergence coupling	For maintaining high level readings while the transducer is submerged
Certificates and approvals	CE[3], CSA, FM Class 1, Div. 1, ATEX II 2G

[1] Approximate shipping weight of transducer with standard cable length
[2] When measuring chemicals, check compatibility of ETFE and epoxy, or mount joint external to process.
[3] EMC certificate available on request

Selection and Ordering data

		Order No.
Echomax® ST-H ultrasonic transducer	C)	**7ML1100-**
Level measurement in chemical storage and liquid tanks		**A**
The narrow design of the ST-H allows the transducer to be mounted on a 2" standpipe.		
measuring range: min. 0.3 m (1 ft), max. 10 m (33 ft)		**0**
Process connection		
2" NPT [(Taper), ANSI/ASME B1.20.1]		**0**
R 2" [(BSPT), EN 10226]		**1**
G 2" [(BSPP), EN ISO 228-1]		**2**
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, Div. 1 [only with 2" NPT (Taper), ANSI/ASME B1.20.1 process connection]		**2**
ATEX II 2G, CSA		**3**
Instruction manual		
Quick Start Manual, multi-language	C)	**7ML1998-5QK81**
Applications Guidelines, multi-language	C)	**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 CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
ST-H universal submergence shield		**7ML1830-1CF**
Universal box bracket, mounting kit		**7ML1830-1BK**
3" ASME, DIN 65 PN 10, JIS 10K 3B ETFE flange adapter for 2" NPT		**7ML1830-1BT**
3" ASME, DIN 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 SS couplings		**7ML1830-1GN**

C) Subject to export regulations AL: N, ECCN: EAR99

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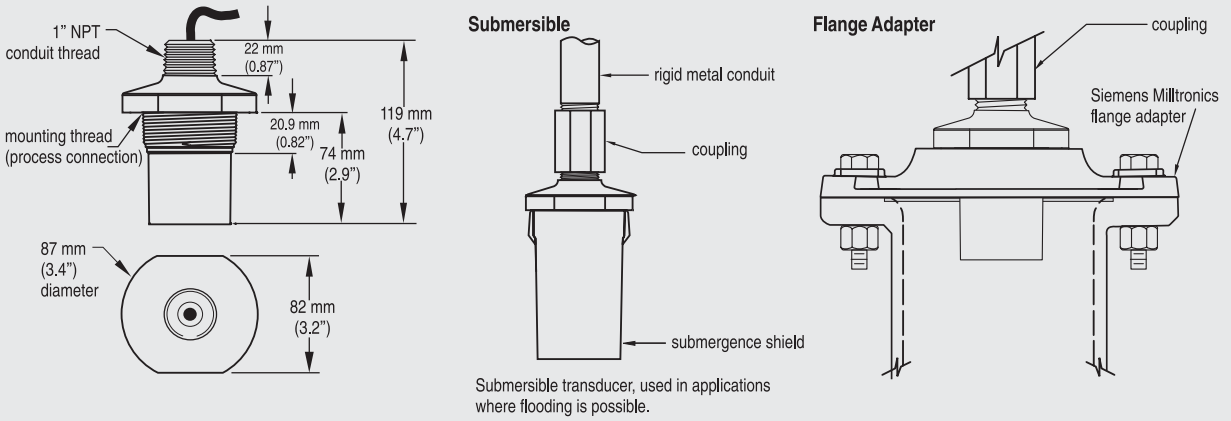
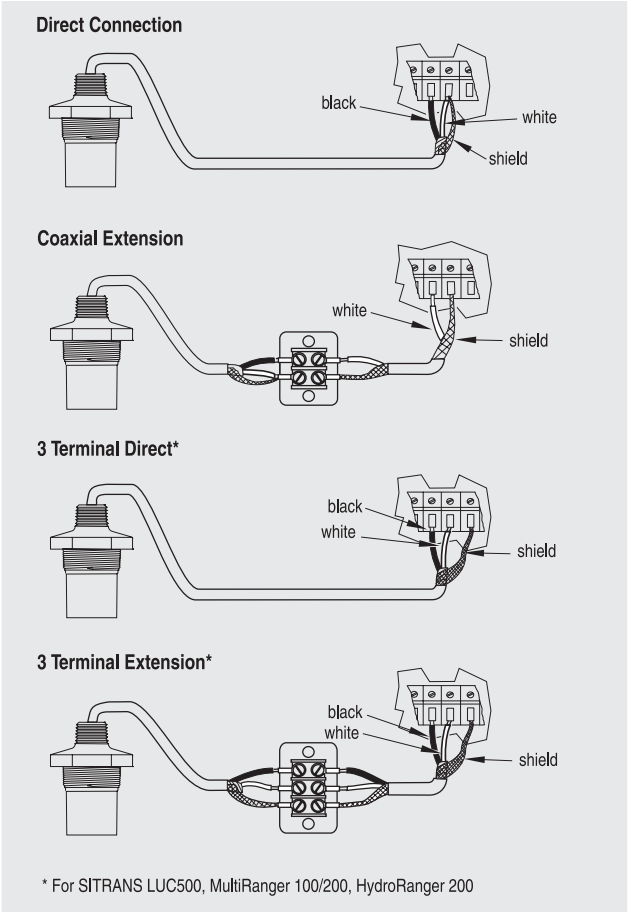
ST-H

Dimensional drawings



ST-H ultrasonic transducer dimensions

Schematics



ST-H ultrasonic transducer connections

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 to 8 m (1 to 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 Milltronics 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 to 8 m (1 to 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 to +65 °C (-4 to +149° F)
Design	
Weight (approximate shipping weight of sensor with standard cable length)	1.2 kg (2.6 lbs)
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	IP68
Cable connection	2-core shielded/twisted, 0.5 mm^2 (20 AWG), PVC sheath
Cable (max. length)	• 365 m (1200 ft) with RG 62 A/U coaxial cable • 365 m (1200 ft) with 2-core twisted pair, foil shield, 0.5 mm^2 (20 AWG), PVC sheath, only for SITRANS LUC500, MultiRanger 100/200
Options	
Flange version	Factory flange with PTFE face for ASME, DIN or JIS configuration
Submergence shield	For applications with flooding possible
Certificates and approvals	CE (EMC certificate available on request), CSA Class I Div. 2, FM Class I, ATEX II 2G, SAA Ex s Class I

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Echomax XRS-5

Selection and Ordering data — Order No.

Echomax® XRS-5 transducer C) **7ML1106 - 0 - 0**

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)

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

FM Class I, ATEX II 2G, CSA Class I Div. 2, SAA Class I	2

Mounting flange (flush mount)

None	A
3" ASME, 150 lbs, flat faced	B
4" ASME, 150 lbs, flat faced	C
6" ASME, 150 lbs, 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 2238 standard.

Instruction manual

Quick Start Manual, multi-language	C)	**7ML1998-5QT81**
Applications Guidelines, multi-language	C)	**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 CD containing the complete ATEX Quick Start and instruction manual library.

Selection and Ordering data — Order No.

Echomax® XRS-5 transducer C) **7ML1106 - 0 - 0**

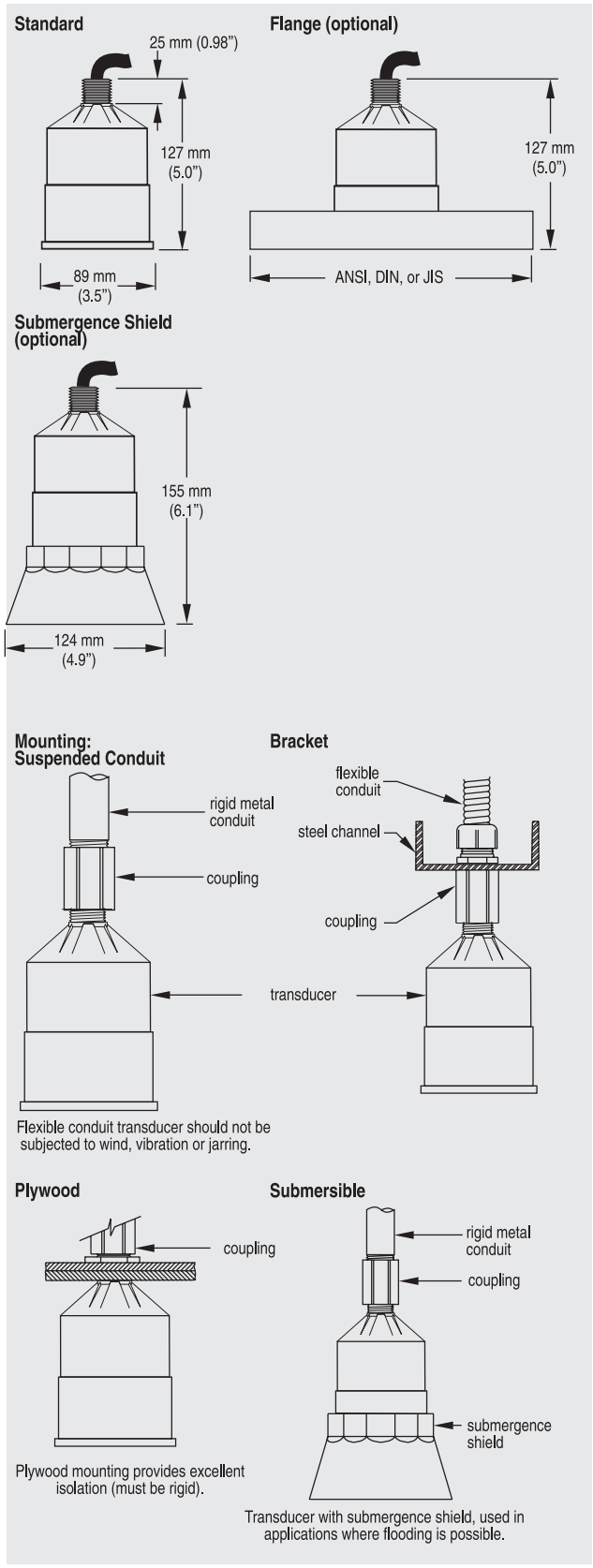
With a beam angle of 10°, the XRS-5 provides reliable, continuous level monitoring of liquids and slurries in narrow lift stations/wet wells, flumes, weirs and filter beds.
Measuring range: min. 0.3 m (1 ft), max. 8 m (26 ft)

Accessories

Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77"), one text line for fastening on sensors	**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 SS 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 5/143 for more information.)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSPT locknut, plastic	**7ML1830-1DR**

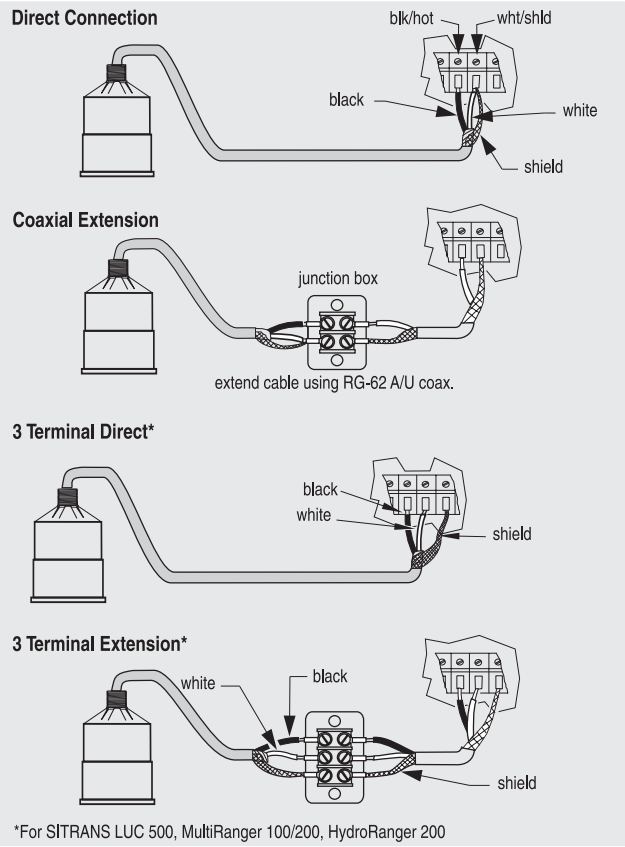
C) Subject to export regulations AL: N, ECCN: EAR99

Dimensional drawings



XRS-5 ultrasonic transducer dimensions

Schematics



XRS-5 ultrasonic transducer connections

5

Echomax XPS and XCT

Overview

Echomax® XPS/XCT 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 40 m (130 ft) and up to a max. temperature of +95 °C (+203 °F).

The XCT series can be used in applications at higher temperatures to measure level up to a distance of 12 m (40 ft) and at a max. temperature of +145 °C (+293 °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.

Technical specifications

Input	XPS-10 (standard and F models)	XPS-15 (standard and F models)	XPS-30	XPS-40	XCT-8 (standard and sanitary models)	XCT-12
Measuring range	0.3 to 10 m (1 to 33 ft)	Standard: 0.3 to 15 m (1 to 50 ft) Flanged: 0.45 to 15 m (1.5 to 50 ft)	0.6 to 30 m (2 to 100 ft)	0.9 to 40 m (3 to 130 ft)	0.6 to 8 m (2 to 26 ft)	0.6 to 12 m (2 to 40 ft)
Output						
Frequency	44 kHz	44 kHz	30 kHz	22 kHz	44 kHz	44 kHz
Beam angle	12°	6°	6°	6°	12°	6°
Environmental						
Location	Indoors/outdoors					
Ambient temperature	-40 to +95 °C (-40 to +203 °F)				Standard: -40 to +145 °C (-40 to +293 °F) Sanitary: -40 to +125 °C (-40 to +260 °F)	-40 to +145 °C (-40 to +293 °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)	0.5 bar g (7.25 psi g)	Standard: 4 bar g (60 psi g): -40 to +138 °C (-40 to +280 °F) Standard: 8 bar g (120 psi g): -40 to +95 °C (-40 to +203 °F) Flanged: 0.5 bar g (7.25 psi g) Sanitary: XCT-8: 0.5 bar g (7.25 psi g)	
Design						
Weight	0.8 kg (1.8 lbs)	1.3 kg (2.8 lbs) Flanged: 2 kg (4.4 lbs)	4.3 kg (9.5 lbs)	8 kg (18 lbs)	0.8 kg (1.7 lbs)	1.3 kg (2.8 lbs)
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	PVDF	Standard: PVDF Options: DERAKANE® flange; PTFE face with universal PVDF flange	
Color	Standard: blue F: gray	Standard: blue F: gray	blue	blue	white	
Process connection	Standard: 1" NPT or 1" BSPT F: 1" NPT	Standard: 1" NPT or 1" BSPT F: 1" NPT	1.5" universal thread (NPT or BSPT)		1" NPT or R 1" (BSPT), EN 10226	
Cable	2 wire twisted pair/braided and foil shielded 0.5 mm² (20 AWG) PVC jacket				2 wire twisted pair/braided and foil shielded 0.5 mm² (20 AWG) silicone jacket	
Separation	Max. 365 m (1200 ft)					
Certificates and approvals	Standard: CE[1], CSA, FM, ATEX II 2GD F: FM Class I, Div 1, Groups A, B, C and D, Class II Div 1, Groups E, F and G, Class III	Standard: CE[1], CSA, FM, ATEX II 2GD F: 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	CE[1], CSA, FM, ATEX II 2G 1D	Standard: CE[1], CSA, FM, ATEX II 2G Sanitary: CSA, 3A	CE[1], CSA, FM, ATEX II 2G

[1] EMC certificate available on request.

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Echomax XPS and XCT

Selection and Ordering data		Order No.
Echomax® XPS-10 ultrasonic transducer	C)	**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 2238 standard.)		**R**
Approvals		
ATEX II 2 GD, FM Class I Div. 2, SAA Class I		**3**
CSA Class I Div. 1[3]		**4**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**

Selection and Ordering data		Order No.
Echomax® XPS-10 ultrasonic transducer	C)	**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**
Instruction Manual		
Quick Start guide, multi-language	C)	**7ML1998-5QM82**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C)	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
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 SS 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 5/143 for more information.)		**7ML1830-1BQ**
1" NPT locknut, plastic		**7ML1830-1DS**
1" BSPT locknut, plastic		**7ML1830-1DR**

[1] Not available with flanged versions

[2] Available with flanged versions only

[3] Valid with mounting thread and facing options 0, 1 and 2 only

C) Subject to export regulations AL: N, ECCN: EAR99

Selection and Ordering data		Order No.
Echomax® XPS-10F ultrasonic transducer	C)	**7ML1170-**
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]		**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**
3" ASME, 150 lb, flat faced		**B**
4" ASME, 150 lb, flat faced		**C**
6" ASME, 150 lb, flat faced		**D**
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 2238 standard.)		**E**
Approvals		
FM Class I Div. 1		**1**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text		**Y15**
Instruction manual		Order No.
English Note: The Instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-1DU01**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C)	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
Submergence shield kit		**7ML1830-1BH**
Easy Aimer 2, with ¾" x 1" NPT PVC coupling		**7ML1830-1AQ**
Easy Aimer 304, with stainless steel coupling		**7ML1830-1AU**
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 5/143 for more information.)		**7ML1830-1BQ**
1" NPT locknut, plastic		**7ML1830-1DS**

C) Subject to export regulations AL: N, ECCN: EAR99

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Echomax XPS and XCT

Selection and Ordering data		Order No.
Echomax® XPS-15 ultrasonic transducer	C)	**7ML1118 -**
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		**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 10/16, 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 2238 standard.)		**P**
Approvals		
ATEX II 2GD, FM Class I Div. 2, SAA Class I		**3**
CSA Class I Div. 1, available with mounting options 0, 1, 2 only		**4**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text		**Y15**

Selection and Ordering data		Order No.
Instruction manual		
Quick Start Manual, multi-language	C)	**7ML1998-5QM82**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C)	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
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 5/143 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 SS couplings		**7ML1830-1GN**

[1] Not available with flanged versions

[2] Available with flanged versions only

C) Subject to export regulations AL: N, ECCN: EAR99

Selection and Ordering data

		Order No.
Echomax® XPS-15F ultrasonic transducer	C)	**7ML1171 -**
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. 15m		**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 2238 standard.)		**C**
Approvals		
FM Class I Div. 1		**1**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text		**Y15**
Instruction manual		Order No.
English Note: The Instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-1DU01**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C)	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
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 5/143 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

		Order No.
Echomax® XPS-30 ultrasonic transducer	C)	**7ML1123 -**
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)		**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 10/16, 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 2238 standard.)		**P**
Approvals		
ATEX II 2G 1D, FM Class I Div 2, SAA		**5**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**
Instruction manual		Order No.
Quick Start Manual, multi-language	C)	**7ML1998-5QM82**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C)	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
1½" BSPT locknut, plastic		**7ML1830-1DP**
Easy Aimer 2, 1½" NPT galvanized coupling		**7ML1830-1AN**
Easy Aimer 2, 1½" NPT with stainless steel 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 SS couplings		**7ML1830-1GN**

[1] Not available with flanged versions

[2] Available with flanged versions only

C) Subject to export regulations AL: N, ECCN: EAR99

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Echomax XPS and XCT

Selection and Ordering data		Order No.
Echomax® XPS-40 ultrasonic transducer	C)	**7ML1127-**
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. 0.9 m (2.95 ft), max. 40 m (131.23 ft)		**0**
Mounting thread and facing		
1½" universal thread		**0**
1½" universal thread, foam facing		**1**
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**
Approvals		
ATEX II 2G 1D, FM Class I Div 2, SAA		**5**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**
Instruction manual		Order No.
Quick Start Manual, multi-language	C)	**7ML1998-5QM82**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C)	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
1½" BSPT locknut, plastic		**7ML1830-1DP**
Easy Aimer 2, 1½" NPT galvanized coupling		**7ML1830-1AN**
Easy Aimer 2, 1½" NPT with stainless steel 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 SS couplings		**7ML1830-1GN**

C) Subject to export regulations AL: N, ECCN: EAR99

Selection and Ordering data		Order No.
Echomax® XCT-8 ultrasonic transducer	C)	**7ML1132-**
High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. Ambient temperatures up to +145 °C (+293 °F) Measuring range: min. 0.6 m (2 ft), max. 8 m (26 ft)		**0**
Mounting thread and facing		
1" NPT [(Taper), ANSI/ASME B1.20.1]		**0**
1" NPT [(Taper), ANSI/ASME B1.20.1], PTFE facing[1]		**1**
R 1" [(BSPT), EN 10226]		**2**
R 1" [(BSPT), EN 10226], PTFE facing[1]		**3**
Cable length		
1 m (3.28 ft)		**A**
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**
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**
JIS10K 3B		**M**
JIS10K 4B		**P**
JIS10K 6B (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 or JIS B 2238 standard.)		**R**
3" universal[2]		**S**
4" universal[3]		**T**
6" universal[4]		**U**
4" sanitary flange, available with approval option 6 and PTFE facing only		**V**
Approvals		
ATEX II 2G, FM Class I, Div. 2, SAA		**4**
CSA Class I Div. 1, available with mounting thread and facing option 0		**5**
3A Sanitary (only with 4" sanitary flange, option V)		**6**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**

Selection and Ordering data		Order No.
Echomax® XCT-8 ultrasonic transducer	C)	**7ML1132-**
High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor. Ambient temperatures up to +145 °C (+293 °F) Measuring range: min. 0.6 m (2 ft), max. 8 m (26 ft)		**0**
Instruction manual		
Quick start manual, multi-language	C)	**7ML1998-5QM82**
XCT-8 with Sanitary Flange, multi-language Note: This manual should be ordered as a separate line item with Mounting Option V.	C)	**7ML1998-5HX61**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C)	**7ML1998-5HV61**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
Submersible hood		**7ML1830-1BH**
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 5/143 for more information.)		**7ML1830-1BQ**
1" NPT locknut, plastic		**7ML1830-1DS**
1" BSPT locknut, plastic		**7ML1830-1DR**
Easy Aimer 304 with stainless steel coupling		**7ML1830-1AU**
Easy Aimer, aluminum, with M20 adapter and ¾ to 1" and 1½" BSPT couplings		**7ML1830-1AX**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 SS couplings		**7ML1830-1GN**
Sanitary, 4" mounting clamp		**7ML1830-1BR**
Sanitary, isolating gasket	C)	**7ML1830-1KC**

[1] Available with flange versions S, T, U and V only

[2] Universal fits 3" ASME, DN80, JIS 10K3B style

[3] Universal fits 4" ASME, DN100, JIS 10K4B style

[4] Universal fits 6" ASME, DN150, JIS 10K6B style

C) Subject to export regulations AL: N, ECCN: EAR99

5

Echomax XPS and XCT

Selection and Ordering data

Order No.

Echomax® XCT-12 ultrasonic transducer C) **7ML1136 -**
High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor.
Ambient temperatures up to +145 °C (+293 °F)
Measuring range: min. 0.6 m (2 ft), max.12 m (40 ft) **0**

Mounting thread and facing

1" NPT [(Taper), ANSI/ASME B1.20.1]	**0**
1" NPT [(Taper), ANSI/ASME B1.20.1], PTFE facing, available for flange options U only	**1**
R 1" [(BSPT), EN 10226]	**2**
R 1" [(BSPT), EN 10226], PTFE facing, available for flange options U only	**3**

Cable length

1 m (3.28 ft)	**A**
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 10/16, 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 2238 standard.)	**P**
6" universal for 6" ASME, DIN 150 or JIS 10K6B style	**U**

Approvals

ATEX II 2G, FM Class I, Div. 2, SAA	**3**
CSA Class I, Div. 1, available with mounting thread and facing option 0 only	**4**

Further designs

Order code

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

Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text **Y15**

Instruction manual

Order No.

Quick Start Manual, multi-language C) **7ML1998-5QM82**
Applications Guidelines, multi-language C) **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 CD containing the complete ATEX Quick Start and instruction manual library.

Selection and Ordering data

Order No.

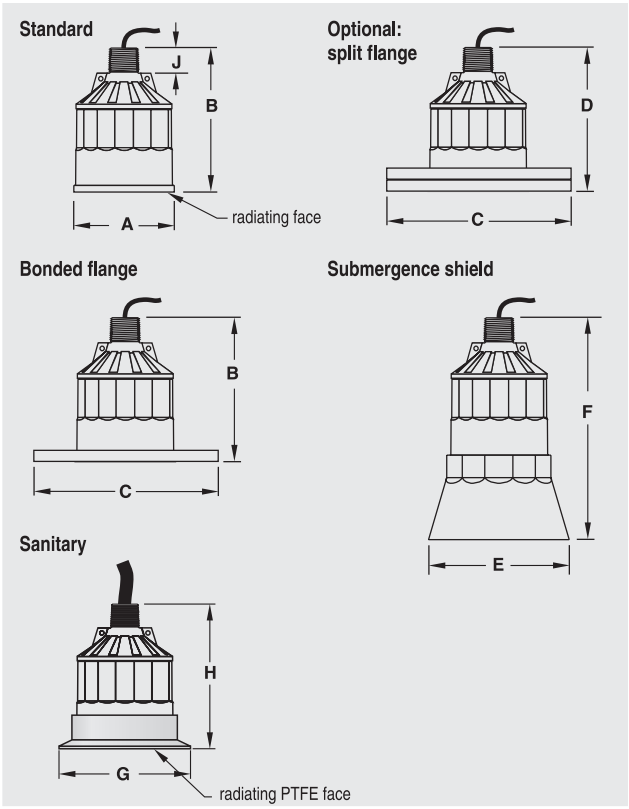
Echomax® XCT-12 ultrasonic transducer C) **7ML1136 -**
High-frequency ultrasonic transducer designed for a wide variety of liquid and solid applications, for use with approved controllers. Includes integral temperature sensor.
Ambient temperatures up to +145 °C (+293 °F)
Measuring range: min. 0.6 m (2 ft), max.12 m (40 ft) **0**

Accessories

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 5/143 for more information.)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSPT locknut, plastic	**7ML1830-1DR**
Easy Aimer 304 with stainless steel coupling	**7ML1830-1AU**
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 SS couplings	**7ML1830-1GN**

C) Subject to export regulations AL: N, ECCN: EAR99

Dimensional drawings

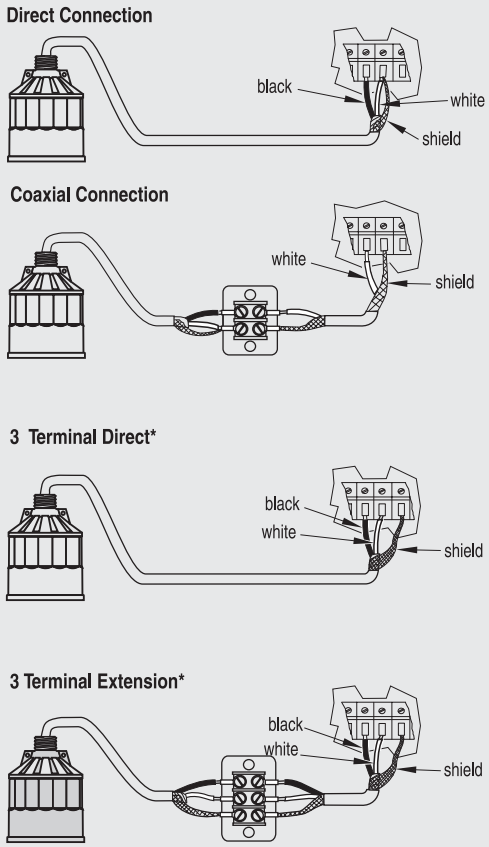


XPS and XCT ultrasonic transducer dimensions

Version				
Dimen.	**XPS-10**	**XPS-15**	**XPS-30**	**XPS-40**
A	88 mm (3.464")	121 mm (4.764")	175 mm (6.890")	206 mm (8.110")
B	122 mm (4.803")	132 mm (5.197")	198 mm (7.795")	229 mm (9.016")
C	According to ASME, DIN and JIS n/a			n/a
E	124 mm (4.882")	158 mm (6.220")	n/a	n/a
F	152 mm (5.984")	198 mm (7.795")	n/a	n/a
J	28 mm (1.1")	28 mm (1.1")	28 mm (1.1")	28 mm (1.1")

Version		
Dimen.	**XCT-8**	**XCT-12**
A	88 mm (3.464")	121 mm (4.764")
B	122 mm (4.803")	132 mm (5.197")
C	According to ASME, DIN and JIS	
E	n/a	n/a
F	n/a	n/a
G	sanitary version: 119 mm (4.68")	n/a
H	sanitary version: 122 mm (4.8")	n/a
J	28 mm (1.1")	28 mm (1.1")

Schematics



* For SITRANS LUC500, MultiRanger 100/200, HydroRanger 200

Mounting
Make particularly sure that the radiating face of the transducer is protected from damage. Mount the transducer so that it is above the maximum material level by at least the blanking value. On liquid applications, the transducer must be mounted so that the axis of transmission is perpendicular to the liquid surface. On solids applications, a Milltronics Easy Aimer should be used to facilitate aiming the transducer. Consider the optional temperature sensor when mounting the transducer.

Interconnection
Do not route cable openly or near high voltage or current runs, contactors and SCR control drives. For optimum isolation against electrical noise, run cable separately in a grounded metal conduit. Seal all thread connections to prevent ingress of moisture.

XPS and XCT ultrasonic transducer connections

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Echomax XLT

Overview

Echomax® XLT transducers use ultrasonic technology to measure level in a wide range of bulk solids.

Benefits

- Sealed aluminum face
- Integral temperature sensor
- Self-cleaning and low maintenance
- Connect using only two wires
- Easy to install

Application

XLT transducers operate with Siemens Milltronics SITRANS LU transceivers in measuring ranges from 0.9 to 60 m (1.8 to 200 ft) and temperatures up to +150 °C (+300 °F). A beam angle of just 5° provides accurate readings in deep, narrow tanks.

With increased signal sensitivity, the XLT transducers from Siemens Milltronics can operate in difficult applications such as limestone, cement clinker and hot stone. All models have a sealed aluminum face to withstand very harsh environments.

During operation, Echomax transducers emit acoustic pulses in a narrow beam. 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. Temperature variations are automatically compensated by the integral temperature sensor.

- Key Applications: bulk solids including limestone, cement clinker, hot stone and coal bunkers

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic transducer
Input	
Measuring range	
• XLT-30	0.9 to 30 m (3.0 to 100 ft)
• XLT-60	1.8 to 60 m (6.0 to 200 ft)
Output	
• Frequency	
- XLT-30	22 kHz
- XLT-60	13 kHz
• Beam angle[1)]	5°
Accuracy	
Temperature error	Compensated by transducers internal temperature sensor
Rated operating conditions	
Ambient conditions	
• Ambient temperature	
- XLT-30 and XLT-60	-40 to +150 °C (-40 to +300 °F)
Design	
• Weight	
- XLT-30	4.3 kg (9.5 lbs)
- XLT-60	6.6 kg (14.5 lbs)
• Material (enclosure)	Aluminium, 304 stainless steel, polyester and silicone
• Color	
- XLT-30 and XLT-60	Red
Mounting	1" NPT [(Taper), ANSI/ASME B1.20.1]
• Cable connection	2-core shielded/twisted, 0.5 mm^2 (20 AWG), silicone sheath
• Cable (max. length)	365 m (1200 ft) with RG 62 AU coaxial cable
• Certificates and approvals	CE (EMC certificate available on request), $CSA_{NRTL/C}$, FM, ATEX II 2G 1D T5

[1)] Definition of beam width: twice the angle at which the off-axis transmission is 3 dB less than the acoustic pressure level of the transmission axis (as measured equidistant from the sensor face).

Selection and Ordering data

Order No.

Echomax® XLT-30, XLT-60, 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. 0.9 m, max. 30 m
Process connection:
1" NPT [(Taper), ANSI/ASME B1.20.1]

XLT-30:	C)	**7ML1141 - ■■E■0**
XLT-60:	C)	**7ML1145 - ■■E■0**

Facing	
XLT-30	**0**
XLT-60	**1**
XLT-30, nylon (standard model)	**2**
XLT-60, nylon (standard model)	**3**
Cable length	
1 m (3.28 ft)	**A**
5 m (16.40 ft)	**B**
10 m (32.81 ft)	**C**
20 m (65.62 ft)	**D**
30 m (98.43 ft)	**E**
50 m (164.04 ft)	**F**
70 m (229.66 ft)	**G**
80 m (262.47 ft)	**H**
90 m (295.28 ft)	**J**
100 m (328.08 ft)	**K**
Approvals	
ATEX II 2G 1D, CSA Class I Div. 1, FM Class I Div. 2, CE	**3**

Further designs

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

	Order code
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	**Y15**

Instruction manual

		Order No.
Quick Start manual, multi-language	C)	**7ML1998-5QS81**
Applications Guidelines, multi-language Note: The Applications Guidelines should be ordered as a separate line item on the order.	C)	**7ML1998-5HV61**

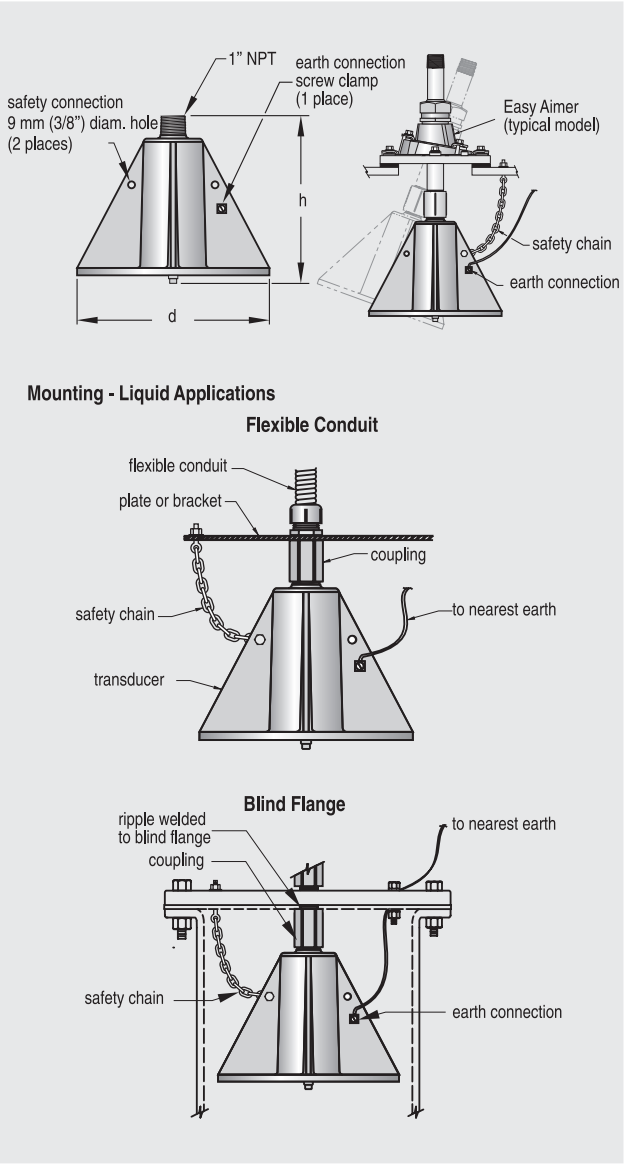
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

Accessories

Easy Aimer 2, 1" NPT galvanized	**7ML1830-1AP**
Easy Aimer 304 with stainless steel coupling	**7ML1830-1AU**
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 SS couplings	**7ML1830-1GN**

C) Subject to export regulations AL: N, ECCN: EAR99

Dimensional drawings

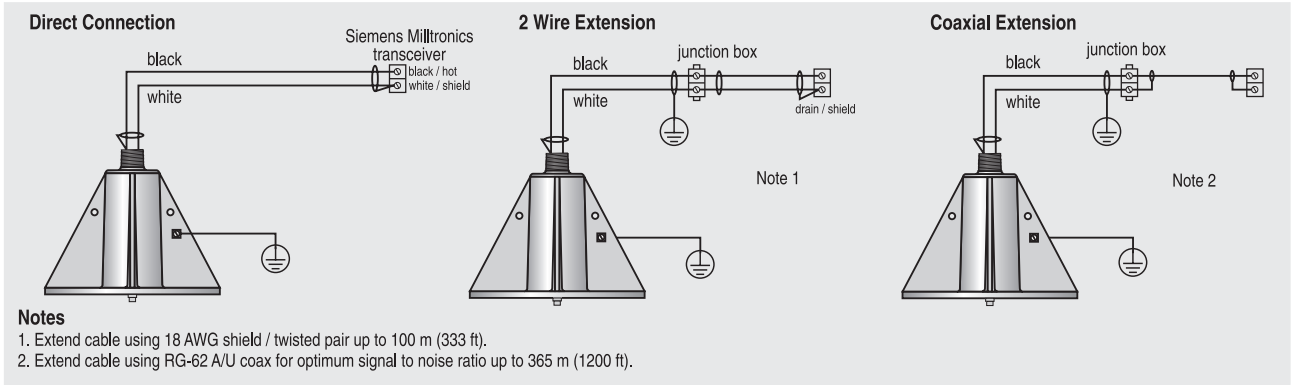


XLT ultrasonic transducer dimensions

5

Echomax XLT

Schematics



XLT ultrasonic transducer connections

5

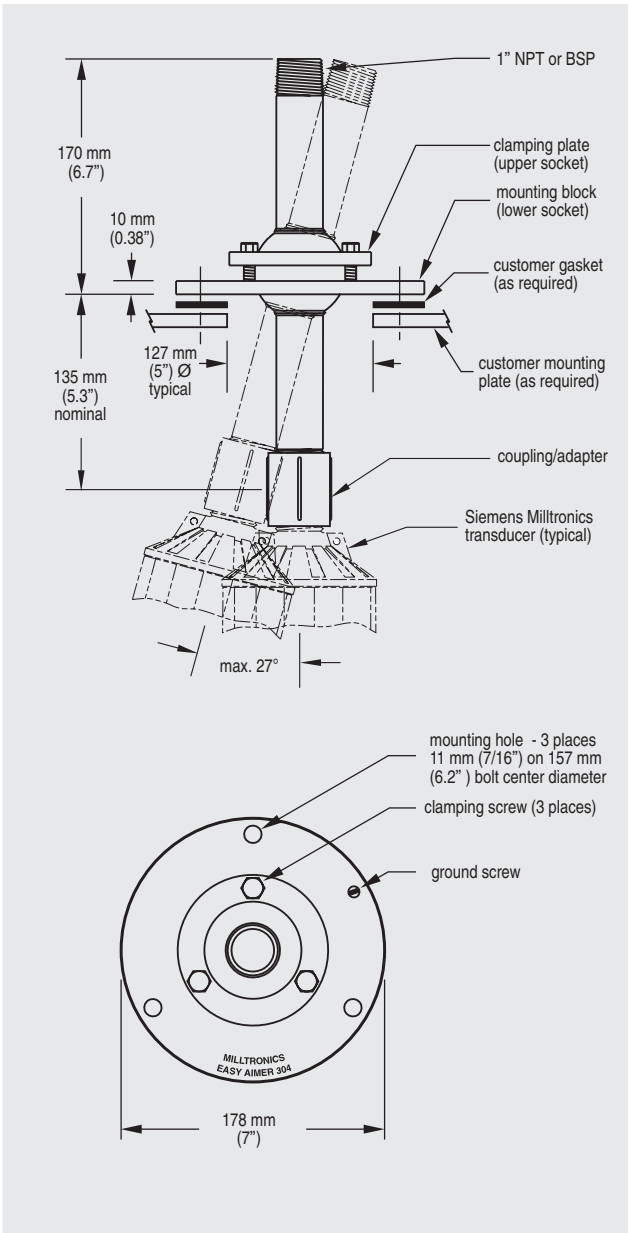
Application

EA 304 aiming device

The Easy Aimer 304 flange is a stainless steel aiming device for alignment of Siemens Milltronics 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.

Dimensional drawings



EA 304 aiming device dimensions

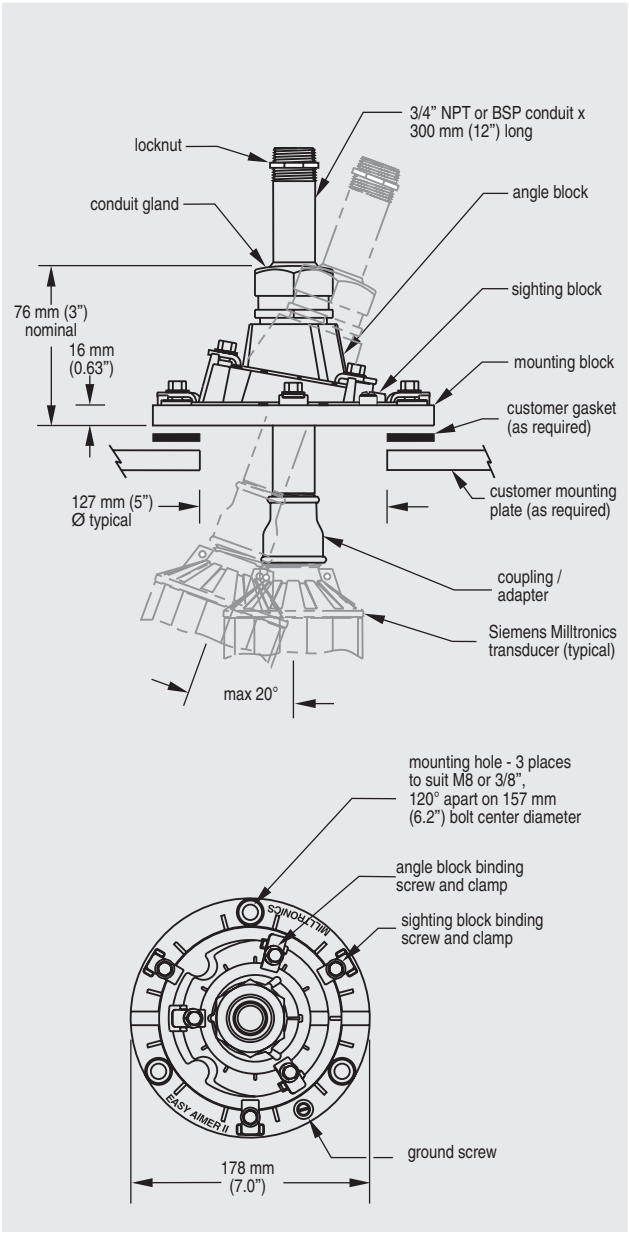
Application

EA 2 aiming device

The Easy Aimer 2 flange is a cast aluminum aiming device for alignment of Siemens Milltronics ultrasonic transducers.

The flange has graduated adjustments and an adjustable insertion length. When used for applications with bulk solids, the sensor is mounted so that it is aimed towards the lower level draw point in the silo. The sensor can be rotated through 360° and angled at 0 to 20° off vertical. It must be mounted using an access plate with welded studs or a flange in order to isolate the mounting holes from the pressurized environment. When installed properly, the EA 2 aiming device is capable of withstanding pressures up to 0.5 bar (Europe) or 15 psi (North America). It can even be used in corrosive and aggressive environments.

Dimensional drawings



EA 2 aiming device dimensions

EA aiming devices

Selection and Ordering data	Order 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 SS couplings	**7ML1830-1GN**
Easy Aimer 2, aluminum, BSPT conduit	**7ML1830-1AL**
Easy Aimer 2, aluminum, without conduit	**7ML1830-1AM**
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**
Instruction manual	
Easy Aimer 2 and 304 Instruction manual, Multi-language Note: The instruction manual should be ordered as a separate line item on the order.	**7ML1998-5HG62**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	

[1] For use with XPS-30 or XPS-40 transducers only

Application

Siemens Milltronics 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" or 2" threaded connection.

Distance from sensor to wall or beam: 20 to 31 cm (8 to 12").

The unique box design also acts as a sun shield for transducers with 1" threaded connections.

FMS-210 wall mounting set

Mounting of transducers with 1" threaded connection.

Distance from transducer to wall or beam: 12 to 48 cm (5 to 19").

FMS-220 extended wall mounting set

Mounting of transducers with 1" threaded connection.

Distance from transducer to wall or beam: 32 to 98 cm (13 to 39").

FMS-310 floor mounting set

Mounting of transducers with 1" threaded connection.

Distance from transducer to floor: 20 to 48 cm (8 to 19").

Distance from mounting support: 5 to 57 cm (2 to 22").

FMS-320 extended floor mounting set

Mounting of transducers with 1" threaded connection.

Distance from transducer to floor: 20 to 48 cm (8 to 19").

Distance from mounting support: 41 to 108 cm (16 to 43").

FMS-350 floor mounting set, bridge

Mounting of transducers with 1" threaded connection.

Distance from transducer to floor: 20 to 48 cm (8 to 19"), anywhere along the complete width of the bridge [166 cm (65")].

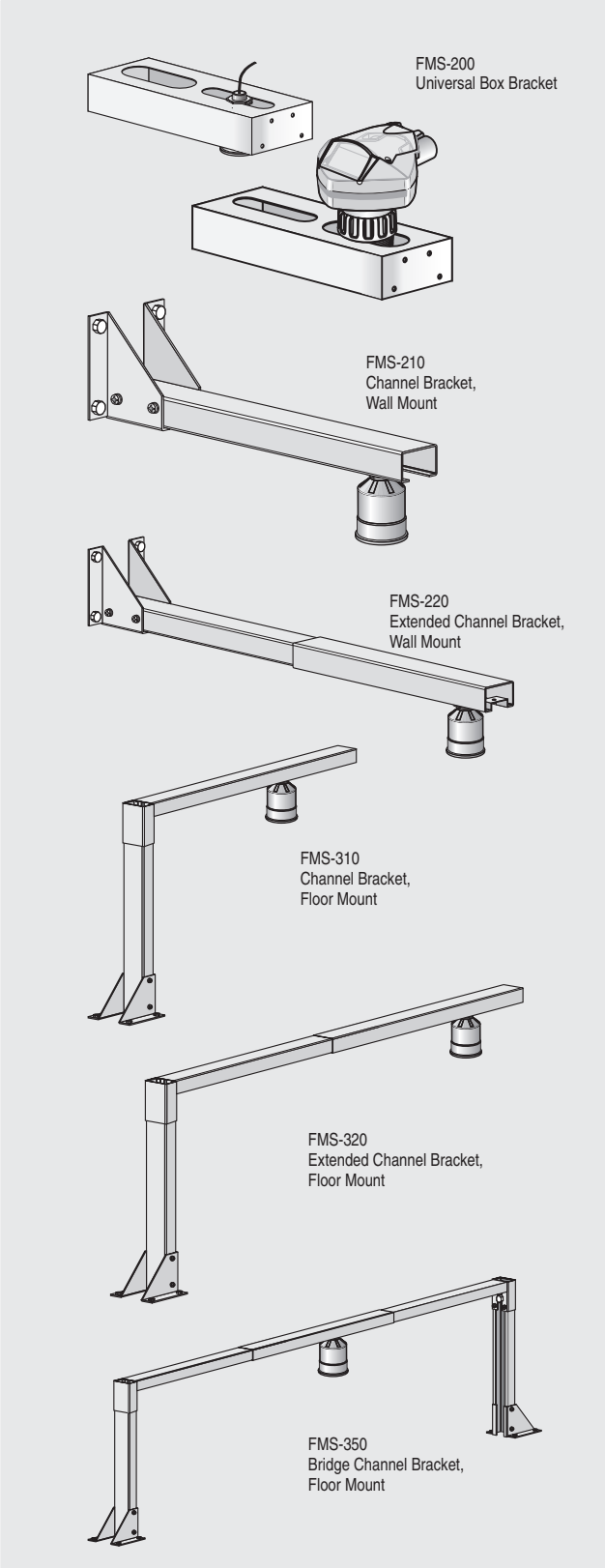
This kit is particularly suitable for measurements on open channels (OCM) by providing a very stable mount for the transducer above a flume or weir.

Selection and Ordering data

	Order No.
Mounting brackets for XPS-10/XCT-8 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 instruction manual	
FMS-200	**7ML1998-1BK61**
FMS-210	**7ML1998-1BL61**
FMS-220	**7ML1998-1BM61**
FMS-310	**7ML1998-1BN61**
FMS-320	**7ML1998-1BP61**
FMS-350	**7ML1998-1BQ61**

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

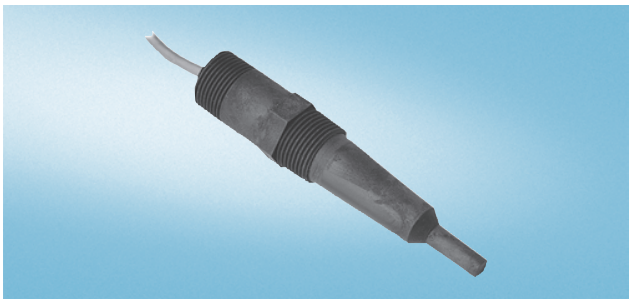
Integration



FMS mounting brackets

TS-3 temperature sensor

Overview



The TS-3 temperature sensor provides an input signal for temperature compensation of specific Siemens Milltronics 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.

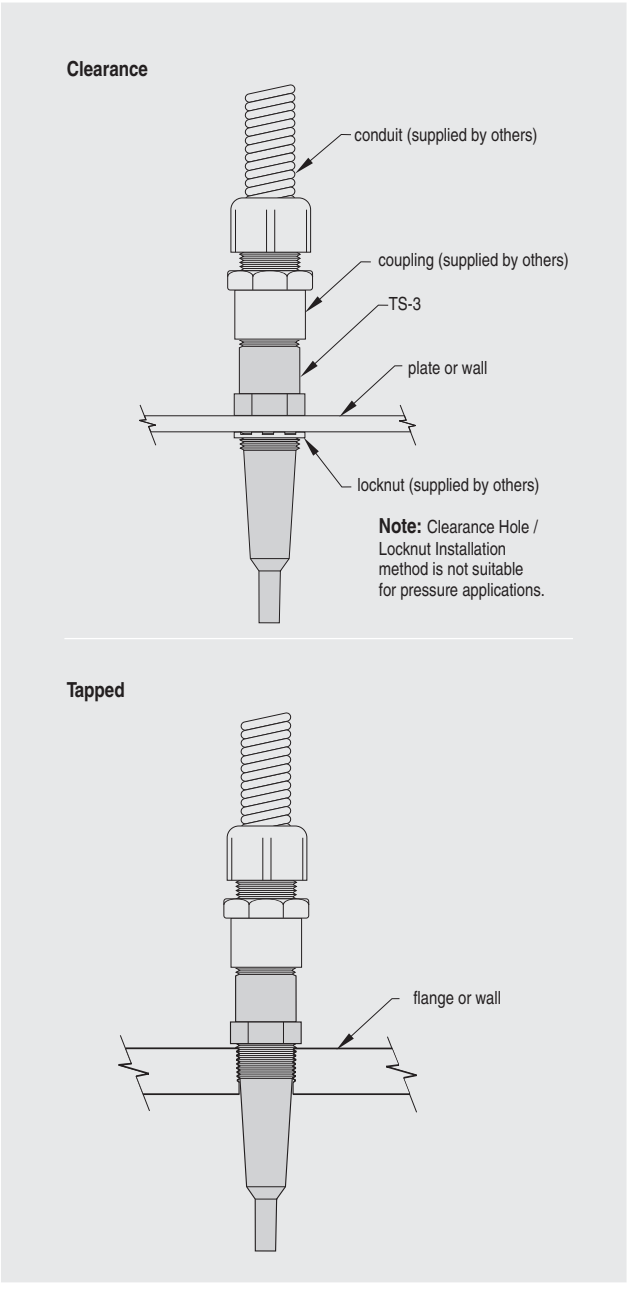
The TS-3 is used in conjunction with ultrasonic transducers that do not have an integral temperature sensor. It is also recommended in cases where the integral temperature sensor of the transducer cannot be used.

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 transceiver 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 to +150 °C (-40 to + 302 °F)
Output	
Response time	
• Forced circulation (temperature variation: 63 %)	55 seconds
• Flange, forced circulation	90 seconds
• Natural convection	150 seconds
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, FM, CSA, ATEX

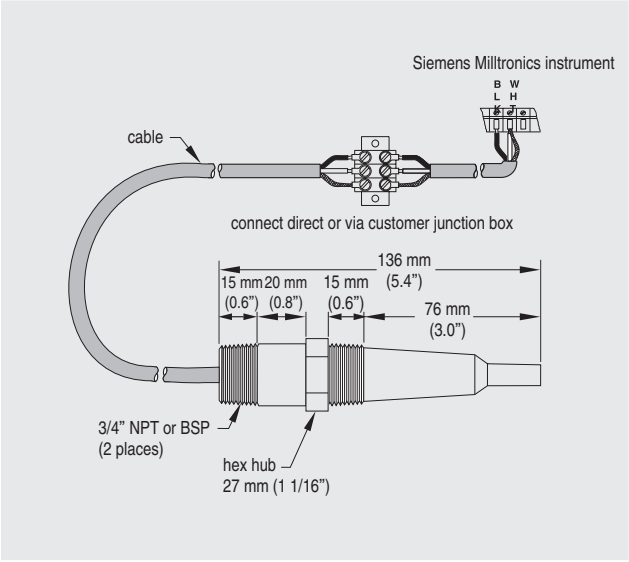
[1)] ETFE is a fluoropolymer inert to most chemicals. For exposure to specific environments, check the chemical compatibility charts before installing the TS-3 in your application.

Selection and Ordering data

		Order No.
TS-3 temperature sensor	C)	**7ML1813-**
TS-3 provides an input signal for temperature compensation of specific Siemens Milltronics ultrasonic level controllers. Compensation is essential in applications where variation in temperature of the sound medium is expected.		**B**
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		
ATEX, CSA, FM, SAA		**2**
Instruction manual		
English	C)	**7ML1998-1EM01**
German	C)	**7ML1998-1EM31**
Note: The instruction manual should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual CD containing ATEX Quick Starts and instruction manuals.		
Optional equipment		
¾" NPT locknut, aluminum	C)	**7ML1930-1BE**
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77") for fastening on sensors		**7ML1930-1BJ**

C) Subject to export regulations AL: N, ECCN: EAR99

Dimensional drawings



TS-3 temperature sensor dimensions

5

Radar transmitters

Overview

Introduction

Radar measurement technology is non-contacting and low maintenance. Because microwaves require no carrier medium, they are virtually unaffected by the process atmosphere (vapour, pressure, dust, or temperature extremes). Siemens Milltronics offers a choice 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 storage and process vessels including high temperature and pressure, to a range of 20 m (66 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, to a range of 20 m (66 ft). Ideal for small vessels and low dielectric media.

SITRANS LR300 is a 4-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 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). It is ideal for low dielectric media.

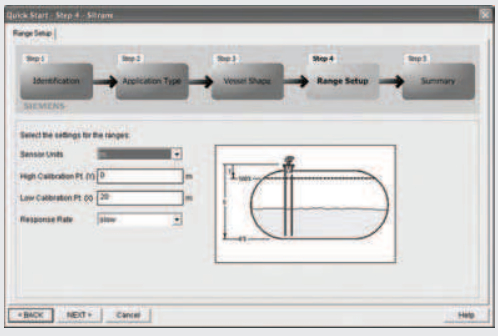
SITRANS LR460 is a 4-wire, 24 GHz FMCW radar level transmitter with extremely high signal to noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft). It is ideal for measurement in extreme dust.

Auto False-Echo Suppression

SITRANS LR instruments offer the unique advantage of patented Sonic 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 LR250)



Quick to configure Quick Start Wizard via SIMATIC PDM guides you during setup (available with LR250, LR460)

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.

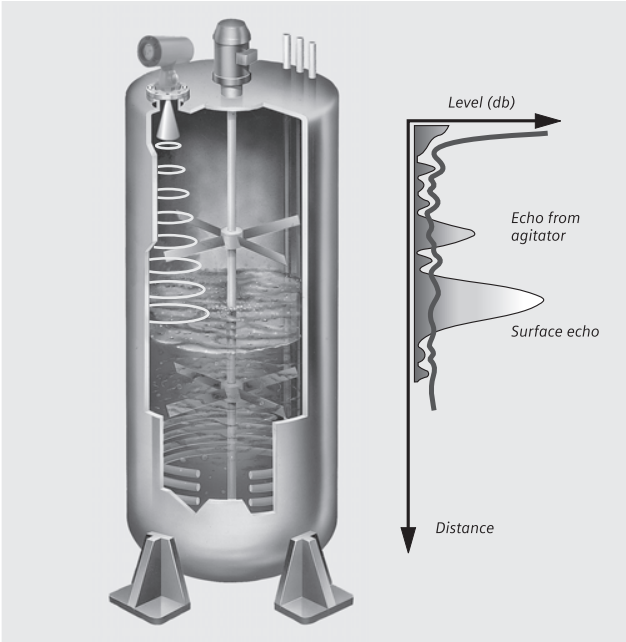
Unlike ultrasonic measurement, radar technology does not require a carrier medium and travels at the speed of light (300 000 000 m/s). Most industrial radar devices operate from 6 to 26 GHz.

Siemens Milltronics offers pulse radar transmitters (SITRANS Probe LR, SITRANS LR200, SITRANS LR250, SITRANS LR300) and FMCW (Frequency Modulated Continuous Wave) radar transmitters (SITRANS LR400, SITRANS LR460).

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

Technical specifications

Radar Selection Guide

Criteria	SITRANS Probe LR	SITRANS LR200	SITRANS LR250	SITRANS LR300	SITRANS LR400	SITRANS LR460
Typical industries	Chemicals	Chemicals, petro-chemicals	Chemicals, petrochemicals	Chemicals, petro-chemicals	Cement, petro-chemicals	Cement, power generation, food processing, mineral processing, mining
Typical applications	Liquids, storage vessels	Liquids, storage and process vessels	Liquids, storage and process vessels with agitators, vaporous liquids, high temperatures, low dielectric media	Liquids, process vessels	Liquids storage vessels, liquid petroleum gas (LPG)	Cement, flyash, grain, coal, flour, plastics
Range	0.3 to 20 m (1 to 65 ft)	0.3 to 20 m (1 to 65 ft)	50 mm (2") from end of horn to 20 m (65 ft), horn dependent	0.4 to 20 m (1.3 to 65 ft)	0.35 to 50 m (1.14 to 164 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)	5.8 GHz (North America 6.3 GHz)	24 to 25 GHz FMCW	24 to 25 GHz FMCW
Performance accuracy	0.1% of range or 10 mm (0.4")	0.1% of range or 10 mm (0.4")	5 mm (0.02")	± 15 mm (0.6") from 0.4 to 10 m (1.3 to 32.8 ft) ± 0.15% from 10 to 20 m (1.3 to 65 ft)	≤ 5 mm (0.2") from 2 to 10 m (6.6 to 32.8 ft) ≤ 15 mm (0.6") from 10 to 50 m (32.8 to 164 ft)	0.25%
Temperature	Ambient: -40 to +80 °C (-40 to +176 °F) Process: -40 to +80 °C (-40 to +176 °F)	Ambient: -40 to +80 °C (-40 to +176 °F) Process: -40 to +200 °C (-40 to +392 °F), dependent on antenna type	Ambient: -40 to +80 °C (-40 to +176 °F) Process: -40 to +150 °C (-40 to +302 °F) dependent on antenna type	Ambient: -40 to +60 °C (-40 to +140 °F) Process: -40 to +200 °C (-40 to +392 °F), dependent on antenna type	Ambient: -40 to +65 °C (-40 to +149 °F) Process: -40 to +250 °C (-40 to +482 °F), dependent on antenna type	Ambient: max. +65 °C (+149 °F) Process: max. +200 °C (+392 °F)
Output/Communications	• 4 to 20 mA/HART® • SIMATIC PDM for remote configuration and diagnostics	• 4 to 20 mA/HART • PROFIBUS PA • SIMATIC PDM for remote configuration and diagnostics	• 4 to 20 mA/HART • PROFIBUS PA • SIMATIC PDM for remote configuration and diagnostics	• 4 to 20 mA/HART • PROFIBUS PA • Modbus ASCII/RTU • SIMATIC PDM for remote configuration and diagnostics	• 4 to 20 mA/HART • PROFIBUS PA • SIMATIC PDM for remote configuration and diagnostics	• 4 to 20 mA/HART • PROFIBUS PA • SIMATIC PDM for remote configuration and diagnostics
Power	• 4 to 20 mA, 24 V DC nominal, 30 V DC max. • Minimum voltage depends on total loop resistance	• 4 to 20 mA loop, 24 V DC nominal, 30 V DC max. • Minimum voltage depends on total loop resistance	• 4 to 20 mA loop, 24 V DC nominal, 30 V DC max. • Minimum voltage depends on total loop resistance	• Universal AC/DC • 24 to 230 V AC, ±15%, 40 to 70 Hz, 28 VA/11W • 24 to 230 V DC, ± 15%, 9W	• 120 to 230 V AC, ±15%, 50/60 Hz • 24 V DC, +25/-20%, 6 W (optional)	• 100 to 230 V AC, ±15%, 50/60 Hz, 6 W • 24 V DC, +25/-20%, 6 W
Approvals	CE, $CSA_{US/C}$, FM, Lloyd's Register of Shipping, ABS, FCC, Industry Canada, R&TTE, ATEX, PED	CE, $CSA_{US/C}$, FM, Lloyd's Register of Shipping, ABS, FCC, Industry Canada, R&TTE, ATEX, PED	$CSA_{US/C}$, CE, FM FCC, Industry Canada, R&TTE, ATEX, PED, C-TICK	CE, $CSA_{NRTL/C}$, FM, Lloyd's Register of Shipping, ABS, FCC, Industry Canada, R&TTE, ATEX, 3A, PED	CE, $CSA_{US/C}$, FM, Lloyd's Register of Shipping, ABS, FCC, Industry Canada, R&TTE, ATEX, PED	$CSA_{US/C}$, CE, FM R&TTE, Industry Canada, FCC, ATEX, C-TICK

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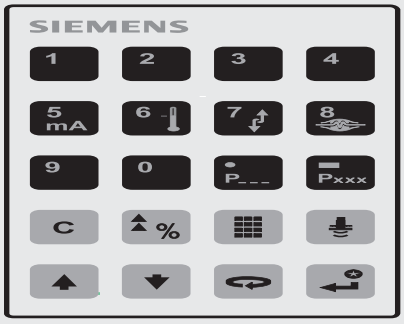
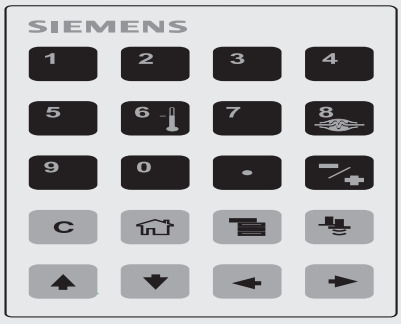
Radar transmitters



SITRANS Probe LR
SITRANS LR 200 HART
SITRANS LR 300



SITRANS LR 200 PROFIBUS
SITRANS LR 400

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Handheld Programmer Selection Guide

SIEMENS

Radar Application Questionnaire

Customer information

Contact: _____ Prepared By: _____

Company: _____ Date: _____

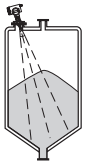
Address: _____ Notes on the Application: _____

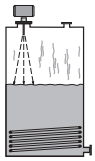
City: _____ Country: _____

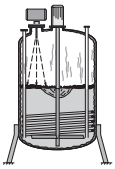
Zip/Postal Code: _____ Phone: ( )

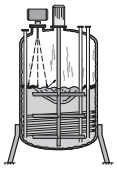
E-mail: _____ Fax: ( )

Vessel Information *(supply sketch where possible)* ☐ Sketch attached

☐ Storage Solids 

☐ Storage Liquids 

☐ Process 

☐ Reactor 

Area safety classification: _____

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

Top:
☐ Flat
☐ Parabolic
☐ Conical

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

Pressure:
Norm: _____
Relief: _____

Mounting connection *(specify type)* _____

Distance to sidewall: _____ cm/in

Mounting connection maximum temperature: _____ C/F

Max. temperature at electronics: _____ C/F

Stilling well diameter: _____ cm/in

Critical Information

Nozzle Length: _____ cm/in

Nozzle Diameter: _____ cm/in

Material

Material being measured: _____ ☐ Liquid ☐ Solid ☐ Liquified gas

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

Material surface: ☐ Flat ☐ Turbulent ☐ Agitated ☐ Vortex

Dielectric constant: ☐ $\varepsilon r < 3$ ☐ $\varepsilon r > 3$

Installation *(indicate all that apply)*
☐ Separated Head
☐ Side ☐ Manhole
☐ Centre

Available voltage:
☐ 100 ☐ 230 V ac
☐ 115 ☐ 24 V dc
☐ 200

Communications:
☐ HART®
☐ PROFIBUS PA
☐ None

Products recommended:

SITRANS Probe LR

Overview

SITRANS Probe LR is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft).

Benefits

- Uni-Construction polypropylene rod antenna standard
- Easy installation and simple startup
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART® handheld communicator
- Communication using HART
- Patented Sonic 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 vapours, temperature gradients, vacuum or pressure, such as tank farms, chemical storage, digesters and long-range applications. SITRANS Probe LR has a range of 0.3 to 20 m (1 to 65 ft).

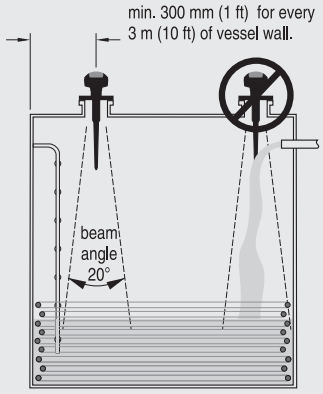
Probe LR is designed for safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna includes an internal, integrated shield that eliminates vessel nozzle interference. SITRANS Probe LR incorporates Sonic 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.

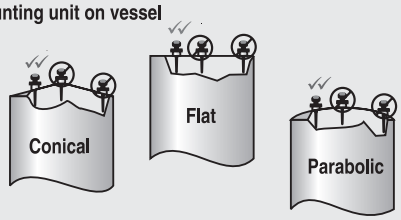
- Key Applications: tank farms, chemical storage

Configuration

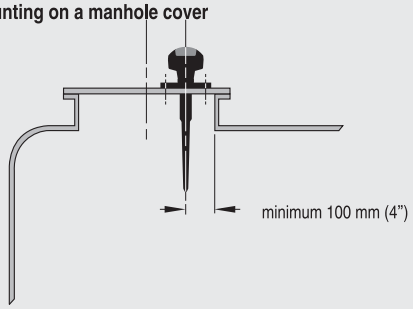
Installation



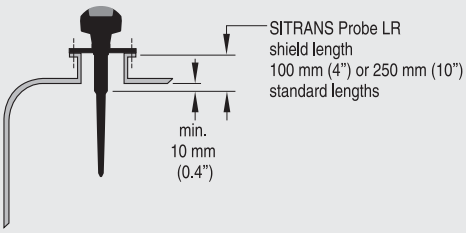
Mounting unit on vessel



Mounting on a manhole cover



Mounting on a nozzle



Technical specifications

Mode of operation	
Measuring principle	Pulse radar level measurement
Frequency	5.8 GHz (North America 6.3 GHz)
Measuring range	0.3 to 20 m (1.0 to 65 ft)
Output	
Analog output	4 to 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")
Influence of ambient temperature	0.003%/K
Repeatability	± 5 mm (2")
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 to +80 °C (-40 to +176 °F)
- Installation category	I
- Pollution degree	4
Medium conditions	
Dielectric constant εr	εr > 1.6 (for εr < 3, use stillpipe)
Vessel temperature	-40 to +80 °C (-40 to +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") shield for maximum 100 mm (4") nozzle or optional 250 mm (10") 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 to 20 mA
Certificates and approvals	
General	$CSA_{US/C}$, CE, FM
Marine	• Lloyd's Register of Shipping • ABS Type Approval
Radio	FCC, Industry Canada and European (R&TTE)
Hazardous	
• Europe	ATEX II 1G EEx ia IIC T4
• USA	Intrinsically Safe barrier required FM Class I, Div.1, Groups A,B,C,D; Class II, Div. 1, Groups E,F, G; Class III
• Canada	Intrinsically Safe barrier required CSA Class I, Div.1, Groups A,B,C,D; Class II, Div. 1, Group G; Class III
Programming	
Handheld communicator	HART
PC	SIMATIC PDM
Intrinsically safe Siemens Milltronics 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 @ max. ambient
Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages

SITRANS Probe LR

Selection and Ordering data		Order No.
SITRANS Probe LR	C)	**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 pressure and +80 °C (+176 °F)		**0**
Enclosure		
Plastic, (PBT), 2 x ½" NPT		**1**
Plastic, (PBT), 2 x M20x1.5		**2**
Antenna type/Material - (max. 3 bar and +80 °C)		
Polyproylene Antenna		
1½" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield		**A**
R 1½" [(BSPT), EN 10226], c/w integral 100 mm shield		**B**
G 1½" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield		**C**
1½" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield		**D**
R 1½" [(BSPT), EN 10226], c/w integral 250 mm shield		**E**
G 1½" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield		**F**
Approvals		
General Purpose, CE[1]		**A**
General Purpose, FM, CSA$_{US/C}$[2]		**B**
CSA Class I, Div 1, Groups A, B, C, D, Class II, Div. 1 Group G, Class III, Intrinsically Safe with suitable barrier[2]		**C**
FM, Class I, II and III, Div 1, Groups A, B, C, D, E, F, G, Intrinsically Safe with suitable barrier[2]		**D**
ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier[1]		**E**
Communication/Output		
4 to 20 mA, HART®		**1**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**
Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000		**C11**
Instruction manual		Order No.
English	C)	**7ML1998-5HR02**
French	C)	**7ML1998-5HR11**
Spanish	C)	**7ML1998-5HR21**
German	C)	**7ML1998-5HR31**
Note: The instruction manual should be ordered as a separate item on the order.		
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Additional quick start manual		
Multi-language Quick Start manual	C)	**7ML1998-5QP81**
Note: Due to ATEX regulations, one Quick Start manual is included with every product.		
Optional equipment		
Handheld programmer, Intrinsically Safe, ATEX II 1G, EEx ia		**7ML5830-2AH**
HART® modem/RS-232 (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DB**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F)		**7ML1930-1AP**
Spare parts		
Plastic lid	C)	**7ML1830-1KB**

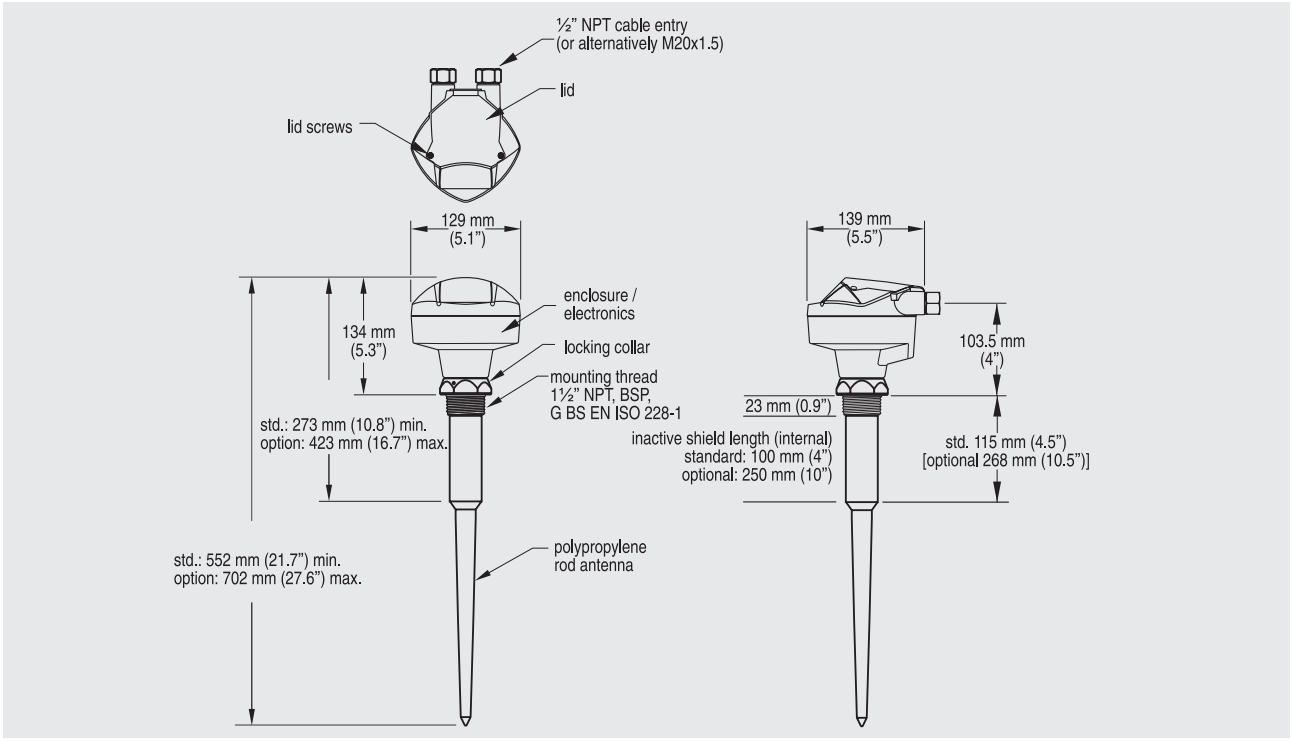
[1] Includes European Radio approvals (R&TTE), 5.8 GHz

[2] Includes FCC Radio approvals, 6.3 GHz for North America only

C) Subject to export regulations AL: N, ECCN: EAR99

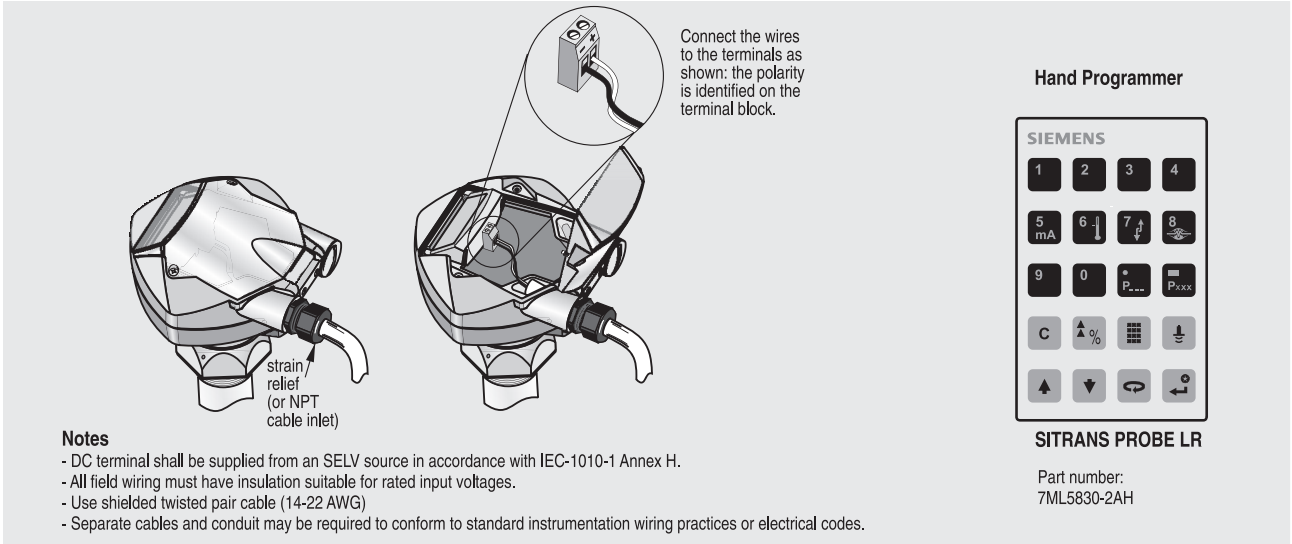
D) Subject to export regulations AL: N, ECCN: EAR99H

Dimensional drawings



SITRANS Probe LR dimensions

Schematics



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

SITRANS LR200

Overview

SITRANS LR200 is a 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).

Benefits

- Uni-Construction polypropylene rod antenna standard, other antenna options available
- Easy installation and simple start-up
- Programming using infrared Intrinsically Safe handheld programmer or SIMATIC PDM
- Communication using HART® or PROFIBUS PA
- Patented Sonic Intelligence® signal processing
- Extremely high signal-to-noise ratio
- Auto False-Echo Suppression of fixed obstructions
- Various flanges, horn and waveguide antenna options available

Application

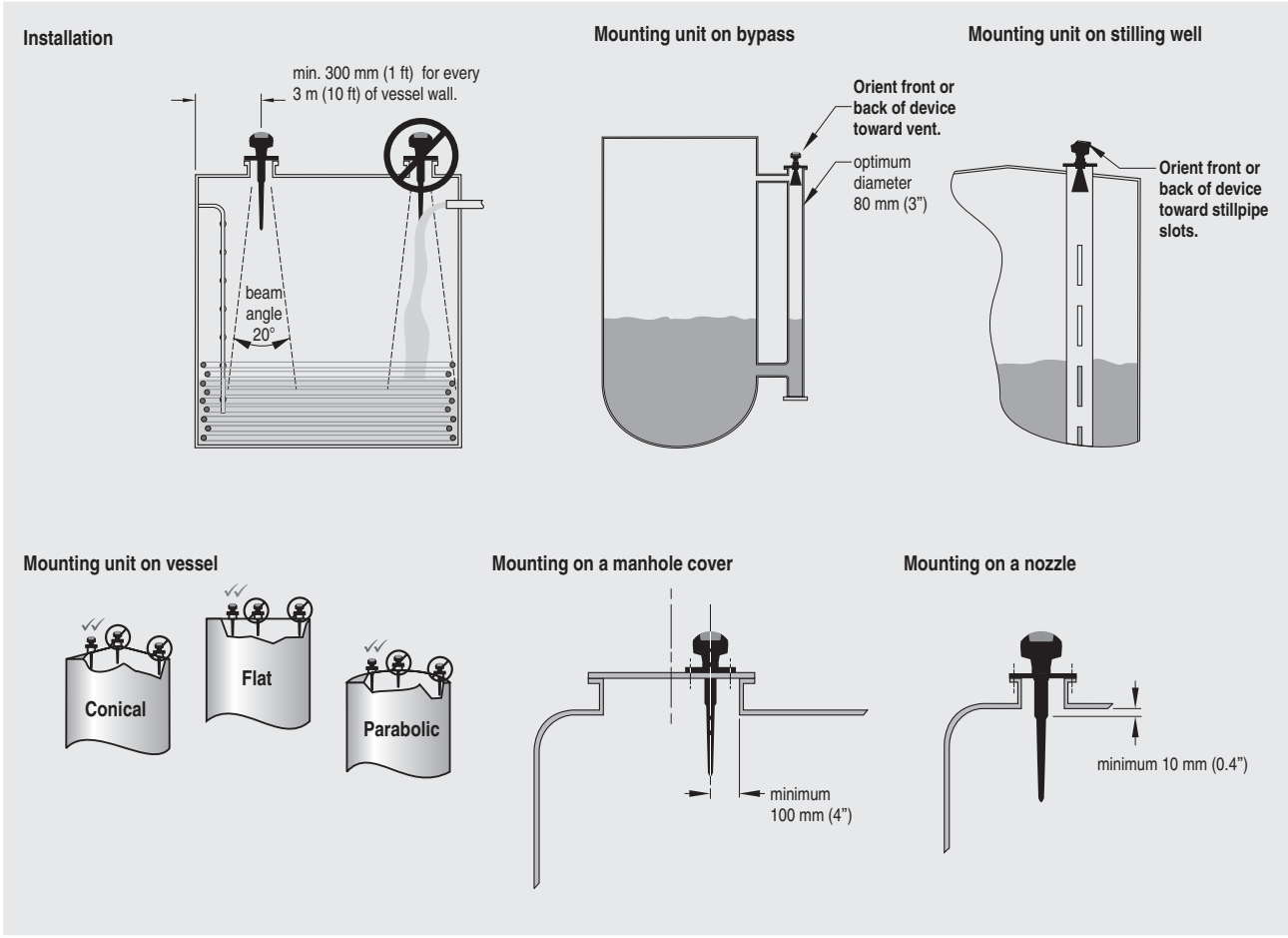
SITRANS LR200's unique design allows safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It also features a built-in alphanumeric display in four languages.

The SITRANS LR200 has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. With other instruments, you may need to consider compatibility of multiple materials including the seal between the materials. 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 Sonic Intelligence signal-processing technology for superior reliability.

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

Configuration



SITRANS LR200 installation

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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 to 20 m (1.0 to 65 ft)
Output	
• Analog output	4 to 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 (reference conditions)	
• Blanking distance	0.3 m (from reference point plus any shield length)
• Accuracy	± the greater of 0.1% of range or 10 mm
• Influence of ambient temperature	0.003% / K
• Non-repeatibility	± 5 mm
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 to +80 °C (-40 to +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	Aluminium, 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 lbs) (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") shield for maximum 100 mm (4") nozzle, or optional 250 mm (10") long shield
- Optional rods, horn and waveguides	Refer to SITRANS LR200/LR300 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/LR300 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
• Marine	• Lloyd's Register of Shipping
	• ABS Type Approval
• Radio	FCC, Industry Canada and European (R&TTE)
• Hazardous	
- Flame proof (Europe)	ATEX II 1/2 G EEx dm ia IIC T4
- Increased safety (Europe)	ATEX II 1/2 G EEx em ia IIC T4
- Explosion proof (USA/Canada)	FM/CSA (barrier not required) T4, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
- Non-incendive (USA)	FM (barrier not required) T5, Class I, Div. 2, Groups A, B, C, D
- Intrinsically Safe (Europe)	ATEX II 1G EEx ia IIC T4
- Intrinsically Safe (USA/Canada)	FM/CSA (barrier required) T4, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
- Intrinsically Safe (Australia)	ANZEX Ex ia IIC T4 (Tamb = -40 to +80 °C) IP67
- Intrinsically Safe (International)	IECEX TSA 04.0020X T4
Programming	
• Intrinsically Safe Siemens Milltronics handheld programmer	Infrared receiver
- Approvals for handheld programmer	IS model with ATEX EEx ia IIC T4, FM/CSA Class I, Div. 1, Groups A, B, C, D
• Handheld communicator	HART
• PC	SIMATIC PDM
• Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages

HART® is a registered trademark of the Hart Communications Foundation.

Selection and Ordering data		Order 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 storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft). [Max. +80 °C (+176 °F), 3 bar]	C)	7ML5422- 0
Enclosure/Cable inlet		
Aluminum, Epoxy painted		
2 x ½" NPT		0
2 x M20x1.5		1
Polypropylene antenna type - (Max. 3 Bar pressure and +80 °C)		
1½" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield		A
R 1½" [(BSPT), EN 10226], c/w integral 100 mm shield		B
G 1½" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield		C
1½" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield		D
R 1½" [(BSPT), EN 10226], c/w integral 250 mm shield		E
G 1½" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield		F
Approvals		
General Purpose, CE[1]		A
General Purpose, CSA$_{US/C}$, FM, for North America only[2]		B
CSA Class I and II, Div. I, Groups A, B, C, D, G, 6.3 GHz, for North America only, Intrinsically Safe with suitable barrier[2]		C
FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier[2]		D
ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier[1]		E
FM, Class I, Div. 2, Groups A, B, C, D, for North America only (no barrier required)[2), 4)]		F
ATEX II 1/2 G EEx em ia IIC T4 (no barrier required)[1), 3), 5)]		G
ATEX II 1/2 G EEx dm ia IIC T4 (no barrier required)[1), 5)]		H
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G (no barrier required)[2), 4), 5)]		J
Communication/Output		
4 to 20 mA, HART®		1
PROFIBUS PA		2
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text		**Y15**
Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000		**C11**

Selection and Ordering data		Order 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 storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft). [Max. +80 °C (+176 °F), 3 bar]	C)	7ML5422- 0
Instruction manual for HART/mA device		
English	C)	**7ML1998-5FN04**
French	C)	**7ML1998-5FN11**
German Note: The instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-5FN34**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	C)	**7ML1998-5QL83**
Instruction manual for PROFIBUS device		
English	C)	**7ML1998-5HP01**
French	C)	**7ML1998-5HP11**
German Note: The instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-5HP31**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	C)	**7ML1998-5QG81**
Accessories		
Handheld programmer, Intrinsically Safe, EEx ia (for HART device)		**7ML5830-2AH**
Handheld programmer, Intrinsically Safe, EEx ia (for PROFIBUS PA device)	C)	**7ML5830-2AJ**
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DB**
One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only)		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 °C (-40 °F) to +80 °C (+176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**

1) Includes European Radio approval (R&TTE), 5.8 GHz
2) Includes Radio approval FCC, 6.3 GHz
3) Available with enclosure option 1 only
4) Available with enclosure option 0 only
5) Available with communication option 1 only
C) Subject to export regulations AL: N, ECCN: EAR99
D) Subject to export regulations AL: N, ECCN: EAR99H

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SITRANS LR200

Selection and Ordering data		Order No.
SITRANS LR200, Flange Adapter, Sanitary Version 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)	C)	**7ML5424-**
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		**0**
2 x M20x1.5		**1**
Communication/Output		
4 to 20 mA, HART®		**A**
PROFIBUS PA		**B**
Approvals		
General Purpose, CE[1]		**A**
General Purpose, CSA US/C, FM, for North America only		**B**
CSA Class I and II, Div. I, Groups A, B, C, D, G, for North America only, Intrinsically Safe with suitable barrier		**C**
FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier		**D**
ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier[1]		**E**
FM, Class I, Div. 2, Groups A, B, C, D, FCC 6.3 GHz, for North America only (no barrier required) [2] and [4]		**F**
ATEX II 1/2 G EEx em ia IIC T4 (no barrier required)[1], [3] and [5]		**G**
ATEX II 1/2 G EEx dm ia IIC T4 (no barrier required)[1] and [5]		**H**
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G (no barrier required)[2], [4] and [5]		**J**
Pressure rating		
Rating per Pressure/Temperature curves in Manual		**0**
0.5 bar (7.25 psi) maximum		**1**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000		**C11**
Inspection Certificate Type 3.1 per EN 10204		**C12**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text		**Y15**

Selection and Ordering data		Order No.
SITRANS LR200, Flange Adapter, Sanitary Version 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)	C)	**7ML5424-**
Instruction manual for HART/mA device		
English	C)	**7ML1998-5FN04**
French	C)	**7ML1998-5FN11**
German Note: The instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-5FN34**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	C)	**7ML1998-5QL83**
Instruction manual for PROFIBUS device		
English	C)	**7ML1998-5HP01**
French	C)	**7ML1998-5HP11**
German Note: The instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-5HP31**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	C)	**7ML1998-5QG81**
Accessories		
Handheld programmer, Intrinsically Safe, EEx ia (for HART device)		**7ML5830-2AH**
Handheld programmer, Intrinsically Safe, EEx ia (for PROFIBUS PA device)	C)	**7ML5830-2AJ**
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DB**
One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only)		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**
Sanitary fitting clamps		
2", 304 stainless steel		**7ML1830-1HD**
3", 304 stainless steel		**7ML1830-1HE**
4", 304 stainless steel		**7ML1830-1HF**

[1] Includes European Radio approval (R&TTE), 5.8 GHz
[2] Includes Radio approval FCC, 6.3 GHz
[3] Available with enclosure option 1 only
[4] Available with enclosure option 0 only
[5] Available with communication option A only
C) Subject to export regulations AL: N, ECCN: EAR99
D) Subject to export regulations AL: N, ECCN: EAR99H

Selection and Ordering data		Order No.
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft)	C)	**7ML5423 -**
Antenna material (uses antenna adapter)		
PTFE, uses antenna adapter and additional process connection below		**1**
Process connection (refer to Pressure/Temperature curves in Instruction manual)		
Flat Faced Flanges (316L stainless steel)		
DN 50 PN 16, Type A, flat faced		**AA**
DN 80 PN 16, Type A, flat faced		**BA**
DN 100 PN 16, Type A, flat faced		**CA**
DN 150 PN 16, Type A, flat faced		**DA**
2" ASME 150 lb, flat faced		**FB**
3" ASME 150 lb, flat faced		**GB**
4" ASME 150 lb, flat faced		**HB**
6" ASME 150 lb, flat faced		**JB**
DN 50 PN 40, flat faced		**AC**
DN 80 PN 40, flat faced		**BC**
DN 100 PN 40, flat faced		**CC**
DN 150 PN 40, flat faced		**DC**
2" ASME 300 lb, flat faced, available with Pressure Rating option 1 only		**FD**
3" ASME 300 lb, flat faced		**GD**
4" ASME 300 lb, flat faced		**HD**
6" ASME 300 lb, flat faced		**JD**
JIS DN50 10K		**AE**
JIS DN80 10K		**BE**
JIS DN100 10K		**CE**
JIS DN150 10K		**DE**
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2238 standard.)		
Threaded connection (316L stainless steel)		
1-½" NPT [(Taper), ANSI/ASME B1.20.1]		**LA**
2" NPT [(Taper), ANSI/ASME B1.20.1]		**MA**
R 1-½" [(BSPT), EN 10226]		**LC**
R 2" [(BSPT), EN 10226]		**MC**
G 1-½" [(BSPP), EN ISO 228-1]		**LE**
G 2" [(BSPP), EN ISO 228-1]		**ME**
Antenna extensions or Inactive shield length		
No antenna extension		**0**
50 mm (2") extension, PTFE		**1**
100 mm (4") extension, PTFE		**2**
100 mm (4") extension, 316L stainless steel shield[6]		**3**
150 mm (6") extension, 316L stainless steel shield[6]		**4**
200 mm (8") extension, 316L stainless steel shield[6]		**5**
250 mm (10") extension, 316L stainless steel shield[6]		**6**
Custom inactive shield length 101 mm to 1000 mm (in 1 mm increments) Add order code Y01 and plain text: "Inactive shield length...mm"[6]		**7**
Process Seal/Gasket		
Integral Gasket, for flat faced flange process connections only, not for Antenna extension options 3 to 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		**0**
2 x M20x1.5		**1**
Communication/Output		
4 to 20 mA, HART®		**A**
PROFIBUS PA		**B**

Selection and Ordering data		Order No.
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft)	C)	**7ML5423 -**
Approvals		
General Purpose, CE[1]		**A**
General Purpose, CSA$_{US/C}$, FM, for North America only[2]		**B**
CSA Class I and II, Div. I, Groups A, B, C, D, G, for North America only, Intrinsically Safe with suitable barrier[2]		**C**
FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier[2]		**D**
ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier[1]		**E**
FM, Class I, Div. 2, Groups A, B, C, D, FCC 6.3 GHz, for North America only (no barrier required) [2) and 4)]		**F**
ATEX II 1/2 G EEx em ia IIC T4 (no barrier required)[1), 3) and 5)]		**G**
ATEX II 1/2 G EEx dm ia IIC T4 (no barrier required)[1) and 5)]		**H**
CSA/FM Class I, II and III, Div. 1, Groups A,B, C, D, E, F, G (no barrier required)[2), 4) and 5)]		**J**
Pressure rating		
rating per Pressure/Temperature curves in Manual		**0**
0.5 bar (7.25 psi) maximum		**1**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000		**C11**
Inspection Certificate Type 3.1 per EN 10204		**C12**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text		**Y15**
Inactive custom shield lengths: Enter the total length of the inactive shield in plain text description (in 1 mm increments).		**Y01**
Instruction manual for HART/mA device		Order No.
English	C)	**7ML1998-5FN04**
French	C)	**7ML1998-5FN11**
German Note: The instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-5FN34**
Multi-language Quick Start manual	C)	**7ML1998-5QL83**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Instruction manual for PROFIBUS device		
English	C)	**7ML1998-5HP01**
French	C)	**7ML1998-5HP11**
German Note: The instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-5HP31**
Multi-language Quick Start manual	C)	**7ML1998-5QG81**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		

SITRANS LR200

Selection and Ordering data		Order No.
SITRANS LR200, Flange Adapter/PTFE Rod Antenna Version 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft)	C)	**7ML5423-** ■■■■■ - ■■■■
Accessories		
Handheld programmer, Intrinsically Safe, EEx ia (for HART® device)		**7ML5830-2AH**
Handheld programmer, Intrinsically Safe, EEx ia (for PROFIBUS PA device)	C)	**7ML5830-2AJ**
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DB**
Antenna, rod, PTFE		**7ML1830-1HC**
Antenna extension, 50 mm (2") PTFE		**7ML1830-1CG**
Antenna extension, 100 mm (4") PTFE		**7ML1830-1CH**
One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only)		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**

1) Includes European Radio approval (R&TTE), 5.8 GHz

2) Includes Radio approval FCC, 6.3 GHz

3) Available with enclosure option 1 only

4) Available with enclosure option 0 only

5) Available with communication option A only

6) Available with process connection options BA, CA, DA, GB, HB, JB, BC, CC, DC, GD, HD, JD, BE, CE, DE, MA, MC, ME only

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

Selection and Ordering data

Order No.

SITRANS LR200, Flange Adapter/Horn Antenna C) **7ML5425-**

Version

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)

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[7] **1**
Sliding waveguide system with 1000 mm (40") waveguide[7] **2**

Process connection (refer to Pressure/Temperature curves on specification sheets)

Flat Faced Flanges (316L stainless steel)

DN 50 PN 16, Type A, flat faced[7] **AA**
DN 80 PN 16, Type A, flat faced **BA**
DN 100 PN 16, Type A, flat faced **CA**
DN 150 PN 16, Type A, flat faced **DA**
DN 200 PN 16, Type A, flat faced **EA**
2" ASME 150 lb, flat faced[7] **FB**
3" ASME 150 lb, flat faced **GB**
4" ASME 150 lb, flat faced **HB**
6" ASME 150 lb , flat faced **JB**
8" ASME 150 lb, flat faced **KB**
DN 50 PN 40, flat faced[7] **AC**
DN 80 PN 40, flat faced **BC**
DN 100 PN 40, flat faced **CC**
DN 150 PN 40, flat faced **DC**
DN 200 PN 40, flat faced **EC**
2" ASME 300 lb, flat faced[7] **FD**
3" ASME 300 lb, flat faced **GD**
4" ASME 300 lb, flat faced **HD**
6" ASME 300 lb, flat faced **JD**
8" ASME 300 lb, flat faced **KD**
JIS DN 50 10K[7] **AE**
JIS DN 80 10K **BE**
JIS DN 100 10K **CE**
JIS DN 150 10K **DE**
JIS DN 200 10K **EE**
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2238 standard.)

Communication/Output

4 to 20 mA, HART® **0**
PROFIBUS PA **1**

Process Seal/Gasket

FKM (-40 to +200 °C) **0**
Nitrile (-40 to +100 °C), sliding waveguide sytems only **1**
FFKM (-35 to +200 °C) **2**

Enclosure/Cable inlet

Aluminum, Epoxy painted
2 x ½" NPT **0**
2 x M20x1.5 **1**

Horn size/Waveguide options

80 mm (3") horn[3] **B**
100 mm (4") horn[3] **C**
150 (6") mm horn **D**
200 (8") mm horn **E**
100 mm (4") horn with 100 mm (4") waveguide extension[3] **F**
100 mm (4") horn with 150 mm (6") waveguide extension[3] **G**
100 mm (4") horn with 200 mm (8") waveguide extension[3] **H**
100 mm (4") horn with 250 mm (10") waveguide extension[3] **J**
150 mm (6") horn with 100 mm (4") waveguide extension **K**
150 mm (6") horn with 150 mm (6") waveguide extension **L**
150 mm (6") horn with 200 mm (8") waveguide extension **M**

Selection and Ordering data

Order No.

SITRANS LR200, Flange Adapter/Horn Antenna C) **7ML5425-**

Version

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)

150 mm (6") horn with 250 mm (10") waveguide extension **N**
200 mm (8") horn with 100 mm (4") waveguide extension **P**
200 mm (8") horn with 150 mm (6") waveguide extension **Q**
200 mm (8") horn with 200 mm (8") waveguide extension **R**
200 mm (8") horn with 250 mm (10") waveguide extension **S**
Waveguide only - Waveguide length 500 mm to 3000 mm (in 1 mm increments) (Add order code Y01 and plain text: "waveguide length ...mm") **T**
Horn with custom waveguide lengths 101 to 2000 mm (Add order codes Y01 and Y03 and plain text: "waveguide length...mm", and "horn size ...mm")[8] **U**

Approvals

General Purpose, CE[1] **A**
General Purpose, CSA$_{US/C}$, FM, for North America only[2] **B**
CSA Class I and II, Div. I, Groups A, B, C, D, G, for North America only, Intrinsically Safe with suitable barrier[2] **C**
FM, Class I and II, Div. I, Groups A, B, C, D, E, F, G, for North America only, Intrinsically Safe with suitable barrier[2] **D**
ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier[1] **E**
FM, Class I, Div. 2, Groups A, B, C, D, for North America only (no barrier required)[2] **F**
ATEX II 1/2 G EEx em ia IIC T4 (no barrier required)[1), 4) and 6)] **G**
ATEX II 1/2 G EEx dm ia IIC T4 (no barrier required)[1) and 6)] **H**
CSA/FM Class I, II and III, Div. 1, Groups A B, C, D, E, F, G (no barrier required)[2), 5) and 6)] **J**

Pressure rating

Rating per Pressure/Temperature curves in Manual 0.5 bar (7.25 psi) maximum **0**
1

Further designs

Order code

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

Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 **C11**
Inspection Certificate Type 3.1 per EN 10204 **C12**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text **Y15**
Waveguide custom lengths: Enter the total length of the waveguide in plain text description (1 mm increments) **Y01**
Enter the waveguide length (100 mm to 1000 mm) and enter the horn size (100 mm, 150 mm, and 200 mm only) in plain text description **Y03**

Instruction manual for HART/mA device

Order No.

English C) **7ML1998-5FN04**
French C) **7ML1998-5FN11**
German C) **7ML1998-5FN34**
Note: The instruction manual should be ordered as a separate line item on the order.

Multi-language Quick Start manual C) **7ML1998-5QL83**

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

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SITRANS LR200

Selection and Ordering data

		Order No.
SITRANS LR200, Flange Adapter/Horn Antenna Version	C)	**7ML5425-**
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)		
Instruction manual for PROFIBUS device		
English	C)	**7ML1998-5HP01**
French	C)	**7ML1998-5HP11**
German	C)	**7ML1998-5HP31**
Note: The instruction manual should be ordered as a separate line item on the order.		
Multi-language Quick start manual	C)	**7ML1998-5QG81**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
Handheld programmer, Intrinsically Safe, EEx ia (for HART® device)		**7ML5830-2AH**
Handheld programmer, Intrinsically Safe, EEx ia (for PROFIBUS PA® device)	C)	**7ML5830-2AJ**
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM®)	D)	**7MF4997-1DB**
One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) (available for HART only)		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 °C to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**

1) Includes European Radio approval (R&TTE), 5.8 GHz

2) Includes Radio approval FCC, 6.3 GHz

3) For stillpipe applications only

4) Available with enclosure option 1 only

5) Available with enclosure option 0 only

6) Available with communication option 0 only

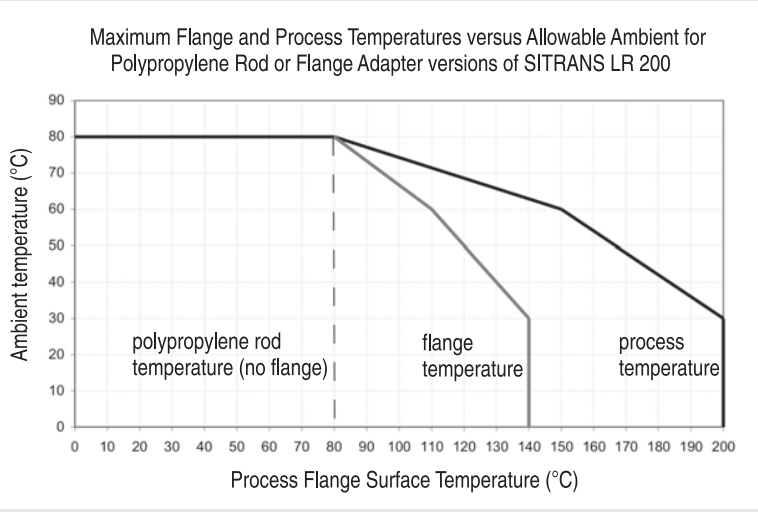
7) Available with pressure rating option 1 only

8) Order standard waveguide lengths 100, 150, 200, 250 mm (3.93, 5.91, 7.87, 9.84") by choosing options from *Horn size/Waveguide options*

C) Subject to export regulations AL: N, ECCN: EAR99

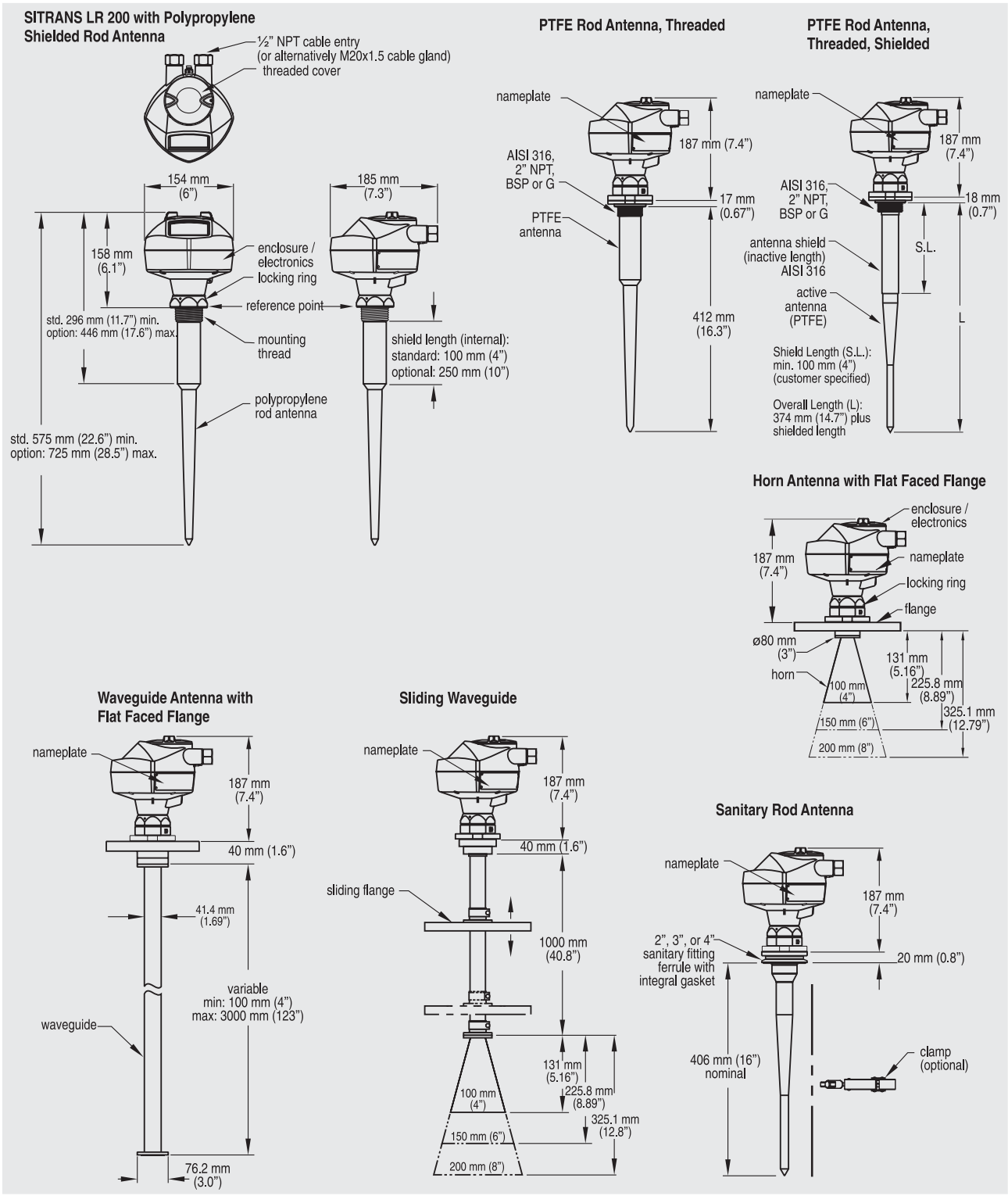
D) Subject to export regulations AL: N, ECCN: EAR99H

Characteristic curves



SITRANS LR200 Temperature/Pressure Curve

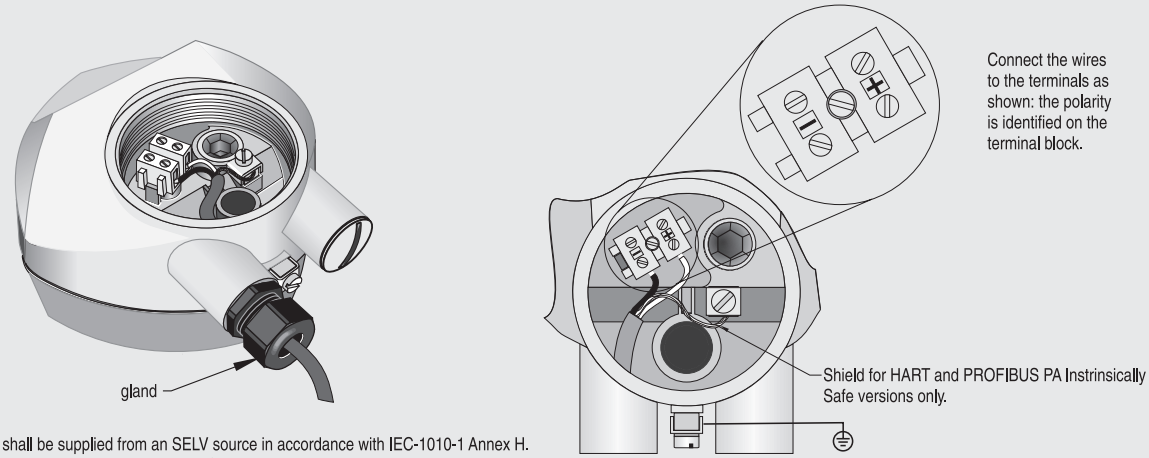
Dimensional drawings



SITRANS LR200 dimensions

SITRANS LR200

Schematics



Notes:

1. DC terminal shall be supplied from an SELV source in accordance with IEC-1010-1 Annex H.
2. All field wiring must have insulation suitable for rated input voltages.
3. Use shielded twisted pair cable (14 to 22 AWG) for HART version.
4. Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

Hand Programmers

SITRANS LR 200 HART

Part number:
7ML5830-2AH

SITRANS LR 200 PROFIBUS PA

Part number:
7ML5830-2AJ

SITRANS LR200 connections

Overview

SITRANS LR250 is a 2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage and process vessels including high temperature and pressure, to a range of 20 m (66 ft).

Benefits

- Graphical local user interface (LUI) makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard
- LUI displays echo profiles for diagnostic support
- 25 GHz high frequency allows for small horn 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 from the end of the horn
- 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 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.

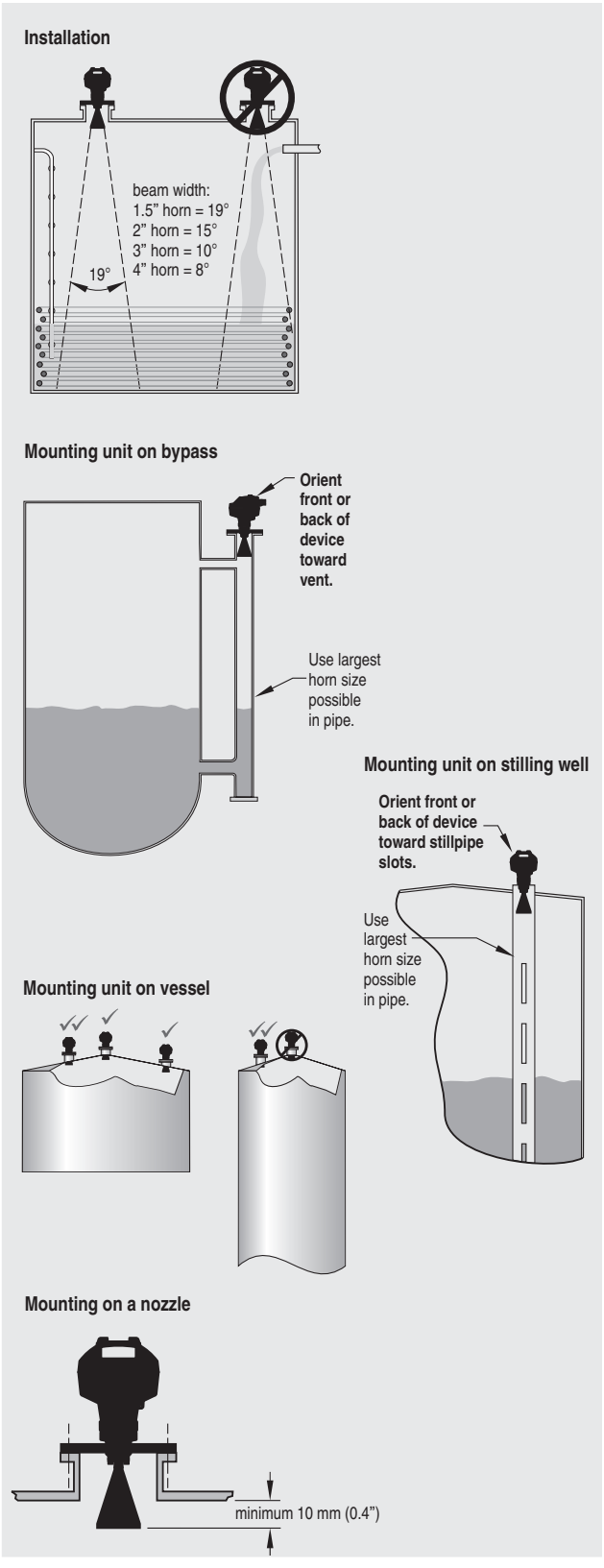
The 25 GHz frequency creates a narrow, focused beam allowing for smaller horn options and decreasing sensitivity to obstructions.

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 on low dielectric media, and in small vessels, as well as tall and narrow vessels.

- Key Applications: liquid bulk storage tanks, process vessels with agitators, vaporous liquids, high temperatures, low dielectric media

Configuration



SITRANS LR250 installation

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SITRANS LR250

Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
Frequency	K-band (25.0 GHz)
Minimum measuring range	50 mm (2") from end of horn
Maximum measuring range	20 m (65 ft), horn dependent
Output	
• Analog output	4 to 20 mA
• Accuracy	± 0.02 mA
• Communications	HART®
	Optional: PROFIBUS PA (Profile 3.0, Class B)
• Fail-safe	• Programmable as high, low or hold (Loss of Echo)
	• NE 43 programmable
Performance (according to reference conditions IEC60770-1)	
• Maximum measured error	= 5 mm (0.2")
• Influence of ambient temperature	<0.003%/K
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 to +80 °C (-40 to +176 °F)
• Installation category	I
• Pollution degree	4
Medium conditions	
• Dielectric constant ε_r	ε_r > 1.6, horn and application dependent
• Process temperature	-40 to +150 °C (-40 to +302 °F) (at process connection with FKM 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	Aluminium, 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 lbs) 3.75 mm (1½") 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" (40 mm), 2" (48 mm), 3" (75 mm), 4" (95 mm) horn and optional 100 mm (4") horn extension
Process connections	
• Process connection	1½" or 2" NPT [(Taper), ANSI/ASME B1.20.1] R 1½" or 2" [(BSPT), EN 10226] G 1½" or 2" [(BSPP), EN ISO 228-1]
• Flange connection	2", 3", 4" (ANSI 150, 300 lbs), 50, 80, 100 mm (PN 16, 40, JIS 10K)
Power supply	
4 to 20 mA/HART	Nominal 24 V DC (max. 30 V DC) with max. 550 Ω
PROFIBUS PA	• 15.0 mA
	• per IEC 61158-2
Certificates and approvals	
• General	$CSA_{US/C}$, CE, FM, NE 21, C-TICK
• Radio	FCC, Industry Canada and Europe ETSI EN 302-372, C-TICK
• Hazardous	
- Intrinsically Safe (Europe)	ATEX II 1G EEx ia IIC T4 ATEX II 1D EEx tD A20 IP67 T90 °C
- Intrinsically Safe (USA/Canada)	FM/CSA (barrier required) Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
- Intrinsically Safe (International)	IECEX SIR 05.0031X, Ex ia IIC T4, EX tD A20 IP67 T90 °C
- Non-incendive (USA/Canada)	FM/CSA Class I, Div. 2, Groups A, B, C, D T5
Programming	
• Intrinsically Safe Siemens handheld programmer	Infrared receiver
- Approvals for handheld programmer	IS model with ATEX II 1G EEx ia IIC T4, FM/CSA Class I, Div. 1, Groups A, B, C, D
• Handheld communicator	HART 5
• PC	SIMATIC PDM
• Display (local)	Graphic local user interface including quick start wizard and echo profile displays

®HART is a registered trademark of the Hart Communications Foundation.
®Hastelloy and ®C-22 are registered trademarks of Haynes International Inc.

Selection and Ordering data

		Order No.
SITRANS LR250	C)	**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). 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		**0**
316L (1.4435 or 1.4404) stainless steel, PTFE emitter, FFKM seal		**1**
Hastelloy C-22/2.4602, PTFE emitter, FKM seal[1]		**2**
Hastelloy C-22/2.4602, PTFE emitter, FFKM seal[1]		**3**
Process Connection Type		
1½" NPT [(Taper), ANSI/ASME B1.20.1][2]		**A A**
R 1½" [(BSPT), EN 10226][2]		**A B**
G 1½" [(BSPP), EN ISO 228-1] (parallel thread)[2]		**A C**
2" NPT [(Taper), ANSI/ASME B1.20.1]		**A D**
R 2" [(BSPT), EN 10226]		**A E**
G 2" [(BSPP), EN ISO 228-1] (parallel thread)		**A F**
2" ASME, 150 lb		**B A**
3" ASME, 150 lb		**B B**
4" ASME, 150 lb		**B C**
2" ASME, 300 lb		**C A**
3" ASME, 300 lb		**C B**
4" ASME, 300 lb		**C C**
DN 50 PN16		**D A**
DN 80 PN16		**D B**
DN 100 PN16		**D C**
DN 50 PN40		**E A**
DN 80 PN40		**E B**
DN 100 PN40		**E C**
JIS 50A 10K		**F A**
JIS 80A 10K		**F B**
JIS 100A 10K		**F C**
(Note: Stainless steel flanges provided as flat faced; Hastelloy flanges provided as raised face. Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2238 standard.)		
Communication/Output		
4 to 20 mA, HART®		**0**
PROFIBUS PA		**1**
Enclosure/Cable inlet		
Aluminum, Epoxy painted		
2 x ½" NPT		**0**
2 x M20x1.5		**1**
Antenna		
1½" horn[3]		**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[2]		**E**
2" horn with 100 mm extension		**F**
3" horn with 100 mm extension		**G**
4" horn with 100 mm extension		**H**
(Note: Please use largest horn size possible.)		
Approvals		
General Purpose, CE, CSA, FM, FCC, R&TTE, C-TICK		**A**
CSA/FM Class I and II, Div. I, Groups A,B, C, D, E, F, G Intrinsically safe, barrier required, FCC, C-TICK		**B**
ATEX II 1 GD EEx ia IIC T4, Intrinsically safe, barrier required, R&TTE, C-TICK, INMETRO		**C**
CSA/FM Class I, Div. 2, Non-Incendive, no barrier required, FCC, C-TICK		**D**
Pressure rating		
Rating per Pressure/Temperature curves in Manual 0.5 bar (7.25 psi) maximum		**0**
		1

Selection and Ordering data

		Order No.
SITRANS LR250	C)	**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). Ideal for small vessels and low dielectric media.		**0 -**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000		**C11**
Inspection Certificate Type 3.1 per EN 10204		**C12**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 27 characters) specify in plain text		**Y15**
Instruction manual for HART/mA device		Order No.
English	C)	**7ML1998-5JE01**
German	C)	**7ML1998-5JE31**
Note: The instruction manual should be ordered as a separate line item on the order.		
Multi-language Quick Start manual	C)	**7ML1998-5QX81**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Instruction manual for PROFIBUS device		
English	C)	**7ML1998-5JF01**
German	C)	**7ML1998-5JF31**
Note: The instruction manual should be ordered as a separate line item on the order.		
Multi-language Quick Start manual	C)	**7ML1998-5XE81**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
Handheld programmer, Intrinsically Safe, EEx ia (LUI enabled)	C)	**7ML1930-1BK**
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DA**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F)		**7ML1930-1AP**
One metallic cable gland M20 x 1.5, rated -40 to 80 °C (-40 to 176 °F), PROFIBUS PA		**7ML1930-1AQ**

[1] Not available with process connection options AA to AF

[2] For 1½" horn antennas only, max. range 10 m (32.8 ft), dk > 3

[3] For 1½" threaded connection only, max. range 10 m (32.8 ft), dk > 3

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

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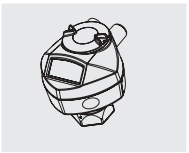
SITRANS LR250

Selection and Ordering Data

SITRANS LR250 Spare parts

SITRANS LR250 Enclosures



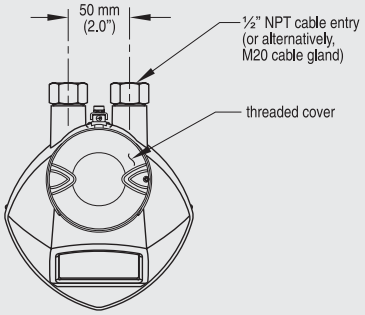
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option A, with HART communication, no process connection	**A5E01156819**
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option A, with HART communication, no process connection	**A5E01156820**
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option B, with HART communication, no process connection	**A5E01156823**
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option B, with HART communication, no process connection	**A5E01156824**
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option C, with HART communication, no process connection	**A5E01156827**
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option C, with HART communication, no process connection	**A5E01156832**
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with HART communication, no process connection	**A5E01156834**
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option D, with HART communication, no process connection	**A5E01156835**
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option A, with PROFIBUS communication, no process connection	**A5E01156836**
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS communication, no process connection	**A5E01156838**
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option B, with PROFIBUS communication, no process connection	**A5E01156839**
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option B, with PROFIBUS communication, no process connection	**A5E01156841**
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option C, with PROFIBUS communication, no process connection	**A5E01156843**
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option C, with PROFIBUS communication, no process connection	**A5E01156844**
SITRANS LR250 enclosure with board stack, NPT cable inlet, approval option D, with PROFIBUS communication, no process connection	**A5E01156846**
SITRANS LR250 enclosure with board stack, M20 cable inlet, approval option D, with PROFIBUS communication, no process connection	**A5E01156848**

SITRANS LR250 horn antenna and extension kits

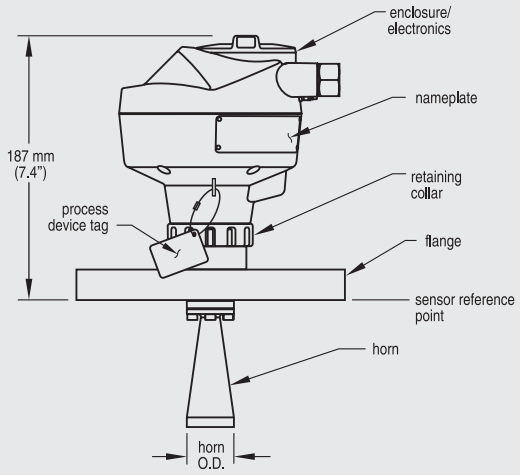
38 mm (1.5") horn antenna kit	**A5E01151539**
100 mm (4") horn antenna extension kit, Process Connection	**A5E01151553**
50 mm (2") stainless steel horn antenna kit	**A5E01151569**
75 mm (3") stainless steel horn antenna kit	**A5E01151571**
100 mm (4") stainless steel horn antenna kit	**A5E01151573**
100 mm (4") horn antenna extension kit, 50 mm (2"), 75 mm (3") and 100 mm (4") process connection	**A5E01151577**
50 mm (2") horn antenna kit, Hastelloy C-22	**A5E01151584**
75 mm (3") horn antenna kit, Hastelloy C-22	**A5E01151585**
100 mm (4") horn antenna kit, Hastelloy C-22	**A5E01151587**
5 Dupont 1Gr Polyback, PTFE grease kit	**A5E01151626**

Dimensional drawings

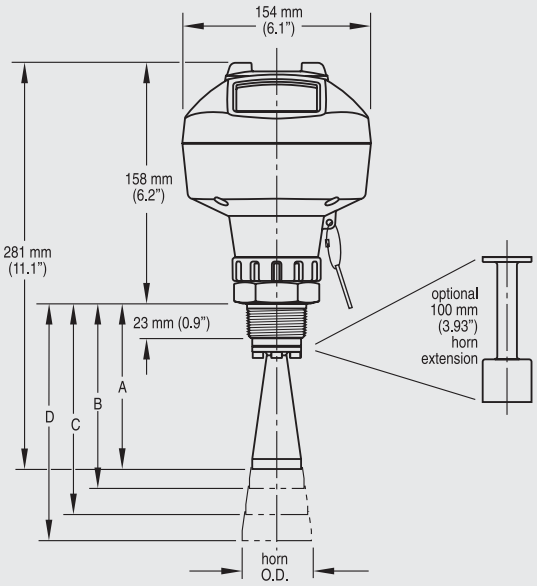
SITRANS LR250

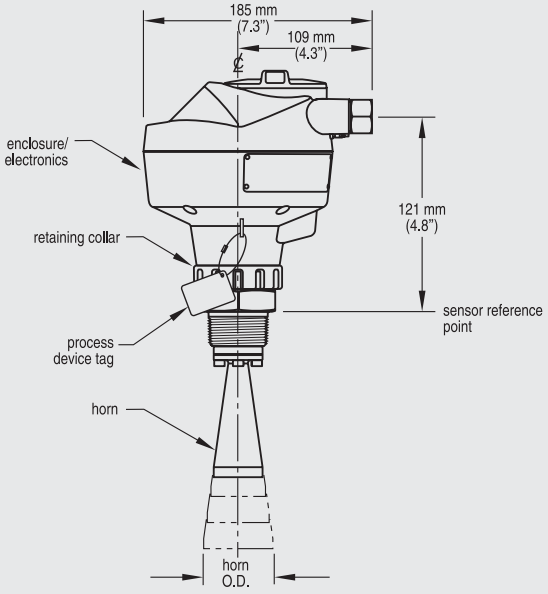


Flanged



Threaded



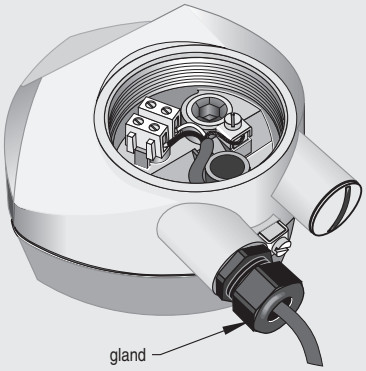


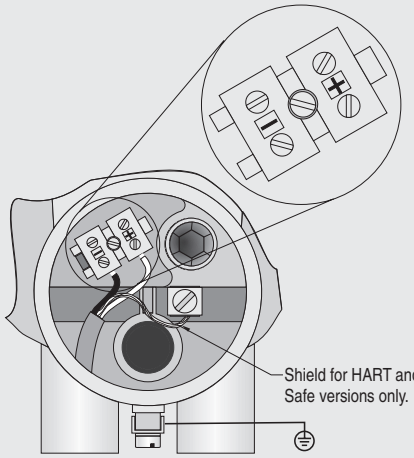
Nominal Horn Size	Horn O.D.	Horn Height		Beam Angle	Measurement Range
40 mm (1.5")	39.8 mm (1.57")	A	100 mm (3.93")	19 degrees	10 m (32.8 ft)
50 mm (2")	47.8 mm (1.88")	B	131.5 mm (5.18")	15 degrees	20 m (65.6 ft)
80 mm (3")	74.8 mm (2.94")	C	164.5 mm (6.48")	10 degrees	20 m (65.6 ft)
100 mm (4")	94.8 mm (3.73")	D	219.5 mm (8.64")	8 degrees	20 m (65.6 ft)

SITRANS LR250 dimensions

SITRANS LR250

Schematics





Remaques :

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

Hand Programmer

SITRANS LR250 HART

Part number:
7ML1930-1BK

SITRANS LR250 connections

Overview

SITRANS LR300 is a 4-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).

Benefits

- Auto False-Echo Suppression
- Infrared Intrinsically Safe handheld or remote programming
- 5.8 GHz (U.S.A. 6.3 GHz)
- Built-in diagnostics
- Various flanges, horn and waveguide antenna options available
- Extremely high signal-to-noise ratio

Application

The SITRANS LR300 is available both for standard applications and for applications that require explosion proof protection.

The SITRANS LR300 features a compact design and robust construction and is available with an epoxy-coated aluminum or stainless steel enclosure. Operating at low frequency and high signal transmission speed, it is virtually unaffected by atmospheric or temperature conditions. It provides reliable measurement in environments with harsh chemicals, steam, dust, encrustation, turbulence and agitation.

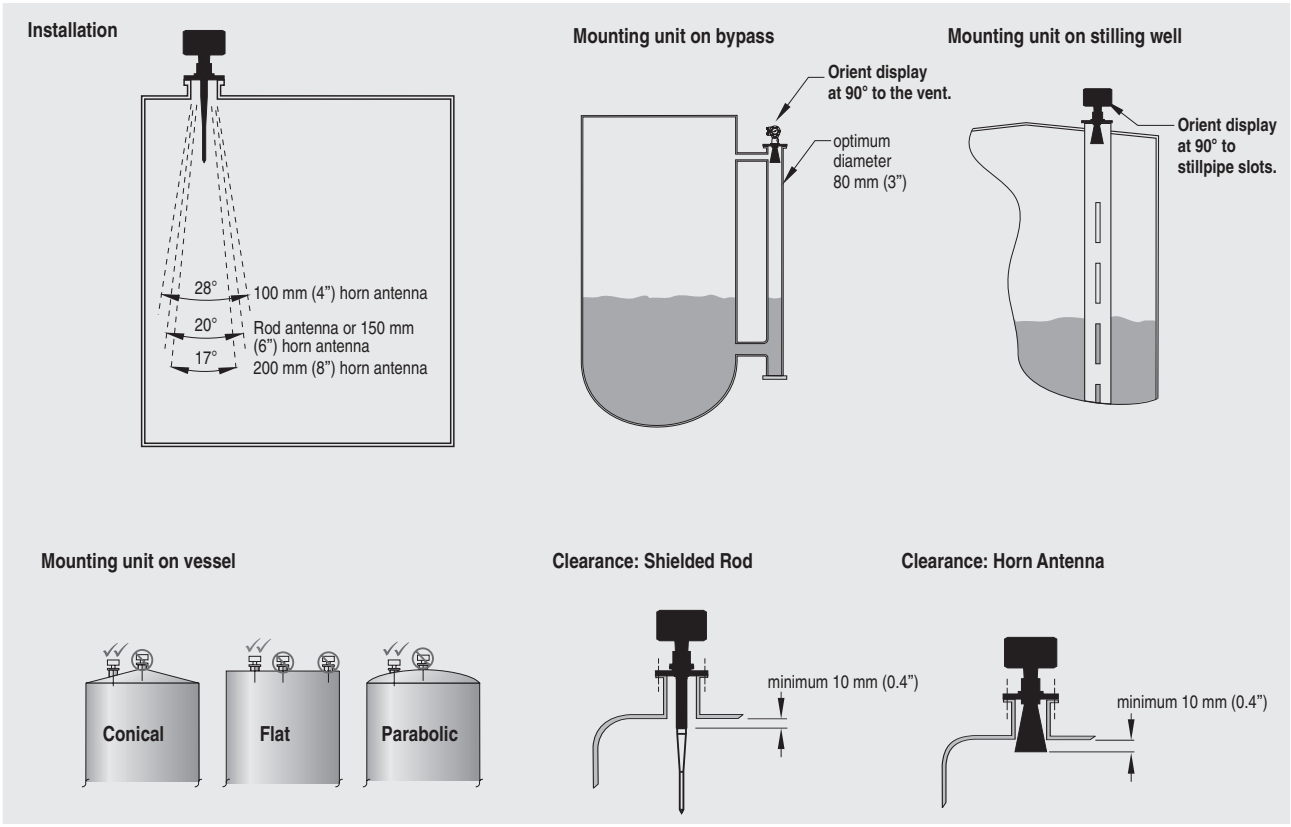
The high resistance PTFE rod antenna is chemically immune and resistant to material buildup. The SITRANS LR300 can communicate using the following protocols: Modbus®, HART® or optional PROFIBUS PA.

When using the flange or threaded antenna options, the SITRANS LR300 is easily installed by positioning the unit on a standpipe, bolting or threading it in place and connecting it to the power supply. There's no need to fill or empty the vessel for calibration or commissioning.

- Key Applications: liquid bulk storage tanks, agitated process vessels

SITRANS LR300

Configuration



SITRANS LR300 installation

SITRANS LR300

Technical specifications

Mode of operation	
Measuring principle	Radar level measurement
Frequency	5.8 GHz (U.S.A. 6.3 GHz)
Input	
Measuring range	0.4 to 20 m (1.3 to 65 ft)
Output	
Output signal	
• Analog output	Optically isolated, 4 to 20 mA
- Load	Max. 450 Ω
- Accuracy	0.02 mA
• Communications	Modbus/RS-485 connection, HART® or optional PROFIBUS PA
Performance (reference conditions)	
• Error in measurement at +20 °C (+68 °F)	± 15 mm from 0.4 to 10 m ± 0.15% from 10 to 20 m
- Temperature drift	< ± 0.25% of range, -40 to +60 °C (-40 to +140 °F)
- Repeatability	± 2 mm, up to 3 m ± 3 mm, from 3 m to 5 m ± 5 mm, from 5 m to 10 m ± 10 mm, from 10 m to 20 m
- Fail-safe	mA signal programmable as high, low or hold (Loss of Echo)
Rated operating conditions	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 to +60 °C (-40 to +140 °F)
• Installation category	II
• Pollution degree	4
Medium conditions	
• Dielectric constant εr	ε_r > 1.6 (For ε_r < 3, use waveguide antenna or stillpipe)
• Temperature	-40 to +200 °C (-40 to +392 °F)
• Pressure (vessel)	Dependent on process connection and temperature (refer to Pressure/Temperature curves)
Design	
• Enclosure	
- Material	Aluminium, epoxy coated or optional stainless steel
- Cable inlet	2 x ½" NPT or M20x1.5
• Degree of protection	Type 4X/NEMA 4X, Type 6/ NEMA 6, IP67, IP68
• Weight	6.5 kg (14.3 lbs) with 2"/150 psi flange; weight varies depending on flange size and pressure rating
• Dielectric rod antennas	
- Material	PTFE
- Dimensions	41 cm (16.3") long including integral gasket (other antenna types available)
Process connections	
• Flange	Flat faced flanges: 316L stainless steel, 50, 80, 100, 150, 200 mm (2, 3, 4, 6, 8"), bolt hole pattern to ASME, DIN and JIS sizes
• Other connections	Available

Power supply	
• Universal power supply unit	24 to 230 V AC ± 15%, 40 to 70 Hz, 28 VA (11 W) 24 to 230 V DC ± 15%, 9 W
Certificates and approvals	
• Safety	$CSA_{NRTL/C}$, CE, FM
• Marine	• Lloyd's Register of Shipping • ABS Type Approval
• Radio	Europe, Industry Canada, FCC
• Explosion Proof	• ATEX II 1/2 G EEx de IIC T6 • ATEX II 1/2 G EEx de [ia] IIC T6 • CSA Class I, Div 1, Groups A, B, C, D, E, F, G • FM Class I, Div.1, Groups A, B, C, D, E, F and G
• Sanitary	3A Sanitary (Sanitary rod antenna only)
Communication	
• Intrinsically Safe Siemens Milltronics 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
• Programmer (remote keypad)	Modbus, HART or optional PROFIBUS PA; upgradable Flash via RS-485
• PC	SIMATIC PDM
• Display (local)	Alphanumeric and multi-graphic liquid crystal for readout and entry

SITRANS LR300

Selection and Ordering data

Order No.

SITRANS LR300, horn antenna version C) **7ML5411-**

4-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).

Antenna version

Stainless steel 316L with PTFE emitter	0
Stainless steel 316L with PTFE emitter and purging kit[1]	1
Sliding waveguide system 1000 mm (40") long[1] and 2)	2

Flange design (Flat faced, 316L Stainless Steel)

DN 50 PN 16, Type A, flat faced[1]	AA
DN 80 PN 16, Type A, flat faced	BA
DN 100 PN 16, Type A, flat faced	CA
DN 150 PN 16, Type A, flat faced	DA
DN 200 PN 16, Type A, flat faced	EA
2" ASME, 150 lb[1]	FB
3" ASME, 150 lb, flat faced	GB
4" ASME, 150 lb, flat faced	HB
6" ASME, 150 lb, flat faced	JB
8" ASME, 150 lb, flat faced[1]	KB
DN 50 PN 40, flat faced[1]	AC
DN 80 PN 40, flat faced	BC
DN 100 PN 40, flat faced	CC
DN 150 PN 40, flat faced	DC
DN 200 PN 40, flat faced	EC
2" ASME, 300 lb, flat faced[1]	FD
3" ASME, 300 lb, flat faced	GD
4" ASME, 300 lb, flat faced	HD
6" ASME, 300 lb, flat faced	JD
8" ASME, 300 lb, flat faced	KD
JIS DN 50 10K[1]	AE
JIS DN 80 10K	BE
JIS DN 100 10K	CE
JIS DN 150 10K	DE
JIS DN 200 10K	EE

(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2238 standard.)

Communication/output

4 to 20 mA, HART®, Modbus	0
PROFIBUS PA, Modbus	1

Process seal/Gasket

FKM	0
Nitrile, only for sliding waveguide systems	1
FFKM [-35 to +200 °C (-31 to +392 °F)]	2

Enclosure/Cable inlet

Aluminum, Epoxy painted	
2 x ½" NPT	0
2 x M20x1.5	1
Stainless steel 316L	
2 x ½" NPT	2
2 x M20x1.5	3

Horn size/Waveguide options

80 mm (3") horn[3]	B
100 mm (4") horn[3]	C
150 mm (6") horn	D
200 mm (8") horn	E
100 mm (4") horn with 100 mm (4") waveguide extension[3]	F
100 mm (4") horn with 150 mm (6") waveguide extension[3]	G
100 mm (4") horn with 200 mm (8") waveguide extension[3]	H
100 mm (4") horn with 250 mm (10") waveguide extension[3]	J
150 mm (6") horn with 100 mm (4") waveguide extension	K
150 mm (6") horn with 150 mm (6") waveguide extension	L
150 mm (6") horn with 200 mm (8") waveguide extension	M
150 mm (6") horn with 250 mm (10") waveguide extension	N
200 mm horn with 100 mm (4") waveguide extension	P
200 mm horn with 150 mm (6") waveguide extension	Q
200 mm (8") horn with 200 mm (8") waveguide extension	R
200 mm (8") horn with 250 mm (10") waveguide extension	S
Waveguide only - Waveguide length 500 mm to 3000 mm (in 1 mm increments) (Add order code Y01 and plain text: "waveguide length ...mm")	T
Horn with custom waveguide lengths 101 to 2000 mm (Add order code Y01 and plain text: "waveguide length...mm", and Add order code Y03 and plain text: "horn size ...mm")[4]	U

Approvals

General Purpose, CE, $CSA_{US/C}$[5]	A
CSA Class I, Div 1, Groups A, B, C, D, E, F, G, CE[5]	D
ATEX II 1/2 G EEx de IIC T6, CE[5] and 6)	E
FM Class I, Div 1, Groups A, B, C, D, E, F, G, FCC, 6.3 GHz, for U.S.A. only	F
General Purpose, FM, FCC, 6.3 GHz, for U.S.A. only	G
ATEX II 1/2 G EEx de [ia] IIC T6	J

Pressure rating

Rating per Pressure/Temperature curves in manual	0
0.5 bar (7.25 psi maximum)	1

Further designs

Order code

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

Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Inspection Certificate Type 3.1 per EN 10204	C12
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	Y15
Horn with waveguide extension custom lengths: Enter the total length of the waveguide in plain text description (1 mm increments)	Y01
Enter the Horn size in plain text description [100 mm (3.94"), 150 mm (5.91"), and 200 mm (7.87") only]	Y03

Selection and Ordering data		Order No.
SITRANS LR300, horn antenna version	C)	**7 M L 5 4 1 1 -**
4-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).		
Instruction manual		
English	C)	**7ML1998-5CL05**
French	C)	**7ML1998-5CL14**
German Note: Instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-5CL34**
Multi-language Quick Start manual	C)	**7ML1998-5QA85**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
Handheld programmer for SITRANS LR300, Intrinsically Safe, EEx ia	C)	**7ML5830-2AH**
Enclosure wrench		**7ML1830-1HB**
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77"), for fastening on mounting-eye, one text line, (e.g. for Sensors)		**7ML1930-1BJ**
HART® modem/RS-232 (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DB**
RS 485 to RS 232 converter, not isolated, port powered	C)	**7ML1830-1HA**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only)		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**

1) Available with pressure rating option 1 only

2) Available with horn size option C, D, E only

3) For stilling well applications only

4) Order standard waveguide lengths 100, 150, 200, 250 mm (3.93, 5.91, 7.87, 9.84") by choosing options from *Horn size/Waveguide options*

5) Includes European Radio and Industry Canada approvals, 5.8 GHz

6) Available with communication option 0 only

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

SITRANS LR300

Selection and Ordering data

Order No.

SITRANS LR300, sanitary version C) **7ML5412-**

4-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).

Antenna version	
PTFE, one piece rod antenna	0
UHMW-PE, one piece rod antenna	1
Process connection	
Sanitary fitting clamp	A
Configuration/connection size	
Only for rod antenna	
• 2" (50.8 mm) connection	A
• 3" (76.2 mm) connection	B
• 4" (101.6 mm) connection	C
Antenna extension	
Without antenna extension	0
Mounting Clamp	
No mounting clamp	0
Mounting clamp included[1]	1
Enclosure/cable inlet	
Aluminum, epoxy coated	
• 2 x ½" NPT	0
• 2 x M20x1.5	1
Stainless steel 316L	
• 2 x ½" NPT	2
• 2 x M20x1.5	3
Communication/output	
4 to 20 mA, HART®, Modbus	A
PROFIBUS PA, Modbus	B
Approvals	
General Purpose, CE, $CSA_{US/C}$[2]	A
CSA Class I, Div I, Groups A, B, C, D, E, F, G, CE[2]	D
ATEX II 1/2 G EEx de IIC T6, CE[2] and 3)	E
FM Class I, Div I, Groups A, B, C, D, E, F, G, FCC, 6.3 GHz, for U.S.A. only	F
General Purpose, FM, FCC, 6.3 GHz, for U.S.A. only	G
ATEX II 1/2 G EEx de [ia] IIC T6	J
Pressure rating	
Rating per Pressure/Temperature curves in manual	0
0.5 bar (7.25 psi maximum)	1

Further designs

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

	Order code
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	**Y15**

Selection and Ordering data

Order No.

SITRANS LR300, sanitary version C) **7ML5412-**

4-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).

Instruction manual

English	C)	**7ML1998-5CL05**
French	C)	**7ML1998-5CL14**
German Note: The instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-5CL34**
Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	C)	**7ML1998-5QA85**

Accessories

Handheld programmer for SITRANS LR300, Intrinsically Safe, EEx ia	C)	**7ML5830-2AH**
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77"), for fastening on mounting-eye, one text line, (e.g. for Sensors)		**7ML1930-1BJ**
Sanitary fitting clamp, stainless steel:		
2" (50.8 mm)		**7ML1830-1HD**
3" (76.2 mm)		**7ML1830-1HE**
4" (101.6 mm)		**7ML1830-1HF**
Enclosure wrench		**7ML1830-1HB**
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DB**
RS 485 to RS 232 converter, not isolated, port powered	C)	**7ML1830-1HA**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only)		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**

1) Available with pressure rating option 1 only

2) Includes European Radio and Industry Canada approvals, 5.8 GHz

3) Available with communication option A only

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

Selection and Ordering data

Order No.

SITRANS LR300, rod antenna version C) **7ML5413-**

4-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).

Antenna version

PTFE **0**

Process connection

Flange version (Flat faced, 316L Stainless Steel)

DN 50 PN 16, Type A, flat faced **AA**
DN 80 PN 16, Type A, flat faced **BA**
DN 100 PN 16, Type A, flat faced **CA**
DN 150 PN 16, Type A, flat faced **DA**
2" ASME, 150 lb, flat faced **FB**
3" ASME, 150 lb, flat faced **GB**
4" ASME, 150 lb, flat faced **HB**
6" ASME, 150 lb, flat faced **JB**
DN 50 PN 40, flat faced **AC**
DN 80 PN 40, flat faced **BC**
DN 100 PN 40, flat faced **CC**
DN 150 PN 40, flat faced **DC**
2" ASME 300 lb, flat faced[1] **FD**
3" ASME, 300 lb, flat faced **GD**
4" ASME, 300 lb,flat faced **HD**
6" ASME, 300 lb, flat faced **JD**
JIS DN 50 10K **AE**
JIS DN 80 10K **BE**
JIS DN 100 10K **CE**
JIS DN 150 10K **DE**

(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2238 standard.)

Threaded version (316L Stainless Steel)

1½" NPT [(Taper), ANSI/ASME B1.20.1] **LA**
2" NPT [(Taper), ANSI/ASME B1.20.1] **MA**
R 1½" [(BSPT), EN 10226] **LC**
R 2" [(BSPT), EN 10226] **MC**
G 1½" [(BSPP), EN ISO 228-1] **LE**
G 2" [(BSPP), EN ISO 228-1] **ME**

Antenna extension, or inactive shield length

Without antenna extension **0**

PTFE extension

50 mm (1.97") **1**
100 mm (3.94") **2**

Stainless steel 316L extension[2]

100 mm (3.94") **3**
150 mm (5.91") **4**
200 mm (7.87") **5**
250 mm (9.84") **6**
Custom inactive shield length 101 mm to 1000 mm (in 1 mm increments) Add order code Y01 and plain text: "Inactive shield length...mm"[2] **7**

Process Seal/Gasket

Integral Gasket[3) and 4)] **0**
FKM O-ring[5] **1**

Enclosure/Cable inlet

Aluminum, Epoxy painted

2 x ½" NPT **0**
2 x M20x1.5 **1**

316L Stainless steel

2 x ½" NPT **2**
2 x M20x1.5 **3**

Communication/output

4 to 20 mA, HART®, Modbus **A**
PROFIBUS PA, Modbus **B**

Selection and Ordering data

Order No.

SITRANS LR300, rod antenna version C) **7ML5413-**

4-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).

Approvals

General Purpose, CE, $CSA_{US/C}$[6] **A**
CSA Class I, Div I, Groups A, B, C, D, E, F, G, CE[6] **D**
ATEX II 1/2 G EEx de IIC T6, CE[7] **E**
FM Class I, Div I, Groups A, B, C, D, E, F, G, FCC, 6.3 GHz, for U.S.A. only **F**
General Purpose, FM, FCC, 6.3 GHz, for U.S.A. only **G**
ATEX II 1/2 G EEx de [ia] IIC T6 **J**

Pressure rating

Rating per Pressure/Temperature curves in manual **0**
0.5 bar (7.25 psi maximum) **1**

Further designs

Order code

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

Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000 **C11**
Inspection Certificate Type 3.1 per EN 10204 **C12**
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 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text **Y15**

Instruction manual

Order No.

English C) **7ML1998-5CL05**
French C) **7ML1998-5CL14**
German C) **7ML1998-5CL34**

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

Multi-language Quick Start manual C) **7ML1998-5QA85**

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

Accessories

Handheld programmer for SITRANS LR300, Intrinsically Safe, EEx ia C) **7ML5830-2AH**
Antenna rod, PTFE **7ML1830-1HC**
Antenna extension, 50 mm (2"), PTFE **7ML1830-1CH**
Antenna extension, 100 mm (4"), PTFE **7MH1830-1CG**
Tag, stainless steel with hole, 12 x 45 mm (0.47 x 1.77"), for fastening on mounting-eye, one text line, (e.g. for Sensors) **7ML1930-1BJ**
Enclosure wrench **7ML1830-1HB**
HART® modem/RS-232 (for use with a PC and SIMATIC PDM) D) **7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM) D) **7MF4997-1DB**
RS 485 to RS 232 converter, not isolated, port powered C) **7ML1830-1HA**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only) **7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F with integrated shield connection (available for PROFIBUS PA) **7ML1930-1AQ**

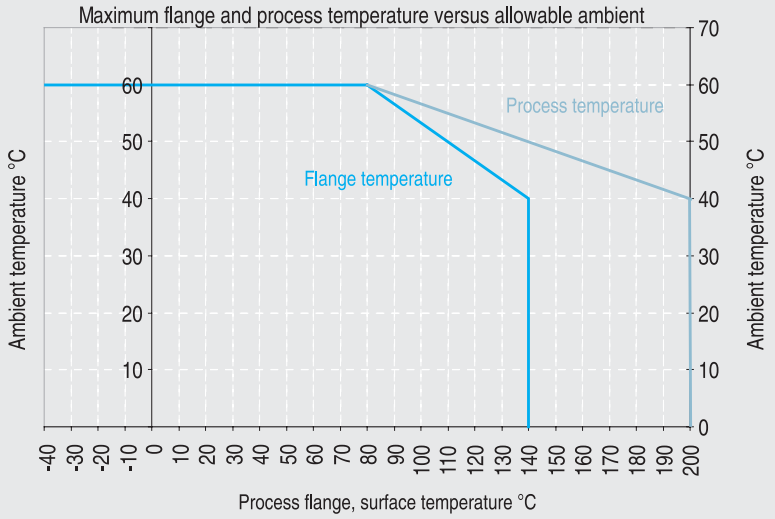
1) For use with pressure rating option 1 only
2) For use with all process connection options except AA, FB, AC, FD, AE, LA, LC and LE
3) Available with flat faced flange process connections only
4) Available with antenna extension options 0, 1, 2 only
5) Not available for combination of flat faced flanges with antenna extension options 0, 1 or 2
6) Includes European Radio and Industry Canada approvals, 5.8 GHz
7) Not available with Communication option B

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

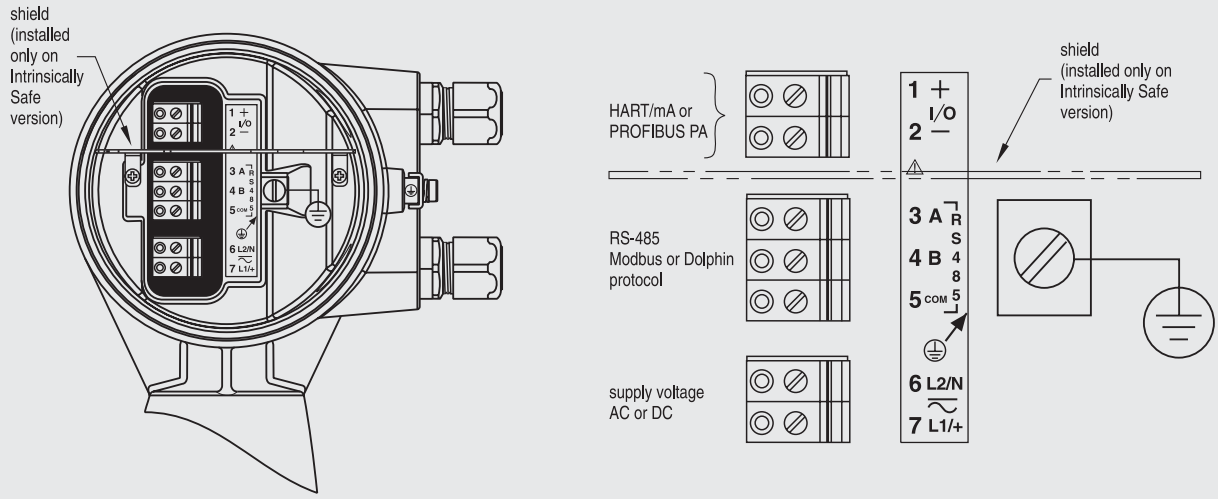
SITRANS LR300

Characteristic curves



SITRANS LR300 Process Pressure/Temperature derating curves

Schematics



Notes

- recommended torque on terminal clamping screws, 0.5 to 0.6 Nm
- ground shields at one end only
- 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
- a circuit breaker or switch in the building installation, marked as the disconnect switch, shall be in close proximity to the equipment and within easy reach of the operator

Wiring requirements

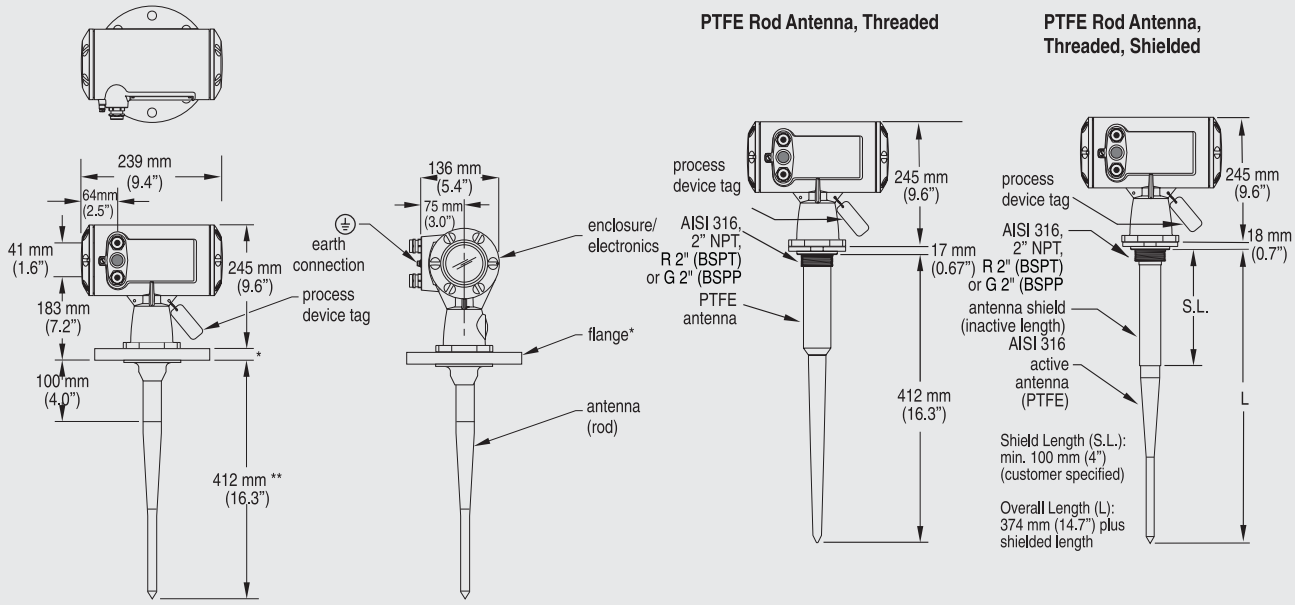
- Increased safety, EEx e version
  - solid 4
  - flexible stranded 2.5
- General safety or hazardous EEx d version
  - rigid 0.2 to 4
  - flexible stranded 0.2 to 2.5
  - AWG 24 to 12

Hand Programmer

Part number:
7ML5830-2AH

SITRANS LR300 connections

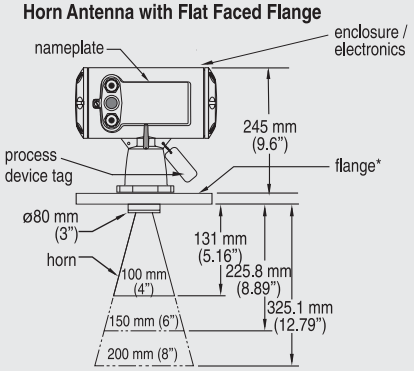
Dimensional drawings



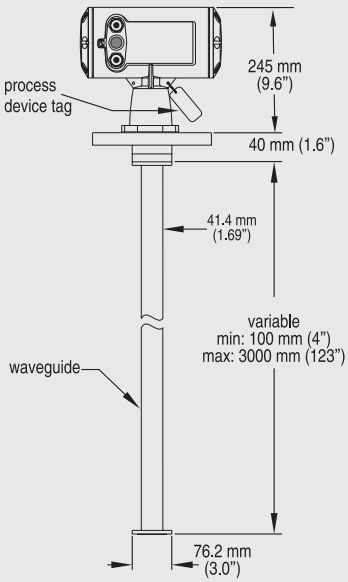
* Flange thickness 25 mm (1") nominal

**Standard length, 50 mm and 100 mm (2" and 4") antenna extensions available.

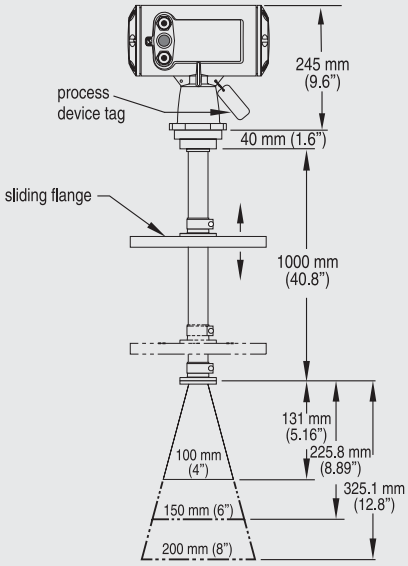
Horn Antenna with Flat Faced Flange



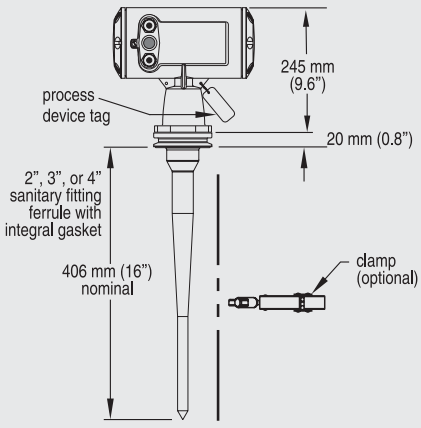
Waveguide Antenna with Flat Faced Flange



Sliding Waveguide



Sanitary Rod Antenna



SITRANS LR300 dimensions

SITRANS LR200 and SITRANS LR300 Antennas

Integration

Antenna configurations for SITRANS LR200 and LR300

Technical specifications

Antenna Types	Flat Faced Flange with Rod	Shielded Rod	Sanitary Rod (1 piece construction)	Horn (4", 6", 8" sizes available)	Waveguide
Connection Type	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6")	Threaded 2" NPT, R 2" (BSPT), G 2" (BSPP) or flat faced flange nominal pipe sizes 80, 100 mm (3, 4")	Sanitary fitting clamp 50, 80, 100 mm (2, 3, 4") sizes	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6")	Flat faced flange nominal pipe sizes 50, 80, 100, 150 mm (2, 3, 4, 6")
Wetted Parts	PTFE	PTFE, 316L stainless steel, FKM o-ring	UHME-PE or PTFE	316L stainless steel PTFE, FKM o-ring	316L stainless steel PTFE, FKM o-ring
Extensions	50 or 100 mm (2" or 4") PTFE or UHMW-PE	100, 150, 200 or 250 mm (4, 6, 8 or 10") standard shield length	N/A	use waveguide for extensions to 6 m (20 ft) long	two sections (max.) can be connected together Max. overall length: 3 m (9.8 ft)
Dielectric Constant	> 3	> 3	> 3	> 3	> 1.6
Insertion Length (max.)	41 cm (16.3")	variable	41 cm (16.3")	variable with extension	variable
Purging Option (Liquid or Gas)	No	No	No	Yes	Yes
Sliding Waveguide Option for Digesters[2]	Yes	No	No	Yes	N/A
Weight[3]	6.5 kg (14.3 lbs)	5.0 kg (11 lbs)	5.0 kg (11 lbs)	7.5 kg (16.5 lbs)	8.0 kg (17.6 lbs) 1 m (39") length
Approvals	[1]	[1]	3A	[1]	[1]

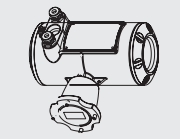
[1] Please see a Siemens Milltronics representative for a list of safety and radio approvals.

[2] Maximum pressure 0.5 bar at +60 °C (7.25 psi at +140 °F)

[3] Not including extensions, includes SITRANS LR200 or SITRANS LR300 and smallest process connection

Selection and Ordering data

SITRANS LR200 and SITRANS LR300 Specials

	Order No.
SITRANS LR300 Aluminum Enclosure Kit with Electronics and Covers (7ML5411, 7ML5412, 7ML5413), calibrated for use with standard rod antenna	
SITRANS LR300 aluminum enclosure with board stack, M20 cable inlet, approval option A, with HART® communication, no process connection. See note 7.	C) **PBD-51035860**
SITRANS LR300 aluminum enclosure with board stack, M20 cable inlet, approval option E, with HART communication, no process connection. See note 7.	**PBD-51035377**
SITRANS LR300 aluminum enclosure with board stack, M20 cable inlet, approval option G, with HART communication, no process connection. See note 7.	C) **PBD-51035336**
SITRANS LR300 aluminum enclosure with board stack, M20 cable inlet, approval option J, with HART communication, no process connection. See note 7.	C) **PBD-51035566**
SITRANS LR300 aluminum enclosure with board stack, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection. See note 7.	C) **PBD-51036053**
SITRANS LR300 aluminum enclosure with board stack, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection. See note 7.	C) **PBD-51036054**
SITRANS LR300 aluminum enclosure with board stack, NPT cable inlet, approval option G, with PROFIBUS PA communication, no process connection. See note 7.	C) **PBD-51036055**
SITRANS LR300 aluminum enclosure with board stack, M20 cable inlet, approval option J, with PROFIBUS PA communication, no process connection. See note 7.	C) **PBD-51036056**
SITRANS LR200 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, 5.8 GHz, M20 cable inlet, approval option A, with HART communication, no process connection. See note 7.	C) **PBD-51036169**
SITRANS LR200 aluminum enclosure with board stack, 5.8 GHz, M20 cable inlet, approval option E, with HART communication, no process connection. See note 7.	C) **PBD-51036236**
SITRANS LR200 aluminum enclosure with board stack, 6.3 GHz, M20 cable inlet, approval option C, with HART communication, no process connection. See note 7.	C) **PBD-51036530**
SITRANS LR200 aluminum enclosure with board stack, 5.8 GHz, M20 cable inlet, approval option E, with PROFIBUS PA communication, no process connection. See note 7.	C) **PBD-51036531**
SITRANS LR200 aluminum enclosure with board stack, 5.8 GHz, M20 cable inlet, approval option A, with PROFIBUS PA communication, no process connection. See note 7.	C) **PBD-51036532**
SITRANS LR200 aluminum enclosure with board stack, 6.3 GHz, M20 cable inlet, approval option C, with PROFIBUS PA communication, no process connection. See note 7.	C) **PBD-51036533**

SITRANS LR200 and SITRANS LR300 Antennas

SITRANS LR200 aluminum enclosure with board stack, 5.8 GHz, NPT cable inlet, approval option A, with HART communication, no process connection. See note 7.	C) **PBD-51036534**
SITRANS LR200 aluminum enclosure with board stack, 6.3 GHz, NPT cable inlet, approval option C, with HART communication, no process connection. See note 7.	C) **PBD-51036535**
SITRANS LR200 aluminum enclosure with board stack, 5.8 GHz, NPT cable inlet, approval option E, with HART communication, no process connection. See note 7.	C) **PBD-51036536**
SITRANS LR200 aluminum enclosure with board stack, 5.8 GHz, NPT cable inlet, approval option A, with PROFIBUS PA communication, no process connection. See note 7.	C) **PBD-51036537**
SITRANS LR2 00 aluminum enclosure with board stack, 6.3 GHz, NPT cable inlet, approval option C, with PROFIBUS PA communication, no process connection. See note 7.	C) **PBD-51036538**
SITRANS LR200 aluminum enclosure with board stack, 5.8 GHz, NPT cable inlet, approval option E, with PROFIBUS PA communication, no process connection. See note 7.	C) **PBD-51036539**
SITRANS LR200/LR300 Horn Antenna Kits with mounting screws (no emitter supplied)	
80 mm (3") horn antenna kit	**PBD-25500K02A**
100 mm (4") horn antenna kit	**PBD-25500K03A**
150 mm (6") horn antenna kit	**PBD-25500K05A**
200 mm (8") horn antenna kit	**PBD-25500K07A**
SITRANS LR300 Horn Antenna Extension Kits with mounting screws	
100 mm (4") horn antenna extension kit	**PBD-25501K0100A**
150 mm (6") horn antenna extension kit	**PBD-25501K0150A**
200 mm (8") horn antenna extension kit	**PBD-25501K0200A**
250 mm (10") horn antenna extension kit	**PBD-25501K0250A**
500 mm (20") horn antenna extension kit	**PBD-25501K0500A**
1000 mm (40") horn antenna extension kit	**PBD-25501K1000A**
SITRANS LR200/LR300 Flanged Rod Antenna Kit with 316L SS flat faced flanges	
Flanged PTFE rod antenna kit, 2" ASME, 150 lb. See drawing 51003 on http://www.siemens.com/radar. See notes 1 and 6.	**PBD-51003K020AAAA**
Flanged PTFE rod antenna kit, 2" ASME, 150 lb. See drawing 51003 on http://www.siemens.com/radar. See notes 1 and 6.	**PBD-51003K050AJAA**
Flanged PTFE rod antenna kit, JIS 10K DN50. See drawing 51003 on http://www.siemens.com/radar. See notes 1 and 6.	**PBD-51003K050AOAA**

C) Subject to export regulations AL: N, ECCN: EAR99

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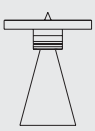
SITRANS LR200 and SITRANS LR300 Antennas

SITRANS LR200/LR300 PTFE Rod Antenna Kit with 316L SS 1½" pipe thread process connection	
PTFE rod antenna kit, 1½" NPT 316L SS Process Connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar. See note 6.	**PBD-51004K1AAA**
PTFE rod antenna kit, R 1½" (BSPT), EN 10226 316L SS Process Connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar. See note 6.	**PBD-51004K2AAA**
PTFE rod antenna kit, 1½" G 316L SS Process Connection, FKM O-ring; See drawing 51004 on http://www.siemens.com/radar. See note 6.	**PBD-51004K3AAA**
SITRANS LR200/LR300 PTFE Rod Antenna Kit with 316L SS 2" pipe thread process connection	
PTFE rod antenna kit, 2" NPT 316L SS Process Connection, FKM O-ring; See drawing 51005 on http://www.siemens.com/radar. See note 6.	**PBD-51005K1AAA**
PTFE rod antenna kit, R 2" (BSPT), EN 10226 316L SS Process Connection, FKM O-ring; See drawing 51005 on http://www.siemens.com/radar. See note 6.	**PBD-51005K2AAA**
PTFE rod antenna kit, 2" G 316L SS Process Connection, FKM O-ring; See drawing 51005 on http://www.siemens.com/radar. See note 6.	**PBD-51005K3AAA**
SITRANS LR200/LR300 PTFE Rod Antenna Kit (100 mm shield) with 316L SS 2" pipe thread process connection	
PTFE rod antenna shielded kit, 2" NPT 316L SS Process Connection, FKM O-ring, 100 mm 316L SS shield. See drawing 51002 on http://www.siemens.com/radar. See notes 3 and 6.	**PBD-51002K0100AAA**
PTFE rod antenna shielded kit, R 2" (BSPT), EN 10226 316L SS Process Connection, FKM O-ring, 100 mm 316L SS shield. See drawing 51002 on http://www.siemens.com/radar. See notes 3 and 6.	**PBD-51002K0100BAA**
PTFE rod antenna shielded kit, 2" G 316L SS Process Connection, FKM O-ring, 100 mm 316L SS shield. See drawing 51002 on http://www.siemens.com/radar. See notes 3 and 6.	**PBD-51002K0100CAA**
SITRANS LR200/LR300 Horn Antenna Kit with 316L SS flat faced flange, with PTFE emitter (without waveguide)	
Horn antenna kit, 2" ASME 316L SS flange 3" horn, PTFE emitter; See notes 1 and 6.	**PBD-51006K020AAAA**
Horn antenna kit, 2" ASME 316L SS flange 4" horn, PTFE emitter; See notes 1 and 2.	**PBD-51006K020AABA**
Horn antenna kit, 2" ASME 316L SS flange 6" horn, PTFE emitter; See notes 1 and 2.	**PBD-51006K020AACA**
Horn antenna kit, 2" ASME 316L SS flange 8" horn, PTFE emitter; See notes 1 and 2.	**PBD-51006K020AADA**
Horn antenna kit, DN 50 PN 16 316L SS flange 80 mm horn, PTFE emitter; See notes 1 and 2.	**PBD-51006K050AJAA**
Horn antenna kit, DN 50 PN 16 316L SS flange 100 mm horn, PTFE emitter; See notes 1 and 2.	**PBD-51006K050AJBA**
Horn antenna kit, DN 50 PN 16 316L SS flange 150 mm horn, PTFE emitter; See notes 1 and 2.	**PBD-51006K050AJCA**
Horn antenna kit, DN 50 PN 16 316L SS flange 200 mm horn, PTFE emitter; See notes 1 and 2.	**PBD-51006K050AJDA**
SITRANS LR200/LR300 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. See note 6.	**PBD-51010K1AA**
PTFE sanitary rod antenna kit, 3" mounting connection. See note 6.	**PBD-51010K2AA**
PTFE sanitary rod antenna kit, 4" mounting connection. See note 6.	**PBD-51010K3AA**
UHMW-PE sanitary rod antenna kit, 2" mounting connection. See note 6.	**PBD-51010K1AB**
UHMW-PE sanitary rod antenna kit, 3" mounting connection. See note 6.	**PBD-51010K2AB**
UHMW-PE sanitary rod antenna kit, 4" mounting connection). See note 6.	**PBD-51010K3AB**
SITRANS LR200/LR300 PTFE Flanged Rod Antenna Kit with 316L SS shield and 316L SS flat faced flange	
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 100 mm 316L SS shield. See notes 1 and 6.	**PBD-51014K0100AAA**
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 100 mm 316L SS shield. See notes 1 and 6.	**PBD-51014K0100EJA**
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 150 mm 316L SS shield. See notes 1 and 6.	**PBD-51014K0150AAA**
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 150 mm 316L SS shield. See notes 1 and 6.	**PBD-51014K0150EJA**
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 200 mm 316L SS shield. See notes 1 and 6.	**PBD-51014K0200AAA**
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 200 mm 316L SS shield. See notes 1 and 6.	**PBD-51014K0200EJA**
PTFE shielded rod antenna kit, flanged, 3" ASME 150 lb 316L SS flange, 250 mm 316L SS shield. See notes 1 and 6.	**PBD-51014K0250AAA**
PTFE shielded rod antenna kit, flanged, DN 80 PN 16 316L SS flange, 250 mm 316L SS shield. See notes 1 and 6.	**PBD-51014K0250EJA**

PTFE paste		
Kit, PTFE paste, Tube, 250 mL. See note 7.	C)	**PBD-51036065**
Cable gland		
One polymeric cable gland M20x1.5, rated -20 to +80 °C (-4 to +176 °F) for General Purpose and ATEX EEx e		**7ML1930-1AN**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only)		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**

C) Subject to export regulations AL: N, ECCN: EAR99

Note 1: Available in flange sizes including ASME, DIN and JIS: please contact nacc.smpi@siemens.com.

Note 2: Available with no pressure rating

Note 3: Available in other shield lengths: please contact nacc.smpi@siemens.com.

Note 4: Available with no pressure rating and with General Purpose Approvals only

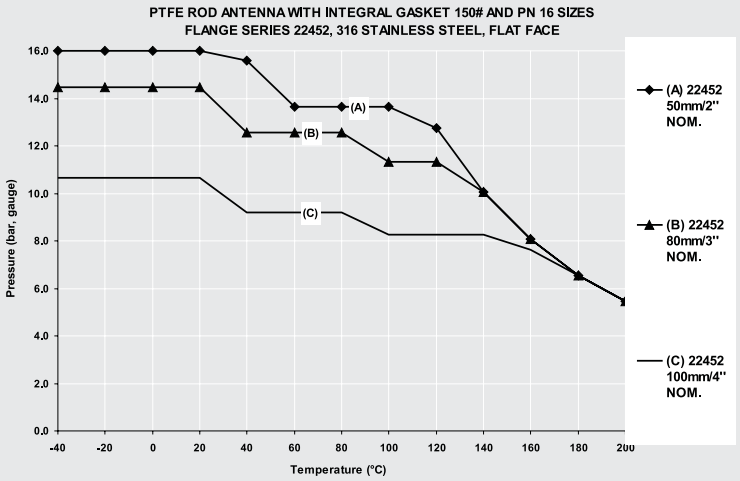
Note 5: Please contact nacc.smpi@siemens.com for pricing and part number. Submit completed Application Questionnaire found on page 5/149.

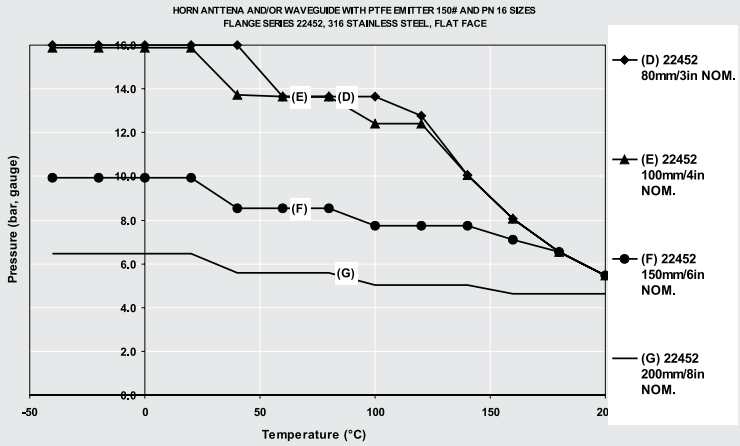
Note 6: Available with Pressure rating; serial number of original unit required with completed Application Questionnaire found on page 5/149.

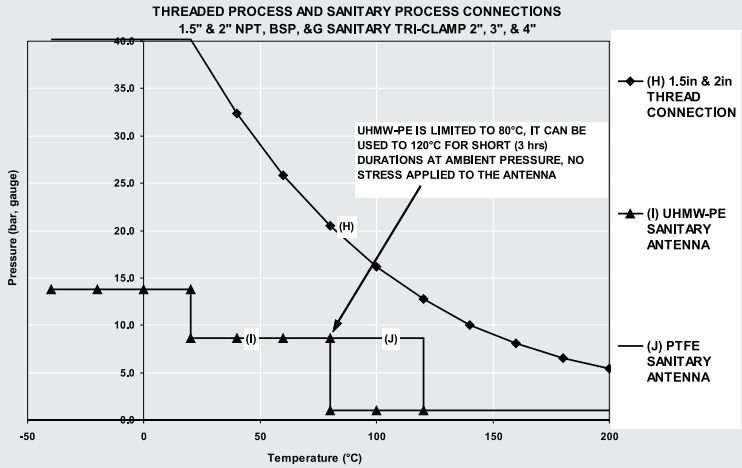
Note 7: Subject to export regulations AL: N, ECCN: EAR99

SITRANS LR200 and SITRANS LR300 Antennas

Characteristic curves







SITRANS LR200/LR300 Process Pressure/Temperature derating curves

SITRANS LR400

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 or high pressure, low dielectric media, such as L.P.G. (liquid, petroleum, gas).

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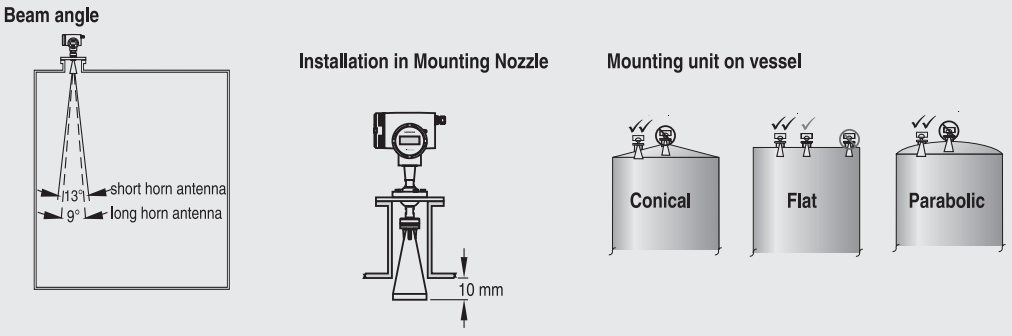
Configuration



SITRANS LR400 installation

SITRANS LR400

Technical specifications

Mode of operation	
Measuring principle	FMCW radar level measurement
Frequency	24 to 25 GHz FMCW
Measuring range	0.35 to 50 m (1.15 to 164 ft)
Output	
Analog output (HART®)	
• Signal range	Optically isolated 4 to 20 mA
• Load	Max. 600 Ω
Communication	HART, optional PROFIBUS PA
Digital output	Relay, NC or NO function, max. DC 50 V, max. 200 mA, rating 5 W
PROFIBUS PA protocol	Layer 1 and 2, Class A, Profile 3.0
Performance (Reference conditions)	
• Dead band	0 to 350 mm from bottom edge of flange
• Error in measurement at +25 °C (+77 °F)	≤ 5 mm from 2 to 10 m ≤ 15 mm from 10 to 50 m
- Repeatability	≤ 1 mm
- Fail-safe	mA signal programmable as high, low or hold (LOE)
Rated operating conditions	
• Amb. temperature for enclosure	-40 to +65 °C (-40 to +149 °F)
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Medium conditions	
Dielectric constant	ε_r>1.4
Process temperature range	
• Standard	-40 to +200 °C (-40 to +392 °F) -20 to +200 °C (-4 to +392 °F) for SITRANS LR400 with ATEX rating
• With optional temperature extension	-40 to +250 °C (-40 to +482 °F)
Vessel Pressure	Up to 40 bar (process connection dependent)
Design	
Weight	Approx. 12.2 kg (26.8 lbs) with 3" 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 2238
• Raised face flanges	316L stainless steel, 3", 4", 6", bolt holes matching ASME B 16.5

Programming	
Intrinsically Safe Siemens Milltronics 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 @ max. ambient temperature of +40 °C (+104 °F)
Handheld communicator	HART
PC	SIMATIC PDM
Display (local)	Alphanumeric LCD for readout and entry
Power supply	120 to 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
• Shipping	• Lloyd's Register of Shipping • ABS
• Radio	Europe (R&TTE, CETECOM), Industry Canada, FCC
• Hazardous areas	ATEX II 1/2 G EEx dem [ia] IIC T6 ATEX II 1/2 G EEx dem IIC T6 CSA/FM Class I, Div. 1, Groups B, C, D; Class II, Div. 1, Groups E, F, G; Class III T6
Optional equipment	Purging (self-cleaning) system PTFE dust cover

Selection and Ordering data

Order No.

SITRANS LR400 C) **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 to +200 °C (-40 to +392 °F), standard	0
-40 °C to +250 °C (-40 to +482 °F), high temperature extension	1
Process connection	
Universal, 0.5 bar (7.25 psi) maximum	
3"/80 mm[1]	A
4"/100 mm[1]	B
6"/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	V
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1, or JIS B 2238 standard.)	
Antenna	
Horn antenna, long 93 mm (3.66") diam. for 100 mm (4") nozzles	D
Horn antenna, short 74 mm (2.91") diam. for 80 mm (3") nozzles	K
Antenna purging system	
None	0
Purging system Note: Available with process connections A, B or D, only, and available for Area Classifications A or B only	1
Process seal/gasket	
PTFE for -40 to +250 °C (-40 to +482 °F) flange temperatures	1
FKM for -20 to +200 °C (-4 to +392 °F) flange temperatures[4]	3
Output/Communication	
4 to 20 mA, HART	0
PROFIBUS PA	1
Power supply/cable inlet	
120 to 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
Area classification	
General Purpose, CE, CETECOM[3]	A
General Purpose, CSA$_{US/C}$, Industry Canada, FCC, CE and R&TTE	B
ATEX II 2G EEx d IIC T6; CE, R&TTE	E
ATEX II 2G EEx dem IIC T6; CE, R&TTE	F
ATEX II 2G EEx dem [ia] IIC T6; CE, R&TTE[2]	G
ATEX II 1/2 GD EEx d IIC T6; CE, R&TTE[3]	J
ATEX II 1/2 GD EEx dem IIC T6; CE, R&TTE[4]	K

Selection and Ordering data

Order No.

SITRANS LR400 C) **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!

ATEX II 1/2 GD EEx dem [ia] IIC T6; CE, R&TTE[2] and 4)	L
ATEX II 2G EEx d IIC T6; CE, CETECOM[3]	M
ATEX II 2G EEx dem IIC T6; CE, CETECOM[3]	N
ATEX II 2G EEx dem [ia] IIC T6; CE, CETECOM[2] and 3)	P
ATEX II 1/2 GD EEx d IIC T6; CE, CETECOM[3] and 4)	Q
ATEX II 1/2 GD EEx dem IIC T6; CE, CETECOM[3] and 4)	R
ATEX II 1/2 GD EEx dem [ia] IIC T6; CE, CETECOM[2], 3) and 4)	S
FM Class I, Div. 1, Groups B, C, D; Class II/III, Div. 1, Groups E, F, G; FCC[4]	T
CSA Class I, Div. 1, Groups B, C, D; Class II/III, Div. 1, Groups E, F, G; FCC[4]	U
Local operation	
Local Display Only. Handheld programmer not included **(Order programmer separately.)**	2

Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	**Y15**

Instruction manual		Order No.
English	C)	**7ML1998-5FH06**
German	C)	**7ML1998-5FH36**
French	C)	**7ML1998-5FH15**
Multi-language Quick start manual	C)	**7ML1998-5QN83**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		

Accessories		
Handheld programmer Intrinsically Safe, EEx ia	C)	**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)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DB**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) for General Purpose or ATEX EEx e installations (available for HART only)		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**

1) Available with antenna purging system option 1 only

2) Available only with power supply option E or F

3) Germany and Belgium end customers only

4) Available with process temperature range option 0 only

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

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SITRANS LR400

Selection and Ordering data — Order No.

SITRANS LR400 Spare parts

3"/80 mm Universal Flange, without horn or hub. See note 1.		**PBD-51035813**
4"/100 mm Universal Flange, without horn or hub. See note 1.		**PBD-51035814**
6"/150 mm Universal Flange, without horn or hub. See note 1.		**PBD-51035815**
8"/200 mm Universal Flange, without horn or hub. See note 1.		**PBD-51035816**
Purging kit with Easy Aimer ball, no flange, no horn. See note 1.		**PBD-51036110**
Purging kit with Easy Aimer ball with 4"/100 mm flange, no horn. See note 1.		**PBD-51035810**
Purging kit with Easy Aimer ball with 6"/150 mm flange, no horn. See note 1.		**PBD-51035811**
Purging Kit with Easy Aimer ball with 8"/200 mm flange, no horn. See note 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" Horn antenna extension kit with General Purpose approvals		**PBD-51035474**
8" Horn antenna extension kit with General Purpose approvals		**PBD-51035473**
8" Horn antenna extension kit for hazardous units		**PBD-51036180**
SITRANS LR400 Aluminum enclosure with AC power, M20 cable inlet, HART® communication, and GP, CE, and CETECOM approvals. See note 2.	C)	**PBD-51036479**
SITRANS LR400 Aluminum enclosure with AC power, M20 cable inlet, PROFIBUS PA communication and GP, CE, and CETECOM approvals. See note 2.	C)	**PBD-51036480**
SITRANS LR400 Aluminum enclosure with AC power, M20 cable inlet, HART communication and GP, CE, CSA, Industry Canada, FCC and R&TTE. See note 2.	C)	**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. See note 2.	C)	**PBD-51035871**
SITRANS LR400 Aluminum enclosure with AC power, M20 cable inlet, HART® communication and ATEX II 1/2 GD EEx d IIC T6, CE and R&TTE approvals. See note 2.	C)	**PBD-51035872**
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. See note 2.	C)	**PBD-51035873**
SITRANS LR400 Aluminum enclosure with DC power, M20 cable inlet, HART communication and and GP, CE and CETECOM approvals. See note 2.	C)	**PBD-51036481**
SITRANS LR400 Aluminum enclosure with DC power, M20 cable inlet, PROFIBUS PA communication and GP, CE and CETECOM approvals. See note 2.	C)	**PBD-51036482**
SITRANS LR400 Aluminum enclosure with DC power, M20 cable inlet, HART communication and GP, CE, CSA, Industry Canada, FCC and R&TTE. See note 2.	C)	**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. See note 2.	C)	**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. See note 2.	C)	**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. See note 2.	C)	**PBD-51036486**

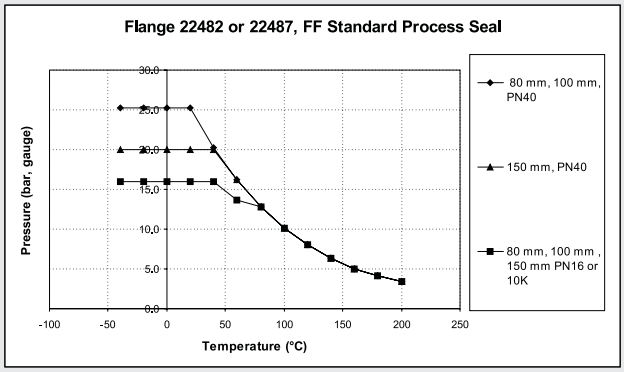
Note 1: Available with no pressure rating and with General Purpose approvals only

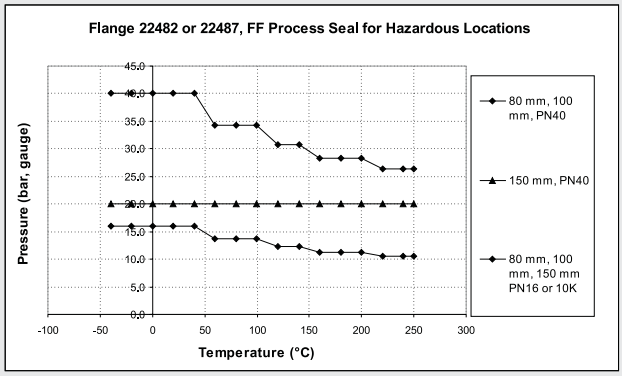
Note 2: Subject to export regulations AL: N, ECCN: EAR99

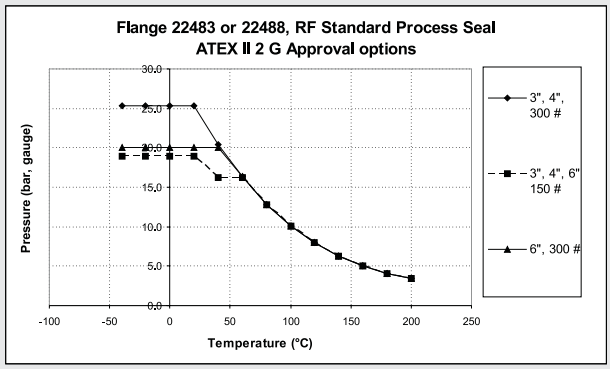
Please contact nacc.smpi@siemens.com for special requests.

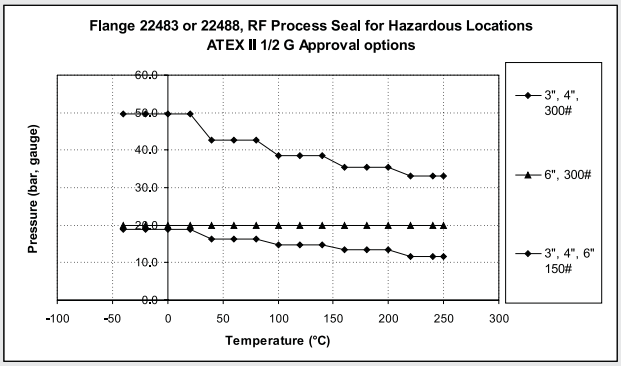
C) Subject to export regulations AL: N, ECCN: EAR99

Characteristic curves









SITRANS LR400 Process Pressure/Temperature derating curves

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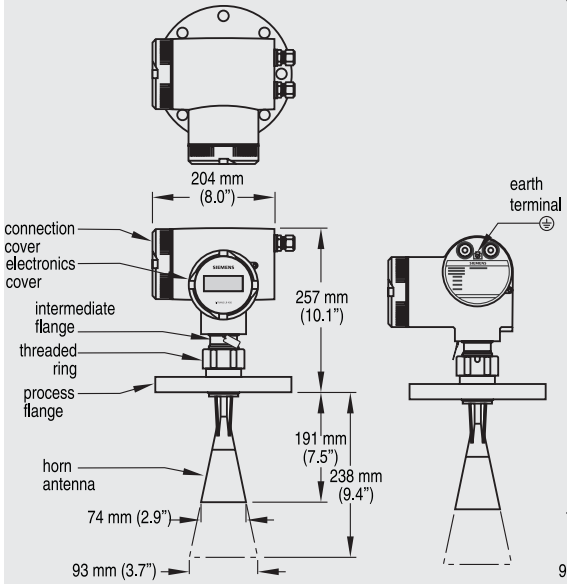
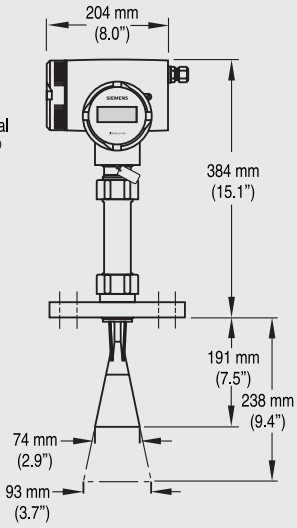
SITRANS LR400

Dimensional drawings

SITRANS LR400 (7ML5421)

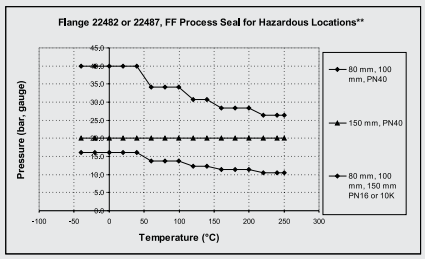


**SITRANS LR400
(with temperature extension)**

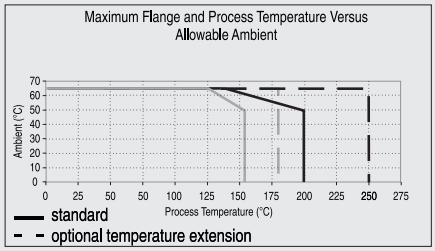


SITRANS LR400

Process Temperature/Pressure De-rating Curves



**process seal for hazardous locations rated for a max. of 250°C of continuous duty
Charts for other sizes available upon request

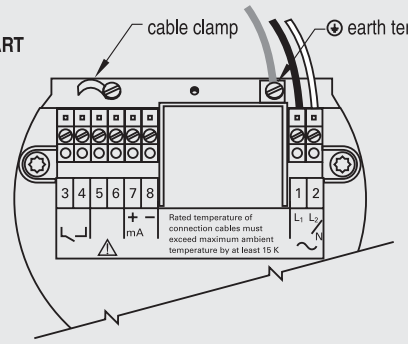


SITRANS LR400 dimensions

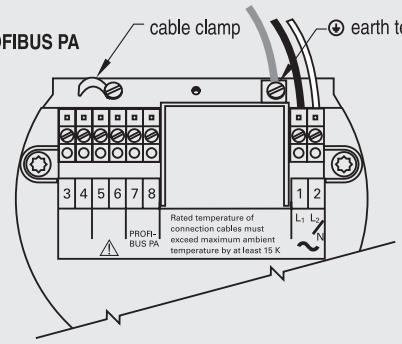
Schematics

AC version

HART

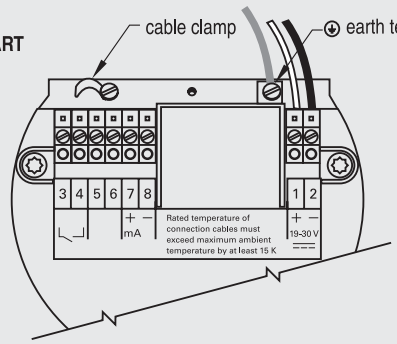


PROFIBUS PA

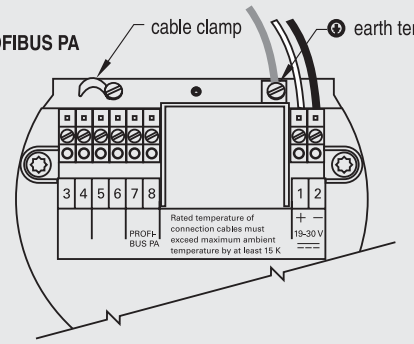


DC version

HART



PROFIBUS PA



Notes

- recommended torque on terminal clamping screws, 0.5 to 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

Hand Programmer

Part number:
7ML5830-2AJ

SITRANS LR400

SITRANS LR400 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.

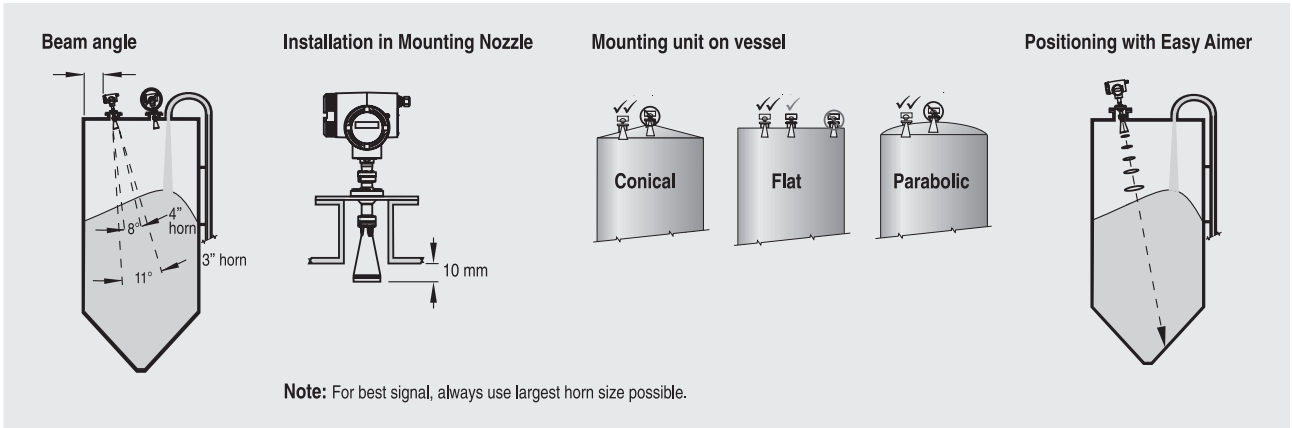
An optional dust cap is available for sticky solids. Optional air purging is also available for extremely sticky applications.

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



SITRANS LR460 installation

Technical specifications

Mode of operation	
Measuring principle	FMCW radar level measurement
Frequency	24.2 to 25.2 GHz FMCW
Measuring range	0.35 to 100 m (1.15 to 328.08 ft)
Output	
Analog output (HART®)	
• Signal range	Optically isolated 4 to 20 mA
• 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") or 0.25% of span
• Non-repeatability	≤ 10 mm (0.4")
Rated operating conditions	
• Amb. temperature for enclosure	-40 to +65 °C (-40 to +149 °F)
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4
Medium conditions	
Dielectric constant	εr > 1.4
Process temperature range	-40 to +200 °C (-40 to +392 °F)
Vessel Pressure	0.5 bar (7.25 psi) maximum
Design	
Weight	Approx. 6.1 kg (13.4 lbs) with 3" 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, 316L stainless steel, flat faced, with integral Easy Aimer	3"/80 mm, 4"/100 mm, 6"/150 mm (mates with flange EN 1092-1, ASME B16.5, or JIS B2238 bolt pattern), 0.5 bar (7.25 psi) max. pressure
Programming	
Intrinsically Safe Siemens Milltronics 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 @ 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 to 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
Optional equipment	
Dust cap	PTFE
Air purge connection	1/8" NPT

SITRANS LR460

Selection and Ordering data — Order No.

SITRANS LR460 C) **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.

Order handheld programmer separately!

0 _ _ 0 - _ _ 0

Process connection

Universal, flat faced, 0.5 bar (7.25 psi) maximum with integral Easy Aimer ball

3" (80 mm)	A
4" (100 mm)	B
6" (150 mm)	C

Antenna

3" horn antenna, fits 80 mm (3") nozzles	A
3" horn antenna, fits 80 mm (3") nozzles with 100 mm extension	B
3" horn antenna, fits 80 mm (3") nozzles with 200 mm extension	C
3" horn antenna, fits 80 mm (3") nozzles with 500 mm extension[1]	D
3" horn antenna, fits 80 mm (3") nozzles with 1000 mm extension[1]	E
4" horn antenna, fits 100 mm (4") nozzles	F
4" horn antenna, fits 100 mm (4") nozzles with 100 mm extension	G
4" horn antenna, fits 100 mm (4") nozzles with 200 mm extension	H
4" horn antenna, fits 100 mm (4") nozzles with 500 mm extension[1]	J
4" horn antenna, fits 100 mm (4") nozzles with 1000 mm extension[1]	K

Purge (self-cleaning) connection

No purge connection	0
Purge connection	1

Output/Communication

4 to 20 mA, HART®	0
PROFIBUS PA	1

Power supply/cable inlet

100 to 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, 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

Further designs — Order code

Please add "**-Z**" to Order 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 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	**Y15**

Selection and Ordering data — Order No.

SITRANS LR460 C) **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.

Order handheld programmer separately!

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Instruction manual

English	C)	**7ML1998-5JM02**
German	C)	**7ML1998-5JM32**
Multi-language Quick Start manual	C)	**7ML1998-5QW82**

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

Accessories

Handheld programmer, Infra-red, Intrinsically Safe, EEx ia	C)	**7ML5830-2AJ**
Dust cap, PTFE, for 3"/80 mm horn		**7ML1930-1BL**
Dust cap, PTFE, for 4"/100 mm horn		**7ML1930-1BM**
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DA**
HART modem/USB (for use with a PC and SIMATIC PDM)	D)	**7MF4997-1DB**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) (available for HART only - two cable glands required)		**7ML1930-1AP**
One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)		**7ML1930-1AQ**

[1] Available with Purge option 0 only

C) Subject to export regulations AL: N, ECCN: EAR99

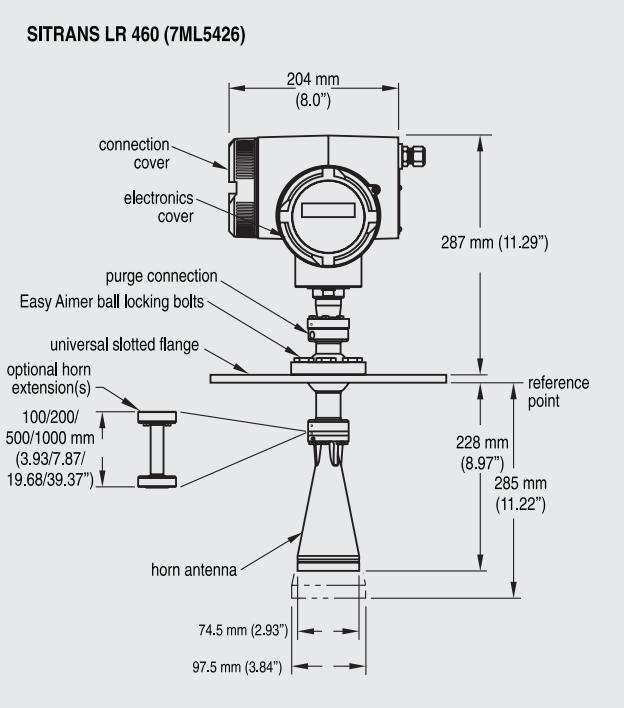
D) Subject to export regulations AL: N, ECCN: EAR99H

Selection and Ordering data — Order No.

SITRANS LR460 Spare parts (7ML5426)

100 mm (4") horn extension kit, no purge	**A5E01087872**
200 mm (8") horn extension kit, no purge	**A5E01091262**
500 mm (16") horn extension kit, no purge	**A5E01091263**
1000 mm (32") horn extension kit, no purge	**A5E01091264**

Dimensional drawings



SITRANS LR460 dimensions

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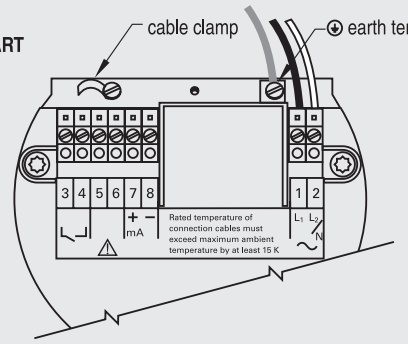
SITRANS LR460

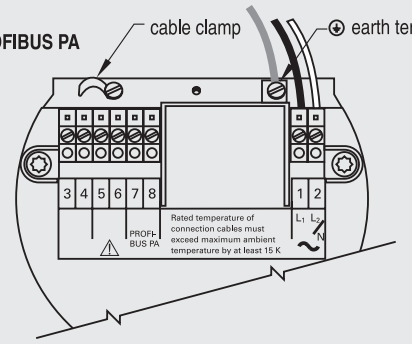
Schematics

AC version

HART

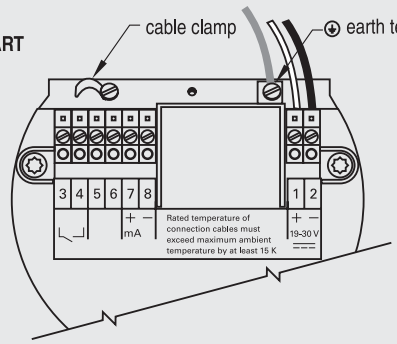


PROFIBUS PA

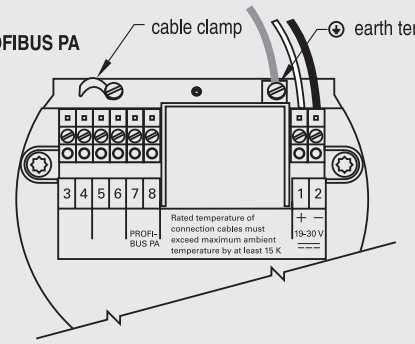


DC version

HART



PROFIBUS PA



Notes
- recommended torque on terminal clamping screws, 0.5 to 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

Hand Programmer

Part number:
7ML5830-2AJ

SITRANS LR460

SITRANS LR460 connections

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
- Guided wave radar measurement for up to 2.5 mm (0.12") 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 (6250 psi g) and temperatures as high as 427 °C (800 °F).

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).

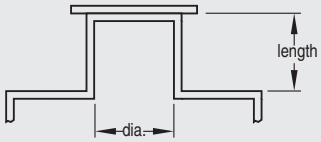
SITRANS LG200 measures accurately in liquid or slurry applications of corrosive vapors, foam, saturated steam, high viscosity, quick fill/empty rates, low levels and varying dielectrics and product densities.

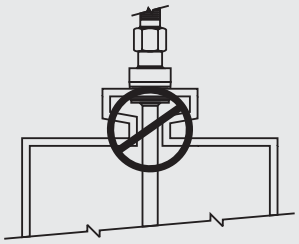
Ideal for retrofitting torque tube applications, SITRANS LG200 chamber replacement probe can be mounted in existing chambers or cages for optimal measurement.

- Key applications: hydrocarbon processing, interface/level measurement, low dielectric liquids, high temperature/pressure applications, powdered solids with high angle of repose.

Configuration

Mounting on a nozzle





Single Rod mounting:

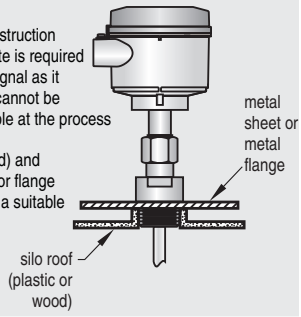
1. Do not mount in nozzles <50 mm (2") in diameter.
2. Mount in applications where ratio of diameter to length is 1:1 or greater. Any ratio less than 1:1 (ie: 2"x6" nozzle = 1:3) may require a blanking distance and/or dielectric adjustment.
3. Do not use pipe reducers.
4. Keep conductive objects away from probe to ensure proper performance.

Twin Rod mounting:

1. Active rod must be mounted at least 25 mm (1") away from any obstructions.
2. Minimum stillwell or nozzle diameter for probe is 76 mm (3").

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.



[1)] See Electromagnetic compatibility

SITRANS LG200 installation

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SITRANS LG200

Technical specifications

Mode of operation	
Measuring principle	Guided wave radar measurement
Measuring range	0.15 to 22.5 m (0.5 to 75 ft)
Output	
mA analog output with HART digital signal	Optically isolated 4 to 20 mA, 620 Ω max.
Output range	
• Analog	3.8 to 20.5 mA usable
Diagnostic alarm	adjustable 3.6 mA, 22 mA, HOLD
Digital communication	HART Version 5.x compatible
Performance	
Non-linearity	
• Coaxial/twin rod probes	<0.1% of probe length or 2.5 mm (0.1"), whichever is greater
• Single rod probes	<0.3% or 8 mm (0.3"), whichever is greater
• Interface models	Upper layer: ±25.4 mm (1") Interface layer: ±25.4 mm (1") (distinct interface surface required)
Resolution and repeatability	≤ 2.5 mm (0.1")
Electromagnetic compatibility	Meets CE requirements (EN 61000-6-2/2001, EN6100-6-4/2001) (Single and Twin Rod probes must be used in metallic vessel or stilling well to maintain CE compliance.)
Rated operating conditions[1]	
• Ambient temperature for enclosure	-40 to +80 °C (-40 to +176 °F)
• LCD readable temperature range	-20 to +70 °C (-5 to 160 °F)
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	2
• SIL 2	Safe Failure Fraction (SFF) 91%
• MTBF (mean time between failures)	96 years
Medium conditions[1]	
Dielectric constant	dK ≥ 1.4
Process temperature range[2]	-195 to +427 °C (-320 to +800 °F)
Vessel Pressure[3]	Full vacuum to 431 bar g (6250 psi g), probe dependent
Design	
Weight of transmitter with solid lid:	1.28 kg (2.83 lbs)
Weight of transmitter with glass window lid	1.60 kg (3.52 lbs)
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" to 4" NPT, ANSI, DIN flanges
Programming	
Local	Three button, menu-driven data entry with security passwords
Remote	SIMATIC PDM via HART
Power	11 to 36 V DC
Certificates and approvals	
• General Purpose	$CSA_{US/C}$, CE
• Intrinsically Safe	FM Class I, Div. 1, Groups A, B, C and D, Class II, Div. 1, Groups E, F, and G T4, Class III, Type 4 IP65 CSA Class I, Div. 1, Groups A, B, C, and D, Class II, Div. 1, Groups E, F, and G T 4, Class III, Type 4 ATEX II 1G EEx ia IIC T4
• Explosion Proof/Flame Proof	FM Class I, Div 1, Groups B, C, and D, Class II, Div. 1, Groups E, F, and G T4, Class III, Type 4 IP65 CSA Class I, Div. 1, Groups B to D, Class II, Div. 1, Group E, F, and G T4, Class III, Type 4 ATEX II 1/2 GD EEx d [ia] IIC T6
• Non-Incendive	FM Class I, Div. 2, Groups A, B, C, and D, Class II, Div. 2, Groups F, G T4, Class III, Type 4 IP65 CSA Class I, Div. 2, Groups A, B, C, and D, Class II, Div. 2, Groups E, F, and G T4, Class III, Type 4
• Non-sparking	ATEX II 3G EEx nA (nL) IIC T4 to T6 ATEX II 3G EEx nA II T4 to T6

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.

	Coaxial Probe (7ML1301-1)	Coaxial HT/HP Probe (7ML1301-2)	Coaxial HP Probe (7ML1301-3)	Coaxial Overfill/Flooded Cage Probe (7ML1301-4)
Recommended applications:	General purpose: clean, low viscosity liquids < +150 °C (+300 °F)	Clean, high temperature/high pressure liquids > +200 °C (+400 °F)	Clean, high pressure liquids < +200 °C (+400 °F)	Overfill, temperatures to +200 °C (+400 °F), clean, low viscosity liquids
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 SS, TFE, Viton® GFLT	316L SS, Alumina, Borosilicate, Inconel X750	316L SS, TFE, Borosilicate, Inconel X750	316L SS, TFE, Viton GFLT
Optional	Hastelloy® C, Monel®	Hastelloy C, Monel	Hastelloy C, Monel	Hastelloy C, Monel
Process Seal	Viton GFLT O-ring	Borosilicate	Borosilicate	Viton GFLT O-Ring
Rod/Tube Diameter:	ø 8 mm (0.3125") rod	ø 8 mm (0.3125") rod	ø 8 mm (0.3125") rod	ø 8 mm (0.3125") rod
Standard	ø 22 mm (0.875") tube	ø 22 mm (0.875") tube	ø 22 mm (0.875") tube	ø 22 mm (0.875") tube
Enlarged	ø 15 mm (0.63") rod ø 45 mm (1.75") tube	ø 15 mm (0.63") rod ø 45 mm (1.75") tube	ø 15 mm (0.63") rod ø 45 mm (1.75") tube	ø 15 mm (0.63") rod ø 45 mm (1.75") 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 ANSI (DIN):				
Standard	1 to 4" (DN25 to 100)	1 to 4" (DN25 to 100)	1 to 4" (DN25 to 100)	1 to 4" (DN25 to 100)
Enlarged	2 to 4" (DN50 to 100)	2 to 4" (DN50 to 100)	2 to 4" (DN50 to 100)	2 to 4" (DN50 to 100)
Length	60 to 610 cm (24 to 240")	60 to 610 cm (24 to 240")	60 to 610 cm (24 to 240")	60 to 610 cm (24 to 240")
Transition Zone:	25 mm (1") @ dk = 1.4	none	25 mm (1") @ dk = 1.4	none
Top	150 mm (6") @ dk = 80		150 mm (6") @ dk = 80	
Transition Zone:	150 mm (6") @ dk = 1.4	150 mm (6") @ dk = 1.4	150 mm (6") @ dk = 1.4	150 mm (6") @ dk = 1.4
Bottom	25 mm (1") @ dk = 80	25 mm (1") @ dk = 80	25 mm (1") @ dk = 80	25 mm (1") @ dk = 80
Process temperature maximum	+150 °C @ 27 bar g (+300 °F @ 400 psi g)	+427 °C @ 133 bar g (+800 °F @ 2000 psi g)	+200 °C @ 379 bar g (+400 °F @ 5500 psi g)	+200 °C @ 18 bar g (+400 °F @ 270 psi g)
Process temperature minimum	-40 °C @ 70 bar g (-40 °F @ 1000 psi g)	-195 °C @ 430 bar g (-320 °F @ 6250 psi g)	-195 °C @ 430 bar g (-320 °F @ 6250 psi g)	-40 °C @ 70 bar g (-40 °F @ 1000 psi g)
Process pressure maximum	70 bar g @ +20 °C (1000 psi g @ +70 °F)	431 bar @ +20 °C (6250 psi g @ +70 °F)	431 bar @ +20 °C (6250 psi g @ +70 °F)	70 bar g @ +20 °C (1000 psi g @ +70 °F)
Process pressure minimum/vacuum service	Yes, not hermetic[1)]	Yes, hermetic (<10^{-8} cc/sec @ 1 atmosphere)	Yes, hermetic (<10^{-8} cc/sec @ 1 atmosphere)	Yes, not hermetic
Dielectric range	1.4 to 100	1.4 to 100	1.4 to 100	1.4 to 100
Maximum viscosity (cP)				
Standard	500	500	500	500
Enlarged	1500	1500	1500	1500
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) Not hermetic: sealing by means of O-ring. Hermetic: sealing by means of borosilicate glass window.

®Viton is a registered trademark of DuPont Dow Elastomers.
®Hastelloy is a registered trademark of Haynes International.
®Kalrez is a registered trademark of DuPont Dow Elastomers.
®Monel is a registered trademark of Special Metals Corporation.

SITRANS LG200

	Coaxial HT/HP 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)
Recommended applications:	Hot water (steam) (external chamber is required for use in boilers)	Temperatures to +200 °C (+400 °F); clean, low-viscosity liquids	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)
Materials/Wetted parts	316 L SS, PEEK, Aegis PF128	316L SS, TFE, Viton GFLT	316L SS, TFE, Viton GFLT	316L SS, PFA, Viton GFLT
Optional	N/A	Hastelloy C, Monel	Hastelloy C, Monel	N/A
Process seal	Aegis PF128 O-ring, PEEK	Viton GFLT O-ring	7ML1303-1: Viton GFLT O-ring 7ML1303-2: Aegis PF128	Viton GFLT O-ring
Rod/Tube Diameter:				ø 12 mm (0.5") rod
Standard	ø 8 mm (0.3125") rod ø 22 mm (0.875") tube	ø 8 mm (0.3125") rod ø 22 mm (0.875") tube	ø 12 mm (0.5") rod	ø 16 mm (0.625") insulation
Enlarged	N/A	ø 15 mm (0.63") rod ø 45 mm (1.75") tube	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]	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]
Enlarged	N/A	2" NPT [(Taper), ANSI/ASME B1.20.1]	N/A	N/A
Flange ANSI (DIN):				
Standard	1 to 4" (DN25 to 100)	1 to 4" (DN25 to 100)	2 to 4" (DN50 to 100)	2 to 4" (DN50 to 100)
Enlarged	N/A	2 to 4" (DN50 to 100)	N/A	N/A
Length	60 to 455 cm (24 to 180")	60 to 610 cm (24 to 240")	60 to 610 cm (24 to 240")	60 to 610 cm (24 to 240")
Transition Zone: **Top**	25 mm (1") @ dk ≥ 10	none	Blocking distance: 12 to 91 cm (4.8 to 36"), probe length dependent	Blocking distance: 12 to 91 cm (4.8 to 36"), probe length dependent
Transition Zone: **Bottom**	25 mm (1") @ dk ≥ 10	150 mm (6") @ dk = 1.4 25 mm (1") @ dk = 80	25 mm (1") @ dk >10	25 mm (1") @ dk >10
Process temperature maximum	+343 °C @ 165 bar g (+650 °F @ 2400 psi g) (saturated steam)	+200 °C @ 18 bar g (+400 °F @ 270 psi g)	7ML1303-1: +150 °C @ 27 bar g (+300 °F @ 400 psi g) 7ML1303-2: +316 °C @ 165 bar g (+605 °F@2400 psi g)	+150 °C @ 27 bar g (+300 °F @ 400 psi g)
Process temperature minimum	-40 °C @ 207 bar g (-40 °F @ 3000 psi g)	-40 °C @ 70 bar g (-40 °F @ 1000 psi g)	-40 °C @ 70 bar g (-40 °F @ 1000 psi g)	-40 °C @ 50 bar g (-40 °F @ 750 psi g)
Process pressure maximum	165 bar @ +343 °C (2400 psi g @ 650 °F)	70 bar @ +20 °C (1000 psi g @ +70°F)	7ML1303-1: 70 bar @ +20 °C (1000 psi g @ +70 °F) 7ML1303-1: 207 bar @ +20 °C (3000 psi g @ +70 °F)	70 bar @ +20 °C (1000 psi g @ +70 °F)
Process pressure minimum/vacuum service	Yes, not hermetic	Yes, not hermetic	Not suitable	Not suitable
Dielectric range	10 to 100	Upper Liquid Layer 1.4 to 5 Interface Liquid Layer 15 to 100	1.9 to 100[1]	1.9 to 100[1]
Maximum viscosity (cP)				
Standard	500	500	10 000 (consult factory if severe agitation/turbulence	
Enlarged	N/A	1500		
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
Corrosives	Yes	Yes	Yes	Yes
Sanitary	No	No	No	No
Overfill	Yes	Yes	No	No

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

	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)
Recommended applications:	Applications demanding sanitary specifications	Extreme corrosives, coating/buildup, foam	Coating and buildup, foam; lengths > 6 m (20 ft) headroom	Bulk solids applications (powders, grain, dust) 3000 lb pull down force
Not recommended for:	Low dielectric media (dK < 10)[1)]	Low dielectric media (dK < 10)[1)]	Low dielectric media (dK < 10)	Solids with dK > 4
Materials/Wetted parts	316 L SS, TFE, <20 R_a finish	All PFA - wetted surfaces	316L SS, TFE, Viton GFLT	316L SS, TFE, Viton GFLT
Optional	Hastelloy C, Monel, AL6XN SS	N/A	N/A	N/A
Process seal	316L SS, TFE, Viton GFLT O-ring	PFA, no o-ring	Viton GFLT O-ring	Sealant
Rod/Tube Diameter	ø 12 mm (0.5") rod	ø 12 mm (0.5") rod ø 16 mm (0.625") insulation	ø 5 mm (0.188") cable	ø 6 mm (0.25") cable
Process Conn. 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 ANSI (DIN)	38 to 100 mm (1.5 to 4") Triclover-style 16 amp fitting	2 to 4" (DN50 to 100)	2 to 4" (DN50 to 100)	2 to 4" (DN50 to 100)
Length	60 to 610 cm (24 to 240")	60 to 610 cm (24 to 240")	2 to 22 meters (6 to 75 ft)	2 to 22 meters (6 to 75 ft)
Transition Zone: Top	Blocking distance: 0 to 91 cm (0 to 36"), probe length dependent	Blocking distance: 12 to 91 cm (4.8 to 36"), probe length dependent	Blocking distance: 12 to 91 cm (4.8 to 36"), probe length dependent	Blocking distance: 12 to 91 cm (4.8 to 36"), probe length dependent
Transition Zone: Bottom	25 mm (1") @ dk >10	25 mm (1") @ dk >10	305 mm (12")	305 mm (12")
Process temperature maximum	+150 °C @ 5.1 bar g (+300 °F @ 75 psi g)	+150 °C @ 27 bar g (+300 °F @ 400 psi g)	+150 °C @ 27 bar g (+300 °F @ 400 psi g)	+66 °C (+150 °F)
Process temperature minimum	0 °C at 5.1 bar g 32 °F at 75 psi g	-40 °C @ 13.7 bar g (-40 °F @ 200 psi g)	-40 °C @ 70 bar g (-40 °F @ 1000 psi g)	-40 °C @ 3.4 bar g (-40 °F @ 50 psi g)
Process pressure maximum	5.1 bar g @ +150 °C (75 psi g @ +300 °F)	70 bar @ +20 °C (1000 psi g @ +70°F)	70 bar @ +20 °C (1000 psi g @ +70 °F)	3.4 bar g (50 psi g)
Process pressure minimum/vacuum service	Not suitable for vacuum applications			
Dielectric range	1.9 to 100[1)]	1.9 to 100	10 to 100[1)]	4 to 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 to 10, the device must be mounted between 50 and 150 mm (2 to 6") of metal tank wall or in chamber/bridle.

Continuous level measurement - Guided wave radar transmitters

SITRANS LG200

	Twin Rod Probe (7ML1302-1)	Flexible Twin Rod Probe (7ML1302-3)	Flexible Light Duty Bulk Solids Probe (7ML1302-2)
Recommended applications:	General purpose, foam, minor film coating	Low dielectric media (2.0 to 10) with lengths > 6 m (20 ft)	Light bulk solids applications (powders, grains, dust), 3000 lbs pull-down force
Not recommended for:	Media bridging between rods or building up on spacers	Dielectric > 10: media bridging on flexible elements	Media bridging flexible elements
Materials/Wetted parts	316L SS, TFE, Viton GFLT	316L SS, FEP, Viton GFLT	316L SS, TFE, Viton GFLT
Optional	Hastelloy C, Monel	N/A	N/A
Process seal	Viton GFLT O-ring	Viton GFLT O-ring	Sealant
Rod/Tube Diameter	Two, ø 12 mm (0.5") rod; 22 mm (0.875") C_L to C_L	Two, ø 6 mm (0.25") cables; 22 mm (0.875") C_L to C_L	Two, ø 6 mm (0.25") cables; 22 mm (0.875") C_L to C_L
Process Conn. Thread	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]	2" NPT [(Taper), ANSI/ASME B1.20.1], G 2" [(BSPP), EN ISO 228-1]
Flange ANSI (DIN)	2 to 4" (DN50 to 100)	2 to 4" (DN50 to 100)	2 to 4" (DN50 to 100)
Length	60 to 610 cm (24 to 240")	2 to 22 m (6 to 75 ft)	2 to 22 m (6 to 75 ft)
Transition Zone[1]: **Top**	150 mm (6") @ dK > 1.9 Blocking distance: none	150 mm (6") @ dK > 1.9 Blocking distance: 12 to 50 cm (4.8 to 20")	150 mm (6") @ dK > 1.9 Blocking distance: 12 to 50 cm (4.8 to 20")
Transition Zone: **Bottom**	150 mm (6") @ dK = 1.9 25 mm (1") @ dK = 80	305 mm (12")	305 mm (12")
Process temperature max.[2]	+200 °C @ 19 bar g (+400 °F @ 275 psi g)		+66 °C (+ 150 °F)
Process temperature min.	-40 °C @ 70 bar g (-40 °F @ 100 psi g)		-40 °C @ 3.4 bar g (-40 °F @ 50 psi g)
Process pressure max.	70 bar g @ +20 °C (1000 psi g @ +70 °F)		3.4 bar g (50 psi g)
Process pressure min./vacuum service	Yes, not hermetic		Not suitable
Dielectric range	1.9 to 100	1.9 to 100	1.9 to 100
Maximum viscosity (cP)	1500	1500	Not suitable
Coating/buildup	Yes, maximum error 3% of coated length with conductive media Bridging not recommended.[3]		
Foam	Yes	Yes	Yes
Corrosives	Yes	No	Yes
Sanitary	No	No	No
Overfill	No	No	No

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

2) Refer to Ambient Temperature vs Process Temperature graphs in instruction manual.

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

O-Ring (seal) Selection Guide

Material	Maximum Temperature	Maximum Pressure	Minimum Temperature	Recommended for Use in:	Not Recommended for Use In:
Viton GFLT	+200 °C @ 16 bar g (+400 °F @ 232 psi g)	70 bar g @ +20 °C (1000 psi g@+70 °F)	-40 °C (-40 °F)	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	+125 °C @ 14 bar g (+250 °F @ 200 psi g)	70 bar g @ +20 °C (1000 psi g@+70 °F)	-50 °C (-60 °F)	Acetone, MEK, skydrol fluids	Petroleum oils, di-ester base lubricants, propane, steam, anhydrous ammonia
Kalrez (4079)	+200 °C @ 16 bar g (+400 °F @ 232 psi g)	70 bar g @ +20 °C (1000 psi g @+70 °F)	-40 °C (-40 °F)	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	+200 °C @ 16 bar g (+400 °F @ 232 psi g)	70 bar g @ +20 °C (1000 psi g@+70 °F)	-20 °C (-4 °F)	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	+427 °C @ 135 bar g (+800 °F @ 2000 psi g)	430 bar g @ +20 °C (6250 psi g@+70 °F)	-195 °C (-320 °F)	General high temperature/high pressure applications, hydrocarbons, full vacuum (hermetic), anhydrous ammonia	Steam, hot alkaline solutions, HF acid, media with pH>12

Selection and Ordering data

Order No.

SITRANS LG200 C) **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.

Power
24 V DC, 2-wire **1**

Signal Output
4 to 20 mA HART **A**

Options
Standard (SIL-1 Approved) **A**
SIL 2 (FMEDA) approved **B**

Enclosure/lid
Aluminum **1**
Aluminum with glass window **2**

Cable inlet
2 x ½" NPT, IP65 **0**
2 x M20x1.5, IP65[1] **1**

Approvals
General Purpose and Intrinsically Safe (FM/CSA Class I, Div. 1, Groups A, B, C, and D; Class II, Div. 1, Groups E, F, and 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 (FM/CSA Class I, Div. 1, Groups B, C, and D; Class II, Div. 1, Groups E, F, and 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**

General Purpose and Intrinsically Safe (ATEX II 1G EEx ia IIC T4) **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**

Instruction manual

English C) **7ML1998-5KA01**
German C) **7ML1998-5KA31**
Multi-language Quick Start manual C) **7ML1998-5XG81**

This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.

[1] Available with Approval option C, D, and E only.

Selection and Ordering data

Order No.

SITRANS LG200 Coaxial Probes C) **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 to 100).

Model
Coaxial **1**
Coaxial, High Temperature/High Pressure[1] **2**
Coaxial, High Pressure[1] **3**
Coaxial, Overfill/Flooded Cage **4**
Coaxial, High Temperature/High Pressure, Steam[2] and 3) **5**
Coaxial, Interface[1] **6**

Material of Construction
316/316L stainless steel probe and process connection **A**
Hastelloy C probe and process connection **B**
Monel probe and process connection **C**
316/316L SS probe and process connection, ASME B31.1 specifications[4] **D**
Enlarged Coaxial, 316/316L stainless steel probe and process connection[5] **E**
Enlarged Coaxial, Hastelloy C probe and process connection[5] **F**
Enlarged Coaxial, Monel probe and process connection[5] **G**
316/316L stainless steel probe and process connection with PEEK HT spacers[6] **H**
316/316L stainless steel probe and process connection with Teflon® spacers[6] **J**

Probe Insertion Length

Add order code Y01 and plain text: "Insertion length ... cm"

Model option 1,4 and Material of Construction option A, E: 60 to 100 cm (23.6 to 39.4") **A 1**
Model option 1,4 and Material of Construction option A, E: 101 to 200 cm (39.8 to 78.7") **A 2**
Model option 1,4 and Material of Construction option A, E: 201 to 300 cm (79.1 to 118.1") **A 3**
Model option 1,4 and Material of Construction option A, E: 301 to 400 cm (118.5 to 157.5") **A 4**
Model option 1,4 and Material of Construction option A, E: 401 to 500 cm (157.9 to 196.9") **A 5**
Model option 1,4 and Material of Construction option A,E: 501 to 610 cm (197.2 to 240.2") **A 6**

Add order code Y01 and plain text: "Insertion length ... cm"

Model options 3, 6 with Material of Construction option A: 60 to 100 cm (23.6 to 39.4") **B 1**
Model options 3, 6 with Material of Construction option A: 101 to 200 cm (39.8 to 78.7") **B 2**
Model options 3, 6 with Material of Construction option A: 201 to 300 cm (79.1 to 118.1") **B 3**
Model options 3, 6 with Material of Construction option A: 301 to 400 cm (118.5 to 157.5") **B 4**
Model options 3, 6 with Material of Construction option A: 401 to 500 cm (157.9 to 196.9") **B 5**
Model options 3, 6 with Material of Construction option A: 501 to 610 cm (197.2 to 240.2") **B 6**

Add order code Y01 and plain text: "Insertion length ... cm"

Model options 3, 6 with Material of Construction option E: 60 to 100 cm (23.6 to 39.4") **C 1**
Model options 3, 6 with Material of Construction option E: 101 to 200 cm (39.8 to 78.7") **C 2**
Model options 3, 6 with Material of Construction option E: 201 to 300 cm (79.1 to 118.1") **C 3**

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SITRANS LG200

Selection and Ordering data — Order No.

SITRANS LG200 Coaxial Probes C) 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 to 100).

Model options 3, 6 with Material of Construction option E: 301 to 400 cm (118.5 to 157.5")	C	4		
Model options 3, 6 with Material of Construction option E: 401 to 500 cm (157.9 to 196.9")	C	5		
Model options 3, 6 with Material of Construction option E: 501 to 610 cm (197.2 to 240.2")	C	6		
Add order code Y01 and plain text: "Insertion length ... cm"				
Model options 2, 5 with Material of Construction options A, D, E, H, J: 60 to 100 cm (23.6 to 39.4")	D	1		
Model options 2, 5 with Material of Construction options A, D, E, H, J: 101 to 200 cm (39.8 to 78.7")	D	2		
Model options 2, 5 with Material of Construction options A, D, E, H, J: 201 to 300 cm (79.1 to 118.1")	D	3		
Model options 2, 5 with Material of Construction options A, D, E, H, J: 301 to 400 cm (118.5 to 157.5")	D	4		
Model options 2, 5 with Material of Construction options A, D, E, H, J: 401 to 500 cm (157.9 to 196.9")	D	5		
Model options 2, 5 with Material of Construction options A, D, E, H, J: 501 to 610 cm (197.2 to 240.2")	D	6		
Note: For orders of 10 or more, please consult factory				
O-Rings				
Viton			1	1
EPDM (Ethylene Propylene)			1	2
Kalrez 4079			1	3
HSN			1	4
Buna-N			1	5
Neoprene			1	6
Chemraz			1	7
Polyurethane			1	8
Aegis PF 128[4]			2	1
Kalrez 2035			2	2
None[7]			2	3
Process Connection (Size/Type)				
Threaded				
¾" NPT [(Taper), ANSI/ASME B1.20.1]				A A
G 1" [(BSPP), EN ISO 228-1]				A B
ANSI flanges				
1" 150 lb ANSI raised face flange				B A
1" 300 lb ANSI raised face flange				B B
1" 600 lb ANSI raised face flange[8]				B C
1" 900/1500 lb ANSI raised face flange[8]				B D
1" 2500 lb ANSI raised face flange[8]				B E
1" 900/1500 lb ANSI ring joint flange[8]				B F
1" 2500 lb ANSI ring joint flange[8]				B G
1½" 150 lb ANSI raised face flange				C A
1½" 300 lb ANSI raised face flange				C B
1½" 600 lb ANSI raised face flange[8]				C C
1½" 900/1500 lb ANSI raised face flange[8]				C D
1½" 2500 lb ANSI raised face flange[8]				C E
1½" 600 lb ANSI ring joint flange[8]				C F
1½" 900/1500 lb ANSI ring joint flange[8]				C G
1½" 2500 lb ANSI ring joint flange[8]				C H

Selection and Ordering data — Order No.

SITRANS LG200 Coaxial Probes C) 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 to 100).

2" 150 lb ANSI raised face flange		D A
2" 300 lb ANSI raised face flange		D B
2" 600 lb ANSI raised face flange[8]		D C
2" 900/1500 lb ANSI raised face flange[8]		D D
2" 2500 lb ANSI raised face flange[8]		D E
2" 600 lb ANSI ring joint flange[8]		D F
2" 900/1500 lb ANSI ring joint flange[8]		D G
2" 2500 lb ANSI ring joint flange[8]		D H
2" 150 lb ANSI raised face carbon steel flange with top hat		D J
2" 300/600 lb ANSI raised face carbon steel flange with top hat		D K
3" 150 lb ANSI raised face flange		E A
3" 300 lb ANSI raised face flange		E B
3" 600 lb ANSI raised face flange[8]		E C
3" 900 lb ANSI raised face flange[8]		E D
3" 1500 lb ANSI raised face flange[8]		E E
3" 2500 lb ANSI raised face flange [8]		E F
3" 600 lb ANSI ring joint flange[8]		E G
3" 900 lb ANSI ring joint flange[8]		E H
3" 1500 lb ANSI ring joint flange[8]		E J
3" 2500 lb ANSI ring joint flange[8]		E K
3" 150 lb ANSI raised face carbon steel flange with top hat		E L
3" 300/600 lb ANSI raised face carbon steel flange with top hat		E M
4" 150 lb ANSI raised face flange		F A
4" 300 lb ANSI raised face flange		F B
4" 600 lb ANSI raised face flange[8]		F C
4" 900 lb ANSI raised face flange[8]		F D
4" 1500 lb ANSI raised face flange[8]		F E
4" 2500 lb ANSI raised face flange[8]		F F
4" 600 lb ANSI ring joint flange[8]		F G
4" 900 lb ANSI ring joint flange[8]		F H
4" 1500 lb ANSI ring joint flange[8]		F J
4" 2500 lb ANSI ring joint flange[8]		F K
EN/DIN flanges		
DN 25 PN 16 DIN 2527 form B flange		G A
DN 25 PN 25/40 DIN 2527 form B flange		G B
DN 25 PN 64/100 DIN 2527 form E flange[8]		G C
DN 25 PN 160 DIN 2527 form E flange[8]		G D
DN 25 PN 250 DIN 2527 form E flange[8]		G E
DN 25 PN 320 DIN 2527 form E flange[8]		G F
DN 25 PN 400 DIN 2527 form E flange[8]		G G
DN 40 PN 16 DIN 2527 form B flange		H A
DN 40 PN 25/40 DIN 2527 form B flange		H B
DN 40 PN 64/100 DIN 2527 form E flange[8]		H C
DN 40 PN 160 DIN 2527 form E flange[8]		H D
DN 40 PN 250 DIN 2527 form E flange[8]		H E
DN 40 PN 320 DIN 2527 form E flange[8]		H F
DN 40 PN 400 DIN 2527 form E flange[8]		H G
DN 50 PN 16 DIN 2527 form B flange		J A
DN 50 PN 25/40 DIN 2527 form B flange		J B
DN 50 PN 64 DIN 2527 form E flange[8]		J C
DN 50 PN 100 DIN 2527 form E flange[8]		J D
DN 50 PN 160 DIN 2527 form E flange[8]		J E
DN 50 PN 250 DIN 2527 form E flange[8]		J F
DN 50 PN 320 DIN 2527 form E flange[8]		J G
DN 50 PN 400 DIN 2527 form E flange[8]		J H

Selection and Ordering data

Order No.

SITRANS LG200 Coaxial Probes C) **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 to 100).

DN 80 PN 16 DIN 2527 form B flange	**KA**
DN 80 PN 25/40 DIN 2527 form B flange	**KB**
DN 80 PN 64 DIN 2527 form E flange[8]	**KC**
DN 80 PN 100 DIN 2527 form E flange[8]	**KD**
DN 80 PN 160 DIN 2527 form E flange[8]	**KE**
DN 80 PN 250 DIN 2527 form E flange[8]	**KF**
DN 80 PN 320 DIN 2527 form E flange[8]	**KG**
DN 80 PN 400 DIN 2527 form E flange[8]	**KH**
DN 100 PN 16 DIN 2527 form B flange	**LA**
DN 100 PN 25/40 DIN 2527 form B flange	**LB**
DN 100 PN 64 DIN 2527 form E flange[8]	**LC**
DN 100 PN 100 DIN 2527 form E flange[8]	**LD**
DN 100 PN 160 DIN 2527 form E flange[8]	**LE**
DN 100 PN 250 DIN 2527 form E flange[8]	**LF**
DN 100 PN 320 DIN 2527 form E flange[8]	**LG**
DN 100 PN 400 DIN 2527 form E flange[8]	**LH**
Fisher torque tube flange, carbon steel (249B)	**MA**
Fisher torque tube flange, 316 stainless steel (249C)	**MB**
Masoneilan torque tube flange, carbon steel	**MC**
Masoneilan torque tube flange, 316 stainless steel	**MD**
Masoneilan torque tube flange, carbon steel with top hat	**ME**
316 stainless steel with top hat	**MF**

Further designs Order code

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

Enter the total insertion length in plain text description, max. 610 cm (240.2")	**Y01**

Instruction manual

English	C)	**7ML1998-5KA01**
German	C)	**7ML1998-5KA31**
Multi-language Quick Start manual	C)	**7ML1998-5XG81**

This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.

1) Consult factory for these options in Hastelloy C or Monel.
2) Only offered in 316/316L.
3) Coaxial, High Temperature/High Pressure Steam Probe used with O-ring type Aegis PF128.
4) Available with model option 5 only
5) 2" minimum Process Connection
6) Used with HT/HP Probe only
7) Available with model option 2 and 3 only
8) Available with High Temperature/High Pressure and High Pressure probes only.

Selection and Ordering data

Order No.

SITRANS LG200 Twin Rod Probes C) **7ML1302-**

SITRANS LG200 twin rod probes are used in applications where coating and buildup are possible. Used in application with dielectric constant ≥1.9.

Model					
Twin rod	**1**				
Flexible twin rod bulk solids probe[1]	**2**				
Flexible twin rod probe[1]	**3**				
Material of Construction					
316/316L stainless steel probe and process connection	**A**				
Hastelloy C probe and process connection	**B**				
Monel probe and process connection	**C**				
Process Connection (size/type)					
316/316L (1.4401/1.4404)					
2" NPT [(Taper), ANSI/ASME B1.20.1]		**A 1**			
G 2" [(BSPP), EN ISO 228-1]		**A 2**			
2" 150 lb ANSI raised face flange		**A 3**			
2" 300 lb ANSI raised face flange		**B 1**			
3" 150 lb ANSI raised face flange		**B 2**			
3" 300 lb ANSI raised face flange		**C 1**			
4" 150 lb ANSI raised face flange		**C 2**			
4" 300 lb ANSI raised face flange		**D 1**			
DN 50 PN 16 DIN 2527 form B flange		**D 2**			
DN 50 PN 25/40 DIN 2527 form B flange		**E 1**			
Fisher Torque Tube flange, 316SS (249C)		**F 1**			
Masoneilan Torque Tube flange, 316SS		**G 1**			
Carbon Steel					
2" 150 lb ANSI raised face Carbon Steel flange with top hat		**H 1**			
2" 300 lb /600 lb ANSI raised face Carbon Steel flange with top hat		**H 3**			
3" 150 lb ANSI raised face Carbon Steel flange with top hat		**J 1**			
3" 300 lb /600 lb ANSI raised face Carbon Steel flange with top hat		**J 2**			
Fisher Torque Tube flange, Carbon Steel (249B)		**K 1**			
Fisher Torque Tube flange, Carbon steel with top hat (249B)		**K 2**			
Masoneilan Torque Tube flange, Carbon Steel		**L 1**			
Masoneilan Torque Tube flange, Carbon steel with top hat		**L 2**			
O-Ring					
Viton			**1**	**1**	
EPR (Ethylene Propylene Rubber)			**1**	**2**	
Kalrez 4079			**1**	**3**	
HSN (NACE)			**1**	**4**	
Buna-N			**1**	**5**	
Neoprene			**1**	**6**	
Chemraz			**1**	**7**	
Polyurethane			**1**	**8**	
Aegis PF 128			**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 to 100 cm (23.6 to 39.4")					**AA**
Model option 1 and Material of Construction option A: 101 to 200 cm (39.8 to 78.7")					**AB**
Model option 1 and Material of Construction option A: 201 to 300 cm (79.1 to 118.1")					**AC**

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SITRANS LG200

Selection and Ordering data		Order No.
SITRANS LG200 Twin Rod Probes	C)	**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 to 400 cm (118.5 to 157.5")		**AD**
Model option 1 and Material of Construction option A: 401 to 500 cm (157.9 to 196.9")		**AE**
Model option 1 and Material of Construction option A: 501 to 610 cm (197.2 to 240.2")		**AF**
Add order code Y01 and plain text: "Insertion length ... cm"		
Model option 1 and Material of Construction option B: 60 to 100 cm (23.6 to 39.4")		**BA**
Model option 1 and Material of Construction option B: 101 to 200 cm (39.8 to 78.7")		**BB**
Model option 1 and Material of Construction option B: 201 to 300 cm (79.1 to 118.1")		**BC**
Model option 1 and Material of Construction option B: 301 to 400 cm (118.5 to 157.5")		**BD**
Model option 1 and Material of Construction option B: 401 to 500 cm (157.9 to 196.9")		**BE**
Model option 1 and Material of Construction option B: 501 to 610 cm (197.3 to 240.2")		**BF**
Add order code Y01 and plain text: "Insertion length ... cm"		
Model option 1 and Material of Construction option C: 60 to 100 cm (23.6 to 39.4")		**CA**
Model option 1 and Material of Construction option C: 101 to 200 cm (39.8 to 78.7")		**CB**
Model option 1 and Material of Construction option C: 201 to 300 cm (79.1 to 118.1")		**CC**
Model option 1 and Material of Construction option C: 301 to 400 cm (118.5 to 157.5")		**CD**
Model option 1 and Material of Construction option C: 401 to 500 cm (157.9 to 196.9")		**CE**
Model option 1 and Material of Construction option C: 501 to 610 cm (197.2 to 240.2")		**CF**
Standard lengths		
Model option 2,3 and Material of Construction option A: 1 meter (39.4")		**EA**
Model option 2,3 and Material of Construction option A: 2 meters (78.7")		**EB**
Model option 2,3 and Material of Construction option A: 3 meters (118.1")		**EC**
Model option 2,3 and Material of Construction option A: 4 meters (157.5")		**ED**
Model option 2,3 and Material of Construction option A: 5 meters (196.9")		**EE**
Model option 2,3 and Material of Construction option A: 6 meters (236.2")		**EF**
Model option 2,3 and Material of Construction option A: 7 meters (275.6")		**EG**
Model option 2,3 and Material of Construction option A: 8 meters (315.0")		**EH**
Model option 2,3 and Material of Construction option A: 9 meters (354.3")		**EJ**
Model option 2,3 and Material of Construction option A: 10 meters (393.7")		**EK**
Model option 2,3 and Material of Construction option A: 11 meters (433.1")		**EL**
Model option 2,3 and Material of Construction option A: 12 meters (472.4")		**EM**
Model option 2,3 and Material of Construction option A: 13 meters (511.8")		**EN**
Model option 2,3 and Material of Construction option A: 14 meters (551.2")		**EP**
Model option 2,3 and Material of Construction option A: 15 meters (590.6")		**EQ**
Model option 2,3 and Material of Construction option A: 16 meters (629.9")		**ER**

Selection and Ordering data		Order No.
SITRANS LG200 Twin Rod Probes	C)	**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 2,3 and Material of Construction option A: 17 meters (669.3")		**ES**
Model option 2,3 and Material of Construction option A: 18 meters (708.7")		**ET**
Model option 2,3 and Material of Construction option A: 19 meters (748.0")		**EU**
Model option 2,3 and Material of Construction option A: 20 meters (787.4")		**EV**
Model option 2,3 and Material of Construction option A: 21 meters (826.8")		**EW**
Model option 2,3 and Material of Construction option A: 22.5 meters (885.8")		**EX**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s).		
Enter the total insertion length in plain text description, max. 610 cm (240.2")		**Y01**
Instruction manual		
English	C)	**7ML1998-5KA01**
German	C)	**7ML1998-5KA31**
Multi-language Quick Start manual	C)	**7ML1998-5XG81**
This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.		

[1] Available with material of construction option A only.

Selection and Ordering data

Order No.

SITRANS LG200 Single Rod Rigid Probes C) 7ML1303-

SITRANS LG200 single rod rigid probes are used in applications where coating and buildup are likely. Used in application with dielectric constant ≥10, or dk >1.9 when installed within 2 to 6" of a metal tank wall or in cage or bridle.

Model

Single rod rigid probe	1
High Temperature/High Pressure Single rod[1]	2

Material of Construction

316/316L stainless steel probe and process connection	A
Hastelloy C276 probe and process connection	B
Monel probe and process connection	C
316/316L stainless steel sanitary probe and process connection	D
PFA faced-flange and rod insulation, all PFA wetted parts (316 SS rod)	E
316 AL6XN stainless steel sanitary probe and process connection	F
Hastelloy C22 sanitary probe and process connection	G
Paint probe, 316/316L SS, ¾" process connection or larger[2] (72" max length)	H
PFA rod insulation (316 SS rod and process connection)	J

Process Connection (size/type)

316 Stainless steel	
¾" NPT [(Taper), ANSI/ASME B1.20.1]	A 0
1½" Tri-Clover 16 amp sanitary fitting	A 1
2" NPT [(Taper), ANSI/ASME B1.20.1]	A 2
G 2" [(BSPP), EN ISO 228-1]	A 3
2" 150 lb ANSI raised face flange	A 4
2" 300 lb ANSI raised face flange	A 5
2" Tri-Clover 16 amp sanitary fitting	A 6
3" 150 lb ANSI raised face flange	B 1
3" 300 lb ANSI raised face flange	B 2
3" Tri-Clover 16 amp sanitary fitting	B 3
4" 150 lb ANSI raised face flange	C 1
4" 300 lb ANSI raised face flange	C 2
4" Tri-Clover 16 amp sanitary fitting	C 3
DN 50, PN 16, DIN 2527 form B flange	D 1
DN 50, PN 25/40, DIN 2527 form B flange	D 2
AL6XN	
1½" Tri-Clover 16 amp sanitary fitting	E 1
2" Tri-Clover 16 amp sanitary fitting	E 2
3" Tri-Clover 16 amp sanitary fitting	F 1
4" Tri-Clover 16 amp sanitary fitting	G 1
PFA Coated 316 stainless steel flange[3]	
2" 150 lb ANSI raised face flange	H 1
2" 300 lb ANSI raised face flange	H 2
3" 150 lb ANSI raised face flange	J 1
3" 300 lb ANSI raised face flange'	J 2
4" 150 lb ANSI raised face flange	K 1
4" 300 lb ANSI raised face flange	K 2
DN 50, PN 16, DIN 2527 form B flange	L 1
DN 50, PN 25/40, DIN 2527 form B flange	L 2

O-Ring

Viton	1 1
EPR (Ethylene Propylene Rubber)	1 2
Kalrez 4079	1 3
HSN (NACE)	1 4
Buna-N	1 5
Neoprene	1 6

Selection and Ordering data

Order No.

SITRANS LG200 Single Rod Rigid Probes C) 7ML1303-

SITRANS LG200 single rod rigid probes are used in applications where coating and buildup are likely. Used in application with dielectric constant ≥10, or dk >1.9 when installed within 2 to 6" of a metal tank wall or in cage or bridle.

Chemraz	1 7
Polyurethane	1 8
Aegis PF 128	2 1
Kalrez 2035	2 2
None[4]	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 to 100 cm (23.6 to 39.4")	A A
Model option 1,2 and Material of Construction option A: 101 to 200 cm (39.8 to 78.7")	A B
Model option 1,2 and Material of Construction option A: 201 to 300 cm (79.1 to 118.1")	A C
Model option 1,2 and Material of Construction option A: 301 to 400 cm (118.5 to 157.5")	A D
Model option 1,2 and Material of Construction option A: 401 to 500 cm (157.9 to 196.9")	A E
Model option 1,2 and Material of Construction option A: 501 to 610 cm (197.2 to 240.2")	A F
Add order code Y01 and plain text: "Insertion length ... cm"	
Model option 1 and Material of Construction option D: 60 to 100 cm (23.6 to 39.4")	B A
Model option 1 and Material of Construction option D: 101 to 200 cm (39.8 to 78.7")	B B
Model option 1 and Material of Construction option D: 201 to 300 cm (79.1 to 118.1")	B C
Model option 1 and Material of Construction option D: 301 to 400 cm (118.5 to 157.5")	B D
Model option 1 and Material of Construction option D: 401 to 500 cm (157.9 to 196.9")	B E
Model option 1 and Material of Construction option D: 501 to 610 cm (197.2 to 240.2")	B F
Add order code Y01 and plain text: "Insertion length ... cm"	
Model option 1 and Material of Construction option F: 60 to 100 cm (23.6 to 39.4")	C A
Model option 1 and Material of Construction option F: 101 to 200 cm (39.8 to 78.7")	C B
Model option 1 and Material of Construction option F: 201 to 300 cm (79.1 to 118.1")	C C
Model option 1 and Material of Construction option F: 301 to 400 cm (118.5 to 157.5")	C D
Model option 1 and Material of Construction option F: 401 to 500 cm (157.9 to 196.9")	C E
Model option 1 and Material of Construction option F: 501 to 610 cm (197.2 to 240.2")	C F
Add order code Y01 and plain text: "Insertion length ... cm"	
Model option 1 and Material of Construction option E: 60 to 100 cm (23.6 to 39.4")	D A
Model option 1 and Material of Construction option E: 101 to 200 cm (39.8 to 78.7")	D B
Model option 1 and Material of Construction option E: 201 to 300 cm (79.1 to 118.1")	D C
Model option 1 and Material of Construction option E: 301 to 400 cm (118.5 to 157.5")	D D
Model option 1 and Material of Construction option E: 401 to 500 cm (157.9 to 196.9")	D E
Model option 1 and Material of Construction option E: 501 to 610 cm (197.2 to 240.2")	D F

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SITRANS LG200

Selection and Ordering data — Order No.

SITRANS LG200 Single Rod Rigid Probes C) **7ML1303-**

SITRANS LG200 single rod rigid probes are used in applications where coating and buildup are likely. Used in application with dielectric constant ≥10, or dk >1.9 when installed within 2 to 6" of a metal tank wall or in cage or bridle. — **-0**

Add order code Y01 and plain text: "Insertion length ... cm"

Model option 1 and Material of Construction option J: 60 to 100 cm (23.6 to 39.4")	**EA**
Model option 1 and Material of Construction option J: 101 to 200 cm (39.8 to 78.7")	**EB**
Model option 1 and Material of Construction option J: 201 to 300 cm (79.1 to 118.1")	**EC**
Model option 1 and Material of Construction option J: 301 to 400 cm (118.5 to 157.5")	**ED**
Model option 1 and Material of Construction option J: 401 to 500 cm (157.9 to 196.9")	**EE**
Model option 1 and Material of Construction option J: 501 to 610 cm (197.2 to 240.2")	**EF**

Further designs — Order code

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

Enter the total insertion length in plain text description, max. 610 cm (240.2")	**Y01**

Instruction manual

English	C)	**7ML1998-5KA01**
German	C)	**7ML1998-5KA31**
Multi-language Quick Start manual	C)	**7ML1998-5XG81**

This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.

1) Available with O-ring option 21 only
2) Available with O-ring option 23 only
3) Available with Material of Construction F only
4) Available with Material of Construction D, E, and H only

Selection and Ordering data — Order No.

SITRANS LG200 Single Rod Flexible Probes C) **7ML1304-**

SITRANS LG200 single rod flexible probes are used in applications where coating and buildup are possible. Used in application with dielectric constant ≥10 or dk >1.9 when installed within 2 to 6" of a metal tank wall or in cage or bridle. — **-0**

Model

Single rod flexible probe	**1**
Single rod bulk solids flexible probe	**2**

Material of Construction

316/316L 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]	**A0**
G 2" [(BSPP), EN ISO 228-1]	**A1**
2" 150 lb ANSI raised face flange	**A2**
2" 300 lb ANSI raised face flange	**A3**
3" 150 lb ANSI raised face flange	**B1**
3" 300 lb ANSI raised face flange	**B2**
4" 150 lb ANSI raised face flange	**C1**
4" 300 lb ANSI raised face flange	**C2**
DN 50 PN 16 DIN 2527 form B flange	**D1**
DN 50 PN 25/40 DIN 2527 form B flange	**D2**

O-Ring

Viton	**11**
EPR (Ethylene Propylene Rubber)	**12**
Kalrez 4079	**13**
HSN (NACE)	**14**
Buna-N	**15**
Neoprene	**16**
Chemraz	**17**
Polyurethane	**18**
Aegis PF 128	**21**
Kalrez 2035	**22**

Flexible Rod Length

1 meter (39.4")	**AA**
2 meters (78.7")	**AB**
3 meters (118.1")	**AC**
4 meters (157.5")	**AD**
5 meters (196.9")	**AE**
6 meters (236.2")	**AF**
7 meters (275.6")	**AG**
8 meters (315.0)	**AH**
9 meters (354.3")	**AJ**
10 meters (393.7")	**AK**
11 meters (433.1")	**AL**
12 meters (472.4")	**AM**
13 meters (511.8")	**AN**
14 meters (551.2")	**AP**
15 meters (590.6")	**AQ**
16 meters (629.9")	**AR**
17 meters (669.3")	**AS**
18 meters (708.7")	**AT**
19 meters (748.0")	**AU**
20 meters (787.4")	**AV**
21 meters (826.8")	**AW**
22.5 meters (885.8")	**AX**

Instruction manual

English	C)	**7ML1998-5KA01**
German	C)	**7ML1998-5KA31**
Multi-language Quick Start manual	C)	**7ML1998-5XG81**

This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.

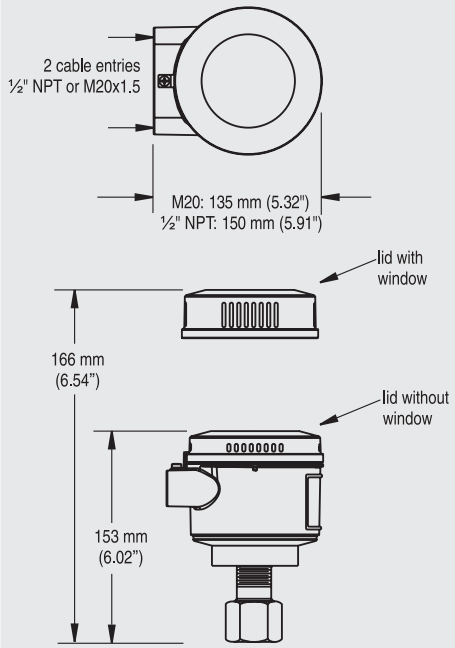
Selection and Ordering data		Order No.
SITRANS LG200 Chamber Replacement Probe	C)	**7ML1305-**
SITRANS LG200 Chamber Replacement Probe replaces existing aging torque tube transmitters. Proprietary flanges can be used with existing chambers and cages.		**0**
Model		
Chamber Replacement Probe		**1**
Material of Construction		
316/316L stainless steel probe and process connection (B31.1 construction)		**A**
Carbon Steel (106 Grade B)		**B**
Carbon Steel (B31.1 construction)		**C**
Process Connection (size/type)		
316/316L (1.4401/1.4404)		
1½" NPT [(Taper), ANSI/ASME B1.20.1] thread		**A 0**
1½", 150 lb ANSI raised face flange		**A 1**
1½", 300 lb ANSI raised face flange		**A 2**
1½", 600 lb ANSI raised face flange		**A 3**
1½" Socket weld		**B 1**
2" NPT [(Taper), ANSI/ASME B1.20.1] thread		**B 2**
2", 150 lb ANSI raised face flange		**C 1**
2", 300 lb ANSI raised face flange		**C 2**
2", 600 lb ANSI raised face flange		**D 1**
2" Socket weld		**D 2**
Other flange sizes available. Please consult factory.		
Level Range		
14" (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[1)]		**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**
Instruction manual		
English	C)	**7ML1998-5KA01**
German	C)	**7ML1998-5KA31**
Multi-language Quick Start manual	C)	**7ML1998-5XG81**
This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.		

[1)] Available with Materials of Construction options A or C only.

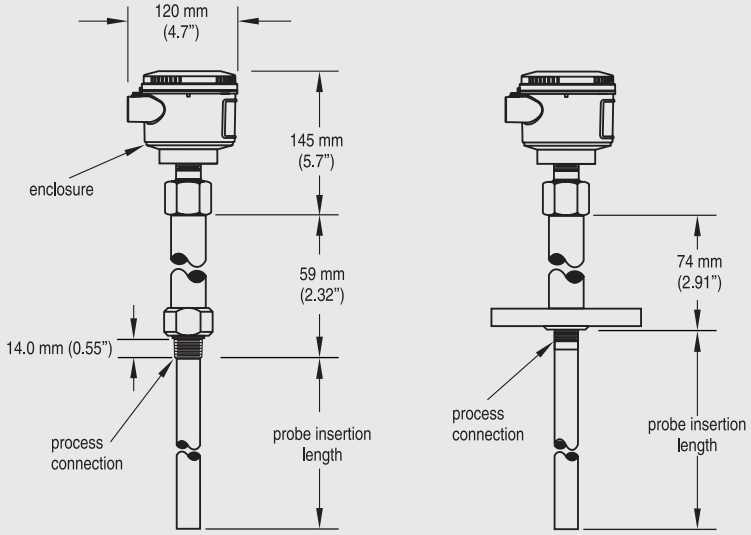
SITRANS LG200

Dimensional drawings

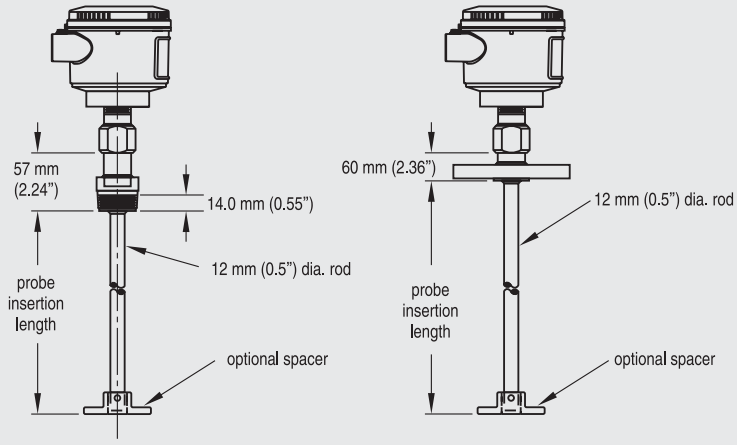
SITRANS LG200 Enclosure



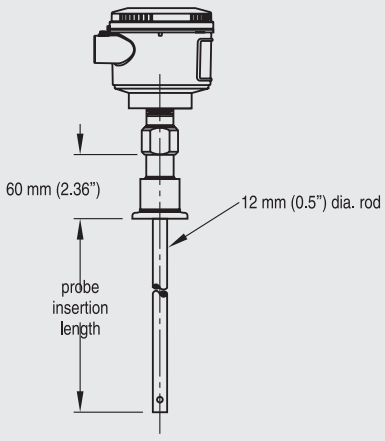
7ML1301-1 Probe, NPT Threaded and Flanged Connection



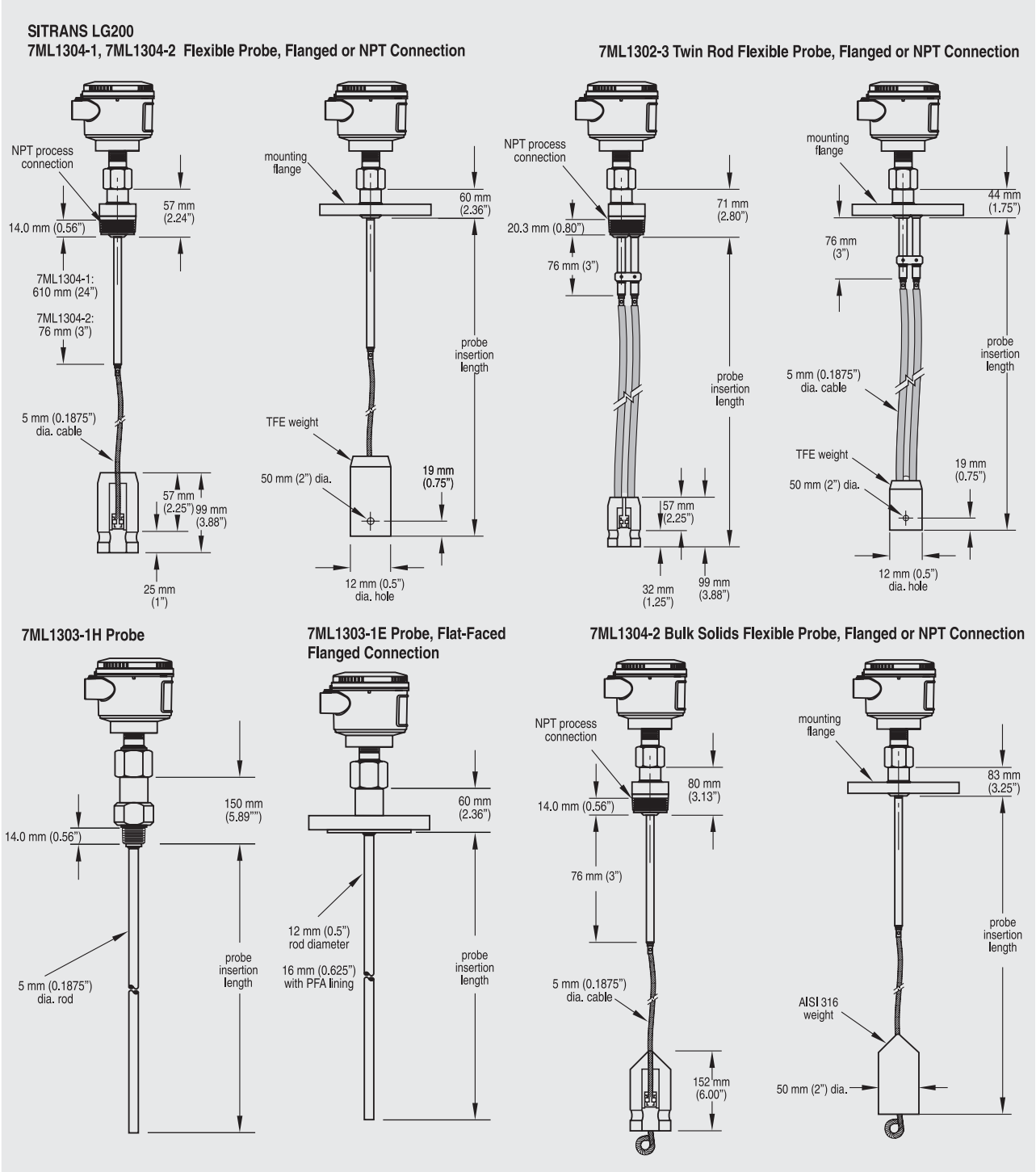
7ML1303-1 Probe, NPT Threaded and Flanged Connection



7ML1303-1D Probe, Sanitary Connection



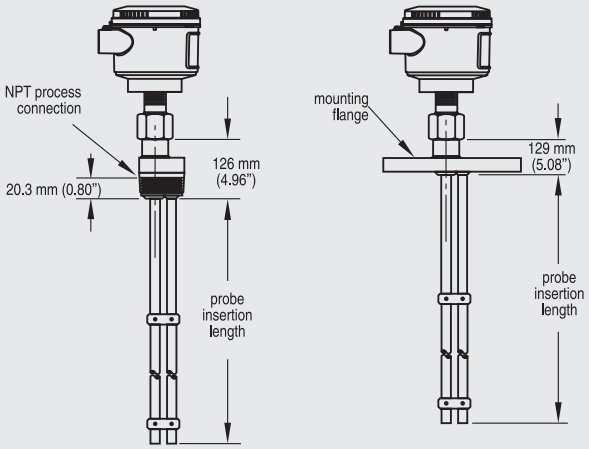
SITRANS LG200 dimensions



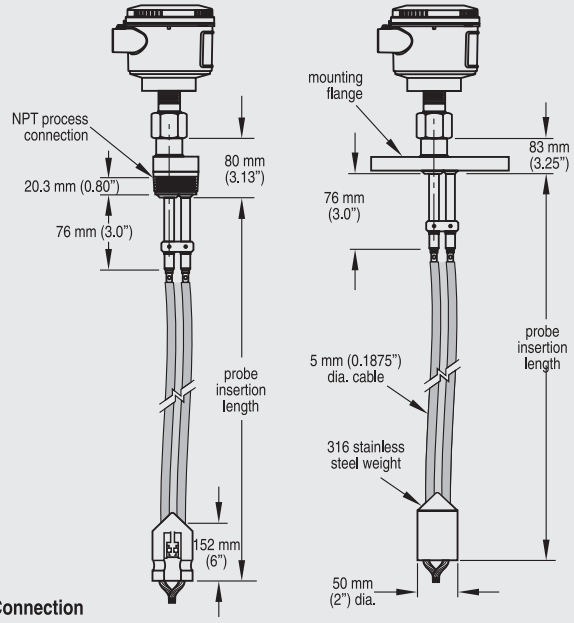
SITRANS LG200 dimensions

SITRANS LG200

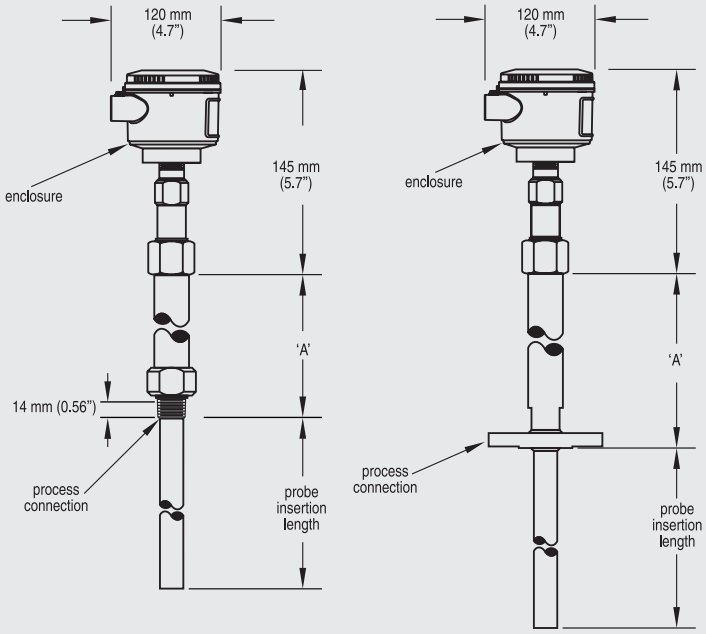
SITRANS LG200
7ML1302-1 Twin Rod Probe, NPT Threaded and Flanged Connection



7ML1302-2 Twin Rod Bulk Solids Flexible Probe
Flanged or NPT Connection



7ML1301-2, 7ML1301-3, 7ML1301-4, 7ML1301-6, Threaded or Flanged Connection

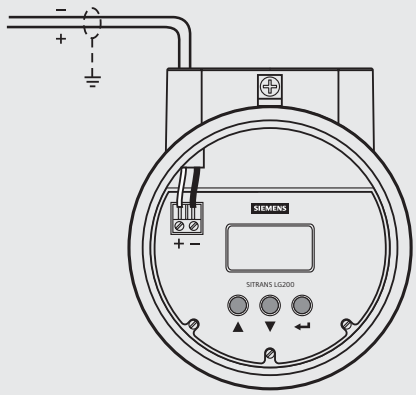


Probes	'A' Dimension (NPT)	'A' Dimension (Flanged)
7ML1301-2 (Coaxial HT/HP Probe)	217 mm (8.55")	277 mm (10.91")
7ML1301-3 (Coaxial HP Probe)	106 mm (4.18")	166 mm (6.54")
7ML1301-4 (Coaxial Overfill/Flooded Cage Probe), 7ML1301-6 (Coaxial Interface Probe)	150 mm (5.89")	167 mm (6.57")
7ML1301-5 (Coaxial HT/HP Steam Probe)	180 mm (7.10")	242 mm (9.52")

SITRANS LG200 dimensions

Schematics

SITRANS LG200 General Purpose Wiring



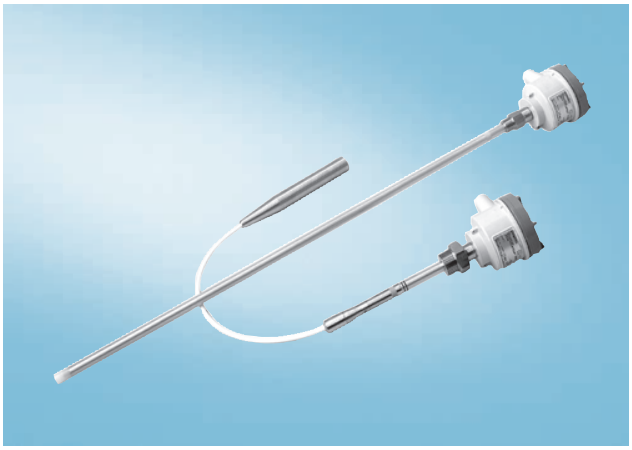
Intrinsically Safe wiring
When connecting SITRANS LG200 in Intrinsically Safe applications, install an approved IS barrier in the non-hazardous (safe) area.

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") of the transmitter. An Explosion Proof conduit fitting is required between the hazardous and safe areas.

SITRANS LG200 connections

SITRANS LC300

Overview



SITRANS LC300 is an inverse frequency shift capacitance continuous level transmitter for liquids and solids applications. It is ideal for standard industrial applications in chemical, hydrocarbon processing, food and beverage 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 signalling according to NAMUR NE 43
- Push-button calibration and programming

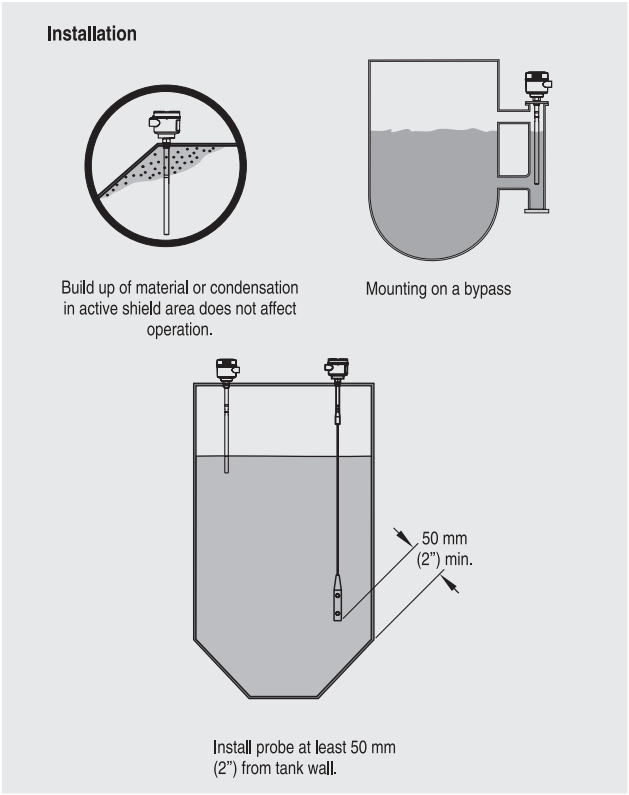
Application

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 two versions: rod and cable.

SITRANS LC300 has a stainless steel process connection with PFA-lined probe. Materials with low or high dielectric properties are accurately measured and patented Active-Shield technology helps in ignoring the effects of buildup near vessel nozzle.

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

Configuration



SITRANS LC300 installation

Technical specifications

Input	
Measuring range	1.66 to 3300 pF
Span	Min. 3.3 pF
Output	
Loop current	Continuous signal 4 to 20 mA/ 20 to 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 (transmitter)	-40 to +85 °C (-40 to +185 °F)
• Installation category	II
• Pollution degree	4
• Ingress protection	Type 4/NEMA 4/IP65, IP68
Installation conditions	
• Location	Indoor/outdoor
Pressure range	-1 to 35 bar g (-14.6 to 511 psi g)
Process temperature (probe)	-40 to +200 °C (-40 to +392 °F)
Min. dielectric constant εr	1.5
Design	
Material	
• Enclosure	Aluminum, epoxy-coated
Probe diameter	
• Rod version	19 mm (0.75") with PFA jacket
• Cable version	9 mm (0.35") with PFA jacket, 6 mm (0.24") without PFA jacket
Active shield length	
• Rod version	100 mm (3.94")
• Cable version	105 mm (4.13")
Process connection of probe	
• Threaded rod mounting	¾",1",1¼", 1½" NPT [(Taper), ANSI/ASME B1.20.1] R ¾",1",1¼", 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 to 4" ASME, DIN DN 25 to 100
Enclosure cable inlet	2 x ½" NPT or 2 x M20x1.5
Power supply	9 to 32 V DC any polarity, 2-wire current loop circuit (9 V @ 22 mA)
User Interface	
Display	Local LCD, 4 digit, each 0 to 9 and limited alpha characters
Safety	
Measurement current signalling	According to NAMUR NE 43, signal 3.8 to 20.5 mA, fault ≤ 3.6 or ≥ 21 mA (22 mA)
Certificates and approvals	
• General	CE, CSA, FM
• Dust Ignition Proof (Intrinsically Safe probe circuit)	• CSA/FM Class II, III, Div 1, Groups E, F, G T4 • ATEX II 1/2 D T100 °C
• Explosion Proof (Intrinsically Safe probe circuit)	• CSA/FM Class I, Div 1, Groups A, B, C, D T4 • ATEX II 1/2 G EEx d [ia] IIC T6 to T1
• Marine	Lloyd's Register of Shipping, categories ENV1, ENV2, ENV3 and ENV5, American Bureau of Shipping (ABS)
• Pressure	PED 97/23/EC, CSA B51
• Other	C-TICK (Australia)

[1] When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 5/220.

Consider diameter of cable weight (34.5 mm/1.36") when choosing Process Connection.

Design: Probe		
	Standard version	Cable version
Length	Min. 300 mm (12"), max. 5000 mm (197")	Min. 1000 mm (40"), max. 25000 mm (984")
Sensor wetted parts	PFA, 316L stainless steel	316 stainless steel, optional PFA
O-ring seal material[1]	FKM	FKM
Thermal isolator	Optional	Optional

[1] FFKM available as special option. Contact nacc.smpi@siemens.com for details.

5

SITRANS LC300

Selection and Ordering data	Order No.
SITRANS LC300, threaded	7ML5625-
An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications.	■■■■■-■■A■
Version (threaded lengths include process thread)	
Rod, 19 mm (0.75") diameter, PFA insulated Add order code Y01 and plain text: "Insertion length ... mm"	
- 300 to 1000 mm (11.81 to 39.37")	0A
- 1001 to 2000 mm (39.41 to 78.74")	1A
- 2001 to 3000 mm (78.78 to 118.11")[4]	2A
- 3001 to 4000 mm (118.15 to 157.48")[4]	3A
- 4001 to 5000 mm (157.52 to 196.85")[4]	4A
Rod, 19 mm (0.75") diameter, PFA insulated with 35 mm (1.38") diameter stilling well Add order code Y01 and plain text: "Insertion length ... mm"	
- 300 to 1000 mm (11.81 to 39.37")[1]	0B
- 1001 to 2000 mm (39.41 to 78.74")[1]	1B
- 2001 to 3000 mm (78.78 to 118.11")[1] and 4)	2B
- 3001 to 4000 mm (118.15 to 157.48")[1] and 4)	3B
- 4001 to 5000 mm (157.52 to 196.85")[1] and 4)	4B
Cable, 9 mm (0.75") diameter, PFA insulated, weighted Add order code Y01 and plain text: "Insertion length ... mm"	
- 1000 to 2000 mm (39.37 to 78.74")[1]	0E
- 2001 to 4000 mm (78.78 to 157.48")[1]	1E
- 4001 to 6000 mm (157.52 to 236.22")[1]	2E
- 6001 to 8000 mm (236.26 to 314.96")[1]	3E
- 8001 to 10000 mm (315 to 393.70")[1]	4E
Cable, 6 mm (0.24") diameter, non-insulated, weighted Add order code Y01 and plain text: "Insertion length ... mm"	
- 1000 to 2000 mm (39.37 to 78.74")[1]	0F
- 2001 to 4000 mm (78.78 to 157.48")[1]	1F
- 4001 to 6000 mm (157.52 to 236.22")[1]	2F
- 6001 to 8000 mm (236.26 to 314.96")[1]	3F
- 8001 to 10000 mm (315 to 393.70")[1]	4F
Cable lengths up to 25000 mm (984.25") are possible for non-conductive media. Cable lengths up to 15000 mm (590.55") are possible for conductive media. Contact nacc.smpi@siemens.com for details.	
Process connection	
¾" NPT [(Taper), ANSI/ASME B1.20.1][2]	A0
1" NPT [(Taper), ANSI/ASME B1.20.1][2]	B0
1½" NPT [(Taper), ANSI/ASME B1.20.1]	C0
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203][2]	D0
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203][2]	E0
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	F0
1¼" NPT [(Taper), ANSI/ASME B1.20.1]	K0
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202][2]	L0
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202][2]	M0
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	N0
Approvals	
General purpose	1
CSA and FM Class II and III, Div. 1, Groups E, F, G T4; ATEX II 1/2 D T100 °C	2
ATEX II 1/2 G EEx d [ia] IIC T6 to T1	3
CSA/FM Class I, Div. 1, Groups A, B, C, D T4	4

Selection and Ordering data	Order No.
SITRANS LC300, threaded	7ML5625-
An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications.	■■■■■-■■A■
Enclosure	
Aluminum, epoxy-coated	
Cable entry 2 x ½" NPT, IP65	0
Cable entry 2 x M20x1.5, IP65	1
Cable entry 2 x ½" NPT, IP68	2
Cable entry 2 x M20x1.5, IP68	3
Thermal isolator/remote version	
None	A
With thermal isolator	B
With mounting eye[3]	C
With thermal isolator and mounting eye[3]	D
Electronic transmitter	
3300 pF range	1
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	**Y01**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	**Y15**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Instruction manual	Order No.
English	**7ML1998-5HE01**
French	**7ML1998-5HE11**
German	**7ML1998-5HE31**
Spanish Note: The instruction manual should be ordered as a separate line item on the order.	**7ML1998-5HE21**
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.	
Accessories	
½" NPT cable gland, nickel plated brass, fits cable diameter 6 to 12 mm (0.24 to 0.47") -40 to +100 °C (-40 to +212 °F), IP68 (General Purpose)	**7ML1830-1JA**
½" NPT cable gland, brass, ATEX II 2GD EEx d IIC and EEx e II, fits cable diameter 6.5 to 14 mm (0.26 to 0.55"), -60 to +130 °C (-76 to +266 °F), IP68 (Explosion Proof)	**7ML1830-1JB**
M20x1.5 cable gland, PA polyamide, ATEX II 2G EEx e II, fits cable diameter 7 to 12 mm (0.28 to 0.47"), -20 to +70 °C (-4 to +158 °F), IP68 (General Purpose)	**7ML1830-1JC**
M20x1.5 cable gland, brass, ATEX II 2GD EEx d IIC and EEx e II, fits cable diameter 10.5 to 15.9 mm (0.41 to 0.63"), under armour cable diameter 6.1 to 11.5 mm (0.24 to 0.45"), -60 to 130 °C (-76 to +266 °F), IP68 (Explosion Proof)	**7ML1830-1JD**
Electronic transmitter kit (includes transmitter and driver)	**7ML1830-1KN**

[1] For process connections 1½" and larger

[2] Available for rod versions only

[3] Available for PFA insulated cable versions 0E to 4E only

[4] Custom shipping methods required. Contact factory for more details.

Selection and Ordering data

Order No.

SITRANS LC300, welded flange — 7ML5626-

An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications. — -A

Version (lengths from flange face)

Rod, PFA insulated
Add order code Y01 and plain text: "Insertion length ... mm"

- 300 to 1000 mm (11.81 to 39.37") — 0A
- 1001 to 2000 mm (39.41 to 78.74") — 1A
- 2001 to 3000 mm (78.78 to 118.11")[3] — 2A
- 3001 to 4000 mm 118.15 to 157.48")[3] — 3A
- 4001 to 5000 mm (157.52 to 196.85")[3] — 4A

Rod, PFA insulated with stilling well
Add order code Y01 and plain text: "Insertion length ... mm"

- 300 to 1000 mm (11.81 to 39.37")[1] — 0B
- 1001 to 2000 mm (39.41 to 78.74")[1] — 1B
- 2001 to 3000 mm (78.78 to 118.11")[1) and 3] — 2B
- 3001 to 4000 mm (118.15 to 157.48")[1) and 3] — 3B
- 4001 to 5000 mm (157.52 to 196.85")[1) and 3] — 4B

Cable, PFA insulated, weighted
Add order code Y01 and plain text: "Insertion length ... mm"

- 1000 to 2000 mm (39.37 to 78.74")[1] — 0E
- 2001 to 4000 mm (78.78 to 157.48")[1] — 1E
- 4001 to 6000 mm (157.52 to 236.22")[1] — 2E
- 6001 to 8000 mm (236.26 to 314.96")[1] — 3E
- 8001 to 10000 mm (315 to 393.70")[1] — 4E

Cable, non-insulated, weighted
Add order code Y01 and plain text: "Insertion length ... mm"

- 1000 to 2000 mm (39.37 to 78.74")[1] — 0F
- 2001 to 4000 mm (78.78 to 157.48")[1] — 1F
- 4001 to 6000 mm)157.52 to 236.22")[1] — 2F
- 6001 to 8000 mm (236.26 to 314.96")[1] — 3F
- 8001 to 10000 mm (315 to 393.70")[1] — 4F

Cable lengths up to 25000 mm (984.25") are possible for non-conductive media. Cable lengths up to 15000 mm (590.55") are possible for conductive media. Contact nacc.smpi@siemens.com for details.

Process connection

Welded flange, 316L stainless steel, raised face

- 1" ASME 150 lb[4] — A1
- 1" ASME 300 lb[4] — A2
- 1" ASME 600 lb[4] — A3
- 1½" ASME 150 lb — B1
- 1½" ASME 300 lb — B2
- 1½" ASME 600 lb — B3
- 2" ASME 150 lb — C1
- 2" ASME 300 lb — C2
- 2" ASME 600 lb — C3
- 3" ASME 150 lb — D1
- 3" ASME 300 lb[3] — D2
- 3" ASME 600 lb[3] — D3
- 4" ASME 150 lb[3] — E1
- 4" ASME 300 lb[3] — E2
- 4" ASME 600 lb[3] — E3

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

- DN 25, PN 16[4] — J4
- DN 25, PN 40[4] — J6
- DN 40, PN 16 — K4
- DN 40, PN 40 — K6
- DN 50, PN 16 — L4
- DN 50, PN 40 — L6
- DN 80, PN 16 — M4
- DN 80, PN 40[3] — M6
- DN 100, PN 16[3] — N4

Selection and Ordering data

Order No.

SITRANS LC300, welded flange — 7ML5626-

An inverse frequency shift capacitance continuous level transmitter for liquids and solids applications. — -A

- DN 100, PN 40[3] (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.) — N6

Approvals

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

Enclosure

Aluminum, epoxy-coated

- • Cable entry 2 x ½" NPT, IP65 — 0
- • Cable entry 2 x M20x1.5, IP65 — 1
- • Cable entry 2 x ½" NPT, IP68 — 2
- • Cable entry 2 x M20x1.5, IP68 — 3

Thermal isolator/remote version

- None — A
- With thermal isolator — B
- With mounting eye[2] — C
- With thermal isolator and mounting eye[2] — D

Electronic transmitter

- 3300 pF range — 1

Further designs — Order code

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

- Insertion length, specify in plain text: Y01: ... mm — **Y01**
- Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text — **Y15**
- Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000 — **C11**
- Inspection Certificate Type 3.1 per EN 10204 — **C12**

Instruction manual — Order No.

- English — **7ML1998-5HE01**
- French — **7ML1998-5HE11**
- German — **7ML1998-5HE31**
- Spanish — **7ML1998-5HE21**

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

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.

Accessories

- ½" NPT cable gland, nickel plated brass, fits cable diameter 6 to 12 mm (0.24 to 0.47") -40 to +100 °C (-40 to +212 °F), IP68 (General Purpose) C) — **7ML1830-1JA**
- ½" NPT cable gland, brass, ATEX II 2GD EEx d IIC and EEx e II, fits cable diameter 6.5 to 14 mm (0.26 to 0.55"), -60 to +130 °C (-76 to +266 °F), IP68 (Explosion Proof) C) — **7ML1830-1JB**
- M20x1.5 cable gland, PA polyamide, ATEX II 2G EEx e II, fits cable diameter 7 to 12 mm (0.28 to 0.47"), -20 to +70 °C (-4 to +158 °F), IP68 (General Purpose) C) — **7ML1830-1JC**
- M20x1.5 cable gland, brass, ATEX II 2GD EEx d IIC and EEx e II, fits cable diameter 10.5 to 15.9 mm (0.41 to 0.63"), under armour cable diameter 6.1 to 11.5 mm (0.24 to 0.45"), -60 to 130 °C (-76 to +266 °F), IP68 (Explosion Proof) C) — **7ML1830-1JD**
- Electronic transmitter kit (includes transmitter and driver) — **7ML1830-1KN**

1) For process connections 1½" and larger
2) Available for PFA insulated cable versions 0E to 4E only
3) Custom shipping methods required. Contact factory for more details.
4) Only for use with Versions 0A to 4A
F) Subject to export regulations AL: 9I999, ECCN: N

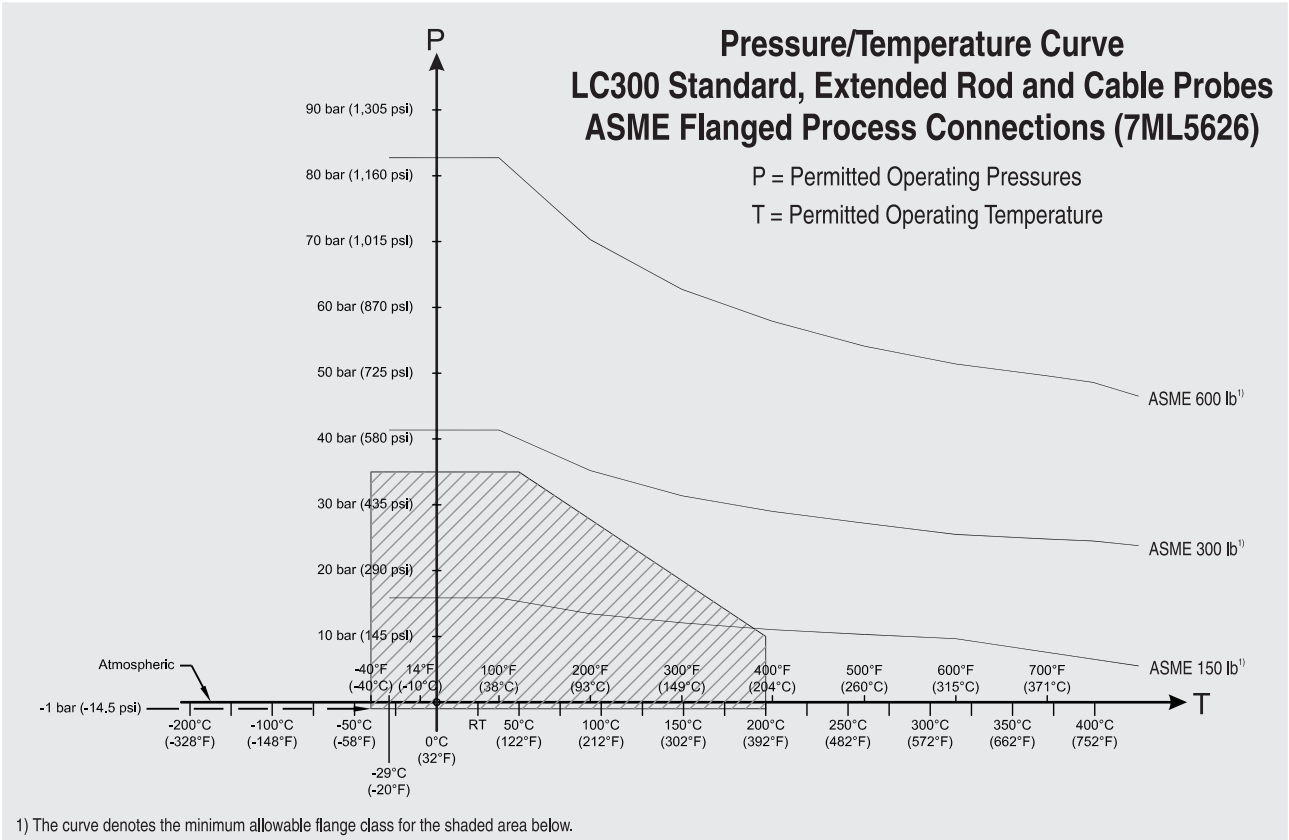
SITRANS LC300

Characteristic curves

Threaded Process Connections (7ML5625)

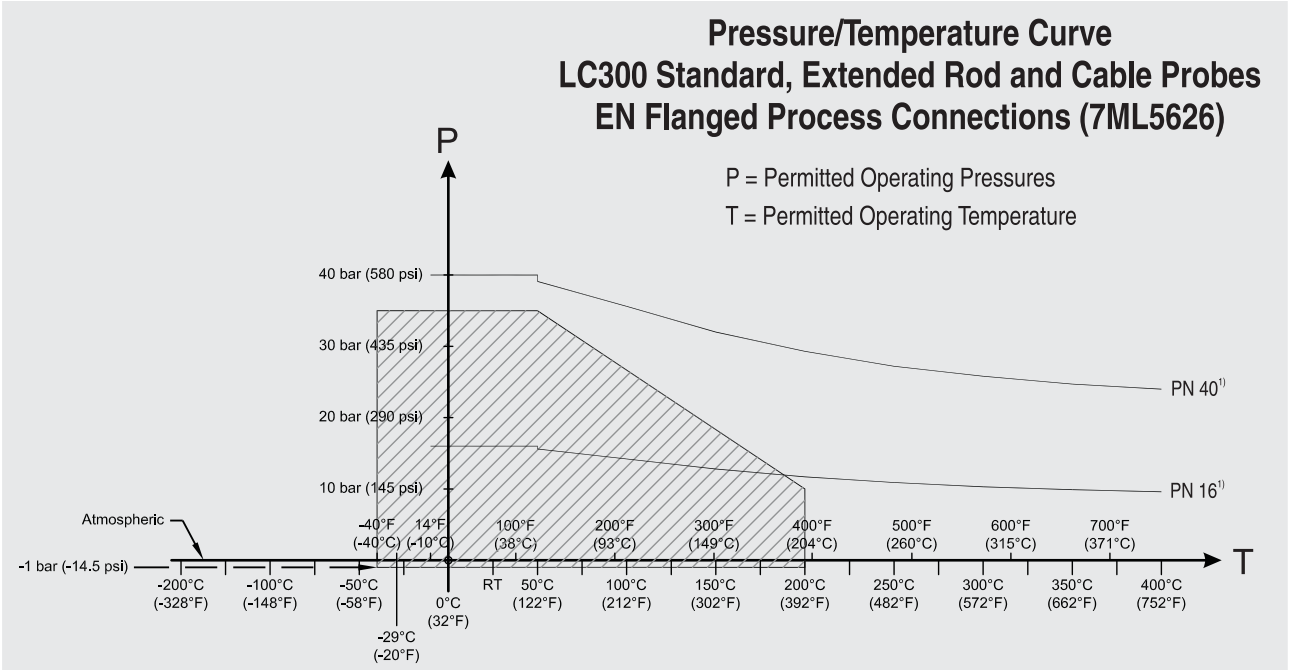
P = Permitted Operating Pressures
T = Permitted Operating Temperature

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



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

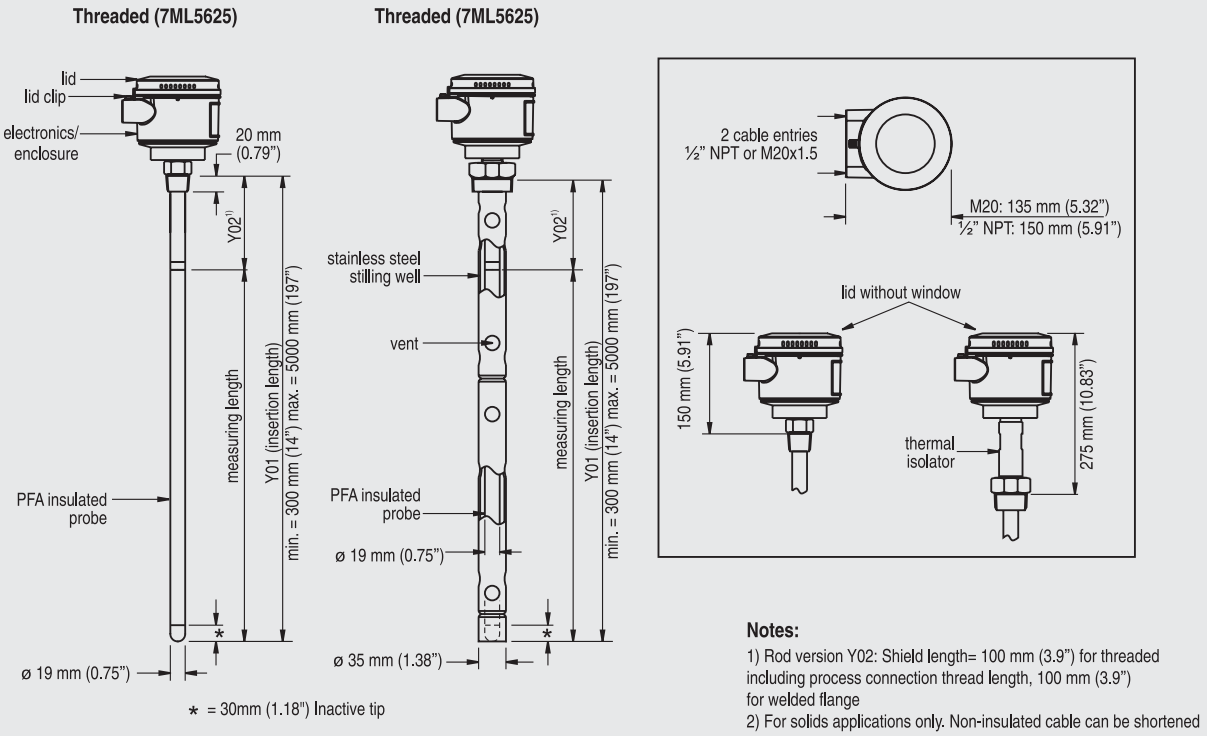
SITRANS LC300 Process Pressure/Temperature derating curves (7ML5626)



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

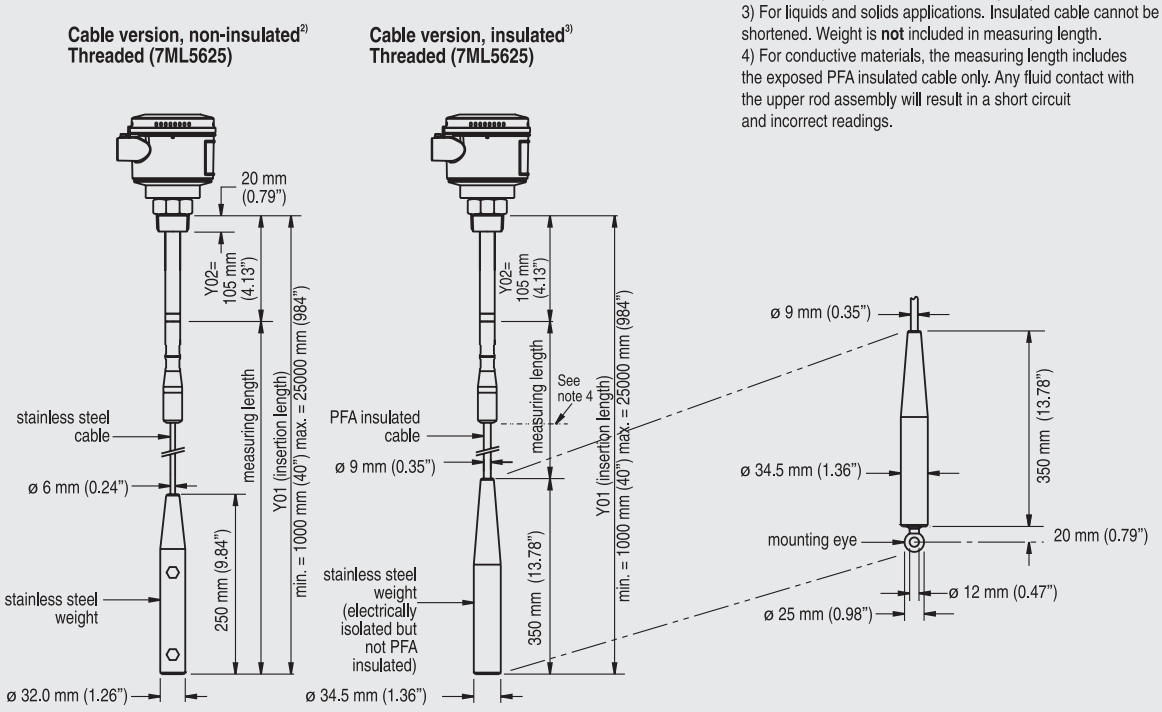
SITRANS LC300 Process Pressure/Temperature derating curves (7ML5626)

Dimensional drawings

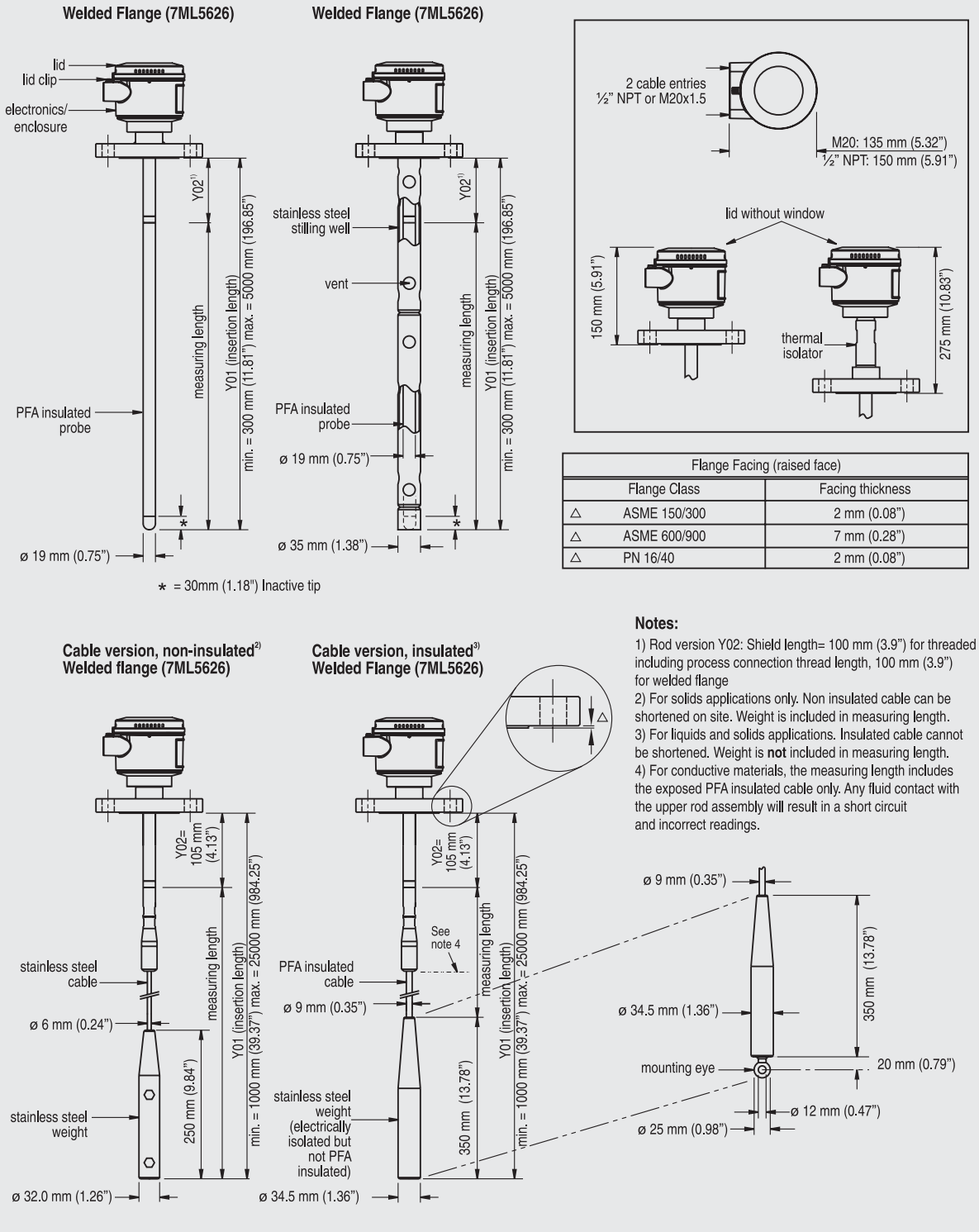


Notes:

1) Rod version Y02: Shield length= 100 mm (3.9") for threaded including process connection thread length, 100 mm (3.9") for welded flange
2) For solids 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.



SITRANS LC300 dimensions - Threaded Process Connections



Flange Facing (raised face)	
Flange Class	Facing thickness
△ ASME 150/300	2 mm (0.08")
△ ASME 600/900	7 mm (0.28")
△ PN 16/40	2 mm (0.08")

Notes:

1) Rod version Y02: Shield length= 100 mm (3.9") for threaded including process connection thread length, 100 mm (3.9") for welded flange

2) For solids applications only. Non insulated cable can be shortened on site. Weight is included in measuring length.

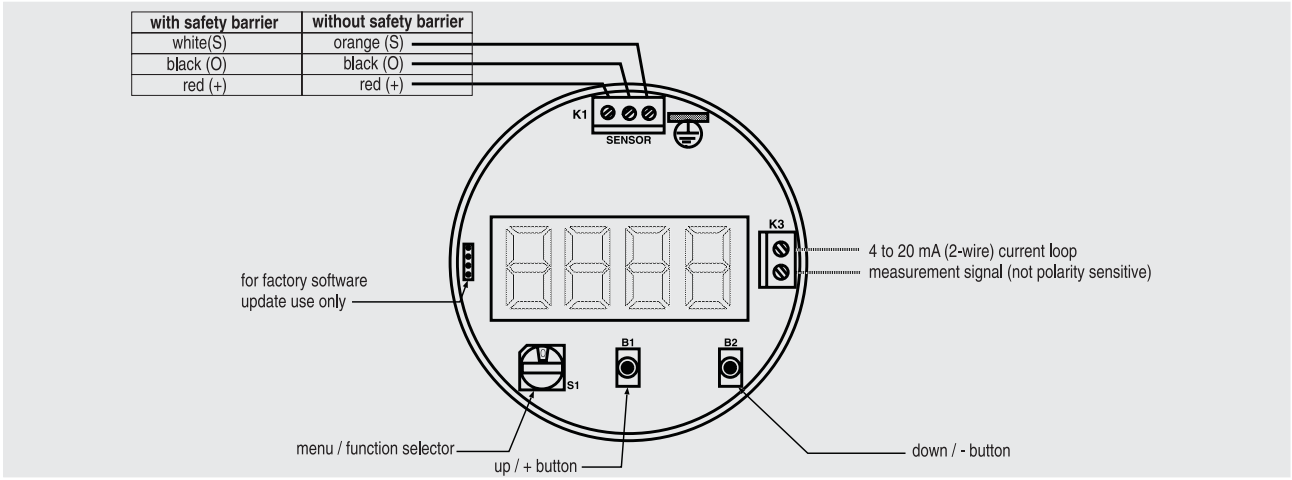
3) For liquids and solids applications. Insulated cable cannot be shortened. Weight is **not** included in measuring length.

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.

SITRANS LC300 dimensions - Flanged Process Connections

SITRANS LC300

Schematics



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 vapours.

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

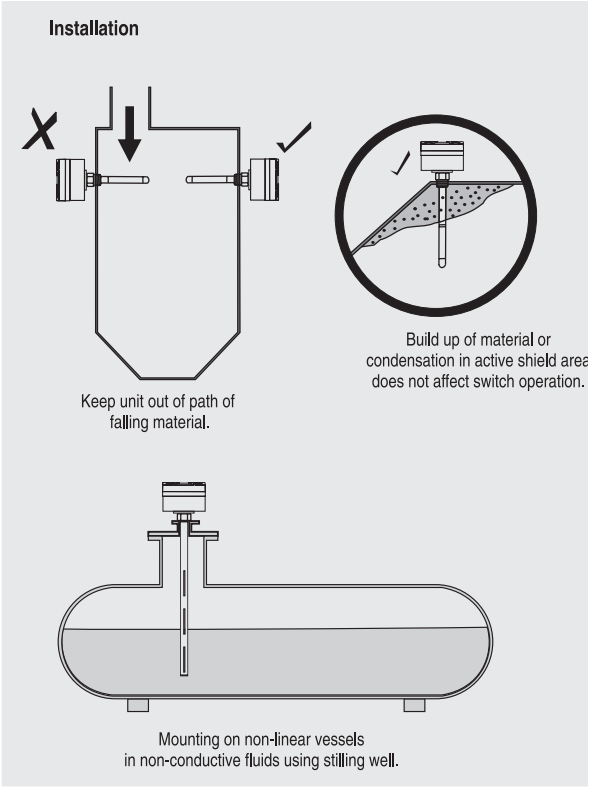
SITRANS LC500's advanced electronics provide one-step, push-button calibration and local display for easy on-site installation and setup.

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 C02 and liquified natural gas (LNG), distillation/regeneration tanks with high temperatures

Configuration



SITRANS LC500 installation

Technical specifications

Input	
Measuring range	1 to 3300 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 to 60 s
Loop current	3.6 to 22 mA/22 to 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 to +85 °C (-40 to +185 °F)
• Installation category	II
• Pollution degree	4
Medium conditions	
• Dielectric constant ε_r	Min. 1.5
• Process temperature (probe)	Temperature rating of process seal is pressure dependent. See Pressure/Temperature curves on page 5/231.
- Standard (PFA)	-50 to +200 °C (-58 to +392 °F)
- High temperature version with thermal isolator and enamel insulation	-60 to +400°C (-76 to +752 °F)
- Cryogenic version	-200 to +200 °C (-328 to +392 °F) Contact nacc.smpi@siemens.com for details.
Pressure range	Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 5/231.
• Standard (PFA)	-1 to 150 bar g (2175 psi g)
• High temperature version (Enamel)	-1 to 345 bar g (5004 psi g)
Design	
Material	
• Wetted parts material	
- Standard rod	316L stainless steel
• Probe insulation (rod)	PFA, enamel
• Cable	316 Stainless steel/316 stainless steel PFA
Probe diameter	
• Rod version	16 mm (0.63") or 24 mm (0.95")
• Cable version	9 mm (0.35") with PFA jacket, 6 mm (0.24") without PFA jacket
Active shield length	
• Minimum (Rod version)	50 mm (1.97"), customer selectable (order number Y02)
Probe length	
• Rod version	Max. 3.5 m (138") with 16 mm rod, PFA Max. 1.5 m (59") with 16 mm rod, enamel Max. 5.5 m (216") with 24 mm rod, PFA
• Cable version	Max. 35 m (1378")
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	Aluminium, epoxy-coated
• Cable inlet	2 x ½" NPT
• Degree of protection	Type 4X/NEMA4X/IP68

Power supply	Max. 33 V DC (30 V DC with Intrinsically Safe operation), min. 12 V DC @ 3.6 mA, min. 9.5 V DC @ 22 mA
User Interface	
Display	Local LCD, 4 digit, each 0 to 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 signalling	According to NAMUR NE 43, signal 3.8 to 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 to 9, A to F
• SMART communication	Conforming to HART Communication Foundation (HCF)
Certificates and approvals	
• General Purpose	CE (complies with E.C.C. requirements of EN 55011 and EN 61326)
• Non incendive/Non sparking	• CSA/FM Class 1, Div. 2, Groups A, B, C, D T4 • ATEX II 3G 2D EExn A [ib] IIC T6 to T4 T100 °C
• Dust Ignition Proof	• CSA/FM Class II and III, Div. 1, Groups E, F, G • ATEX II 1/2 GD EEx d [ia] T6 to T1
• Intrinsically Safe[2]	• CSA/FM Class 1, Div. 1, Groups A, B, C, D T4 • ATEX II 1G EEx [ia] IIC T6 to T4
• 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
• Marine	Lloyd's Register of Shipping, Categories ENV1, ENV2, ENV3 and ENV5
• Pressure	PED 97/23/EC, CSA B51
• Other	C-TICK (Australia)

[1] When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 5/231.

[2] Barrier required for Intrinsically Safe protection

Selection and Ordering data	Order No.
SITRANS LC500, Threaded or Welded Flange with Cable Sensor	**7 M L 5 5 1 3 -**
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") diameter, 316 stainless steel with PFA insulation, weighted	
Add order code Y01 and plain text: "Insertion length ... mm"	
- 1000 to 2000 mm (39.37 to 78.74")	**0 E**
- 2001 to 4000 mm (78.78 to 157.48")	**1 E**
- 4001 to 6000 mm (157.52 to 236.22")	**2 E**
- 6001 to 8000 mm (236.26 to 314.96")	**3 E**
- 8001 to 10000 mm (315 to 393.70")	**4 E**
Longer lengths possible to a max. of 35000 mm (114.83 ft). Contact nacc.smpi@siemens.com for details.	
Cable, 6 mm (0.24") diameter, 316L stainless steel, non-insulated, weighted	
Add order code Y01 and plain text: "Insertion length ... mm"	
- 1000 to 2000 mm (39.37 to 78.74")[2]	**0 F**
- 2001 to 4000 mm (78.78 to 157.48")[2] and 3)	**1 F**
- 4001 to 6000 mm (157.52 to 236.22")[2] and 3)	**2 F**
- 6001 to 8000 mm (236.26 to 314.96")[2] and 3)	**3 F**
- 8001 to 10000 mm (315 to 393.70")[2] and 3)	**4 F**
Cable lengths up to 25000 mm (984.25") are possible for non-conductive media. Cable lengths up to 15000 mm (590.55") are possible for conductive media. Contact nacc.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	Order No.
SITRANS LC500, Threaded or Welded Flange with Cable Sensor	**7 M L 5 5 1 3 -**
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	**1**
CSA/FM Class 1, Div. 2, Groups A, B, C, D T4; ATEX II 3G 2D EExn A [ib] IIC T6 to T4 T100 °C; CSA/FM Class II and III, Div. 1, Groups E, F, G;	**2**
CSA/FM Class I, Div. 1, Groups A, B, C, D T4; ATEX II 1G EEx ia IIC T6 to T4[4]	**3**
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**
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[5]	**B**
Thermal isolator/remote version	
Without thermal isolator or remote electronics	**A**
Isolator, only for use when temperature range is outside of -40 to +85 °C (-40 to +185 °F), explosion proof approval -40 to +70 °C (-40 to +158 °F)	**B**
Electronic output	
No transmitter supplied	**0**
2-wire loop current 4 to 20 mA (transmitter MSP 2002-2 _3300 pF)	**1**
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Insertion length, specify in plain text: **Y01: ... mm**	**Y01**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	**Y15**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Instruction manual	**See page 5/230**
Accessories	**See page 5/230**

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) Barrier required for Intrinsically Safe protection
5) Available in PFA insulated version only

SITRANS LC500

Selection and Ordering data	Order No.							
SITRANS LC500, Threaded or Welded Flange, with Rod Sensor	7 M L 5 5 1 5 -							
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								
Rod, 16 mm (0.63"), PFA insulated								
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"								
- 200 to 1000 mm (7.87 to 39.37")[1]	0 A							
- 1001 to 2000 mm (39.41 to 78.74")	1 A							
- 2001 to 3000 mm (78.78 to 118.11")[2]	2 A							
- 3001 to 3500 mm (118.15 to 137.80")[2]	3 A							
Rod, 16 mm (0.63"), PFA insulated with 35 mm (1.38") stilling well in 316L stainless steel								
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"								
- 200 to 1000 mm (7.87 to 39.37")[1] and 3)	0 B							
- 1001 to 2000 mm (39.41 to 78.74")[3]	1 B							
- 2001 to 3000 mm (78.78 to 118.11")[2] and 3)	2 B							
- 3001 to 3500 mm (118.15 to 137.80")[2] and 3)	3 B							
Rod, 24 mm (0.94"), PFA insulated								
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"								
- 200 to 1000 mm (7.87 to 39.37")[4]	0 C							
- 1001 to 2000 mm (39.41 to 78.74")[4]	1 C							
- 2001 to 3000 mm (78.78 to 118.11")[2] and 4)	2 C							
- 3001 to 4000 mm (118.15 to 137.80")[2] and 4)	3 C							
- 4001 to 5000 mm (173.26 to 196.88")[2] and 4)	4 C							
- 5001 to 5500 mm (196.89 to 216.54")[2] and 4)	5 C							
Rod, 24 mm (0.94"), PFA insulated with 48 mm (1.89") stilling well in 316L stainless steel								
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"								
- 200 to 1000 mm (7.87 to 39.37")[5]	0 D							
- 1001 to 2000 mm (39.41 to 78.74")[4]	1 D							
- 2001 to 3000 mm (78.78 to 118.11")[2] and 5)	2 D							
- 3001 to 4000 mm (118.15 to 137.80")[2] and 5)	3 D							
- 4001 to 5000 mm (173.26 to 196.88")[2] and 5)	4 D							
- 5001 to 5500 mm (196.89 to 216.54")[2] and 5)	5 D							
Rod, 16 mm (0.63"), Glassteel Enamel insulated								
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"								
- 250 to 1500 mm (9.84 to 59.06")[2] and 5)	0 E							
Rod, 16 mm (0.63"), Glassteel Enamel insulated, with 40 mm (1.57") stilling well in 316L stainless steel								
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"								
- 250 to 1500 mm (9.84 to 59.06")[2] and 5)	0 F							
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	Order No.							
SITRANS LC500, Threaded or Welded Flange, with Rod Sensor	7 M L 5 5 1 5 -							
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.								
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			1					
CSA/FM Class 1, Div. 2, Groups A, B, C, D T4; ATEX II 3G 2D EExn A [ib] IIC T6 to T4 T100 °C; CSA/FM Class II and III, Div. 1, Groups E, F, G;			2					
CSA/FM Class I, Div. 1, Groups A, B, C, D T4; ATEX II 1G EEx ia IIC T6 to T4[6]			3					
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					
Enclosure/Cable inlet								
Aluminum epoxy coated								
2 x ½" NPT, IP68					1			
2 x M20x1.5 (IP68, adapter)					2			
Options								
No additional options						A		
Slotted holes instead of standard vent holes in stilling well (Refer to instruction manual for dimensions.)[7]						B		
Thermal isolator/remote version								
Without thermal isolator or remote electronics							A	
Thermal isolator, only for use when temperature range is outside of -40 to +85 °C (-40 to +185 °F), explosion proof approval -40 to +70 °C (-40 to +158 °F)							B	
Remote electronics with mounting bracket and cable[8]								
• Length: 2 m (79")							C	
• Length: 3 m (118")							D	
• Length: 4 m (158")							E	
• Length: 5 m (197")							F	

Selection and Ordering data	Order 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.	**7 M L 5 5 1 5 -** ■■■■ - ■■■■
Electronic output No transmitter supplied 2-wire loop current 4 to 20 mA (transmitter MSP 2002-2 _3300 pF)	**0** **1**
Further designs Please add "**-Z**" to Order No. and specify Order code(s).	Order code
Insertion length, specify in plain text: Y01: ... mm **[minimum 200 mm (7.87")]**	**Y01**
Active shield length, specify in plain text [min. length is 50 mm (2")]: Y02: ... mm	**Y02**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	**Y15**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Manufacturing Test Report (Electrode Test)	**C18**
Instruction manual	**See page 5/230**
Accessories	**See page 5/230**

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) Barrier required for Intrinsically Safe protection
7) Available with version 0B to 3B, 0D to 5D and 0F only
8) Available with approval option 1 only

SITRANS LC500

Selection and Ordering data	Order No.
SITRANS LC500, Single Piece Flanged with Rod Sensor	7ML5517 -
Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.	
Version	
Rod, 16 mm (0.63"), PFA insulated	
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"	
- 250 to 1000 mm (9.84 to 39.37")[1]	0 A
- 1001 to 2000 mm (39.41 to 78.74")	1 A
- 2001 to 3000 mm (78.78 to 118.11")[2]	2 A
- 3001 to 3500 mm (118.15 to 137.80")[2]	3 A
Rod, 16 mm (0.63"), PFA insulated with 35 mm (1.34") stilling well in 316L stainless steel	
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"	
- 250 to 1000 mm (9.84 to 39.37")[3]	0 B
- 1001 to 2000 mm (39.41 to 78.74")[3]	1 B
- 2001 to 3000 mm (78.78 to 118.11")[2] and 3)	2 B
- 3001 to 3500 mm (118.15 to 137.80")[2]and 3)	3 B
Rod, 24 mm (0.94"), PFA insulated	
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"	
- 250 to 1000 mm (9.84 to 39.37")[4]	0 C
- 1001 to 2000 mm (39.41 to 78.74")[4]	1 C
- 2001 to 3000 mm (78.78 to 118.11")[2] and 4)	2 C
- 3001 to 4000 mm (118.15 to 137.80")[2] and 4)	3 C
- 4001 to 5000 mm (173.26 to 196.88")[2] and 4)	4 C
- 5001 to 5500 mm (196.89 to 216.54")[2] and 4)	5 C
Rod, 24 mm (0.94"), PFA insulated with 48 mm (1.89") stilling well in 316L stainless steel	
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"	
- 250 to 1000 mm (9.84 to 39.37")	0 D
- 1001 to 2000 mm (39.41 to 78.74")[2] and 5)	1 D
- 2001 to 3000 mm (78.78 to 118.11")[2] and 5)	2 D
- 3001 to 4000 mm (118.15 to 137.80")[2] and 5)	3 D
- 4001 to 5000 mm (173.26 to 196.88")[2 and 5))	4 D
- 5001 to 5500 mm (196.89 to 216.54")[2] and 5)	5 D
Rod, 16 mm (0.63"), Glassteel Enamel insulated	
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"	
- 300 to 1500 mm (11.81 to 59.01")[2] and 6)	0 E
Rod, 16 mm (0.63"), Glassteel Enamel insulated, with 40 mm (1.57") stilling well in 316L stainless steel	
Add order code Y01 and Y02 and plain text: "Insertion length ... mm and active shield length ... mm"	
- 300 to 1500 mm (11.81 to 59.01")[2] and 6)	0 F
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
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 to 3A and 0C to 5C)[7]	
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 to 3A, 0C to 5C)[7]	
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.)	
Approvals	
General Purpose	1
CSA/FM Class 1, Div. 2, Groups A, B, C, D T4; ATEX II 3G 2D EExn A [ib] IIC T6 to T4 T100 °C; CSA/FM Class II and III, Div. 1, Groups E, F, G;	2
CSA/FM Class I, Div. 1, Groups A, B, C, D T4; ATEX II 1G EEx ia IIC T6 to T4[8]	3
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
Enclosure/Cable inlet	
Aluminum epoxy coated	
2 x ½" NPT, IP68	1
2 x M20x1.5 (IP68, adapter)	2
Options	
None	A
Slotted holes instead of standard vent holes in stilling well (Refer to manual for dimensions.)	B
Thermal isolator/remote version	
Without thermal isolator or remote electronics	A
Isolator, only for use when temperature range is outside of -40 to +85 °C (-40 to +185 °F), explosion proof approval -40 to +70 °C (-40 to +158 °F)	B
Remote electronics with mounting bracket and cable[9]	
• Length: 2 m (79")	C
• Length: 3 m (118")	D
• Length: 4 m (158")	E
• Length: 5 m (197")	F

Selection and Ordering data	Order 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.	**7 M L 5 5 1 7 -** ■■■■ - ■■■■
Electronic output No transmitter supplied 2-wire loop current 4 to 20 mA (transmitter MSP 2002-2 _3300 pF)	**0** **1**
Further designs Please add "**-Z**" to Order No. and specify Order code(s).	Order code
Insertion length, specify in plain text: **Y01: ... mm** Y01 for version 0A to 5D: min. = 200 mm (7.87") Y01 for version 0E and 0F: min. = 250 mm (9.84")	**Y01**
Active shield length, specify in plain text [min. length is 50 mm (2")]: **Y02: ... mm** Y02 for version 0A to 5D: min. = 50 mm (1.97") Y02 for version 0E and 0F: min. = 100 mm (3.94")	**Y02**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	**Y15**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Manufacturing Test Report (Electrode Test)	**C18**
Instruction manual	**See page 5/230**
Accessories	**See page 5/230**

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, and only available with process connection options C1 to C3, D1 to D3, E1 to E3, F1 to F3, L4 and L5, M4 and M5, N4 and N5, P4 and P5

6) Available with version 0B to 3B, 0D to 5D and 0F only

7) Not available with versions 0E and 0F

8) Barrier required for Intrinsically Safe protection

9) Available with approval option 1 only

SITRANS LC500

Selection and Ordering data	Order 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"), 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) and 4)]	
- 5000 to 10 000 mm (196.85 to 393.70")[1]	0A
- 10001 to 15000 mm (393.74 to 590.55")[1]	1A
- 15001 to 20000 mm (590.59 to 787.40")[1]	2A
- 20001 to 25000 mm (787.44 to 984.25")[1]	3A
- 25001 to 30000 mm (984.29 to 1181.10")[1]	4A
- 30001 to 35000 mm (1181.14 to 1377.95")[1]	5A
Rod, 24 mm (0.94"), 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) and 4)]	
- 5000 to 10 000 mm (196.85 to 393.70")[1]	0B
- 10001 to 15000 mm (393.74 to 590.55")[1]	1B
- 15001 to 20000 mm (590.59 to 787.40")[1]	2B
- 20001 to 25000 mm (787.44 to 984.25")[1]	3B
- 25001 to 30000 mm (984.29 to 1181.10")[1]	4B
- 30001 to 35000 mm (1181.14 to 1377.95")[1]	5B
Process connection (316L stainless steel)	
Threaded connection	
2" NPT [(Taper), ANSI/ASME B1.20.1]	A0
R 2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]	B0
G 2" [(BSPP), EN ISO 228-1/PF (JIS-P) JIS B 0202]	D0
Welded flange, raised face	
2", ASME, 150 lb	C1
2", ASME, 300 lb	C2
3", ASME, 150 lb[1]	D1
3", ASME, 300 lb[1]	D2
4", ASME, 150 lb[1]	E1
4", ASME, 300 lb[1]	E2
6", ASME, 150 lb[1]	F1
6", ASME, 300 lb[1]	F2
Welded flange, Type A flat faced	
DN 50, PN 16	L4
DN 50, PN 40	L5
DN 80, PN 16	M4
DN 80, PN 40[1]	M5
DN 100, PN 16[1]	N4
DN 100, PN 40[1]	N5
DN 125, PN 16[1]	P4
DN 125, PN 40[1]	P5
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.)	
Approvals	
General Purpose	1
CSA/FM Class 1, Div. 2, Groups A, B, C, D T4; ATEX II 3G 2D EExn A [ib] IIC T6 to T4 T100 °C; CSA/FM Class II and III, Div. 1, Groups E, F, G;	2
CSA/FM Class I, Div. 1, Groups A, B, C, D T4; ATEX II 1G EEx ia IIC T6 to T4[5]	3
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
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

Selection and Ordering data	Order 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.	
Thermal isolator	
Without thermal isolator	A
Isolator, only for use when temperature range is outside of -40 to +85 °C (-40 to +185 °F), explosion proof approval -40 to +70 °C (-40 to +158 °F)	B
Electronic output	
No transmitter supplied	0
2-wire loop current 4 to 20 mA (transmitter MSP 2002-2 _3300 pF)	1
Further designs	Order code
Please add "**-Z**" to Order No. and specify Order code(s).	
Total Insertion length, specify in plain text: Y01: ... mm **[min. PFA rod length 200 mm (7.87")]**[3]	**Y01**
Active shield length, specify in plain text: Y02: ... mm **[min. length 50 mm (2")]**[4]	**Y02**
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	**Y15**
Acceptance test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and ISO 9000	**C11**
Inspection Certificate Type 3.1 per EN 10204	**C12**
Instruction manual	**See page 5/230**
Accessories	**See page 5/230**

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 5/241 for further explanation of Y01.

4) Inactive length is equal to the flexible extension plus transition. See dimension drawings on page 5/241 for further explanation of Y02.

5) Barrier required for Intrinsically Safe protection

Selection and Ordering data		Order No.
Instruction manual for SITRANS LC500		
English		**7ML1998-5GE01**
French		**7ML1998-5GE11**
Spanish		**7ML1998-5GE21**
German		**7ML1998-5GE31**
Note: The instruction manual should be ordered as a separate line item on the order.		
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Accessories		
Transmitter, MSP 2002-1, 330 PF	H)	**7ML1830-1JP**
Transmitter, MSP 2002-2, 3300 PF	H)	**7ML1830-1JQ**
Transmitter, MSP 2002-3, 6600 PF (used with conductive fluids and probe lengths >10 000 mm)	H)	**7ML1830-1JR**

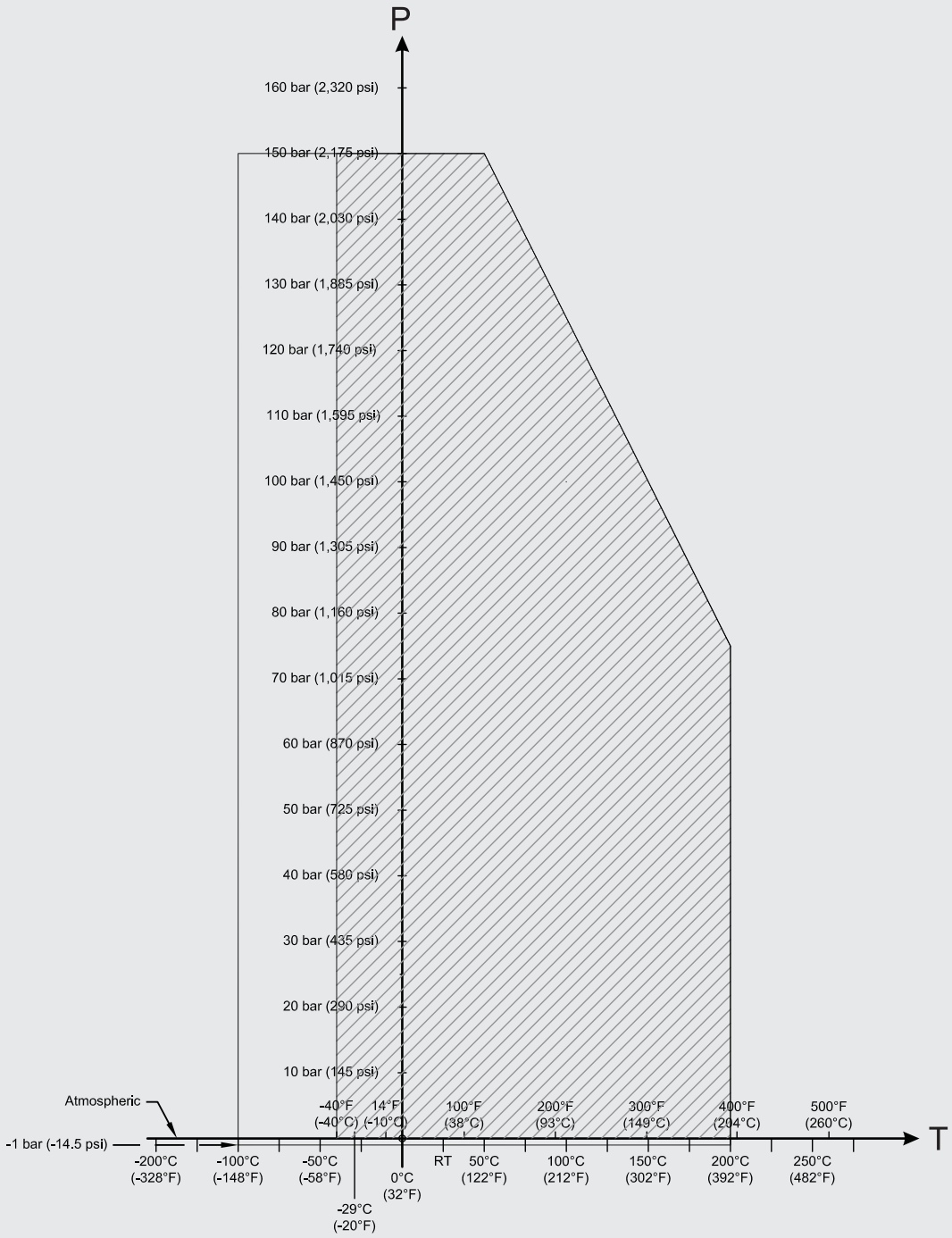
H) Subject to export regulations AL: N, ECCN: 3A991

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

Characteristic curves

P = Permitted Operating Pressures
T = Permitted Operating Temperature

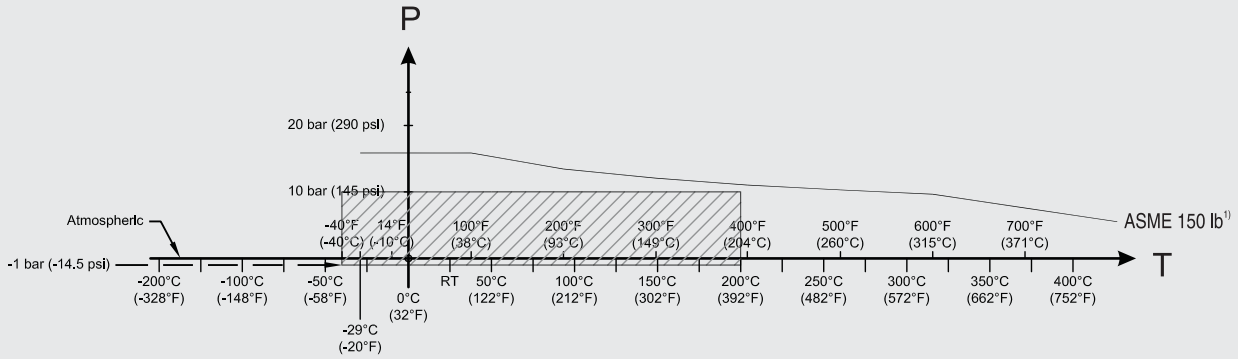
SITRANS LC500 Process Pressure/Temperature derating curves (7ML5513)



Pressure/Temperature Curve
LC500 PFA Rod Probes
Threaded Process Connections (7ML5515)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

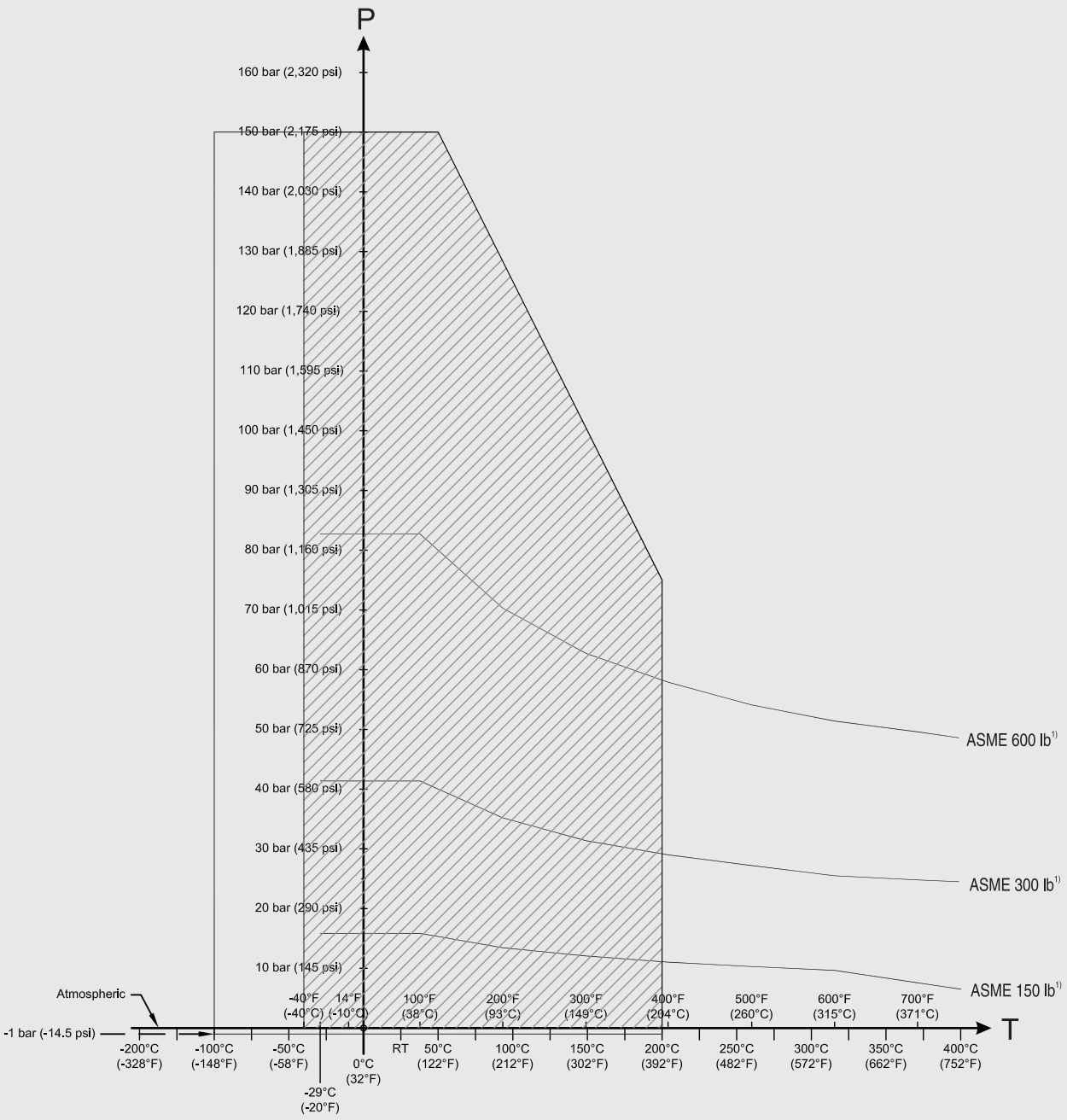


Pressure/Temperature Curve
LC500 Cable Probes
ASME Flanged Process Connections (7ML5513)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

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

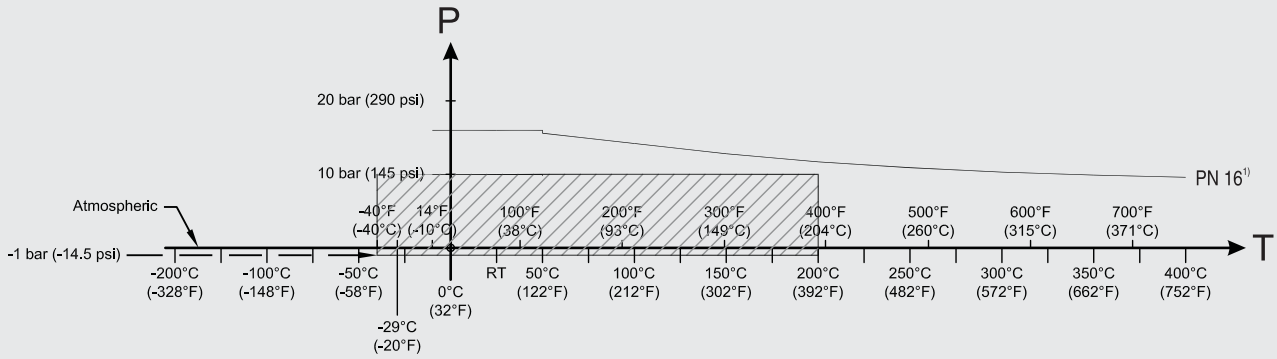


Pressure/Temperature Curve
LC500 PFA Rod Probes
ASME Flanged Process Connections (7ML5515 and 7ML5517)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

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



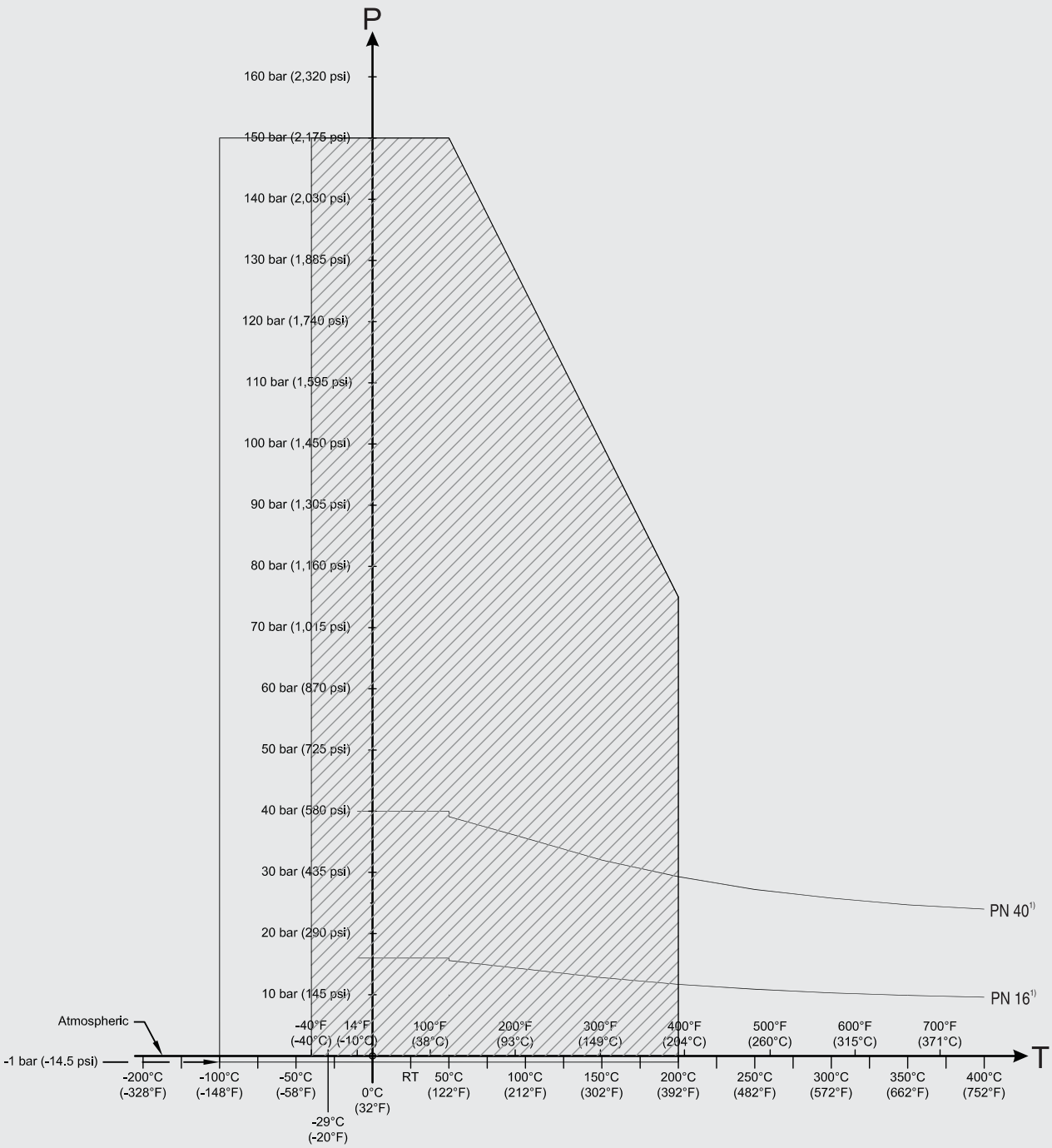
Pressure/Temperature Curve
LC500 Cable Probes
EN Flanged Process Connections (7ML5513)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

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

5



Pressure/Temperature Curve
LC500 PFA Rod Probes
EN Flanged Process Connections (7ML5515 and 7ML5517)

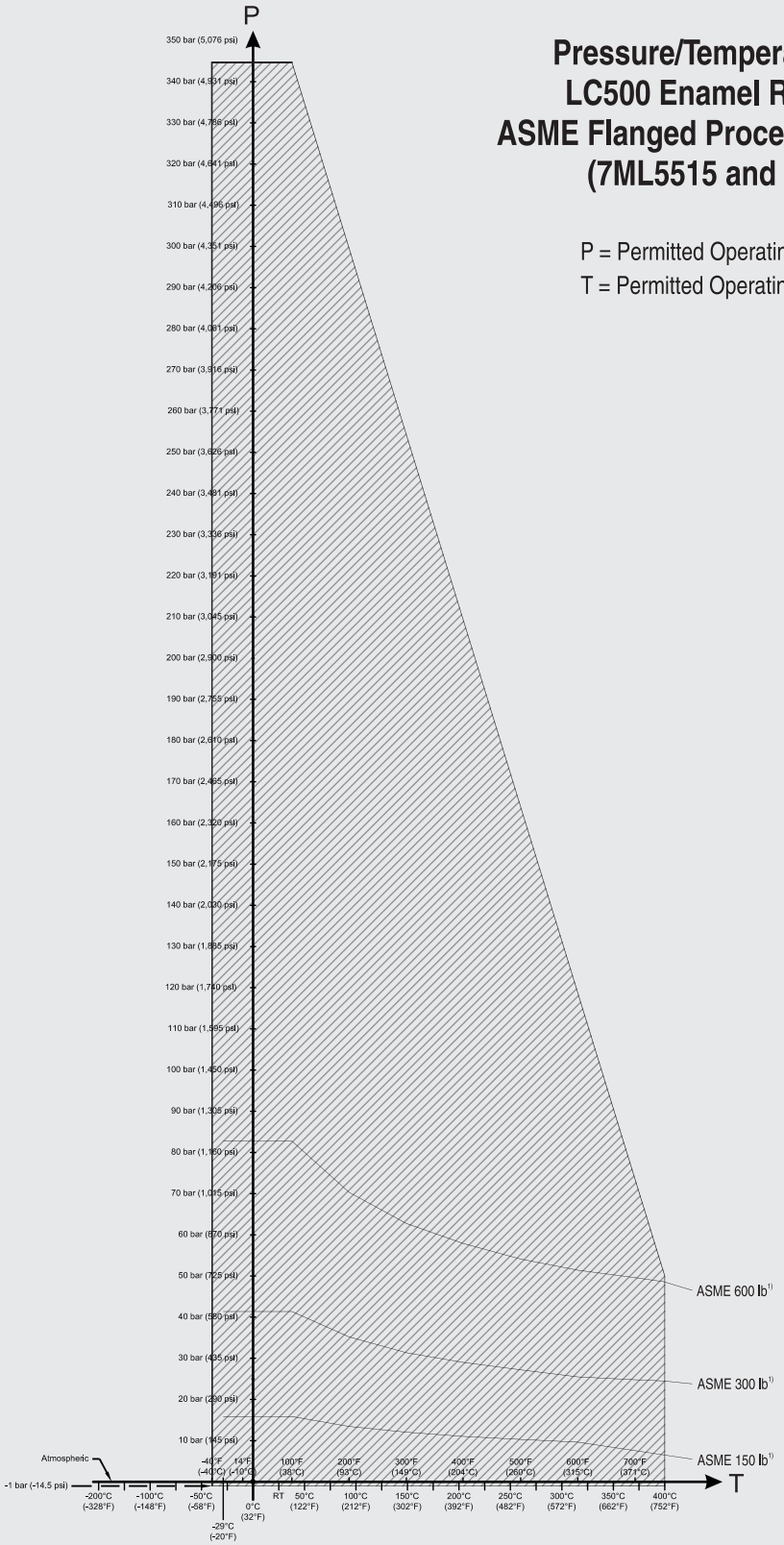
P = Permitted Operating Pressures
T = Permitted Operating Temperature

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 Enamel Rod Probes ASME Flanged Process Connections (7ML5515 and 7ML5517)

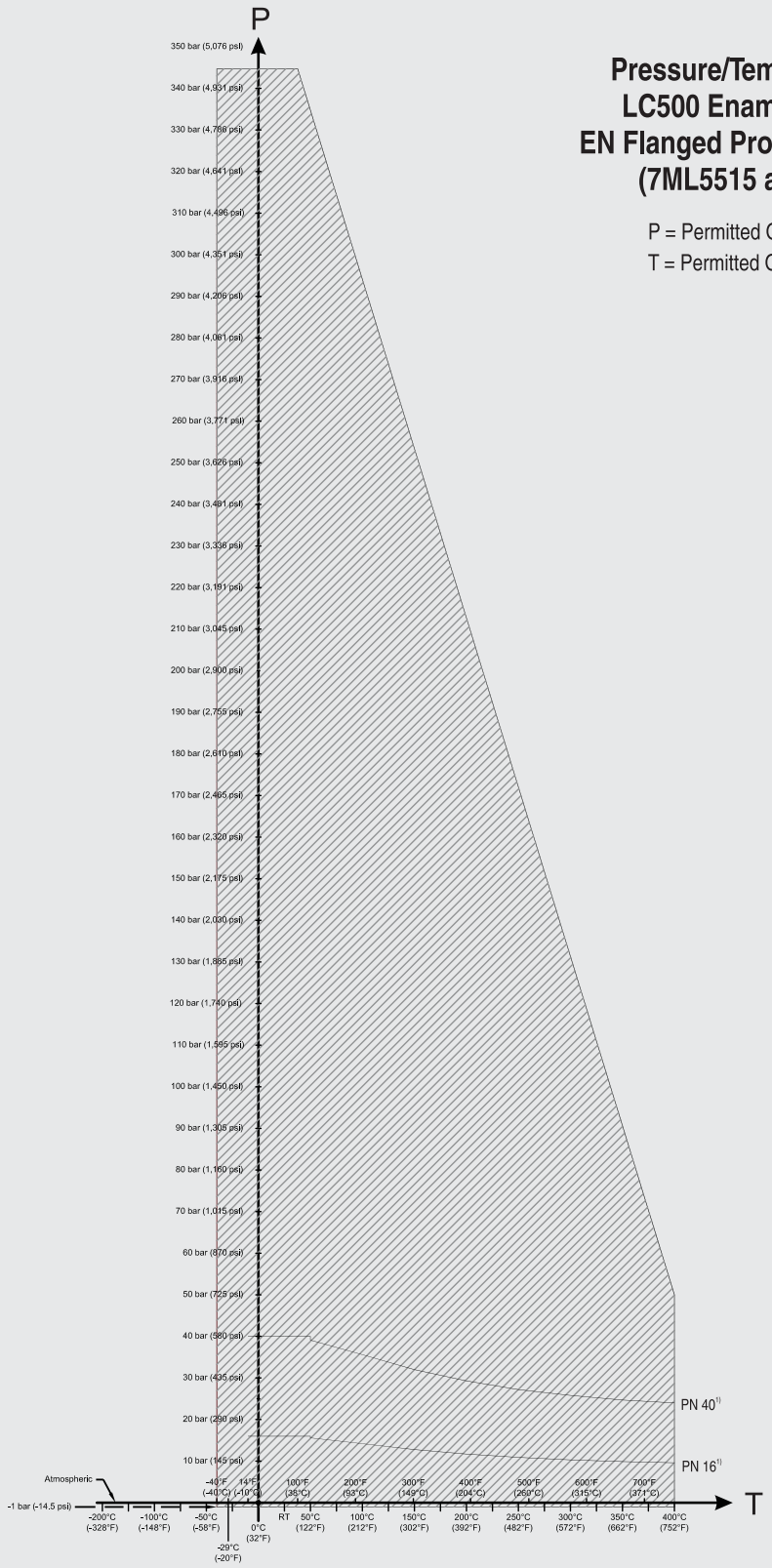
P = Permitted Operating Pressures
T = Permitted Operating Temperature



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

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

5

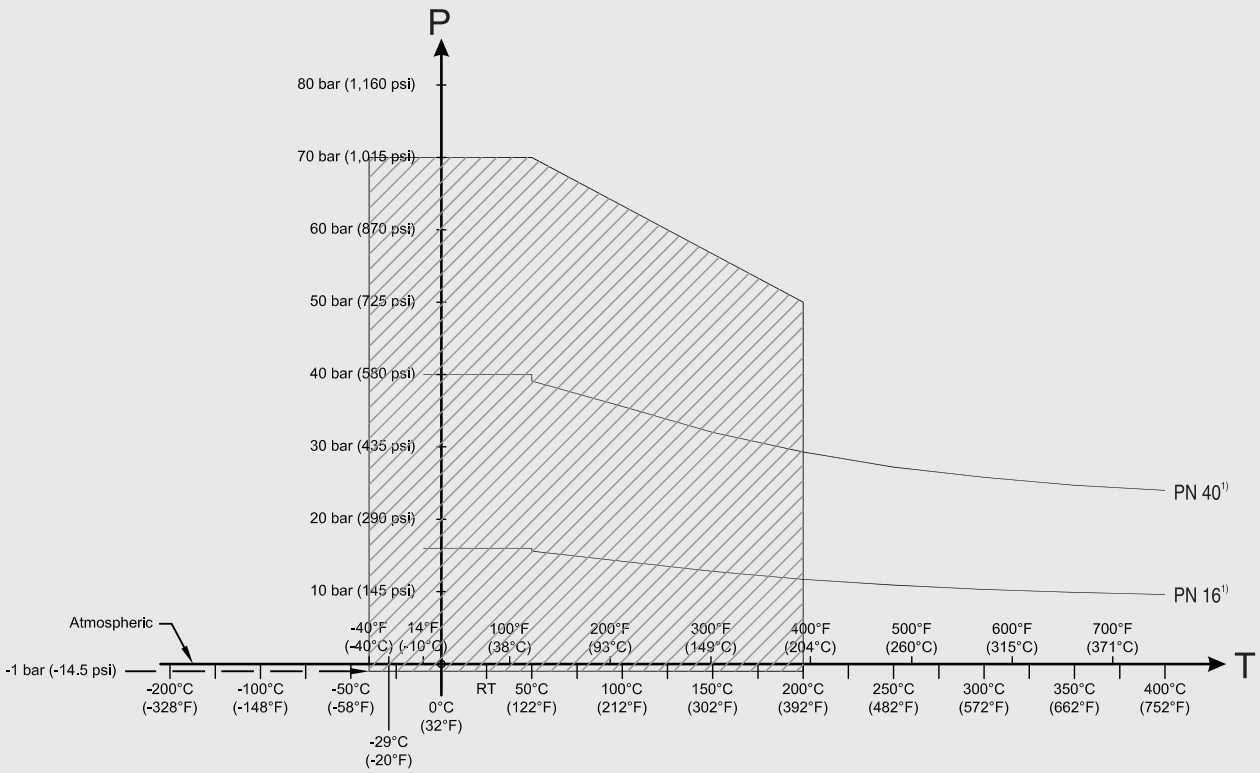


Pressure/Temperature Curve
LC500 Enamel Rod Probes
EN Flanged Process Connections
(7ML5515 and 7ML5517)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

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

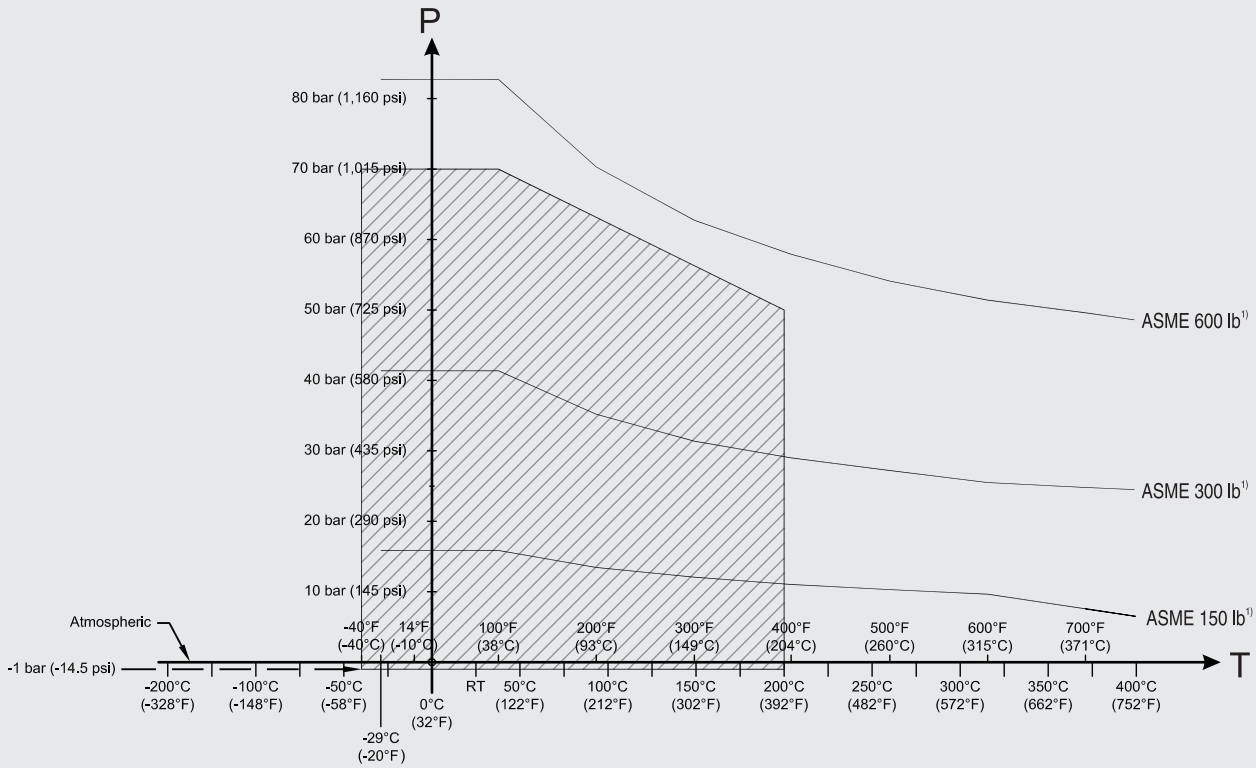


Pressure/Temperature Curve
LC500 Single Piece Flanged Rod Probes with PTFE facing
EN Flanged Process Connections (7ML5517)

P = Permitted Operating Pressures
T = Permitted Operating Temperature

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)

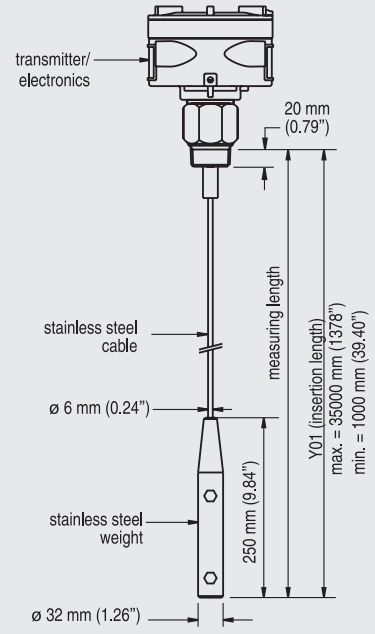
P = Permitted Operating Pressures
T = Permitted Operating Temperature

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

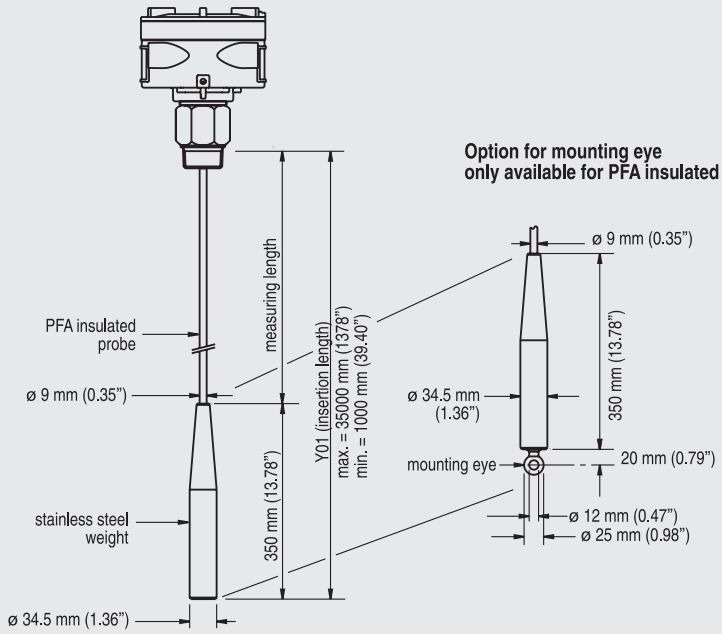
SITRANS LC500 Process Pressure/Temperature derating curves (7ML5517)

Dimensional drawings

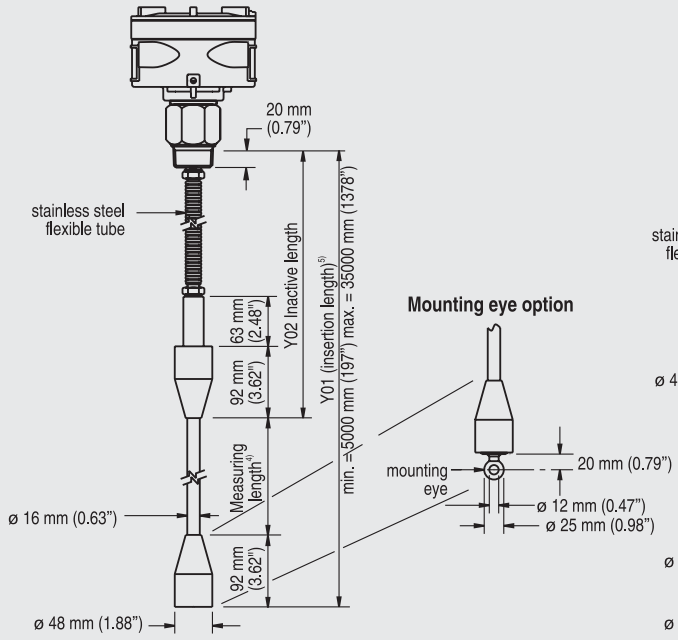
Cable version (non-insulated)[1]
Threaded (7ML5513)



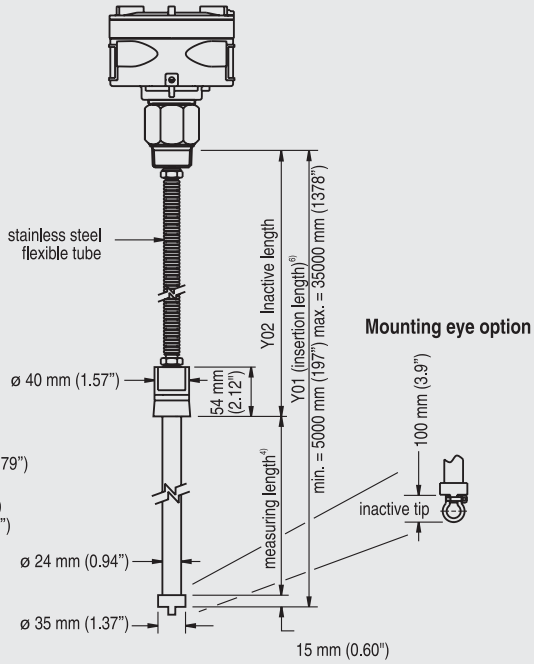
Cable version (insulated)[2]
Threaded (7ML5513)



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



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

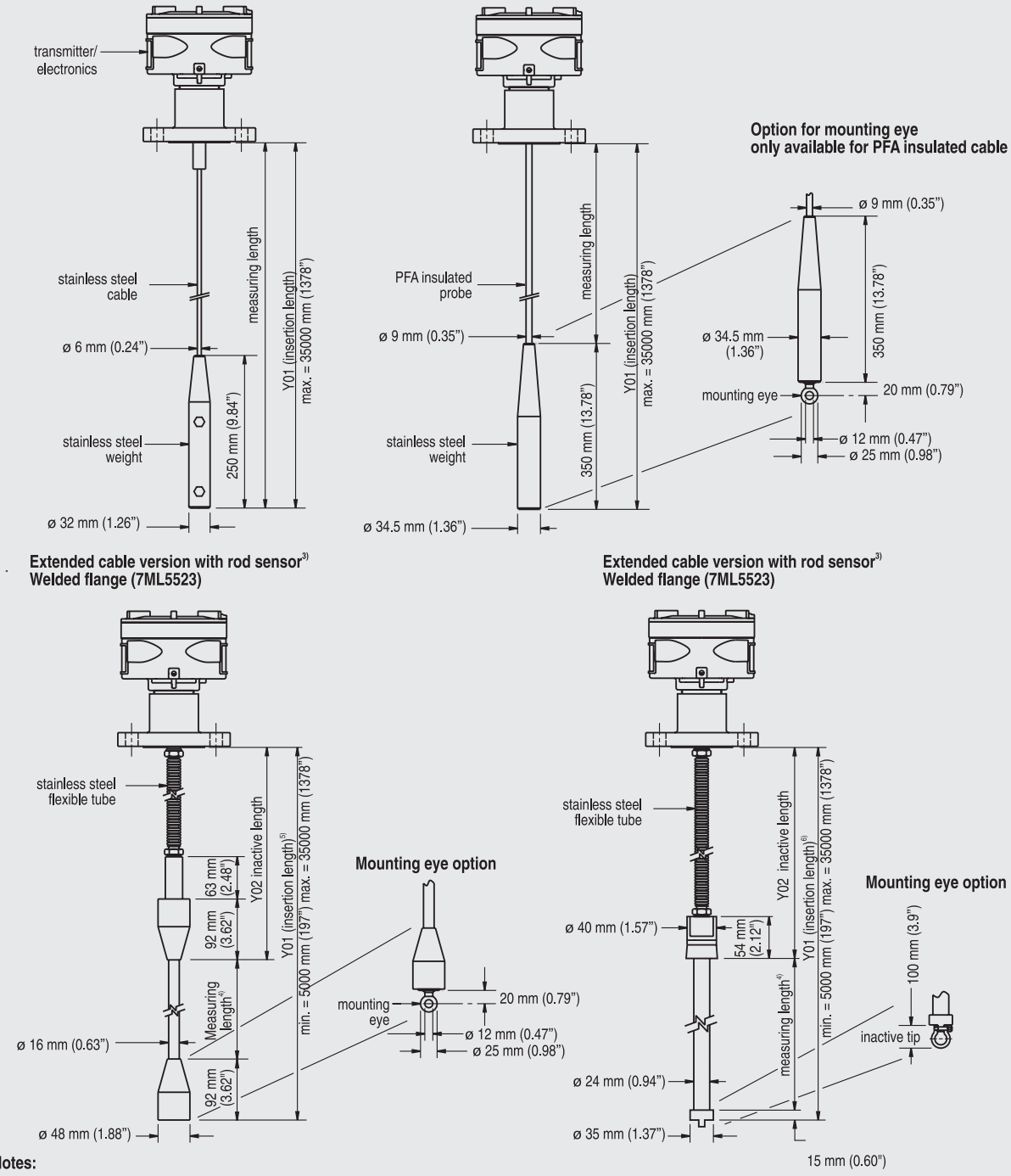


Notes:

1) Applicable for solids 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 5000 mm (197"), cable is inactive and is **not** actively shielded.
4) Minimum length = 200 mm (7.87")
5) Insertion length Y01 = Y02 + measuring length + 92 mm (3.62")
6) Insertion length Y01 = Y02 + measuring length + 15 mm (0.59")

SITRANS LC500 dimensions - Cable Versions

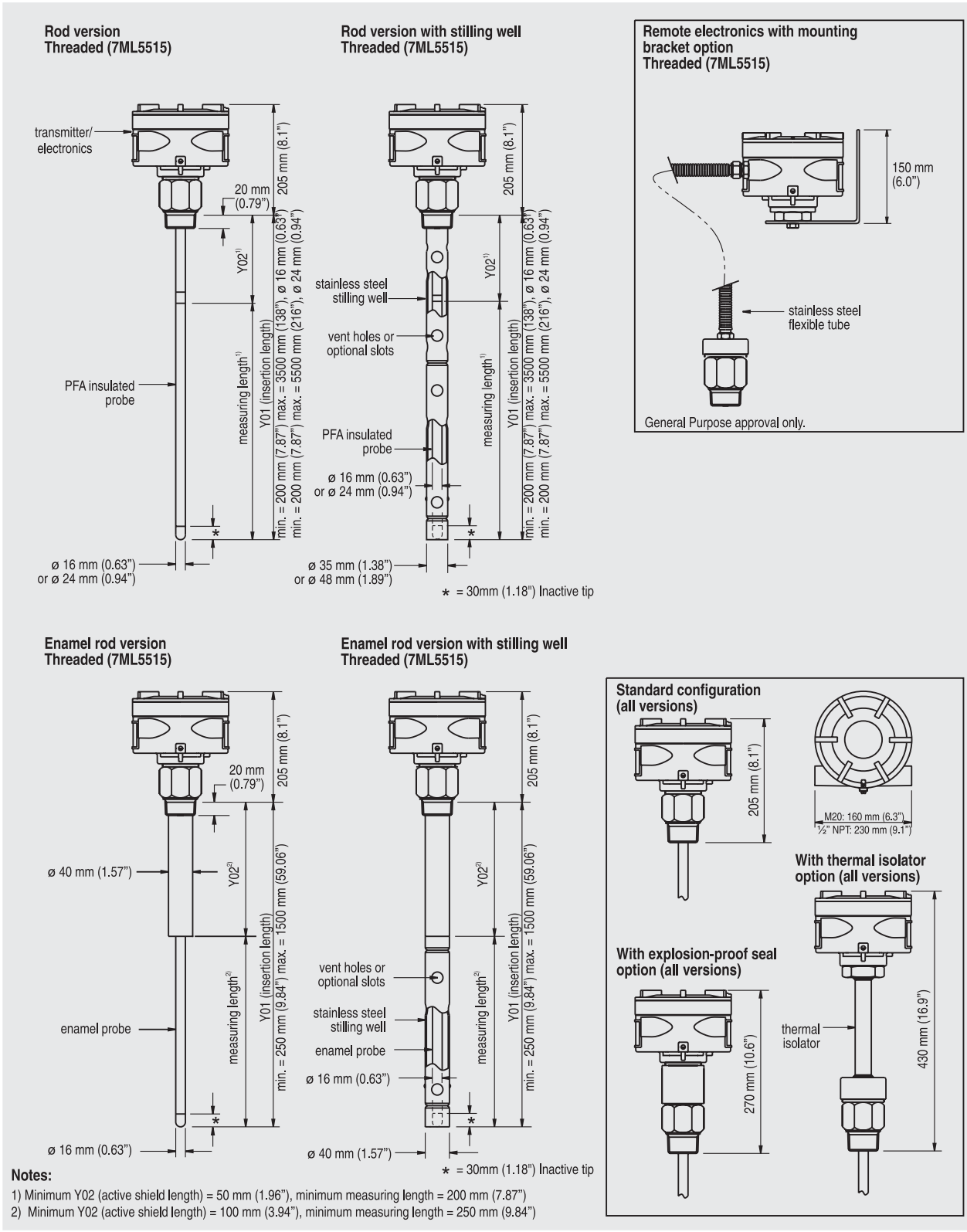
SITRANS LC500



Notes:

1) Applicable for solids 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 5000 mm (197"), cable is inactive and is **not** actively shielded.
4) Minimum length = 200 mm (7.87")
5) Insertion length Y01 = Y02 + measuring length + 92 mm (3.62")
6) Insertion length Y01 = Y02 + measuring length + 15 mm (0.59")

SITRANS LC500 dimensions - Cable Versions



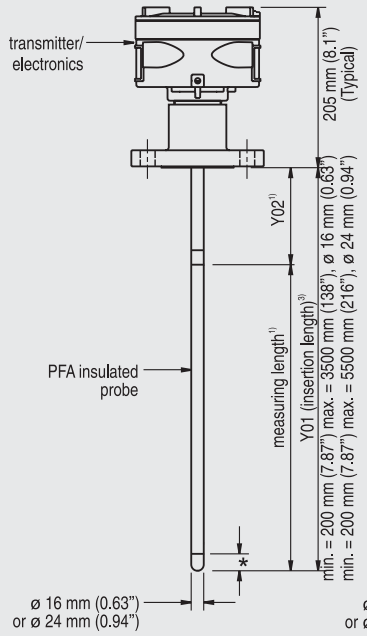
Notes:

1) Minimum Y02 (active shield length) = 50 mm (1.96"), minimum measuring length = 200 mm (7.87")
2) Minimum Y02 (active shield length) = 100 mm (3.94"), minimum measuring length = 250 mm (9.84")

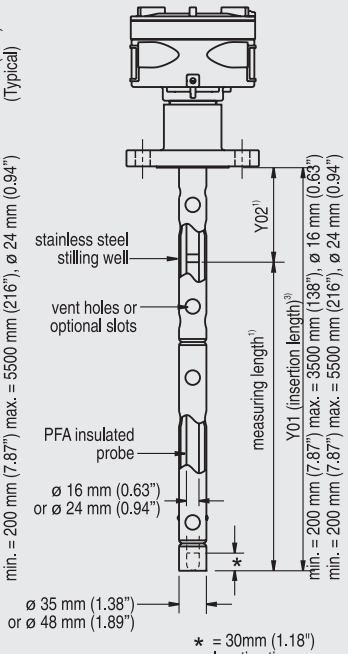
SITRANS LC500 dimensions - Rod Versions

SITRANS LC500

Rod version
Welded flange (7ML5515)
Single Piece Flange (7ML5517)

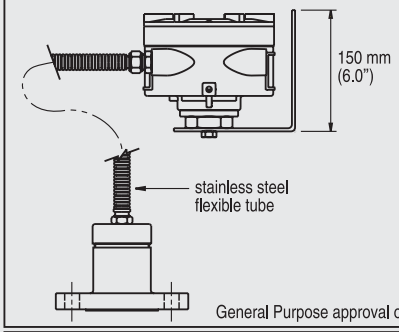


Rod version with stilling well
Welded flange (7ML5515)
Single Piece Flange (7ML5517)

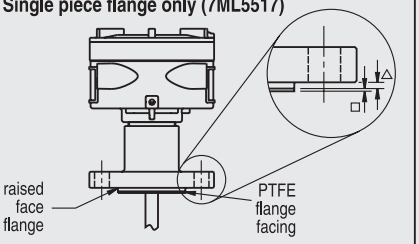


* = 30mm (1.18") Inactive tip

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



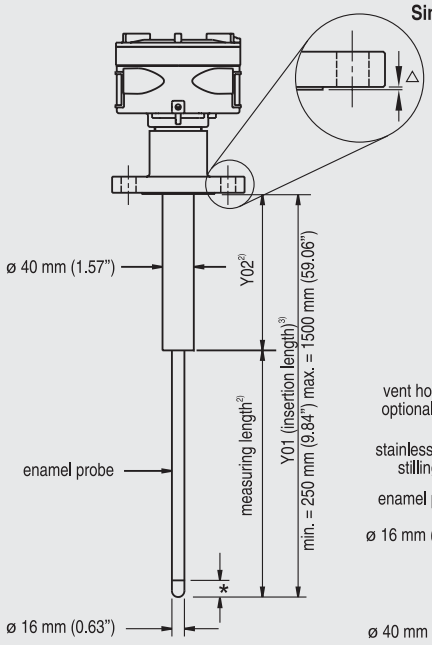
PFTE flange facing option
Single piece flange only (7ML5517)



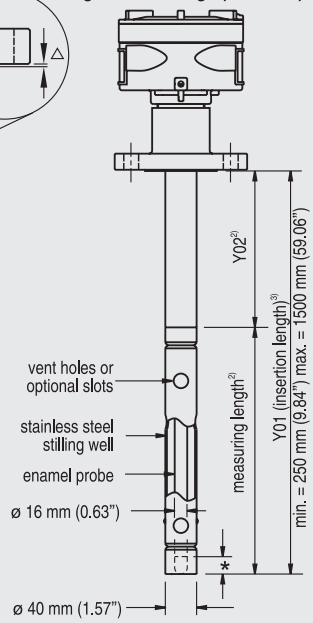
No stilling well or enamel probe available with this option.

Flange Facing (raised face)		
Flange Class		Facing thickness
△	ASME 150/300	2 mm (0.08")
△	ASME 600/900	7 mm (0.28")
△	PN16/25/40/63	2 mm (0.08")
□	PTFE facing (additional)	2 mm (0.08")

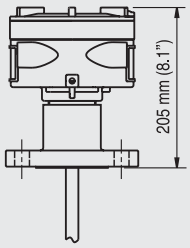
Enamel rod version
Welded flange (7ML5515)
Single Piece Flange (7ML5517)

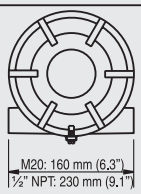


Enamel rod version with stilling well
Welded flange (7ML5515)
Single Piece Flange (7ML5517)

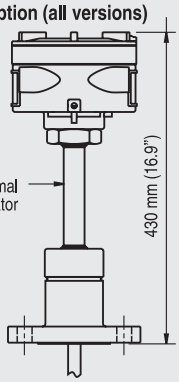


Standard configuration (all versions)

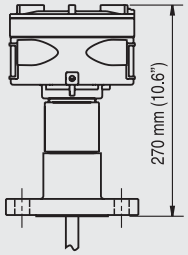




With thermal isolator option (all versions)



With explosion-proof seal option (all versions)



Notes:

* = 30mm (1.18") Inactive tip

1) Minimum Y02 (active shield length) = 50 mm (1.96"), minimum measuring length = 200 mm (7.87")
2) Minimum Y02 (active shield length) = 100 mm (3.94"), minimum measuring length = 250 mm (9.84")
3) Insertion length does not include any raised face/gasket face dimension (see Flange Facing table above).

SITRANS LC500 dimensions - Rod Versions

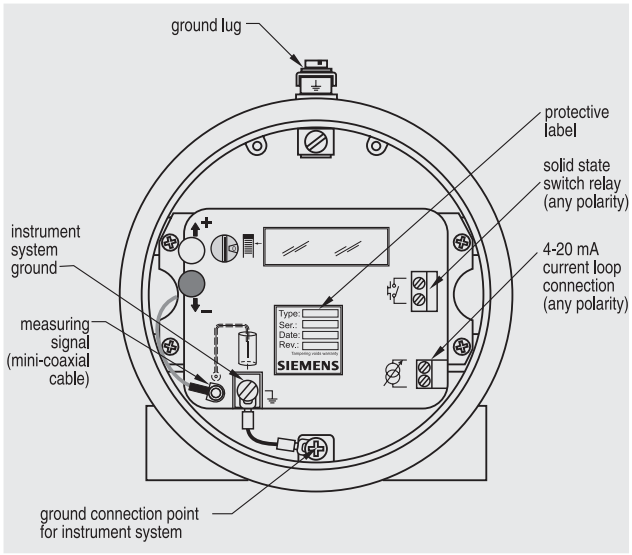
SITRANS LC500 probe version	Standard		Extended Cable version with Rod Sensor
Process connection types	Threaded or welded flange	Single piece flanged	Threaded or welded flange
Threaded	Available as standard	–	Available as standard
Flange	Available as standard	Available as standard	Available as standard
Sanitary fitting clamp	–	–	–
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
Enamel	Available as standard	Available as standard	–
Length and Process parameters[1)]			
Rod length for PFA 16 mm version	Min. 200 mm (7.87") Max. 3500 mm (137.80")	Min. 200 mm (7.87") Max. 3500 mm (137.80")	Min. 200 mm (7.87") Max. 3500 mm (137.80")
Rod length for PFA 24 mm version	Min. 200 mm (7.87") Max. 5500 mm (216.54")	Min. 200 mm (7.87") Max. 5500 mm (216.54")	Min. 200 mm (7.87") Max. 5500 mm (216.54")
Rod length for enamel 16 mm version	Min. 250 mm (9.84") Max. 1500 mm (59.06")	Min. 250 mm (9.84") Max. 1500 mm (59.06")	–
Cable length	Min. 1000 mm (39.37") Max. 35000 mm (1377.95")	Min. 1000 mm (39.37") Max. 35000 mm (1377.95")	Min. 5000 mm (196.85")[2)] Max. 35000 mm (1377.95")[2)]
Maximum pressure	150 bar g (2175 psi g)	150 bar g (2175 psi g)	5 bar g (73 psi g)
Maximum temperature	+200 °C (+392 °F)	+200 °C (+392 °F)	+100 °C (+212 °F)

[1)] Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves of respective configuration.

[2)] Refers to total insertion length. See dimension drawing on page 5/241 for further explanation.

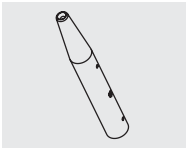
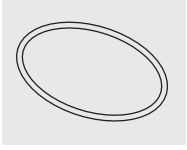
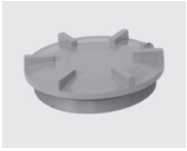
- Not available as standard

Schematics



SITRANS LC500 connections

SITRANS LC300 and LC500 Specials

Selection and Ordering data	Order No.
LC300 and LC500 Specials. See note 1.	
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 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	
LC500 Sanitary versions	**See note 2.**

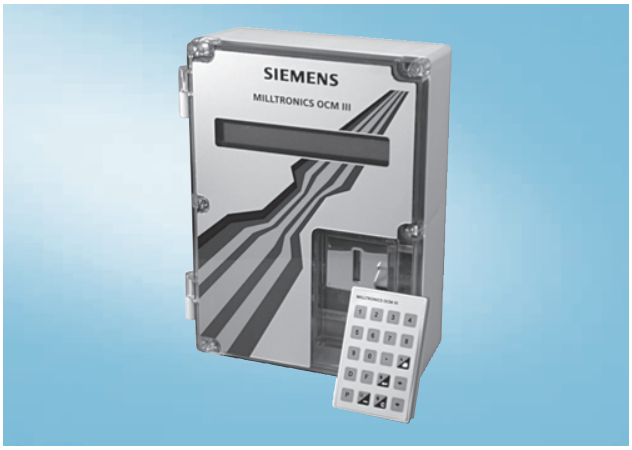
Note 1: Special flange sizes and facings are available. Please contact nacc.smpi@siemens.com for part number and pricing. Submit Application Questionnaire found on page 5/8.

Note 2: Please contact nacc.smpi@siemens.com for part number and pricing. Submit Application Questionnaire found on page 5/8.

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

OCM III

Overview



The OCM III is a high accuracy ultrasonic flow monitor for open channels.

Benefits

- Influent and effluent monitor
- BS 3680 calculations provide exceptional accuracy in measuring flow
- 1 to 24 months data log, subject to logging rate
- RS-232 serial communication
- High accuracy on unique or non-standard weirs and flumes
- AC and DC operation. Automatically switches to battery operation for uninterrupted power
- Dual power input
- Low power remote monitoring
- Flow Reporter software available for remote monitoring, configuration and data retrieval

Application

In addition to monitoring flowrate in sewage works, Milltronics OCM III can monitor industrial discharge, rainfall/storm water studies, inflow/infiltration studies and sewer system evaluations. As well as being compatible with many standard weirs and flumes, the programmable head versus flow curve (up to 16 points) accurately defines flow rate on unique or non-standard weirs and flumes.

The OCM III has data logging and is adjustable from once per minute to once a day. It records the average flow rate for that time period. Daily, it records minimum/maximum of temperature and flow rates, and the time they occurred, as well as the daily total. Advanced functions include variable rate logging. It can be pre-programmed to log at a higher rate when needed. Under steady conditions, the OCM III automatically logs less frequently to conserve data log space.

The OCM III has two-way communication via RS-232 with a modem or a bi-polar current loop with a current-to-voltage communication converter. Data logs can be downloaded to a file that can be manipulated into a spreadsheet or ASCII format.

Technical specifications

Mode of Operation	
Measuring range[1)]	0.3 to 1.2 m (1 to 4 ft) or 0.6 to 3 m (2 to 10 ft)
Output	
Transducer	Echomax® XRS-5, 44 kHz
Relays	3 alarm/control relays, 1 SPDT Form C contact per relay, rated 5 A at 250 V AC non-inductive or 30 V DC
mA output	0/4 to 20 mA, isolated
• Max. load	1 KΩ max. load
• Resolution	5 uA
• Isolation	300 V AC continuous
• DC output	+24 V DC, 20 mA average to 200 mA at 1/10 duty cycle max. 0 to 20
Accuracy	
Error in measurement	±1 mm/m, calculated error less than 0.02%
Resolution	0.2 mm (0.007")
Rated operating conditions	
Installation conditions	
Location	Indoor/outdoor
Installation category	II
Pollution degree	4
Ambient conditions	
Ambient temperature (enclosure)	-20 to +50 °C (-5 to +122 °F)
Design	
Weight	2.3 kg (5.1 lbs)
Material (enclosure)	Polycarbonate
Degree of protection (enclosure)	IP65/Type 4X/NEMA 4X
Cable	
Transducer and mA output signal	• Transducer: co-axial to be RG62-A/U low capacity • mA output signal to be 2 copper conductors, twisted, with foil shield/drain wire, 300 V 0.5 to 0.75 mm² (22 to 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	183 m (600 ft)
Displays and controls	LCD 5 x 7 dot matrix display with 2 lines of 40 characters each
Programming	Via removable programmer and communication link
Memory	3 V battery (NEDA 5003LC or equivalent), operating life 1 year, SuperCap capacitor for back-up during battery replacement
Power supply	
AC version	100/115/200/230 V AC ± 15%, 50/60 Hz, 20 VA max.
DC version	9 to 30 V DC, 8 W max.
Certificates and approvals	CE[2)], FM, $CSA_{NRTL/C}$, MCERTS
Communication	RS-232 or ± 20 mA bipolar current loop, 300, 600, 1200, 2400, 4800, 9600, 19200 baud
Options	
Temperature sensor	TS-2
Remote monitoring	Flow Reporter, a Windows®-based configuration software and data extractor
Velocity sensor	Consult with factory.

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

2) EMC performance available upon request.

Windows® is a registered trademark of Microsoft Corporation.

OCM III

Selection and Ordering data		Order No.
OCM III High accuracy ultrasonic flow monitor for open channels.	C)	**7ML1002-** ■**A**■**0**■
Input voltage		
AC, voltage selector switch		**0**
Enclosure		
Wall mount, standard enclosure		**A**
Wall mount, 6 entries, M20 holes[1]		**B**
Approvals		
CSA$_{NRTL/C}$, FM, CE (EN61326)		**5**
CE[2]		**6**
Instruction manual		
English	C)	**7ML1998-5AB01**
French	C)	**7ML1998-1AB11**
Spanish	C)	**7ML1998-1AB21**
German	C)	**7ML1998-1AB31**
Note: The instruction manual should be ordered as a separate line on the order.		
This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and instruction manual library.		
Required equipment		
TS-2 Temperature Sensor		
TS-2, 1 m cable	C)	**7ML1812-1AA1**
TS-2, 5 m cable	C)	**7ML1812-2AA1**
TS-2, 10 m cable	C)	**7ML1812-3AA1**
TS-2, 30 m cable	C)	**7ML1812-4AA1**
TS-2, 50 m cable	C)	**7ML1812-5AA1**
TS-2, 70 m cable	C)	**7ML1812-6AA1**
TS-2, 90 m cable	C)	**7ML1812-7AA1**
TS-2 Instruction manual Note: The TS-2 instruction manual should be ordered as a separate line item on the order.	C)	**7ML1998-1EW01**
Accessories		
Handheld programmer		**7ML1830-2AA**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosure		**7ML1930-1AC**
M20 cable gland kit (6 M20 cable glands, 6 M20 nuts, 3 stop plugs)		**7ML1830-1GM**
Flow Reporter software license	B)	**7ML1930-1AK**
Flow Reporter Kit (includes disk, authorization code and cable)	B)	**7ML1930-1AL**
Spare parts		
Card, Mother, main	C)	**7ML1830-1MG**
Card, daughter/display	C)	**7ML1830-1LT**
Card, LCD		**7ML1830-1KY**
Eprom	C)	**7ML1830-1KW**
Battery	C)	**7ML1830-1JV**
OCM III Lid overlay		**7ML1830-1KV**

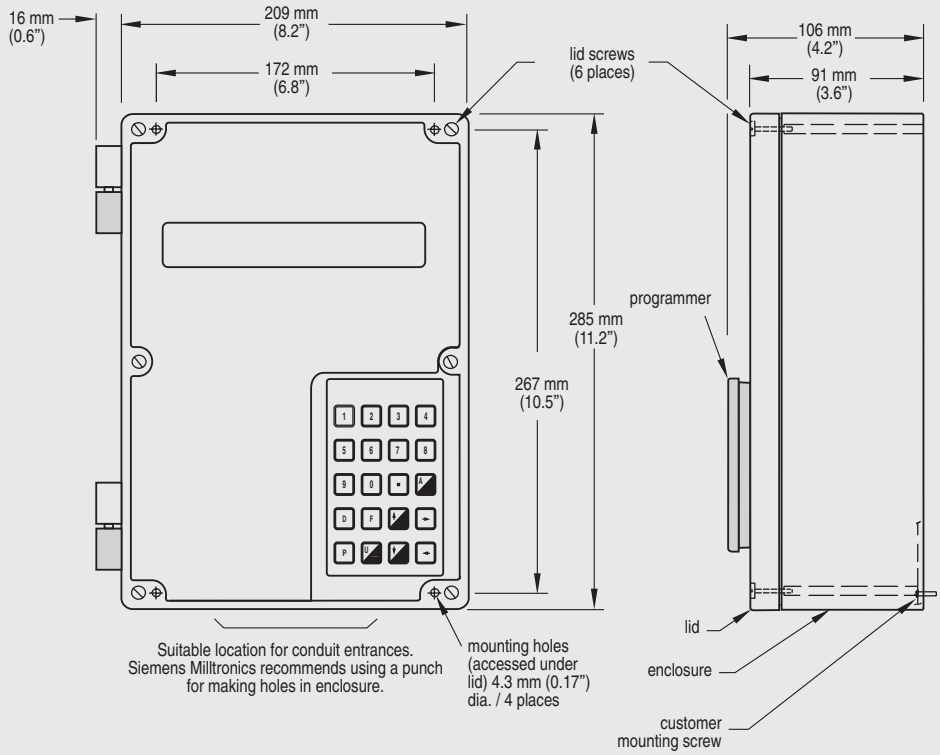
[1] Available with approval option 6 only

[2] Available with enclosure option B only

C) Subject to export regulations AL: N, ECCN: EAR99

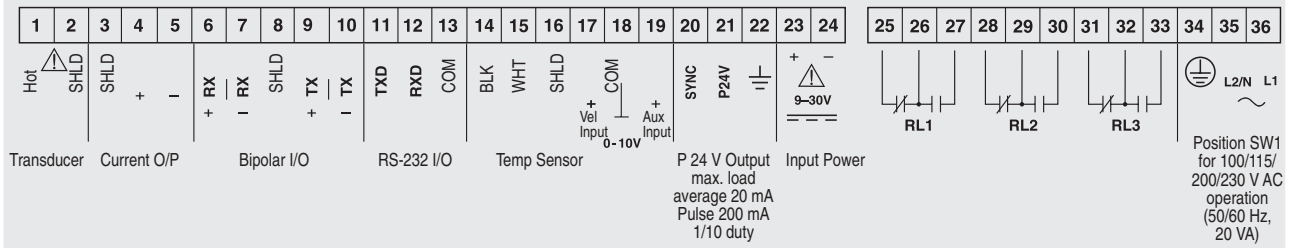
B) Subject to export regulations AL: N, ECCN: EAR99S

Dimensional drawings



OCM III dimensions

Schematics

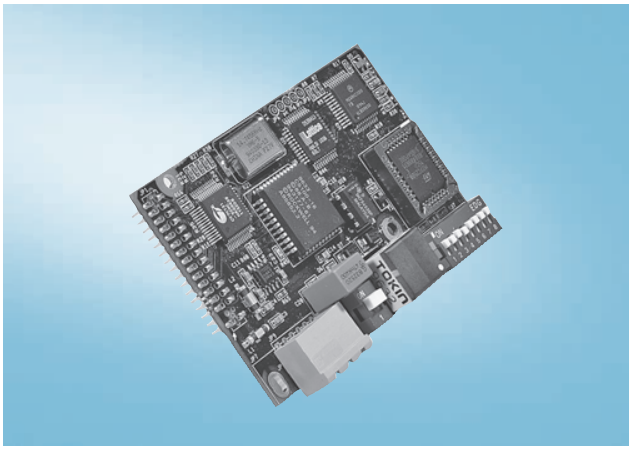


Notes:
1. Use RG62-A/U Coaxial (or equivalent) for extensions up to 183 m (600 ft). Run in grounded metal conduit, separate from other wiring.
2. Each relay has 1 set of form 'C' (SPDT) contacts, relay rated at 5A, 250 V AC, non-inductive, when equal or lower rated limiting fuses are installed. Relay de-energized when in alarm conditions and energized for pump control.

OCM III connections

SmartLinx modules

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 Milltronics 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 to 73, ¼ to full rack
• Connection	RIO slave
• SmartLinx module compatibility	• SITRANS LU01 • SITRANS LU02 • SITRANS LU10 • SITRANS LUC500 • MultiRanger 100/200 • HydroRanger 200

Module type	PROFIBUS DP
• Interface	RS-485 (PROFIBUS standard)
• Transmission rate	All valid PROFIBUS DP rates from 9600 Kbps to 12 Mbps
• Rack address	0 to 99
• Connection	Slave
• SmartLinx module compatibility	• SITRANS LU01 • SITRANS LU02 • SITRANS LU10 • SITRANS LUC500 • MultiRanger 100/200 • HydroRanger 200

Module type	MODBUS RTU
• Interface	RS-232 or RS-485
• Transmission rate in bps	1200, 2400, 4800, 9600, 19200, 38400
• Rack address	1 to 247
• Connection	Slave
• SmartLinx module compatibility	• SITRANS LU01 • SITRANS LU02 • SITRANS LU10 Included with product: • SITRANS LUC500 • MultiRanger 100/200 • HydroRanger 200

Module type	DeviceNet
• Interface	DeviceNet physical layer
• Transmission rate in kbps	125, 250, 500
• Rack address	0 to 63
• Connection	Slave (group 2)
• SmartLinx module compatibility	• SITRANS LUC500 • MultiRanger 100/200 • HydroRanger 200

Selection and Ordering data		Order No.
SmartLinx® module for SITRANS LU01, LU02, LU10		
Allen-Bradley Remote I/O module	C)	**7ML1830-1CP**
PROFIBUS DP module		**7ML1830-1CQ**
Modbus RTU module		**7ML1830-1CR**
SmartLinx module for SITRANS LUC500 Rack and Panel Mount models		
Allen-Bradley Remote I/O module	C)	**7ML1830-1HP**
PROFIBUS DP module	C)	**7ML1830-1CS**
DeviceNet module		**7ML1830-1HQ**
SmartLinx module for SITRANS LUC500 Wall Mount model, MultiRanger 100/200, HydroRanger 200		
Allen-Bradley Remote I/O module	C)	**7ML1830-1HS**
PROFIBUS DP module	C)	**7ML1830-1HR**
DeviceNet module		**7ML1830-1HT**
Instruction manuals		
Allen-Bradley Remote I/O communications module, English	C)	**7ML1998-1AP03**
PROFIBUS communications module		
• English	C)	**7ML1998-1AQ03**
• French	C)	**7ML1998-1AQ12**
• German	C)	**7ML1998-1AQ32**
Modbus RTU communications module, English	C)	**7ML1998-1BF01**
Modbus RTU communications module, German	C)	**7ML1998-1BF31**
SmartLinx modem, English	C)	**7ML1998-1BG01**
DeviceNet, English	C)	**7ML1998-1BH02**
This device is shipped with the Siemens Milltronics manual CD containing ATEX Quick Starts and instruction manuals.		
Spare SmartLinx software		
Allen-Bradley data diskette	C)	**7ML1830-1CK**
PROFIBUS DP data diskette	C)	**7ML1830-1CL**
DeviceNet data diskette	C)	**7ML1830-1CM**

C) Subject to export regulations AL: N, ECCN: EAR99

5

Dolphin Plus Software

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 Milltronics 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 CD. 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 works with a wide range of Siemens products, including:

- SITRANS LUC500
- HydroRanger Plus
- 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

		Order No.
Dolphin Plus	C)	**7ML1841-**
Instrument configuration software to quickly and easily configure, monitor, tune and diagnose most Siemens Milltronics devices remotely, from your desktop PC or connected directly in the field using a laptop. Dolphin Plus Software includes a software CD, and a nine pin adapter with a 2.1 m (82.7") cable for connection to a PC serial port.		**AA0**
RS-485 to RS-232 converter		
No		**0**
Yes		**1**
ComVerter		
No		**0**
Yes		**1**
Instruction manual		
• Connection manual, English: **Included on Dolphin Plus CD and available at www.siemens.com/processautomation** This device is shipped with the Siemens Milltronics manual CD containing ATEX Quick Starts and instruction manuals.		
Spare parts		
Converter, RS 485 to RS 232 (D-Sub)	C)	**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	C)	**7ML1830-1MM**

C) Subject to export regulations AL: N, ECCN: EAR99

Overview

The SITRANS RD100 is a 2-wire loop powered, NEMA 4X enclosed remote digital display for process instrumentation.

Benefits

- Easy setup
- Approved for hazardous locations
- NEMA 4X, IP67 impact-resistant enclosure
- Simple two-step calibration
- Two modes of input allow for easy servicing, with no interruption of loop required

Application

The RD100 is very versatile. It can be installed indoors or outdoors, in hot or cold environments, and in safe or hazardous areas.

It has been approved by FM and CSA as Intrinsically Safe and non-incendive, and operates from -40 to +85 °C (-40 to +185 °F), adding only 1 V to the loop.

The RD100 has a large 1" (2.54 cm) high display making it easy to read.

Calibration consists of a quick two-step process involving the adjustment of only two non-interacting potentiometers.

- Key Applications: Remotely displays process variables in level, flow, pressure, temperature and weighing applications, in a 4 to 20 mA loop.

Technical specifications

Mode of operation	
• Measuring principle	Analog to digital conversion
• Measuring range	4 to 20 mA
• Measuring points	1 instrument only
Accuracy	±0.1% of span ±1 count
Rated operating conditions	
Ambient conditions	
Operating temperature range	-40 to +85 °C (-40 to +185 °F)
Design	
Weight	340 g (12 oz)
Material (enclosure)	Impact-resistant glass filled polycarbonate body and clear polycarbonate cover
Degree of protection	NEMA 4X, IP67
Power supply	
External loop power supply	30 V DC max.
Display	• 1.0" (2.54 cm) high LCD • Numeric range from -1000 to +1999
Certificates and approvals	
Hazardous	
• Intrinsically Safe	• FM/CSA Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G T4 • FM/CSA Class I, Zone 0, Group IIC
• Non-incendive	• FM/CSA Class I, Div. 2, Groups A, B, C, D • FM/CSA Class II and III, Div. 2, Groups F and G
Options	
• Mounting	• 2" (5.08 cm) pipe mounting kit (zinc plated or stainless steel) • Panel mounting kit

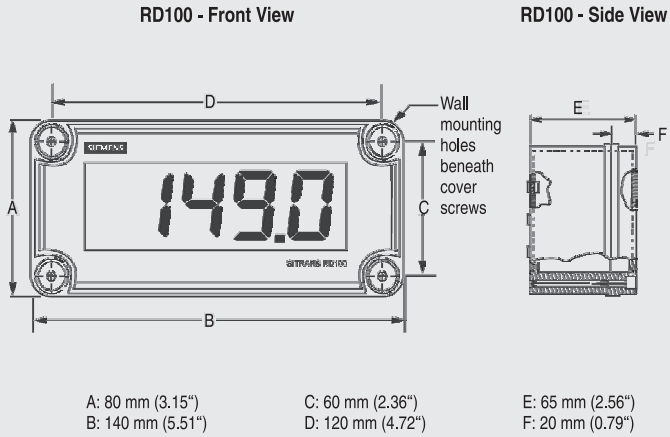
Selection and Ordering data

		Order No.
SITRANS RD100	C)	**7ML5741-**
A 2-wire loop powered, NEMA 4X enclosed remote digital display for process instrumentation.		**-AA00-0**
Conduit hole location (½")		
None		**1**
Bottom		**2**
Rear		**3**
Top		**4**
Instruction manual		
English	C)	**7ML1998-5JU01**
German	C)	**7ML1998-5JU31**
Note: The instruction manual should be ordered as a separate line item.		
This device is shipped with the Siemens Milltronics manual CD containing ATEX Quick Starts and instruction manuals.		
Accessories		
Panel mount kit	C)	**7ML1930-1BN**
2" (5.08 cm) pipe mounting kit (zinc plated seal)	C)	**7ML1930-1BP**
2" (5.08 cm) pipe mounting kit (stainless steel, Type 304, EN 1.4301)	C)	**7ML1930-1BQ**

C) Subject to export regulations AL: N, ECCN: EAR99

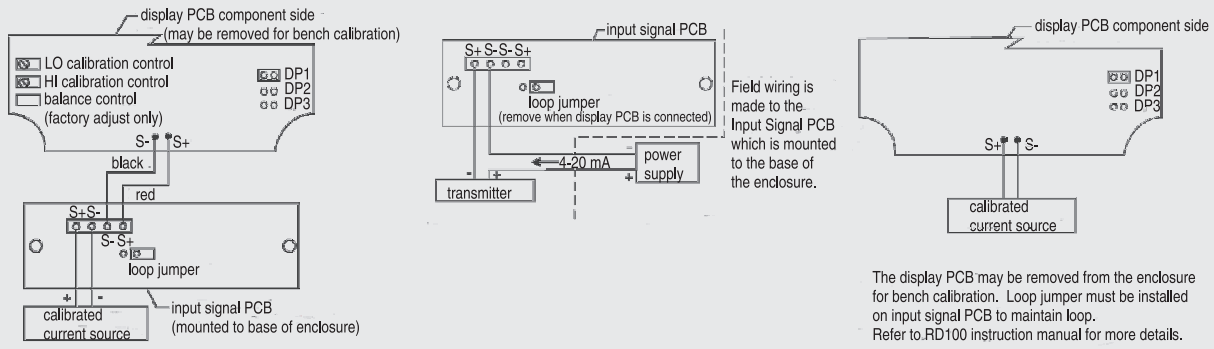
SITRANS RD100

Dimensional drawings



SITRANS RD100 dimensions

Schematics



SITRANS RD100 connections

Overview

The SITRANS RD200 is a universal input, panel mount remote digital display for process instrumentation.

Benefits

- Easy setup and programming via front panel buttons or remotely using RD software
- Display readable in sunlight
- Universal input: accepts current, voltage, thermocouple and RTD signals
- Single or dual 24 V DC transmitter power supply
- Serial communication using built in protocol or optional Modbus® RTU
- Two optional relays for alarm indication or process control applications
- Linear or square root function supported
- Meter Copy feature to reduce setup time, cost or errors
- RD software supporting remote configuration, monitoring and logging for up to 100 displays

Application

The RD200 is a universal remote display for level, flow, pressure, temperature, weighing, and other process instruments.

Data can be remotely collected, logged and presented from as many as 100 displays on your local computer using the free downloadable RD Software.

The display can accept various inputs, including current, voltage, thermocouple, and RTD. This makes the RD200 an ideal fit for use with most field instruments.

The RD200 can be set up as a standard panel mount, or combined with optional enclosures to allow it to house up to 6 displays.

- Key Applications: Tank farms, pump alternation control, local or remote display of level, temperature, flow, pressure and weighing instrument values, PC monitoring and data logging with RD Software.

Technical specifications

Mode of operation	
• Measuring principle	Analog to digital conversion
• Measuring points	• 1 instrument • Remote monitoring of 100 instruments with PC and RD Software
Input	
Measuring range	
• Current	• 4 to 20 mA, 0 to 20 mA
• Voltage	• 0 V DC to +10 V DC, 1 to 5 V, 0 to 5 V
• Thermocouple temperature	• Type J: -50 to +750 °C (-58 to +1382 °F) • Type K: -50 to +1260 °C (-58 to +2300 °F) • Type E: -50 to +870 °C (-58 to +1578 °F) • Type T: -180 to +371 °C (-292 to +700 °F) • Type T, 0.1° Resolution: -180.0 to +371 °C (-199.9 to +700 °F)
• RTD temperature	• 100 Ω RTD: -200 to +750 °C (-328 to +1382 °F)
Output signal	
• Output	• PDC output • 4 to 20 mA (optional) • Modbus (optional)
• Relays	2 SPDT Form C relays, rated 3 A @ 30 V DC or 3 A @ 250 V AC, non-inductive, auto-initializing (optional)
• Communications	• RS-232 with PDC or Modbus RTU • RS-422/485 with PDC or Modbus RTU
Accuracy	
• 4 to 20 mA optional output	± 0.1% FS ± 0.004 mA
• Process input	± 0.05% of span ± 1 count, square root: 10 to 100% FS
• Thermocouple temperature input	• Type J: ± 1 °C (± 2 °F) • Type K: ± 1 °C (± 2 °F) • Type E: ± 1 °C (± 2 °F) • Type T: ± 1 °C (± 2 °F) • Type T, 0.1° Resolution: ± 1 °C (± 1.8 °F)
• RTD temperature input	• 100 Ω RTD: ± 1 °C (± 1 °F)
Rated operating conditions	
Ambient conditions	
Operating temperature range	0 to +65 °C (+32 to +149 °F)
Design	
Weight	269 g (9.5 oz) (including options)
Material (enclosure)	• 1/8 DIN, high impact plastic, UL94V-0, color: gray • Optional plastic, steel and stainless steel (Type 304, EN 1.4301) NEMA 4 enclosures
Degree of protection	Type 4X, NEMA 4X, IP65 (front cover); panel gasket provided

5

SITRANS RD200

Electrical connection	
• mA output signal	2-core copper conductor, twisted, shielded, 0.82 to 3.30 mm² (18 to 12 AWG), Belden® 8760 or equivalent is acceptable
• Electrical connection and relay connection	Copper conductor according to local requirements, rated 3A @ 250 V AC
Power supply	
Input voltage option 1	85 to 265 V AC, 50/60 Hz; 90 to 265 V DC, 20 W max.
Input voltage option 2	12 to 36 V DC; 12 to 24 V AC, 6 W max.
Transmitter power supply	One or two isolated transmitter power supplies (optional) • One 24 V DC ±10% @ 200 mA max. • Two 24 V DC ±10% @ 200 mA and 40 mA max.
External loop power supply	35 V DC max.
Output loop resistance	• 24 V DC, 10 to 700 Ω max. • 35 V DC (external), 100 to 1200 Ω max.
Displays and controls	
• Display	• 14 mm (0.56“) high LED • Numeric range from -1999 to +9999 • Four digits, automatic lead zero blanking • Eight intensity levels
• Memory	• Non-volatile • Stores settings for minimum of 10 years if power is lost
• Programming	• Primary: front panel • Secondary: Meter Copy or PC with SITRANS RD Software
Certificates and approvals	CE, UL, $_{C}$UL
Options	
• Enclosures	Plastic, steel and stainless steel (Type 304, EN 1.4301) NEMA 4 and 4X enclosures
• Communications	Modbus RTU

®Modbus is a registered trademark of Schneider Electric.
®Belden is a registered trademark of Belden Wire and Cable Company.

Selection and Ordering data		Order No.
SITRANS RD200	C)	**7ML5740-**
A universal input, panel mount remote digital display for process instrumentation.		**-0A**
Input voltage		
85 to 265 V AC, 50/60 Hz; 90 to 265 V DC, 20 W max.		**1**
12 to 36 V DC; 12 to 24 V AC, 6 W max.		**2**
Transmitter supply		
None		**A**
Single 24 V DC transmitter supply[1]		**B**
Dual 24 V DC transmitter supply[1] and 2)		**C**
Output		
None		**A**
2 relays		**B**
4 to 20 mA output		**C**
Communication		
Modbus disabled		**0**
Modbus enabled		**1**
Approvals		
CE, UL, cUL		**1**
Instruction manual		
English	C)	**7ML1998-5JS01**
German	C)	**7ML1998-5JS31**
Note: The instruction manual should be ordered as a separate line item.		
This device is shipped with the Siemens Milltronics manual CD containing ATEX Quick Starts and instruction manuals..		
Other Instruction manuals		
SITRANS RD Enclosures, English	C)	**7ML1998-5JX01**
SITRANS RD Serial Adapters, English	C)	**7ML1998-5JV01**
SITRANS RD Software, English	C)	**7ML1998-5JW01**
SITRANS RD Enclosures, German	C)	**7ML1998-5JX31**
SITRANS RD Serial Adapters, German	C)	**7ML1998-5JV31**
SITRANS RD Software, German	C)	**7ML1998-5JW31**

Selection and Ordering data		Order No.
SITRANS RD200	C)	**7ML5740-**
A universal input, panel mount remote digital display for process instrumentation.		**-0A**
Accessories		
SITRANS RD200 copy cable 2.1 m (7 ft)	C)	**7ML1930-1BR**
SITRANS RD200 RS-232 serial adapter (copy cable included)	C)	**7ML1930-1BS**
SITRANS RD200 RS-422/485 serial adapter (copy cable included)	C)	**7ML1930-1BT**
RS-232 to RS-422/485 isolated converter	C)	**7ML1930-1BU**
RS-232 to RS-422/485 non-isolated converter	C)	**7ML1930-1BV**
SITRANS RD200 RS-232 and RS-485 isolated multi-input adapter board	C)	**7ML1930-1BW**
USB to RS-422/485 isolated converter	C)	**7ML1930-1BX**
USB to RS-422/485 non-isolated converter	C)	**7ML1930-1BY**
USB to RS-232 converter	C)	**7ML1930-1DC**
RD Software CD for 1 to 100 displays	C)	**7ML1930-1CC**
Modbus option enabled		**7ML1930-1CD**
Low cost polycarbonate plastic enclosure for 1 display	C)	**7ML1930-1CF**
Thermoplastic enclosure		
For use with 1 display	C)	**7ML1930-1CG**
For use with 2 displays	C)	**7ML1930-1CH**
For use with 3 displays	C)	**7ML1930-1CJ**
For use with 4 displays	C)	**7ML1930-1CK**
For use with 5 displays	C)	**7ML1930-1CL**
For use with 6 displays	C)	**7ML1930-1CM**
Stainless steel enclosure (Type 304, EN 1.4301)		
For use with 1 display	C)	**7ML1930-1CN**
For use with 2 displays	C)	**7ML1930-1CP**
For use with 3 displays	C)	**7ML1930-1CQ**
For use with 4 displays	C)	**7ML1930-1CR**
For use with 5 displays	C)	**7ML1930-1CS**
For use with 6 displays	C)	**7ML1930-1CT**
Steel enclosure		
For use with 1 display	C)	**7ML1930-1CU**
For use with 2 displays	C)	**7ML1930-1CV**
For use with 3 displays	C)	**7ML1930-1CW**
For use with 4 displays	C)	**7ML1930-1CX**
For use with 5 displays	C)	**7ML1930-1CY**
For use with 6 displays	C)	**7ML1930-1DA**

[1] Available with input voltage option 1 only

[2] Available with output option C only

C) Subject to export regulations AL: N, ECCN: EAR99

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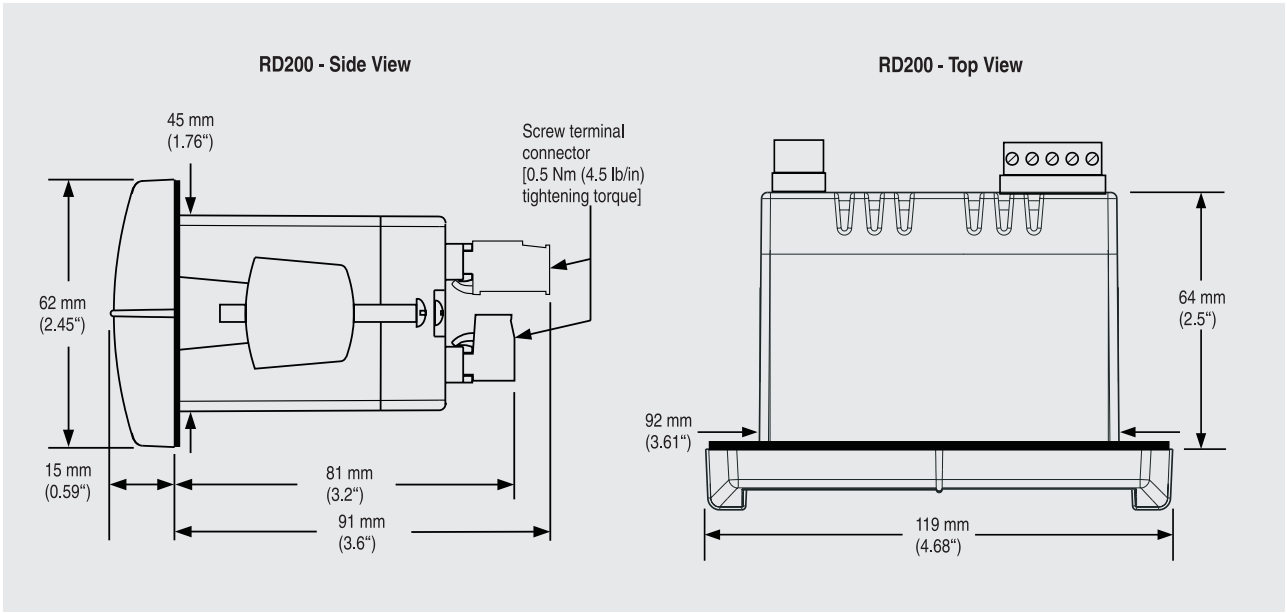
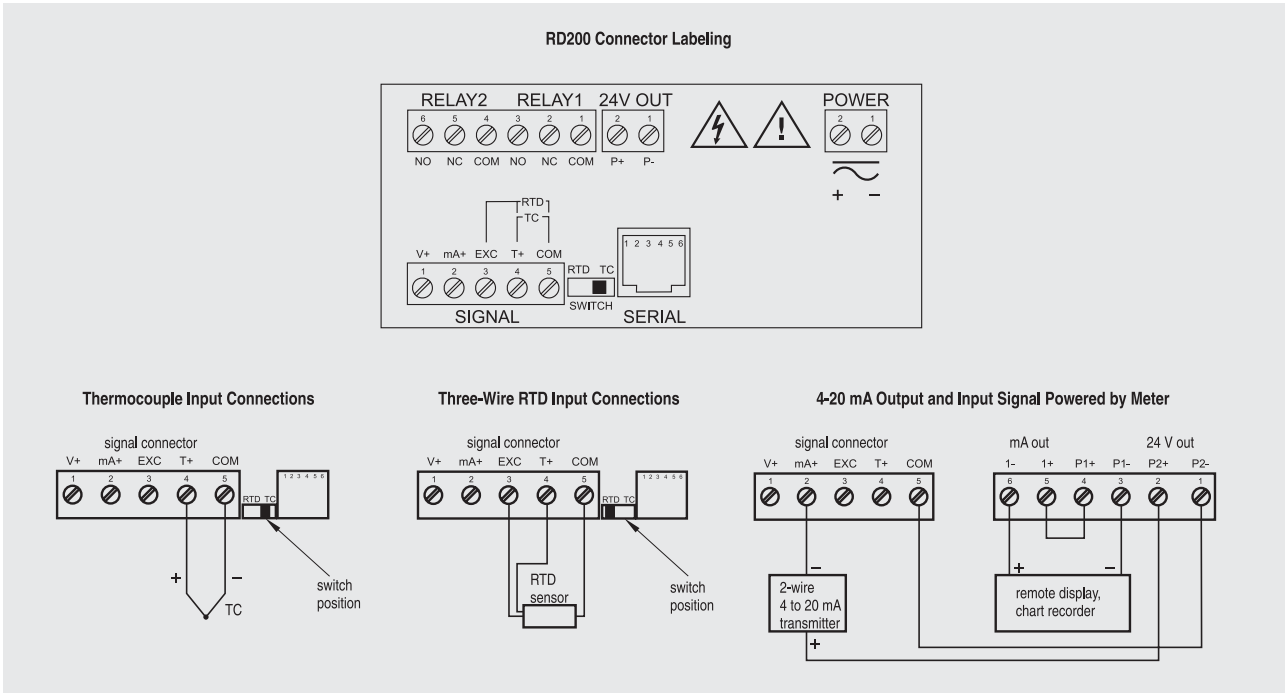
SITRANS RD200

Dimensional drawings



SITRANS RD200 dimensions

Schematics



SITRANS RD200 connections