# Noncontact Temperature Measurement for Industrial Applications



## Raytek®
### A Fluke Company

# TX Highlights

- Simple, two-wire installation
- Simultaneous 4-20 mA and digital output for smart TX sensors
- Compact, rugged sensor with NEMA-4 (IP 65) rating
- Wide temperature range from -18ºC to 2000ºC (0ºF to 3600ºF)
- Advanced signal processing
- Point-to-point or multidrop installation
- Install up to 15 sensors on a single multidrop network
- Windows software for remote configuration and monitoring
- Wide choice of focus distances
- Special models for glass and plastics applications

The Thermalert TX combines high performance noncontact temperature measurement with industry standard two-wire technology. Choose between the smart TX sensor with remotely addressable digital control, or the basic TX.

Smart TX sensors provide digital communications, as well as 4-20 mA output, allowing remote configuration and monitoring. Up to 15 sensors can be installed on a single multidrop network.

Smart TX sensors feature remotely adjustable temperature and output subranges, adjustable emissivity, ambient temperature check, and a user-defined alarm output. Averaging and Advanced Peak/Valley Hold algorithms are provided for accurate measurement of complex discrete processes.

DataTemp Multidrop software provides an easy-to-use interface for configuration and monitoring. Temperatures can be archived or exported to other applications for analysis and process documentation.

Basic TX models provide the same accuracy, repeatability, and response time as the smart TX sensors, with fixed temperature and output ranges. Emissivity on these models is switched manually at the sensor.

# Measurement Specifications

| Model: | Spectral Response: | Temperature Range: |
|---|---|---|
| LT (Low Temp) | 8 to 14 µm | -18°C to 500°C (0°F to 1000°F) |
| LT0 (Low Temp) | 8 to 14 µm | 0°C to 500°C (32°F to 932°F) |
| MT (Medium Temp) | 3.9 µm | 200°C to 1000°C (400°F to 1800°F) |
| HT (High Temp) | 2.2 µm | 500°C to 2000°C (950°F to 3600°F) |
| G5 (Glass) | 5.0 µm | 250°C to 1650°C (500°F to 3000°F) |
| P7 (Plastics) | 7.9 µm | 10°C to 360°C (50°F to 650°F) |

| | |
|---|---|
| Accuracy | ±1% of measured value or ±1.4°C (2.5°F), whichever is greater, @23°C ±5°C (73°F ±9°F) |
| Repeatability | ±0.5% of measured value or ±0.7°C (1.2°F), whichever is greater |
| Temperature Resolution | 0.1°C (0.2°F) for all models except LT; 0.1°C (0.2°F) LT only |
| Response Time (95%) | 165 mSec (100 mSec for HT models) |
| Emissivity | Adjustable; 0.10 to 1.00 for all models |
| Signal Processing (smart models) | °C/°F, Advanced Peak/Valley Hold, Averaging, Ambient temperature compensation |

# Nominal Optical Specifications
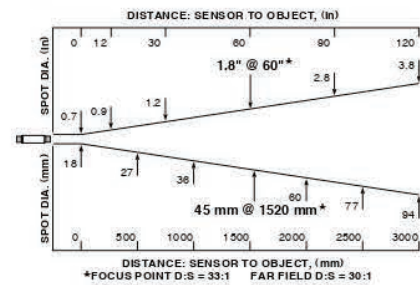
(Note: Nominal Spot Size based on 90% energy)

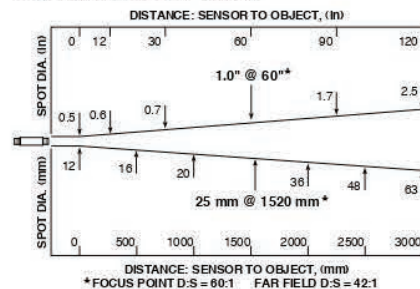**Plastic Fresnel Lens**
Standard Resolution (LT and LT0 models)
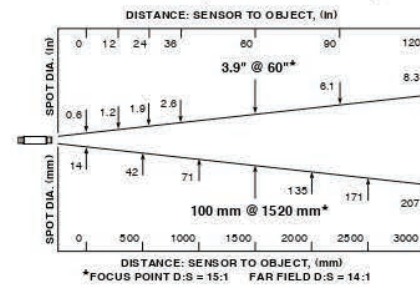


**Standard Focus**
High Resolution (LT, LT0, MT, G5, and P7 models)



| CLOSE FOCUS OPTION 1 | | | |
|---|---|---|---|
| Distance to Object | | Spot Diameter | |
| mm | in | mm | in |
| 0 | 0 | 16 | 0.6 |
| **76** | **3** | **2.5** | **0.1\*** |
| 500 | 24 | 92 | 4.6 |
| D:S = 30:1 Far Field = 5:1 | | | |

| CLOSE FOCUS OPTION 2 | | | |
|---|---|---|---|
| mm | in | mm | in |
| 0 | 0 | 17 | 0.7 |
| **200** | **8** | **6.4** | **0.25\*** |
| 450 | 18 | 32 | 1.3 |
| D:S = 32:1 Far Field = 10:1 | | | |

*focus point

Close Focus options not available for G5 or P7

**High Temperature Model**
High Resolution (HT model)



| CLOSE FOCUS OPTION 1 | | | |
|---|---|---|---|
| Distance to Object | | Spot Diameter | |
| mm | in | mm | in |
| 0 | 0 | 11 | 0.4 |
| **76** | **3** | **1.3** | **0.05\*** |
| 500 | 24 | 66 | 3.3 |
| D:S = 60:1 Far Field = 7:1 | | | |

| CLOSE FOCUS OPTION 2 | | | |
|---|---|---|---|
| mm | in | mm | in |
| 0 | 0 | 11 | 0.4 |
| **200** | **8** | **3.4** | **0.13\*** |
| 450 | 18 | 22 | 0.9 |
| D:S = 60:1 Far Field = 14:1 | | | |

*focus point

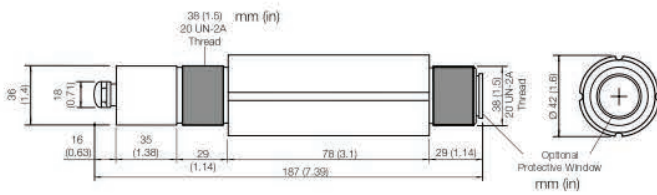# Electrical Specifications

**Outputs:**

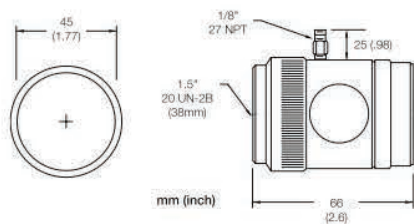| | |
|---|---|
| Analog | 4-20 mA (all models), max. loop resistance 700 ohms@24 VDC |
| Digital (Smart models) | Hart® or RS-232 (with optional adapter) |
| Alarm (Smart models) | 24 V/150 mA; adjustable setpoints, deadband, normally open/closed settings |
| Power Supply | 12-24 VDC ±20% (Basic models); 24 VDC (Smart models) 4-20 mA loop power for both Basic and Smart models |

# Sensor Specifications

| | |
|---|---|
| Environmental Rating | NEMA-4 (IP 65) |
| Ambient Temperature Range: | 0°C to 70°C (32°F to 160°F) |
| With air cooling | up to 120°C (up to 250°F) |
| With water cooling | up to 175°C (up to 350°F) |
| With ThermoJacket | up to 315°C (up to 600°F) |
| Storage Temperature | -18°C to 85°C (0°F to 185°F) |
| Relative Humidity | 10 to 95%, non-condensing |
| Shock: | IEC 68-2-27 (MIL STD 810D) 50 g's, 11 mSec, any axis |
| Vibration: | IEC 68-2-27 (MIL STD 810D) 3 g's, any axis, 11-200 Hz |
| Dimensions: | 187 mm L x 42 mm diameter (7.4 L in x 1.7 in diameter) |
| With cooling jacket | 187 mm L x 60 mm diameter (7.4 L in x 2.4 in diameter) |
| Weight: | 330 g (0.72 lbs) |
| With cooling jacket | 595 g (1.3 lbs) |

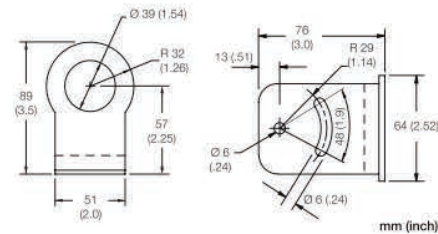# Sensor Dimensions



# Accessories / Options

- Remote Communications Kit (XXXTXACRCK) Requirement for smart models, the kit includes the HART® protocol/RS232 adapter and the Windows DataTemp software package. One kit serves multiple sensors. Requires RS232 serial port voltage and Windows 95/Windows 98/Windows NT/ Windows 2000.

- Accessory air purge collar to keep lens clean (XXXTXXACAP)

- Accessory conduit adapter, adapts sensor threads to .5 in. NPT (XXXTXXACCA)

- Accessory pipe adapter, adapts sensor threads to 1.5 in. NPT (XXXTXXACPA)

- Accessory right angle mirror, provides perpendicular view of target in tight installations (XXXTXXACRA)

- *Optional air/water cooled housing for installation in environments up to 175°C (350°F)

- *Optional NIST traceable calibration certificate (call for specifications)

- Optional intrinsic safety (call for specifications)

- Accessory lens protectors can be replaced without affecting factory calibration

- ThermoJacket protective enclosure enables installation in very harsh environments and provides air purging and water cooling up to 315°C (600°F)
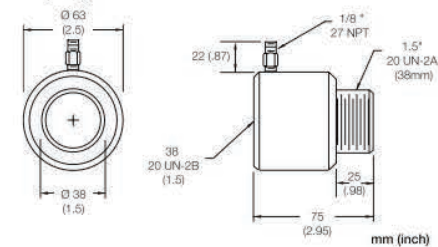
- *Options must be specified at time of order
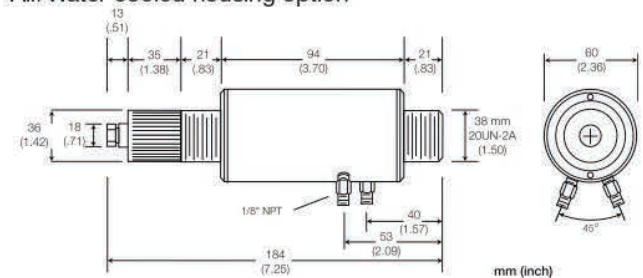
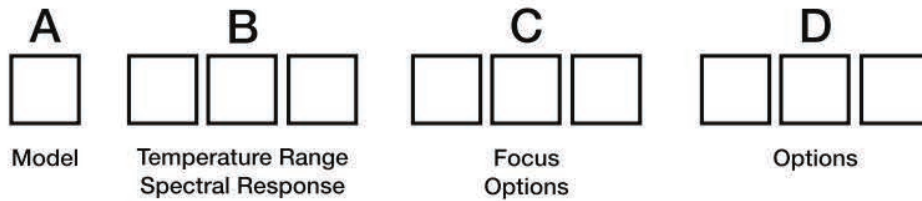### Adjustable bracket XXXTXXACAB
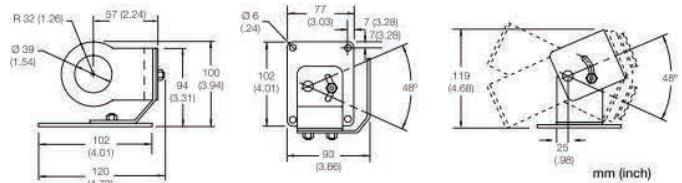


### Fixed bracket XXXTXXACFB



### Air purge collar XXXTXXACAP



### Right angle mirror XXXTXXACRA



### Air/Water cooled housing option

## RAYTX

| A | B | C | D |
|---|---|---|---|
| Model | Temperature Range Spectral Response | Focus Options | Options |

| RAYTX | Description |
|---|---|
| **Code A** | **Model** *(°C or °F must be specified with Basic models.)* |
| S | Smart Model, includes remote RS232 set-up for range scaling, maintenance, various signal conditioning methods, emissivity adjustment and built in alarm relay which can be set to alarm on internal overtemp condition. |
| F | Basic model, includes fixed 4–20mA output scaled in °F, manual emissivity adjustment located inside rear wiring cover. Emissivity preset @ 0.95. |
| C | Basic model, includes fixed 4–20mA output scaled in °C, manual emissivity adjustment located inside rear wiring cover. Emissivity preset @ 0.95. |
| **Code B** | **Temperature Range and Spectral Response** |
| LT | Low Temp: -18°C to 500°C (0°F to 932°F) / 8 to 14 microns, TXSLT default scaling is -18°C to 500°C (0°F to 932°F) and can be field set up to -18°C to 538°C (0° to 1000°F), TXFLT output fixed and scaled to 0° to 1000°F, TXCLT output is fixed and scaled to -18°C to 500°C |
| LT0 | Low Temp: 0°C to 500°C / 8 to 14 microns, available on TXCLT only output is fixed and scaled 0°C to 500°C |
| MT | Medium Temp: 200°C to 1000°C (392°F to 1832°F) / 3.9 microns, TXSMT default scaling is 200°C to 1000°C (392°F to 1832°F), TXFMT output fixed and scaled to 400°F to 1800°F, TXCMT output is fixed and scaled to 200°C to 1000°C |
| HT | High Temp: 500°C to 2000°C (932°F to 3632°F) / 2.2 microns, TXSHT default scaling is 500°C to 2000°C (932°F to 3632°F), TXFHT output fixed and scaled to 950°F to 3600°F, TXCHT output is fixed and scaled to 500°C to 2000°C |
| G5 | Glass Surface: 250°C to 1650°C (482°F to 3002°F) / 5.0 microns, TXSG5 default scaling is 250°C to 1650°C (482°F to 3002°F), TXFG5 output fixed and scaled to 500°F to 3000°F, TXCG5 output is fixed and scaled to 250°C to 1650°C |
| P7 | Thin Film Plastics (Polyester and Teflon): 10°C to 360°C (50°F to 680°F) / 7.9 microns, TXSP7 default scaling is 10°C to 360°C (50°F to 680°F), TXFP7 output fixed and scaled to 50°F to 650°F, TXCP7 output is fixed and scaled to 10°C to 360°C |
| **Code C** | **Focus** |
| SF | Standard Focus, (33:1 D:S for all models except HT which has 60:1) |
| CF1 | Close Focus 1, (Not available for P7, consult factory for special G5 close focus) |
| CF2 | Close Focus 2, (Not available for P7, consult factory for special G5 close focus) |
| PSF | Plastic Fresnel Lens, Standard Focus, 15:1 D:S for LT models only |
| **Code D** | **Options** |
| W | Coolable Housing, includes Lens Air Purge Collar. For ambient temperatures up to 175°C (350°F). |
| IS2 | Consult factory for intrinsically safe TX models. |
| 2132258 | Calibration Certificate with NIST/DKD traceability, (must be ordered with sensor as a separate line item) |

Included with each sensor is a mounting nut, a fixed mounting bracket and an operator's manual.
**Typical Model Number:** RAYTXSLTSF Specifies a Smart, Low Temperature, Standard Focus, TX sensor

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### Worldwide Leader in Noncontact Temperature Measurement

www.raytek.com

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