



CA Moisture Probe Installation Guide

To re-order quote part number:	HD1077
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ACKNOWLEDGEMENTS

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Revision history

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1.0.0	Jan 2023	First Release
1.1.0	Oct 2024	Maintenance section added, specifications section updated. Sensor positioning information updated. Risk assessment section added.

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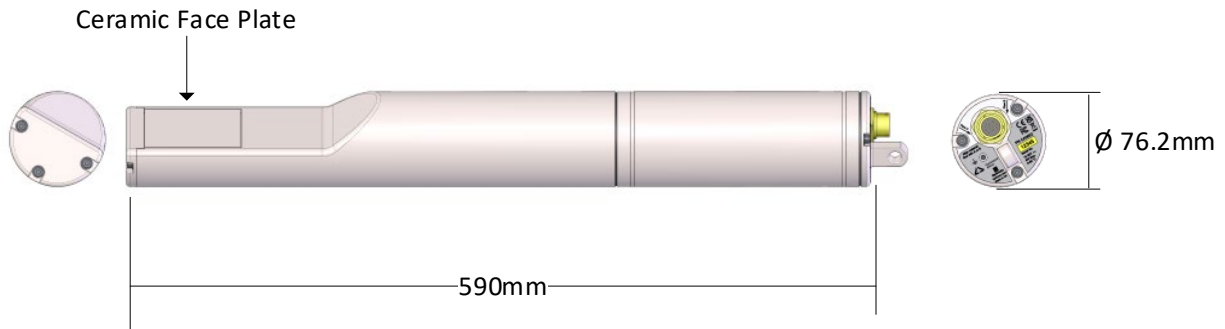


Figure 1: The CA Moisture Probe Sensor

Available accessories:

0025	Standard Mounting Sleeve
0975A	Sensor cable, available in lengths: 4m, 10m, 25m and 50m
0975AT	Sensor cable with network termination, lengths: 4m, 10m, 25m and 50m
0116	Power Supply – 30 Watt for up to 4 sensors
0067	Terminal Box (IP65, 10 terminals)
0049A	RS232/485 converter (DIN rail mounting)
0049B	RS232/485 converter (9 pin D type to terminal block)
SIMxx	USB Sensor Interface Module including cables and power supply
EAK01	Ethernet Adapter Kit
EPK01	Ethernet Power Adapter Kit

Hydro-Com configuration and diagnostics software is available for free download from www.hydronix.com

This CA Moisture Probe Installation Guide is only valid for model number CA0022

1 General to All Applications

Follow the advice below for good sensor positioning:

- The 'sensing area' of the sensor (ceramic faceplate) should always be positioned in the moving, smooth, stream of material.
- The sensor should not obstruct the material flow.
- Position the sensor so that it is easily accessible for routine maintenance.
- To prevent damage from excessive vibration, position the sensor as far as reasonably practical from vibrators.
- To reduce material sticking to the sensor it should be angled with the ceramic faceplate initially set to 60° to the flow (as shown below). This is indicated on the label when the A or B line is in line with the material flow.
- It is recommended to install a switch close to the sampling point to manually start sensor averaging for calibration purposes. (see Electrical Installation Guide HD0678 for connection details)
- A calibration sample point must be available as close to the sensor as possible (no more than 150cm downstream)

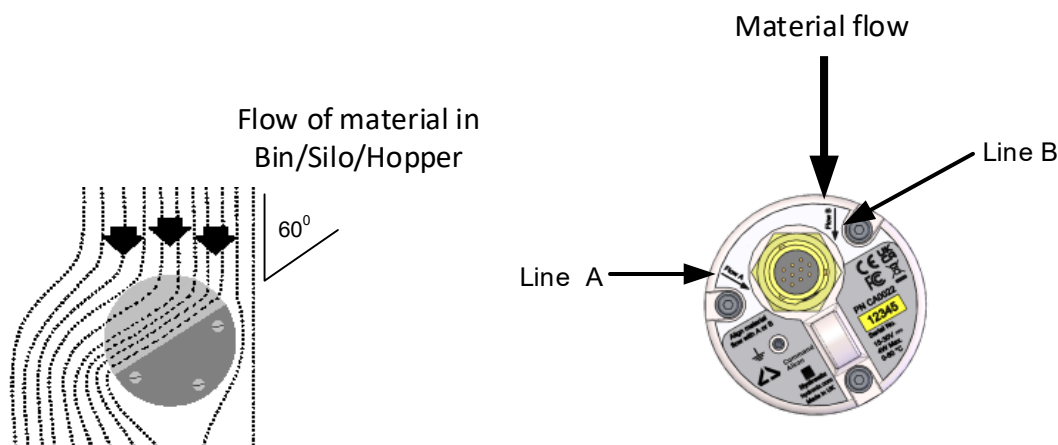


Figure 2: CA Moisture Probe mounting angle and material flow

When filling a bin/silo/hopper using large aggregates (>12mm), the ceramic faceplate is susceptible to damage by direct or indirect impact. To prevent this, a deflection plate should be fitted above the sensor.

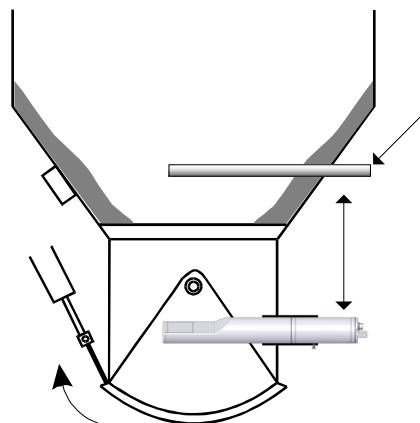


Figure 3: Fitting a Deflection Plate to prevent damage

2 Positioning the Sensor

The sensor can be mounted in an outdoor location. The 'wet side' of the sensor is designed to be in contact with wet material. The 'dry side' of the sensor must not get in contact with any liquid.

The optimum location for the sensor varies depending on the type of installation – a number of options are detailed on the following pages.

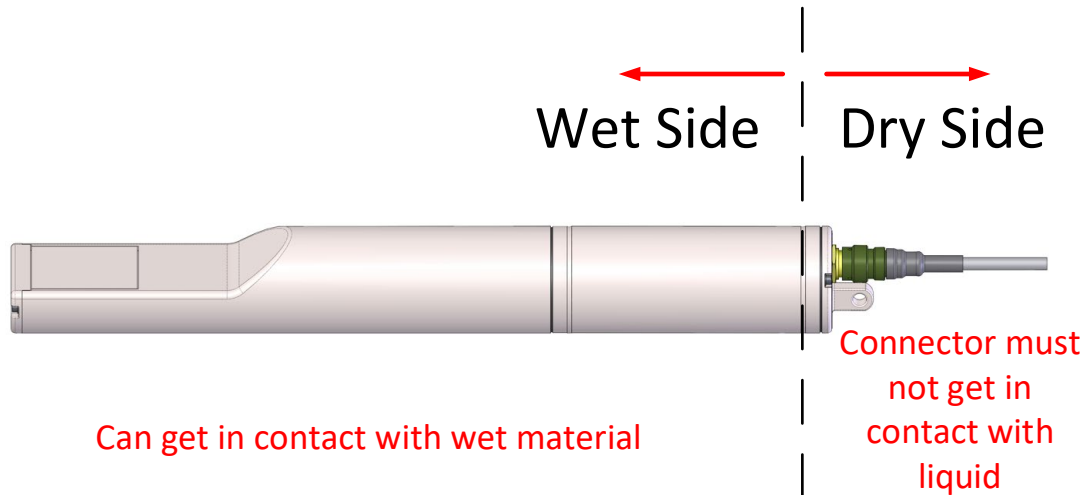


Figure 4: Outdoor installation conditions

2.1 Bin/Silo/Hopper Mounting

The sensor may be mounted in the neck or the wall of the bin so the ceramic faceplate is in the centre of the flow, as shown below.

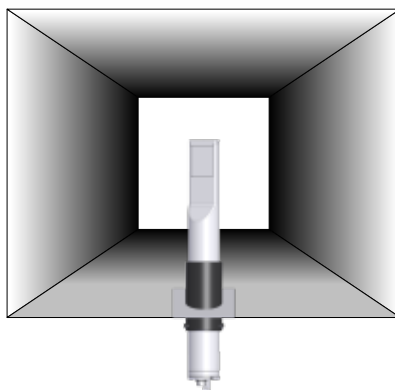


Figure 5: Overhead View of CA Moisture Probe Mounted in a Bin

2.2 Neck Mounting

The sensor should be located on the opposite side to the door-opening and centred within the neck. If it is fitted on the same side as the ram, it should be angled towards the centre. Positioning the sensor under the bin will also help where space is limited.

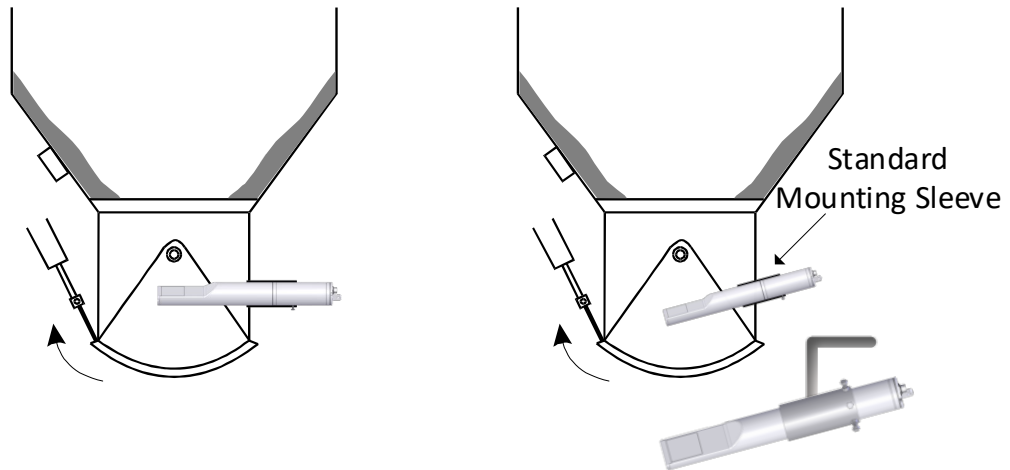


Figure 6: Mounting the CA Moisture Probe in the Neck of the Bin

2.3 Bin Wall Mounting

The sensor can be placed horizontally in the bin wall, or if the space is limited, angled down to 45° as shown, using the Standard Mounting Sleeve (part no: 0025).

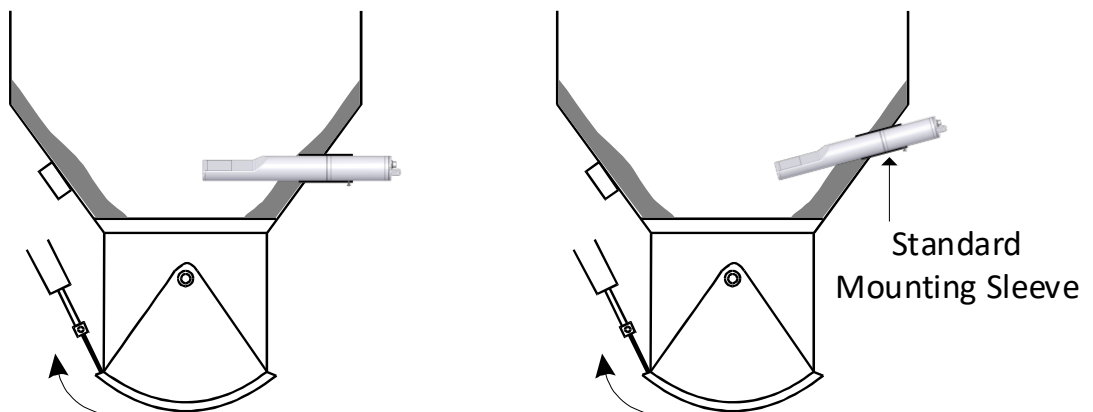


Figure 7: Mounting the CA Moisture Probe in the Bin Wall

2.4 Standard Mounting Sleeve (part no 0025)

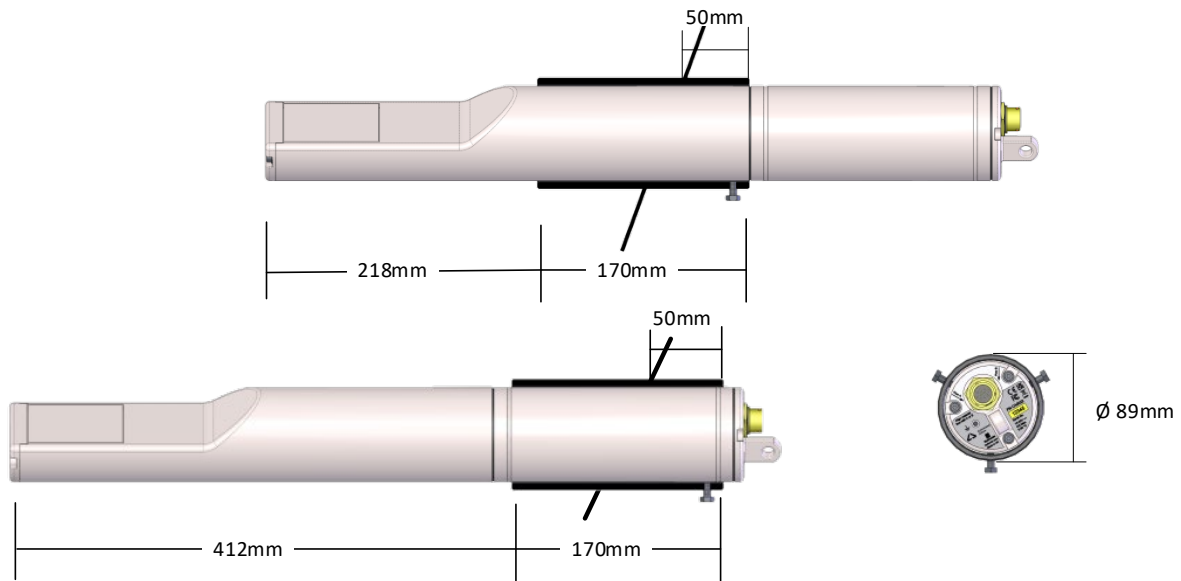


Figure 8: The Standard Mounting Sleeve (part no 0025)

3 Maintenance

- The unit contains no user serviceable parts and cannot be opened, modified or field repaired. If damaged, or in the case of a fault, the unit must be returned for repair.
- Periodic inspection of the sensor shall be carried out to ensure it is not damaged or showing excessive wear. If discovered stop using the sensor immediately and arrange return for repair.
- Do not disconnect any sensor wiring when energised.
- Periodic inspection of the sensor's ceramic face for encrusted with hardened, dry material. If found the ceramic face must be cleaned with water. No cleaning chemicals are required.

1 Corrosion Protection

In situations where corrosive materials are in use, there is potential for the cable connector to be damaged. Protection from this corrosion is possible with a few simple adjustments to how the sensor is installed.

1.1 Sensor Position

Position the sensor so that no material comes into contact with the connector (See Figure 9).

The sensor must remain in the main flow of the material at all times to produce accurate measurements of the moisture.

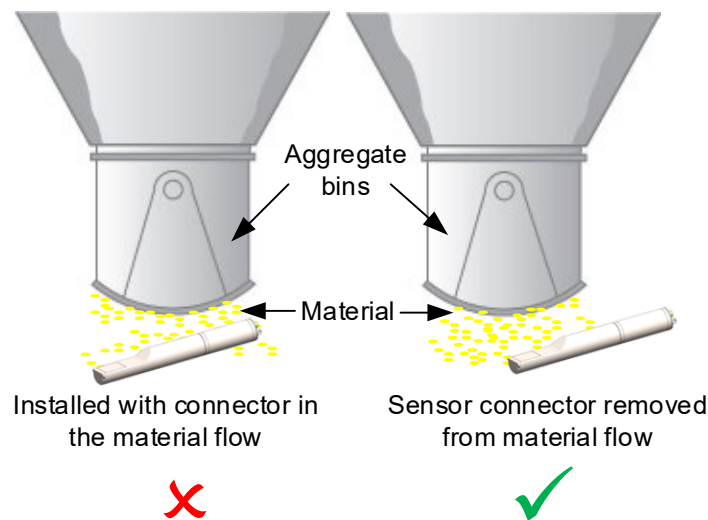


Figure 9: CA Moisture Probe installed under an Aggregate Bin

1.1.1 Drip Loop

Although the connector is specified to withstand water ingress it is recommended to install with a drip loop in the cable. (See Figure 10).

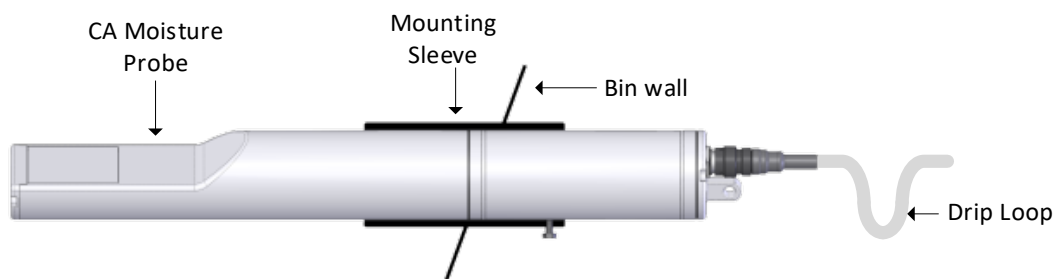


Figure 10: CA Moisture Probe installed with a Drip Loop

1.1.2 Protection Cover

Install a cover over the top of the sensor to deflect the material away from the connector. (See Figure 11). Self-amalgamating tape can also be used to seal the connector.

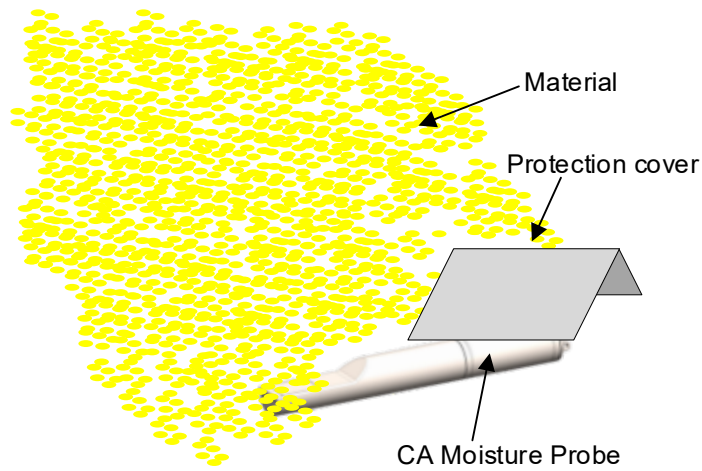


Figure 11: CA Moisture Probe Protection Cover

1 Technical Specification

1.1 Dimensions & Weight

Diameter:	76.2mm (3in.)
Length:	590mm (23.2in.)
Mass:	6.1kg (13.4lbs)

1.2 Construction

Body:	Cast stainless steel
Faceplate:	Ceramic

1.3 Operating Temperatures

Operation Temperature Range:	Minimum	0°C (32°F)
	Maximum:	+60°C (140°F)
Moisture Detection Temperature Range:	Minimum:	0°C (32°F)
	Maximum:	+60°C (140°F)
Storage Temperature Range:	Minimum:	-20°C (-4°F)
	Maximum:	+75°C (167°F)

1.4 Operating environment

Humidity Range:	0-90%RH Non-Condensing
Rated Altitude:	2000 Metres
Pollution Degree Environment:	Pollution Degree 2
Overvoltage Category:	Category 1

1.5 Measurement Field and Frequency Range

Material Penetration:	Approximately 75 -100mm dependent upon material.
Operating Frequency:	760 – 870MHz

1.6 Range of Moisture

For bulk materials the sensor will measure up to the point of saturation.

1.7 Electrical Ratings

Nominal Power Consumption:	4 W	
Supply Voltage Range:	Minimum	15 VDC
	Maximum:	30 VDC

Power-On Current: Maximum 1 ADC

1.7.1 Digital Inputs / Outputs

- One configurable digital input: 15 - 30 VDC
- One configurable digital input/output:
 - input specification 15 - 30 VDC
 - output specification: open collector output, maximum current 500mA (over current protection required)

1.7.2 Analogue Output

Two configurable 0-20mA or 4-20mA current loop outputs (sink) available for moisture and temperature. The sensor outputs may also be converted to 0-10 VDC

1.8 Digital (Serial) Communications

Opto-isolated RS485 2 wire port – for serial communications including changing operating parameters and sensor diagnostics.

1.9 Connections

Connector on Sensor: MIL-DTL-26482 Circular 10-Pin Male Socket

1.9.1 Sensor Cable

- Six pairs twisted (12 cores total) screened (shielded) cable with 22 AWG, 0.35mm² conductors.
- Screen (shield): Braid with 65% minimum coverage plus aluminium/polyester foil.
- Recommended cable types: Belden 8306, Alpha 6373
- 500 Ohm resistor – The recommended resistor is an epoxy sealed precision resistor of the following specification: 500 Ohm, 0.1% 0.33W)
- Maximum cable run: 100m, separate to any heavy equipment power cables.

1.9.2 Grounding

The sensor body is connected to the cable shield. Ensure equipotential bonding of all exposed metalwork. In areas of high lightning risk, correct and adequate protection should be used.

The sensor cable shield is connected to the sensor body. To prevent earth loops the shield must not be connected at the control panel.

1.10 Measurement Modes

1.10.1 CA Moisture Probe

Mode F only

1.11 Brix measurement output

No

1 Document Cross Reference

This section lists all of the other documents that are referred to in this User Guide. You may find it beneficial to have a copy available when reading this guide.

Document Number	Title
HD0678	Hydronix Moisture Sensor Electrical Installation Guide
HD0679	Hydronix Moisture Sensor Configuration and Calibration Guide

1 Risk Assessments

Information in this section aims to assist with risk analysis.

Severity Group	People	Equipment / Facility	Environment
Catastrophic	Once or more fatalities	System or facility loss	No catastrophic environmental impact
Severe	Disabling injury/illness	Major subsystem loss of facility damage	N/A
Moderate	Medical treatment or restricted work activity.	Minor subsystem loss of facility damage	N/A
Minor	First aid only	Non-serious equipment or facility damage	N/A

Table 1: Severity of harm

Likelihood	Expected rate of occurrence
Frequent	More than five times a year.
Likely	More than once per year, but not more than five times a year.
Possible	More than once in five years, but not more than one a year.
Rare	More than once in ten years, but no more than one in five years.
Unlikely	No more than once in ten years.

Table 2: Probability of harm

Risk assessment / Risk category			
Risk	Probability of Harm	Severity	Remark
Electric shock	Unlikely	Minor	Sensor is supplied with 24VDC will not cause harm.
Ceramic shattering, flying shards	Unlikely	Minor	Sensor should be installed behind safety gate and in location where people are not present during operation.

Table 3: Risk category

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