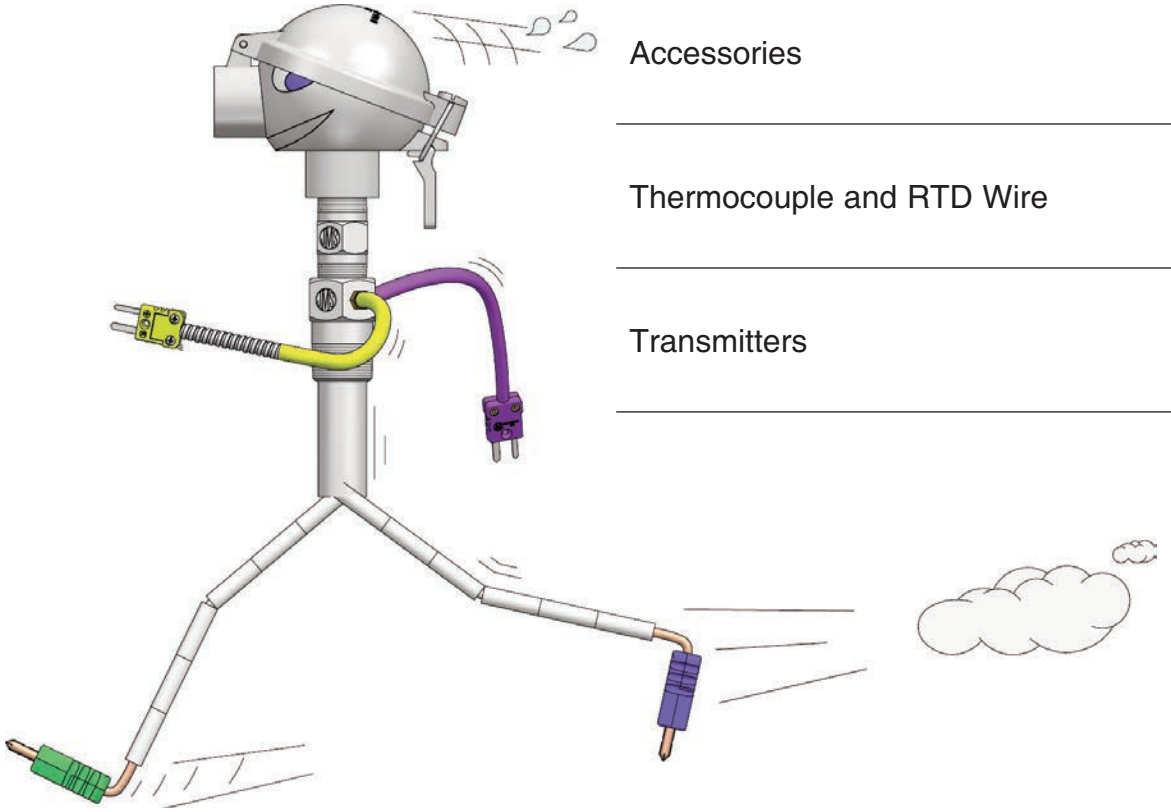
RESISTANCE TEMPERATURE DEVICES (RTDS)

Swifty Sensor



Due to space limitations we have excluded some part number selections from publication. Additional selections are available via JMS catalog cut sheets posted at www.JMS-SE.com. It is the final reference for JMS part numbers. Custom products are also available with drawings to suit your application. Call 1-800-873-1835 or email Sensors@JMS-SE.com for more information.

RESISTANCE TEMPERATURE DEVICES (RTDS)

#1	DESCRIPTION
3	RTD

#2 ELEMENT TYPE [4, 9, 10, 11, 15, 18, 22, 24] — 100 Ω Platinum 0.00385 alpha (Ω/Ω/°C) unless otherwise stated

	Resistor Accuracy at 0°C	Thermometer Class [pg. 3-18]	Resistor Class [pg. 3-18]
B	± 0.30°C (Competitor's Std)	B	≥ F 0.30
E	± 0.15°C (Standard)	A	≥ F 0.15
P*	± 0.06°C	AA	≥ 1/2 F 0.10
S*	± 0.03°C (Best Accuracy)	1/4 AA	≥ 1/10 F 0.10
N	± 0.74°C (120 Ω Nickel α=.00672)	Non-Standard	Non-Standard
M	± 0.30°C (1000 Ω)	B	≥ F 0.30
X	Other, specify [3-22]	--	--

Note: Wound or film resistors may be used.

* For compliant results, use 4 wire RTD for high accuracy (types P & S).

#3 ELEMENT CONSTRUCTION [4] [pg. 3-11]

S	Single	Standard construction
D	Dual	Standard construction
J	Single	Swaged construction
K	Dual	Swaged construction
X	Other, specify	

Note: Use swaged for high temperature, bendability, high vibration and/or longer than 90".

#4 TUBE DIAMETER MUST CHOOSE 1

P	1/2" (.500")	D	1/8" (.125")
A	3/8" (.375")	X	Other, specify
Y	5/16" (.312")	Z	N/A
B	1/4" (.250")		
R	6mm (.236")		
C	3/16" (.188")		

TIP CONSTRUCTION [5-30] [1-13] MUST CHOOSE 1

N	Normal, closed tip (Standard)
K	Pointed tip, 45°
M*	Weld pad
O*	Weld pad, removable
R2*	Gas/Air, exposed
W*	Enlarged tip
Y2*	Reduced tip

* Provide description when selecting these options.

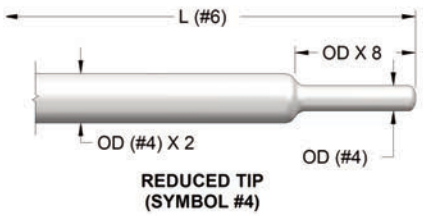
[ ] Brackets indicate page numbers where additional helpful information can be found in technical catalog. Now available online at www.JMS-SE.com/TechnicalCatalog

#5 TUBE MATERIAL [11, 12]

K	316 stainless steel	C	Teflon coated, stainless steel
L	316L stainless steel	S	Titanium
M	I-600 (Use if symbol #7 >500°F)	X	Other, specify

#6 LENGTH (L) (See illustrations on pages 3–1 and 3–2 for "L" dimension)

__" Immersion length in inches (lengths greater than 90" may be coiled for shipment)

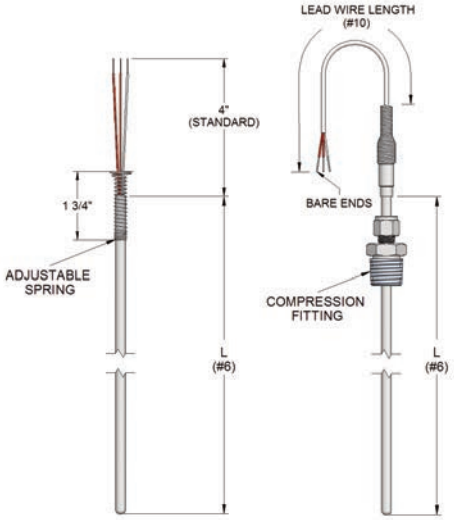


REDUCED TIP (SYMBOL #4)

#7 MAX. TEMPERATURE AT WHICH TIP WILL BE EXPOSED

A	<0°C (32°F) Cryogenic	=5	Kapton
B	<200°C (392°F)	=3	Teflon*
C	<285°C (550°F)	=5	Kapton*
D	<350°C (662°F)	=1	Fiberglass*
E	<660°C (1220°F)	=4	High temperature fiberglass*

* If no transition (Z) is in symbol 13, we recommend these corresponding selections for primary wire insulation in symbol 10.



Note: L is the overall length of the sensor to the transition, wire, plug, head, or fixed attaching device. L excludes non-fixed attaching devices.

NEW ***Skip to page 1-3 to complete selection #8 if your sensor requires a nipple and/or union extension.***

#8 STANDARD INDUSTRIAL ATTACHING DEVICE [1-3, 6-13]

X	Other, specify	
Z	N/A	No Attaching device
G	Single thread (process)	Welded design
F	Single thread (reversed)	
W	Double threaded	
H*	SS w/ SS ferrule	Compression design
I*	SS w/ Teflon ferrule	
J*	SS w/ Lava ferrule	
K*	SS w/ Nylon ferrule	
L*	Brass w/ Brass ferrule	
D	Single threaded (process)	Spring-Loaded design
C	Double threaded w/ oil ring	
A	Double w/ threaded retainer	
E	Adjustable spring	
S	Double threaded (most common)	
B	Double threaded Bayonet	
BS	Double threaded Bayonet w/ oil seal	
BD	Single threaded Bayonet	
BDS	Single threaded Bayonet w/ oil seal	

* For double threaded use a 2 suffix along with your selection. Example: H2

***Note:** High nickel proprietary spring material is rated to 1000°F (for 1/4" Ø sensors)*

OR → S { U N 6" H 1 }

SEE PAGE 1-3

3	E	S	BN	K	12"	B	S

RESISTANCE TEMPERATURE DEVICES (RTDS)

#9	PROCESS NPT		
L	1/8”	O	3/4”
M	1/4”	X	Other, specify
P	1/2” (Standard)	Z	N/A

#10	LEAD WIRE TYPE & LENGTH IN INCHES [see section 7]			
1__”	Fiberglass braid	X__”	Other, specify	**Note**: All wire in tubes > 1/8” OD will be 24 AWG. Smaller tubes will have a max. of 28 AWG. If no transition or armor is specified, wire may be fragile. JMS standard lead wire for RTDs is stranded plated copper.
3__”	Teflon (Standard)	Z	N/A	
4__”	High temperature fiberglass braid			
5__”	Kapton (Standard for Cryogenic)			

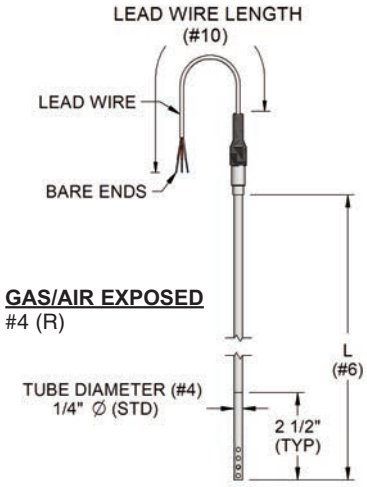
#11	ARMOR OR HEAT SHRINK/JACKET [7-7]		
A	3/16” ID SS flex armor (Standard)	G	Heat shrink/sleeving
B	3/16” ID SS flex armor Teflon coated white	H	Jacket to match primary insulation
C	3/16” ID SS flex armor Teflon coated black	J	Aluminum Mylar shielded and jacketed to match primary insulation
D	1/8” ID SS flex armor	Z	N/A
F	SS overbraid	X	Other, specify

#12	WIRE CONFIGURATION [17, 18]
T	2 Wire
Y	3 Wire
W	4 Wire

Note: Use a double symbol for 2 separate multiconductor lead wires, if dual elements. For example, TT.

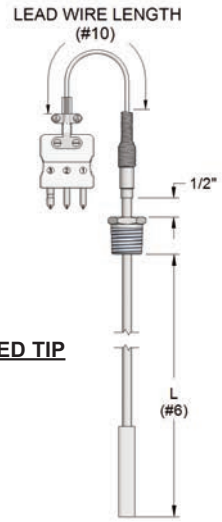
#13	TYPE OF TRANSITION [14]
H	Heat shrink
S	Size on size
T	3/8” OD
R	1/4” OD
Q	Cuttable (Std construction only) [3-12]
X	Other,specify
Z	No transition

Note: For high humidity/moisture environments (≤ 500˚F), put a 2 after your selection. For example, R2.
Note: For high temperatures at the transition area (500°F to 1200°F), put a 3 after your selection. For example, T3.



GAS/AIR EXPOSED
#4 (R)

Note: Immersion shown (#6) is overall length of tube for gas air sensors.



ENLARGED TIP
#4 (W)

#14	COLD END TERMINATION [Add'l options see Pg 1-7] Choose all that apply (Visit our online catalog for additional terminations, www.JMS-SE.com/ends)			
Connectors		**Heads [6-1] Visit www.JMS-SE.com/headspecs**		
B	Miniature plug	Exp. Proof	I	Aluminum, NEMA 4X, FM, CSA, IP66 (6IA/6B4)
C	Standard plug		J	316 SS, NEMA 4X, FM, CSA, IP66 (6ISS/6B4)
F	High temp plug (< 800°F)		P	Aluminum, NEMA 4X, FM, CSA, ATEX, IECEx, IP66 (6IAIEC/6B4)
WM	Microphone style plug		U	316 SS, NEMA 4X, FM, CSA, ATEX, IECEx, IP66 (6ISSATEX/6B4)
D	Miniature jack	Gen. Purpose	L	Aluminum w/ hinged cover (6L/6B4)
E	Standard jack		M	Aluminum w/ screw cover & chain (6M/6B4)
G	High temp jack (< 800°F)		N	Cast Iron w/ screw cover (6N/6B4)
WF	Microphone style jack		Q	Black Noryl plastic (6Q/6B4)
V	Hermetic plug		R	Aluminum high dome w/hinged cover (6R/6B4)
Y	M12 watertight plug		SS	316 SS w/ screw cover & chain (6SS/6B4)
Transmitters		**Other**		
8H	Isolated transmitter	A		Bare ends
8N	Non-isolated transmitter	K		Spade lugs (6SL)
8I	Hart Protocol	O		Open terminal block (6B4)
8E	Intrinsically safe	X		Other, specify
8D	Hart/Intrinsically safe			
8M	Integral transmitter (see page 3-5)			

Note: Add span range after transmitter selection. Example: 8H(0-200C).

#15	OPTIONS (Use only if applicable)		
1	Stainless steel tag	6*	Premium calibration report. Corrections data will be provided for all.
2	Plastic tag		
3	Paper tag		
4	Laser etch on probe	7	CE marking [page XV]
5	Calibrate at specified point(s). Corrections data provided for each point.	8	Guide 17025 calibration
		9	Bar code
		M	MTR

* Must specify increments & range (Example: 0 to 300°F, 10° increments)

P	3-36”	A	Y	T	A	1

COMPLETE PART NUMBER EXAMPLES

-with nipple-union-spring-loaded fitting extension assembly:
3ESBNK12”BS[UN6K1]PZZYZL1
-without extension assembly:
3ESBNK12”BSPZZYZL1

AVERAGING RTDS

Continuous averaging resistance temperature detectors are most frequently used in air washing and air handling systems where turbulent and stratified air flow may effect the temperature measurement in a tip sensitive probe. The average temperature of the air in the duct can be measured with this type of sensor.

Any application which requires an averaging of temperature across an area would be suited for this sensor type. The operating temperature range for a continuous averaging RTD is from -148 to 382°F. Lower temperatures and temperatures up to 900°F are handled with a multipoint design (4, 8, or 16 points).

#1	DESCRIPTION
3A	Averaging RTD

#2	ELEMENT TYPE 0.00385, 100Ω @ 0°C, Class B		
E*	Continuous, -148° to 382°F (-100° to 200°C)	X	Other, specify
P4**	Platinum 4 point, <900°F (<482°C)		
P8**	Platinum 8 point, <900°F (<482°C)		
P16**	Platinum 16 point, <900°F (<482°C)		

* Only available in 1/4" diameter up to 1200" long.
** Maximum probe length is 240"

#3	PROBE DIAMETER		
B	1/4" (.250")	C	3/16" (.188")

#4	SENSING LENGTH
__"	Sensing length in inches **Note:** Sensing length must be at least 4" shorter than the total probe length.

#5	TUBE MATERIAL		
K	316 Stainless steel	U	Copper

#6	TOTAL PROBE LENGTH
__"	Total probe length In inches

#7	STANDARD INDUSTRIAL ATTACHING DEVICE
W	Fixed 1/2" NPT double threaded SS fitting
B	Bayonet spring-loaded assembly for thermowells & heads
F	Reverse mounted single thread SS fitting fixed to sheath for attaching head
G	Fixed single threaded SS fitting
H	Compression fitting SS w/ SS ferrule
I	Compression fitting SS w/ Teflon ferrule
J	Compression fitting SS w/ lava ferrule
K	Compression fitting SS w/ Nylon ferrule
X	Other, specify
Z	N/A

For all compression fittings except fixed, immersion is overall length of the tube.

#8	PROCESS NPT		
L	1/8"	X	Other, specify
M	1/4"	Z	N/A
P	1/2"		

#9	LEAD WIRE TYPE & LENGTH IN INCHES
1 __"	Fiberglass braid
3 __"	Teflon
6 __"	Fiberglass braid/flex armor overall
7 __"	Teflon/flexible armor overall
8 __"	3 conductor fiberglass braid/SS overbraid
9 __"	3 conductor Teflon with Teflon jacket overall
10 __"	3 conductor Teflon/SS overbraid with Teflon jacket overall
X __"	Other, specify
Z	N/A

#10	WIRE CONFIGURATION
T	2 Wire
Y	3 Wire
W	4 Wire

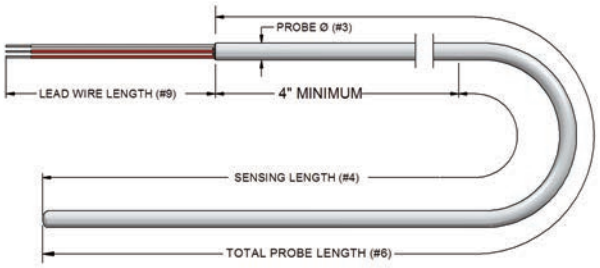
#11	MAX TRANSITION TEMP
P	< 500°F
Q*	> 500°F

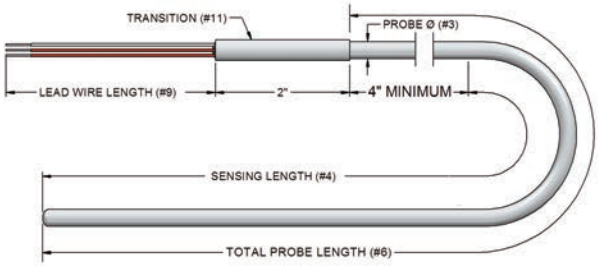
* Not valid for continuous element type.

Note: Call JMS for information about averaging thermocouples, swamp boxes and special proprietary multipoint designs.

Note: When LENGTH (Option #6) exceeds 90", the probe may be coiled for shipment.

Note: 9" minimum bend radius





3A	E	B	12"	K	18"	I	M	3-36"	Y	P

AVERAGING RTDS

#12	COLD END TERMINATION [Add'l options see Pg 1-7] (Choose as many as applicable)
A	Bare ends
B	Miniature plug
C	Standard plug
D	Miniature jack
E	Standard jack
F	High temperature plug (< 800°F)
G	High temperature jack (< 800°F)
I	Explosion proof head, NEMA 4X, FM, CSA, IP66 (6IA/6B4)
K	Spade lugs (6SL)
L	Aluminum head w/ hinged cover (6L/6B4)
M	Aluminum head w/ screw cover & chain (6M/6B4)
N	Cast Iron head w/ screw cover (6N/6B4)
O	Open terminal block (6B4)
Q	Black Noryl plastic head (6Q/6B4)
R	High dome head (6R)
V	Hermetic connector (6DC) - Male
WM	Microphone style connector (6DA) - Male
WF	Microphone style connector (6DA) - Female
X	Other, specify

Note: For any other cold end termination, use appropriate part numbers from section 6 in place of symbol #12.

#13	TAGGING AND CALIBRATION OPTIONS (use only if applicable)		
1	Stainless steel tag	5	Standard room temp calibration. Due to the limited size of calibration chambers and the potential sensing length of these sensors, we recommend one point at room temperature. Please contact factory for any other calibration options.
2	Plastic tag		
3	Paper tag		
4	Laser etch on probe	7	CE marking [Page XV of online technical catalog]
		9	Bar code
		M	MTR

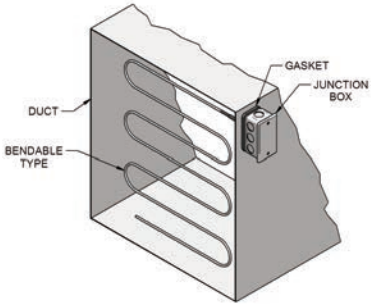
C	1

LOW COST AVERAGING RTDS

Low cost averaging RTDs sense the temperature of air streams in ducts and plenums. This sensor includes a junction box with gasket to prevent leakage and vibration noise.

These thermometers have a continuous element to sense true average temperature along their entire length. They provide accurate composite readings in locations where air may be stratified into hot and cold layers.

Rigid averaging sensors have a brass case. Bendable models have aluminum sheaths (Copper on special order) formable to a radius of 4". Bendable sensors can criss-cross ducts to average temperatures in two dimensions.



Specifications:
Temperature range: -45.5 to 135°C (-50 to 275°F); Gasket: 100°C (212°F); Leadwire: 22AWG, Teflon insulated, 8" long; Sheath diameter: .188" OD.

#1	DESCRIPTION
3L	Platinum, 100Ω @ 0°C, a=.00385

#2	SENSOR TYPE
56	Rigid
57	Bendable

#3	WIRE CONFIGURATION
T	2 Wire
Y	3 Wire

#4	INSERTION LENGTH
_____"	(Standard Lengths for Rigid type (inches): 12", 18", 24", 48", 60", 72" Standard Lengths for Bendable type (inches): 72", 144", 288")

#5	OPTIONS
A	Weatherproof connection box (2.12" W X 4.0" H X1.75" D)
B	Sensor only, no box
C	Stainless steel tag
X	Other

Note: When INSERTION LENGTH (Option #4) exceeds 90", the probe may be coiled for shipment.

3L	56	T	60"	A

RTD WITH INTEGRAL PC PROGRAMMABLE TRANSMITTER

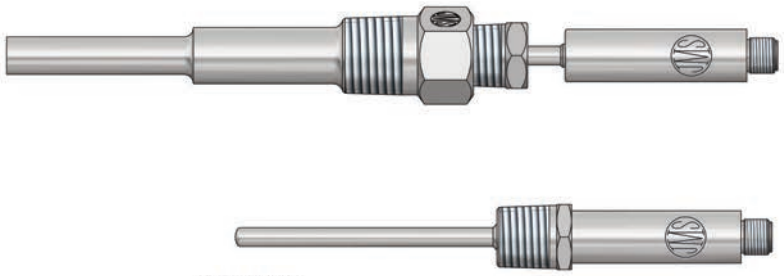
RTD with 4-20 mA INTEGRAL OUTPUT (RTD *in*, 4-20 mA *out*)

INDUSTRIAL STYLE INTEGRAL TRANSMITTER (Transmitter option see page 3-2, #14, 8M)

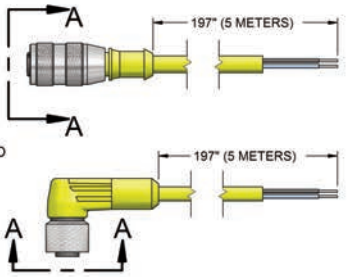
FEATURES:

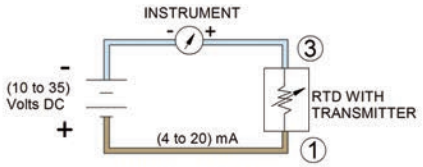
- PC programmable
- Carry a 4-20 mA to your PLC directly from the RTD with no special equipment.
- Available in fixed immersion and spring loaded for thermowells!!
- Quick-n-Clean M12 connection for easy replacement.
- NEMA 6P (IP67) rated with M12 connector.
- Ideal for most applications from -60 to 320°F.
- Ambient temperature limits -40 to 185°F.

Ideal for high moisture environments!



DETAIL VIEW A-A
(M12 CONNECTOR)





4 WIRE RTD WITH TRANSMITTER

JMS PART #	DESCRIPTION
6SKWT*	M12 CORDSET, 4 POLE, FEMALE, STRAIGHT, IP67, 197" (5 METER) LENGTH
6RKWT*	M12 CORDSET, 4 POLE, FEMALE, RIGHT ANGLE, IP67, 197" (5 METER) LENGTH

*Add an X to the end of the part # to specify a custom cord length.

ECONOMY HAND HELD INFRARED SENSOR

To order, use JMS part number: IR20L

Only! *$35.00*

OPERATING INSTRUCTIONS
This thermometer is a non-contact, infrared thermometer. Simply aim the thermometer at the target with the probe and press the measuring button to display the surface temperature. The distance to target diameter ratio (Distance:Spot) is 12:1, therefore the device should be positioned as close to the target as possible.

°C/°F:
The units of temperature indicated on the probe can be changed from °C to °F by pressing °C/°F toggle button.

BATTERY REPLACEMENT:
When an empty battery icon flashes in the LCD, this indicates that the battery is low and should be replaced. Confirm that the power is OFF, open the battery door in the handle and replace the 9 volt battery. Please remember to dispose of the batteries properly and to keep away from children.

SPECIFICATIONS

Measurement Range:	-50 to 380°C (-58 to 716°F).
Operating & Storage Temperature:	0 to 50°C (32 to 122°F)
Accuracy:	± 2% of reading or 2°C (4°F) (*whichever is greater*)
Resolution:	0.1°C/0.1°F
Response Time:	≤ 0.8 second.
Emissivity Range:	0.95 fixed.
Spectral Response:	5-14 µM
Distance to Spot Ratio:	12:1
Auto shut off feature:	Yes