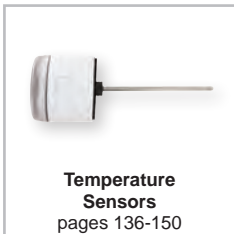
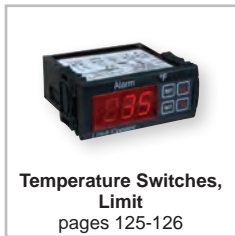
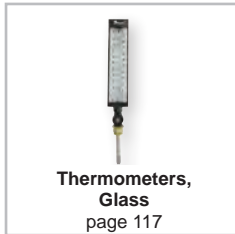
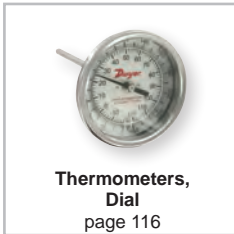


SELECTION GUIDE
pages 112-113

TYPICAL APPLICATIONS
pages 114-115



FEATURED PRODUCTS

LOW LIMIT FREEZE PROTECTION SWITCH SERIES DFS2 | page 131








- (2) SPDT switch contacts allowing for shutdown of equipment and alarming building management system
- Automatic or manual reset action and 10 foot or 20 foot capillary lengths to meet multiple application needs

TEMPERATURE TRANSMITTER MODEL TBU-00 | page 134






- Universal sensor input for thermocouples, RTDs, thermistors, or mV voltage sensors
- Downloadable software allowing for custom ranging of output signal

Dwyer**DIAL**
Thermometers

					
SERIES	BT - page 116	BTLRN - page 116	ITA - page 117	RRT3 - page 118	BTO - page 118
Range	0 to 1000°F	0 to 200°F	-40 to 550°F	-40 to 300°F	0 to 550°F
Dial Size	2", 3" or 5"	3"	9" liquid filled linear scale	3-1/2" with set point and SPDT output	3" or 5" with 4-20 mA temperature output
Stem Length	2.5", 4" or 6"	12" to 72"	2-1/2" or 5" thermowell	3-1/8" remote stem with 10.5" capillary	2-1/2", 4", 6", 9", or 12"
Process Connection	1/2" NPT; Back, Lower, or Adjustable mount	1/2" NPT; Back mount	3/4" NPT; Adjustable lower mount	1/2" NPT; Remote mount	1/2" NPT; Adjustable mount





LIMIT CONTROL
Digital Temperature Switches

			
SERIES	16L - page 125	TSF-DF - page 126	TSF - page 126
Number of Temperature Units	1	1	1
Temperature Input Type	Thermocouple, RTD, voltage, or current	Type J, K, or S thermocouple	Type J, K, or S thermocouple
Digital Input	No	Yes	Yes
Number of Relay Outputs	1 or 2	1	1
Relay Type	2 SPST, 1 SPDT	SPST	SPDT
Approvals	FM, UL	CE, UL	CE, FM, UL

These Selection Guides are for quick comparison of similar products. Please refer to the catalog page number referenced for complete product information and specifications.

PID LOOP CONTROLLERS

Temperature and Process Controllers

				
SERIES	16C, 8C, 4C - page 119	32B, 16B, 8B, 4B - pages 120-121	16G, 8G, 4G - pages 122-123	SCD - page 124
Number of Temperature Inputs	1	1	1	1 to 8
Temperature Input Type	Thermocouple or RTD	Thermocouple, RTD, current, or voltage	Thermocouple, RTD, current, or voltage	Thermocouple, RTD, current, or voltage
DIN Sizes	1/16, 1/8, 1/4	1/32, 1/16, 1/8, 1/4	1/16, 1/8, 1/4	DIN rail mount
Number of Outputs	1	2	2	2 to 16
Output Type	SPDT mechanical relay 14 VDC pulse voltage 4 to 20 mA current	SPDT mechanical relay 14 VDC pulse voltage 4 to 20 mA current 0 to 10 VDC voltage	SPDT mechanical relay 14 VDC pulse voltage 4 to 20 mA current 0 to 10 VDC voltage	SPDT mechanical relay 14 VDC pulse voltage 4 to 20 mA current 0 to 10 VDC voltage
Approvals	CE, UL	CE, UL	CE, UL	CE, UL

HEATING & COOLING/REFRIGERATION CONTROL

Digital Temperature Switches

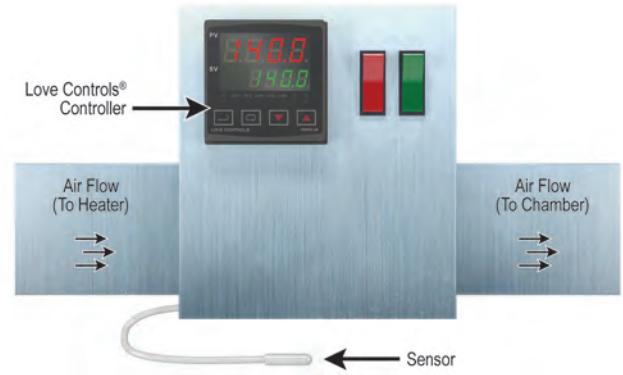
						
SERIES	40T & 40M - page 127	TCS - page 127	TST & TS2 - page 128 & 129	TSXT - page 128	TSS2 - page 129	TSW - page 130
Number of Temperature Units	1	1	1	3	2	1 or 2
Temperature Input Type	40T: Type J or K thermocouple, 2 or 3 wire PT 100 RTD; 40M: Thermocouple, RTD, thermistor, current, or voltage	Type J, K, or S thermocouple	TST: PTC or NTC thermistor; TS2: PTC	PTC or NTC thermistor	PTC or NTC thermistor	PTC or NTC thermistor
Digital Input	No	No	No	Yes	No	No
Number of Relay Outputs	1	1	2	1, 2, or 3	2	1 or 2
Relay Type	SPDT	SPDT	SPDT	1 output models: SPDT 2 & 3 output models: SPST	SPDT	SPDT
Approvals	CE, UL	CE, UL	CE, cURus	CE, cURus	CE, cURus	CE, cURus

These Selection Guides are for quick comparison of similar products. Please refer to the catalog page number referenced for complete product information and specifications.



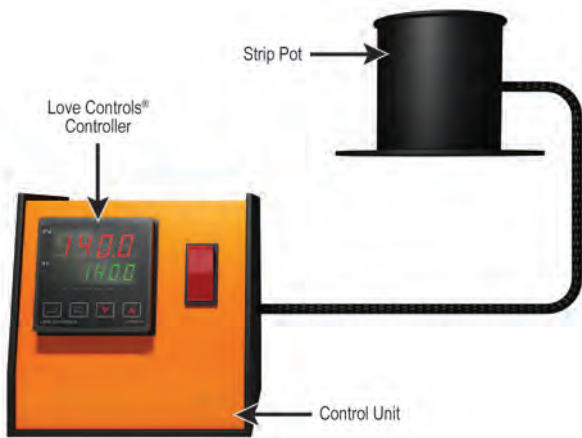
Environmental chamber control simplified with digital zone control.

Environmental chambers have traditionally used separate controls to handle the temperature and relative humidity control tasks. The Love Controls® 32DZ dual zone control with Love® 5000 Series RTD and Dwyer® RH Humidity transmitter controls both parameters in a single small format (1/32 DIN) control to handle both zones, simplifying wiring and reducing panel costs. The 32DZ can switch small resistive loads directly or, when used with Dwyer® Series 62 solid state relays (not shown), can switch larger loads.



Dwyer® controllers used within heater controllers.

In bioscience laboratories, the preferred methods of temperature control for experiments are heated water baths. There are experiments where water cannot be used, so the next feasible option is to send temperature controlled air to the experiment site. In order to use temperature controlled air, an air heater is needed. Within this product, a Love Controls® temperature controller is used for accurate and responsive temperature control. The Love Controls® controller can adapt to a different environment through different operating modes such as SELF-TUNE or manual PID adjustments, or preset PID responses.



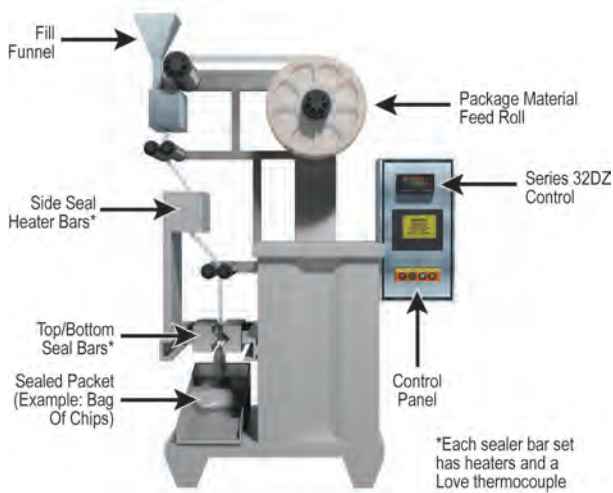
Love Controls® controllers involved in insulation removal.

For most wires, removing the insulation is easy, but for magnetic and enamel wires, removing the insulation is very difficult. One way to easily remove the insulation of the magnetic or enamel wire is to dip them in a solution of molten fused salts. The salts are heated to a temperature high enough to melt the salts into a liquid, but not deteriorate them. This process uses a Love Controls® feedback temperature controller. The Love Controls® controller allows the operator to input a desired temperature and maintain that temperature accurately. The Love Controls® controller will also retain the input temperature after the power is disconnected.



Series TS Digital Temperature Switches regulate temperature in refrigerated and display cases.

When storing food or other perishables in chillers or display cases, temperature must be carefully regulated to ensure the products remain fresh. If the storage area rises above the critical preservation temperature, products can have their shelf life dramatically shortened or be spoiled altogether. A Dwyer® Series TSX3 Digital Temperature Switch will prevent these scenarios by monitoring temperature and activating refrigeration and defrost cycles to ensure the storage temperature stays within safe limits.



Form, fill and seal machine control simplified with dual zone control.

Form, fill and seal machines traditionally have used separate controls to handle the temperature control requirement for the side and top/bottom seal bars. The Love Controls® 32DZ with Love® 5000 Series thermocouples allows for a single small format (1/32 DIN) control to handle both zones, simplifying wiring and reducing panel costs. The 32DZ can switch small resistive loads directly or, when used with the Love® 62 Series solid state relays (not shown), can switch larger loads.



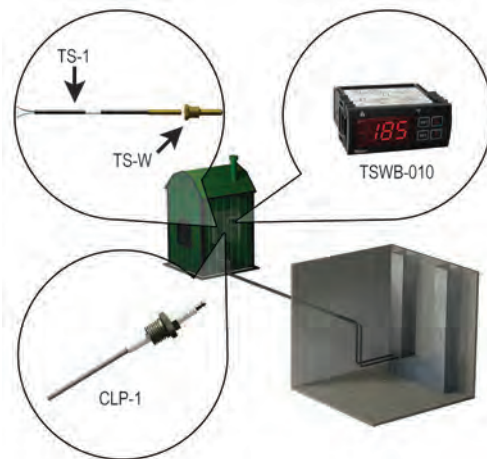
Love Controls® controllers used in the packaging of condiments.

Packaging of condiments require the sealing bars to be heated to a temperature hot enough to seal the packages, but not destroy the packaging material. The heat on the sealing bars needs to be controlled to ensure the heat does not become excessive. Love Controls® controllers are used in this process to accurately control the heat on the sealing bars. The sensors from the Love Controls® controllers are placed on the sealing bars to ensure accurate temperature readings. Should the heat become excessive, an alarm light on the controller notifies the operator of the impending conditions.



Resin transfer molding.

Accurate control of temperature and epoxy resin flow is important during resin transfer molding. For the epoxy resin to have an even and thorough flow, the resin must be at a temperature high enough to allow it to flow, yet not burn the resin. With the help of a Love Controls® controller, the temperature of the resin is accurately controlled under different conditions through the different PID operating modes. Another Love Controls® controller, with a flow transducer, is used in this process to control the flow of the epoxy resin. The Love Controls® controller provides information on the temperature and flow rate to the computer through an RS-485 serial communication option.



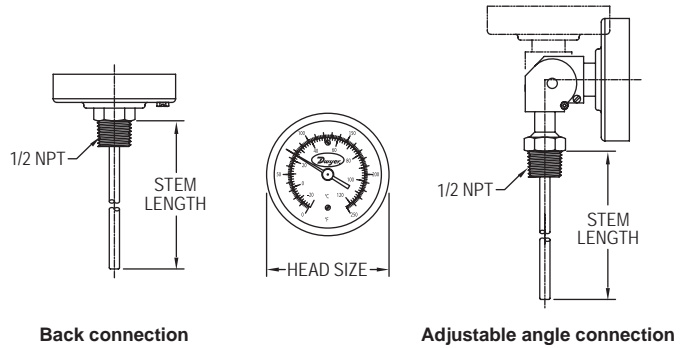
Controlling water temperature in outdoor wood furnace.

The Series TSWB is the ideal control for monitoring water temperature and water level in outdoor wood furnaces. The Series TSWB controls the damper and/or the fan that provides oxygen to the flame in the fire box. Usually an external light will also be controlled by the Series TSWB to inform the user that the furnace is out of wood or that the water level is low. The TSWB accepts thermistor inputs for temperature and conductivity probe, Dwyer CLP-1, inputs for monitoring water level.

Dwyer
SERIES BT

BIMETAL THERMOMETER

2", 3" or 5" Dial, Dual Scale, ±1% FS Accuracy, External Reset



The **Series BT Bimetal Thermometer** offers accurate, reliable service even in the toughest environments. These corrosion resistant units are constructed from stainless steel and are hermetically sealed to prevent crystal fogging.

FEATURES/BENEFITS

- Hermetically sealed
- Adjustable dial position models

APPLICATIONS

- Chiller or boiler water temperature monitoring
- Treatment plant temperature monitoring

SPECIFICATIONS

Wetted Materials: 304 SS.
Housing Material: Series 300 SS.
Lens: Glass.
Accuracy: ±1% full-scale.
Response Time: ≤ 40 s.
Temperature Limits: Head: 200°F (93°C); Stem: Not to exceed 50% over-range or 1000°F (538°C) or 800°F (427°C) continuously.
Process Connection: 1/4" NPT on 2" dial size; 1/2" NPT on 3" or 5" dial size.
Stem Diameter: 1/4" OD.
Immersion Depth: Minimum 2" in liquids, 4" in gas.

MODEL CHART

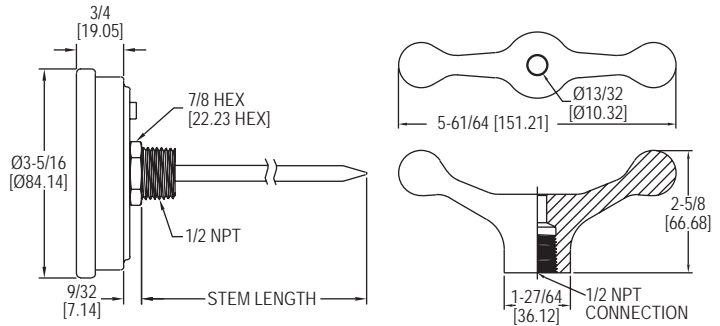
Model	Dial Size	Stem Length	Connection	Range °F (°C)	Degree Div °F (°C)	Model	Dial Size	Stem Length	Connection	Range °F (°C)	Degree Div °F (°C)
BTB22551*	2"	2-1/2"	Back	0 to 250	2	BTB3605D	3"	6"	Back	0 to 250 (-20 to 120)	2 (2)
BTB2405D	2"	4"	Back	0 to 250 (-20 to 120)	2 (2)	BTA54010D	5"	4"	Adjustable	0 to 200 (-20 to 100)	2 (2)
BTB2409D	2"	4"	Back	200 to 1000 (100 to 550)	10 (5)	BTA5405D	5"	4"	Adjustable	0 to 250 (-20 to 120)	2 (2)
BTB32510D	3"	2-1/2"	Back	0 to 200 (-20 to 100)	2 (2)	BTA5407D	5"	4"	Adjustable	50 to 550 (10 to 290)	5 (5)
BTB3255D	3"	2-1/2"	Back	0 to 250 (-20 to 120)	2 (2)	BTA56010D	5"	6"	Adjustable	0 to 200 (-20 to 100)	2 (2)
BTB3257D	3"	2-1/2"	Back	50 to 550 (10 to 290)	5 (5)	BTA5605D	5"	6"	Adjustable	0 to 250 (-20 to 120)	2 (2)
BTB34010D	3"	4"	Back	0 to 200 (-20 to 100)	2 (2)	BTA5607D	5"	6"	Adjustable	50 to 550 (10 to 290)	5 (5)
BTB3405D	3"	4"	Back	0 to 250 (-20 to 120)	2 (2)	BTC3255D	3"	2-1/2"	Lower	0 to 250 (-20 to 120)	2 (2)
BTB3407D	3"	4"	Back	50 to 550 (10 to 290)	5 (5)						

*Model offered in Fahrenheit scale only.

SERIES BTLRN

LONG REACH BIMETAL THERMOMETER

Extra-long Stems Reach Remote Areas, Gripping Handle Available



The **Series BTLRN Long Reach Bimetal Thermometer** reaches areas that other thermometers can't. A gripping handle is available as an accessory to comfortably hold the thermometer during temporary installations.

FEATURES/BENEFITS

- Stem lengths from 12" to 72"

APPLICATIONS

- Large container monitoring
- Duct temperature measurement

SPECIFICATIONS

Wetted Materials: 304 SS.
Housing Materials: Series 300 SS.
Lens: Glass.
Accuracy: ±1%.
Temperature Limits: Ambient: -40 to 392°F (-40 to 200°C).
Dial Size: 3".
Process Connection: 1/2" NPT.
Resolution: 2°F (1°C).
Weight: 1.0 lb (0.45 kg).

MODEL CHART

Model	Stem Length	Range*
BTLRN312101	12"	0 to 200°F
BTLRN318101	18"	0 to 200°F
BTLRN324101	24"	0 to 200°F
BTLRN336101	36"	0 to 200°F
BTLRN348101	48"	0 to 200°F
BTLRN360101	60"	0 to 200°F
BTLRN372101	72"	0 to 200°F

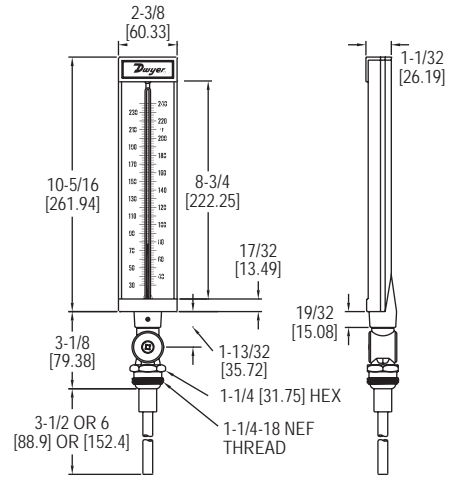
*Dual scale units available by changing last digit to D. Example: BTLRN31210D

ACCESSORIES

Model	Description
BTLR-GH	Gripping handle

INDUSTRIAL THERMOMETER

9" Scale, Adjustable Angle Stem



The **Series IT Industrial Thermometer** allows users to easily take accurate temperature measurements in any environment. The case of the IT series is made of die cast aluminum for extra durability in industrial environments.

FEATURES/BENEFITS

- Organic, non-toxic fill fluid
- Dual scale in °F and °C
- Adjustable stem angle

APPLICATIONS

- Boiler or chiller temperature monitoring

MODEL CHART			
3-1/2" Stem Model	Range	6" Stem Model	Range
ITA9351D	-40 to 110°F (-40 to 43°C)	ITA9601D	-40 to 110°F (-40 to 43°C)
ITA9352D	0 to 120°F (-17 to 49°C)	ITA9602D	0 to 120°F (-17 to 49°C)
ITA9353D	0 to 160°F (-17 to 71°C)	ITA9603D	0 to 160°F (-17 to 71°C)
ITA9354D	20 to 180°F (-6 to 82°C)	ITA9604D	20 to 180°F (-6 to 82°C)
ITA9355D	30 to 240°F (0 to 114°C)	ITA9605D	30 to 240°F (0 to 114°C)
ITA9356D	30 to 300°F (-1 to 149°C)	ITA9606D	30 to 300°F (-1 to 149°C)
ITA9357D	50 to 400°F (10 to 240°C)		
ITA9358D	50 to 550°F (10 to 288°C)		

SPECIFICATIONS

Wetted Material: Tapered cast aluminum with graphite fill.

Housing Material: 9" (228 mm)

Lens: Glass.

Accuracy: 1% accuracy.

Scales: Aluminum painted white with black markings.

Process Connection: 1-1/4-18 NEF thread.

Liquid Filling: Organic blue liquid filled tube.

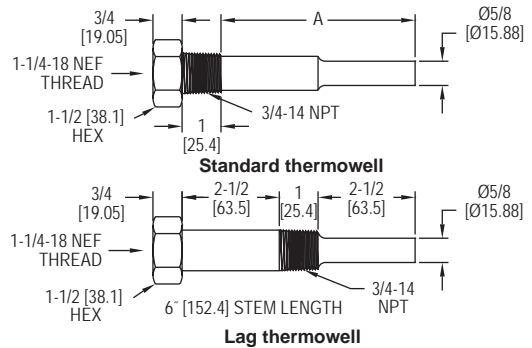
Mounting: Adjustable stem: Vertical plane 180° horizontal plane 360°.

Weight: 1 lb 7 oz (0.65 kg).

SERIES IT-W

INDUSTRIAL THERMOMETER THERMOWELLS

Fits IT Thermometers with 3-1/2" and 6" Stem Lengths



The **Series IT-W Industrial Thermometer Thermowells** reduce installation cost and time by eliminating the need to drain the system when servicing industrial thermometers. The thermowells protect industrial thermometers from high pressure, flow and corrosive media.

FEATURES/BENEFITS

- Designed to fit the Series IT industrial thermometers
- Lag stems available

APPLICATIONS

- Boiler or chiller temperature monitoring

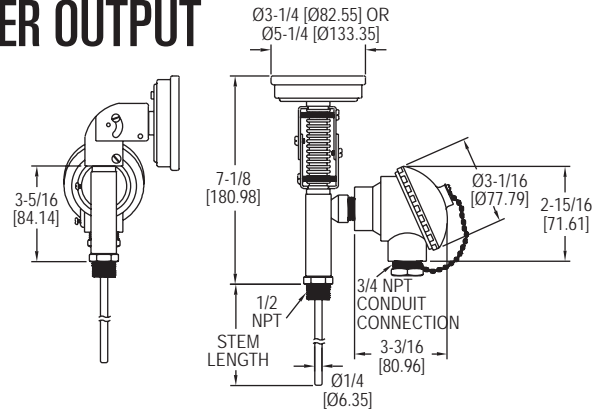
MODEL CHART			
Model	Material	Insertion Length	Lag
IT-W01	Brass	2-1/2"	N/A
IT-W11	304 SS	2-1/2"	N/A
IT-W21	316 SS	2-1/2"	N/A
IT-W04	Brass	5"	N/A
IT-W14	304 SS	5"	N/A
IT-W24	316 SS	5"	N/A
IT-W07	Brass	2-1/2"	2-1/2"
IT-W17	304 SS	2-1/2"	2-1/2"
IT-W27	316 SS	2-1/2"	2-1/2"

USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

BIMETAL THERMOMETER WITH TRANSMITTER OUTPUT

Bimetal Stem with 4-20 mA Output, 3" or 5" Dial



The **Series BTO Bimetal Thermometer with Transmitter Output** eliminates the need for a separate thermometer and transmitter.

FEATURES/BENEFITS

- Thermometer and transmitter in one device
- Weatherproof construction

APPLICATIONS

- Boilers
- Compressors
- Thermal oxidizers

SPECIFICATIONS

THERMOMETER SPECIFICATIONS
Wetted Materials: 304 SS.
Housing Material: 304 SS.
Lens: Glass.
Accuracy: $\pm 1\%$ FS.
Temperature Limits: Ambient: -58 to 185°F (-50 to 85°C).
Dial Size: 3" or 5".
Process Connection: 1/2" NPT.
Resolution: 2°F (5°F for 400°F and 550°F models).
Weight: 1.95 lb.

TRANSMITTER SPECIFICATIONS
Temperature Limits: Ambient: -58 to 185°F (-50 to 85°C).
Power Requirement: 10-33 VDC.
Output Signal: 4-20 mA.
Loop Resistance: 1045 Ω .
Power Consumption: 38 mA.
Enclosure Rating: NEMA 4X (IP66).

MODEL CHART

Model	Dial Size	Stem Length	Range	Model	Dial Size	Stem Length	Range
BTO32551	3"	2.5"	0 to 250°F	BTO52551	5"	2.5"	0 to 250°F
BTO32571	3"	2.5"	50 to 550°F	BTO52571	5"	2.5"	50 to 550°F
BTO34051	3"	4"	0 to 250°F	BTO54051	5"	4"	0 to 250°F
BTO34071	3"	4"	50 to 550°F	BTO54071	5"	4"	50 to 550°F
BTO36051	3"	6"	0 to 250°F	BTO56051	5"	6"	0 to 250°F
BTO36071	3"	6"	50 to 550°F	BTO56071	5"	6"	50 to 550°F
BTO39051	3"	9"	0 to 250°F	BTO59051	5"	9"	0 to 250°F
BTO39071	3"	9"	50 to 550°F	BTO59071	5"	9"	50 to 550°F
BTO31251	3"	12"	0 to 250°F	BTO51251	5"	12"	0 to 250°F
BTO31271	3"	12"	50 to 550°F	BTO51271	5"	12"	50 to 550°F

Note: -40 to 160°F, 0 to 200°F, 50 to 300°F, and 50 to 400°F ranges available, contact factory for more information.

USA: California Proposition 65

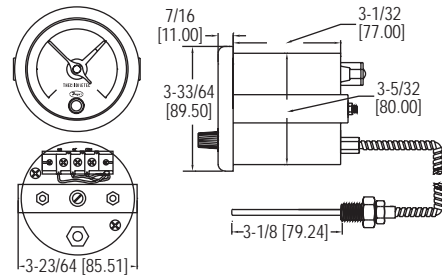
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Thermometers with Transmitter/Switch

SERIES RRT3

REMOTE READING THERMOMETER WITH SWITCH

SPDT Relay, Liquid Actuated Bulb and Capillary



The **Series RRT3 Remote Reading Thermometer with Switch** combines an easy to read 3-1/4" dual scale dial thermometer and a SPDT relay. Color coordinated pointers display the current process temperature and set point.

FEATURES/BENEFITS

- Quick connect electrical terminals
- Industrial armored capillary

APPLICATIONS

- High temp shut down in process applications
- Boiler or chiller control

SPECIFICATIONS

Wetted Materials: 304 SS.
Accuracy: $\pm 3\%$ FS.
Housing Material: 304 SS.
Temperature Limit: -4 to 158°F (-20 to 70°C).
Switch Type: SPDT.
Electrical Ratings: 3 A @ 250 VAC, .2 A @ 250 VDC.
Electrical Connections: Screw terminal.
Process Connection: 1/2" (12.7 mm) male NPT.
Dial Size: 3-1/2" (90 mm).
Capillary Length: 10.5' (3.2 m).
Bulb Length: 3-1/8" (79.24 mm).
Weight: 2 lb (900 g).

MODEL CHART

Model	Temperature Ranges
RRT3120U	-40 to 120°F (-40 to 50°C)
RRT3250U	32 to 248°F (0 to 120°C)
RRT3300U	0 to 300°F (-18 to 149°C)

USA: California Proposition 65

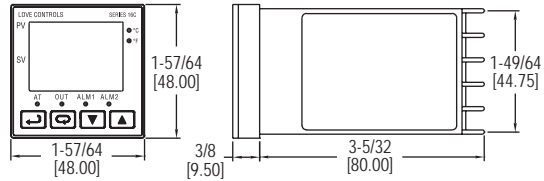
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TEMPERATURE LOOP CONTROLLERS

Universal Temperature Input, Single Control Output, RS-485 Communication



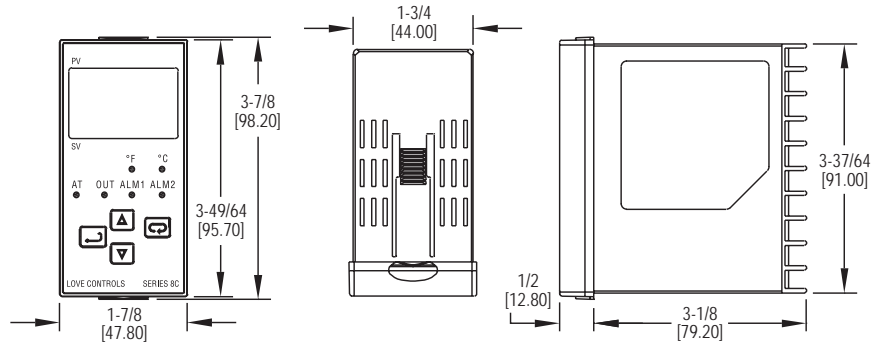
16C



16C



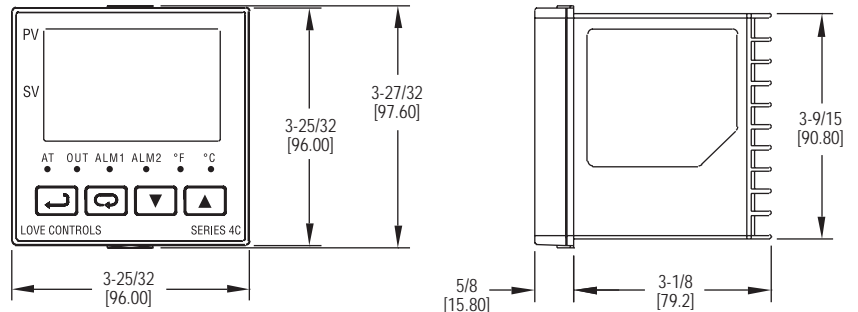
8C



8C



4C



4C

The **Series 16C, 8C, & 4C Temperature Loop Controllers** offer advanced control features for the most demanding temperature or process applications. Offered in 3 standard DIN cutout housing sizes, these controllers are designed with dual, 4 digit LED displays for local indication of the process value, set point, and output conditions.

FEATURES/BENEFITS

- Universal input accepts RTD or thermocouple sensors
- On/Off, PID, or manual output control
- RS-485 standard on all models

APPLICATIONS

- Oven, boiler, or chiller control
- Hot plates/melt pots
- Food service equipment
- Environmental chambers
- Packaging equipment

MODEL CHART	
Model	Output
16C-2	Voltage pulse
16C-3	Relay
16C-5	Current

MODEL CHART	
Model	Output
8C-2	Voltage pulse
8C-3	Relay
8C-5	Current

MODEL CHART	
Model	Output
4C-2	Voltage pulse
4C-3	Relay
4C-5	Current

ACCESSORIES	
Model	Description
MN-1	Mini-Node™ RS-485 to USB converter
SCD-SW	Configuration software
A-600	R/C snubber

SPECIFICATIONS

Inputs: Thermocouple or RTD.
Display: Two 4 digit, 7 segment LED's. PV: Red, SV: Green.
Accuracy: ±0.25% of span, ±1 least significant digit.
Power Requirements: 100 to 240 VAC, 50/60 Hz.
Power Consumption: 5 VA max.
Operating Temperature: 32 to 122°F (0 to 50°C).
Memory Backup: Nonvolatile memory.
Control Output Ratings: Relay: SPST, 5 A @ 250 VAC resistive for 16C; SPDT, 5 A @ 250 VAC resistive for 8C and 4C; Voltage Pulse: 14 VDC (max. 40 mA); Current: 4 to 20 mA.
Communication: RS-485 Modbus® ASCII communication protocol.
Weight: 4 oz (114g) for 16C, 15 oz (425g) for 8C and 4C.
Front Panel Rating: IP56.
Agency Approvals: CE, cULus.

INPUT RANGES	
Input Types	Range
K Type TC	-328 to 2372°F (-200 to 1300°C)
K Type TC	-328 to 932°F (-200 to 500°C)
J Type TC	-148 to 2192°F (-100 to 1200°C)
J Type TC	-4 to 752°F (-20 to 400°C)
T Type TC	-328 to 752°F (-200 to 400°C)
T Type TC	4 to 752°F (-20 to 400°C)
E Type TC	32 to 1112°F (0 to 600°C)
N Type TC	-328 to 2372°F (-200 to 1300°C)
R Type TC	32 to 3092°F (0 to 1700°C)
S Type TC	32 to 3092°F (0 to 1700°C)
B Type TC	212 to 3272°F (100 to 1800°C)
L Type TC	-328 to 932°F (-200 to 500°C)
U Type TC	-328 to 1472°F (-200 to 800°C)
Pt 100 RTD	-328 to 1112°F (-200 to 600°C)
Pt 100 RTD	-4 to 932°F (-20 to 500°C)
Pt 100 RTD	32 to 212°F (0 to 100°C)

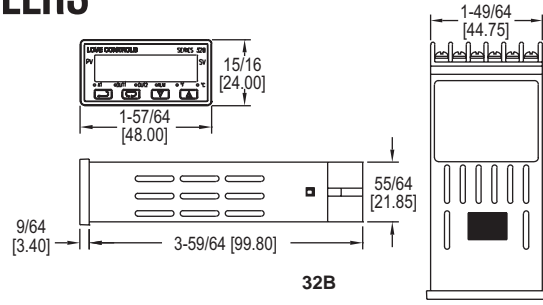
Modbus® is a registered trademark of Schneider Automation, Inc.

TEMPERATURE/PROCESS LOOP CONTROLLERS

Universal Input, Dual Control Output, RS-485 Communication



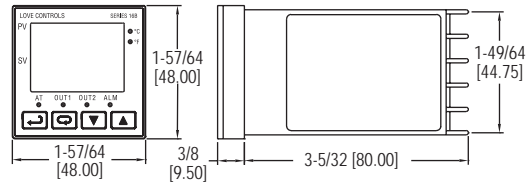
32B



32B



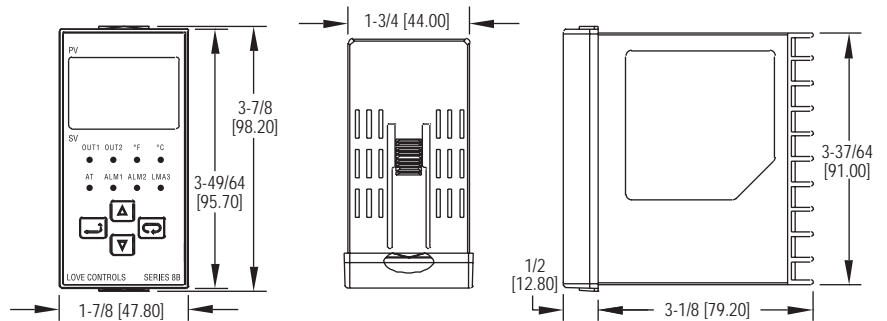
16B



16B



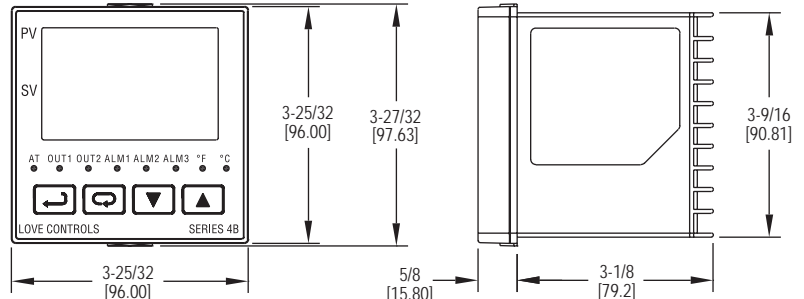
8B



8B



4B



4B

The **SERIES 32B, 16B, 8B, & 4B Temperature/Process Loop Controllers** offer advanced control features for the most demanding temperature or process applications. Offered in 4 standard DIN cutout housing sizes, these controllers are designed with dual, 4 digit LED displays for local indication of the process value, set point, and output conditions.

FEATURES/BENEFITS

- Universal input accepts process transmitters, RTD's or thermocouple signals
- On/off, PID, or manual output control
- RS-485 standard on all models
- Stage control program for up to 64 ramp/soak actions

APPLICATIONS

- Oven, boiler, or chiller control
- Environmental chambers
- Hot plates/melt pots
- Medical equipment
- Packaging equipment
- Food service equipment

SPECIFICATIONS

Inputs: Thermocouple, RTD, DC voltages or DC current.
Display: Two 4 digit, 7 segment LED's. PV: Red, SV: Green.
Accuracy: ±0.25% span, ±1 least significant digit.
Power Requirements: 100-240 VAC, 50/60 Hz; Optional 24 VDC.
Power Consumption: 5 VA max.
Operating Temperature: 32 to 122°F (0 to 50°C).
Memory Backup: Nonvolatile memory.
Control Output Ratings: Relay: SPST, 3 A @ 250 VAC resistive for 32B; SPST, 5 A @ 250 VAC resistive for 16B; SPDT, 5 A @ 250 VAC resistive for 8B and 4B;
Voltage pulse: 14 VDC (max. 40 mA); Current: 4-20 mA; Linear voltage: 0-10 V.
Communication: RS-485 Modbus® ASCII/RTU communication protocol.
Weight: 32B and 16B: 4 oz (114 g); 8B and 4B: 15 oz (425 g).
Front Panel Rating: IP56.
Agency Approvals: CE, cULus.

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TEMPERATURE/PROCESS LOOP CONTROLLERS

Universal Input, Dual Control Output, RS-485 Communication

MODEL CHART - 32B			
Model	Supply Power	Output 1	Output 2
32B-23	100 to 240 VAC	Voltage pulse	Relay
32B-23-LV	24 VDC	Voltage pulse	Relay
32B-33	100 to 240 VAC	Relay	Relay
32B-33-LV	24 VDC	Relay	Relay
32B-53	100 to 240 VAC	Current	Relay
32B-53-LV	24 VDC	Current	Relay

MODEL CHART - 16B			
Model	Supply Power	Output 1	Output 2
16B-23	100 to 240 VAC	Voltage pulse	Relay
16B-23-LV	24 VDC	Voltage pulse	Relay
16B-33	100 to 240 VAC	Relay	Relay
16B-33-LV	24 VDC	Relay	Relay
16B-53	100 to 240 VAC	Current	Relay
16B-53-LV	24 VDC	Current	Relay
16B-63	100 to 240 VAC	Linear voltage	Relay
16B-63-LV	24 VDC	Linear voltage	Relay

MODEL CHART - 8B			
Model	Supply Power	Output 1	Output 2
8B-23	100 to 240 VAC	Voltage pulse	Relay
8B-23-LV	24 VDC	Voltage pulse	Relay
8B-33	100 to 240 VAC	Relay	Relay
8B-33-LV	24 VDC	Relay	Relay
8B-53	100 to 240 VAC	Current	Relay
8B-53-LV	24 VDC	Current	Relay
8B-63	100 to 240 VAC	Linear voltage	Relay
8B-63-LV	24 VDC	Linear voltage	Relay

MODEL CHART - 4B			
Model	Supply Power	Output 1	Output 2
4B-23	100 to 240 VAC	Voltage pulse	Relay
4B-23-LV	24 VDC	Voltage pulse	Relay
4B-33	100 to 240 VAC	Relay	Relay
4B-33-LV	24 VDC	Relay	Relay
4B-53	100 to 240 VAC	Current	Relay
4B-53-LV	24 VDC	Current	Relay
4B-63	100 to 240 VAC	Linear voltage	Relay
4B-63-LV	24 VDC	Linear voltage	Relay
4B-33-986/U	120 VAC	Relay	Relay

INPUT RANGES	
Input Types	Range
K Type TC	-328 to 2372°F (-200 to 1300°C)
J Type TC	-148 to 2192°F (-100 to 1200°C)
T Type TC	-328 to 752°F (-200 to 400°C)
E Type TC	32 to 1112°F (0 to 600°C)
W Type TC	-328 to 2372°F (-200 to 1300°C)
R Type TC	32 to 3092°F (0 to 1700°C)
S Type TC	32 to 3092°F (0 to 1700°C)
B Type TC	212 to 3272°F (100 to 1800°C)
L Type TC	-328 to 1562°F (-200 to 850°C)
U Type TC	-328 to 932°F (-200 to 500°C)
JPt 100 RTD	-4 to 752°F (-20 to 400°C)
Pt 100 RTD	-328 to 1562°F (-200 to 850°C)
0 to 5 V	-999 to 9999
0 to 10 V	-999 to 9999
0 to 20 mA*	-999 to 9999
4 to 20 mA*	-999 to 9999
0 to 50 mV	-999 to 9999

*Requires 250 Ω precision resistor across input terminals

ACCESSORIES	
Model	Description
MN-1	Mini-Node™ RS-485 to USB converter
SCD-SW	Configuration software
A-277	250 Ω precision resistor
A-600	R/C snubber
A-900	Weatherproof front mount enclosure
A-901	Weatherproof internal mount enclosure with window

Application Note:

When using a relay output to operate a contactor or solenoid an R/C snubber should be installed across the coil to prevent damage to the controller relays.



A-600



MN-1



A-900



A-901



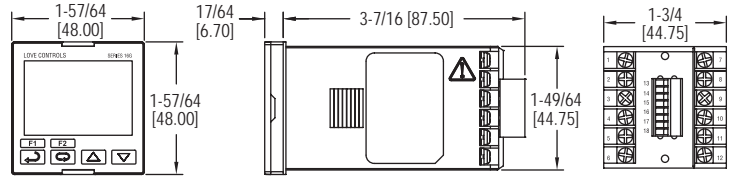
4B-33-986/U Benchtop Controller

TEMPERATURE/PROCESS LOOP CONTROLLERS

Universal Input, Dual Output, On/Off PID or FUZZY Logic Output Control



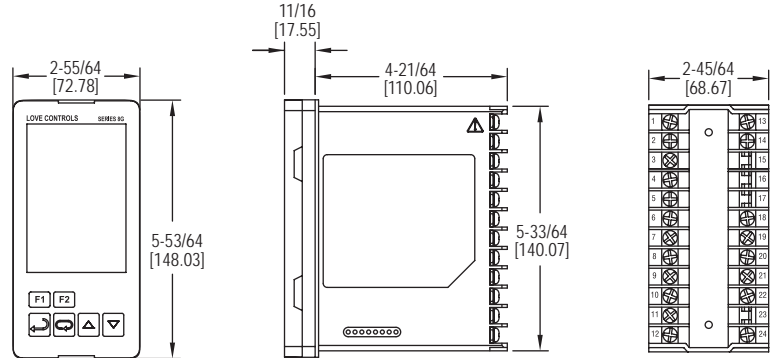
16G



16G



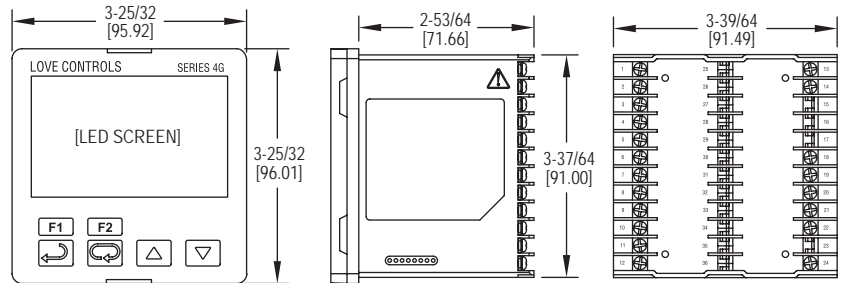
8G



8G



4G



4G

The Series 16G, 8G, & 4G Temperature/Process Loop Controllers allow for monitoring and control of temperature or process conditions. The controller features two independent control outputs for dual loop control using on/off, auto-tune or self-tune PID, fuzzy logic, or manual control methods. RS-485 interface is included with Modbus® communication protocol, for easy bench-top configuration or integration with a PLC or data control system.

FEATURES/BENEFITS

- On/off, PID, fuzzy logic, or manual output control
- Constant, sloped, program (ramp/soak), or remote set point control
- 2 primary control outputs, 2 secondary/alarm relay outputs, and RS-485 standard on all models
- Remote set point, input retransmission, or event input functions available with optional hardware

APPLICATIONS

- Oven control
- Packaging equipment
- Parts washers

SPECIFICATIONS

Inputs: Thermocouple, RTD, DC voltages or DC current.
Display: Process value: 4 digit, 0.47" H (12mm), orange LCD; Set point value: 4 digit, 0.47" H (12mm), green LCD.
Accuracy: ± 1.8°F plus ±0.3% of span (±1°C plus ±0.3% of span) at 77°F (25°C) after 20 minutes warm up.
Power Requirements: 100-240 VAC -20/+8%, 50/60 Hz; Optional 24 VDC, ±10%.
Power Consumption: 5 VA max.
Operating Temperature: 32 to 122°F (0 to 50°C).
Storage Temperature: -42 to 150°F (-20 to 65°C).
Memory Backup: Nonvolatile memory.
Control Output Ratings: Relay: SPST, 5 A @ 250 VAC resistive; Voltage pulse: 12 V (max. 40 mA); Current: 4-20 mA; Linear voltage: 0-10 V.
Alarm Relay Ratings: 3 A @ 250 VAC resistive.
Communication: RS-485 Modbus® ASCII/RTU communication protocol.
Weight: 9 oz (255g).
Front Panel Rating: IP66.
Agency Approvals: CE, cULus.

TEMPERATURE/PROCESS LOOP CONTROLLERS

Universal Input, Dual Output, On/Off PID or FUZZY Logic Output Control

MODEL CHART - 16G				
Model	Output 1	Output 2	Option 1	Option 2
16G-23-11	Voltage pulse	Relay	Event	Event
16G-23-31	Voltage pulse	Relay	Input retrans.	Event
16G-23-32	Voltage pulse	Relay	Input retrans.	Remote SP
16G-33-11	Relay	Relay	Event	Event
16G-33-31	Relay	Relay	Input retrans.	Event
16G-33-32	Relay	Relay	Input retrans.	Remote SP
16G-53-11	Current	Relay	Event	Event
16G-53-31	Current	Relay	Input retrans.	Event
16G-53-32	Current	Relay	Input retrans.	Remote SP
16G-63-11	Linear voltage	Relay	Event	Event
16G-63-31	Linear voltage	Relay	Input retrans.	Event
16G-63-32	Linear voltage	Relay	Input retrans.	Remote SP

MODEL CHART - 8G				
Model	Output 1	Output 2	Option 1	Option 2
8G-23-31	Voltage pulse	Relay	Input retrans.	Event
8G-23-32	Voltage pulse	Relay	Input retrans.	Remote SP
8G-33-31	Relay	Relay	Input retrans.	Event
8G-33-32	Relay	Relay	Input retrans.	Remote SP
8G-53-31	Current	Relay	Input retrans.	Event
8G-53-32	Current	Relay	Input retrans.	Remote SP
8G-63-31	Linear voltage	Relay	Input retrans.	Event
8G-63-32	Linear voltage	Relay	Input retrans.	Remote SP

MODEL CHART - 4G				
Model	Output 1	Output 2	Option 1	Option 2
4G-23-11	Voltage pulse	Relay	Event	Event
4G-23-31	Voltage pulse	Relay	Input retrans.	Event
4G-23-32	Voltage pulse	Relay	Input retrans.	Remote SP
4G-33-11	Relay	Relay	Event	Event
4G-33-31	Relay	Relay	Input retrans.	Event
4G-33-32	Relay	Relay	Input retrans.	Remote SP
4G-53-11	Current	Relay	Event	Event
4G-53-31	Current	Relay	Input retrans.	Event
4G-53-32	Current	Relay	Input retrans.	Remote SP
4G-63-11	Linear voltage	Relay	Event	Event
4G-63-31	Linear voltage	Relay	Input retrans.	Event
4G-63-32	Linear voltage	Relay	Input retrans.	Remote SP

INPUT RANGES	
Input Types	Range
K Type TC	-328 to 2372°F (-200 to 1300°C)
J Type TC	-148 to 2192°F (-100 to 1200°C)
T Type TC	-328 to 752°F (-200 to 400°C)
E Type TC	32 to 1112°F (0 to 600°C)
N Type TC	-328 to 2372°F (-200 to 1300°C)
R Type TC	32 to 3092°F (0 to 1700°C)
S Type TC	32 to 3092°F (0 to 1700°C)
B Type TC	212 to 3272°F (100 to 1800°C)
L Type TC	-328 to 1562°F (-200 to 850°C)
U Type TC	-328 to 932°F (-200 to 500°C)
TXK Type TC	-328 to 1472 °F (-200 to 800 °C)
JPt 100 RTD	-4 to 752 °F (-20 to 400 °C)
Pt 100 RTD	-328 to 1562 °F (-200 to 850 °C)
Ni 120 RTD	-112 to 572 °F (-80 to 300 °C)
Cu 50 RTD	-58 to 302 °F (-50 to 150 °C)
0 to 5 V	-999 to 9999
0 to 10 V	-999 to 9999
0 to 20 mA*	-999 to 9999
4 to 20 mA*	-999 to 9999
0 to 50 mV	-999 to 9999

*Requires 250 Ω precision resistor across input terminals

ACCESSORIES	
Model	Description
MN-1	Mini-Node™ RS-485 to USB Converter
SCD-SW	Configuration software
A-277	250 Ω precision resistor
A-600	R/C snubber
A-900	Weatherproof front mount enclosure
A-901	Weatherproof internal mount enclosure with window

Application Note:

When using a relay output to operate a contactor or solenoid an R/C snubber should be installed across the coil to prevent damage to the controller relays.



A-600



MN-1



A-900



A-901

DIN RAIL TEMPERATURE/PROCESS CONTROLLERS

Universal Inputs, Up to 8 PID Loops, Modbus® Communications



Master controller



Slave controller

The **Series SCD DIN Rail Temperature/Process Controllers** offer multiple PID loops in a compact size. Each SCD-1000 master controller can be combined with up to seven SCD-2000 slave controllers without any wires. Each controller has one universal input, one relay output and one user selected output.

FEATURES/BENEFITS

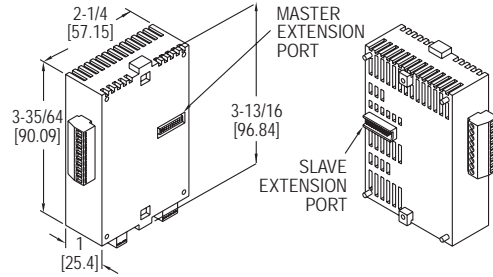
- Expandable from 1 to 8 process control loops
- Universal transmitter or temperature sensor inputs
- RS-485 Modbus® communication
- Dual loop or single loop/alarm output control

APPLICATIONS

- Oven, boiler, or chiller control
- Hot plates/melt pots
- Packaging equipment
- Environmental chambers
- Medical equipment
- Food service equipment

MODEL CHART			
Model	Controller	Output 1	Output 2
SCD-1023	Master	Voltage pulse	Relay
SCD-1033	Master	Relay	Relay
SCD-1053	Master	Current	Relay
SCD-1063	Master	Linear voltage	Relay
SCD-2023	Slave	Voltage pulse	Relay
SCD-2033	Slave	Relay	Relay
SCD-2053	Slave	Current	Relay
SCD-2063	Slave	Linear voltage	Relay

*DC current input requires 250 Ω precision resistor



SPECIFICATIONS

Inputs: Thermocouple, RTD, DC linear voltage, and DC currents.*
Supply Voltage: 24 VDC.
Power Consumption: 3 W.
Operating Temperature: 32 to 122°F (0 to 50°C).
Memory Backup: Non-volatile.

Control Output Ratings: Relay: 3 A @ 250 VAC resistive; Voltage pulse: 12 VDC, max. output current: 40 mA; Current: 4-20 mA output; Linear voltage: 0-10 VDC.
Communication: RS-485 Modbus® A-5-11/RTU communication protocol.
Weight: 2.7 oz (76.5 g).
Agency Approvals: CE, cULus.

ACCESSORIES

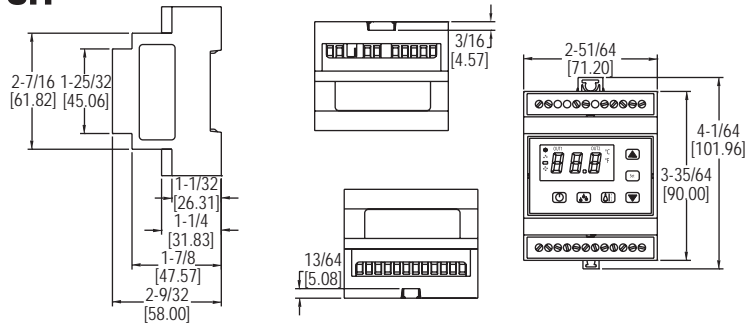
Model	Description
SCD-PS	100-240 VAC/VDC to 24 VDC power supply
SCD-SW	Configuration software
A-277	250 ohm precision resistor
MN-1	Mini-Node™ USB/RS-485 converter
A-600	R/C snubber

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SERIES TSDIN

DIN RAIL MOUNT TEMPERATURE SWITCH

HACCP Alarm Logging, Intelligent Defrost



The **Series TSDIN DIN Rail Mount Temperature Switch** is ideally designed to control compressor, defrost, and fan cycles in refrigeration applications. The digital input can be used to remotely trigger a defrost cycle, monitor cooler door status, or act as an external alarm. Three other probe inputs measure cabinet, defrost, and product temperature. Programming performed on the 6 button keypad or with the Model TS2-K configuration key.

FEATURES/BENEFITS

- 3 temperature probe inputs
- Real-time clock used for HACCP logging of temperature limit alarms or loss of power
- Intelligent Defrost parameters manage defrost cycle in order to save energy cost

APPLICATIONS

- Refrigerated cabinets
- Walk in coolers
- Applications requiring defrost cycles

MODEL CHART			
Model	Supply Power	# of Outputs	Display Color
TSDIN-013	115 VAC	1, 2, 3	Red
TSDIN-015	115 VAC	1, 2, 3, 4, 5	Red
TSDIN-023	230 VAC	1, 2, 3	Red
TSDIN-025	230 VAC	1, 2, 3, 4, 5	Red
TSDIN-033	12 VAC/VDC	1, 2, 3	Red
TSDIN-043	24 VAC/VDC	1, 2, 3	Red
TSDIN-213	115 VAC	1, 2, 3	Blue
TSDIN-215	115 VAC	1, 2, 3, 4, 5	Blue
TSDIN-223	230 VAC	1, 2, 3	Blue
TSDIN-225	230 VAC	1, 2, 3, 4, 5	Blue
TSDIN-233	12 VAC/VDC	1, 2, 3	Blue
TSDIN-243	24 VAC/VDC	1, 2, 3	Blue

SPECIFICATIONS

Probe Range: PTC: -58 to 302°F (-50 to 150°C); NTC: -58 to 230°F (-50 to 110°C).
Input: PTC/NTC.
Output: Output 1: SPST relay rated 16A @ 240 VAC resistive, 10 FLA, 60 LRA, 1HP @ 240 VAC inductive; Output 2: SPDT relay rated 8A @ 240 VAC resistive; Output 3: SPST relay rated 8A @ 240 VAC resistive; Output 4: SPDT relay rated 8A @ 240 VAC resistive; Output 5: SPST relay rated 16A @ 240 VAC resistive, 10 FLA, 60 LRA, 1HP @ 240 VAC inductive.
Control Type: On/off.
Power Requirement: 115 VAC, 230 VAC, 12 VAC/VDC, 24 VAC/VDC (±10% depending on model).
Power Consumption: 6 VA.
Accuracy: Better than 1% of full-scale.
Display: 3-digits plus sign.
Resolution: 0.1°.
Memory Backup: Non-volatile memory.
Temperature Limits: Operating: 32 to 131°F (0 to 55°C); Storage: -4 to 176°F (-20 to 80°C).
Weight: 10.8 oz (306 g).
Agency Approvals: CE, cURus.

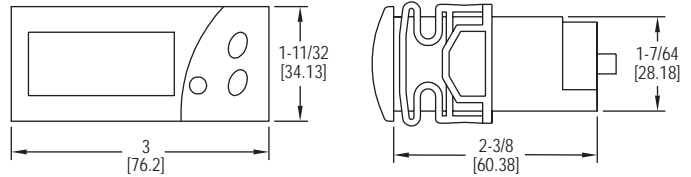
ACCESSORIES

See page reference 1 below.

1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

TEMPERATURE/PROCESS INDICATOR

Low Cost, 3-Digit Display, 1% Accuracy



The **Series TID Temperature/Process Indicator** displays temperature or a process value measured by a PTC or NTC thermistor or a 4-20 mA transmitter.

FEATURES/BENEFITS

- Thermistor or transmitter input models available
- 3 digit bright LED

APPLICATIONS

- Panel process indication
- Refrigerators, walk in coolers

MODEL CHART			
Model	Input	Supply Power	Unit
TID-1110	PTC thermistor	115 VAC	°F
TID-1120	PTC thermistor	115 VAC	°C
TID-1410	PTC thermistor	24 VAC/DC	°F
TID-3100	4-20 mA	115 VAC	None
TID-3200	4-20 mA	230 VAC	None
TID-3400	4-20 mA	24 VAC/DC	None

SPECIFICATIONS

Range: -58 to 302°F (thermistor); -999 to 999 counts (4-20 mA).
Input: PTC/NTC thermistor or 4-20 mA.
Power Requirements: 115 VAC, 230 VAC, 24 VAC/DC.
Accuracy: > 1%.
Display: 3-digits; red, green or blue display.
Resolution: 1° or 0.1 count.
Front Panel Rating: IP64 (NEMA 3R).
Weight: 2.3 oz (65 g).
Agency Approvals: CE, cURus.

ACCESSORIES

See page reference 1 below.

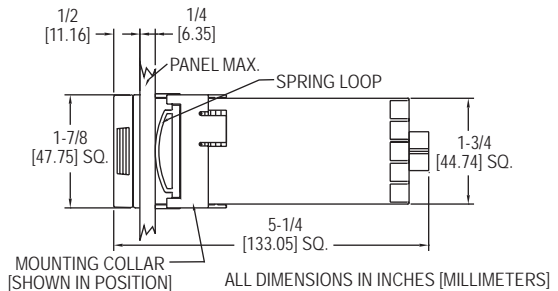
1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

SERIES 16L



LIMIT CONTROL

FM Approved, Large Dual Display, Universal Input



Panel cutout 1.77" + 0.02" [45 mm + 0.6 mm] square

The **Series 16L Limit Control** offers FM approved limit control with universal input, single set point or dual set point control.

FEATURES/BENEFITS

- Remote or integral reset button
- Peak and valley temperature indication
- Open sensor protection

APPLICATIONS

- Gas fired heater limit control

MODEL CHART		
Model	Output A	Output B
16L2030	N.O. relay	None
16L2034	N.O. relay	N.C. relay

Note: For other configurations, see website

ACCESSORIES	
Model	Description
A-600	R/C snubber

SPECIFICATIONS

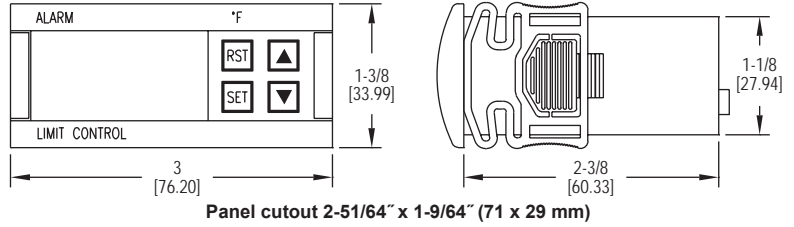
Selectable Inputs: 10 thermocouple, 4 RTD, DC voltage, or DC current selectable.
Display: Two 4 digit, 7 segment 0.3" (7.62 mm) high LEDs.
Accuracy: ±0.25% of span, ±1 least significant digit.
Power Requirements: 100-240 VAC, nominal, +10 -15%, 50 to 400 Hz. single phase; 132-240 VDC, nominal, +10 -20%.
Power Consumption: 5 VA maximum.
Temperature Limits: 14 to 131°F (-10 to 55°C).
Memory Backup: Nonvolatile memory. No batteries required.
Output: Relay: SPST, 3 A @ 240 VAC resistive; 1.5 A @ 240 VAC inductive.
Weight: 8 oz (227 g).
Front Panel Rating: NEMA 4X (IP66).
Agency Approvals: FM, cULus.

OPTIONS

To order add suffix:	Description
-934	Process signal output, isolated 0-20 mADC
-936	Process signal output, isolated 0-10 VDC
-992	RS-RS-485 serial communications
-993	RS-RS-232 serial communications

THERMOCOUPLE LIMIT CONTROL

FM Approved Temperature Limit Control



The **Series TSF Thermocouple Limit Control** provides audible alarm status along with a relay output. Unit allows the user to easily select automatic or manual reset via a built in reset button on the front panel or an external contact.

FEATURES/BENEFITS

- FM approved temperature limiting control
- Integral and remote reset capabilities

APPLICATIONS

- Gas fired oven and burner control

MODEL CHART		
Model	Supply Power	Unit
TSF-4010	115 VAC	°F
TSF-4011	115 VAC	°C
TSF-4021	230 VAC	°C
TSF-4040	24 VAC/VDC	°F

ACCESSORIES
See page reference 1 below.

SPECIFICATIONS

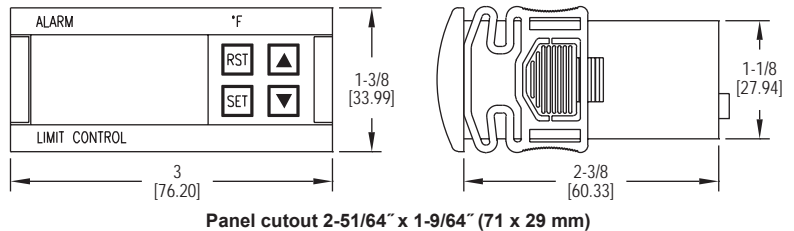
Probe Range: 32 to 999°F (0 to 700°C) for Type J thermocouple; 32 to 999°F (0 to 999°C) for type K or S thermocouples.
Input: Type J, K or S thermocouple.
Output: SPDT relay rated 16 A @ 240 VAC resistive.
Horsepower Rating (HP): 1 HP.
Control Type: ON/OFF; manual/automatic reset.
Power Requirements: 115 VAC, 230 VAC, 12 VAC/VDC or 24 VAC/VDC (depending on model).
Power Consumption: 4 VA.
Accuracy: ±1% FS.
Display: 3-digit, red, 1/2" (12.7 mm) digits, plus sign.
Resolution: 1°.
Memory Backup: Nonvolatile memory.
Temperature Limits: Ambient: 32 to 150°F (0 to 65°C); Storage: -4 to 176°F (-20 to 80°C).
Weight: 2.3 oz (65 g).
Front Panel Rating: IP64 (NEMA 3R).
Agency Approvals: CE, FM, cURus.

1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

SERIES TSF-DF

THERMOCOUPLE LIMIT CONTROL

UL Approved Temperature Limit Control



The **Series TSF-DF Thermocouple Limit Control** is a UL approved temperature limit control that provides visual alarm status along with a relay output. The Series TSF-DF controls have a built in reset button on the front panel or can accept an external reset signal.

Program settings on model TSF-DF controls cannot be changed through the buttons on the device. It is necessary to purchase a model TSF-MDF and a model TS2-K in addition to the model TSF-DF. Desired program parameters are entered on a TSF-MDF programming control. Using the TS2-K configuration key, the parameters can be easily copied from the TSF-MDF and transferred to the TSF-DF Limit Alarms.

FEATURES/BENEFITS

- UL approved limit control

APPLICATIONS

- Gas fired oven and burner control

MODEL CHART			
Model	Control	Supply Power	Unit
TSF-4010-DF	Limit alarm	115 VAC	°F
TSF-4011-DF	Limit alarm	115 VAC	°C
TSF-4021-DF	Limit alarm	230 VAC	°C
TSF-4040-DF	Limit alarm	24 VAC/VDC	°F
TSF-4010-MDF	Programming control	115 VAC	°F
TSF-4011-MDF	Programming control	115 VAC	°C
TSF-4021-MDF	Programming control	230 VAC	°C
TSF-4040-MDF	Programming control	24 VAC/VDC	°F

SPECIFICATIONS

Probe Range: 32 to 999°F (0 to 700°C) for thermocouple J type; 32 to 999°F (0 to 999°C) for thermocouple K or S type.
Input: Type J, K, or S thermocouple.
Output: NO SPST relay rated 16 A @ 240 VAC resistive.
Horsepower Rating (HP): 1 HP.
Control Type: ON/OFF; manual/automatic reset.
Power Requirements: See model chart.
Power Consumption: 4 VA @ 230 VAC.
Accuracy: ±1% FS.
Display: 3-digit, red, 1/2" (12.7 mm) digits, plus sign.
Resolution: 1°.
Memory Backup: Nonvolatile memory.
Ambient Operating Temperature: 32 to 140°F (0 to 60°C).
Storage Temperature: -4 to 176°F (-20 to 80°C).
Weight: 2.3 oz (65 g).
Front Panel Rating: IP64.
Agency Approvals: CE, cURus (DF models only).

ACCESSORIES
See page reference 1 below.

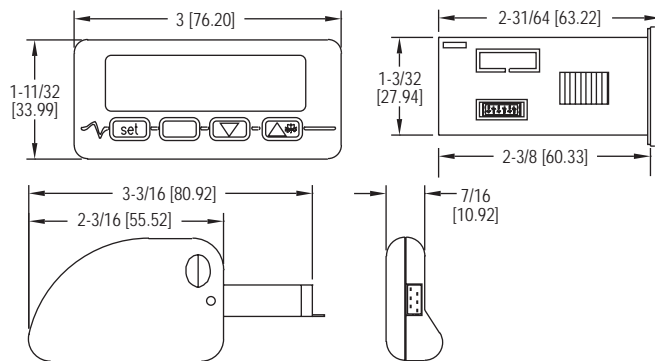
1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

DIGITAL TEMPERATURE SWITCH

3-1/2 Digit Display, Programming Configuration Key



40X-K configuration key



The **Series 40T/40M Digital Temperature Switch** accepts a variety of inputs to allow temperature measurements and set points up to 1999°F (1300°C).

FEATURES/BENEFITS

- Field selectable °F or °C
- Universal temperature sensor or transmitter input on 40M models
- Configuration key to quickly load parameters from one unit to another
- Heating or cooling models

APPLICATIONS

- Food service equipment
- Industrial process control

SPECIFICATIONS

Probe Range: K T/C: -140 to 1999°F (-100 to 1300°C); J T/C: -140 to 1450°F (-100 to 800°C); RTD: -320 to 1200°F (-200 to 650°C); PTC: -58 to 300°F (-50 to 150°C); NTC: -40 to 230°F (-40 to 110°C); N. RTD: -110 to 570°F (-80 to 300°C).
Output: 16 A @ 250 VAC SPDT relay (max current allowed is 10 A).
Control Type: On/off.

Power Requirements: 12-24 VAC/VDC, 115 VAC or 230 VAC depending on model.
Accuracy: ±1% FS.
Display: 3-1/2 digit red display.
Resolution: 0.1°C.
Memory Backup: Non-volatile memory.
Ambient Temperature: 32 to 131°F (0 to 55°C).
Weight: 2.3 oz (65 g).
Front Panel Rating: IP65.
Agency Approvals: CE, cULus.

MODEL CHART			
Thermocouple/ RTD Input Model	Supply Power	Universal Input Model	Supply Power
40T-10	115 VAC	40M-10	115 VAC
40T-20	230 VAC	40M-20	230 VAC
40T-40	12-24 VAC/VDC	40M-40	12-24 VAC/VDC

ACCESSORIES

Model	Description
40X-K	Configuration key

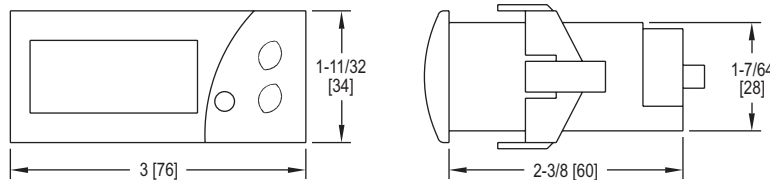
For sensor accessories, see page reference 1 below.

1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

SERIES TCS

THERMOCOUPLE TEMPERATURE SWITCH

Heating and Cooling Control, 16 Amp Rating, Two Alarms



Panel cutout 2-51/64" x 1-9/64" (71 mm x 29 mm)

The **Series TCS Thermocouple Temperature Switch** monitors and controls temperature while offering a wide temperature range, two selectable alarm sets, and an internal buzzer indicating alarm condition or error.

FEATURES/BENEFITS

- Heating or cooling modes
- Internal alarm buzzer
- Configuration key to quickly load parameters from one unit to another

APPLICATIONS

- Food service equipment
- Industrial process control

SPECIFICATIONS

Probe Range: 32 to 999°F (0 to 700°C) for Type J thermocouple; 32 to 999°F (0 to 999°C) for Type K thermocouple.
Input: Type J or K thermocouple.
Output: SPDT relay rated 16 A @ 240 VAC resistive.
Horsepower Rating (HP): 1 HP.
Control Type: ON/OFF.
Power Requirements: 115 VAC, 230 VAC, 12 VAC/VDC or 24 VAC/VDC (depending on model).

Accuracy: ±1% FS.
Display: 3-digit, red, 1/2" (12.7 mm) digits, plus sign.
Resolution: 1°.
Memory Backup: Nonvolatile memory.
Temperature Limits: Ambient: 32 to 158°F (0 to 70°C); Storage: -4 to 176°F (-20 to 80°C).
Weight: 2.3 oz (65 g).
Front Panel Rating: IP64.
Agency Approvals: CE, cURus.

MODEL CHART					
Model	Supply Power	Unit	Model	Supply Power	Unit
TCS-4010	115 VAC	°F	TCS-4030	12 VAC/VDC	°F
TCS-4011	115 VAC	°C	TCS-4031	12 VAC/VDC	°C
TCS-4020	230 VAC	°F	TCS-4040	24 VAC/VDC	°F
TCS-4021	230 VAC	°C			

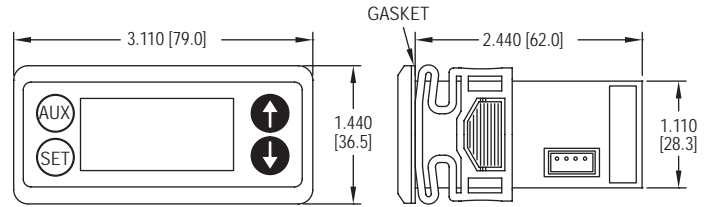
ACCESSORIES

See page reference 1 below.

1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

DIGITAL TEMPERATURE SWITCH

Heating and Cooling Control, 16 Amp Rating



Panel cutout 2-51/64" x 1-9/64" (71 x 29 mm)

The **Series TST Digital Temperature Switch** is designed with many heating and cooling applications in mind. This low cost switch is simple to set up with one probe input and SPDT switch output. Programming performed using either the front keypad or through a TS2-K programming key.

FEATURES/BENEFITS

- Buzzer indicates probe/memory error or high/low temperature alarm conditions
- Capacitive buttons offer clean panel face design
- Modbus® communication protocol through TTL serial connection

APPLICATIONS

- Refrigeration
- Holding ovens
- Boilers
- Brewing systems

MODEL CHART	
Model	Supply Power
TST-011	115 VAC
TST-021	230 VAC
TST-031	12 VAC/VDC
TST-041	24 VAC/VDC

ACCESSORIES
See page reference 1 below.

SPECIFICATIONS
Probe Range: PTC: -58 to 302°F (-50 to 150°C); NTC: -58 to 230°F (-50 to 110°C).
Input: PTC (1000 Ω @ 25°C) or NTC (10 KΩ @ 25°C) thermistor.
Output: SPDT relay rated 16 A @ 240 VAC resistive, 10 FLA, 60 LRA.
Horsepower Rating (HP): 1 HP.
Control Type: On/Off.
Power Requirements: 115 VAC, 230 VAC, 24 VAC/VDC, or 12 VAC/VDC.
Power Consumption: 4 VA @ 115/230 VAC; 1.5 VA @ 12/24 VAC/VDC.
Accuracy: ±1% FS.
Display: 3-digit, plus sign.
Resolution: 0.1°.
Memory Backup: Nonvolatile memory.
Ambient Temperature: 32 to 131°F (0 to 55°C).
Storage Temperature: -4 to 176°F (-20 to 80°C).
Weight: 115 and 230 V models: 7.2 oz (204 g); 12 and 24 V models: 4.8 oz (136 g).
Front Panel Rating: IP65.
Agency Approvals: CE, cURus.

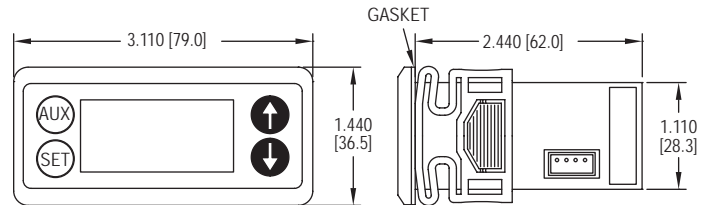
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1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

SERIES TSXT

DIGITAL TEMPERATURE SWITCH

Refrigeration Control, Up To 3 Probe Inputs and 3 Relay Outputs



Panel cutout 2-51/64" x 1-9/64" (71 x 29 mm)

The **Series TSXT Digital Temperature Switch** is designed for refrigeration control. It accepts PTC or NTC temperature probe types and can control the compressor, defrost, fan, alarm, and light in a refrigeration system. Master/slave configurations allow synchronization of defrost cycles between different units. Programming is performed through the front keypad, or by using the TS2-K programming key.

FEATURES/BENEFITS

- Models available with 1, 2, or 3 relay outputs
- 3 temperature inputs and one digital input for complete refrigeration control
- Configuration key available for programing multiple units
- Capacitive buttons offer clean panel face design
- Modbus® communication protocol through TTL serial connection

APPLICATIONS

- Refrigerated cabinets
- Walk in coolers
- Applications requiring defrost cycles

MODEL CHART					
Model	Supply Power	Outputs	Model	Supply Power	Outputs
TSXT-211	115 VAC	1	TSXT-232	12 VAC/VDC	2
TSXT-221	230 VAC	1	TSXT-242	24 VAC/VDC	2
TSXT-231	12 VAC/VDC	1	TSXT-213	115 VAC	3
TSXT-241	24 VAC/VDC	1	TSXT-223	230 VAC	3
TSXT-212	115 VAC	2	TSXT-233	12 VAC/VDC	3
TSXT-222	230 VAC	2	TSXT-243	24 VAC/VDC	3

SPECIFICATIONS	
Probe Range: PTC: -58 to 302°F (-50 to 150°C); NTC: -58 to 230°F (-50 to 110°C).	Power Consumption: 3.6 VA @ 115/230 VAC; 1.5 VA @ 12/24 VAC/VDC.
Input: PTC (1000 Ω @ 25°C) or NTC (10 KΩ @ 25°C) thermistor.	Accuracy: ±1% FS.
Output: Relay 1: SPST relay rated 16 A @ 240 VAC resistive, 10 FLA, 60 LRA; Relay 2: SPST relay rated 5 A @ 240 VAC resistive; Relay 3: SPST relay rated 8 A @ 240 VAC resistive.	Display: 3-digit, plus sign.
Horsepower Rating (HP): 1 HP (Relay 1).	Resolution: 0.1°.
Control Type: On/off with defrost options.	Memory Backup: Nonvolatile memory.
Power Requirements: 115 VAC, 230 VAC, 24 VAC/VDC, or 12 VAC/VDC.	Ambient Operating Temperature: 32 to 131°F (0 to 55°C).
	Storage Temperature: -4 to 176°F (-20 to 80°C).
	Weight: 115 and 230 V models: 7.2 oz (204 g); 12 and 24 V models: 4.8 oz (136 g).
	Front Panel Rating: IP65.
	Agency Approvals: CE, cURus.

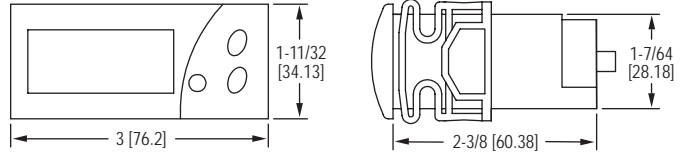
ACCESSORIES
See page reference 1 below.

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1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

DIGITAL TEMPERATURE SWITCH

Easy Multi-Unit Programming, 16A SPDT Relay Output



Panel cutout 2-51/64" x 1-9/64" (71 mm x 29 mm)

The **Series TS2 Digital Temperature Switch** offers an easy to use OEM friendly solution to monitor and control temperature in heating or cooling applications.

FEATURES/BENEFITS

- Simple to use temperature control device
- Configuration key

APPLICATIONS

- Refrigerators
- Chillers
- Food service equipment
- Medical sterilizers or equipment

MODEL CHART		
Model	Supply Power	Unit
TS2-010	115 VAC	°F
TS2-011	115 VAC	°C
TS2-020	230 VAC	°F
TS2-030	12 VAC/VDC	°F
TS2-040	24 VAC/VDC	°F
TS2-041	24 VAC/VDC	°C

SPECIFICATIONS
Probe Range: -58 to 302°F (-50 to 150°C).
Input: PTC (1000Ω @ 25°C).
Output: 16 A SPDT relay @ 250 VAC resistive, 5 A inductive.
Horsepower Rating (HP): 1 HP.
Control Type: On/off.
Power Requirements: 115 VAC, 230 VAC, 12 VAC/VDC or 24 VAC/VDC.
Accuracy: ±1% FS.
Display: 3-digit, red, 1/2" digits.
Resolution: 1°.
Memory Backup: Nonvolatile memory.
Temperature Limits: Ambient: 32 to 158°F (0 to 70°C).
Storage Temperature: -4 to 176°F (-20 to 80°C).
Weight: 2.3 oz (65 g).
Front Panel Rating: IP64.
Agency Approvals: CE, cURus.

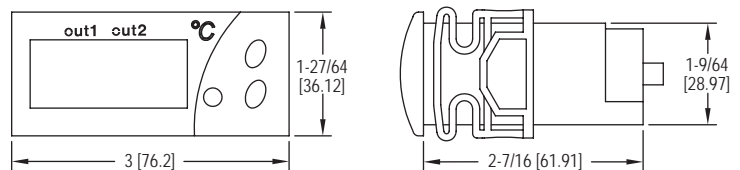
ACCESSORIES
See page reference 1 below.

1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

SERIES TSS2

DUAL STAGE TEMPERATURE SWITCH

Two Independent Relay Outputs, Heating or Cooling Control



Panel cutout 2-51/64" x 1-9/64" (71 mm x 29 mm)

The **Series TSS2 Dual Stage Temperature Switch** features two independent sensor inputs and control outputs in one device.

FEATURES/BENEFITS

- Simple to use dual temperature control device
- Configuration key

APPLICATIONS

- Refrigerators
- Chillers
- Food service equipment
- Medical sterilizers or equipment

MODEL CHART		
Model	Supply Power	Unit
TSS2-2100	115 VAC	°F
TSS2-2110	115 VAC	°C
TSS2-2210	230 VAC	°C
TSS2-2300	12 VAC/DC	°F
TSS2-2400	24 VAC/DC	°F

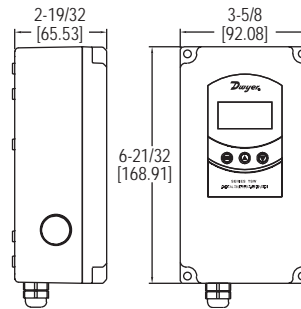
SPECIFICATIONS	
Probe Range: PTC: -58 to 302°F (-50 to 150°C); NTC: -58 to 230°F (-50 to 110°C).	Accuracy: ±1% FS.
Input: PTC (1000Ω @ 25°C); NTC (10KΩ @ 25°C).	Display: 3-digit and sign, red LED.
Outputs: OUT1=SPDT relay rated 16 A @ 240 VAC resistive; OUT2=SPDT relay rated 8 A @ 240 VAC resistive.	Resolution: 0.1° (< 100°); 1° (≥ 100°).
Horsepower Rating (HP): 1 HP (OUT1).	Memory Backup: Nonvolatile memory.
Power Requirements: 115 VAC, 230 VAC, 12 VAC/VDC or 24 VAC/VDC (depending on model).	Temperature Limit: Ambient: 32 to 158°F (0 to 70°C).
	Storage Temperature: -4 to 176°F (-20 to 80°C).
	Dimensions: 3 x 1-27/64 x 2-7/16 in.
	Front Panel Rating: IP64.
	Weight: 2.3 oz (65 g).
	Agency Approvals: CE, cURus.

ACCESSORIES
See page reference 1 below.

1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

WEATHER PROOF DIGITAL TEMPERATURE SWITCH

NEMA 4X Housing, Single or Dual Stage, 20 A Contact Rating



The **Series TSW Weather Proof Digital Temperature Switch** combines the trusted, reliable TS family of temperature controls and an installation friendly weatherproof enclosure. The bright, easy-to-read LED display shows the current output status and the temperature measurement.

FEATURES/BENEFITS

- Weatherproof housing
- Single or dual stage models
- Configuration key
- Physical and passcode parameter setting protection

APPLICATIONS

- Chillers
- Walk in cooler
- Woodboilers
- Brewing systems

MODEL CHART			
Model	Description	Temperature Probe Included	Supply Power
TSW-150	Single stage	TS-8T	90 to 255 VAC
TSW-160	Single stage	TS-8T	12 to 24 VAC/VDC
TSW-250	Dual stage	TS-8T	90 to 255 VAC
TSW-260	Dual stage	TS-8T	12 to 24 VAC/VDC
TSW-150-NP	Single stage	None	90 to 255 VAC
TSW-160-NP	Single stage	None	12 to 24 VAC/VDC
TSW-250-NP	Dual stage	None	90 to 255 VAC 12
TSW-260-NP	Dual stage	None	12 to 24 VAC/VDC

SPECIFICATIONS

Probe Range: PTC: -58 to 302°F (-50 to 150°C); NTC: -58 to 230°F (-50 to 110°C).
Input: PTC (1000Ω @ 25°C); NTC (10K Ω @ 25°C).
Output: R1 SPDT relay resistive load: 20 A @ 240 VAC; R2 SPDT relay resistive load: 8 A @ 240 VAC; Inductive load: 3 A @ 240 VAC.
Horsepower Rating: R1 2HP @ 240 VAC.
Control Type: On/off.
Power Requirements: 90 to 255 VAC or 12 to 24 VAC/VDC (±10%) depending on model.
Power Consumption: 3.6 VA.
Accuracy: ±1% FS.
Display: 3 digits plus sign.
Resolution: Single stage: 1°; Dual stage: 0.1° < 100; 1° ≥ 100°.
Memory Backup: Non-volatile memory.
Ambient Temperature: 32 to 104°F (0 to 40°C).
Weight: 1.2 lb (544 g).
Enclosure Rating: NEMA 4X (IP66).
Agency Approvals: CE, cURus.

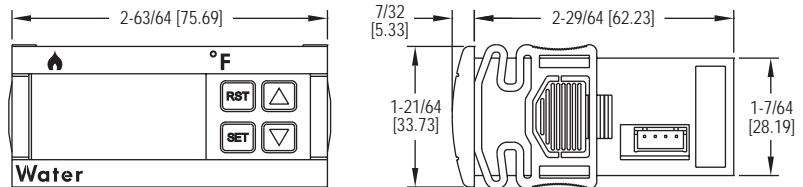
ACCESSORIES

Model	Description
CC1-N	Temperature sensor clip, neutral
CC1-GY	Temperature sensor clip, grey

SERIES TSWB

DIGITAL TEMPERATURE/WATER LEVEL SWITCH

Two Temperature Set Points, Low Water Level Alarm



The **Series TSWB Digital Temperature/Water Level Switch** offers complete boiler control for outdoor wood boilers and other similar heating equipment.

FEATURES/BENEFITS

- 3 outputs for high temp, low temp or input alarm
- Conductivity probe input for water level monitoring
- Configuration key

APPLICATIONS

- Wood or pellet boilers

MODEL CHART		
Model	Supply Power	Unit
TSWB-010	115 VAC	°F
TSWB-011	115 VAC	°C

ACCESSORIES

See page reference 1 below.

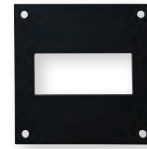
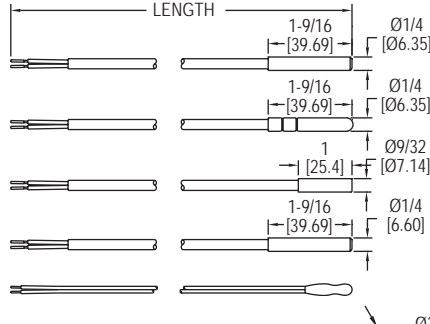
SPECIFICATIONS

Probe Range: PTC: -58 to 302°F (-50 to 150°C); NTC: -58 to 230°F (-50 to 110°C).
Probe Temperature Input: PTC (1000Ω @ 25°C); NTC (10KΩ @ 25°C).
Probe Level Input: Conductivity probe: Max voltage 12 VAC. Sensitivity established from factory at 100KΩ.
Output: R1 SPST NO relay resistive load 5 A @ 250 VAC; R2 SPST NC relay resistive load 5 A @ 250 VAC; R3 SPDT relay resistive load 16 A @ 240 VAC.
Horsepower Rating: 1HP -- 10FLA, 60LRA 250 VAC.
Control Type: On/off.
Power Requirements: 115 VAC ± 10%, 230 VAC ± 10%, 24 VAC/DC ± 10%, 12 VAC/DC ± 10%.
Power Consumption: 4VA (230V/115V), 1.5VA (24V/12V).
Accuracy: > 1% of full-scale.
Display: 3-digit, red 1/2" digits.
Resolution: 1° (3 digits).
Memory Backup: Nonvolatile memory.
Ambient Operating Temperature: 32 to 158°F (-30 to 70°C).
Storage Temperature: -4 to 176°F (-30 to 80°C).
Weight: 3.5 oz.
Front Protection: IP64.
Agency Approvals: CE, cULus.

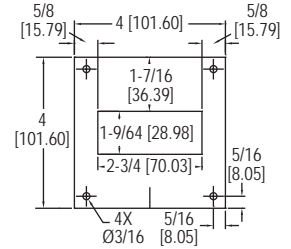
1 Digital Temperature Switch Probes and Accessories: See page 131 (Series TS-Probes)

DIGITAL TEMPERATURE SWITCH PROBES & ACCESSORIES

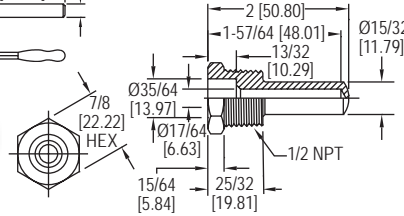
Probes to be used with TS2, TSS2, TSWB, TSW, TS3, TSX3, and 40M



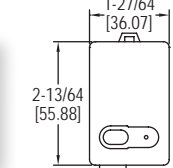
A-TS-AP



TS-W



TS2-K



FEATURES/BENEFITS

- 5 or 10 foot cable lengths
- PTC or NTC temperature curves

APPLICATIONS

- Refrigerated cabinets
- Walk in coolers
- Food service equipment
- Medical sterilizers or equipment
- Wood or pellet boilers
- Brewing systems

SPECIFICATIONS

Sensor: See model chart.
Operating Temperature: PTC or NTC: -58 to 221°F (-50 to 105°C); J-type: 32 to 1400°F (0 to 760°C); K-type: 32 to 2300°F (0 to 1200°C).
Cable: PTC and NTC models: PVC; J-type and K-type models: FEP.

MODEL CHART - SENSORS

Model	Sensor	Cap Material	Length ft (m)	Model	Sensor	Cap Material	Length ft (m)
TS-1	PTC	Brass	5 (1.5)	TS-7	NTC	None	5 (1.5)
TS-11	PTC	Brass	10 (3)	TS-71	NTC	None	10 (3)
TS-2	PTC	Stainless steel	5 (1.5)	TS-8T	NTC	Stainless steel	5 (1.5)
TS-21	PTC	Stainless steel	10 (3)	TS-81T	NTC	Stainless steel	10 (3)
TS-5	PTC	PVC	5 (1.5)	TS-88T	NTC	Stainless steel	15 (4.5)
TS-51	PTC	PVC	10 (3)	TCS-J	J-type	Stainless steel	4 (1.21)
TS-6	PTC	Polyamide resin coated brass	5 (1.5)	TCS-K	K-type	Stainless steel	4 (1.21)
TS-61	PTC	Polyamide resin coated brass	10 (3)				

ACCESSORIES

Model	Description
A-TS-AP	1/4 DIN adapter plate
TS2-K	Configuration key
TS-W	Brass thermowell (for use with TS-1, TS-11, TS-2, TS-21)

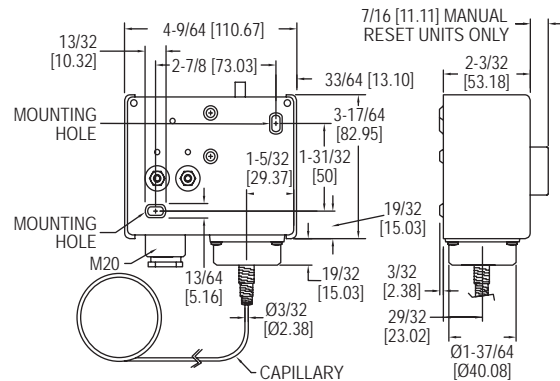
SERIES DFS2

LOW LIMIT FREEZE PROTECTION SWITCH

Manual and Automatic Reset



Manual reset option shown



The **Series DFS2 Low Limit Freeze Protection Switch** protects cooling coils in air handler systems by preventing frost build up. The thermostat and its capillary sensing element provide an antifreeze function by sensing the lowest temperature along any one foot section of capillary. The DPDT manual or automatic reset relays signal the building management system as well as cut off the fan. The Series DFS2 will detect temperature drops below the fixed safety value (set point) which can be set as low as 34°F (1°C) utilizing the visual set point indicator and set point screw.

FEATURES/BENEFITS

- Vapor-filled copper capillary sensing element
- Joint spring protector at capillary-bellow connection
- Set point safety-lock protection and simple adjustment
- Easy installation and wiring
- Automatic and manual reset

APPLICATIONS

- HVAC equipment
- Heat exchangers and cooling coils

MODEL CHART

Model	Reset Action	Capillary Length
DFS2-DA10	Automatic	10' (302 cm)
DFS2-DA20	Automatic	20' (609 cm)
DFS2-DM10	Manual	10' (302 cm)
DFS2-DM20	Manual	20' (609 cm)

SPECIFICATIONS

Sensing Element: Vapor-filled capillary.
Operating Temperature: 14°F to 54°F (-10°C to 12°C).
Storage Temperature: 14°F to 158°F (-10°C to 70°C).
Capillary Overload Temperature: 392°F (200°C), maximum 60 minutes.
Humidity Limit: 0 to 95% RH, non-condensing.
Enclosure: Galvanized steel base, ABS cover.
Enclosure Rating: NEMA 1 (IP40).
Capillary Material: Copper.
Cable Entry: (1) M20 compression fitting.

Reset Action: Available in automatic or manual reset options.
Low-level Setpoint: Factory Set: 39°F (4°C), and safety lock secured; Adjustment via screwdriver slot.
Wire Connection: Terminal with wire-retaining screws.
Wire Size: Max. 14 AWG.
Electrical Rating: 24-250 VAC, 15 (8) A.
Electrical Connections: Two each NO/NC/Common.
Deadband: 1.8°F (fixed).
Weight: 1.6 lb (0.7 kg).
Agency Approvals: CE.

ACCESSORIES

Model	Description
A-DFS2-C	Capillary mounting clips



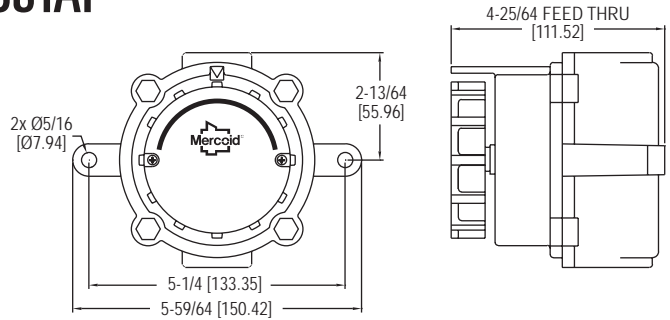


MODEL 862E | MERCROID® BY DWYER



EXPLOSION-PROOF, HEAVY-DUTY THERMOSTAT

Line or Low Voltage, Heating or Cooling



The **Model 862E Explosion-Proof, Heavy-Duty Thermostat** is designed for hazardous-location temperature control of heating, cooling, or ventilation systems and features an adjustable set point knob for easy and convenient set point adjustment.

FEATURES/BENEFITS

- Explosion-proof construction
- Lightweight and durable

APPLICATIONS

- Oil rigs or refineries
- Petrochemical plants
- Grain processing and storage facilities
- HVAC control

MODEL CHART

Model	Description
862E	Explosion-proof, heavy-duty thermostat

SPECIFICATIONS

Service: Compatible gases.
Temperature Limit: -49 to 176°F (-45 to 80°C).
Enclosure Rating: Explosion-proof NEMA 7 & 9, Class I, Divisions 1 & 2, Groups C & D; Class II, Division 1, Groups E, F & G; Class II, Division 2, Groups F & G; Class III; Class I, Zones 1 & 2, Groups IIA & IIB.
Switch Type: SPDT snap action switch.
Electrical Rating: 22 A @ 480 VAC (res.), 1/2 HP @ 125 VAC, 1 HP @ 250 VAC.
Electrical Connection: Screw terminal.
Conduit Connection: 3/4" female NPT.
Set Point Adjustment: External knob.
Adjustable Range: 36 to 82°F (2 to 28°C).
Deadband: 2.5°F (1.5°C).
Weight: 2.1 lb (0.95 kg).
Agency Approvals: CSA, UL.

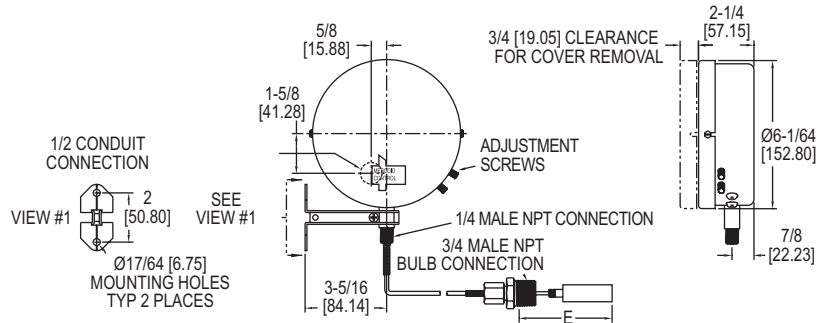
USA: California Proposition 65

⚠WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

SERIES DA-7035N | MERCROID® BY DWYER

TEMPERATURE SWITCH

Bulb and Capillary, Inert Gas Fill



The **Series DA-7035N Temperature Switch** includes the same time-proven switching mechanism used in our Series DA pressure switches. Bourdon tube ensures high sensitivity and long life.

FEATURES/BENEFITS

- Adjustable deadband
- No cross ambient temperature effects
- Visible dial calibrated in both °F and °C
- Visible on/off indication

APPLICATIONS

- Mechanical process temperature monitoring

SPECIFICATIONS

Service: Compatible liquids or gases.
Wetted Materials: Bulb and connection: 304 SS.
Temperature Limit: Process: See model chart; Ambient: 180°F (82°C).
Pressure Limit: 300 psi (20.6 bar).
Enclosure Rating: General purpose. Optional weatherproof and explosion-proof.
Repeatability: ±1% FS.
Switch Type: SPDT snap switch. Optional DPDT snap and a variety of mercury switches.
Electrical Rating: 10 A @ 120/240/480 VAC.
Electrical Connections: Screw terminal.
Conduit Connection: 7/8" (22.23 mm) hole for 1/2" (12.7 mm) conduit hub.

Process Connection: 3/4" male NPT. Other sizes available.
Set Point Adjustment: External knobs for set point and reset point.
Weight: 5 lb (2.3 kg).
Deadband: Adjustable from minimum in model chart to full range. Optional low fixed deadband.
Capillary: 6' (1.8 m) standard. Ranges 1N to 7N, and 10N: copper. Ranges 8N, 9N, 11N: 304 SS.
Set Point Scale: Indication in °F and °C.
Options: See web page for additional option models such as: switch type enclosures, fixed deadband, longer or shorter capillary, armored capillary, wells, two stage, 1/2" or 1" connection sizes, manual reset.

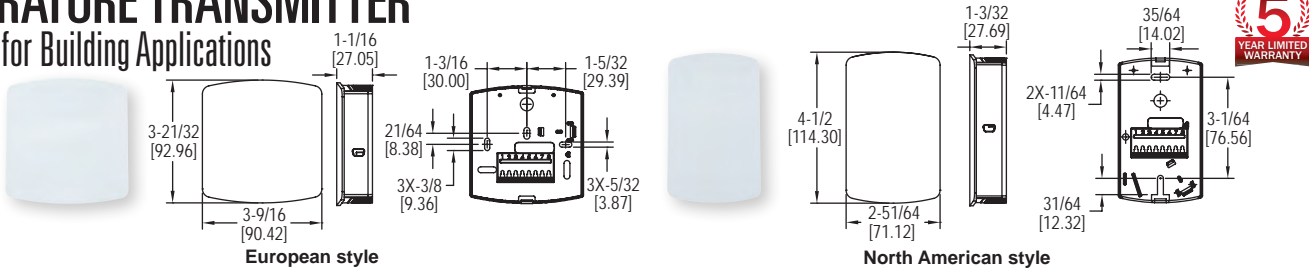
MODEL CHART

Model	Range °F (°C)	Max. Temp. °F (°C)	Min. Deadband °F (°C)	Min. Insertion Depth "E" in. (mm)
DA-7035-153-1N	-60 to +30 (-50 to 0)	150 (65)	23 (13)	2-7/8 (73)
DA-7035-153-3N	0 to 100 (-18 to 40)	240 (115)	25 (14)	2-7/8 (73)
DA-7035-153-4N	50 to 150 (10 to 65)	250 (120)	25 (14)	2-7/8 (73)
DA-7035-153-5N	100 to 200 (40 to 95)	300 (150)	25 (14)	2-7/8 (73)
DA-7035-153-7N	140 to 300 (60 to 150)	500 (260)	41 (23)	2-7/8 (73)
DA-7035-153-8N	250 to 415 (120 to 215)	550 (290)	42 (23)	2-7/8 (73)
DA-7035-153-9N	350 to 550 (175 to 290)	600 (315)	50 (28)	4-7/8 (124)
DA-7035-153-10N	100 to 300 (40 to 150)	500 (260)	50 (28)	2-7/8 (73)
DA-7035-153-11N	100 to 500 (40 to 260)	600 (315)	100 (56)	2-7/8 (73)

Note: Insertion depth can be increased through use of bulb supports or wells. Consult factory.

TEMPERATURE TRANSMITTER

Wall Mount for Building Applications



The Series BTT-E/N Temperature Transmitters offer transmitter output signals with the same form and fit as our popular Series TE-E/N thermistor and RTD sensors for Building Automation and HVAC installations.

FEATURES/BENEFITS

- Transmitter signal offers reliable accuracy for installations with long wire runs between the transmitter and the receiver/controller

MODEL CHART		
Model	Housing	Output
BTT-N00-3	North American style	4-20 mA
BTT-N00-4	North American style	0-10 VDC
BTT-E00-3	European style	4-20 mA
BTT-E00-4	European style	0-10 VDC

APPLICATIONS

- Room or indoor building space temperature monitoring

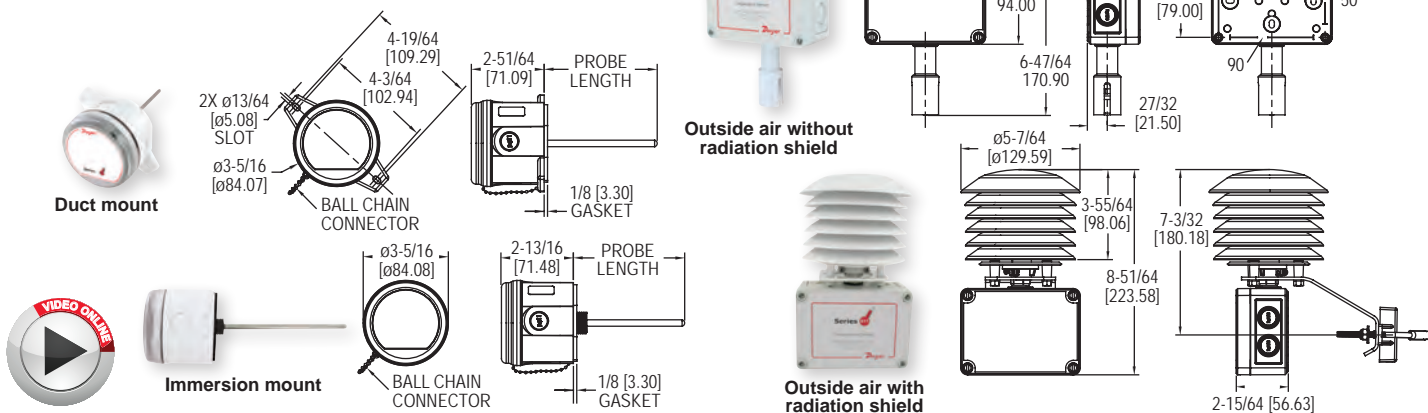
SPECIFICATIONS

Temperature Sensor: Pt 1000 Ω RTD DIN Class A 0.00385Ω/°C.
Range: 32 to 122 °F (0 to 50 °C).
Temperature Limits: 32 to 122 °F (0 to 50 °C).
Accuracy: ±0.5 °C @ 25 °C.
Thermal Effect: ±0.01%/°C.
Response Time: 100 ms.
Power Requirements: 13-36 VDC for current models, 13-36 VDC or 16-28 VAC for voltage models.
Output Signal: 4-20 mA or 0-10 VDC (depending on model).
Electrical Connections: Screw terminal block.
Enclosure Rating: IP20.
Weight: 2.6 oz (73.7 g).
Agency Approvals: CE.

SERIES BTT

TEMPERATURE TRANSMITTERS

Current or Voltage Output, NEMA 4X Enclosures



The Series BTT Temperature Transmitters offer transmitter output signals with the same form and fit as our popular TE thermistor and RTD sensors for building HVAC applications. Thermowells are required when using immersion models in liquid applications.

FEATURES/BENEFITS

- Duct, immersion, and outside air models available
- Radiation shield available for mounting in direct sunlight
- Transmitter output allows for longer wire runs than standard thermistor sensors

APPLICATIONS

- Building automation system temperature monitoring

MODEL CHART					
Example	BTT	-D	04	-1	BTT-D04-1
Series	BTT				Temperature transmitter
Mounting Configuration		D I O R			Duct mount Immersion mount Outside air Outside air with radiation shield
Probe Length*			25 04 06 08 12 18		2.5" (required for "O" and "R" models) 4" 6" 8" 12" 18"
Output				1 2	4 to 20 mA 0 to 10 V
Options				Blank FC NIST	None Factory calibration certificate NIST calibration certificate

*For BTT-I models, actual probe length is approximately 0.75" longer than listed probe length to ensure maximum immersion into thermowells.

SPECIFICATIONS

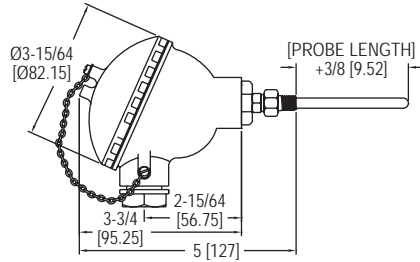
Temperature Sensor: Pt1000 RTD.
Range: -40 to 140°F (-40 to 60°C).
Temperature Limits: Operating: -40 to 302°F (-40 to 150°C).
Accuracy: ±0.5°C @ 25°C.
Thermal Effect: ±0.01%/°C.
Response Time: 100 ms.
Wetted Materials: All models: 304 SS (probe), polycarbonate (housing); Duct and immersion models: Neoprene (gasket); Outside air models: Nylon (insert), silicone (O-ring).
Process Connection: 1/2" NPT (immersion models only).
Electrical Connection: Removable terminal block, knocks out for conduit fitting.
Conduit Connection: 1/2" NPT.
Probe Lengths: 2.5 to 18" (depending on configuration).
Power Requirements: 13-36 VDC for current models, 13-36 VDC or 16-28 VAC for voltage models.
Output Signal: 4-20 mA or 0-10 VDC (depending on model).
Enclosure Rating: NEMA 4X (IP66) (immersions models require thermowell).
Weight: 5.11 oz (145 g) (duct/immersion); 8.4 oz (238 g) (OSA without radiation shield); 1 lb 7.4 oz (663.4 g) (OSA with radiation shield).
Agency Approvals: CE.

THERMOWELLS - WELDED

Model	Material	Connection (Internal/External)	Insertion Length
TE-TNS-N253N-00	304 SS	1/2" NPSM/1/2" NPT	2.5"
TE-TNS-N043N-00	304 SS	1/2" NPSM/1/2" NPT	4"
TE-TNS-N063N-00	304 SS	1/2" NPSM/1/2" NPT	6"
TE-TNS-N083N-00	304 SS	1/2" NPSM/1/2" NPT	8"
TE-TNS-N123N-00	304 SS	1/2" NPSM/1/2" NPT	12"
TE-TNS-N183N-00	304 SS	1/2" NPSM/1/2" NPT	18"

WEATHERPROOF IMMERSION TEMPERATURE TRANSMITTER

Pt100 RTD, PC Programmable Transmitter



The **Series TTW Weatherproof Immersion Temperature Transmitter** offers a field adjustable temperature transmitter pre-assembled with an RTD sensor and weatherproof enclosure.

FEATURES/BENEFITS

- Preset to 32 to 212°F (0 to 100°C) output range
- USB port for easy output scale adjustment in the field

APPLICATIONS

- Immersion temperature sensing in HVAC systems

MODEL CHART	
Model	Probe Length
TTW-104	4"
TTW-106	6"
TTW-108	8"
TTW-112	12"
TTW-118	18"

THERMOWELLS - MACHINED

Model	Material	Length	Connection (Internal/External) (NPT)
TE-TNS-N044N-14	304 SS	4"	1/4" / 1/2"
TE-TNS-N064N-14	304 SS	6"	1/4" / 1/2"
TE-TNS-N094N-14	304 SS	9"	1/4" / 1/2"
TE-TNS-N124N-14	304 SS	12"	1/4" / 1/2"

SPECIFICATIONS

TEMPERATURE SENSOR

Accuracy: ±3°F (±1.7°C).
Temperature Limits: Operating: -40 to 302°F (-40 to 150°C).
Sensor Curves: Pt100 RTD (TE Series Curve D).

TEMPERATURE TRANSMITTER

Input Range: -328 to 986°F (-200 to 530°C).
Output: Two-wire 4-20 mA.
Output Impedance: 600 Ω @ 24 VDC.
Power Requirements: 12-35 VDC.
Accuracy: ±0.2% FS.
Temperature Limits: -40 to 185°F (-40 to 85°C).
Response Time: <100 ms.

ENCLOSURE

Temperature Limits: -40 to 212°F (-40 to 100°C).
Rating: NEMA 4X (IP65).
Material: Painted aluminum housing.

FREE software download: See page 134 (Series TBU-00)



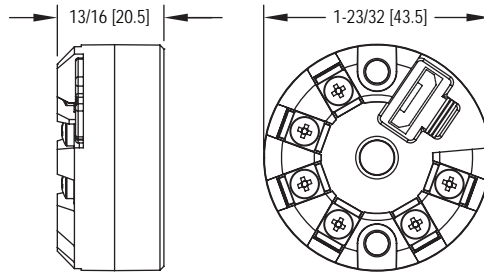
Machined thermowell

Technical Specifications and Additional Thermowell Models: See page 147 (Series TE-TNS)

MODEL TBU-00

TEMPERATURE TRANSMITTER

Field Selectable, Universal Input, In-Head Mounting



The **Model TBU-00 Temperature Transmitter** is a high precision temperature transmitter designed to easily mount in most temperature sensor instrument enclosures. The universal input reduces inventory while the micro-USB port facilitates easy configuration, and calibration in the lab or in the field. The versatile TBU model allows for selection and configuration of input type, measurement range, and calibration. The output can be set as either direct 4-20 mA, or reverse 20-4 mA, through easy to use configuration software.

FEATURES/BENEFITS

- Configurable measurement range
- Standard temperature sensor head enclosure mounting
- Pt100 connection for 2, 3, or 4 wires

APPLICATIONS

- Process applications where a 4-20 mA signal is required
- Food processing equipment
- Boiler equipment
- Refrigeration equipment

MODEL CHART	
Model	Description
TBU-00*	Universal input temperature transmitter with customizable measurement ranges

*TBU-00 FREE downloadable configuration software available at www.dwyer-inst.com

ACCESSORIES

Model	Description
A-709	NEMA 4X aluminum transmitter enclosure
UHH-CBL2	USB to micro-USB cable

SPECIFICATIONS

Input: Thermocouples J, K, R, S, T, N, E, and B; 2, 3, or 4 wire Pt100 RTD, 2 or 3 wire Pt1000 RTD, 2 wire NTC thermistor, or 0-50 mV voltage.
Output: Linearized 4-20 mA, 2 wire or 20-4 mA loop powered.
Transmitter Type: 2, 3, or 4 wire.
Temperature Limits: -40°F to 185°F (-40 to 85°C).
Power Requirements: 10-35 VDC.
Accuracy: See chart below.
Temperature Drift: < ±0.16% / 25°C.
Response Time: 1.6 s, typical.
Weight: 1.4 oz (40 g).
Agency Approvals: CE.

Note: Factory set to Pt100 Ω RTD, 0 to 100°C, direct acting

ACCURACY CHART

Input Type	Temperature Range	Accuracy (Typical)
Thermocouples and mV	Configured with software	±0.1% FS
Pt100/ Pt1000 RTDs	-328 to 1202°F (-200 to 650°C) -238 to 752°F (-150 to 400°C)	±0.13% FS ±0.1% FS

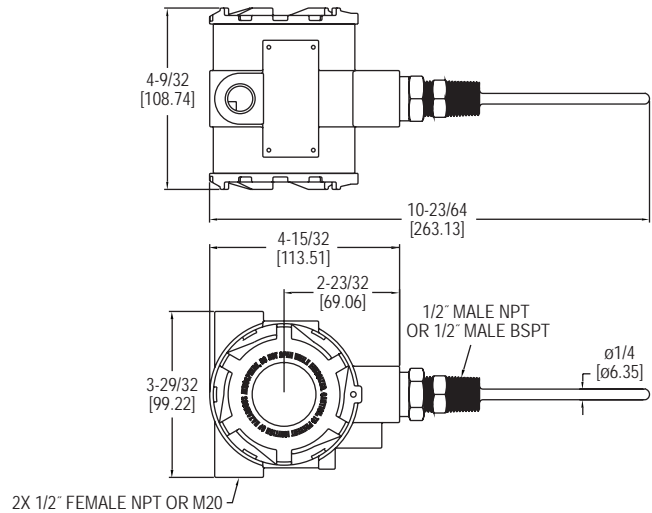


EXPLOSION-PROOF RTD TEMPERATURE TRANSMITTER

User Selectable Ranges, Optional LCD Display



*Shown with optional LCD display



The **Series TTE Explosion-Proof RTD Temperature Transmitter** is the ideal product for hazardous temperature measurement applications. The TTE series has seven pre-programmed temperature ranges that are selectable via an internal dip switch. For those applications that need a custom range, the transmitter can be easily configured for any range between -30 to 250°F with a minimum span of 40°F. The span and zero can be quickly adjusted with a simple push-button design. This unit has optional listings of FM for use in Class I, Division 1, Groups B, C and D, Class II, Division 1, Groups E, F and G and Class III atmospheres or ATEX (Directive 2014/34/EU) for **CE** II 2 G Ex db IIC T6...T4 Gb (-20°C ≤ Ta ≤ +70°C), **CE** II 1 D Ex ta IIIC T111°C Da (-20°C ≤ Ta ≤ +70°C) and IECEx for Ex db IIC T6...T4 Gb (-20°C ≤ Ta ≤ +70°C), Ex ta IIIC T111°C Da (-20°C ≤ Ta ≤ +70°C). The compact housing allows for the transmitter to be mounted in virtually any application.

FEATURES/BENEFITS

- FM approved for Class I, Groups B, C, D; Class II, Groups E, F, G classified explosive environments
- Optional LCD
- Output span selected from seven common ranges or user determined

APPLICATIONS

- Explosive process environments
- Offshore HVAC monitoring

MODEL CHART						
Example	TTE	-1	04	-W	-LCD	TTE-104-W-LCD
Series	TTE					Explosion-proof RTD temperature transmitter
Agency		1				FM*
		2				ATEX/IECEx flameproof
Probe Length			02			2" probe
			04			4" probe
			06			6" probe
			09			9" probe
			12			12" probe
			15			15" probe
			18			18" probe
Construction				W		Well probe
Options					Blank	No LCD display
					BSPT	1/2" male BSPT process connection
					C5	C5-M housing paint specification
					LCD	LCD display
					M20	Female M20 thread electrical connection

*Options that do not have ATEX and IECEx.

Attention: Units without the "2" suffix following "TTE" are not directive 2014/34/EU (ATEX) Compliant. These units are not intended for use in potentially hazardous atmospheres in the EU. These units may be CE marked for other directives of the EU.

ACCESSORIES

Model	Description
A-287	Mounting bracket for pipe or surface mounting (Includes bracket and two 2" U-bolts)

SPECIFICATIONS

Temperature Sensor: Pt1000, 0.00385 DIN.
Output Temperature Ranges: User selectable – any range between -30 to 250°F with a minimum span of 40°F.
Temperature Limits: Ambient: -4 to 158°F (-20 to 70°C); Process: -30 to 250°F (-34.4 to 120°C).
Accuracy: Transmitter ±0.1% FS; Probe ±0.3% FS.
Thermal Drift Effects: ±0.02%/°C max.
Response Time: 250 ms.
Wetted Materials: 316 SS.
Process Connection: 1/2" male NPT or 1/2" male BSPT.
Conduit Connection: 1/2" female NPT or M20.
Probe Length: 2" to 18" (depending on model).
Pressure Limits: 2000 psi (137.9 bar).
Power Requirements: 10 to 35 VDC.
Output Signal: 4 to 20 mA (two wire loop powered).
Optional Display: 2 lines X 8 character LCD.
Enclosure Rating: Weatherproof and Explosion-proof. Listed with FM for Class I, Division 1, Groups B, C and D, and dust-ignitionproof for Class II, Division 1, Groups E, F and G and Class III atmospheres.
ATEX Certified: **CE** 0518 **Ex** II 2 G Ex db IIC T6...T4 Gb, **CE** II 1 D Ex ta IIIC T111°C Da, T6 Process Temp ≤80°C, Temperature Class T5 Process Temp ≤95°C, Temperature Class T4 Process Temp ≤120°C as defined on nameplate. EU-type Certificate No.: EMT17ATEX0021 X.
 ATEX Standards: EN 60079-0:2012+A11:2013; EN 60079-1:2015; EN 60079-31:2014.
IECEx Certified: For Ex db IIC T6...T4 Gb, Ex ta IIIC T111°C Da, T6 Process Temp ≤80°C, Temperature Class T5 Process Temp ≤95°C, Temperature Class T4 Process Temp ≤120°C as defined on nameplate.
IECEx Certificate of Conformity: Element IECEx EMT 17.0007X; IECEx Standards: IEC 60079-0:2011 (Edition 6); IEC 60079-1:2014 (Edition 7); IEC 60079-31:2013 (Edition 2).
Weight: 2 lb 8 oz (1134 g).
Agency Approvals: FM, CE, ATEX/IECEx.

THERMOWELLS - MACHINED

Model	Material	Length	Connection (Internal/External) (NPT)
TE-TNS-N044N-12	304 SS	4"	1/2" / 3/4"
TE-TNS-N064N-12	304 SS	6"	1/2" / 3/4"
TE-TNS-N094N-12	304 SS	9"	1/2" / 3/4"
TE-TNS-N124N-12	304 SS	12"	1/2" / 3/4"



Machined thermowell

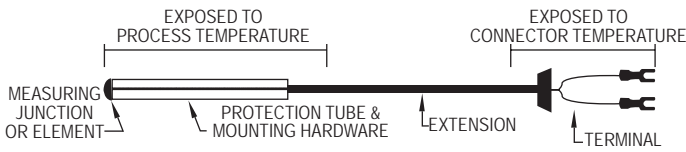
FIELD-SELECTABLE RANGES

40 to 90°F (4.4 to 32.2°C)
 -20 to 140°F (-28.9 to 60°C)
 0 to 100°F (-17.8 to 37.8°C)
 30 to 240°F (-1.1 to 115.6°C)
 32 to 212°F (0 to 100°C)
 32 to 122°F (0 to 50°C)
 -30 to 65°C (-1.1 to 18.3°C)
 Custom range between -30 to 250°F (-34.4 to 121.1°C)

Technical Specifications and Additional Thermowell Models: See page 147 (Series TE-TNS)



TEMPERATURE SENSORS



Thermocouple Types	Wire Types	Temperature Range (°F)	Temperature Range (°C)
J	Iron/constantan	32 to 1400	0 to 760
K	Chromel/alumel	32 to 2300	0 to 1200
E	Chromel/constantan	-300 to 1600	-184 to 871
T	Copper/constantan	-300 to 700	-184 to 371
R	Plat. 13%/rhod./plat.	32 to 2700	0 to 1482
S	Plat. 10%/rhod./plat.	32 to 2700	0 to 1482
RTD Types		Temperature Range (°F)	Temperature Range (°C)
Low range thin film		-58 to 392	-50 to 200
Medium range thin film		-58 to 896	-50 to 480
High range wire wound		-328 to 1112	-200 to 600

ORDERING SENSORS

Sensors are constructed with various types of protection/mounting hardware, extensions, and wire terminations. The sensor types and their temperature ranges are shown in the table. See "Temperature Limits" for maximum service temperatures applicable to the protection tube, mounting hardware, wire extensions, etc.

This section shows only a limited selection of the available sensors. The sensors are organized by hardware type. Most hardware can house any type thermocouple or RTD. Terminations are usually either lug type or standard plugs, but many other types are available. Various 'head enclosures' are also available. Dimensions can be custom designed to meet your specifications.

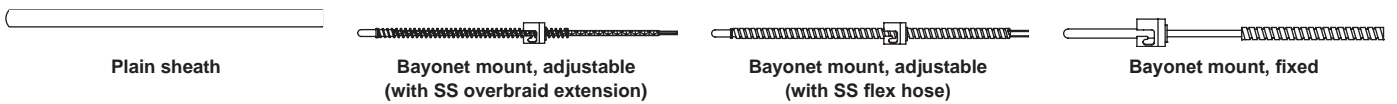
SERVICE TEMPERATURES

304/316 SS tubing/protection/mounting hardware	1600°F
Inconel® 600 tubing/protection/mounting hardware	2100°F
Alumina	3400°F
Mullite	2700°F
Fiberglass insulated extension wire	842°F
FEP insulated extension wire	392°F
Junction box (BX) connector	400°F
Plug	400°F

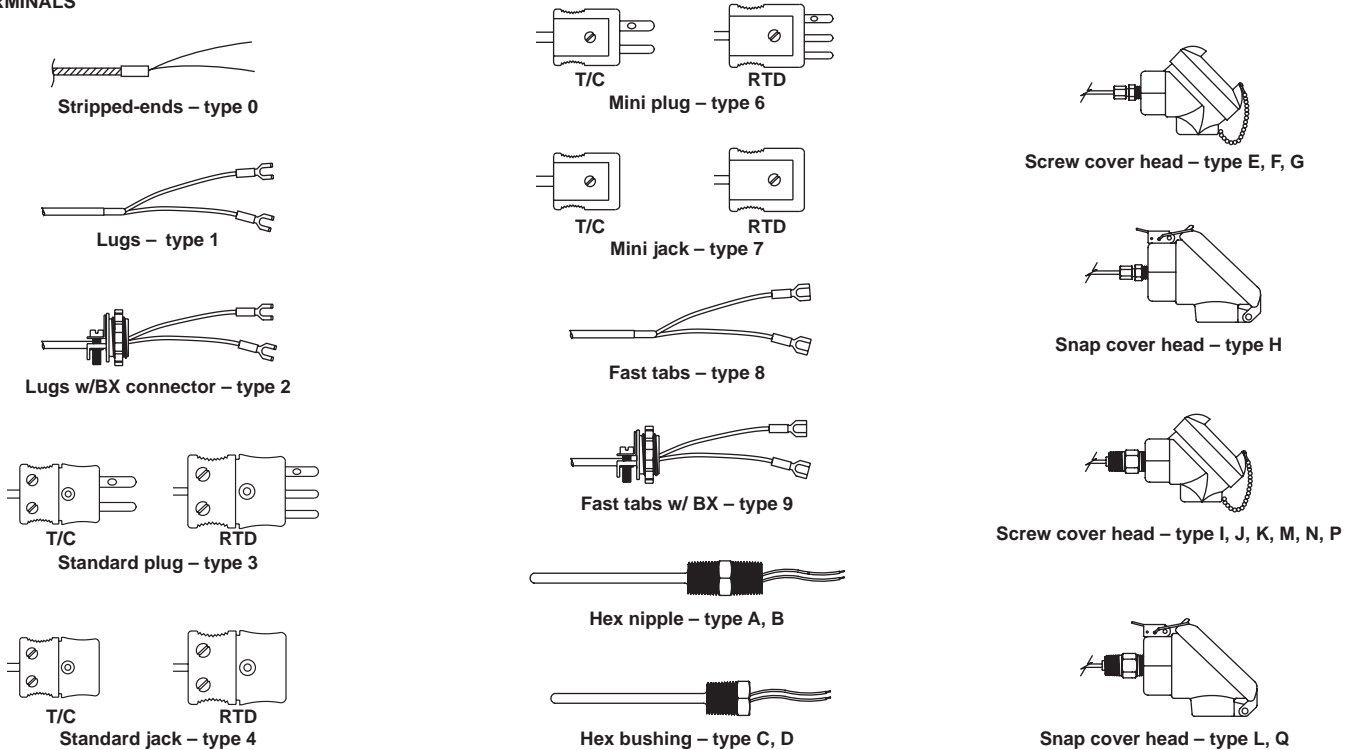
TEMPERATURE LIMITS

Sensor selection depends on two separate temperatures: process temperature and connector temperature. Make sure the local temperature at each component does not exceed the maximum rated service temperature for that component. Note that extension wire must withstand the process temperature.

HARDWARE TYPE



TERMINALS

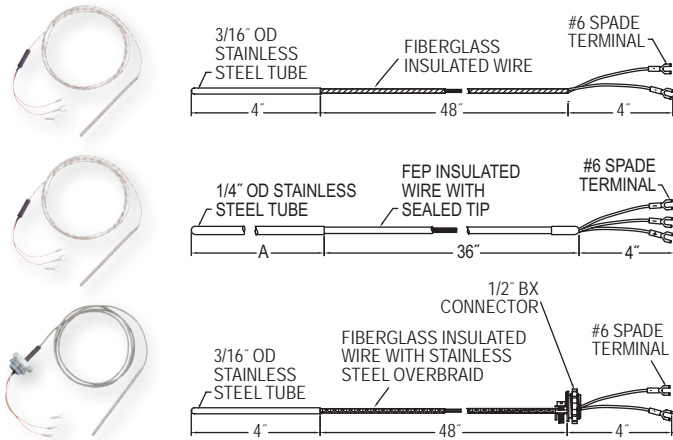


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THERMOCOUPLES & RTD'S

GENERAL PURPOSE

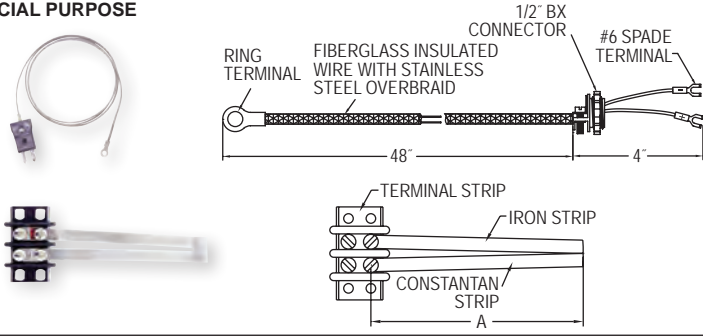


MODEL CHART - BASIC		
Model	Sensor Type	Terminal
122095-84	J	#6 spade
122095-01	K	#6 spade
122095-04	(3-wire) 100 Ω RTD	#6 spade

MODEL CHART - FEP INSULATION EXTENSION			
Model	Sensor Type	A Length	Terminal
122087-00	100 Ω RTD	6"	#6 spade

MODEL CHART - SS OVERBRAID EXTENSION			
Model	Sensor Type	Bend	Terminal
122095-19	J	0°	#6 spade
122095-25	100 Ω RTD	0°	#6 spade

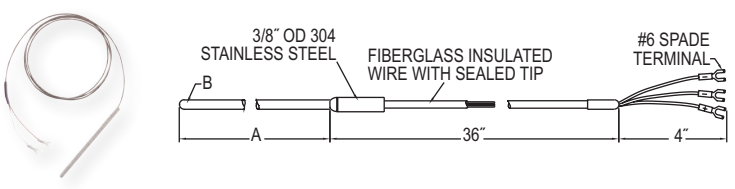
SPECIAL PURPOSE



MODEL CHART - SURFACE THERMOCOUPLE (900°F MAX.)			
Model	Sensor Type	Ring Terminal ID	Terminal
122095-24	J	13/32"	#6 spade
122095-32	J	13/64"	#6 spade

MODEL CHART - WEB STYLE		
Model	A Length	Terminal
122095-86	2.75"	No

MINERAL INSULATED

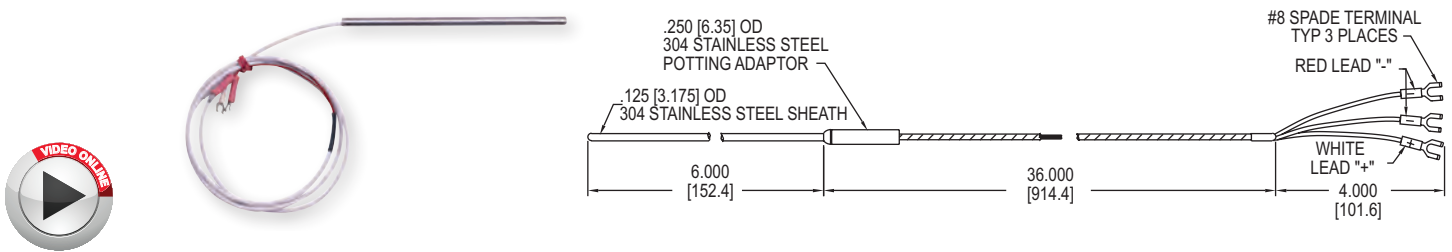


MODEL CHART				
Model	Sensor Type	A Length	B Diameter	Terminal
122088-00	100 Ω RTD	6"	1/4"	#6 spade
122088-01	100 Ω RTD	12"	1/4"	#6 spade
122086-00	100 Ω RTD	6"	1/8"	#6 spade

SERIES RTD

RESISTANCE TEMPERATURE DETECTOR

High Temperature, Mineral Insulated, 316 SS Sheath



Precision **Series RTD Resistance Temperature Detector** offers excellent accuracy and stability over a wide temperature range. Industry standard 3-wire 100 Ω (DIN) probes are available in 6" (15 cm), 12" (30.5 cm), or 18" (46 cm) sheath lengths with 30" (76 cm) extension cable and spade lug terminals.

- FEATURES/BENEFITS**
- 304 stainless steel sheath
 - High temperature rating

APPLICATIONS
Air ducts, bearing temperature, oil temperature indicator, soldering equipment, ovens, environmental test chambers, pharmaceutical mfg., food processing, plastic molding, petroleum & chemical processing, electric generating plants, etc.

SPECIFICATIONS		
Sensor Type:	Wire wound, 100 Ω.	
Temperature Range:	-328 to 1202°F (-200 to 650°C).	
Pressure Limits:	250 psig (17.2 bar).	
Probe Material:	316 SS.	
Extension Length:	30" (76 cm).	
Element Standard:	DIN .00385 (Class B, 0.12%).	

MODEL CHART		
Model	Length	Diameter
RTD-686	6" (15 cm)	1/8"
RTD-646	6" (15 cm)	1/4"

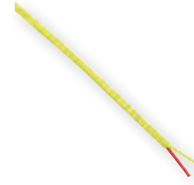
THERMOCOUPLE WIRE



J type - FEP



J type - FB



K type - FEP



K type - FB

MODEL CHART - SPOOLS

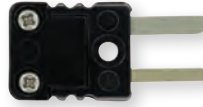
Model	Specification
A-TC-J25-FB	J type, 25' on spool, fiber glass insulation, 450°C, black outer sheath, 24 AWG, 0.20 SQMM
A-TC-J25-FEP	J type, 25' on spool, FEP insulation, 200°C, black outer sheath, 24 AWG, 0.20 SQMM
A-TC-K25-FB	K type, 25' on spool, fiber glass insulation, 450°C, yellow outer sheath, 24 AWG, 0.20 SQMM
A-TC-K25-FEP	K type, 25' on spool, FEP insulation, 200°C, yellow outer sheath, 24 AWG, 0.20 SQMM
A-TC-J50-FB	J type, 50' on spool, fiber glass insulation, 450°C, black outer sheath, 24 AWG, 0.20 SQMM
A-TC-J50-FEP	J type, 50' on spool, FEP insulation, 200°C, black outer sheath, 24 AWG, 0.20 SQMM
A-TC-K50-FB	K type, 50' on spool, fiber glass insulation, 450°C, yellow outer sheath, 24 AWG, 0.20 SQMM
A-TC-K50-FEP	K type, 50' on spool, FEP insulation, 200°C, yellow outer sheath, 24 AWG, 0.20 SQMM
A-TC-J100-FB	J type, 100' on spool, fiber glass insulation, 450°C, black outer sheath, 24 AWG, 0.20 SQMM
A-TC-J100-FEP	J type, 100' on spool, FEP insulation, 200°C, black outer sheath, 24 AWG, 0.20 SQMM
A-TC-K100-FB	K type, 100' on spool, fiber glass insulation, 450°C, yellow outer sheath, 24 AWG, 0.20 SQMM
A-TC-K100-FEP	K type, 100' on spool, FEP insulation, 200°C, yellow outer sheath, 24 AWG, 0.20 SQMM

PLUGS (MALE)



MODEL CHART - STANDARD SIZE SINGLE

Model	Type
481-0001	J
481-0002	K
481-0003	T
481-0004	Cu11 (2-wire)
481-0015	E
481-0134	Cu (3-wire)



MODEL CHART - MINIATURE SIZE SINGLE

Model	Type
481-0093	J
481-0095	K
481-0094	T
481-0098	R
481-0097	S
481-0096	E
481-0099	Cu (2-Wire)
481-0175	Cu (3-Wire)

JACKS (FEMALE)



MODEL CHART - STANDARD SIZE SINGLE

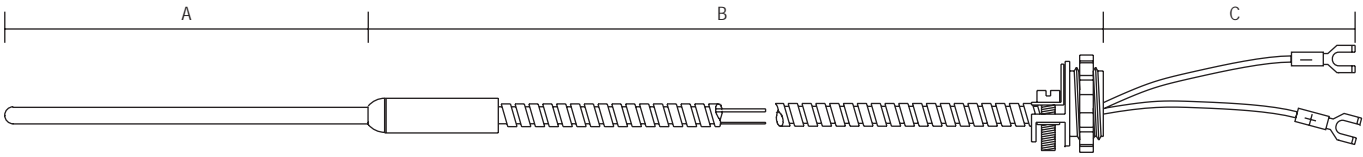
Model	Type
481-0006	J
481-0007	K
481-0008	T
481-0009	Cu11 (2-Wire)
481-0016	E
481-0135	Cu (3-Wire)



MODEL CHART - MINIATURE SIZE SINGLE

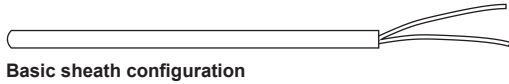
Model	Type
481-0100	J
481-0102	K
481-0101	T
481-0105	R
481-0104	S
481-0103	E
481-0106	Cu (2-Wire)
481-0174	Cu (3-Wire)

MINERAL INSULATED THERMOCOUPLES AND RTD'S

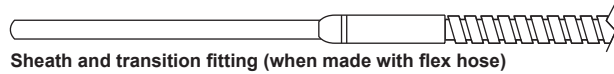


MINERAL INSULATED TRANSITIONS

Due to the varying size of connection wire and cable, a transition fitting is used between the cold end of the sheath and the connecting wires. This fitting measures 1-1/4" long by 1/4" OD for 1/8" or smaller sheaths, and 1-1/2" long by 3/8" OD for 3/16" and 1/4" sheaths. Larger sheaths and sheaths terminating in connectors other than wire or cable do not require transition fittings.



Basic sheath configuration



Sheath and transition fitting (when made with flex hose)



Sheath and transition fitting (when made with SS overbraid wire)



Sheath and transition fitting (when made with fiberglass wire)



Series R & 8 Mineral Insulated Thermocouples and RTD's are known for their excellent mechanical durability and resistance to electrical breakdown. Mineral Insulated Thermocouples can be bent to most any angle without special equipment.

MODEL CODING

Fill in the appropriate numbers or letters to specify the probe of your choice. Fill in all boxes. If an item or dimension does not apply, fill those boxes with zeros '0'.

		RTD TYPE											
		2 - 2-Wire; Class B											
		3 - 3-Wire; Class B											
		4 - 4-Wire; Class B											
		5 - 2-Wire; Class A											
		6 - 3-Wire; Class A											
		7 - 4-Wire; Class A											
SENSOR TYPE													
6 - 100 Ω RTD: 0.00385 Ω/°C													
4 - 100 Ω RTD: 0.00392 Ω/°C													
R	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
8	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
				A			AA			B		C	
				IN 1/10 INCH			IN 1/10 INCH			IN INCHES		IN INCHES	
SENSOR TYPE	HARDWARE TYPE	EXTENSION TYPE		SENSOR TERMINALS	ELEMENTS	JUNCTION TYPE	SENSOR O.D.	BEND					
J - T/C	1 - Plain Sheath (304 SS)	0 - Fiberglass Singles		0 - Stripped Ends	1 - Single	1 - Grounded	1 - 1/16"	1 - None					
K - T/C	2 - Plain Sheath (316 SS)	1 - Fiberglass Insulation		1 - Leads With #6 Spade Lugs	2 - Dual	2 - Ungrounded	2 - 1/8"	2 - 45°					
E - T/C	3 - Inconel® 600 Sheath	2 - Fiberglass Insulation w/ SS Flex Hose		2 - Leads With #6 Spade Lugs & 1/2 BX	3 - Exposed Tip	3 - Exposed Tip	3 - 3/16"	3 - 90°					
T - T/C		3 - Fiberglass Insulation w/ SS Overbraid		3 - Standard Plug			4 - 1/4"						
				4 - Standard Jack			5 - 3/8"						

HEAD ASSEMBLY OPTIONS (3/4" NPT Conduit Connection)

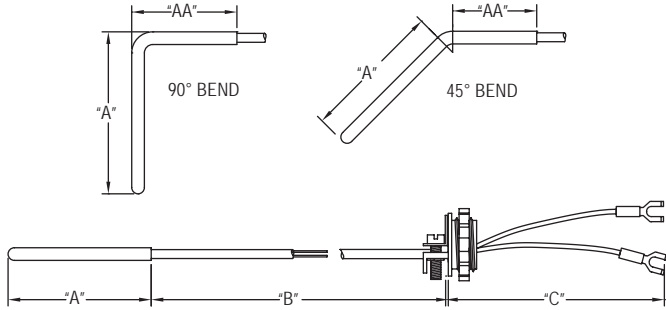
- E - Screw Cover Head, AL w/ No Process Connection
- F - Screw Cover Head, Plastic w/ No Process Connection
- G - Screw Cover Head, SS w/ No Process Connection
- H - Snap Cover Head, AL w/ No Process Connection
- I - Screw Cover Head, AL w/ 1/2" NPT Process Connection
- J - Screw Cover Head, Plastic w/ 1/2" NPT Process Connection
- K - Screw Cover Head, SS w/ 1/2" NPT Process Connection
- L - Snap Cover Head, AL w/ 1/2" NPT Process Connection
- M - Screw Cover Head, AL w/ 3/4" NPT Process Connection
- N - Screw Cover Head, Plastic w/ 3/4" Process Connection
- P - Screw Cover Head, SS w/ 3/4" Process Connection
- Q - Snap Cover Head, AL w/ 3/4" Process Connection

- 6 - Mini Plug
 - 7 - Mini Jack
 - 8 - Leads With 1/4" Fastabs
 - 9 - Leads With 1/4" Fastabs 1/2" BX
 - A - 1/2" NPT Hex Nipple (316 SS)
 - B - 3/4" NPT Hex Nipple (316 SS)
 - C - 1/2" NPT Hex Bushing (316 SS)
 - D - 3/4 NPT Hex Bushing (316 SS)
- See table for **HEAD ASSEMBLY OPTIONS**

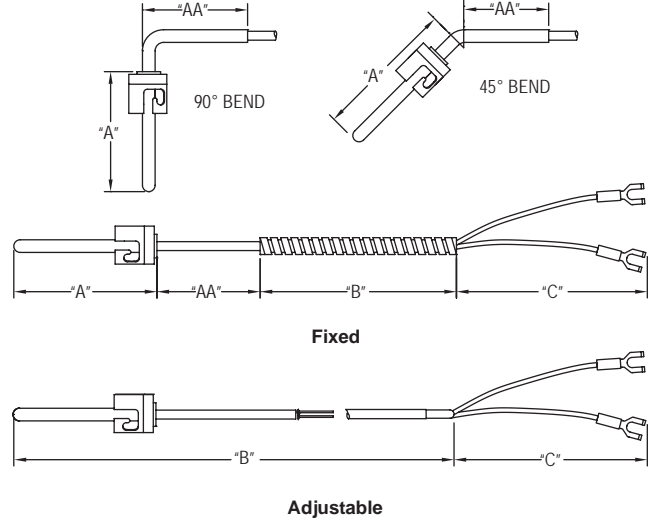
Inconel® is a registered trademark of Huntington Alloys Corporation

GENERAL PURPOSE AND BAYONET TYPE THERMOCOUPLES & RTD'S

GENERAL PURPOSE



BAYONET



Series 4 & 5 General Purpose and Bayonet Type Thermocouples & RTD's tip temperatures can be as high as 842°F (450°C) for fiberglass insulated wire, and 392°F (200°C) for FEP insulated wire. Models can be specified with lead wires or head assembly construction. For higher temperatures see the Series R & 8 Mineral Insulated Probes. ●

MODEL CODING

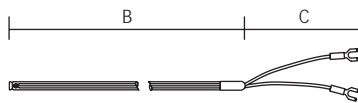
Fill in the appropriate numbers or letters to specify the probe of your choice. Fill in all boxes. If an item or dimension does not apply, fill those boxes with zeros '0'.

SENSOR TYPE		RTD TYPE											
6 – 100 Ω RTD: 0.00385 Ω/°C		2 – 2-Wire; Class B											
Z – 1000 Ω RTD: 0.00385 Ω/°C		3 – 3-Wire; Class B											
4 – 100 Ω RTD: 0.00392 Ω/°C		5 – 2-Wire; Class A											
		6 – 3-Wire; Class A											
				A			AA			B		C	
				IN 1/10 INCH			IN 1/10 INCH			IN INCHES		IN INCHES	
4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
SENSOR TYPE	HARDWARE TYPE	EXTENSION TYPE				SENSOR TERMINALS	ELEMENTS TYPE	JUNCTION TYPE	SENSOR O.D.	BEND			
J – T/C	1 – Plain Sheath (316 SS)	1 – Fiberglass Insulation 842°F/450°C				0 – Stripped Ends	1 – Single	1 – Grounded	2 – 1/8"	1 – None			
K – T/C	2 – Plain Sheath w/ FEP Coating	2 – Fiberglass Insulation w/ SS Flex Hose				1 – Leads With #6 Spade Lugs	2 – Dual	2 – Ungrounded	3 – 3/16"	2 – 45°			
E – T/C	4 – Back Filled Sheath*	3 – Fiberglass Insulation w/ SS Overbraid				2 – Leads With #6 Spade Lugs 1/2 BX	3 – Exposed Tip	3 – 1/4"	4 – 1/4"	3 – 90°			
T – T/C	5 – Back Filled Sheath w/ FEP Coating*	4 – FEP Insulation 392°F/200°C				3 – Standard Plug			5 – 3/8"				
	6 – Bayonet Mount Adjustable Length	5 – FEP Insulation w/ SS Overbraid				4 – Standard Jack							
	7 – Bayonet Mount Fixed Length	6 – FEP Insulation w/ FEP Coated Flex Hose				6 – Mini Plug							
						7 – Mini Jack							
						8 – Leads With 1/4" Fastabs							
						9 – Leads With 1/4" Fastabs 1/2" BX							
						A – 1/2" NPT Hex Nipple (316 SS)*							
						B – 3/4" NPT Hex Nipple (316 SS)*							
						C – 1/2" NPT Hex Bushing (316 SS)*							
						D – 3/4 NPT Hex Bushing (316 SS)*							
						See list for HEAD ASSEMBLY OPTIONS*							
						*Options only available on Series 4 RTD's							

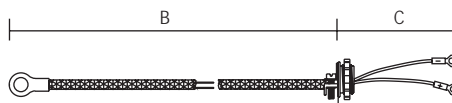
● See page 139 (Series R & 8)

SPECIAL APPLICATION THERMOCOUPLES & RTD'S

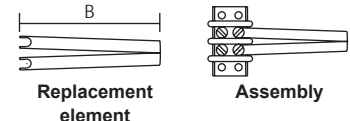
SERIES 9 SPECIALTY SENSOR STYLES



Flexible FEP covered bead junction

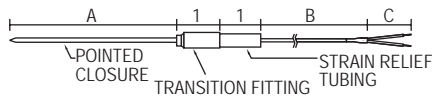


Ring type surface thermocouples and RTD's

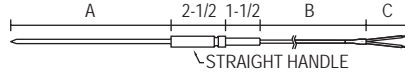


Replacement element
Assembly
Web type surface thermocouples

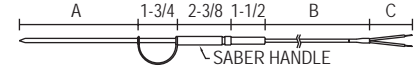
SERIES P PENETRATION PROBE STYLES



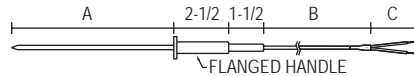
1. Transition fitting



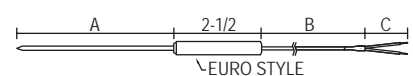
2. Straight handle



3. Saber handle



4. Flanged handle



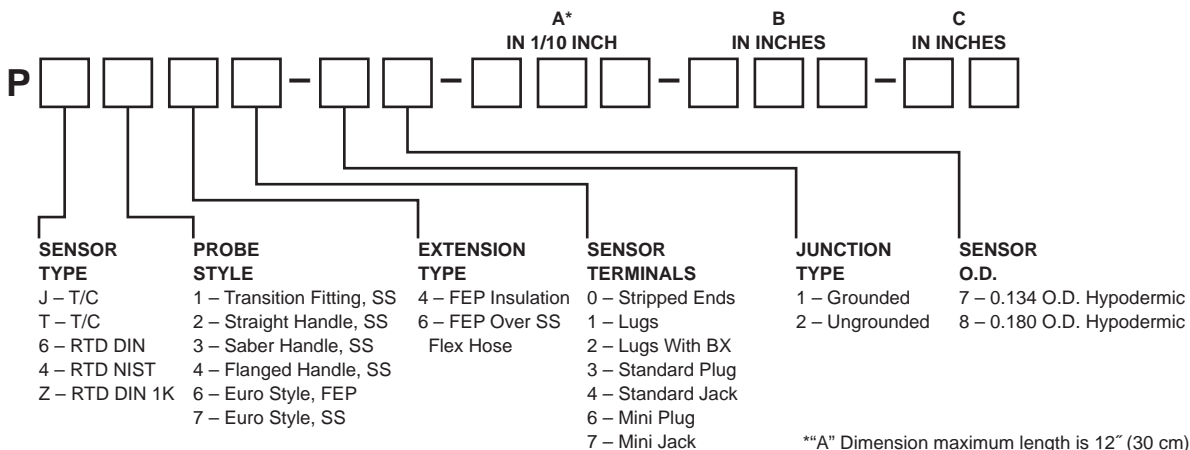
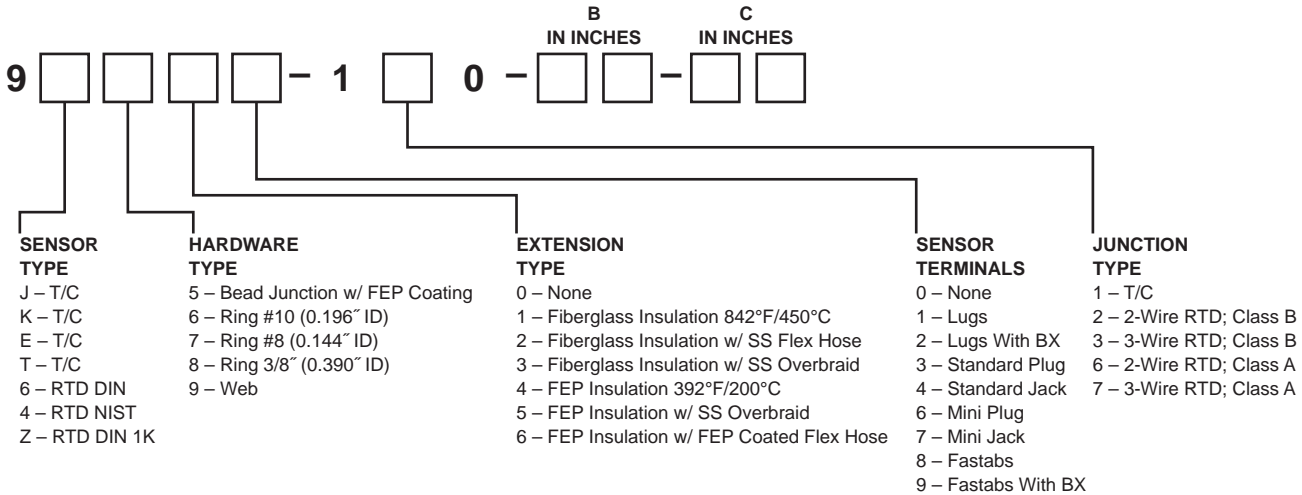
6&7. Euro style handle (FEP or SS)



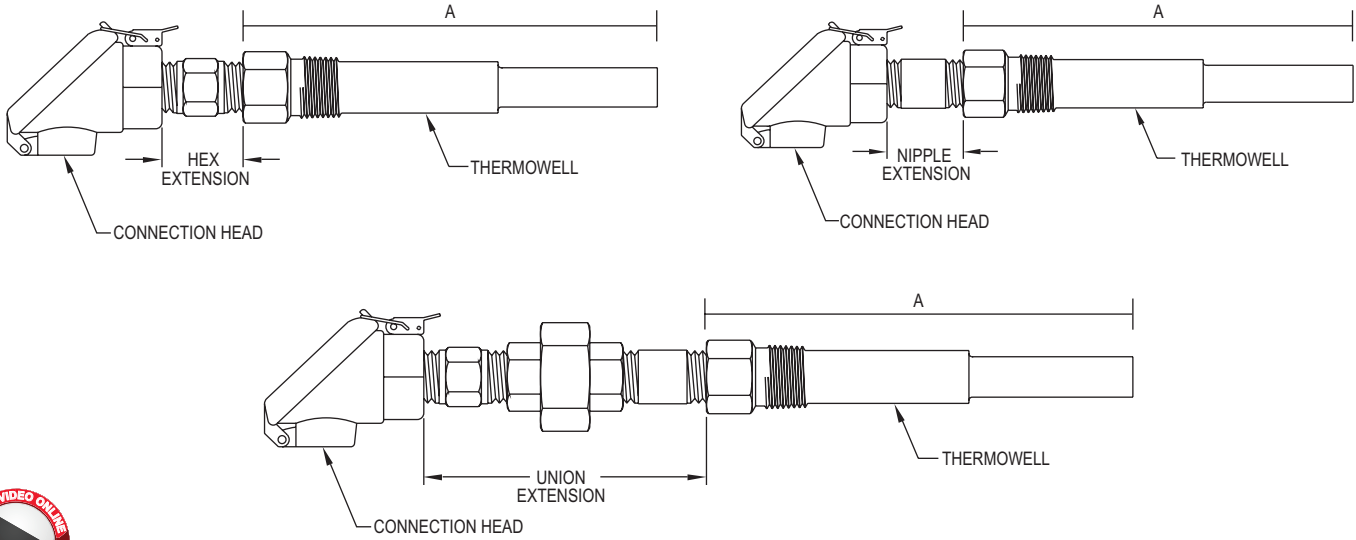
Series 9 & P Special Application Thermocouples and RTD's cover a wide variety of types and configurations. This section covers FEP covered thermocouples and RTD's, ring type thermocouples and RTD's for surface measurement, web type thermocouples for surface measurement of moving objects such as rollers, and penetration thermocouples and RTD's with sharp tips for measurement of viscous liquids and semisolids such as plastic compounds, rubber and slightly frozen food products.

MODEL CODING

Fill in the appropriate numbers or letters to specify the probe of your choice. Fill in all boxes. If an item or dimension does not apply, fill those boxes with zeros '0'.



TEMPERATURE SENSOR ASSEMBLIES WITH THERMOWELLS



Series T Temperature Sensor Assemblies with Thermowells are available in a variety of head styles and thermowell materials. All elements are spring loaded to ensure positive contact in the thermowell. Thermowells are non-lagging. The sensor sheath material is constructed of 316 SS regardless of the well material specified.

MODEL CODING

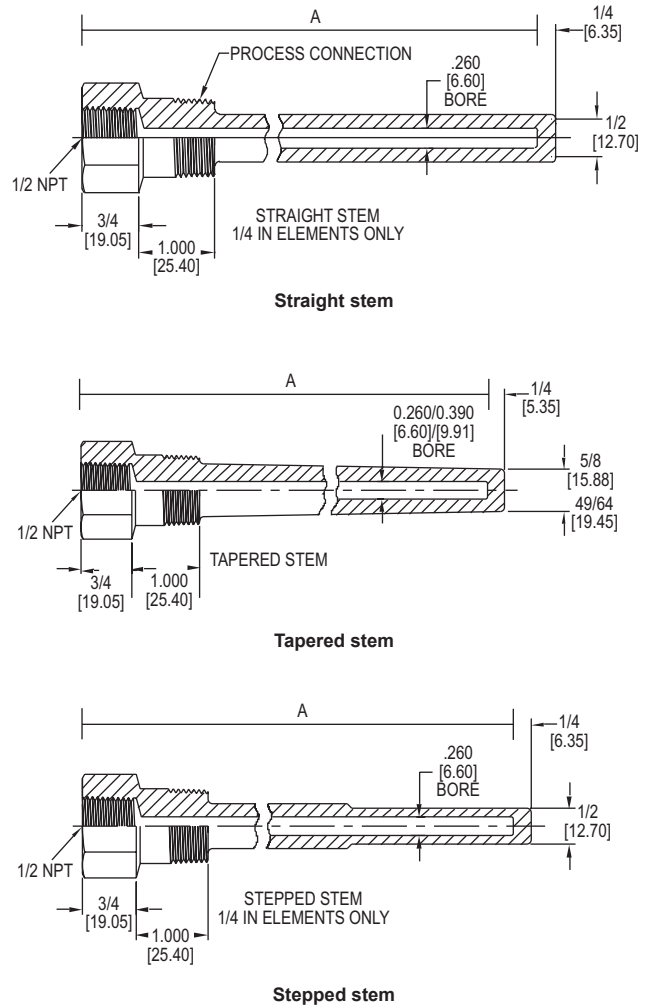
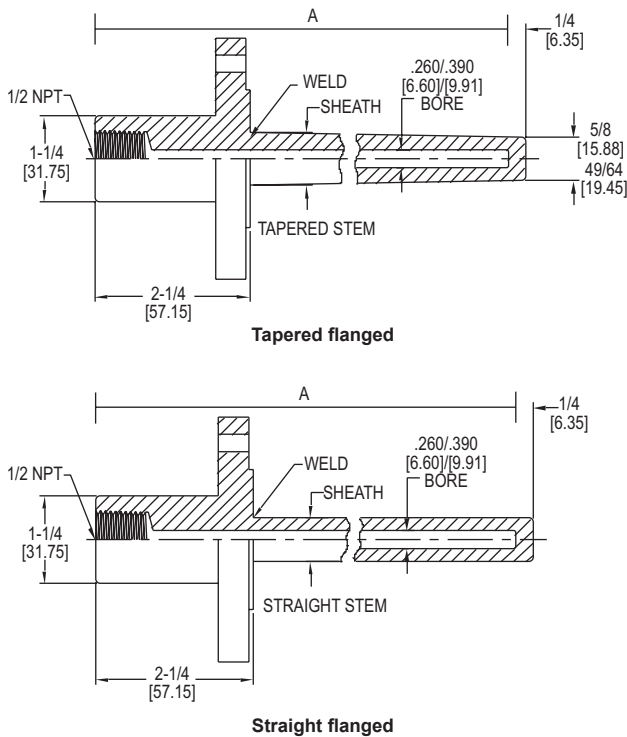
Fill in the appropriate numbers or letters to specify the probe of your choice. Fill in all boxes. If an item or dimension does not apply, fill those boxes with zeros '0'.

A
IN INCHES

SENSOR TYPE	WELL MATERIAL	TAPER/BORE	EXTENSION	ELEMENTS	HEAD	PROCESS CONNECTION (NOMINAL/REDUCED O.D.)
J - T/C	0 - None	0 - None	1 - Steel	1 - Single (Ungrounded/RTD)	0 - Aluminum Screw Cover	0 - None*
K - T/C	1 - 304 SS	1 - Step/0.260	1/2 NPT 1 in hex	2 - Dual (Ungrounded/RTD)	1 - Aluminum Snap Cover	1 - 1/2" NPT (5/8" to 1/2" Step)
E - T/C	2 - 316 SS	2 - Straight/0.385	4 - Steel	3 - Single (Grounded)	2 - Polypropylene Snap Cover	4 - 3/4" NPT (3/4" to 1/2" Step)
T - T/C	3 - Brass	3 - Taper/0.260	1/2 NPT 4 in nipple	4 - Dual (Grounded)	3 - Polypropylene Snap Cover	6 - 1" NPT (7/8" to 1/2" Step)
6 - 100 Ω RTD: 3-Wire 0.00385 Ω/°C	4 - Carbon Steel	4 - Taper/0.385	7 - Steel			7 - 3/4" NPT (7/8" to 5/8" Taper)
Z - 1000 Ω RTD: 3-Wire 0.00385 Ω/°C		5 - Straight/0.260	1/2 NPT 4 in union			8 - 1" NPT (1-1/16" to 5/8" Taper)
4 - 100 Ω RTD: 3-Wire 0.00392 Ω/°C			K - 316 SS 1/2 NPT 1 in hex N - 316 SS 1/2 NPT 4 in hex S - 316 SS 1/2 NPT 4 in nipple 1/2 NPT 4 in union			9 - 3/4" NPT (7/8" to 49/64" Taper)
						A - 1" NPT (1-1/16" to 49/64" Taper) B - 1/2" NPT (5/8" Straight) E - 3/4" NPT (3/4" Straight) D - 1" NPT (7/8" Straight)

*For replacement sensors, specify "0" for well material, taper and bore, and process connections

THERMOWELLS



Select bore as 0.260 for 1/4" diameter elements and 0.390 for 3/8" diameter elements. Specify heavy duty mounting for tapered sheaths.

MODEL CODING

Fill in the appropriate numbers or letters to specify the thermowell of your choice. Fill in all boxes. If an item or dimension does not apply, fill those boxes with zeros '0'.

A
IN INCHES

W - -

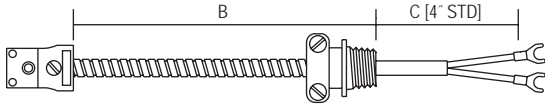
HARDWARE TYPE	TAPER/BORE	INSIDE THREAD	PROCESS CONNECTION	MOUNTING	LAG	SHEATH O.D. BASE / TAPER
1 - 304 SS Sheath	0 - Straight/0.260	1 - 1/2" Female NPT	1 - 1/2 NPT	1 - Threaded	0 - None	1 - 5/8" / 1/2" Step
2 - 316 SS Sheath	1 - Step/0.260		2 - 3/4 NPT	2 - Heavy Duty Threaded	2 - 2"	4 - 3/4" / 1/2" Step
3 - Brass	2 - Straight/0.390		3 - 1 NPT	3 - Heavy Duty Flanged	3 - 3"	6 - 7/8" / 1/2" Step
4 - Carbon Steel	3 - Taper/0.260		4 - 1" 150# Flange	4 - Flanged		7 - 7/8" / 5/8" Taper
	4 - Taper/0.390		5 - 1-1/2" 150# Flange			8 - 1-1/16" / 5/8" Taper
			6 - 2" 150# Flange			9 - 7/8" / 49/64" Taper
			7 - 1" 300# Flange			A - 1-1/16" / 49/64" Taper
			8 - 1-1/2" 300# Flange			B - 5/8" Straight
			9 - 2" 300# Flange			D - 7/8" Straight
			A - 1" 600# Flange			E - 3/4" Straight
			B - 1-1/2" 600# Flange			
			C - 2" 600# Flange			

USA: California Proposition 65
 ⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov



THERMOCOUPLE ACCESSORIES

EXTENSION CABLES



MODEL CODING

Fill in the appropriate numbers or letters to specify the extension cable of your choice. Fill in all boxes. If an item or dimension does not apply, fill those boxes with zeros '0'.

B
 IN FEET

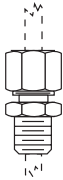
C (TERM. #1)
 IN INCHES

C (TERM. #2)
 IN INCHES

EC-

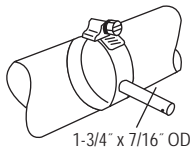
SENSOR TYPE J – T/C K – T/C E – T/C T – T/C 2 – RTD 2-Wire 3 – RTD 3-Wire	EXTENSION TYPE 0 – No Extension 1 – Fiberglass Insulation 3 – Stainless Steel Overbraided 4 – FEP Insulation 5 – Stainless Steel Flex Hose 6 – FEP Over SS Flex Hose	TERMINAL #1 0 – Stripped Ends 1 – Lugs 2 – Lugs With BX 3 – Standard Plug 4 – Standard Jack 6 – Mini Plug 7 – Mini Jack 9 – Fastabs A – Fastabs With BX	TERMINAL #2 0 – Stripped Ends 1 – Lugs 2 – Lugs With BX 3 – Standard Plug 4 – Standard Jack 6 – Mini Plug 7 – Mini Jack 9 – Fastabs A – Fastabs With BX	ELEMENTS 1 – Single 2 – Dual
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COMPRESSION FITTINGS



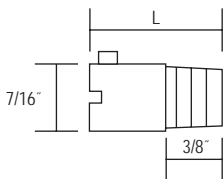
MODEL CHART							
Model	Type OD	Thread Size	Material	Model	Type OD	Thread Size	Material
144-0012	1/8"	1/8-27 NPT	Brass	144-0014	1/4"	1/4-18 NPT	Brass
144-0020	1/8"	1/8-27 NPT	Stainless steel	144-0024	1/4"	1/8-27 NPT	Stainless steel
144-0009	3/16"	1/8-27 NPT	Brass	144-0037	.260 - .275"	1/4-18 NPT	FEP
144-0022	3/16"	1/8-27 NPT	Stainless steel				

PIPE ADAPTERS



MODEL CHART					
Model	Fits Pipe Diameters	Model	Fits Pipe Diameters	Model	Fits Pipe Diameters
1568-0007	1/2" to 7/8"	1568-0013	4-5/16" to 5-1/4"	1568-0024	15-3/4" to 16-1/4"
1568-0008	7/8" to 1-1/2"	1568-0020	6-1/4" to 6-3/4"	1568-0025	17-3/4" to 18-1/4"
1568-0009	1-5/16" to 2-1/4"	1568-0021	7-3/4" to 8-1/4"	1568-0027	19-3/4" to 20-1/4"
1568-0011	2-1/4" to 3-5/16"	1568-0022	9-3/4" to 10-1/4"	1568-0028	23-3/4" to 24-1/4"
1568-0012	3-5/8" to 4-1/4"	1568-0023	11-3/4" to 12-1/4"	1568-0029	29-3/4" to 30-1/4"

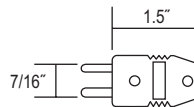
BAYONET ADAPTERS



MODEL CHART		
Model	L	Thread Size
1568-0001	7/8"	1/8-27 UNF
1568-0002	7/8"	3/8-24 UNF
1568-0003	1-3/8"	1/8-27 UNF
1568-0004	1-3/8"	3/8-24 UNF
1568-0005	2-1/2"	1/8-27 UNF
1568-0006	2-1/2"	3/8-24 UNF
1568-0016	2-1/2"	10 x 1.5 mm

TRANSITION ADAPTERS

These adapters convert the miniature plug on the end of the coiled cable on the Master Probe Handle to a standard lug. Simply plug the cord into the adapter.



MODEL CHART	
Model	Type
481-0127	K
481-0126	J
481-0128	T

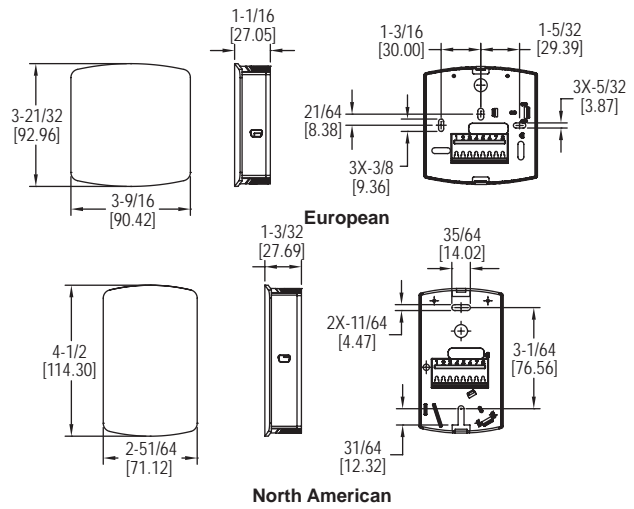
WALL MOUNT TEMPERATURE SENSORS

Discrete Wall Mount Housing



European

North American



The **Series TE-E/N Wall Mount Temperature Sensors** provide a low cost temperature input for any building management system.

FEATURES/BENEFITS

- North American or European housing aesthetic options
- Uniform look matches other Dwyer wall mount devices
- Universal mounting plate meets various installation requirements

APPLICATIONS

- Building automation
- Room temperature monitoring

MODEL CHART			
North American Model	Sensor Type	European Model	Sensor Type
TE-NND-A	10k Ω type III thermistor	TE-END-A	10k Ω type III thermistor
TE-NND-B	10k Ω type II thermistor	TE-END-B	10k Ω type II thermistor
TE-NND-C	3k Ω thermistor	TE-END-C	3k Ω thermistor
TE-NND-D	Pt100 Ω RTD	TE-END-D	Pt100 Ω RTD
TE-NND-E	Pt1000 Ω RTD	TE-END-E	Pt1000 Ω RTD
TE-NND-F	20k Ω thermistor	TE-END-F	20k Ω thermistor

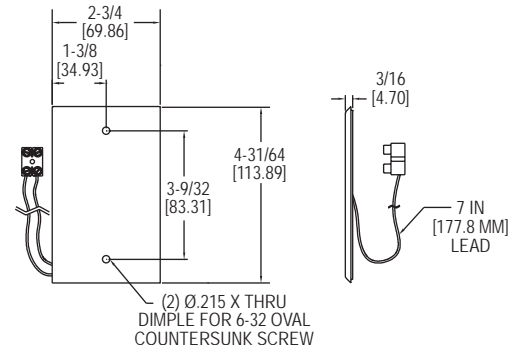
SPECIFICATIONS

Accuracy: Thermistor temp sensor: ±0.22°C @ 25°C (±0.4°F @ 77°F); RTD temp sensor: DIN class B; ±0.3°C @ 0°C (±0.5°F @ 32°F).
Temperature Limits: -40 to 140°F (-40 to 60°C).
Housing Material: ABS plastic.
Weight: 0.3 lb (136 g).

SERIES TE-WSS

STAINLESS STEEL WALL PLATE TEMPERATURE SENSOR

Screw Terminal Connection, Suitable for Wash Down Applications



The **Series TE-WSS Stainless Steel Wall Plate Temperature Sensor** measures the ambient air temperature in classrooms and industrial environments.

FEATURES/BENEFITS

- SS flush plate design
- Standard single gang junction box cover plate mounting

APPLICATIONS

- Building automation
- Room temperature monitoring
- Wash down environments

SPECIFICATIONS

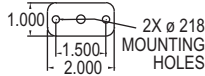
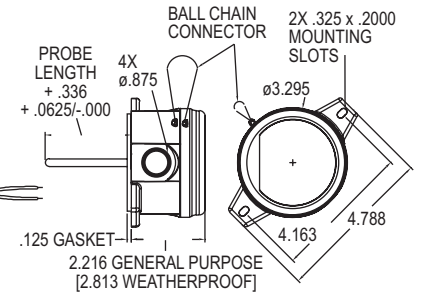
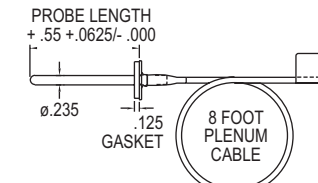
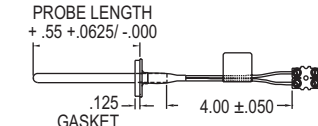
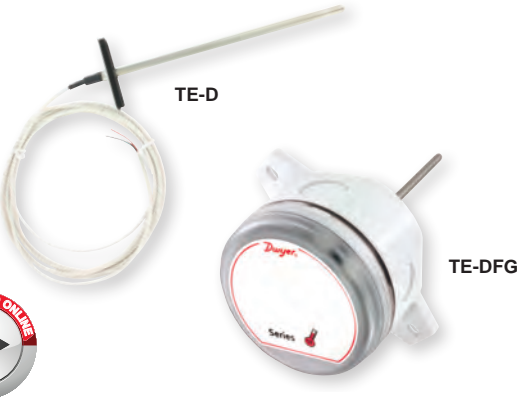
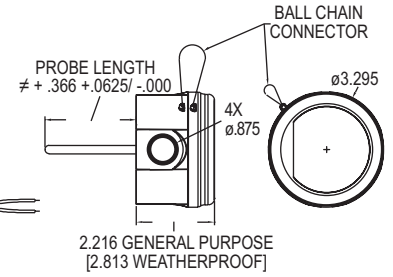
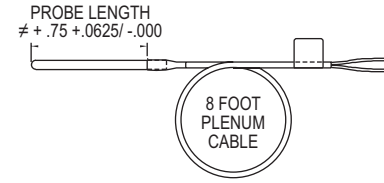
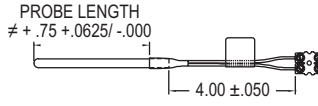
Accuracy: Thermistor: ±0.22°C @ 25°C (±0.4°F @ 77°F); RTD: DIN Class B ±0.3°C @ 0°C.
Temperature Limits: Operating -40 to 140°F (-40 to 60°C).
Sensor Curves: See page reference 1 below.
Housing Material: 304 SS wall plate.
Weight: 2.3 oz (65 g).

MODEL CHART	
Model	Sensor Type
TE-WSS-A	10k Ω type III thermistor
TE-WSS-B	10k Ω type II thermistor
TE-WSS-C	3k Ω thermistor
TE-WSS-D	PT100 Ω RTD
TE-WSS-E	PT1000 Ω RTD
TE-WSS-F	20k Ω thermistor

●Resistance vs. Temperature Table: See page 148 (Series TE-OND/RND/OSA)

DUCT AND IMMERSION BUILDING AUTOMATION TEMPERATURE SENSORS

Available up to 18" Probe Length, Thermistor or RTD Outputs



The **Series TE Duct and Immersion Building Automation Temperature Sensors** can be used to monitor air or water temperature throughout a building management system or an air handler unit. Duct or immersion options available with or without an enclosure.

FEATURES/BENEFITS

- Easy to mount external tab housing and flange options for duct applications
- 1/4 turn housing cover with chain to prevent dropping
- Multiple conduit knockouts for easy installation positioning
- 8" plenum rated cable option
- Terminal connector eliminates need for wire nuts

APPLICATIONS

- Building automation
- VAV temperature sensing
- Chiller or boiler loops
- AHU monitoring

SPECIFICATIONS

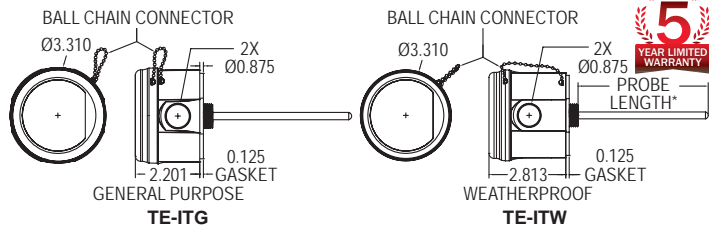
Accuracy: Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); RTD temperature sensor: DIN class A: $\pm 0.15^{\circ}\text{C}$ @ 0°C ($\pm 0.28^{\circ}\text{F}$ @ 32°F).
Temperature Limits: Operating: -40 to 302°F (-40 to 150°C).
Sensor Curves: See page reference 1 below.
Cable Rating: Plenum option includes UL listed plenum cable.
Housing Material: Meets UL, 94 V-0 polycarbonate plastic.
Housing Rating: NEMA 4X (IP66) (DFW, IBW only).
Weight: 5.3 oz (150.3 g).
Agency Approvals: Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

MODEL CHART										
Example	TE	-DFN	-A	04	4	8	-00	TE-DFN-A0448-00		
Series	TE							Temperature sensor		
Mounting Configuration	DFN	DFG	DFW	IBN	IBG	IBW		Duct mount probe only Duct mount probe in general purpose housing Duct mount probe in NEMA 4X housing Immersion probe only Immersion probe in general purpose housing Immersion probe in NEMA 4X housing		
Sensor Type			A	B	C	D	E	F	Q	10k Ω type III thermistor 10k Ω type II thermistor 3k Ω thermistor Pt100 Ω RTD Pt1000 Ω RTD 20k Ω thermistor 10k Ω type III with 11k Ω shunt
Probe Length				25	04	06	08	12	18	2.5" 4" 6" 8" 12" 18" (DFN/DFG only)
Probe Diameter					4	5				1/4" 1/4" double encapsulated
Termination						3	4	7	8	4" leads with spade connectors 4" leads 8" plenum rated cable with spade connectors 8" plenum rated cable
Fittings							00	12	14	None (probe only) 1/2" NPT compression fitting 1/4" NPT compression fitting

●Resistance vs. Temperature Table: See page 162 (Series TE-OND/RND/OSA)

IMMERSION TEMPERATURE SENSORS

Integral Mounting Connection, Welded Thermowells



The Series TE-I Immersion Style Temperature Sensors accurately measure water temperature inside chilled and hot water loops in HVAC systems. Thermowells are required to protect the electrical connection from the process water and to allow replacement of the sensors without draining the system.

FEATURES/BENEFITS

- Integral 1/2" NPSM connection for direct mounting to a thermowell
- 1/4 turn housing cover with chain to prevent dropping
- Multiple conduit knockouts for easy installation positioning
- General purpose or weatherproof enclosure options
- Terminal connection eliminates need for wire nuts

APPLICATIONS

- Chiller or boiler loops
- Building automation

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); RTD temperature sensor DIN Class A: $\pm 0.15^{\circ}\text{C}$ @ 0°C ($\pm 0.28^{\circ}\text{F}$ @ 32°F).
Temperature Limits: Operating: -40 to 302°F (-40 to 150°C).
Sensor Curves: See page reference below.
Housing Material: Meets UL, 94 V-0 polycarbonate plastic.
Thermowell Material: 304 SS.
Thermowell Connections: Internal = 1/2" NPSM; External = 1/2" NPT.
Weight: 5.3 oz (150.3 g).

MODEL CHART

Example	TE	-ITG	-A	25	4	4	-00	TE-ITG-A2544-00
Series	TE							Duct and immersion building automation temperature sensor
Mounting Configuration		ITG ITW						Immersion in general purpose housing Immersion in NEMA 4X housing
Sensor Type			A B C D E F Q					10k Ω type III thermistor 10k Ω type II thermistor 3k Ω thermistor Pt100 Ω RTD Pt1000 Ω RTD 20k Ω thermistor 10k Ω type III with 11k Ω shunt
Probe Length*				25 04 06 08 12 18				2.5" 4" 6" 8" 12" 18"
Probe Diameter					4 5			1/4" 1/4" double encapsulated
Termination						4		4" flying leads terminal block
Fittings							00	None (integral)

*Actual probe length is approximately 0.75" longer than listed probe length to ensure maximum immersion into thermowells.

● Resistance vs. Temperature Table: See page 148 (Series TE-OND/RND/OSA)

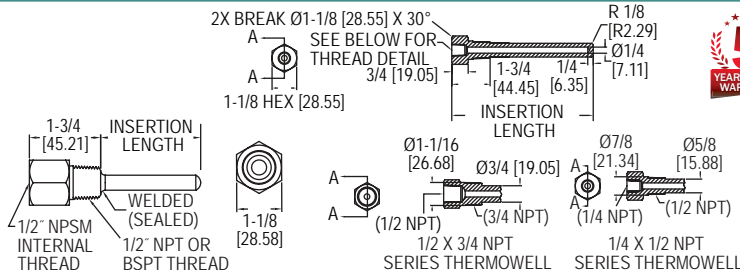
TE-TNS

THERMOWELLS

Thermowells for Building Automation Temperature Sensors



Fabricated (welded) thermowell



The Series TE-TNS Stainless Steel Thermowells are used to separate the instrument from the surrounding media. When used with the Series TE and TE-I Immersion Temperature Sensors, further protection is offered from aggressive media, high pressures, and flow rates while allowing for quick and easy installation of temperature sensors without having to drain process media. Thermowells are offered in both 304 and 316 stainless steel allowing for superior corrosion resistance. Fabricated, or welded, thermowells are constructed from a tube that is closed at the tip by a welded solid tip. Solid-machined thermowells are manufactured from barstock.

FEATURES/BENEFITS

- Configurable materials and sizes
- Fabricated (welded) or machined construction
- 1/2" or 3/4" NPT process connections

APPLICATIONS

- Building automation
- Chiller or boiler loops
- Chemical industry or process technology

MODEL CHART

Example	TE-TNS	-N	9	5N	-14	TE-TNS-N095N-14
Series	TE-TNS					Stainless steel thermowell
Thread Type		N				NPT
Length			2.5 04 06 09 12 18			2.5" 4" 6" 9" 12" 18"
Material & Construction				3N 4N 5N		304 SS fabricated (welded) 304 SS machined 316 SS machined
Connection (Internal & External)					00 12 14	1/2" NPSM / 1/2" NPT 1/2" NPT / 3/4" NPT 1/4" NPT / 1/2" NPT

SPECIFICATIONS

Maximum Pressure: Fabricated: 140 psi; Machined: 304 SS: 3700 psi; 316 SS: 5500 psi.
Maximum Temperature: Fabricated: 1000°F (538°C); Machined: 1200°F (648°C).
Construction: Fabricated (welded) or machined model specific.

MODEL CHART

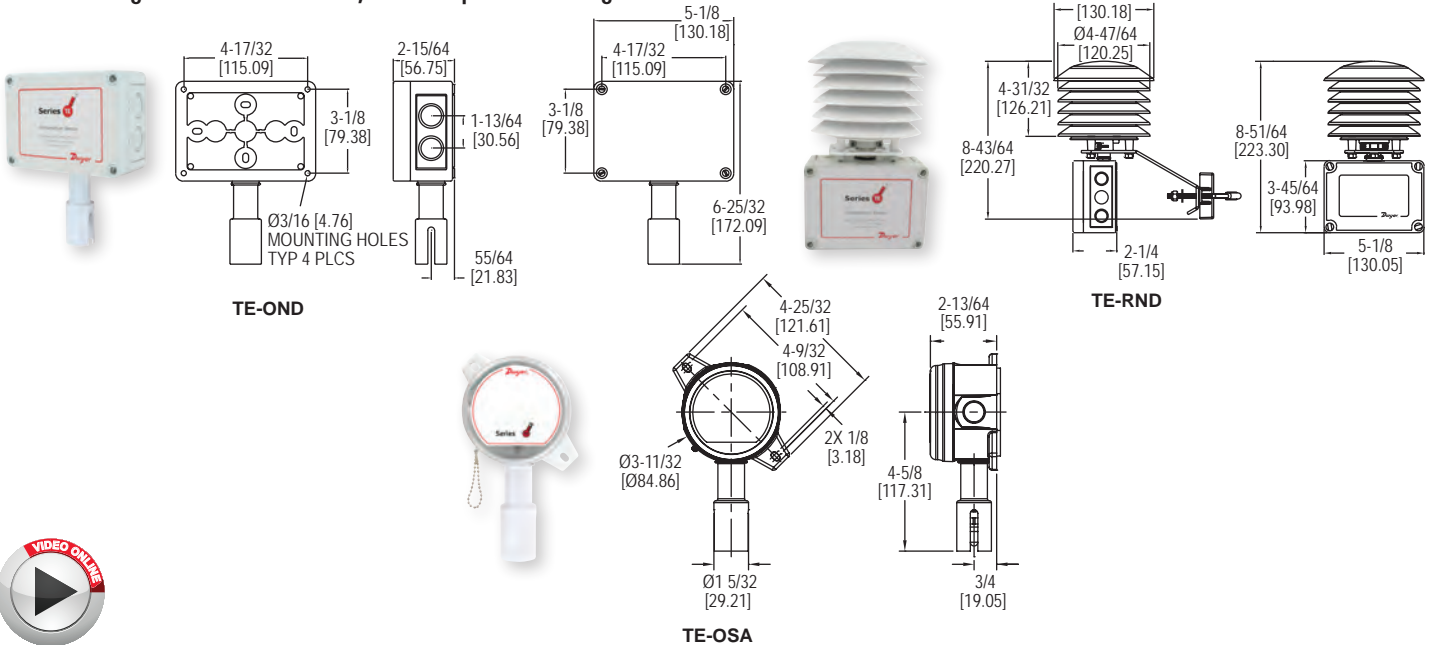
Model	Material	Length	Construction	Connection (Internal/External)
TE-TNS-N044N-14	304 SS	4"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N044N-12	304 SS	4"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N064N-14	304 SS	6"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N064N-12	304 SS	6"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N094N-14	304 SS	9"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N094N-12	304 SS	9"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N124N-14	304 SS	12"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N124N-12	304 SS	12"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N045N-14	316 SS	4"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N045N-12	316 SS	4"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N065N-14	316 SS	6"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N065N-12	316 SS	6"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N095N-14	316 SS	9"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N095N-12	316 SS	9"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N125N-14	316 SS	12"	Machined	1/4" NPT / 1/2" NPT
TE-TNS-N125N-12	316 SS	12"	Machined	1/2" NPT / 3/4" NPT
TE-TNS-N253N-00	304 SS	2.5"	Fabricated	1/2" NPSM / 1/2" NPT
TE-TNS-N043N-00	304 SS	4"	Fabricated	1/2" NPSM / 1/2" NPT
TE-TNS-N063N-00	304 SS	6"	Fabricated	1/2" NPSM / 1/2" NPT
TE-TNS-N083N-00	304 SS	8"	Fabricated	1/2" NPSM / 1/2" NPT
TE-TNS-N123N-00	304 SS	12"	Fabricated	1/2" NPSM / 1/2" NPT
TE-TNS-N183N-00	304 SS	18"	Fabricated	1/2" NPSM / 1/2" NPT



SERIES TE-OND/TE-RND/TE-OSA

OUTDOOR TEMPERATURE SENSORS

Protection Against Radiated Heat, Weatherproof Housing



The Series TE-OND/TE-RND/TE-OSA Outdoor Temperature Sensors are offered different configurations to increase measurement accuracy by reducing radiated heat effects. For applications where the north side of the building is accessible, the TE-OND/TE-OSA can be used to protect against low levels of radiated heat.

FEATURES/BENEFITS

- Weatherproof for outdoor installation
- Radiation shield available to eliminate heating effects following installation in direct sunlight
- Terminal connector eliminates need for wire nuts

APPLICATIONS

- Building automation
- Outdoor temperature reference

MODEL CHART	
Model	Sensor Type
TE-OND-A	10k Ω type III thermistor
TE-OND-B	10k Ω type II thermistor
TE-OND-C	3k Ω thermistor
TE-OND-D	PT100 Ω RTD
TE-OND-E	PT1000 Ω RTD
TE-OND-F	20k Ω thermistor
TE-OND-Q	10k Ω type III thermistor with 11k Ω shunt
TE-RND-A	10k Ω type III thermistor
TE-RND-B	10k Ω type II thermistor
TE-RND-C	3k Ω thermistor
TE-RND-D	PT100 Ω RTD
TE-RND-E	PT1000 Ω RTD
TE-RND-F	20k Ω thermistor
TE-RND-Q	10k Ω type III thermistor with 11k Ω shunt
TE-OSA-A	10k Ω type III thermistor
TE-OSA-B	10k Ω type II thermistor
TE-OSA-C	3k Ω thermistor
TE-OSA-D	PT100 Ω RTD
TE-OSA-E	PT1000 Ω RTD
TE-OSA-F	20k Ω thermistor
TE-OSA-Q	10k Ω type III thermistor with 11k Ω shunt

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: ±0.22°C @ 25°C (±0.4°F @ 77°F); RTD temperature sensor: DIN class A: ±0.15°C @ 0°C (±0.28°F @ 32°F).
Temperature Limits: Operating: -40 to 302°F (-40 to 150°C).
Sensor Curves: See Resistance vs. Temperature Table.
Housing Material: Polycarbonate.
Enclosure Rating: TE-OND/TE-RND: NEMA 4X (IP65); TE-OSA: NEMA 3R (IP54).
Weight: 0.65 lb (295 g).

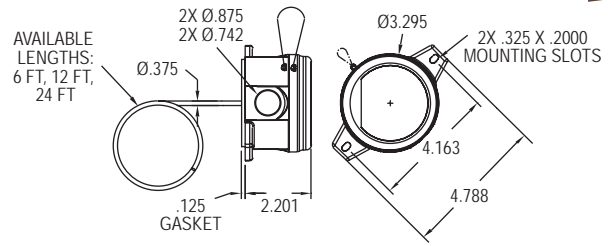
RESISTANCE VS TEMPERATURE TABLE

Temperature Resistance Curves (Ω)

°C	°F	A - 10k Ω type III thermistor	B - 10k Ω type II thermistor	C - 3k Ω thermistor	D - PT100 Ω RTD	E - PT1000 Ω RTD	F - 20k Ω thermistor	Q - 10k Ω type III thermistor with 11k Ω shunt
		Green/Green	Red/Green	Black/Black	Yellow/Yellow	Red/Red	Green/Blue	Red/White
-55	-67.0	607800.00	963849.00	289154.70	78.32	783.2	2394000.00	10804
-50	-58.0	441200.00	670166.00	201049.80	80.31	803.1	1646200.00	10732
-45	-49.0	323600.00	471985.00	141595.50	82.29	822.9	1145800.00	10638
-40	-40.0	239700.00	336479.00	100943.70	84.27	842.7	806800.00	10517
-35	-31.0	179200.00	242681.00	72804.30	86.25	862.5	574400.00	10364
-30	-22.0	135200.00	176974.00	53092.20	88.22	882.2	413400.00	10172
-25	-13.0	102900.00	130421.00	39126.30	90.19	901.9	300400.00	9938
-20	-4.0	78910.00	97081.00	29124.30	92.16	921.6	220600.00	9654
-15	5.0	61020.00	72957.00	21887.10	94.12	941.2	163500.00	9320
-10	14.0	47540.00	55329.00	16598.70	96.09	960.9	122280.00	8933
-5	23.0	37310.00	42327.00	12698.10	98.04	980.4	92240.00	8495
0	32.0	29490.00	32650.00	9795.00	100.00	1000.0	70160.00	8012
5	41.0	23460.00	25392.00	7617.60	101.95	1019.5	53780.00	7489
10	50.0	18780.00	19901.00	5970.30	103.90	1039.0	41560.00	6937
15	59.0	15130.00	15712.00	4713.60	105.85	1058.5	32340.00	6369
20	68.0	12260.00	12493.00	3747.90	107.79	1077.9	25360.00	5798
25	77.0	10000.00	10000.00	3000.00	109.74	1097.4	20000.00	5238
30	86.0	8194.00	8057.00	2417.10	111.67	1116.7	15892.00	4696
35	95.0	6752.00	6531.00	1959.30	113.61	1136.1	12704.00	4184
40	104.0	5592.00	5326.00	1597.80	115.54	1155.4	10216.00	3707
45	113.0	4655.00	4368.00	1310.40	117.47	1174.7	8264.00	3271
50	122.0	3893.00	3602.00	1080.60	119.40	1194.0	6722.00	2875
55	131.0	3271.00	2986.00	895.80	121.32	1213.2	5498.00	2521
60	140.0	2760.00	2488.00	746.40	123.24	1232.4	4520.00	2206
65	149.0	2339.00	2083.00	624.90	125.16	1251.6	3734.00	1929
70	158.0	1990.00	1752.00	525.60	127.08	1270.8	3100.00	1685
75	167.0	1700.00	1480.00	444.00	128.99	1289.9	2586.00	1472
80	176.0	1458.00	1255.00	376.50	130.90	1309.0	2166.00	1287
85	185.0	1255.00	1070.00	321.00	132.80	1328.0	1822.60	1126
90	194.0	1084.00	915.50	274.65	134.71	1347.1	1540.00	986.8
95	203.0	939.30	786.60	235.98	136.61	1366.1	1306.40	865.4
100	212.0	816.80	678.60	203.58	138.51	1385.1	1112.60	760.3
105	221.0	712.60	587.60	176.28	140.40	1404.0	951.00	669.2
110	230.0	623.60	510.60	153.18	142.29	1422.9	815.80	590.1
115	239.0	547.30	445.30	133.59	144.18	1441.8	702.20	521.4
120	248.0	481.80	389.60	116.88	146.07	1460.7	606.40	461.6
125	257.0	425.30	341.90	102.57	147.95	1479.5	525.60	409.5
130	266.0	376.40	301.00	90.30	149.83	1498.3	N/A	363.9
135	275.0	334.00	265.80	79.74	151.71	1517.1	N/A	324.2
140	284.0	297.20	235.30	70.59	153.58	1535.8	N/A	289.4
145	293.0	265.10	208.90	62.67	155.46	1554.6	N/A	258.9
150	302.0	237.00	186.10	55.83	157.33	1573.3	N/A	232.0

AVERAGING TEMPERATURE SENSOR

Available in 6', 12' and 24' Lengths



The Series TE-A Averaging Temperature Sensor features a long bendable aluminum capillary to measure the average temperature in large ducts and air handler units.

FEATURES/BENEFITS

- Easy to mount external tab housing
- 1/4 turn housing cover with chain
- Multiple conduit knockouts for easy installation positioning

APPLICATIONS

- Building automations
- Air handler unit monitoring
- Large air duct temperature monitoring

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F).
Temperature Limits: -40 to 302°F (-40 to 150°C).
Capillary Lengths: 6, 12 or 24' (depending on model).
Cable Length: 4".
Sensor Curves: See page reference 1 below.
Probe Material: Bendable aluminum probe.
Housing Material: Meets UL, 94 V-0 polycarbonate plastic.
Weight: 14 oz (397 g).

MODEL CHART

Model	Sensor Type	Capillary Length	Model	Sensor Type	Capillary Length
TE-AAG-A0634-00	10k type III NTC thermistor	6'	TE-AAG-C0634-00	3k NTC thermistor	6'
TE-AAG-A1234-00	10k type III NTC thermistor	12'	TE-AAG-C1234-00	3k NTC thermistor	12'
TE-AAG-A2434-00	10k type III NTC thermistor	24'	TE-AAG-C2434-00	3k NTC thermistor	24'
TE-AAG-B0634-00	10k type II NTC thermistor	6'	TE-AAG-F0634-00	20k NTC thermistor	6'
TE-AAG-B1234-00	10k type II NTC thermistor	12'	TE-AAG-F1234-00	20k NTC thermistor	12'
TE-AAG-B2434-00	10k type II NTC thermistor	24'	TE-AAG-F2434-00	20k NTC thermistor	24'

AVERAGING TEMPERATURE SENSOR CLIPS

Model	Color	Sensor Diameter Size
CC1-N	Natural	3/8", 1/4", or 1/8"
CC1-GY	Grey	3/8", 1/4", or 1/8"

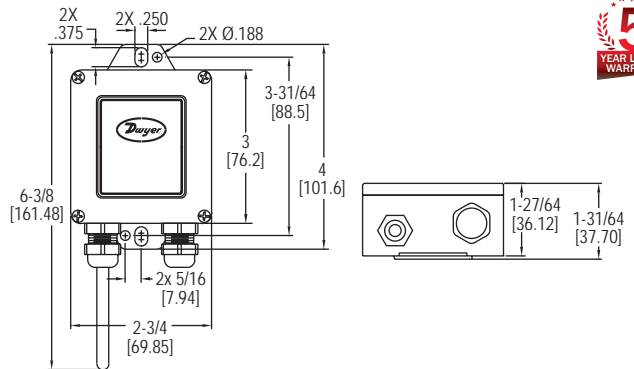
Note: Sold individually

1 Resistance vs. Temperature Table: See page 148 (Series TE-OND/RND/OSA)

SERIES O-4

OUTSIDE AIR TEMPERATURE SENSOR

NEMA 4X, Removable Terminal Block



The Series O-4 Outside Air Temperature Sensor is great for monitoring ambient air temperatures in outdoor applications. The temperature sensors are mounted in a NEMA 4X enclosure with integral mounting tabs.

FEATURES/BENEFITS

- NEMA 4X weatherproof housing
- Surface or suspension mount

APPLICATIONS

- Agricultural house ventilation
- HVAC and building automation

MODEL CHART

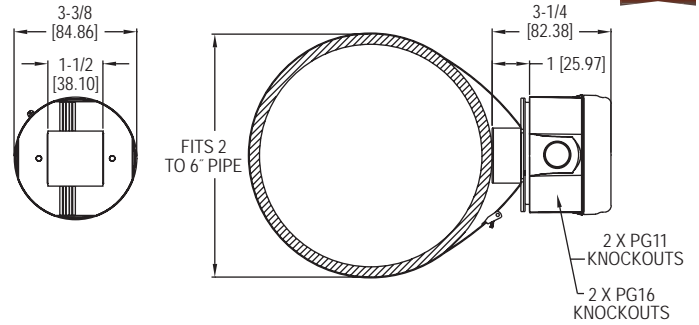
Model	Sensor Type	Model	Sensor Type
O-4A	10k Ω type III thermistor	O-4D	Pt100 Ω RTD
O-4B	10k Ω type II thermistor	O-4E	Pt1000 Ω RTD
O-4C	3k Ω thermistor	O-4F	20k Ω thermistor

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); RTD temperature sensor: DIN class B: $\pm 0.3^{\circ}\text{C}$ @ 0°C ($\pm 0.54^{\circ}\text{F}$ @ 32°F).
Operating Temperature: -40 to 250°F .
Probe Diameter: 0.235" (5.97 mm).
Probe Length: 3.5".
Probe Material: 304 SS.
Mounting: Suspension or surface.
Enclosure Rating: NEMA 4X (IP66).
Weight: 3 oz (85 g).
Agency Approvals: Meets the technical requirements of EU Directive 2011/65/EU (RoHS II).

WEATHER RESISTANT SURFACE TEMPERATURE SENSOR

Strap On Design, Twist Off Cover, 2 to 6" Pipe Sizes



The **Series TE-SNW Weather Resistant Surface Temperature Sensor** non-intrusively measures the process temperature in hot and cold water loops in buildings. In order to work with most common building controllers, the output of the sensor can be chosen from 6 different RTD and Thermistor curves.

FEATURES/BENEFITS

- Easy to mount external tab housing
- 1/4 turn housing cover with chain
- Multiple conduit knockouts for easy installation positioning
- Non-intrusive temperature measurement of 2 to 6" pipes

APPLICATIONS

- Heating or cooling loop line temperature monitoring
- HVAC systems

SPECIFICATIONS

Accuracy: Thermistor temperature sensor: $\pm 0.22^{\circ}\text{C}$ @ 25°C ($\pm 0.4^{\circ}\text{F}$ @ 77°F); RTD temperature sensor: DIN Class A $\pm 0.15^{\circ}\text{C}$ @ 0°C ($\pm 0.28^{\circ}\text{F}$ @ 32°F).
Temperature Limits: Operating: -32 to 240°F (-35.5 to 115.5°C).
Sensor Curves: See page reference 1 below.
Housing Material: Meets UL 94 V-0 polycarbonate plastic, NEMA 3R.
Weight: 7 oz (198 g).

MODEL CHART

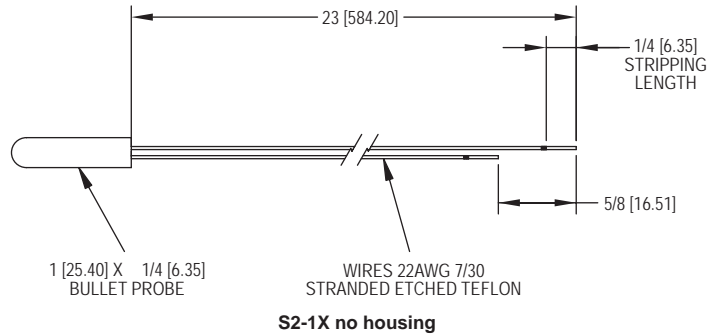
Model	Sensor Type
TE-SNW-A	10k Ω type III thermistor
TE-SNW-B	10k Ω type II thermistor
TE-SNW-C	3k Ω thermistor
TE-SNW-D	Pt100 Ω RTD
TE-SNW-E	Pt1000 Ω RTD
TE-SNW-F	20k Ω thermistor

1 Resistance vs. Temperature Table: See page 148 (Series TE-OND/RND/OSA)

SERIES S2-1

SURFACE MOUNT TEMPERATURE SENSOR

RTD and Thermistor, 304 SS Probe



The **Series S2-1 Surface Mount Temperature Sensor** provides a cost effective and reliable solution for surface contact temperature measurement of conditioned water pipes, low pressure steam or refrigerant lines.

FEATURES/BENEFITS

- Low profile sensor can be taped or strapped to the outside of a pipe
- Ideal for applications where immersion wells are not feasible

APPLICATIONS

- Heating or cooling loop line temperature monitoring
- HVAC systems

SPECIFICATIONS

Accuracy: Platinum RTD: $\pm 0.1\%$ @ 32°F (0°C), alpha 385 per DIN 43760; Thermistor: $\pm 0.5^{\circ}\text{C}$ interchangeable @ 77°F (25°C).
Operating Temperature: -40 to 250°F (-40 to 120°C).
Probe Diameter: $1/4"$ (6.3 mm).
Probe Length: $1"$ (25 mm).
Probe Material: 304 SS.

MODEL CHART

Model	Sensor Type
S2-1A	10k Type III thermistor
S2-1B	10k Type II thermistor
S2-1C	3k thermistor
S2-1D	Pt100 RTD
S2-1E	Pt1000 RTD
S2-1F	20k thermistor

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