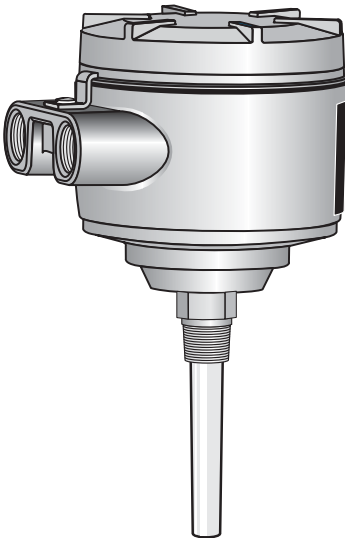


SIEMENS

POINTEK CLS 200
CAPACITANCE • LIQUIDS/SOLIDS

Instruction Manual

December 2001



POINTEK CLS 200

Safety Guidelines

Warning notices must be observed to ensure personal safety as well as that of others, and to protect the product and the connected equipment. These warning notices are accompanied by a clarification of the level of caution to be observed.

Qualified Personnel

This device/system may only be set up and operated in conjunction with this manual. Qualified personnel are only authorized to install and operate this equipment in accordance with established safety practices and standards.

Warning: This product can only function properly and safely if it is correctly transported, stored, installed, set up, operated, and maintained.

Note: Always use product in accordance with specifications.

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Introduction to the Pointek CLS 200

Note: Pointek CLS 200 is only to be used in the manner outlined in this instruction manual.

The Pointek CLS 200 capacitance level switch provides output on high or low process material levels. When the measured material approaches or contacts the switch's probe, an increase in capacitance is sensed triggering a high level alarm. If low level monitoring is required, then the lack of material contact is sensed, triggering the low level alarm.

Pointek CLS 200 Outputs

- One form C (SPDT) relay
- One open isolated, non-polarized, solid-state switch

Pointek CLS 200 Features

- NPT, BSP, and 3A compliant Tri-clamp connections (other connections on request)
- Corrosion resistant construction, Kynar[®], and 316 stainless steel wetted parts
- 35m (115 ft) maximum insertion length
- Fully adjustable process alarm (level, time delay, and fail-safe mode)
- Rigid extensions of standard and sanitary versions
- Cable version with customizable length

Pointek CLS 200 Applications

- Liquids, slurries, powders, granules, and solids
- Foods and pharmaceuticals
- Chemical and petrochemical
- High pressure and temperature

Specifications

Power

- 12 - 250V ac/dc
- 50/60 Hz
- 2 VA / 2 W max

Environmental

location:	indoor/outdoor
altitude:	2000m max
ambient temperature:	-40 to 85°C (-40 to 185°F)
relative humidity:	suitable for outdoor (Type 4X / NEMA 4X / IP65)
installation category:	II
pollution degree:	4

Process

dielectric constant (ϵ_r):	1.5 min
temperature:	-40 to 125°C (-40 to 257°F)
pressure:	standard and rigid extension versions <ul style="list-style-type: none">• 0 to 25 bar / 365 p.s.i. / 2500 kPa gauge (nominal) cable version <ul style="list-style-type: none">• 0 to 10 bar / 150 p.s.i. / 1000 kPa gauge (nominal)

Alarm Output

relay:	1 form C (SPDT) contact, rated 8A at 250V ac / 5A at 30V dc, non-inductive
solid state switch:	rated 250V ac / 300V dc, 100mA max (2VA max.)
time delay:	ON/OFF alarm selectable, 1 to 60 seconds adjustable
hysteresis:	2mm (0.08")
repeatability:	2mm (0.08")
fail-safe operation	(high or low)

Electronics/Enclosure

termination:	removable terminal block, 2.5mm ² max
construction:	epoxy coated aluminum with gasket (optional thermal isolator, 316 stainless steel)
ingress protection:	Type 4X / NEMA 4X / IP65
electrical:	2 x 1/2" NPT conduit entry

Probe

	Length (max)	Mounting ¹	Extension	Tensile (max)	Sensor
Standard	5.5m (18ft)	¾" NPT, 1" BSPT, 1 ½" BSPT 316 stainless steel	316 stainless steel	n/a	Kynar ^{® 2}
Sanitary	5.5m (18ft)	1", 1 ½", and 2"; 3A compliant tri- clamp	316 stainless steel	n/a	Kynar ^{® 2}
Cable	35m (115ft)	¾" NPT, 1" BSPT, 1 ½" BSPT 316 stainless steel	Kynar ^{® 3}	180kg (400 lbs)	Kynar ^{® 2}

Approvals

CE, CSA_{NRTL/C} FM, CENELEC, 3A. Please verify against device nameplate.

¹ Other process connections available on request.

² Option: P.P.S. (Polyphenylen Sulfide)

³ Kynar[®] is a registered trademark of ELF Atochem. For a chemical resistance list for Kynar, contact your local distributor.

Installation

Location

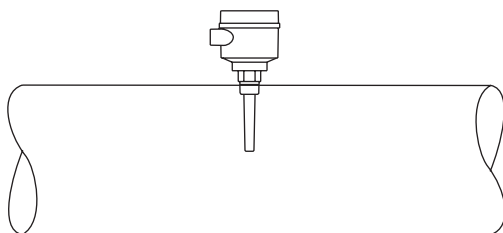
Notes:

- Installation shall only be performed by qualified personnel and in accordance with local governing regulations.
- This product is susceptible to electrostatic shock. Follow proper grounding procedures.

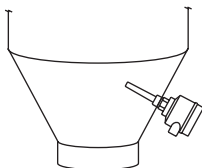
The Pointek CLS 200 standard probe length is normally mounted into the vessel top (high detection alarm) or through the tank wall at the detection level (high or low detection alarm).

The extended versions are designed for top mounting. The probe suspends vertically so that it reaches into the process at the desired detection level (high or low detection alarm).

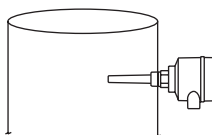
Vertical



Angle



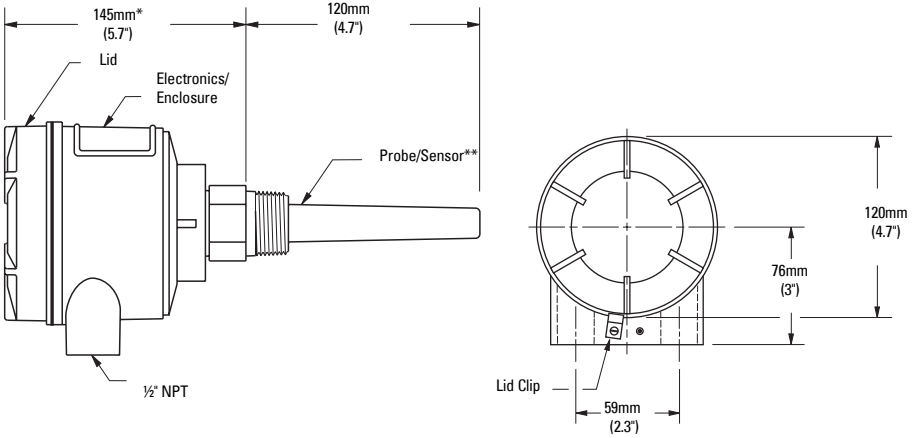
Horizontal



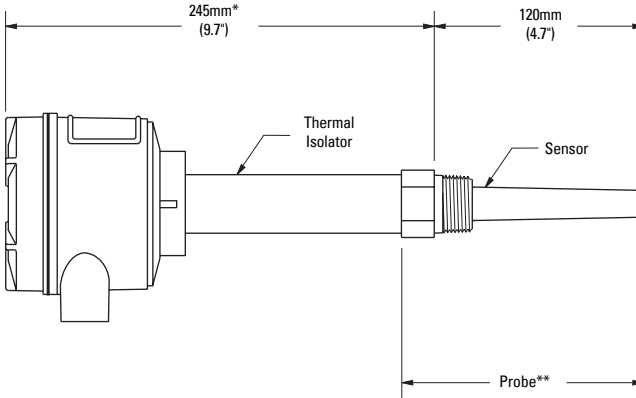
Dimensions

CLS 200 Versions

Standard



Standard with Thermal Isolator

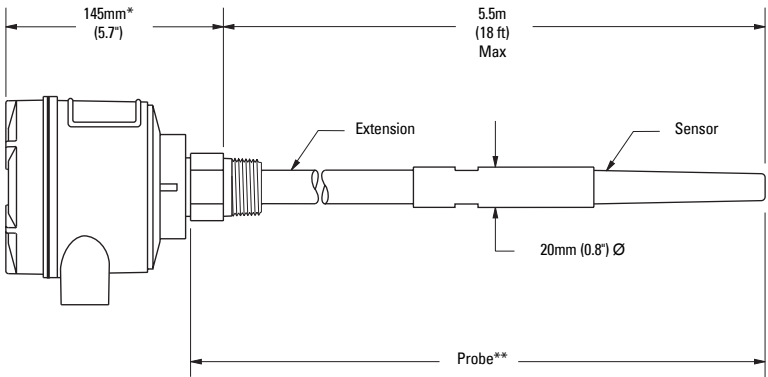


Note:

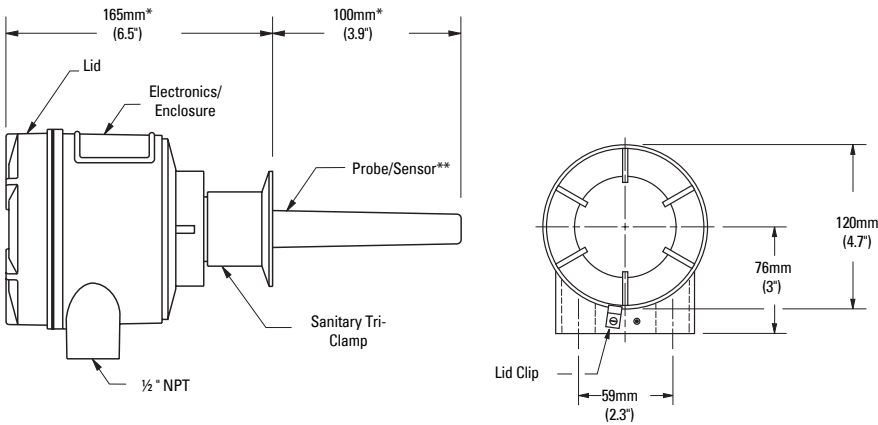
* Nominal Values

** Wetted parts are Kynar® and 316 stainless steel

Standard with Extension



Sanitary

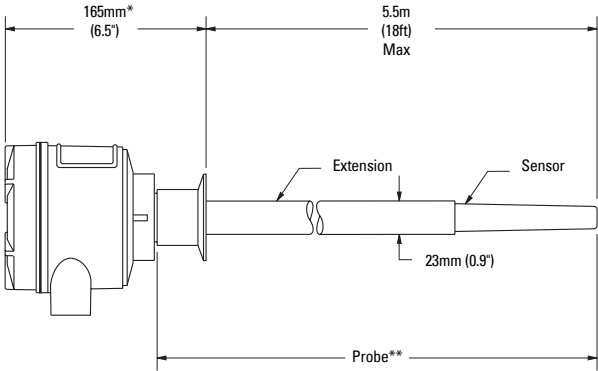


Note:

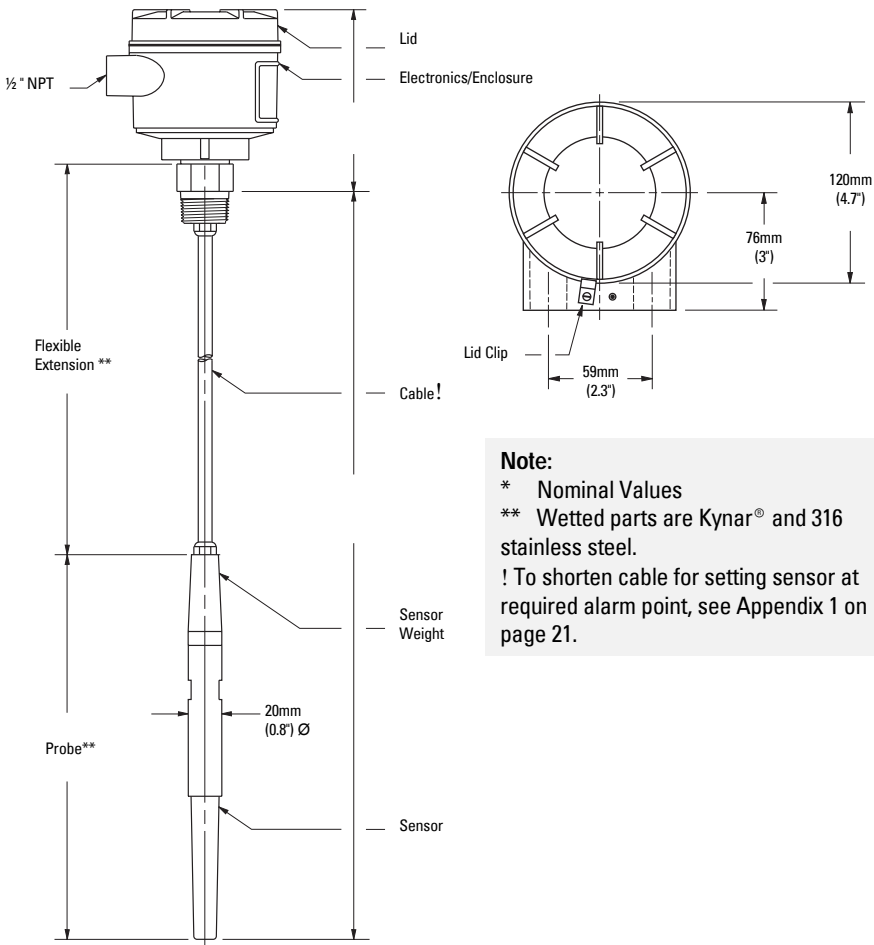
* Nominal Values

** Wetted parts are Kynar® and 316 stainless steel

Sanitary with Extension



Cable



Note:

* Nominal Values

** Wetted parts are Kynar® and 316 stainless steel.

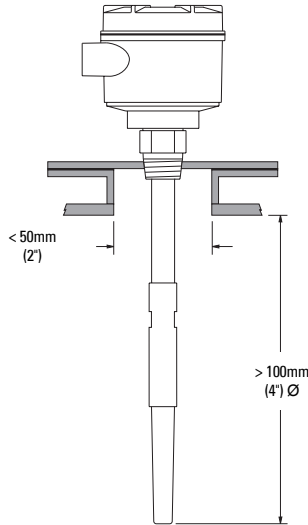
! To shorten cable for setting sensor at required alarm point, see Appendix 1 on page 21.

Mounting

Installation Features and Restrictions

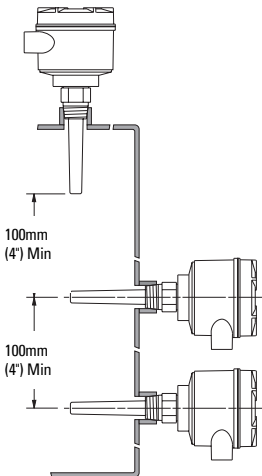
Please note the following installation features and restrictions to ensure that your unit operates properly.

Standpipes

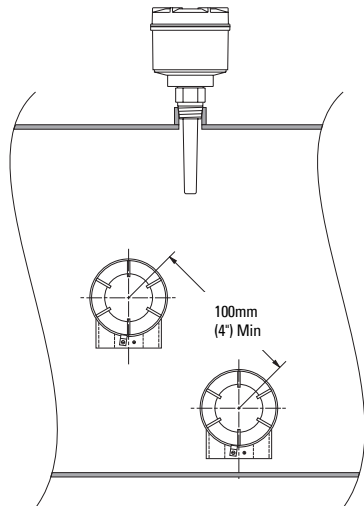


Multiple Units

End View



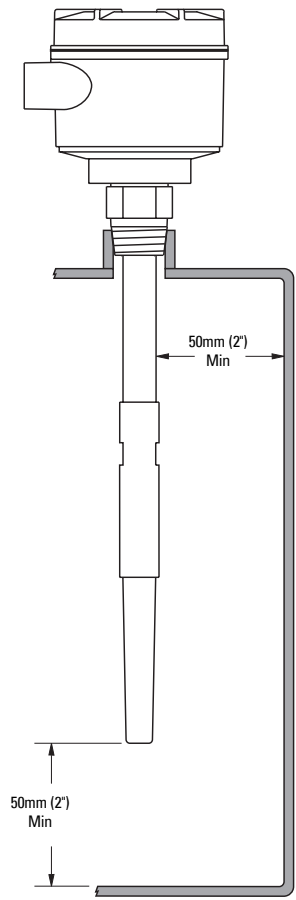
Side View



Sensors must be 100mm apart.

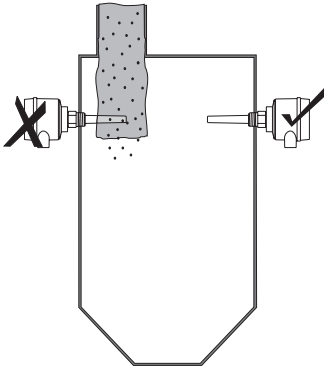
Mount diagonally if vertical space is restricted.

Wall Restrictions

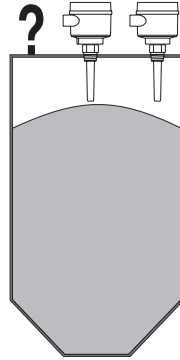


Process Cautions

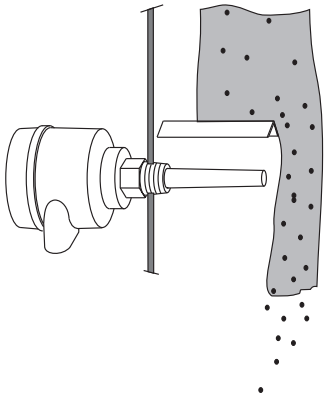
Caution: Keep unit out of path of falling material.



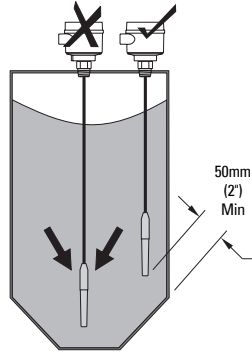
Caution: Consider material surface configuration when installing unit.



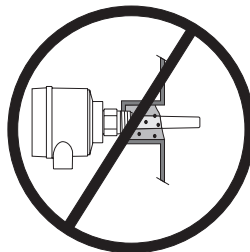
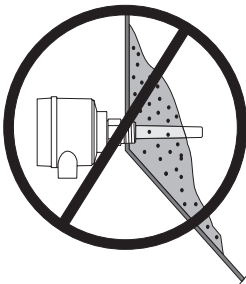
Caution: Protect probe from falling material.



Caution: Tensile load must not exceed probe or vessel rating.



Caution: Avoid areas where material build up occurs.

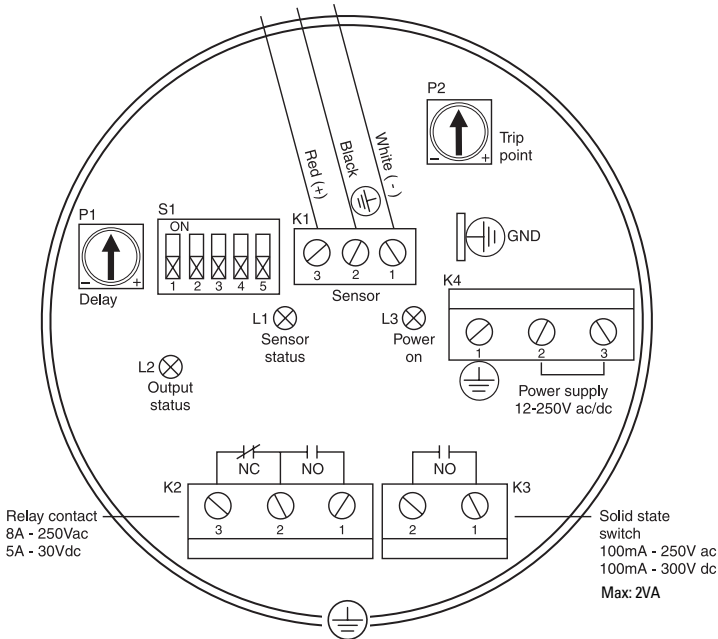


Interconnection

Loosen the lid clip and remove the lid to access the connectors and electronics. The identification label is on the underside of the lid.

Please note the following:

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

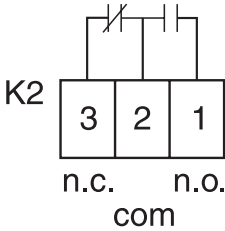


Note: Switch and potentiometer settings are for illustration purposes only.



All field wiring must have insulation suitable for at least 250V.

Relay Output Connection

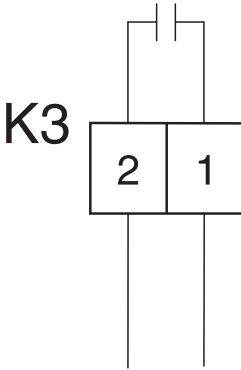


The relay is shown in a de-energized state.

K2 contact ratings:

- 8A at 250V ac
- 5A at 30V dc

Solid State Switch



Solid state switch to customer's control or instrumentation device.

Switch shown in de-energized state.

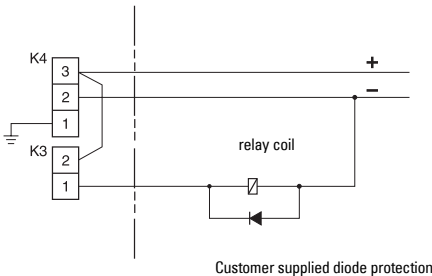
K3 contact ratings:

- 250V ac, 100mA max., non-polarized (max. 2VA)
- 300V dc, 100mA max, non-polarized (max. 2VA)

Note: When driving an external relay with either the solid state switch and/or relay outputs using dc power, protection diodes must be connected in the correct polarity to prevent possible switch/relay damage resulting from inductive spikes generated by the relay coil.

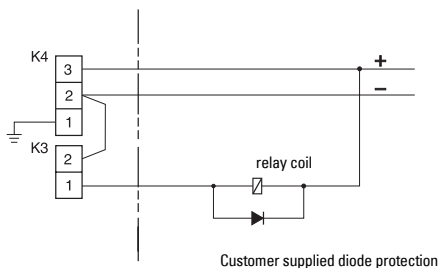
Diode Protection

When driving an external relay with either the solid stated switch and/or relay outputs using dc power, protection diodes must be connected in the correct polarity across the relay coil to prevent possible switch/relay damage resulting from inductive spikes generated by the relay coil.

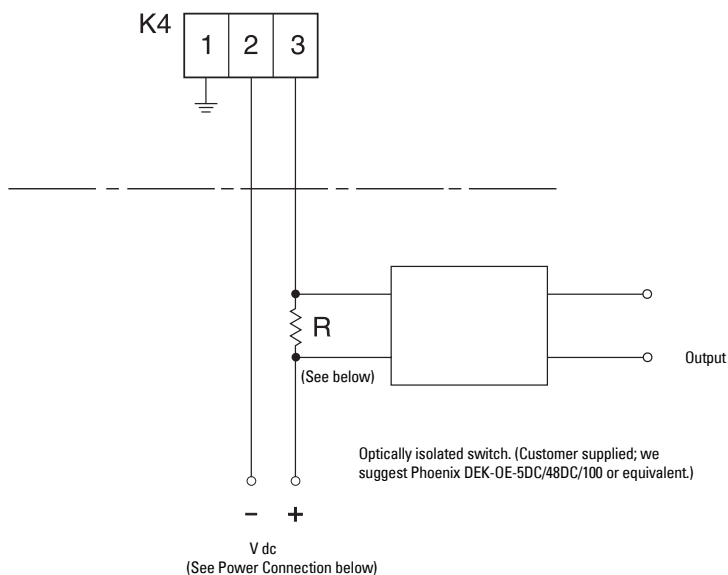


Switch capacity:

- 250V ac 100mA max.
2VA/2W max
- 300V dc. 100mA max.
2VA/2W max

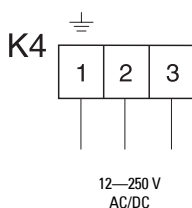


Ancillary 2-Wire Output Connection



Power Connection

Nominal	24 V dc	48 V dc
V dc	22—26 V	46—50 V
R	120 Ω	234 Ω



Operation

Setup

Note: Setup can be done in the field with the Pointek CLS mounted into process, or in the shop prior to mounting.

Dip Switch 1

- Set **ON** to open the alarm relay immediately when the sensor detects a change in contact. Use this setting when time is critical.
- Set **OFF** to keep the alarm relay closed by the amount set on potentiometer #1 (P1). Use this setting when you want to slow the response to account for turbulence or false readings.

Dip Switch 2

- Set **ON** to open the alarm relay immediately when the sensor detects a change in contact. Use this setting when you need the alarm to stop as soon as the contact state changes.
- Set **OFF** to keep the alarm relay closed by the amount of time set on potentiometer #1 (P1). Use this setting when you want to avoid false or early alarm relay cut-outs due to turbulence or false readings.

Dip Switch 3

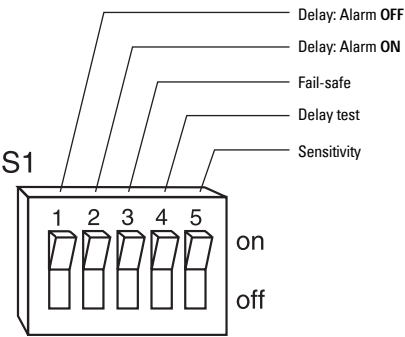
- Set **ON** for fail-safe high alarm.
- Set **OFF** for fail-safe low alarm.

Dip Switch 4

- Set **ON** to test the delay of the alarm relays as set by the potentiometer #1 (P1).
- Set **OFF** for normal operation.

Dip Switch 5

- Set **ON** for normal sensitivity on the sensor. Use this setting for measuring dry solids or non-conductive liquids.
- Set **OFF** for low sensitivity on the sensor. Use this setting for measuring conductive liquids or wet conductive solids that can build up.



Switches shown in **OFF** position.

	Delay ON	Delay OFF	Fail Safe	Delay Test	Sensitivity
	SI-1	SI-2	SI-3	SI-4	SI-5
ON	disabled	disabled	high	test	normal
OFF	enabled	enabled	low	normal	low

Start Up

After the CLS is properly mounted and the switch bank is set up, apply power to the unit. The green LED (L3) lights up to indicate the unit is powered and operational.

Indicators

Three LEDs indicate the following:

L1 (yellow) = sensor status:

When P2 is properly set, this LED indicates when the sensor is in contact with the process material (material capacitance is greater than the setpoint, P2).

L1 is off when the sensor is out of contact with the process material (material capacitance is less than the setpoint).

L2 (red) = output status:

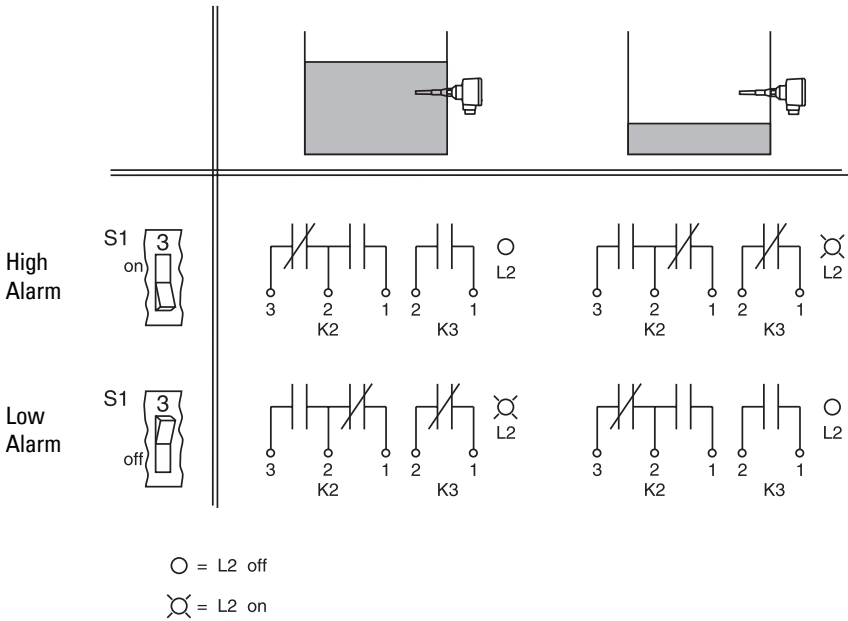
This LED indicates relay and solid switch contact status. Refer to Operation/Output Status below.

L3 (green) = power:

This LED is on when the Pointek CLS is properly powered.

Alarm Output

Alarm Output Status



Setpoint Adjustment

As reference, and to assist in adjusting the alarm setpoint for reliable and accurate detection of the process material, we have classified the materials and applications into three cases.

Follow the setup procedure for the case outline describing your application.

Case 1:

General applications, characterized by the following:

- dry solids
- low viscosity liquids

Case 2:

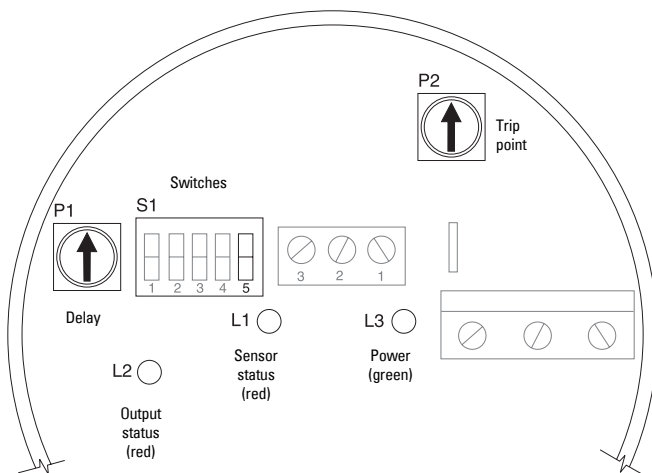
Demand applications, characterized by the following:

- hygroscopic / wet solids
- high viscosity and high conductivity liquids

Case 3:

Interface detection:

- e.g. liquid A / liquid B, foam / liquid



Case 1

Preparation

- Ensure that L3 (green) is **ON**
- Turn both potentiometers, **P1** and **P2**, fully CCW (counterclockwise)
- Set S1 switches 1 to 4 to **OFF** and S1 switch 5 to **ON** (normal sensitivity)

Configuration

1. With sensor uncovered and a minimum 100mm free space all around, turn **P2** CW (clockwise) until L1 (yellow) turns **ON**.
2. Turn **P2** CCW until L1 goes **OFF**.

Case 2

Preparation

- Ensure that L3 (green) is **ON**
- Turn potentiometer **P1** fully CCW (counterclockwise)
- Turn potentiometer **P2** fully CW (clockwise)
- Set S1 switches 1 to 4 to **OFF** and S1 switch 5 to **OFF** (low sensitivity).

Configuration

1. Adjust the material level of the process so that the sensor is immersed, L1 (yellow) should be **ON**. If L1 does not light, reset S1 switch 5 to **ON** (back to normal sensitivity; the appropriate position of S1 switch 5 depends on the dielectric properties of the material).
2. Adjust the material level of the process so that the sensor is uncovered, but retains a significant (as much as possible) build up of material on the sensor.
3. Adjust **P2** CCW until L1 **OFF**. To get the true feel for the correct position, please adjust **P2** CW then CCW several times to ensure that L1 is **OFF**. (This adjustment is very sensitive, and we recommend this practice exercise so you can fine tune P2 until L1 turns **OFF** with minimal adjustment.)

Case 3

Preparation

- Ensure that L3 (green) is **ON**
- Turn potentiometer **P1** fully CCW (counterclockwise)
- Turn potentiometer **P2** fully CW (clockwise)
- Set S1 switches 1 to 5 to **OFF**

Configuration

1. Immerse the sensor in the material that has the lowest dielectric constant. L1 (yellow) should be **ON**. If not, S1 switch 5 should be set to **ON** (normal sensitivity).
2. Adjust **P2** CCW until L1 goes **OFF**.
3. Immerse the sensor in the material that has the highest dielectric constant. L1 should come **ON**.

Delay

The alarm actuation can be delayed for either or both **ON ALARM** and **OFF ALARM** conditions.

- The selection is made by setting **S1-1** and **S1-2**. (Refer to Setup/Switch Bank on page 15.)
- Adjust the delay time from 1 to 60 seconds by setting potentiometer **P1**.

Operation

After completing the setup, replace the Pointek CLS lid and lid clip. The unit is now in service, providing level detection of your process.

Troubleshooting

Symptom	Observation	Action
No Alarm Response	L3 (green) off	Check power supply
Alarm doesn't switch when sensor is uncovered	L1 (yellow) doesn't respond to uncovering the sensor	Check sensitivity S1-5 sensor (and zener barrier if used)
	L1 (yellow) responds to uncovering the sensor	Check that relay changes state when S1-3 is toggled.
Alarm doesn't switch on when sensor is covered	L1 doesn't respond to covering the sensor	Check sensitivity S1-5 sensor (and zener barrier if used)
	L1 responds to covering the sensor	Check that relay changes state when S1-3 is toggled.
	L1 flashes when approaching the alarm setpoint	

Maintenance

The Pointek CLS requires no maintenance or cleaning.

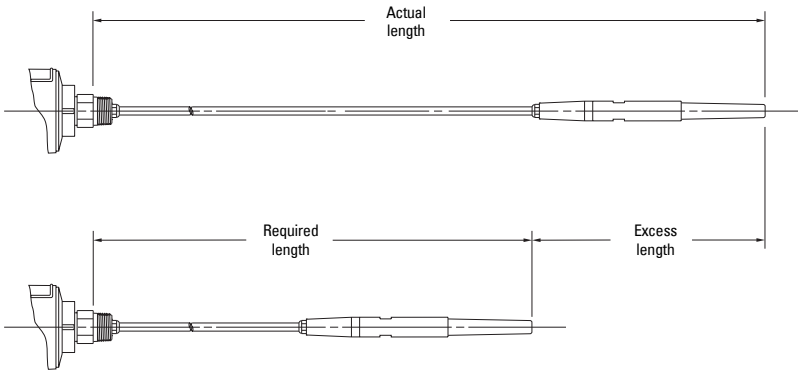
Appendix 1: Shortening the Cable

Caution: Allowed in general purpose version only; please verify against device nameplate.

Preparation

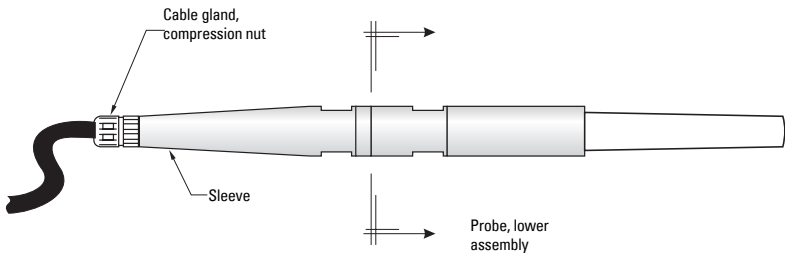
Measure the actual length of the cable and subtract the required length to determine the amount to be cut off in step 5.

e.g.	actual length	10 m
	desired length	<u>- 9 m</u>
	excess	= 1 m

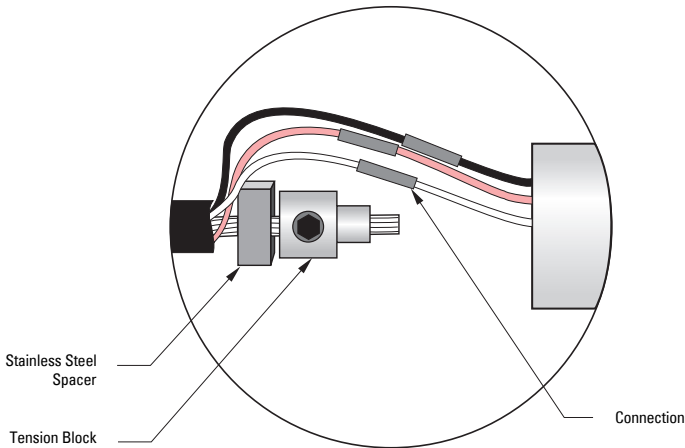


Steps

1. Unscrew the cable gland compression nut to relieve the compression ferrule and release the cable.



2. Unscrew the probe sleeve from the lower assembly using two wrenches (17mm) across the flats, exposing the leads (3), the spacer, and the tension block.



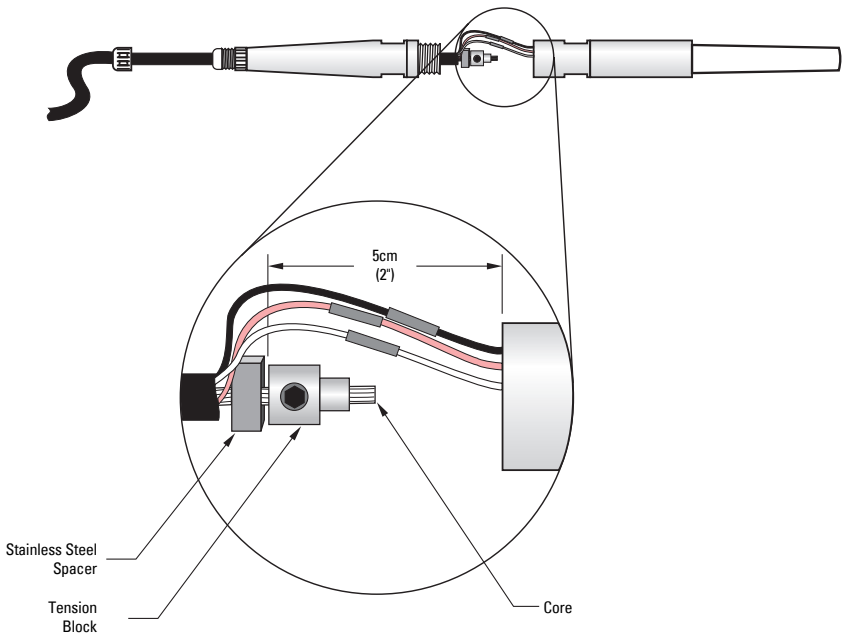
3. Remove the insulation covering the solder connections.
4. Unsolder the connections.

Note: Do not cut the connection to the probe leads, as this can render them too short to work with later.

5. Remove the sheathing around the tension block, and then remove the block for re-use in step 7.
6. Cut off the excess cable.
7. Remove approximately 6cm (2.4") of cable jacket, shield, and filler strands.
8. Replace the tension block and shorten the lead to approximately 4cm (1.6").
9. Prepare the leads for soldering.

Note: If heat shrink is used to insulate splices and sheath the tension block (steps 9 and 11), remember to slip them on before soldering the leads.

10. Make the solder connections and insulate.



11. Remove the excess core.

12. Sheath the tension block.

13. Re-dress the probe sleeve thread with Teflon tape or sealant.

14. Reassemble the sleeve and cable gland. Insure that the cable is not turned excessively, as this could break the leads.

15. Check unit for proper operation.



Appendix 2: Approvals

WRITTEN DECLARATION OF CONFORMITY

We, Siemens Milltronics Process Instruments B.V.
Nikkelstraat 10 - 4823 AB BREDA - The Netherlands

Declare, solely under own responsibility, that the product
Point Level Switch, Pointek CLS 200

Mentioned in this declaration, complies with the following standards and/or normative documents:

Requirements	Remarks	Certificate No
Environment	Commercial, light Industrial and industrial	2008949-KRQ/EMC 01-4229
EN 61326: 1998	Product group standard for "Electrical equipment for measurement, control and laboratory use", from which:	
EN 55011: 1998	Emission – Class B	
EN 61000-4-2: 1995	Electrostatic Discharge (ESD) Immunity	
EN 61000-4-3: 1996	Radiated Electro-Magnetic Field Immunity	
EN 61000-4-4: 1995	Electrostatic Fast Transient (EFT) Immunity	
EN 61000-4-5: 1995	Surge Transient Immunity	
EN 61000-4-6: 1996	Conducted Radio-Frequency Disturbances Immunity	
ATEX Directive 94/9/EC	Audit Report No 2003068	KEMA 00ATEXQ3047
	 I 1/ 2 GD EEx d [ia] IIC T6...T4  0344	KEMA 00ATEX2039X
	T 100 °C IP 66	
EN 50014: 1992	General Requirements	
EN 50018: 1994	Flameproof Enclosures "d"	
EN 50020: 1994	Intrinsic Safety "i"	
EN 50284: 1999	Special Requirements for Category 1G Equipment	
EN 50281-1-1: 1998	Dust Ignition Proof	

Notified body: N.V. KEMA – Utrechtseweg 310 – 6812 AR Arnhem – The Netherlands

97/23/EC Pressure Equipment Directive Lloyd's Register, DAD No.:
8033472, 8033473, 8033628

Notified body: Stoomwezen B.V. – Weena Zuid 168 – 3012 NC Rotterdam – The Netherlands

Location: Breda **Representative Name:** C.S. van Gils
Date: August 31, 2001 **Function:** Managing Director

Remark: For specific safety specifications, please consult the instrument label.

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SIEMENS

Siemens Milltronics Process Instruments Inc.
1954 Technology Drive, P.O. Box 4225
Peterborough, ON, Canada K9J 7B1
Tel: (705) 745-2431 Fax: (705) 741-0466
www.siemens-milltronics.com

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