

## SITRANS L Level instruments

### Point level measurement - Capacitance switches

#### Pointek CLS 500

#### Overview



Pointek CLS 500 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

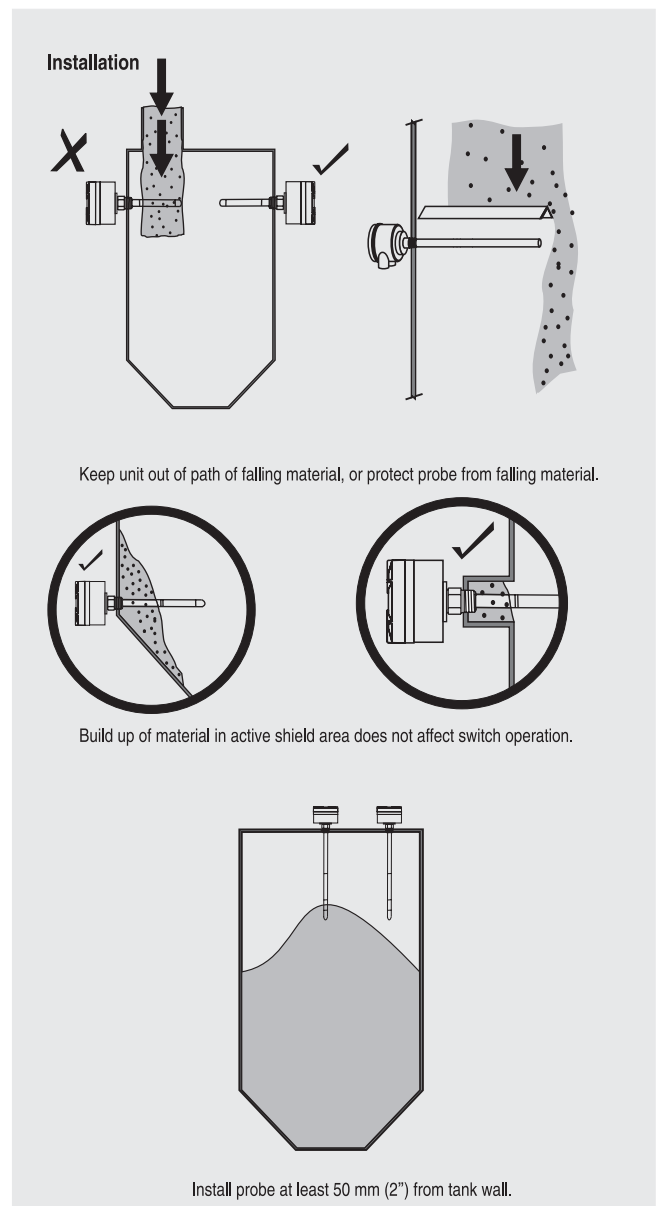
#### Application

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 CLS 500'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 CLS 500 installation

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### Technical specifications

#### Input

Measuring range	0 to 330 pF
Span	Min. 1 pF

#### Output

Solid-state switch	40 V DC/28 V AC/100 m A at 2 VA max
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

##### Installation conditions

- Location	Indoor/outdoor
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##### Ambient conditions

• Ambient temperature (transmitter)	
- General Purpose	-40 to +85 °C (-40 to +185°F)
- ATEX Ex protection	<ul style="list-style-type: none"> <li>• -40 to +70 °C (-40 to +158 °F) for T6,</li> <li>• -40 to +85 °C (-40 to +185 °F) for T5 to T1</li> </ul>
• Installation category	II
• Pollution degree	4

##### Medium conditions

• Dielectric constant er	Min. 1.5
• Process temperature (probe)	
- Standard (PFA)	-50 to +200 °C (-58 to +392 °F)
- High temperature stainless steel version with enamel insulation and thermal isolator	-60 to +325 °C (-76 to +617 °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. Contact Siemens Milltronics at [nacc.smpi@siemens.com](mailto:nacc.smpi@siemens.com) for derating curves of high temperature configurations.)

• Standard (PFA)	-1 to 50 bar (725 psi)
• High temperature version (Enamel)	-1 to 100 bar (1450 psi)
• High temperature version (Stainless steel)	Contact Siemens Milltronics at <a href="mailto:nacc.smpi@siemens.com">nacc.smpi@siemens.com</a> for pressure rating of this version.

#### Design

Material	
• Wetted parts material	
- Standard	316L stainless steel
• Probe isolation	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, BSPT, JIS
• Flange mounting	ASME, EN 1092-1

#### Enclosure

• Material	Aluminium, epoxy-coated
• Cable inlet	2 x 1/2" NPT
• Degree of protection	Type 4X/NEMA4X/IP65

#### 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	<ul style="list-style-type: none"> <li>• Inputs/outputs fully galvanically isolated</li> <li>• Polarity-insensitive current loop</li> <li>• Fully potted</li> <li>• Integrated safety barrier</li> </ul>
• 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	CE: Complies with EMC Directive 89/336/EEC, as per EN 55011 and EN 61326
• Hazardous	<ul style="list-style-type: none"> <li>• ATEX II 3GD EEx nA [ib] IIC T4 to T6</li> <li>• CSA/FM Class I, Div. 2, Groups A,B,C,D T4, Class II, Div. 1, Groups E,F,G T4, Class III, Div. 1, Groups E,F,G T4</li> <li>• ATEX II 1 G EEx ia IIC T4 to T6</li> <li>• CSA/FM Class I, Div. 1, Groups A,B,C,D T4</li> <li>• ATEX II 1/2 GD EEx d [ia] IIC T6 to T1</li> <li>• CSA/FM Class I, Div. 1, Groups A,B,C,D T4</li> </ul>
• Marine	Lloyd's Register of Shipping, Categories ENV1, ENV2, ENV3, ENV5
• Pressure	PED 97/23/EC, CSA B51

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#### Standard Combinations

Pointek CLS 500 probe version	S series	HT Series
<b>Process connection types</b>	<b>Standard (PFA)</b>	<b>High Temperature (Enamel or Stainless steel)</b>
Threaded	Available as Standard	-
Flange	Available as Standard	Available as Standard
<b>Process connection materials</b>		
316L stainless steel	Available as Standard	Available as Standard
<b>Probe insulation</b>		
None	-	HT Stainless: Available as Standard
PFA	Available as Standard	-
Enamel		HT Enamel: Available as Standard
<b>Length parameters</b>		
Max. rod length (mm/inch)	1000/40	1000/40
<b>Process conditions</b>		
Max. pressure (bar/psi) <sup>1)</sup>	50/735	100/1470
Max. temperature (°C/°F) <sup>2)</sup>	+200/+392	+400/+752 <sup>3)</sup>

- Not available as standard

1) Depends on temperature range

2) Depends on pressure range

3) Enamel probe can be used up to +325 °C (+617 °F)

# SITRANS L Level instruments

## Point level measurement - Capacitance switches

Pointek CLS 500

Selection and Ordering data	Order No.
<b>Pointek CLS 500, threaded</b> Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	<b>7 ML 5 6 0 1 - A 0</b>
<b>Electronic transmitter</b> No transmitter supplied MSP2002-1 (330 pF)	0 1
<b>Process connection</b> 3/4" 1" 1 1/4" 1 1/2" 2"	A B C D E
<b>Connection type and rating</b> Threaded NPT (ANSI/ASME B1.20.1) Threaded BSPT (EN 10226-1) Threaded JIS (B 0202)	A B C
<b>Probe insulation/material of process connection</b> PFA insulation/316L stainless steel	1
<b>Approvals</b> General Purpose ATEX II 3 GD EEx nA [ib] IIC T6 to T4; CSA/FM Class I, Div. 2, Groups A, B, C and D T4; Class II, III Div. 1, Groups E, F and G T4 ATEX II 1 G EEx ia IIC T6 to T4; CSA/FM Class I, Div. 1, Groups A, B, C and D, T4 ATEX II 1/2 GD EEx d [ja] IIC T6 to T1 CSA/FM Class I, Div. 1, Groups A, B, C and D, T4	1 2 3 4 5
<b>Probe/electrode diameter</b> 16 mm (0.63") rigid rod, minimum length 200 mm (7.9"), maximum length 1000 mm (39.4")(Y01)	1
<b>Thermal isolator/remote version</b> Rigid thermal isolator [for process temperature over +85 °C (+185 °F)] No thermal isolator	A B
<b>Further designs</b>	Order code
Please add <b>"-Z"</b> to Order No. and specify Order code(s).	
Insertion length, specify in plain text: <b>Y01: ... mm [minimum 200 mm (7.87")]</b>	<b>Y01</b>
Active Shield length - minimum length is 50 mm. <b>Y02: ... mm</b>	<b>Y02</b>
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters) specify in plain text	<b>Y15</b>
Inspection Certificate Type 3.1 per EN 10204	<b>C12</b>
<b>Instruction manual</b>	
English	<b>7ML1998-5GG01</b>
French	<b>7ML1998-5GG11</b>
German	<b>7ML1998-5GG31</b>
Dutch	<b>7ML1998-5GG41</b>
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 instruction manual library.	

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## Point level measurement - Capacitance switches

### Pointek CLS 500

Selection and Ordering data	Order No.	Selection and Ordering data	Order No.
<b>Pointek CLS 500, welded flange</b> Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	7 ML 5 6 0 2 -	<b>Instruction manual</b> English French German  Dutch 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 instruction manual library.	7ML1998-5GG01 7ML1998-5GG11 7ML1998-5GG31 7ML1998-5GG41
<b>Electronic transmitter</b> No transmitter supplied MSP2002-1 (330 pF)	0 1		
<b>Process connection and pressure rating</b> <u>Welded flange, 316L stainless steel, raised face</u> 2" ASME, 150 lb 2" ASME, 300 lb 3" ASME, 150 lb 3" ASME, 300 lb 4" ASME, 150 lb 4" ASME, 300 lb 6" ASME, 150 lb 6" ASME, 300 lb <u>Welded flange, 316L stainless steel, Type A flat faced</u> DN 50, PN 16 DN 50, PN 25 DN 80, PN 16 DN 80, PN 25 DN 100, PN 16 DN 125, PN 16 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 or JIS B 2238 standard.)	AA AB BA  BB CA CB  DA DB  EC ED FC FD  GC HC		
<b>Probe insulation/material of process connection</b> PFA insulation/316L stainless steel	1		
<b>Approvals</b> General Purpose ATEX II 3 GD EEx nA [ib] IIC T6 to T4; CSA/FM Class I, Div. 2, Groups A, B, C and D T4; Class II, III Div. 1, Groups E, F and G T4 ATEX II 1 G EEx ia IIC T6 to T4; CSA/FM Class I, Div. 1, Groups A, B, C and D, T4 ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 CSA/FM Class I, Div. 1, Groups A, B, C and D, T4	1 2 3 4 5		
<b>Probe/electrode diameter</b> 16 mm (0.63") rigid rod, min. length 200 mm (7.9"), max. length 1000 mm (39.4")	1		
<b>Thermal isolator/remote version</b> Rigid thermal isolator [for process temperature over +85 °C (+185 °F)] No thermal isolator	A B		
<b>Further designs</b> Please add "-Z" to Order No. and specify Order code(s).  Insertion length, specify in plain text: <b>Y01: ... mm [minimum 200 mm (7.87")]</b> Active Shield length - minimum length is 50 mm. <b>Y02: ... mm</b> Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters) specify in plain text Inspection Certificate Type 3.1 per EN 10204	Order code  Y01 Y02 Y15 C12		

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## Point level measurement - Capacitance switches

Pointek CLS 500

Selection and Ordering data	Order No.
<b>Pointek CLS 500, single piece flange</b>	7 ML 5 6 0 3 -
Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	A 0
<b>Electronic transmitter</b>	
No transmitter supplied	0
MSP2002-1 (330 pF)	1
<b>Process connection and pressure rating</b>	
<u>Single piece flange, 316L stainless steel, raised face</u>	
2" ASME, 150 lb	AA
2" ASME, 300 lb	AB
3" ASME, 150 lb	BA
3" ASME, 300 lb	BB
4" ASME, 150 lb	CA
4" ASME, 300 lb	CB
6" ASME, 150 lb	DA
6" ASME, 300 lb	DB
<u>Single piece flange, 316L stainless steel, Type B1, raised faced</u>	
DN 50, PN 16	EC
DN 50, PN 25	ED
DN 80, PN 16	FC
DN 80, PN 25	FD
DN 100, PN 16	GC
DN 100, PN 25	GD
DN 125, PN 16	HC
DN 125, PN 25	HD
(Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 or JIS B 2238 standard.)	
<b>Probe insulation/material of process connection</b>	
PFA insulation/316L stainless steel	1
<b>Approvals</b>	
General Purpose	1
ATEX II 3 GD EEx nA [ib] IIC T6 to T4; CSA/FM Class I, Div. 2, Groups A, B, C and D T4; Class II, III Div. 1, Groups E, F and G T4	2
ATEX II 1 G EEx ia IIC T6 to T4; CSA/FM Class I, Div. 1, Groups A, B, C and D, T4	3
ATEX II 1/2 GD EEx d [ia] IIC T6 to T1	4
CSA/FM Class I, Div. 1, Groups A, B, C and D, T4	5
<b>Probe/electrode diameter</b>	
16 mm (0.63") rigid rod, maximum length 1000 mm (39.4") (Y01)	1
<b>Thermal isolator/remote version</b>	
Rigid thermal isolator [for process temperature over +85 °C (+185 °F)]	A
No thermal isolator	B

Selection and Ordering data	Order No.
<b>Further designs</b>	Order code
Please add "-Z" to Order No. and specify Order code(s).	
Insertion length, specify in plain text: <b>Y01: ... mm [minimum 200 mm (7.87")]</b>	<b>Y01</b>
Active Shield length - minimum length is 50 mm. <b>Y02: ... mm</b>	<b>Y02</b>
Stainless steel tag [69 x 38 mm (2.7 x 1.5")]: Measuring-point number/identification (max. 20 characters) specify in plain text	<b>Y15</b>
Inspection Certificate Type 3.1 per EN 10204	<b>C12</b>
<b>Instruction manual</b>	
English	<b>7ML1998-5GG01</b>
French	<b>7ML1998-5GG11</b>
German	<b>7ML1998-5GG31</b>
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Selection and Ordering data	Order No.
<b>Pointek CLS 500 High temperature, single piece flange</b> Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	7 ML 5 6 0 4 - A - A
<b>Electronic transmitter</b> No transmitter supplied MSP2002-1 (330 pF)	0 1
<b>Process connection and pressure rating</b> <u>Single piece flange, 316L stainless steel, raised face</u> 2" ASME, 150 lb 2" ASME, 300 lb 2" ASME, 600 lb 2" ASME, 900 lb 3" ASME, 150 lb 3" ASME, 300 lb 3" ASME, 600 lb 3" ASME, 900 lb 4" ASME, 150 lb 4" ASME, 300 lb 4" ASME, 600 lb 4" ASME, 900 lb 6" ASME, 150 lb 6" ASME, 300 lb 6" ASME, 600 lb 6" ASME, 900 lb <u>Single piece flange, 316L stainless steel, Type B1, raised face</u> DN 50, PN 16 DN 50, PN 25 DN 50, PN 40 DN 50, PN 64 DN 80, PN 16 DN 80, PN 25 DN 80, PN 40 DN 80, PN 64 DN 100, PN 16 DN 100, PN 25 DN 100, PN 40 DN 100, PN 64 DN 125, PN 16 DN 125, PN 25 DN 125, PN 40 DN 125, PN 64 (Note: Flange bolting patterns and facings dimensionally correspond to the applicable ASME B16.5 or EN 1092-1 or JIS B 2238 standard.)	A 1 A 2 A 3 A 4 B 1 B 2 B 3 B 4 C 1 C 2 C 3 C 4 D 1 D 2 D 3 D 4 E 1 E 2 E 3 E 4 F 1 F 2 F 3 F 4 G 1 G 2 G 3 G 4 H 1 H 2 H 3 H 4
<b>Probe insulation/material of process connection</b> No insulation/316L stainless steel <sup>1)</sup> Enamel insulation/316L stainless steel <sup>2)</sup>	1 2
<b>Stilling well</b> No stilling well	0

Selection and Ordering data	Order No.
<b>Pointek CLS 500 High temperature, single piece flange</b> Inverse frequency shift capacitance level switch for detecting interfaces, solids, liquids, toxic and aggressive chemicals in critical conditions of extreme temperature and pressure.	7 ML 5 6 0 4 - A - A
<b>Approvals</b> General Purpose ATEX II 3 GD EEx nA [ib] IIC T6 to T4; CSA/FM Class I, Div. 2, Groups A, B, C and D T4; Class II, III Div. 1, Groups E, F and G T4 ATEX II 1 G EEx ia IIC T6 to T4; CSA/FM Class I, Div. 1, Groups A, B, C and D, T4 ATEX II 1/2 GD EEx d [ia] IIC T6 to T1 CSA/FM Class I, Div. 1, Groups A, B, C and D, T4	A B C D E
<b>Thermal isolator/remote version</b> Rigid thermal isolator [for process temperature over +85 °C (+185 °F)]	1
<b>Further designs</b> Please add <b>"-Z"</b> to Order No. and specify Order code(s).	Order code
Insertion length, specify in plain text: <b>Y01: ... mm [minimum 200 mm (7.87")]</b> Active Shield length - minimum length is 50 mm. <b>Y02: ... mm</b> (not applicable for Probe insulation option 2, enamel <sup>3)</sup> and <sup>4)</sup>	Y01 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
Inspection Certificate Type 3.1 per EN 10204	C12
<b>Instruction manual</b> English French German Dutch 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 instruction manual library.	7ML1998-5GG01 7ML1998-5GG11 7ML1998-5GG31 7ML1998-5GG41
<sup>1)</sup> Non-conductive material only, stainless steel non-insulated probe diameter 19 mm <sup>2)</sup> Enamel insulated probe diameter 16 mm <sup>3)</sup> Minimum insertion length (Y01) for enamel probe is 250 mm (Probe Insulation option 2). Minimum active shield length (Y02) for enamel probe is 100 mm. <sup>4)</sup> Maximum insertion length 1000 mm, maximum shield length 750 mm.	

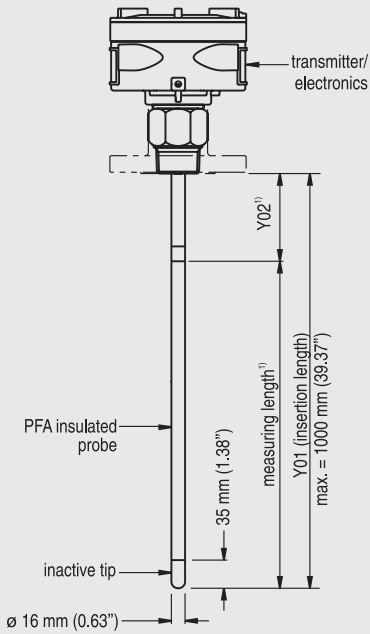
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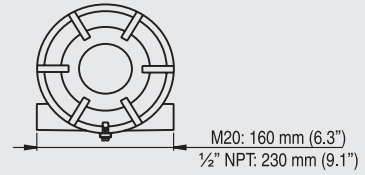
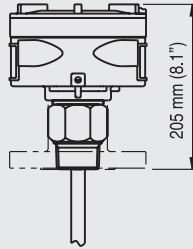
Pointek CLS 500

### Dimensional drawings

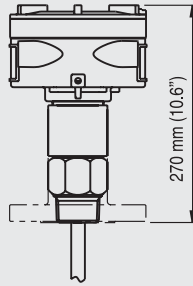
Standard Rod version  
Threaded (7ML5601)  
Welded flange (7ML5602)  
Single Piece Flange (7ML5603)



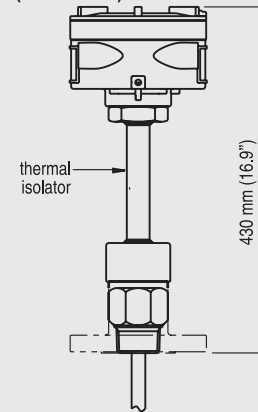
Standard configuration  
(7ML5601, 7ML5602, 7ML5603)



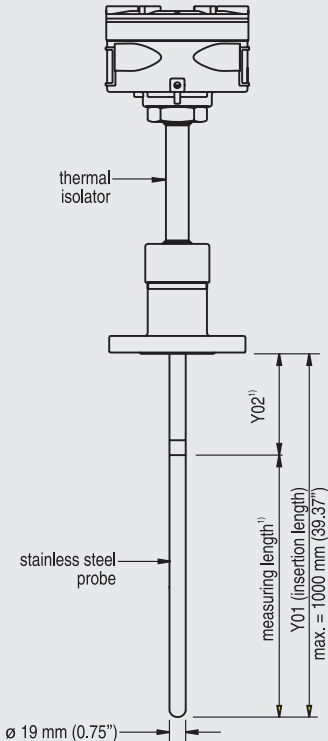
With explosion-proof seal option  
(all versions)



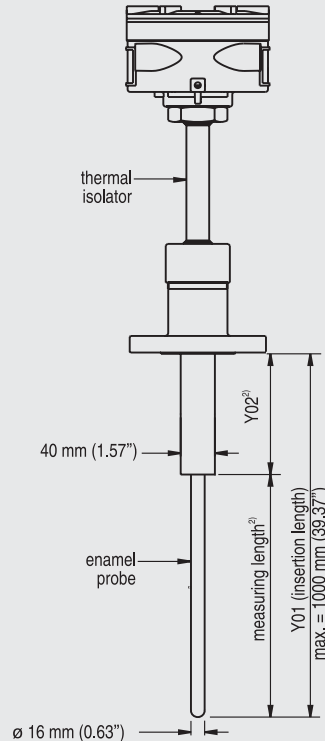
With thermal isolator option  
(all versions)



High temperature rod version  
Single Piece Flange (7ML5604), Stainless steel rod



High temperature rod version  
Single Piece Flange (7ML5604), Enamel rod



#### Notes:

- 1) Minimum Y02 (active shield length) = 50 mm (1.96"), minimum measuring length = 150 mm (5.9")
- 2) Minimum Y02 (active shield length) = 100 mm (3.94"), minimum measuring length = 150 mm (5.9")

Pointek CLS 500 dimensions

icenta Controls Ltd

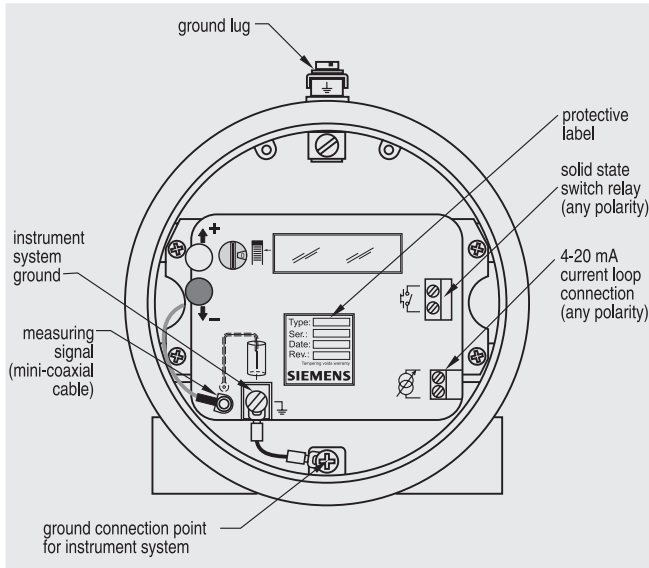
Tel: 0845 895 1020 Fax: 0845 895 1021 E: sales@icenta.co.uk www.icenta.co.uk

# SITRANS L Level instruments

## Point level measurement - Capacitance switches

### Pointek CLS 500

#### Schematics



Pointek CLS 500 connections