

# Temperature °Controls Pty Ltd

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**SD 1947**

## INOR TEMPERATURE TRANSMITTERS

### What is a temperature transmitter?

A temperature transmitter is generally recognized as a device, which on the input side is connected to some sort of temperature sensor and on the output side generates a signal that is amplified and modified in different ways. Normally the output signal is directly proportional to the measured temperature within a defined measurement range. Many additional features can be added depending on the type of transmitter being used.

The features of the temperature transmitters are often described by using different terms with respect to technology, mounting method, functions etc.

The following is a short summary of the terms used.

### Technology

#### Analog transmitters

These transmitters are designed on analog circuit technology. They normally offer basic functions such as temperature linearization and sensor break detection. Sometimes they are adjustable for different measuring ranges, often with a fast response time.

#### Digital transmitters

This transmitter type is mainly based on a microprocessor. They are often called intelligent transmitters, because they normally offer many extra features, which are not possible to realize in analog transmitters.

Read more about these features in the product descriptions for the IPAQ and MESO transmitters.

### Mounting method

#### In-head transmitters

In-head transmitters are designed for mounting in the connection heads of temperature sensors. All Inor's in-head transmitters fit into DIN B heads or larger. Special care has to be devoted to the ruggedness because of the harsh conditions that sometimes exist.

#### DIN rail transmitters

Din rail transmitters are designed to be snapped onto a DIN rail. The Inor transmitters fit on a 35 mm rail according to DIN EN 50022.

### Input type

#### RTD transmitters

RTD transmitters are used only for RTD sensors (Pt100, Pt1000, Ni100 etc.). Normally they can handle only one RTD type. Most of Inor's transmitters can handle more than one type of RTD, and are either fix-ranged or adjustable. They all have a temperature linear output.

#### Thermocouple (T/C) transmitters

A T/C transmitter measures a mV-signal from the T/C and compensates for the temperature of the cold junction. The cold junction compensation (CJC) is normally made by measuring the terminal temperature. Alternatively some transmitters can be adjusted to compensate for an external fixed cold junction temperature. Pure T/C transmitters are often not temperature linearized because of the complicated nonlinearity of the T/Cs.

#### Universal transmitters

Universal transmitters are normally of the intelligent (microprocessor based) type. They are programmable for different input types and ranges and have an accurate temperature linearization. The Inor transmitters in the IPAQ and MESO families are all universal with input types such as RTDs, T/Cs, resistance, voltage and current. For details, see the product descriptions.

**THERMOCOUPLES \* RTD SENSORS \* THERMOWELLS \* EXTENSION CABLES \* LEVEL SWITCHES**

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### Output type

#### Analog output

The output signal is a current, 4-20 mA, some transmitters are also available with 0-20 mA or 0-10V output. The signal is normally proportional to the measured value within a defined measurement range (temperature linear).

#### Digital output

The measured value (temperature) is presented as a binary coded message. So called Fieldbus transmitters use this technique. The Fieldbus transmitters on the market today use different standards for the communication thus creating some problems when integrating them with other instrumentation.

Examples of standards available are: Profibus, Interbus, Foundation Fieldbus, LonWorks and CAN-bus.

#### Analog and digital output

The HART transmitters (see description under the MESO/IPAQ 520 transmitters) have an analog output with a superimposed digital signal on the same wires. Typically the analog signal is used for normal measurements and the digital signal only for temporary measurements because of the low communication speed. The digital signal is mainly used for configuration and status information.

### Output / power supply connection

#### 2- wire transmitters:

Totally two leads are used in common for power supply and output signal.

#### 3- wire transmitters:

Totally three leads are used for power supply and output signal. One lead is common.

#### 4- wire transmitters:

Totally four leads are used, two for the power supply and two for the output signal.

#### Non-isolated transmitters

These transmitters have leading connections between for instance input and output circuits. They should be used with care.

#### Isolated transmitters

Isolated transmitters have no leading connection between circuits that are isolated from each other. The isolation effectively eliminates the risk for circulating currents and facilitates that connection of transmitters to control systems with grounded inputs. Read more under "Why using isolated transmitters?"

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