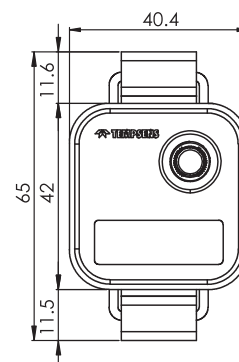
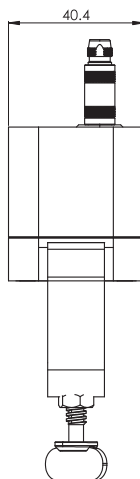
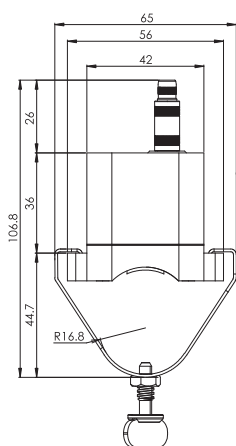
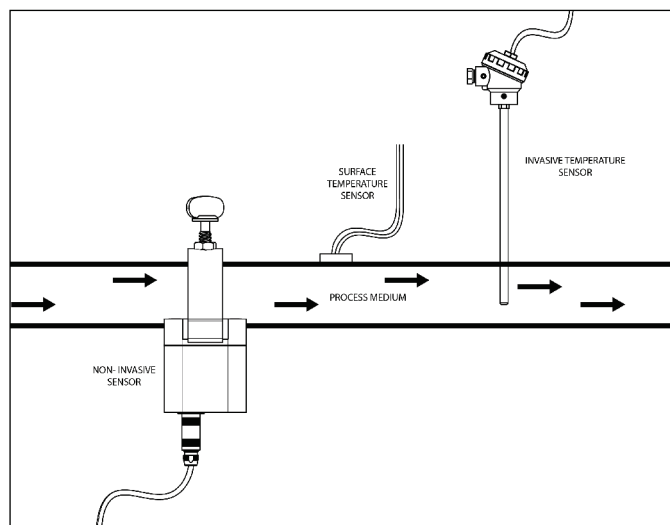


Conventional invasive type sensors such as RTDs and thermocouples with Thermowells were used to measure process media temperature inside a pipe. Surface temperature sensors were also used to approximate the inside temperature. However, the accuracy of surface temperature sensor is very poor due to ambient temperature fluctuation and other factors.

The major problem with these conventional types of sensors are as follows:-

- High installation time
- Leakage issues due to drilling
- Contamination of process media
- Poor accuracy

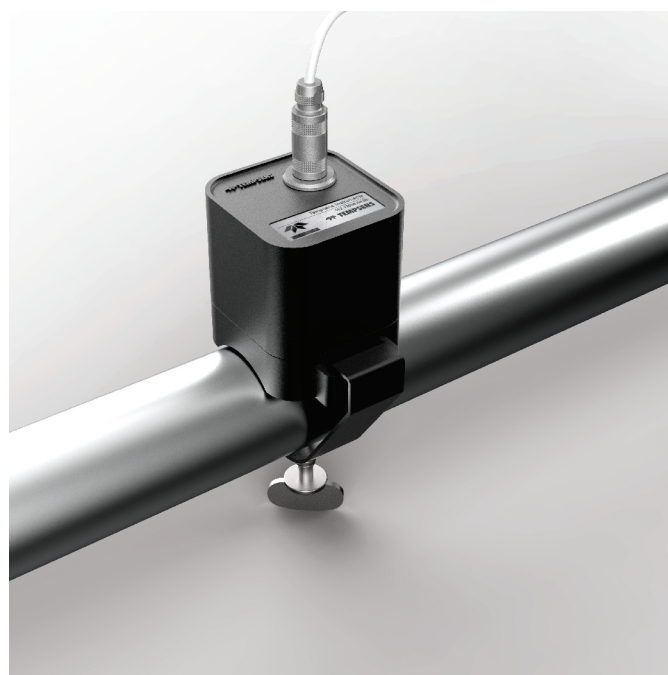


At Tempsens, we have developed India's first non-invasive sensors for measuring the temperature of process media flowing inside the pipe. This sensor eliminates all of the major problems faced by conventional thermowell sensing technology and surface temperature sensors.

The clamp sensor is equipped with an Inbuilt four-digit LCD and microcontrollers ICS which offers many signal processing features. The electronic box with an integrated Keypad helps in setting parameters like pipe material (Mild steel, Stainless steel, copper, and many more), pipe diameter, pipe schedule, Analog Output, Unit of temp( $^{\circ}\text{C}$  or  $^{\circ}\text{F}$ ), Response Time, and many more. Our standard non-invasive clamp sensor comes with 4-20mA analog output. Other analog output options available are 0-20mA, 0-10V. RS-232/RS-485 serial interface card is available as optional.

The clamp sensor is provided with USB 2.0 output port which facilitates the user to take reading when and where required in PC/Computer or update software.

The electronics can be powered through a USB port. In this case, no external power supply is required. 24 V DC is required for operation of Analog Output, RS-232 & RS-485 & Relay Output.



## Technical Specifications

Temperature Range <sup>*1</sup>	0°C - 100°C
Ambient Temperature	0°C - 40°C
Accuracy for metal Pipes <sup>*2</sup>	±3°C
Response time	7 sec.
Standard pipe size <sup>*3</sup>	1, 2 inch
Components	Sensor head, Clamp and electronic box
Analog Output	0 - 20mA, 4 - 20mA, 0 - 10V
Digital Output	USB 2.0 RS-232/RS-485 interface card (Optional) *At a time only one digital output possible
Relay Output	Relay Output with hysteresis 60V DC/42V AC RMS, 0.4A
Adjustable Parameters and Features via Keypad	Pipe diameter, Pipe material, user defined thermal resistance, Analog Output, Unit of temperature and many more.
Material of construction	Sensor head- oxidized copper Sensor housing- Polyoxymethylene (POM) /acetal Clamp- Mild steel
Power Supply	12V DC to 28 V DC with reverse polarity protection.
Operating Humidity	10-95%, non condensing conditions
Weight & Dimensions	600 gms.

\*<sup>1</sup> process media temperature

\*<sup>2</sup> Better accuracy can be achieved by single/multi point calibration.

\*<sup>3</sup> customized clamp sensors are also available on customer's request.

## Features

- Accuracy and response time close to or better than an invasive measurement for common industrial process conditions.
- No penetration and no contamination risk for the sensor.
- Easy and Faster installation via clamp on mechanism
- More accurate than conventional surface temperature sensors.
- Reduction in mechanical design complexity due to omission of thermowells.
- Plug and play interface.

## Applications

- Verify existing invasive sensors.
- Any application that don't support process intervention or a thermowell in the process / measurement medium.
- Low viscosity liquid media with medium to high flow rates are well suited (turbulent flow).
- Adding new temperature monitoring point.

**Tempsens Instruments (I) Pvt. Ltd.**

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