# Thermocouple / RTD without Thermowell
# PCI-CTL

'Quality Matters'



## Application

- For installation on pipes, vessels, etc., that are already equipped with thermowells.
- The bore diameter of the thermowell should be 0.5 to 1 mm larger than the diameter of the insert. Bore depth and connections must comply with the ISA-dS 49 standard.
- Special versions are available for explosive environments, with ATEX, IECEx, and EACEx certifications.

## Description

These temperature sensor probes can be fitted with one or two resistance temperature detectors (RTDs) or thermocouples (TCs). Each probe consists of a temperature sensor (inset), a connection head, and a lag extension with a standardised process connection. For applications in explosive environments, versions are available that comply with IEC/EN 60079-0 (general requirements for electrical equipment in potentially explosive atmospheres), IEC/EN 60079-1 (flameproof enclosure "d"), IEC/EN 60079-11 (intrinsic safety "i"), or IEC/EN 60079-31 (dustproof equipment "t").

## Limiting temperatures for insets

The permissible operating temperature is typically defined by the maximum temperature allowed for the thermowell. The standard materials used are AISI 316 and INCONEL. Other materials and diameters are available upon request.

## Connection head

An internal terminal board with a load spring is provided when an internal temperature transmitter is not installed.

**Standard Head:** is suitable for ambient temperatures ranging from -40°C to +100°C, with a degree of protection ranging from IP 54 to IP 65, depending on the configuration. The cable gland should be selected according to the cable entry requirements.

**Exd Head:** Made from injected aluminium casting, it offers a degree of protection rated at IP 65 for lag extensions with an integrated sealing compression fitting. The installation position is limited to a maximum of 60° from the vertical. When installed without a lag extension or when mounted with a connection head, the free length of the sheathed cable is restricted due to the weight of the head. The limits are as follows: 100 mm for cables with a diameter of 6 mm, and up to 200 mm for cables with a diameter of 1/2" (12.70 mm), depending on the mechanical conditions.

## Operating position

Unrestricted, provided that the connection head is suitably remote from the heat source

## Lag extensions

The length of the lag extension should be sufficient to guarantee that the ambient temperature around the connection head, transmitter and wiring does not exceed the limiting value.

## Standard Lengths:

A specific length “LN” is designed for a standard insert length (refer to technical sheet TS8-1). When the Thermo-Sensor is installed with a thermowell, the “LN” length ensures proper spring-loaded mounting of the insert (3 ± 1 mm).

## Thermowells

If the probe dimensions are unknown, the following information about the thermowell is required:
Bore diameter (and any steps, if present)
Bore depth
Thread size for connecting the lag extension
Required minimum lag extension length



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## Recommendations for Mounting:

The PCI-CTL probes are intended to fit within ISA or DIN-standard thermowells. Before installation, ensure the thermowell bore is clean and free from dust, dirt, swarf, oil, grease, etc. If the probe is installed in non-ISA or non-DIN standard thermowells, check the thread dimensions (size and depth). The lengths "U" and "L" account for a 4 mm spring travel in the insert mounting. To accommodate assembly tolerances caused by conical threads, the use of a telescopic lag extension is highly recommended.

## Temperature Probes for Explosive Environments:

The connection head and temperature sensor must be located in Zone 1 or 2 (Class 1 Div. 1; Class 1 Div. 2). Zone 0 (Class 1 Div. 1) must be separated from Zone 1 or Zone 2 by thermowells made of stainless steel, with a minimum wall thickness of 1 mm (3 mm or thicker for other steel types). PCI is not responsible for any applications that do not conform to regulations or recommendations for explosive environments.

**Type of Protection "Flameproof Enclosure" (Exd/Ext Execution):**

The certified system includes the entire temperature assembly: an Exd connection head, a lag extension, and an insert. The sensor marking plate provides guidance on using the probes in explosive environments. There are no special restrictions for the measuring circuits, but any limitations will be outlined in the safety instructions. The connection head is equipped with ground terminals.

**Type of Protection "Intrinsic Safety Exi":**

According to IEC/EN 60079-11, temperature sensors are considered "simple apparatus." They must be connected to the safe area via a certified safety barrier. They hold "EC" Type certification from an external body. The temperature sensor may be equipped with one or two measuring circuits, which are tested for dielectric strength by applying 500 VAC between the circuits and ground, as well as between the measuring circuits themselves. The sensor marking plate provides guidance on using the probes in intrinsic safety measuring circuits.

## Options:

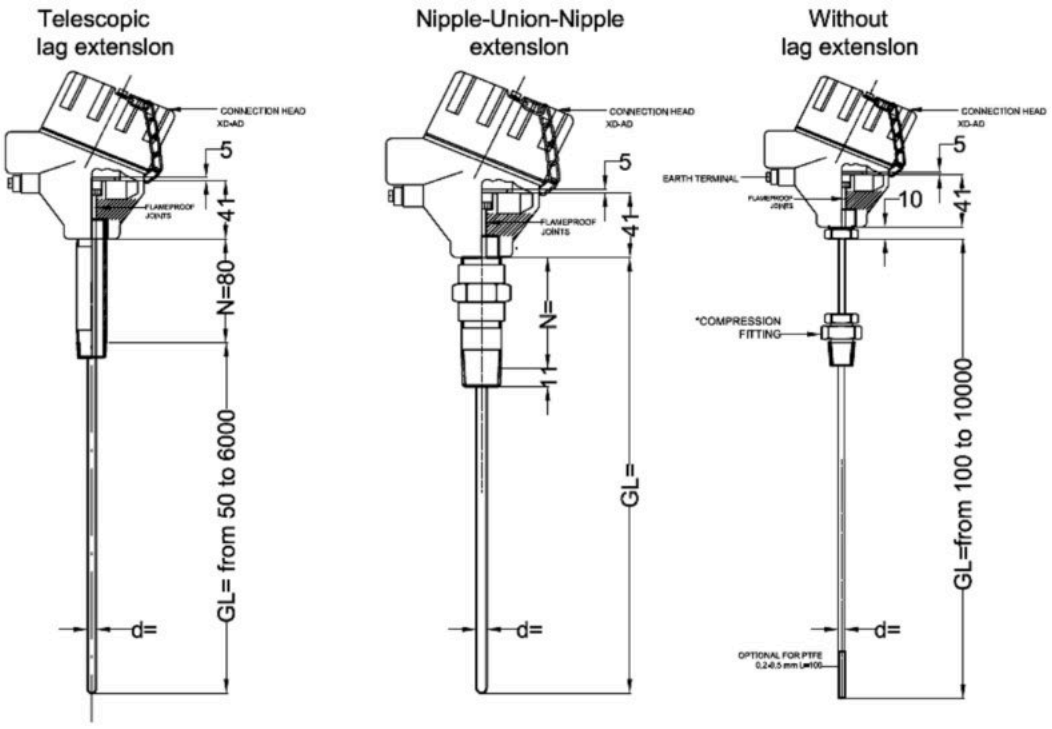
Temperature probes can be customised with temperature transmitters, either mounted directly into the connection head or remotely, including:

- Analog
- Digital SMART "HART"® or "PROFIBUS"®

## How to order

Specify: model, type of sensor, length, Ln and of the extension, dimension of process connection, options if any

Example: model PCI-CTL-Thermocouple-250mm, 50mm ½"NPTM






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