Non-Contact Temperature Sensor Selection Guide

Non-contact infrared temperature sensors can measure the temperature of surfaces with a split-second response time, and with similar (or better) accuracy to contact thermocouples.

Things to consider

Target material	General purpose sensors are suitable for non-reflective non-metals. Short-wavelength types give better results on bare iron and steel surfaces.
Temperature range	Sensors can measure low, medium, high or wide temperature ranges. What is the critical temperature in your process? How much higher and lower than this do you need the sensor to measure?
Optics	A choice of wide or narrow optics is available, so you can measure small or large targets at short or long distances. What is the size of the target? How far away will the sensor be positioned? Note that there is no maximum measurement distance – the measured area is larger at longer distances, but the accuracy of the measurement is the same.
Output	Sensors are available with a choice of outputs including current, voltage, thermocouple, relay and USB, to suit your instrumentation.
Ambient temperature	Most sensors can be used in ambient temperature of up to 60 to 70°C. Other types, with cooling or without, are available for higher temperatures.
Special features	Built-in temperature display, data logging, easy smartphone configurability via NFC, ATEX certification for explosive atmospheres

Measuring non-metals

Painted surfaces, paper, thick plastics, food, water, asphalt, rubber and wood all have a high emissivity. These materials can be measured easily using simple, general purpose sensors with a fixed emissivity setting, such as the PyroCouple or PyroNFC.

Sensors with an adjustable emissivity setting allow you to fine-tune the accuracy of the measurement on partially reflective materials.

A choice of temperature ranges, outputs and optics is available.

Model	RS Stock Number	Temperature Range	Output	Optics	Built-in Display and Data Logging	Emissivity Setting
PC21LT-0	839-0702	-20°C to 100°C	4 to 20 mA	2:1 (Wide Angle)	No	Fixed 0.95
PC21MT-0	553-349	0°C to 250°C	4 to 20 mA	2:1 (Wide Angle)	No	Fixed 0.95
PC21MT-1	553-343	0°C to 250°C	0 to 50 mV	2:1 (Wide Angle)	No	Fixed 0.95
PC21MT-3	553-333	0°C to 250°C	Type J	2:1 (Wide Angle)	No	Fixed 0.95
PC21MT-4	553-337	0°C to 250°C	Type K	2:1 (Wide Angle)	No	Fixed 0.95
PC151LT-0	839-0705	-20°C to 250°C	4 to 20 mA	15:1 (General Purpose)	No	Fixed 0.95

PC151MT-0	553-321	0°C to 250°C	4 to 20 mA	15:1 (General Purpose)	No	Fixed 0.95
PC151HT-0	839-0708	0°C to 500°C	4 to 20 mA	15:1 (General Purpose)	No	Fixed 0.95
PM-MA-21-CT-CRT-MSD	779-4301	-20°C to 1000°C	4 to 20 mA & Relay	2:1 (Wide Angle)	Yes - Touch Screen	Adjustable
PM-MA-151-CT-CRT-MSD	779-4305	-20°C to 1000°C	4 to 20 mA & Relay	15:1 (General Purpose)	Yes - Touch Screen	Adjustable
PN151	905-8768	0°C to 1000°C	Voltage & NFC	15:1 (General Purpose)	No	Adjustable
PN151K	100-0153	0°C to 1000°C	Type K & NFC	15:1 (General Purpose)	No	Adjustable
PMU21	905-8774	-20°C to 1000°C	USB	2:1 (Wide Angle)	No	Adjustable
PMU201	905-8783	-20°C to 1000°C	USB	20:1 (General Purpose)	No	Adjustable

Measuring Reflective Metals and High Temperatures

Bare, shiny iron and steel surfaces (as well as non-metals) can be measured with the PyroMini 2.2 series. The “HT” model measures up to 2000°C.

Model	RS Stock Number	Temperature Range
PM2.2-151-PT-CRT-MSD	839-0727	100°C to 400°C
PM2.2-251-MT-CRT-MSD	839-0720	250°C to 1000°C
PM2.2-251-HT-CRT-MSD	839-0724	450°C to 2000°C

Note: infrared temperature sensors are not suitable for bare copper or aluminium. If possible, metals should be painted, coated or black-anodised to reduce reflection for accurate temperature measurement.

Measuring Very Low Temperatures

The PyroUSB measures down to -40°C, making it ideal for subzero applications such as frozen food manufacturing and storage. The “WJ” model can be heated with air to keep the sensor body above 0°C and prevent frost forming on the lens.

Model	RS Stock Number	Temperature Range	Air/Water Cooled Jacket
PU151	553-315	-40°C to 1000°C	No
PU151WJ	553-359	-40°C to 1000°C	Yes (includes air purge collar)

High Ambient Temperatures

The sensing head of the PyroMini –HA model withstands up to 180°C without cooling:

Model	RS Code
PM-HA-201-CT-CRT-MSD	779-4314

Sensors with air or water cooling are also available:

Model	RS Code	Temperature Range	Optics	Air/Water Cooled Jacket
PC21MT-0WJ	553-327	0°C to 250°C	2:1 (Wide Angle)	Yes (includes air purge collar)
PC151MT-0WJ	553-311	0°C to 250°C	15:1 (General Purpose)	Yes (includes air purge collar)
PU151WJ	553-359	-40°C to 1000°C	15:1 (General Purpose)	Yes (includes air purge collar)

Hazardous Areas

ExTemp sensors are ATEX, IECEx and TIIS certified for use in all hazardous areas in surface applications, up to and including gas Zone 0 and dust Zone 20.

Model	RS Code
EX-151-HT-C-5	839-0714