TX

Noncontact Temperature Measurement for Industrial Applications

Raytek®
Fluke Process Instruments

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 2000°C (0ºF 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 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

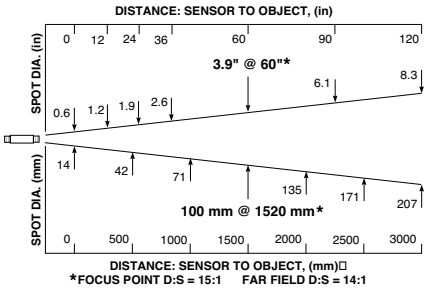
Model:	Spectral Response:	Temperature Range:
LT (Low Temp)	8 to 14 µm	-18°C to 500°C (0°F to 1000°F)
LT0 (Low Temp)	8 to 14 µm	0°C to 500°C (32°F to 932°F)
MT (Medium Temp)	3.9 µm	200°C to 1000°C (400°F to 1800°F)
HT (High Temp)	2.2 µm	500°C to 2000°C (950°F to 3600°F)
G5 (Glass)	5.0 µm	250°C to 1650°C (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)	ºC/ºF, Advanced Peak/Valley Hold, Averaging, Ambient temperature compensation

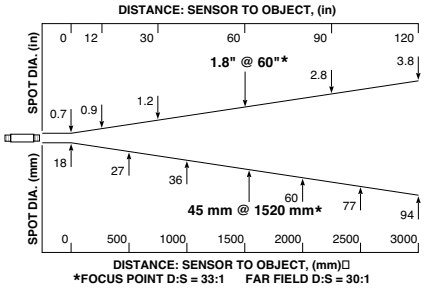
Nominal Optical Specifications

(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)



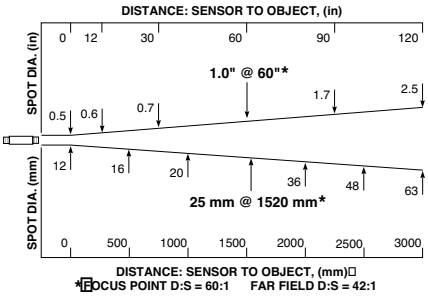
CLOSE FOCUS OPTION 1			
Distance to Object		Spot Diameter	
mm	in	mm	in
0	0	16	0.6
76	**3**	**2.5**	**0.1***
500	24	92	4.6
D:S = 30:1 Far Field = 5:1			

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

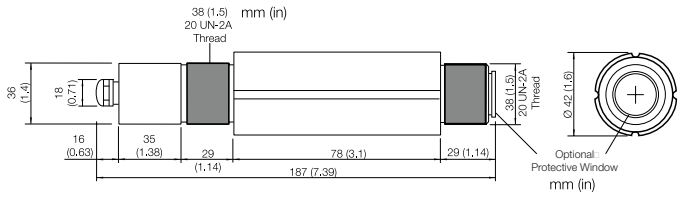
Electrical Specifications

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

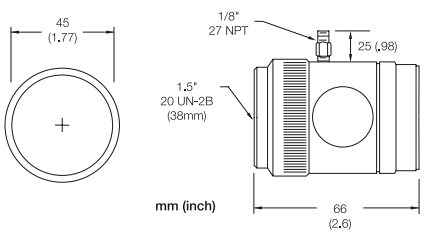
Sensor Specifications

Environmental Rating	NEMA-4 (IP 65)
Ambient Temperature Range: With air cooling With water cooling With ThermoJacket	0°C to 70°C (32°F to 160°F) up to 120°C (up to 250°F) up to 175°C (up to 350°F) 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: With cooling jacket	187 mm L x 42 mm diameter (7.4 L in x 1.7 in diameter) 187 mm L x 60 mm diameter (7.4 L in x 2.4 in diameter)
Weight: With cooling jacket	330 g (0.72 lbs) 595 g (1.3 lbs)

Sensor Dimensions



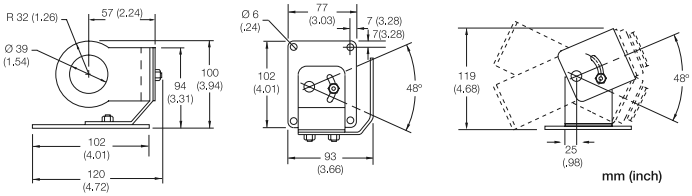
Right angle mirror XXXTXXACRA



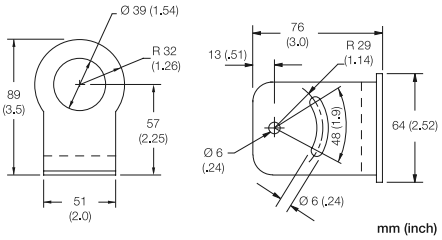
Accessories / Options

- 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 (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 175ºC (350ºF)
- *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 315ºC (600ºF)
- *Options must be specified at time of order

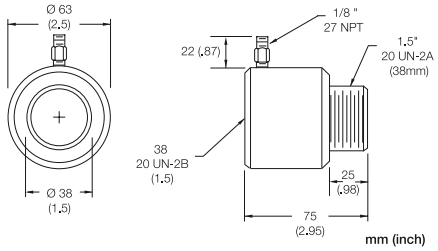
Adjustable bracket XXXTXXACAB



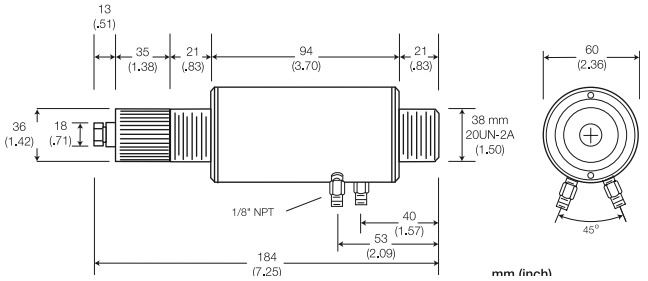
Fixed bracket XXXTXXACFB



Air purge collar XXXTXXACAP



Air/Water cooled housing option



RAYTX

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

RAYTX	Description
Code A	**Model** *(ºC or ºF 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 ºF, manual emissivity adjustment located inside rear wiring cover. Emissivity preset @ 0.95.
C	Basic model, includes fixed 4–20mA output scaled in ºC, manual emissivity adjustment located inside rear wiring cover. Emissivity preset @ 0.95.
Code B	**Temperature Range and Spectral Response**
LT	Low Temp: -18ºC to 500ºC (0ºF to 932ºF) / 8 to 14 microns, TXSLT default scaling is -18ºC to 500ºC (0ºF to 932ºF) and can be field set up to -18ºC to 538ºC (0º to 1000ºF), TXFLT output fixed and scaled to 0º to 1000ºF, TXCLT output is fixed and scaled to -18ºC to 500ºC
LT0	Low Temp: 0ºC to 500ºC / 8 to 14 microns, available on TXCLT only output is fixed and scaled 0ºC to 500ºC
MT	Medium Temp: 200ºC to 1000ºC (392ºF to 1832ºF) / 3.9 microns, TXSMT default scaling is 200ºC to 1000ºC (392ºF to 1832ºF), TXFMT output fixed and scaled to 400ºF to 1800ºF, TXCMT output is fixed and scaled to 200ºC to 1000ºC
HT	High Temp: 500ºC to 2000ºC (932ºF to 3632ºF) / 2.2 microns, TXSHT default scaling is 500ºC to 2000ºC (932ºF to 3632ºF), TXFHT output fixed and scaled to 950ºF to 3600ºF, TXCHT output is fixed and scaled to 500ºC to 2000ºC
G5	Glass Surface: 250ºC to 1650ºC (482ºF to 3002ºF) / 5.0 microns, TXSG5 default scaling is 250ºC to 1650ºC (482ºF to 3002ºF), TXFG5 output fixed and scaled to 500ºF to 3000ºF, TXCG5 output is fixed and scaled to 250ºC to 1650ºC
P7	Thin Film Plastics (Polyester and Teflon): 10ºC to 360ºC (50ºF to 680ºF) / 7.9 microns, TXSP7 default scaling is 10ºC to 360ºC (50ºF to 680ºF), TXFP7 output fixed and scaled to 50ºF to 650ºF, TXCP7 output is fixed and scaled to 10ºC to 360ºC
Code C	**Focus Options**
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 175ºC (350ºF).
	Intrinsically-Safe Rating, for TXS models only
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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