

### Duct, Immersion and Outdoor-Air Temperature Transmitters General Instructions

#### Application

2252 Series Temperature Transmitters are used in pneumatic control systems to measure air or fluid temperatures and transmit fixed-span, 3 to 15 psig pneumatic output signals to indicating and controlling devices, such as receiver gauges, receiver-controllers, sensitive pressure switches and narrow-differential snap-acting diverting relays.

These transmitters are available with several types of sensing elements. The transmitters are "one-pipe" devices requiring an external source of constant pressure main air, supplied through a 1.0 scfh restrictor or restrictor-tee. Their design features pneumatic feedback to assure accuracy and stability over a wide temperature span.

#### Features

- Transmitters permit remote readout (in multiple locations, if desired) and/or control of temperature associated with HVAC Systems.
- Eight different temperature ranges permit proper match of transmitter range to applications.
- Quality design and construction, with beryllium copper feedback bellows, provides excellent linearity, response and stability.
- Field-accessible "zero" adjustment.
- Liquid-filled sensing elements in the following styles:
  - 20 ft. (6.1 m) averaging, for air ducts.
  - Rigid, for immersion (in well), or air duct insertion.
  - 10 in. (25.4 cm) rigid coiled, for fast response in air ducts where averaging is not required.
- Remote-bulb, for various applications.

#### SPECIFICATIONS

**Action:** Direct, proportional.

**Adjustments:** None required, factory calibrated. (Field accessible zero adjustment.)

**Supply air pressure:** 20 psig  $\pm 0.5$  psi (138 kPa  $\pm 3.4$  kPa), clean, dry air, supplied through 1.0 scfh (0.0063" dia.) restrictor or restrictor-tee.

**Maximum air pressure:** 30 psig (207 kPa).

**Output pressure:** 3 to 15 psig (21 to 103 kPa).

**Air connection:** 1/8 in. FNPT.

**Maximum case ambient temperature:** 140°F (60°C).

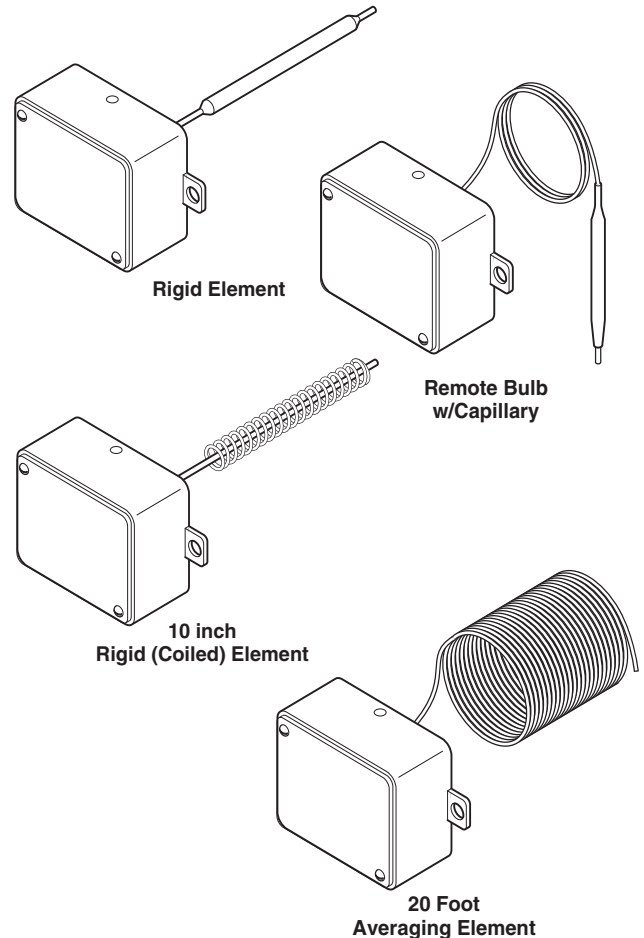
Minimum case operating ambient temperature 40 °F (4.4 °C).

**Construction:** Liquid-Filled copper sensing element, cast aluminum base, beryllium copper feedback bellows, zinc-plated steel cover.

**Mounting:** Duct, immersion, or remote-bulb applications. See "Model Chart".

**Weight (nominal):** 0.9 lb (0.4 kg).

**Case dimensions:** 2-5/8 H x 3-1/16 W x 1-3/4 D in. (67 x 78 x 44 mm).



#### ACCESSORIES

Part Number	Replaces Model	Description
20-778 <sup>a</sup>	100-17	3/8 x 7-1/32 in. copper well with 1/2 in. NPT bushing.
20-782	100-25	3/8 x 10-17/32 in. copper well with 1/2 in. NPT bushing.
20-803 <sup>a</sup>	100-47	Neck extension adaptor - converts 7-1/32 in. well to 10-17/32 in. well.
20-805	100-49	3/8 x 7-1/32 in. Stainless steel well with 1/2 in. NPT bushing (includes 20-803).
22-401	100-71	Adapter, brass, for mounting 2252 Series immersion transmitter in AT-201 or AT-203 well.
20-944	N4-32	Restrictor tee, copper tubing.
21-038	N100-0010	Restrictor tee, polyethylene tubing.
21-153	N100-2501	In-line restrictor.

<sup>a</sup> Use together for copper well with extended neck.

**Table-1 Model Chart.**

TAC Model No.	Replaces	Range (non-adjustable) °F (°C)	Span °F (°C)	Mounting	Maximum Temp. of Thermal Element °F (°C)	Sensing Element Description
2252-510	T150-1011	40 to 140 (4 to 60)	100 (56)	Duct or immersion	256 (124)	Rigid element, 1/4 x 9-3/8 in. long (6 x 238 mm)
2252-501	T150-1012			Duct		Averaging element, 20 ft. long (6.1 m)
2252-502	T150-1013			Rigid (coiled) element, 10 in. long (254 mm)		
2252-250	T150-1021	0 to 100 (-18 to 38)	100 (56)	Duct or immersion	216 (102)	Rigid element, 1/4 x 9-3/8 in. long (6 x 238 mm)
2252-251	T150-1022			Duct		Averaging element, 20 ft. long (6.1 m)
2252-252	T150-1023			Rigid (coiled) element, 10 in. long (254 mm)		
2252-610	T150-1031	40 to 240 (4 to 115)	200 (111)	Duct or immersion	471 (244)	Rigid element, 1/4 x 7-1/16 in. long (6 x 179 mm)
2252-635	T150-1035					Remote bulb, 1/4 x 10-1/2 in. long (6 x 267 mm) with 9-ft. Capillary (2.7 m)
2252-110	T150-1041	-40 to 160 (-40 to 71)	200 (111)	Duct or immersion	391 (199)	Rigid element, 1/4 x 7-1/16 in. long (6 x 179 mm)
2252-703	T150-1046					Remote bulb, 1/4 x 2.5 in. long (6 x 64 mm) with 42 in. (1.1 m) capillary
2252-151	T150-1054	-25 to 125 (-32 to 52)	150 (84)	Duct or outdoor air	241 (116)	Remote bulb, 1/4 x 4 in. long (6 x 102 mm) with 36 in. (0.91 m) capillary
2252-655	T150-1055					Remote bulb, 1/4 x 10-1/2 in. long (6 x 267 mm) with 9 ft. (2.7 m) capillary
2252-662	T150-1062	30 to 80 (-1 to 27)	50 (28)	Duct	138 (59)	Averaging element, 20 ft. long (6.1 m)
2252-273	T150-1073	50 to 100 (10 to 38)				Rigid (coiled) element, 10 in. long (254 mm)
2252-701	T150-1082	50 to 150 (10 to 66)	100 (56)	Duct	266 (130)	Averaging element, 20 ft. long (6.1 m)
2252-702	T150-1083					Rigid (coiled) element, 10 in. long (254 mm)

**TYPICAL APPLICATION**

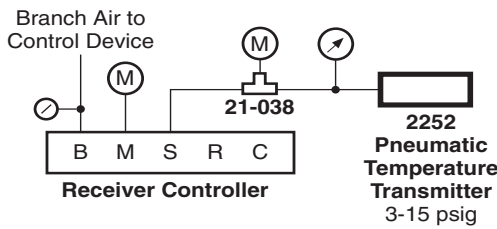


Figure-1 Typical Application.

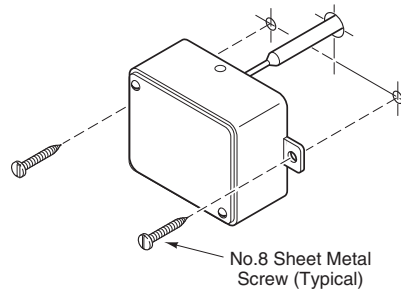


Figure-2 Surface Mounting Hole Dimensions and Duct Installation Detail.

**INSTALLATION**

**Inspection**

Inspect the package for damage. If damaged, notify the appropriate carrier immediately.  
 If undamaged, open the package and inspect the device for obvious damage. Return damaged products.

**DUCT INSTALLATION**

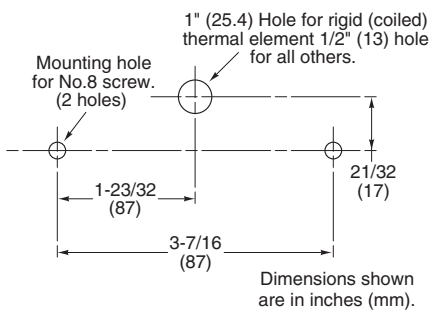
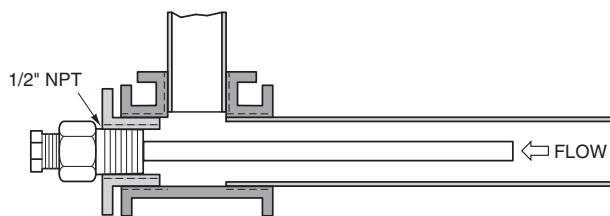
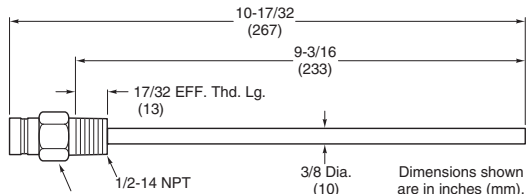
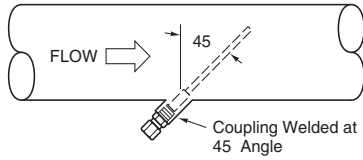


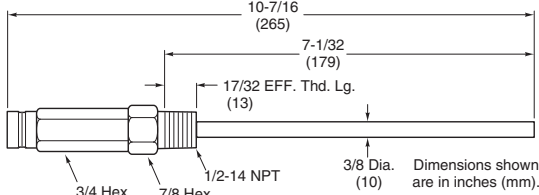
Figure-3 Averaging Element

**IMMERSION INSTALLATION**

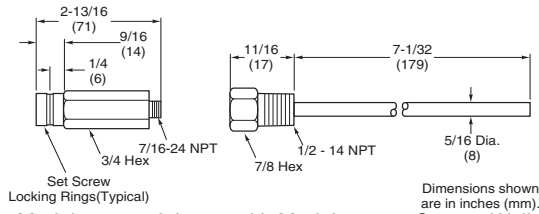




Model 20-782 Copper Well (Std.)



Model 20-805 Stainless Steel Well



Model 20-803 Adaptor with Model 20-778 Copper Well

Figure-4 Series Immersion Well Pipe Installation and Dimensions.

**Note:** Use thermo-conductive paste (M-500) for best sensor performance.

**Note:** Maximum pressure rating of wells and adaptors is 500 psig (34.5 bar).

## OUTSIDE WALL INSTALLATION

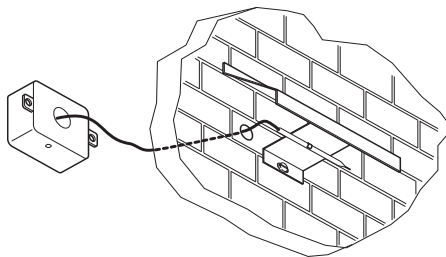
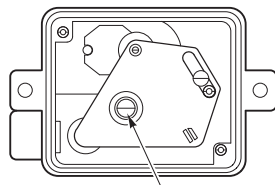


Figure-5 Outside Wall Mounting Detail.

## ADJUSTMENTS

### “Zero” Adjustment



Adjusting Screw "A"

Figure-6 “Zero” Adjustment Screw Location.

The 2252 transmitters feature an accessible “zero” adjustment. In applications where it is desirable to obtain very accurate temperature indication (and/or control) within a given narrow temperature span, minor “zero” adjustments may be made as follows:

**Caution:** Do not attempt adjustment of transmitter span.

1. With the cover removed, measure the sensed temperature and transmitter output pressure with suitably accurate instruments.
  2. Turn adjusting screw “A” to increase or decrease the output pressure as required (clockwise turn increases output pressure). See Figure 6.
- The air supply to the restrictor must be 20 psig  $\pm 0.5$  psi (138 kPa  $\pm 3.4$  kPa) and must be clean, dry, oil free air.
  - The proper size restrictor must be used (0.0063" diameter, 1 SCFH; see “Accessories”), and must be clean and free of obstructions.

## MAINTENANCE

Regular maintenance of the total system is recommended to assure sustained, optimum performance.

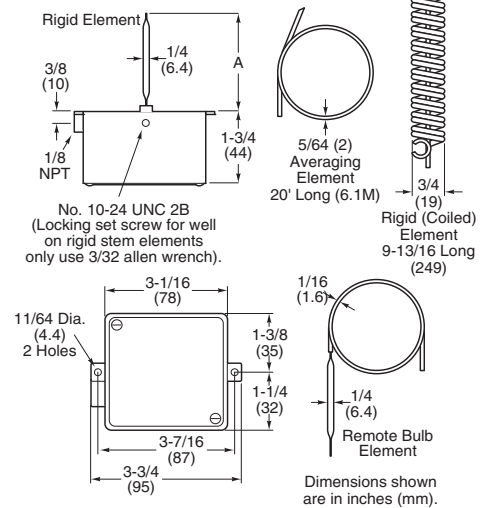
## FIELD REPAIR

None. If transmitter does not function properly when properly installed with clean 1.0 scfh (0.0063" diameter) restrictor or restrictor-tee and 20 psig clean, dry air supply, replace entire unit.

## DIMENSIONAL DATA

Dimensions shown in inches and millimeters. Refer to Figure-7 for general description and dimensions.

Temperature Range	Dim "A"
0 to 100 F (-18 <sub>i</sub> to 38 <sub>i</sub> C)	9 3/8 (238)
40 to 140 F (4 <sub>i</sub> to 60 <sub>i</sub> C)	
-40 to 160 F (-40 <sub>i</sub> to 71 <sub>i</sub> C)	7 1/16 (179)
40 to 240 F (4 <sub>i</sub> to 116 <sub>i</sub> C)	



1 2252-655 Remote bulb model, with 9 ft. (2.7m) capillary, has 1/4" OD copper sleeve silver-soldered to bulb, for use with immersion wells.

Figure-7 2252 Series Transmitter Dimensions.

**Table-2 Pneumatic Temperature Transmitters Output Pressures vs. Temperatures.**

Output Pressure for 2252 Pneumatic Temperature Transmitters								
TAC Model Numbers								Output psig (kPa)
2252-151 2252-662	2252-250 2252-251 2252-252	2252-510 2252-501 2252-502	2252-110 2252-703	2252-610 2252-635	2252-662	2252-273	2252-701 2252-702	
Temperature Range °F (°C)								
-25 to 125 (-32 to 52)	0 to 100 (-18 to 38)	40 to 140 (4 to 60)	-40 to 160 (-40 to 71)	40 to 240 (4 to 115)	30 to 80 (-1 to 27)	50 to 100 (10 to 38)	50 to 150 (10 to 66)	
-25	0	40	-40	40	30	50	50	3.0 (20.69)
-22	2	42	-36	44	31	51	52	3.24 (22.34)
-19	4	44	-32	48	32	52	54	3.48 (23.99)
-16	6	46	-28	52	33	53	56	3.72 (25.65)
-13	8	48	-24	56	34	54	58	3.96 (27.30)
-10	10	50	20	60	35	55	60	4.2 (28.96)
-7	12	52	-16	64	36	56	62	4.44 (30.61)
-4	14	54	-12	68	37	57	64	4.68 (32.27)
-1	16	56	-8	72	38	58	66	4.92 (33.92)
2	18	58	-4	76	39	57	68	5.16 (35.58)
5	20	60	0	80	40	66	70	5.4 (37.23)
8	22	62	4	84	41	61	72	5.64 (38.89)
11	24	64	8	88	42	62	74	5.88 (40.54)
14	26	66	12	92	43	63	76	6.12 (42.20)
17	28	68	16	96	44	64	78	6.36 (43.85)
20	30	70	20	100	45	65	80	6.6 (45.51)
23	32	72	24	104	46	66	82	6.84 (47.16)
26	34	74	28	108	47	67	84	7.08 (48.82)
29	36	76	32	112	48	68	86	7.32 (50.47)
32	38	78	36	116	49	69	88	7.56 (52.13)
35	40	80	40	120	50	70	90	7.8 (53.78)
38	42	82	44	124	51	71	92	8.04 (55.44)
41	44	84	48	128	52	72	94	8.28 (57.09)
44	46	86	52	132	53	73	96	8.52 (58.75)
47	48	88	56	136	54	74	98	8.76 (60.40)
50	50	90	60	140	55	75	100	9.0 (62.06)
53	52	92	64	144	56	76	102	9.24 (63.71)
56	54	94	68	148	57	77	104	9.48 (65.36)
59	56	96	72	152	58	78	106	9.72 (67.02)
62	58	98	76	156	59	79	108	9.96 (68.67)
65	60	100	80	160	60	80	110	10.2 (70.33)
68	62	102	84	164	61	81	112	10.44 (71.98)
71	64	104	88	168	62	82	114	10.68 (73.64)
74	66	106	92	172	63	83	116	10.92 (75.29)
77	68	108	96	176	64	84	118	11.16 (76.95)
80	70	110	100	180	65	85	120	11.4 (78.60)
83	72	112	104	184	66	86	122	11.64 (80.26)
86	74	114	108	188	67	87	124	11.88 (81.91)
89	76	116	112	192	68	88	126	12.12 (83.57)
92	78	118	116	196	69	89	128	12.36 (85.22)
95	80	120	120	200	70	90	130	12.6 (86.88)
98	82	122	124	204	71	91	132	12.84 (88.53)
101	84	124	128	208	72	92	134	13.08 (90.19)
104	86	126	132	212	73	93	136	13.32 (91.84)
107	88	128	136	216	74	94	138	13.56 (93.50)
110	90	130	140	220	75	95	140	13.8 (95.15)
113	92	132	144	224	76	96	142	14.04 (96.81)
116	94	134	148	228	77	97	144	14.28 (98.46)
119	96	136	152	232	78	98	146	14.52 (100.12)
122	98	138	156	236	76	99	148	14.76 (101.77)
125	100	140	160	240	80	100	150	15.0 (103.43)

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