

Temperature Sensors



Models TE-211Z & TE-213

RoHS



- Six enclosures available for space, duct, immersion, duct averaging, probe strap-on and outside air applications
- Three temperature compensated output versions, 4 to 20 mA, 0-5 VDC and 0-10 VDC
- Non-interacting zero and span trimmers
- NIST traceable calibration
- Custom calibration of temperature range is available
- -30°F to 250°F wide operating range

TE-211Z/213 temperature sensors offer the industry's most extensive range of enclosure, installation and sensor types to satisfy all HVAC, industrial and commercial applications. These revolutionary sensors incorporate more than thirty plus years of product development and experience drawn from millions of installations world wide in all types of applications. The RTD and transmitter are matched and calibrated as a complete assembly in a temperature chamber against a NIST traceable calibrated standard. The final accuracy is verified with a three point calibration check against the standard over the specified temperature range. The transmitter is equipped with non-interacting zero and span adjustment trimmers for site calibration and is reverse polarity protected against accidental mis-wiring. Output accuracy is not affected by long wire runs or electrical noise. The TE-211Z/213 provide an analog output linear and proportional to the calibrated temperature range. This product and process design combined with automated manufacturing processes yields a rugged, reliable, repeatable and stable temperature sensor at a low cost.

 **MAMAC SYSTEMS®**

TE-211Z & TE-213

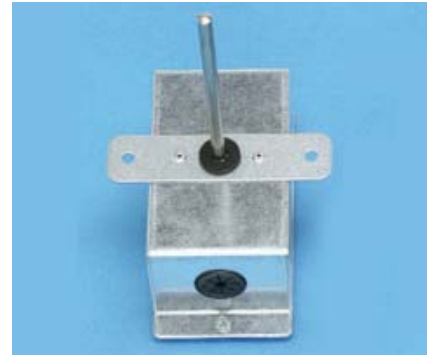
TE-211Z/213-A Temperature Transducer Space

Aesthetically appealing ABS plastic enclosure which may be flush mounted on any flat surface or fits a 2" x 4" handy box. Louvers are provided at the top and bottom of the enclosure to ensure ample air flow for fast response. Allen screws hold the cover to the base to ensure tamper resistance.



TE-211Z/213-B Temperature Transducer Duct

Sturdy NEMA-1/ IP-30 galvanized sheet metal enclosure houses the electronic circuit board. Available with 4, 6, 8 or 12 inch (100, 150, 200, 300 millimeter) stainless steel probe. Probe protrudes from the bottom of the enclosure and is crimped to the enclosure. The bottom of the duct enclosure is gasketed for a tight seal to the duct work.



TE-211Z/213-C Temperature Transducer Immersion

Sturdy NEMA-1/ IP-30 galvanized sheet metal enclosure houses the electronic circuit board. Available with 4, 6 or 8 inch (100, 150, 200 millimeter) stainless steel probe. Probe protrudes from the bottom of the enclosure and is crimped to the enclosure. The immersion sensor is equipped with a 1/4" NPT or 1/2" NPT thermowell fitting that can be screwed directly into the A-500 thermowell providing a rigid support to the transducer.



TE-211Z/213-D Temperature Transducer Duct Averaging

NEMA-1/ IP-30 galvanized steel enclosure with 6, 12 or 24 ft (1.8, 3.6, 7.2 meter) aluminum probe for averaging duct air temperature. The probe incorporates numerous sensors encapsulated at equal distances across the length of the probe. The complete assembly acts as a single sensor and temperature change is averaged across the sensors. The probe can be easily bent to fit any size duct.



TE-211Z & TE-213

TE-211Z/213-E

Temperature Transducer Remote Probe Strap-on

A NEMA-1/ IP-30 galvanized steel enclosure is provided with 6 ft. of 18-AWG twisted shielded cable. The sensing element is housed in a 2" stainless steel probe at the end of the cable suitable for being strapped onto a pipe or used in a remote application.



TE-211Z/213-F

Temperature Transducer Outside Air

The weatherproof enclosure can be easily screwed into 1/2" conduit. The sturdy NEMA-1/IP-30 galvanized steel enclosure houses the electronic circuit board. The sensing element is housed in a sun shielded aluminum enclosure separated by 6 ft. of 18-AWG twisted shielded cable.



SPECIFICATIONS:

Accuracy*: $\pm 0.50^{\circ}\text{F}$ FS

Linearity: $\pm 0.05^{\circ}\text{F}$

Repeatability: $\pm 0.01^{\circ}\text{F}$

Transmitter Error: Better than $\pm 0.01\%$ span

Supply Voltage: 12-40 VDC
12-35 VAC (VDC output units only)

Ambient Temperature: -30°F to 150°F
(-35°C to 60°C)

Accuracy of Duct Averaging Transducer is $\pm 3^{\circ}\text{F}$

Environmental: 10 - 95% RH Non-condensing

Maximum Temperature Span: 250°F (138°C)

Minimum Temperature Span: 35°F (19°C)

CONFORMANCE & TESTING:

RoHS Compliant

EMC Testing:

BS EN 55022:1998, BS EN 55024:1998,
EN 61000-3-3, EN 61000-4-2,
EN 61000-4-3, EN 61000-4-4,
EN 61000-4-5, EN 61000-4-6,
EN 61000-4-11

CAUTION: Do not use in explosive/hazardous environment or with flammable/combustible media.

TE-211Z & TE-213

ORDERING INFORMATION: TE-211Z (4-20 mA)

Installation	Probe Length	Probe Material	Well Fitting	Supply Voltage	Signal Output	Range
A Space	—	—	—	1 24 VDC	E 4-20 mA 2 wire	1 50 to 85°F 2 40 to 140°F 4 0 to 100°F 7 Custom**
B Duct*	A 4 inches/ 100mm B 6 inches/ 150mm C 8 inches/ 200mm D 12 inches/ 300mm	2 Stainless Steel	—	1 24 VDC	E 4-20 mA 2 wire	2 40 to 140°F 3 -30 to 130°F 4 0 to 100°F 5 100 to 250°F 6 0 to 250°F 7 Custom**
C Immersion*	A 4 inches/ 100mm B 6 inches/ 150mm C 8 inches/ 200mm	2 Stainless Steel	A Brass 1/4" NPT B Brass 1/2" NPT	1 24 VDC	E 4-20 mA 2 wire	2 40 to 140°F 3 -30 to 130°F 4 0 to 100°F 5 100 to 250°F 6 0 to 250°F 7 Custom**
D Duct Averaging*	F 6 feet/ 1.8 m G 12 feet/ 3.6 m H 24 feet/ 7.2 m	1 Aluminum	—	1 24 VDC	E 4-20 mA 2 wire	2 40 to 140°F 3 -30 to 130°F 4 0 to 100°F 5 100 to 250°F 6 0 to 250°F 7 Custom**
E Remote Probe Strap On*	E 2 inches/ 50mm	2 Stainless Steel	—	1 24 VDC	E 4-20 mA 2 wire	2 40 to 140°F 3 -30 to 130°F 4 0 to 100°F 5 100 to 250°F 6 0 to 250°F 7 Custom**
F Outside Air (Weatherproof)*	—	—	—	1 24 VDC	E 4-20 mA 2 wire	2 40 to 140°F 3 -30 to 130°F 4 0 to 100°F 5 100 to 250°F 6 0 to 250°F 7 Custom**

Example: TE-211Z-A-1-E-4: Space Temperature Transducer with a supply voltage of 24 VDC, 4-20mA signal output and a range of 0 to 100°F

* For Installation Styles B-F, a NEMA-1/IP-30 enclosure is standard. If a NEMA-4/IP-65 enclosure is required the NEMA-4/IP-65 must be specified when placing an order.

** For (#7) Custom temperature range, the custom range must be specified in either Fahrenheit or Celcius when placing an order.

TE-211Z & TE-213

ORDERING INFORMATION: TE-213 (VDC)

Installation	Probe Length	Probe Material	Well Fitting	Supply Voltage	Signal Output	Range
A Space	—	—	—	1 24 VDC 2 24 VAC	B 0 - 5 VDC C 0 - 10 VDC	1 50 to 85°F 2 40 to 140°F 4 0 to 100°F 7 Custom**
B Duct*	A 4 inches/ 100mm B 6 inches/ 150mm C 8 inches/ 200mm D 12 inches/ 300mm	2 Stainless Steel	—	1 24 VDC 2 24 VAC	B 0 - 5 VDC C 0 - 10 VDC	2 40 to 140°F 3 -30 to 130°F 4 0 to 100°F 5 100 to 250°F 6 0 to 250°F 7 Custom**
C Immersion*	A 4 inches/ 100mm B 6 inches/ 150mm C 8 inches/ 200mm	2 Stainless Steel	A Brass 1/4" NPT B Brass 1/2" NPT	1 24 VDC 2 24 VAC	B 0 - 5 VDC C 0 - 10 VDC	2 40 to 140°F 3 -30 to 130°F 4 0 to 100°F 5 100 to 250°F 6 0 to 250°F 7 Custom**
D Duct Averaging*	F 6 feet/ 1.8 m G 12 feet/ 3.6 m H 24 feet/ 7.2 m	1 Aluminum	—	1 24 VDC 2 24 VAC	B 0 - 5 VDC C 0 - 10 VDC	2 40 to 140°F 3 -30 to 130°F 4 0 to 100°F 5 100 to 250°F 6 0 to 250°F 7 Custom**
E Remote Probe Strap On*	E 2 inches/ 50mm	2 Stainless Steel	—	1 24 VDC 2 24 VAC	B 0 - 5 VDC C 0 - 10 VDC	2 40 to 140°F 3 -30 to 130°F 4 0 to 100°F 5 100 to 250°F 6 0 to 250°F 7 Custom**
F Outside Air (Weatherproof)*	—	—	—	1 24 VDC 2 24 VAC	B 0 - 5 VDC C 0 - 10 VDC	2 40 to 140°F 3 -30 to 130°F 4 0 to 100°F 5 100 to 250°F 6 0 to 250°F 7 Custom**

Example: TE-213-A-2-C-4: Space Temperature Transducer with a supply voltage of 24VAC, 0-10 VDC signal output and a range of 0 to 100°F

* For Installation Styles B-F, a NEMA-1/IP-30 enclosure is standard. If a NEMA-4/IP-65 enclosure is required the NEMA-4/IP-65 must be specified when placing an order.

** For (#7) Custom temperature range, the custom range must be specified in either Fahrenheit or Celcius when placing an order.

TE-211Z & TE-213

DIMENSIONS:

Figure 1: SPACE TEMPERATURE ENCLOSURE

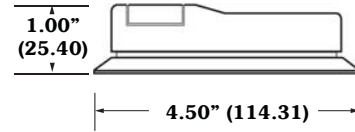
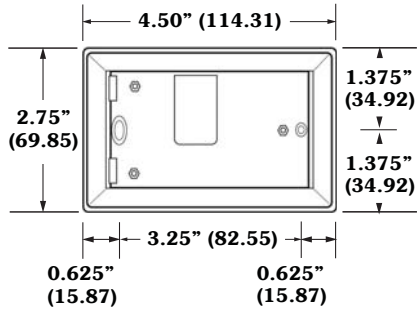


Figure 2: DUCT ENCLOSURE

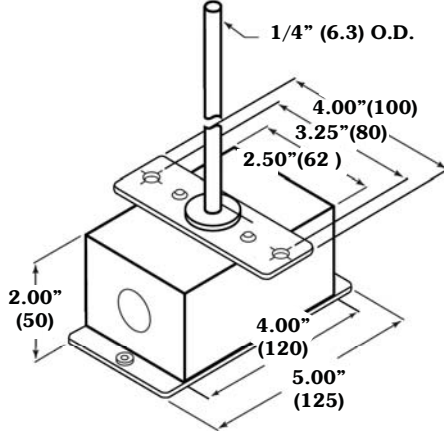


Figure 3: IMMERSION ENCLOSURE

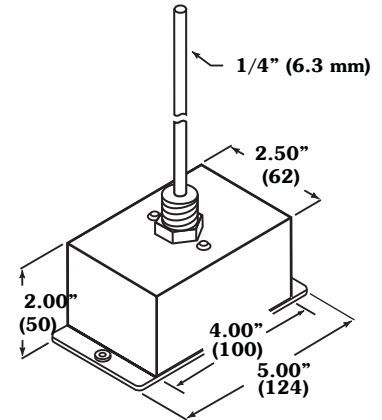


Figure 4: DUCT AVERAGING ENCLOSURE

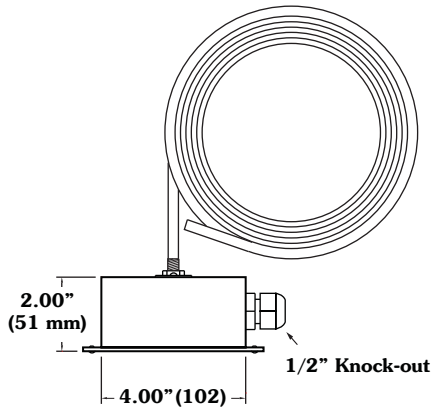


Figure 5: STRAP-ON ENCLOSURE

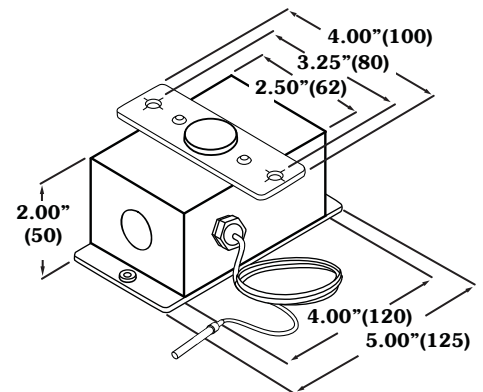
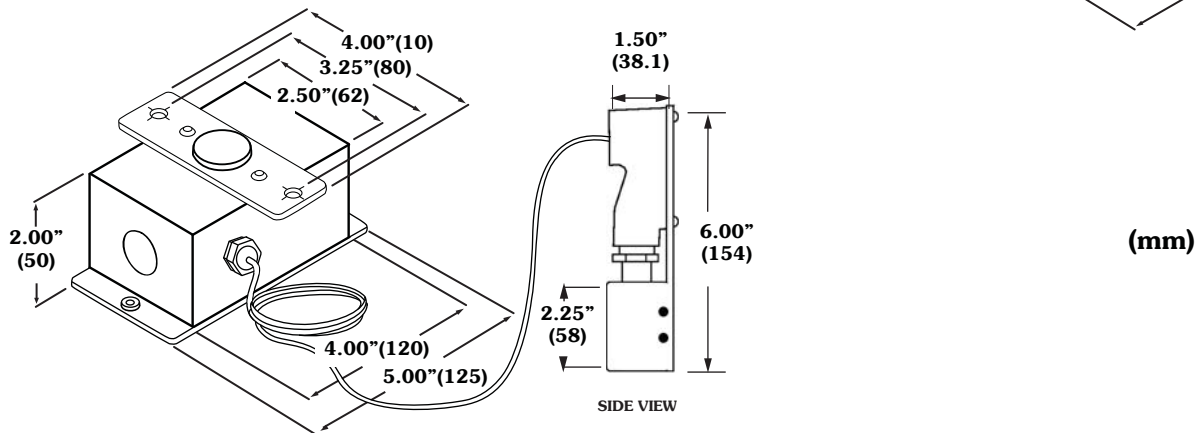


Figure 6: OUTDOOR AIR ENCLOSURE



TE-211Z & TE-213



MAMAC Systems is the leading global manufacturer of sensors, transducers, control peripherals and web browser based IP appliances. MAMAC products are used for HVAC and environmental controls, remote monitoring, alarming, energy metering and industrial automation.

All MAMAC products are manufactured in the USA.

WARRANTY: MAMAC Systems, Inc. and its subsidiaries (hereinafter referred to as MAMAC Systems) warrants its products to be free of defects in material and workmanship for a period of five (5) years from date of shipment. If a unit is malfunctioning, it must be returned to the factory for evaluation. A return authorization number (RMA) will be issued by the customer service department and this number must be written or prominently displayed on the shipping boxes and all related documents. The defective part should be shipped freight pre-paid to the factory. Upon examination by MAMAC Systems, if the unit is found to be defective, it will be repaired or replaced at no charge to the customer. However, this warranty is void if the unit shows evidence of being tampered with, damaged during installation, misapplied, misused, or used in any other operating condition outside of the unit's published specifications.

MAMAC Systems makes no other warranties or representations of any kind whatsoever, expressed or implied, except that of title. All implied warranties including any warranty of merchantability and fitness for a particular purpose are hereby disclaimed. User is responsible to determine suitability for intended use.

LIMITATIONS OF LIABILITY: The remedies of buyer set forth herein are exclusive and the total liability of MAMAC Systems with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the product upon which liability is based. **In no event shall MAMAC Systems be liable for consequential, incidental or special damages.** MAMAC Systems reserves the right to change any specifications without notice to improve performance, reliability, or function of our products.

Every precaution for accuracy has been taken in the preparation of this manual, however, MAMAC Systems neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that result from the use of the product in accordance with the information contained in the manual.

