Pointek CLS 500

Overview

Pointek CLS 500 is a capacitance point level switch for detecting interfaces, solids, liquids, slurries, and viscous materials in critical conditions of extreme temperatures up to 400 °C (752 °F) and pressures up to 525 bar (7665 psi).

Benefits

- 2-wire loop powered with solid-state switch or 4-20/20-4 mA output
- Simple push-button calibration and integrated local display
- Patented Active-Shield technology
- Full function diagnostics
- Unique inverse-frequency approach provides high resolution

Application

The CLS 500 features HART® communications for remote commissioning and inspection. Its microprocessor-based electronics provide one-point calibration, making setup possible without shutting down your production process.

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.

Technical specifications

Input	
• Measuring range	0 to 330 pF
• Span	Min. 1 pF
• Measurement frequency	420 kHz
• Measurement current signalling	NAMUR NE 43
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	22 to 3.6 mA (2-wire current loop)
• 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	
Pressure range (Pressure rating of process seal is temperature dependent. Contact Siemens Milltronics for derating curves of high-temperature configurations.)	
- Standard	Vacuum up to 50 bar (725 psi)
- As option	Vacuum up to 525 bar (7665 psi)
Ambient conditions	
• Ambient temperature (transmitter)	-40 to +85 °C (-40 to +185°F) ATEX Ex protection: -40 to +70 °C (-40 to +158 °F) for T6, -40 to +85 °C (-40 to +185 °F) for T5 to T1
• Process temperature (probe)	
- Standard	-200 to +200 °C (-328 to +392 °F)
- With thermal isolator	-200 to +400 °C (-328 to +752 °F)
• Installation category	II
• Pollution degree	4
Installation conditions	
• Location	Indoor/outdoor
Design	
Material	
• Wetted parts material	
- Standard	AISI 316 L
- Optional	C 22.8 N, Monel 400, Hastelloy C22, Duplex
• Probe isolation	PFA, enamel
Probe diameter	
• Standard rod version	16 mm (0.63") or 24 mm (0.95")
• High temperature rod version	19 mm (0.75")
Probe length	
• Standard rod version	Max. 1000 mm (216") with 16 or 24 mm diameter probe
• High temperature rod version	Max. active length 750 mm (29.5") with 19 mm diameter probe
Process connection of probe	
• Threaded mounting	NPT, BSPT, JIS
• Flat-faced flange mounting	ANSI, DIN
Enclosure	
• Material	Aluminium, epoxy-coated
• Cable entry	2 x ½" NPT
• Degree of protection	Type 4X /NEMA 4X / 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

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Pointek CLS 500

Features

Safety	• Probe input ESD protected to 55 kV • Inputs/outputs fully galvanically isolated • Polarity-insensitive current loop • Fully potted • Integrated safety barrier
• Diagnostics with fault alarm when:	Primary variable (PV) out of limits, system failure in measurement circuit, deviation between A/D and D/A converter, check sum, watch dog and self-checking facility
• Function rotary switch	positions 0 to 9, A to F
• Smart communication	Conforming to HART Communication Foundation (HCF)
Certificates and approvals	• CE: Complies with EMC Directive 89/336/EEC, as per EN 55011 and EN 61326 • ATEX II 3GD (EEx nA [ib] IIC T4...T6) FM/CSA: Class I, Div. 2, Gr. A,B,C,D T4 Class II, Div. 1, Gr. E,F,G T4 Class III, Div. 1, Gr. E,F,G T4 • ATEX II 1 G (EEx ia IIC T4...T6) FM/CSA: Class I, Div. 1, Gr. A,B,C,D T4 • ATEX II 1/2 GD (EEx d [ia] IIC T6...T1) FM/CSA: Class I, Div. 1, Gr. A,B,C,D T4 • Lloyd's Register of Shipping: Categories ENV1, ENV2, ENV3, ENV5 • European Pressure: PED 97/23/EC

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Standard Combinations

Pointek CLS 500 probe version	**Standard**	
Process connection types	**S series**	**HT Series**
Threaded	Available as Standard	Available as Standard
Flange	Available as Standard	Available as Standard
Process connection materials		
Stainless steel AISI 316L	Available as Standard	Available as Standard
Duplex steel	–	Available as Standard
Hastelloy[1] B2 or C22	Available as Standard	–
Monel 400	Available as Standard	–
Probe insulation		
PFA	Available as Standard	–
Enamel	Available as Standard	Available as Standard
Length parameters		
Max. rod length (mm/inch)	1000/39	1000/39
Process condtitions		
Max. pressure (bar/psi)[2]	200/2900	525/7665
Max. temperature (°C/°F)[3]	200/392+	400/752

– Not available as standard

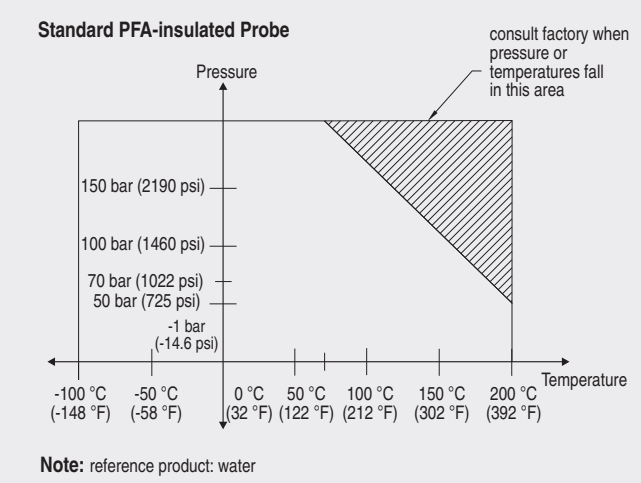
1) Flange made of AISI 316L stainless steel with a 5 mm welded Hastelloy plate

2) Depends on temperature range

3) Depends on pressure range

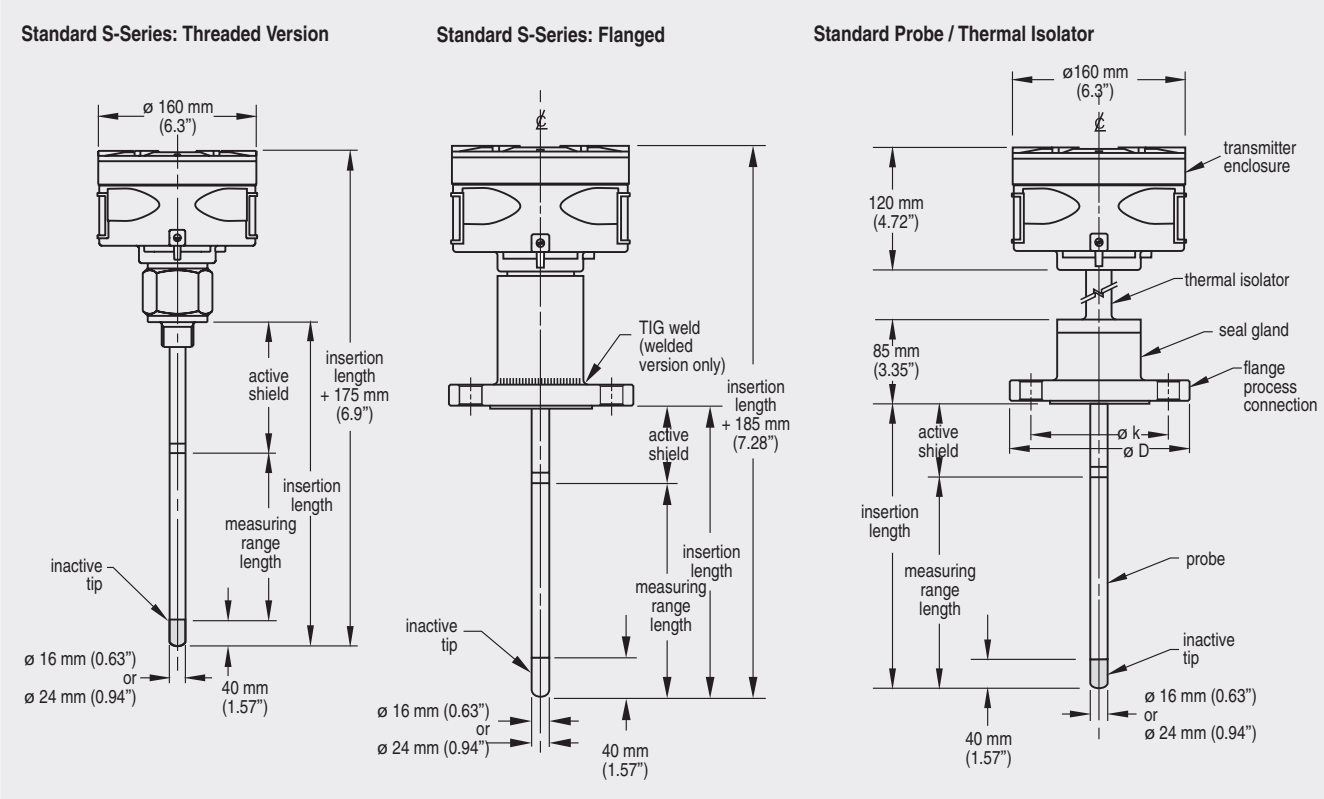
+Up to 400 °C (752 °F) with enamel probe insulation

Characteristic curves



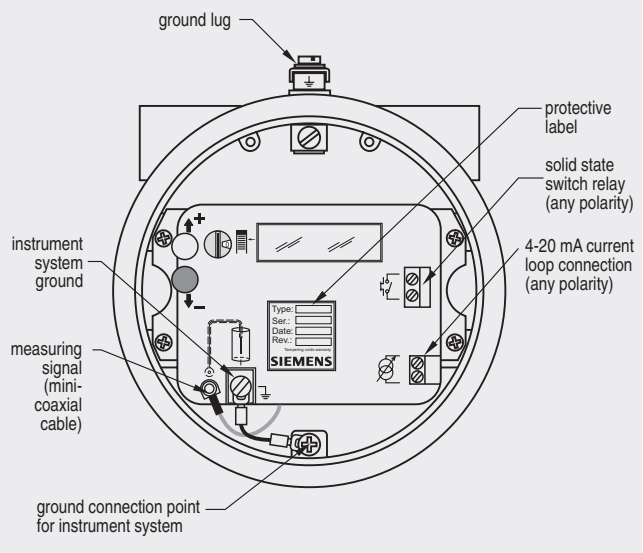
Pointek CLS 500 Derating curves

Dimensional drawings



Probe configurations

Schematics



Pointek CLS 500 connections

Pointek CLS 500

Ordering data — Pointek CLS 500, S-series, threaded

Order No. **7ML5601-** _ _ **A0**

Capacitance point level switch for detecting interfaces, solids, liquids, slurries, and viscous materials in critical conditions of extreme temperature and extreme pressure

Electronic transmitter

None	0
MSP2002-1 (330 pF)	1

Process connection

¾"	A
1"	B
1¼"	C
1½"	D
2"	E

Connection Type and Rating

Threaded NPT	A
Threaded BSPT	B
Threaded JIS	C

Probe insulation/material of process connection

PFA insulation/316L stainless steel	1

Approvals

General Purpose	1
ATEX II 3 GD (EEx nA [ib] IIC T6 to T4); FM/CSA Class I, Div. 2, Group A, B, C and D T4; Class II, III Div. 1, Group E, F and G T4	2
ATEX II 1 G (EEx ia IIC T6 to T4); FM/CSA 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
FM/CSA Class I, Div. 1, Groups A, B, C and D, T4	5

Probe/electrode diameter

16 mm rigid rod, maximum length 1000 mm	1

Thermal isolator/remote version

rigid thermal isolator	A

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 - minimum length is 50 mm. **Y02: ... mm**	**Y02**
Stainless Steel tag (69 mm x 38 mm), Tag information (max 20 characters), specify in plain text:	**Y15**
Test Certificate, Acceptance test certificate B to DIN 50049 section 3.1 and EN 10204	**C12**

Instruction Manual

English		**7ML1998-5GG01**
German		**7ML1998-5GG31**
Dutch	D)	**7ML1998-5GG41**

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

Ordering data — Pointek CLS 500, S-series, welded flange

Order No. **7ML5602-** _ _ **A0**

Capacitance point level switch for detecting interfaces, solids, liquids, slurries, and viscous materials in critical conditions of extreme temperature and extreme pressure

Electronic transmitter

None	0
MSP2002-1 (330 pF)	1

Process connection and pressure rating

2" ANSI, 150 lb	A A
2" ANSI, 300 lb	A B
3" ANSI, 150 lb	B A
3" ANSI, 300 lb	B B
4" ANSI, 150 lb	C A
4" ANSI, 300 lb	C B
6" ANSI, 150 lb	D A
6" ANSI, 300 lb	D B
DN 50 PN16	E C
DN 50 PN25	E D
DN 80 PN16	F C
DN 80 PN25	F D
DN 100 PN16	G C
DN 100 PN25	G D
DN 125 PN16	H C
DN 125 PN25	H D

Note: for other flange sizes or pressure ratings, please call for availability and pricing

Probe insulation/material of process connection

PFA insulation/316L stainless steel	1

Approvals

General Purpose	1
ATEX II 3 GD (EEx nA [ib] IIC T6 to T4); FM/CSA Class I, Div. 2, Group A, B, C and D T4; Class II, III Div. 1, Group E, F and G T4	2
ATEX II 1 G (EEx ia IIC T6 to T4); FM/CSA 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
FM/CSA Class I, Div. 1, Groups A, B, C and D, T4	5

Probe/electrode diameter

16 mm rigid rod, maximum length 1000 mm	1

Thermal isolator/remote version

rigid thermal isolator	A

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 - minimum length is 50 mm. **Y02: ... mm**	**Y02**
Stainless Steel tag (69 mm x 38 mm), Tag information (max 20 characters), specify in plain text:	**Y15**
Test Certificate, Acceptance test certificate B to DIN 50049 section 3.1 and EN 10204	**C12**

Instruction Manual

English	**7ML1998-5GG01**
German	**7ML1998-5GG31**
Dutch	**7ML1998-5GG41**

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

Ordering data	Order No.
Pointek CLS 500, S-series, single piece flange	**7ML5603-**
Capacitance point level switch for detecting interfaces, solids, liquids, slurries, and viscous materials in critical conditions of extreme temperature and extreme pressure	■■■■■-■■**A0**
Electronic transmitter	
None	**0**
MSP2002-1 (330 pF)	**1**
Process connection and pressure rating	
2" ANSI, 150 lb	**AA**
2" ANSI, 300 lb	**AB**
3" ANSI, 150 lb	**BA**
3" ANSI, 300 lb	**BB**
4" ANSI, 150 lb	**CA**
4" ANSI, 300 lb	**CB**
6" ANSI, 150 lb	**DA**
6" ANSI, 300 lb	**DB**
DN 50 PN16	**EC**
DN 50 PN25	**ED**
DN 80 PN16	**FC**
DN 80 PN25	**FD**
DN 100 PN16	**GC**
DN 100 PN25	**GD**
DN 125 PN16	**HC**
DN 125 PN25 Note: for other flange sizes or pressure ratings, please call for availability and pricing	**HD**
Probe insulation/material of process connection	
PFA insulation/316L stainless steel	**1**
Approvals	
General Purpose	**1**
ATEX II 3 GD (EEx nA [ib] IIC T6 to T4); FM/CSA Class I, Div. 2, Group A, B, C and D T4; Class II, III Div. 1, Group E, F and G T4	**2**
ATEX II 1 G (EEx ia IIC T6 to T4); FM/CSA 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**
FM/CSA Class I, Div. 1, Groups A, B, C and D, T4	**5**
Probe/electrode diameter	
16 mm rigid rod, maximum length 1000 mm	**1**
Thermal isolator/remote version	
rigid thermal isolator	**A**
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 - minimum length is 50 mm.**Y02: ... mm**	**Y02**
Stainless Steel tag (69 mm x 38 mm), Tag information (max 20 characters), specify in plain text:	**Y15**
Test Certificate, Acceptance test certificate B to DIN 50049 section 3.1 and EN 10204	**C12**
Instruction Manual	
English	**7ML1998-5GG01**
German	**7ML1998-5GG31**
Dutch Note: The instruction manual should be ordered as a separate line on the order.	**7ML1998-5GG41**

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Pointek CLS 500

Ordering data	Order No.
Pointek CLS 500 HT, S-series, single piece flange	7ML5604-
Capacitance point level switch for detecting interfaces, solids, liquids, slurries, and viscous materials in critical conditions of extreme temperature and extreme pressure	A -
Electronic transmitter	
None	0
MSP2002-1 (330 pF)	1
Process connection and pressure rating	
2" ANSI, 150 lb	A 1
2" ANSI, 300 lb	A 2
2" ANSI, 600 lb	A 3
2" ANSI, 900 lb	A 4
3" ANSI, 150 lb	B 1
3" ANSI, 300 lb	B 2
3" ANSI, 600 lb	B 3
3" ANSI, 900 lb	B 4
4" ANSI, 150 lb	C 1
4" ANSI, 300 lb	C 2
4" ANSI, 600 lb	C 3
4" ANSI, 900 lb	C 4
6" ANSI, 150 lb	D 1
6" ANSI, 300 lb	D 2
6" ANSI, 600 lb	D 3
6" ANSI, 900 lb	D 4
DN 50 PN16	E 1
DN 50 PN25	E 2
DN 50 PN40	E 3
DN 50 PN64	E 4
DN 80 PN16	F 1
DN 80 PN25	F 2
DN 80 PN40	F 3
DN 80 PN64	F 4
DN 100 PN16	G 1
DN 100 PN25	G 2
DN 100 PN40	G 3
DN 100 PN64	G 4
DN 125 PN16	H 1
DN 125 PN25	H 2
DN 125 PN40	H 3
DN 125 PN64	H 4
Note: for other flange sizes or pressure ratings, please call for availability and pricing	
Probe insulation/material of process connection	
no insulation/316L stainless steel (probe electrode diameter option B only)	1
Enamel insulation/316L stainless steel (probe electrode diameter option A only)	2
Ceramic insulation/316L stainless steel, (probe electrode diameter option A only)[1]	3
Stilling well	
no stilling well	0
48 mm, 316 stainless steel, available for process connections 2" or DN 50 or larger	1
70 mm, 316 stainless steel, available for process connections 3" or DN 80 or larger	2

Ordering data	Order No.
Pointek CLS 500 HT, S-series, single piece flange	7ML5604-
Capacitance point level switch for detecting interfaces, solids, liquids, slurries, and viscous materials in critical conditions of extreme temperature and extreme pressure	A -
Approvals	
General Purpose	A
ATEX II 3 GD (EEx nA [ib] IIC T6 to T4); FM/CSA Class I, Div. 2, Group A, B, C and D T4; Class II, III Div. 1, Group E, F and G T4	B
ATEX II 1 G (EEx ia IIC T6 to T4); FM/CSA Class I, Div. 1, Groups A, B, C and D, T4	C
ATEX II 1/2 GD (EEx d [ia] IIC T6 to T1)	D
FM/CSA Class I, Div. 1, Groups A, B, C and D, T4	E
Probe/electrode diameter	
16 mm rigid rod, maximum length 1000 mm	A
24 mm rigid rod, maximum length 1000 mm	B
Thermal isolator/remote version	
rigid thermal isolator	1
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 - minimum length is 50 mm.**Y02: ... mm**	**Y02**
Stainless Steel tag (69 mm x 38 mm), Tag information (max 20 characters), specify in plain text:	**Y15**
Test Certificate, Acceptance test certificate B to DIN 50049 section 3.1 and EN 10204	**C12**
Instruction Manual	
English	**7ML1998-5GG01**
German	**7ML1998-5GG31**
Dutch	**7ML1998-5GG41**
Note: The instruction manual should be ordered as a separate line on the order.	

1) Maximum insertion length 1000 mm, maximum shield length 750 mm