

TX
Datasheet



Noncontact Temperature Measurement for Industrial Applications



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 -18°C to 2000°C (0°F to 3600°F)
- 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 non-contact 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

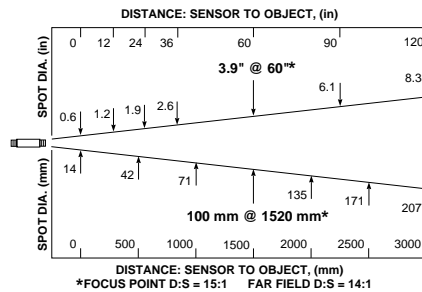
Model:	Spectral	Temperature
	Response:	Range:
LT (Low Temp)	8 to 14 μm	-18°C to 500°C (0°F to 1000°F)
LT0 (Low Temp)	8 to 14 μm	0°C to 500°C (32°F to 932°F)
MT (Medium Temp)	3.9 μm	200°C to 1000°C (400°F to 1800°F)
HT (High Temp)	2.2 μm	500°C to 2000°C (950°F to 3600°F)
G5 (Glass)	5.0 μm	250°C to 1650°C (500°F to 3000°F)
P7 (Plastics)	7.9 μm	10°C to 360°C (50°F to 650°F)
Accuracy	$\pm 1\%$ of measured value or $\pm 1.4^\circ\text{C}$ (2.5°F), whichever is greater, @23°C $\pm 5^\circ\text{C}$ (73°F $\pm 9^\circ\text{F}$)	
Repeatability	$\pm 0.5\%$ of measured value or $\pm 0.7^\circ\text{C}$ (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)

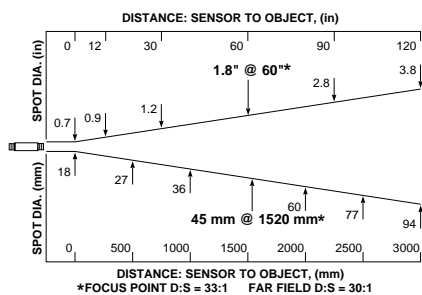
Plastic Fresnel Lens

Standard Resolution (LT and LT0 models)



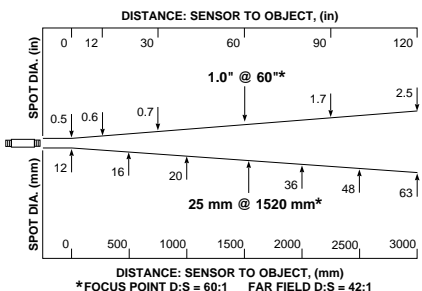
Standard Focus

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



High Temperature Model

High Resolution (HT model)



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

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

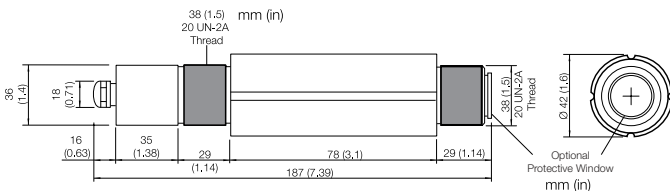
Outputs:

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, dead-band, 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

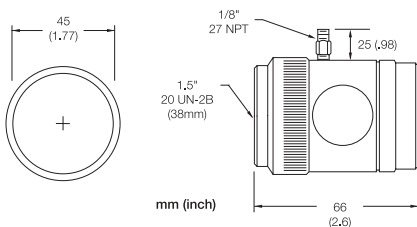
Sensor Specifications

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



Right angle mirror XXXTXXACRA

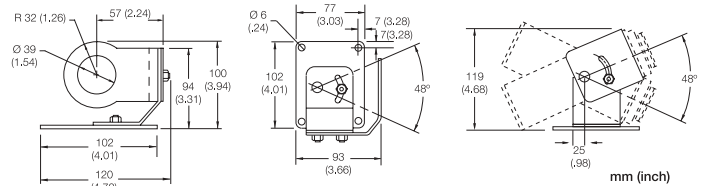


Accessories / Options

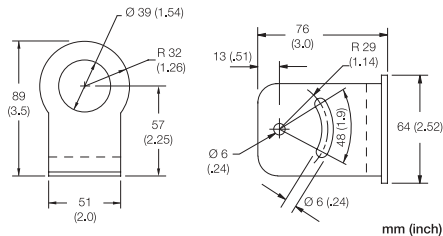
Remote Communications Kit (XXXTXACRCK)

- 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 (XXTXXACAP)
- Accessory conduit adapter, adapts sensor threads to .5 in. NPT (XXTXXACCA)
- Accessory pipe adapter, adapts sensor threads to 1.5 in. NPT (XXTXXACPA)
- Accessory right angle mirror, provides perpendicular view of target in tight installations (XXTXXACRA)
- *Optional air/water cooled housing for installation in environments up to 175°C (350°F)
- *Optional NIST traceable calibration certificate (XXTXXCERT)
- 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

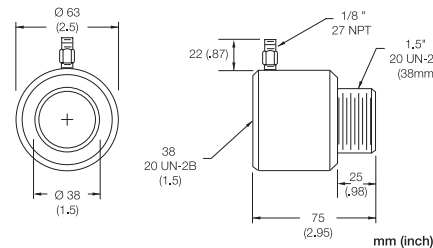
Adjustable bracket XXXTXXACAB



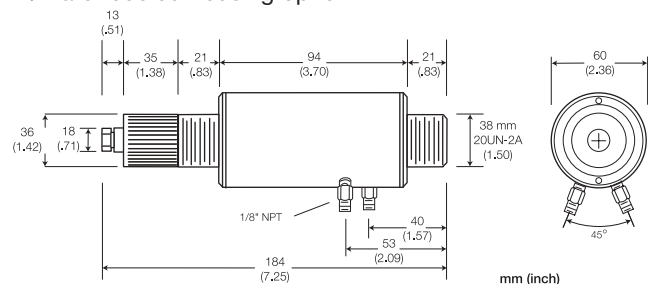
Fixed bracket XXXTXXACFB



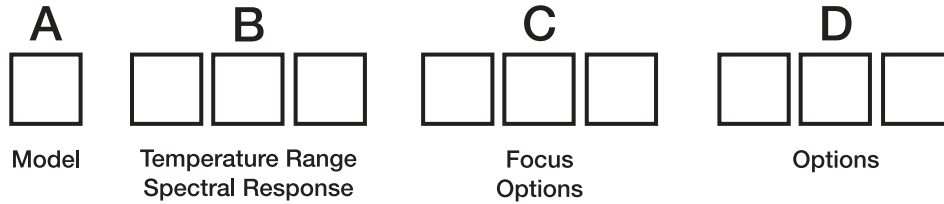
Air purge collar XXXTXXACAP



Air/Water cooled housing option



RAYTX



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, TXCLT 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.

XXTXCERT 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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