



TO Series



SPECIFICATIONS

Wiring	22 AWG; 2-wire: RTD/Thermistor, 4 to 20 mA; 3-wire: voltage output models
Junction Box	Weather resistant
Temperature Transmitter Option	
Input Power	4 to 20 mA version - Loop powered Class 2, 12 to 30 Vdc only, 30 mA max; 0-5/0-10 V versions - 12-30 Vdc/24 Vac, 50/60 Hz, 15 mA max
Temp. Output	2-wire, loop powered Class 2, 4 to 20mA; 3-wire, 0-5 V/0-10 Vdc
Sensor Type	Solid-state, integrated circuit (Transmitter)
Accuracy	$\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$) typical
Ranges	0 to 50 $^{\circ}\text{C}$ (32 to 122 $^{\circ}\text{F}$), -40 to 50 $^{\circ}\text{C}$ (-40 to 122 $^{\circ}\text{F}$)*
LINITEMP OPTION	
Input Power	5 to 30 Vdc
Output	10mV/ $^{\circ}\text{C}$
Operating Temp	-25 to 105 $^{\circ}\text{C}$ (-13 to 221 $^{\circ}\text{F}$)
Calibration Offset	1.5 $^{\circ}\text{C}$ (2.7 $^{\circ}\text{F}$) typical; 2.5 $^{\circ}\text{C}$ (4.5 $^{\circ}\text{F}$) max. at 25 $^{\circ}\text{C}$ (77 $^{\circ}\text{F}$)
Offset over Temp.	1.8 $^{\circ}\text{C}$ (3.24 $^{\circ}\text{F}$) typical; 3.0 $^{\circ}\text{C}$ (5.4 $^{\circ}\text{F}$) max. over 0 to 70 $^{\circ}\text{C}$ (32 to 158 $^{\circ}\text{F}$) range; 2.0 $^{\circ}\text{C}$ (3.6 $^{\circ}\text{F}$) typical, 3.5 $^{\circ}\text{C}$ (6.3 $^{\circ}\text{F}$) max. over -25 to 105 $^{\circ}\text{C}$ (-13 to 221 $^{\circ}\text{F}$) range
RESISTIVE OPTION	
Operating Temp	-25 to 105 $^{\circ}\text{C}$ (-13 to 221 $^{\circ}\text{F}$)
RTD/Thermistor	See table at right
WARRANTY	
Limited Warranty	5 years

SLEEK DESIGN, REDUCES SOLAR HEATING

FEATURES

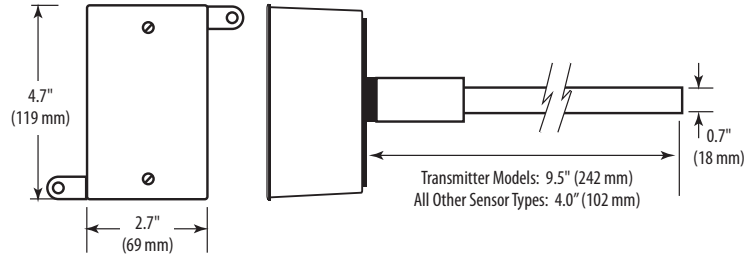
- Sleek design reduces solar heating...reliable and accurate
- Available with transmitter, linitemp, RTDs, or thermistors

DESCRIPTION

The TO Series outdoor temperature sensors feature a sleek, weather resistant design, and provide easy installation. The durable probe is encased in a radiation shield to reduce the effects of solar heating. Choose from a variety of RTD, thermistor, or transmitter outputs to suit any application.



DIMENSIONAL DRAWING



ORDERING INFORMATION



RTD/Thermistor Models

Sensor Type



B = 100R platinum, RTD
 C = 1k platinum, RTD
 D = 10k T2, Thermistor
 E = 2.2k, Thermistor
 F = 3k, Thermistor
 G = 10k CPC, Thermistor
 H = 10k T3, Thermistor
 I = 1k Balco (Nickel-iron) RTD
 J = 10k Dale, Thermistor
 K = 10k w/11k shunt, Thermistor
 M = 20k NTC, Thermistor
 N = 1800 ohm, Thermistor
 P = 10mV/°C, Linitemp
 R = 10k US, Thermistor
 S = 10k 3A221, Thermistor
 T = 100k, Thermistor
 U = 20k "D", Thermistor
 W = 10k T2 high accuracy, Thermistor
 Y = 10k T3 high accuracy, Thermistor
 Z = 10k E1, Thermistor
 CC = 15k, Thermistor

Output



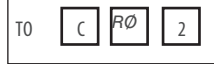
= Resistive Output

Cal Certificate



0 = None
 1 = 1 point Cal validation
 2 = 2 point Cal validation

Example:



*The CE mark indicates RoHS2 compliance. Please refer to the Declaration of Conformity for additional details.

Temperature Transmitter Models

Output



M = 4-20 mA
 V = 0-5/0-10 Vdc

Range



1 = -40 to 50 °C
 (-40 to 122 °F)
 2 = 0 to 50 °C
 (32 to 122 °F)

Cal Certificate



0 = None
 1 = 1 point Cal validation
 2 = 2 point Cal validation

Example:



Class	Pt RTD		Balco RTD	THERMISTOR										10k Type 2	10k Type 3
Type	100 Ohm	1000 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k	20k "D"	100k		
Accuracy	±0.3°C 0.00385 curve	±0.3°C 0.00385 curve	±1% @70°C	±0.2°C 0/70°C	±0.2°C 0/70°C	±1.0°C -50/150°C	±0.2°C 0/70°C	±1.1°C -20/70°C	±0.2°C 0/70°C	±1.1°C 0/70°C	Consult Factory	Consult Factory	Consult Factory	±0.1°C 20/70°C ±0.2°C 0/20°C	±0.1°C 0/70°C
Temp. Response*	PTC	PTC	PTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC

*PTC: Positive Temperature Coefficient *NTC: Negative Temperature Coefficient

STANDARD RTD AND THERMISTOR VALUES (Ohms Ω)															
°C	°F	100 Ohm	1000 Ohm	1000 Ohm	2.2k	3k	10k Type 2	10k Type 3	10k Dale	10k 3A221	10k "G" US	20k NTC	20k "D"	100k	
-50	-58	80.306	803.06	740.46	154.464	205.800	692.700	454.910	672.300	-	441.200	1,267.600	-	-	692.700
-40	-40	84.271	842.71	773.99	157.081	208.690	704.700	465.089	692.300	333.562	239.700	643.800	803.200	3,366.000	344.700
-30	-22	88.222	882.22	806.02	160.330	212.340	720.100	477.307	707.200	346.081	251.300	666.000	825.800	3,570.000	367.100
-20	-4	92.160	921.60	841.00	164.022	216.446	736.300	489.307	719.200	358.162	263.300	688.000	848.000	3,774.000	389.200
-10	14	96.086	960.86	877.46	167.674	220.552	752.300	501.307	731.200	370.223	275.300	710.000	869.000	3,978.000	411.300
0	32	100.000	1,000.00	913.66	171.326	224.668	768.300	513.307	743.200	382.284	287.300	732.000	890.000	4,182.000	433.400
10	50	103.903	1,039.03	952.25	175.078	228.824	784.300	525.307	755.200	394.345	299.300	754.000	911.000	4,386.000	455.500
20	68	107.794	1,077.94	991.82	178.784	232.980	800.300	537.307	767.200	406.406	311.300	776.000	932.000	4,590.000	477.600
25	77	109.735	1,097.35	1,013.50	181.814	237.136	816.300	549.307	779.200	418.467	323.300	798.000	953.000	4,794.000	499.700
30	86	111.673	1,116.73	1,035.18	184.848	241.292	832.300	561.307	791.200	430.528	335.300	820.000	974.000	4,998.000	521.800
40	104	115.541	1,155.41	1,077.68	189.199	249.585	868.300	585.307	815.200	454.528	359.300	844.000	1,016.000	5,202.000	563.900
50	122	119.397	1,193.97	1,120.52	193.550	257.878	904.300	609.307	839.200	478.528	383.300	868.000	1,058.000	5,406.000	586.000
60	140	123.242	1,232.42	1,166.13	197.901	266.171	940.300	633.307	853.200	502.528	407.300	892.000	1,100.000	5,610.000	608.100
70	158	127.075	1,270.75	1,210.75	202.252	274.464	976.300	657.307	867.200	526.528	431.300	916.000	1,142.000	5,814.000	630.200
80	176	130.897	1,308.97	1,254.55	206.503	282.757	1,012.300	681.307	881.200	550.528	455.300	938.000	1,184.000	6,018.000	652.300
90	194	134.707	1,347.07	1,301.17	210.744	291.050	1,048.300	705.307	895.200	574.528	479.300	960.000	1,226.000	6,222.000	674.400
100	212	138.506	1,385.06	1,348.38	214.985	299.343	1,084.300	729.307	909.200	598.528	503.300	982.000	1,268.000	6,426.000	696.500
110	230	142.293	1,422.93	1,397.13	219.226	307.636	1,120.300	753.307	923.200	622.528	527.300	1,004.000	1,310.000	6,630.000	718.600
120	248	146.068	1,460.68	1,444.44	223.467	315.929	1,156.300	777.307	937.200	646.528	551.300	1,026.000	1,352.000	6,834.000	740.700
130	266	149.832	1,498.32	1,496.28	227.708	324.222	1,192.300	801.307	951.200	670.528	575.300	1,048.000	1,394.000	7,038.000	762.800
Sensor Codes		B	C	I	E	F	D	H	J	S	R	M	U	T	W
															Y

To compute Linitemp Temperature
mV reading/10 - 273.15 = Temperature in °C