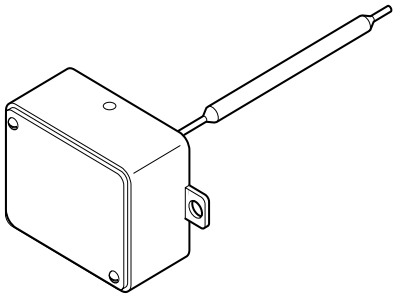
T150 Series (2252 Series)

Duct, Immersion and Outdoor-Air Temperature Transmitters General Instructions

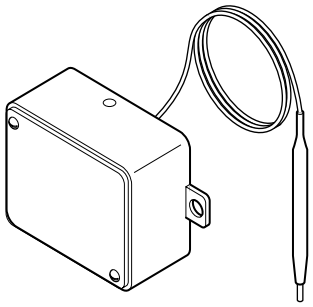
Application

T150 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.

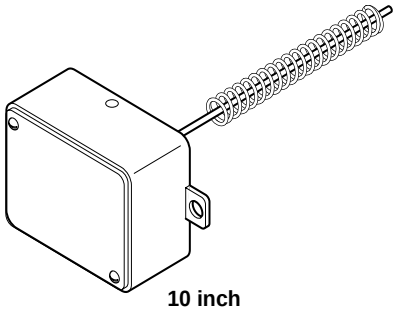
These transmitters are available with several types of sensing elements. The transmitters are “one-pipe” devices requiring an external source of constant pressure main air, supplied through a 1.0 scfh restrictor or restrictor-tee. Their design features pneumatic feedback to assure accuracy and stability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



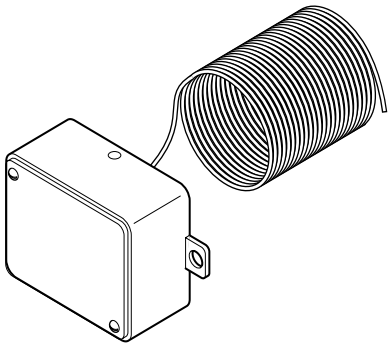
Rigid Element



Remote Bulb w/Capillary



10 inch Rigid (Coiled) Element



20 Foot Averaging Element

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.

Applicable Literature

- TAC Pneumatic Products Catalog, F-7383
- TAC Environmental Controls Cross-Reference Guide, F-23638
- TAC Environmental Controls Reference Manual, F-21683
- TAC Environmental Controls Application Manual, F-21335

SPECIFICATIONS

Action: Direct, proportional.
Adjustments: None required, factory calibrated. (Field accessible zero adjustment.)
Supply air pressure: 20 psig ±0.5 psi (138 kPa ±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).

Table-1 Model Chart.

TAC Model No.	TAC Uni-Line Model No.	Range (non-adjustable) °F (°C)	Span °F (°C)	Mounting	Maximum Temp. of Thermal Element °F (°C)	Sensing Element Description
T150-1011	2252-510	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)
T150-1012	2252-501			Duct		Averaging element, 20 ft. long (6.1 m)
T150-1013	2252-502					Rigid (coiled) element, 10 in. long (254 mm)
T150-1021	2252-250	0 to 100 (-18 to 38)		Duct or immersion	216 (102)	Rigid element, 1/4 x 9-3/8 in. long (6 x 238 mm)
T150-1022	2252-251			Duct		Averaging element, 20 ft. long (6.1 m)
T150-1023	2252-252					Rigid (coiled) element, 10 in. long (254 mm)
T150-1031	2252-610	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)
T150-1035	2252-635					Remote bulb, 1/4 x 10-1/2 in. long (6 x 267 mm) with 9-ft. Capillary (2.7 m)
T150-1041	2252-110	-40 to 160 (-40 to 71)			391 (199)	Rigid element, 1/4 x 7-1/16 in. long (6 x 179 mm)
T150-1046	2252-703			Duct or outdoor air		Remote bulb, 1/4 x 2.5 in. long (6 x 64 mm) with 42 in. (1.1 m) capillary
T150-1054	2252-151	-25 to 125 (-32 to 52)	150 (84)		241 (116)	Remote bulb, 1/4 x 4 in. long (6 x 102 mm) with 36 in. (0.91 m) capillary
T150-1055	2252-655					Remote bulb, 1/4 x 10-1/2 in. long (6 x 267 mm) with 9 ft. (2.7 m) capillary
T150-1062	2252-662	30 to 80 (-1 to 27)	50 (28)	Duct	138 (59)	Averaging element, 20 ft. long (6.1 m)
T150-1073	2252-273	50 to 100 (10 to 38)			158 (70)	Rigid (coiled) element, 10 in. long (254 mm)
T150-1082	2252-701	50 to 150 (10 to 66)	100 (56)		266 (130)	Averaging element, 20 ft. long (6.1 m)
T150-1083	2252-702					Rigid (coiled) element, 10 in. long (254 mm)

ACCESSORIES

TAC Model No.	TAC Uni-Line Model No.	Description
100-02	20-772	Bulb holder, for mounting Remote-bulb element in air duct.
100-13	20-777	Sunshield, for outdoor mounting of Remote-bulb element.
100-17[a]	20-778	Copper Well (See Figure-5). 3/8 x 7-1/32 in. copper well with 1/2 in. NPT bushing.
100-25	20-782	Standard Copper Well, for Rigid elements. 3/8 x 10-17/32 in. long with 1/2 in. NPT bushing.
100-47[a]	20-803	Brass, Neck extension adaptor. Adapts existing 7/16"-24 female threaded wells (used with obsolete Series 100 controllers) for T150 set screw mounting. (See Figure-5)
100-49	20-805	Stainless steel well with extended neck, for Rigid elements.
100-71	22-401	Adaptor, Brass, for mounting Rigid element T150 Immersion Transmitter in TAC Barber-Colman AT-201 or AT-203 Well. (See Figure-5)
N4-32	20-944	Restrictor, 1.0 scfh, 1/4" O.D. compression fittings for copper tubing.
N100-0010	21-038	Restrictor tee (red), 1.0 scfh, Barbed fittings for 1/4 Polytube.
N100-2501	21-153	In-line restrictor, 1.0 scfh, for 1/4" Polytube or MCS-TUBE.

[a] Use100-17 and 100-47 together, for copper well with extended neck for mounting Rigid-elements.

TYPICAL APPLICATION

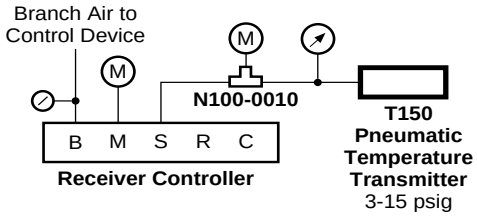


Figure-1 Typical Application.

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

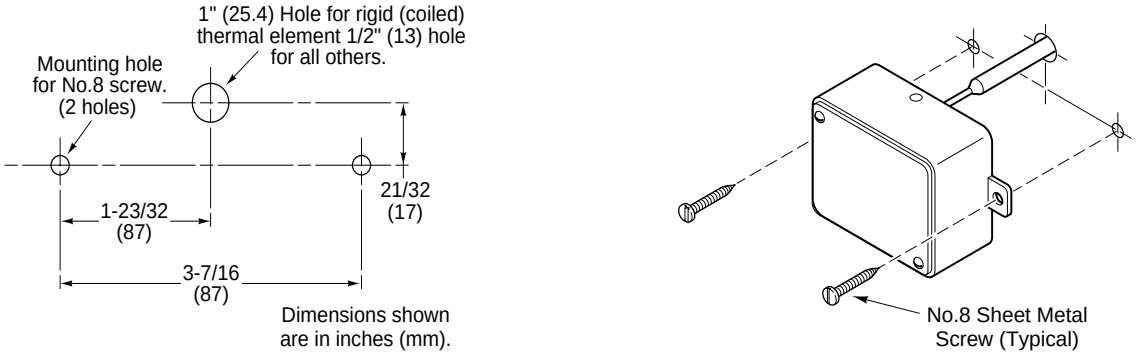


Figure-2 Surface Mounting Hole Dimensions and Duct Installation Detail.

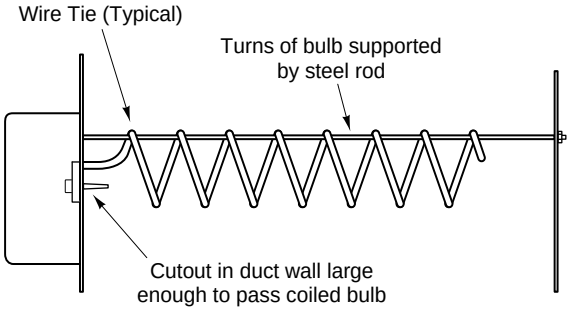


Figure-3 Averaging Element.

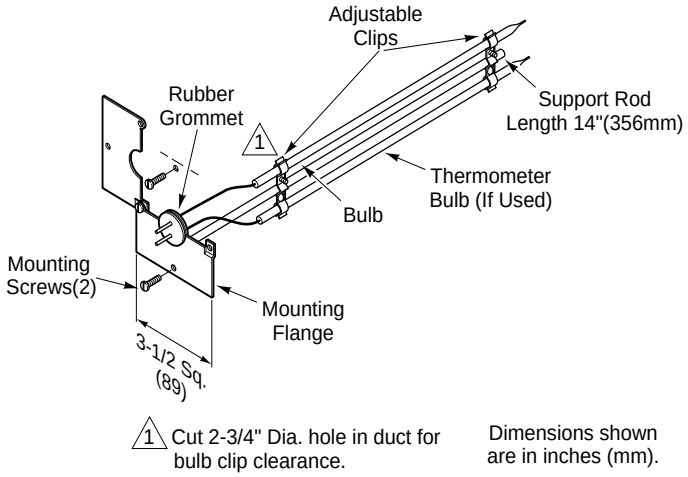
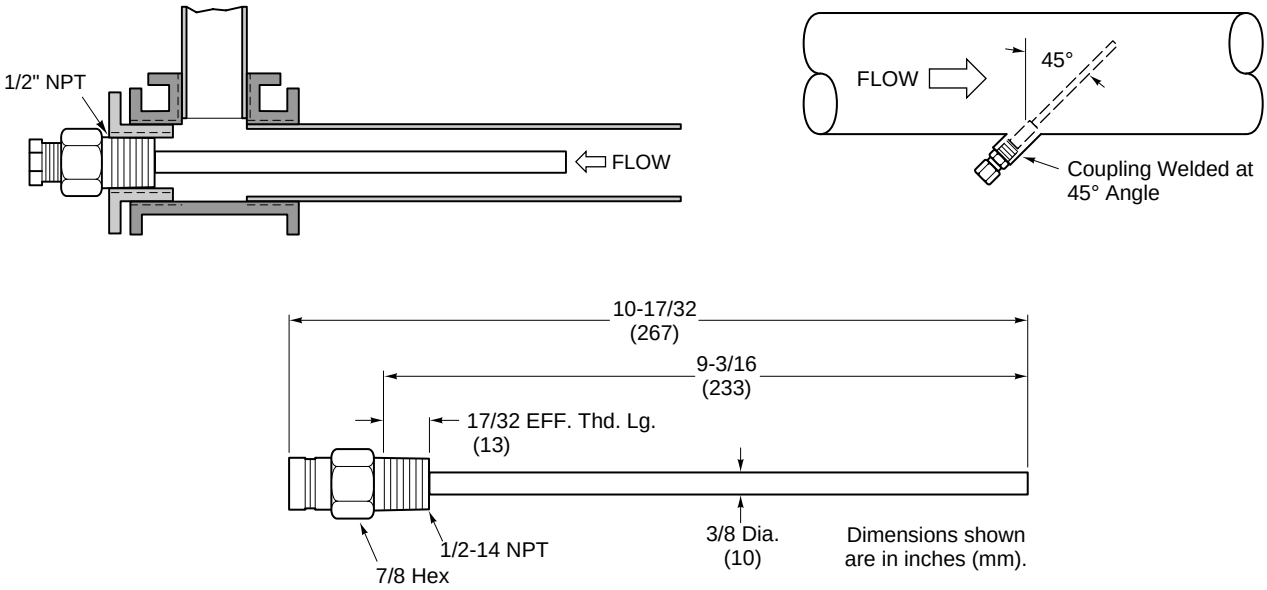
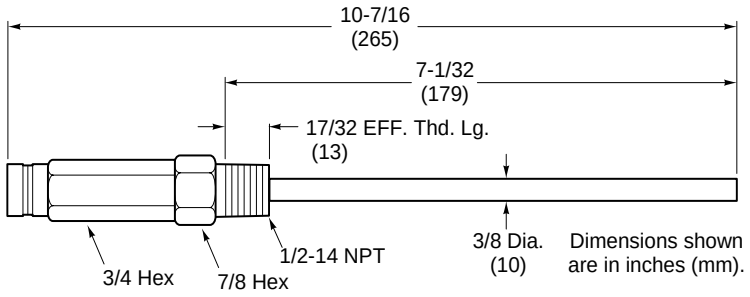


Figure-4 Model 100-02 Bulb Holder For Remote Bulb Element.

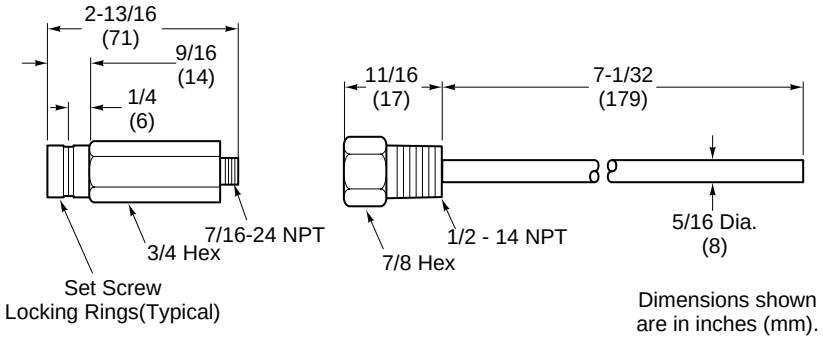
IMMERSION INSTALLATION



Model 100-25 Copper Well (Std.)



Model 100-49 Stainless Steel Well



Note: 100-71 Adaptor, for installing T150 transmitter in TAC Barber-Colman AT-201 or AT-203 Well, is similar to 100-47 Adaptor.

Model 100-47 Adaptor with Model 100-17 Copper Well

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

Figure-5 T150 Series Immersion Well Pipe Installation and Dimensions.

OUTSIDE WALL INSTALLATION

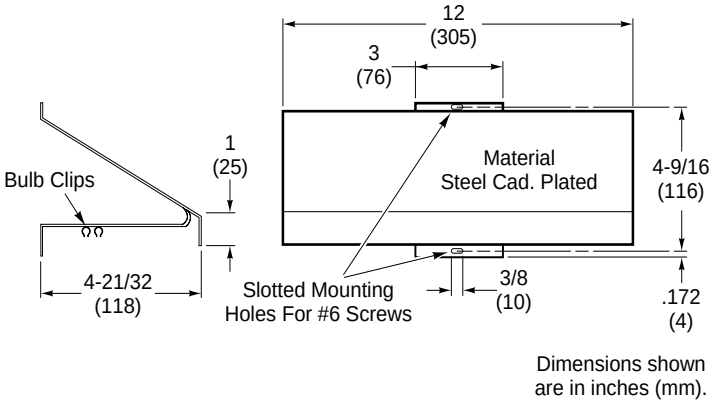


Figure-6 Model 100-13 Sunshield For Mounting Temperature Sensing Bulbs On Outside Walls.

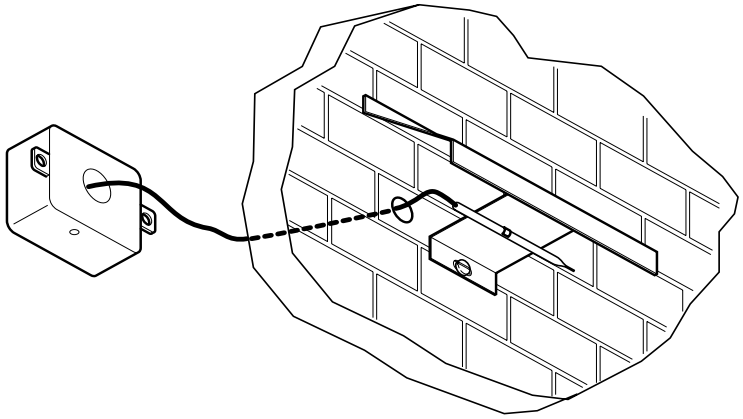


Figure-7 Outside Wall Mounting Detail.

ADJUSTMENTS

“Zero” Adjustment

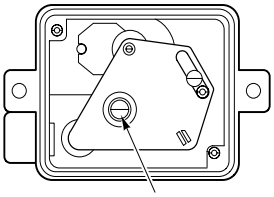


Figure-8 “Zero” Adjustment Screw Location.

The T150 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-8.

NOTE

- The air supply to the restrictor must be 20 psig ±0.5 psi (138 kPa ±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

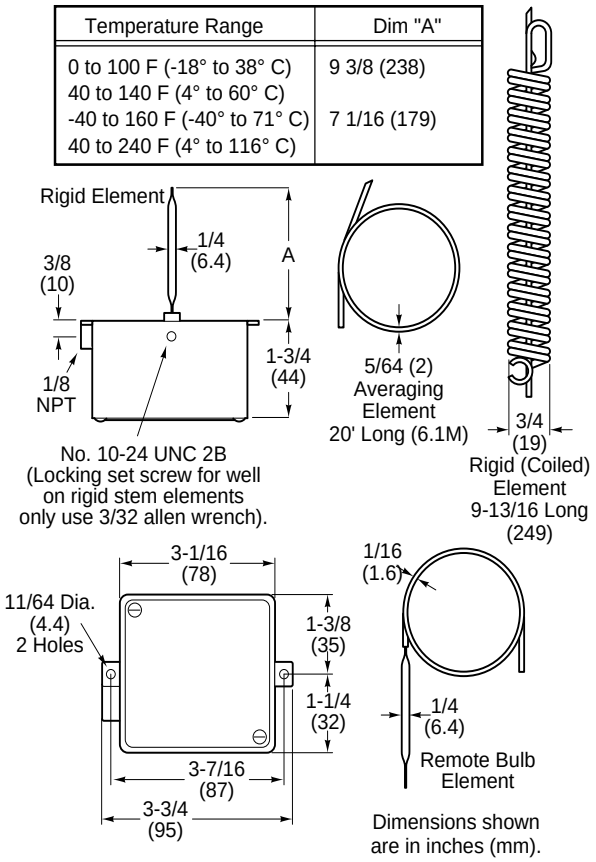
None. If transmitter does not function properly when properly installed with clean 1.0 scfh (0.0063" diameter) restrictor or restrictor-tee and 20 psig clean, dry air supply, replace entire unit.

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

Output Pressure for T150 (2252) Pneumatic Temperature Transmitters								
TAC Uni-Line Model Numbers								Output psig (kPa)
T150-1054 (2252-151) T150-1055 (2252-662)	T150-1021 (2252-250) T150-1022 (2252-251) T150-1023 (2252-252)	T150-1011 (2252-510) T150-1012 (2252-501) T150-1013 (2252-502)	T150-1041 (2252-110) T150-1046 (2252-703)	T150-1031 (2252-610) T150-1035 (2252-635)	T150-1062 (2252-662)	T150-1073 (2252-273)	T150-1082 (2252-701) T150-1083 (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)

DIMENSIONAL DATA

Dimensions shown in inches and millimeters. Refer to Figure-9 for general description and dimensions.



1 T150-1055 (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-9 T150 Series Transmitter Dimensions.

F-25908-2

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