

PyroCouple, PyroEpsilon, PyroCAN

General Purpose Infrared Temperature Sensors



shown actual size

- Temperature ranges from -20°C to 1000°C (depending on model)
- 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 1000°C, accurately and consistently, with an outstanding response time of 240 ms. All models conform to industrial EMC standards.

PYROCOUPLE



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.

- Temperature ranges from -20°C to 500°C
- 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 sensor body temperature output on four-wire models: indicates the air temperature around the sensor and helps prevent overheating or overcooling

PYROEPSILON



PyroEpsilon with PyroTune emissivity adjuster

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

- Temperature ranges from -20°C to 500°C
- 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 optional PyroTune emissivity adjuster
- If you are not sure the emissivity of the target is high, choose the PyroEpsilon instead of the PyroCouple

PYROCAN



PyroCAN with CAN Bus communications

The **PyroCAN** is an infrared temperature sensor with CAN communications.

- Temperature range: -20°C to 1000°C
- Raw CAN communications
- Adjustable emissivity setting for measuring a variety of materials
- Ideal for onboard vehicle temperature monitoring, and many other applications
- Conforms with EMC standard EN 13309:2010

GENERAL SPECIFICATIONS

| | PyroCouple | PyroEpsilon | PyroCAN |
|---------------------|--|---|-------------------------------|
| Output | 4-20 mA, Thermocouple or mV See "PyroCouple Output Types" Below | Two-wire 4-20 mA | Raw CAN |
| Temperature Range | LT = -20 to +100 °C MT = 0 to 250 °C HT = 0 to 500 °C | | -20°C to 1000°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 CAN |
| Response Time | 240 ms (90% response) | | 200 ms (90% response) |
| Spectral Range | 8 to 14 µm | | |
| Supply Voltage | 24 V DC (28 V DC max.) | | 24 V DC (28 V DC max) |
| Min. Sensor Voltage | 6 V DC | | 12 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) | | |
| Baud Rate | - | | 250 kbps* |

* Other configurations available upon request

PYROCOUPLE OUTPUT TYPES

| PyroCouple Output Option (see Model Numbers) | Target Temperature Output | Sensor Temperature Output |
|---|---------------------------------|---------------------------|
| -0 | 4-20 mA, two-wire, loop-powered | Not available |
| -1 | 0-50 mV | 4-20 mA |
| -3 | Type J thermocouple | 4-20 mA |
| -4 | Type K thermocouple | 4-20 mA |

MECHANICAL

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

ENVIRONMENTAL

| | PyroCouple | PyroEpsilon | PyroCAN |
|--|-------------------------|-------------|---------|
| Environmental Rating | IP65 | | |
| Ambient (Operating) Temperature Range | 0°C to 70°C | 0°C to 90°C | |
| Ambient (Operating) Humidity | 95% max. non-condensing | | |

PYROCAN DATA FORMAT

Example data message received from sensor:

| | Object Temperature | | | | | Ambient Temperature | | | |
|----------|--------------------|------------|-------|-------|-------|---------------------|-------|-------|-------|
| Bytes | DLC | DATA0 | DATA1 | DATA2 | DATA3 | DATA4 | DATA5 | DATA6 | DATA7 |
| Value | 8 | 0x51 | 0x39 | 0xB2 | 0x41 | 0xA4 | 0x70 | 0xDF | 0x41 |
| Hex | | 0x41B23951 | | | | 0x41DF70A4 | | | |
| Encoding | | Float | | | | Float | | | |
| Decimal | | 22.28 °C | | | | 27.93 °C | | | |

PYROTUNE

Emissivity adjuster for PyroEpsilon

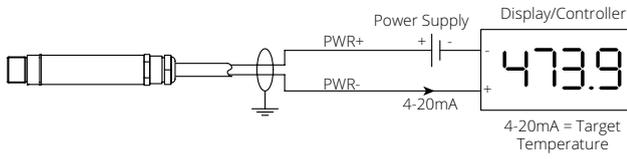
| General Specifications (PyroTune) | |
|-----------------------------------|---|
| Output | 4-20 mA for emissivity adjustment of PyroEpsilon sensor |
| Supply Voltage | 24 V DC (13 V to 28 V DC) |
| Display Format | 3.5 digit LCD |
| Display Units | Emissivity (0.2 to 1.0) or current (4 - 20 mA) |
|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

| Mechanical Specifications (PyroTune) | |
|--------------------------------------|--|
| 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 |

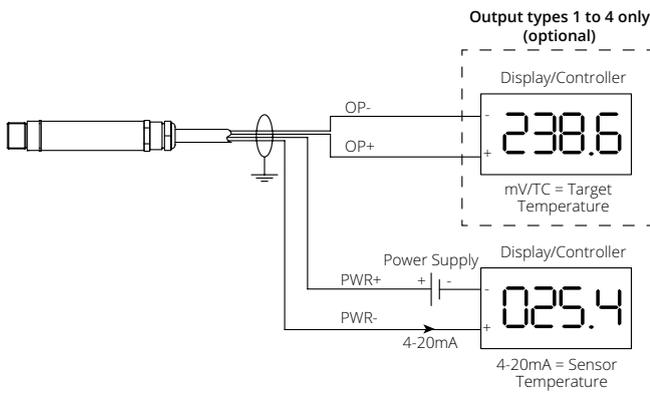
| Environmental Specifications (PyroTune) | |
|---|-------------------------|
| Environmental Rating | IP65 |
| Ambient Temperature Range | 0°C to 70°C |
| Relative Humidity | 95% max. non-condensing |

PyroCouple

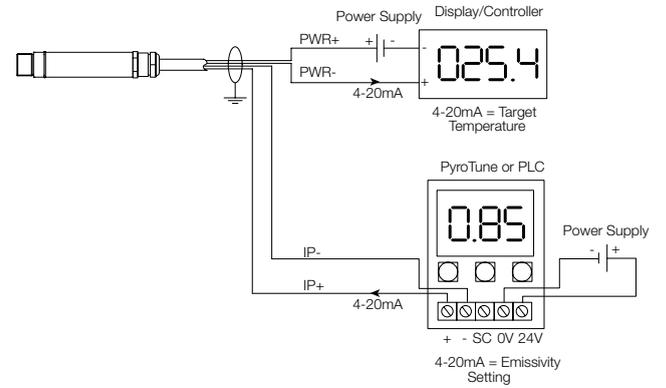
Two-wire (option 0)



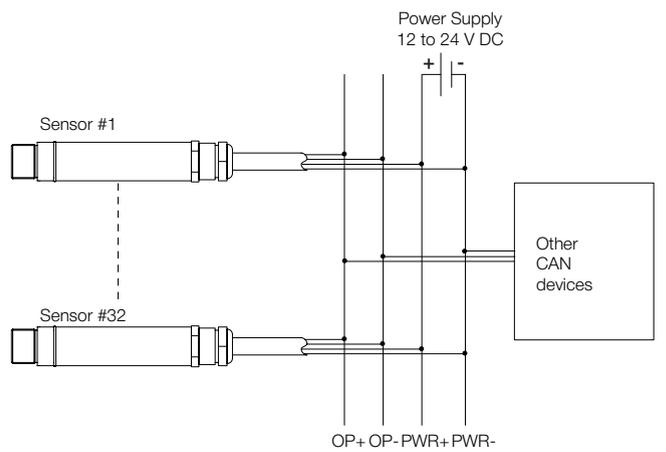
Four-wire (options 1 to 4)



PyroEpsilon

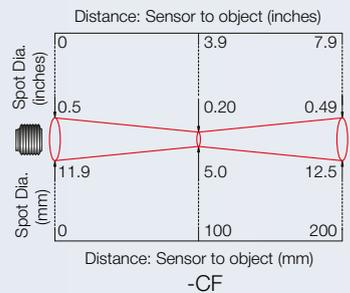
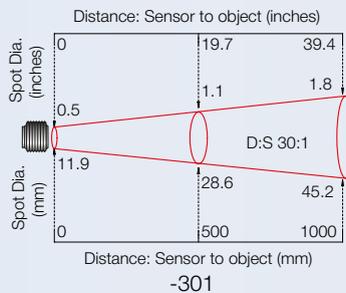
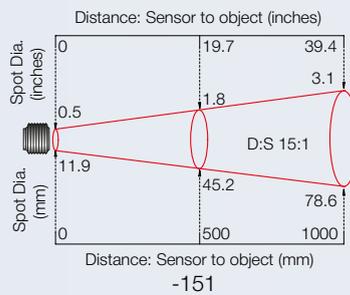
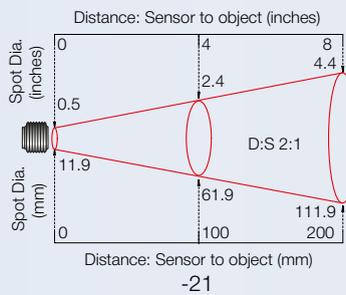


PyroCAN

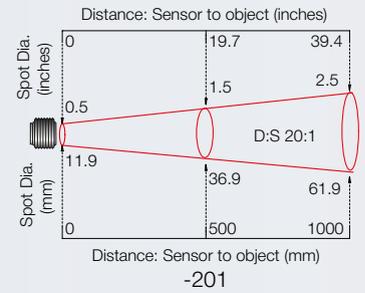
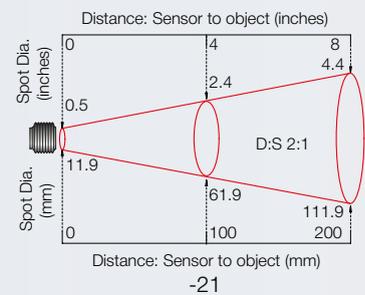


OPTICS

Optics available for PyroCouple and PyroEpsilon



Optics available for PyroCAN



All models can measure at longer distances than shown, with a larger measured spot size. Diagrams show the diameter of the measured target spot versus the distance from the 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)



Protective plastic window with
stainless steel holder **PWS**
(not compatible with PyroCouple)

MODEL NUMBERS



| | | | | | | |
|--------------------|------|-----|----|----|----|---|
| PyroCouple | PC | 151 | MT | -0 | WJ | Example Model Numbers: PC151MT-0, PC301HT-4WJ |
| PyroEpsilon | PE | 151 | MT | | WJ | Example Model Numbers: PE151MT, PECFHTWJ |
| PyroCAN | PCAN | 201 | | | WJ | Example Model Numbers: PCAN201, PCAN21WJ |

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.)
- 3 4-wire, J Thermocouple (target temp.), 4-20mA (sensor temp.)
- 4 4-wire, K Thermocouple (target temp.), 4-20mA (sensor temp.)

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

Field of view

- 21** 2:1 divergent optics
- 151** 15:1 divergent optics
- 201** 20:1 general-purpose divergent optics (PCAN series only)
- 301** 30:1 divergent optics
- CF** Close-focus optics (focal spot size 5 mm at 100mm distance)

Note: PyroCAN sensors are available with 2:1 and 20:1 optics only

Series

- PC** PyroCouple Fixed emissivity, choice of analogue outputs
- PE** PyroEpsilon Adjustable emissivity, 4-20 mA output
- PCAN** PyroCAN Adjustable emissivity, CAN Bus communications