

# Level instruments

## Point level measurement - Capacitance switches

Pointek CLS100

### Overview



Pointek CLS100 is a compact 2-wire inverse frequency shift capacitance switch for level detection in constricted spaces, interfaces, solids, liquids, slurries and foam.

### Benefits

- Easy installation with verification by built-in LED
- Low maintenance with no moving parts
- Sensitivity adjustment
- Integrated cable or PBT enclosure versions available
- Intrinsically Safe, Dust Ignition Proof and General Purpose options available

### Application

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

Its advanced tip-sensing technology provides accurate, repeatable switchpoint performance. The PPS (Polyphenylene sulfide) probe [optional PVDF (Polyvinylidene Fluoride)] is chemically resistant with an effective process operating temperature range from -30 to +100 °C (-22 to +212 °F) (7ML5501), and -10 to +100 °C (+14 to +212 °F) (7ML5610). The fully potted design ensures reliability in a vibrating environment such as agitated tanks up to 4 g. When used with a SensGuard protection cover, the CLS100 is protected from shearing, impact and abrasion in tough primary processes.

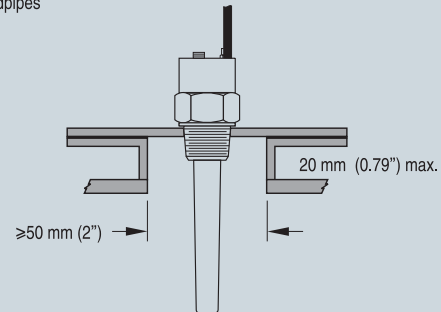
The Pointek CLS100 is available in three versions. The integral cable version has a stainless steel process connection and probe options of PPS or PVDF. The fully synthetic version has a thermoplastic polyester enclosure with a PPS process connection combined with a PPS probe. The standard enclosure version has a thermoplastic polyester enclosure with a stainless steel process connection in combination with a PPS or PVDF probe.

- Key Applications: liquids, slurries, powders, granules, food and pharmaceuticals, chemicals, hazardous areas

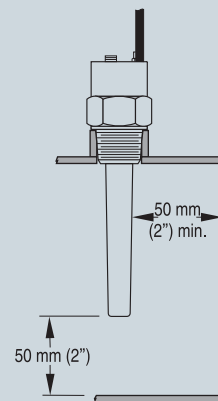
### Configuration

#### Installation

Standpipes



Wall Restriction



Pointek CLS100 installation

# Level instruments

## Point level measurement - Capacitance switches

### Pointek CLS100

#### Technical specifications

	Stainless steel process connection (integral cable or enclosure version) (7ML5501)	Synthetic process connection (fully synthetic enclosure version only) (7ML5610)
<b>Mode of operation</b>		
Measuring principle	Inverse frequency shift capacitive level detection	Inverse frequency shift capacitive level detection
<b>Input</b>		
Measured variable	Change in picoFarad (pF)	Change in picoFarad (pF)
<b>Output</b>		
Output signal		
• Alarm output	4 or 20/20 or 4 mA 2-wire loop	4 or 20/20 or 4 mA 2-wire loop
• Switch output	Solid-state: 30 V DC/30 V AC, max. 82 mA	Max. switching voltage: 60 V DC/30 V AC Max. switching current: 1 A
• Fail-safe mode	Min. or max.	Min. or max.
<b>Accuracy</b>		
Repeatability	2 mm (0.08")	2 mm (0.08")
<b>Rated operating conditions<sup>1)</sup></b>		
<u>Installation conditions</u>		
• Location	Indoor/outdoor	Indoor/outdoor
<u>Ambient conditions</u>		
• Ambient temperature	-30 to +85 °C (-22 to +185 °F)	-10 to +85 °C (+14 to +185 °F)
• Installation category	I	I
• Pollution degree	4	4
<u>Medium conditions</u>		
• Relative dielectric constant $\epsilon_r$	Min. 1.5	Min. 1.5
• Temperature	-30 to +100 °C (-22 to +212 °F)	-10 to +100 °C (+14 to +212 °F)
• Pressure (vessel)	-1 to +10 bar g (-14.6 to +146 psi g), nominal <sup>2)</sup>	-1 to +10 bar g (-14.6 to +146 psi g), nominal
• Degree of protection		
- Enclosure version	IP68/Type 4/NEMA 4	IP68/Type 4/NEMA 4
- Integral cable version	IP65/Type 4/NEMA 4	Not applicable
• Cable inlet	½" NPT (M20x1.5 optional)	½" NPT (M20x1.5 optional)
<b>Design</b>		
	<u>Enclosure/Integral cable version</u>	<u>Fully synthetic version</u>
• Material		
- Body (Enclosure version)	Thermoplastic polyester	Thermoplastic polyester
- Lid (Enclosure version)	Transparent thermoplastic polycarbonate (PC)	Transparent thermoplastic polycarbonate (PC)
- Integrated cable body (Integral cable version)	316L stainless steel	Not applicable
• Sensor length (nominal)	100 mm (4")	100 mm (4")
• Process connection material of probe/wetted parts	Connection: 316L stainless steel; Process seal: FKM (optional FFKM); Sensor: PPS (optional PVDF) <sup>2)</sup>	PPS process connection and PPS sensor (Uni-Construction)
• Connection (Enclosure version)	Internal 5-point terminal block, ½" NPT wiring entrance, M20x1.5 optional	Removable internal 5-point terminal block, ½" NPT wiring entrance, M20 x 1.5 optional
• Connection (Integral cable version)	4 conductors, 1 m (3.3 ft), 0.5 mm <sup>2</sup> (22 AWG), shielded, polyester jacket	Not applicable
• Process connection	¾" NPT [(Taper), ANSI/ASME B1.20.1] R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]	¾" NPT [(Taper), ANSI/ASME B1.20.1] R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]
<b>Power supply</b>		
• Standard	12 to 33 V DC	12 to 33 V DC
• Intrinsically Safe	10 to 30 V DC (Intrinsically Safe barrier required)	Not applicable

# Level instruments

## Point level measurement - Capacitance switches

Pointek CLS100

	<b>Stainless steel process connection (integral cable or enclosure version) (7ML5501)</b>	<b>Synthetic process connection (fully synthetic enclosure version only) (7ML5610)</b>
<b>Certificates and approvals</b>	<ul style="list-style-type: none"> <li>• General: CE</li> <li>• Marine: Lloyds Register of Shipping, categories ENV1, ENV2, and ENV5</li> <li>• Dust Ignition Proof (barrier required): CSA/FM Class II and III, Div. 1, Groups E, F, G T4</li> <li>• Intrinsically Safe (barrier required): CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G T4</li> <li>• ATEX II 1 GD 1/2GD EEx ia IIC T4 to T6 T107 °C</li> <li>• Overfill protection: WHG (Germany)</li> <li>• C-TICK (Australia)</li> </ul>	<ul style="list-style-type: none"> <li>• General: CE</li> <li>• Marine: Lloyds Register of Shipping, categories ENV1, ENV2, and ENV5</li> <li>• Dust Ignition Proof: ATEX II 1D 1/3D T107 °C</li> <li>• Overfill protection: WHG (Germany)</li> <li>• C-TICK (Australia)</li> </ul>

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

<sup>2)</sup> When FFKM O-ring (Option A22) is selected, process temperature is restricted to -20 °C (-4 °F)

# Level instruments

## Point level measurement - Capacitance switches

### Pointek CLS100

#### Selection and Ordering data

##### Pointek CLS100, stainless steel process connection

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

##### Process connection

¾" NPT [(Taper), ANSI/ASME B1.20.1]  
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203]  
G 1" [(BSPP), EN ISO 228-1/PF (JIS-P), JIS B 0202]

##### Approvals

General Purpose  
CSA/FM Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G T4; ATEX II 1 GD 1/2GD EEx ia IIC T4 to T6 T107 °C  
CSA/FM Class II and III, Div. 1, Groups E, F, G

##### Device version

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

##### WHG approval, German overfill protection

Not required 0  
Required 1

##### Further designs

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

##### FFKM seal O-ring<sup>1)</sup>

Inspection Certificate Type 3.1 per EN 10204

##### Instruction manual

Quick start manual, multi-language  
Note: due to ATEX regulations one Quick start manual is included with every product.  
This device is shipped with the Siemens Milltronics manual CD containing ATEX Quick Starts and instruction manuals.

##### Optional equipment

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

Siemens Intrinsically Safe Barrier (DC powered), ATEX II 1 G EEx ia 7NG4122-1AA10

½" NPT cable gland, nickel plated brass, fits cable diameter 6 to 12 mm (0.24 to 0.47") -40 to +100 °C (-40 to +212 °F), IP68 (General Purpose) 7ML1830-1JA

M20x1.5 cable gland, PA polyamide, ATEX II 2G EEx e II, fits cable diameter 7 to 12 mm (0.28 to 0.47"), -20 to +70 °C (-4 to +158 °F), IP68 (General Purpose) 7ML1830-1JC

<sup>1)</sup> See Temperature restriction on page 5/13

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

Order No.

C) 7ML5501-0

A  
E  
JA  
C  
G1  
3  
5  
6  
7  
8  
0  
1

Order code

A22  
C12

Order No.

7ML1998-5QJ81

7ML1830-1DL

7ML1830-1DM

7ML1930-1AC

7NG4122-1AA10

7ML1830-1JA

7ML1830-1JC

#### Selection and Ordering data

##### Pointek CLS100, PPS process connection

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

##### Process connection (PPS)

¾" NPT [(Taper), ANSI/ASME B1.20.1] (PPS probe body)  
R 1" [(BSPT), EN 10226/PT (JIS-T), JIS B 0203] (PPS probe body)

##### Approvals

General Purpose  
ATEX II 1D 1/3D T107 °C

##### Versions/Options

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

##### WHG approval, German overfill protection

Not required 0  
Required 1

##### Instruction manual

Quick start manual, multi-language  
Note: due to ATEX regulations one Quick start manual is included with every product  
This device is shipped with the Siemens Milltronics manual CD containing ATEX Quick Starts and instruction manuals.

##### Accessories

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

Order No.

C) 7ML5610-0

A  
BA  
C1  
2  
0  
1

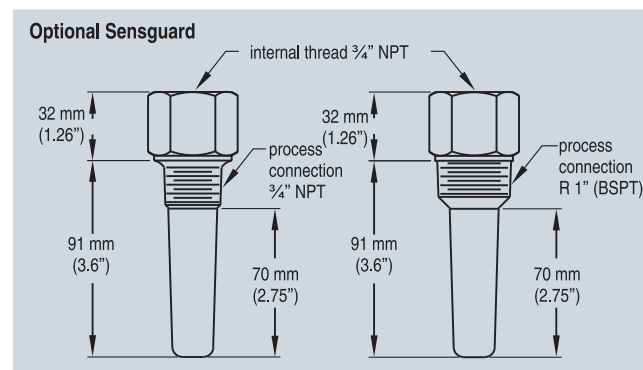
7ML1998-5QJ81

7ML1830-1DL

7ML1830-1DM

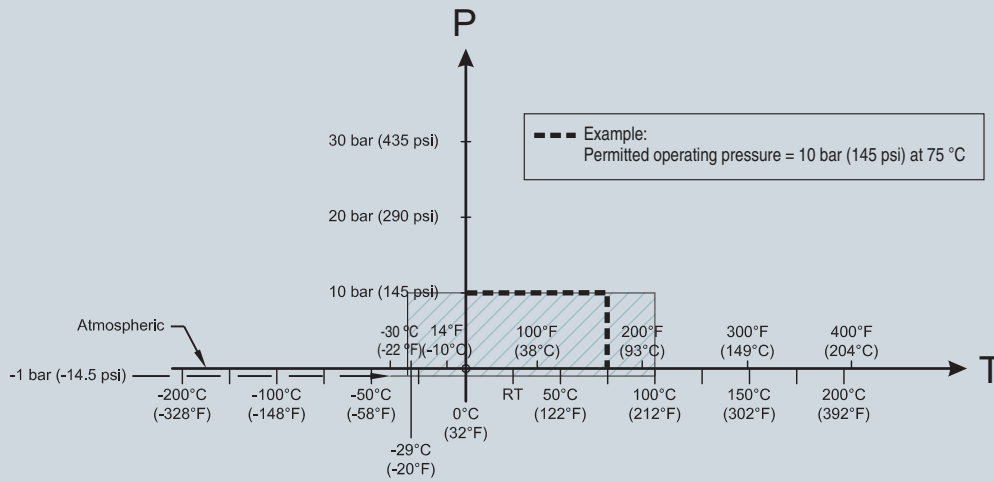
7ML1930-1AC

#### Options



Optional Sensguard dimensions

### Characteristic curves



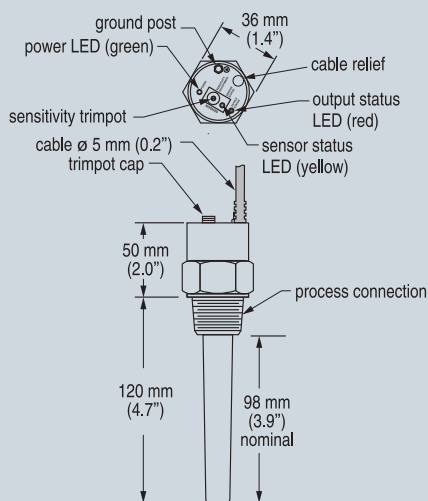
### Pressure/Temperature Curve CLS100 (7ML5501) Threaded Process Connections

P = Permitted Operating Pressures  
T = Permitted Operating Temperature

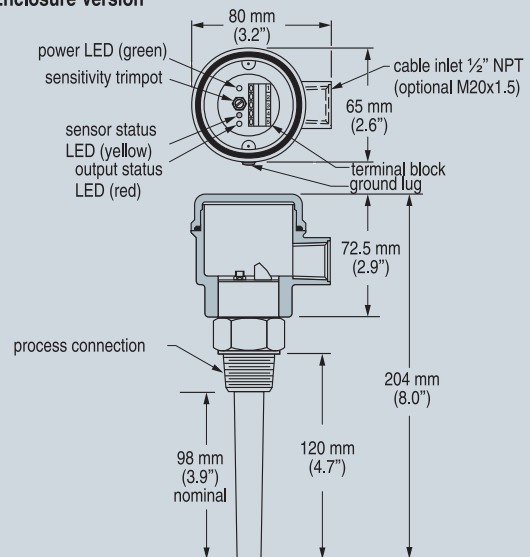
Pointek CLS100 Process Pressure/Temperature derating curves

### Dimensional drawings

#### Integral Cable Version



#### Enclosure Version



Pointek CLS100 dimensions

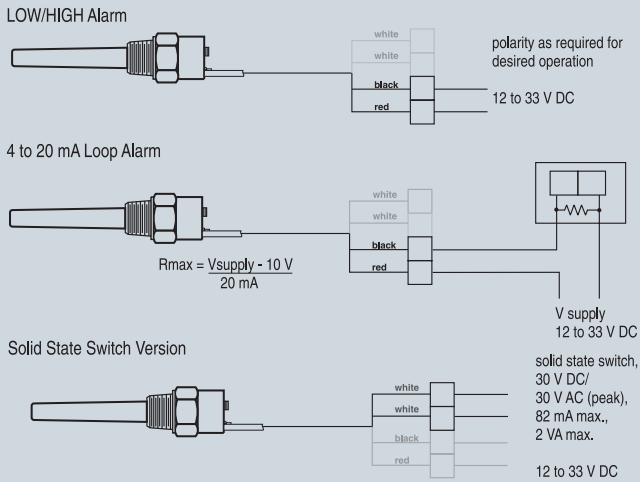
# Level instruments

## Point level measurement - Capacitance switches

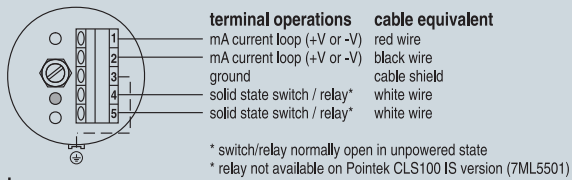
### Pointek CLS100

#### Schematics

##### Integral Cable Version - Non Intrinsically Safe only



##### Enclosure and Fully Synthetic Version



**Note:**

When driving an inductive load (for example, an external relay), a protection diode must be connected in the correct polarity to prevent possible switch damage due to inductive spikes generated by switching the inductor (please refer to instruction manual).  
Intrinsically Safe Models - please follow local regulations and area classifications; refer to instruction manual for more details.

Pointek CLS100 connections

5