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

**Overview**

SITRANS LC500's advanced electronics provide one-step, push-button calibration and local display for easy on-site installation and setup.

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

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

- **Key Applications:** oil/water or foam/liquid interface measurement in separators or coalescers, cryogenic applications including CO₂ and liquefied natural gas (LNG), distillation/regeneration tanks with high temperatures

### Benefits

- 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)

### Example

**Probe Applications**

<table>
<thead>
<tr>
<th>Probe Type</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rod version</td>
<td>Conductive liquids, slurries or solids</td>
</tr>
<tr>
<td>Rod version with stilling well</td>
<td>Conductive liquids or slurries in non-conductive tanks</td>
</tr>
<tr>
<td></td>
<td>Non-conductive liquids in non-conductive tanks</td>
</tr>
<tr>
<td></td>
<td>Tanks with agitation or turbulent liquids</td>
</tr>
<tr>
<td></td>
<td>Liquids with a dielectric constant below 2</td>
</tr>
<tr>
<td></td>
<td>Non-linear tanks, such as parabolic or spherical tanks</td>
</tr>
<tr>
<td></td>
<td>Interface measurements</td>
</tr>
<tr>
<td>Cable version</td>
<td>Non-conductive solids or liquids</td>
</tr>
<tr>
<td>PFA coated cable version</td>
<td>Conductive or sticky liquids, slurries, or solids</td>
</tr>
<tr>
<td>Extended cable with rod version</td>
<td>Long range conductive liquids, slurries or solids when level or interface measurements are required in the low area of the bin or tank</td>
</tr>
</tbody>
</table>

### Configuration

- **Installation**
  - Build up of material or condensation in active shield area does not affect switch operation.
  - Mounting on non-linear vessels in non-conductive fluids using stilling well.
## Technical specifications

### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>1 ... 3 300 pF</td>
</tr>
<tr>
<td>Span</td>
<td>Min. 3.3 pF</td>
</tr>
</tbody>
</table>

### Output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid-state switch</td>
<td>Galvanically isolated</td>
</tr>
<tr>
<td>Output</td>
<td>Bipolar</td>
</tr>
<tr>
<td>Max. switching voltage</td>
<td>30 V (DC)</td>
</tr>
<tr>
<td>Min. switching voltage</td>
<td>30 V (AC)</td>
</tr>
<tr>
<td>Max. load current</td>
<td>82 mA</td>
</tr>
<tr>
<td>Voltage drop</td>
<td>&lt; 1 V, typical at 50 mA</td>
</tr>
<tr>
<td>Time delay (pre or post switching)</td>
<td>1 ... 60 s</td>
</tr>
<tr>
<td>Loop current</td>
<td>3.6 ... 22 mA/22 ... 3.6 mA</td>
</tr>
</tbody>
</table>

### Accuracy (transmitter)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature stability</td>
<td>0.15 pF (0 pF) or &lt; 0.25 % (typically &lt; 0.1 %) of actual measured value, whichever is greater over the full temperature range</td>
</tr>
<tr>
<td>Non-linearity and repeatability</td>
<td>&lt; 0.1 % of range and actual measured value respectively</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Deviation &lt; 0.1 % of measured value</td>
</tr>
</tbody>
</table>

### Rated operating conditions

#### Installation conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Indoor/outdoor</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature (transmitter)</td>
<td>-40 ... +85 °C (-40 ... +185 °F)²</td>
</tr>
<tr>
<td>Installation category</td>
<td>II</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>4</td>
</tr>
<tr>
<td>Medium conditions</td>
<td></td>
</tr>
<tr>
<td>Relative dielectric constant εr</td>
<td>Min. 1.5</td>
</tr>
<tr>
<td>Minimum difference in dielectric constant for interface</td>
<td>5</td>
</tr>
<tr>
<td>Process temperature</td>
<td>Temperature rating of process seal is pressure dependent. See Pressure/temperature curves on page 4/360.</td>
</tr>
<tr>
<td>- Standard (PFA)³</td>
<td>-50 ... +200 °C (-58 ... +392 °F)</td>
</tr>
<tr>
<td>- Cryogenic version⁴</td>
<td>-200 ... +200 °C (-328 ... +392 °F)</td>
</tr>
<tr>
<td>Process pressure</td>
<td>Pressure rating of process seal is temperature dependent. See Pressure/temperature curves on page 4/360.</td>
</tr>
<tr>
<td>- Standard (PFA)</td>
<td>-1 ... 150 bar g (2 175 psi g)</td>
</tr>
</tbody>
</table>

#### Design

<table>
<thead>
<tr>
<th>Material</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetted parts material</td>
<td>316L stainless steel</td>
</tr>
<tr>
<td>- Standard rod</td>
<td>PFA</td>
</tr>
<tr>
<td>Probe insulation (rod)</td>
<td>316 stainless steel</td>
</tr>
<tr>
<td>- Cable</td>
<td>316 stainless steel PFA</td>
</tr>
<tr>
<td>Probe diameter</td>
<td>16 mm (0.63 inch) or 24 mm (0.95 inch)</td>
</tr>
<tr>
<td>Rod version</td>
<td>9 mm (0.35 inch) with PFA jacket, 6 mm (0.24 inch) without PFA jacket</td>
</tr>
<tr>
<td>Cable version</td>
<td></td>
</tr>
<tr>
<td>Active shield length</td>
<td>50 mm (1.97 inch), customer selectable (order number Y02)</td>
</tr>
<tr>
<td>Probe length</td>
<td>Max. 3.5 m (138 inch) with 16 mm rod, PFA</td>
</tr>
<tr>
<td>Rod version</td>
<td>Max. 5.5 m (216 inch) with 24 mm rod, PFA</td>
</tr>
<tr>
<td>Cable version</td>
<td>Max. 3.5 m (1 378 inch)</td>
</tr>
<tr>
<td>Process connection of probe</td>
<td>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]</td>
</tr>
<tr>
<td>Threaded mounting</td>
<td></td>
</tr>
<tr>
<td>Flange mounting</td>
<td>ASME, EN 1092-1</td>
</tr>
<tr>
<td>Enclosure</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Aluminum, epoxy-coated</td>
</tr>
<tr>
<td>Cable inlet</td>
<td>2 x ½ inch NPT (2 x M20 x 1.5, IP68 adapter, optional)</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>Type 4X/NEMA4X/IP66, IP68</td>
</tr>
</tbody>
</table>

### Power supply

| Specification   | 12 ... 33 V DC |

### User Interface

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
<td>Local LCD, 4 digit, each 0 ... 9 and limited alpha characters</td>
</tr>
<tr>
<td>Rotary function switch</td>
<td>For selecting programmable menu items</td>
</tr>
<tr>
<td>Push buttons</td>
<td>Red +, blue -, used in conjunction with rotary switch for programming</td>
</tr>
</tbody>
</table>

### Features

<table>
<thead>
<tr>
<th>Specification</th>
<th>According to NAMUR NE 43, signal 3.8 ... 20.5 mA, fault ≤ 3.6 or ≥ 21 mA (22 mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Inputs/outputs fully galvanically isolated</td>
</tr>
<tr>
<td>- Polarity-insensitive current loop</td>
<td>Fully potted</td>
</tr>
<tr>
<td>- Integrated safety barrier</td>
<td></td>
</tr>
<tr>
<td>Diagnostics with fault alarm when:</td>
<td>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</td>
</tr>
<tr>
<td>Function rotary switch</td>
<td>Positions 0 ... 9, A ... F</td>
</tr>
<tr>
<td>SMART communication</td>
<td>Conforming to HART Communication Foundation (HCF)</td>
</tr>
</tbody>
</table>
Level Measurement
Continuous level measurement - Capacitance transmitters

SITRANS LC500

Certificates and approvals

<table>
<thead>
<tr>
<th>General Purpose</th>
<th>CE, CSA, FM, RCM, KCC, EAC</th>
</tr>
</thead>
</table>
| Non-incendive/Non-sparking | • CSA/FM Class I, Div. 1, Groups A, B, C, D, T4, ATEX II 3G 2D EEx nA (ib) IIC  
| | • T6...T4 T100 °C |
| Dust Ignition Proof (Intrinsically Safe Probe Circuit) | • Canada/USA  
| | CSA/FM Class II and III, Div. 1, Groups E, F, G  
| | • Europe  
| | ATEX II 1/2 GD EEx d [ia] T6...T1 T100 °C  
| | • Brazil  
| | INMETRO Ex d [ia Ga] IIC T6...T1 Gb Ex tb [ia Da] IIIC T100 °C Db -40 °C ≤ Ta ≤ +70 °C IP65/IP68  
| | • Russia/Kazakhstan  
| | EAC Ex  
| Explosion Proof (Intrinsically Safe Probe Circuit) | • Canada/USA  
| | FM Class I, Div. 1, Groups A, B, C, D T4  
| | • Europe  
| | ATEX II 1/2 GD EEx d [ia] IIC T6...T1  
| | • Marine  
| | Lloyd's Register of Shipping, Categories ENV1, ENV2, ENV3, and ENV5, Bureau Veritas  
| | • Other  
| | Pattern approval (AQSIQ, China), CRN  

1) When operation is in areas classified as hazardous, observe restrictions according to relevant certificate. See also Pressure/Temperature curves on page 4/360.
2) Thermal isolator is used if process connection temperature exceeds 85 °C (185 °F).
3) Not recommended for steam environments.
4) Customers interested in a custom designed device should consult a local salesperson. For more information, please visit http://www.automation.siemens.com/aspa_app.

SITRANS LC500 probe version

<table>
<thead>
<tr>
<th>Process connection types</th>
<th>Standard</th>
<th>Extended Cable version with Rod Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threaded</td>
<td>Threaded or welded flange</td>
<td>Single piece flanged</td>
</tr>
</tbody>
</table>
| Flange                  | Available as standard     | –  
| Available as standard   | Available as standard     | Available as standard |

Process connection materials

| Stainless steel 316L | Available as standard | Available as standard | Available as standard |

Probe insulation

| PFA | Available as standard | Available as standard | Available as standard |

Length and Process parameters

<table>
<thead>
<tr>
<th>Rod length for PFA 16 mm version</th>
<th>Min. 200 mm (7.87 inch)</th>
<th>Max. 3 500 mm (137.80 inch)</th>
<th>Min. 200 mm (7.87 inch)</th>
<th>Max. 3 500 mm (137.80 inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rod length for PFA 24 mm version</td>
<td>Min. 200 mm (7.87 inch)</td>
<td>Max. 5 500 mm (216.54 inch)</td>
<td>Min. 200 mm (7.87 inch)</td>
<td>Max. 5 500 mm (216.54 inch)</td>
</tr>
<tr>
<td>Cable length</td>
<td>Min. 1 000 mm (39.37 inch)</td>
<td>Max. 35 000 mm (1 377.95 inch)</td>
<td>Min. 1 000 mm (39.37 inch)</td>
<td>Max. 35 000 mm (1 377.95 inch)</td>
</tr>
<tr>
<td>Maximum process pressure</td>
<td>See Pressure/Temperature curves for specific probe type</td>
<td>5 bar g (73 psi g)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum process temperature</td>
<td>100 °C (212 °F)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Continuous level measurement - Capacitance transmitters

Selection and Ordering data

SITRANS LC500, Threaded or Welded Flange with Cable 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.

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

Version

Cable, 9 mm (0.35 inch) diameter, 316 stainless steel with PFA insulation, weighted

Add Order code Y01 and plain text:

Insertion length, specify in plain text:

T 000 ... 2 000 mm (39.37 ... 78.74 inch) 0 E
2 001 ... 4 000 mm (78.78 ... 157.48 inch) 1 E
4 001 ... 6 000 mm (157.52 ... 236.22 inch) 2 E
6 001 ... 8 000 mm (236.26 ... 314.96 inch) 3 E
8 001 ... 10 000 mm (315 ... 393.70 inch) 4 E

Longer lengths possible to a max. of 35 000 mm (114.83 ft).

Please contact local sales person for details.

Cable, 6 mm (0.24 inch) diameter, 316L stainless steel, non-insulated, weighted (non-conductive media only)

Add Order code Y01 and plain text:

Insertion length, specify in plain text:

T 000 ... 2 000 mm (39.37 ... 78.74 inch) 0 F
2 001 ... 4 000 mm (78.78 ... 157.48 inch) 1 F
4 001 ... 6 000 mm (157.52 ... 236.22 inch) 2 F
6 001 ... 8 000 mm (236.26 ... 314.96 inch) 3 F
8 001 ... 10 000 mm (315 ... 393.70 inch) 4 F

Cable lengths up to 25 000 mm (984.25 inch) are possible for non-conductive media. Cable lengths up to 15 000 mm (590.55 inch) are possible for non-conductive media.

Please contact a local sales person 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 C O
1¼” NPT ([Taper], ANSI/ASME B1.20.1) K 0
G 1¼” [BSPP], EN ISO 228-1/1PF (JIS-F), 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 D 1
3”, ASME, 300 lb D 2
3”, ASME, 600 lb D 3
4”, ASME, 150 lb E 1
4”, ASME, 300 lb E 2
4”, ASME, 600 lb E 3
6”, ASME, 150 lb F 1
6”, ASME, 300 lb F 2
6”, ASME, 600 lb 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 M 5
DN 100, PN 16 N 4
DN 100, PN 40 N 5
DN 125, PN 16 P 4
DN 125, PN 40 P 5

Welded flange, Type B 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 M 5
DN 100, PN 16 N 4
DN 100, PN 40 N 5
DN 125, PN 16 P 4
DN 125, PN 40 P 5

(Nota: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5, or EN 1092-1 standard.) Sanitary, hastelloy, duplex or other custom process connections available.

Please contact a local sales person for details.

Selection and Ordering data

SITRANS LC500, Threaded or Welded Flange with Cable 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.

Approvals

General Purpose: CE, CSA, FM, RCM
CSA / FM Class I, Div. 2, Groups A, B, C, D
CSA / FM Class II, III, Div. 1, Groups E, F, G
ATEX II 3G D Ex d [ia] IIC T6 ... T4 T 100 °C
ATEX II 1/2 GD Ex e d [ib] IIC T6 ... T1 T 100 °C
FM Class I, Div. 1, Groups A, B, C, D, T4

Enclosure/Cable inlet

Aluminum epoxy coated
2 x ½” NPT, IP68
2 x M20 x 1.5 (IP68, adapter)
Stainless steel
Please contact a local sales person for details.

Options

No additional options
With mounting eye

Thermal isolator

Without thermal isolator
Isolator, only for use when temperature range is outside of −40 ... +85 °C (-40 ... +185 °F), explosion proof approval -40 ... +70 °C (-40 ... +158 °F)

Electronic output

No transmitter supplied
2-wire loop current 4 ... 20 mA
(transmitter MSP 2002-2, 3300 pF)

Selection and Ordering data

Order code

Further designs

Please add “Z” to Article No. and specify Order code(s).

Insertion length, specify in plain text: Y01: ... mm
Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:
Measuring-point number/identification (max. 27 characters) specify in plain text
Manufacturer’s test certificate: M to DIN 55350, Part 18 and to ISO 9000
Inspection Certificate Type 3.1 per EN 10204

Accessories

See page 4/359

See page 4/359
Level Measurement
Continuous level measurement - Capacitance transmitters

SITRANS LC500

Selection and Ordering data

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.

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

Version
Rod, 16 mm (0.63 inch), PFA insulated
Add Order code Y01 and Y02 and plain text:

Insertion length ... mm and active shield length ... mm

000 mm (0.78 ... 39.7 inch)
1 001 ... 2 000 mm (39.41 ... 78.74 inch)
01 001 ... 3 000 mm (78.78 ... 118.1 inch)
02 001 ... 5 000 mm (118.15 ... 137.80 inch)

Rod, 16 mm (0.63 inch), PFA insulated with 35 mm (1.38 inch) stilling well in 316L stainless steel
Add Order code Y01 and Y02 and plain text:

Insertion length ... mm and active shield length ... mm

000 mm (0.78 ... 39.7 inch)
1 001 ... 2 000 mm (39.41 ... 78.74 inch)
01 001 ... 3 000 mm (78.78 ... 118.1 inch)
02 001 ... 5 000 mm (118.15 ... 137.80 inch)

Rod, 24 mm (0.94 inch), PFA insulated
Add Order code Y01 and Y02 and plain text:

Insertion length ... mm and active shield length ... mm

000 mm (0.78 ... 39.7 inch)
1 001 ... 2 000 mm (39.41 ... 78.74 inch)
01 001 ... 3 000 mm (78.78 ... 118.1 inch)
02 001 ... 5 000 mm (118.15 ... 137.80 inch)

Proc. connection (316L stainless steel)
Threaded connection
- ½" NPT (Taper), ANSI/ASME B1.20.1
- 1" NPT (Taper), ANSI/ASME B1.20.1
- 1 ½" NPT (Taper), ANSI/ASME B1.20.1
- 2" NPT (Taper), ANSI/ASME B1.20.1
- R ¾" [BSPT], EN 10226/PFT (JIS-T), JIS B 0203
- R 1 ½" [BSPT], EN 10226/PFT (JIS-T), JIS B 0203
- R 2" [BSPT], EN 10226/PFT (JIS-T), JIS B 0203
- 1 ¼" NPT (Taper), ANSI/ASME B1.20.1
- G ¾" [BSPP], EN ISO 228-1/FPF (JIS-P), JIS B 0202
- G 1" [BSPP], EN ISO 228-1/FPF (JIS-P), JIS B 0202
- G 1 ½" [BSPP], EN ISO 228-1/FPF (JIS-P), JIS B 0202
- G 2" [BSPP], EN ISO 228-1/FPF (JIS-P), JIS B 0202

Enclosure/Cable inlet
Aluminum epoxy coated
- 2 x ½" NPT, IP66
- 2 x M20 x1.5 (IP68, adapter)

Stainless steel
Please contact a local salesperson for details.

Options
No additional options

Thermal isolator/remote version
Without thermal isolator or remote electronics
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)

Remote electronics with mounting bracket and cable
- Length: 2 m (79 inch)
- Length: 3 m (118 inch)
- Length: 4 m (158 inch)
- Length: 5 m (197 inch)

Electronic output
No transmitter supplied
2-wire loop current 4 ... 20 mA (transmitter MSP 2002-2 ... 3300 pF)

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 1 ½" or larger
4) Available with process connection 1" or larger
5) Available with process connection 2" or larger
6) Available with approval option 1 only

Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.

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## Selection and Ordering data

<table>
<thead>
<tr>
<th>Further designs</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please add ‘-Z’ to Article No. and specify Order code(s).</td>
<td></td>
</tr>
<tr>
<td>Insertion length, specify in plain text: Y01: ... mm</td>
<td>Y01</td>
</tr>
<tr>
<td>Active shield length, specify in plain text [min. length is 50 mm (2 inch), max. length is 3 350 mm (131.89 inch)]; Y02: ... mm</td>
<td>Y02</td>
</tr>
<tr>
<td>Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]; Measuring-point number/identification (max. 27 characters) specify in plain text</td>
<td>Y15</td>
</tr>
<tr>
<td>Manufacturer’s test certificate: M to DIN 55350, Part 18 and to ISO 9000</td>
<td>C11</td>
</tr>
<tr>
<td>Inspection Certificate Type 3.1 per EN 10204</td>
<td>C12</td>
</tr>
<tr>
<td>Manufacturing Test Report (Electrode Test)</td>
<td>C18</td>
</tr>
<tr>
<td>Operating Instructions</td>
<td>See page 4/359</td>
</tr>
<tr>
<td>Accessories</td>
<td>See page 4/359</td>
</tr>
</tbody>
</table>
### Level Measurement

**Continuous level measurement - Capacitance transmitters**

<table>
<thead>
<tr>
<th>Selection and Ordering data</th>
<th>Article No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITRANS LC500, Single Piece Flanged with Rod Sensor</td>
<td>7ML5517-7ML5517-7ML5517-</td>
</tr>
</tbody>
</table>

**Inverse frequency shift capacitance level and interface transmitter for extreme and critical process conditions, such as oil and liquid gas, toxic and aggressive chemicals and vapours.**

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

**Version**

- Rod, 16 mm (0.63 inch), PFA insulated
  - Add Order code Y01 and Y02 and plain text:
    - Insertion length ... mm and active shield
      - length ... mm
        - 250 ... 1 000 mm (9.84 ... 39.37 inch) +
          - 1 001 ... 2 000 mm (39.41 ... 78.74 inch) +
          - 2 001 ... 3 000 mm (78.78 ... 118.11 inch) +
          - 3 001 ... 5 000 mm (118.15 ... 137.80 inch) +
- Rod, 16 mm (0.63 inch), PFA insulated with 35 mm (1.34 inch) stilling well in 316L stainless steel
  - Add Order code Y01 and Y02 and plain text:
    - Insertion length ... mm and active shield
      - length ... mm
        - 250 ... 1 000 mm (9.84 ... 39.37 inch)
          - 1 001 ... 2 000 mm (39.41 ... 78.74 inch)
          - 2 001 ... 3 000 mm (78.78 ... 118.11 inch)
          - 3 001 ... 5 000 mm (118.15 ... 137.80 inch)
- Rod, 24 mm (0.94 inch), PFA insulated
  - Add Order code Y01 and Y02 and plain text:
    - Insertion length ... mm and active shield
      - length ... mm
        - 250 ... 1 000 mm (9.84 ... 39.37 inch)
          - 1 001 ... 2 000 mm (39.41 ... 78.74 inch)
          - 2 001 ... 3 000 mm (78.78 ... 118.11 inch)
          - 3 001 ... 4 000 mm (118.15 ... 157.48 inch)
          - 4 001 ... 5 000 mm (173.26 ... 196.88 inch)
          - 5 001 ... 5 500 mm (196.89 ... 216.54 inch)
- Rod, 24 mm (0.94 inch), PFA insulated with 48 mm (1.89 inch) stilling well in 316L stainless steel
  - Add Order code Y01 and Y02 and plain text:
    - Insertion length ... mm and active shield
      - length ... mm
        - 250 ... 1 000 mm (9.84 ... 39.37 inch)
          - 1 001 ... 2 000 mm (39.41 ... 78.74 inch)
          - 2 001 ... 3 000 mm (78.78 ... 118.11 inch)
          - 3 001 ... 4 000 mm (118.15 ... 157.48 inch)
          - 4 001 ... 5 000 mm (173.26 ... 196.88 inch)
          - 5 001 ... 5 500 mm (196.89 ... 216.54 inch)

**Process connection (316L stainless steel)**

- Single piece flange, raised face
  - 1 1/2" ASME, 150 lb
  - 1 1/2", ASME, 300 lb
  - 1 1/2", ASME, 600 lb
  - 2", ASME, 150 lb
  - 2", ASME, 300 lb
  - 2", ASME, 600 lb
  - 3", ASME, 150 lb
  - 3", ASME, 300 lb
  - 3", ASME, 600 lb
  - 4", ASME, 150 lb
  - 4", ASME, 300 lb
  - 4", ASME, 600 lb
  - 6", ASME, 150 lb
  - 6", ASME, 300 lb
  - 6", ASME, 600 lb

Please contact a local sales person for details.

---

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## Selection and Ordering data

<table>
<thead>
<tr>
<th>Article No.</th>
<th>SITRANS LC500, Single Piece Flanged with Rod Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>7ML5517-7</td>
<td>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.</td>
</tr>
</tbody>
</table>

### Approvals

- **General Purpose:** CE, CSA, FM, RCM
- **CSA / FM Class I, Div. 2, Groups A, B, C, D**
- **CSA / FM Class II, III, Div. 1, Groups E, F, G T4**
- **ATEX II 3G 2D Ex nA [ib] IIC T6 T 100 °C**
- **FM Class I, Div. 1, Groups A, B, C, D, T4**

### Enclosure/Cable inlet

- Aluminum epoxy coated
  - 2 x \( \frac{1}{2} “ \) NPT, IP68
  - 2 x M20 x 1.5 (IP68, adapter)
- Stainless steel
  - Please contact a local sales person for details.

### Options

- **None**

### Thermal isolator/remote version

- **Without thermal isolator**
- Isolator, only for use when temperature range is outside of \(-40 \ldots +85 °C \) (-40 \ldots +185 °F), explosion proof approval -40 \ldots +70 °C (-40 \ldots +158 °F)
- Remote electronics with mounting bracket and cable

#### Insertion length

- Length: 2 m (79 inch)
- Length: 3 m (118 inch)
- Length: 4 m (158 inch)
- Length: 5 m (197 inch)

#### Active shield length

- [min. length is 50 mm (2 inch), max. length is 3 350 mm (131.89 inch)]: Y02 ... mm

#### Stainless steel tag

- [69 x 50 mm (2.71 x 1.97 inch)]: Y15

#### Measuring-point number/identification

- (max. 27 characters) specify in plain text

#### Manufacturer’s test certificate

- M to DIN 55350, Part 18 and to ISO 9000
- Inspection Certificate Type 3.1 per EN 10204
- Manufacturing Test Report (Electrode Test)

### Electronic output

- No transmitter supplied
- 2-wire loop current 4 ... 20 mA (transmitter MSP 2002-2 _3300 pF)

### Operating Instructions

See page 4/359

### Accessories

See page 4/359

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

Customers interested in a custom designed device should consult a local sales person. For more information, please visit [http://www.automation.siemens.com/aspa_app](http://www.automation.siemens.com/aspa_app).
## Selection and Ordering data

**SITRANS LC500, Extended Cable version with Rod Sensor, threaded connection or welded flange**

Inverse frequency shift capacitance level and interface transmitter for short range continuous measurement in large storage vessels.

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

### Version

Rod, 16 mm (0.63 inch), PFA insulated and 316L stainless steel flexible extension tube
Total insertion length:
Add Order code Y01 and plain text: "Total insertion length ... mm and Y02 and plain text:
Active shield length ... mm."

- 5,000 ... 10,000 mm (196.85 ... 393.70 inch)\(^1\)
- 10,001 ... 15,000 mm (393.74 ... 590.55 inch)\(^1\)
- 15,001 ... 20,000 mm (590.59 ... 787.40 inch)\(^1\)
- 20,001 ... 25,000 mm (787.44 ... 984.25 inch)\(^1\)
- 25,001 ... 30,000 mm (984.29 ... 1,181.10 inch)\(^1\)
- 30,001 ... 35,000 mm (1,181.14 ... 1,377.95 inch)\(^1\)

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

### Process connection (316L stainless steel)

**Threaded connection**

- 2” NPT ([Taper], ANSI/ASME B1.20.1) [A]
- R 2” ([BSPT], EN 10226/PT (JIS-T), JIS B 0203) [D]

**Welded flange, raised face**

- 2”, ASME, 150 lb [C]
- 2”, ASME, 300 lb [C]
- 3”, ASME, 150 lb\(^1\) [D]
- 3”, ASME, 300 lb\(^1\) [D]
- 4”, ASME, 150 lb\(^1\) [E]
- 4”, ASME, 300 lb\(^1\) [E]
- 6”, ASME, 150 lb\(^1\) [F]
- 6”, ASME, 300 lb\(^1\) [F]

**Welded flange, Type A flat faced**

- DN 50, PN 16 [L]
- DN 50, PN 40 [L]
- DN 80, PN 16 [M]
- DN 80, PN 40\(^1\) [M]
- DN 100, PN 16\(^1\) [N]
- DN 100, PN 40\(^1\) [N]
- DN 125, PN 16\(^1\) [P]
- DN 125, PN 40\(^1\) [P]

\(^1\) Sanitary, hastelloy, duplex or other custom process connections available.

Please contact a local sales person for details.

### Approvals

**General Purpose:** CE, CSA, FM, ROM [1]

**CSA / FM Class I, Div. 2, Groups A, B, C, D** [2]

**CSA / FM Class II, III, Div. 1, Groups E, F, G T4** [3]

**ATEX II 3G 2D EEx nA [ib] IIC T6 ... T4 T 100 °C** [4]

**ATEX II 1/2 GD EEx d [ia] IIC T6 ... T1 T 100 °C** [4]


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## Selection and Ordering data

<table>
<thead>
<tr>
<th>Further designs</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please add &quot;-Z&quot; to Article No. and specify Order code(s).</td>
<td></td>
</tr>
<tr>
<td>Insertion length, specify in plain text: Y01: to mm (Includes measuring range plus cable extension) - see dimensional information on page 4/368</td>
<td>Y01</td>
</tr>
<tr>
<td>Active shield/cable extension length, specify in plain text [min. length is 50 mm (2 inch), max. length is 5 500 mm (216.54 inch)]: Y02: to mm (see dimensional information on page 4/368)</td>
<td>Y02</td>
</tr>
<tr>
<td>Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters) specify in plain text</td>
<td>Y15</td>
</tr>
<tr>
<td>Manufacturer’s test certificate M to DIN 55350, Part 18 and to ISO 9000</td>
<td>C11</td>
</tr>
<tr>
<td>Inspection Certificate Type 3.1 per EN 10204</td>
<td>C12</td>
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## Selection and Ordering data

<table>
<thead>
<tr>
<th>Accessories</th>
<th>Article No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Purpose</td>
<td>7ML1830-1JA</td>
</tr>
<tr>
<td>1/2” NPT General Purpose Cable Entry IP68/IP69K NEMA6, -40 ... +100 °C (-40 ... +212 °F), cable size 6 ... 12 mm (0.236 ... 0.472 inch)</td>
<td>7ML1830-1JC</td>
</tr>
<tr>
<td>M20 x 1.5 General Purpose Cable Entry IP68/IP69K NEMA6, -40 ... +100 °C (-40 ... +212 °F), cable size 7 ... 12 mm (0.275 ... 0.472 inch)</td>
<td>7ML1830-1JB</td>
</tr>
<tr>
<td>Hazardous Locations</td>
<td>7ML1830-1JD</td>
</tr>
<tr>
<td>1/2” NPT EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX II 2 GD Exd A21 (Zone 1, Zone 2, Zone 21, Zone 22, and in Gas Groups II A, II B and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)</td>
<td>7ML1830-1JC</td>
</tr>
<tr>
<td>M20 EMC rated Cable Gland: Dust Ignition Proof, Flameproof Exd, and Increased Safety ATEX II 2 GD Exd A21 (Zone 1, Zone 2, Zone 21, Zone 22, and in Gas Groups II A, II B and IIC) -60 ... +80 °C IP66, IP67, IP68, NEMA4X, cable sizes 5.5 ... 12 mm (0.216 ... 0.472 inch)</td>
<td>7ML1830-1JR</td>
</tr>
<tr>
<td>Transmitter, MSP 2002-1, 330 PF</td>
<td>7ML1830-1JP</td>
</tr>
<tr>
<td>Transmitter, MSP 2002-2, 3 300 PF</td>
<td>7ML1830-1JQ</td>
</tr>
<tr>
<td>Transmitter, MSP 2002-3, 6 600 PF (used with conductive fluids and probe lengths &gt; 10 000 mm)</td>
<td>7ML1830-1JR</td>
</tr>
<tr>
<td>SITRANS RD100, loop powered display - see Chapter 7</td>
<td>7ML5741-...</td>
</tr>
<tr>
<td>SITRANS RD200, universal input display with Modbus conversion - see Chapter 7</td>
<td>7ML5740-...</td>
</tr>
<tr>
<td>SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7</td>
<td>7ML5744-...</td>
</tr>
<tr>
<td>SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7</td>
<td>7ML5750-...</td>
</tr>
</tbody>
</table>

1) Transmitters not suitable for Intrinsically Safe application (ATEX II 1G Exe i IIC T4 or CSA/FM Class I Div. 1 Groups A, B, C and D)

Customers interested in a custom designed device should consult local sales person. For more information, please visit [http://www.automation.siemens.com/aspa_app](http://www.automation.siemens.com/aspa_app).
Level Measurement
Continuous level measurement - Capacitance transmitters

SITRANS LC500

Characteristic curves

Permitted operating pressures $P$
- 30 bar (435 psi)
- 20 bar (290 psi)
- 10 bar (145 psi)
- Atmospheric
  - 30 bar (435 psi)
  - 20 bar (290 psi)
  - 10 bar (145 psi)
  - -1 bar (-14.5 psi)

Permitted operating temperatures $T$
- -150 ºC (-238 ºF)
- -100 ºC (-148 ºF)
- -50 ºC (-58 ºF)
- 0 ºC (32 ºF)
- RT (21 ºF)
- 100 ºC (212 ºF)
- 150 ºC (302 ºF)
- 200 ºC (392 ºF)
- 250 ºC (482 ºF)
- 300 ºF (149 ºC)
- 400 ºF (204 ºC)
- 500 ºF (260 ºC)

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

SITRANS LC500 process pressure/temperature derating curves (7ML5513)
SITRANS LC500 process pressure/temperature derating curves (7ML5515)
Level Measurement
Continuous level measurement - Capacitance transmitters

SITRANS LC500

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

Permitted operating pressures $P$

Permitted operating temperature $T$

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

SITRANS LC500 process pressure/temperature derating curves (7ML5513)
SITRANS LC500 process pressure/temperature derating curves (7ML5515 and 7ML5517)

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

1) The curve denotes the minimum allowable flange class for the shaded area below.
Continuous level measurement - Capacitance transmitters

SITRANS LC500 process pressure/temperature derating curves (7ML5513)

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

SITRANS LC500 process pressure/temperature derating curves (7ML5513)
Pressure/temperature curve
LC500 PFA rod probes
EN flanged process connections
(7ML5515 and 7ML5517)

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

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)

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

1) The curve denotes the minimum allowable flange class for the shaded area below.
Level Measurement
Continuous level measurement - Capacitance transmitters

SITRANS LC500

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

Permitted operating pressures P

Permitted operating temperature T

Atmospheric

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

SITRANS LC500 process pressure/temperature derating curves (7ML5517)
Continuous level measurement - Capacitance transmitters

SITRANS LC500

Dimensional drawings

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

Cable version, insulated welded flange (7ML5513)

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

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

Note:
1) Applicable for non-conductive media only. Cable can be shortened on site. Weight is included in measuring length.
2) Applicable for both liquids and solids. Cable cannot be shortened. Weight is not part of measuring length.
3) For Y02 lengths greater than 5 000 (197), cable is inactive and is not actively shielded.
4) Minimum length = 200 (7.87), maximum length = 5 500 (216.54)
5) Insertion length Y01 = Y02 + measuring length + 92 (3.62)
6) Insertion length Y01 = Y02 + measuring length + 15 (0.59)

SITRANS LC500 cable versions, dimensions in mm (inch)
Continuous level measurement - Capacitance transmitters

**SITRANS LC500**

### Cable version, non-insulated
**Welded flange (7ML5513)**

- Stainless steel cable
- Measuring length: 750 (29.53)
- Stainless steel weight, actual weight = (1.27 kg [2.80 lb])
- Ø32 (1.26)

### Cable version, insulated
**Welded flange (7ML5513)**

- PFA insulated probe
- Measuring length: 750 (29.53)
- Stainless steel weight, actual weight = (2.15 kg [4.75 lb])
- Ø34.5 (1.36)

### Extended cable version with rod sensor
**Welded flange (7ML5523)**

- Stainless steel flexible tube
- Measuring length: 63 (2.48)
- Ø48 (1.88)

### Option for mounting eye
Only available for PFA insulated cable

**Mounting eye**
- Ø9 (0.35)
- Ø34.5 (1.36)

**Extended cable version with rod sensor**
**Welded flange (7ML5523)**

- Stainless steel flexible tube
- Measuring length: 54 (2.12)
- Ø40 (1.57)

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

**Stainless steel**
- Weight, actual weight = (1.27 kg [2.80 lb])
- Weight, actual weight = (2.15 kg [4.75 lb])

**Stainless steel cable**
- PFA insulated probe
- Probe Y01 (insertion length)
- Measuring length

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

**Mounting eye option**
- Ø12 (0.47)
- Ø25 (0.98)

**Mounting eye option**
- Ø16 (0.63)
- Ø48 (1.88)

**Stainless steel**
- Ø6 (0.24)
- Ø25 (0.98)
- Ø9 (0.35)
- Ø12 (0.47)

**Stainless steel flexible tube**
- Ø34.5 (1.36)
- Ø40 (1.57)
- Ø24 (0.94)
- Ø35 (1.37)
- Ø16 (0.63)
- Ø25 (0.98)
- Ø48 (1.88)

**Mounting eye option**
- Ø12 (0.47)
- Ø25 (0.98)

---

SITRANS LC500 cable versions, dimensions in mm (inch)
Level Measurement
Continuous level measurement - Capacitance transmitters

SITRANS LC500

Rod version threaded (7ML5515)

Rod version with stilling well threaded (7ML5515)

Remote electronics with mounting bracket option threaded (7ML5515)

SITRANS LC500 rod versions, dimensions in mm (inch)

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

* = 30 (1.18) inactive tip

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Level Measurement
Continuous level measurement - Capacitance transmitters

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)

PFA insulated probe

With explosion-proof seal option (all versions)

With thermal isolator option (all versions)

Standard configuration (all versions)

Flange facing (raised face)

<table>
<thead>
<tr>
<th>Flange class</th>
<th>Facing thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASME 150/300</td>
<td>2 (0.08)</td>
</tr>
<tr>
<td>ASME 600/900</td>
<td>7 (0.28)</td>
</tr>
<tr>
<td>PN16/25/40/64</td>
<td>2 (0.08)</td>
</tr>
<tr>
<td>PTFE facing (additional)</td>
<td>2 (0.08)</td>
</tr>
</tbody>
</table>

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)

* = 30 (1.18) inactive tip
SITRANS LC500 connections

- Ground lug
- Protective label
- Solid state switch relay (any polarity)
- 4...20 mA current loop connection (any polarity)
- Instrument system ground
- Measuring signal (mini-coaxial cable)
- Ground connection point for instrument system
Selection and ordering data

<table>
<thead>
<tr>
<th>LC300 and LC500 Specials</th>
<th>Article No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC300 Cable Extensions, 316L stainless steel</td>
<td></td>
</tr>
<tr>
<td>Kit, stainless steel cable extension, 1 m, adjustable by customer</td>
<td>A5E01163688</td>
</tr>
<tr>
<td>Kit, stainless steel cable extension, 3 m, adjustable by customer</td>
<td>A5E01163689</td>
</tr>
<tr>
<td>Kit, stainless steel cable extension, 5 m, adjustable by customer</td>
<td>A5E01163690</td>
</tr>
<tr>
<td>Kit, stainless steel cable extension, 10 m, adjustable by customer</td>
<td>A5E01163691</td>
</tr>
<tr>
<td>Kit, stainless steel cable extension, 15 m, adjustable by customer</td>
<td>A5E01163693</td>
</tr>
<tr>
<td>Kit, stainless steel cable extension, 20 m, adjustable by customer</td>
<td>A5E01163695</td>
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<tr>
<td>LC300 Cable Extensions, 316 stainless steel with PFA coating</td>
<td></td>
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<tr>
<td>Kit, PFA cable extension, 1 m</td>
<td>A5E01163709</td>
</tr>
<tr>
<td>Kit, PFA cable extension, 3 m</td>
<td>A5E01163710</td>
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<tr>
<td>Kit, PFA cable extension, 5 m</td>
<td>A5E01163711</td>
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<tr>
<td>Kit, PFA cable extension, 10 m</td>
<td>A5E01163712</td>
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<tr>
<td>Kit, PFA cable extension, 15 m</td>
<td>A5E01163713</td>
</tr>
<tr>
<td>Kit, PFA cable extension, 20 m</td>
<td>A5E01163714</td>
</tr>
</tbody>
</table>

1) Special flange sizes and facings are available. Please contact a local sales person for details.

2) Please contact a local sales person for part number and pricing.

Customers interested in a custom designed device should consult a local sales person. For more information, please visit http://www.automation.siemens.com/aspa_app.