

PyroCouple, PyroEpsilon, PyroBus

Compact Non-Contact Temperature Sensors



shown actual size

- Temperature range: -20°C to 500°C
- Choice of precision optics for large or small targets at short or long distances
- Fast response with high stability
- Stainless steel housing, sealed to IP65
- Quick and easy installation
- Wide range of accessories

The Calex Compact Series is a range of high quality, low cost non-contact sensors that measure the temperature of inaccessible or moving objects and materials. They measure temperatures from -20°C to 500°C, accurately and consistently, with an outstanding response time of 240 ms. All models conform to industrial EMC standards.



PyroCouple with indicator

The **PyroCouple** is a simple infrared temperature sensor with a choice of analogue outputs. No complicated setup is required - just connect a temperature indicator and power supply, and instantly start taking measurements.

- Suitable for non-contact temperature measurement on most non-reflective non-metal surfaces, such as paper, thick plastics, asphalt, painted surfaces, food, rubber and organic materials, among many others.
- Choice of analogue outputs for measured temperature:
 - Two-wire 4-20 mA,
 - Four-wire 0-50 mV,
 - Four-wire Type K, J or T thermocouple
- Additional 4-20 mA sensor body temperature output on the power supply loop of four-wire models: indicates the air temperature around the sensor and helps prevent overheating or overcooling



PyroEpsilon with PyroTune emissivity adjuster

The **PyroEpsilon** is a simple sensor with an adjustable emissivity setting. It is ideal if the target is partially reflective.

- Two-wire 4-20 mA output
- Emissivity adjustment via a separate two-wire 4-20 mA input
- Adjust the emissivity continuously during the process using a variable 4-20 mA source
- Set the emissivity manually with the PyroTune emissivity adjuster
- If you are not sure the emissivity of the target is high, choose the PyroEpsilon instead of the PyroCouple.



PyroBus sensors with PM180 touch screen display

The **PyroBus** is a networkable, fully configurable sensor with RS485 Modbus RTU communications.

- Up to 247 sensors may be connected to a single network.
- Adjustable emissivity setting for use on a wide range of materials
- Averaging function to smooth the temperature output
- Peak and valley hold processing for measuring individual objects on a conveyor
- Reflected energy compensation for accurately measuring the temperature of objects in ovens or chillers, from outside
- Maximum, minimum and instantaneous temperature readings
- Optional 6-channel touch screen terminal for local display, configuration and data logging
- Connect sensors and 6-channel terminals directly to an existing RS485 Modbus system

GENERAL SPECIFICATIONS - SENSORS

Output (PyroCouple)

PyroCouple Output Option (see Model Numbers)	Target Temperature Output	Sensor Temperature Output
-0	4-20 mA	Not available
-1	0-50 mV	4-20 mA
-2	Type T thermocouple	4-20 mA
-3	Type J thermocouple	4-20 mA
-4	Type K thermocouple	4-20 mA
-5	0-50 mV (very low current draw: 3.2 mA)	Not available

	PyroCouple	PyroEpsilon	PyroBus
Output	See Above	Two-wire 4-20 mA	RS485 Modbus RTU
Temperature Range	LT = -20 to +100 °C MT = 0 to 250 °C HT = 0 to 500 °C		-20 to 500°C
Accuracy	±1% of reading or ±1°C whichever is greater		
Repeatability	± 0.5% of reading or ± 0.5°C whichever is greater		
Emissivity Setting	Fixed at 0.95	Variable 0.2 to 1.0 via continuous 4-20 mA input	Adjustable 0.2 to 1.0 via RS485 Modbus
Response Time, t₉₀	240 ms (90% response)		
Spectral Range	8 to 14 µm		
Supply Voltage	24 V DC (28 V DC max.)		12 V DC (13 V DC max.)
Min. Sensor Voltage	6 V DC		
Max. Loop Impedance	900 Ω (4-20 mA output)		-
Output Impedance	56 Ω (voltage/thermocouple output)	-	
Input Impedance	-	50 Ω	-
Current Draw	20 mA max. (PyroCouple -5 models: 3.2 mA @ 24 V DC)		50 mA max
Baud Rate	-		9600 baud*
Format	-		8 data bits, no parity, 1 stop bit *

* Other configurations available upon request

MECHANICAL

Construction	Stainless Steel
Dimensions	18 mm diameter x 103 mm long
Thread Mounting	M16 x 1 mm pitch
Cable Length	1m (longer lengths available to order)
Weight with Cable	95 g

ENVIRONMENTAL

Environmental Rating	IP65
Ambient Temperature Range	0°C to 70°C
Relative Humidity	95% max. non-condensing

GENERAL SPECIFICATIONS - PYROTUNE

Output	4-20 mA for emissivity adjustment of PyroEpsilon sensor
Supply Voltage	24 V DC (13 V to 28 V DC)
Display Format	3.5 digit LCD
Display Units	Emissivity (0.2 to 1.0) or current (4 - 20 mA)
Adjustment	Push-buttons (raise/lower/set)

MECHANICAL

Construction	Polycarbonate with gasket, transparent lid (PC) and quick release screws
Mounting	Surface
Dimensions	65 mm tall x 50 mm wide x 35 mm deep
Weight	72 g

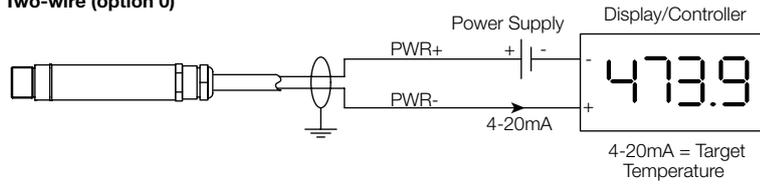
ENVIRONMENTAL

Environmental Rating	IP65
Ambient Temperature Range	0°C to 70°C
Relative Humidity	95% max. non-condensing

CONNECTIONS

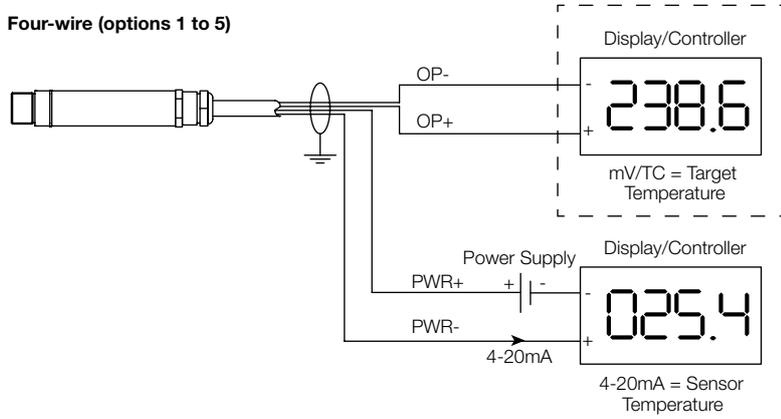
PYROCOUPLE

Two-wire (option 0)

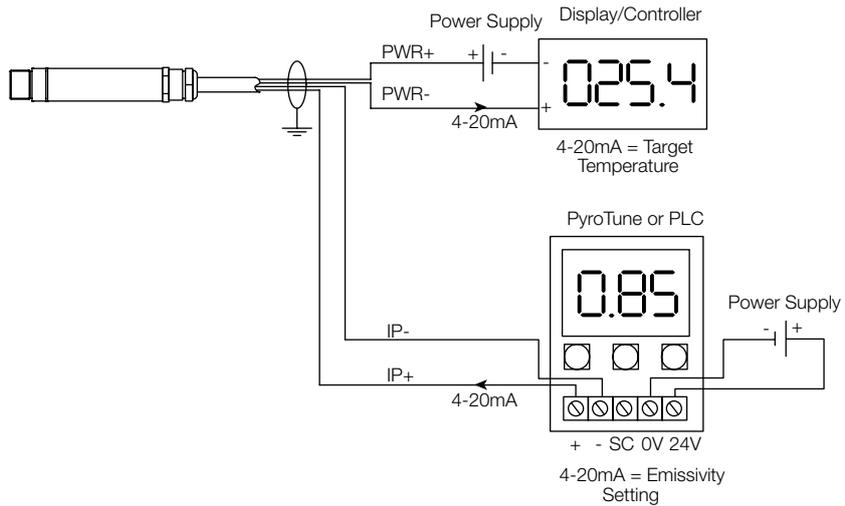


Output types 1 to 4 only (optional)

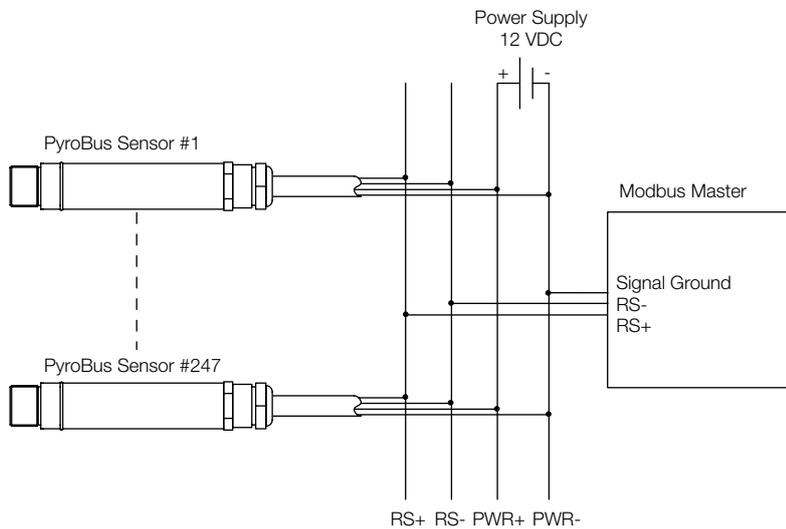
Four-wire (options 1 to 5)



PYROEPSILON

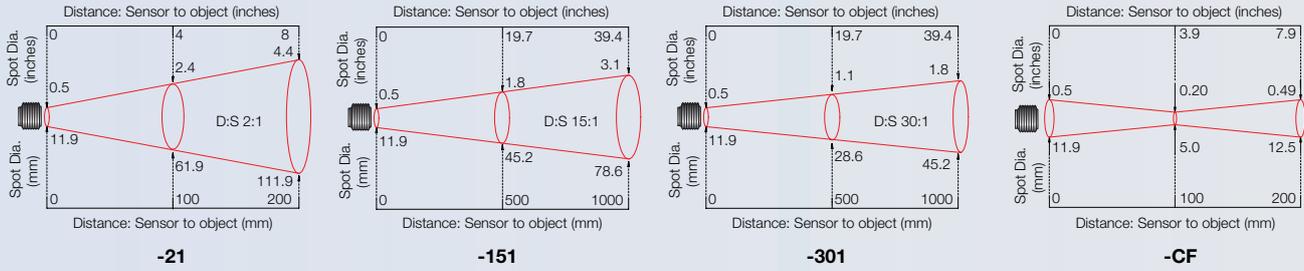


PYROBUS



OPTICS

Diameter of target spot measured versus distance from sensing head (90% energy)



ACCESSORIES



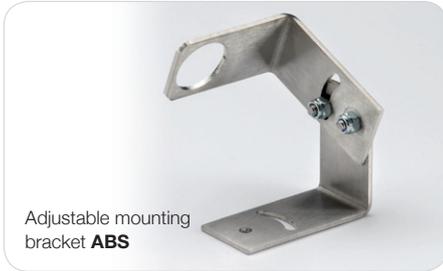
Fixed mounting bracket **FBS**



Air purge collar for 2:1 optics **APSW**
or for all other optics (shown above) **APSN**



Laser sighting tool **LSTS**



Adjustable mounting bracket **ABS**



Air or water cooled jacket with air purge collar **WJ**
(see Model Numbers)



Dual laser sighting bracket, adjustable **DLSBAS**
or fixed **DLSBFS**



PyroTune emissivity adjuster **PT**
(for PyroEpsilon only)



6-channel touch screen interface for temperature display, configuration and data logging (PyroBus only) **PM180**



Protective plastic window with stainless steel holder **PWS**
(PyroEpsilon and PyroBus only)

MODEL NUMBERS



PC **151** **MT** **0** **WJ**

Cooling
(blank) = Sensor without cooling
WJ = Air/water cooled jacket with air purge collar

Output option (PyroCouple only)

- 0** = 2-wire, 4-20mA
- 1** = 4-wire, 0-50mV (target temp.), 4-20mA (sensor temp.)
- 2** = 4-wire, T Thermocouple (target temp.), 4-20mA (sensor temp.)
- 3** = 4-wire, J Thermocouple (target temp.), 4-20mA (sensor temp.)
- 4** = 4-wire, K Thermocouple (target temp.), 4-20mA (sensor temp.)
- 5** = 4-wire, 0-50 mV (target temp.), very low current draw

e.g. Model PC151HT-4 has a type K thermocouple output representing target temperatures of 0°C to 500°C plus a 4-20 mA output proportional to internal sensor temperature. For simplicity, the sensor temperature range is always set the same as the target temperature range

Temperature range (PyroCouple and PyroEpsilon only)

- LT** = -20 to +100 °C
- MT** = 0 to 250 °C
- HT** = 0 to 500 °C (not normally available on PC21 models)

Field of view

- 21** = 2:1 divergent optics
- 151** = 15:1 divergent optics
- 301** = 30:1 divergent optics
- CF** = Close-focus optics (focal spot size 5 mm at 100mm distance)

Series

- PC** = PyroCouple: fixed emissivity, choice of analogue outputs
- PE** = PyroEpsilon: adjustable emissivity, 4-20 mA output
- PB** = PyroBus: fully configurable, RS485 Modbus communications

Example Model Numbers: PC151MT-0, PE151MT, PB151

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