SITRANS LC500

Overview

SITRANS LC500 is an inverse frequency shift capacitance level or interface transmitter for extreme and critical process conditions, such as oil and liquified natural gas (LNG) as well as toxic and aggressive chemicals and 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.

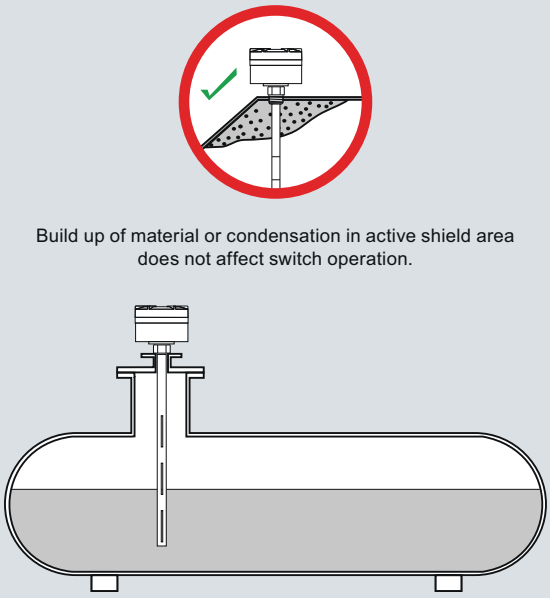
The unique mechanical probe design coupled with a high performance transmitter gives superior performance in toxic and aggressive chemicals, acids, caustics, adhesives and in viscous conductive and non-conductive materials.

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 $C0_2$ and liquified natural gas (LNG), distillation/regeneration tanks with high temperatures

Configuration

Installation



SITRANS LC500 installation

Technical specifications

Input	
Measuring range	1 ... 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 ... 60 s
Loop current	3.6 ... 22 mA/22 ... 3.6 mA (2-wire current loop)
Accuracy (transmitter)	
Temperature stability	0.15 pF (0 pF) or < 0.25 % (typically < 0.1 %) of actual measured value, whichever is greater over the full temperature range
Non-linearity and repeatability	< 0.1 % of range and actual measured value respectively
Accuracy	Deviation < 0.1 % of measured value

Rated operating conditions[1]	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions	
• Ambient temperature (transmitter)	-40 ... +85 °C (-40 ... +185 °F)[2]
• Installation category	II
• Pollution degree	4
Medium conditions	
• Relative dielectric constant ε_r	Min. 1.5
• Process temperature	Temperature rating of process seal is pressure dependent. See Pressure/Temperature curves on page 5/291.
- Standard (PFA) [3]	-50 ... +200 °C (-58 ... +392 °F)
- High temperature version with thermal isolator and enamel insulation	-60 ... +400 °C (-76 ... +752 °F)
- Cryogenic version	-200 ... +200 °C (-328 ... +392 °F) Contact nacc.smpi@siemens.com for details.
• Process pressure	Pressure rating of process seal is temperature dependent. See Pressure/Temperature curves on page 5/291.
• Standard (PFA)	-1 ... 150 bar g (2175 psi g)
• High temperature version (Enamel)[4]	Contact nacc.smpi@siemens.com for details.
Design	
Material	
• Wetted parts material	
- Standard rod	316L stainless steel
• Probe insulation (rod)	PFA, enamel, contact nacc.smpi@siemens.com for details.
• 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 (2 x M20x1.5, IP68 adapter, optional)
• Degree of protection	Type 4X/NEMA4X/IP65, IP68

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

1) When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 5/291.
2) Thermal isolator is used if process connection temperature exceeds +85 °C (+185 °F).
3) Not recommended for steam environments
4) Enamel insulation is available as a special order item, subject to application review. Please complete the Application Questionnaire on page 5/9 and contact nacc.smpi@siemens.com

SITRANS LC500

SITRANS LC500 probe version	Standard		Extended Cable version with Rod Sensor
Process connection types	Threaded or welded flange	Single piece flanged	Threaded or welded flange
Threaded	Available as standard	–	Available as standard
Flange	Available as standard	Available as standard	Available as standard
Process connection materials			
Stainless steel 316L	Available as standard	Available as standard	Available as standard
Probe insulation			
PFA	Available as standard	Available as standard	Available as standard
Enamel[1)]	contact nacc.smpi@siemens.com for details.	contact nacc.smpi@siemens.com for details.	–
Length and Process parameters[2)]			
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[3)]	contact nacc.smpi@siemens.com for details.	contact nacc.smpi@siemens.com for details.	–
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")[3)] Max. 35000 mm (1377.95")[3)]
Maximum process pressure	See Pressure/Temperature curves for specific probe type		5 bar g (73 psi g)
Maximum process temperature	See Pressure/Temperature curves for specific probe type		+100 °C (+212 °F)

1) Thermal isolator is used if process connection temperature exceeds +85 °C (+185 °F).
2) See Pressure/Temperature curves for specific probe type
3) Refers to total insertion length. See dimensional drawing on page 5/301 for further explanation
- Not available as standard

Selection and Ordering data		Order No.
SITRANS LC500, Threaded or Welded Flange with Cable Sensor	C)	**7ML5513 -**
Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.		■■■■■ - ■■■■
Version[1]		
Cable, 9 mm (0.35") diameter, 316 stainless steel with PFA insulation, weighted		
Add order code Y01 and plain text: "Insertion length ... mm"		
1000 ... 2000 mm (39.37 ... 78.74")		**0 E**
2001 ... 4000 mm (78.78 ... 157.48")		**1 E**
4001 ... 6000 mm (157.52 ... 236.22")		**2 E**
6001 ... 8000 mm (236.26 ... 314.96")		**3 E**
8001 ... 10000 mm (315 ... 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 (non-conductive media only)		
Add order code Y01 and plain text: "Insertion length ... mm"		
1000 ... 2000 mm (39.37 ... 78.74")[2]		**0 F**
2001 ... 4000 mm (78.78 ... 157.48")[2] [3]		**1 F**
4001 ... 6000 mm (157.52 ... 236.22")[2] [3]		**2 F**
6001 ... 8000 mm (236.26 ... 314.96")[2] [3]		**3 F**
8001 ... 10000 mm (315 ... 393.70")[2] [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	C)	**7ML5513 -**
Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.		■■■■■ - ■■■■
Approvals		
General Purpose: CE, CSA, FM, C-TICK		**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**
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**
Enclosure/Cable inlet		
Aluminum epoxy coated		
2 x ½" NPT, IP68		**1**
2 x M20x1.5 (IP68, adapter)		**2**
Options		
No additional options		**A**
With mounting eye[4]		**B**
Thermal isolator		
Without thermal isolator		**A**
Isolator, only for use when temperature range is outside of -40 ... +85 °C (-40 ... +185 °F), explosion proof approval -40 ... +70 °C (-40 ... +158 °F)		**B**
Electronic output		
2-wire loop current 4 ... 20 mA (transmitter MSP 2002-2 _3300 pF)		**1**

1) A minimum span of 3 pF must be maintained
2) Available with non-conductive media only
3) Custom shipping methods required. Contact factory for more details.
4) Available in PFA insulated version only

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

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Order No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	**Y01**
Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: 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**
Operating Instructions	**See page 5/290**
Accessories	**See page 5/290**

SITRANS LC500

Selection and Ordering data		Order No. 7ML5515-
SITRANS LC500, Threaded or Welded Flange, with Rod Sensor	C)	
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		
NOTE:		
Enamel insulation is available as a special order item, subject to application review. Please complete the Application Questionnaire on page 5/9 and contact nacc.smpi@siemens.com		
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 ... 1000 mm (7.87 ... 39.37")[1]		0 A
1001 ... 2000 mm (39.41 ... 78.74")		1 A
2001 ... 3000 mm (78.78 ... 118.11")[2]		2 A
3001 ... 3500 mm (118.15 ... 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 ... 1000 mm (7.87 ... 39.37")[1] [3]		0 B
1001 ... 2000 mm (39.41 ... 78.74")[3]		1 B
2001 ... 3000 mm (78.78 ... 118.11")[2] [3]		2 B
3001 ... 3500 mm (118.15 ... 137.80")[2] [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 ... 1000 mm (7.87 ... 39.37")[4]		0 C
1001 ... 2000 mm (39.41 ... 78.74")[4]		1 C
2001 ... 3000 mm (78.78 ... 118.11")[2] [4]		2 C
3001 ... 4000 mm (118.15 ... 157.48")[2] [4]		3 C
4001 ... 5000 mm (173.26 ... 196.88")[2] [4]		4 C
5001 ... 5500 mm (196.89 ... 216.54")[2] [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 ... 1000 mm (7.87 ... 39.37")[5]		0 D
1001 ... 2000 mm (39.41 ... 78.74")[5]		1 D
2001 ... 3000 mm (78.78 ... 118.11")[2] [5]		2 D
3001 ... 4000 mm (118.15 ... 157.48")[2] [5]		3 D
4001 ... 5000 mm (173.26 ... 196.88")[2] [5]		4 D
5001 ... 5500 mm (196.89 ... 216.54")[2] [5]		5 D
Process connection (316L Stainless steel)		
Threaded connection		
¾" NPT [(Taper), ANSI/ASME B1.20.1]		A 0
1" NPT [(Taper), ANSI/ASME B1.20.1]		B 0
1½" NPT [(Taper), ANSI/ASME B1.20.1]		C 0
2" NPT [(Taper), ANSI/ASME B1.20.1]		D 0
R ¾" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		E 0
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		F 0
R 1½" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		J 0
R 2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		K 0
1¼" NPT [(Taper), ANSI/ASME B1.20.1]		N 0
G ¾" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		P 0
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		R 0
G 1½" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		S 0
G 2" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]		T 0

Selection and Ordering data		Order No. 7ML5515-
SITRANS LC500, Threaded or Welded Flange, with Rod Sensor	C)	
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: CE, CSA, FM, C-TICK		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
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
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 Operating Instructions for dimensions.)[6]		B
Thermal isolator/remote version		
Without thermal isolator or remote electronics		A
Thermal isolator, only for use when temperature range is outside of -40 ... +85 °C (-40 ... +185 °F), explosion proof approval -40 ... +70 °C (-40 ... +158 °F)		B
Remote electronics with mounting bracket and cable[7]		
• Length: 2 m (79")		C
• Length: 3 m (118")		D
• Length: 4 m (158")		E
• Length: 5 m (197")		F
Electronic output		
2-wire loop current 4 ... 20 mA (transmitter MSP 2002-2 _3300 pF)		1

1) A minimum span of 3 pF must be maintained
2) Custom shipping methods required. Contact factory for more details.
3) Available with process connection 1½" or larger
4) Available with process connection 1" or larger
5) Available with process connection 2" or larger
6) Available with version 0B to 3B, 0D to 5D and 0F only
7) Available with approval option 1 only

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

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Order No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	**Y01**
Active shield length, specify in plain text [min. length is 50 mm (2")]: Y02: ... mm	**Y02**
Stainless steel tag [69 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**
Operating Instructions	**See page 5/290**
Accessories	**See page 5/290**

SITRANS LC500

Selection and Ordering data	Order No.
SITRANS LC500, Single Piece Flanged with Rod Sensor C)	**7 M L 5 5 1 7 -**
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	
NOTE: **Enamel insulation is available as a special order item, subject to application review. Please complete the Application Questionnaire on page 5/9 and contact** nacc.smpi@siemens.com	
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 ... 1000 mm (9.84 ... 39.37")[1]	**0 A**
1001 ... 2000 mm (39.41 ... 78.74")	**1 A**
2001 ... 3000 mm (78.78 ... 118.11")[2]	**2 A**
3001 ... 3500 mm (118.15 ... 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 ... 1000 mm (9.84 ... 39.37")	**0 B**
1001 ... 2000 mm (39.41 ... 78.74")	**1 B**
2001 ... 3000 mm (78.78 ... 118.11")[2]	**2 B**
3001 ... 3500 mm (118.15 ... 137.80")[2]	**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 ... 1000 mm (9.84 ... 39.37")	**0 C**
1001 ... 2000 mm (39.41 ... 78.74")	**1 C**
2001 ... 3000 mm (78.78 ... 118.11")[2]	**2 C**
3001 ... 4000 mm (118.15 ... 157.48")[2]	**3 C**
4001 ... 5000 mm (173.26 ... 196.88")[2]	**4 C**
5001 ... 5500 mm (196.89 ... 216.54")[2]	**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 ... 1000 mm (9.84 ... 39.37")	**0 D**
1001 ... 2000 mm (39.41 ... 78.74")[2] [3]	**1 D**
2001 ... 3000 mm (78.78 ... 118.11")[2] [3]	**2 D**
3001 ... 4000 mm (118.15 ... 157.48")[2] [3]	**3 D**
4001 ... 5000 mm (173.26 ... 196.88")[2] [3]	**4 D**
5001 ... 5500 mm (196.89 ... 216.54")[2] [3]	**5 D**
Process connection (316L Stainless steel)	
Single piece flange, raised face	
1½", ASME, 150 lb	**B 1**
1½", ASME, 300 lb	**B 2**
1½", ASME, 600 lb	**B 3**
2", ASME, 150 lb	**C 1**
2", ASME, 300 lb	**C 2**
2", ASME, 600 lb	**C 3**
3", ASME, 150 lb[2]	**D 1**
3", ASME, 300 lb[2]	**D 2**
3", ASME, 600 lb[2]	**D 3**
4", ASME, 150 lb[2]	**E 1**
4", ASME, 300 lb[2]	**E 2**
4", ASME, 600 lb[2]	**E 3**
6", ASME, 150 lb[2]	**F 1**
6", ASME, 300 lb[2]	**F 2**
6", ASME, 600 lb[2]	**F 3**

Selection and Ordering data	Order No.
SITRANS LC500, Single Piece Flanged with Rod Sensor C)	**7 M L 5 5 1 7 -**
Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.	■■■■■ - ■■■■
Single piece flange, Type B1 raised face	
DN 40, PN 16	**K 4**
DN 40, PN 40	**K 5**
DN 50, PN 16	**L 4**
DN 50, PN 40	**L 5**
DN 80, PN 16	**M 4**
DN 80, PN 40[2]	**M 5**
DN 100, PN 16[2]	**N 4**
DN 100, PN 40[2]	**N 5**
DN 125, PN 16[2]	**P 4**
DN 125, PN 40[2]	**P 5**
Single piece flange with PTFE flange facing (applicable with versions 0A ... 3A and 0C ... 5C)[4]	
1½", ASME, 150 lb	**B 4**
1½", ASME, 300 lb	**B 5**
1½", ASME, 600 lb	**B 6**
2", ASME, 150 lb	**C 4**
2", ASME, 300 lb	**C 5**
2", ASME, 600 lb	**C 6**
3", ASME, 150 lb[2]	**D 4**
3", ASME, 300 lb[2]	**D 5**
3", ASME, 600 lb[2]	**D 6**
4", ASME, 150 lb[2]	**E 4**
4", ASME, 300 lb[2]	**E 5**
4", ASME, 600 lb[2]	**E 6**
6", ASME, 150 lb[2]	**F 4**
6", ASME, 300 lb[2]	**F 5**
6", ASME, 600 lb[2]	**F 6**
Single piece flange with PTFE flange facing (applicable with versions 0A ... 3A, 0C ... 5C)[4]	
DN 40, PN 16	**K 6**
DN 40, PN 40	**K 7**
DN 50, PN 16	**L 6**
DN 50, PN 40	**L 7**
DN 80, PN 16	**M 6**
DN 80, PN 40[2]	**M 7**
DN 100, PN 16[2]	**N 6**
DN 100, PN 40[2]	**N 7**
DN 125, PN 16[2]	**P 6**
DN 125, PN 40[2]	**P 7**
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.)	
Approvals	
General Purpose: CE, CSA, FM, C-TICK	**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**
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**
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)[5]	**B**

Selection and Ordering data	Order No.
SITRANS LC500, Single Piece Flanged with Rod Sensor C) Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.	**7ML5517 -** ■■■■■ - ■■■■
Thermal isolator/remote version	
Without thermal isolator	**A**
Isolator, only for use when temperature range is outside of -40 ... +85 °C (-40 ... +185 °F), explosion proof approval -40 ... +70 °C (-40 ... +158 °F)	**B**
Remote electronics with mounting bracket and cable[6]	
• Length: 2 m (79")	**C**
• Length: 3 m (118")	**D**
• Length: 4 m (158")	**E**
• Length: 5 m (197")	**F**
Electronic output	
2-wire loop current 4 ... 20 mA (transmitter MSP 2002-2 _3300 pF)	**1**

1) A minimum span of 3 pF must be maintained
2) Custom shipping methods required. Contact factory for more details.
3) Available with process connection 2" or larger, and only available with process connection options C1 to F3, L4 to P5
4) Not available with versions 0E and 0F
5) Available with version 0B to 3B, 0D to 5D and 0F only
6) Available with approval option 1 only

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

Selection and Ordering data	Order code
Further designs	
Please add "**-Z**" to Order No. and specify Order code(s).	
Insertion length, specify in plain text: Y01: ... mm	**Y01**
Active shield length, specify in plain text [min. length is 50 mm (2")]: Y02: ... mm	**Y02**
Stainless steel tag [69 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**
Operating Instructions	**See page 5/290**
Accessories	**See page 5/290**

SITRANS LC500

Selection and Ordering data		Order No.
SITRANS LC500, Extended Cable version with Rod Sensor, threaded connection or welded flange[1]	C)	**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] [4]		
• 5000 ... 10000 mm (196.85 ... 393.70")[1]		**0 A**
• 10001 ... 15000 mm (393.74 ... 590.55")[1]		**1 A**
• 15001 ... 20000 mm (590.59 ... 787.40")[1]		**2 A**
• 20001 ... 25000 mm (787.44 ... 984.25")[1]		**3 A**
• 25001 ... 30000 mm (984.29 ... 1181.10")[1]		**4 A**
• 30001 ... 35000 mm (1181.14 ... 1377.95")[1]		**5 A**
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] [4]		
• 5000 ... 10000 mm (196.85 ... 393.70")[1]		**0 B**
• 10001 ... 15000 mm (393.74 ... 590.55")[1]		**1 B**
• 15001 ... 20000 mm (590.59 ... 787.40")[1]		**2 B**
• 20001 ... 25000 mm (787.44 ... 984.25")[1]		**3 B**
• 25001 ... 30000 mm (984.29 ... 1181.10")[1]		**4 B**
• 30001 ... 35000 mm (1181.14 ... 1377.95")[1]		**5 B**
Process connection (316L stainless steel)		
Threaded connection		
2" NPT [(Taper), ANSI/ASME B1.20.1]		**A 0**
R 2" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]		**B 0**
G 2" [(BSPP), EN ISO 228-1/PF (JIS-P) JIS B 0202]		**D 0**
Welded flange, raised face		
2", ASME, 150 lb		**C 1**
2", ASME, 300 lb		**C 2**
3", ASME, 150 lb[1]		**D 1**
3", ASME, 300 lb[1]		**D 2**
4", ASME, 150 lb[1]		**E 1**
4", ASME, 300 lb[1]		**E 2**
6", ASME, 150 lb[1]		**F 1**
6", ASME, 300 lb[1]		**F 2**
Welded flange, Type A flat faced		
DN 50, PN 16		**L 4**
DN 50, PN 40		**L 5**
DN 80, PN 16		**M 4**
DN 80, PN 40[1]		**M 5**
DN 100, PN 16[1]		**N 4**
DN 100, PN 40[1]		**N 5**
DN 125, PN 16[1]		**P 4**
DN 125, PN 40[1]		**P 5**
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.)		
Approvals		
General Purpose: CE, CSA, FM, C-TICK		**1**
CSA/FM Class 1, Div. 2, Groups A, B, C, D T4;		**2**
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		**4**
ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 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]	C)	**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 ... +85 °C (-40 ... +185 °F), explosion proof approval -40 ... +70 °C (-40 ... +158 °F)		**B**
Electronic output		
2-wire loop current 4 ... 20 mA (transmitter MSP 2002-2 _3300 pF)		**1**

1) Custom shipping methods required. Contact factory for more details.
2) A minimum span of 3 pF must be maintained.
3) See dimension drawings on page 5/301 for further explanation of Y01.
4) Inactive length is equal to the flexible extension plus transition. See dimension drawings on page 5/301 for further explanation of Y02.

Selection and Ordering data		Order code
Further designs		
Please add "**-Z**" to Order No. and specify Order code(s).		
Insertion length, specify in plain text: Y01: to mm		**Y01**
Active shield length, specify in plain text [min. length is 50 mm (2")]: Y02: to mm		**Y02**
Stainless steel tag [69 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**
Operating Instructions		Order No.
English	C)	**7ML1998-5GE01**
French		**7ML1998-5GE11**
Spanish		**7ML1998-5GE21**
German		**7ML1998-5GE31**
Note: The Operating Instructions 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 Operating Instructions library.		
Accessories		
Transmitter, MSP 2002-1, 330 PF[1]	C)	**7ML1830-1JP**
Transmitter, MSP 2002-2, 3300 PF[1]	C)	**7ML1830-1JQ**
Transmitter, MSP 2002-3, 6600 PF (used with conductive fluids and probe lengths >10000 mm)[1]	D)	**7ML1830-1JR**
SITRANS RD100 Remote display - see Chapter 8		
SITRANS RD200 Remote display - see Chapter 8		
SITRANS RD500 Remote display - see Chapter 8		

1) Transmitters not suitable for Intrinsically Safe application (ATEX II 1G EEx ia IIC T4 or CSA/FM Class 1 Div 1 Grp A,B,C and D)

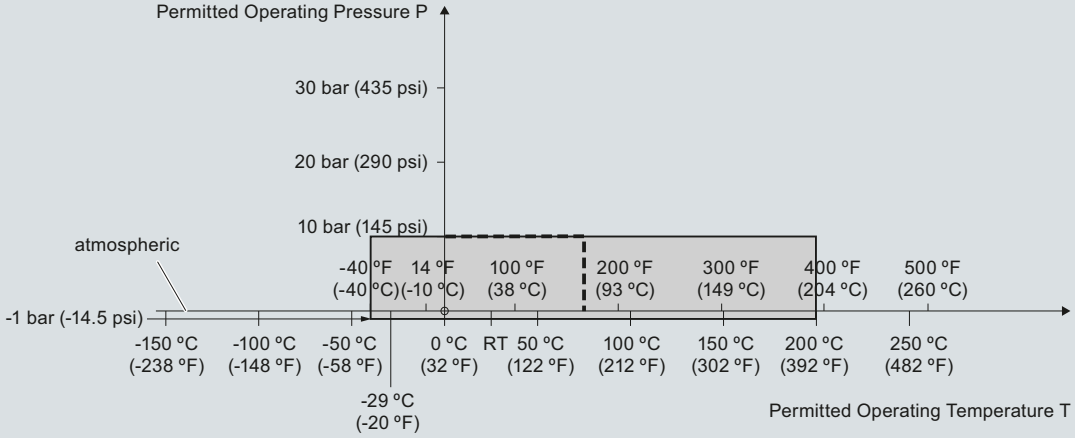
C) Subject to export regulations AL: N, ECCN: EAR99

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

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

Characteristic curves

Pressure/Temperature Curve
LC500 Cable Probes
Threaded Process Connections
(7ML5513)

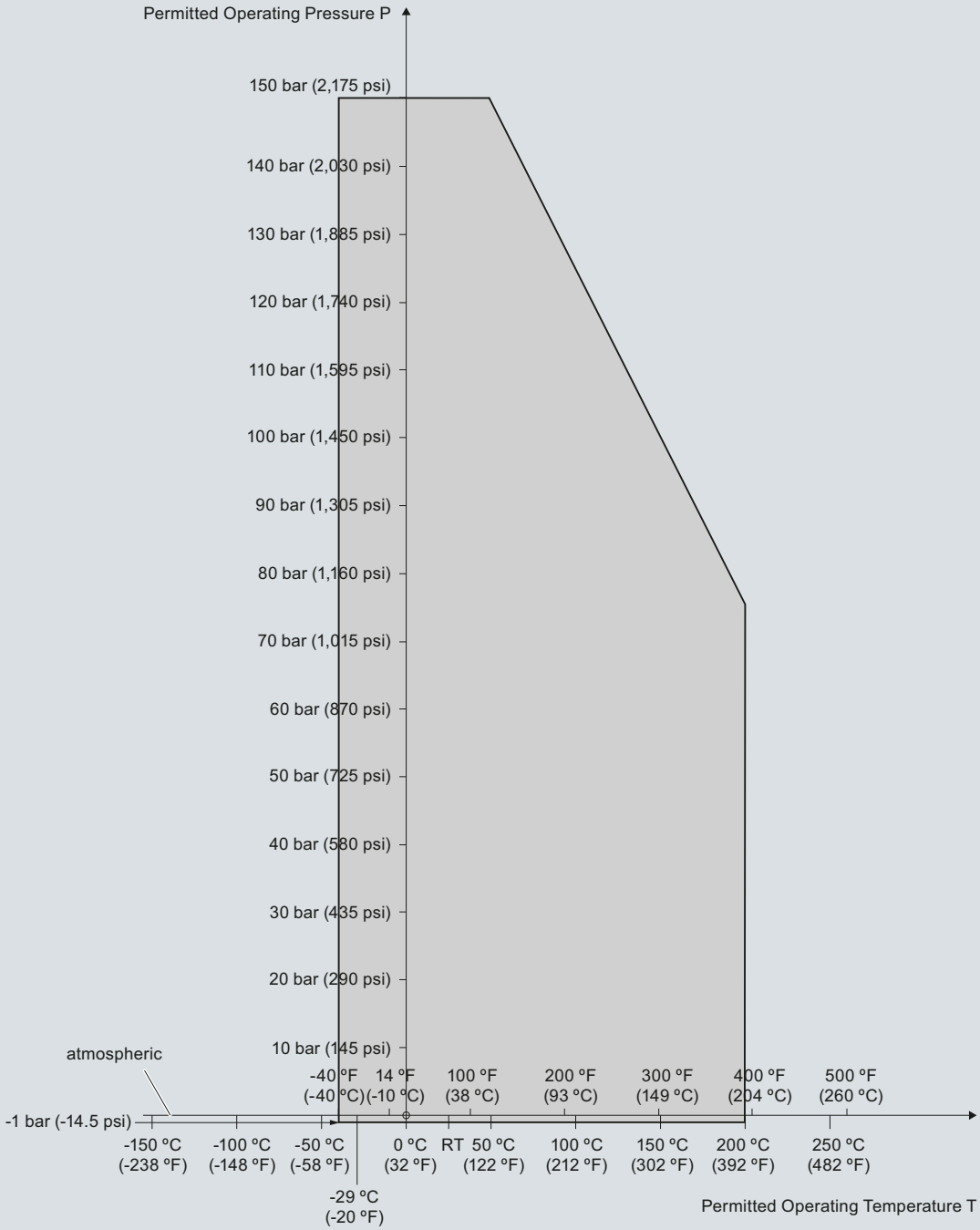


---- Example:
Permitted operating pressure = 10 bar (145 psi) at 75 °C

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

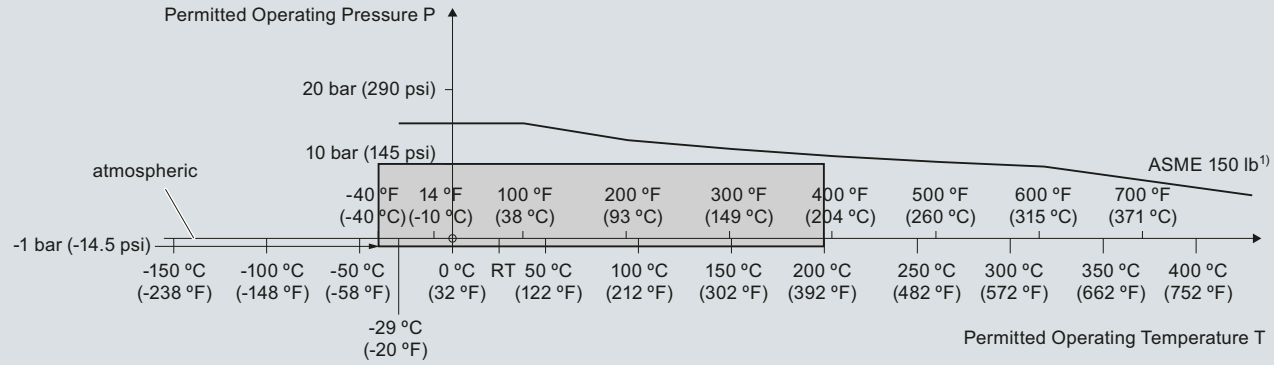
5

Pressure/Temperature Curve
LC500 PFA Rod Probes
Threaded Process Connections
(7ML5515)



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

Pressure/Temperature Curve
LC500 Cable Probes
ASME Flanged Process Connections
(7ML5513)

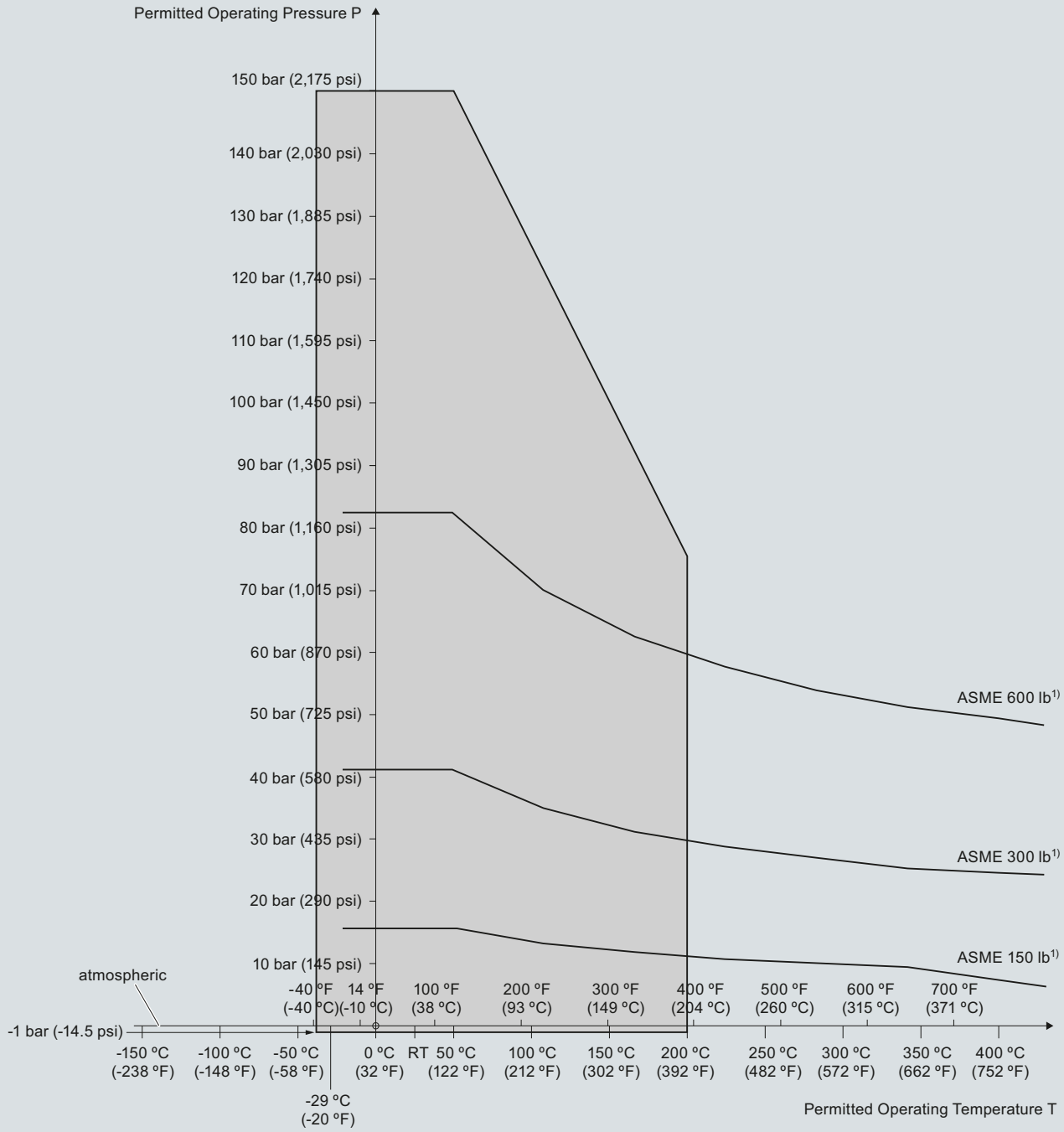


1) The curve denotes the minimum allowable flange class for the shaded area below.

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

5

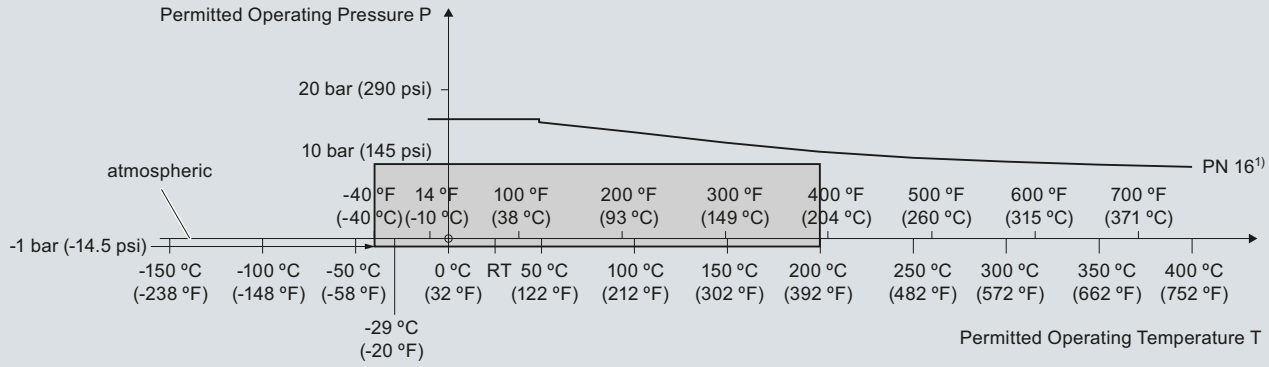
Pressure/Temperature Curve
LC500 PFA Rod Probes
ASME Flanged Process Connections
(7ML5515 and 7ML5517)



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

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

Pressure/Temperature Curve
LC500 Cable Probes
EN Flanged Process Connections
(7ML5513)

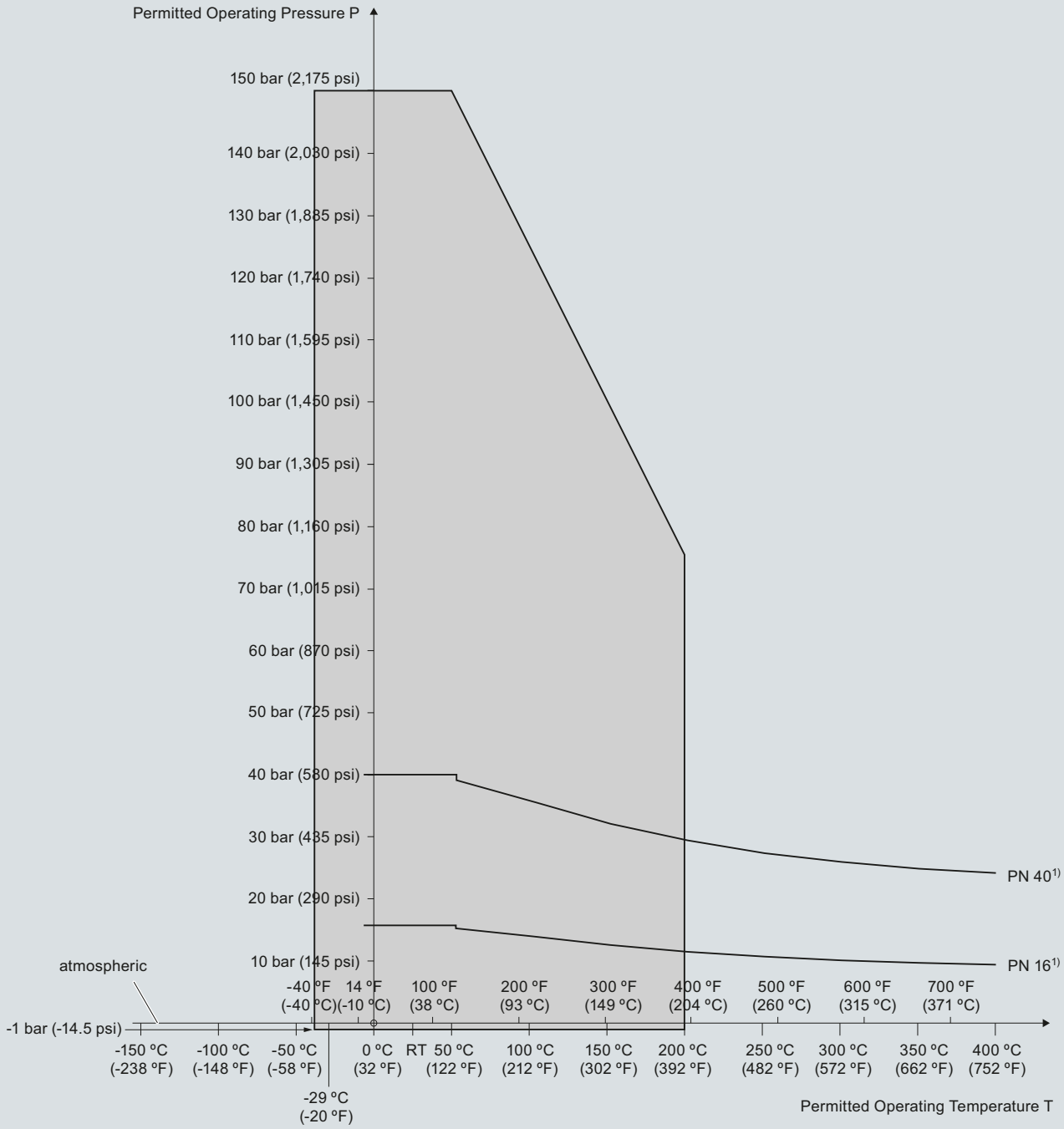


[1)] The curve denotes the minimum allowable flange class for the shaded area below.

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

5

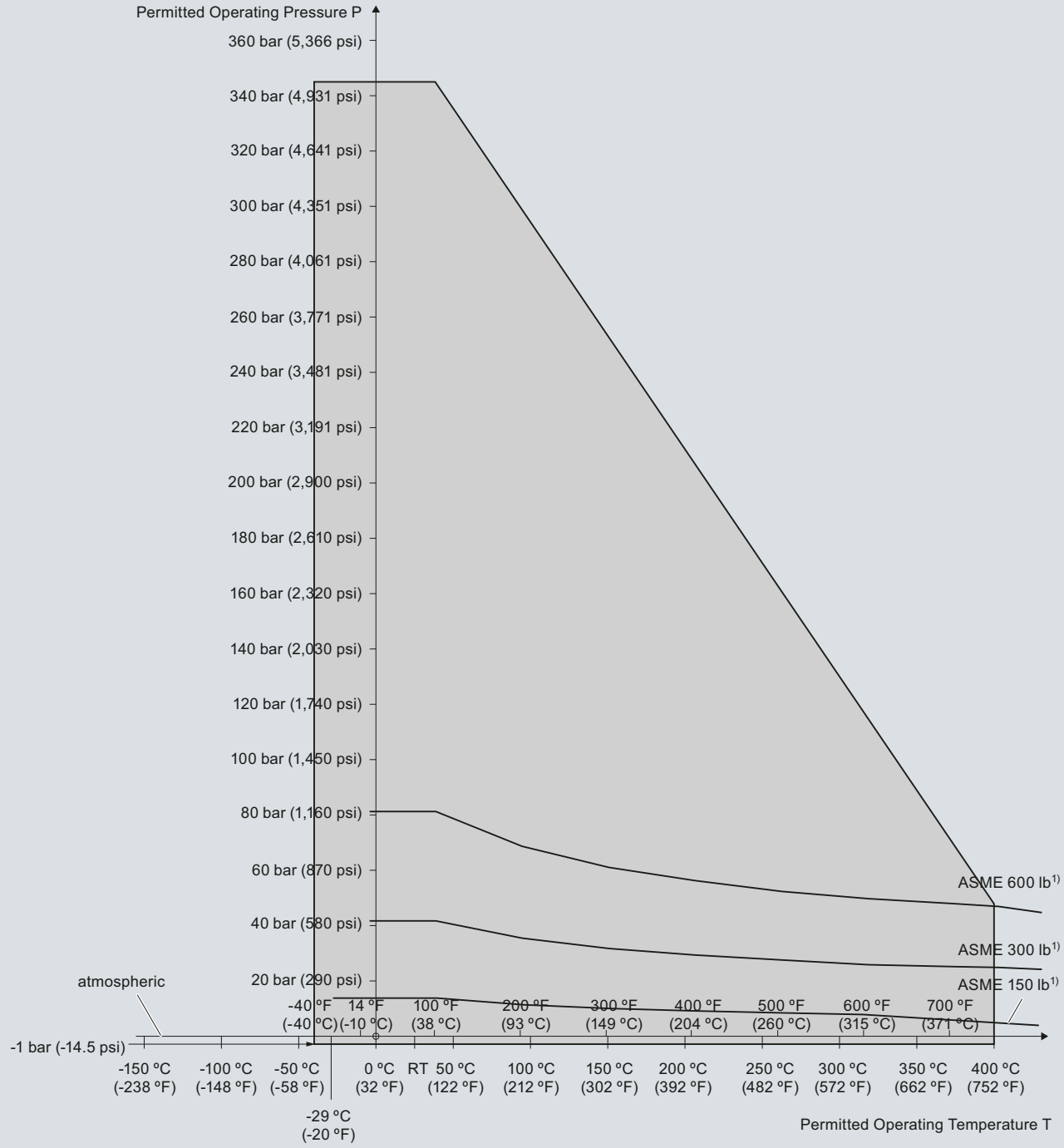
Pressure/Temperature Curve
LC500 PFA Rod Probes
EN Flanged Process Connections
(7ML5515 and 7ML5517)



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

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

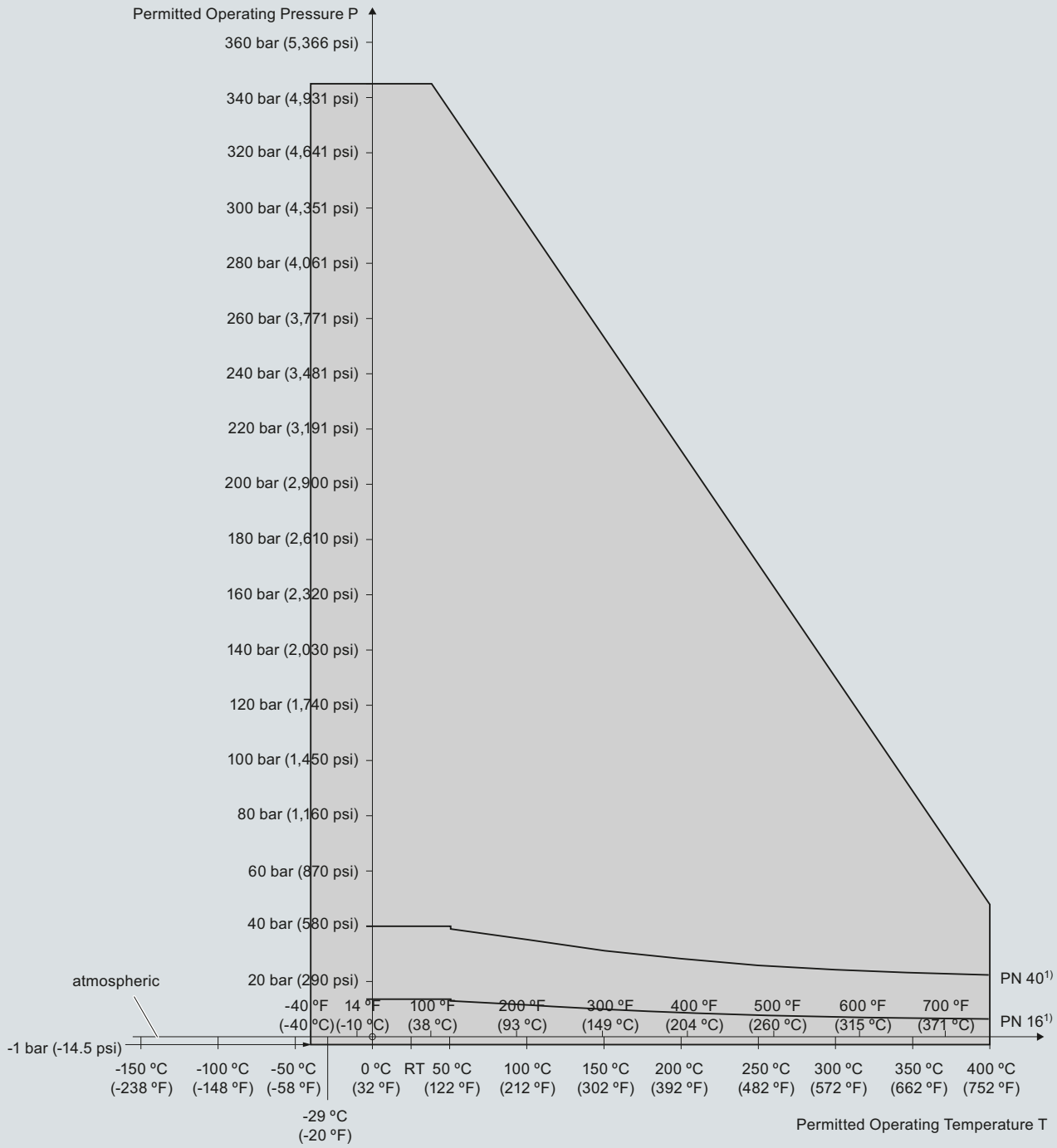
Pressure/Temperature Curve
LC500 Enamel Rod Probes
ASME Flanged Process Connections (7ML5515 and 7ML5517)



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

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

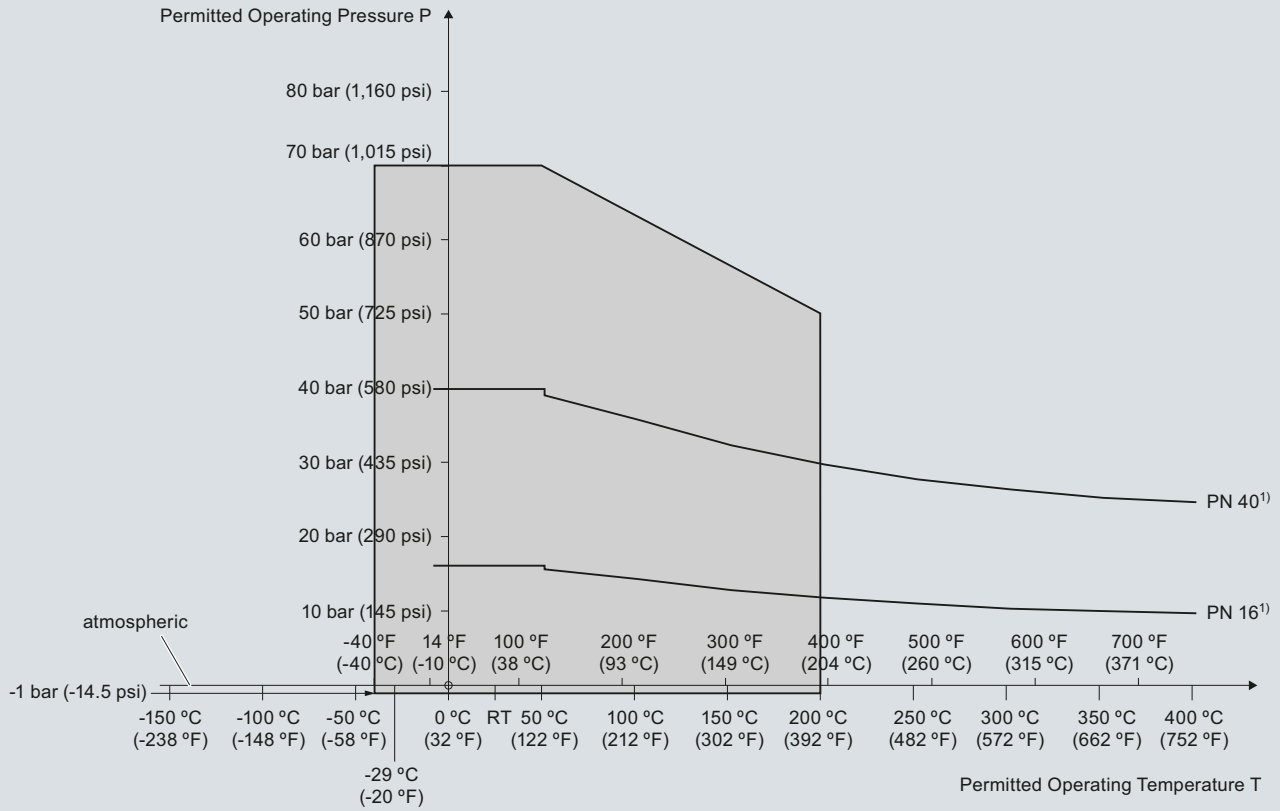
Pressure/Temperature Curve
LC500 Enamel Rod Probes
EN Flanged Process Connections (7ML5515 and 7ML5517)



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

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

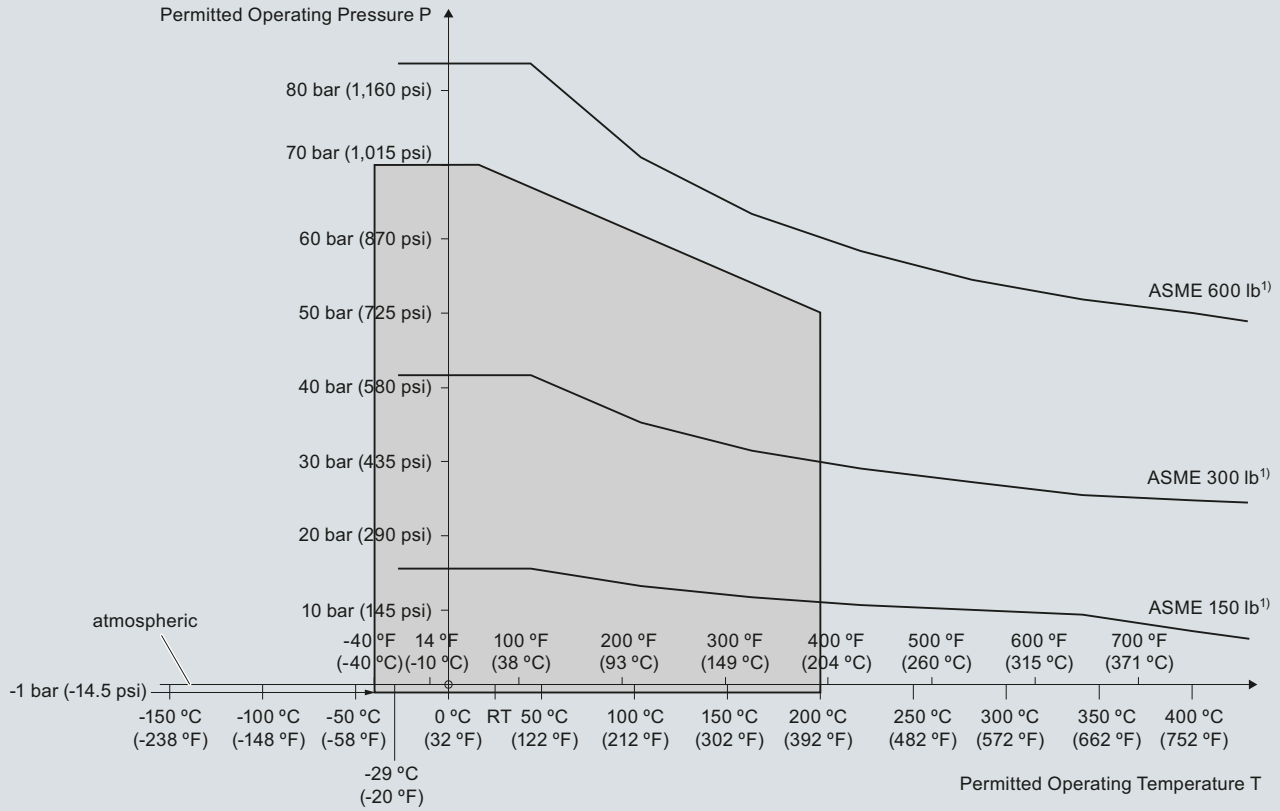
Pressure/Temperature Curve
LC500 Single Piece Flanged Rod Probes with PTFE facing
EN Flanged Process Connections
(7ML5517)



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

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

Pressure/Temperature Curve
LC500 Single Piece Flanged Rod Probes with PTFE facing
ASME Flanged Process Connections
(7ML5517)

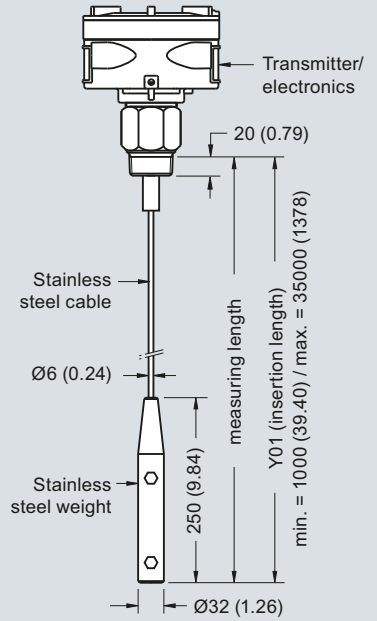


1) The curve denotes the minimum allowable flange class for the shaded area below.

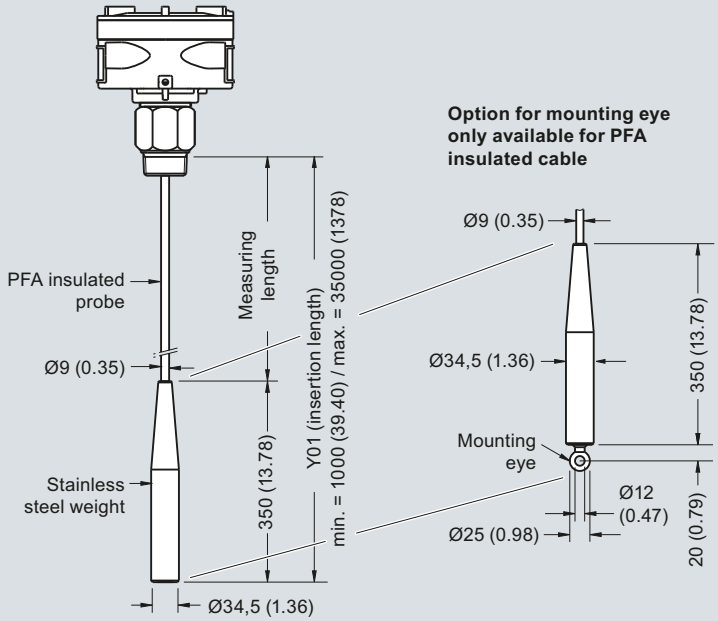
SITRANS LC500 Process Pressure/Temperature derating curves (7ML5517)

Dimensional drawings

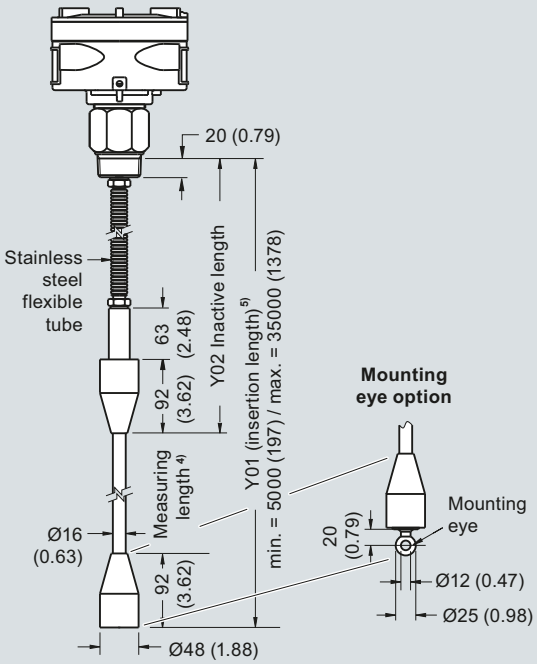
Cable version, non-insulated [1]
Welded Flange (7ML5513)



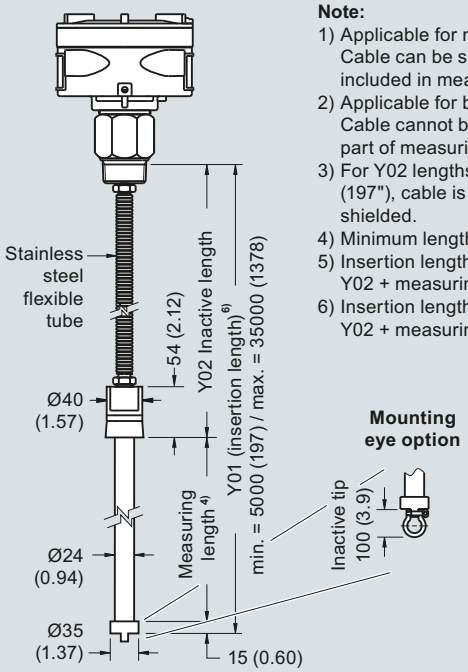
Cable version, insulated [2]
Welded Flange (7ML5513)



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



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

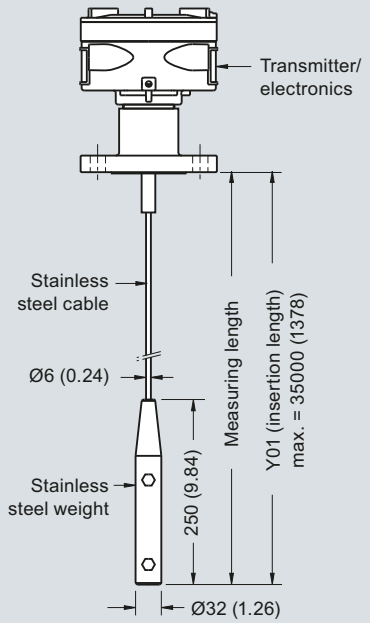


Note:
1) Applicable for non-conductive media only. Cable can be shortened on site. Weight is included in measuring length.
2) Applicable for both liquids and solids. Cable cannot be shortened. Weight is **not** part of measuring length.
3) For Y02 lengths greater than 5000 mm (197"), cable is inactive 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")

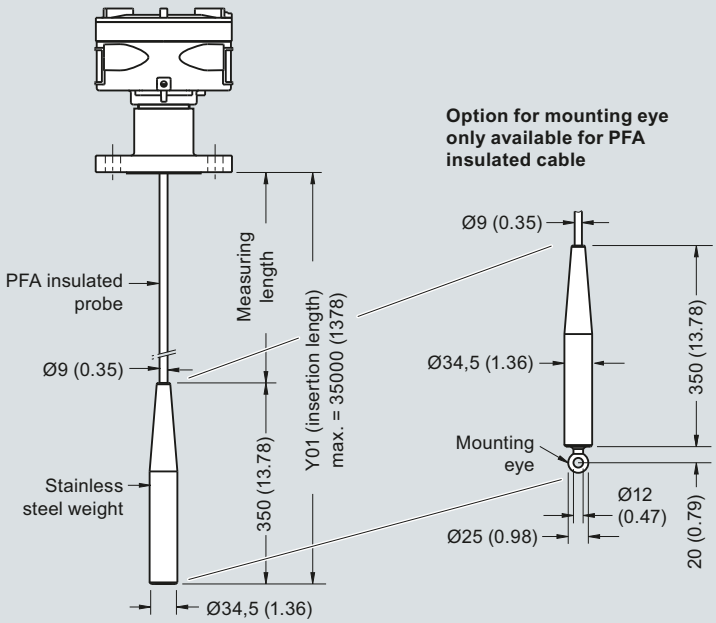
SITRANS LC500 - Cable Versions, dimensions in mm (inch)

SITRANS LC500

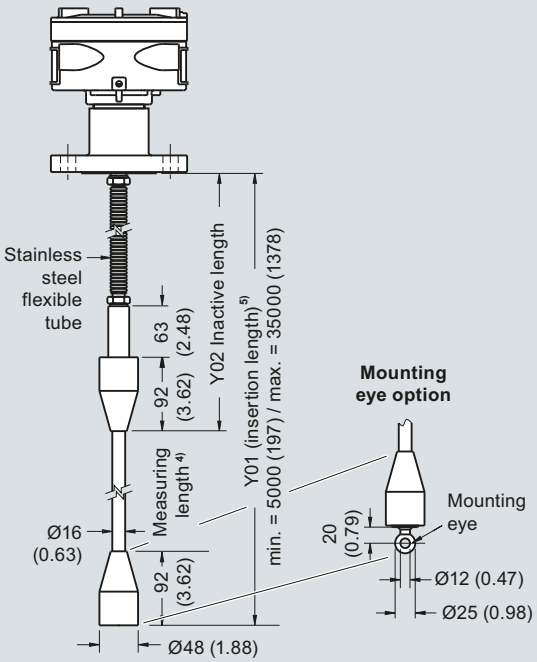
Cable version, non-insulated [1]
Welded Flange (7ML5513)



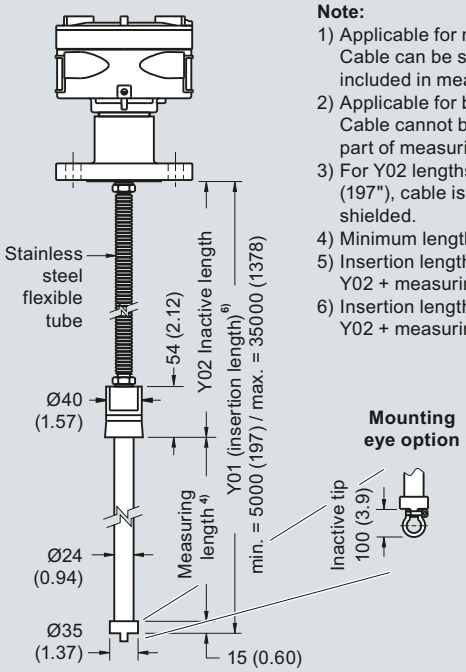
Cable version, insulated [2]
Welded Flange (7ML5513)



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



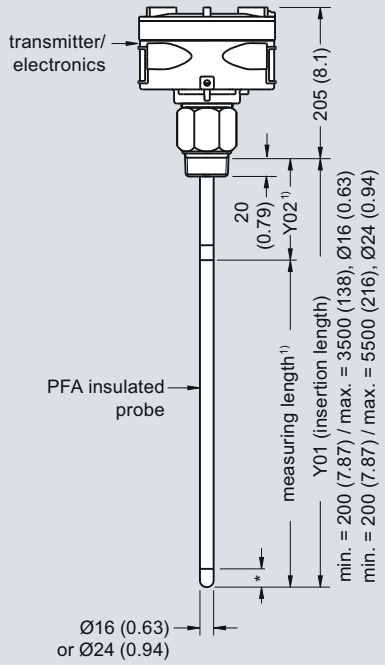
Extended cable version with rod sensor [3]
Welded Flange (7ML5523)



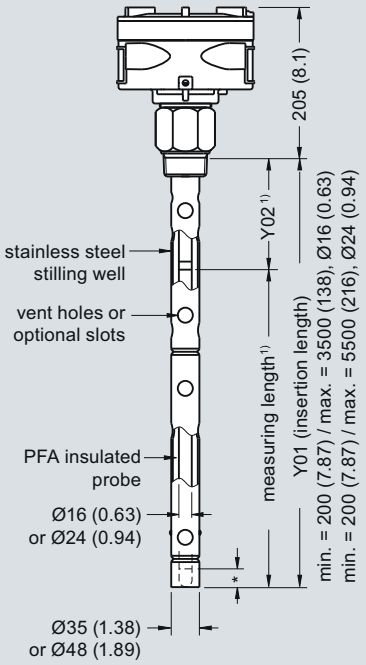
Note:
1) Applicable for non-conductive media only. Cable can be shortened on site. Weight is included in measuring length.
2) Applicable for both liquids and solids. Cable cannot be shortened. Weight is **not** part of measuring length.
3) For Y02 lengths greater than 5000 mm (197"), cable is inactive 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 - Cable Versions, dimensions in mm (inch)

Rod version
Threaded (7ML5515)



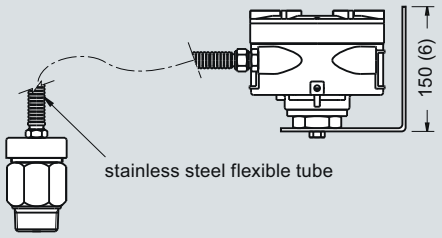
Rod version with stilling well
Threaded (7ML5515)



* = 30 (1.18) Inactive tip

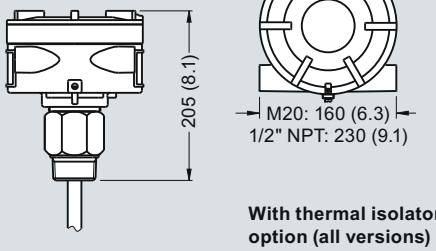
Note:
1) Minimum Y02 (active shield length) = 50 (1.96), minimum measuring length = 200 (7.87)

Remote electronics with mounting bracket option
Threaded (7ML5515)



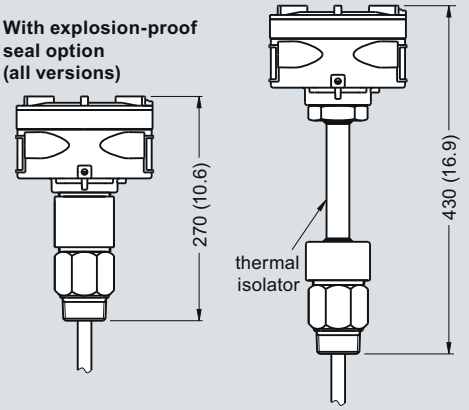
General Purpose approval only.

Standard configuration
(all versions)



With thermal isolator
option (all versions)

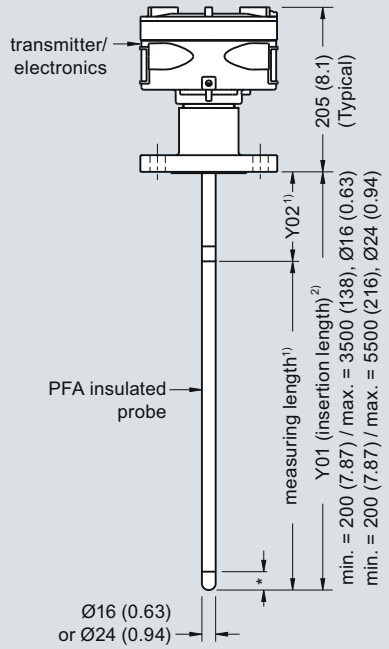
With explosion-proof
seal option
(all versions)



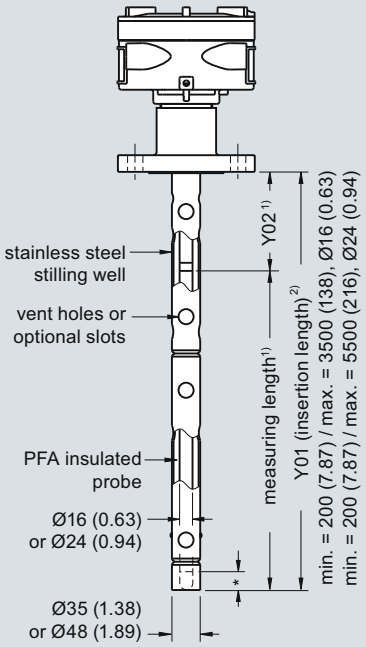
SITRANS LC500 - Rod Versions, dimensions in mm (inch)

SITRANS LC500

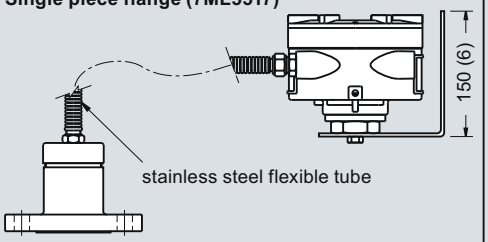
Rod version
Welded flange (7ML5515)
Single piece flange (7ML5517)



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

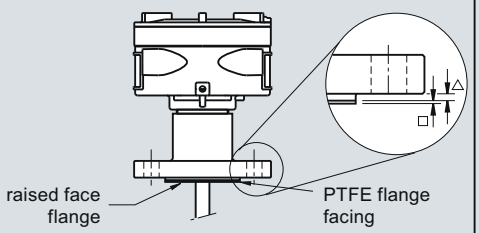


Remote electronics with mounting bracket option
Welded flange (7ML5515)
Single piece flange (7ML5517)



General Purpose approval only.

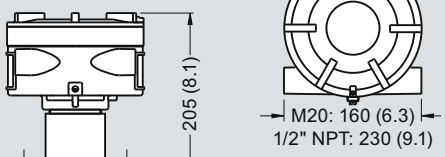
PTFE flange facing option
Single piece flange only (7ML5517)



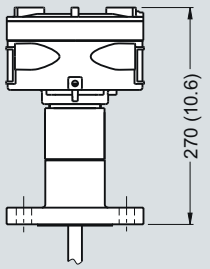
No stilling well or enamel probe available with this option.

* = 30 (1.18) Inactive tip

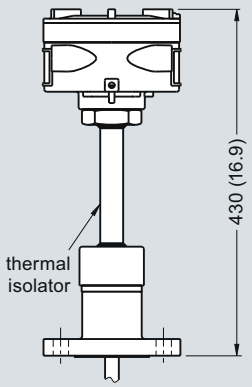
Standard configuration (all versions)



With explosion-proof seal option (all versions)



With thermal isolator option (all versions)

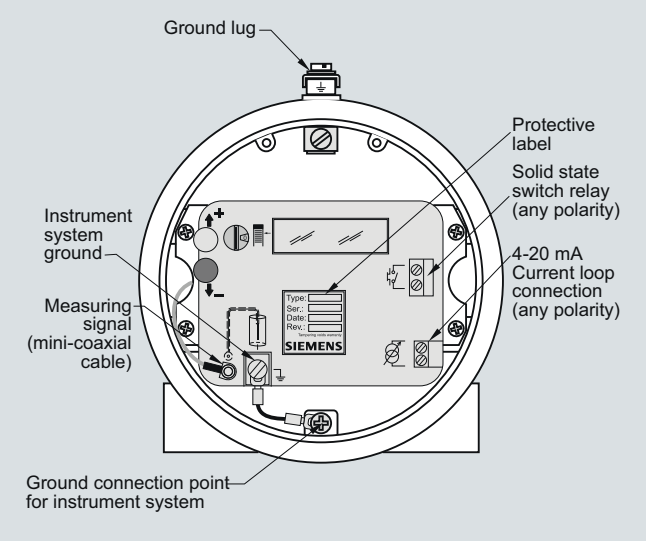


Flange Facing (raised face)	
Flange Class	**Facing thickness**
△ ASME 150/300	2 (0.08)
△ ASME 600/900	7 (0.28)
△ PN16/25/40/64	2 (0.08)
□ PTFE facing (additional)	2 (0.08)

Notes:
1) Minimum Y02 (active shield length) = 50 (1.96), minimum measuring length = 200 (7.87)
2) Insertion length does not include any raised face/gasket face dimension (see Flange Facing table above).

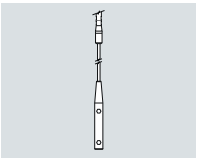
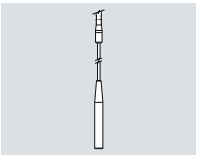
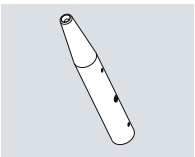
SITRANS LC500 - Rod Versions, dimensions in mm (inch)

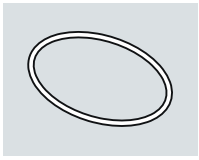
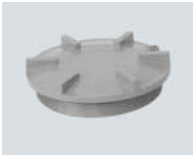
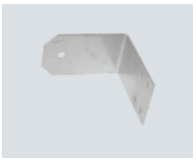
Schematics



SITRANS LC500 connections

SITRANS LC300/LC500 Specials

SITRANS LC300/LC500 Specials[1]	Order No.
LC300 Cable Extensions, 316L stainless steel	
Kit, Stainless steel cable extension, 1 m, adjustable by customer	**A5E01163688**
Kit, Stainless steel cable extension, 3 m, adjustable by customer	**A5E01163689**
Kit, Stainless steel cable extension, 5 m, adjustable by customer	**A5E01163690**
Kit, Stainless steel cable extension, 10 m, adjustable by customer	**A5E01163691**
Kit, Stainless steel cable extension, 15 m, adjustable by customer	**A5E01163693**
Kit, Stainless steel cable extension, 20 m, adjustable by customer	**A5E01163695**
LC300 Cable Extensions, 316 stainless steel with PFA coating	
Kit, PFA cable extension, 1 m	**A5E01163709**
Kit, PFA cable extension, 3 m	**A5E01163710**
Kit, PFA cable extension, 5 m	**A5E01163711**
Kit, PFA cable extension, 10 m	**A5E01163712**
Kit, PFA cable extension, 15 m	**A5E01163713**
Kit, PFA cable extension, 20 m	**A5E01163714**
LC300 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**

SITRANS LC300/LC500 Specials[1]	Order No.
LC500 Gasket (IP65), Silicone	
Spare gasket, LC500 enclosure version, IP65 N)	**A5E01163728**
LC500 Blind Lid	
Spare LC500 aluminum blind lid	**A5E01163729**
LC500 Mounting Eye	
Spare mounting eye (PFA cable version only)	**A5E01163717**
LC500 Mounting Bracket	
Spare mounting bracket	**A5E01163730**
LC500 Sanitary Versions[2]	

[1] Special flange sizes and facings are available.

[2] Please contact nacc.smpi@siemens.com for part number and pricing.

Submit Application Questionnaire found on page 5/9.

J) Subject to export regulations AL: 9I999 ECCN: EAR99

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