

Capacitance Point Level Detection Sensors

NEW!

 **MILLTRONICS**



How is our capacitance offering different?

- Compact design and 3.9" insertion length, so you can use more of your tank for product.
- No ground reference required: active sensing element embedded in sensor.
- Universal power supply: accepts 12-240V AC or DC.
- Multiple sensing element configurations (pipe, cable extensions, sanitary).
- Adjustable insertion lengths: slide coupling lets you put more probe into the process.
- Multiple mounting options: 3/4", 1", 1.5" NPT and BSP, 3A sanitary, and flanges.
- Electronics tested to 4G vibration levels in three dimensions.
- Flame-, explosion- and dust/ignition-proof approvals.

Capacitance Technology

The Pointek product line reflects Milltronics' continuing commitment to provide the widest range of technology choices, together with the highest product flexibility. Pointek products are designed to satisfy even the most demanding requirements.

Pointek CLS provides level detection in applications with liquids, solids, slurries and interfaces – and provides effective measurement solutions in a wide range of processes.

While no single point level technology will suit every process requirement, Pointek CLS200 meets more application needs with a single device than any competitive capacitance level switch.

These chemically resistant switches operate effectively in any liquid, solid, or slurry with a dielectric constant greater than 1.5. Level points can be set to alarm before or on contact with material as diverse as flour, liquefied gas, and viscous media (conductive or nonconductive) at temperatures from -40° to 257°F.

Pointek CLS capacitance point level detection devices:

- operate without the use of a reference electrode.
- detect a single, high, or low level for liquids, solids, slurries, or foam (any material with a dielectric constant greater than 1.5).
- operate in a vessel of any shape, constructed of conductive or nonconductive material.
- operating in applications with temperatures up to 257°F.
- accept voltage from 12 to 250 VAC/DC, without jumpers.

Other manufacturers offer more than 200 electrode variations, making product selection confusing, requiring technical support in almost every case, and adding potential delay to product delivery.

Pointek's application universality simplifies product ordering, installation, setup, troubleshooting, staff training, spare and replacement unit ordering; all of which save you time, effort, and money.

Modular design and construction means a quality, cost effective product that provides a wide choice of configurations, including rod, cable and sanitary versions. The basic components are the same in every model, with the electronics (including the power supply and signal processing modules) remaining constant.

You can select the right Pointek model for any application, simply by choosing (1) the process connection you need, (2) the sensor extension, and (3) the required approvals.

The 316L stainless steel and PVDF (Kynar) construction, common to all models, is impervious to most chemicals. The Pointek CLS sensor is totally encapsulated, eliminating the risk of sheathing separation, creep, and process material entrapment.

Other manufacturers' capacitance switches require special reference electrodes for nonmetallic vessels. A conductive material effectively short circuits the electrode to the tank, causing significant commissioning difficulties, and requiring optional sensors and/or transmitters for reliable detection.

The Pointek CLS overcomes the problem by providing its own ground reference, eliminating the need for a special electrode when installed in a nonmetallic vessel.

By design, the CLS sensor presents a minimal, fixed initial capacitance that reduces the minimum capacitance deviation required for reliable performance, and eliminates the need for application-dependant transmitter options.

A high frequency oscillator coexists with the sensor inside the PVDF probe. All electronic circuits are potted in an epoxy resin for maximum protection against high shock, vibration, humidity and condensation.

The electronics, including power supply and signal processing, are common to all CLS200 models, and are housed in an epoxy coated aluminum enclosure, rated IP65/Nema 4X, 7, and 9. The Pointek enclosure is chemical resistant, flame and explosion proof, to ensure superior performance in both light and heavy industrial applications.

System Operation

The system consists of a Pointek CLS unit mounted on the top or side of the vessel. In high temperature applications where the electronics need to be separated from the sensing probe, a thermal isolator can be

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NEMA 4/IP65 Cast Aluminum Enclosure with Convenient Screw-Off Lid for Fast, Easy Installation

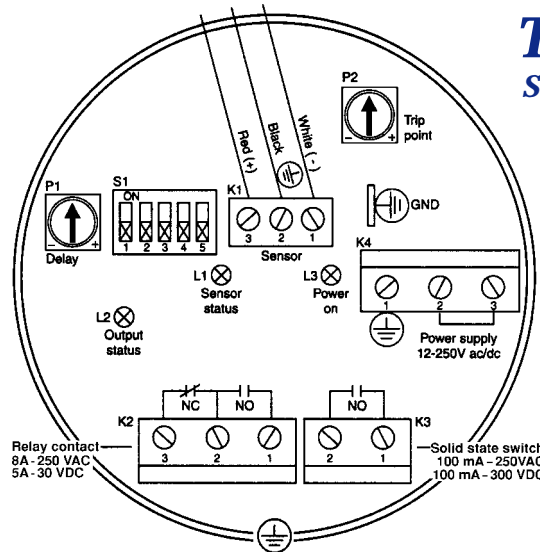
The cast aluminum enclosure is epoxy coated to provide additional chemical resistance. By removing the lid, you gain access to wiring, dip switch settings, and LED functions.

Relays and Outputs for Maximum Installation Flexibility — Alarm/Control Functions and Failsafe Operation

All output options are standard. The SPDT relay provides normally open and normally closed contacts. You can use the failsafe relay operation for alarm purposes to alarm on material detection or instrument power interruption.

The single solid state relay connection (300 VDC or 250VAC at 100 mA max.) is polarity insensitive for simplified wiring, and galvanically isolated for circuit protection.

You can add a relay across the power source to generate a two-wire output based on the drawn power supply current.



Material Sensitivity Adjustment Reduces Spare Parts

The preset material detection sensitivity suits most applications. But, when you're detecting a sticky conductive material, you can easily adjust the material level detection switchpoint. For maximum flexibility, both a range selection switch and potentiometer are provided.

Take A Look Inside! *See what makes Pointek different.*

Output Delay Prevents Relay Chatter!

An adjustable output delay prevents chatter when material is at the critical detection level, or due to agitation or other turbulence. The delay is adjusted by a single potentiometer and applied to both the SPDT relay and transistor outputs.

It can also be applied when entering or leaving alarm, or both. The delay can be temporarily disabled to confirm appropriate output operation, without readjusting the delay setting.

LED Indicators Simplify Installation, Commissioning, and Troubleshooting

The Power On, Sensor Status, and Output Status LED indicators provide a simple means to verify performance during installation.

Power On confirms that power is supplied to the unit. Sensor Status indicates that material has been detected by the sensor. Output Status shows the change in output state.

installed. Alarms can be programmed to signal material level prior to, or on contact with the probe. An LED is activated when the sensor is triggered, another provides output status, and the third indicates power supply condition.

Switch output provides relay contacts, solid state (NPN/PNP) and/or 2-wire level detection with one electronic circuit. A high and low gain switch is provided to cover the widest range of applications and materials. Setup and adjustment is verified by two LED indicators, and can be carried out without the use of any external instrument.

Selection of Models

Several configurations are available, including rigid, sanitary and cable sensor models. While the base unit remains constant, each model may have a different selection of process connections, extensions, and approvals. Both standard and extended length units are designed to operate in clean-in-place (CIP) applications in the food industry.

Standard Models: Suitable for use in virtually any point level detection application. With a minimum insertion length of just 4 inches compared with 14 inches on competitive products, the Standard Model can be easily installed in small diameter pipes. In tank applications, content capacity can be maximized.

Sanitary Models: Meet industry requirements for temperatures exceeding 212°F. The process connection is a sanitary standard tri-clamp. Wetted parts of 316L stainless steel and PVDF (Kynar®) are 3A compliant and food-grade safe.

Extended Models: Available in both cable and rigid versions. When it is not possible to penetrate the tank wall near the bottom, Pointek CLS cable versions provide excellent application flexibility through the use of cable extension, protected by a PVDF jacket.

Effective in both liquids and solids, these versatile units can also be used for level detection and for interface detection (e.g. oil/water) in large storage tanks. Cable can be supplied at lengths up to 115 feet to meet specific application requirements.

Rigid versions have short or extended rod lengths up to 18 ft. An adjustable sliding process mount is available.

Options

Thermal Isolator (Thermopart): In applications where the ambient temperature of the transmitter could exceed 185°F due to high process temperature, a thermal isolator extension is available. The extension raises the enclosure approximately 4" above the process fitting to provide separation from the process environment.

Process Connections: The smallest fitting available on the CLS is 3/4" NPT. Other process connections are provided as standard. Many nonstandard threads and flanges can be ordered as options.

Adjustable Sliding Process Mount: For applications where the exact level sensing point is in doubt, a sliding process sealing gland is available to provide exact adjustment of the sensor's position.

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Specifications

Standard Model

Process Connections: 3/4" NPT, 1" BSP, 1.5" BSP
Materials: *Process Connection:* 316L Stainless Steel; *Sensor Probe:* PVDF (Kynar); *Enclosure:* Epoxy Coated Aluminum (Nema 4X, 7/9, IP65)
Maximum Length: 4"
Pressure Resistance: 365 PSI maximum
Temperature Range: -40° to 257°F
Switch Point Repeatability: 0.08"
Hysteresis: 0.08"
Dielectric Constant: 1.5 minimum
Operating Frequency: 5 MHz maximum
Cable Entry: 1/2" NPT
Cable Gland: PG 13.5 (available)



Sanitary Model

Process Connections: 1", 1.5" or 2" Tri-Clamp
Materials: *Process Connection:* 316L Stainless Steel; *Sensor Probe:* PVDF (Kynar); *Extension Tube:* 316L Stainless Steel; *Enclosure:* Epoxy Coated Aluminum (Nema 4X, 7/9, IP65)
Maximum Length: 4"
Pressure Resistance: 365 PSI maximum
Temperature Range: -40° to 257°F
Switch Point Repeatability: 0.08"
Hysteresis: 0.08"
Dielectric Constant: 1.5 minimum
Operating Frequency: 5 MHz maximum
Cable Entry: 1/2" NPT
Cable Gland: PG 13.5 (available)



Extended Cable Model

Process Connections: 3/4" NPT; Also available in 1" or 1.5" BSP
Materials: *Process Connection:* 316L Stainless Steel; *Sensor Probe:* PVDF (Kynar); *Extension Cable:* PVDF (Kynar) Jacket; *Enclosure:* Epoxy Coated Aluminum (Nema 4X, 7/9, IP65)
Maximum Length: 1,378"
Maximum Tensile Strength: 396 Lbs.
Pressure Resistance: 150 PSI maximum
Temperature Range: -40° to 257°F
Switch Point Repeatability: 0.08"
Hysteresis: 0.08"
Dielectric Constant: 1.5 minimum
Operating Frequency: 5 MHz maximum
Cable Entry: 1/2" NPT
Cable Gland: PG 13.5 (available)



Extended Rigid Model

Process Connections: 3/4" NPT, 1" or 1.5" BSP
Materials: *Process Connection:* 316L Stainless Steel; *Sensor Probe:* PVDF (Kynar); *Extension Tube:* 316L Stainless Steel; *Enclosure:* Epoxy Coated Aluminum (Nema 4X, 7/9, IP65)
Maximum Length: 216"
Pressure Resistance: 365 PSI maximum
Temperature Range: -40° to 257°F
Switch Point Repeatability: 0.08"
Hysteresis: 0.08"
Dielectric Constant: 1.5 minimum
Operating Frequency: 5 MHz maximum
Cable Entry: 1/2" NPT
Cable Gland: PG 13.5 (available)



Common Specifications

Supply Voltage: 12 to 260 VAC/DC, any polarity, galvanically isolated (no jumpers)
Power Consumption: 2VA/2 Watts
Wiring Connections: Maximum. 2.5 mm²
Signal Indicators: 3 LEDs provide adjustment control, output status, and power
Adjustment: *Potentiometers:* 2, for adjustment of time delay and sensitivity; *Switches:* 1 SPST dip switch for time delay select. Failsafe high/low, and time delay test/adjust, high low sensitivity
Temperature Ranges: -40° to 185°F operation and storage

Output Functions

Relay Contact: Form C SPDT, NC or NO contact selectable, includes sensor failure detection
Contact Load: 10 mA/50 VCD minimum, 50A/30VDC maximum; 8A/250VAC maximum
Switching Capacity: 2000VA/150Watt maximum
Time Delay: 1-60 seconds
Solid State Switch: Galvanically isolated, with sensor failure detection
Safety: Non-polarity sensitive (no wiring errors)
Load: 2 Watt Maximum.
Switch Voltage: 250 VAC/300 VDC maximum
Load Current: 100 mA maximum
Voltage Drop: Less than 1 Volt
Time Delay: (On/Off) 1-60 seconds
Two-Wire Switch: With customer-supplied external trip devices

Approvals

General Purpose; **Dust Ignition Proof:** CSA/FM Class II, Div. 1, Group E, F, G, Class III; Flame Proof; FM Class I, Div. 1, Groups A-D; **Explosion Proof:** CSA Class I, Div. 1, Groups A-D

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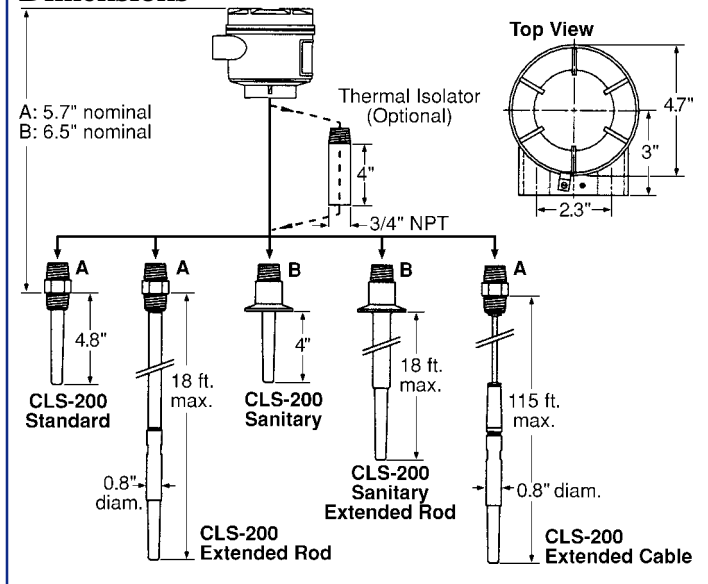
Ordering Instructions

Select the sensor version and one option from each table following. A complete model number looks like this: **C220-C4G-1200.0-B** (CLS200 extended cable version, 1.5" NPT process connection, explosion proof rating, abrasive-resistant cover and sliding coupling, with a 1,200" cable extension length.)

Model Selection Guide

Description		Model Number	Price Each	
Capacitance Point Level Detection Sensor		C2_ _	\$ 0.00	
Version	Standard Compact, 3.9" Insertion Length	00	296.00	
	Extended Rod, 10" Insertion Length	10	410.00	
	Extended Rod, 14" Insertion Length	11	426.00	
	Extended Rod, 20" Insertion Length	12	440.00	
	Extended Rod, 30" Insertion Length	13	485.00	
	Extended Rod, 40" Insertion Length	14	514.00	
	Extended Rod, Customer Specified Length*	15	472.00	
	Extended Cable, Customer Specified Length*	20	474.00	
	Extended Cable, Length 118" Insertion Length	23	474.00	
	Extended Cable, Length 236" Insertion Length	26	558.00	
Sanitary Compact, 3.9" Insertion Length	30	430.00		
Extended Sanitary, Customer Specified Length*	35	461.00		
Process Connection	Threaded, 3/4" NPT	A _ _	0.00	
	Threaded, 1" NPT	B _ _	0.00	
	Threaded, 1.5" NPT	C _ _	0.00	
	Sanitary, 1"	R _ _	0.00	
	Sanitary, 1.5"	S _ _	0.00	
	Sanitary, 2"	T _ _	25.00	
	Flanged (Flange Sold Separately)	Z _ _	0.00	
Approvals	General Purpose	_ 1 _	0.00	
	Dust Ignition Proof	_ 2 _	30.00	
	Flame Proof	_ 3 _	42.00	
	Explosion Proof	_ 4 _	42.00	
Options	None	_ _ A	0.00	
	Thermal Isolator	_ _ B	50.00	
	Abrasive-Resistant Cover	_ _ C	30.00	
	Thermal Isolator and Abrasive-Resistant Cover	_ _ D	80.00	
	Sliding Coupling	_ _ E	120.00	
	Thermal Isolator and Sliding Coupling	_ _ F	170.00	
	Abrasive-Resistant Cover and Sliding Coupling	_ _ G	150.00	
	Thermal Isolator, Abrasive-Resistant Cover, and Sliding Coupling	_ _ H	200.00	
(*Complete only for versions 15, 20, or 35.)				
Extended Length (4 digits + 1 decimal place)		_ _ _ _ . _	2.50/in	
Extended Length Units in Millimeters		A	0.00	
Extended Length Units in Inches		B	0.00	
Flange Selection (Process Connection Z_ _ Option)				
		Pressure Rating (ANSI B16.5)		
		150 Lbs. (_ A)	300 Lbs. (_ B)	600 Lbs. (_ C)
Flanged Process Connection Size	1" (A _)	\$135.00	\$155.00	\$170.00
	1.5" (B _)	155.00	175.00	215.00
	2" (C _)	175.00	195.00	220.00
	3" (D _)	235.00	295.00	330.00
	4" (E _)	305.00	405.00	495.00
Spare Parts	Aluminum Enclosure	C2 1010	\$99.00	
	1/2" HF Cable Gland (GP, DustIgn Prf)	C2 1015	8.75	
	1/2" HF Cable Gland (Exp Prf)	C2 1016	17.25	
	Thermal Isolator	C2 1020	50.00	
	Sensor CLS200	C2 1030	106.00	
	Sensor CLS215/220	C2 1040	106.00	
	Sensor CLS230	C2 1050	128.00	
	Abrasive-Resistant Cover	C2 1060	30.00	
	Safety Barrier	C2 1070	60.00	
	Amplifier/Power Supply	C2 1080	198.00	
Phoenix 2-Wire DC Trip Device	C2 1090	105.00		
English Instruction Manual		33455400	15.00	

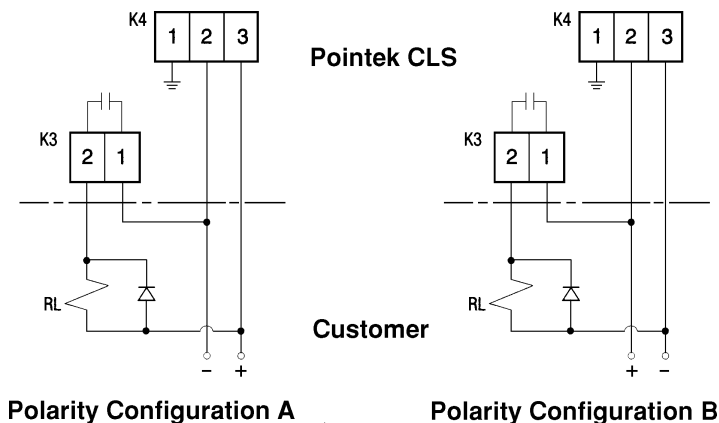
Dimensions



Watch for the full-featured, digital model of Milltronics' Pointek capacitance point level detection system, the CLS500... coming soon.

All field wiring must have insulation suitable for at least 250V. Relay contact terminals are for use with equipment having no accessible live parts, and wiring with insulation suitable for at least 250V. Maximum working voltage between adjacent relay contacts is 250V.

Isolated Solid State Switch



Ancillary 2-Wire Output Connection

Optically isolated switch. Customer supplied. (Phoenix DEK-0E-5DC/48DC100 or equivalent.)