

PRESSURE, VACUUM, DIFFERENTIAL PRESSURE AND TEMPERATURE SWITCHES



FEATURES

- Single Switch Output
- Epoxy Coated and Gasketed Cast Aluminum Enclosure Type 4X
- Tamper-Resistant Set Point "Lock"
- Heat Trace and Freeze Protection Thermostats
- Proof Pressures to 10,000 psi (689,5 bar)
- Adjustable Ranges:

Pressure:
30 "Hg Vac to 5000 psi
(-1 to 344,7 bar)

"wc Ranges:
300 "wc Vacuum to 250 "wc Pressure
(-746,7 to 622,3 mbar)

Differential Pressure:
0.2 "wcd to 500 psid
(0,5 mbar to 34,5 bar)

Temperature:
-180 to 650°F
(-117.8 to 343.3°C)



OVERVIEW

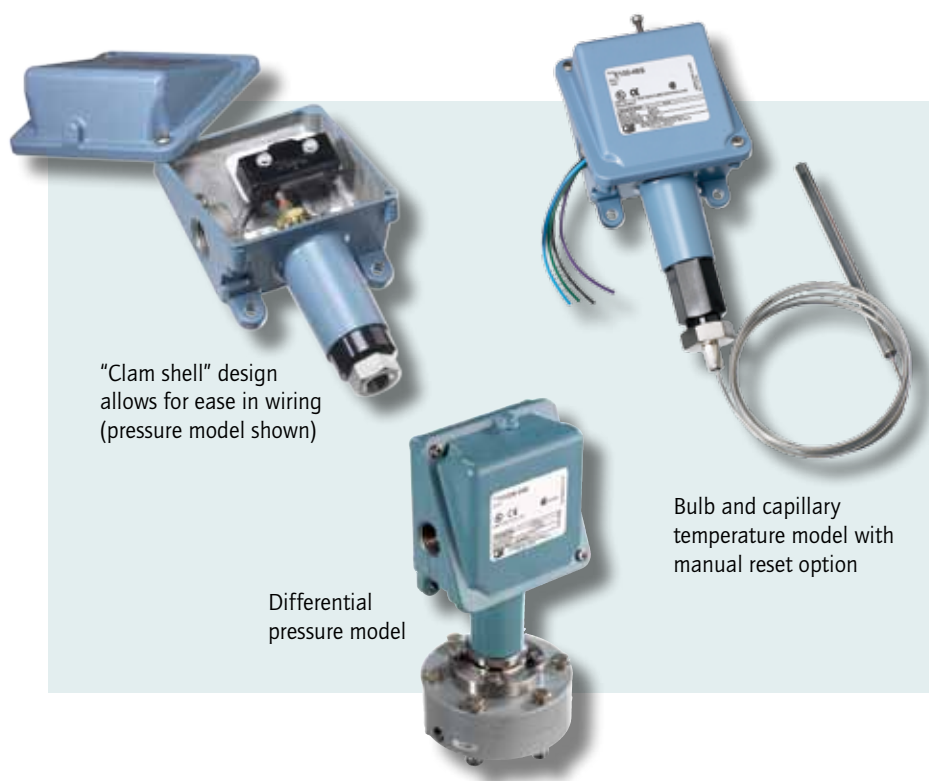
The 100 Series is a cost-effective pressure and temperature switch for process plants and OEM equipment. The rugged, one piece enclosure features a slanted cover for wiring accessibility.

A wide variety of microswitch and process-connection options make this versatile series ideal for applications requiring a rugged weather-proof mechanical switch.

Typical applications that utilize the 100 Series are heat tracing, freeze protection, processing equipment (pumps, compressors), inputs for annunciator panels, and fire suppression systems.

FEATURES

- UL listed and cUL certified.
- CE compliant to low voltage directive and pressure equipment directive.
- Optional ATEX or GOST intrinsic safety compliance
- Single switch (SPDT or DPDT) output
- Welded stainless steel diaphragm models
- Ultra low pressure, "wc models
- Optional sensor material for corrosive media
- Polished stainless steel flush-mount connection
- Pump switch models with wide adjustable deadband



SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71 °C)
AMBIENT TEMPERATURE LIMITS	-40 to 160°F (-40 to 71 °C); models 520-525, 540-548, 700-706, 15731-15736: 0 to 160°F (-18 to 71 °C); Set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change
SET POINT REPEATABILITY	Temperature models: ± 1% of adjustable range Pressure models 15623, 15731-15737, 171-174, 218, 270-376, 520-535, 540-543, 700-706, 560-564: ± 1% of adjustable range; models 190-194, 183-189, 483-494, 544-548, 565-567, 610-680, 15884: ±1.5% of adjustable range Internal set point lock on all pressure models
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 Hz
ENCLOSURE	Die cast aluminum, epoxy powder coated, gasketed, captive cover screws
ENCLOSURE CLASSIFICATION	Enclosure type 4X
SWITCH OUTPUT	One SPDT snap action switch; switch may be wired "normally open" or "normally closed"
ELECTRICAL RATING	15A 125/250/480 VAC resistive except for H100-15623, 15731-15737, 15884, 20A 125/250/480 VAC resistive, B100-13546 and E100-13545, 22A/480 VAC. Electrical switches have limited DC capabilities at 24-30 VDC, 2A resistive and 1A inductive. 125 VDC, 0.5A resistive, 0.03A inductive. Consult factory for additional information.
WEIGHT	2-7 lbs; Varies with model
ELECTRICAL CONNECTION	1/2" NPT (female); Two 7/8" diameter knockouts
PRESSURE CONNECTION	Models 15623, 218, 270-376, 610-680, 701-706, 15731-15884: 1/4" NPT (female); Models 171-194, 483-494, 520-535, 15737: 1/2" NPT (female); Models 540-548: 1/8" NPT (female); Models 560-564: 2" Sanitary Fitting; Models 565-567: 1.5" Sanitary Fitting (Sanitary fittings mate with Tri-Clamp® fitting systems)
TEMPERATURE ASSEMBLY	Bulb and capillary: 6 feet 304 stainless steel except for E100-13545, 10 feet 304 stainless steel Immersion stem: nickel-plated brass (standard) except for B100-13546 stainless steel; optional 316L stainless steel
FILL	Models 1BS/BC are solvent filled, models 2-8 non-toxic oil filled
TEMPERATURE DEADBAND	Type F typically 1% and type B, C, and E typically 2% of range under laboratory conditions (70°F ambient circulating bath at rate of 1/2°F per minute change)
HEAT TRACING OR FREEZE PROTECTION	Thermostats designed specifically for heat tracing and freeze protection ambient sensing applications are available with types B100 and E100



APPROVALS

UE declaration and third-party issued Agency certifications are available. Please consult your UE representative for additional information.



UNITED STATES AND CANADA

UL Listed, **cUL** Certified

Temperature: UL 873; CSA C22.2 no. 24, File # E10667

Pressure: UL 508; CSA C22.2 no. 14, File # E42272;

Enclosure Type 4X



EUROPE

ATEX Directive (94/9/EC)



II 1 G EEx ia IIC T6, **(OPTIONAL - code M405)**

Tamb = -50°C to +60°C

UL International DEMKO A/S (N.B.#0539)

Certificate #DEMKO 03 ATEX 0335063

EN 50014, 50020, 50284

Low Voltage Directive (LVD) (73/23/EC & 93/68/EEC)

UEC compliant to LVD

Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD

Pressure Equipment Directive (PED) (97/23/EC)

Compliant to PED

Products rated lower than 7.5 psi are outside the scope of the PED



RUSSIA

Gosgortekhnadzor Permit **(OPTIONAL - code M406)**

0ExiaIIC T6

Tamb = -50°C to +60°C

NANIO CCVE Certification Center

Certificate # ROSS US.GB05.Bo2933

GOST R 51330.0, 51330.1, 51330.10 & 51330.14

PRESSURE MODEL CHART

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**					
	Low end of range on fall; High end of range on rise											
	"wc	mbar	"wc	mbar	psi	bar	psi	bar				
Type H100												
Buna N diaphragm and O-Ring with epoxy coated aluminum 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes (other wetted materials available see page 11)												
520	300 Vac to 0	-746,7 to 0	0.2 to 8	0,5 to 19,9	200	13,8	400	27,6				
521	10 Vac to 10	-24,9 to 24,9	0.1 to 0.6	0,2 to 1,5	200	13,8	400	27,6				
522	50 Vac to 50	-124,5 to 124,5	0.1 to 3	0,2 to 7,5	200	13,8	400	27,6				
523	0.5 to 5.0	1,2 to 12,4	0.1 to 0.3	0,2 to 0,7	200	13,8	400	27,6				
524	2.5 to 50	6,2 to 124,5	0.1 to 0.8	0,2 to 2,0	200	13,8	400	27,6				
525	10 to 250	24,9 to 622,3	0.1 to 6	0,2 to 14,9	200	13,8	400	27,6				
Welded 316L stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes												
530	300 Vac to 0	-746,7 to 0	0.2 to 15	0,5 to 37,3	50	3,4	100	6,9				
531	10 Vac to 10	-24,9 to 24,9	0.1 to 0.6	0,2 to 1,5	50	3,4	100	6,9				
532	50 Vac to 50	-124,5 to 124,5	0.1 to 3	0,2 to 7,5	50	3,4	100	6,9				
533	0.5 to 5.0	1,2 to 12,4	0.1 to 0.3	0,2 to 0,7	50	3,4	100	6,9				
534	2.5 to 50	6,2 to 124,5	0.1 to 0.8	0,2 to 2,0	50	3,4	100	6,9				
535	10 to 250	24,9 to 622,3	0.1 to 10	0,2 to 24,9	50	3,4	100	6,9				
Model	Adjustable Set Point Range		Adjustable Deadband				Over Range Pressure*		Proof Pressure**			
	"wc	mbar	Low End "wc	Mid Range mbar	High Range "wc			psi	bar	psi	bar	
Buna N diaphragm and O-Ring with epoxy coated aluminum, 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes; includes adjustable deadband microswitch												
15737	50 Vac to 50	-124,5 to 124,5	0.5 to 7	1,2 to 17,4	1 to 10	2,5 to 24,9	2 to 13	5,0 to 32,4	200	13,8	400	27,6
Deadband												
	psi	bar (unless noted)	psi	mbar				psi	bar	psi	bar	
Welded 316L stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes (NACE MR-0175 compliant)												
171	1 to 20	68,9 mbar to 1,4	0.1 to 1	6,9 to 68,9				500	34,5	1000	68,9	
172	2 to 50	0,1 to 3,4	0.1 to 1.5	6,9 to 103,4				500	34,5	1000	68,9	
173	4 to 100	0,3 6,9	0.1 to 2.5	6,9 to 172,4				500	34,5	1000	68,9	
174	8 to 200	0,6 to 13,8	0.1 to 3.5	6,9 to 241,3				500	34,5	1000	68,9	
2" sanitary welded 316L stainless steel diaphragm and pressure connection. Mates with Tri-Clamp® fitting systems (not UE supplied)												
560	0.5 to 15	34,5 mbar to 1.0	0.1 to 1	6,9 to 68,9				200	13,8	300	20,7	
561	1 to 25	68,9 mbar to 1,7	0.1 to 1.5	6,9 to 103,4				200	13,8	300	20,7	
562	2 to 50	0,1 to 3,4	0.1 to 2.5	6,9 to 172,4				200	13,8	300	20,7	
563	4 to 100	0,3 6,9	0.1 to 4	6,9 to 275,8				200	13,8	300	20,7	
564	8 to 200	0,6 to 13,8	0.1 to 5	6,9 to 344,7				200	13,8	300	20,7	

Tri-Clamp® is a registered trademark of Alfa Laval.

Application Note: The use of metallic diaphragms where higher pressure shock or heavy cycling is expected should be avoided. Models 171-174 should not be used where system or start-up vacuum pressure might exceed 26" Hg Vac (-0.9 bar).

* Over Range Pressure: The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

** Proof Pressure: The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g., start-up, testing).



100 Series

100 Series

PRESSURE MODEL CHART

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise							
	psi	bar (unless noted)	psi	bar (unless noted)	psi	bar	psi	bar
Type H100								

1.5" sanitary welded 316L stainless steel diaphragm and pressure connection. Mates with Tri-Clamp® fitting systems (not UE supplied)

565	5 to 30	0,3 to 2,1	1 to 5	68,9 mbar to 0,3	1000	68,9	1500	103,4
566	10 to 100	0,7 to 6,9	1 to 12	68,9 mbar to 0,8	1000	68,9	1500	103,4
567	15 to 300	1,0 to 20,7	3 to 22	0,2 to 1,5	1000	68,9	1500	103,4

Buna-N diaphragm and O-ring with nickel-plated brass 1/4" NPT (female) pressure connection; Option M540 Viton® diaphragm and O-ring available for models 701-705

701	1.5 to 30	103,4 mbar to 2,1	1 to 2	68,9 mbar to 0,1	500	34,5	600	41,4
702	3 to 100	0,2 to 6,9	1 to 4	68,9 mbar to 0,3	500	34,5	600	41,4
703	9 to 300	0,6 to 20,7	1 to 5	68,0 mbar to 0,3	500	34,5	600	41,4
704	15 to 500	1,0 to 34,5	2 to 8	0,1 to 0,6	1500	103,4	2500	172,4
705	30 to 1000	2,1 to 68,9	3 to 20	0,2 to 1,4	1500	103,4	2500	172,4
706	100 to 1700	6,9 to 117,2	10 to 30	0,7 to 2,1	2000	103,4	2500	172,4

psi bar psi bar psi bar psi bar

Viton® diaphragm and O-Ring with 316 stainless steel 1/4" NPT (female) pressure connection (includes adjustable deadband switch)

15623	20 to 200	1,4 to 13,8	12 to 26	0,8 to 1,8	500	34,5	1000	68,9
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Model	Adjustable Set Point Range		Adjustable Deadband						Over Range Pressure*		Proof Pressure**	
			Low End		Mid Range		High End					
	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar

Buna N diaphragm and O-Ring nickel-plated brass 1/4" NPT (female) pressure connection; includes adjustable deadband microswitch

15731	3 to 30	0,2 to 2,1	1.5 to 4	0,1 to 0,3	2 to 4.5	0,1 to 0,3	2.5 to 5	0,2 to 0,3	500	34,5	600	41,4
15732	5 to 100	0,3 to 6,9	3 to 6	0,2 to 0,4	4 to 7.5	0,3 to 0,5	5 to 9	0,3 to 0,6	500	34,5	600	41,4
15733	9 to 300	0,6 to 27,0	4 to 11	0,3 to 0,8	5 to 13	0,3 to 0,9	5 to 16	0,3 to 1,1	500	34,5	600	41,4
15734	15 to 500	1,0 to 34,5	8 to 25	0,6 to 1,7	9 to 28	0,6 to 1,9	10 to 31	0,7 to 2,1	1500	103,4	2500	172,4
15735	30 to 1000	2,1 to 68,9	9 to 30	0,6 to 2,1	10 to 35	0,7 to 2,4	30 to 90	2,1 to 6,2	1500	103,4	2500	172,4
15736	100 to 1700	6,9 to 117,2	25 to 60	1,7 to 4,1	40 to 80	2,8 to 5,5	50 to 100	3,4 to 6,9	2000	137,9	2500	172,4

Model	Adjustable Set Point Range		Deadband				Over Range Pressure*		Proof Pressure**	
			Lower 75% range span		Top 25% range span					
	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar

Welded 316 stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes (NACE MR-0175 compliant)

190	5 to 30	0,3 to 2,1	1 to 3	0,1 to 0,2	6 max	0,4	1500	103,4	2500	172,4
191	10 to 100	0,7 to 6,9	1 to 8	0,1 to 0,6	15 max	1,0	1500	103,4	2500	172,4
192	15 to 300	1,0 to 20,7	3 to 18	0,2 to 1,2	25 max	1,7	1500	103,4	2500	172,4
193	20 to 500	1,4 to 34,5	4 to 30	0,3 to 2,1	45 max	3,1	1500	103,4	2500	172,4
194	80 to 1700	5,5 to 117,2	5 to 120	0,3 to 8,3	150 max	10,3	2000	137,9	2500	172,4

Tri-Clamp® is a registered trademark of Alfa Laval.

Application Note: The use of metallic diaphragms where higher pressure shock or heavy cycling is expected should be avoided. Models 171-174 should not be used where system or start-up vacuum pressure might exceed 26" Hg Vac (-0.9 bar).

Model	Adjustable Set Point Range		Deadband		Top 25% range span		Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; psi	High end of range on rise bar	Lower 75% range span psi	bar	psi	bar	psi	bar	psi	bar
Type H100										
Welded 316 stainless steel diaphragm and 1/2" NPT (female) pressure connection, 0.06" orifice to dampen pulsations										
490	5 to 30	0,3 to 2,1	1 to 3	0,1 to 0,2	6 max	0,4	1500	103,4	2500	172,4
491	10 to 100	0,7 to 6,9	1 to 8	0,1 to 0,6	15 max	1,0	1500	103,4	2500	172,4
492	15 to 300	1,0 to 20,7	3 to 18	0,2 to 1,2	25 max	1,7	1500	103,4	2500	172,4
493	20 to 500	1,4 to 34,5	4 to 30	0,3 to 2,1	45 max	3,1	1500	103,4	2500	172,4
494	80 to 1700	5,5 to 117,2	5 to 120	0,3 to 8,3	150 max	10,3	2000	137,9	2500	172,4
	psi (unless noted)	bar	psi (unless noted)	bar (unless noted)			psi	bar	psi	bar
316L stainless steel diaphragm (optional Hastelloy® C or Monel®); Viton® GLT O-Ring (optional Kalrez®, Silicone, Ethylene Propylene, or Aflas®); 316 stainless steel 1/2" NPT (female) pressure connection (optional Hastelloy® C or Monel®), large 0.72" orifice for clean-out purposes. Models 188 and 189 have a 316L stainless steel 1/2" NPT (female) pressure connection (NACE MR-0175 compliant)										
183	1 to 20	0,1 to 1,4	0.3 to 2.5		20,7 to 172,4 mbar		500	34,5	1000	68,9
184	2 to 50	0,1 to 3,4	0.3 to 3		20,7 to 206,8 mbar		500	34,5	1000	68,9
185	4 to 100	0,3 to 6,9	0.5 to 6		34,5 to 413,7 mbar		500	34,5	1000	68,9
186	8 to 200	0,6 to 13,8	1 to 11		0,1 to 0,8		500	34,5	1000	68,9
188	50 to 1000	3,4 to 68,9	25 to 125		1,7 to 8,6		2000	137,9	7000	482,6
189	250 to 3500	17,2 to 241,3	50 to 300		3,4 to 20,7		4000	275,8	7000	482,6
316L stainless steel diaphragm (optional Hastelloy® C or Monel®); Viton® GLT O-Ring (optional Kalrez®, Silicone, ethylene propylene or Aflas®); 316 stainless steel 1/2" NPT (female) pressure connection (optional Hastelloy® C or Monel®), 0.06" orifice to dampen pulsations. Models 488 and 489 316L stainless steel pressure connection (NACE MR-0175 compliant)										
483	1 to 20	0,1 to 1,4	0.3 to 2.5		20,7 to 172,4 mbar		500	34,5	1000	68,9
484	2 to 50	0,1 to 3,4	0.3 to 3		20,7 to 206,8 mbar		500	34,5	1000	68,9
485	4 to 100	0,3 to 6,9	0.5 to 6		34,5 to 413,7 mbar		500	34,5	1000	68,9
486	8 to 200	0,6 to 13,8	1 to 11		0,1 to 0,8		500	34,5	1000	68,9
488	50 to 1000	3,4 to 68,9	25 to 125		1,7 to 8,6		2000	137,9	7000	482,6
489	250 to 3500	17,2 to 241,3	50 to 300		3,4 to 20,7		4000	275,8	7000	482,6
Phosphor bronze bellows with nickel-plated brass 1/4" NPT (female) pressure connection. Model 218 has 300 series stainless steel spring exposed to media										
218	30 "Hg Vac to 0	-1 to 0	1 to 2 "Hg		33,9 to 67,7 mbar		3	0,2	30	2,1
270	4 to 200	0,3 to 13,8	1 to 8		0,1 to 0,6		200	13,8	250	17,2
274	6 to 300	0,4 to 20,7	1 to 10		0,1 to 0,7		300	20,7	350	24,1
Welded 316L stainless steel bellows and 1/4" NPT (female) pressure connection										
358	15 to 200	1,0 to 13,8	1 to 3		0,1 to 0,2		200	13,8	800	55,2
361	20 to 300	1,4 to 20,7	1 to 4		0,1 to 0,3		300	20,7	800	55,2
376	25 to 500	1,7 to 34,5	1.5 to 5		0,1 to 0,3		500	34,5	800	55,2

Hastelloy® is a registered trademark of Haynes International, Inc. Monel® is a registered trademark of The Special Metals Corporation. Viton® and Kalrez® are registered trademarks of E.I. duPont de Nemours and Company. Aflas® is a registered trademark of Asahi Glass.

* Over Range Pressure: The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

** Proof Pressure: The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g., start-up, testing).

Deadband Note: Models 190-194, 490-494 are expressed as the lower 75% and top 25% of the range span because of the operating characteristics of the diaphragm sensor and switch. Use of optional diaphragm materials for models 483-489 may increase deadband.



100 Series

100 Series

PRESSURE MODEL CHART

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise							
	psi	bar	psi	bar	psi	bar	psi	bar
Type H100								
303 stainless steel piston, Buna N O-Ring with 303 stainless steel 1/4" NPT (female) pressure connection								
610	75 to 1000	5,2 to 68,9	30 to 150	2,1 to 10,3	6000	413,7	10,000	689,5
612	125 to 3000	8,6 to 206,8	40 to 250	2,8 to 17,2	6000	413,7	10,000	689,5
616	700 to 5000	48,3 to 344,7	40 to 375	2,8 to 25,9	6000	413,7	10,000	689,5
	psi	bar	psi	bar	psi	bar	psi	bar
303 stainless steel piston, Buna N O-Ring with 303 stainless steel 1/4" NPT (female) pressure connection (includes adjustable deadband switch)								
15884	700 to 5000	48,3 to 344,7	80 to 500	5,5 to 34,5	6000	413,7	10,000	689,5
316 stainless steel bellows and 1/4" NPT (female) pressure connection (Not recommended for rapid or high cycling pressure changes)								
680	100 to 1700	6,9 to 117,2	9 to 40	0,6 to 2,8	1700	117,2	2500	172,4

DIFFERENTIAL PRESSURE MODEL CHART

Model	Adjustable Set Point Range		Deadband		Working Pressure***		Proof Pressure**	
	Low end of range on fall; High end of range on rise							
	psid	bar	psi	bar	psi	bar	psi	bar
Type H100K								
(unless noted)								
Buna N diaphragms and sealing O-rings with epoxy coated aluminum 1/8" NPT (female) pressure connections								
540	0.2 to 7 "wcd	0,5 to 17,4 mbar	0.05 to 0.6 "wc	0,1 to 1,5 mbar	30 "Hg Vac to 200	-1 to 13,8	400	27,6
541	1 to 20 "wcd	2,5 to 49,8 mbar	0.1 to 1.0 "wc	0,2 to 2,5 mbar	30 "Hg Vac to 200	-1 to 13,8	400	27,6
542	5 to 50 "wcd	12,4 to 124,5 mbar	0.2 to 2.5 "wc	0,5 to 6,2 mbar	30 "Hg Vac to 200	-1 to 13,8	400	27,6
543	10 to 200 "wcd	24,9 to 497,8 mbar	0.5 to 8 "wc	1,2 to 19,9 mbar	30 "Hg Vac to 200	-1 to 13,8	400	27,6
544	2 to 20	0,1 to 1,4	0.1 to 1.3	6,9 to 89,6 mbar	30 "Hg Vac to 1200	-1 to 82,7	2500	172,4
545	5 to 50	0,3 to 3,4	0.2 to 2.2	13,8 mbar to 0,1	30 "Hg Vac to 1200	-1 to 82,7	2500	172,4
546	10 to 125	0,7 to 8,6	0.4 to 5.0	27,6 mbar to 0,3	30 "Hg Vac to 1200	-1 to 82,7	2500	172,4
547	50 to 250	3,4 to 17,2	0.8 to 10	0,1 to 0,7	30 "Hg Vac to 1200	-1 to 82,7	2500	172,4
548	100 to 500	6,9 to 34,5	2.0 to 15	0,1 to 1,0	30 "Hg Vac to 1200	-1 to 82,7	2500	172,4

* Over Range Pressure: The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

** Proof Pressure: The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing).

***Working Pressure Range: The pressure range within which two opposing sensors can be safely operated and still maintain set point adjustability.

TEMPERATURE MODEL CHART

Model	Adjustable Set Point Range		Max. Temp		Scale Division		Stem or Bulb Size†/Finish‡‡
	°F	°C	°F	°C	°F	°C	
OD x Length							
Type B100 Internal adjustment via reference dial Type C100 No reference dial; model 13546 not available							
120	0 to 225	-17.8 to 107.2	275	135	10†	5†	9/16" x 1-7/8" below 1/2 "NPT thread (nickel-plated brass)
121	200 to 425	93.3 to 218.3	475	246.1	10†	5†	9/16" x 1-7/8" below 1/2 "NPT thread (nickel-plated brass)
13546† (Freeze Protection)	15 to 140	-9.4 to 60	160	71.1	5†	2†	9/16" x 2-11/16" long stainless steel
Type E100 Stainless steel bulb and capillary; internal adjustment via reference dial							
2BSA	-120 to 100	-84.4 to 37.8	150	65.6	10	5	3/8 x 2-7/16"
2BSB	30 to 250	-1.1 to 121.1	300	148.9	10	5	3/8 x 2-7/16"
3BS	100 to 400	37.8 to 204.4	450	232.2	10	5	3/8 x 2-1/8"
4BS	25 to 100	-3.9 to 37.8	150	65.6	2	1	3/8 x 6-3/4"
5BS	-20 to 80	-28.9 to 26.7	130	54.4	5	2	3/8 x 5"
8BS	350 to 640	176.7 to 337.8	690	365.6	10	5	3/8 x 3-1/4"
13545 (Heat Tracing)	25 to 325	-3.9 to 162.8	360	182.2	10	5	1/8 x 11-5/8"
Copper bulb and capillary							
2BCA	-120 to 100	-84.4 to 37.8	150	65.6	10	5	3/8 x 2-7/16"
2BCB	30 to 250	-1.1 to 121.1	300	148.9	10	5	3/8 x 2-7/16"
3BC	100 to 400	37.8 to 204.4	450	232.2	10	5	3/8 x 2-1/8"
4BC	25 to 100	-3.9 to 37.8	150	65.6	2	1	3/8 x 6-3/4"
5BC	-20 to 80	-28.9 to 26.7	130	54.4	5	2	3/8 x 5"
8BC	350 to 640	176.7 to 337.8	690	365.6	10	5	3/8 x 3-1/4"
Type F100 Stainless steel bulb and capillary; no reference dial							
1BS	-180 to 120	-117.8 to 48.9	170	76.7	N/A		3/8 x 3-3/4"
2BS	-125 to 350	-87.2 to 176.7	400	204.4	N/A		3/8 x 2-7/16"
3BS	-125 to 500	-87.2 to 260	550	287.8	N/A		3/8 x 2-1/8"
4BS	-40 to 120	-40 to 48.9	170	76.7	N/A		3/8 x 6-3/4"
5BS	-40 to 180	-40 to 82.2	230	110	N/A		3/8 x 5"
6BS	0 to 250	-17.8 to 121.1	300	148.9	N/A		3/8 x 4-1/2"
7BS	0 to 400	-17.8 to 204.4	450	232.2	N/A		3/8 x 3"
8BS	50 to 650	10 to 343.3	700	371.1	N/A		3/8 x 3-1/4"
Copper bulb and capillary							
1BC	-180 to 120	-117.8 to 48.9	170	76.7	N/A		3/8 x 3-3/4"
2BC	-125 to 350	-87.2 to 176.7	400	204.4	N/A		3/8 x 2-7/16"
3BC	-125 to 500	-87.2 to 260	550	287.8	N/A		3/8 x 2-1/8"
4BC	-40 to 120	-40 to 48.9	170	76.7	N/A		3/8 x 6-3/4"
5BC	-40 to 180	-40 to 82.2	230	110	N/A		3/8 x 5"
6BC	0 to 250	-17.8 to 121.1	300	148.9	N/A		3/8 x 4-1/2"
7BC	0 to 400	-17.8 to 204.4	450	232.2	N/A		3/8 x 3"
8BC	50 to 650	10 to 343.3	700	371.1	N/A		3/8 x 3-1/4"

†Type B100 only

‡Optional immersion stem lengths and capillary lengths are available. Standard capillary length is 6 ft except models 13545 which is 10 ft.

‡‡Optional stainless steel immersion stem, and armored capillary covering available.



HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts".

Determine model based on adjustable range, deadband and proof pressure.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section.

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number.

Leave "option" portion blank if no options are needed.

FOR MULTIPLE OPTIONS: Call United Electric Controls.

TYPE

DESCRIPTION

PRESSURE

Type H100 - One SPDT output; epoxy coated enclosure; internal adjustment with "High-Low" reference scale

DIFFERENTIAL PRESSURE

Type H100K - One SPDT output; epoxy coated enclosure; internal adjustment with "High-Low" reference scale

TEMPERATURE

Type B100 - Immersion stem; one SPDT output; internal adjustment with reference dial

Type C100 - Immersion stem; one SPDT output; internal adjustment with no reference

Type E100 - Bulb and capillary; one SPDT output; internal adjustment with reference dial

Type F100 - Bulb and capillary; one SPDT output; internal adjustment with no reference

SWITCH OPTIONS*

0140	Gold contacts, 1A 125 VAC resistive. NOT AVAILABLE MODELS 13545, 13546, 15623, 15731-15884
0500	Close deadband, 5A 125/250 VAC resistive. NOT AVAILABLE MODELS 520-535, 13545, 13546, 15623, 15731-15884
1010	DPDT switch, 10A 125/250 VAC resistive; deadband and minimum set point will increase. NOT AVAILABLE TEMPERATURE VERSIONS, TYPE H100K OR MODELS 171-194, 483-567, 680, 15623, AND 15731-15884
1070	10 A 125 VDC resistive; deadband and minimum set point will increase. NOT AVAILABLE MODELS 171-194, 483-535, 560-567, 13545, 13546, 15623, 15731-15884
1519	Adjustable deadband, 15 A 125/250/480 VAC resistive; adjustment wheel changes rise setting only. If adjustment on fall setting is required, use primary adjustment. NOT AVAILABLE TYPES B100, E100 OR MODELS 171-194, 483-494, 560-567, 610-616, 51623, 15731-15884
1530	External manual reset, 15 A 125/250/480 VAC resistive; latches on rise, only. NOT AVAILABLE MODELS 13545, 13546, 15623, 15731-15884
1535	High ambient, 15 A 125/250 VAC resistive; temperatures up to 250°F (121.1°C). NOT AVAILABLE MODELS 520-535, 13545, 13546, 15623, 15731-15884
1537	Vapor sealed switch, 15 A 125/250 VAC resistive. NOT AVAILABLE MODELS 523, 533, 13545, 13546, 15623, 15731-15884
2000	20 A 125/250/480 VAC resistive. NOT AVAILABLE TYPE H100K OR MODELS 520-535, 13545, 13546, 15623, 15731-15884
3000	30 A 125/250/277 VAC resistive. NOT AVAILABLE TYPE H100K OR MODELS 171-194, 483-567, 680, 13545, 13546, 15623, 15731-15884

* All switches have limited DC capabilities. Consult factory for details.

OTHER OPTIONS

M020	Red status light, 115 VAC only. NOT AVAILABLE MODELS 13545, 13546, 15623, 15731-15884
M201	Factory set one switch; specify increasing or decreasing pressure or temperature and setpoint
M277	Range indicated on nameplate in kPa or MPa, factory selected. NOT AVAILABLE ON TEMPERATURE VERSIONS
M278	Range indicated on nameplate in Kg/cm ² . NOT AVAILABLE ON TEMPERATURE VERSIONS
M405	Intrinsic safety compliance for European Union per ATEX standards
M406	Intrinsic Safety compliance for Russia per Gosgortekhnadzor standards.
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M449	Mounting bracket kit. Required for models 520-535, 15737 when surface mounting. Use kit part number 6361-704 for other models
M504	316L stainless steel immersion stem. AVAILABLE TEMPERATURE MODELS 120, 121 ONLY
M540	Viton® construction (deadband and low end range may increase slightly); wetted parts include Viton® diaphragm and O-ring plus stainless steel pressure connection. AVAILABLE ON MODELS 610-616 (O-ring only), 701-705 (Viton diaphragm & O-ring, stainless steel pressure connection), AND 540-548 (sealing diaphragms only, main diaphragm remains Kapton®, pressure connections remain aluminum)
M550	Oxygen service cleaning; internal construction may change. NOT AVAILABLE ON PRESSURE MODEL 706
M914	1/2" NPT (female) stainless steel pressure connection. AVAILABLE MODELS 358-376, 610-616
M921	Brass pressure connection. AVAILABLE MODELS 610-616
6361-704	Surface and Pipe Mounting Hardware (required for model 520-535, 15737, 540-548 when surface mounting)
SD6286-51	Watertight conduit fitting; connects 7/8" hole to 1/2" NPT (female) fitting
ALSO AVAILABLE:	UE Final Inspection Reports, Certified Drawings, and other Certificates are available. Please consult your UE representative for additional information.

OPTIONAL SENSOR MATERIAL FOR "WC RANGES. AVAILABLE MODELS 520-525

XC001	Aluminum pressure connection, Viton® diaphragm, Viton® O-ring
XC002	Aluminum pressure connection, Kapton® diaphragm, Buna N O-ring
XC003	Aluminum pressure connection, Kapton® diaphragm, Viton® O-ring
XC004	316L Stainless steel pressure connection, 316L stainless steel diaphragm, Viton® O-ring. (Over range pressure is limited to 100 psi)
XC005	316L Stainless steel pressure connection, Viton® diaphragm, Viton® O-ring
XC006	316L Stainless steel pressure connection, Kapton® diaphragm, Viton® O-ring
XC007	316L Stainless steel pressure connection, Teflon® diaphragm, Viton® O-ring

OPTIONAL SENSOR MATERIALS FOR CORROSIVE MEDIA. AVAILABLE MODELS 183-189, 483-489

XD002	Hastelloy C diaphragm
XD003	Monel diaphragm
XP112	Hastelloy C pressure connection
XP113	Monel pressure connection
XR211	Kalrez® O-ring
XR212	Silicone O-ring. NOT AVAILABLE MODELS 188-189, 488-489
XR213	Ethylene propylene O-ring
XR214	Aflas® O-ring

OPTIONAL FLUSH MOUNT FLANGES. AVAILABLE MODELS 560-567

Other flanges (150# and 300#) available, please consult UE. Flanges conform to ANSI B16.5. Maximum pressure is limited by flange rating.

F196	Flush mounted flange, 150#, 1" lap joint, raised face	AVAILABLE MODELS 565-567 ONLY
F197	Flush mounted flange, 150#, 2" lap joint, raised face	AVAILABLE MODELS 560-564 ONLY
F198	Flush mounted flange, 300#, 1" lap joint, raised face	AVAILABLE MODELS 565-567 ONLY
F199	Flush mounted flange, 300#, 2" lap joint, raised face	AVAILABLE MODELS 560-564 ONLY

Note: No options are available on Heat Trace and Freeze Protection models 13546 and 13545 or pump switch model 15623 & 15884 except M201, M444 and M446.



OPTIONS FOR TEMPERATURE MODELS

UNION CONNECTORS**

Option	Replacement Number	Description
<u>Brass</u>		
W027	SD6213-27	1/2" NPT w/ 3/4" bushing
W045	SD6213-45	3/4" NPT
W051	SD6213-51	1/2" NPT
<u>304 Stainless Steel</u>		
W028	SD6213-28	1/2" NPT w/ 3/4" bushing
W046	SD6213-46	3/4" NPT
W050	SD6213-50	1/2" NPT

THERMOWELLS**

For all bulb & capillary switches, except Model 13545

<u>Brass</u>		
W075	SD6225-75	1/2" NPT with 3/4" NPT adapter bushing, 4" BT
W191	SD6225-191	1/2" NPT, 4" BT
W118	SD6225-118	1/2" NPT with 3/4" NPT adapter bushing, 7" BT
W192	SD6225-192	1/2" NPT, 7" BT
<u>316 Stainless Steel</u>		
W076	SD6225-76	3/4" NPT, 4.5" BT
W193	SD6225-193	1/2" NPT, 4.5" BT
W119	SD6225-119	3/4" NPT, 7.5" BT
W177	SD6225-177	1/2" NPT, 7.5" BT

For all immersion stem switches; except Model 13546

W139	SD6225-139	3/4" NPT X 1-23/32" BT, BRASS
W140	SD6225-140	3/4" NPT X 1-23/32" BT, 316 ST/ST

W000 IMMERSION STEM AND THERMOWELLS

Note: Option W000 is a special Immersion Stem construction that has no external thread. This option fits inside a special thermowell and is secured with a set-screw.

Option	Description
W000	Immersion stem only, brass
W097	Immersion stem and thermowell. Includes W000 stem and 1/2" NPT x 1-23/32" BT Brass thermowell
W099	Immersion stem and thermowell. Includes W000 stem and 1/2" NPT x 1-23/32" BT 316 ST/ST thermowell.

OPTIONAL LENGTHS:

Optional immersion stem lengths to 15" available in Brass, with or without 316 ST/ST thermowell. Consult UE for additional information. Optional capillary length to *50' available in Copper or 304 ST/ST. Armor or Teflon® capillary protection available to lengths less than or equal to capillary length. Consult UE for additional information.

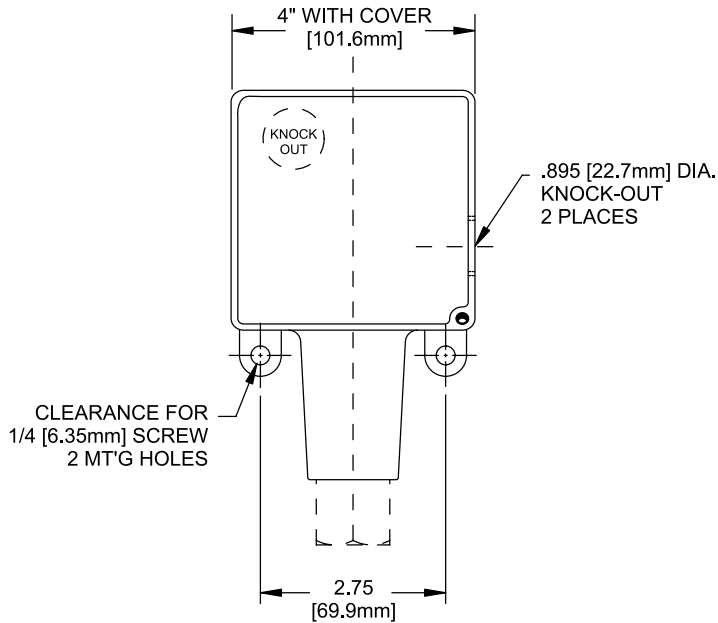
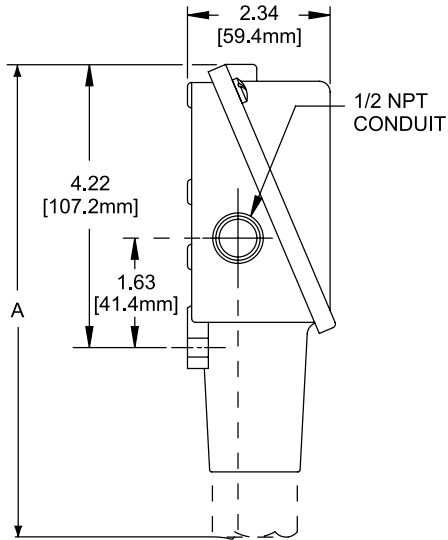
*Consult UE regarding repeatability and ambient effects on capillary lengths over 30'.

** Dimensional drawings for union connectors and thermowells may be found at www.ueonline.com

DIMENSIONAL DRAWINGS

Dimensional drawings for all models may be found at www.ueonline.com

Types B100, C100, E100, F100, H100, H100K



Dimension A			
Models	Inches	mm	NPT
Pressure			
171-174	7.63	193.8	1/2"
183-186, 484-486	7.56	192.0	1/2"
188-189, 488-489	6.63	168.4	1/2"
190-194, 490-494	6.63	168.4	1/2"
218	6.56	166.6	1/4"
270-274	7.00	177.8	1/4"
358-376	7.00	177.8	1/4"
520-525, 15737	8.44	214.4	1/2"
530-535	8.00	203.2	1/2"
560-564	6.63	168.4	2" Sanitary Fitting
565-567	6.63	168.4	1-1/2" Sanitary Fitting
610-616, 680, 15884	7.00	177.8	1/4"
701-706, 15623, 15731-15736	6.63	168.4	1/4"
Differential Pressure			
540-543	8.47	215.1	1/8"
544-548	8.53	216.7	1/8"
Temperature			
120, 121, 13546	9.38	238.3	Immersion stem
1BC-8BC, 1BS-8BS, 13545	8.69	220.7	Bulb & capillary

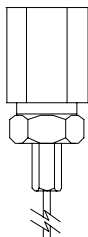
All dimensions stated in inches (millimeters)

DIMENSIONAL DRAWINGS

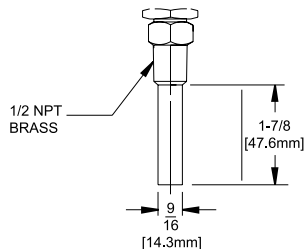
Dimensional drawings for all models may be found at www.ueonline.com

Temperature Sensors

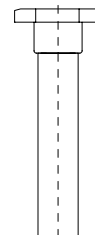
Models 1BC-8BC, 1BS-8BS, 13545



Models 120,121

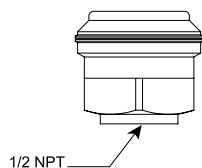


Model 13546

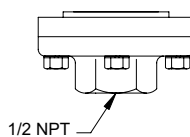


Pressure Sensors

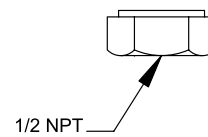
Models 171-174



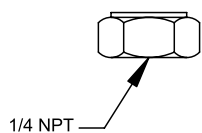
Models 183-186, 483-486



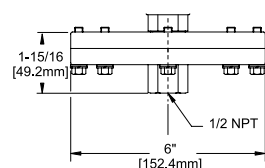
Models 188-194, 488-494



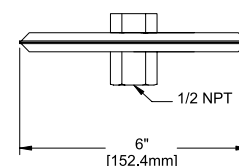
Models 218-376, 610-706,
15623,15731-15736



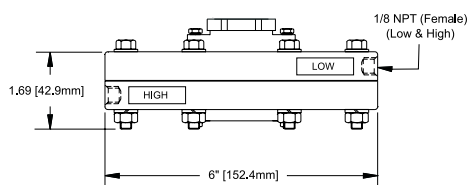
Models 520-525, 15737



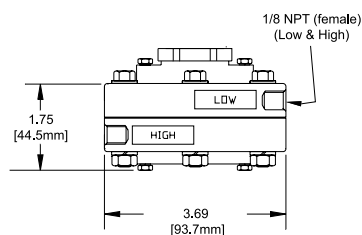
Models 530-535



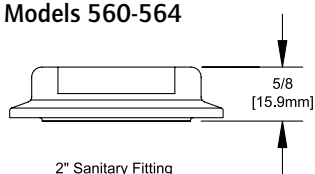
Models 540-543



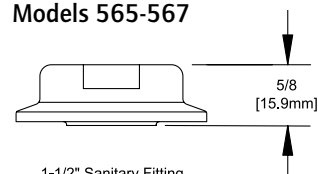
Models 544-548



Models 560-564



Models 565-567



*All dimensions
stated in inches
(millimeters)*

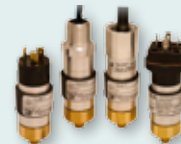
ALTERNATIVE PRODUCTS FROM UE

One Series

- Electronic solid-state reliability
- Two-wire operation
- Digital display with keypad set-up
- 100% of range adjustable on-off deadband
- 4-20 mA output models
- Continuous diagnostic health check

**10 Series**

- Compact, cylindrical enclosure
- Pressure ranges from 4 to 7,500 psi, and proof pressure to 12,000 psi
- Choice of seven electrical terminations
- NPT or SAE threaded pressure connections

**117 Series**

- Single Switch for Corrosive and Hazardous Division 2 Locations
- Compact pressure, differential pressure and temperature models
- Hermetically-sealed SPDT and DPDT output
- Epoxy-coated weather-tight design houses stainless steel internal construction
- Convenient terminal block wiring

**400 Series**

- 1, 2, and 3 switch output may be separated up to 100% of range
- Wide selection of pressure, differential pressure, and temperature ranges
- Setting via reference dial or hex screw adjustment
- Weathertight 4X design ideal for ordinary location applications

**Temperature Sensors**

Rugged RTDs and thermocouples for process and energy applications, available with Nema 4X and explosion-proof heads to match heat-trace, turbine, combustion, and stack-emission applications



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated over range pressure. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

Be sure to visit www.ueonline.com for the latest information.

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CP04102500

PRESSURE, VACUUM, DIFFERENTIAL PRESSURE AND TEMPERATURE SWITCHES



FEATURES

- 1, 2 & 3 switch outputs
- Epoxy-coated enclosure designed to meet enclosure type 4X
- Wide variety of pressure sensors and materials
- Setting via reference dial or hex screw adjustment
- FM approved
- Adjustable Ranges:

"WC ranges: 300 "wc vacuum to 250 "wc pressure (-746,7 to 622,3 mbar)

Pressure: 30 "Hg Vac to 6000 psi (-1,0 to 413,7 bar)

Differential pressure: 1"wc d to 200 psid (2.5 mbar to 13,8 bar)

Temperature: -180 to 650 °F (-117.8 to 343.3 °C)





OVERVIEW

The 400 Series is a versatile family of pressure, differential pressure and temperature switches for applications that require single or multiple switching capabilities. Dual and triple switch versions provide multi-output for alarm and shutdown, pre-alarm and alarm, high/low limit or level staging functions.

A wide variety of microswitch and process connection options, along with a weather-tight enclosure, make the 400 Series an ideal choice for most ordinary location applications. Its worldwide use is assured with approvals and certifications to agency standards.

Widely used throughout the process industries, the 400 Series provides threshold protection and control for many critical functions. Typical installations are found in industrial gas production, energy generation including pumps, turbines and compressors, pulp and paper, and water and wastewater treatment.

FEATURES

- UL listed and cUL certified. FM approved.
- CE compliant to low voltage directive and pressure equipment directive.
- Optional ATEX or GOST intrinsic safety compliance.
- One, two or three switch outputs may be separated up to 100% of range.
- Wide variety of available options and pressure sensor modules.
- Most models available for immediate delivery.

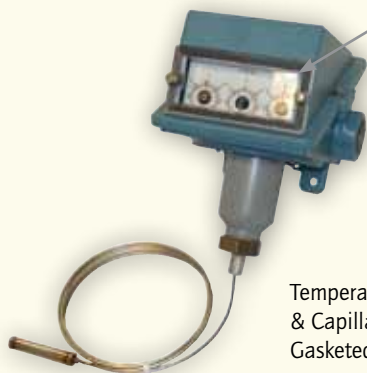


Reference scale, for types B, E & H with option M321

Enlarged View



Differential Pressure Model with M210 Option - Dial Indication



Temperature Model with Remote Bulb & Capillary and M321 option - Gasketed Lexan Window



Dual Switch, Low Water Column Differential Pressure Model

SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71 °C)
AMBIENT TEMPERATURE LIMITS	-40 to 160°F (-40 to 71 °C); set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change
SET POINT REPEATABILITY	Temperature models: ± 2% of full scale range Pressure: models 126-376, 520-535, 540-547, 570-572, S126B-S164B: ± 2% of full scale range; models 440-457, 550-559: ± 1% of full scale range; models 610-614: ± 3% of full scale range
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 Hz
ENCLOSURE	Die cast aluminum, epoxy powder coated, gasketed, captive cover screws
ENCLOSURE CLASSIFICATION	Designed to meet enclosure type 4X requirements
SWITCH OUTPUT	One, two or three SPDT switches, may be separated up to 100% of range except models 521-524, 531-534: 50%; models 520, 525, 530, 535, 570-572: 30%; switches may be wired "normally open" or "normally closed"
ELECTRICAL RATING	15 A 125/250/480 VAC resistive. Electrical switches have limited DC capabilities. Consult factory for additional information.
WEIGHT	Approx. 3 to 7.5 lbs.; varies with model
ELECTRICAL CONNECTION	One 3/4" NPT and two 7/8" diameter knockouts
PRESSURE CONNECTION	All models 1/4" NPT (female) except models S126B-S164B, 520-535: 1/2" NPT (female); models 540-547: 1/8" NPT (female)
TEMPERATURE ASSEMBLY	'E' types use the same assemblies as 'F' types, however, range spans are limited due to use of reference dials Bulb and capillary: 6 feet 304 stainless steel Immersion stem: models 120 & 121: nickel-plated brass; optional 316L stainless steel available
FILL	Temperature Models: Model 1BS: solvent filled; models 2-8: non-toxic oil filled
TEMPERATURE DEADBAND	Type F typically 1% and type E, B & C typically 2% of range under laboratory conditions (70°F ambient circulating bath at rate of 1/2°F per minute change)
DIFFERENTIAL PRESSURE INDICATOR (OPTION M210)	Differential pressure indication available J400K, J402K models 147-S157B; accuracy approximately 1-1/2% mid 50% of range, 3% at ends; window is plexiglass and gasketed; indicator may be field adjusted for approximately ±1% accuracy at any set point within range

APPROVALS



UNITED STATES AND CANADA

Type 400 & 402

UL Listed, cUL Certified

Pressure: UL 508; CSA C22.2 No. 14, file # E42272

Temperature: UL 873; CSA C22.2 No. 24, file # E10667



Type 403

UL Recognized, cUL Recognized

Pressure: UL 508; CSA C22.2 No. 14, file # E42272

Temperature: UL 873; CSA C22.2 No. 24, file # E10667



All Types

FM Approved

Pressure: Class 3510

Temperature: Class 3545



EUROPE

ATEX Directive (94/9/EC)

II 1 G EEx ia IIC T6 **(OPTIONAL – code M405)**

Tamb = -50°C to +60°C

UL International DEMKO A/S (N.B.# 0539)

Certificate # DEMKO 03 ATEX 0335063

EN 50014, 50020 & 50284



Low Voltage Directive (LVD) (73/23/EC & 93/68/EEC)

Compliant to LVD

Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD

Pressure Equipment Directive (PED) (97/23/EC)

Compliant to PED

Products rated below 7.5 PSI are outside the scope of PED



RUSSIA

Gosgortekhnadzor Permit **(OPTIONAL – code M406)**

0ExiaIICT6

Tamb = -50°C to +60°C

NANIO CCVE Certification Center

Certificate # ROSS US.GB05.Bo2933

GOST R 51330.0, 51330.1, 51330.10 & 51330.14

PRESSURE MODEL CHART

Type J400, single switch output with internal hex screw adjustment

Type J402, dual switch output with internal hex screw adjustment

Type J403, triple switch output with internal hex screw adjustment

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise		Deadband doubles for 2 and 3 switch types					
	"wc	mbar	"wc	mbar	psi	bar	psi	bar
Buna-N diaphragm and O-Ring with epoxy coated aluminum 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes. Other wetted materials available, see pg. 12								
520†	300 Vac to 0	-746,7 to 0	0.2 to 12	0,5 to 29,9	200	13,8	400	27,6
521†	10 Vac to 10	-24,9 to 24,9	0.1 to 1	0,2 to 2,5	200	13,8	400	27,6
522†	50 Vac to 50	-124,5 to 124,5	0.1 to 5	0,2 to 12,4	200	13,8	400	27,6
523†	0.5 to 5.0	1,2 to 12,4	0.1 to 0.3	0,2 to 0,7	200	13,8	400	27,6
524†	2.5 to 50	6,2 to 124,5	0.1 to 2	0,2 to 5,0	200	13,8	400	27,6
525†	10 to 250	24,9 to 622,3	0.1 to 10	0,2 to 24,9	200	13,8	400	27,6
Welded 316L stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes								
530†	300 Vac to 0	-746,7 to 0	0.2 to 15	0,5 to 37,3	50	3,4	100	6,9
531†	10 Vac to 10	-24,9 to 24,9	0.1 to 1	0,2 to 2,5	50	3,4	100	6,9
532†	50 Vac to 50	-124,5 to 124,5	0.1 to 6	0,2 to 14,9	50	3,4	100	6,9
533†	0.5 to 5.0	1,2 to 12,4	0.1 to 0.3	0,2 to 0,7	50	3,4	100	6,9
534†	2.5 to 50	6,2 to 124,5	0.1 to 2.5	0,2 to 6,2	50	3,4	100	6,9
535†	10 to 250	24,9 to 622,3	0.1 to 10	0,2 to 24,9	50	3,4	100	6,9
	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)
316L stainless steel diaphragm and Viton® O-Ring with 316L stainless steel 1/4" NPT (female) pressure connection								
570 ¹	0 to 20	0 to 1,4	0.2 to 4	13,8 to 275,8 mbar	20	1,4	225	15,5
571 ¹	0 to 50	0 to 3,4	0.7 to 6	48,3 to 413,7 mbar	50	3,4	225	15,5
572 ¹	0 to 100	0 to 6,9	1 to 7	0,1 to 0,5	100	6,9	225	15,5
Welded 316L stainless steel bellows and 1/2" NPT (female) pressure connection								
S126B	30 "Hg Vac to 0	-1 to 0	0.2 to 0.9 "Hg	6,8 to 30,5 mbar	3	0,2	5	0,3
S134B	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	6,8 to 40,6 mbar	20	1,4	25	1,7
S137B	0 to 80 "wc	0 to 199,1 mbar	2 to 6 "wc	5 to 14,9 mbar	80 "wc	199,1 mbar	5	0,3
S144B	0 to 20	0 to 1,4	0.1 to 0.5	6,9 to 34,5 mbar	20	1,4	25	1,7
S146B	0 to 30	0 to 2,1	0.1 to 0.6	6,9 to 41,4 mbar	30	2,1	40	2,8
S156B	0 to 100	0 to 6,9	0.2 to 0.8	13,8 to 55,2 mbar	100	6,9	125	8,6
S164B	0 to 200	0 to 13,8	0.3 to 2	20,7 to 137,9 mbar	200	13,8	200	13,8
Welded 316L stainless steel bellows and 1/4" NPT (female) pressure connection								
358	0 to 200	0 to 13,8	1.5 to 8	0,1 to 0,6	200	13,8	250	17,2
361	0 to 300	0 to 20,7	2 to 9	0,1 to 0,6	300	20,7	350	24,1
376	0 to 500	0 to 34,5	3 to 12	0,2 to 0,8	500	34,5	575	39,6

*Over Range Pressure: The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability

**Proof pressure: The maximum pressure to which a pressure sensor may be subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing).

Viton® is a registered trademark of DuPont Performance Elastomers.

† Model not available on types J400 and J403; actual deadband shown, do not double – switch separation a maximum of 30 - 50% of range.

¹ Switch separation of 30% maximum for dual and triple switch units.



400 Series

400 Series

PRESSURE MODEL CHART

Type J400, single switch output with internal hex screw adjustment

Type J402, dual switch output with internal hex screw adjustment

Type J403, triple switch output with internal hex screw adjustment

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise		Deadband doubles for 2 and 3 switch types					
	psi (unless noted)	bar (unless noted)	psi	bar	psi (unless noted)	bar	psi	bar
303 stainless steel piston with Buna-N O-Ring and 303 stainless steel 1/4" NPT (female) pressure connection (not recommended for gas service since drying of the O-Ring seal can allow bleeding of medium into the atmosphere)								
610	100 to 1,000	6,9 to 68,9	30 to 150	2,1 to 10,3	6,000	413,7	10,000	689,5
612	200 to 3,000	13,8 to 206,8	40 to 250	2,8 to 17,2	6,000	413,7	10,000	689,5
614	500 to 6,000	34,5 to 413,7	50 to 400	3,4 to 27,6	6,000	413,7	10,000	689,5
Brass bellows with nickel-plated brass 1/4" NPT (female) pressure connection; Models 126 and 134 have zinc-plated steel spring exposed to media								
126	30 "Hg Vac to 0	-1 to 0	0.2" to 0.9 "Hg	6,8 to 30,5 mbar	3	0,2	5	0,3
134	30 "Hg Vac to 20 psi	-1 to 1,4	0.2" to 1.2 "Hg	6,8 to 40,6 mbar	20	1,4	25	1,7
137	0 to 80 "wc	0 to 199,1 mbar	2 to 6 "wc	5 to 14,9 mbar	3	0,2	5	0,3
144	0 to 20	0 to 1,4	0.1 to 0.5	6,9 to 34,5 mbar	20	1,4	25	1,7
146	0 to 30	0 to 2,1	0.1 to 0.6	6,9 to 41,4 mbar	30	2	40	2,8
156	0 to 100	0 to 6,9	0.2 to 0.8	13,8 to 55,2 mbar	100	6,9	125	8,6
164	0 to 200	0 to 13,8	0.3 to 2	20,7 to 137,9 mbar	200	13,8	200	13,8
Phosphor bronze bellows with nickel-plated brass 1/4" NPT (female) pressure connection								
270	0 to 200	0 to 13,8	1.5 to 8	0,1 to 0,6	200	13,8	250	17,2
274	0 to 300	0 to 20,7	2 to 10	0,1 to 0,7	300	20,7	350	24,1
Buna-N diaphragm and O-Ring with aluminum 1/4" NPT (female) pressure connection and cap								
440††	0 to 2 "wc	0 to 5 mbar	0.07 to 0.25 "wc	0,2 to 0,6 mbar	3	0,2	225	15,5
441†††	0 to 10 "wc	0 to 24,9 mbar	0.15 to 0.3 "wc	0,4 to 0,7 mbar	3	0,2	225	15,5
442	0 to 20 "wc	0 to 49,8 mbar	0.2 to 0.5 "wc	0,5 to 1,2 mbar	3	0,2	225	15,5
443	0 to 80 "wc	0 to 199,1 mbar	0.5 to 1.8 "wc	1,2 to 4,5 mbar	3	0,2	225	15,5
448	80 "wc Vac to 0	-199,1 to 0 mbar	1 to 3 "wc	2,5 to 7,5 mbar	3	0,2	225	15,5
449†††	0 to 20 "wc	0 to 49,8 mbar	1 to 2 "wc	2,5 to 5,0 mbar	3	0,2	225	15,5
450	30 "Hg Vac to 0	-1 to 0	0.1 to 0.4 "Hg	3,4 to 13,5 mbar	3	0,2	225	15,5
451	0 to 80 "wc	0 to 199,1 mbar	1 to 3 "wc	2,5 to 7,5 mbar	3	0,2	225	15,5
452	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1 "Hg	6,8 to 33,9 mbar	20	1,4	225	15,5
453	0 to 20	0 to 1,4	0.05 to 0.2	3,4 to 13,8 mbar	20	1,4	225	15,5
454	0 to 30	0 to 2,1	0.05 to 0.3	3,4 to 20,7 mbar	30	2,1	225	15,5
Teflon® diaphragm and O-Ring with 316L stainless steel 1/4" NPT (female) pressure connection and cap								
550	30 "Hg Vac to 0	-1 to 0	0.1 to 0.6 "Hg	3,4 to 20,3 mbar	3	0,2	225	15,5
551	0 to 80 "wc	0 to 199,1 mbar	1.5 to 3.5 "wc	3,7 to 8,7 mbar	3	0,2	225	15,5
552	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1 "Hg	6,8 to 33,9 mbar	20	1,4	225	15,5
553	0 to 20	0 to 1,4	0.05 to 0.3	3,4 to 20,7 mbar	20	1,4	225	15,5
554	0 to 30	0 to 2,1	0.1 to 0.4	6,9 to 27,6 mbar	30	2,1	225	15,5
555	0 to 100	0 to 6,9	0.25 to 0.75	17,2 to 51,7 mbar	100	6,9	225	15,5

Teflon® is a registered trademark of E.I. DuPont de Nemours and Company

†† Model not available on types J402 and J403

††† Model not available on type J403

PRESSURE MODEL CHART

Type H400, single switch output with internal adjustment via reference dial

Type H402, dual switch output with internal adjustment via reference dial

Type H403, triple switch output with internal adjustment via reference dial

Model	Adjustable Set Point Range		Deadband		Proof Pressure**		Scale Division
	High end of range on rise Low end of range on fall; psi (unless noted)	bar (unless noted)	Deadband doubles for 2 and 3 switch types psi (unless noted)	bar (unless noted)	psi	bar	psi (unless noted)
Welded 316L stainless steel bellows and 1/2" NPT (female) pressure connection							
S126B	30 "Hg Vac to 0	-1 to 0	0.2 to 0.9 "Hg	6,8 to 30,5 mbar	5	0,3	2 "Hg
S134B	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	6,8 to 40,6 mbar	25	1,7	2 "Hg & 2 psi
S137B†	0 to 80 "wc	0 to 199,1 mbar	2 to 6 "wc	5 to 14,9 mbar	5	0,3	5 "wc
S144B	0 to 20	0 to 1,4	0.1 to 0.5	6,9 to 34,5 mbar	25	1,7	1
S146B	0 to 30	0 to 2,1	0.1 to 0.6	6,9 to 41,4 mbar	40	2,8	1
S156B	0 to 100	0 to 6,9	0.2 to 0.8	13,8 to 55,2 mbar	125	8,6	5
S164B	0 to 200	0 to 13,8	0.3 to 2	20,7 to 137,9 mbar	200	13,8	10
Welded 316L stainless steel bellows and 1/4" NPT (female) pressure connection							
358	0 to 200	0 to 13,8	1.5 to 8	0,1 to 0,6	250	17,2	10
361	0 to 300	0 to 20,7	2 to 9	0,1 to 0,6	350	24,1	10
376	0 to 500	0 to 34,5	3 to 12	0,2 to 0,8	575	39,6	20
Brass bellows with nickel-plated brass 1/4" NPT (female) pressure connection; Models 126 and 134 have zinc-plated steel spring exposed to media							
126	30 "Hg Vac to 0	-1 to 0	0.2 to 0.9 "Hg	6,8 to 30,5 mbar	5	0,3	2 "Hg
134	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	6,8 to 40,6 mbar	25	1,7	2 "Hg & 2 psi
137†	0 to 80 "wc	0 to 199,1 mbar	2 to 6 "wc	5 to 14,9 mbar	5	0,3	5 "wc
144	0 to 20	0 to 1,4	0.1 to 0.5	6,9 to 34,5 mbar	25	1,7	1
146	0 to 30	0 to 2,1	0.1 to 0.6	6,9 to 41,4 mbar	40	2,8	1
156	0 to 100	0 to 6,9	0.2 to 0.8	13,8 to 55,2 mbar	125	8,6	5
164	0 to 200	0 to 13,8	0.3 to 2	20,7 to 137,9 mbar	200	13,8	10
Phosphor bronze bellows with nickel plated brass 1/4" NPT (female) pressure connection							
270††	0 to 200	0 to 13,8	1.5 to 8	0,1 to 0,6	250	17,2	10
274††	0 to 300	0 to 20,7	2 to 10	0,1 to 0,7	350	24,1	10
Buna-N diaphragm and O-Ring with aluminum 1/4" NPT (female) pressure connection and cap							
440†	0 to 2 "wc	0 to 5 mbar	0.07 to 0.25 "wc	0,2 to 0,6 mbar	225	15,5	0.1 "wc
441†	0 to 10 "wc	0 to 24,9 mbar	0.15 to 0.3 "wc	0,4 to 0,7 mbar	225	15,5	0.5 "wc
442†	0 to 20 "wc	0 to 49,8 mbar	0.2 to 0.5 "wc	0,5 to 1,2 mbar	225	15,5	1 "wc
443†	0 to 80 "wc	0 to 199,1 mbar	0.5 to 1.8 "wc	1,2 to 4,5 mbar	225	15,5	5 "wc
448†	80 "wc Vac to 0	-199,1 to 0 mbar	1 to 3 "wc	2,5 to 7,5 mbar	225	15,5	5 "wc
450††	30 "Hg Vac to 0	-1 to 0	0.1 to .04 "Hg	3,4 to 13,5 mbar	225	15,5	2 "Hg
452††	30 "Hg Vac to 20 psi	-1 to 1,4	0.1 to 1 "Hg	3,4 to 33,9 mbar	225	15,5	2 "Hg & 2 psi
453††	0 to 20	0 to 1,4	0.05 to 0.2	3,4 to 13,8 mbar	225	15,5	1
454††	0 to 30	0 to 2,1	0.05 to 0.3	3,4 to 20,7 mbar	225	15,5	1

**Proof pressure: The maximum pressure to which a pressure sensor may be subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing).

† Model not available on types H402 and H403

†† Model not available on type H403



400 Series

400 Series

PRESSURE MODEL CHART

Type H400, single switch output with internal adjustment via reference dial

Type H402, dual switch output with internal adjustment via reference dial

Type H403, triple switch output with internal adjustment via reference dial

Model	Adjustable Set Point Range		Deadband		Proof Pressure**		Scale Division
	Low end of range on fall; High end of range on rise		Deadband doubles for 2 and 3 switch types		psi	bar	psi (unless noted)
	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)			

Teflon® diaphragm and O-Ring with 316L stainless steel 1/4" NPT (female) pressure connection and cap

550††	30 "Hg Vac to 0	-1 to 0	0.1 to 0.6 "Hg	3,4 to 20,3 mbar	225	15,5	2 "Hg
551†	0 to 80 "wc	0 to 199,1 mbar	1.5 to 3.5 "wc	3,7 to 8,7 mbar	225	15,5	5 "wc
552††	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1 "Hg	6,8 to 33,9 mbar	225	15,5	2 "Hg & 2 psi
553††	0 to 20	0 to 1,4	0.05 to 0.3	3,4 to 20,7 mbar	225	15,5	1
554††	0 to 30	0 to 2,1	0.1 to 0.4	6,9 to 27,6 mbar	225	15,5	1
555††	0 to 100	0 to 6,9	0.25 to 0.75	17,2 to 51,7 mbar	225	15,5	5

****Proof pressure:** The maximum pressure to which a pressure sensor may be subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing).

† Model not available on types H402 and H403

†† Model not available on type H403

DIFFERENTIAL PRESSURE MODEL CHART

Type J400K, single switch output with internal hex screw adjustment

Type J402K, dual switch output with internal hex screw adjustment

Model	Adjustable Set Point Range		Deadband		Working Pressure***		Proof Pressure**	
	Low end of range on fall; High end of range on rise		Deadband doubles for 2 and 3 switch types					
	psid (unless noted)	bar (unless noted)	psi (unless noted)	mbar	psi	bar	psi	bar

Welded 316L stainless steel bellows and 1/2" NPT (female) pressure connections

S147B	3 to 30	0,2 to 2,1	0.5 to 2	34,5 to 137,9	30 "Hg Vac to 100	-1 to 6,9	300	20,7
S157B	10 to 100	0,7 to 6,9	0.5 to 3	34,5 to 206,8	30 "Hg Vac to 180	-1 to 12,4	300	20,7

Brass bellows with nickel-plated brass 1/4" NPT (female) pressure connections

147	3 to 30	0,2 to 2,1	0.5 to 2	34,5 to 137,9	30 "Hg Vac to 100	-1 to 6,9	180	12,4
157	10 to 100	0,7 to 6,9	0.5 to 3	34,5 to 206,8	30 "Hg Vac to 150	-1 to 10,3	180	12,4

Buna-N diaphragm and O-Ring with aluminum 1/4" NPT (female) pressure connections

455	5 to 80 "wcd	12,4 to 199,1 mbar	1 to 4 "wc	2,5 to 10	30 "Hg Vac to 225	-1 to 15,5	225	15,5
456	2 to 20	0,1 to 1,4	0.1 to 0.3	6,9 to 20,7	30 "Hg Vac to 225	-1 to 15,5	225	15,5
457	3 to 30	0,2 to 2,1	0.1 to 0.4	6,9 to 27,6	30 "Hg Vac to 225	-1 to 15,5	225	15,5

*****Working Pressure Range:** The pressure range within which two opposing sensors can be safely operated and still maintain set point adjustability.

DIFFERENTIAL PRESSURE MODEL CHART

Type J400K, single switch output with internal hex screw adjustment

Type J402K, dual switch output with internal hex screw adjustment

Model	Adjustable Set Point Range		Deadband		Working Pressure***		Proof Pressure**	
	Low end of range on fall; High end of range on rise		Deadband doubles for 2 and 3 switch types					
	psid (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi	bar	psi	bar
Buna-N diaphragms and o-ring with epoxy coated aluminum 1/8" NPT (female) pressure connections (J402K only)								
540†	1 to 7 "wcd	2.5 to 17,4 mbar	0.1 to 0.5"wc	0,2 to 1,2 mbar	30 "Hg Vac to 200	-1 to 13,8	400	27,6
541†	2 to 20 "wcd	5 to 49,8 mbar	0.5 to 2 "wc	1,2 to 5 mbar	30 "Hg Vac to 200	-1 to 13,8	400	27,6
542†	5 to 50 "wcd	12,4 to 124,5 mbar	0.5 to 5 "wc	1,2 to 12,4 mbar	30 "Hg Vac to 200	-1 to 13,8	400	27,6
543†	15 to 100 "wcd	37,3 to 248,9 mbar	0.5 to 7 "wc	1,2 to 17,4 mbar	30 "Hg Vac to 200	-1 to 13,8	400	27,6
544†	2 to 20	0,1 to 1,4	1 to 2.5	0,1 to 0,2	30 "Hg Vac to 1200	-1 to 82,7	2500	172,4
545†	5 to 50	0,3 to 3,4	1 to 3	0,1 to 0,2	30 "Hg Vac to 1200	-1 to 82,7	2500	172,4
546†	10 to 100	0,7 to 6,9	1 to 5	0,1 to 0,3	30 "Hg Vac to 1200	-1 to 82,7	2500	172,4
547†	20 to 200	1,4 to 13,8	1 to 7	0,1 to 0,5	30 "Hg Vac to 1200	-1 to 82,7	2500	172,4
Teflon® and Buna-N diaphragms, Buna-N O-Ring with aluminum 1/4" NPT (female) pressure connections								
559	10 to 100	0,7 to 6,9	0.2 to 1	13,8 to 68,9 mbar	30 "Hg Vac to 225	-1 to 15,5	225	15,5
Type H400K, single switch output with internal adjustment via reference dial								
Type H402K, dual switch output with internal adjustment via reference dial								
Buna-N diaphragm and O-Ring with 1/4" NPT (female) aluminum pressure connections								
455	5 to 80 "wcd	12,4 to 199,1 mbar	1 to 4 "wc	2,5 to 10 mbar	30 "Hg Vac to 225	-1 to 15,5	225	15,5
456	2 to 20	0,1 to 1,4	0.1 to 0.3	6,9 to 20,7 mbar	30 "Hg Vac to 225	-1 to 15,5	225	15,5
457	3 to 30	0,2 to 2,1	0.1 to 0.4	6,9 to 27,6 mbar	30 "Hg Vac to 225	-1 to 15,5	225	15,5
Teflon and Buna-N diaphragms, Buna-N O-Ring with 1/4" NPT (female) aluminum pressure connections								
559	10 to 100	0,7 to 6,9	0.2 to 1	13,8 to 68,9 mbar	30 "Hg Vac to 225	-1 to 15,5	225	15,5

***Working Pressure Range: The pressure range within which two opposing sensors can be safely operated and still maintain set point adjustability.

† Model not available on type J400K; actual deadband shown, do not double



400 Series

400 Series

TEMPERATURE MODEL CHART

Type B400, single switch output, immersion stem, internal adjustment via reference dial

Type B402, dual switch output, immersion stem, internal adjustment via reference dial

Type B403, triple switch output, immersion stem, internal adjustment via reference dial

Type C400, single switch output, immersion stem, internal hex screw adjustment

Type C402, dual switch output, immersion stem, internal hex screw adjustment

Type C403, triple switch output, immersion stem, internal hex screw adjustment

Type E400, single switch output, bulb & capillary***, internal adjustment via reference dial

Type E402, dual switch output, bulb & capillary***, internal adjustment via reference dial

Type E403, triple switch output, bulb & capillary***, internal adjustment via reference dial

Type F400, single switch output, bulb & capillary***, internal hex screw adjustment

Type F402, dual switch output, bulb & capillary***, internal hex screw adjustment

Type F403, triple switch output, bulb & capillary***, internal hex screw adjustment

Model	Adjustable Set Point Range		Max. Temp.		Scale Division††		Stem or Bulb Size*/Finish**
	°F	°C	°F	°C	°F	°C	
Type B400, B402, B403, single, dual, or triple switch output, immersion stem, internal adjustment via reference dial.							
Type C400, C402, C403, single, dual, or triple switch output, immersion stem, internal hex screw adjustment							
120	0 to 225	-17.8 to 107.2	275	135	5	5	9/16" x 1-7/8" nickel-plated brass
121	200 to 425	93.3 to 218.3	475	246.1	5	5	9/16" x 1-7/8" nickel-plated brass
Type E400, E402, E403, single, dual, or triple switch output, bulb & capillary***, internal adjustment via reference dial							
2BSA	-120 to 100	-84.4 to 37.8	150	65.6	10	5	3/8 x 2-7/16"
2BSB	30 to 250	-1.1 to 121.1	300	148.9	10	5	3/8 x 2-7/16"
3BS	100 to 400	37.8 to 204.4	450	232.2	10	10	3/8 x 2-1/8"
4BS	25 to 100	-3.9 to 37.8	150	65.6	5	2	3/8 x 6-3/4"
5BS	-20 to 80	-28.9 to 26.7	130	54.4	5	2	3/8 x 5"
8BS	350 to 640	176.7 to 337.8	690	365.6	10	10	3/8 x 3-1/4"
Type F400, F402, F403, single, dual, or triple switch output, bulb & capillary***, internal hex screw adjustment							
1BS†	-180 to 120	-117.8 to 48.9	170	76.7	N/A		3/8 x 3-3/4"
2BS	-125 to 350	-87.2 to 176.7	400	204.4	N/A		3/8 x 2-7/16"
3BS	-125 to 500	-87.2 to 260	550	287.8	N/A		3/8 x 2-1/8"
4BS	-40 to 120	-40 to 48.9	170	76.7	N/A		3/8 x 6-3/4"
5BS	-40 to 180	-40 to 82.2	230	110	N/A		3/8 x 5"
6BS	0 to 250	-17.8 to 121.1	300	148.9	N/A		3/8 x 4-1/2"
7BS	0 to 400	-17.8 to 204.4	450	232.2	N/A		3/8 x 3"
8BS	50 to 650	10 to 343.3	700	371.1	N/A		3/8 x 3-1/4"

† Model not available on type F403

†† Only applies to types B400, B402, B403, E400, E402 and E403

* Optional immersion stem lengths and capillary lengths are available

** Optional stainless steel immersion stem and capillary covering available

*** Standard capillary lengths are 6ft

HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts".

Determine model based on adjustable range, deadband and proof pressure.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section.

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number.

Leave "option" portion blank if no options are needed.

FOR MULTIPLE OPTIONS: Call United Electric Controls.

TYPE

DESCRIPTION

PRESSURE

- Type J400 - One SPDT output; internal hex screw adjustment
- Type J402 - Two SPDT outputs; internal hex screw adjustment
- Type J403 - Three SPDT outputs; internal hex screw adjustment
- Type H400 - One SPDT output; internal adjustment with reference dial
- Type H402 - Two SPDT outputs; internal adjustment with reference dial
- Type H403 - Three SPDT outputs; internal adjustment with reference dial

DIFFERENTIAL PRESSURE

- Type J400K - One SPDT output; internal hex screw adjustment
- Type J402K - Two SPDT outputs; internal hex screw adjustment
- Type H400K - One SPDT output; internal adjustment with reference dial
- Type H402K - Two SPDT outputs; internal adjustment with reference dial

TEMPERATURE

- Type B400 - Immersion stem; one SPDT output; internal adjustment with reference dial
- Type B402 - Immersion stem; two SPDT outputs; internal adjustment with reference dial
- Type B403 - Immersion stem; three SPDT outputs; internal adjustment with reference dial
- Type C400 - Immersion stem; one SPDT output; internal hex screw adjustment
- Type C402 - Immersion stem; two SPDT outputs; internal hex screw adjustment
- Type C403 - Immersion stem; three SPDT outputs; internal hex screw adjustment
- Type E400 - Bulb and capillary; one SPDT output; internal adjustment with reference dial
- Type E402 - Bulb and capillary; two SPDT outputs; internal adjustment with reference dial
- Type E403 - Bulb and capillary; three SPDT outputs; internal adjustment with reference dial
- Type F400 - Bulb and capillary; one SPDT output; internal hex screw adjustment
- Type F402 - Bulb and capillary; two SPDT outputs; internal hex screw adjustment
- Type F403 - Bulb and capillary; three SPDT outputs; internal hex screw adjustment



400 Series

400 Series

HOW TO ORDER OPTIONS

SWITCH OPTIONS* DESCRIPTION

0140	Gold contacts, 1 A 125 VAC resistive. NOT AVAILABLE MODELS 440-443
0500	Close deadband, 5 A 125/250 VAC resistive. NOT AVAILABLE MODELS 440-443
1010	DPDT switch, 10 A 125/250 VAC resistive; deadband and minimum set point will increase. NOT AVAILABLE TEMPERATURE VERSIONS, TYPE J403, TYPE H403 AND MODELS 440-449, 520-535, 540-547, 570-572
1070	10 A 125 VDC resistive; deadband and minimum set point will increase. NOT AVAILABLE TYPES B, E AND MODELS 440-449, 520-535, 540-547, 570-572
1520	Adjustable deadband, 15 A 125/250/277 VAC resistive. Adjustment wheel changes rise setting only if adjustment on fall setting is required, use primary adjustment. NOTE: NOT AVAILABLE ON MIDDLE SWITCH FOR TYPE J403, C403 AND F403. NOT AVAILABLE TYPES B, E, H, OR MODELS 440-443, 520-535, 540-547, 570-572, 610-614
1530	External manual reset, 15 A 125/250/480 VAC resistive, latches on rise only. NOT AVAILABLE TRIPLE SWITCH VERSIONS, OR MODELS 440-443, 520-535, 570-572
1535	High ambient, 15 A 125/250/480 VAC resistive; temperatures up to 250°F/145°C. NOT AVAILABLE MODELS 440-443, 520-535
1537	Vapor-sealed 15 A 125/250 VAC resistive. NOT AVAILABLE MODELS 440-443, 520-535
1539	Fungus resistant case, 15 A 125/250 VAC resistive. NOT AVAILABLE MODELS 440-443, 520-535
2000	20 A 125/250/480 VAC resistive. NOT AVAILABLE MODELS 440-443, 520-535, 540-547, 570-572

OTHER OPTIONS

M020	Red status light, 115 VAC only. Specify whether light goes on or off with increasing or decreasing pressure or temperature. NOT AVAILABLE J400K, H400K, J402K, H402K OR MODELS 440-443
M201	Factory set one switch; specify set point on increasing or decreasing pressure, differential pressure or temperature. NOT AVAILABLE DUAL OR TRIPLE SWITCH VERSIONS
M202	Factory set two switches; specify set points on increasing or decreasing pressure, differential pressure or temperature. NOT AVAILABLE SINGLE OR TRIPLE SWITCH VERSIONS
M203	Factory set three switches; note: the third or middle switch must always be set to highest pressure or temperature when switches are set apart; specify set points on increasing or decreasing pressure, differential pressure or temperature. NOT AVAILABLE SINGLE OR DUAL SWITCH VERSIONS
M210	Differential pressure indication. AVAILABLE J400K AND J402K, MODELS 147, S147B, 157 & S157B
M277	Range indicated on nameplate in kPa or MPa, factory selected. NOT AVAILABLE TEMPERATURE VERSIONS
M278	Range indicated on nameplate in Kg/cm ² . NOT AVAILABLE TEMPERATURE VERSIONS
M321	Gasketed Lexan® window. NOT AVAILABLE ON J, C, F TYPES
M405	Intrinsic safety compliance for European Union per ATEX standards
M406	Intrinsic safety compliance for Russia per Gosgortekhnadzor standards
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M449	Mounting bracket kit. Required for models 520-535 when surface mounting. Use kit part number 6361-704 for other models
M504	316L Stainless steel immersion temperature stem. AVAILABLE TEMPERATURE MODELS 120, 121 ONLY
M540	Viton® wetted parts with standard connection material. Deadbands and low end of range may increase. AVAILABLE MODELS 448-454 and 540-547. MODELS 455-457 (Viton® sealing diaphragms and o-rings with Teflon® main diaphragm). MODELS 610-614 (o-ring only)
M550	Oxygen service cleaning; alcohol cleaning to remove residue from the process connection. NOT AVAILABLE ON MODELS 440-443
M900	Watertight conduit fitting; converts 7/8" hole to 1/2" NPT fitting. Required for product to meet NEMA 4X if using knockout holes for wiring
M913	1/4" NPT (female) stainless steel pressure connection. AVAILABLE MODELS S126B-S146B, S156B, S164B ONLY
M914	1/2" NPT (female) stainless steel pressure connection. AVAILABLE MODELS 358-376
M921	1/4" NPT (female) brass pressure connection. AVAILABLE MODELS 610-614, TYPE J402 ONLY
6361-704	Surface and Pipe Mounting Hardware (required for models 520-535, 540-547 when surface mounting)

OPTIONAL MATERIAL FOR "WC SENSORS: (AVAILABLE MODELS 520-525)

XC001	Aluminum pressure connection, Viton® diaphragm, Viton® O-Ring
XC002	Aluminum pressure connection, Kapton® diaphragm, Buna-N O-Ring
XC003	Aluminum pressure connection, Kapton® diaphragm, Viton® O-Ring
XC004	316L stainless steel pressure connection, 316L stainless steel diaphragm, Viton® O-Ring (Over range pressure is limited to 100 psi)
XC005	316L stainless steel pressure connection, Viton® diaphragm, Viton® O-Ring
XC006	316L stainless steel pressure connection, Kapton® diaphragm, Viton® O-Ring
XC007	316L stainless steel pressure connection, Teflon® diaphragm, Viton® O-Ring

Lexan® is a registered trademark of Sabic Innovative Plastics.

*All switches have limited DC capabilities. Consult factory for details.

OPTIONS FOR TEMPERATURE MODELS

UNION CONNECTORS**

For all bulb & capillary switches, types E and F

Option	Replacement Number	Description
	<u>Brass</u>	
W027	SD6213-27	1/2" NPT w/ 3/4" bushing
W045	SD6213-45	3/4" NPT
W051	SD6213-51	1/2" NPT
	<u>304 Stainless Steel</u>	
W028	SD6213-28	1/2" NPT w/ 3/4" bushing
W046	SD6213-46	3/4" NPT
W050	SD6213-50	1/2" NPT

THERMOWELLS**

For all bulb & capillary switches, types E and F

	<u>Brass</u>	
W075	SD6225-75	1/2" NPT with 3/4" NPT adapter bushing, 4" BT
W191	SD6225-191	1/2" NPT, 4" BT
W118	SD6225-118	1/2" NPT with 3/4" NPT adapter bushing, 7" BT
W192	SD6225-192	1/2" NPT, 7" BT
	<u>316 Stainless Steel</u>	
W076	SD6225-76	3/4" NPT, 4.5" BT
W193	SD6225-193	1/2" NPT, 4.5" BT
W119	SD6225-119	3/4" NPT, 7.5" BT
W177	SD6225-177	1/2" NPT, 7.5" BT

For all immersion stem switches; types B and C

W139	SD6225-139	3/4" NPT X 1-23/32" BT, BRASS
W140	SD6225-140	3/4" NPT X 1-23/32" BT, 316 ST/ST

W000 IMMERSION STEM AND THERMOWELLS

Note: Option W000 is a special Immersion Stem construction that has no external thread. This option fits inside a special thermowell and is secured with a set-screw. Available on types B and C only.

Option	Description
W000	Immersion stem only, brass
W097	Immersion stem and thermowell. Includes W000 stem and 1/2" NPT x 1-23/32" BT brass thermowell
W099	Immersion stem and thermowell. Includes W000 stem and 1/2" NPT x 1-23/32" BT 316 st/st thermowell.

OPTIONAL LENGTHS:

Optional immersion stem lengths to 15" available in brass, with or without 316 st/st thermowell. Consult UE for additional information. Optional capillary length to *50' available in copper or 304 st/st. Armor or Teflon® capillary protection available to lengths less than or equal to capillary length. Consult UE for additional information.

* Consult UE regarding repeatability and ambient effects on capillary lengths over 30'.

** Dimensional drawings for union connectors and thermowells may be found at www.ueonline.com

DIMENSIONAL DRAWINGS

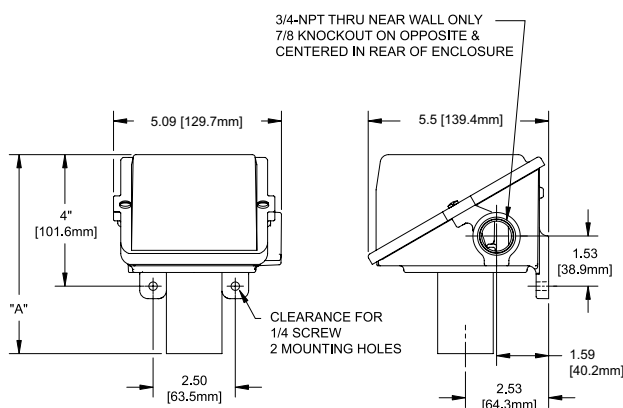
Dimensional drawings for all models may be found at www.ueonline.com

Internal Hex Screw Set Point Adjustment

Types J400, J402, J403, J400K, J402K, C400, C402, C403, F400, F402, F403

Set Point Adjustment via Reference Dial

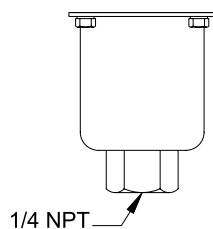
Types H400, H402, H403, H400K, H402K, B400, B402, B403, E400, E402, E403



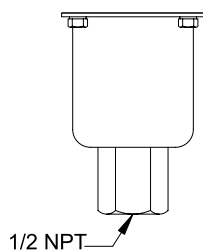
Models	Dimension A		
	Inches	mm	NPT
PRESSURE			
126-164	5.91	150.0	1/4
S126B-S164B	6.31	160.3	1/2
270-376	5.50	139.7	1/4
440-443, 449			
451, 453, 454	4.28	108.7	1/4
448, 450, 452	5.03	127.8	1/4
520-525	8.25	209.6	1/2
530-535	8.13	206.5	1/2
551, 553-555	4.56	115.8	1/4
550, 552	5.03	127.8	1/4
570-572	4.56	115.8	1/4
610-614	6.31	160.3	1/4
DIFFERENTIAL PRESSURE			
147-157	6.13	155.7	1/4
S147B-S157B	6.13	155.7	1/2
455-559	7.00	177.8	1/4
540-543	7.97	202.4	1/8
544-547	8.03	204.0	1/8
TEMPERATURE			
120, 121	7.38	187.3	Immersion Stem
1BS-8BS	6.72	170.7	Bulb & Capillary

Pressure Sensors All dimensions stated in inches (millimeters)

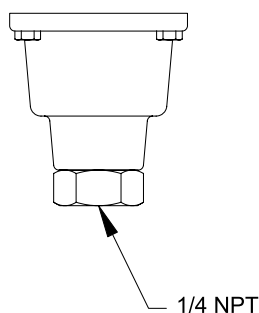
Models 126-164



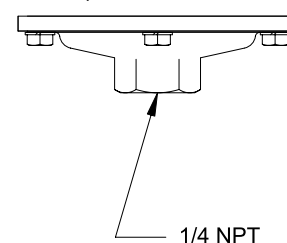
Models S126B-S164B



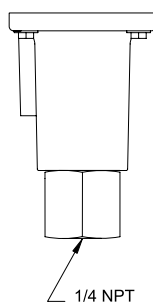
Models 270-376



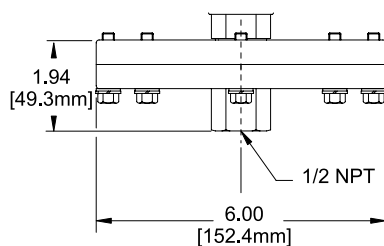
Models 440-454,
550-555, 570-572



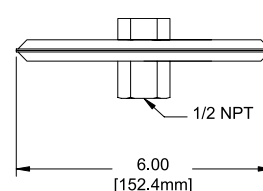
Models 610-614



Models 520-525



Models 530-535

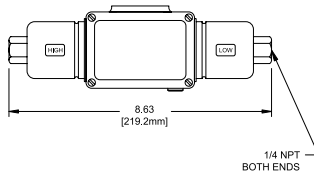


DIMENSIONAL DRAWINGS

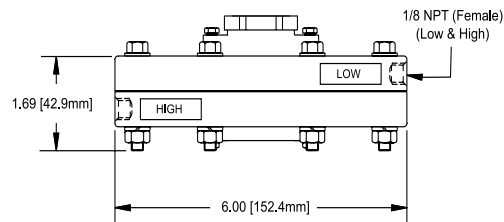
Dimensional drawings for all models may be found at www.ueonline.com

Differential Pressure Sensors

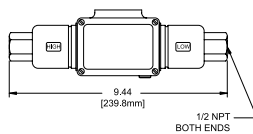
Models 147-157



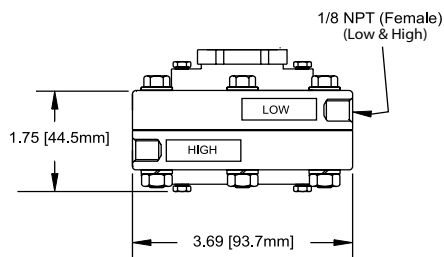
Models 540-543



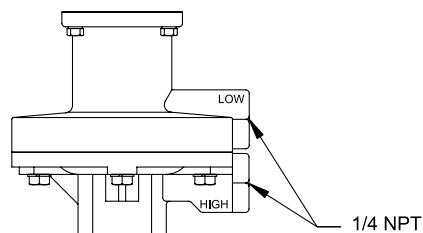
Models S147B-S157B



Models 544-547

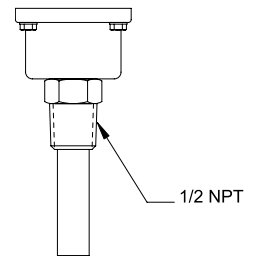


Models 455-457, 559



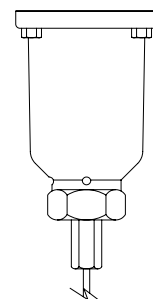
Temperature Sensors

Models 120-121



Local mount temperature version

Models 1BS-8BS



Remote mount temperature version

RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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CP02101000

DIFFERENTIAL PRESSURE SWITCH



FEATURES

- Sealed Metal Bellows Sensors
- Welded 316 Stainless Steel Sensors
- Gasketed Die-Cast Aluminum Enclosure with Epoxy Coating
- Single Switch Output
- Adjustable Ranges:
30 "Hg Vac to 90 psid (-1 to 6 bar)



OVERVIEW

The J21K differential pressure switch monitors the difference between two system pressures or vacuums and senses excessive flow deviation, or verifies that a filter is clogged.

The J21K's rugged design - with epoxy coated enclosure and sealed metal bellows - lends itself to exacting applications. Widely used in refrigeration (chiller) and compressor applications, the J21K can be used for filter status monitoring and proof of flow.

FEATURES

- Designed to meet Enclosure Type 4X (with watertight conduit fitting)
- UL listed and cUL certified
- Optional ATEX and Rostechnadzor (GOST-R) intrinsic safety compliance
- Optional adjustable deadband
- Single switch output
- Opposing bellows design



J21K-150 differential pressure switch with nickel-plated brass pressure connections and brass bellows



J21K-254 differential pressure switch with brass pressure connections and phosphor bronze bellows

SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71 °C)
AMBIENT TEMPERATURE LIMITS	-40 to 160°F (-40 to 71 °C); Set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change
SET POINT REPEATABILITY	±1% of full scale range
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 Hz
ENCLOSURE	Die cast aluminum, epoxy powder coated, gasketed
ENCLOSURE CLASSIFICATION	Designed to meet enclosure type 4X requirements with M900 option (watertight conduit fitting)
SWITCH OUTPUT	One SPDT snap action switch; switch may be wired "normally open" or "normally closed"
ELECTRICAL RATING	15 A 125/250/480 VAC resistive. Electrical switches have limited DC capabilities. Consult factory for additional information.
WEIGHT	Approximately 2 lbs. (0.90 kg.)
ELECTRICAL CONNECTION	7/8" diameter conduit hole
PRESSURE CONNECTION	Models 127-150, 232-254, 357, 16020: 1/4" NPT (female); models S127B-S150B, 16021: 1/2" NPT (female)



APPROVALS



UNITED STATES AND CANADA

UL listed, **cUL** certified

UL 508; CSA C22.2, no. 14 File # E42272



EUROPE

Low Voltage Directive (LVD) 73/23/EC & 93/68/EEC

Compliant to LVD

Products rated lower than 50 VAC and 75 VDC are outside the scope of the LVD

Pressure Equipment Directive (PED) 97/23/EC

Compliant to PED

Products rated lower than 7.5 psi are outside the scope of the PED



ATEX Directive (94/9/EC)

II 1G EEx ia IIC T6 **(Optional - code M405)**

Tamb. = -50°C to +60°C

UL International DEMKO A/S (N.B.#0539)

Certificate # DEMKO 03 ATEX 0335063

EN 50014, 50020, 50284



RUSSIA

Rostechnadzor Permit and GOST-R CoC **(Optional - code M406)**

0ExiaIIC T6

Tamb = -50C to +60C

NANIO CCVE Certification Center

Certificate # ROSS US.GB05.Bo2933

GOST R 51330.0, 51330.1, 51330.10 & 51330.14

MODEL CHART

Model	Adjustable Set Point Range		Deadband		Differential Proof Pressure**		Working Pressure*	
	Low end of range on fall; psid (unless noted)	High end of range on rise bar (unless noted)	psi (unless noted)	bar (unless noted)	psi	bar	psi (unless noted)	bar
Welded 316L stainless steel bellows with 1/2" NPT (female) pressure connections								
S127B	30 "Hg Vac to 0	-1 to 0	0.4 to 0.6 "Hg	13,5 to 20,3 mbar	15	1.0	30 "Hg Vac to 0	-1 to 0
S140B	0 to 6	0 to 0,4	0.1 to 0.4	6,9 to 27,6 mbar	6	0,4	30 "Hg Vac to 30	-1 to 2,1
S150B	0 to 40	0 to 2,8	0.3 to 0.7	20,7 to 48,3 mbar	300	20,7	30 "Hg Vac to 300	-1 to 20,7
16021	1 to 15	0,07 to 1,0	0.1 to 0.6	6,9 to 41,4 mbar	125	8,6	30 "Hg Vac to 125	-1 to 8,6
316L welded stainless steel bellows with 1/4" NPT (female) pressure connections								
357	0 to 70	0 to 4,8	2 to 4	0,1 to 0,3	70	4,8	30 "Hg Vac to 350	-1 to 24,1
Brass bellows with 1/4" NPT (female) pressure connections								
127	30 "Hg Vac to 0	-1 to 0	0.4 to 0.6 "Hg	13,5 to 20,3 mbar	15	1.0	30 "Hg Vac to 0	-1 to 0
140	0 to 6	0 to 0,4	0.1 to 0.4	6,9 to 27,6 mbar	6	0,4	30 "Hg Vac to 30	-1 to 2,1
150	0 to 40	0 to 2,8	0.3 to 0.7	20,7 to 48,3 mbar	40	2,8	30 "Hg Vac to 180	-1 to 12,4
16020	1 to 15	0,07 to 1,0	0.1 to 0.6	6,9 to 41,4 mbar	125	8,6	30 "Hg Vac to 125	-1 to 8,6
Phosphor bronze bellows with 1/4" NPT (female) pressure connections								
232	0 to 25	0 to 1,7	0.6 to 1	41,4 to 68,9 mbar	25	1,7	30 "Hg Vac to 110	-1 to 7,6
254	0 to 90	0 to 6,2	2 to 4	0,1 to 0,3	90	6,2	30 "Hg Vac to 200	-1 to 13,8

***Working Pressure Range:** The pressure range within which two opposing sensors can be safely operated and still maintain set point adjustability.

**** Differential Proof Range:** The maximum differential pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage.

The unit may require calibration (e.g. start up, testing)



HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts"

Determine model based on adjustable range, deadband and proof pressure.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number. Leave "option" portion blank if no options are needed.

FOR MULTIPLE OPTIONS: Call United Electric Controls.

TYPE	DESCRIPTION
Differential Pressure	Type J21K - one SPDT output, internal adjustment with no reference dial.

SWITCH OPTIONS*

0140	Gold contacts, 1 A 125 VAC resistive
0500	Close deadband, 5 A 125/250 VAC resistive
1520	Adjustable deadband, 15 A 125/250/277 VAC resistive; adjustment wheel changes rise setting only. If adjustment on fall setting is required use primary adjustment
1535	High ambient, 15 A 125/250 VAC resistive; temperatures up to 250°F (121 °C)
1537	Vapor sealed switch, 15A 125/250 VAC resistive

OTHER OPTIONS

M201	Factory set one switch; specify increasing or decreasing pressure and set point
M277	Range indicated on nameplate in kPa or MPa, factory selected
M278	Range indicated on nameplate in Kg/cm ²
M405	European ATEX Intrinsic Safety compliance
M406	Intrinsic safety compliance per Russian Rostekhnadzor (GOST-R)
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M550	Oxygen service cleaning; alcohol cleaning to remove residue from the process connection. NOT AVAILABLE MODEL 254
M900	Watertight conduit fitting; converts 7/8" hole to 1/2" NPT fitting. Required for product to meet Enclosure Type 4X

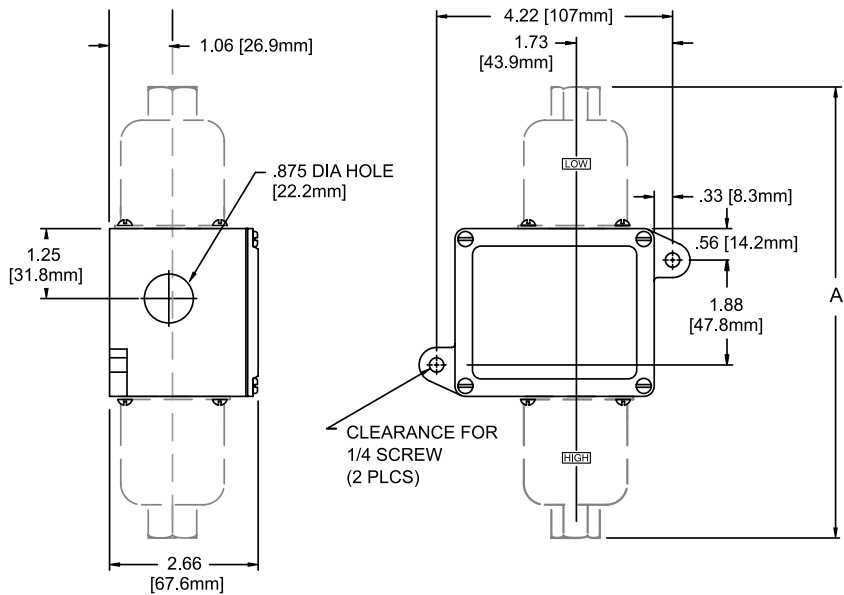
*All switches have limited DC capabilities. Consult factory for details.

DIMENSIONAL DRAWINGS

Dimensional drawings for all models may be found at www.ueonline.com

Type J21K

INTERNAL SET POINT ADJUSTMENT

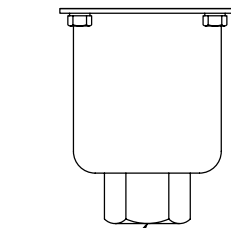


Dimension A			
Models	Inches	mm	NPT
127-16020	8.06	204.7	1/4
S127B-16021	8.86	225.0	1/2
232	6.53	165.9	1/4
254	6.50	165.1	1/4
357	6.88	174.8	1/4

All dimensions stated in inches (millimeters)

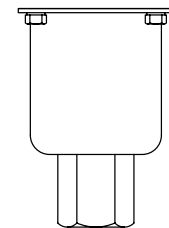
PRESSURE SENSORS

Model 127-16020



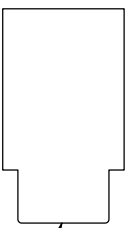
1/4 NPT

Model S127B-16021



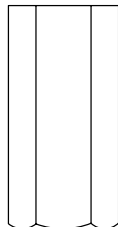
1/2 NPT

Model 232



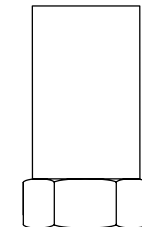
1/4 NPT

Model 254



1/4 NPT

Model 357



1/4 NPT

RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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CP01111500

PRESSURE AND VACUUM SWITCHES



FEATURES

- Gasketed, Die Cast Aluminum Enclosure with Epoxy Coating
- SPDT Switch Output
- Adjustable Deadband Option
- Sealed, Isolated Metal Bellows Sensors
- Adjustable Pressure Ranges:
30 "Hg Vac to 6000 psi
(-1 to 414 bar)



OVERVIEW

The UE J6 is a reliable, sensitive pressure switch, originally designed for instrument air applications in process plants. Its compact design and combination of set-point sensitivity and narrow or optional adjustable deadband, offers cost-saving solutions for a variety of applications.

The J6 is ideally suited for a wide range of industrial processes such as alarm/shutdown and low/high service pressures. OEMs also utilize the J6 in machinery and equipment for threshold protection.

FEATURES

- UL listed and cUL certified
- Optional ATEX or GOST intrinsic safety compliance
- Designed to meet Enclosure Type 4X
- SPDT switch output
- Adjustable deadband option for precise on-off control
- Brass or welded stainless steel bellows sensors
- External manual reset option



SPECIFICATIONS

STORAGE TEMPERATURE	-65° to 160°F (-54 to 71 °C)
AMBIENT TEMPERATURE LIMITS	-40° to 160°F (-40 to 71 °C); set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change
SET POINT REPEATABILITY	Models S126B-S164B, 126-364, 680: ± 1% of adjustable range; models 610-614: ± 1.5% of adjustable range
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 Hz
ENCLOSURE	Die cast aluminum, epoxy powder coated, gasketed; captive cover screws
ENCLOSURE CLASSIFICATION	Designed to meet Enclosure Type 4X requirements
SWITCH OUTPUT	One SPDT; switch may be wired "normally open" or "normally closed"
ELECTRICAL RATING	15 A 125/250/480 VAC resistive. Electrical switches have limited DC capabilities. Consult factory for additional information.
WEIGHT	Approx. 1 lb., 8 oz. (0.68 kg.)
ELECTRICAL CONNECTION	1/2" NPT (female)
PRESSURE CONNECTION	All models 1/4" NPT (female) except models S126B-S164B: 1/2" NPT (female)

APPROVALS



UNITED STATES AND CANADA

UL Listed,
UL 508, file #E42272
cUL Certified
CSA C22.2 No. 14, file #42272



EUROPEAN UNION

ATEX Directive (94/9/EC)
II 1 G EEx ia IIC T6 **(OPTIONAL - Code M405)**



Tamb = -50°C to +60°C
UL International DEMKO A/S (N.B.# 0539)
Certificate #DEMKO 03 ATEX 0335063
EN 50014, 50020 & 50284



Low Voltage Directive (LVD) (73/23/EC & 93/68/EEC)

Compliant to LVD
Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD
The Low Voltage Directive does not apply to products for use in hazardous locations

Pressure Equipment Directive (PED) (97/23/EC)

Compliant to PED
Products rated below 7.5 psi are outside the scope of PED



RUSSIA

Gosgortekhnadzor Permit (OPTIONAL - Code M406)

OExia IIC T6
Tamb. = -50°C to +60°C
NANIO CCVE Certification Center
Certificate ROSS US.GB05.Bo2933
GOST R 51330.0, 51330.1, 51330.10 & 51330.14



PRESSURE MODEL CHART

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband		Over Range Pressure*		Proof Pressure**	
	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)
Welded 316L stainless steel bellows and 1/2" NPT (female) pressure connection								
S126B	30 "Hg Vac to 0 psi	-1 to 0	0.2 to 0.8 "Hg	6,8 to 27,1 mbar	3	0,2	5	0,3
S134B	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 0.8 "Hg	6,8 to 27,1 mbar	20	1,4	25	1,7
S136B	0 to 50" wc	0 to 124,5 mbar	3 to 6 "wc	7,5 to 14,9 mbar	50 "wc	124,5 mbar	5	0,3
S142B	0 to 18	0 to 1,2	4 to 7 "wc	10 to 17,4 mbar	18	1,2	25	1,7
S148B	0 to 40	0 to 2,8	0.1 to 0.4	6,9 to 27,6 mbar	40	2,8	40	2,8
S152B	0 to 50	0 to 3,4	0.1 to 0.5	6,9 to 34,5 mbar	50	3,4	75	5,2
S156B	3 to 100	0,2 to 6,9	0.2 to 0.8	13,8 to 55,2 mbar	100	6,9	125	8,6
S160B	50 to 180	3,4 to 12,4	0.3 to 1	20,7 to 68,9 mbar	180	12,4	180	12,4
S164B	0 to 200	0 to 13,8	0.3 to 2	20,7 to 137,9 mbar	200	13,8	200	13,8
Welded 316L stainless steel bellows and 1/4" NPT (female) pressure connection (Model 680 not recommended for rapid or high cycling pressure changes)								
354	0 to 50	0 to 3,4	1.5 to 2.5	0,1 to 0,2	50	3,4	75	5,2
356	0 to 100	0 to 6,9	2 to 4	0,1 to 0,3	100	6,9	150	10,3
358	0 to 200	0 to 13,8	3 to 5	0,2 to 0,3	200	13,8	250	17,2
360	0 to 250	0 to 17,2	3 to 5	0,2 to 0,3	250	17,2	330	22,8
362	0 to 350	0 to 24,1	2 to 8	0,1 to 0,6	350	24,1	430	29,6
364	0 to 500	0 to 34,5	3 to 9	0,2 to 0,62	500	34,5	575	39,6
680	100 to 1700	6,9 to 117,2	9 to 23	0,6 to 1,6	1700	117,2	2500	172,4
303 stainless steel piston with Buna N O-ring and 303 stainless steel 1/4" NPT (female) pressure connection (not recommended for gas service since drying of the O-ring can allow bleeding of the medium into the atmosphere)								
610	75 to 1000	5,2 to 68,9	30 to 150	2,1 to 10,3	1000	68,9	10,000	689,5
612	125 to 3000	8,6 to 206,8	40 to 250	2,8 to 17,2	3000	206,8	10,000	689,5
614	500 to 6000	34,5 to 413,7	50 to 400	3,4 to 27,6	6000	413,7	10,000	689,5

* **Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

** **Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g., start-up, testing).

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise							
	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)
Brass bellows with nickel-plated brass 1/4" NPT (female) pressure connection†; Models 126 and 134 have zinc-plated steel spring exposed to media								
126	30 "Hg Vac to 0 psi	-1 to 0	0.2 to 0.8 "Hg	6,8 to 27,1 mbar	3	0,2	5	0,3
134	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 0.8 "Hg	6,8 to 27,1 mbar	20	1,4	25	1,7
136	0 to 50" wc	0 to 124,5 mbar	3 to 6 "wc	7,5 to 14,9 mbar	50 "wc	124,5 mbar	5	0,3
142	0 to 18	0 to 1,2	4 to 7 "wc	10 to 17,4 mbar	18	1,2	25	1,7
148	0 to 40	0 to 2,8	0.1 to 0.4	6,9 to 27,6 mbar	40	2,8	40	2,8
152	0 to 50	0 to 3,4	0.1 to 0.5	6,9 to 34,5 mbar	50	3,4	75	5,2
156	3 to 100	0,2 to 6,9	0.2 to 0.8	13,8 to 55,2 mbar	100	6,9	125	8,6
160	50 to 180	3,4 to 12,4	0.3 to 1	20,7 to 68,9 mbar	180	12,4	180	12,4
Phosphor bronze bellows with nickel-plated brass 1/4" NPT (female) pressure connection; Model 218 has 300 series stainless steel spring exposed to media								
218	30 "Hg Vac to 0 psi	-1 to 0	1 to 2 "Hg	33,9 to 67,7 mbar	0	0	30	2,1
222	0 to 20	0 to 1,4	0.5 to 1	34,5 to 68,9 mbar	20	1,4	30	2,1
224	0 to 30	0 to 2,1	0.5 to 1	34,5 to 68,9 mbar	30	2,1	45	3,1
226	0 to 50	0 to 3,4	0.7 to 1.3	48,3 to 89,6 mbar	50	3,4	75	5,2
230	0 to 100	0 to 6,9	1 to 2	68,9 mbar to 0,1 bar	100	6,9	110	7,6
258	0 to 50	0 to 3,4	1.5 to 2.5	0,1 to 0,2	50	3,4	75	5,2
266	0 to 100	0 to 6,9	2 to 5	0,1 to 0,3	100	6,9	150	10,3
270	0 to 200	0 to 13,8	3 to 5	0,2 to 0,3	200	13,8	250	17,2
272	0 to 250	0 to 17,2	3 to 5	0,2 to 0,3	250	17,2	330	22,8
274	0 to 300	0 to 20,7	4 to 6	0,3 to 0,4	300	20,7	350	24,1

†Several of these models were previously offered with adjustable deadband as J6D. Specify option code 1520 if adjustable deadband is required.



J6 Series

J6 Series

HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts".

Determine model based on adjustable range, deadband and proof pressure.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section.

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number.

Leave "option" portion blank if no options are needed. *FOR MULTIPLE OPTIONS:* Call United Electric Controls.

TYPE

DESCRIPTION

Pressure **Type J6** - One SPDT output; epoxy coated enclosure; internal adjustment with no reference dial

SWITCH OPTIONS*

0140	Gold contacts, 1 A 125 VAC resistive
0500	Close deadband, 5 A 125/250 VAC resistive
1070	10 A 125 VDC resistive; deadband and minimum set point will increase
1520	Adjustable deadband, 15 A 125/250/277 VAC resistive. Adjustment wheel changes rise setting only - if adjustment on fall setting is required, use primary adjustment. NOT AVAILABLE ON MODELS 258-274, 354-364, 610-614, 680. NOTE: Must select this option for models previously listed as J6D.
1530	External manual reset, 15 A 125/250/480 VAC resistive, latches on rising pressure only
2000	20 A 125/250 VAC resistive

SENSOR AND OTHER OPTIONS

M201	Factory set one switch; specify increasing or decreasing pressure and set point
M277	Range indicated on nameplate in kPa or MPa factory selected
M278	Range indicated on nameplate in Kg/cm ²
M405	Intrinsic safety compliance for European Union per ATEX standards, NOT AVAILABLE ON MODEL S164B
M406	Intrinsic safety compliance for Russia per Gosgortekhnadzor standards
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M540	Viton® construction (deadbands and low end of range may increase); wetted parts include Viton® O-ring and standard connection material. AVAILABLE ON MODELS 610-614 ONLY
M550	Oxygen service cleaning; alcohol cleaning to remove residue from the process connection
M913	1/4" NPT (female) 316L stainless steel pressure connection. AVAILABLE MODELS S126B-S164B
M914	1/2" NPT (female) 316L stainless steel pressure connection. AVAILABLE MODELS 354-364

* All switches have limited DC capabilities. Consult factory for details.

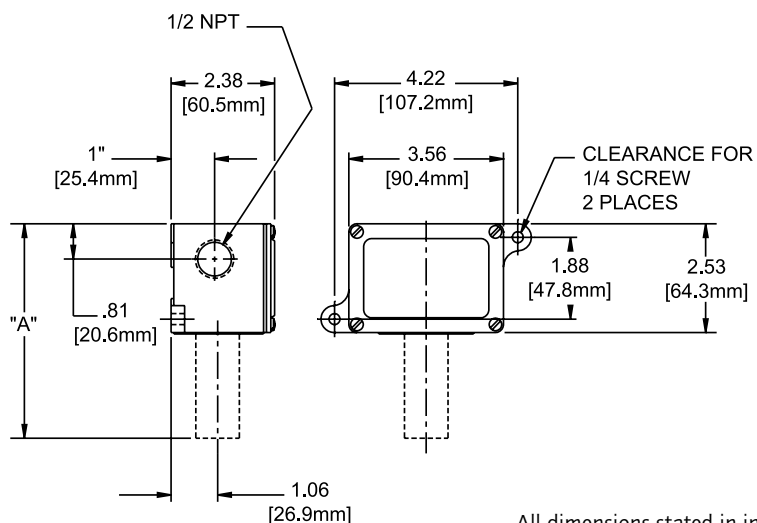
Viton® is a registered trademark of E.I. DuPont

DIMENSIONAL DRAWINGS

Dimensional drawings for all models may be found at www.ueonline.com

Internal Set Point Adjustment

Types J6

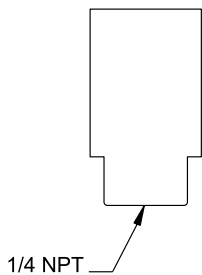


All dimensions stated in inches (millimeters)

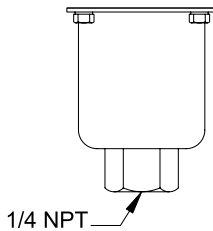
Models	Dimension A		
	Inches	mm	NPT
126-160	5.06	128.5	1/4
S126B-S164B	5.47	138.9	1/2
218-230	4.31	109.5	1/4
258-274	4.75	120.7	1/4
354-364	4.78	121.4	1/4
610-614	5.72	145.3	1/4
680	4.97	126.2	1/4

Pressure Sensors

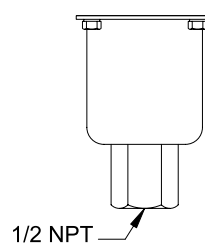
Models 218-230



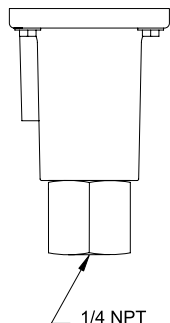
Models 126-160



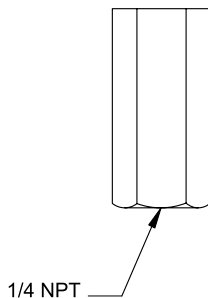
Models S126B-S164B



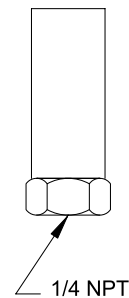
Models 610-614



Models 258-274



Models 354-364, 680



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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Telephone: 617 926-1000 Fax: 617 926-2568
<http://www.ueonline.com>

Be sure to visit www.ueonline.com for the latest information.

CP05102000

INDICATING TEMPERATURE CONTROLS AND THERMOMETERS



FEATURES

- Temperature Indication and Control
- Single or Dual SPDT Output
- Stainless Steel Bulb and Capillary
- $\pm 1\%$ Repeatability
- Enclosure Type 1, 4, and Explosion Proof Versions
- Temperature Ranges:
-180 to 650°F
(-117.8 to 343.3°C)





OVERVIEW

For applications that require a visual display of process temperature and set point, the 800 Series offers a highly readable four inch setting/indication scale. It is available in two versions: a Lexan® enclosure for enclosure type 1 or 4 applications (with option M300), and with Lexan® window and epoxy-coated aluminum enclosure for Div. 1 explosion proof applications. For temperature indication only, the T800 thermometer incorporates the same performance and construction features of the 800 Series.

800 Series models control and indicate the temperature of food service appliances, ovens, packaging machines, HVAC equipment, and various temperature applications within process plants.

FEATURES

- Temperature indication and control switching
- Single or dual SPDT output
- Stainless steel bulb & capillary
- Simple to adjust via external knob
- Explosion proof models are UL listed, cUL certified, and ATEX compliant
- Optional Russian, Ukrainian, and Chinese, flameproof or intrinsic safety compliance
- Optional thermowells and union connectors available



Lexan® is a registered trademark of General Electric Co.

SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71°C)
AMBIENT TEMPERATURE LIMITS	-40 to 160°F (-40 to 71°C); set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change
SET POINT REPEATABILITY	± 1% of adjustable range
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 Hz
ENCLOSURE	Types 800, 802: Lexan® black finish; clear Lexan® faceplate Types T800, 820E, 822E: Die cast aluminum, epoxy coated enclosure, gasketed; Lexan® cover and faceplate
ENCLOSURE CLASSIFICATION	Types 800, 802, T800: Designed to meet enclosure type 1 requirements (enclosure type 4 by specifying option M300). Types 820E, 822E: Designed to meet enclosure type 4X; Class I Div. 1 products meet enclosure type 7; Class II, Div. 1 products meet enclosure type 9. Certified to IP66 requirements
INDICATION ACCURACY	± 1% of adjustable range
SWITCH OUTPUT	One or two SPDT; dual switch may be separated up to 100% of range; except type 822E where switch #2 can be set up to 25% of range span below switch #1 set point. Switches may be wired "normally open" or "normally closed"
DUAL SWITCH ADJUSTMENT	Type 802: Dual switch controls have separate knob & temperature pointers for each switch set point (standard); turn inner green knob for setting #1 switch; outer black knob for switch #2. Type 822E common adjustment single knob and pointer for set point
ELECTRICAL RATING	15 A 125/250/480 VAC resistive. Electrical switches have limited DC capabilities. Consult factory for additional information.
WEIGHT	Types 800, 802, T800: Approx. 3 lbs., 4 oz. (1,47 kg) Types 820E, 822E: Approx. 7 lbs (3,18 kg)
ELECTRICAL CONNECTION	Types 800, 802: 7/8" diameter knockout on left hand side; 18 AWG color-coded leadwires, approx. 9 inches exposed with strain relief (option M100 adds terminal block wiring). Types 820E, 822E: two 3/4" NPT E/C with terminal block
BULB AND CAPILLARY	6 feet 304 stainless steel
TEMPERATURE FILL	Model 1BS: solvent filled; models 2-8: non-toxic oil filled
TEMPERATURE DEADBAND	Typically 1% of range under laboratory conditions (70°F ambient circulating bath at rate of 1/2°F per minute change)

APPROVALS



UNITED STATES AND CANADA

800 & 802 Models

UL Listed, CSA Certified

UL 873, file # E10667; CSA C22.2 No. 24, file # LR7814



820E & 822E Models

Class I, Division 1 and 2, Groups B, C & D

Class II, Division 1 and 2, Groups E, F & G

Class III



Class I, Zone 1, Group IIB + H₂ T6

Enclosure Type 4X

UL Listed, cUL Certified

UL 50 & 698; CSA No. 25 & 30 - file # E43374



EUROPE

820E & 822E Models

ATEX Directive (94/9/EC)



II 2 G Ex d IIC T6

II 2 D Ex tD A21 IP66 T+85C

Tamb = -40°C to +75°C

UL International DEMKO A/S (N.B.# 0539)

Certificate # DEMKO 09 ATEX 0815573X

EN 60079-0, 60079-1, 61241-0 & 61241-1



Low Voltage Directive (LVD) (73/23/EC & 93/68/EEC)

UEC compliant to LVD

Products rated lower than 50 VAC and 75 VDC

are outside of the scope of the LVD

The Low Voltage Directive does not apply to products for use in hazardous locations



RUSSIA

820E & 822E Models

Rostekhnadzor Permit and GOST-R CoC

(OPTIONAL - code M406)

1 ExdIICT6X

Tamb = -40°C to +71°C

NANIO CCVE Certification Center

Certificate # ROSS US.GB05.Bo2933

GOST R 51330.0, 51330.1, 51330.10 & 51330-14



UKRAINE

820E & 822E Models

Gosnadzorohrantruda Permit (OPTIONAL - code M404)

1 ExdIICT6X

Tamb = -40°C to +71°C

Certificate # 1867.04.30 - 31.62.4



CHINA

820E & 822E Models

CQST Certified (OPTIONAL - code M408)

Exd IIC T6

DIP A21 TA +85°C

Tamb = -40°C to +75°C

GB 3836.1, 3836.2 & 12476.1

Certificate # CNE09.2180X

TEMPERATURE MODEL CHART

Model	Adjustable Set Point Range		Max. Temp.		Scale Div.		Bulb Size OD x Length
	°F	°C	°F	°C	°F	°C	
1BS*	-180 to 120	-117.8 to 48.9	170	76.7	5	5	3/8 x 3-3/4"
2BS	-125 to 350	-87.2 to 176.7	400	204.4	10	5	3/8 x 2-7/16"
3BS	-125 to 500	-87.2 to 260	550	287.8	10	5	3/8 x 2-1/8"
4BS	-40 to 120	-40 to 48.9	170	76.7	5	2	3/8 x 6-3/4"
5BS	-40 to 180	-40 to 82.2	230	110	5	2	3/8 x 5"
6BS	0 to 250	-17.8 to 121.1	300	148.9	5	2	3/8 x 4-1/2"
7BS	0 to 400	-17.8 to 204.4	450	232.2	10	5	3/8 x 3"
8BS	50 to 650	10 to 343.3	700	371.1	10	10	3/8 x 3-1/4"

Standard capillary length is 6 ft., optional capillary lengths and protection are available, consult UE.

*NOT AVAILABLE TYPE T800

HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts."

Determine model based on adjustable range, deadband and proof pressure.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section.

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number.

Leave "option" portion blank if no options are needed. FOR MULTIPLE OPTIONS: Call United Electric Controls.

TYPE

TEMPERATURE

Type 800 - Bulb and capillary; one SPDT output; external indication

Type 802 - Bulb and capillary; two SPDT outputs; external indication

Type 820E - Bulb and capillary; one SPDT output; external indication, explosion proof

Type 822E - Bulb and capillary; two SPDT outputs; external indication, explosion proof

Type T800 - Thermometer only with external indication

OPTIONS

SWITCH OPTIONS* DESCRIPTION

0140	Gold contacts, 1 A 125 VAC resistive. NOT AVAILABLE TYPE 800, 820E, T800
0500	Close deadband, 5 A 125/250 VAC resistive. NOT AVAILABLE TYPE T800
1070	10 A 125 VDC or VAC resistive; deadband and minimum set point may increase. NOT AVAILABLE TYPES 802, 820E, T800
2000	20 A 125/250 VAC resistive. NOT AVAILABLE TYPE T800

OTHER OPTIONS

M007	Drilled 7/8" electrical opening on right side. NOT AVAILABLE TYPES 820E, 822E and T800
M100	Terminal block wiring. NOT AVAILABLE TYPE 820E, 822E (standard) AND T800
M201	Factory set one switch; specify increasing or decreasing temperature and set point. NOT AVAILABLE TYPE 802, 822E, T800
M202	Factory set two switches; specify increasing or decreasing temperature and set point. NOT AVAILABLE TYPE 800, 820E, T800
M300	Enclosure Type 4 construction; includes watertight conduit fitting and gasketing. NOT AVAILABLE TYPES 820E, 822E (which already meet enclosure type 4X)
M320	Tamper resistant cover. NOT AVAILABLE TYPES T800
M404	Flameproof compliance for Ukraine per Gosnadzorohrantruda standards. NOT AVAILABLE TYPES 800, 802, T800
M406	Flameproof compliance for Russia per Rostekhnadzor permit (RTN). NOT AVAILABLE TYPES 800, 802, T800
M408	Flameproof compliance for China per CQST standards. NOT AVAILABLE TYPES 800, 802, T800
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M550	Oxygen service cleaning; alcohol cleaning to remove residue from the process connection
M900	Watertight conduit fitting; converts 7/8" hole to 1/2" NPT fitting. NOT AVAILABLE TYPES 820E, 822E, T800

* All switch options have limited DC capabilities. Consult factory for details.

OPTIONS FOR TEMPERATURE MODELS

UNION CONNECTORS**

Option	Replacement Number	Description
<u>Brass</u>		
W027	SD6213-27	1/2" NPT w/ 3/4" bushing
W045	SD6213-45	3/4" NPT
W051	SD6213-51	1/2" NPT
<u>304 Stainless Steel</u>		
W028	SD6213-28	1/2" NPT w/ 3/4" bushing
W046	SD6213-46	3/4" NPT
W050	SD6213-50	1/2" NPT

THERMOWELLS**

For all bulb & capillary switches

<u>Brass</u>		
W075	SD6225-75	1/2" NPT with 3/4" NPT adapter bushing, 4" BT
W191	SD6225-191	1/2" NPT, 4" BT
W118	SD6225-118	1/2" NPT with 3/4" NPT adapter bushing, 7" BT
W192	SD6225-192	1/2" NPT, 7" BT
<u>316 Stainless Steel</u>		
W076	SD6225-76	3/4" NPT, 4.5" BT
W193	SD6225-193	1/2" NPT, 4.5" BT
W119	SD6225-119	3/4" NPT, 7.5" BT
W177	SD6225-177	1/2" NPT, 7.5" BT

OPTIONAL LENGTHS:

Optional capillary length to 50' available in 304 st./st. Armor or Teflon® capillary protection available to lengths less than or equal to capillary length. Consult UE for additional information.

Consult UE regarding repeatability and ambient effects on capillary lengths over 30'

**Dimensional drawings for union connectors and thermowells may be found at www.ueonline.com

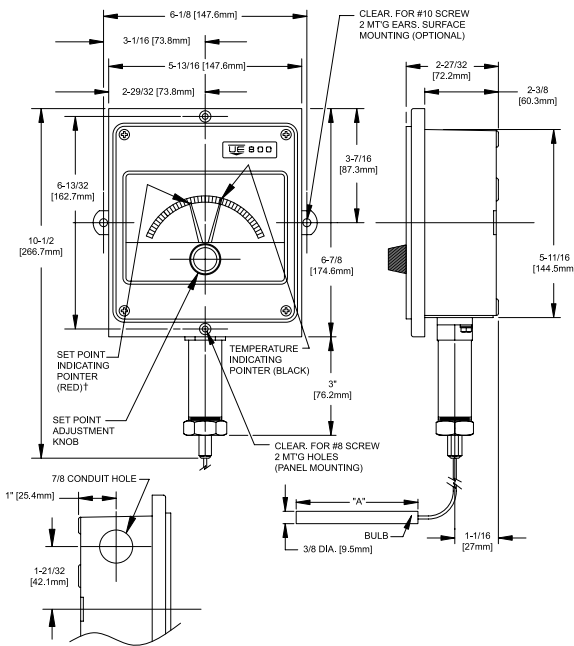
DIMENSIONAL DRAWINGS

(Dimensional drawings for all models may be found at www.ueonline.com)

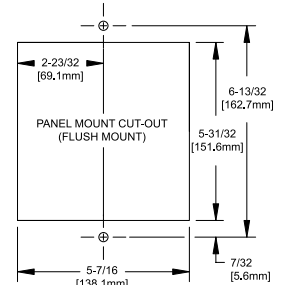
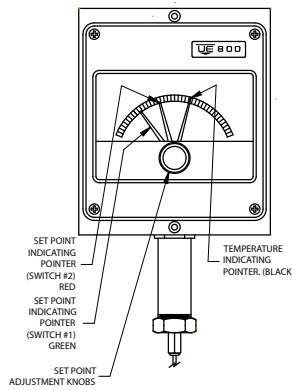
800 Series

External Set Point Adjustment & Temperature Indication

Types 800 & T800

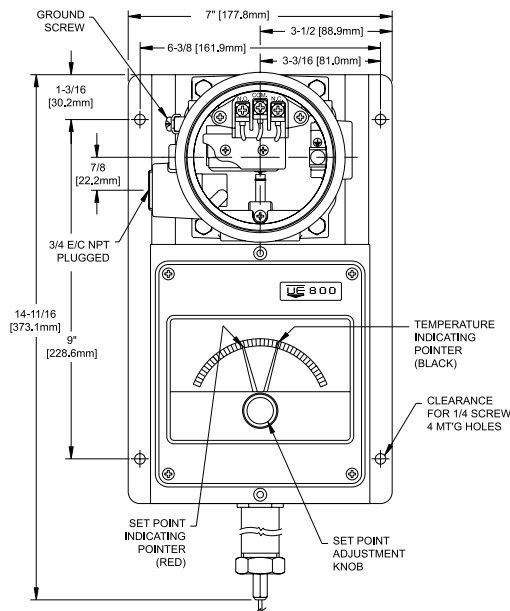


Types 802

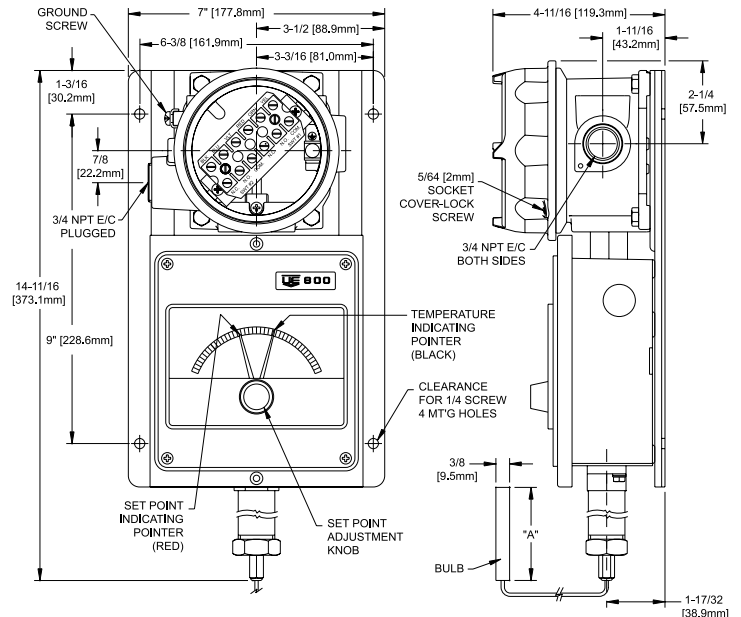


Dimension A		
Models	Inches	mm
1BS	3-3/4	95.3
2BS	2-7/16	62.0
3BS	2-1/8	54.0
4BS	6-3/4	171.5
5BS	5	127.0
6BS	4-1/2	114.3
7BS	3	76.2
8BS	3-1/4	82.6

Type 820 E



Type 822 E



†Type T800 has no set point indicating pointer.

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- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

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UNITED ELECTRIC
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CP04101500

PRESSURE, DIFFERENTIAL PRESSURE, AND TEMPERATURE SWITCHES



FEATURES

- 316 Stainless Steel Construction
- Hermetically Sealed Micro-switch
- Convenient Field Adjustment
- Belleville Actuated
- UL, cUL approved and ATEX compliant
- Dual Seal Certified
- Adjustable Ranges:

Pressure: 1 to 12,500 psi
(68,9 mbar to 861,9 bar)

Differential Pressure:
0.7" wcd to 150 psid
(1,7 mbar to 10,3 bar)

Temperature: -130°F to 650°F
(-90°C to 340°C)



OVERVIEW

12 Series hazardous location switches are ideal for operation in tough applications where space is at a premium. A snap-action Belleville spring assembly is used to provide vibration resistance and prolonged switch life. The 316 stainless steel enclosure and hermetically sealed switch provide rugged protection from the environment. Approved for use in hazardous locations worldwide, the 12 Series is installed within applications ranging from offshore oil rigs to rotating equipment, and more.

FEATURES

- UL, cUL and ATEX approved for Div. 1 or Zone 1 hazardous locations, CE compliant
- Dual seal compliant to ANSI/ISA 12.27.01
- Pressure switch wetted parts are NACE MR-0175 compliant
- Snap-acting Belleville spring for long life, vibration resistance and stability
- Optional Hastelloy® and Monel® sensor material for corrosive media
- Optional medium-pressure and high-pressure autoclave pressure connections
- Mounting bracket available for retrofit applications
- 72" leadwires
- 3-year warranty



APPLICATIONS

Triple approval (UL, cUL and ATEX) mean the 12 Series meets the demanding requirements of critical applications within hazardous locations. Additionally, the 12 Series complies with ANSI/ISA 12.27.01, "secondary seal requirements for process sealing between electrical systems and flammable or combustible process fluids." It can be used in a variety of applications where space is at a premium. All metal wetted parts comply with NACE MR-0175 and the 316 stainless steel, type 4X enclosure rating assure long-term performance in the harshest environments.

Offshore Platforms



Chemical Plants & Refineries



Instrument Panels



Rotating Equipment

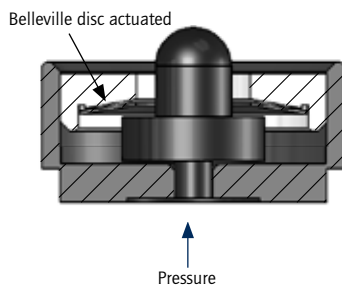


TECHNOLOGY

At the heart of the 12 Series is a Belleville spring assembly. The spring is a small conical washer that transfers motion to a hermetically sealed 1 or 5 amp microswitch. Its 'snap-action' provides fast, positive contact transfer. The Belleville spring 'snaps over' when pressure is applied and 'snaps back' upon pressure release.

Advantages:

- Set point stability: The switch performs under challenging environmental conditions such as vibration and temperature changes. In addition, minimal movement of components reduces sensor fatigue thereby increasing life and accuracy.
- Resistance to vibration: Preloading of the electrical switch helps reduce 'contact chatter.'
- Small size: Belleville springs are simple in appearance, but can deliver a heavy load with a relatively small deflection, contributing to a compact design.
- Deadbands: The Belleville is a 'negative-rate' snap acting device, so on-off deadband values are wider at the low end of the range. To minimize deadbands, select a model with a set point at the higher end of the range whenever possible.



SPECIFICATIONS

STORAGE TEMPERATURE	-58° to 203°F (-50 to 95°C)
OPERATING AMBIENT TEMPERATURE	-58 to 203°F (-50 to 95°C). Set point shifts less than 1% of range for a 50°F (28°C) ambient temperature change. Slight ambient effects for 25-50' extra capillary length on temperature switch models, consult factory.
MEDIA TEMPERATURE	Pressure models: Sensor types 2, 7, 9: -50 to 400°F (-45 to 204°C) Sensor types 3, 4, 8: -20 to 200°F (-28 to 93°C) Sensor types 5, 6: 0 to 320°F (-18 to 160°C) Sensor type P: 0 to 200°F (-18 to 93°C); 20 to 250°F (-7 to 121°C) for optional Viton sensor Differential pressure models: Sensor type K: 0 to 180°F (-18 to 82°C); 20 to 250°F (-7 to 121°C) for optional Viton sensor Temperature models: See model chart.
SET POINT REPEATABILITY	Temperature models: ±1% of adjustable range Pressure models: Sensor types 2, P: ±1.5% of adjustable range Sensor types 3-9: ±1% of adjustable range Differential pressure models: K1 to K3: ±1%, K4 to K6: ±1.5% of adjustable range
SHOCK	Differential pressure and temperature models: set point repeats after 15 G's, 10 millisecond duration Pressure models: Set point repeats after 75 G's, 10 milliseconds
VIBRATION	Differential pressure and temperature models: Set point repeats after 2.5 G's, 10-2000 Hz. Pressure models: Set point repeats after 15 G's, 10-2000 Hz
ENCLOSURE	316 stainless steel
ENCLOSURE CLASSIFICATION	Certified to Enclosure Type 4X Class I, Division 1 product meets enclosure Type 7; Class II, Division I product meets enclosure type 9. Certified to IP66 requirements
SWITCH OUTPUT	Code S: One SPDT, hermetically sealed. Code D: Two SPDT for DPDT action, hermetically sealed
ELECTRICAL RATINGS	Code H: 5 A at 125/250 VAC, 5 A resistive and 3 A inductive at 28 VDC. Silver contacts Code L: 1 A at 125 VAC, 1 A resistive and 0.5 A inductive at 28 VDC Bifurcated gold contacts
ELECTRICAL CONNECTION	Code N: 1/2" NPT (male) with 72" leadwires Code M: M20 metric threads, 72" leads Option M515, 4 terminal DIN connector (DIN 43650 Form A) available SPDT only (does not meet Div. 1 or 2, or ATEX requirements.)

WEIGHT	Temperature models: approximately 1 lb 14 oz. (0,85 kg) Pressure models: approximately 12 ounces (0,34 kg) Differential models: approximately 3 lb (1,4 kg)
TEMPERATURE ASSEMBLY	Non-toxic oil fill; 6 feet 304 stainless steel. Optional lengths available
TEMPERATURE DEADBAND	Typically 2% of range under laboratory conditions (70°F ambient circulating bath at a rate of 1/2°F per minute change)
PRESSURE CONNECTION	1/2" NPT (female) or 1/4" NPT (female). Differential pressure: 1/8" NPT (female) Optional pressure connections available, see page 11.
MOUNTING	Pressure: May be pipe mounted or bracket mounted using kit 62169-13 Differential Pressure: Should be mounted using 2 mounting holes on sensor bracket Temperature: Mounting kit 62169-13 should be specified for new installations

APPROVALS



UNITED STATES AND CANADA **UL Listed, cUL Certified**

Class I, Division 1 and 2, Groups A, B, C & D
Class II, Division 1 and 2, Groups E, F & G
Class III
Class I, Zone 1, Group IIC
Enclosure Type 4X
Pressure: UL 508 & 698; CSA C22.2 No. 14, 25 & 30 -
File # E40857
Dual seal certified to ISA 12.27.01 (meets CEC secondary
seal requirements) standard on straight pressure models
only
Temperature: UL 873, 1203; CSA C22.2 No. 24, 25 & 30 -
File # E43374



EUROPEAN UNION **ATEX Directive 94/9/EC**



II 2 G Ex d IIC T6
II 2 D Ex tD A21 IP66 T+85C
Tamb = -50°C to +80°C
UL International DEMKO A/S (N.B.# 0539)
Certificate # DEMKO 08 ATEX 0717128X
EN 60079-0, 60079-1, 61241-0 & 61241-1

II 1 G EEx ia IIC T6 (OPTIONAL – code M405)

Tamb = -50°C to +60°C
UL International DEMKO A/S (N.B.# 0539)
Certificate # DEMKO 03 ATEX 0335063
EN 50014, 50020 & 50284

Pressure Equipment Directive (PED) 97/23/EC

Compliant to PED
Products rated lower than 7.5 psi are outside the scope of the
PED



Low Voltage Directive (LVD) 73/23/EC & 93/68/EEC

Compliant to LVD
Products rated lower than 50 VAC and 75 VDC are outside the
scope of the LVD
The Low Voltage Directive does not apply to products for use in
hazardous locations



RUSSIA

Gosgortekhnadzor Permit **(OPTIONAL – code M406)**
0ExiaIICT6
Tamb = -50°C to +60°C
1ExdIICT6X
Tamb = -56°C to +85°C
NANIO CCVE Certification Center
Certificate # ROSS US.GB05.Bo2933
GOST R 51330.0, 51330.1, 51330.10 & 51330.14

MODEL CHART

Model	Adjustable Range Lower end of range on fall; High end of range on rise	Deadband	Over Range Pressure*	Proof Pressure**
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Sensor Type 2, 316 stainless steel 1/2" NPT (female) pressure connection and welded diaphragm, 23/32" orifice for clean out purposes. High proof pressure. Not recommended for high cycling applications. (NACE MR-0175 compliant)

	psi	bar	psi	bar	psi	bar	psi	bar
A	10 to 25	0,7 to 1,7	2 to 7	0,1 to 0,5	1000	68,9	2500	172,4
B	15 to 45	1,0 to 3,1	3 to 10	0,2 to 0,7	1000	68,9	2500	172,4
C	25 to 85	1,7 to 5,9	5 to 20	0,3 to 1,4	1000	68,9	2500	172,4
D	50 to 130	3,4 to 9,0	7 to 25	0,5 to 1,7	1500	103,4	2500	172,4
E	100 to 210	6,9 to 14,5	8 to 30	0,6 to 2,1	1500	103,4	2500	172,4
F	160 to 400	11,0 to 27,6	10 to 50	0,7 to 3,4	1500	103,4	2500	172,4
G	275 to 850	19,0 to 58,6	40 to 125	2,8 to 8,6	1500	103,4	2500	172,4

Sensor Type 3, 316L stainless steel 1/2" NPT (female) pressure connection, Teflon® coated Polyimide (Kapton®) diaphragm, Buna N O-ring, 1/2" orifice for clean out purposes. (NACE MR-0175 compliant)

Sensor Type 4, 316L stainless steel 1/4" NPT (female) pressure connection, Teflon® coated Polyimide (Kapton®) diaphragm, Buna N O-ring, 1/8" orifice. (NACE MR-0175 compliant)

	psi	bar	psi	bar	psi	bar	psi	bar
A	8 to 30	0,6 to 2,1	2 to 6	0,1 to 0,4	600	41,4	1000	68,9
B	15 to 55	1,0 to 3,8	3 to 8	0,2 to 0,6	600	41,4	1000	68,9
C	30 to 170	2,1 to 11,7	5 to 15	0,3 to 1,0	600	41,4	1000	68,9
D	100 to 370	6,9 to 25,5	15 to 50	1,0 to 3,4	600	41,4	1000	68,9
E	200 to 700	13,8 to 48,3	40 to 90	2,8 to 6,2	1500	103,4	3000	206,8
F	400 to 1500	27,6 to 103,4	100 to 250	6,9 to 17,2	3000	206,8	4500	310,3
G	1000 to 3200	68,9 to 220,6	100 to 500	6,9 to 34,5	6000	413,7	10000	689,5
H	2000 to 6000	137,9 to 413,7	400 to 800	27,6 to 55,2	8000	551,6	10000	689,5

***Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

****Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g., start-up, testing).

Kapton® is a registered trademark of E.I. DuPont de Nemours and Company.

Teflon® is a registered trademark of the DuPont Company.

Kalrez® and **Viton®** are registered trademarks of Dupont Performance Elastomers.

Hastelloy® is a registered trademark of Haynes International, Inc.

Monel® is a registered trademark of The Special Metals Corporation.

Aflas® is a registered trademark of Asahi Glass.

Model	Adjustable Range Lower end of range on fall; High end of range on rise	Deadband	Over Range Pressure*	Proof Pressure**
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Sensor Type 5, 316L stainless steel 1/2" NPT (female) pressure connection and diaphragm (optional Hastelloy® C or Monel®), Viton® O-ring (optional Kalrez®, Ethylene Propylene, or Aflas®), 1/2" orifice for clean out purposes. (NACE MR-0175 compliant)

Sensor Type 6, 316L stainless steel 1/4" NPT (female) pressure connection and diaphragm (optional Hastelloy® C or Monel®), Viton® O-ring (optional Kalrez®, Ethylene Propylene, or Aflas®), 1/8" orifice. (NACE MR-0175 compliant)

	psi	bar	psi	bar	psi	bar	psi	bar
A	9 to 35	0,6 to 2,4	2 to 7	0,1 to 0,5	600	41,4	1000	68,9
B	25 to 65	1,7 to 4,5	3 to 10	0,2 to 0,7	600	41,4	1000	68,9
C	50 to 150	3,4 to 10,3	5 to 15	0,3 to 1,0	600	41,4	1000	68,9
D	100 to 350	6,9 to 24,1	15 to 50	1,0 to 3,4	600	41,4	1000	68,9
E	250 to 700	17,2 to 48,3	40 to 95	2,8 to 6,6	1500	103,4	3000	206,8
F	400 to 1500	27,6 to 103,4	100 to 300	6,9 to 20,7	3000	206,8	4500	310,3
G	1000 to 3200	68,9 to 220,6	100 to 500	6,9 to 34,5	6000	413,7	10000	689,5
H	2000 to 6000	137,9 to 413,7	400 to 1000	27,6 to 68,9	8000	551,6	10000	689,5

Sensor Type 7, 1/2" 316L stainless steel NPT (female) pressure connection and welded diaphragm. Large 23/32" orifice for clean out purposes. (NACE MR-0175 compliant)

	psi	bar	psi	bar	psi	bar	psi	bar
A	3 to 15	0,2 to 1,0	1 to 4	0,1 to 0,3	300	20,7	500	34,5
B	10 to 35	0,7 to 2,4	1 to 6	0,1 to 0,4	300	20,7	500	34,5
C	25 to 85	1,7 to 5,9	3 to 11	0,2 to 0,8	300	20,7	500	34,5
D	65 to 125	4,5 to 8,6	6 to 18	0,4 to 1,2	300	20,7	500	34,5

Sensor Type 8, 316L stainless steel 1/4" NPT (female) pressure connection, Teflon® coated Polyimide (Kapton®) diaphragm (optional Hastelloy® C or Monel®), Buna N O-ring (optional Kalrez®, Silicone, Ethylene Propylene, or Aflas®), 1/8" orifice. Non-Belleville actuation. (NACE MR-0175 compliant)

	psi	bar	psi	bar (unless noted)	psi	bar	psi	bar
A [†]	3 to 25	0,2 to 1,7	0.5 to 4	34,5 mbar to 0,3 bar	600	41,4	1000	68,9
B	15 to 75	1,0 to 5,2	1 to 7	0,1 to 0,5	600	41,4	1000	68,9
C	25 to 150	1,7 to 10,3	1 to 12	0,1 to 0,8	600	41,4	1000	68,9
D	50 to 450	3,4 to 31,0	3 to 28	0,2 to 1,9	2000	137,9	3000	206,8
E	100 to 900	6,9 to 62,1	10 to 60	0,7 to 4,1	2000	137,9	3000	206,8
F	500 to 2500	34,5 to 172,4	20 to 140	1,4 to 9,7	6000	413,7	7500	517,1
G	700 to 4000	48,3 to 275,8	40 to 250	2,8 to 17,2	6000	413,7	7500	517,1

Application Note: The use of metallic diaphragms where higher pressure shock or heavy cycling is expected should be avoided. Sensor Type 7 or 9 should not be used where system or startup vacuum pressure might exceed 26" Hg Vac.

***Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

****Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g., start-up, testing).

[†]Adjustable range is 4 to 25 psi (0,3 to 1,7 bar) for DPDT switch output



12 Series

12 Series

MODEL CHART

Model	Adjustable Range Lower end of range on fall; High end of range on rise	Deadband	Over Range Pressure*	Proof Pressure**
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Sensor Type 9, 316L stainless steel 1/2" NPT (female) pressure connection and welded diaphragm. Large 23/32" orifice for clean-out purposes. Non-Belleville actuation. (NACE MR-0175 compliant)

	psi	bar	psi	mbar (unless noted)	psi	bar	psi	bar
A	1 to 15	0,1 to 1,0	0.5 to 2	34,5 to 137,9	300	20,7	500	34,5
B	3 to 50	0,2 to 3,4	0.5 to 4	34,5 to 275,8	300	20,7	500	34,5
C	5 to 100	0,3 to 6,9	1.0 to 8	0,1 to 06 bar	300	20,7	500	34,5

Sensor Type P, 316 stainless steel piston and Buna N O-Ring with 316 stainless steel 1/4" NPT (female) pressure connection. Non-Belleville actuation. (NACE MR-0175 compliant)

	psi	bar	psi	bar	psi	bar	psi	bar
0	50 to 500	3,4 to 34,5	15 to 65	1,0 to 4,5	6000	413,7	10000	689,5
1	300 to 1200	20,7 to 82,7	30 to 200	2,1 to 13,8	6000	413,7	10000	689,5
2	600 to 2600	41,4 to 179,3	50 to 350	3,4 to 24,1	6000	413,7	10000	689,5
3	1200 to 5500	82,7 to 379,2	100 to 800	6,9 to 55,2	7500	517,1	10000	689,5
4	4000 to 12,500	275,8 to 861,9	300 to 1250	20,7 to 86,2	14000	965,3	16000	1103,2

Sensor Type P, 316 stainless steel piston and Buna N O-Ring with 316 stainless steel 1/4" NPT (female) pressure connection. Belleville actuation. (NACE MR-0175 compliant)

	psi	bar	psi	bar	psi	bar	psi	bar
6	300 to 1200	20,7 to 82,7	30 to 200	2,1 to 13,8	6000	413,7	10000	689,5
7	600 to 2600	41,4 to 179,3	50 to 350	3,4 to 24,1	6000	413,7	10000	689,5
8	1200 to 5500	82,7 to 379,2	100 to 800	6,9 to 55,2	7500	517,1	10000	689,5
9	4000 to 12,500	275,8 to 861,9	300 to 1250	20,7 to 86,2	14000	965,3	16000	1103,2

***Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

****Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g., start-up, testing).

Application Note: The use of metallic diaphragms where higher pressure shock or heavy cycling is expected should be avoided. Sensor Type 7 to 9 should not be used where system or startup vacuum pressure might exceed 26" Hg Vac.

DIFFERENTIAL PRESSURE MODEL CHART

Model	Adjustable Range Lower end of range on fall; High end of range on rise	Deadband	Working Pressure Range***	Proof Pressure**
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Sensor Type K, Buna N diaphragm and sealing diaphragms with epoxy coated aluminum 1/8" NPT (female) pressure connections. Non-Belleville actuation. 303/304 stainless steel mounting bracket attached.

SPDT Switch (single pole double throw)†

	"wcd	mbar	"wc	mbar	psi (unless noted)	bar	psi	bar
1	0.7 to 10	1,7 to 24,9	0.2 to 1	0,5 to 2,5	30 "Hg Vac to 200	-1,0 to 13,8	400	27,6
2	3 to 20	7,5 to 49,8	0.3 to 1.5	0,7 to 3,7	30 "Hg Vac to 200	-1,0 to 13,8	400	27,6
3	10 to 150	24,9 to 373,4	0.3 to 5	0,7 to 12,4	30 "Hg Vac to 200	-1,0 to 13,8	400	27,6
	psid	bar	psi	bar (unless noted)	psi (unless noted)	bar	psi	bar
4	2 to 20	0,1 to 1,4	0.3 to 1.5	20,7 to 103,4 mbar	30 "Hg Vac to 1200	-1,0 to 82,7	2500	172,4
5	5 to 80	0,3 to 5,5	1 to 8	0,1 to 0,6	30 "Hg Vac to 1200	-1,0 to 82,7	2500	172,4
6	10 to 150	0,7 to 10,3	1 to 10	0,1 to 0,7	30 "Hg Vac to 1200	-1,0 to 82,7	2500	172,4

Sensor Type K, Buna N diaphragm and sealing diaphragms with epoxy coated aluminum and 1/8" NPT (female) pressure connections. Non-Belleville actuation. 303/304 stainless steel mounting bracket attached.

DPDT Switch (double pole double throw)†

	"wcd	mbar	"wc	mbar	psi (unless noted)	bar	psi	bar
1	0.7 to 10	1,7 to 24,9	0.2 to 1.5	0,5 to 3,7	30 "Hg Vac to 200	-1,0 to 13,8	400	27,6
2	3 to 20	7,5 to 49,8	0.3 to 2	0,7 to 5,0	30 "Hg Vac to 200	-1,0 to 13,8	400	27,6
3	10 to 150	24,9 to 373,4	0.3 to 8	0,7 to 19,9	30 "Hg Vac to 200	-1,0 to 13,8	400	27,6
	psid	bar	psi	bar	psi	bar	psi	bar
4	2 to 20	0,1 to 1,4	0.3 to 3	20,7 to 206,8 mbar	30 "Hg Vac to 1200	-1,0 to 82,7	2500	172,4
5	5 to 80	0,3 to 5,5	1 to 10	0,1 to 0,7	30 "Hg Vac to 1200	-1,0 to 82,7	2500	172,4
6	10 to 150	0,7 to 10,3	1 to 15	0,1 to 1,0	30 "Hg Vac to 1200	-1,0 to 82,7	2500	172,4

TEMPERATURE MODEL CHART (Standard capillary: 6ft, 304 st/st)

Installation may require optional mounting bracket kit (P/N 62169-13, see page 14)

Model	Adjustable Range		Max. Temperature		Bulb Size
	°F	°C	°F	°C	
R1	-130 to 120	-90 to 48.9	170	76.7	3/8 O.D. x 4-7/8"
R2	0 to 150	-17.8 to 65.6	200	93.3	3/8 O.D. x 7-1/4"
R3	50 to 300	10 to 148.9	350	176.7	3/8 O.D. x 4-7/8"
R4	150 to 650	65.6 to 343.3	700	371.1	3/8 O.D. x 4"

****Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g., start-up, testing)

*****Working Pressure Range:** The pressure range within which two opposing sensors can be safely operated and still maintain set point adjustability.

†See page 10 on building a part number for switch codes.



12 Series

12 Series

HOW TO ORDER

Select letter or number "codes" to construct part number

Part #	12	S	H	S	N	2	A	M201
	Series	Housing Material	Electrical Rating	Switch Output	Electrical Conduit	Sensor Type	Model	Options
							(see next page)	

12 S H S N 2 A M201

ORDERING

CODE

DESCRIPTION

SERIES 12 DESIGNATION

12 Designation for Spectra 12 product line

HOUSING MATERIAL

S 316 Stainless Steel

ELECTRICAL RATING*

L 1 amp

H 5 amp

SWITCH OUTPUT

S SPDT

D DPDT

ELECTRICAL CONDUIT

N 1/2" NPT male

M M20 metric thread

SENSOR TYPE, PRESSURE CONNECTION OR BULB & CAPILLARY

- 2 Welded 316 stainless steel diaphragm, 1/2" NPT (female) pressure connection
- 3 Teflon® coated Polyimide (Kapton®) diaphragm, Buna N O-ring, 1/2" NPT (female) pressure connection
- 4 Teflon® coated Polyimide (Kapton®) diaphragm, Buna N O-ring, 1/4" NPT (female) pressure connection
- 5 316L stainless steel diaphragm, Viton® O-ring, 1/2" NPT (female) pressure connection
- 6 316L stainless steel diaphragm, Viton® O-ring, 1/4" NPT (female) pressure connection
- 7 Welded 316L stainless steel diaphragm, 1/2" NPT (female) pressure connection
- 8 Kapton® diaphragm, Buna N O-ring, 1/4" NPT (female) pressure connection (non-Belleville actuation)
- 9 316L stainless steel welded diaphragm, 1/2" NPT (female) pressure connection (non-Belleville actuation)
- P 316 stainless steel piston, Buna N O-ring, 1/4" NPT (female) 316 stainless steel pressure connections (Belleville and non-Belleville actuated models)
- K Kapton® diaphragm, Buna N sealing diaphragm, 1/8" NPT (female) pressure connections (non-Belleville actuation)
- R Remote bulb & capillary, temperature

MODELS, RANGE

A, B, C, D, E, See model chart for range specifications

F, G, H, O, 1, 2,

3, 4, 5, 6, 7, 8, 9

* All switches have limited DC capabilities. Consult factory for details.

OPTIONS

- M201 Factory set switch, specify increasing or decreasing pressure
- M277 Range in kPa or mPa on nameplate, factory selected. NOT AVAILABLE ON TEMPERATURE VERSIONS
- M278 Range in kg/cm² on nameplate. NOT AVAILABLE ON TEMPERATURE VERSIONS
- M405 European ATEX intrinsic safety compliance
- M406 Flameproof and intrinsic safety compliance per Russian Gosgortekhnadzor standards
- M421 Gosgortekhnadzor flameproof junction box, pre-wired (not UL approved or ATEX certified) (NOT AVAILABLE ON M20 METRIC THREAD ELECTRICAL CONDUIT VERSION)
- M423 ATEX flameproof compliant junction box, pre-wire (not UL approved) (NOT AVAILABLE ON M20 METRIC THREAD ELECTRICAL CONDUIT VERSION)
- M430 Cover lock
- M444 Paper ID tag
- M446 Stainless steel ID tag and wire attachment
- M460 External ground screw; required for non-metallic conduit systems (ATEX installations only)
- M480 316 Stainless steel construction, pressure connections only, sensor material cannot be changed. AVAILABLE SENSOR TYPE K ONLY.
- M511 1/4" NPT (male) pressure connection for sensor types 3, 4, 5, 6 and 8 only
- M513 UL/CSA approved, explosion proof junction box, pre-wired (meets enclosure 4). NOT AVAILABLE ON M20 METRIC THREAD ELECTRICAL CONDUIT VERSION. NOT ATEX COMPLIANT.
- M515 DIN Connector-4 terminal; conforms to DIN 43650 Form A, (not approved for Class I Div. 1 & 2 or ATEX flame proof requirements). NOT AVAILABLE ON DPDT OR METRIC THREAD ELECTRICAL CONDUIT VERSIONS
- M521 LF4 Medium pressure autoclave 1/4" (female); AVAILABLE SENSOR TYPES P4 & P9 ONLY
- M522 LM4 Medium pressure autoclave 1/4" (male); AVAILABLE SENSOR TYPES P4 & P9 ONLY
- M523 LF6 Medium pressure autoclave 3/8" (female); AVAILABLE SENSOR TYPES P4 & P9 ONLY
- M524 LM6 Medium pressure autoclave 3/8" (male); AVAILABLE SENSOR TYPES P4 & P9 ONLY
- M525 HF4 High pressure autoclave 1/4" (female); AVAILABLE SENSOR TYPES P4 & P9 ONLY
- M526 HM4 High pressure autoclave 1/4" (male); AVAILABLE SENSOR TYPES P4 & P9 ONLY
- M527 HF6 High pressure autoclave 3/8" (female); AVAILABLE SENSOR TYPES P4 & P9 ONLY
- M528 HM6 High pressure autoclave 3/8" (male); AVAILABLE SENSOR TYPES P4 & P9 ONLY
- M540 Viton® construction (deadband and low end of range will increase slightly): SENSOR TYPE K wetted parts include Kapton diaphragm, Viton® O-ring and sealing diaphragm, aluminum pressure connection; SENSOR TYPE 8 wetted parts include stainless steel diaphragm and pressure connection with Viton O-ring; SENSOR TYPE P wetted parts include stainless steel piston and pressure connection with Viton O-ring.
- M541 Ethylene propylene (EPDM) O-ring for sensor types 5, 6, & P only
- M550 Oxygen service cleaning; internal construction and materials may change (includes Viton® diaphragm and/or O-ring when applicable). NOT AVAILABLE ON SENSOR TYPES 3, 4, AND 8
- M924 7/16-20 SAE (female) stainless steel pressure connection. AVAILABLE SENSOR TYPE 6 ONLY
- NC1 NACE certificate; NOT AVAILABLE FOR SENSOR TYPE K AND TEMPERATURE MODELS

ACCESSORIES

- 62169-13 Mounting bracket kit (available with pressure and temperature models only)
- 62169-31 ATEX flameproof compliant junction box and terminal kit, not pre-wired (see option code M423)
- 6361-694 Junction box and terminal kit, not pre-wired (see option code M513 for description)

OPTIONS FOR TEMPERATURE MODELS

OPTIONAL SENSOR MATERIALS FOR CORROSIVE MEDIA AVAILABLE SENSOR TYPE 8

XD002	Hastelloy® C diaphragm
XD003	Monel® diaphragm
XP112	1/2" NPT Hastelloy® C pressure connection
XP113	1/2" NPT Monel® pressure connection
XP114	1/4" NPT Hastelloy® pressure connection
XP115	1/4" NPT Monel® pressure connection
XR211	Kalrez® O-ring
XR213	Ethylene propylene O-ring
XR214	Aflas® O-ring
XR216	Viton O-ring

UNION CONNECTORS*

Option	Replacement Number	Description
	<u>304 Stainless Steel</u>	
W028	SD6213-28	1/2" NPT w/ 3/4" bushing
W046	SD6213-46	3/4" NPT
W050	SD6213-50	1/2" NPT

THERMOWELLS

For all bulb & capillary switches

316 Stainless Steel

W076	SD6225-76	3/4" NPT, 4.5" BT
W193	SD6225-193	1/2" NPT, 4.5" BT
W119	SD6225-119	3/4" NPT, 7.5" BT
W177	SD6225-177	1/2" NPT, 7.5" BT

OPTIONAL LENGTHS

Optional capillary length to ±50' available in 304 st/st. Armor or Teflon® capillary protection available to lengths less than or equal to capillary length. Consult UE for additional information.

‡Consult UE regarding repeatability and ambient effects on capillary lengths over 30'.

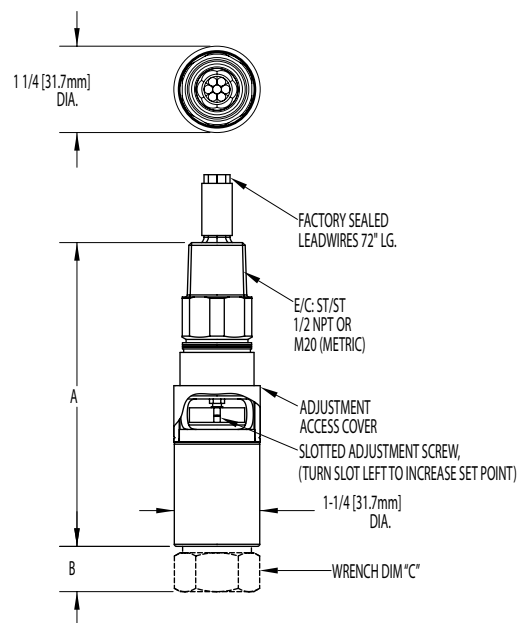
*Dimensional drawings for union connectors and thermowells may be found at www.ueonline.com

DIMENSIONAL DRAWINGS

Dimensional drawings for all models may be found at www.UEonline.com

PRESSURE & TEMPERATURE SWITCH / CONNECTION CHART

Type	Description	Dimension "A"		Dimension "B"		Dimension "C"	
		Inches	mm	Inches	mm	Inches	mm
2	1/2" NPT (female)	4.4	111.1	0.7	16.5	1-1/16	27.0
3, 5	1/2" NPT (female)	4.4	111.1	0.6	15.2	1-1/16	27.0
4, 6, 8	1/4" NPT (female)	4.4	111.1	0.6	15.2	1-1/16	27.0
7, 9	1/2" NPT (female)	4.0	100.3	1.6	40.6	1-1/8	28.6
P1-P9	1/4"NPT (female)	4.4	111.1	1.0	25.4	1-1/16	27.0
K1-K3	1/8"NPT (female)	4.4	111.1	1.7	42.9	N/A	N/A
K4-K6	1/8"NPT (female)	4.4	111.1	1.8	44.5	N/A	N/A
R1-R4	Temperature	4.4	111.1	0.6	15.2	N/A	N/A
M521	LF4 Autoclave 1/4" (female)	4.4	111.1	1.2	29.7	1-1/16	27.0
M522	LM4 Autoclave 1/4" (male)	4.4	111.1	1.4	34.8	1-1/16	27.0
M523	LF6 Autoclave 3/8" (female)	4.4	111.1	1.4	36.1	1-1/16	27.0
M524	LM6 Autoclave 3/8" (male)	4.4	111.1	1.5	38.4	1-1/16	27.0
M525	HF4 Autoclave 1/4" (female)	4.4	111.1	1.2	29.7	1-1/16	27.0
M526	HM4 autoclave 1/4" (male)	4.4	111.1	1.3	32.8	1-1/16	27.0
M527	HF6 Autoclave 3/8" (female)	4.4	111.1	1.4	36.1	1-1/16	27.0
M528	HM6 Autoclave 3/8" (male)	4.4	111.1	1.5	37.6	1-1/16	27.0



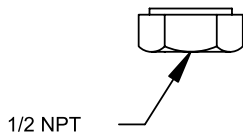
DIMENSIONAL DRAWINGS

Dimensional drawings for all models may be found at www.UEonline.com

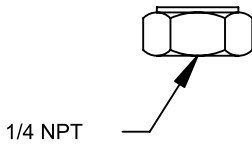
SENSOR DETAILS

Pressure

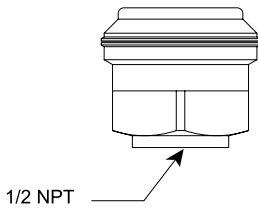
TYPES 2, 3, 5 SENSOR



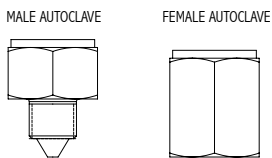
TYPES 4, 6, 8 P0-P9



TYPES 7, 9 SENSOR



TYPES P4 & P9 SENSOR ONLY

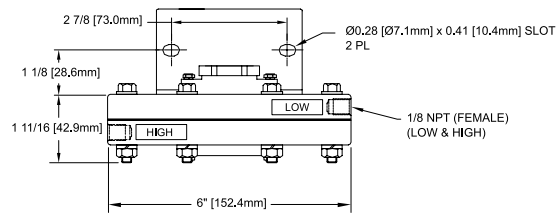


See Options for autoclave types

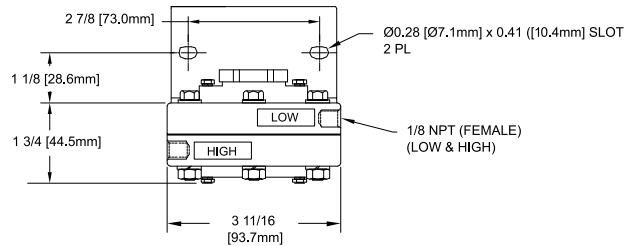
*Shown with mounting bracket attached

Differential Pressure

TYPE K1-K3 *

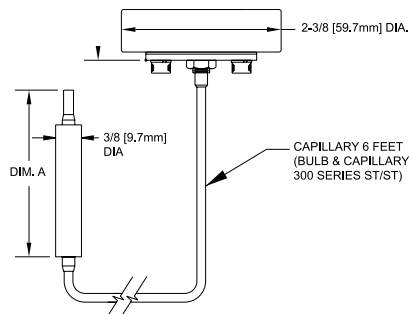


TYPES K4-K6 *



Temperature

TYPES R1-R4



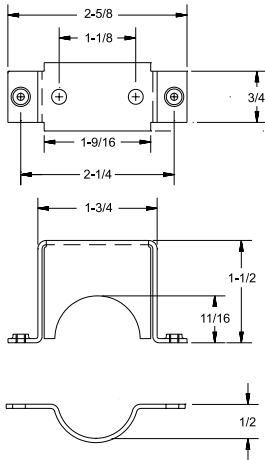
BULB DIMENSIONS

Types	Dimension A	
	Inches	mm
R1	4-7/8"	123.8
R2	7-1/4"	184.2
R3	4-7/8"	123.8
R4	4"	101.6

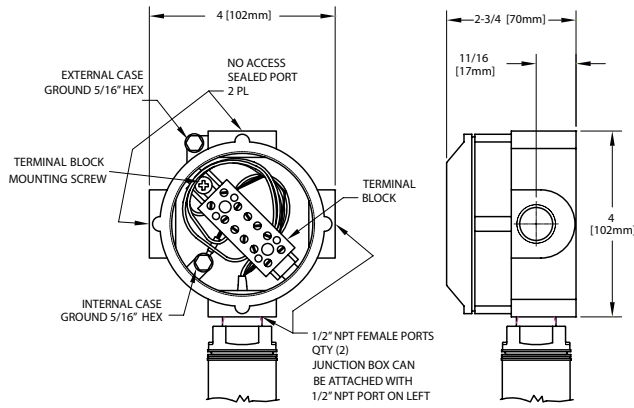
DIMENSIONAL DRAWINGS

Dimensional drawings for all models may be found at www.UEonline.com

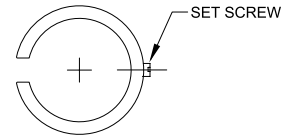
OPTIONAL MOUNTING BRACKET KIT 62169-13



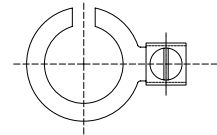
OPTION M423 JUNCTION BOX



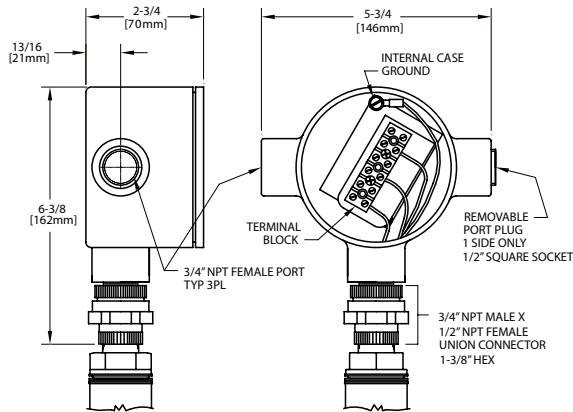
OPTION M430 COVER LOCK



OPTION M460 EXTERNAL GROUNDING SCREW

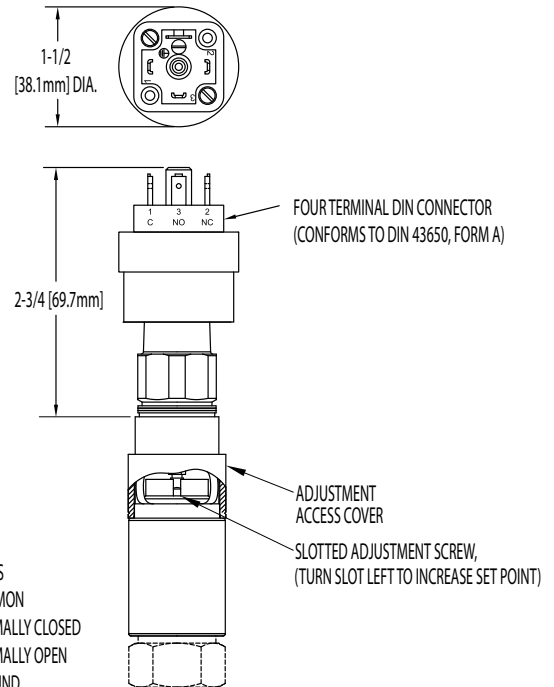


OPTION M513 JUNCTION BOX



Junction box meets enclosure type 4 requirements only. Not ATEX compliant (see option M423 for ATEX junction box)

OPTION M515 DIN CONNECTOR.



TERMINALS
#1 COMMON
#2 NORMALLY CLOSED
#3 NORMALLY OPEN
GROUND

Does not meet Div 1 or 2, or ATEX requirements.

ALTERNATIVE PRODUCTS FROM UE

TX200 Series Pressure Transmitters for Class I, Div. 1, Zone 1 Areas

- Welded, hermetically sealed, 316 stainless steel enclosure type 4X/IP66
- Ranges 0 to 15 psi up to 0 to 25,000 psi
- Choice of field adjustable or fixed range models
- 4-20 mA, 1-5 or 0-10 VDC output



120 Series

- Explosion-proof line of pressure, differential pressure, and temperature models with wide selection of ranges, sensors and pressure connections
- UL, cUL, ATEX certified for hazardous locations
- Single or dual switch outputs
- Welded stainless steel diaphragm pressure sensor
- Internal or external set point adjustment



One Series for Division 1 (Zone 1)

- Electronic pressure and temperature switches with no moving parts
- Fully adjustable deadband and smart self diagnostics
- 4-20 mA output and digital process display
- Explosion-proof enclosure for Division 1 (Zone 1) hazardous areas
- 2-wire, 4-wire and loop powered models available
- Digital display and tamper-proof keypad adjustment of setpoint and deadband



117 Series

- Single switch for corrosive and hazardous Division 2 locations
- Compact pressure, differential pressure and temperature models
- Hermetically-sealed SPDT or DPDT output
- Epoxy-coated, weather-tight design houses stainless steel internal construction
- Convenient terminal block wiring



Temperature Sensors

Rugged RTDs and thermocouples for process and energy applications, available with Nema 4X and explosion-proof heads to match heat-trace, turbine, combustion, and stack-emission applications



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure transmitters. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (i.e., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Supply voltage stated in literature and on nameplate must not be exceeded. Overload on a transmitter can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 36 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

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<http://www.ueonline.com>

CP07103500

Be sure to visit www.ueonline.com for the latest information.

EXPLOSION-PROOF PRESSURE, VACUUM, DIFFERENTIAL PRESSURE AND TEMPERATURE SWITCHES



FEATURES

- Class I, Div. 1 & 2, (Zone 1)
Class II, Div. 1 & 2
Class III
- Worldwide approvals and certifications
- Choice of one or two SPDT,
optional DPDT output
- Dual electrical conduit openings
- Terminal block wiring
- Welded diaphragm or bellows sensor
- Ultra-low pressure ranges



OVERVIEW

As safety requirements become more stringent, the determining factor in specifying an industrial pressure, differential pressure and/or temperature switch rests upon that switch protecting equipment, processes and personnel. Meeting hazardous location requirements through adherence to cULus and ATEX standards, UE's 120 Series is the choice where potentially explosive or highly corrosive atmospheres exist. Additionally, the 120 Series is suitable for use within safety instrumented systems (SIS) according to standard IEC 61511-1. Several 120 Series models have a SIL capability of SIL 2 based upon "proven in use" performance.

The 120 Series offers a variety of pressure, vacuum, differential pressure and temperature ranges, as well as port connections, wetted materials and sensor types. With a common flexible platform, models can quickly be adapted at the factory for special requirements, such as ranges, process connections and electrical ratings. Typical industries using 120 Series switches include chemical, petrochemical, refinery, oil and gas production and transmission, and pharmaceuticals.

FEATURES

- Approvals include cULus and ATEX
- Optional approvals for Russia, Ukraine, China and Australia
- Internal adjustment screw or external adjustment via calibrated dial(s) with tamper resistant cover
- Integral cover lock
- SPDT, DPDT or dual SPDT output
- Wide variety of sensor materials
- Optional Hastelloy® and Monel® sensor material for corrosive media
- Wide adjustable deadband models
- Flush mount sensors
- Stainless steel flanges conforming to ANSI standards
- Heat tracing temperature models
- Most models available for immediate delivery!



SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71°C)
AMBIENT TEMPERATURE LIMITS	-58 to 160°F (-50 to 71°C); models 36-39, 520-525, 540-548, 701-705, 15834-15839: 0 to 160°F (-17 to 71°C); types 820E, 822E: -40 to 160°F (-40 to 71°C) set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change; less than 2% for types E121 & E122
SET POINT REPEATABILITY	Temperature models: Type B, C and F: $\pm 1\%$ of full scale range Type E: $\pm 2\%$ of full scale range Pressure models 126-164, S126B-S164B, 171-174, 270-274, 358-376, 520-535, 540-543, 560-564, 701-705, 15622, 15834-15839: $\pm 1\%$ of full scale range; models 450-559: $\pm 1\frac{1}{2}\%$ of full scale range; models 36-39, 183-194, 483-494, 544-548, 565-567, 612-680, 15875: $\pm 1\frac{1}{2}\%$ of full scale range Set point repeats after 15 G, 10 millisecond duration
SHOCK	
VIBRATION	Set point repeats after 2.5 G, 5-500 Hz
ENCLOSURE	Die cast aluminum, epoxy powder coated; gasketed; coverlock; internal set point lock standard on types J, C, F; gasketed stainless steel tamper-resistant dial cover on types B, H, E; aluminum nameplate
ENCLOSURE CLASSIFICATION	Certified to enclosure type 4X. Class I, Division 1 product meets enclosure type 7; Class II, Division 1 product meets enclosure type 9. Certified to IP66 requirements
SWITCH OUTPUT	One or two SPDT; dual switch may be separated up to 100% of range; except type 822E where switch #2 can be set up to 25% of range span below switch #1 setpoint; switches may be wired "normally open" or "normally closed". Two SPDT hermetic sealed switches available on H122P models
ELECTRICAL RATING	15A 125/250/480 VAC resistive (standard) except types J120-15622, 15834-15839, H121-15875: 20A 125/250/480 VAC resistive; H122P; 11A 125/250 VAC resistive; B121-13272, B122-13322, E121-13273, E122-13321; 22A 480VAC resistive. Electrical switches have limited DC capabilities. Consult factory for additional information
REFERENCE SCALES	Types B, E & H: external dial. Scale divisions vary with range (see model charts)
WEIGHT	3-8 lbs. Varies with type and model
ELECTRICAL CONNECTION	Type H, B, E; one 3/4" NPT E/C; type J, C, F, 820E, 822E; two 3/4" NPT E/C; terminal block standard
PRESSURE CONNECTION	Models S126B-S164B, 171-194, 483-494, 520-535: 1/2" NPT (female); models 560-564: 2" flush mount connection; models 565-567: 1-1/2" flush mount connection; models 540-548: 1/8" NPT (female); all others: 1/4" NPT (female)
TEMPERATURE ASSEMBLY	Bulb and capillary: 6 feet 304 stainless steel (standard) except for E121-13273 and E122-13321: 10 feet; Immersion stem: nickel-plated brass (standard) except for B121-13272 and B122-13322: stainless steel. Fill: Model 1BS: solvent filled; models 2BS-8BS: non-toxic oil filled
TEMPERATURE DEADBAND	Type F120, 820E, 822E: typically 1%; type B-, C-, and E- 121 and 122: typically 2% of range under laboratory conditions (70°F [21°C] ambient circulating bath at rate of 1/2°F per minute change)
PRESSURE DEADBAND	See Individual model charts on pages 5-14
DIFFERENTIAL PRESSURE INDICATOR (OPTION M210)	Differential pressure indication available types H121K and H122K with option M210 (check model availability under options); accuracy approximately 1% mid 50% of range, 3% at ends; window is plexiglass and gasketed; indicator may be field adjusted for approximately $\pm 1\%$ accuracy at any set point within range
TEMPERATURE INDICATION	Temperature indication available types 820E and 822E. Indication accuracy is $\pm 1\%$ of adjustable range

AGENCY APPROVALS



UNITED STATES AND CANADA

Class I, Division 1 and 2, Groups B, C & D
Class II, Division 1 and 2, Groups E, F & G
Class III
Class I, Zone 1, Group IIB + H2 T6
Enclosure Type 4X
UL Listed, cUL Certified
Pressure: UL 50 & 698; CSA C22.2
No. 25 & 30 - File # E40857
Temperature: UL 50 & 698; CSA C22.2
No. 25 & 30 - File # E43374



EUROPE

ATEX Directive (94/9/EC)

II 2 G Ex d IIC T6
II 2 D Ex tD A21 IP66 T+85°C
Tamb = -40°C to +75°C
UL International DEMKO A/S (N.B.# 0539)
Certificate # DEMKO 09 ATEX 0815573X
EN 60079-0, 60079-1, 61241-0 & 61241-1



II 1 G EEx ia IIC T6 **(OPTIONAL – code M405)**
(not available types 820E, 822E)
Tamb = -50°C to +60°C
UL International DEMKO A/S (N.B.# 0539)
Certificate # DEMKO 03 ATEX 0335063
EN 50014, 50020 & 50284



Pressure Equipment Directive (PED) (97/23/EC)

Compliant to PED
Products rated lower than 7.5 psi are outside the scope of the PED

Low Voltage Directive (LVD) (73/23/EC & 93/68/EEC)

UEC compliant to LVD
Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD
The Low Voltage Directive does not apply to products for use in hazardous locations



RUSSIA

Models 120, 121 and 122

Gosgortekhnadzor Permit **(OPTIONAL – code M406)**

OExialICT6
Tamb = -50°C to +60°C
NANIO CCVE Certification Center
Certificate # ROSS US.GB05.Bo2933
GOST R 51330.0, 51330.1, 51330.10 & 51330.14

Models 120, 121, 122, 820 & 822

1ExdIICT6X
Tamb = -56°C to +85°C (models 120, 121 & 122)
Tamb = -40°C to +71°C (models 820 & 822)
NANIO CCVE Certification Center
Certificate # ROSS US.GB05.Bo2933
GOST R 51330.0, 51330.1, 51330.10 & 51330.14



UKRAINE

Gosnadzorohrantruda Permit **(OPTIONAL - code M404)**

1ExdIICT6X
Tamb = -56°C to +85°C (types 120, 121 & 122)
Tamb = -40°C to +71°C (types 820 & 822)
Certificate # 1867.04.30 - 31.62.4



CHINA

CQST Certified **(OPTIONAL – code M408)**

Exd IIC T6
DIP A21 TA +85°C
Tamb. = -40°C to +75°C
GB 3836.1, 3836.2 & 12476.1
Pressure: Certificate # CNEx 09.2181X
Temperature: Certificate # CNEx 09.2180X



GLOBAL CERTIFICATION* (INCLUDES AUSTRALIA)

IECEx Certified **(OPTIONAL – code M403)**

Ex d IIC T6
Ex tD A21 IP66 T+85°C
Tamb. = -40°C to 75°C
IEC 60079-0 & 60079-1, 61241-0 & 61241-1
Certificate # IECEx UL 03.0001X

* See <http://www.iecex.com/countries.htm> for a list of participating members.

PRESSURE MODEL CHART

• Type J120, single switch with internal adjustment, dual conduits

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise							
	"wc	mbar	"wc	mbar	psi	bar	psi	bar
Buna N diaphragm and O-Ring with epoxy coated aluminum, 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes (other wetted materials available see pg. 16)								
520	300 Vac to 0	-746,7 to 0	0.2 to 8	0,5 to 19,9	200	13,8	400	27,6
521	10 Vac to 10	-24,9 to 24,9	0.1 to 0.6	0,2 to 1,5	200	13,8	400	27,6
522	50 Vac to 50	-124,5 to 124,5	0.1 to 3	0,2 to 7,5	200	13,8	400	27,6
523	0.5 to 5	1,2 to 12,4	0.1 to 0.3	0,2 to 0,7	200	13,8	400	27,6
524	2.5 to 50	6,2 to 124,5	0.1 to 0.8	0,2 to 2,0	200	13,8	400	27,6
525	10 to 250	24,9 to 622,3	0.1 to 6	0,2 to 14,9	200	13,8	400	27,6
Welded 316L stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes								
530	300 Vac to 0	-746,7 to 0	0.2 to 15	0,5 to 37,3	50	3,4	100	6,9
531	10 Vac to 10	-24,9 to 24,9	0.1 to 0.6	0,2 to 1,5	50	3,4	100	6,9
532	50 Vac to 50	-124,5 to 124,5	0.1 to 3	0,2 to 7,5	50	3,4	100	6,9
533	0.5 to 5	1,2 to 12,4	0.1 to 0.3	0,2 to 0,7	50	3,4	100	6,9
534	2.5 to 50	6,2 to 124,5	0.1 to 0.8	0,2 to 2,0	50	3,4	100	6,9
535	10 to 250	24,9 to 622,3	0.1 to 10	0,2 to 24,9	50	3,4	100	6,9
	psi	bar (unless noted)	psi	mbar (unless noted)	psi	bar	psi	bar
2" sanitary welded 316L stainless steel diaphragm and pressure connection. Mates with Tri-Clamp® fitting systems, (not UE supplied)								
560	0.5 to 15	34,5 mbar to 1,0 bar	0.1 to 1	6,9 to 68,9	200	13,8	300	20,7
561	1 to 25	68,9 mbar to 1,7 bar	0.1 to 1.5	6,9 to 103,4	200	13,8	300	20,7
562	2 to 50	0,1 to 3,4	0.1 to 2.5	6,9 to 172,4	200	13,8	300	20,7
563	4 to 100	0,3 to 6,9	0.1 to 4	6,9 to 275,8	200	13,8	300	20,7
564	8 to 200	0,6 to 13,8	0.1 to 5	6,9 to 344,7	200	13,8	300	20,7
1.5" sanitary welded 316L stainless steel diaphragm and pressure connection. Mates with Tri-Clamp® fitting systems, (not UE supplied)								
565	5 to 30	0,3 to 2,1	1 to 5	68,9 mbar to 0,3 bar	1000	68,9	1500	103,4
566	10 to 100	0,7 to 6,9	1 to 12	68,9 mbar to 0,8 bar	1000	68,9	1500	103,4
567	15 to 300	1,0 to 20,7	3 to 22	0,2 to 1,5	1000	68,9	1500	103,4
Welded 316L stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes (NACE MR-0175 compliant)								
171	1 to 20	68,9 mbar to 1,4 bar	0.1 to 1	6,9 to 68,9	500	34,5	1000	68,9
172	2 to 50	0,1 to 3,4	0.1 to 1.5	6,9 to 103,4	500	34,5	1000	68,9
173	4 to 100	0,3 to 6,9	0.1 to 2.5	6,9 to 172,4	500	34,5	1000	68,9
174	8 to 200	0,6 to 13,8	0.1 to 3.5	6,9 to 241,3	500	34,5	1000	68,9

Application Note: The use of metallic diaphragms where higher pressure shock or heavy cycling is expected should be avoided. Models 171-174 should not be used where system or start-up vacuum might exceed 26 " Hg Vac

***Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

****Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing)



120 Series

120 Series

PRESSURE MODEL CHART

• Type J120, single switch with internal adjustment, dual conduits (cont.)

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise							
	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi	bar
316L stainless steel diaphragm (optional Hastelloy® C or Monel®); Viton® GLT O-Ring (optional Kalrez®, Silicone, Ethylene Propylene or Aflas®); 316 stainless steel 1/2" NPT (female) pressure connection (optional Hastelloy® C or Monel®), 0.72" orifice for clean-out purposes. Models 188 and 189 have a 316L stainless steel 1/2" NPT (female) pressure connection (NACE MR-0175 compliant)								
183	1 to 20	0,1 to 1,4	0.3 to 2.5	20,7 to 172,4 mbar	500	34,5	1000	68,9
184	2 to 50	0,1 to 3,4	0.3 to 3	20,7 to 206,8 mbar	500	34,5	1000	68,9
185	4 to 100	0,3 to 6,9	0.5 to 6	34,5 to 413,7 mbar	500	34,5	1000	68,9
186	8 to 200	0,6 to 13,8	1 to 11	0,1 to 0,8	500	34,5	1000	68,9
188	50 to 1000	3,4 to 68,9	25 to 125	1,7 to 8,6	2000	137,9	7000	482,6
189	250 to 3500	17,2 to 241,3	50 to 300	3,4 to 20,7	4000	275,8	7000	482,6
316L stainless steel diaphragm (optional Hastelloy® C or Monel®); Viton®GLT O-Ring (optional Kalrez®, Silicone, Ethylene Propylene or Aflas®); 316 stainless steel 1/2" NPT (female) pressure connection (optional Hastelloy® C or Monel®), 0.06" orifice to dampen pulsations. Models 488 and 489 have a 316L stainless steel 1/2" NPT (female) pressure connection (NACE MR-0175 compliant)								
483	1 to 20	0,1 to 1,4	0.3 to 2.5	20,7 to 172,4 mbar	500	34,5	1000	68,9
484	2 to 50	0,1 to 3,4	0.3 to 3	20,7 to 206,8 mbar	500	34,5	1000	68,9
485	4 to 100	0,3 to 6,9	0.5 to 6	34,5 to 413,7 mbar	500	34,5	1000	68,9
486	8 to 200	0,6 to 13,8	1 to 11	0,1 to 0,8	500	34,5	1000	68,9
488	50 to 1000	3,4 to 68,9	25 to 125	1,7 to 8,6	2000	137,9	7000	482,6
489	250 to 3500	17,2 to 241,3	50 to 300	3,4 to 20,7	4000	275,8	7000	482,6
Welded 316L stainless steel bellows and 1/2" NPT (female) pressure connection								
S126B	30 to 3 "Hg Vac	-1 to -0,1	0.2 to 0.6 "Hg	6,8 to 20,3 mbar	80 "wc	199,1 mbar	5	0,3
S134B	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 0.6 "Hg	6,8 to 20,3 mbar	20	1,4	25	1,7
S137B	15 to 80 "wc	37,3 to 199,1 mbar	2 to 6 "wc	5,0 to 14,9 mbar	80 "wc	199,1 mbar	5	0,3
S144B	0.5 to 20	34,5 mbar to 1,4 bar	0.1 to 0.3	6,9 to 20,7 mbar	20	1,4	25	1,7
S152B	1 to 50	0,1 to 3,4	0.1 to 0.5	6,9 to 34,5 mbar	50	3,4	75	5,2
S156B	2 to 100	0,1 to 6,9	0.2 to 0.6	13,8 to 41,4 mbar	100	6,9	125	8,6
S164B	4 to 200	0,3 to 13,8	0.2 to 1	13,8 to 68,9 mbar	200	13,8	200	13,8

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Monel® is a registered trademark of the Special Metals Corporation
Tri-Clover and **Tri-Clamp®** is a registered trademark of Alfa Laval
Hastelloy® is a registered trademark of Haynes International, Inc
Aflas® is a registered trademark of Asahi Glass

PRESSURE MODEL CHART

• Type J120, single switch with internal adjustment, dual conduits (cont.)

Model	Adjustable Set Point Range		Deadband				Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise		Lower 75% range span		Top 25% range span					
	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
Welded 316 stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes (NACE MR-0175 compliant, except model 194)										
190	5 to 30	0,3 to 2,1	1 to 3	0,1 to 0,2	6 max	0,4	1500	103,4	2500	172,4
191	10 to 100	0,7 to 6,9	1 to 8	0,1 to 0,6	15 max	1,0	1500	103,4	2500	172,4
192	15 to 300	1,0 to 20,7	3 to 18	0,2 to 1,2	25 max	1,7	1500	103,4	2500	172,4
193	20 to 500	1,4 to 34,5	4 to 30	0,3 to 2,1	45 max	3,1	1500	103,4	2500	172,4
194	80 to 1700	5,5 to 117,2	5 to 120	0,3 to 8,3	150 max	10,3	2000	137,9	2500	172,4
Welded 316 stainless steel diaphragm and 1/2" NPT (female) pressure connection, 0.06" orifice to dampen pulsations										
490	5 to 30	0,3 to 2,1	1 to 3	0,1 to 0,2	6 max	0,4	1500	103,4	2500	172,4
491	10 to 100	0,7 to 6,9	1 to 8	0,1 to 0,6	15 max	1,0	1500	103,4	2500	172,4
492	15 to 300	1,0 to 20,7	3 to 18	0,2 to 1,2	25 max	1,7	1500	103,4	2500	172,4
493	20 to 500	1,4 to 34,5	4 to 30	0,3 to 2,1	45 max	3,1	1500	103,4	2500	172,4
494	80 to 1700	5,5 to 117,2	5 to 120	0,3 to 8,3	150 max	10,3	2000	137,9	2500	172,4

Model	Adjustable Set Point Range		Deadband				Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise									
	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi	bar
Brass bellows with nickel-plated brass 1/4" NPT (female) pressure connection; models 126 & 134 have zinc-plated steel spring which is exposed to media										
126	30 to 3 "Hg Vac	-1 to -0,1	0.2 to 0.6 "Hg	6,8 to 20,3 mbar	80 "wc	199,1 mbar	5	0,3		
134	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 0.6 "Hg	6,8 to 20,3 mbar	20	1,4	25	1,7		
137	15 to 80 "wc	37,3 to 199,1 mbar	2 to 6 "wc	5,0 to 14,9 mbar	80 "wc	199,1 mbar	5	0,3		
144	0.5 to 20	34,5 mbar to 1,4 bar	0.1 to 0.3	6,9 to 20,7 mbar	20	1,4	25	1,7		
152	1 to 50	0,1 to 3,4	0.1 to 0.5	6,9 to 34,5 mbar	50	3,4	75	5,2		
156	2 to 100	0,1 to 6,9	0.2 to 0.6	13,8 to 41,4 mbar	100	6,9	125	8,6		
164	4 to 200	0,3 to 13,8	0.2 to 1	13,8 to 68,9 mbar	200	13,8	200	13,8		
Welded 316L stainless steel bellows and 1/4" NPT (female) pressure connection										
356	15 to 100	1,0 to 6,9	0.7 to 1.8	48,3 to 124,1 mbar	100	6,9	800	55,2		
358	15 to 200	1,0 to 13,8	1 to 3	0,1 to 0,2	200	13,8	800	55,2		
361	20 to 300	1,4 to 20,7	1 to 4	0,1 to 0,3	300	20,7	800	55,2		
376	25 to 500	1,7 to 34,5	1.5 to 5	0,1 to 0,3	500	34,5	800	55,2		
Phosphor bronze bellows with nickel-plated brass 1/4" NPT (female) pressure connection										
270	4 to 200	0,3 to 13,8	1 to 4	0,1 to 0,3	200	13,8	250	17,2		
274	6 to 300	0,4 to 20,7	1 to 5	0,1 to 0,3	300	20,7	350	24,1		

*Over Range Pressure: The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

**Proof Pressure: The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing)

Deadband note: Models 190-194, 490-494 are expressed as the lower 75 % and top 25% of the range span because of the operating characteristics of the diaphragm sensor and switch.



120 Series

120 Series

PRESSURE MODEL CHART

• Type J120, single switch with internal adjustment, dual conduits (cont.)

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise							
	psi	bar	psi	bar	psi	bar	psi	bar
	(unless noted)	(unless noted)	(unless noted)	(unless noted)	(unless noted)			
303 stainless steel piston with Buna N O-Ring and 303 stainless steel 1/4" NPT (female) pressure connection (not recommended for gas service since drying of the O-Ring seal can allow bleeding of medium into the atmosphere)								
612	125 to 3000	8,6 to 206,8	40 to 250	2,8 to 17,2	6000	413,7	10000	689,5
616	700 to 5000	48,3 to 344,7	40 to 375	2,8 to 25,9	6000	413,7	10000	689,5
316 stainless steel bellows and 1/4" NPT (female) pressure connection (not recommended for rapid or high cycling pressure changes)								
680	100 to 1700	6,9 to 117,2	9 to 40	0,6 to 2,8	1700	117,2	2500	172,4
Buna N diaphragm and O-Ring with nickel-plated brass 1/4" NPT (female) pressure connection; Optional Viton diaphragm and O-Ring available								
701	1.5 to 30	103,4 mbar to 2,1 bar	1 to 2	68,9 mbar to 0,1 bar	500	34,5	1000	68,9
702	3 to 100	0,2 to 6,9	1 to 4	68,9 to 0,3 bar	500	34,5	1000	68,9
703	9 to 300	0,6 to 20,7	1 to 5	68,9 to 0,3 bar	500	34,5	1000	68,9
704	15 to 500	1,0 to 34,5	2 to 8	0,1 to 0,6	1500	103,4	2500	172,4
705	30 to 1000	2,1 to 68,9	3 to 20	0,2 to 1,4	1500	103,4	2500	172,4
Buna N diaphragm and O-Ring with 1/4" NPT (female) aluminum connection and cap								
450	30 "Hg Vac to 3 "Hg Vac	-1 to -0,1	0.1 to 0.3 "Hg	3,4 to 10,2 mbar	80 "wc	199,1 mbar	225	15,5
451	2 to 80" wc	5 to 199,1 mbar	0.8 to 2 "wc	2 to 5 mbar	80 "wc	199,1 mbar	225	15,5
452	30 "Hg Vac to 20 psi	-1,0 to 1,4	0.1 to 0.4 "Hg	3,4 to 13,5 mbar	20	1,4	225	15,5
453	0.5 to 20	34,5 mbar to 1,4 bar	0.05 to 0.1	3,4 to 6,9 mbar	20	1,4	225	15,5
454	0.8 to 30	55,2 mbar to 2,1 bar	0.05 to 0.2	3,4 to 13,8 mbar	30	2,1	225	15,5
Teflon® diaphragm and O-Ring 316 stainless steel with 1/4" NPT (female) 316 stainless steel pressure connection and cap								
550	30 "Hg Vac to 3 "Hg Vac	-1 to -0,1	0.1 to 0.4 "Hg	3,4 to 13,5 mbar	80 "wc	199,1 mbar	225	15,5
551	2 to 80 "wc	5 to 199,1 mbar	1 to 4 "wc	2,5 to 10 mbar	80 "wc	199,1 mbar	225	15,5
552	30 "Hg Vac to 20 psi	-1,0 to 1,4	0.2 to 0.5 "Hg	6,8 to 16,9 mbar	20	1,4	225	15,5
553	0.5 to 20	34,5 mbar to 1,4 bar	0.1 to 0.2	6,9 to 13,8 mbar	20	1,4	225	15,5
554	0.8 to 30	55,2 mbar to 2,1 bar	0.1 to 0.3	6,9 to 20,7 mbar	30	2,1	225	15,5
555	2 to 100	0,1 to 6,9	0.2 to 0.4	13,8 to 27,6 mbar	100	6,9	225	15,5

***Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

****Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing)

PRESSURE MODEL CHART

• Type J120, single switch with internal adjustment, dual conduits with adjustable deadband micro-switch

Model	Adjustable Set Point Range		Adjustable Deadband						Over Range Pressure*		Proof Pressure**	
	Low end of range on fall; High end of range on rise											
	psi	bar	psi		bar				psi	bar	psi	bar
	(unless noted)	(unless noted)	(unless noted)						(unless noted)		(unless noted)	
Viton® diaphragm and O-ring with 1/4" NPT (female) 303 stainless steel pressure connection												
15622	20 to 200	1,4 to 13,8	12 to 26		0,8 to 1,8				500	34,5	1000	68,9
	psi	bar	Low end psi	bar	Mid Range psi	bar	High End psi	bar	psi	bar	psi	bar
Buna N diaphragm and O-Ring with nickel-plated brass 1/4" NPT (female) pressure connection												
15834	3 to 30	0,2 to 2,1	1.5 to 4	0,1 to 0,3	2 to 4.5	0,1 to 0,3	2.5 to 5	0,2 to 0,3	500	34,5	1000	68,9
15835	5 to 100	0,3 to 6,9	3 to 6	0,2 to 0,4	4 to 7.5	0,3 to 0,5	5 to 9	0,3 to 0,6	500	34,5	1000	68,9
15836	9 to 300	0,6 to 27	4 to 11	0,3 to 0,8	5 to 13	0,3 to 0,9	5 to 16	0,3 to 1,1	500	34,5	1000	68,9
15837	15 to 500	1 to 34,5	8 to 25	0,6 to 1,7	9 to 28	0,6 to 1,9	10 to 31	0,7 to 2,1	1500	103,4	2500	172,4
15838	30 to 1000	2,1 to 68,9	9 to 30	0,6 to 2,1	10 to 35	0,7 to 2,4	30 to 90	2,1 to 6,2	1500	103,4	2500	172,4
15839	100 to 1700	6,9 to 117,2	25 to 60	1,7 to 4,1	40 to 80	2,8 to 5,5	50 to 100	3,4 to 6,9	2000	137,9	2500	172,4

• H121, single switch with external adjustment via reference dial, single conduit with adjustable deadband micro-switch

Model	Adjustable Set Point Range		Adjustable Deadband						Proof Pressure**		Dial Divisions
	Low end of range on fall; High end of range on rise										
	psi	bar	Low end psi	bar	Mid Range psi	bar	High End psi	bar	psi	bar	
			bar		bar		bar		bar		
303 stainless steel piston with Buna N O-Ring and 303 stainless steel 1/4" NPT (female) pressure connection, includes adjustable deadband micro-switch (not recommended for gas service since drying of the O-Ring seal can allow bleeding of medium into the atmosphere)											
15875 [†]	500 to 6000	34,5 to 413, 7	150 to 400	10,3 to 27,6	250 to 500	17,2 to 34,5	450 to 750	31,0 to 51,7	10,000	689,5	100

*Over Range Pressure: The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

**Proof Pressure: The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing)

[†]Not available on type H122



PRESSURE MODEL CHART

- **Type H121, single switch with external adjustment via reference dial, single conduit**
- **Type H122, dual switch with external adjustment via reference dial, single conduit**

Model	Adjustable Set Point Range		Deadband		Proof Pressure**		Dial Divisions
	Low end of range on fall; High end of range on rise psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi	bar	psi (unless noted)
Welded 316L stainless steel bellows and 1/2" NPT (female) pressure connection							
S126B	30 "Hg Vac to 0 psi	-1 to 0	0.2 to 0.9 "Hg	6,8 to 30,5 mbar	5	0,3	0.5 "Hg
S134B	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	6,8 to 40,6 mbar	25	1,7	1 "Hg & 0.5 psi
S137B†	2 to 80 "wc	5 to 199,1 mbar	2 to 10 "wc	5 to 24,9 mbar	5	0,3	2 "wc
S144B	0 to 20	0 to 1,4	0.1 to 0.5	6,9 to 34,5 mbar	25	1,7	0.5
S146B	0 to 30	0 to 2,1	0.1 to 0.6	6,9 to 41,4 mbar	40	2,8	0.5
S156B	0 to 100	0 to 6,9	0.2 to 0.8	13,8 to 55,2 mbar	125	8,6	2
S164B	0 to 200	0 to 13,8	0.3 to 2	20,7 to 137,9 mbar	200	13,8	5
Brass bellows with nickel-plated brass 1/4" NPT (female) pressure connection; models 126 & 134 have a zinc-plated steel spring which is exposed to media							
126	30 "Hg Vac to 0 psi	-1 to 0	0.2 to 0.9 "Hg	6,8 to 30,5 mbar	5	0,3	0.5 "Hg
134	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	6,8 to 40,6 mbar	25	1,7	1 "Hg & 0.5 psi
137†	2 to 80 "wc	5 to 199,1 mbar	2 to 10 "wc	5 to 24,9 mbar	5	0,3	2 "wc
144	0 to 20	0 to 1,4	0.1 to 0.5	6,9 to 34,5 mbar	25	1,7	0.5
146	0 to 30	0 to 2,1	0.1 to 0.6	6,9 to 41,4 mbar	40	2,8	0.5
156	0 to 100	0 to 6,9	0.2 to 0.8	13,8 to 55,2 mbar	125	8,6	2
164	0 to 200	0 to 13,8	0.3 to 2	20,7 to 137,9 mbar	200	13,8	5
316L stainless steel bellows and 1/4" NPT (female) pressure connection							
358	0 to 200	0 to 13,8	1.5 to 8	0,1 to 0,6	250	17,2	5
361	0 to 300	0 to 20,7	2 to 9	0,1 to 0,6	350	24,1	10
376	0 to 500	0 to 34,5	3 to 12	0,2 to 0,8	575	39,6	10
303 stainless steel piston with Buna N O-Ring and 303 stainless steel 1/4" NPT (female) pressure connection (not recommended for gas service since drying of the O-Ring seal can allow bleeding of medium into the atmosphere)							
612	200 to 3000	13,8 to 206,8	40 to 250	2,8 to 17,2	10,000	689,5	50
614	500 to 6000	34,5 to 413,7	50 to 400	3,4 to 27,6	10,000	689,5	100

****Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing)

† Not available on type H122

PRESSURE MODEL CHART

- **Type H121, single switch with external adjustment via reference dial, single conduit**
- **Type H122, dual switch with external adjustment via reference dial, single conduit**

Model	Adjustable Set Point Range		Deadband		Proof Pressure**		Dial Divisions
	Low end of range on fall; High end of range on rise psi (unless noted)	bar	psi (unless noted)	bar (unless noted)	psi	bar	psi (unless noted)
Phosphor bronze bellows with nickel-plated brass 1/4" NPT (female) pressure connection							
270	0 to 200	0 to 13,8	1.5 to 8	0,1 to 0,6	250	17,2	5
274	0 to 300	0 to 20,7	2 to 10	0,1 to 0,7	350	24,1	10
Buna N diaphragm and O-Ring with aluminum 1/4" NPT (female) pressure connection and cap							
450	30 "Hg Vac to 0 psi	-1 to 0	0.1 to 0.4 "Hg	3,4 to 13,5 mbar	225	15,5	0.5 "Hg
452	30 "Hg Vac to 20 psi	-1 to 1,4	0.1 to 1 "Hg	3,4 to 33,9 mbar	225	15,5	1 "Hg & 0.5 psi
453	0 to 20	0 to 1,4	0.05 to 0.2	3,4 to 13,8 mbar	225	15,5	0.5
454	0 to 30	0 to 2,1	0.05 to 0.3	3,4 to 20,7 mbar	225	15,5	0.5
Teflon® diaphragm and O-Ring with 316 stainless steel 1/4" NPT (female) pressure connection and cap							
550	30 "Hg Vac to 0 psi	-1 to 0,	0.1 to 0.6 "Hg	3,4 to 20,3 mbar	225	15,5	0.5 "Hg
552	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1 "Hg	6,8 to 33,9 mbar	225	15,5	1 "Hg & 0.5 psi
553	0 to 20	0 to 1,4	0.05 to 0.3	3,4 to 20,7 mbar	225	15,5	0.5
554	0 to 30	0 to 2,1	0.1 to 0.4	6,9 to 27,6 mbar	225	15,5	0.5
555	0 to 100	0 to 6,9	0.25 to 0.75	17,2 to 51,7 mbar	225	15,5	2
Buna N diaphragm and O-Ring with nickel-plated brass 1/4" NPT (female) pressure connection; Optional Viton diaphragm and O-Ring available (models 701-703)							
701†	3 to 30	0,2 to 2,1	1 to 3	0,1 to 0,2	1000	68,9	0.5
702	10 to 100	0,7 to 6,9	1 to 5	0,1 to 0,3	1000	68,9	2
703	30 to 300	2,1 to 20,7	2 to 7	0,1 to 0,5	1000	68,9	10
704	50 to 500	3,4 to 34,5	3 to 12	0,2 to 0,8	2500	172,4	10
705	200 to 1000	13,8 to 68,9	5 to 25	0,3 to 1,7	2500	172,4	25

****Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing)

†*Not available on type H122*



120 Series

120 Series

PRESSURE MODEL CHART

- **Type H122P*, two hermetically sealed single switches with external adjustment via reference dial, single conduit**

Model	Adjustable Set Point Range		Deadband		Proof Pressure**		Dial Divisions
	Low end of range on fall; High end of range on rise psi (unless noted)	bar (unless noted)	psi (unless noted)	mbar (unless noted)	psi	bar	psi (unless noted)
Welded 316L stainless steel bellows and 1/2" NPT (female) pressure connection							
S126B	30 "Hg Vac to 0 psi	-1 to 0	0.7 to 4 "Hg	23,7 to 135,4	5	0,3	0.5 "Hg
S134B	30 "Hg Vac to 20 psi	-1 to 1,4	1 to 6 "Hg	33,9 to 203,2	25	1,7	1 "Hg & 0.5 psi
S144B	0 to 20	0 to 1,4	0.3 to 3	20,7 to 206,8	25	1,7	0.5
S146B	0 to 30	0 to 2,1	0.4 to 4	27,6 to 275,8	40	2,8	0.5
S156B	0 to 100	0 to 6,9	0.6 to 6	40,4 to 413,7	125	8,6	2
S164B	0 to 200	0 to 13,8	1.5 to 13	0,1 to 0,9 bar	200	13,8	5
Brass bellows with nickel-plated brass 1/4" NPT (female) pressure connection; models 126 & 134 have a zinc-plated steel spring which is exposed to media							
126	30 "Hg Vac to 0 psi	-1 to 0	0.7 to 4 "Hg	23,7 to 135,4	5	0,3	0.5 "Hg
134	30 "Hg Vac to 20 psi	-1 to 1,4	1 to 6 "Hg	33,9 to 203,2	25	1,7	1 "Hg & 0.5 psi
144	0 to 20	0 to 1,4	0.3 to 3	20,7 to 206,8	25	1,7	0.5
146	0 to 30	0 to 2,1	0.4 to 4	27,6 to 275,8	40	2,8	0.5
156	0 to 100	0 to 6,9	0.6 to 6	40,4 to 413,7	125	8,6	2
164	0 to 200	0 to 13,8	1.5 to 13	0,1 to 0,9 bar	200	13,8	5
Phosphor bronze bellows with nickel-plated brass 1/4" NPT (female) pressure connection							
270	0 to 200	0 to 13,8	6 to 30	0,4 to 2,1 bar	250	17,2	5
274	0 to 300	0 to 20,7	8 to 40	0,6 to 2,8 bar	350	24,1	10
316L stainless steel bellows and 1/4" NPT (female) pressure connection							
358	0 to 200	0 to 13,8	6 to 30	0,4 to 2,1 bar	250	17,2	5
361	0 to 300	0 to 20,7	8 to 40	0,6 to 2,8 bar	350	24,1	10
376	0 to 500	0 to 34,5	10 to 60	0,7 to 4,1 bar	575	39,6	10
Buna N diaphragm and O-Ring with aluminum 1/4" NPT (female) pressure connection and cap							
450	30 "Hg Vac to 0 psi	-1 to 0	0.4 to 3 "Hg	13,5 to 101,6	225	15,5	0.5 "Hg
452	30 "Hg Vac to 20 psi	-1 to 1,4	0.8 to 6 "Hg	27,1 to 203,2	225	15,5	1 "Hg & 0.5 psi
453	0 to 20	0 to 1,4	0.2 to 2	13,8 to 137,9	225	15,5	0.5
454	0 to 30	0 to 2,1	0.3 to 3	20,7 to 206,8	225	15,5	0.5
Teflon® diaphragm and O-Ring with stainless steel 1/4" NPT (female) 316 pressure connection and cap							
550	30 "Hg Vac to 0 psi	-1 to 0,	0.4 to 3 "Hg	13,5 to 101,6	225	15,5	0.5 "Hg
552	30 "Hg Vac to 20 psi	-1 to 1,4	0.8 to 6 "Hg	27,1 to 203,2	225	15,5	1 "Hg & 0.5 psi
553	0 to 20	0 to 1,4	0.2 to 2	13,8 to 137,9	225	15,5	0.5
554	0 to 30	0 to 2,1	0.3 to 3	20,7 to 206,8	225	15,5	0.5
555	0 to 100	0 to 6,9	0.7 to 7	48,3 to 482,6	225	15,5	2
303 stainless steel piston with Buna N O-Ring and 303 stainless steel 1/4" NPT (female) pressure connection (not recommended for gas service since drying of the O-Ring seal can allow bleeding of medium into the atmosphere)							
612	200 to 3000	13,8 to 206,8	150 to 450	10,3 to 31 bar	10,000	689,5	50
614	500 to 6000	34,5 to 413,7	200 to 500	13,8 to 34,5 bar	10,000	689,5	100

* **Please note:** Must specify option code 1180 with all models (i.e. H122P-270-1180)

DIFFERENTIAL PRESSURE MODEL CHART

• Type J120K, single switch with internal adjustment, dual conduits

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband		Working Pressure***		Proof Pressure**	
	psid (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar	psi	bar
Welded 316L stainless steel bellows and 1/2" NPT (female) pressure connections								
S147B	3 to 30	0,2 to 2,1	0.3 to 1.5	20,7 to 103,4 mbar	30 "Hg Vac to 100	-1 to 6,9	300	20,7
S157B	10 to 100	0,7 to 6,9	0.5 to 2	34,5 to 137,9 mbar	30 "Hg Vac to 180	-1 to 12,4	300	20,7
Welded brass bellows with nickel-plated brass 1/4" NPT (female) pressure connections								
147	3 to 30	0,2 to 2,1	0.3 to 1.5	20,7 to 103,4 mbar	30 "Hg Vac to 100	-1 to 6,9	180	12,4
157	10 to 100	0,7 to 6,9	0.5 to 2	34,5 to 137,9 mbar	30 "Hg Vac to 150	-1 to 10,3	180	12,4
Welded 316L stainless steel bellows and 1/4" NPT (female) pressure connections								
367	10 to 100	0,7 to 6,9	4 to 10	0,3 to 0,7	0 to 350	0 to 24,1	500	34,5
Buna N diaphragm and O-Ring with 303 stainless steel 1/4" NPT (female) pressure connections								
36	3 to 30	0,2 to 2,1	1 to 5	0,1 to 0,3	0 to 350	0 to 24,1	1000	68,9
37	10 to 100	0,7 to 6,9	2 to 8	0,1 to 0,6	0 to 500	0 to 34,5	1000	68,9
38	30 to 300	2,1 to 20,7	2 to 15	0,1 to 1,0	0 to 1000	0 to 68,9	2500	172,4
39	50 to 500	3,4 to 34,5	3 to 20	0,2 to 1,4	0 to 1000	0 to 68,9	2500	172,4
Buna N diaphragm and O-Ring with aluminum 1/4" NPT (female) pressure connections								
455	5 to 80 "wcd	12,4 to 199,1 mbar	1 to 4 "wc	2,5 to 10 mbar	30 "Hg Vac to 225	-1 to 15,5	225	15,5
456	2 to 20	0,1 to 1,4	0.1 to 0.3	6,9 to 20,7 mbar	30 "Hg Vac to 225	-1 to 15,5	225	15,5
457	3 to 30	0,2 to 2,1	0.1 to 0.4	6,9 to 27,6 mbar	30 "Hg Vac to 225	-1 to 15,5	225	15,5
Teflon® and Buna N diaphragms, Buna N O-Ring with aluminum 1/4" NPT (female) pressure connections								
559	10 to 100	0,7 to 6,9	0.2 to 1	13,8 to 68,9 mbar	30 "Hg Vac to 225	-1 to 15,5	225	15,5
Buna N diaphragm and sealing diaphragms with aluminum 1/8" NPT (female) pressure connections								
540	0.2 to 7 "wcd	0,5 to 17,4 mbar	0.05 to 0,6 "wc	0,1 to 1,5 mbar	30 "Hg to 200	-1 to 13,8	400	27,6
541	1 to 20 "wcd	2,5 to 49,8 mbar	0.1 to 1.0 "wc	0.2 to 2,5 mbar	30 "Hg to 200	-1 to 13,8	400	27,6
542	5 to 50 "wcd	12,4 to 124,5 mbar	0.2 to 2.5 "wc	0,5 to 6,2 mbar	30 "Hg to 200	-1 to 13,8	400	27,6
543	10 to 200 "wcd	24,9 to 497,8 mbar	0.5 to 8 "wc	1,2 to 19,9 mbar	30 "Hg to 200	-1 to 13,8	400	27,6
544	2 to 20	0,1 to 1,4	0.1 to 1.3	6,9 to 89,6 mbar	30 "Hg to 1200	-1 to 82,7	2500	172,4
545	5 to 50	0,3 to 3,4	0.2 to 2.2	13,8 mbar to 0,1 bar	30 "Hg to 1200	-1 to 82,7	2500	172,4
546	10 to 125	0,7 to 8,6	0.4 to 5.0	27,6 mbar to 0,3 bar	30 "Hg to 1200	-1 to 82,7	2500	172,4
547	50 to 250	3,4 to 17,2	0.8 to 10	0,1 to 0,7	30 "Hg to 1200	-1 to 82,7	2500	172,4
548	100 to 500	6,9 to 34,5	2.0 to 15	0,1 to 1,0	30 "Hg to 1200	-1 to 82,7	2500	172,4

**Proof Pressure: The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing)

***Working Pressure Range: The pressure range within which two opposing sensors can be safely operated and still maintain set point adjustability.

DIFFERENTIAL PRESSURE MODEL CHART

- Type H121K, single switch with external adjustment dial via reference dial, single conduit
- Type H122K, dual switch with external adjustment dial via reference dial, single conduit

Model	Adjustable Set Point Range		Deadband		Working Pressure***		Proof Pressure**		Dial Divisions
	Low end of range on fall; High end of range on rise								
	psid	bar	psi	mbar	psi (unless noted)	bar	psi	bar	
Welded 316L stainless steel bellows and 1/2" NPT (female) pressure connections									
S147B	3 to 30	0,2 to 2,1	0.3 to 2	20,7 to 137,9	30 "Hg Vac to 100	-1 to 6,9	300	20,7	0.5
S157B	10 to 100	0,7 to 6,9	0.5 to 3	34,5 to 206,8	30 "Hg Vac to 180	-1 to 12,4	300	20,7	2
Brass bellows with nickel-plated brass 1/4" NPT (female) pressure connections									
147	3 to 30	0,2 to 2,1	0.3 to 2	20,7 to 137,9	30 "Hg Vac to 100	-1 to 6,9	180	12,4	0.5
157	10 to 100	0,7 to 6,9	0.5 to 3	34,5 to 206,8	30 "Hg Vac to 150	-1 to 10,3	180	12,4	2
Buna N diaphragm, O-Ring with aluminum 1/4" NPT (female) pressure connections									
456	2 to 20	0,1 to 1,4	0.1 to 0.3	6,9 to 20,7	30 "Hg Vac to 225	-1 to 15,5	225	15,5	0.5
457	3 to 30	0,2 to 2,1	0.1 to 0.4	6,9 to 27,6	30 "Hg Vac to 225	-1 to 15,5	225	15,5	0.5
Teflon® and Buna N diaphragms, Buna N O-Ring with aluminum 1/4" NPT (female) pressure connections									
559	10 to 100	0,7 to 6,9	0.2 to 1	13,8 to 68,9	30 "Hg Vac to 225	-1 to 15,5	225	15,5	2

****Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing)

*****Working Pressure Range:** The pressure range within which two opposing sensors can be safely operated and still maintain set point adjustability.



Differential Pressure Indicating Option M210

TEMPERATURE MODEL CHART

- **Type B121, single switch, immersion stem, external adjustment via reference dial, single conduit**
- **Type B122, dual switch, immersion stem, external adjustment via reference dial, single conduit**
- **Type C120, single switch, immersion stem, internal adjustment, dual conduits**
- **Type E121, single switch, bulb and capillary, external adjustment via reference dial, single conduit**
- **Type E122, dual switch, bulb and capillary, external adjustment via reference dial, single conduit**
- **Type F120, single switch, bulb and capillary, internal adjustment, dual conduits**

Model	Adjustable Set Point Range		Max. Temp.		Scale Div.		Stem or Bulb Size* /Finish**
	°F	°C	°F	°C	°F	°C	OD x Length
Type B121, single switch, immersion stem, external adjustment via reference dial. Type B122, dual switch, immersion stem, external adjustment via reference dial. Type C120, single switch, immersion stem, internal adjustment							
120	0 to 225	-17.8 to 107.2	275	135	5†	5†	9/16" x 1-7/8" below thread, 1/2" NPT nickel-plated brass
121	200 to 425	93.3 to 218.3	475	246.1	5†	5†	9/16" x 1-7/8" below thread, 1/2" NPT nickel-plated brass
13272 (B121) 13322 (B122) (Heat Tracing)	15 to 140	-9.4 to 60	160	71.1	2†	2†	9/16" x 2-11/16" long stainless steel
Type E121, single switch, bulb and capillary, external adjustment via reference dial. Type E122, dual switch, bulb and capillary, external adjustment via reference dial							
2BSA	-120 to 100	-84.4 to 37.8	150	65.6	5	5	3/8 x 2-5/8"
2BSB	30 to 250	-1.1 to 121.1	300	148.9	5	5	3/8 x 2-5/8"
3BS	100 to 400	37.8 to 204.4	450	232.2	5	5	3/8 x 2-1/8"
4BS	25 to 100	-3.9 to 37.8	150	65.6	2	1	3/8 x 6-3/4"
5BS	-20 to 80	-28.9 to 26.7	130	54.4	2	2	3/8 x 5"
8BS	350 to 640	176.7 to 337.8	690	365.6	5	5	3/8 x 3-1/4"
13273 (E121) 13321 (E122) (Heat Tracing)	25 to 325	-3.9 to 162.8	360	182.2	5	5	1/4" x 10-1/4"
Type F120, single switch, bulb and capillary, internal adjustment							
1BS	-180 to 120	-117.8 to 48.9	170	76.7	N/A		3/8 x 3-3/4"
2BS	-125 to 350	-87.2 to 176.7	400	204.4	N/A		3/8 x 2-5/8"
3BS	-125 to 500	-87.2 to 260	550	287.8	N/A		3/8 x 2-1/8"
4BS	-40 to 120	-40 to 48.9	170	76.7	N/A		3/8 x 6-3/4"
5BS	-40 to 180	-40 to 82.2	230	110	N/A		3/8 x 5"
6BS	0 to 250	-17.8 to 121.1	300	148.9	N/A		3/8 x 4-1/2"
7BS	0 to 400	-17.8 to 204.4	450	232.2	N/A		3/8 x 3"
8BS	50 to 650	10 to 343.3	700	371.1	N/A		3/8 x 3-1/4"

† Types B121, B122 only.

*Optional immersion stem lengths and capillary lengths are available – consult UE. Standard capillary length is 6 FT except HTPF models which are 10 FT.

**Optional stainless steel immersion stem, and stainless steel armored or Teflon covered capillary available – consult UE.



INDICATING TEMPERATURE CONTROL MODEL CHART

- **Type 820E, single switch, external adjustment and temperature indication, dual conduits**
- **Type 822E, dual switch, external adjustment and temperature indication, dual conduits**

Model	Adjustable Set Point Range		Max. Temp.		Scale Div.		Bulb Size
	°F	°C	°F	°C	°F	°C	OD x Length
1BS	-180 to 120	-117.8 to 48.9	170	76.7	5	5	3/8 x 3-3/4"
2BS	-125 to 350	-87.2 to 176.7	400	204.4	10	5	3/8 x 2-5/8"
3BS	-125 to 500	-87.2 to 260	550	287.8	10	5	3/8 x 2-1/8"
4BS	-40 to 120	-40 to 48.9	170	76.7	5	2	3/8 x 6-3/4"
5BS	-40 to 180	-40 to 82.2	230	110	5	2	3/8 x 5"
6BS	0 to 250	-17.8 to 121.1	300	148.9	5	2	3/8 x 4-1/2"
7BS	0 to 400	-17.8 to 204.4	450	232.2	10	5	3/8 x 3"
8BS	50 to 650	10 to 343.3	700	371.1	10	10	3/8 x 3-1/4"

Standard capillary length is 6ft. optional lengths and capillary protection available – consult UE.



Explosion proof
indicating temperature
switch, available with
single or dual set points

HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.
Determine type number based on switch output, enclosure, adjustment and reference.
Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts"
Determine model based on adjustable range, deadband and proof pressure.
Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section
Determine option number based on switch output, optional materials or other product enhancements.
Fill in the option portion of your part number with the corresponding number.
Leave "option" portion blank if no options are needed. FOR MULTIPLE OPTIONS: Call United Electric Controls.

TYPE	DESCRIPTION
Pressure	Type J120 - One SPDT; epoxy coated enclosure; internal adjustment with no reference scale , dual conduits Type H121 - One SPDT; epoxy coated enclosure; external adjustment with reference dial , single conduit Type H122 - Two SPDT; epoxy coated enclosure; external adjustment with reference dial , single conduit Type H122P - Two SPDT; hermetically sealed switches; epoxy coated enclosure; external adjustment with reference dial , single conduit
Differential Pressure	Type J120K - One SPDT; epoxy coated enclosure; internal adjustment with no reference scale , dual conduits Type H121K - One SPDT; epoxy coated enclosure; external adjustment with reference dial , single conduit Type H122K - Two SPDT; epoxy coated enclosure; external adjustment with reference dial , single conduit
Temperature	Type B121 - Immersion stem; one SPDT; epoxy coated enclosure; external adjustment with reference dial , single conduit Type B122 - Immersion stem; two SPDT; epoxy coated enclosure; external adjustment with reference dial , single conduit Type C120 - Immersion stem; one SPDT; epoxy coated enclosure; internal adjustment with no reference scale , dual conduits Type E121 - Bulb and capillary; one SPDT; epoxy coated enclosure; external adjustment with reference dial , single conduit Type E122 - Bulb and capillary; two SPDT; epoxy coated enclosure; external adjustment with reference dial , single conduit Type F120 - Bulb and capillary; one SPDT; epoxy coated enclosure; internal adjustment with no reference dial , dual conduits Type 820E - Bulb and capillary; one SPDT; external adjustment and temperature indication , dual conduits Type 822E - Bulb and capillary; two SPDT; external adjustment and temperature indication , dual conduits

SWITCH OPTIONS**

0140	Gold contacts, 1 amp 125 VAC resistive, NOT AVAILABLE TYPE H122P, 820E, & 822E
0500	Close deadband, 5 amp 125/250 VAC resistive. NOT AVAILABLE TYPE H122P AND MODELS 520-535
1010	DPDT switch, 10 amp 125/250 VAC resistive; deadband and minimum set point will increase. NOT AVAILABLE TEMPERATURE VERSIONS; TYPES H122, H122P H122K; OR J120K MODELS 36-39, 367, AND 540-548; OR J120 MODELS 171-194, 483-494, 520-535, 560-567, 680
1070	10 amp 125 VDC or VAC resistive; deadband and minimum set point will increase. NOT AVAILABLE TYPES 820E, 822E, H122P, H122K, B122, AND J120K MODELS 36-39; J120 MODELS 171-194, 483-494, 520-535, 560-567
1180	Hermetically sealed, SPDT, 11 amp 125/250 VAC resistive, must be specified with type H122P. NOT AVAILABLE TYPES B122, E122, H122, H121K and H122K, 820 AND 822E; deadband and minimum set point will increase.
1190	Hermetically sealed, DPDT, 11 amp 125/250 VAC; products set on rising pressure or temperature due to inherent separation of circuits on falling pressure or temperature; specify option 1195 if setting on fall is required; deadband and minimum set point will increase. NOT AVAILABLE TYPES 820E, 822E, B122, E122, H122, H121K, H122K, H122P or models 523, 533
1195	Hermetically sealed, DPDT, 11 amp 125/250 VAC; products set on falling pressure or temperature due to inherent separation of circuits on rising pressure or temperature; specify option 1190 if setting on rise is required; deadband and minimum set point will increase. NOT AVAILABLE TYPES 820E, 822E, B122, E122, H122, H121K, H122K, H122P or models 523, 533

** All switches have limited DC capabilities. Consult factory for details.



SWITCH OPTIONS** (CONT.)

1519*	Adjustable deadband, 15 amp 125/250/480 VAC resistive; adjustable wheel changes rise setting only; if adjustment of fall setting is required use primary adjustment; deadband and minimum set point will increase. NOT AVAILABLE TYPES 820E, 822E, B121, B122, E121, E122, H121, H122, H121K, H122K, H122P or models 171-194, 483-494, 520-535, 560-567, 612-616
1530	External manual reset, 15 amp 125/250/480 VAC resistive; latches on rise only. NOT AVAILABLE TYPES 820E, 822E, B122, E122, H122, H121K, H122K, H122P
1535	High ambient, 15 amp 125/250 VAC resistive; temperatures up to 250°F (120°C). NOT AVAILABLE TYPES 820E, 822E, H122P models 520-535
1537	Vapor sealed switch, 15 amp 125/250 VAC resistive. NOT AVAILABLE TYPES 820E, 822E, H122P or models 520-535
1539	Fungus resistant case, 15 amp 125/250 VAC resistive. NOT AVAILABLE TYPES 820E, 822E, H122P or models 520-535
2000	20 amp 125/250 VAC resistive. NOT AVAILABLE MODELS H122P, 520-535, 540-548
3000	30 amp 125/250/277 VAC resistive. NOT AVAILABLE TYPES 820E, 822E, B121, B122, E122, H121, H122, H121K, H122K, H122P, J120K or models 171-194, 483-494, 520-535, 540-548, 560-567

SENSOR OPTIONS

M504	316L stainless steel stem. AVAILABLE TEMPERATURE MODELS 120 AND 121 ONLY
M540	Viton® wetted parts with standard pressure connection. Deadbands and low end of range may increase. AVAILABLE MODELS 36-39, 450-454, 540-548. Models 455-457 (Viton® sealing diaphragms and O-rings with Teflon® main diaphragm). Models 612-616 (O-Ring only). AVAILABLE TYPE J120 MODELS 701-705 and TYPES H121 and H122 MODELS 701-703 with stainless steel pressure connection.
M913	1/4" NPT (female) stainless steel pressure connection. AVAILABLE ON MODELS S126B - S146B, S152B, S156B, S164B, 188 AND 189 ONLY
M914	1/2" NPT (female) stainless steel pressure connection. AVAILABLE ON MODELS 356, 358, 361, 376, 612 AND 616 ONLY
6361-762	1/2" NPT MALE to G1/2 male stainless steel pressure fitting adaptor kit
6361-761	1/4" NPT male to G1/2 male stainless steel pressure fitting adaptor kit

OPTIONAL SENSOR MATERIAL FOR "WC RANGES. AVAILABLE MODELS 520-525

XC001	Aluminum pressure connection, Viton® diaphragm, Viton® O-Ring
XC002	Aluminum pressure connection, Kapton® diaphragm, Buna N O-Ring
XC003	Aluminum pressure connection, Kapton® diaphragm, Viton® O-Ring
XC004	316L Stainless steel pressure connection, 316L Stainless steel diaphragm, Viton® O-Ring (Over range pressure is limited to 100 psi)
XC005	316L Stainless steel pressure connection, Viton® diaphragm, Viton® O-Ring
XC006	316L Stainless steel pressure connection, Kapton® diaphragm, Viton® O-Ring
XC007	316L Stainless steel pressure connection, Teflon® diaphragm, Viton® O-Ring

OPTIONAL SENSOR MATERIAL FOR CORROSIVE MEDIA. AVAILABLE MODELS 183-189, 483-489

XD002	Hastelloy® C diaphragm (NACE MR-0175 compliant)
XD003	Monel® diaphragm (NACE MR-0175 compliant)
XP112	Hastelloy® C pressure connection (NACE MR-0175 compliant)
XP113	Monel® pressure connection (NACE MR-0175 compliant)

*Please note: In order to accommodate free movement of adjustable wheel, left hand electrical conduit is permanently sealed.

** All switches have limited DC capabilities. Consult factory for details.

OPTIONAL SENSOR MATERIAL FOR CORROSIVE MEDIA (CONT.)

XR211	Kalrez® O-Ring
XR212	Silicone O-Ring. NOT AVAILABLE MODELS 188-189, 488-489
XR213	Ethylene propylene O-Ring
XR214	Aflas® O-Ring

OTHER OPTIONS

M201	Factory set one switch
M202	Factory set two switches. NOT AVAILABLE SINGLE SWITCH VERSIONS
M210	Differential pressure indication. AVAILABLE ON H121K, H122K, MODELS 147, 157, S147B, S157B ONLY
M277	Range indicated on nameplate in kPa or MPa. NOT AVAILABLE ON TEMPERATURE VERSIONS
M278	Range indicated on nameplate in Kg/cm ² . NOT AVAILABLE ON TEMPERATURE VERSIONS
M320	Tamper resistant cover for indication portion of control, internal adjustment. AVAILABLE TYPES 820E AND 822E ONLY
M403	Flameproof compliance for Australia per IECEx standards NOT AVAILABLE ON 820E AND 822E
M404	Flameproof compliance for Ukraine per Gosnadzorohrantruda standards
M405	Intrinsic safety compliance for European Union per ATEX standards. NOT AVAILABLE TYPES 820E AND 822E
M406	Flameproof and intrinsic safety compliance for Russia per Gosgortekhnadzor standards. Intrinsic safety NOT AVAILABLE TYPES 820E & 822E
M408	Flameproof compliance for China per CQST standards
M440	Cover chain
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M450	Breather drain. NOT AVAILABLE WITH OPTIONS 1530, M210 OR WITH ATEX CERTIFICATION
M550	Oxygen service cleaning; alcohol cleaning to remove residue from the process connection. NOT AVAILABLE ON H122, MODELS 704 AND 705
6361-704	Surface and pipe mounting hardware. (required for models 520-535, 540-548 when surface mounting)

ALSO AVAILABLE: 150# and 300# flanges (consult factory for part numbers)

NOTE: Options available on models 13272, 13273, 13321, 13322, 15622, 15834-15839 and 15875 are M201, M202, M444, M446 and various certification related documentation only.



OPTIONS FOR TEMPERATURE MODELS

UNION CONNECTORS

Option	Replacement Number	Description
<u>Brass</u>		
W027	SD6213-27	1/2" NPT w/ 3/4" bushing
W045	SD6213-45	3/4" NPT
W051	SD6213-51	1/2" NPT
<u>304 Stainless Steel</u>		
W028	SD6213-28	1/2" NPT w/ 3/4" bushing
W046	SD6213-46	3/4" NPT
W050	SD6213-50	1/2" NPT

THERMOWELLS

For all bulb & capillary switches, except Models 13273 and 13321

<u>Brass</u>		
W075	SD6225-75	3/4" NPT bushing adapter, 4" BT
W191	SD6225-191	1/2" NPT, 4" BT
W118	SD6225-118	3/4" NPT bushing adapter, 7" BT
W192	SD6225-192	1/2" NPT, 7" BT
<u>316 Stainless Steel</u>		
W076	SD6225-76	3/4" NPT, 4.5" BT
W193	SD6225-193	1/2" NPT, 4.5" BT
W119	SD6225-119	3/4" NPT, 7.5" BT
W177	SD6225-177	1/2" NPT, 7.5" BT

For all immersion stem switches, except Models 13272 and 13322

W139	SD6225-139	3/4" NPT X 1-23/32" BT, BRASS
W140	SD6225-140	3/4" NPT X 1-23/32" BT, 316 ST/ST

W000 IMMERSION STEM AND THERMOWELLS

Note: Option W000 is a special Immersion Stem construction that has no external thread. This option fits inside a special thermowell and is secured with a set-screw.

Option	Description
W000	Immersion stem only, BRASS
W097	Immersion stem and thermowell. Includes W000 stem and 1/2" NPT x 1-23/32" BT BRASS thermowell
W099	Immersion stem and thermowell. Includes W000 stem and 1/2" NPT x 1-23/32" BT 316 ST/ST thermowell

OPTIONAL LENGTHS

Optional immersion stem lengths to 15" available in brass, with or without 316 ST/ST thermowell. Consult UE for additional information.

Optional capillary length to *50' available in copper or 304 ST/ST. Armor or Teflon® capillary protection available to lengths less than or equal to capillary length. Consult UE for additional information.

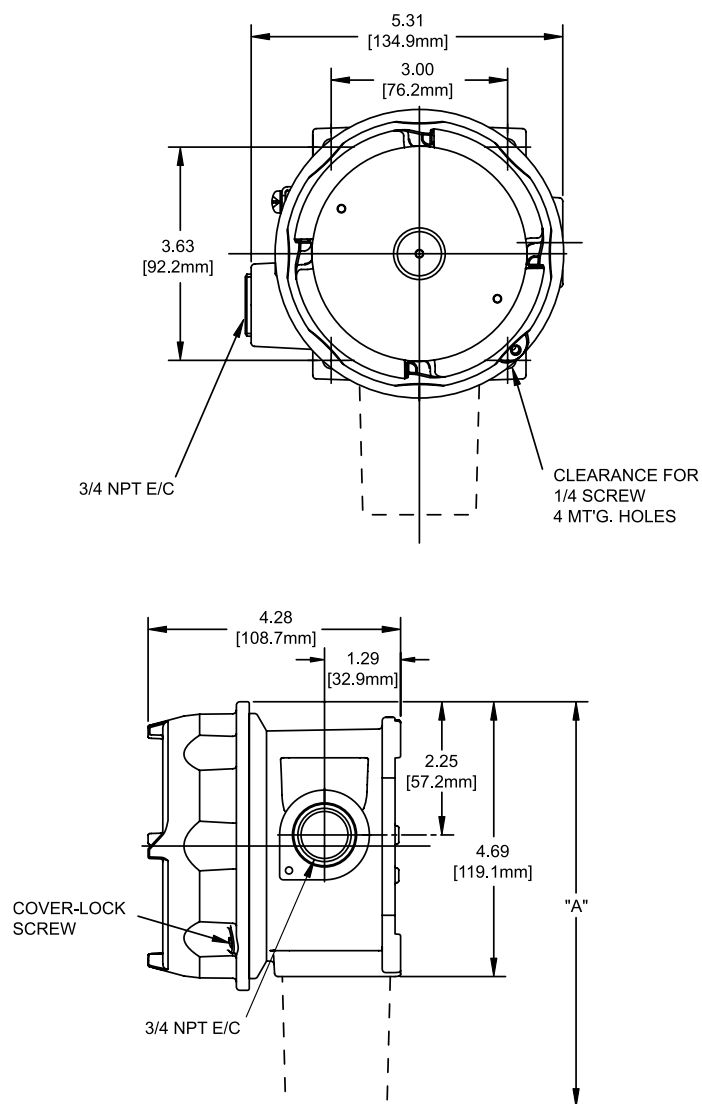
*Consult UE regarding repeatability and ambient effects on capillary lengths over 30'.

DIMENSIONAL DRAWINGS

(Dimensional drawings for all models may be found at www.ueonline.com)

Internal Set Point Adjustment, dual conduits

Types J120, J120K, C120, F120



All dimensions stated in inches (millimeters)

Models	Dimension A		
	Inches	mm	NPT
Pressure			
126-164	7.25	184.2	1/4
S126B-S164B	7.63	193.8	1/2
171-174	8.72	221.5	1/2
183-186, 483-486	8.41	213.6	1/2
188-189, 488-489	7.47	189.7	1/2
190-194, 490-494	7.44	189.0	1/2
270-274	8.13	206.5	1/4
356-361, 376	8.09	205.5	1/4
450, 452	8.81	223.8	1/4
451, 453, 454	8.06	204.7	1/4
520-525	9.25	235.0	1/2
530-535	8.84	224.5	1/2
550, 552	8.81	223.8	1/4
551, 553-555	8.34	211.8	1/4
560-564	7.53	191.3	2" Sanitary
565-567	7.53	191.3	1-1/2" Sanitary
612, 616	7.88	200.2	1/4
680	8.13	206.5	1/4
701-705, 15622	7.44	189.0	1/4
Differential Pressure			
36-39, 147-157, 367	7.59	192.8	1/4
S147B-S157B	7.59	192.8	1/2
455-457, 559	8.44	214.4	1/4
540-543	9.34	237.2	1/8
544-548	9.41	239.0	1/8
Temperature			
120-121	9.13	231.9	Immersion Stem
1B5-8B5	8.47	215.1	Bulb & capillary

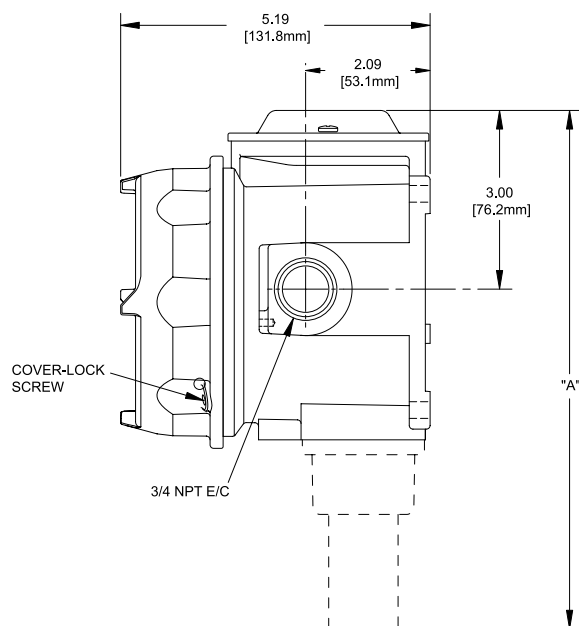
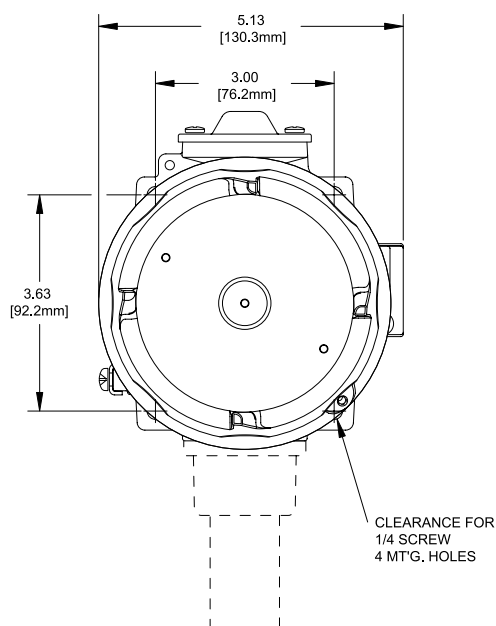


DIMENSIONAL DRAWINGS

(Dimensional drawings for all models may be found at www.ueonline.com)

External Set Point Adjustment, single conduit

Types B121, B122, E121,
E122, H121, H122,
H122P, H121K, H122K



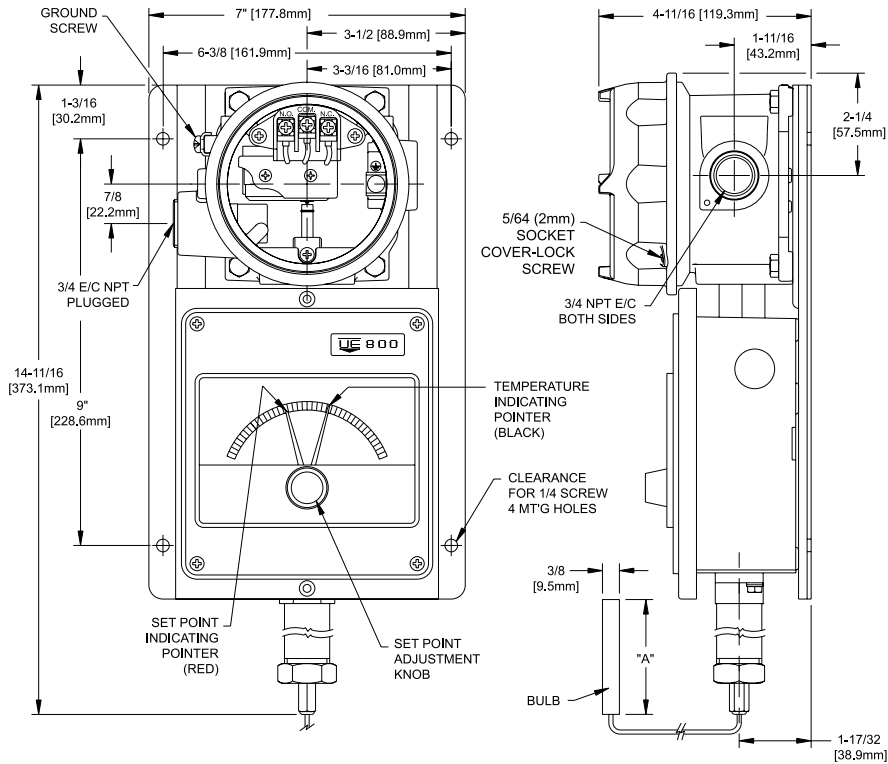
Models	Dimension A		
	Inches	mm	NPT
Pressure			
126-164	8.09	205.5	1/4
S126B-S164B	8.50	215.9	1/2
270-274	7.88	200.2	1/4
358-376	7.81	198.4	1/4
450, 452	9.69	246.1	1/4
453, 454	8.94	227.1	1/4
550, 552	9.75	247.7	1/4
553-555	9.31	236.5	1/4
612, 614	8.75	222.3	1/4
701-705	8.31	211.1	1/4
Differential Pressure			
147-157	8.44	214.4	1/4
S147B-S157B	8.44	214.4	1/2
456-457, 559	9.31	236.5	1/4
Temperature			
120,121	10.00	254.0	Immersion Stem
2B5-8B5	9.31	236.5	Bulb & capillary
13272, 13322	10.00	254.0	Immersion Stem (Heat tracing)
13273, 13321	9.31	236.5	Bulb & capillary (Heat tracing)

DIMENSIONAL DRAWINGS

(Dimensional drawings for all models may be found at www.ueonline.com)

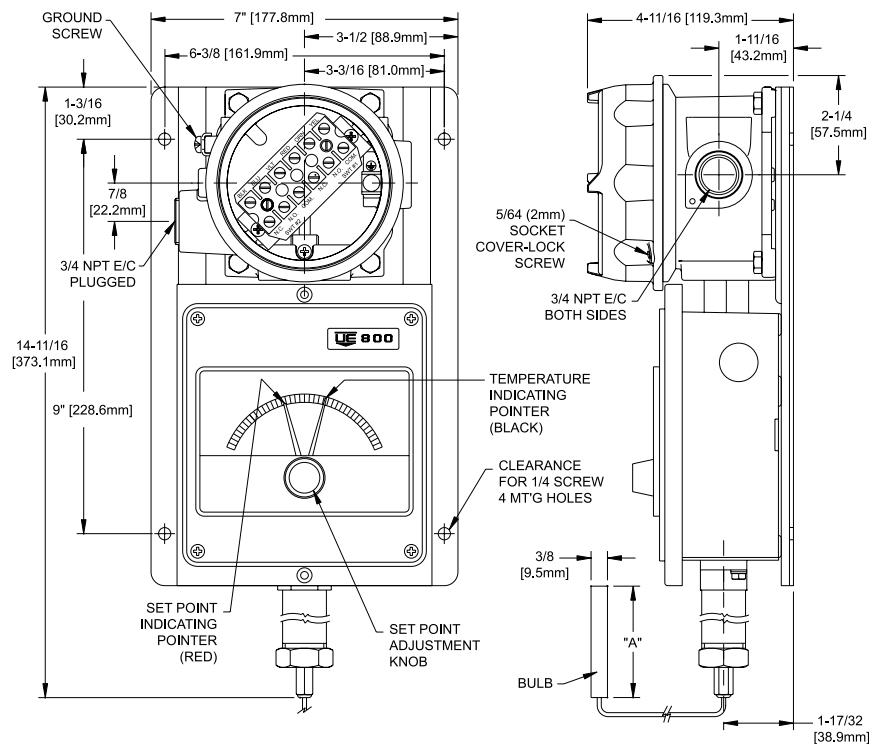
External Set Point Adjustment & Temperature Indication

Type 820E
single switch



Dimension A		
Models	Inches	mm
1BS	3-3/4	95,3
2BS	2-5/8	66,7
3BS	2-1/8	54,0
4BS	6-3/4	171,5
5BS	5	127,0
6BS	4-1/2	114,3
7BS	3	76,2
8BS	3-1/4	82,6

Type 822E
dual switch



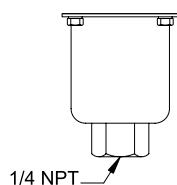


DIMENSIONAL DRAWINGS

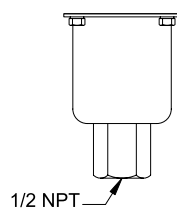
SENSORS

Pressure Sensors

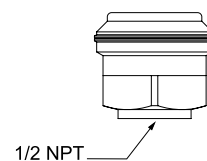
(see drawings and charts on page 21 & 22 for complete dimensions)



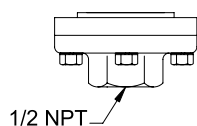
Models 126-164



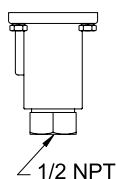
Models S126B-S164B



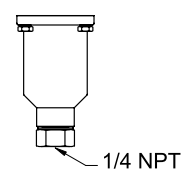
Models 171-174



Models 183-186, 483-486



Models 188-194, 488-494



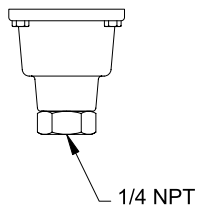
J120 Models 270-376, 680

DIMENSIONAL DRAWINGS

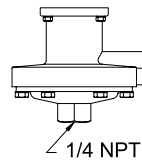
SENSORS

Pressure Sensors

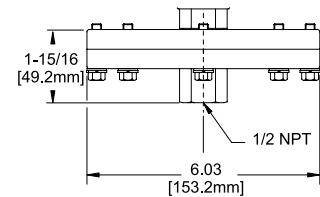
(see drawings and charts on page 21 & 22 for complete dimensions)



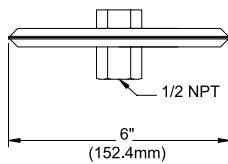
H121/H122 Models 270-376



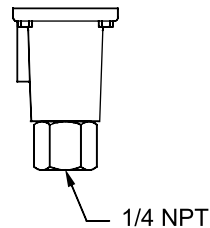
Models 450-454, 550-555



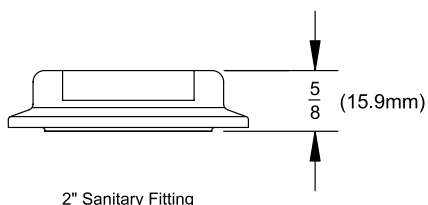
Models 520-525



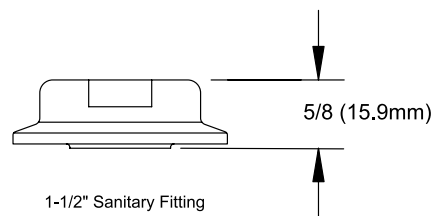
Models 530-535



Models 612-616, 701-705, 15622



Models 560-564



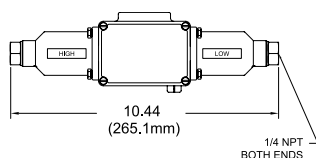
Models 565-567

DIMENSIONAL DRAWINGS

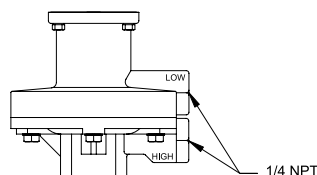
SENSORS

Differential Pressure Sensors

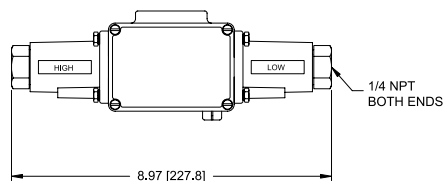
(see drawings and charts on page 21 & 22 for complete dimensions)



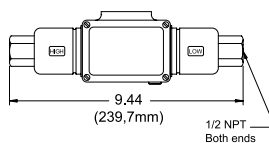
J120K Models 367



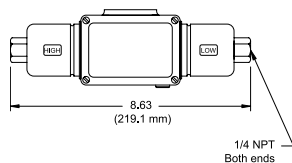
Models 455-457, 559



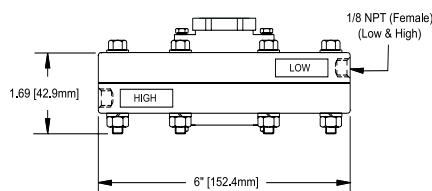
J120K Models 36-39



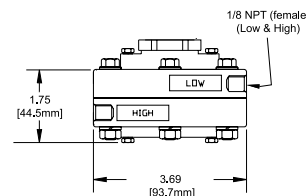
Models S147B-S157B



Models 147-157



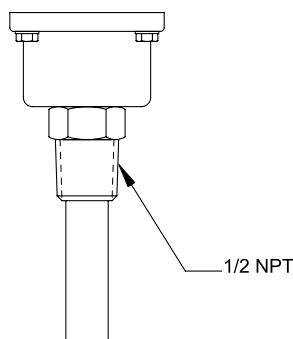
Models 540-543



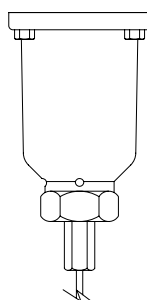
Models 544-548

Temperature Sensors

(See drawings and charts on pages 21-23 for complete dimensions, as well as Temperature Model Chart on pages 15-16 for immersion stem and bulb dimensions. The standard capillary length is 6 feet except for models 13273 & 13321 which is 10 feet)



Models
120-121, 13272, 13322



Models
1BS-8BS, 13273, 13321

ALTERNATIVE PRODUCTS FROM UE

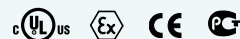
Stainless Steel 12 Series

- Compact, cylindrical 316 stainless steel design
- Hermetically sealed micro-switch
- Explosion Proof
- Snap-acting belleville spring mechanism for maximum vibration resistance and set point stability
- Pressure ranges 1 to 12,500 psi;
DP working pressure ranges 0 to 2500 psid;
temperature ranges -130 to 650°F
- Dual seal compliance to ANSI/ISA 12.27.01



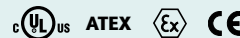
One Series for Division 1 (Zone 1)

- Electronic pressure and temperature switches with no moving parts
- Fully adjustable deadband and smart self diagnostics
- 4-20 mA output and digital process display
- Explosion-proof enclosure for Division 1 (Zone 1) hazardous areas
- 2-wire, 4-wire and loop powered models available



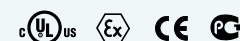
TX200 Series Pressure Transmitters

- Welded, hermetically sealed, 316 Stainless steel construction
- Ranges 0 to 15 psi up to 0 to 40,000 psi
- Choice of field adjustable or fixed range models
- 4-20 mA transmitter output or 1-5 VDC or 0-10 VDC transducer output
- Variety of pressure connections including NPT, SAE, Autoclave



One Series for Division 2 (Zone 2)

- Electronic solid-state reliability
- Two-wire operation
- Digital display with keypad set-up
- 100% of range adjustable on-off deadband
- 4-20 mA output models
- Continuous diagnostic health check



Temperature Sensors

Rugged RTD's and Thermocouples for process and energy applications, available with Nema 4X and explosion-proof heads to match heat-trace, turbine, combustion, and stack-emission applications



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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Moscow, 121552, Russia
Phone: +7 (495) 792-88-06
email: russiansales@ueonline.com

PRESSURE, VACUUM, DIFFERENTIAL PRESSURE, TEMPERATURE



FEATURES

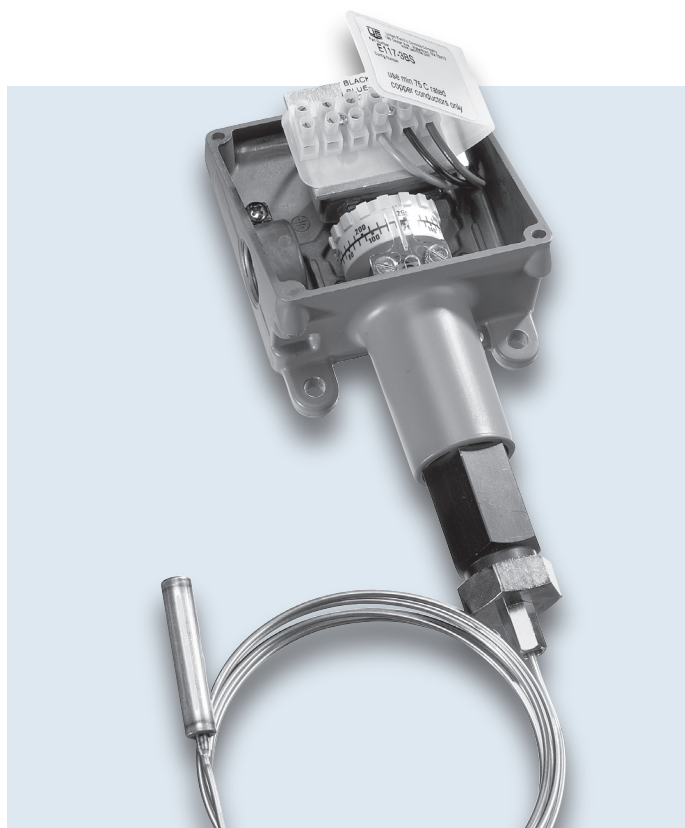
- Epoxy Coated Type 4X Enclosure and Stainless Steel Component Parts
- Hermetically Sealed Snap Switch, SPDT or DPDT Output
- Terminal Block Wiring
- Tamper-Resistant Set Point "Lock"
- Adjustable Ranges:
 - "wc ranges: 300 "wc vacuum to 250 "wc pressure (-747 to 622 mbar)
 - Pressure: 30 "Hg Vac to 3500 psi (-1 to 241 bar)
 - Differential Pressure: 0.8 "wcd to 500 psid (2 mbar to 34.5 bar)
 - Temperature: -120 to 640°F (-85 to 338°C)

OVERVIEW

Approved for Division 2 hazardous locations and corrosive atmospheres, the 117 Series can be used to measure vacuum, pressure, differential pressure or temperature in a variety of applications. Its compact, epoxy-coated enclosure and hermetically sealed snap switch provide superior corrosion resistance within the harshest environments. Popular sensors in a variety of materials are available, ranging from all welded stainless steel to elastomer diaphragms. Rugged, reliable and cost effective, the 117 Series is an ideal choice for the most demanding applications; typically wastewater treatment, pulp and paper mills, food and beverage plants, steel and aluminum mills, petrochemical, and pharmaceutical plants.

FEATURES

- Approved for Division 2 hazardous locations
- Optional ATEX or GOST intrinsic safety compliance for Zone 0
- Hermetically sealed snap switch, SPDT or DPDT output
- Welded stainless steel diaphragms
- Optional sensor material for corrosive media
- Ultra-low pressure ranges
- Polished stainless steel flush mount sensors



SPECIFICATIONS

STORAGE TEMPERATURE	-65° to 160°F (-54 to 71 °C)
AMBIENT TEMPERATURE LIMITS	-40° to 160°F (-40° to 71 °C); except models 520-525, 540-548, 700-706: 0 to 160°F (-18 to 71 °C); set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change
SET POINT REPEATABILITY	Temperature models: ± 1% of adjustable range Pressure models 171-174, 218, 358-376, 520-535, 540-543, 560-564 and 700-706: ± 1% of adjustable range; models 183-194, 544-548, 483-494, 565-567: ± 1.5% of adjustable range Internal set point lock on all pressure models
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 Hz
ENCLOSURE	Die cast aluminum, epoxy powder coated, gasketed; captive cover screws; stainless steel nameplate
ENCLOSURE CLASSIFICATION	Enclosure Type 4X
SWITCH OUTPUT	One SPDT hermetically sealed snap action switch; switch may be wired "normally open" or "normally closed"; DPDT (option 1190/1195)
ELECTRICAL RATING	11 A 125/250 VAC resistive; 5 A @ 28 VDC; 1 A @ 48 VDC; 1/2 A @ 125 VDC; switch contacts gold flashed
WEIGHT	1.5-6.5 lbs. Varies with model
ELECTRICAL CONNECTION	1/2" NPT (female); two 7/8" diameter knockouts
PRESSURE CONNECTION	Models 218, 358-376, 700-706: 1/4" NPT (female); models 171-194, 483-494, 520-535: 1/2" NPT (female); models 560-564: 2" sanitary connection; models 565-567: 1.5" sanitary connection, models 540-548: 1/8" NPT (female)
TEMPERATURE ASSEMBLY	Bulb and capillary: 6 feet; 304 stainless steel Immersion stem: nickel-plated brass (standard length only); optional 316L stainless steel
FILL	Non-toxic oil filled
TEMPERATURE DEADBAND	Typically 4% of range under laboratory conditions (70°F ambient circulating bath at rate of 1/2°F per minute change)
REFERENCE SCALE	Pressure: "Low-Medium-High" increment Temperature: Calibrated dial scale

APPROVALS

**UNITED STATES AND CANADA**

UL Listed, cUL Certified
Class I, Division 2, Groups A, B, C & D
Class II, Division 2, Groups F & G
Class III



Enclosure Type 4X
Pressure: UL 508 & 1604; CSA C22.2 No. 14
& 213 - File # E40857
Temperature: UL 508 & 1604; CSA C22.2 No. 24
& 213 - File # E43374

EUROPEAN UNION**ATEX Directive 94/9/EC**

II 1 G EEx ia IIC T6 **(OPTIONAL – code M405)**

Tamb = -50C to +60C
UL International DEMKO A/S (N.B.# 0539)
Certificate # DEMKO 03 ATEX 0335063
EN 50014, 50020 & 50284

Pressure Equipment Directive (PED) 97/23/EC

Gage pressure models only
Category IV, Module H1 **(OPTIONAL – code M407)**
TÜV Industrie Service, TÜV SÜD AG (N.B.# 0036)
Certificate # USA 02/04/38/001 thru USA
02/07/38/033

**Low Voltage Directive (LVD) 73/23/EC & 93/68/EEC**

Compliant to LVD
Products rated lower than 50 VAC and 75 VDC are outside the scope of the LVD
The Low Voltage Directive does not apply to products for use in hazardous locations

RUSSIA

Gosgortekhnadzor Permit **(OPTIONAL – code M406)**
OExialICT6
Tamb = -50C to +60C
NANIO CCVE Certification Center
Certificate # RRS 00-22739
GOST R 51330.0, 51330.1, 51330.10 & 51330.14

PRESSURE MODEL CHART

Model	Adjustable Set Point Range		Deadband		*Over Range Pressure		**Proof Pressure	
	Low end of range on fall; High end of range on rise							
Type H117	"wc	mbar	"wc	mbar	psi	bar	psi	bar
Buna N diaphragm and O-ring with epoxy coated aluminum 1/2" NPT (female) pressure connection; large 0.72" orifice for clean-out purposes (Other wetted materials available - see page 9)								
520	300 Vac to 0	-746,7 to 0	0.8 to 32	2,0 to 79,6	200	13,8	400	27,6
521	10 Vac to 10	-24,9 to 24,9	0.4 to 2.4	1,0 to 6,0	200	13,8	400	27,6
522	50 Vac to 50	-124,5 to 124,5	0.4 to 12	1,0 to 29,9	200	13,8	400	27,6
523	0.5 to 5	1,2 to 12,4	0.4 to 1.2	1,0 to 3,0	200	13,8	400	27,6
524	2.5 to 50	6,2 to 124,5	0.4 to 3.2	1,0 to 8,0	200	13,8	400	27,6
525	10 to 250	24,9 to 622,3	0.4 to 24	1,0 to 59,7	200	13,8	400	27,6
Welded 316L stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes								
530	300 Vac to 0	-746,7 to 0	0.8 to 60	2,0 to 149,3	50	3,4	100	6,9
531	10 Vac to 10	-24,9 to 24,9	0.4 to 2.4	1,0 to 6,0	50	3,4	100	6,9
532	50 Vac to 50	-124,5 to 124,5	0.4 to 12	1,0 to 29,9	50	3,4	100	6,9
533	0.5 to 5	1,2 to 12,4	0.4 to 1.2	1,0 to 3,0	50	3,4	100	6,9
534	2.5 to 50	6,2 to 124,5	0.4 to 3.2	1,0 to 8,0	50	3,4	100	6,9
535	10 to 250	24,9 to 622,3	0.4 to 40	1,0 to 99,6	50	3,4	100	6,9

***Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

**** Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing).

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband		*Over Range Pressure		**Proof Pressure	
Type H117	psi	bar (unless noted)	psi	bar (unless noted)	psi	bar	psi	bar
2" sanitary welded 316L stainless steel diaphragm and pressure connection. Mates with Tri-Clamp® fitting systems (not UE supplied)								
560	1 to 15	68,9 mbar to 1 bar	0.3 to 3	20,7 mbar to 0,2	200	13,8	300	20,7
561	1 to 25	68,9 mbar to 1 bar	0.3 to 4.5	20,7 mbar to 0,3	200	13,8	300	20,7
562	2 to 50	0,1 to 3,4	0.3 to 7.5	20,7 mbar to 0,5	200	13,8	300	20,7
563	4 to 100	0,3 to 6,9	0.3 to 12	20,7 mbar to 0,8	200	13,8	300	20,7
564	8 to 200	0,6 to 13,8	0.3 to 15	20,7 mbar to 1	200	13,8	300	20,7
1.5" sanitary welded 316L stainless steel diaphragm and pressure connection. Mates with Tri-Clamp® fitting systems (not UE supplied)								
565	5 to 30	0,3 to 2,1	3 to 15	0,2 to 1,0	1000	68,9	1500	103,4
566	10 to 100	0,7 to 6,9	3 to 36	0,2 to 2,5	1000	68,9	1500	103,4
567	15 to 300	1,0 to 20,7	9 to 66	0,6 to 4,6	1000	68,9	1500	103,4
Welded 316L stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes; NACE MR-0175 compliant								
171	1 to 20	68,9 mbar to 1,4 bar	0.1 to 3	6,9 mbar to 0,2	500	34,5	1000	68,9
172	2 to 50	0,1 to 3,4	0.1 to 5	6,9 mbar to 0,3	500	34,5	1000	68,9
173	4 to 100	0,3 to 6,9	0.1 to 10	6,9 mbar to 0,7	500	34,5	1000	68,9
174	8 to 200	0,6 to 13,8	0.1 to 15	6,9 mbar to 1,0	500	34,5	1000	68,9
316L stainless steel diaphragm (optional Hastelloy® C or Monel®); Viton® GLT O-ring (optional Kalrez®, Silicone, Ethylene Propylene, or Aflas®); 316 stainless steel 1/2" NPT (female) pressure connection (optional Hastelloy® C, or Monel®), large 0.72" orifice for clean-out purposes. Models 188 and 189 have a 316L stainless steel 1/2" NPT (female) pressure connection; NACE MR-0175 compliant								
183	1 to 20	0,1 to 1,4	0.3 to 5	20,7 mbar to 0,3	500	34,5	1000	68,9
184	2 to 50	0,1 to 3,4	0.3 to 10	20,7 mbar to 0,4	500	34,5	1000	68,9
185	4 to 100	0,3 to 6,9	0.5 to 16	34,5 mbar to 0,7	500	34,5	1000	68,9
186	8 to 200	0,6 to 13,8	0.5 to 21.5	34,5 mbar to 1,2	500	34,5	1000	68,9
188	50 to 1000	3,4 to 68,9	30 to 300	2,1 to 20,7	2000	137,9	7000	482,6
189	250 to 3500	17,2 to 241,3	50 to 500	3,4 to 34,5	4000	275,8	7000	482,6
316L stainless steel diaphragm (optional Hastelloy® C, or Monel®; Viton® GLT O-ring (optional Kalrez®, Silicone, Ethylene Propylene or Aflas®); 316 stainless steel 1/2" NPT (female) pressure connection (optional Hastelloy® C, or Monel®), 0.06" orifice to dampen pulsations. Models 488 and 489 have a 316L stainless steel 1/2" NPT (female) pressure connection; NACE MR-0175 compliant								
483	1 to 20	0,1 to 1,4	0.3 to 5	20,7 mbar to 0,3	500	34,5	1000	68,9
484	2 to 50	0,1 to 3,4	0.3 to 10	20,7 mbar to 0,4	500	34,5	1000	68,9
485	4 to 100	0,3 to 6,9	0.5 to 16	34,5 mbar to 0,7	500	34,5	1000	68,9
486	8 to 200	0,6 to 13,8	0.5 to 21.5	34,5 mbar to 1,2	500	34,5	1000	68,9
488	50 to 1000	3,4 to 68,9	30 to 300	2,1 to 20,7	2000	137,9	7000	482,6
489	250 to 3500	17,2 to 241,3	50 to 500	3,4 to 34,5	4000	275,8	7000	482,6

Application Note: The use of metallic diaphragms where higher pressure shock or heavy cycling is expected should be avoided. Models 171-174 should not be used where system or start-up vacuum pressure might exceed 26" Hg Vac (-0.9 bar). Use of optional diaphragm materials for models 483-489 may increase deadband.

Hastelloy® is a registered trademark of Haynes International, Inc.

Monel® is a registered trademark of the Special Metals Corporation

Aflas® is a registered trademark of Asahi Glass

Viton® and Kalrez® are registered trademarks of DuPont Performance Elastomers

Tri-Clamp® is a registered trademark of Alfa Laval.

PRESSURE MODEL CHART

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband			*Over Range Pressure		**Proof Pressure	
Type H117	psi (unless noted)	bar	psi (unless noted)		bar (unless noted)	psi	bar	psi	bar
Phosphor bronze bellows with nickel-plated brass 1/4" NPT (female) pressure connection; 303 stainless steel spring exposed to media									
218	30 "Hg Vac to 0	-1 to 0	2 to 5 "Hg		0,07 to 0,17	3	0,2	30	2,1
Welded 316L stainless steel bellows and 1/4" NPT (female) pressure connection									
358	15 to 200	1,0 to 13,8	6 to 20		0,4 to 1,4	200	13,8	800	55,2
361	20 to 300	1,4 to 20,7	8 to 22		0,6 to 1,5	300	20,7	800	55,2
376	25 to 500	1,7 to 34,5	10 to 28		0,7 to 1,9	500	34,5	800	55,2
			Lower 75% range span	Top 25% range span	Lower 75% range span				
			psi (unless noted)	psi	bar				
Welded 316 stainless steel diaphragm and 1/2" NPT (female) pressure connection, large 0.72" orifice for clean-out purposes; NACE MR-0175 compliant (except model 194)									
190	5 to 30	0,3 to 2,1	3 to 8	10 max	0,2 to 0,6	1500	103,4	2500	172,4
191	10 to 100	0,7 to 6,9	3 to 30	45 max	0,2 to 2,1	1500	103,4	2500	172,4
192	15 to 300	1,0 to 20,7	10 to 40	60 max	0,7 to 2,8	1500	103,4	2500	172,4
193	20 to 500	1,4 to 34,5	15 to 45	75 max	1,0 to 3,1	1500	103,4	2500	172,4
194	80 to 1700	5,5 to 117,2	5 to 120	200 max	0,3 to 8,3	2000	137,9	2500	172,4
Welded 316 stainless steel diaphragm and 1/2" NPT (female) pressure connection, 0.06" orifice to dampen pulsations; NACE MR-0175 compliant (except model 494)									
490	5 to 30	0,3 to 2,1	3 to 8	10 max	0,2 to 0,6	1500	103,4	2500	172,4
491	10 to 100	0,7 to 6,9	3 to 30	45 max	0,2 to 2,1	1500	103,4	2500	172,4
492	15 to 300	1,0 to 20,7	10 to 40	60 max	0,7 to 2,8	1500	103,4	2500	172,4
493	20 to 500	1,4 to 34,5	15 to 45	75 max	1,0 to 3,1	1500	103,4	2500	172,4
494	80 to 1700	5,5 to 117,2	5 to 120	200 max	0,3 to 8,3	2000	137,9	2500	172,4

Deadband Notes: Models 190-194, 490-494 are expressed as the lower 75% and top 25% of the range span because of the operating characteristics of the welded stainless steel diaphragm sensor and hermetically sealed switch.

***Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

**** Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing).

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband		*Over Range Pressure		**Proof Pressure	
Type H117	psi	bar	psi	bar	psi	bar	psi	bar
Buna N diaphragm and O-ring with 303 stainless steel 1/4" NPT (female) pressure connection; option M540 Viton® diaphragm and O-ring available								
700	3 to 20	0,2 to 1,4	1,0 to 4	0,1 to 0,3	500	34,5	1000	68,9
702	3 to 100	0,2 to 6,9	2 to 12	0,1 to 0,8	500	34,5	1000	68,9
704	15 to 500	1,0 to 34,5	15 to 30	1,0 to 2,1	1500	103,4	2500	172,4
706	100 to 1700	6,9 to 117,2	20 to 110	1,4 to 7,6	2000	137,9	2500	172,4

DIFFERENTIAL PRESSURE MODEL CHART

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband		***Working Pressure		**Proof Pressure	
Type H117K	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar	psi	bar

Kapton® diaphragm, Buna N sealing diaphragms and epoxy coated aluminum 1/8" NPT (female) pressure connections

540	0.8 to 7 "wcd	2,0 to 17,4 mbar	0.1 to 1.3 "wc	0,2 to 3,2 mbar	30 "Hg to 200	-1 to 13,8	400	27,6
541	2 to 20 "wcd	5,0 to 49,8 mbar	0.2 to 1.6 "wc	0.5 to 4,0 mbar	30 "Hg to 200	-1 to 13,8	400	27,6
542	5 to 50 "wcd	12,4 to 124,5 mbar	0.4 to 4.0 "wc	1,0 to 10,0 mbar	30 "Hg to 200	-1 to 13,8	400	27,6
543	10 to 200 "wcd	24,9 to 497,8 mbar	0.8 to 12 "wc	2,0 to 29,9 mbar	30 "Hg to 200	-1 to 13,8	400	27,6
544	2 to 20	0,1 to 1,4	0.2 to 2	13,8 mbar to 0,1	30 "Hg to 1200	-1 to 82,7	2500	172,4
545	5 to 50	0,3 to 3,4	0.4 to 3.2	27,6 mbar to 0,2	30 "Hg to 1200	-1 to 82,7	2500	172,4
546	10 to 125	0,7 to 8,6	0.7 to 7	48,3 mbar to 0,5	30 "Hg to 1200	-1 to 82,7	2500	172,4
547	50 to 250	3,4 to 17,2	1 to 15	0,1 to 1,0	30 "Hg to 1200	-1 to 82,7	2500	172,4
548	100 to 500	6,9 to 34,5	2 to 20	0,1 to 1,4	30 "Hg to 1200	-1 to 82,7	2500	172,4

TEMPERATURE MODEL CHART

Model	Adjustable Set Point Range		Max. Temp		Scale Division		†Stem/Bulb Size
Type B117	°F	°C	°F	°C	°F	°C	OD x Length
120	0 to 225	-17.8 to 107.2	275	135	10	5	9/16" x 1-7/8" below 1/2" NPT thread (nickel-plated brass)
121	200 to 425	93.3 to 218.3	475	246.1	10	5	9/16" x 1-7/8" below 1/2" NPT thread (nickel-plated brass)
Type E117							Bulb OD x length
2BSA	-120 to 100	-84.4 to 37.8	150	65.6	10	5	3/8 x 2-7/16"
5BS	-20 to 80	-28.9 to 26.7	130	54.4	5	2	3/8 x 5"
4BS	25 to 100	-3.9 to 37.8	150	65.6	2	1	3/8 x 6-3/4"
2BSB	30 to 250	-1.1 to 121.1	300	148.9	10	5	3/8 x 2-7/16"
3BS	100 to 400	37.8 to 204.4	450	232.2	10	5	3/8 x 2-1/8"
8BS	350 to 640	176.7 to 337.8	690	365.6	10	5	3/8 x 3-1/4"

Kapton® is a registered trademark of E.I. DuPont.

†Optional immersion stem lengths and capillary lengths are available.



HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts".

Determine model based on adjustable range, deadband and proof pressure.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section.

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number.

Leave "option" portion blank if no options are needed. *FOR MULTIPLE OPTIONS:* Call United Electric Controls.

TYPE	DESCRIPTION
Pressure	Type H117 - One SPDT output; epoxy coated enclosure; internal adjustment with "High-Low" reference scale
Differential Pressure	Type H117K - One SPDT output; epoxy coated enclosure; internal adjustment with "High-Low" reference scale
Temperature	Type B117 - Immersion stem; One SPDT output; epoxy coated enclosure; internal adjustment with calibrated dial scale, Type E117 - Bulb and capillary; One SPDT output; epoxy coated enclosure; internal adjustment with calibrated dial scale

SWITCH OPTIONS*

1190	Hermetically sealed, DPDT, 11 A 125/250 VAC, products set on rising pressure or temperature only. Due to inherent separation of circuits on falling pressure or temperature, specify Option 1195 if setting on fall is required. Deadband and minimum set point will increase. NOT AVAILABLE MODELS 523, 533
1195	Hermetically sealed, DPDT, 11 A 125/250 VAC; products set on falling pressure or temperature only. Due to inherent separation of circuits on rising pressure or temperature, specify Option 1190 if setting on rise is required. Deadband and minimum set point will increase. NOT AVAILABLE MODELS 523, 533

SENSOR AND OTHER OPTIONS

M201	Factory set one switch, specify increasing or decreasing pressure or temperature and setpoint
M277	Range indicated on nameplate in kPa/MPa, factory selected. NOT AVAILABLE TEMPERATURE VERSIONS
M278	Range indicated on nameplate in Kg/cm ² . NOT AVAILABLE TEMPERATURE VERSIONS
M405	Intrinsic safety compliance for European Union per ATEX standards
M406	Intrinsic safety compliance for Russia per Gosgortekhnadzor standards
M407	CE compliance to Pressure Equipment Directive (category IV). AVAILABLE ON MODELS 171-174, 183-189, 192-194, and 700-706 only. Optional sensor material for corrosive media are excluded.
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M449	Mounting bracket kit. Required for models 520-535 when surface mounting. Use kit part number 6361-704 for other models
M504	316L stainless steel immersion stem. AVAILABLE TEMPERATURE MODELS 120, 121 ONLY
M540	Viton® construction (deadband and low end range may increase slightly); wetted parts include Viton® diaphragm and O-ring. AVAILABLE ON MODELS 700-704 (Viton diaphragm and o-ring, stainless steel pressure connection), AND 540-548 (sealing diaphragms only, main diaphragm remains Kapton®, pressure connections remain aluminum)
M550	Oxygen service cleaning; internal construction may change. NOT AVAILABLE PRESSURE MODEL 706 OR TEMPERATURE TYPE E117
SD6286-51	Watertight conduit fitting; converts 7/8" hole to 1/2" NPT (female) fitting
6361-704	Surface and Pipe Mounting Hardware (required for model 520-535, 540-548 when surface mounting)

**Refer to Electrical Ratings under Specifications on page 3 for DC ratings.*

OPTIONAL SENSOR MATERIAL FOR "WC RANGES. AVAILABLE MODELS 520-525

XC001	Aluminum pressure connection, Viton® diaphragm, Viton® O-ring
XC002	Aluminum pressure connection, Kapton® diaphragm, Buna N O-ring
XC003	Aluminum pressure connection, Kapton® diaphragm, Viton® O-ring
XC004	316L Stainless steel pressure connection, 316L stainless steel diaphragm, Viton® O-ring. (Over range pressure is limited to 100 psi)
XC005	316L Stainless steel pressure connection, Viton® diaphragm, Viton® O-ring
XC006	316L Stainless steel pressure connection, Kapton® diaphragm, Viton® O-ring
XC007	316L Stainless steel pressure connection, Teflon® diaphragm, Viton® O-ring

OPTIONAL SENSOR MATERIALS FOR CORROSIVE MEDIA. AVAILABLE MODELS 183-189, 483-489

XD002	Hastelloy® C diaphragm; NOT NACE COMPLIANT
XD003	Monel® diaphragm; NOT NACE COMPLIANT
XP112	Hastelloy® C pressure connection; NOT NACE COMPLIANT
XP113	Monel® pressure connection; NOT NACE COMPLIANT
XR211	Kalrez® O-ring
XR212	Silicone O-ring. NOT AVAILABLE MODELS 188-189, 488-489
XR213	Ethylene Propylene O-ring
XR214	Aflas® O-ring

OPTIONAL FLUSH MOUNT FLANGES. AVAILABLE MODELS 560-567

Other flanges (150# and 300#) available, please consult UE. Flanges conform to ANSI B16.5. Maximum pressure is limited by flange rating.

F196	Flush mounted flange, 150#, 1" lap joint, raised face. AVAILABLE MODELS 565-567 ONLY
F197	Flush mounted flange, 150#, 2" lap joint, raised face. AVAILABLE MODELS 560-564 ONLY
F198	Flush mounted flange, 300#, 1" lap joint, raised face. AVAILABLE MODELS 565-567 ONLY
F199	Flush mounted flange, 300#, 2" lap joint, raised face. AVAILABLE MODELS 560-564 ONLY

OPTIONS FOR TEMPERATURE MODELS

UNION CONNECTORS (Dimensional drawings may be found at www.ueonline.com)

Option	Replacement Number	Description
<u>Brass</u>		
W027	SD6213-27	1/2" NPT w/ 3/4" bushing
W045	SD6213-45	3/4" NPT
W051	SD6213-51	1/2" NPT
<u>304 Stainless Steel</u>		
W028	SD6213-28	1/2" NPT w/ 3/4" bushing
W046	SD6213-46	3/4" NPT
W050	SD6213-50	1/2" NPT

THERMOWELLS (Dimensional drawings may be found at www.ueonline.com)

For all bulb & capillary switches

<u>Brass</u>		
W075	SD6225-75	1/2" NPT with 3/4" NPT adapter bushing, 4" BT
W191	SD6225-191	1/2" NPT, 4" BT
W118	SD6225-118	1/2" NPT with 3/4" NPT adapter bushing, 7" BT
W192	SD6225-192	1/2" NPT, 7" BT
<u>316 Stainless Steel</u>		
W076	SD6225-76	3/4" NPT, 4.5" BT
W193	SD6225-193	1/2" NPT, 4.5" BT
W119	SD6225-119	3/4" NPT, 7.5" BT
W177	SD6225-177	1/2" NPT, 7.5" BT

For all immersion stem switches

W139	SD6225-139	3/4" NPT X 1-23/32" BT, BRASS
W140	SD6225-140	3/4" NPT X 1-23/32" BT, 316 ST/ST

OPTIONS FOR TEMPERATURE MODELS

W000 IMMERSION STEM AND THERMOWELLS

Note: Option W000 is a special Immersion Stem construction that has no external thread. This option fits inside a special thermowell and is secured with a set-screw.

Option	Description
W000	Immersion stem only, Brass
W097	Immersion stem and thermowell. Includes W000 stem and 1/2" NPT x 1-23/32" BT Brass thermowell
W099	Immersion stem and thermowell. Includes W000 stem and 1/2" NPT x 1-23/32" BT 316 st/st thermowell

OPTIONAL LENGTHS:

Optional immersion stem lengths to 15" available in brass, with or without 316 st/st thermowell. Consult UE for additional information.

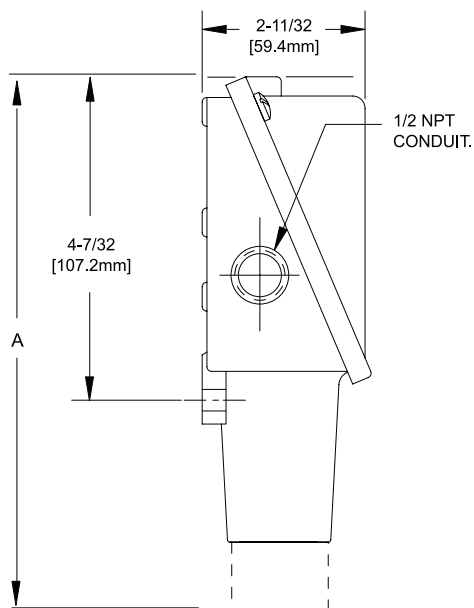
Optional capillary length to *50' available in copper or 304 st/st. Armor or Teflon® capillary protection available to lengths less than or equal to capillary length. Consult UE for additional information.

** Consult UE regarding repeatability and ambient effects on capillary lengths over 30'.*

DIMENSIONAL DRAWINGS

Dimensional drawings for all models may be found at www.ueonline.com

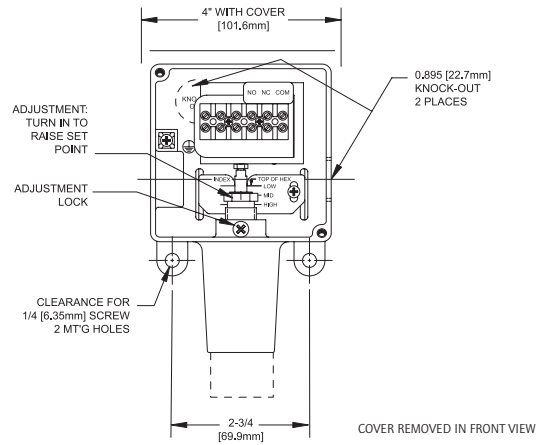
Types H117, H117K, B117, E117



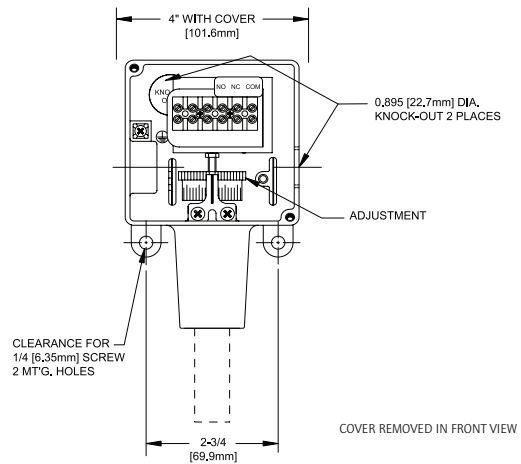
All dimensions stated in inches (millimeters)

Models	Dimension A		
	Inches	mm	NPT
Pressure			
171-174	7.63	193.8	1/2
183-186, 483-486	7.56	192.0	1/2
188, 189, 488-489	6.63	168.4	1/2
190-194, 490-494	6.63	168.4	1/2
218	6.56	166.6	1/4
358-376	7.00	177.8	1/4
520-525	8.44	214.4	1/2
530-535	8.00	203.2	1/2
560-564	6.63	168.4	2" Sanitary Fitting
565-567	6.63	168.4	1-1/2" Sanitary Fitting
700-706	6.63	168.4	1/4
Differential Pressure			
540-543	8.47	215.1	1/8
544-548	8.53	216.7	1/8
Temperature			
120,121	9.38	238.3	Immersion Stem
2BSA-8BS	8.69	220.7	Bulb & Capillary

Types H117, H117K

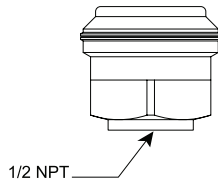


Types B117, E117

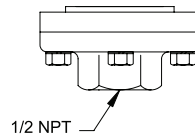


PRESSURE SENSORS

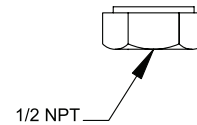
Models 171-174



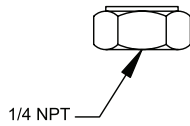
Models 183-186, 483-486



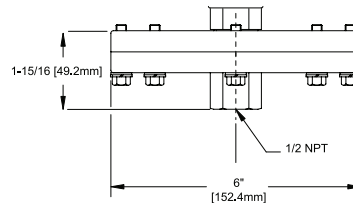
Models 188-194, 488-494



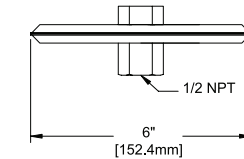
Models 218-376, 700-706



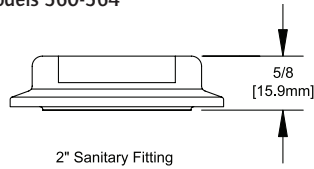
Models 520-525



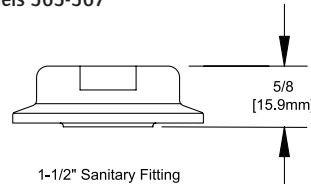
Models 530-535



Models 560-564

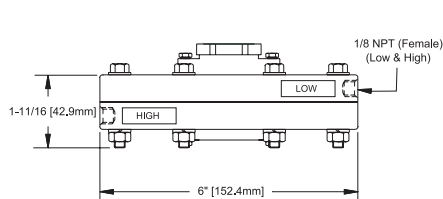


Models 565-567

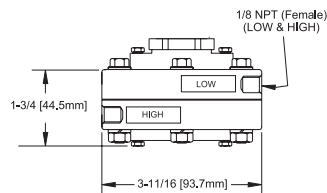


DIFFERENTIAL PRESSURE SENSORS

Models 540-543

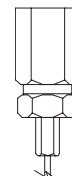


Models 544-548

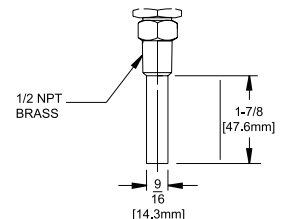


TEMPERATURE SENSORS

Model 2BSA-8BS



Model 120-121



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 36 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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<http://www.ueonline.com>

SP08081500

PRESSURE SWITCH



FEATURES

- Tamper-Resistant Field Adjustment
- Adjustable Ranges from 4 to 7500 PSI (0,3 to 517,1 Bar)
- Choice of 7 Electrical Terminations
- 1-1/4" Diameter
- Height as Small as 3"

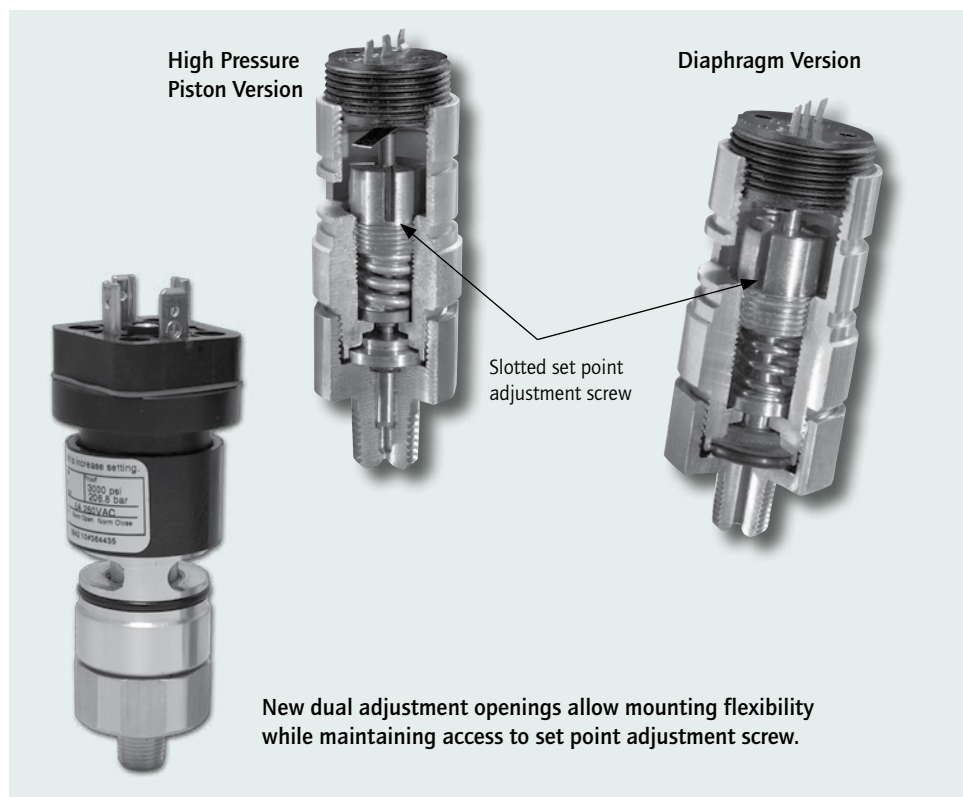
OVERVIEW

Available with seven electrical termination varieties, a choice of sensors, and several pressure connections, the 10 Series is designed to meet most requirements for a variety of OEM and industrial applications. Just 1-1/4 inches in diameter and as small as 3 inches high, this compact, cylindrical switch mounts wherever space is at a premium. A reliable and cost-effective switch, the 10 Series is ideal for applications with high settings and surges. Among the tough applications in which the product has proven itself are: mobile hydraulic units, compactors, balers and lube oil systems.

In addition to standard capabilities, modified designs or options are available to help you meet specific application requirements. Design flexibility allows for customized pressure connections, electrical terminations and pressure ranges. Consult UE for all product capabilities, order restrictions and special conditions.

FEATURES

- cULus recognized, CE compliant to low voltage directive and pressure equipment directive
- Optional ATEX intrinsic safety compliance
- NPT or SAE threaded pressure connections
- Choice of 7 electrical terminations
- Optional leadwire/cable lengths
- Rugged and vibration resistant
- Proof pressures up to 12,000 psi (827 bar)



SPECIFICATIONS

STORAGE TEMPERATURE	-40 to 180°F (-40 to 82°C)
AMBIENT TEMPERATURE LIMITS	0 to 160°F (-18 to 71 °C) with Buna-N construction; 0 to 180°F (-18 to 82°C) with Viton® construction; set point shifts less than 1% of range for a 50°F (28°C) ambient temperature change. Unit will operate down to -40°F (-40°C) but with reduced repeatability
MAX. MEDIA TEMPERATURE	200°F (93°C) with Buna-N sensor; 250°F (121 °C) with Viton® sensor
SHOCK	Set point repeats after 50 G, 10 millisecond duration
VIBRATION	Set point repeats after 10 G, 5-500 CPS
ENCLOSURE CLASSIFICATION	Types C, D, E, F & G: Designed to meet enclosure type 4 requirements Types A & B: Not applicable
SET POINT REPEATABILITY	Models 10-12: ± 1% of full scale range; Models 13-16: ± 1.5% of full scale range
SWITCH OUTPUT	One SPDT
ELECTRICAL RATING	Rated to 5 A resistive and 5 A inductive (75% power factor), at 125 VAC & 250 VAC, 1/4 HP; 5 A resistive and 3 A inductive at 30 VDC; 0.5 A resistive and 0.25 A inductive at 125 VDC; gold flashing over silver contact for loads down to 5 mA at 6 VDC, 2 mA at 12 VDC and 1 mA at 24 VDC
ENCLOSURE	Aluminum
WEIGHT	Type A: 5 oz.; Type B: 6 oz.; Type C: 6.5 oz.; Type D: 6 oz.; Type E: 12 oz.; Type F: 6.5 oz.; Type G: 12 oz.
ELECTRICAL CONNECTION	7 electrical terminations; Refer to "How to Order"
PRESSURE CONNECTION	Models 10-12: 1/8" NPT (male); Models 13-16: 1/4" NPT (male); optional SAE threads and other connections (see options list)
MOUNTING	Via pressure connection. Surface mounting bracket kit available for field installation. (see Options list)

APPROVALS



UNITED STATES AND CANADA

UL Recognized, cUL Recognized
Pressure: UL 508; CSA C22.2 No. 14, file # E42272



EUROPE

ATEX Directive (94/9/EC)
II 1 G EEx ia IIC T6 **(OPTIONAL – code M405)**



Tamb = -50°C to +60°C
UL International DEMKO A/S (N.B.# 0539)
Certificate # DEMKO 03 ATEX 0335063
EN 50014, 50020 & 50284

Low Voltage Directive (LVD) (73/23/EC & 93/68/EEC)

Compliant to LVD
Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD
The Low Voltage Directive does not apply to products for use in hazardous locations



RUSSIA

Gosgortekhnadzor Permit **(OPTIONAL – code M406)**

0ExialICT6
Tamb = -50°C to +60°C
NANIO CCVE Certification Center
Certificate # ROSS US.GB05.Bo2933
GOST 51330.0, 51330.1, 51330.10 & 51330.14

Pressure Equipment Directive (PED) (97/23/EC)

Compliant to PED
Products rated lower than 7.5 psi are outside the scope of the PED

MODEL CHART

Range Code	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	Low end of range on fall High end of range on rise psi bar		Narrower deadbands may be expected at bottom of range psi bar (unless noted)		psi bar		psi bar	
Buna-N diaphragm and O-ring with 1/8" NPT (male) brass pressure connection								
10	4 to 50	0,3 to 3,4	1 to 6	68,9 mbar to 0,4 bar	1000	68,9	3000	206,8
11	10 to 150	0,7 to 10,3	2 to 10	0,1 to 0,7	1500	103,4	3000	206,8
12	30 to 600	2,1 to 41,4	8 to 60	0,6 to 4,1	2500	172,4	3000	206,8
Stainless steel piston and Buna-N O-ring with 1/4" NPT (male) brass pressure connection								
13	100 to 1500	6,9 to 103,4	20 to 220	1,4 to 15,2	8000	551,6	10,000	689,5
14	180 to 3000	12,4 to 206,8	50 to 400	3,4 to 27,6	8000	551,6	10,000	689,5
15	400 to 4700	27,6 to 324,1	100 to 600	6,9 to 41,4	8000	551,6	10,000	689,5
16	4000 to 7500	275,8 to 517,1	400 to 950	27,6 to 65,5	10,000	689,5	12,000	827,4

* **Over Range Pressure:** The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

** **Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g., start-up, testing).

HOW TO ORDER

Build a part number by selecting appropriate code for each feature category. Example: 10-B11 *M201

	10	B	11	M201		
	Series Designation	Electrical Termination Type	Range	Misc. Options		
ORDERING CODE	DESCRIPTION		10	B	11	M201
SERIES DESIGNATION						
10	Designation for 10 Series product line					
ELECTRICAL TERMINATION TYPE						
A	0.11" push-on terminals. Mating terminals supplied					
B	0.25" push-on terminals					
C	NEMA 4; 1/2" NPT (male) conduit connection; 20" leads					
D	NEMA 4; 20" leads					
E	NEMA 4; 1/2" NPT (female) conduit connection; 5' cable					
F	NEMA 4; 4 terminal DIN connector. Mating part not supplied					
G	NEMA 4; 5' cable					
RANGE						
10, 11, 12, 13 14, 15, 16	See model chart on page 4					
MISCELLANEOUS OPTIONS						
M201	Factory set one switch; specify increasing or decreasing pressure and set point					
M277	Range indicated on nameplate in kPa or MPa, factory selected					
M278	Range indicated on nameplate in kg/cm ²					
M405	Intrinsic safety compliance for European Union per ATEX standards					
M406	Intrinsic safety compliance for Russia per Gosgortekhnadzor standards					
M430	Cover lock					
M444	Paper ID Tag					
M446	Stainless steel ID tag & wire attachment					
M449	Surface mounting bracket kit					
M511	1/4" NPT (male) 316 stainless steel pressure connection					
M512	1/4" NPT (male) brass pressure connection. NOT AVAILABLE ON MODELS 13, 14, 15, OR 16					
M540	Viton® construction. Deadbands and low end of range may increase (consult factory). Wetted parts include Viton® diaphragm and/or O-ring plus standard pressure connection material					
M541	Ethylene propylene (EPDM) construction. Deadbands may increase (consult factory). Wetted parts include EPDM diaphragm and/or O-ring plus standard pressure connection material					
M550	Oxygen service cleaning (alcohol cleaning to remove residue from the process connection); Buna-N diaphragm and/or O-ring changes to Viton®					
M925	7/16-20 UNF-2A, SAE male brass pressure connection					
M929	G1/2 straight pipe thread pressure connection					
62169-26	Surface mounting bracket kit					
L040	4' leadwire/cable. NOT AVAILABLE ON TYPES A, B, E, F, G					
L060	6' leadwire/cable. NOT AVAILABLE ON TYPES A, B, F					
L080	8' leadwire/cable. NOT AVAILABLE ON TYPES A, B, F					
L100	10' leadwire/cable. NOT AVAILABLE ON TYPES A, B, F					
L120	12' leadwire/cable. NOT AVAILABLE ON TYPES A,B, F					

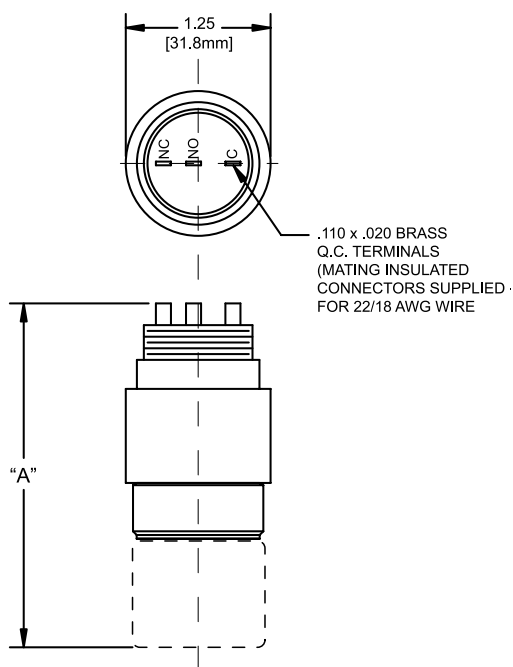
Viton® is a registered trademark of E.I. DuPont Company

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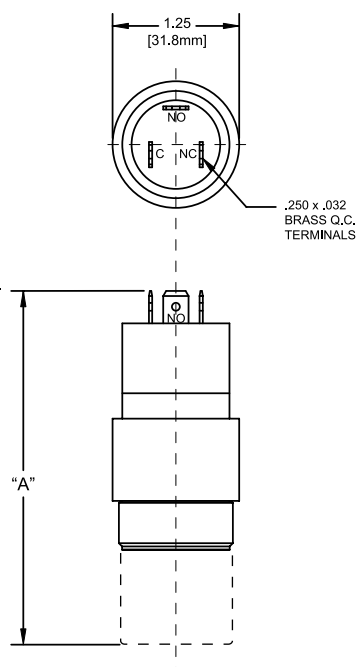
DIMENSIONAL DRAWINGS

Dimensional drawings for all models may be found at www.ueonline.com

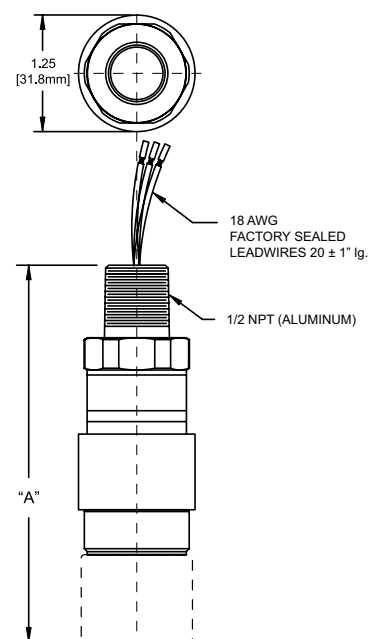
Type 10-A



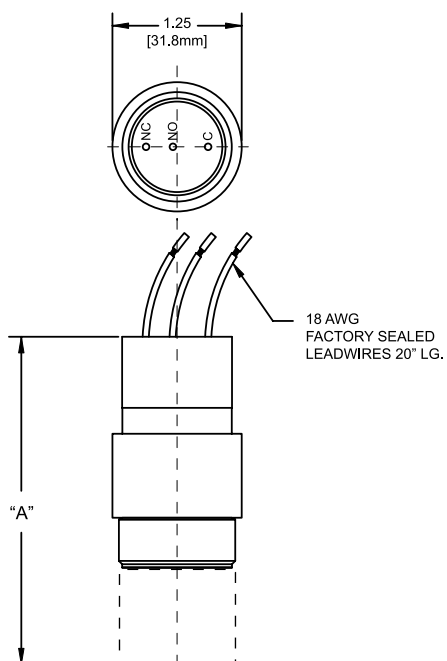
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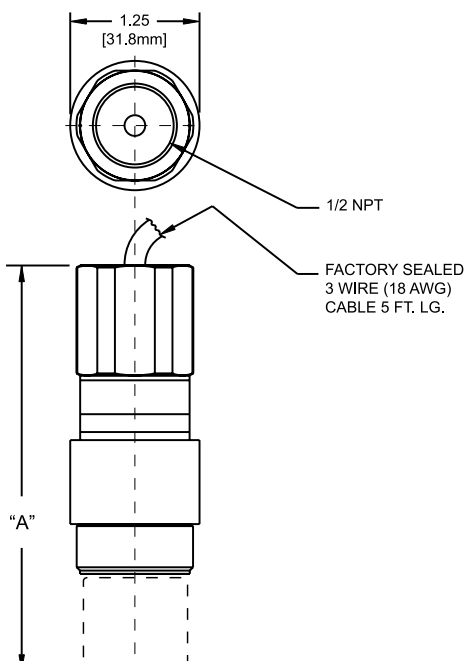
Type 10-C



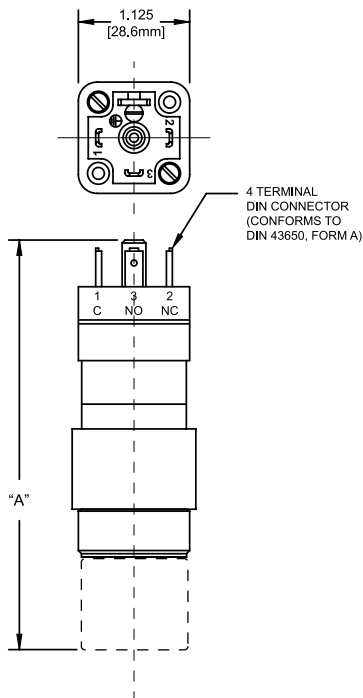
Type 10-D



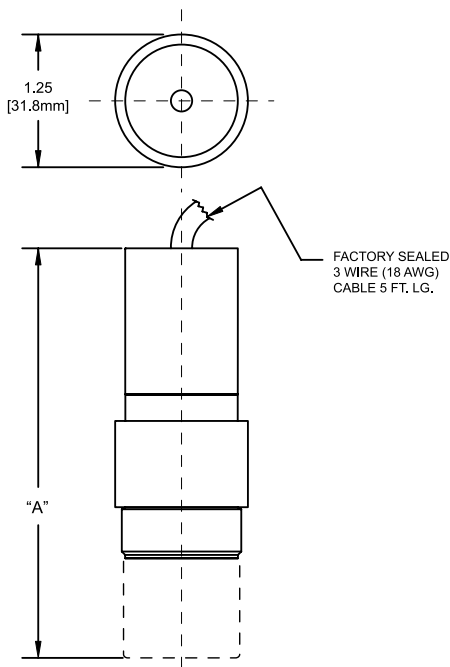
Type 10-E



Type 10-F



Type 10-G



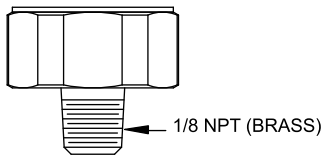
"A" Dimension Chart

Models	Inches	mm	NPT
A10-12	3.00	76.2	1/8"
A13-16	3.31	84.1	1/4"
B10-12	3.50	88.9	1/8"
B13-16	3.81	96.8	1/4"
C10-12	4.06	103.2	1/8"
C13-16	4.38	111.1	1/4"
D10-12	3.19	81.0	1/8"
D13-16	3.50	88.9	1/4"
E10-12	3.94	100.0	1/8"
E13-16	4.25	108.0	1/4"
F10-12	4.13	104.8	1/8"
F13-16	4.44	112.7	1/4"
G10-12	3.88	98.4	1/8"
G13-16	4.19	106.4	1/4"

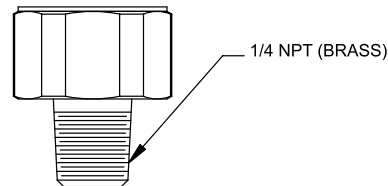
NOTE: For full size drawings, please visit our web site @www.ueonline.com

PRESSURE CONNECTION DETAILS

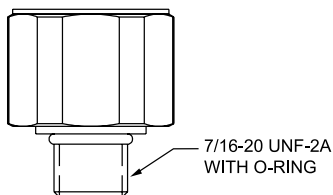
Model 10-12



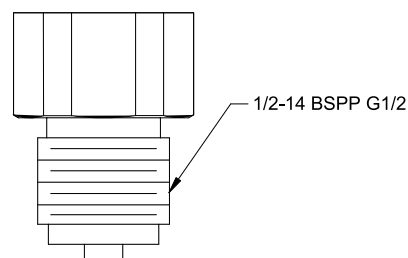
Model 13-16



Option M925



Option M929



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- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
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- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
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- Do not mount unit in ambient temp. exceeding published limits.

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Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

Seller's liability to Buyer for any loss or claim, including liability incurred in connection with (i) breach of any warranty whatsoever, expressed or implied, (ii) a breach of contract, (iii) a negligent act or acts (or negligent failure to act) committed by Seller, or (iv) an act for which strict liability will be inputted to seller, is limited to the "limited warranty" of repair and/or replacement as so stated in our warranty of product. In no event shall the Seller be liable for any special, indirect, consequential or other damages of a like general nature, including, without limitation, loss of profits or production, or loss or expenses of any nature incurred by the buyer or any third party.

UE specifications subject to change without notice.

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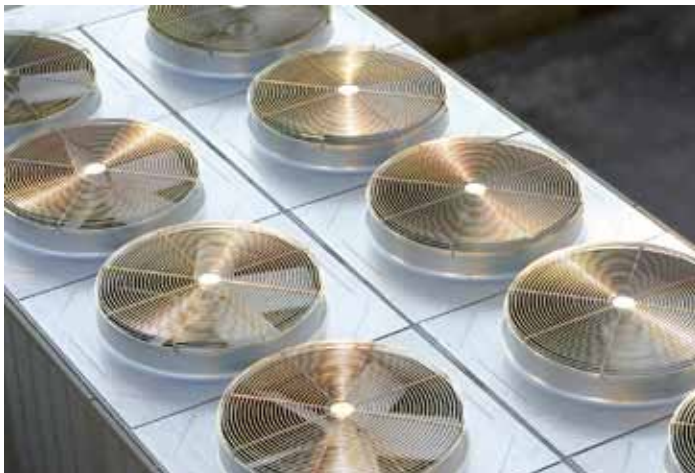
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PRESSURE, VACUUM & DIFFERENTIAL PRESSURE



FEATURES

- Brass & Polysulfone (FDA compliant) Pressure Connections
- Compact Size
- Complies with Enclosure Type 4 with watertight conduit fitting
- Terminal block wiring
- Optional red status light
- Adjustable Ranges:

Pressure: 30" Hg Vac to 90 psid
(-1 to 6,2 bar)

Differential Pressure: 1 to 45 psid
(68,9 mbar to 3,1 bar)

OVERVIEW

The cost-effective 24 Series Delta-Pro™ pressure, vacuum, and differential pressure switches offer a unique blend of compact size, excellent performance, and environmental protection. Available with brass or polysulfone pressure connections the Delta-Pro is ideal for applications involving hot or cool air, water, gas or oil. The precision snap-acting switch and sensitive diaphragms combine to provide a narrow deadband and repeatability of approximately $\pm 1\%$ of full scale range. A convenient, externally accessible adjustment screw is multi-turn to provide easy set point adjustability. The force-balanced design gives the Delta-Pro excellent vibration resistance.

FEATURES

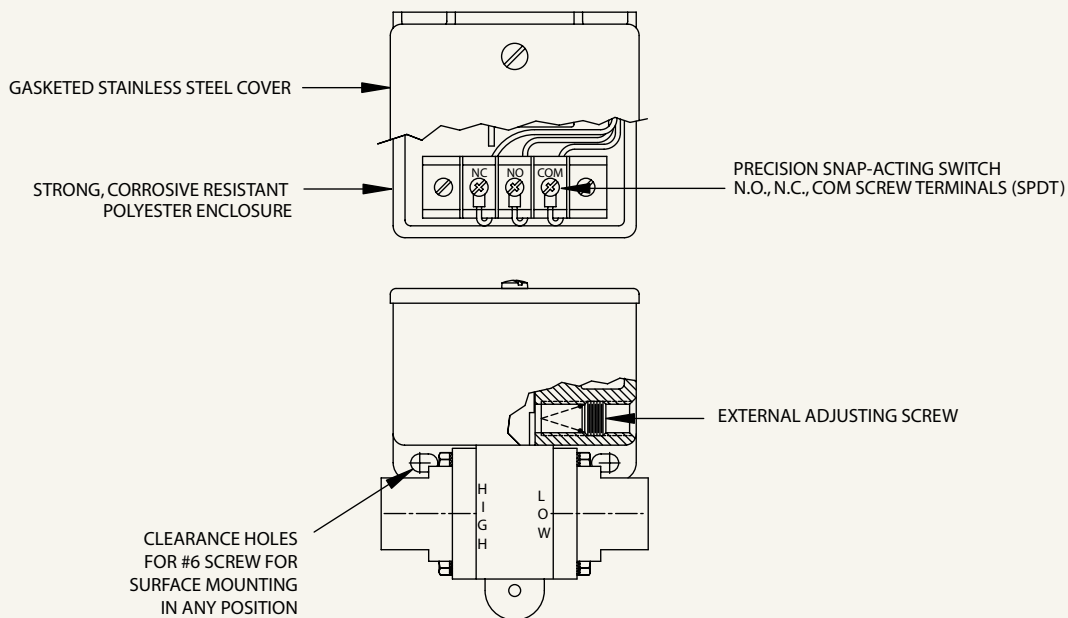
- UL listed and cUL certified. CE compliant to low voltage directive and pressure equipment directive
- Vacuum, Pressure or Differential pressure measurement
- 5 A @ 125/250 VAC SPDT snap-acting switch
- External stainless steel multi-turn adjusting screw
- OEM capabilities include external adjustment knob with or without reference scale



APPLICATIONS

Typical applications include filter monitoring and proof-of-flow. The 24 Series is used within the water & wastewater, bioprocessing, food & beverage, HVAC and gas processing industries.

TECHNOLOGY



The 24 Series (Delta Pro™) was designed to be a compact, cost-effective differential pressure switch for applications such as proof-of-flow, filter monitoring, etc. It depends upon two opposing diaphragms to sense pressure on the "High" and "Low" pressure outputs of a system. The resulting pressure differential is transmitted through a linkage to a snap-action electrical switch, providing an output when a pre-set difference is exceeded. This set point can be easily modified while under pressure via an external adjusting screw. This adjustment "pre-loads" the actuation mechanism, which results in excellent vibration-resistance. Straight pressure and vacuum versions, with a single diaphragm, are also available.



24 Series

24 Series

SPECIFICATIONS

STORAGE TEMPERATURE	-20° to 180°F (-29° to 82°C)
AMBIENT TEMPERATURE	30° to 160°F (-1° to 71°C). Set point typically shifts less than ±0.6% of range for a 50°F (28°C) ambient temperature change; consult factory for special ratings
MAX MEDIA TEMPERATURE	200°F (93°C) at 100 psi working pressure
SHOCK	Set point repeats after 15G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5G, 5-500 Hz
ENCLOSURE CLASSIFICATION	Complies with enclosure type 4 requirements with optional water tight conduit connector. Reinforced polyester body, stainless steel cover with gasket.
SET POINT REPEATABILITY	Typically ± 1% of full scale range.
SWITCH OUTPUT	One SPDT precision snap-acting micro-switch with mechanical contact life of 10 million cycles. Actual life depends on electrical load and cycle frequency
ELECTRICAL RATING	Rated to 5 A resistive and 5 A inductive (75% PF) at 125 VAC and 250 VAC, 1/4 HP; 5 A resistive and 3 A inductive at 30 VDC and 0.5 A resistive and 0.25 inductive at 125 VDC. Gold flash over silver contacts for minimum loads of 5 mA at 6 VDC, 2 mA at 12 VDC and 1 mA at 24 VDC
WEIGHT	6.5 oz.
ELECTRICAL CONNECTION	7/8" hole for optional 1/2" NPT conduit connector. Terminal block with screw terminals. Max wire size 16 AWG
PRESSURE CONNECTION	Models 013-014, 019-022: 1/4" NPT (female) brass; models 011-012, 015-018: 1/4" NPS (female) FDA compliant* Udel® polysulfone, non-tapered to minimize connection stress with 1/4" NPT (male) fittings - max torque is 2-ft.lbs.
MOUNTING & INSTALLATION	Surface mount with two screws through clearance holes, or mount by pressure connections

Udel® is a registered trademark of Solvay Advanced Polymers

* The U.S. Food & Drug Administration (FDA) has approved polysulfone resins as compliant with the specifications of the FDA 21CFR177.1655 for repeated use and selected single use in contact with food under conditions of use as specified in the citation.

APPROVALS



UNITED STATES AND CANADA

UL Listed, **cUL** Certified

Pressure: UL 508; CSA C22.2 No. 14, File #E42272



EUROPEAN UNION

Low Voltage Directive (LVD) 73/23/EC & 93/68/EEC

Compliant to LVD

Products rated lower than 50 VAC and 75 VDC are outside the scope of the LVD

The Low Voltage Directive does not apply to products for use in hazardous locations

Pressure Equipment Directive (PED) 97/23/EC

Pressure models only

Compliant to PED

Products rated below 7.5 psi are outside of the scope of the PED

DIFFERENTIAL PRESSURE MODEL CHART

Model	Adjustable Range		Typical Deadband		***Max. Working Pressure		**Proof Pressure	
	Low end of range of fall	High end of range on rise						
	psid	bar (unless noted)	psid	mbar	psi	bar	psi	bar
Polyurethane (polyether) diaphragm and polysulfone® 1/4" NPS (female) (mechanical) pressure connection								
011	1 to 10	68,9 mbar to 0,7	0.75	51,7	0 to 150	0 to 10,3	150	10,3
012	4 to 45	0,3 to 3,1	1	68,9	0 to 150	0 to 10,3	150	10,3
Polyurethane (polyether) diaphragm and brass 1/4" NPT (female) pressure connection								
013	1 to 10	68,9 mbar to 0,7	0.75	51,7	0 to 150	0 to 10	150	10,3
014	4 to 45	0,3 to 3,1	1	68,9	0 to 150	0 to 10	150	10,3

VACUUM AND PRESSURE MODEL CHART

Model	Adjustable Range		Typical Deadband		*Over Range Pressure		**Proof Pressure	
	psi (unless noted)	bar (unless noted)	psi (unless noted)	mbar (unless noted)	psi	bar	psi	bar
Polyurethane (polyether) diaphragm and polysulfone®, 1/4" NPS (female) (mechanical) pressure connection								
015	30" to 2" Hg VAC	-1 bar to -68,9 mbar	2.5" Hg	84,7	150	10,3	150	10,3
016	1 to 10	68,9 mbar to 0,7	0.75	51,7	150	10,3	150	10,3
017	4 to 45	0,3 to 3,1	1	68,9	150	10,3	150	10,3
018	10 to 90	0,7 to 6,2	3	0,2 bar	150	10,3	150	10,3
Polyurethane (polyether) diaphragm and brass 1/4" NPT (female) pressure connection								
019	30" to 2" Hg VAC	-1 bar to -68,9 mbar	2.5" Hg	84,7	150	10,3	150	10,3
020	1 to 10	68,9 mbar to 0,7	0.75	51,7	150	10,3	150	10,3
021	4 to 45	0,3 to 3,1	1	68,9	150	10,3	150	10,3
022	10 to 90	0,7 to 6,2	3	0,2 bar	150	10,3	150	10,3

*Over Range Pressure: The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

**Proof Pressure: The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing).

***Working Pressure: The pressure range within which two opposing sensors can be safely operated and still maintain set point adjustability.



HOW TO ORDER

Build a part number by selecting a model and options. Choose the Sensor Type and the Range from the Model Chart. If options are required, add the code from the option list below. Example: 24-013 * M900.

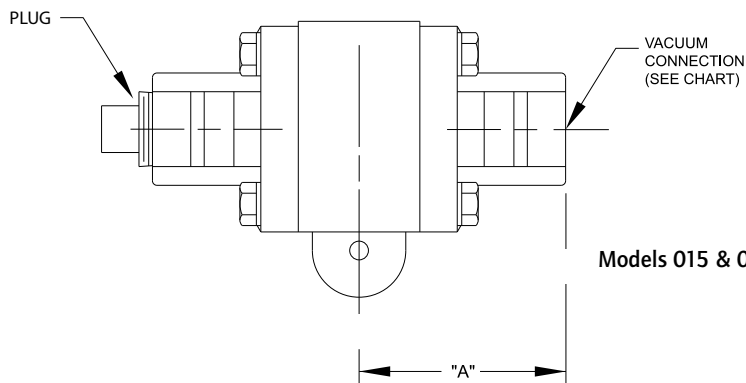
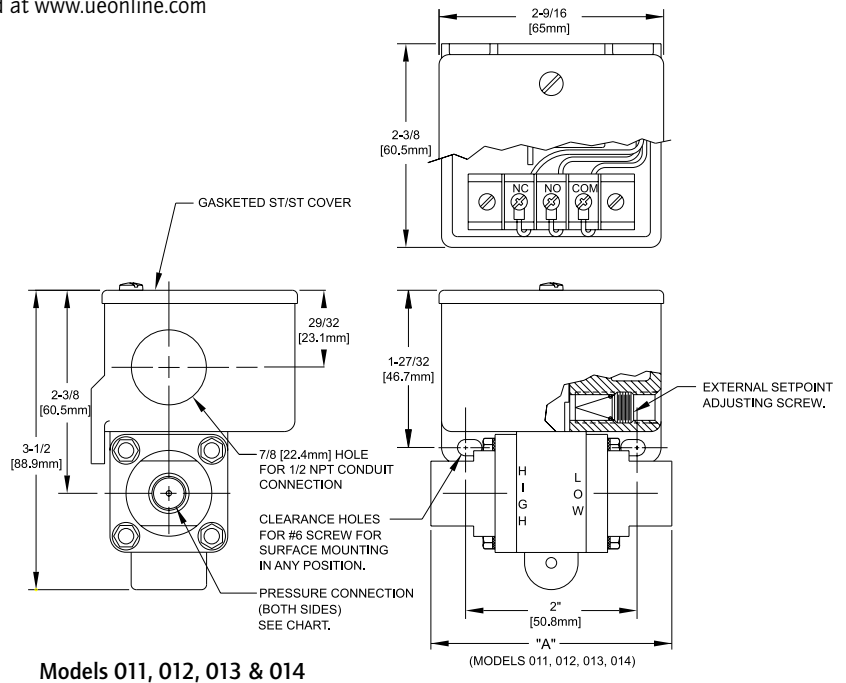
		24	013	M900
		Select a Type	Select a Model	Select an Option
		24	013	M900
COMPONENTS	DESCRIPTION			
CODE				
SERIES DESIGNATION				
24	Designation for 24 Series product line			
DIFFERENTIAL PRESSURE MODELS *				
011, 012	Polyurethane (polyether) diaphragm and 1/4" NPS (female) (mechanical) polysulfone pressure connection			
013, 014	Polyurethane (polyether) diaphragm and 1/4" NPT (female) brass pressure connection			
	*(See Model Chart for Differential Pressure Ranges)			
VACUUM AND PRESSURE MODELS *				
015, 016, 017, 018	Polyurethane (polyether) diaphragm and 1/4" NPS (female) (mechanical) polysulfone pressure connection			
019, 020, 021, 022	Polyurethane (polyether) diaphragm and 1/4" NPT (female) brass pressure connection			
	*(See Model Chart for Pressure Ranges)			
OPTIONS				
M020	Red status light, 115 VAC only. Specify whether light turns on or off with increasing or decreasing pressure			
M201	Factory set one switch; specify set point on increasing or decreasing pressure			
M260	Self-contained battery-operated audible alarm			
M262	Buna-N diaphragm			
M277	Range indicated on nameplate in kPa or MPa, factory selected			
M278	Range indicated on nameplate in Kg/cm ²			
M540	Viton® construction (deadband and low end of range may increase slightly. Consult factory.) Wetted parts include Viton® diaphragm plus standard connection material.			
M900	Water tight conduit fitting; converts 7/8" hole to 1/2" NPT fitting; must specify for Enclosure Type 4 compliance			

Viton® is a registered trademark of E.I. duPont de Nemours and Company.

DIMENSIONAL DRAWINGS

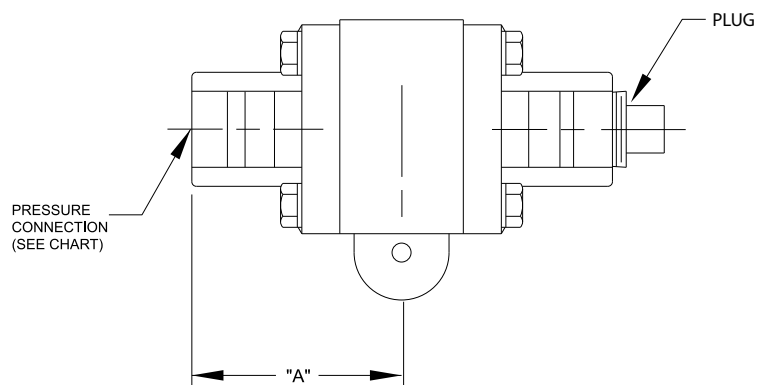
Dimensional drawings for all models may be found at www.ueonline.com

All dimensions stated in inches (millimeters)



Models 015 & 019

Models 016, 017, 018, 020, 021 & 022



Model	DIMENSION A	Pressure Connection
011, 012	2.75" (69.9 mm)	1/4 " NPS (F) Polysulfone
013, 014	3.13" (79.5 mm)	1/4" NPT (F) Brass
015, 016, 017, 018	1.44" (36.6 mm)	1/4" NPS (F) Polysulfone
019, 020, 021, 022	1.56" (39.6 mm)	1/4 " NPT (F) Brass

RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

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**UNITED ELECTRIC
CONTROLS**

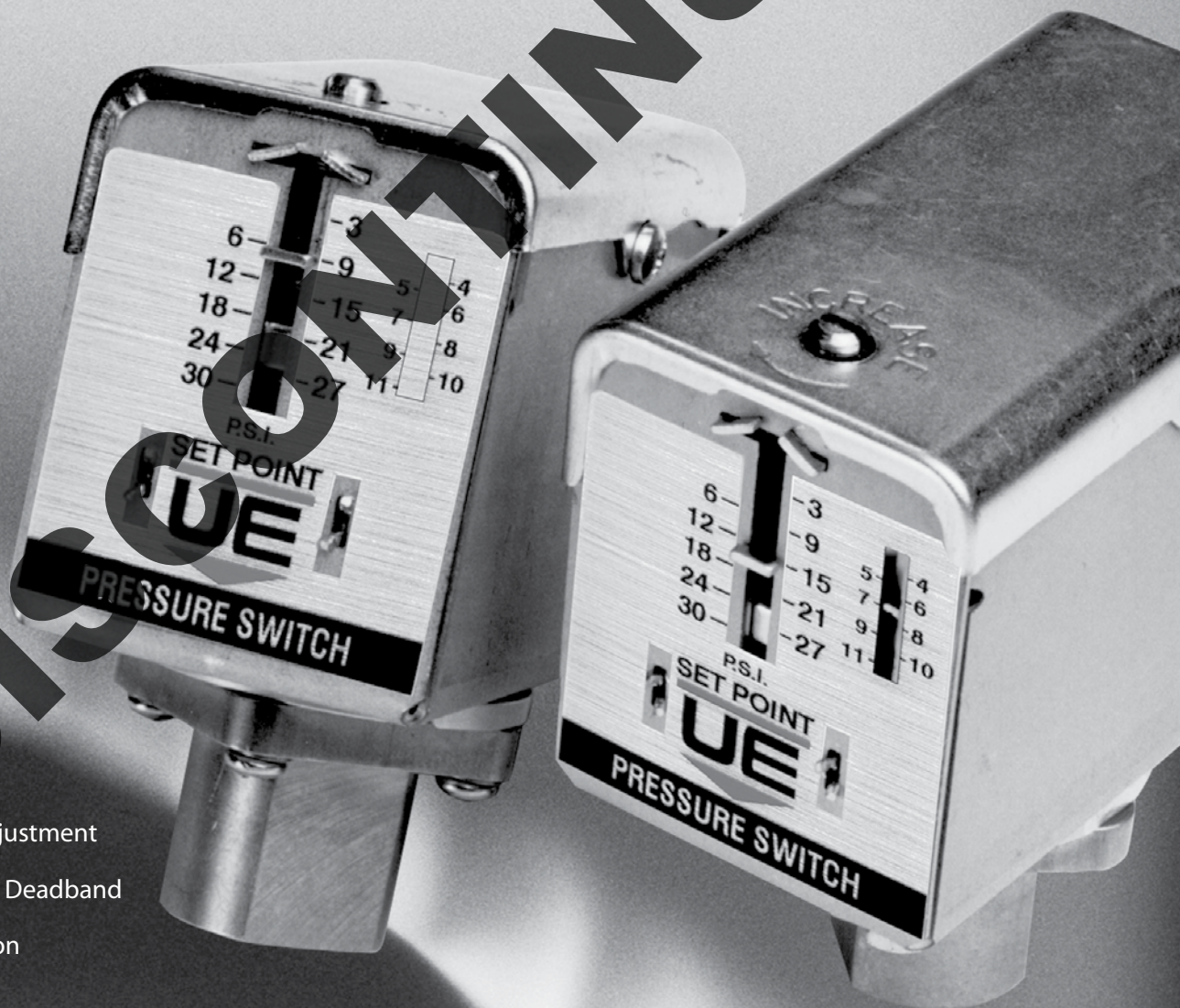
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<http://www.ueonline.com>



25 Series

25 Series

PRESSURE SWITCH



FEATURES

- External Setpoint Adjustment
- Internally Adjustable Deadband
- Compact Construction
- All Metal Enclosure



UNITED ELECTRIC
CONTROLS

overview

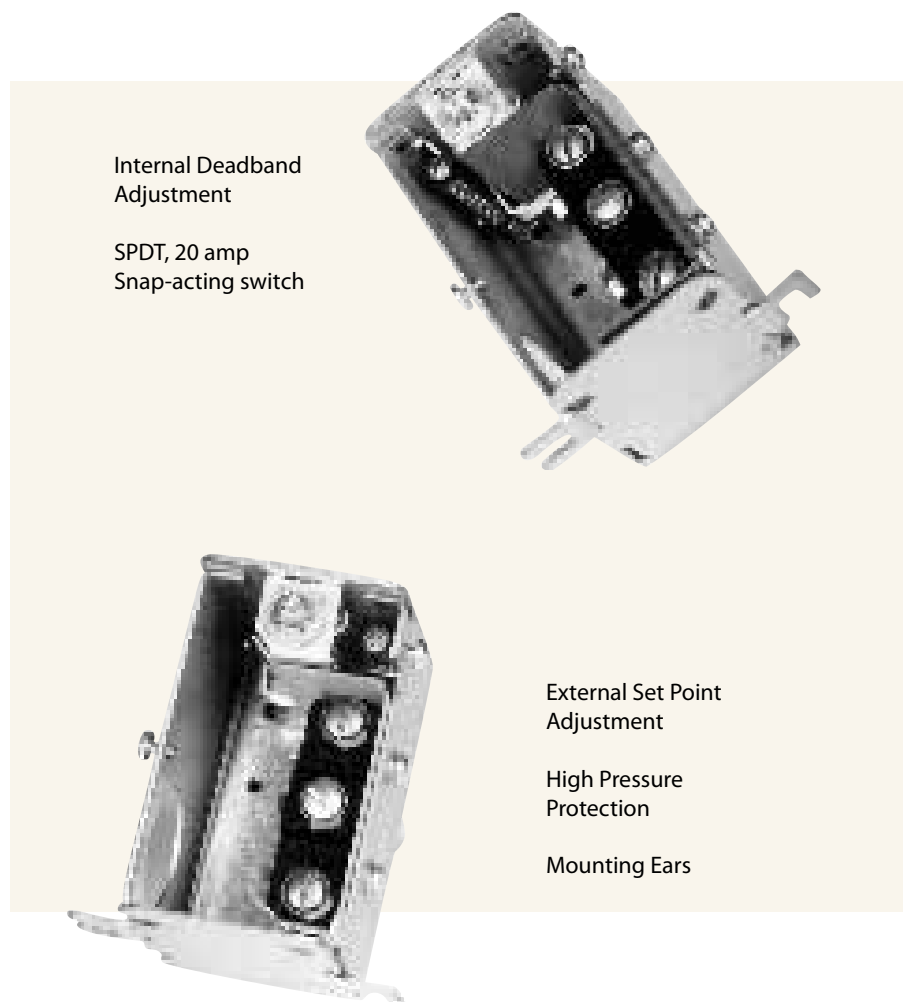
The 25 Series is a low cost pressure switch featuring an externally adjustable set point and an internally adjustable deadband. It offers a self contained solution for direct control of AC loads up to 20 amps with adjustable pressure ranges up to 475 psi.

The adjustable set point and deadband feature is a real benefit for applications where a full function logic controller would not be necessary. Technicians can make on-the-fly corrections during development testing, start-up or maintenance. The compact design and low cost also makes the 25 Series well suited for installation on OEM equipment or in panels.

features

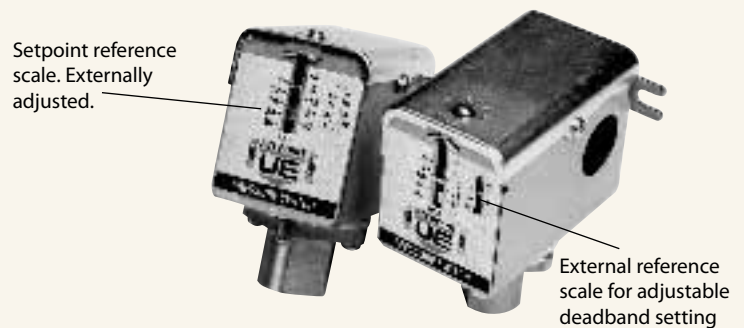
- External Adjustment
- Adjustable Deadband
- Compact Construction
- All Metal Enclosure

The 25 Series features proven diaphragm sensing technology, a 20 amp snap-acting switch, and adjustable ranges up to 475 psi, highlighting its versatility. The 25 Series is cULus listed and is available with a Buna-N, Viton® or EPDM diaphragm pressure sensor. The switch comes with a standard brass pressure connection; however, other materials are available for volume applications. All models achieve a rated proof pressure of 600 psi and are contained in a NEMA housing. The robust design provides repeatability of $\pm 1\%$, even when subjected to shock and vibration.



Applications

The 25 Series Adjustable Pressure Switch offers an easy to install solution for direct control of HVAC fans and blowers, as well as control of pumps, compressors and valves. The switch is ideal for alarm and shutdown applications where the user must protect people, equipment or the environment.



technology

The 25 Series relies on simple, but dependable technology to achieve its purpose: a cost-effective, ideal product for direct pump monitoring/control and similar applications. The 25 uses a diaphragm to sense changes in pressure, which are transmitted through a lever to the 20A snap-action switch. Changes to set point are accomplished easily while the unit is under pressure through the external adjusting screw. This adjustment "pre-loads" the lever, which results in excellent vibration-resistance. On many models, the deadband (the difference between actuation and de-actuation) is also field adjustable, giving the user flexibility in configuring the product to the application.



25 Series

25 Series

specifications

STORAGE TEMPERATURE -65 to 160°F (-54 to 71°C)

OPERATING AMBIENT
TEMPERATURE

0 to 160°F (17 to 71°C) Set point shifts less than 1% of range
for a 50°F (28°C) ambient temperature change

MAXIMUM
MEDIA TEMPERATURE

Buna-N sensor: 200°F (93°C)
Viton® sensor: 250°F (121°C)
EPDM sensor: 250°F (121°C)

ENCLOSURE

Zinc plated steel with bright chromate finish

ENCLOSURE
CLASSIFICATION

Complies with enclosure type 1

SHOCK

Set point repeats after 15 G, 10 millisecond duration

VIBRATION

Set point repeats after 2.5 G, 5 to 500 Hz

SET POINT
REPEATABILITY

Typically $\pm 1\%$ of span

SWITCH OUTPUT

One SPDT, snap-acting switch

ELECTRICAL RATINGS

20 A @ 480 VAC resistive
1 HP @ 125 VAC Resistive, adjustable deadband versions (choice F)
2 HP @ 250 VAC Resistive, adjustable deadband versions (choice F)

ELECTRICAL CONNECTION

7/8" hole for optional NPT conduit connector

WEIGHT

16 oz.

PRESSURE CONNECTION 1/4" NPT female Brass, or 1/8" NPT female Brass

MOUNTING

Surface mount with two screws through clearance holes,
or mount by pressure connection
Viton is a registered trademark of E.I. DuPont Company.

approvals



UL 873 listed, files # E10667, # E57086
CSA C22.2 No. 24-1993, Files # E10667, # 57086



CE Compliance with LVD (Low Voltage Directive)

model chart

Adjustable Deadband Version - Deadband Choice A

Model	Adjustable Range*				Adjustable Deadband Range				Max. Working Pressure		Proof Pressure	
	Low end of range on fall		High end of range on rise									
	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
A	3	0,2	30	2,1	5	0,3	11	0,8	30	2,1	600	41,4
B	20	1,4	200	13,8	20	1,4	70	4,83	200	13,8	600	41,4
C	25	1,7	475	32,8	35	2,4	140	9,7	475	32,8	600	41,4

Fixed Deadband Version - Deadband Choice F

Model	Adjustable Range*				Fixed Deadband Tolerance				Max. Working Pressure		Proof Pressure	
	Low end of range on fall		High end of range on rise									
	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
A	3	0,2	30	2,1	2	0,1	5	0,3	30	2,1	600	41,4
B	20	1,4	200	13,8	4	0,3	10	0,7	200	13,8	600	41,4
C	25	1,7	475	32,8	10	0,7	25	1,7	475	32,8	600	41,4

* Value indicated on dial is the set point on falling pressure.

Deadband represents the reset point above this setting. Dial setting plus deadband must not exceed adjustable range.



25 Series

25 Series

how to order

Select a single letter or number "Code" to make up a part number.

25	A	1	F	2	A	M201
Series Designation	Model/Range	Number of Switches	Pressure Connection	Sensor Material	Deadband	Miscellaneous Options

(Example of "Code") 25 A 1 F 2 A M201

COMPONENTS

SERIES DESIGNATION

25

DESCRIPTION

Designation for 25 Series product line

MODEL/RANGE

A

3 to 30 psi

B

20 to 200 psi

C

25 to 475 psi

NUMBER OF SWITCHES

1

(1) SPDT snap-switch, 20 A @ 480 VAC resistive

PRESSURE CONNECTION

E

1/8" NPT(female), Brass Pressure Connection

F

1/4" NPT(female), Brass Pressure Connection

SENSOR MATERIAL

2

Buna-N

3

Viton®

4

EPDM

DEADBAND

F

Fixed

A

Adjustable

MISCELLANEOUS OPTIONS

M201

Factory set point

M230*

Set adjustable deadband

M444

Paper tag

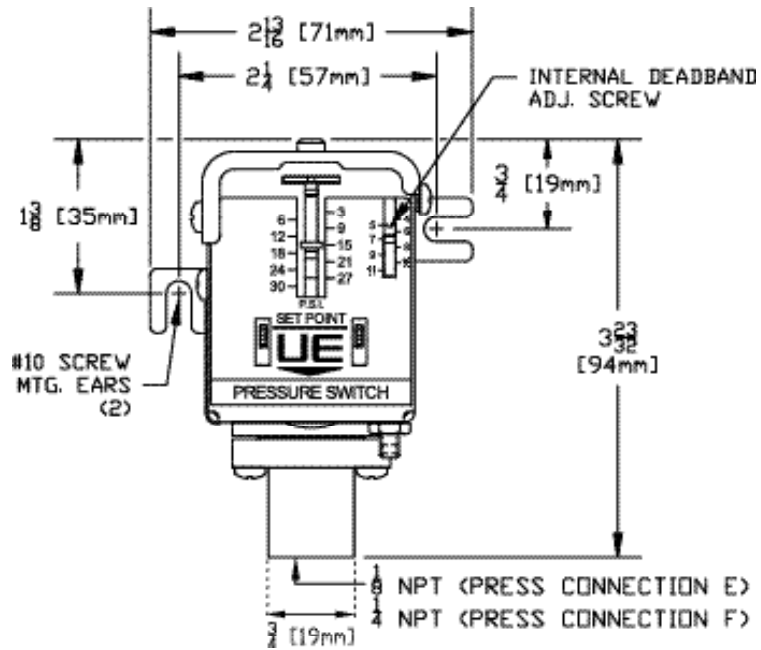
M446

Stainless steel tag

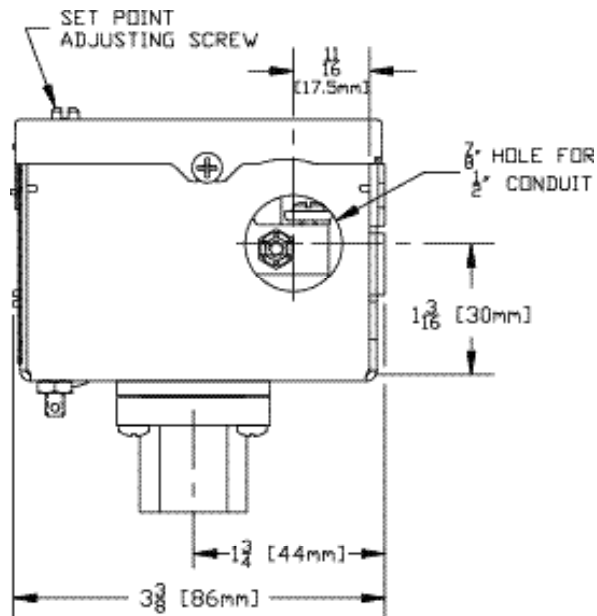
* Do not specify M201 when specifying M230

dimensional drawings

Front View



Side View



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum temperature is acceptable on a limited basis (i.e., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that in correct, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. Orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- For all applications, a factory set unit should be tested before use.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Use only factory authorized replacement parts and procedures.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY OF REPAIR AND REPLACEMENT

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (F.O.B. UE Watertown); provided, however, that this warranty applies only to equipment found to be so defective within a period of 18 months from the date of manufacture by the Seller (36 months for the Spectra 12 and One Series products). Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives.

EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIABILITY LIMITATION

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE IMPUTED TO SELLER, IS LIMITED TO THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED HEREIN. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

U.S. SALES OFFICES

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United Electric Controls
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Unidad Nacional 89410
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Watertown, MA 02471-9143 USA
Telephone: 617 926-1000 Fax: 617 926-2568
<http://www.ueonline.com>

PRESSURE, VACUUM AND TEMPERATURE



FEATURES

- Compact Size
- Wide Selection of Adjustable Ranges:
Pressure: 30" Hg Vac to 6000 psi (-1 to 413,7 bar)
Temperature: -130 to 650°F (-90 to 343.3 °C)
- Choice of One or Two Switch Outputs
- Adjustable or Narrow Deadband Options
- Reference Dial or Hex Screw Set Point Adjustment



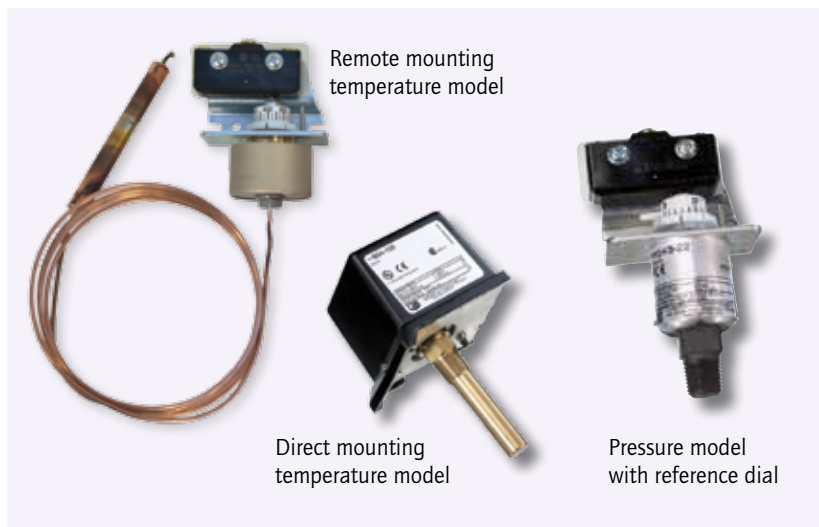
OVERVIEW

The 54 Series offers the OEM a combination of reliable performance and low cost. Available in pressure and temperature versions, with single or dual SPDT outputs and enclosed or open frame (skeleton) construction, the 54 Series family provides design versatility.

The 54 has been field-proven in a wide variety of OEM applications, including medical, laboratory, fire protection and heating equipment.

FEATURES

- Compact size
- Choice of one or two switch outputs
- Reference dial or hex screw-type setting
- Optional 1/2" NPT (male) by 1/8" NPT (female) polysulfone® pressure connection
- Optional external manual reset
- NEMA 1 or open frame (skeleton) versions for OEM applications
- Brass bellows models



Polysulfone® is a registered trademark of Amoco

SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71°C)
AMBIENT TEMPERATURE LIMITS	
Pressure Models	Models 126-164, 610-614: -40 to 160°F (-40 to 71°C); Models 22-28: 0 to 160°F (-18 to 71°C)
Temperature Models	-40 to 160°F (-40 to 71°C). Set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change.
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 CPS
ENCLOSURE CLASSIFICATION	Types C54, C54A, B54, F54, E54, J54, J54A, H54: complies with NEMA 1 requirements. Types C54S, B54S, F54S, E54S, J54S, J54AS, H54S: not applicable
SET POINT REPEATABILITY	
Pressure Models	Models 22-28, 126-164: ± 1% of full scale range; Models 610-614: ± 1.5% of full scale range
Temperature Models	± 1% of full scale range
SWITCH OUTPUT	One or two SPDT snap action switch(es); dual switch may be separated up to 100% of range; switches may be wired "normally open" or "normally closed"
ELECTRICAL RATING	15A 125/250/480 VAC resistive. Electrical switches have limited DC capabilities. Consult UE for additional information.
ENCLOSURE MATERIAL	Lexan® black finish for Types J54, J54A, H54, B54, C54, C54A, E54, F54 only
WEIGHT	Approximately 12 oz.
ELECTRICAL CONNECTION	Types J54 & H54, C54, C54A, B54, E54, F54: 7/8" diameter hole; Type J54A: 1-1/16" diameter hole
PRESSURE CONNECTION	Models 22-28: 1/4" NPT (male); 126-164, 610-614: 1/4" NPT (female)
TEMPERATURE ASSEMBLY	Bulb and Capillary: 6 feet copper or 304 stainless steel capillary Immersion Stem: Brass
TEMPERATURE FILL	Non-toxic oil
TEMPERATURE DEADBAND	Typically 1% of range under laboratory conditions (70°F circulating bath at rate of 1/2°F per minute change)

APPROVALS



UNITED STATES AND CANADA

Type J54, J54A, H54

UL Listed, cUL Certified

Pressure: UL 508, CSA C22.2 No. 14, file # E42272

Type J54S, J54AS, H54S

UL Recognized, cUL Recognized

Pressure: UL 508, CSA C22.2 No. 14, file #E42272

Type B54, C54, E54, F54

UL listed, CSA Certified

Temperature: UL 873, file # E10667;

CSA C22.2 No. 0 & 24, file # LR7814

Type B54S, C54S, E54S, F54S

UL Recognized, CSA Certified

Temperature: UL 873, file # E10667;

CSA C22.2 No. 0 & 24, file # LR7814

EUROPE



Low Voltage Directive (LVD) (73/23/ED & 93/68/EEC)

UEC compliant to LVD

Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD

Pressure Equipment Directive (PED) (97/23/EC)

Compliant to PED

Products rated lower than 7.5 psi are outside the scope of the PED

Lexan® is a registered trademark of General Electric Company



PRESSURE MODEL CHART

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	psi (unless noted)	bar (unless noted)	psi (unless noted)	bar (unless noted)	psi	bar	psi	bar
J54, J54A, J54S, J54AS, H54, H54S								
Buna N diaphragm and O-Ring with 1/4" NPT (male) aluminum pressure connection; limited to process temperature below 200°F								
22	30" Hg Vac to 0	-1 to 0	1 to 3.5" Hg Vac	33,9 to 118, 5 mbar	0	0	50	3,4
24	3 to 30	0,2 to 2,1	0.4 to 1.3	27,6 to 89,6 mbar	50	3,4	200	13,8
25	10 to 100	0,7 to 6,9	1 to 2.5	68,9 to 172,4 mbar	100	6,9	above set point	above set point
27	30 to 300	2,1 to 20,7	1.3 to 4	89,6 to 275,8 mbar	above set point	above set point	Max 600	Max 41,4
28	50 to 500	3,4 to 34,5	1.5 to 5	103,4 to 344,7 mbar				
Brass bellows with nickel-plated brass 1/4" NPT (female) pressure connection; Model 126 has a zinc-plated steel spring exposed to media								
126	30" Hg Vac to 0	-1 to 0	0.2 to 0.9" Hg	6,8 to 30,5 mbar	3	0,2	5	0,3
137	0 to 80 "wc	0 to 199,1 mbar	1 to 8 "wc	2,5 to 19,9 mbar	3	0,2	5	0,3
144	0 to 20	0 to 1,4	0.1 to 0.5	6,9 to 34,5 mbar	20	1,4	25	1,7
146	0 to 30	0 to 2,1	0.1 to 0.6	6,9 to 41,4 mbar	30	2,1	40	2,8
152†	0 to 50	0 to 3,4	0.1 to 0.7	6,9 to 48,3 mbar	50	3,4	75	5,2
156	0 to 100	0 to 6,9	0.2 to 0.8	13,8 to 55,2 mbar	100	6,9	125	8,6
164	0 to 200	0 to 13,8	0.3 to 2	20,7 to 137,9 mbar	200	13,8	200	13,8
J54, J54S								
303 stainless steel piston and Buna N O-Ring with 1/4" NPT (female) pressure connection (not recommended for gas service since drying of the O-Ring can allow bleeding of the medium into the atmosphere)								
610	75 to 1000	5,2 to 68,9	30 to 150	2,1 to 10,3	6000	413,7	10,000	689,5
612	125 to 3000	8,6 to 206,8	40 to 250	2,8 to 17,2	6000	413,7	10,000	689,5
614	700 to 6000	48,3 to 413,7	50 to 400	3,4 to 27,6	6000	413,7	10,000	689,5

*Over Range Pressure: The Maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.

**Proof Pressure: The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g., start-up, testing).

† Model not available for types H54, H54S

TEMPERATURE MODEL CHART

Model	Adjustable Set Point Range		Max. Temperature		Scale*** Division		Stem Size
	°F	°C	°F	°C	°F	°C	NPT x BT (inches)
B54, B54S, C54, C54S, C54A, C54AS , Brass immersion stem							
103	0 to 225	-17.8 to 107.2	250	121.1	10	5	3/8 x 2-1/8
109	200 to 425	93.3 to 218.3	425	218.3	10	5	3/8 x 2-1/8
							OD x Length
E54, F54 , Copper bulb and capillary							
D20BC	-130 to 120	-90 to 48.9	170	76.7	10	5	3/8 x 4-1/2
D21BC	0 to 150	-17.8 to 65.6	200	93.3	5	5	3/8 x 6-7/8
D22BC	50 to 300	10 to 148.9	350	176.7	10	5	3/8 x 4-1/2
D23BC	150 to 650	65.6 to 343.3	700	371.1	25	10	3/8 x 3-5/8
E54, F54 , Stainless steel bulb and capillary							
D20BS†	-130 to 120	-90 to 48.9	170	76.7	10	5	3/8 x 4-1/2
D21BS	0 to 150	-17.8 to 65.6	200	93.3	5	5	3/8 x 6-7/8
D22BS	50 to 300	10 to 148.9	350	176.7	10	5	3/8 x 4-1/2
D23BS	150 to 650	65.6 to 343.3	700	371.1	25	10	3/8 x 3-5/8
E54S, F54S , Copper bulb and capillary							
D21BC	0 to 150	-17.8 to 65.6	200	93.3	5	5	3/8 x 6-7/8
D22BC	50 to 300	10 to 148.9	350	176.7	10	5	3/8 x 4-1/2
D23BC	150 to 650	65.6 to 343.3	700	371.1	25	10	3/8 x 3-5/8
E54S, F54S , Stainless steel bulb and capillary							
D21BS	0 to 150	-17.8 to 65.6	200	93.3	5	5	3/8 x 6-7/8
D22BS	50 to 300	10 to 148.9	350	176.7	10	5	3/8 x 4-1/2
D23BS	150 to 650	65.6 to 343.3	700	371.1	25	10	3/8 x 3-5/8

† Not available Type F54

*** Applies to Types B54, B54S, E54, E54S only



HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts."

Determine model based on adjustable range, deadband and proof pressure.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section.

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number.

Leave "option" portion blank if no options are needed. FOR MULTIPLE OPTIONS: Call United Electric Controls.

TYPE

J54:	NEMA 1 enclosure; One SPDT output; internal hex adjustment with no reference dial
J54A:	NEMA 1 enclosure; Two SPDT outputs; internal hex adjustment with no reference dial
J54S:	Skeleton construction; One SPDT output; hex adjustment with no reference dial
J54AS:	Skeleton construction; Two SPDT outputs; hex adjustment with no reference dial
H54:	NEMA 1 enclosure; One SPDT output; internal adjustment with reference dial
H54S:	Skeleton construction; One SPDT output; adjustment with reference dial

DESCRIPTION - PRESSURE MODELS

J54:	NEMA 1 enclosure; One SPDT output; internal hex adjustment with no reference dial
J54A:	NEMA 1 enclosure; Two SPDT outputs; internal hex adjustment with no reference dial
J54S:	Skeleton construction; One SPDT output; hex adjustment with no reference dial
J54AS:	Skeleton construction; Two SPDT outputs; hex adjustment with no reference dial
H54:	NEMA 1 enclosure; One SPDT output; internal adjustment with reference dial
H54S:	Skeleton construction; One SPDT output; adjustment with reference dial

TEMPERATURE MODELS

C54:	NEMA 1 enclosure; Immersion stem; one SPDT output; internal hex adjustment with no reference dial
C54A:	NEMA 1 enclosure; Immersion stem; two SPDT outputs; internal hex adjustment with no reference dial
C54S:	Skeleton construction; Immersion stem; one SPDT output; hex adjustment with no reference dial
C54AS:	Skeleton construction; Immersion stem; Two SPDT outputs; hex adjustment with no reference dial
B54:	NEMA 1 enclosure; Immersion stem; one SPDT output; internal adjustment with reference dial
B54S:	Skeleton construction; Immersion stem; one SPDT output; adjustment with reference dial
F54:	NEMA 1 enclosure; Bulb and capillary; one SPDT output; internal hex adjustment with no reference dial
F54S:	Skeleton construction; Bulb and capillary; one SPDT output; hex adjustment with no reference dial
E54:	NEMA 1 enclosure; Bulb and capillary; one SPDT output; internal adjustment with reference dial
E54S:	Skeleton construction; Bulb and capillary; one SPDT output; adjustment with reference dial

SWITCH OPTIONS*

CODE

DESCRIPTION

0500	Close deadband, 5A 125/250 VAC resistive NOT AVAILABLE ON B54, B54S, C54, C54S, C54A, C54AS, E54S, F54, F54S
1520	Adjustable deadband, 15A 125/250/277 VAC resistive. Adjustable wheel changes rise setting only. If adjustment of fall setting is required, use primary adjustment. NOT AVAILABLE ON TYPES J54A, J54AS, H54, H54S, PRESSURE MODELS 610-614 & TEMPERATURE VERSIONS
1530	External manual reset, 15A 125/250/480 VAC resistive; reset on increasing pressure or temperature only. NOT AVAILABLE ON TYPES J54A, J54S, J54AS, H54S, B54S, C54A, C54AS, C54S, E54S, F54S OR MODELS 610-614
2000	20A 125/250 VAC resistive

* All switches have limited DC capabilities. Consult factory for details.

GENERAL OPTIONS

CODE	DESCRIPTION
M201	Factory set one switch; specify increasing or decreasing pressure or temperature and set point. NOT AVAILABLE ON TYPES J54A, J54AS, C54A, C54AS
M202	Factory set two switches; specify increasing or decreasing pressure or temperature and set point. NOT AVAILABLE ON TYPES J54, J54S, H54, H54S, B54, B54S, C54, C54S, E54, E54S, F54, F54S
M270	Calibrated dial in Celsius. NOT AVAILABLE ON PRESSURE VERSIONS AND TYPES B54, B54S, C54, C54S, C54A, C54AS, F54, F54S
M277	Range indicated on nameplate in kPa or MPa. NOT AVAILABLE ON TEMPERATURE VERSIONS
M278	Range indicated on nameplate in kg/cm ² . NOT AVAILABLE ON TEMPERATURE VERSIONS.
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M540	Viton® construction (deadband and low end range may increase slightly. Consult factory); Wetted parts include Viton® diaphragm and O-Ring plus standard connection material. NOT AVAILABLE MODELS 126-164 OR TEMPERATURE VERSIONS

PRESSURE CONNECTION OPTIONS

M501	Polysulfone® pressure connection 1/2" NPT (male) x 1/8" NPT (female). NOT AVAILABLE MODELS 126-164, 610-614 OR TEMPERATURE VERSIONS
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OPTIONS FOR TEMPERATURE MODELS

UNION CONNECTORS

For all bulb & capillary switches

Option	Replacement Number	Description
	<u>Brass</u>	
W027	SD6213-27	1/2" NPT w/ 3/4" bushing
W045	SD6213-45	3/4" NPT
W051	SD6213-51	1/2" NPT
	<u>304 Stainless Steel</u>	
W028	SD6213-28	1/2" NPT w/ 3/4" bushing
W046	SD6213-46	3/4" NPT
W050	SD6213-50	1/2" NPT

THERMOWELLS

For all bulb & capillary switches

	<u>Brass</u>	
W075	SD6225-75	3/4" bushing adapter, 4" BT
W191	SD6225-191	1/2" NPT, 4" BT
W118	SD6225-118	3/4" bushing adapter, 7" BT
W192	SD6225-192	1/2" NPT, 7" BT
	<u>316 Stainless Steel</u>	
W076	SD6225-76	3/4" NPT, 4.5" BT
W193	SD6225-193	1/2" NPT, 4.5" BT
W119	SD6225-119	3/4" NPT, 7.5" BT
W177	SD6225-177	1/2" NPT, 7.5" BT
	<i>For all Immersion stem switches</i>	
W141	SD6225-141	1/2" NPT x 1 9/16" BT, brass
W146	SD6225-146	1/2" NPT x 1 9/16" BT, 316 stainless steel

OPTIONAL LENGTHS:

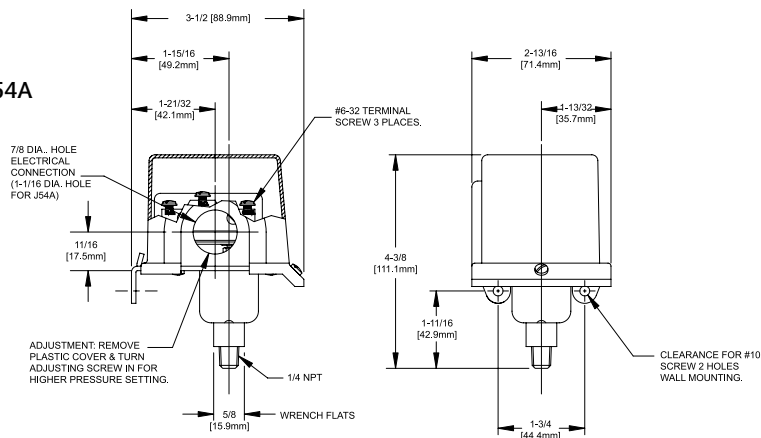
Optional immersion stem lengths to 15" available in brass, with or without 316 st/st thermowell. Consult UE for additional information. Optional capillary length to *50' available in copper or 304 st/st. Armor or Teflon® capillary protection available to lengths less than or equal to capillary length. Consult UE for additional information.

**Consult UE regarding repeatability and ambient effects on capillary lengths over 30'.
Viton® is a registered trademark of Dupont Dow Elastomers*

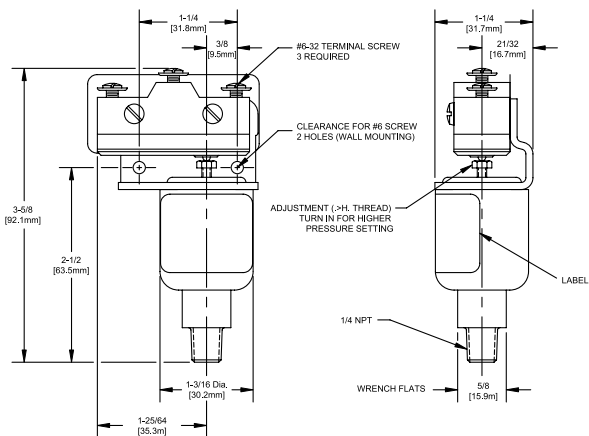
DIMENSIONAL DRAWINGS

Pressure Models

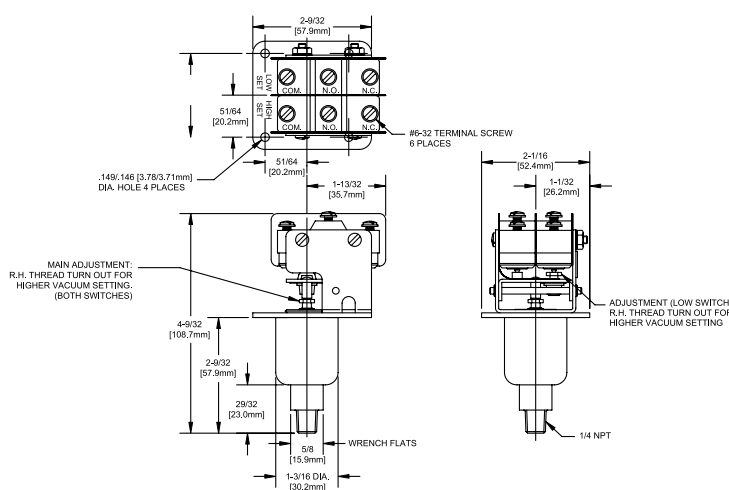
Type H54, J54 and J54A Models 22 - 28



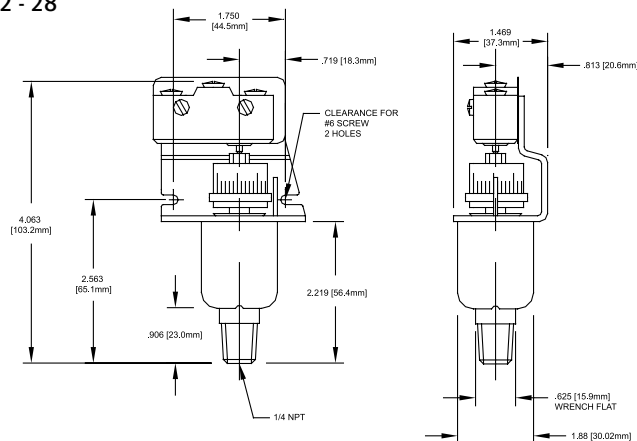
Type J54S, Models 22 - 28



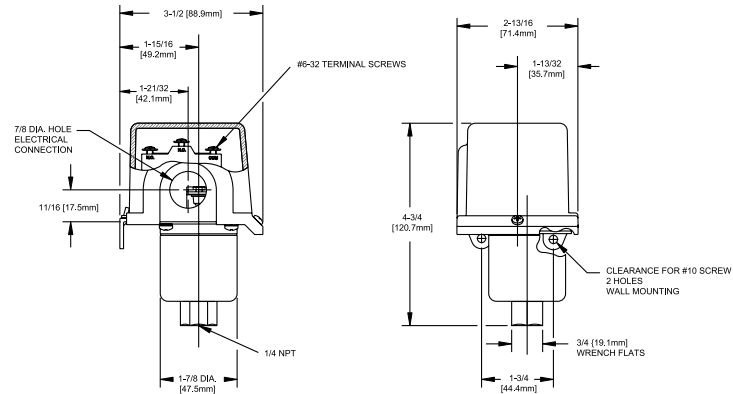
Type J54AS, Models 22 - 28



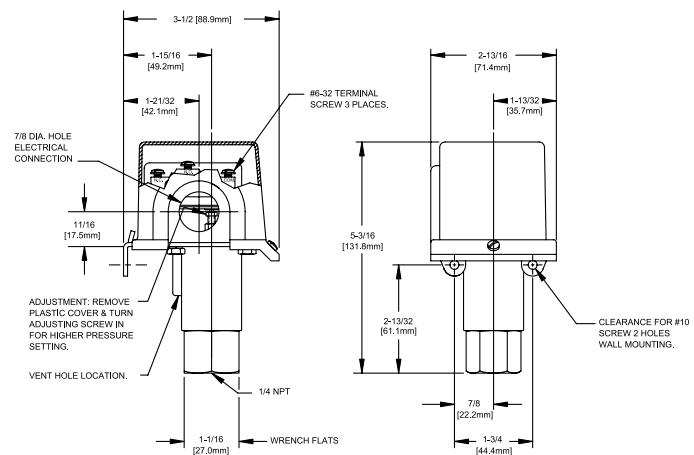
Type H54S, Models 22 - 28



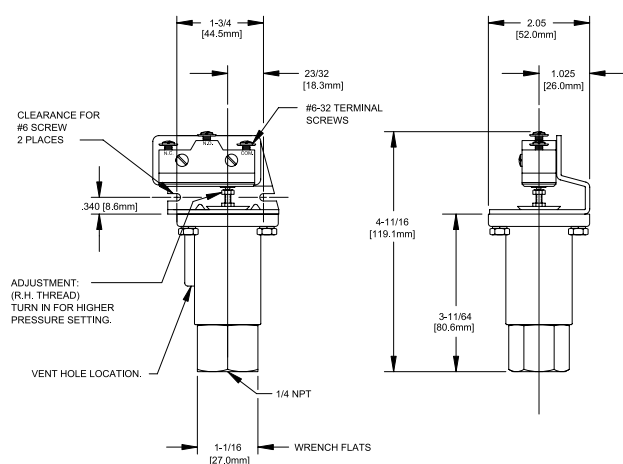
Type H54, J54, and J54A Models 126-164



Type J54 Models 610 - 614



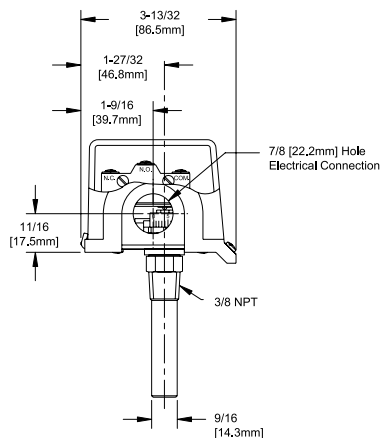
Type J54S Models 610 - 614



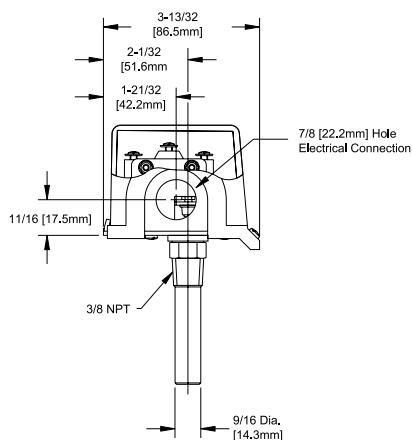
DIMENSIONAL DRAWINGS

Temperature Models

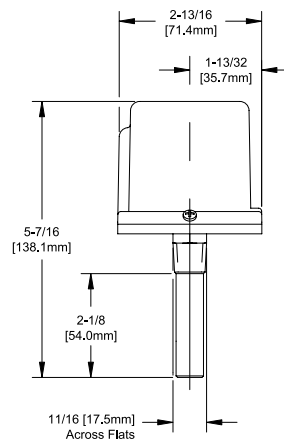
Types B54, C54



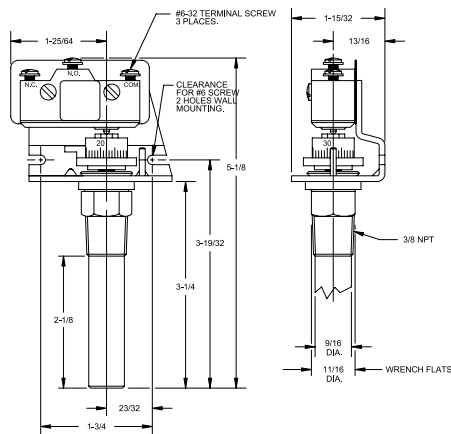
Type C54A



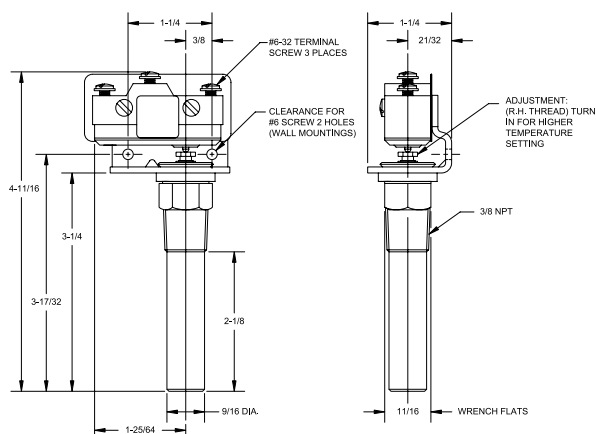
Types B54, C54, C54A



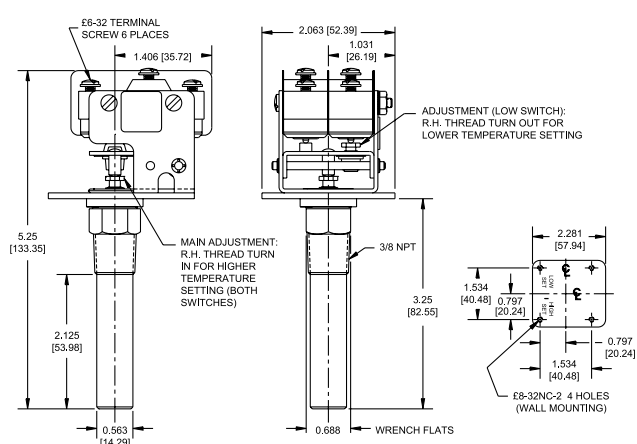
Type B54S



Type C54S

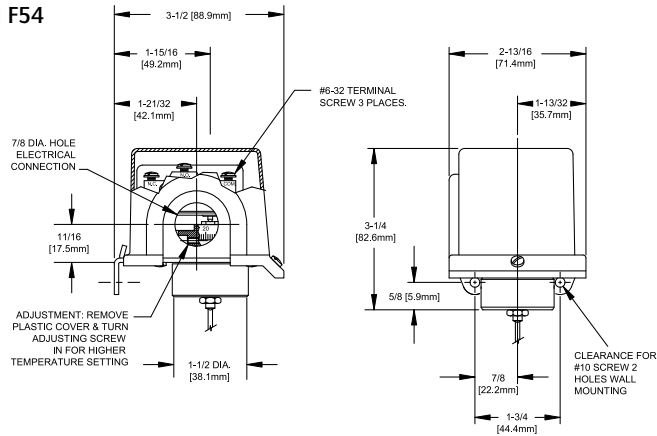


Type C54AS

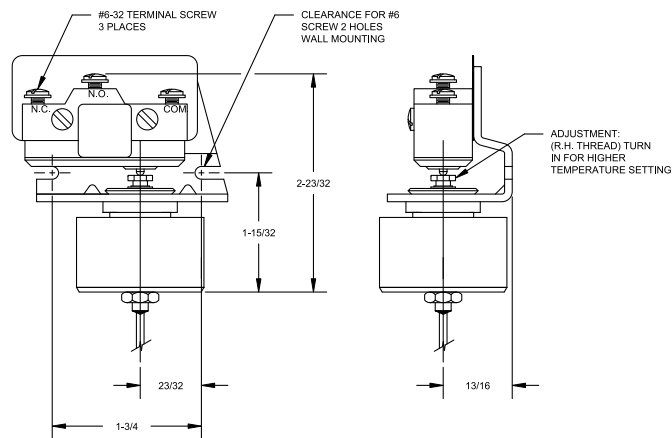


All dimensions stated in inches (millimeters)

Types E54 and F54

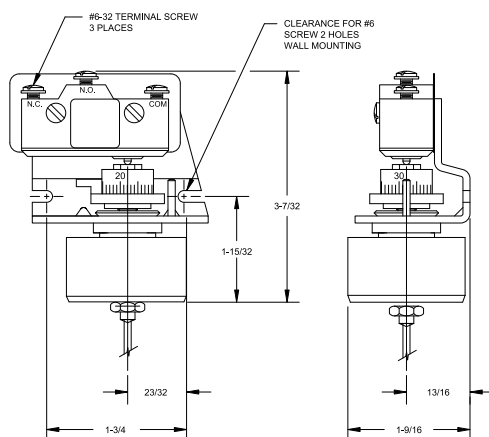


Type F54S



Bulb Size		
Models	Inches	mm
E54 & F54		
D20BC, D20BS, D22BC, D22BS	4.50	114.3
D21BC, D21BS	6.86	174.6
D23BC, D23BS	3.63	92.1
E54S & F54S		
D21BC, D21BS	6.86	174.6
D22BC, D22BS	4.50	114.3
D23BC, D23BS	3.63	92.1

Type E54S



RECOMMENDED PRACTICES AND WARNINGS

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- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

Seller's liability to Buyer for any loss or claim, including liability incurred in connection with (i) breach of any warranty whatsoever, expressed or implied, (ii) a breach of contract, (iii) a negligent act or acts (or negligent failure to act) committed by Seller, or (iv) an act for which strict liability will be inputted to seller, is limited to the "limited warranty" of repair and/or replacement as so stated in our warranty of product. In no event shall the Seller be liable for any special, indirect, consequential or other damages of a like general nature, including, without limitation, loss of profits or production, or loss or expenses of any nature incurred by the buyer or any third party.

UE specifications subject to change without notice.

Be sure to visit www.ueonline.com for the latest information.

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CP01101500

REMOTE MOUNTING TEMPERATURE SWITCH AND CONTROL



FEATURES

- Single or Dual 15 A Switch Output
- Panel or Surface Mount
- External adjustment via reference dial
- Heat Tracing Models
- Adjustable Ranges Within -130 to 650°F (-90 to 343.3°C)





OVERVIEW

The E55 Series provides rugged, dependable temperature control for many applications. Available in single or dual output versions, with either an epoxy coated enclosure (designed to meet NEMA Type 4X) or skeleton construction, the E55 combines flexibility with compact size. It has been used in diverse applications such as food service appliances, oven control, and heat tracing.

FEATURES

- Single or dual 15 A switch output
- Skeleton or Enclosure construction - designed to meet NEMA Type 4X
- Optional external manual reset
- Compact size
- Copper or stainless steel bulb & capillary



Remote mount heat tracing
model (E55-R25HT)

Dual switch, skeleton model



SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71°C)
AMBIENT TEMPERATURE LIMITS	-40 to 160°F (-40 to 71°C); set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change
SET POINT REPEATABILITY	± 1% of adjustable range
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 Hz
ENCLOSURE CLASSIFICATION	Type E55 & E55A: Designed to meet enclosure type 4X requirements Types E55S & E55AS: Skeleton, open frame construction, not applicable
ENCLOSURE	Die cast aluminum, epoxy powder coated with stainless steel, gasketed adjustment cover (E55 and E55A)
SWITCH OUTPUT	One or two SPDT; dual switch may be separated up to 100% of range; switches may be wired "normally open" or "normally closed"
ELECTRICAL RATING	15 A 125/250/480 VAC resistive; 22 A 480 VAC for E55-R25HT and E55-L24HT heat trace models. Electrical switches have limited DC capabilities. Consult factory for additional information
ELECTRICAL CONNECTION	1/2" NPT (female) (E55 and E55A)
WEIGHT	Types E55S, E55AS (skeleton): approximately 12 oz.; Types E55, E55A: approximately 1 lb.
BULB AND CAPILLARY	Models E20BC - E23BC: 6 feet copper; Models E20BS - E23BS: 6 feet stainless steel Model R25HT-101: 10 feet stainless steel Model L24HT: stainless steel, Local sensor, no capillary, for ambient sensing
TEMPERATURE FILL	Non-toxic oil
TEMPERATURE DEADBAND	Typically 1% of range under laboratory conditions (70°F circulating bath at rate of 1/2°F per minute change)

APPROVALS



UNITED STATES AND CANADA

E55(A) Models

UL Listed, CSA Certified

UL 873, file # E10667; C22.2 no. 24, file # LR7814

E55(A)S Models

UL Recognized, CSA Certified

UL 873, file # E10667; C22.2 no. 24, file # LR7814

EUROPE

Low Voltage Directive (LVD) (73/23/EC & 93/68/EEC)

UEC compliant to LVD

Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD



55 Series

55 Series

MODEL CHART

Model	Adjustable Set Point Range		Max. Temp.		Dial Div.		Bulb Size
	°F	°C	°F	°C	°F	°C	OD x Length (inches)
Copper bulb & capillary							
E20BC	-130 to 120	-90 to 48.9	170	76.7	10	5	3/8 x 4-3/8
E21BC	0 to 150	-17.8 to 65.6	200	93.3	5	5	3/8 x 6-7/8
E22BC	50 to 300	10 to 148.9	350	176.7	10	5	3/8 x 4-3/8
E23BC	150 to 650	65.6 to 343.3	700	371.1	25	10	3/8 x 3-5/8
Stainless steel bulb and capillary							
E20BS [‡]	-130 to 120	-90 to 48.9	170	76.7	10	5	3/8 x 4-3/8
E21BS	0 to 150	-17.8 to 65.6	200	93.3	5	5	3/8 x 6-7/8
E22BS	50 to 300	10 to 148.9	350	176.7	10	5	3/8 x 4-3/8
E23BS	150 to 650	65.6 to 343.3	700	371.1	25	10	3/8 x 3-5/8
R25HT ^{‡‡}	25 to 325	-3.9 to 162.8	600	315.6	10	–	1/4 x 7-3/16
L24HT ^{‡‡}	15 to 140	-9.4 to 60	190	87.8	5	–	3/8 x 7

[‡] Not available with Type E55AS

^{‡‡} Not available with Types E55A, E55S, E55AS

HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts".

Determine model based on adjustable range, and capillary material.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section.

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number.

Leave "option" portion blank if no options are needed. *FOR MULTIPLE OPTIONS:* Call United Electric Controls.

TYPE

E55	Bulb & capillary; one SPDT output; Epoxy coated enclosure; external adjustment with reference dial, tamper-resistant cover
E55A	Bulb & capillary; two SPDT outputs; Epoxy coated enclosure; external adjustment with reference dial, tamper-resistant cover
E55S	Bulb & capillary; one SPDT output; skeleton construction; external adjustment with reference dial
E55AS	Bulb & capillary; two SPDT outputs; skeleton construction; external adjustment with reference dial

SWITCH OPTIONS*

0500	Close deadband, 5 A 125/250 VAC resistive. NOT AVAILABLE ON MODELS R25HT, L24HT
1530	External manual reset, 15 A 125/250/480 VAC resistive; reset on increasing temperature. NOT AVAILABLE ON TYPES E55S, E55AS, & MODELS R25HT, L24HT
2000	20 A 125/250 VAC resistive. NOT AVAILABLE ON MODELS R25HT, L24HT

GENERAL

M020	Pilot light. AVAILABLE HEAT TRACE MODELS R25HT, L24HT ONLY
M201	Factory set one switch; specify increasing or decreasing temperature and set point. NOT AVAILABLE ON TYPES E55A, E55AS
M202	Factory set two switches; specify increasing or decreasing temperature and set point. NOT AVAILABLE ON TYPES E55, E55S
M270	Calibrated dial in Celsius. NOT AVAILABLE ON HEAT TRACE MODELS R25HT, L24HT
M444	Paper ID tag. NOT AVAILABLE ON HEAT TRACE MODELS R25HT, L24HT
M446	Stainless steel ID tag & wire attachment

UNION CONNECTORS**

(Not available on model L24HT or R25HT)

Option	Replacement Number	Description
<u>Brass</u>		
W027	SD6213-27	1/2" NPT w/ 3/4" bushing
W045	SD6213-45	3/4" NPT
W051	SD6213-51	1/2" NPT
<u>304 Stainless Steel</u>		
W028	SD6213-28	1/2" NPT w/ 3/4" bushing
W046	SD6213-46	3/4" NPT
W050	SD6213-50	1/2" NPT

THERMOWELLS**

For all bulb & capillary switches, all 1/2" NPT Internal (Not available on models R25HT, L24HT)

<u>Brass</u>		
W075	SD6225-75	1/2" NPT with 3/4" NPT bushing adapter, 4" BT
W191	SD6225-191	1/2" NPT, 4" BT
W118	SD6225-118	1/2" NPT with 3/4" NPT bushing adapter, 7" BT
W192	SD6225-192	1/2" NPT, 7" BT
<u>316 Stainless Steel</u>		
W076	SD6225-76	3/4" NPT, 4.5" BT
W193	SD6225-193	1/2" NPT, 4.5" BT
W119	SD6225-119	3/4" NPT, 7.5" BT
W177	SD6225-177	1/2" NPT, 7.5" BT

OPTIONAL LENGTHS:

Optional capillary length to 50' available in copper or 304 st/st. Armor or Teflon® capillary protection available to lengths less than or equal to capillary length. Consult UE for additional information.

Consult UE regarding repeatability and ambient effects on capillary lengths over 30'.

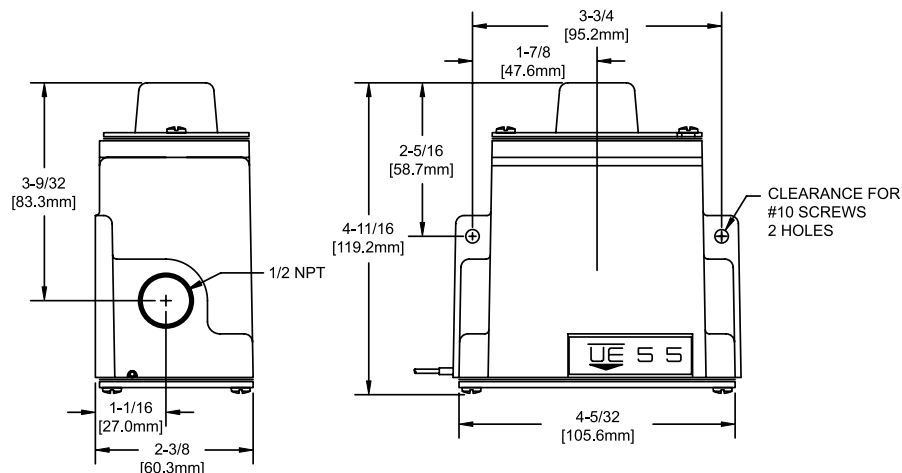
* All switch options have limited DC capabilities. Consult factory for details.

** Dimensional drawings for union connector and thermowells may be found at www.ueonline.com

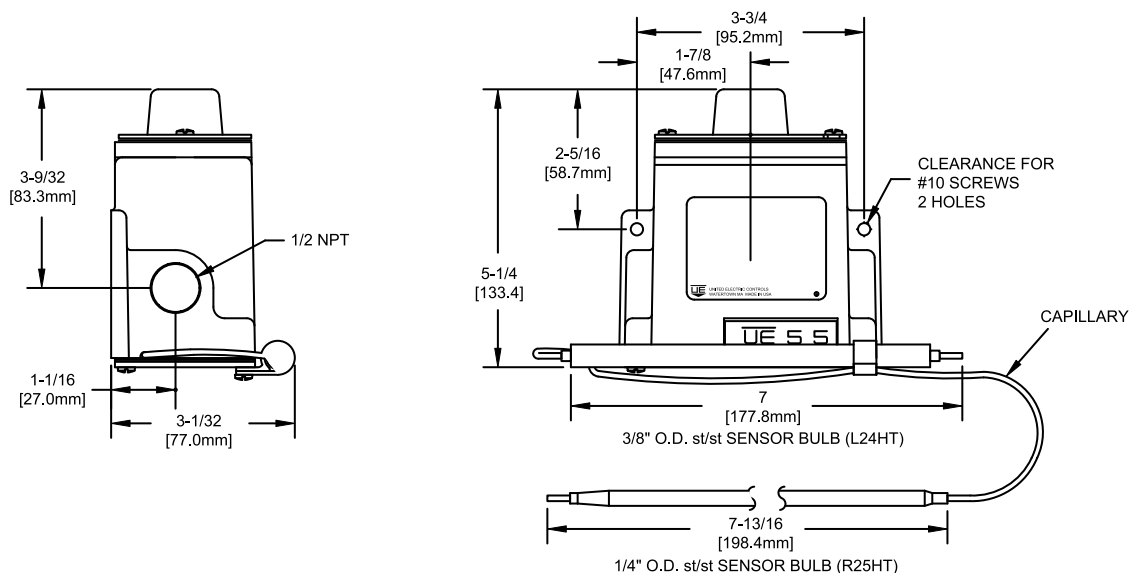
DIMENSIONAL DRAWINGS

(Dimensional drawings for all models may be found at www.ueonline.com)

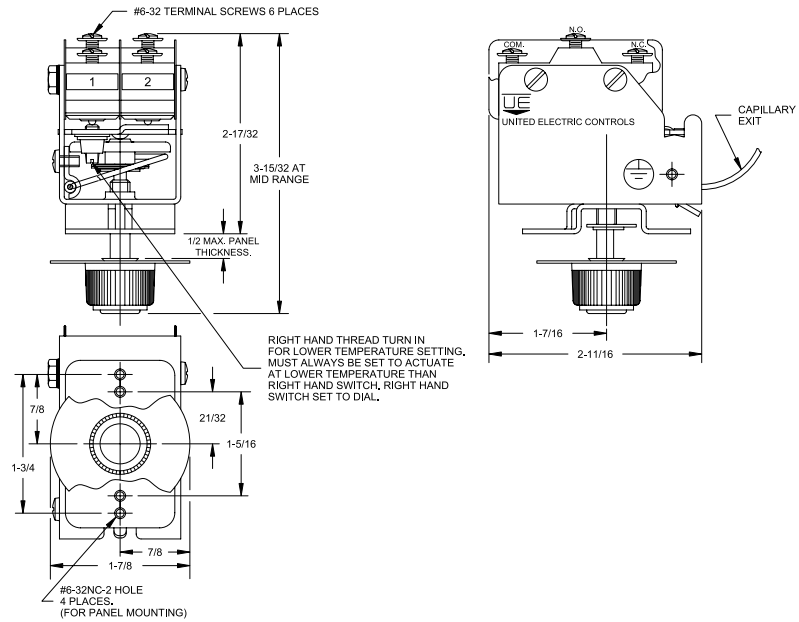
Types E55 / E55A



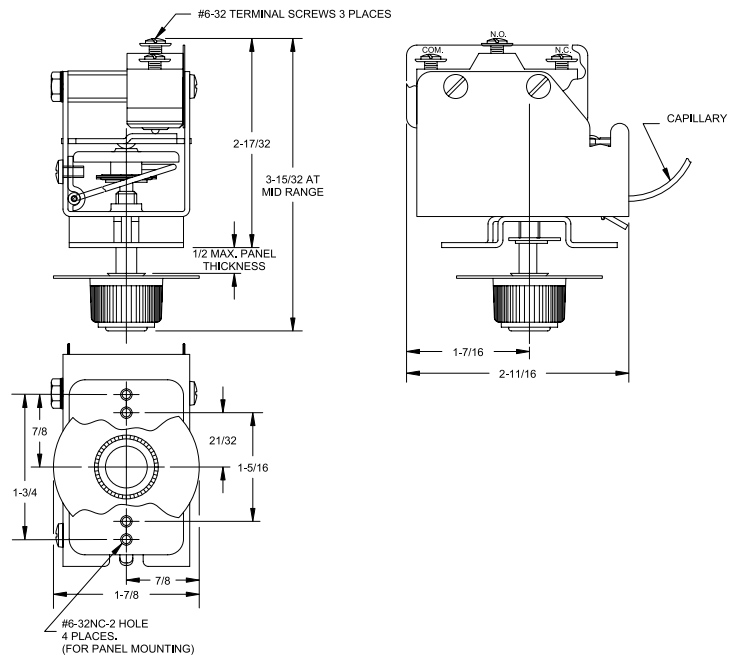
Type E55 Heat Tracing Models



Type E55AS



Type E55S



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- Do not mount unit in ambient temp. exceeding published limits.

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Be sure to visit www.ueonline.com for the latest information.

CP04101000

SKELETON PRESSURE AND VACUUM SWITCHES



FEATURES

- Sealed Metal Bellows Sensor
- Brass or Phosphor Bronze Wetted Material
- Small Size
- 15 A SPDT Switch Output
- Easy to Wire Screw Terminals
- Adjustable Ranges from 30" Hg Vac to 300 psi (-1 to 20,7 bar)

J 4 0 - B - 0 4

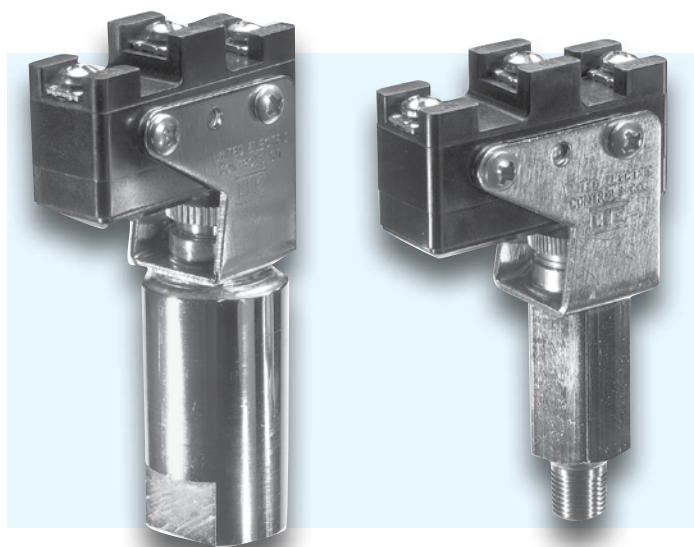


OVERVIEW

The J40 can be utilized in OEM applications where compact size and performance are required. The sealed bellows sensor provides a "leak-free" sensor for applications where elastomers are unacceptable. Proven reliability involving sterilizers, plasma-cutting, anesthesia equipment, and even protective switching devices for power equipment, have made the J40 a versatile OEM pressure switch.

FEATURES

- Sealed metal bellows sensor
- Brass or phosphor bronze wetted material
- Compact size
- Easy external adjustment
- Optional adjustable deadband switch
- UL recognized for the US and Canada; CE compliant to LVD & PED



Optional Hex bellows housing

SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71°C)
AMBIENT TEMPERATURE LIMITS	-40 to 160°F (-40 to 71°C)
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 CPS
ENCLOSURE CLASSIFICATION	Not applicable
SET POINT REPEATABILITY	± 1% of full scale range
SWITCH OUTPUT	One SPDT; switch may be wired "normally open" or "normally closed"
ELECTRICAL RATING	15 A 125/250 VAC resistive. Electrical switches have limited DC capabilities. Consult UE for additional information.
ENCLOSURE	Skeleton construction
WEIGHT	Approx. 4 oz.
ELECTRICAL CONNECTION	Direct to switch terminals
PRESSURE CONNECTION	Models 218-230: 1/4" NPT (female); Models 256-274: 1/8" NPT (male)
MOUNTING	Via NPT pressure connection

APPROVALS



UNITED STATES AND CANADA
UL Recognized, cUL Recognized
 UL 508; CSA C22.2 No. 14, file #E42272



EUROPE
Low Voltage Directive (LVD) (73/23/ED & 93/68/EEC)
 UEC Compliant to LVD
 Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD

Pressure Equipment Directive (PED) (97/23/EC)
 Compliant to PED
 Products rated below 7.5 psi are outside of the scope of the PED



MODEL CHART

Model	Adjustable Set Point Range		Deadband		*Proof Pressure	
	psi (unless noted)	bar	psi (unless noted)	bar (unless noted)	psi	bar
Phosphor bronze bellows with brass 1/8" NPT (male) pressure connection						
256	0 to 30	0 to 2,1	1.5 to 2.5	0,1 to 0,2	45	3,1
260	0 to 60	0 to 4,1	1.5 to 4	0,1 to 0,3	90	6,2
262	0 to 90	0 to 6,2	1.5 to 4	0,1 to 0,3	135	9,3
266	0 to 100	0 to 6,9	2 to 4	0,1 to 0,3	150	10,3
271	0 to 240	0 to 16,5	2 to 6	0,1 to 0,4	330	22,8
274	0 to 300	0 to 20,7	4 to 6	0,3 to 0,4	350	24,1
Phosphor bronze bellows with brass 1/4" NPT (female) pressure connection						
218	30" Hg Vac to 0	-1 to 0	1 to 2.5" Hg Vac	33,9 to 84,7 mbar	5	0,3
222	0 to 20	0 to 1,4	0.2 to 1.3	13,8 to 89,6 mbar	30	2,1
224	0 to 30	0 to 2,1	0.2 to 1.3	13,8 to 89,6 mbar	45	3,1
226	0 to 50	0 to 3,4	0.2 to 1.3	13,8 to 89,6 mbar	75	5,2
230	0 to 100	0 to 6,9	1 to 2.3	0,1 to 0,2	110	7,6

* Proof Pressure: The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing).

HOW TO ORDER

BUILDING A PART NUMBER

Select a **Type**

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

Select a **Model**

Refer to the "Model Charts"

Determine model based on adjustable range, deadband and proof pressure.

Fill in the model portion of your part number with the corresponding number.

Select an **Option**

Refer to the "Options" section

Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number. Leave "option" portion blank if no options are needed.

FOR MULTIPLE OPTIONS: Call United Electric Controls.

TYPE	DESCRIPTION
J40	One SPDT output; skeleton open frame construction; external adjustment with no reference dial

SWITCH OPTIONS*

0140	Gold contacts, 1 A 125 VAC resistive
0500	Close deadband, 5 A 125/250 VAC resistive
1070	10 A 125 VDC or VAC resistive; deadband and minimum set point will increase; consult factory for information
1520	Adjustable deadband, 15 A 125/250/277 VAC resistive. Adjustable wheel changes rise setting only. If adjustment of fall setting is required, use primary adjustment
1535	High ambient, 15 A 125/250 VAC resistive; temperatures up to 250°F (121 °C)

GENERAL

M201	Factory set one switch; specify set point on increasing or decreasing pressure
M444	Paper ID tag
M446	Stainless steel ID tag and wire attachment
M514	Hex bellows housing. NOT AVAILABLE ON MODELS 218-230
M550	Oxygen service cleaning; alcohol cleaning to remove residue from the process connection.

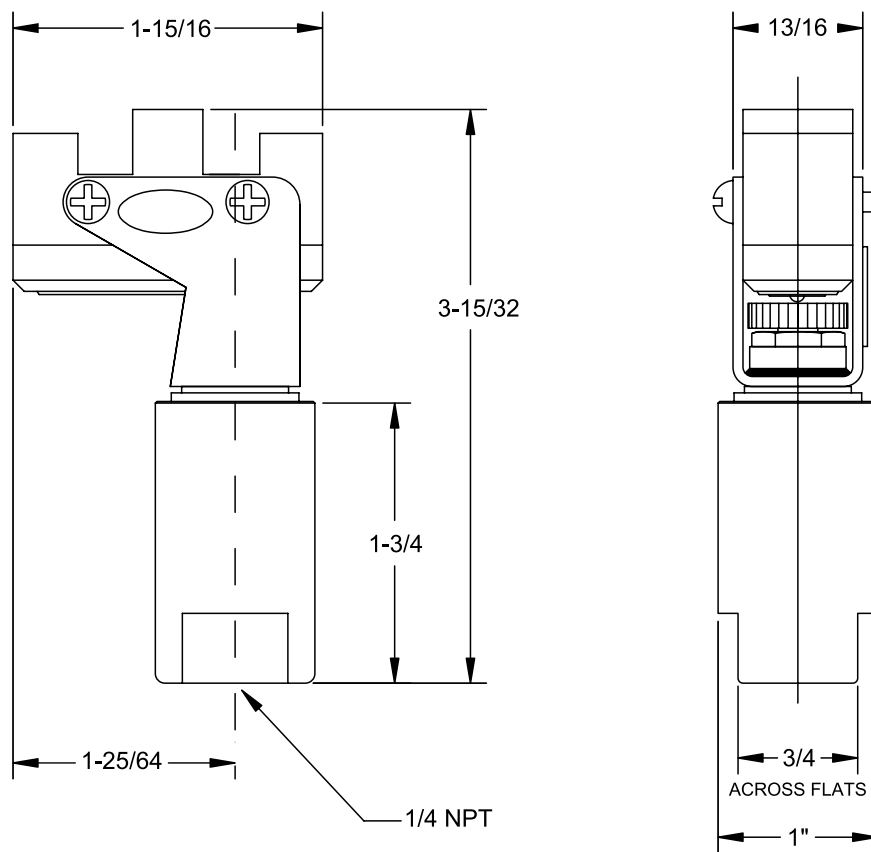
** All switches have limited DC capabilities. Consult factory for details.*



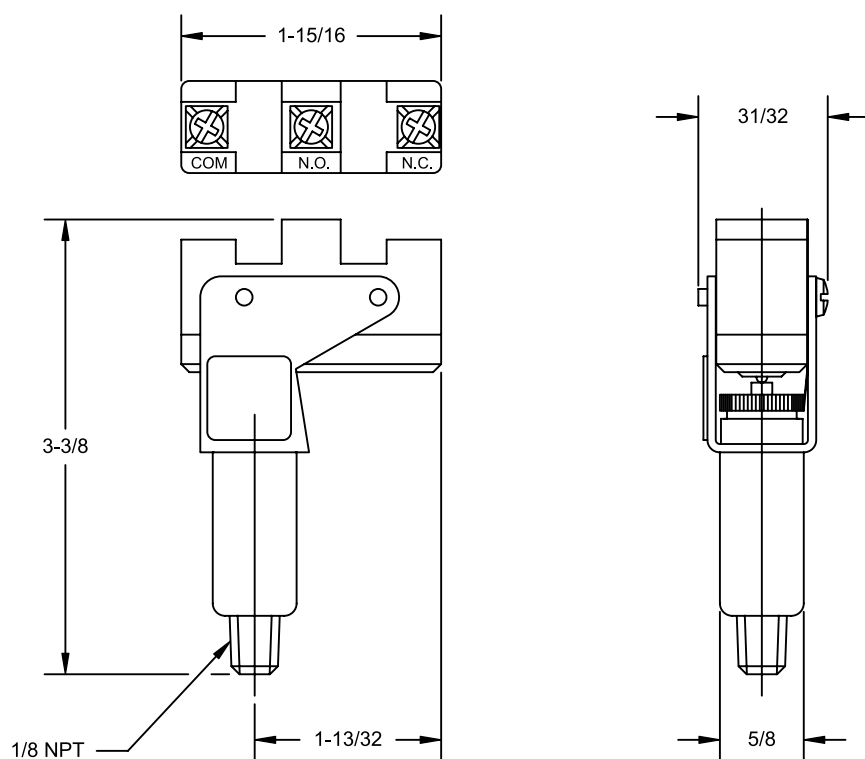
DIMENSIONAL DRAWINGS

Dimensional drawings for all models may be found at www.ueonline.com

Type J40, Models 218-230



Type J40, Models 256-274



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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Be sure to visit www.ueonline.com for the latest information.

CP12091500



APPLIED SENSOR TECHNOLOGIES

A Division of UNITED ELECTRIC CONTROLS



PRODUCTS:

- Thermocouples
- RTDs
- Thermowell & Protection Tubes
- Sensor Box™
- Transmitters
- Accessories

Thermocouple Index		
Style(s)	Description	Page#
Terminal Head Styles - Types J, K, E, T		
15	NEMA 4, welded NPT process fitting	1-1a/b
45	NEMA 4, spring-loaded, NUN hardware	1-2a/b
78	Explosion-proof, welded NPT process fitting	1-3a/b
77	Explosion-proof, spring-loaded, NUN hardware	1-4a/b
75	Spring-loaded hex fitting, with optional head	1-5a/b
48	Spring loaded hex fitting, NUN hardware, optional head	1-6a/b
21	Welded sheath, no process fitting, with optional head	1-7a/b
22	ATEX-approved, explosion-proof, welded NPT process fitting	1-20a/b
80	NEMA 4 head, beaded element	1-24a/b
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03	Sheath with leadwire and armor	1-12a/b
05/07/69	Sheath with leads and plug	1-13a/b
14/74	Sheath with attached plug	1-14a/b
38	Cutable sheath	1-15a/b
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32	Washer mounting with leads and armor	1-18a/b
41	Mounting lug with leadwire	1-19a/b
50	Replacement element for J/K beaded thermocouples	1-22a/b
RTD Index		
Style(s)	Description	Page#
Terminal Head Styles		
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45	NEMA 4, spring-loaded, NUN hardware	2-2a/b
78	Explosion-proof, welded NPT process fitting	2-3a/b
22	ATEX-approved, explosion-proof, welded NPT process fitting	2-19a/b
77	Explosion-proof, spring-loaded, NUN hardware	2-4a/b
21	Welded sheath, no process fitting, with optional head	2-5a/b
75	Spring-loaded hex fitting, with optional head	2-6a/b
48	Spring loaded hex fitting, NUN hardware, optional head	2-7a/b
Sanitary Procces Connection Styles		
33	Sanitary process connection with terminal head	2-8a/b
58	Sanitary process connection with leadwire	2-9a/b
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03	Sheath with leadwire and armor	2-11a/b
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38	Cutable sheath	2-13a/b
39	Weld pad mounting with leadwire	2-14a/b
23I/23P/24	Sheath with leads and NPT process or instrument fitting	2-15a/b

PRODUCT INDEX

RTD Index (continued)		
Style(s)	Description	Page#
Terminal Head Styles		
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41	Mounting lug with leadwire	2-17a/b
42	Sheath with protective teflon sleeve	2-18a/b
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HL, SL	NPT process connections, with lag	3-2
LS	NPT process connections, limited space	3-3
F, FH	Flange connection, welded or ring-type joint	3-4
SW	Socket-weld connection	3-5
SWL	Socket-weld connection, with lag	3-6
WIH	Weld-in connection	3-7
WIHL	Weld-in connection, with lag	3-8
VS	Van Stone flange connection	3-9
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For terminal head mounting		
UNI5-S	Isolated 4-20 mA output	5-1
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Accessories Index		
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NEMA 4 & 4X terminal heads and blocks	6-1	
FM/CSA/ATEX approved explosion-proof terminal heads and blocks	6-2	
Connection Components (plugs/jacks, compression fittings, spring-loaded fittings, bayonet adaptors)	6-3	
Thermocouple and extension wire	6-4	

CONNECTION HEAD WITH WELDED NPT PROCESS CONNECTION

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

SENSOR TYPE

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

15 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel

process connection; head conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; gasketed screw cover with stainless steel chain (Note: for spring-loaded assembly, see Style 75 and add optional head)

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

2 – 310 stainless steel (available on diameters 6 & 7, with K or KK calibration)

3 – 316 stainless steel

5 – Inconel® 600

CALIBRATION – Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

Special limits are available – consult AST

HOT JUNCTION

G – Grounded junction

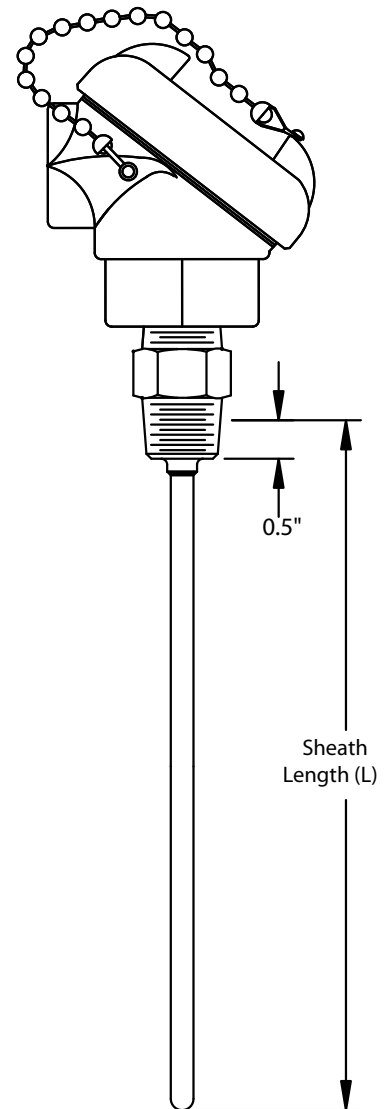
U – Ungrounded junction

E – Exposed junction

SHEATH LENGTH (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

L# – (e.g., L6 = 6" sheath, L12.5 = 12.5" length)

OPTIONS – see page 1-1b



STYLE 15

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
PC25	1/4" NPT process connection
PC75	3/4" NPT process connection
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections
TRANSMITTERS – For complete specs, see Transmitters section	
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
Std.*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
*can be used with transmitters			

Notes:

1. See Accessories for additional information.
2. For former Style 60, use option HD20.
3. For former Style 29, use option HD32.

CONNECTION HEAD WITH SPRING-LOADED ASSEMBLY AND MOUNTING HARDWARE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION	CONNECTION LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

SENSOR TYPE

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

45 – Sheath with cast aluminum head; spring-loaded in head; head conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; 1/2" NPT carbon steel process connection; gasketed screw cover with stainless steel chain; maximum head temperature 100°C

CONNECTION

H – Head only, no mounting hardware; 1/2" NPT (female) instrument connection

N – 1/2" NPT carbon steel nipple

NU – 1/2" NPT carbon steel nipple and union

NUN – 1/2" NPT carbon steel nipple, union and nipple

Add suffix **"1S"** for 304 stainless steel

Add suffix **"2S"** for 316 stainless steel

See chart below for restrictions

CONNECTION LENGTH

(e.g., 006 = 6 inch)

(See chart below for standard available lengths)

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

CALIBRATION – Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

Special limits are available – consult AST

HOT JUNCTION

G – Grounded junction

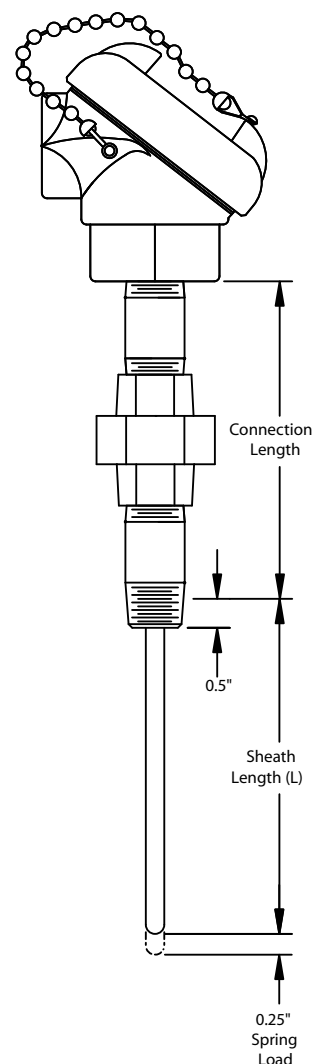
U – Ungrounded junction

SHEATH LENGTH (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

OPTIONS – see page 1-2b

STANDARD AVAILABLE CONNECTION LENGTHS		
N	NU	NUN
N/A	2.00	2.50
0.50	2.50	3.00 *
1.00	3.00	4.00 *
1.50	3.50	5.00
2.00	4.00	6.00 *
3.00	5.00	8.00
5.00	7.00	12.00
6.00	8.00	14.00
* NUN 2S OPTION AVAILABLE IN THESE LENGTHS ONLY.		
DIMENSIONS ARE GIVEN IN INCHES		



STYLE 45

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections
Transmitters: see Style 48	

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10	HD11	1/2"	1/2"
Std.	HD13	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50	HD51	1/2"	1/2"
HD52	HD53	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20	HD21	1/2"	1/2"
HD22	HD23	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40	HD41	1/2"	3/4"

Notes:

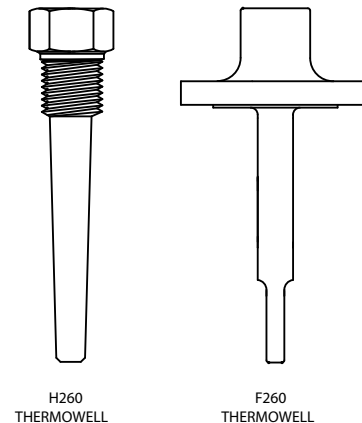
1. See Accessories for additional information
2. For former Style 46, use option HD20

EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.



EXPLOSION-PROOF CONNECTION HEAD WITH WELDED NPT PROCESS CONNECTION

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

SENSOR TYPE

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

78 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel process connection; head CSA/FM approved for Class I, Division 1, Groups B, C, D; Class II, Groups E, F, G; screw cover with chain and gasketed o-ring, meets NEMA 4; ceramic terminal block; 1/2" NPT conduit connection (Note: for spring-loaded fitting, see Style 75 and add optional head).

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

2 - 310 stainless steel (available on diameters 6 & 7, with K or KK calibration)

3 - 316 stainless steel

5 - Inconel® 600

CALIBRATION – Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

Special limits are available – consult AST

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

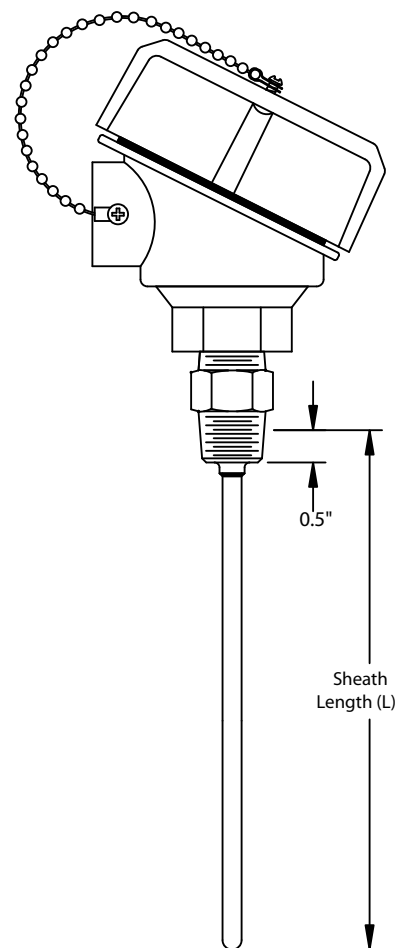
E – Exposed junction

(Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

SHEATH LENGTH

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

OPTIONS – see page 1-3b



STYLE 78

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
PC25	1/4" NPT process connection
PC75	3/4" NPT process connection
CAL1	Calibration, NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
TRANSMITTERS – For complete specs, see Transmitters section	
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C)
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.

EXPLOSION-PROOF TERMINAL HEAD OPTIONS		
Option Code	Process Connection	Conduit Connection
Cast aluminum; screw cover with chain; o-ring gasket (Gasket rated to 100°C exposure); ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C and D; Class II Groups E, F and G; internal ground screw.		
HD71	1/2"	3/4"
Stainless steel (same specs as HD71)		
HD74	1/2"	1/2"
HD75	1/2"	3/4"
Epoxy-coated (same specs as HD71)		
HD80	1/2"	1/2"
HD81	1/2"	3/4"

Note: See Accessories section for additional specs.

EXPLOSION-PROOF CONNECTION HEAD WITH SPRING-LOADED ASSEMBLY AND MOUNTING HARDWARE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION	CONNECTION LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

SENSOR TYPE

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

77 – Sheath with cast aluminum head; spring-loaded in head; CSA/FM approved head for Class I, Division 1, Groups B, C, D; Class II, Groups E, F, G; screw cover with chain and gasketed o-ring; designed for NEMA 4; ceramic terminal block; 1/2" NPT conduit and process connections.

CONNECTION

H – Head only, no mounting hardware; 1/2" NPT (female) instrument connection

N – 1/2" NPT carbon steel nipple

NU – 1/2" NPT carbon steel nipple and plated steel explosion-proof union

NUN – 1/2" NPT carbon steel nipples and plated steel explosion-proof union

Add suffix **"1S"** for 304 stainless steel nipples

CONNECTION LENGTH

(e.g., 006 = 6 inch)

(See chart below for standard available lengths)

SHEATH DIAMETER

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

CALIBRATION - Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

Special limits are available – consult AST

HOT JUNCTION

G – Grounded junction

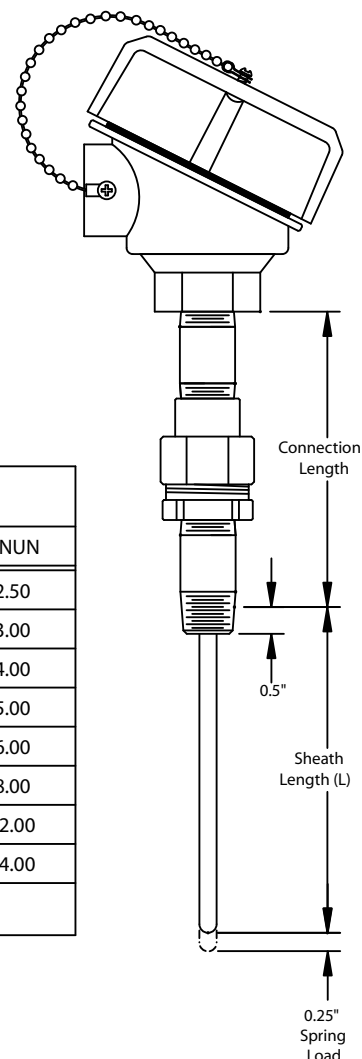
U – Ungrounded junction

SHEATH LENGTH: (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

L# - (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

OPTIONS – see page 1-4b

STANDARD AVAILABLE CONNECTION LENGTHS		
N	NU	NUN
N/A	2.00	2.50
0.50	2.50	3.00
1.00	3.00	4.00
1.50	3.50	5.00
2.00	4.00	6.00
3.00	5.00	8.00
5.00	7.00	12.00
6.00	8.00	14.00
DIMENSIONS ARE GIVEN IN INCHES		



STYLE 77

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Codes	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
TRANSMITTERS	
See Style 48 for available transmitters	

EXPLOSION-PROOF TERMINAL HEAD OPTIONS		
Option Code	Process Connection	Conduit Connection
Cast aluminum; screw cover with chain; o-ring gasket; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C and D; Class II Groups E, F and G (Gasket rated to 100°C exposure); internal ground screw		
HD71	1/2"	3/4"
Same as above, except epoxy-coated		
HD80	1/2"	1/2"
HD81	1/2"	3/4"

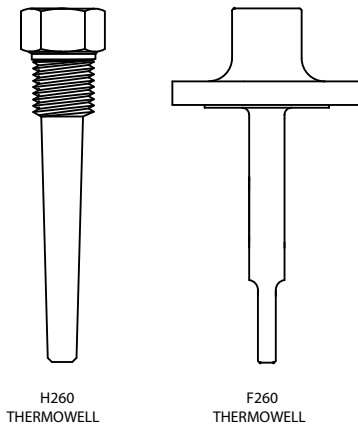
Note: See Accessories section for outline drawings and additional specs.

THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.

EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.



DOUBLE-SIDED, SPRING-LOADED PROCESS MOUNTING WITH TERMINAL HEAD OPTIONS

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTION

SENSOR TYPE

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

75 – Sheath with double-sided, spring-loaded fitting; Teflon® insulated conductors; 1/2" NPT stainless steel connection. (Note: a variety of terminal heads may be added to this style – see page 1-5b)

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

5 – Inconel® 600

CALIBRATION Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

Special limits are available – consult AST

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

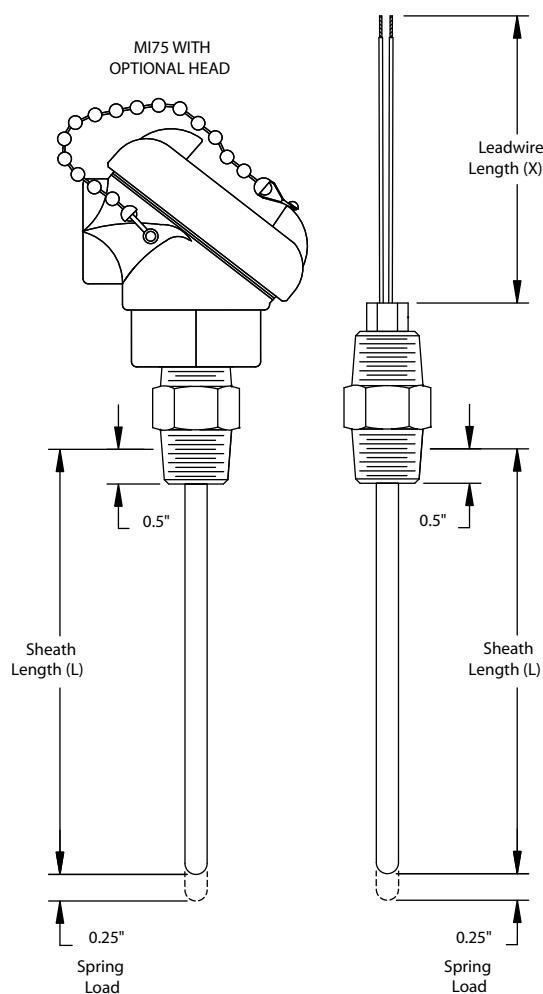
SHEATH LENGTH (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12-1/2" length)

LEADWIRE LENGTH

X# – (e.g., X3 = 3 inch length; X3 is standard if specifying a terminal head)

OPTIONS – see page 1-5b



STYLE 75

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections
WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
TRANSMITTERS	
TR11	4-20 mA, 2-wire; single input; isolated output; specify range, units of measure (e.g., 0-200°C) and terminal head with *. See Accessories section for additional information.
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.

THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
HD12*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
EXPLOSION-PROOF TERMINAL HEAD OPTIONS			
Option Code	Process Connection		Conduit Connection
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw			
HD70*	1/2"		1/2"
HD71 *	1/2"		3/4"
Stainless steel (same spec as HD70/71)			
HD74*	1/2"		1/2"
HD75*	1/2"		3/4"
Epoxy-coated (same spec as HD70/71)			
HD80*	1/2"		1/2"
HD81 *	1/2"		3/4"
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws			
HD72*	1/2"		1/2"
HD73*	1/2"		3/4"
Cast aluminum (Formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.			
HD60	1/2"		1/2"
HD61	1/2"		3/4"
*can be used with transmitters			

Note: Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements. HART® is a registered trademark of the HART Communication Foundation.

SPRING-LOADED PROCESS MOUNTING HARDWARE WITH OPTIONAL TERMINAL HEAD

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION TYPE AND MATERIAL	CONN. LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

48 – Sheath with spring-loaded hex connector and connection hardware; head as option

CONNECTION TYPE AND MATERIAL

Code	Union Type	Union Material	Lower Nipple Material
NU	Ordinary location	Carbon steel	None
NUS	Ordinary location	Stainless steel	None
NUX	Explosion-proof	Electroplated steel	None
NUN	Ordinary location	Carbon steel	Carbon steel
NUNS	Ordinary location	Stainless steel	Stainless steel
NUNX	Explosion-proof	Electroplated steel	Carbon steel
NUNXS	Explosion-proof	Electroplated steel	Stainless steel

CONNECTION LENGTH (For NU, NUX, NUS, use 002.5)

(e.g., 006 = 6 inch)

(See chart for available standard lengths)

SHEATH DIAMETER (in inches)

4 – 1/8" (0.125)

6 – 3/16" (0.188)

7 – 1/4" (0.250)

9 – 3/8" (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

5 – Inconel® 600

CALIBRATION – Standard limits

J – Single J **JJ** – Dual J

K – Single K **KK** – Dual K

T – Single T **TT** – Dual T

E – Single E **EE** – Dual E

Special limits are available – consult AST

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

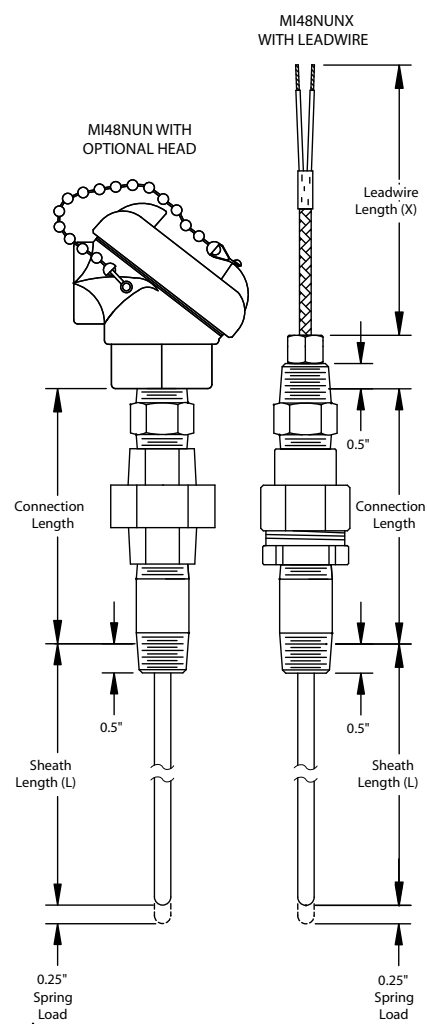
SHEATH LENGTH (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

LEADWIRE LENGTH

X# – (e.g., X3 = 3 inch length; X3 is standard if specifying optional head)

OPTIONS – see page 1-6b



STANDARD AVAILABLE CONNECTION LENGTHS FOR NUN CONNECTIONS
3.00
3.50
4.00
4.50
5.00
6.00
8.00
DIMENSIONS ARE GIVEN IN INCHES

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections
WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
TRANSMITTERS - for complete specs, see Transmitters section	
TR11	4-20 mA, 2-wire; single input; isolated output; specify range, units of measure (e.g., 0-200°C) and terminal head with *. See Accessories section for additional information.
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.

THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
HD12*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
EXPLOSION-PROOF TERMINAL HEAD OPTIONS			
Option Code	Process Connection		Conduit Connection
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw			
HD70*	1/2"		1/2"
HD71 *	1/2"		3/4"
Stainless steel (same specs as HD70/71)			
HD74*	1/2"		1/2"
HD75*	1/2"		3/4"
Epoxy-coated (same specs as HD70/71)			
HD80*	1/2"		1/2"
HD81 *	1/2"		3/4"
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws			
HD72*	1/2"		1/2"
HD73 *	1/2"		3/4"
Cast aluminum (Formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.			
HD60	1/2"		1/2"
HD61	1/2"		3/4"
*can be used with transmitters			

Note: Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements. HART® is a registered trademark of the HART Communication Foundation.

CONNECTION HEAD WITH WELDED HEX FITTING

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

SENSOR TYPE

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

21 – Sheath with cast aluminum head and welded stainless steel connection; for use as ambient sensor or with compression fitting for process mounting; head conforms to NEMA 4 requirements; 3/4" conduit connection; ceramic terminal block; gasketed screw cover with stainless steel chain. See page 1-7b for other head options.

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

5 – Inconel® 600

CALIBRATION – Standard Limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

Special limits are available – consult AST

HOT JUNCTION

G – Grounded junction

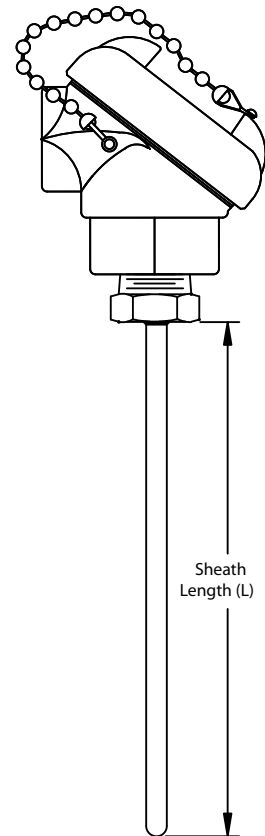
U – Ungrounded junction

E – Exposed junction

SHEATH LENGTH (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

L# – (e.g., L6 = 6" sheath, L12.5 = 12.5" length)

OPTIONS – see page 1-7b



Style 21

STYLE 21

ASSEMBLY OPTIONS			
Option Code	Description		
TAG1	Stainless steel tag and wire		
B90-	90° bend in sheath [specify length from tip in inches e.g., B90-6]		
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)		
CAL1	NIST traceable calibration [specify point(s)]		
CRT1	Certificate of conformance		
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections		
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections		
COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass
TRANSMITTERS - for complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional head with *. See Accessories section for additional information.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
WELD PADS			
Option Code	Radius To Fit Pipe		
WP00	Horizontal pad/flat		
WP10	1" nominal pipe size		
WP15	1.5" nominal pipe size		
WP20	2" nominal pipe size		
WP25	2.5" nominal pipe size		
WP30	3" nominal pipe size		
WP35	3.5" nominal pipe size		
WP40	4" nominal pipe size		

Note: Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements. HART® is a registered trademark of the HART Communication Foundation.

AVAILABLE OPTIONS and MODIFICATIONS

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain			
HD10*	HD11 *	1/2"	1/2"
Std.*	HD13 *	1/2"	3/4"
Epoxy-coated, cast aluminum, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover; NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
Polypropylene, white, screw cover			
HD30	N/A	1/2"	3/4"
Polypropylene, black screw cover			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
EXPLOSION-PROOF TERMINAL HEAD OPTIONS			
Option Code	Process Connection	Conduit Connection	
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw			
HD70*	1/2"	1/2"	
HD71 *	1/2"	3/4"	
Stainless steel (same specs as HD70/71)			
HD74*	1/2"	1/2"	
HD75*	1/2"	3/4"	
Epoxy-coated (same specs as HD70/71)			
HD80*	1/2"	1/2"	
HD81 *	1/2"	3/4"	
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws			
HD72*	1/2"	1/2"	
HD73*	1/2"	3/4"	
Cast aluminum (Formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.			
HD60	1/2"	1/2"	
HD61	1/2"	3/4"	
*can be used with transmitters			

Note: See Accessories section for outline drawings and additional specs.

NOBLE METAL THERMOCOUPLE WITH TERMINAL HEAD AND PROTECTION TUBE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	STYLE	PROTECTION TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	PRIMARY TUBE LENGTH	OPTIONS

SENSOR TYPE

BTC – Beaded construction

STYLE

81N – Noble metal element with primary protection tube only; threaded connection between head and tube; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

PROTECTION TUBE CONFIGURATION

(e.g., **00A6** = 3/8" O.D. tube with 6" nipple and 1/2" NPT connection. See page 1-8b for available combinations of OD and thread size)

Protection tube diameter

- 0** – 3/8" O.D.
- 1** – 1/2" O.D.
- 2** – 11/16" O.D.
- 3** – 3/4" O.D.

Process thread size and material

- | | |
|---------------------|----------------------------|
| <i>Carbon Steel</i> | <i>316 stainless steel</i> |
| 0 – 1/2" NPT | 3 – 1/2" NPT |
| 1 – 3/4" NPT | 4 – 3/4" NPT |
| 2 – 1" NPT | 5 – 1" NPT |

Protection tube material

- A** – Alumina (98.8% aluminum oxide)
- M** – Mullite (not recommended over 1200°C)

Connection Length ("CL")

- 1** – hex fitting only
- #** – length of nipple

CALIBRATION

Single junction

- R** – Platinum and Platinum/13% Rhodium
- S** – Platinum and Platinum/10% Rhodium
- B** – Platinum/6% Rhodium and Platinum/30% Rhodium

Dual junctions

- RR**
- SS**
- BB**

WIRE GAUGE

24 – 24 AWG

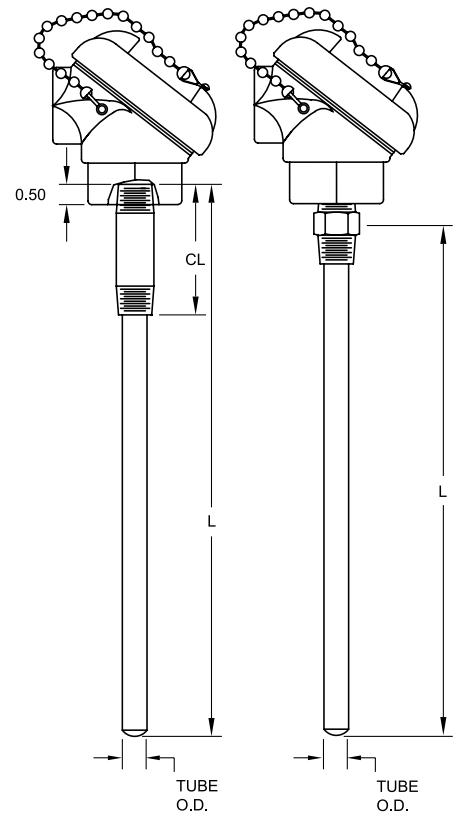
BEAD MATERIAL

A – Alumina beads (0.125" OD for single junction, 0.188" for dual)

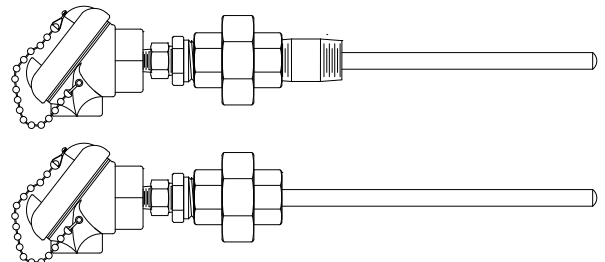
PROTECTION TUBE LENGTH

L# – (e.g., L12 = 12" protection tube length)

OPTIONS – see page 1-8b



Note: union fitting or union with nipple can be added to this style (consult AST for part numbers and availabilities)



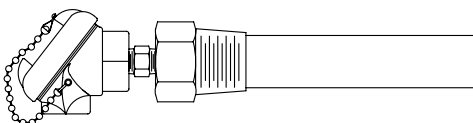
STYLE 81N

TERMINAL HEAD OPTIONS

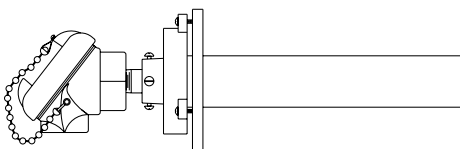
ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections

For additional Noble Metal Thermocouple styles, see:

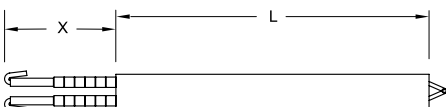
Style 81B – Secondary tube with mounting bushing



Style 81F – Secondary tube with slip flange mounting



Style 51 – Replacement Sensor



Notes:

- Not all materials and process thread sizes are compatible with all tubing O.D.'s. Use the chart below as a guide for the possible combinations.

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11*	1/2"	1/2"
Std.*	HD13*	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51*	1/2"	1/2"
HD52*	HD53*	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21*	1/2"	1/2"
HD22*	HD23*	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41*	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
*can be used with transmitters			
TRANSMITTERS – For complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		

PROCESS THREAD (NPT)

		Carbon steel			316 Stainless		
TUBE O.D.	CODE	0 (1/2")	1 (3/4")	2 (1")	3 (1/2")	4 (3/4")	5 (1")
	0 (3/8")	Yes			Yes		
	1 (1/2")	Yes	Yes		Yes	Yes	
	2 (11/16")		Yes			Yes	
	3 (3/4")		Yes	Yes		Yes	Yes

- Applied Sensor Technologies recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.
- In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact Applied Sensor Technologies for further information.
- Applied Sensor Technologies offers many other temperatures sensor designs and technologies, including base metal thermocouples, RTDs, thermistors and Integrated Circuit chips, along with a full line of accessory items such as thermowells, transmitters, etc. Please visit our website or contact us for further information.

NOBLE METAL THERMOCOUPLE WITH SECONDARY PROTECTION TUBE & BUSHING

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	STYLE	SECONDARY TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	SECONDARY TUBE LENGTH	OPTIONS

SENSOR TYPE

BTC – Beaded construction

STYLE

81B – Noble metal element with inner and outer protection tubes; threaded bushing process attachment; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

SECONDARY TUBE CONFIGURATION

(e.g., **9C5A** = 1.75" O.D. silicon carbide protection tube with 2" NPT carbon steel bushing. See page 1-9b for available combinations of materials and sizes)

Outer protection tube diameter

3 – 3/4" O.D.	7 – 1-1/4" O.D.
4 – 7/8" O.D.	8 – 1-1/2" O.D.
5 – 1" O.D.	9 – 1-3/4" O.D.
6 – 1-1/10" O.D.	

Outer protection tube material

C – Silicon Carbide, oxide bonded*	H – Hexalloy®
S – Sialon®	L – LT1

* Other grades of silicon carbide available upon request. Consult AST.

Bushing thread and material

<i>Carbon Steel</i>	<i>316 Stainless steel</i>
2 – 1" NPT	6 – 1" NPT
3 – 1-1/4" NPT	7 – 1-1/4" NPT
4 – 1-1/2" NPT	8 – 1-1/2" NPT
5 – 2" NPT	9 – 2" NPT

Inner protection tube material

A – Alumina (98.8% aluminum oxide)
M – Mullite (not recommended over 1200°C)

CALIBRATION

Single junction

R – Platinum and Platinum/13% Rhodium
S – Platinum and Platinum/10% Rhodium
B – Platinum/6% Rhodium and Platinum/30% Rhodium

Dual junctions

RR
SS
BB

WIRE GAUGE

24 – 24 AWG

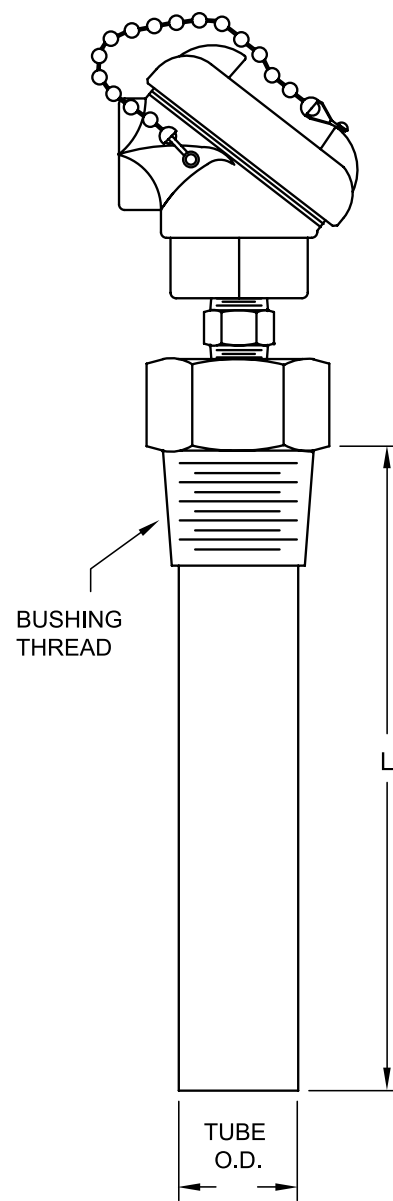
BEAD MATERIAL

A – Alumina beads (0.125" OD for single junction, 0.188" for dual)

SECONDARY TUBE LENGTH

L# – (e.g., L12 = 12" outer protection tube length)

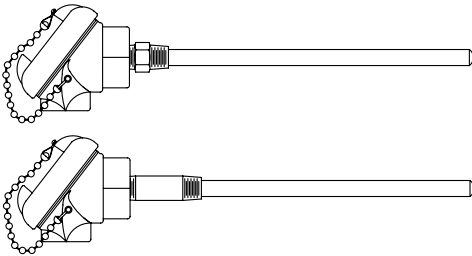
OPTIONS – see page 1-9b



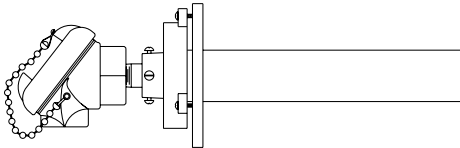
ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections

For additional Noble Metal Thermocouple styles, see:

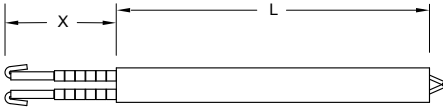
Style 81N – Single, primary protection tube only



Style 81F – Secondary tube with slip flange mounting



Style 51 – Replacement Sensor



Notes:

1. Not all materials and process thread sizes are compatible with all tubing O.D.'s. Use the chart below as a guide for the possible combinations. For each combination of thread and O.D., available materials are noted - Silicon Carbide (C), Sialon® (S), Hexalloy® (H) and LT1 (L).

OUTER TUBE O.D.	CODE	CARBON STEEL				316 STAINLESS			
		2 (1")	3 (1-1/4")	4 (1-1/2")	5 (2")	6 (1")	7 (1-1/4")	8 (1-1/2")	9 (2")
3 (3/4")		H	H	H	H	H	H	H	H
4 (7/8")		L,S	L,S	L,S	L,S	L,S	L,S	L,S	L,S
5 (1")			H	H	H		H	H	H
6 (1-1/10")			S	S	S		S	S	S
7 (1-1/4")				H	H			H	H
8 (1-1/2")				H	H			H	H
9 (1-3/4")					C				C

- Applied Sensor Technologies recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.
- In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact Applied Sensor Technologies for further information.
- Applied Sensor Technologies offers many other temperatures sensor designs and technologies, including base metal thermocouples, RTDs, thermistors and Integrated Circuit chips, along with a full line of accessory items such as thermowells, transmitters, etc. Please visit our website or contact us for further information.

STYLE 81B

TERMINAL HEAD OPTIONS

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11*	1/2"	1/2"
Std.*	HD13*	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51*	1/2"	1/2"
HD52*	HD53*	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21*	1/2"	1/2"
HD22*	HD23*	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41*	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
*can be used with transmitters			
TRANSMITTERS – For complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		

PROCESS THREAD (NPT)

NOBLE METAL THERMOCOUPLE WITH SECONDARY PROTECTION TUBE & MOUNTING FLANGE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	STYLE	PROTECTION TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	OUTER PROTECTION TUBE LENGTH	OPTIONS

SENSOR TYPE

BTC – Beaded construction

STYLE

81F – Noble metal element with primary and secondary protection tubes; mounting flange process attachment; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

PROTECTION TUBE CONFIGURATION

(e.g., **9C5A** = 1.75" O.D. silicon carbide protection tube with 4-7/8" mounting flange and alumina inner protection tube)

Outer protection tube diameter

9 - 1-3/4" O.D.

Outer protection tube material

C - Silicon carbide, oxide bonded*

* Other grades of silicon carbide available upon request. Consult AST.

Flange size

5 - 4-7/8" O.D.

Inner protection tube material

A – Alumina (98.8% aluminum oxide)

M – Mullite (not recommended over 1200°C)

CALIBRATION

Single junction

R – Platinum and Platinum/13% Rhodium

S – Platinum and Platinum/10% Rhodium

B – Platinum/6% Rhodium and Platinum/30% Rhodium

Dual junctions

RR

SS

BB

WIRE GAUGE

24 – 24 AWG

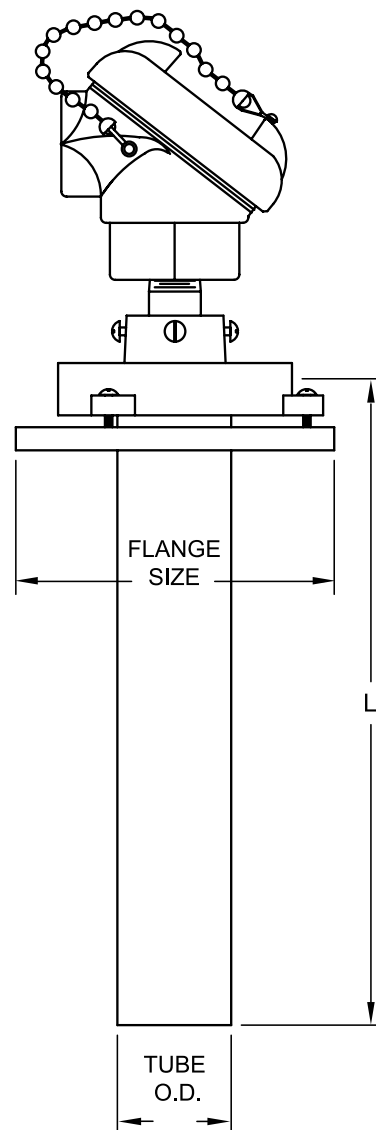
BEAD MATERIAL

A – Alumina beads (0.125" OD for single junction, 0.188" for dual)

OUTER PROTECTION TUBE LENGTH

L# – (e.g., L12 = 12" outer protection tube length)

OPTIONS – see page 1-10b



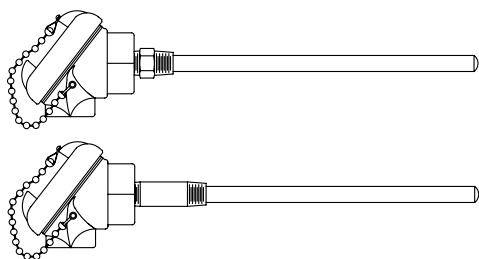
STYLE 81F

TERMINAL HEAD OPTIONS

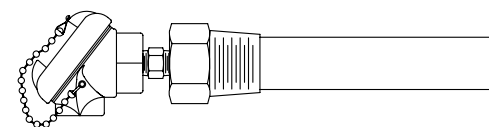
ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections

For additional Noble Metal Thermocouple styles, see:

Style 81N – Single, primary protection tube only



Style 81B – Secondary tube with mounting bushing



Style 51 – Replacement Sensor



NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
Std.*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53*	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
* can be used with transmitters			
TRANSMITTERS – For complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		

Notes:

- Applied Sensor Technologies recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.
- In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact Applied Sensor Technologies for further information.
- Applied Sensor Technologies offers many other temperatures sensor designs and technologies, including base metal thermocouples, RTDs, thermistors and Integrated Circuit chips, along with a full line of accessory items such as thermowells, transmitters, etc. Please visit our website or contact us for further information.

SHEATH WITH LEADWIRE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE*

GP – General purpose thermocouple

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

02 – Sheath with leadwire; fiberglass insulated conductors; fiberglass jacket

04 – Sheath with leadwire; fiberglass insulated conductors; fiberglass jacket; stainless steel overbraid overall

28 – Sheath with Teflon® insulated conductors; Teflon® jacketed cable

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

5 – Inconel® 600 (MI only)

CALIBRATION - Standard limits

J – Single J **JJ** – Dual J

K – Single K **KK** – Dual K

T – Single T **TT** – Dual T

E – Single E **EE** – Dual E

Special limits are available – consult AST

Dual junction not available with all GP Thermocouples in sheath diameter 4 and GP04 diameter 6

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

E – Exposed junction

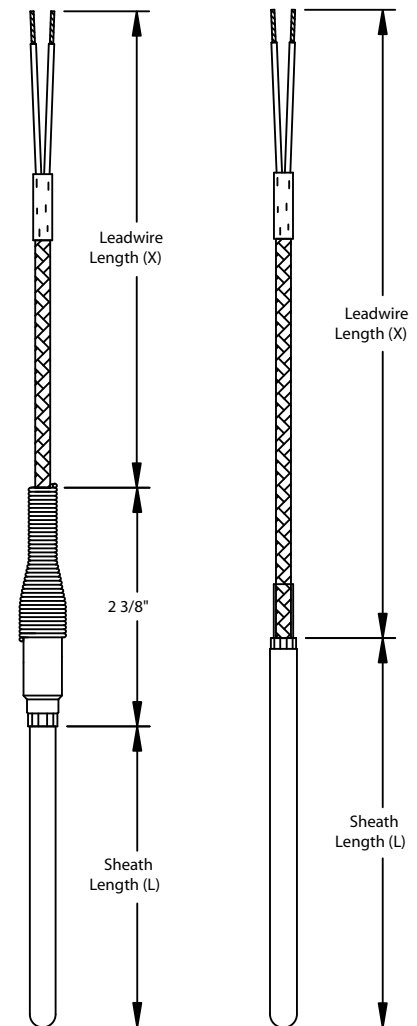
SHEATH LENGTH (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

LEADWIRE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 1-11b



MI Type

GP Type

*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.

STYLES 02, 04, 28

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
HT10	High temperature (900°F) transition. (Standard transition on Styles 02 and 04 is 500°F/260°C)

WIRING CONNECTION OPTIONS			
WC76	#6 spade terminals, plated copper		
WC70	#10 spade terminals, plated copper		
WC84	1/4" push-on insulated terminals, plated copper		
WC90	#10 ring terminals		
WC98	#8 ring terminals		
For plugs and jacks, see Styles 05, 07, 69.			
COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass
WELD PADS			
WP00	Horizontal pad/flat		
WP10	1" nominal pipe size		
WP15	1.5" nominal pipe size		
WP20	2" nominal pipe size		
WP25	2.5" nominal pipe size		
WP30	3" nominal pipe size		
WP35	3.5" nominal pipe size		
WP40	4" nominal pipe size		

EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

SHEATH WITH LEADWIRE AND ARMOR

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	ARMOR CABLE LENGTH	OPTIONS

SENSOR TYPE*

GP – General purpose thermocouple

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

03 – Sheath with leadwire and flexible stainless steel armor cable; fiberglass-insulated conductors; fiberglass jacket.

03P – PVC-coated armor, Teflon®-insulated conductors

03T – Teflon® coated armor, Teflon®-insulated conductors

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

5 – Inconel® 600 (MI only)

CALIBRATION Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

Special limits are available – consult AST

Dual junction not available with GP thermocouples in sheath diameter 4

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

E – Exposed junction

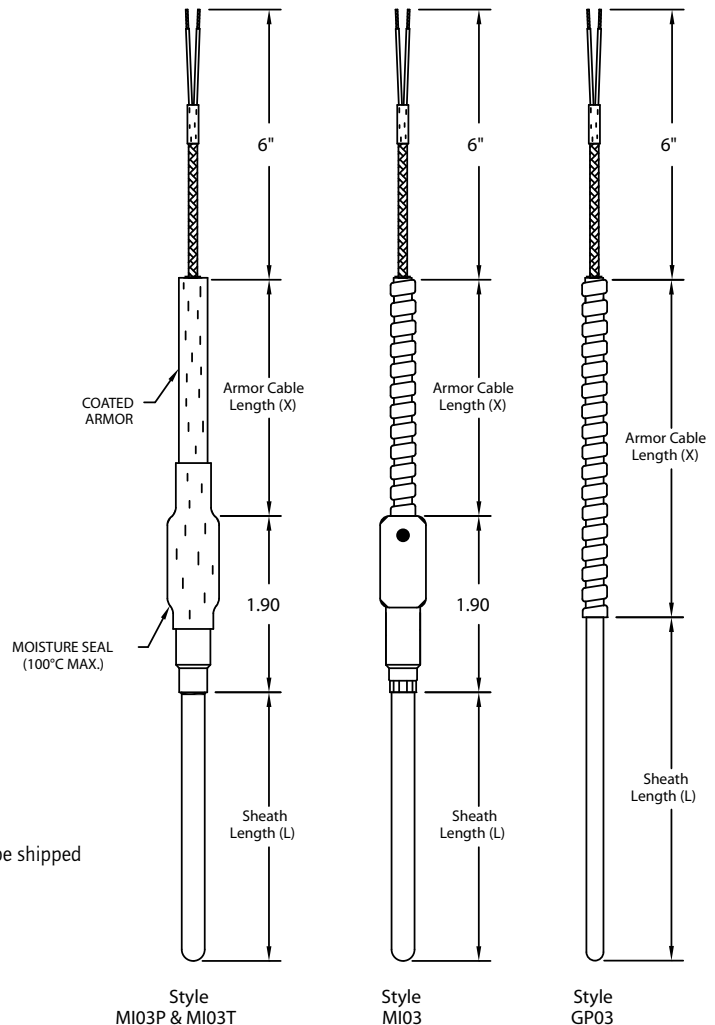
SHEATH LENGTH (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

ARMOR CABLE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 1-12b



*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.

STYLE 03

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS			
Option Code	Description		
TAG1	Stainless steel tag and wire		
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)		
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)		
CAL1	NIST traceable calibration [specify point(s)]		
CRT1	Certificate of conformance		
HT10	High temperature (900°F) transition. (Standard transition rated 500°F/260°C)		
COMPRESSION FITTINGS			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass
LEADWIRE AND ARMOR OPTIONS			
BA50	Bayonet cap on armor, no spring (formerly Style 25)		
Note: For assembly with sheath, armor and terminal head, see Style 66.			

WIRING CONNECTION OPTIONS	
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
PLUGS AND JACKS (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
PJ30	Miniature plug, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. plug, rated to 260°C (500°F)
PJ60	High temp. jack, rated to 260°C (500°F)
BX CONNECTORS	
WC40	1/2"
WC50	3/4"
WELD PADS	
WP00	Horizontal pad/flat
WP10	1" nominal pipe size
WP15	1.5" nominal pipe size
WP20	2" nominal pipe size
WP25	2.5" nominal pipe size
WP30	3" nominal pipe size
WP35	3.5" nominal pipe size

EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

SHEATH WITH LEADWIRE AND PLUG

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE*

GP – General purpose thermocouple

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

05 – Sheath with leadwire; standard male plug; fiberglass insulated conductors; fiberglass jacket

07 – Sheath with leadwire; stainless steel overbraid; standard male plug; fiberglass insulated conductors; fiberglass jacket

69 – Sheath with leadwire; miniature plug; fiberglass insulated conductors; fiberglass jacket

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

5 – Inconel® 600 (MI only)

CALIBRATION – Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

Special limits are available – consult AST

Dual junctions not available with all GP Thermocouples in sheath diameter 4 and GP07 diameter 6

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

E – Exposed junction

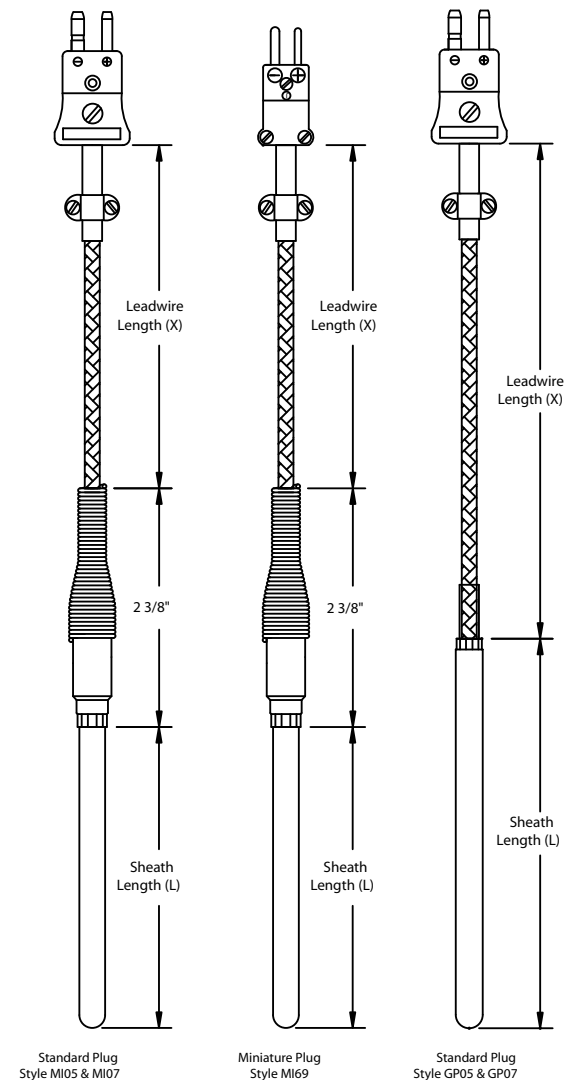
SHEATH LENGTH (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

LEADWIRE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 1-13b



*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.

STYLES 05, 07, 69

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
HT10	High temperature (900°F) transition. (Standard transition rated 500°F/260°C)
PLUG AND JACK OPTIONS (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ20	Standard jack, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. standard plug, rated to 260°C (500°F)
PJ60	High temp. standard jack, rated to 260°C (500°F)

EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass
WELD PADS			
WP00	Horizontal pad/flat		
WP10	1" nominal pipe size		
WP15	1.5" nominal pipe size		
WP20	2" nominal pipe size		
WP25	2.5" nominal pipe size		
WP30	3" nominal pipe size		
WP35	3.5" nominal pipe size		
WP40	4" nominal pipe size		

SHEATH WITH MALE PLUG

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

SENSOR TYPE*

GP – General purpose thermocouple

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

14 – Sheath with standard male plug; maximum termination temperature 177°C (350°F)

74 – Sheath with miniature male plug; maximum sheath diameter 3/16" OD; maximum termination temperature 177°C (350°F)

SHEATH DIAMETER (in inches)

3 – 1/16 (0.063) (Style MI 74 only)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250) (Style 14 only)

SHEATH MATERIAL

3 – 316 stainless steel

5 – Inconel® 600 (MI only)

CALIBRATION – Standard limits

J – Single J

K – Single K

T – Single T

E – Single E

Special limits are available – consult AST

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

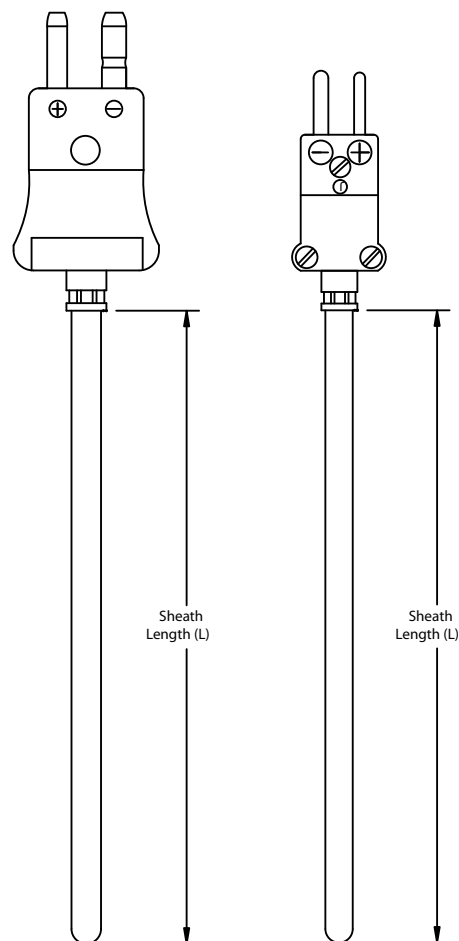
E – Exposed junction

SHEATH LENGTH (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

L# – (e.g., L6 = 6" sheath, L12.5 = 12.5" length)

OPTIONS – see page 1-14b

*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.



Style 14

Style 74

STYLES 14 & 74

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
PLUGS AND JACKS	
PJ20	Standard jack, rated to 177°C (350°F) (Style 14 only)
PJ40	Miniature jack, rated to 177°C (350°F) (Style 74 only)

EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass

CUTABLE SHEATH WITH LEADWIRE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE

GP – General purpose thermocouple

ASSEMBLY STYLE

38 – Field cuttable sheath length with leadwire; fiberglass insulated conductors; fiberglass jacket; stainless steel overbraid; (cannot be shortened to less than 4")

SHEATH DIAMETER (in inches)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

SHEATH MATERIAL

3 – 316 stainless steel

CALIBRATION - Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

Special limits are available- consult AST

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

SHEATH LENGTH (Maximum L=96")

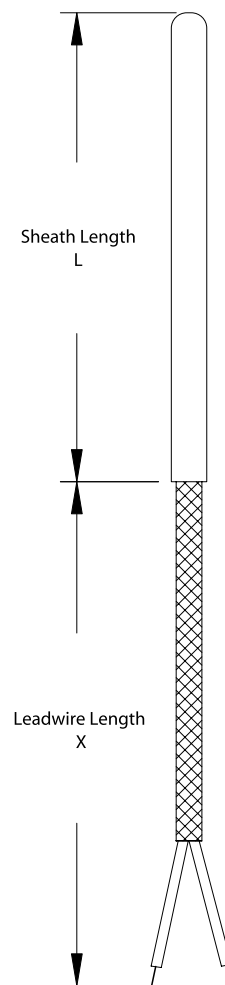
L# – (e.g., L24 = 24 inch sheath)

LEADWIRE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTION

TAG1 – stainless steel tag and wire



STYLE 38



EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

Many additional components are available in our Sensor Box program, including spring-loaded fittings and plugs and jacks.

The Sensor Box allows you to build sensor assemblies on-site, saving time and expense. See the Sensor Box literature for further details.

SPRING LOADED BAYONET FITTING WITH ARMOR

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	ARMOR CABLE LENGTH	OPTIONS

SENSOR TYPE*

GP – General purpose thermocouple

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

71 – Sheath with stainless steel armor; fiberglass insulated conductors; fiberglass jacket; spring-loaded bayonet cap; (use with Bayonet Adapter- see options on page 1-16b)

SHEATH DIAMETER (in inches)

6 – 3/16 (0.188)

SHEATH MATERIAL

3 – 316 stainless steel

CALIBRATION - Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

SHEATH LENGTH (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

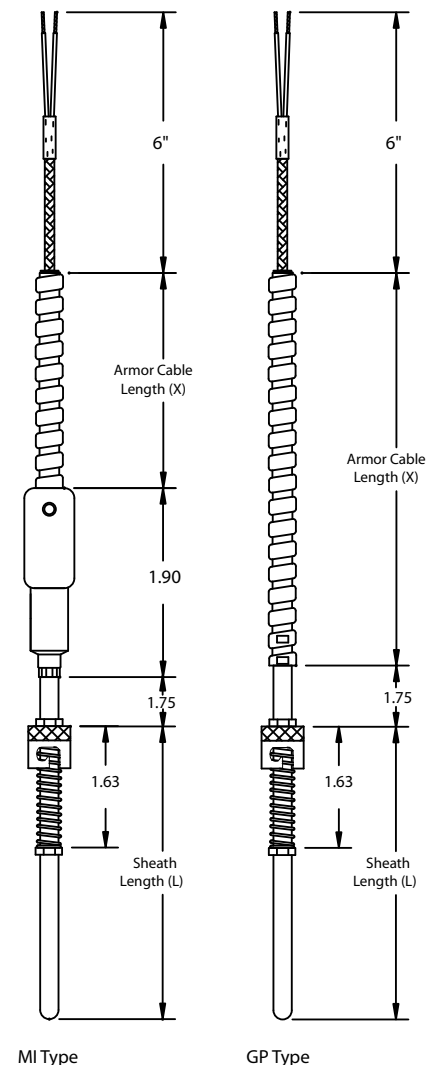
L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

ARMOR CABLE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 1-16b

*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.



STYLE 71

AVAILABLE OPTIONS and MODIFICATIONS

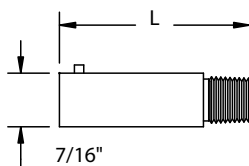
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
BD90	90° bend in sheath, 3/4" from back end of cap Formerly Style 35	
BD45	45° bend in sheath, 3/4" from back end of cap Formerly Style 70	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
HT10	High temperature (900°F) transition. (Standard transition rated 500°F/260°C)	
BAYONET ADAPTERS (PLATED STEEL)		
Option Code	Thread Size	Length (L)
BA20	1/8" - 27 NPT	7/8"
BA22	1/8" - 27 NPT	1-1/2"
BA24	1/8" - 27 NPT	2-1/2"
PIPE CLAMP AND BAYONET ADAPTERS		
Option Code	Band Diameter	Adapter Length (l)
BA30	11/16" to 1-1/4"	2"
BA31	1-1/16" to 2"	2"
BA32	2-1/16" to 3"	2"
BA33	3-5/16" to 4-1/4"	2"
BA34	4-1/8" to 5"	2"

WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
PLUGS AND JACKS (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
PJ30	Miniature plug, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. standard plug, rated to 260°C (500°F)
PJ60	High temp. standard jack, rated to 260°C (500°F)
BX CONNECTORS	
WC40	1/2"
WC50	3/4"

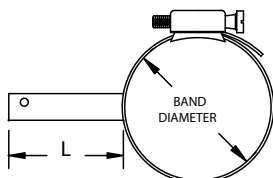
EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

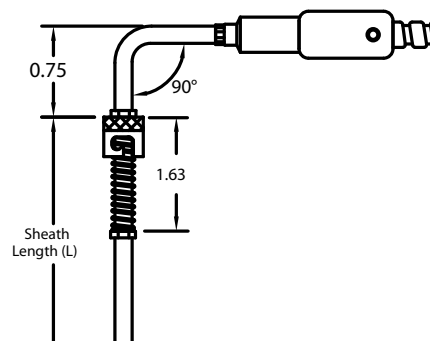
BAYONET ADAPTER
(PLATED STEEL)



PIPE CLAMP WITH
BAYONET ADAPTER



BD90 OPTION VIEW
ON MI71 STYLE



SHEATH WITH WELDED PROCESS MOUNTING

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

23P – Sheath with single-sided process mounting; fiberglass insulated conductors; fiberglass jacket; 1/2" NPT stainless steel connection with leadwire

23I – Sheath with single-sided instrument mounting; fiberglass insulated conductors; fiberglass jacket; 1/2" NPT stainless steel connection with leadwire

24 – Sheath with double-sided hex fitting; fiberglass insulated conductors and jacket; 1/2" NPT stainless steel connection with leadwire

SHEATH DIAMETER (in inches)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

5 – Inconel® 600

CALIBRATION – Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

Special limits are available – consult AST

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

E – Exposed junction

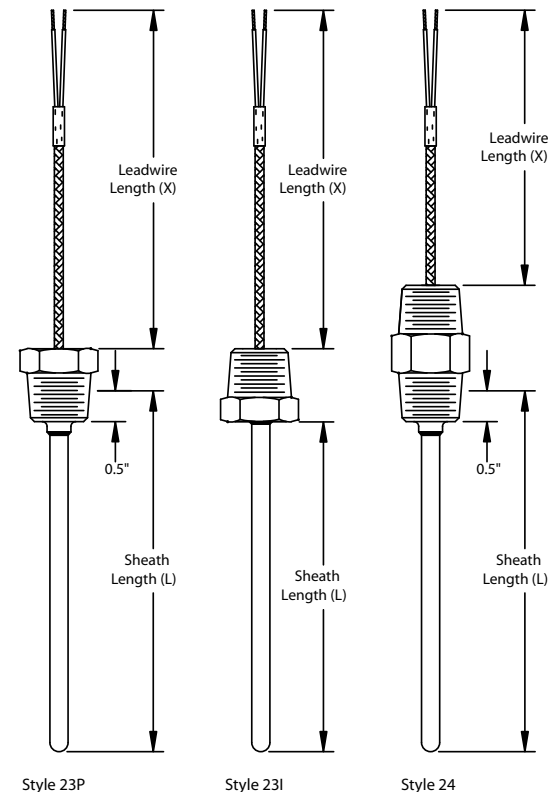
SHEATH LENGTH (Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

LEADWIRE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 1-17b



STYLE 23I, 23P, 24

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
B90-	90° bend in sheath [specify length from tip in inches e.g., B90-6]
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
HT10	High temperature (900°F) transition. (Standard transition rated 500°F/260°C)

WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
PLUGS AND JACKS (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
PJ30	Miniature plug, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. standard plug, rated to 260°C (500°F)
PJ60	High temp. standard jack, rated to 260°C (500°F)
WELD PADS (Style 23I only)	
WP00	Horizontal pad/flat
WP10	1" nominal pipe size
WP15	1.5" nominal pipe size
WP20	2" nominal pipe size
WP25	2.5" nominal pipe size
WP30	3" nominal pipe size
WP35	3.5" nominal pipe size
WP40	4" nominal pipe size

WASHER WITH LEADWIRE AND ARMOR

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	WASHER SIZE	MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	ARMOR CABLE LENGTH	OPTIONS

SENSOR TYPE*

GP – General purpose thermocouple

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

32 – Washer with leadwire; fiberglass insulated conductors; fiberglass jacket; armor cable; stainless steel washer thickness 1/4" (0.250); sheath diameter 0.188" only

WASHER SIZE (in inches)

FOR BOLT SIZE	ID	OD
6 – 3/16 (0.188)	0.193	0.375
7 – 1/4 (0.250)	0.255	0.500
9 – 3/8 (0.375)	0.380	0.750
10 – 1/2 (0.500)	0.510	1.000

WASHER AND SHEATH MATERIAL

3 – 316 stainless steel

CALIBRATION Standard limits

J – Single J **JJ** – Dual J

K – Single K **KK** – Dual K

T – Single T **TT** – Dual T

E – Single E **EE** – Dual E

Special limits are available – consult AST

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

SHEATH LENGTH (Note: maximum L=96" for GP; for MI, lengths over L84 will be shipped coiled unless otherwise specified)

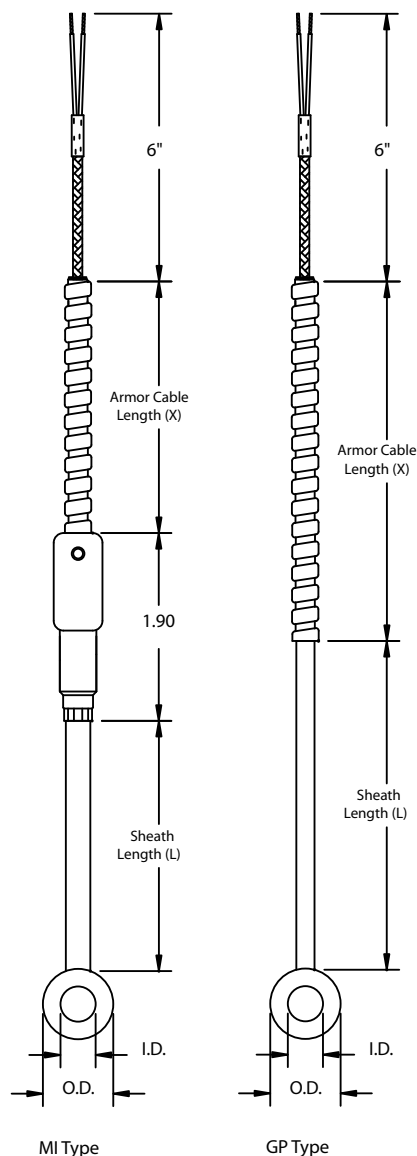
L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

ARMOR CABLE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 1-18b

*Note: GP thermocouples, manufactured using hollow tubing and wire, tend to be lower cost than MI, but cannot be bent in the field and are standardly designed for sensing temperatures below 500°F. MI thermocouples are more rugged than GP due to compacted magnesium-oxide powder insulation, can be bent in the field, and are appropriate for the temperature range of the sensor and sheath.



STYLE 32

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
B90-	90° bend in sheath [specify length from tip in inches e.g., B90-6]
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
HT10	High temperature (900°F) transition. (Standard transition rated 500°F/260°C)

WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
PLUGS AND JACKS (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
PJ30	Miniature plug, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. plug, rated to 260°C (500°F)
PJ60	High temp. jack, rated to 260°C (500°F)
BX CONNECTORS	
WC40	1/2"
WC50	3/4"

EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

MOUNTING LUG WITH LEADWIRE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	LUG HOLE SIZE	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE

GP – General purpose thermocouple

ASSEMBLY STYLE

41F – Stainless steel mounting lug with fiberglass leadwire; diameter 0.312" only; 500°F max.

41T – Stainless steel mounting lug with Teflon® leadwire; diameter 0.312" only; 400°F max.

LUG HOLE SIZE - diameter of hole (in inches)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

CALIBRATION - Standard limits

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

T – Single T

TT – Dual T

E – Single E

EE – Dual E

HOT JUNCTION

G – Grounded junction

U – Ungrounded junction

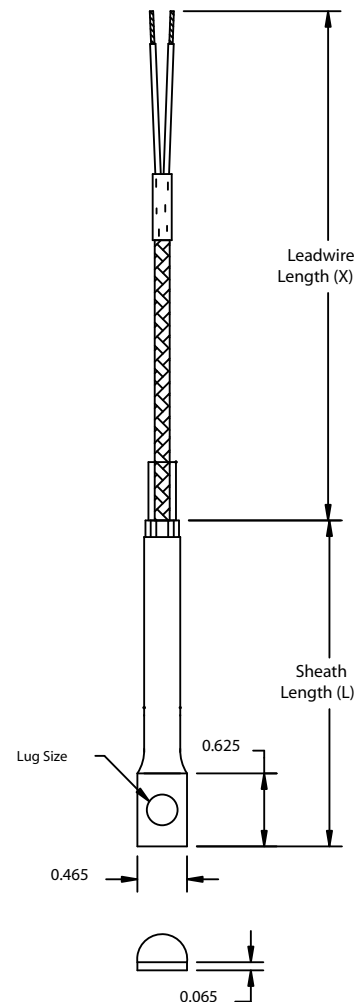
SHEATH LENGTH (Minimum L=1.75"; maximum L=96")

L# - (e.g., L6 = 6 inch sheath)

LEADWIRE LENGTH

X# - (e.g., X72 = 72 inch length)

OPTIONS – see page 1-19b



STYLES 41F & 41T

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance

WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminals
WC98	#8 ring terminals
PLUGS AND JACKS (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)	
PJ10	Standard plug, rated to 177°C (350°F)
PJ20	Standard jack, rated to 177°C (350°F)
PJ30	Miniature plug, rated to 177°C (350°F)
PJ40	Miniature jack, rated to 177°C (350°F)
PJ50	High temp. standard plug, rated to 260°C (500°F)
PJ60	High temp. standard jack, rated to 260°C (500°F)

EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

ATEX-APPROVED, CONNECTION HEAD WITH WELDED NPT PROCESS CONNECTION

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	CALIBRATION	HOT JUNCTION	SHEATH LENGTH	OPTIONS

SENSOR TYPE

MI – Mineral insulated thermocouple

ASSEMBLY STYLE

22 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel process connection; head ATEX approved for EEx d IIC; IP66 to 68; screw cover with chain and gasketed o-ring, meets NEMA 4X; ceramic terminal block; 3/4" NPT conduit connection; internal and external ground screws (Note: for spring-loaded fitting, see Style 75 and add optional head).

SHEATH DIAMETER (in inches)

- 4** – 1/8 (0.125)
- 6** – 3/16 (0.188)
- 7** – 1/4 (0.250)
- 9** – 3/8 (0.375)

SHEATH MATERIAL

- 3** – 316 stainless steel
- 5** – Inconel® 600

CALIBRATION – Standard limits

- J** – Single J **JJ** – Dual J
- K** – Single K **KK** – Dual K
- T** – Single T **TT** – Dual T
- E** – Single E **EE** – Dual E

Special limits are available – consult AST

HOT JUNCTION

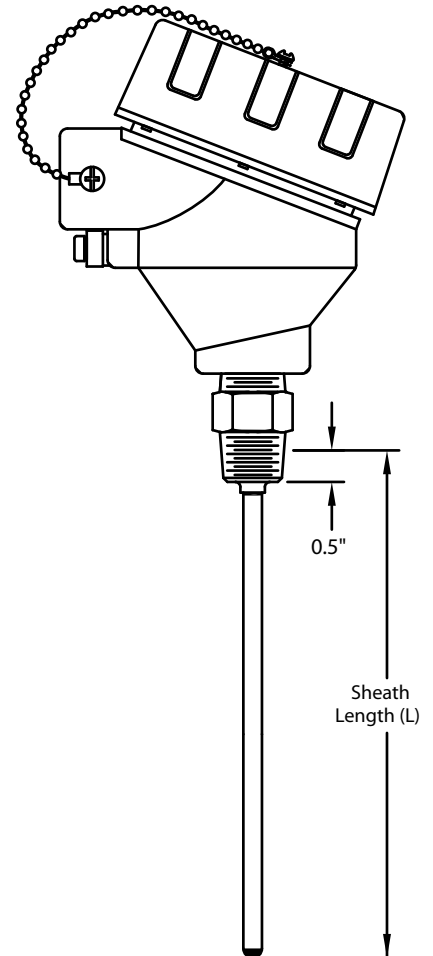
- G** – Grounded junction
- U** – Ungrounded junction
- E** – Exposed junction

(Note: lengths over L84 will be shipped coiled unless otherwise specified at time of order)

SHEATH LENGTH

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

OPTIONS – see page 1-20b



AVAILABLE OPTIONS and MODIFICATIONS

TERMINAL HEAD OPTION		
Same specification as standard head		
Option Code	Process Connection	Conduit Connection
HD72	1/2"	1/2"
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
PC25	1/4" NPT process connection	
PC75	3/4" NPT process connection	
CAL1	Calibration, NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
TRANSMITTERS – For complete specs, see Transmitters section		
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C)	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	

NOBLE METAL THERMOCOUPLE WITH SECONDARY PROTECTION TUBE & MOUNTING COLLAR

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	STYLE	PROTECTION TUBE CONFIGURATION	CALIBRATION	WIRE GAUGE	BEAD MATERIAL	OUTER PROTECTION TUBE LENGTH	OPTIONS

SENSOR TYPE

BTC – Beaded construction

STYLE

81C – Noble metal element with primary and secondary protection tubes; mounting collar process attachment; NEMA 4 aluminum terminal head and ceramic terminal block; 3/4" NPT conduit connection; gasketed screw cover with stainless steel chain

PROTECTION TUBE CONFIGURATION

(e.g., **9CA** = 1.75" O.D. silicon carbide protection tube with collar and alumina inner protection tube)

Outer protection tube diameter

9 - 1-3/4" O.D.

Outer protection tube material

C - Silicon carbide, oxide bonded*

* Other grades of silicon carbide available upon request. Consult AST.

Inner protection tube material

A – Alumina (98.8% aluminum oxide)

M – Mullite (not recommended over 1200°C)

CALIBRATION

Single junction

R – Platinum and Platinum/13% Rhodium

S – Platinum and Platinum/10% Rhodium

B – Platinum/6% Rhodium and Platinum/30% Rhodium

Dual junctions

RR

SS

BB

WIRE GAUGE

24 – 24 AWG

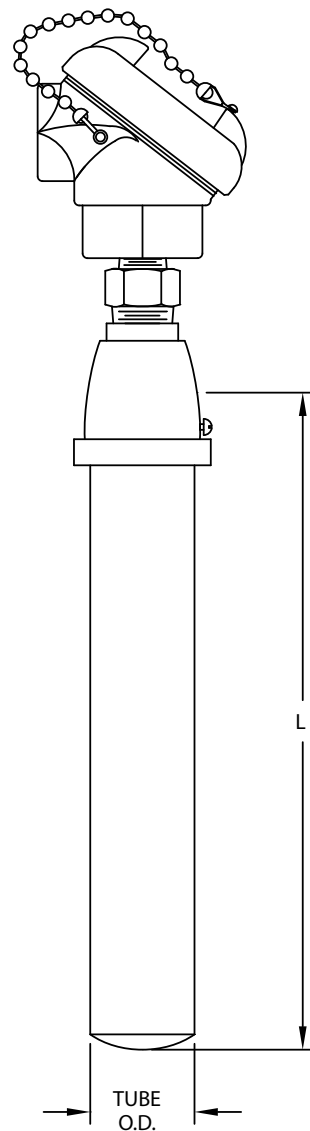
BEAD MATERIAL

A – Alumina beads (0.125" OD for single junction, 0.188" for dual)

OUTER PROTECTION TUBE LENGTH

L# – (e.g., L12 = 12" outer protection tube length)

OPTIONS – see page 1-21b



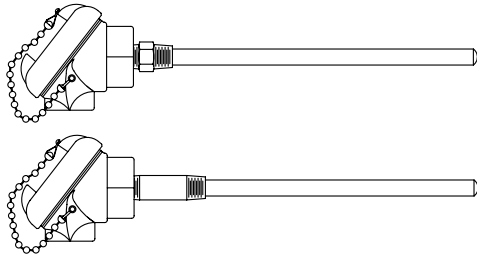
STYLE 81C

TERMINAL HEAD OPTIONS

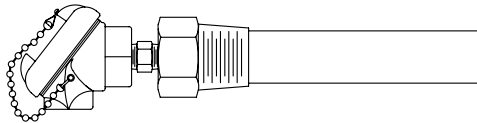
ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections
HW10	Split flange for mounting

For additional Noble Metal Thermocouple styles, see:

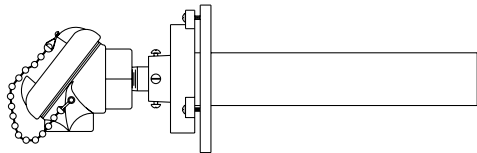
Style 81N – Single, primary protection tube only



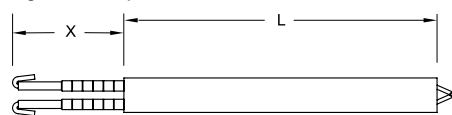
Style 81B – Secondary tube with mounting bushing



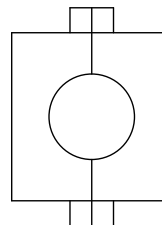
Style 81F – Secondary tube with mounting flange



Style 51 – Replacement Sensor



NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
Std.*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
*can be used with transmitters			
TRANSMITTERS – For complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		



Split flange option HW10

Notes:

1. Applied Sensor Technologies recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.
2. In many cases platinum thermocouples can be recycled, thereby reducing the long-term overall cost. Please contact Applied Sensor Technologies for further information.
3. Applied Sensor Technologies offers many other temperatures sensor designs and technologies, including base metal thermocouples, RTDs, thermistors and Integrated Circuit chips, along with a full line of accessory items such as thermowells, transmitters, etc. Please visit our website or contact us for further information.

BEADED REPLACEMENT ELEMENT FOR BASE-METAL THERMOCOUPLES

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	WIRE GAUGE	BEAD SHAPE	CALIBRATION	HOT JUNCTION	INSULATOR MATERIAL	BEAD LENGTH	LEADWIRE LENGTH

SENSOR TYPE

BTC – Beaded thermocouple

ASSEMBLY STYLE

50 – Replacement element for beaded base-metal thermocouple styles (such as Style 80)

WIRE GAUGE

08 – 0.128" diameter (K and KK calibrations only)

14 – 0.064" diameter

BEAD SHAPE

R – Round

CALIBRATION

J – Single J

JJ – Dual J

K – Single K

KK – Dual K

HOT JUNCTION

U – Ungrounded junction

E – Exposed junction

TE – Twisted, exposed junction

INSULATOR MATERIAL

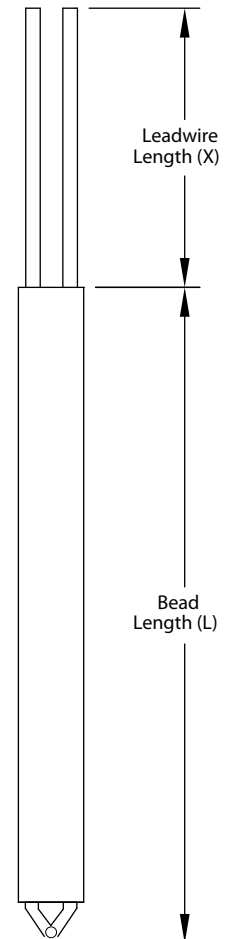
M – Mullite

BEAD LENGTH (length of insulator + junction)

L# – (e.g., L12=12" insulator, including junction end)

LEADWIRE EXTENSION LENGTH (length of wires at cold end)

X# – (e.g., X3=3" leadwire extension)

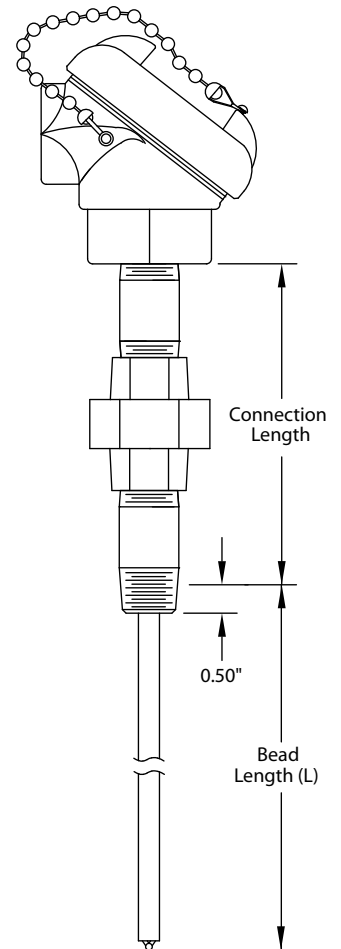


STYLE 50



Applied Sensor Technologies offers a wide variety of constructions using the Style 50 element. Many are based on the common Style 80 shown at the right. Many others are available to meet your requirements.

Give us a call!



BEADED REPLACEMENT ELEMENT FOR NOBLE-METAL THERMOCOUPLES

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	WIRE GAUGE	BEAD SHAPE	CALIBRATION	HOT JUNCTION	INSULATOR MATERIAL	BEAD LENGTH	LEADWIRE LENGTH

SENSOR TYPE

BTC – Beaded thermocouple

ASSEMBLY STYLE

51 – **Replacement element** for beaded noble-metal thermocouple styles (such as Style 81)

WIRE GAUGE

24 – 0.020" diameter

BEAD SHAPE

R – Round

CALIBRATION

R – Single R **RR** – Dual R

S – Single S **SS** – Dual S

B – Single B **BB** – Dual B

HOT JUNCTION

E – Exposed junction

INSULATOR MATERIAL

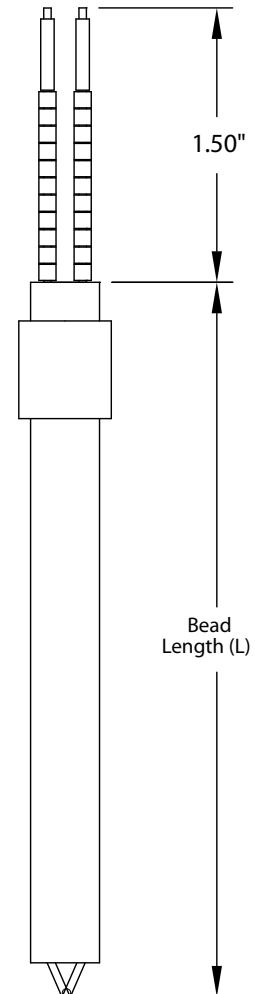
A – Alumina

BEAD LENGTH (length of insulator + junction)

L# – (e.g., L12=12" insulator, including junction end)

LEADWIRE EXTENSION LENGTH (length of wires at cold end)

X# – (e.g., X3=3" leadwire extension)

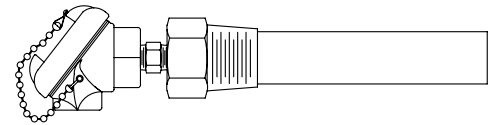


STYLE 51

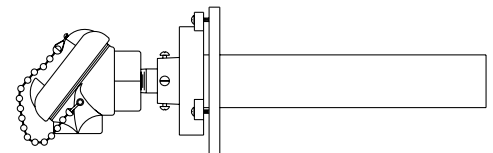


For additional Noble Metal Thermocouple styles, see:

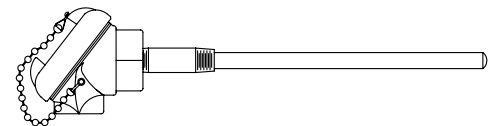
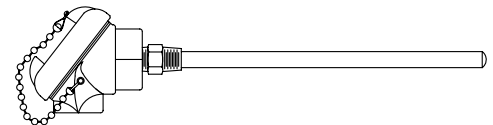
Style 81B – Secondary tube with mounting bushing



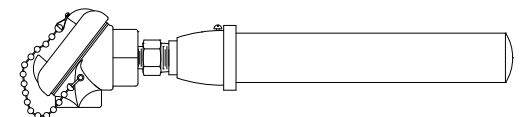
Style 81F – Secondary tube with mounting flange



Style 81N – Single, primary protection tube only



Style 81C – Secondary tube with mounting collar



Applied Sensor Technologies offers a wide variety of constructions using the Style 51 element. Some of the more common Styles are listed at the right. Many others are available to meet your requirements.

Give us a call!

CONNECTION HEAD WITH BEADED THERMOCOUPLE AND MOUNTING HARDWARE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION	CONNECTION LENGTH	WIRE GAUGE	BEAD SHAPE	CALIBRATION	HOT JUNCTION	INSULATOR MATERIAL	BEAD LENGTH	OPTIONS

SENSOR TYPE

BTC – Beaded thermocouple

ASSEMBLY STYLE

80 – Sheath with cast aluminum head and beaded base-metal thermocouple; head conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; 1/2" NPT carbon steel process connection; gasketed screw cover with stainless steel chain; maximum head temperature 100°C

CONNECTION

H – Head only, no mounting hardware; 1/2" NPT (female) instrument connection

N – 1/2" NPT carbon steel nipple

NU – 1/2" NPT carbon steel nipple and union

NUN – 1/2" NPT carbon steel nipple, union and nipple

Add suffix **"1S"** for 304 stainless steel

Add suffix **"2S"** for 316 stainless steel

See chart below for restrictions

CONNECTION LENGTH

(e.g., 006 = 6 inch)

(See chart below for standard available lengths)

WIRE GAUGE

14 – 0.064" diameter

08 – 0.128" diameter (*K & KK calibrations only*)

BEAD SHAPE

R – Round

CALIBRATION – Standard limits

J – Single J **JJ** – Dual J

K – Single K **KK** – Dual K

HOT JUNCTION

E – Exposed junction

TE – Twisted exposed

INSULATOR MATERIAL

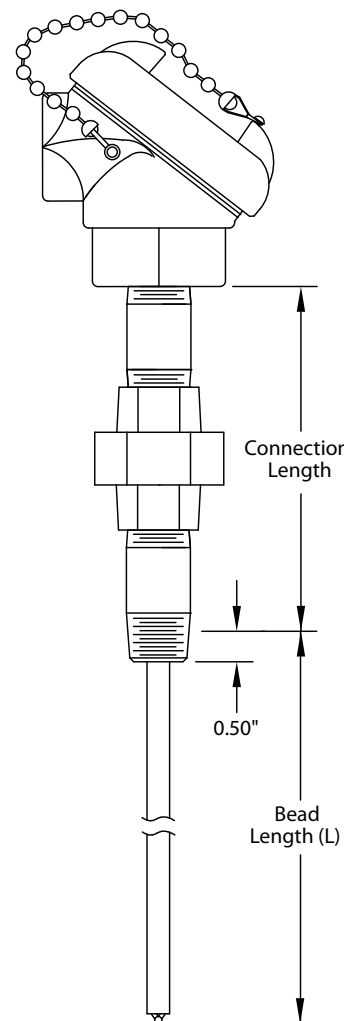
M – Mullite

BEAD LENGTH

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

OPTIONS – see page 1-24b

STANDARD AVAILABLE CONNECTION LENGTHS		
N	NU	NUN
N/A	2.00	2.50
0.50	2.50	3.00 *
1.00	3.00	4.00 *
1.50	3.50	5.00
2.00	4.00	6.00 *
3.00	5.00	8.00
5.00	7.00	12.00
6.00	8.00	14.00
* NUN 2S OPTION AVAILABLE IN THESE LENGTHS ONLY.		
DIMENSIONS ARE GIVEN IN INCHES		



STYLE 80

AVAILABLE OPTIONS and MODIFICATIONS

ASSEMBLY OPTIONS	
Option Code	Description
TAG1	Stainless steel tag and wire
CAL1	NIST traceable calibration [specify point(s)]
CRT1	Certificate of conformance
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10	HD11	1/2"	1/2"
Std.	HD13	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50	HD51	1/2"	1/2"
HD52	HD53	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20	HD21	1/2"	1/2"
HD22	HD23	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40	HD41	1/2"	3/4"

Notes:

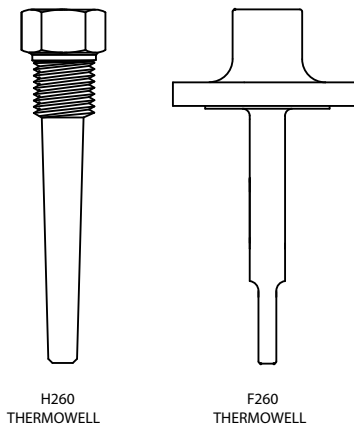
1. See Accessories for additional information

EXTENSION WIRE

A selection of extension-grade thermocouple wire is available to connect the sensor to its input device. Consult Accessories section.

THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.



REPLACEMENT ELEMENT – see Style 50

Style 50 – Beaded replacement for base-metal thermocouple



NEMA 4 CONNECTION HEAD WITH WELDED PROCESS CONNECTION

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

SENSOR TYPE (See page 2-1b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction **(For dual element, add prefix "D", e.g., DRTP1)**

ASSEMBLY STYLE

15 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel process connection; head conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; gasketed screw cover with stainless steel chain

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

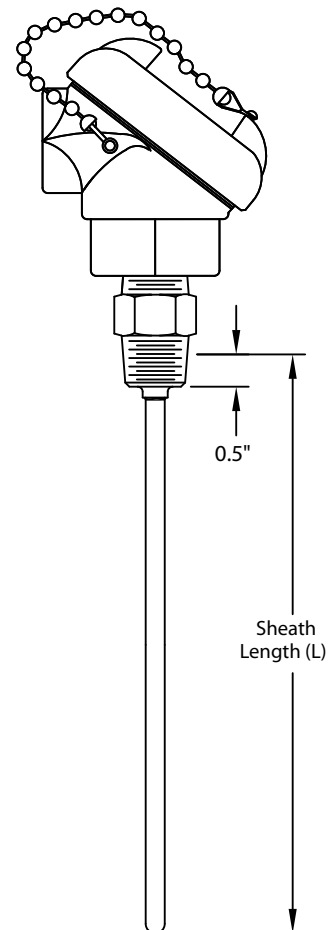
3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

OPTIONS – see page 2-1b



Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

STYLE 15

AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections	
TRANSMITTERS – For complete specs, see Transmitters section		
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional terminal head with *.	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
Std.*	HD13*	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53*	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
*can be used with transmitters			

Notes:

1. See Accessories for additional information
2. For former Style 16, use option HD20
3. For former Style 29, use option HD32

NEMA 4 CONNECTION HEAD WITH SPRING-LOADED ASSEMBLY AND MOUNTING HARDWARE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION	CONNECTION LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

SENSOR TYPE (See page 2-2b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., DRTP1)

ASSEMBLY STYLE

45 – Sheath with cast aluminum head; spring-loaded in head; conforms to NEMA 4 requirements; 3/4" NPT conduit connection; ceramic terminal block; 1/2" NPT process connection; gasketed screw cover with stainless steel chain

CONNECTION

H – Head only; 1/2" NPT (female) instrument connection

N – 1/2" NPT carbon steel nipple only

NU – 1/2" NPT carbon steel nipple and union

NUN – 1/2" NPT carbon steel nipple, union and nipple

Add suffix "1S" for 304 stainless steel

Add suffix "2S" for 316 stainless steel

See chart below for restrictions

CONNECTION LENGTH

– (e.g., 006 = 6 inch)

See chart below for standard available lengths

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

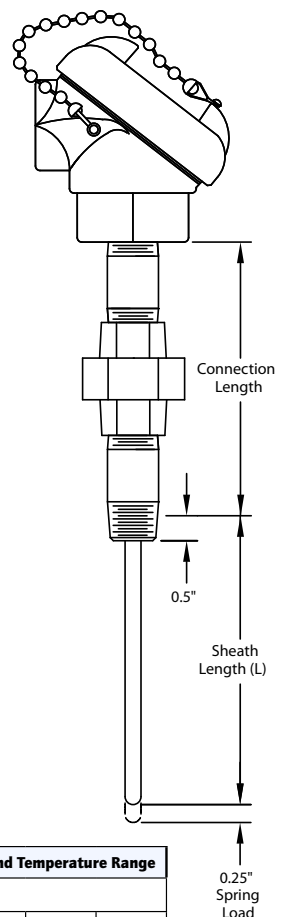
SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

OPTIONS – see page 2-2b

STANDARD AVAILABLE CONNECTION LENGTHS		
N	NU	NUN
N/A	2.00	2.50
0.50	2.50	3.00 *
1.00	3.00	4.00 *
1.50	3.50	5.00
2.00	4.00	6.00 *
3.00	5.00	8.00
5.00	7.00	12.00
6.00	8.00	14.00
* NUN 2S OPTION AVAILABLE IN THESE LENGTHS ONLY.		
DIMENSIONS ARE GIVEN IN INCHES		

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			



STYLE 45

AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections	
Transmitters: see Style 48		

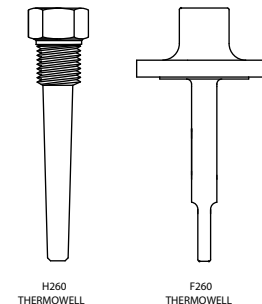
NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10	HD11	1/2"	1/2"
Std.	HD13	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50	HD51	1/2"	1/2"
HD52	HD53	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20	HD21	1/2"	1/2"
HD22	HD23	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40	HD41	1/2"	3/4"

Note:

- For former Style 46, use option HD20

THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.



Note: Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements.

EXPLOSION-PROOF CONNECTION HEAD WITH WELDED PROCESS CONNECTION

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

SENSOR TYPE (See page 2-3b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

(For dual element, add prefix "D" - e.g., DRTP1)

ASSEMBLY STYLE

78 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel process connection; head CSA/FM approved for Class I, Division I, Groups B, C, D; Class II, Groups E, F, G; screw cover with chain and gasketed o-ring; meets NEMA 4; ceramic terminal block; 1/2" NPT conduit connection

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

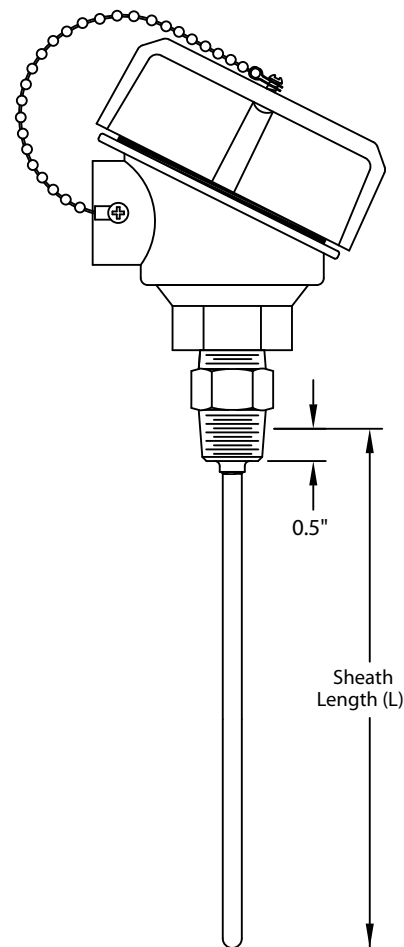
3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

OPTIONS – see page 2-3b



Smallest Diameter Sheath Available By Sensor Type and Temperature Range

SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

STYLE 78

AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP6)		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
PC25	1/4" NPT process connection	
PC75	3/4" NPT process connection	
CAL1	Calibration, NIST traceable calibration [specify point{s}]	
CRT1	Certificate of conformance	
TRANSMITTERS – For complete specs, see Transmitters section		
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C)	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated ouput; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	

EXPLOSION-PROOF TERMINAL HEAD OPTIONS		
Option Code	Process Connection	Conduit Connection
Cast aluminum; screw cover with chain; o-ring gasket (Gasket rated to 100°C exposure); ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C and D; Class II Groups E, F and G; internal ground screw.		
HD71	1/2"	3/4"
Stainless steel (same specs as HD71)		
HD74	1/2"	1/2"
HD75	1/2"	3/4"
Epoxy-coated (same specs as HD71)		
HD80	1/2"	1/2"
HD81	1/2"	3/4"

Note: See Accessories section for additional specs.

EXPLOSION-PROOF CONNECTION HEAD WITH SPRING-LOADED ASSEMBLY AND MOUNTING HARDWARE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION	CONNECTION LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

SENSOR TYPE (See page 2-4b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm +/- 0.12% @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., DRTP1)

ASSEMBLY STYLE

77 – Sheath with cast aluminum head; spring-loaded in head; head CSA/FM approved for Class I, Division I, Groups B, C, D; Class II, Groups E, F, G, including union; screw cover with chain and gasketed o-ring. Ceramic terminal block; 1/2" NPT conduit and process connections

CONNECTION

H – Head only; 1/2" NPT (female) instrument connection

N – 1/2" NPT carbon steel nipple only

NU – 1/2" NPT carbon steel nipple and plated steel union

NUN – 1/2" NPT carbon steel nipples and plated steel union

Add suffix "1S" for 304 stainless steel nipples

CONNECTION LENGTH

– (e.g., 006=6 inch)

See chart below for standard available lengths.

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

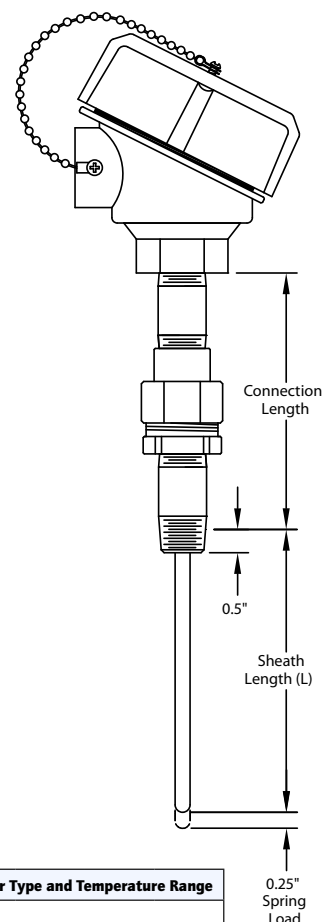
SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

OPTIONS – see page 2-4b

STANDARD AVAILABLE CONNECTION LENGTHS		
N	NU	NUN
N/A	2.00	2.50
0.50	2.50	3.00
1.00	3.00	4.00
1.50	3.50	5.00
2.00	4.00	6.00
3.00	5.00	8.00
5.00	7.00	12.00
6.00	8.00	14.00
DIMENSIONS ARE GIVEN IN INCHES		

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			



STYLE 77

AVAILABLE OPTIONS and MODIFICATIONS

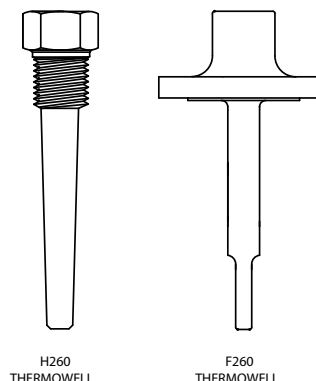
OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP6)		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Codes	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
TRANSMITTERS		
See Style 48 for available transmitters		

EXPLOSION-PROOF TERMINAL HEAD OPTIONS		
Option Code	Process Connection	Conduit Connection
Cast aluminum; screw cover with chain; o-ring gasket; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C and D; Class II Groups E, F and G (Gasket rated to 100°C exposure); internal ground screw		
HD71	1/2"	3/4"
Same as above, except epoxy-coated		
HD80	1/2"	1/2"
HD81	1/2"	3/4"

Note: See Accessories section for outline drawings and additional specs.

THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.



CONNECTION HEAD WITH WELDED HEX FITTING

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

SENSOR TYPE (See page 2-5b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm \pm 0.12% @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., DRTP1)

ASSEMBLY STYLE

21 – Sheath with head; for use as ambient sensor or with compression fitting for process mounting. See page 2-5b for head options.

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

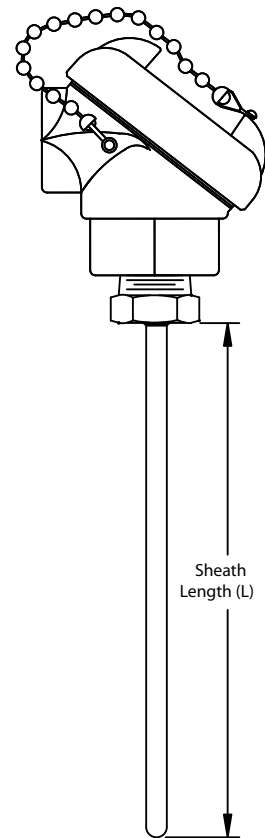
3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6" sheath)

OPTIONS – see page 2-5b



Style 21

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire

Notes:

- For dual element, add prefix "D" (e.g., DRTP6)
- Additional materials, curves and resistance values are available - see Capabilities brochure.

ASSEMBLY OPTIONS			
Option Code	Description		
TAG1	Stainless steel tag and wire		
B90-	90° bend in sheath [specify length from tip in inches e.g., B90-6]		
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)		
CAL1	NIST traceable calibration [specify point(s)]		
CRT1	Certificate of conformance		
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections		
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections		
TRANSMITTERS - for complete specs, see Transmitters section			
TR11	4-20 mA, 2-wire, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and optional head with *.		
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.		
COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass

STYLE 21

AVAILABLE OPTIONS and MODIFICATIONS

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
Std.*	HD13*	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53*	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
EXPLOSION-PROOF TERMINAL HEAD OPTIONS			
Option Code	Process Connection		Conduit Connection
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw			
HD70*	1/2"		1/2"
HD71 *	1/2"		3/4"
Stainless steel (same specs as HD70/71)			
HD74*	1/2"		1/2"
HD75 *	1/2"		3/4"
Epoxy-coated (same specs as HD70/71)			
HD80*	1/2"		1/2"
HD81 *	1/2"		3/4"
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws			
HD72 *	1/2"		1/2"
HD73 *	1/2"		3/4"
Cast aluminum (formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.			
HD60	1/2"		1/2"
HD61	1/2"		3/4"
*can be used with transmitters			

Note: Many non-standard options, including additional sheath diameters and materials, may also be available - consult AST for specific requirements. HART® is a registered trademark of the HART Communication Foundation.



DOUBLE-SIDED, SPRING-LOADED PROCESS MOUNTING WITH TERMINAL HEAD OPTIONS

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE (See page 2-6b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., **DRTP1**)

ASSEMBLY STYLE

75 – Sheath with double-sided, spring-loaded fitting; Teflon® insulated conductors; 1/2" NPT stainless steel connection. (Note: a variety of terminal heads may be added to this style – see page 2-6b)

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

SHEATH LENGTH (for lengths greater than L=36", consult AST)

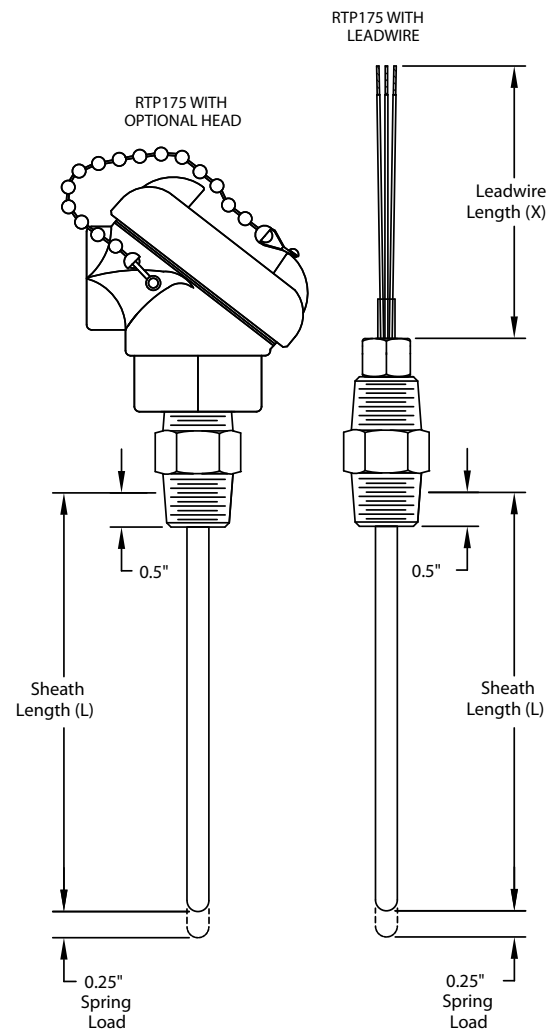
L# – (e.g., L6 = 6 inch sheath)

LEADWIRE LENGTH

X# – (e.g., X3=3 inch length; X3 is standard if specifying a terminal head)

OPTIONS – see page 2-6b

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			



OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
TRANSMITTERS		
TR11	4-20 mA, 2-wire; single input; isolated output; specify range, units of measure (e.g., 0-200°C) and terminal head with *. See Accessories section for additional information.	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	

THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.

STYLE 75

AVAILABLE OPTIONS and MODIFICATIONS

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
HD12*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22*	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
EXPLOSION-PROOF TERMINAL HEAD OPTIONS			
Option Code	Process Connection		Conduit Connection
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw			
HD70*	1/2"		1/2"
HD71 *	1/2"		3/4"
Stainless steel (same spec as HD70/HD71)			
HD74 *	1/2"		1/2"
HD75 *	1/2"		3/4"
Epoxy-coated (same spec as HD70/HD71)			
HD80*	1/2"		1/2"
HD81 *	1/2"		3/4"
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws			
HD72 *	1/2"		1/2"
HD73 *	1/2"		3/4"
Cast aluminum (formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.			
HD60	1/2"		1/2"
HD61	1/2"		3/4"
*can be used with transmitters			

Note: Many non-standard options, including additional sheath diameters and materials, may also be available - consult AST for specific requirements. HART® is a registered trademark of the HART Communication Foundation.

SPRING-LOADED PROCESS MOUNTING HARDWARE WITH OPTIONAL TERMINAL HEAD

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection.

SENSOR TYPE	ASSEMBLY STYLE	CONNECTION TYPE AND MATERIAL	CONNECTION LENGTH	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE (See page 2-7b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., **DRTP1**)

ASSEMBLY STYLE

48 – Sheath with spring-loaded hex connector and connection hardware; head as option

CONNECTION TYPE AND MATERIAL

Code	Union Type	Union Material	Lower Nipple Material
NU	Ordinary location	Carbon steel	None
NUS	Ordinary location	Stainless steel	None
NUX	Explosion-proof	Electroplated steel	None
NUN	Ordinary location	Carbon steel	Carbon steel
NUNS	Ordinary location	Stainless steel	Stainless steel
NUNX	Explosion-proof	Electroplated steel	Carbon steel
NUNXS	Explosion-proof	Electroplated steel	Stainless steel

CONNECTION LENGTH (For NU, NUX, NUS, use 002.5)

(e.g., 006 = 6 inch)

(See chart below for available standard lengths)

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8" (0.125)

6 – 3/16" (0.188)

7 – 1/4" (0.250)

9 – 3/8" (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

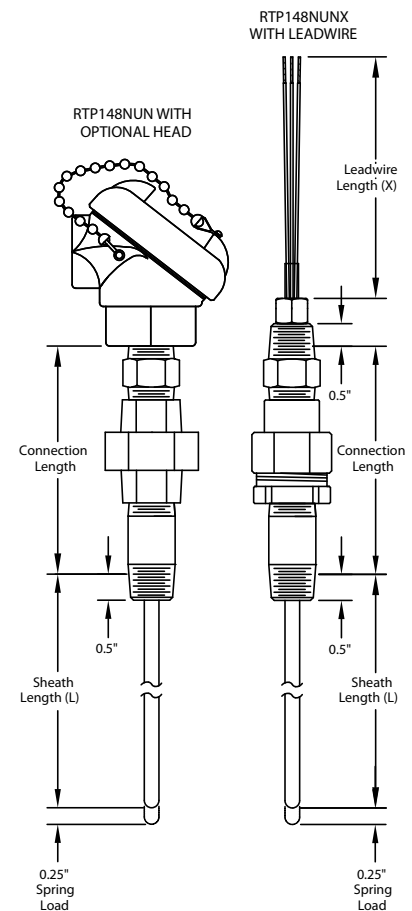
SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

LEADWIRE LENGTH

X# – (e.g., X3 = 3 inch length; X3 is standard if specifying optional head)

OPTIONS – see page 2-7b



STANDARD AVAILABLE CONNECTION LENGTHS FOR NUN CONNECTIONS
3.00
3.50
4.00
4.50
5.00
6.00
8.00
DIMENSIONS ARE GIVEN IN INCHES

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
TRANSMITTERS - for complete specs, see Transmitters section		
TR11	4-20 mA, 2-wire; single input; isolated output; specify range, units of measure (e.g., 0-200°C) and terminal head with *. See Accessories section for additional information.	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	

THERMOWELLS & PROTECTION TUBES

For a complete offering of metal, ceramic and composite material thermowells and protection tubes, please see the Thermowell and Protection Tube sections.

STYLE 48

AVAILABLE OPTIONS and MODIFICATIONS

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4			
HD10*	HD11 *	1/2"	1/2"
HD12 *	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52 *	HD53 *	1/2"	3/4"
Cast iron, screw cover with chain, NEMA 4			
HD20*	HD21 *	1/2"	1/2"
HD22 *	HD23 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
White polypropylene, screw cover with chain, NEMA 4			
HD30	N/A	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
Nylon, screw cover			
HD32	N/A	1/2"	1/2"
EXPLOSION-PROOF TERMINAL HEAD OPTIONS			
Option Code	Process Connection		Conduit Connection
Cast aluminum, screw cover with chain; o-ring gasket rated to 100°C; ceramic terminal block; FM/CSA approved for Class I Div. 1, Groups B, C, D; Class II, Groups E, F, G; internal ground screw			
HD70*	1/2"		1/2"
HD71 *	1/2"		3/4"
Stainless steel (same specs as HD70/HD71)			
HD74 *	1/2"		1/2"
HD75 *	1/2"		3/4"
Epoxy-coated (same specs as HD70/HD71)			
HD80*	1/2"		1/2"
HD81 *	1/2"		3/4"
Cast aluminum; ATEX approved for EEx d IIC; screw cover with chain; silicone rubber o-ring gasket; ceramic terminal block; rated for NEMA 4X, IP66 to IP68; internal and external ground screws			
HD72 *	1/2"		1/2"
HD73 *	1/2"		3/4"
Cast aluminum (Formerly Style 60); screw cover; plastic terminal block; UL/CSA approved for Class I Div. 1, Groups C and D; Class II Groups E, F and G.			
HD60	1/2"		1/2"
HD61	1/2"		3/4"
*can be used with transmitters			

Note: See Accessories section for outline drawings and additional specs.

Note: Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements. HART® is a registered trademark of the HART Communication Foundation.



SANITARY PROCESS CONNECTION WITH TERMINAL HEAD

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CAP SIZE	CAP STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

SENSOR TYPE (See page 2-8b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., DRTP1)

ASSEMBLY STYLE

33 – Sheath with sanitary process connection and white polypropylene head; 3/4" NPT conduit connection; ceramic terminal block; maximum termination temperature 104°C (220°F)

CAP SIZE

A – 0.50* **E** – 2.00

B – 0.75* **F** – 2.50

C – 1.00 **G** – 3.00

D – 1.50 **H** – 4.00

*Available in cap style C only

CAP STYLE

A – 16 A Tri Clamp® cap

C – 16AMP Tri Clamp® cap

SHEATH DIAMETER

6 – 3/16 (0.188)

7 – 1/4 (0.250)

SHEATH MATERIAL

3 – 316 stainless steel

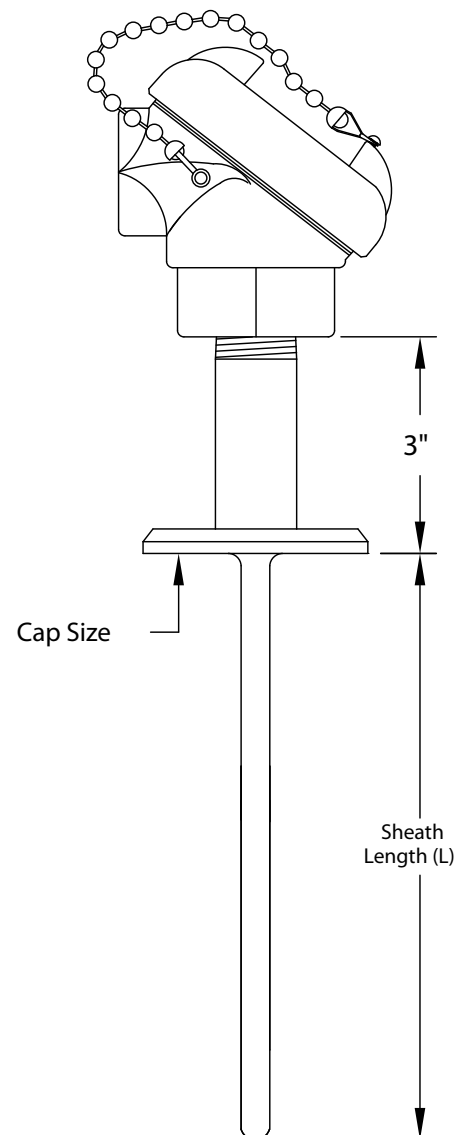
TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 200°C (-50 to 400°F)

SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

OPTIONS – see page 2-8b



Tri Clamp® is a registered trademark of Alfa-Laval, Inc.

STYLE 33

AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP1) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WC20	Wiring cable gland for 0.187 - 0.312 diameter cables, for terminal heads with 1/2" NPT conduit connections	
WC21	Wiring cable gland for 0.125 - 0.187 diameter cables, for terminal heads with 1/2" NPT conduit connections	
TRANSMITTERS		
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range, units of measure (e.g., 0-200°C) and head with *.	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	

NEMA 4 OR 4X TERMINAL HEAD OPTIONS			
Head without ground screw	Head with internal ground screw	Process Connection	Conduit Connection
Cast aluminum, screw cover with chain, NEMA 4 (Formerly Style 67)			
HD10*	HD11 *	1/2"	1/2"
HD12*	HD13 *	1/2"	3/4"
Epoxy-coated aluminum, screw cover with chain, NEMA 4X			
HD50*	HD51 *	1/2"	1/2"
HD52*	HD53 *	1/2"	3/4"
316 stainless steel, screw cover with chain, NEMA 4X			
HD40*	HD41 *	1/2"	3/4"
Black polypropylene, screw cover with chain, NEMA 4			
HD31	N/A	1/2"	3/4"
*can be used with TR11 transmitter			

SANITARY CONNECTION WITH LEADWIRE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	CAP SIZE	CAP STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE (See page 2-9b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

ASSEMBLY STYLE

58 – Sheath with leadwire; sanitary process connection; Teflon® insulated conductors; Teflon® jacketed cable

CAP SIZE (in inches)

A – 0.50* **E** – 2.00
B – 0.75* **F** – 2.50
C – 1.00 **G** – 3.00
D – 1.50 **H** – 4.00

*Available in Cap Style C only.

CAP STYLE

A – 16 A Tri Clamp® cap
C – 16AMP Tri Clamp® cap

SHEATH DIAMETER (in inches)

6 – 3/16 (0.188)
7 – 1/4 (0.250)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 200°C (-50 to 400°F)

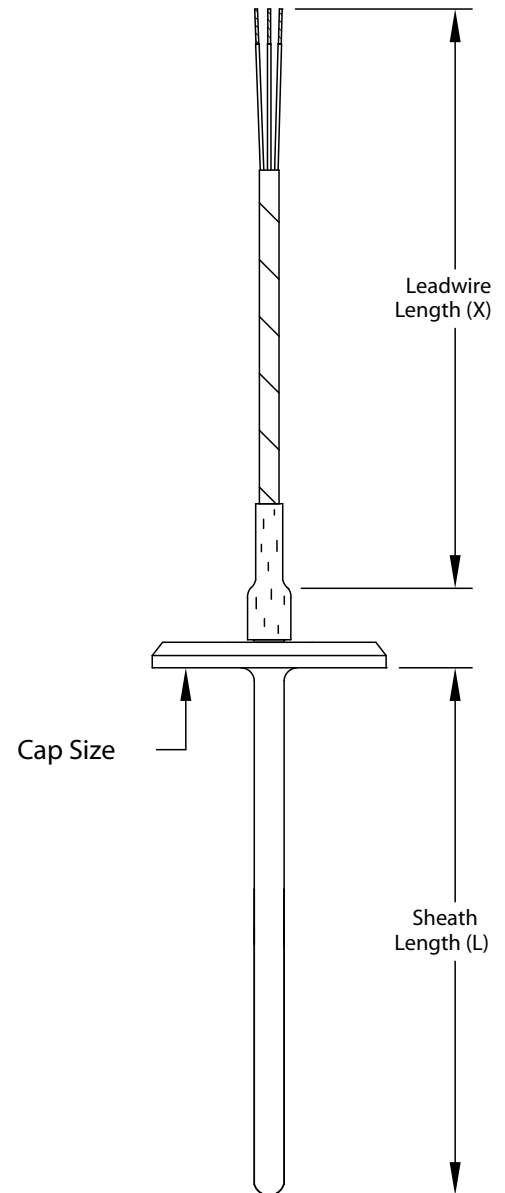
SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

LEADWIRE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 2-9b



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Tri Clamp® is a registered trademark of Alfa-Laval, Inc.

STYLE 58

AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
Note: additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify points]	
CRT1	Certificate of conformance	

WIRING CONNECTION OPTIONS	
Option Code	Description
WC76	#6 spade terminals, plated copper
WC70	#10 spade terminals, plated copper
WC84	1/4" push-on insulated terminals, plated copper
WC90	#10 ring terminal
WC98	#8 ring terminal

SHEATH WITH LEADWIRE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE (See page 2-10b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm \pm 0.12% @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., DRTP1)

ASSEMBLY STYLE

20 – Sheath with leadwire; Teflon® insulated conductors; no jacket

28 – Sheath with Teflon® jacketed cable; Teflon® insulated conductors

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

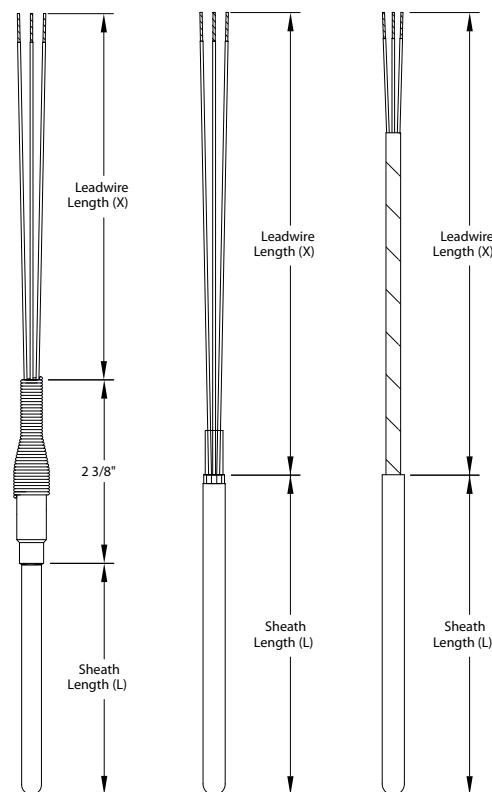
SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath, L12.5 = 12.5 inch length)

LEADWIRE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 2-10b



Temperature Range 3 view
for Style 20 & 28

Style 20

Style 28

Temperature Range 2 & 4
view for Style 28

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
Style 20, SINGLE							
Temp Range	RTP 1	RTP 1A		RTP 6	RTP 7	RTP 7A	
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
Style 20, DUAL							
Temp Range	DRTP 1			DRTP 6	DRTP 7		
1	3/16	3/16	3/16	3/16	1/4	1/4	1/4
2	1/4	1/4	1/4	3/16	3/8	3/8	3/8
3	1/4			1/4	1/4		
4	3/16			3/16	1/4		

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
Style 28, SINGLE ONLY							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8				
2	3/16	3/16	3/16				
3	3/16						
4	1/8						

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STYLES 20 & 28

AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6 [minimum length = 3"])	
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6 [minimum length = 3"])	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
PLUGS AND JACKS (For 2 and 3 wire constructions only. Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)		
PJ10	Standard plug, rated to 177°C (350°F)	
PJ20	Standard jack, rated to 177°C (350°F)	
For flexible stainless steel armor, see Style 03		

COMPRESSION FITTINGS (for diameters 4, 6, 7)			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass

SHEATH WITH LEADWIRE AND ARMOR CABLE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE (See page 2-11b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm \pm 0.12% @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., DRTP1)

ASSEMBLY STYLE

03 – Sheath with leadwire and flexible stainless steel armor cable; Teflon® insulated conductors

03P – PVC coated armor

03T – Teflon® coated armor

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

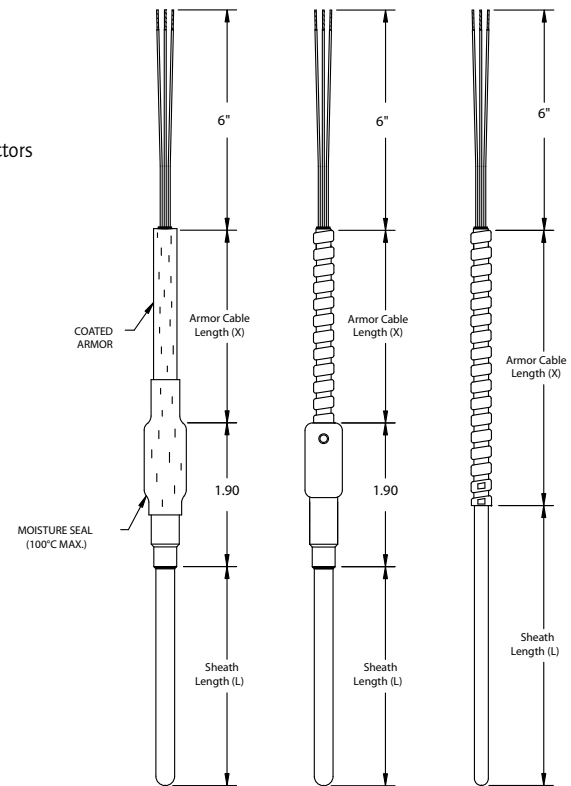
SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

ARMOR CABLE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 2-11b



Style
RT03P & RT03T

Style RT03
Temperature
Range: 2,3,4

Style RT03
Temperature
Range: 1

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16	1/4	1/4	1/4
2	1/4	1/4	1/4	3/16	3/8	3/8	3/8
3	1/4			1/4	1/4		
4	3/16			3/16	1/4		

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STYLE 03

AVAILABLE OPTIONS AND MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
B45–	45° bend in sheath (specify length from tip in inches e.g., B45-6)	
B90–	90° bend in sheath (specify length from tip in inches e.g., B90-6)	
ARMOR OPTIONS		
BA50	Bayonet cap on armor (Style 03, temperature range 1 only) – formerly Style 25	
PLUGS AND JACKS (2 and 3-wire construction only. Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)		
PJ10	Standard plug, rated to 177°C (350°F)	
PJ20	Standard jack, rated to 177°C (350°F)	
WELD PADS		
WP00	Horizontal pad/flat	
WP10	1" nominal pipe size	
WP15	1.5" nominal pipe size	
WP20	2" nominal pipe size	
WP25	2.5" nominal pipe size	
WP30	3" nominal pipe size	
WP35	3.5" nominal pipe size	
WP40	4" nominal pipe size	

COMPRESSION FITTINGS			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass
WIRING CONNECTION OPTIONS			
Option Code	Description		
WC76	#6 spade terminals		
WC70	#10 spade terminals, plated copper		
WC84	1/4" push-on insulated terminals, plated copper		
WC90	#10 ring terminals		
WC98	#8 ring terminals		
BX CONNECTORS			
WC40	1/2"		
WC50	3/4"		
Note: for assembly with sheath, armor and terminal head, see Style 66.			

SHEATH WITH MALE PLUG

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

SENSOR TYPE (See page 2-12b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

ASSEMBLY STYLE

14 – Sheath with standard male plug; hollow pins; maximum termination temperature 177°C (350°F)

SHEATH DIAMETER (in inches)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

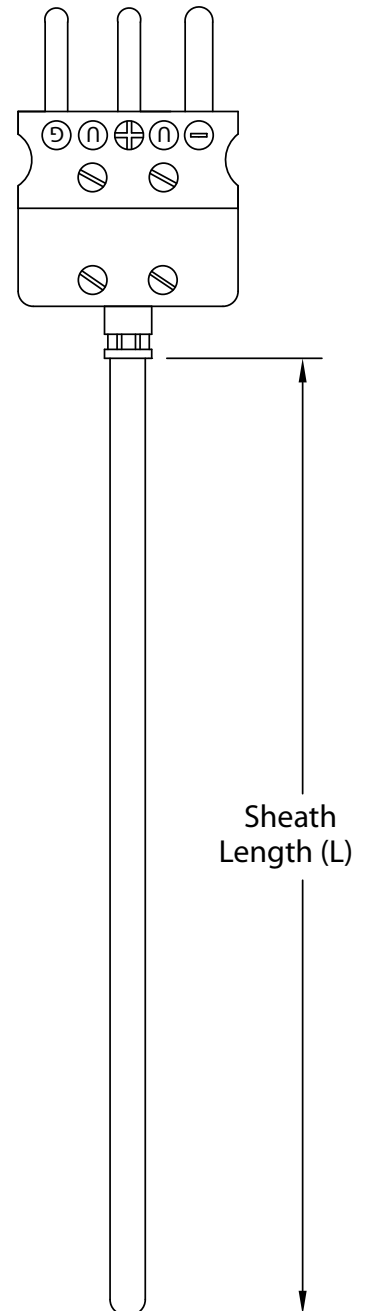
1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

OPTIONS – see page 2-12b



STYLE 14

AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
Note: additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
PJ20	Standard jack included	

COMPRESSION FITTINGS			
Option Code	NPT	Material	Ferrule
CF10	1/8"	Stainless steel	Stainless steel
CF11	1/8"	Stainless steel	Teflon®
CF12	1/8"	Brass	Brass
CF20	1/4"	Stainless steel	Stainless steel
CF21	1/4"	Stainless steel	Teflon®
CF22	1/4"	Brass	Brass
CF30	1/2"	Stainless steel	Stainless steel
CF31	1/2"	Stainless steel	Teflon®
CF32	1/2"	Brass	Brass

CUTABLE SHEATH WITH LEADWIRE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH

SENSOR TYPE

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

ASSEMBLY STYLE

38 – Field cutable sheath length with leadwire; Teflon® insulated conductors for temperature range 1; Fiberglass insulated conductors for temperature range 2; cannot be cut to less than 4"

SHEATH DIAMETER

6 – 3/16 (0.188)

7 – 1/4 (0.250)

SHEATH MATERIAL

3 – stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

SHEATH LENGTH (for lengths greater than L=36", consult AST)

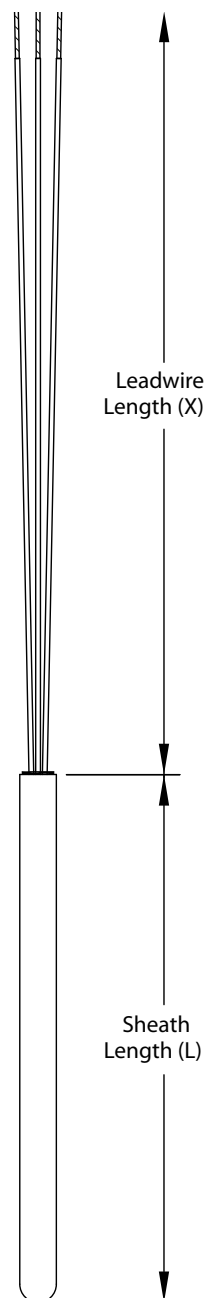
L# – (e.g., L6 = 6 inch sheath)

LEADWIRE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTION

TAG1 – stainless steel tag and wire



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Style 38

STYLE 38



Many additional components are available in our Sensor Box program, including spring-loaded fittings and plugs and jacks.

The Sensor Box allows you to build sensor assemblies on-site, saving time and expense. See the Sensor Box literature for further details.

WELD PAD WITH LEADWIRE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE (See page 2-14b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

ASSEMBLY STYLE

39 – Sheath with flat weld pad and leadwire; Teflon® insulated conductors; Teflon® jacket; pad same material as sheath, 1" X 1" pad size; 1/8" pad thickness; radiused pad available as an option.

SHEATH DIAMETER

6 – 3/16 (0.188)

7 – 1/4 (0.250)

SHEATH MATERIAL

3 – stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

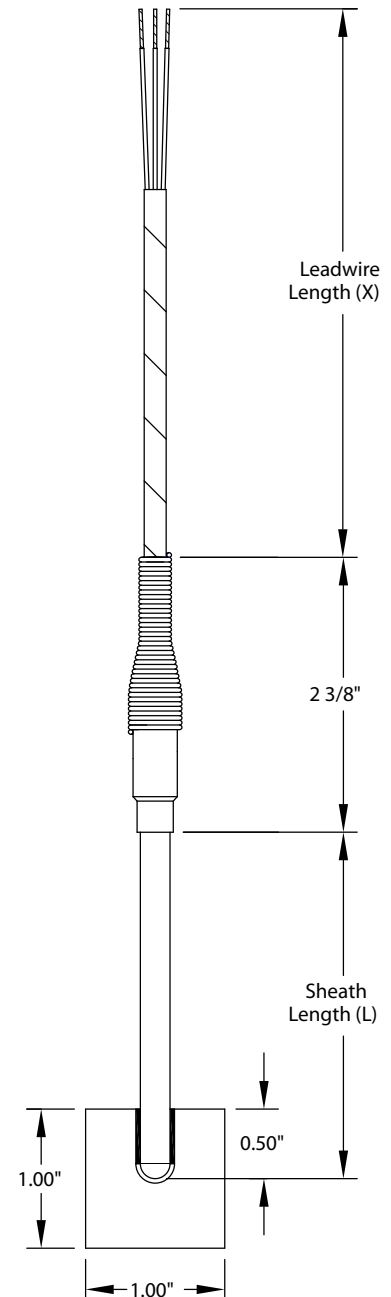
SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

LEADWIRE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 2-14b



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STYLE 39

AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
Note: additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)	
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
PLUGS AND JACKS (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)		
PJ10	Standard plug, rated to 177°C (350°F)	
PJ20	Standard jack, rated to 177°C (350°F)	

WELD PADS	
Pads are normally supplied flat. For matching a pipe radius, use the codes below:	
WP10	1" nominal pipe size
WP15	1.5" nominal pipe size
WP20	2" nominal pipe size
WP25	2.5" nominal pipe size
WP30	3" nominal pipe size
WP35	3.5" nominal pipe size
WP40	4" nominal pipe size

SHEATH WITH WELDED PROCESS MOUNTING

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE (See page 2-15b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., DRTP1)

ASSEMBLY STYLE

23I – Sheath with single sided instrument mounting; Teflon® insulated conductors; 1/2" NPT stainless steel connection with leadwire

23P – Sheath with single sided process mounting; Teflon® insulated conductors; 1/2" NPT stainless steel connection with leadwire

24 – Sheath with double-sided mounting; Teflon® insulated conductors; 1/2" NPT stainless steel connection

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

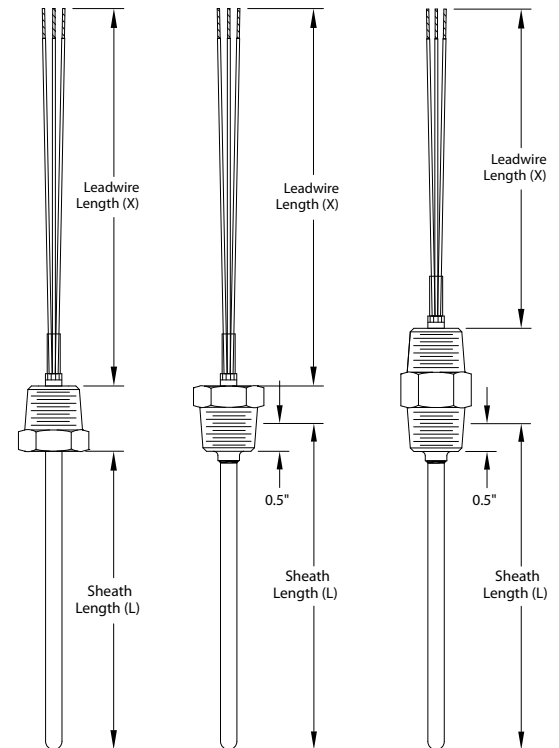
SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

LEADWIRE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 2-15b



Style 23I

Style 23P

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16	1/4	1/4	1/4
2	1/4	1/4	1/4	3/16	3/8	3/8	3/8
3	1/4			1/4	1/4		
4	3/16			3/16	1/4		

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STYLES 23I, 23P & 24

AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)	
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)	
For spring-loaded design, see Style 75		
For terminal heads, see Styles 15 and 21		
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
PLUGS AND JACKS (Available on 23P only, 2 and 3 wire constructions only. Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)		
PJ10	Standard plug, rated to 177°C (350°F)	
PJ20	Standard jack, rated to 177°C (350°F)	

WELD PADS (Style 23I only)	
WP00	Horizontal pad/flat
WP10	1" nominal pipe size
WP15	1.5" nominal pipe size
WP20	2" nominal pipe size
WP25	2.5" nominal pipe size
WP30	3" nominal pipe size
WP35	3.5" nominal pipe size
WP40	4" nominal pipe size

WASHER STYLE WITH LEADWIRE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	WASHER SIZE	WASHER MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE (See page 2-16b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., DRTP1) (see page 2-16b for restrictions)

ASSEMBLY STYLE

32 – Washer with leadwire; Teflon® insulated conductors; armor cable; washer thickness 3/16" (0.188"); Sheath diameter 0.188" only

WASHER SIZE (in inches)

	Washer	
	ID	OD
6 – 3/16 (0.188)	0.193	0.375
7 – 1/4 (0.250)	0.255	0.500
9 – 3/8 (0.375)	0.380	0.750
10 – 1/2 (0.500)	0.510	1.000

WASHER MATERIAL

3 – stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

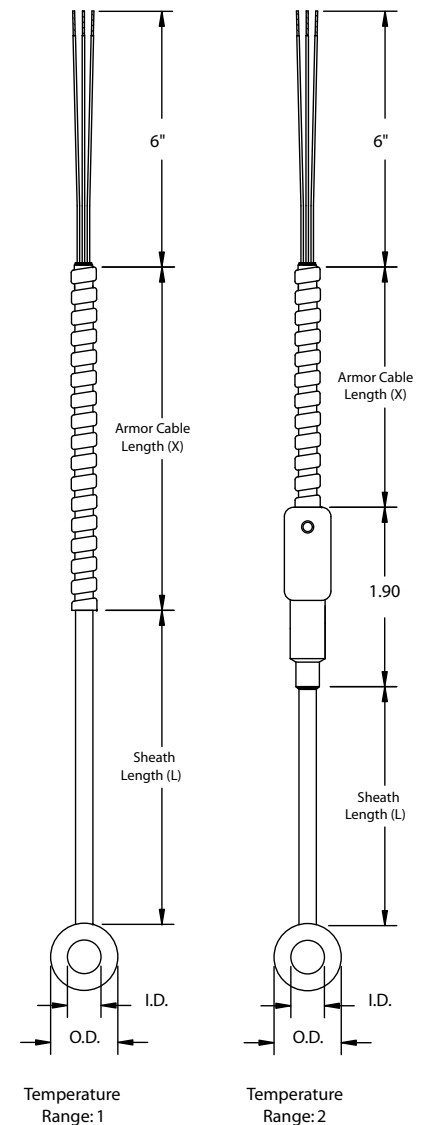
SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

LEADWIRE LENGTH

X# – (e.g., X6 = 6 inch length)

OPTIONS – see page 2-16b



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AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes:		
1. For dual element, add prefix "D" (e.g., DRTP6). Dual available on 2 and 3-wire constructions only.		
2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)	
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
PLUGS AND JACKS (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)		
PJ10	Standard plug, rated to 177°C (350°F)	
PJ20	Standard jack, rated to 177°C (350°F)	
BX CONNECTORS		
WC40	1/2"	
WC50	3/4"	

MOUNTING LUG WITH LEADWIRE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	LUG HOLE SIZE	TEMPERATURE RANGE	SHEATH LENGTH	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE (See page 2-17b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., DRTP1)

ASSEMBLY STYLE

41 – Stainless steel mounting lug with Teflon® leadwire; diameter 0.312" only

LUG HOLE SIZE (in inches)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

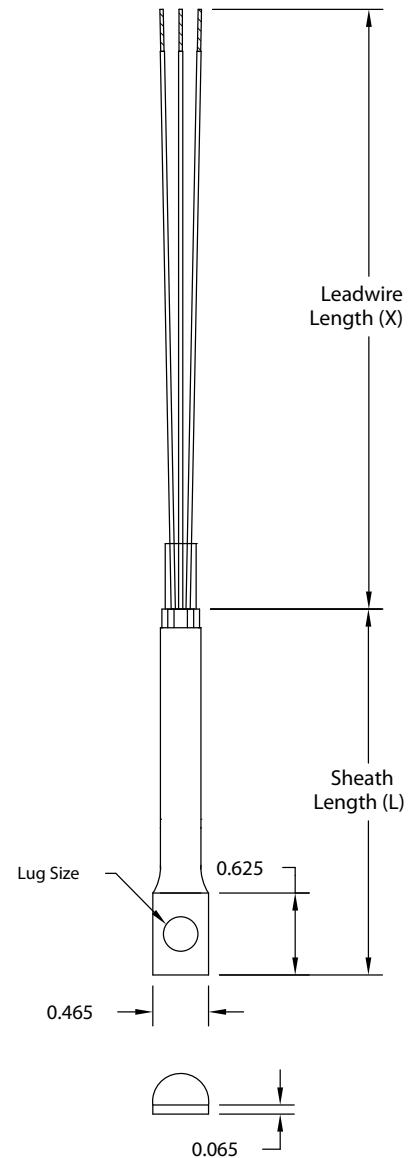
SHEATH LENGTH (Minimum L=1.75"; for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

LEADWIRE LENGTH

X# – (e.g., X72 = 72 inch length)

OPTIONS – see page 2-17b



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AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1 / 4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
PLUGS AND JACKS (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)		
PJ10	Standard plug, rated to 177°C (350°F)	
PJ20	Standard jack, rated to 177°C (350°F)	

SHEATH WITH LEADWIRE AND PROTECTIVE TEFLON® SLEEVE

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	TEFLON® SLEEVE	LEADWIRE LENGTH	OPTIONS

SENSOR TYPE (See page 2-18b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

(For dual element, add prefix "D"- e.g., DRTP1)

ASSEMBLY STYLE

42 – Sheath with protective Teflon® sleeve; Teflon® insulated leadwire extension beyond Teflon® sleeve

SHEATH DIAMETER (in inches) (see below for restrictions)

6 – 3/16 (0.188) Finished OD = 0.240

7 – 1/4 (0.250) Finished OD = 0.300

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

TEFLON® SLEEVE

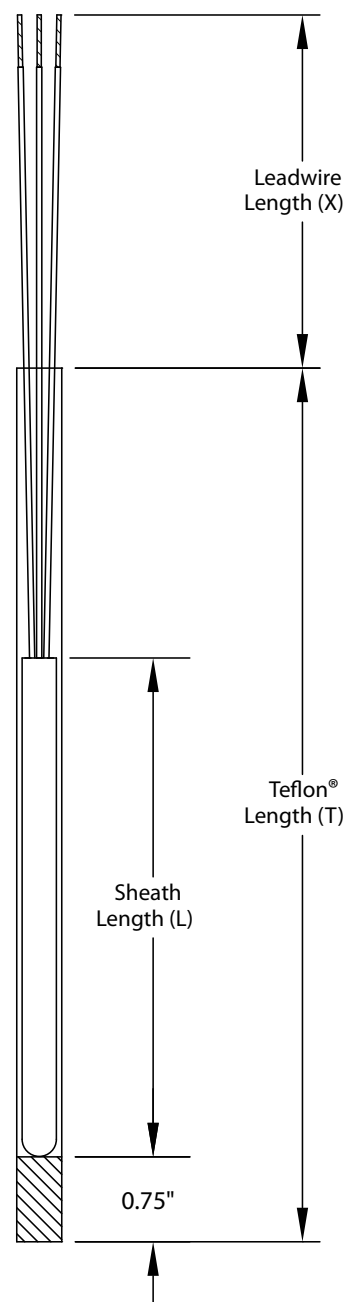
T# – (e.g., T12 = 12" of Teflon®)

LEADWIRE LENGTH

X# – (e.g., X12.5 = 12.5 inch length beyond Teflon® sleeve)

OPTIONS – see page 2-18b

Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	3/16	3/16	3/16	3/16	3/16	3/16	3/16
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16	1/4	1/4	1/4



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AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
CAL1	NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
B45-	45° bend in sheath (specify length from tip in inches e.g., B45-6)	
B90-	90° bend in sheath (specify length from tip in inches e.g., B90-6)	
WIRING CONNECTION OPTIONS		
Option Code	Description	
WC76	#6 spade terminals, plated copper	
WC70	#10 spade terminals, plated copper	
WC84	1/4" push-on insulated terminals, plated copper	
WC90	#10 ring terminals	
WC98	#8 ring terminals	
PLUGS AND JACKS (Note: plug is designed to be attached to sensor assemblies. Jack options – for customer wiring – should only be specified if plug option is also included. Cable clamp is included for both plug and jack options.)		
PJ10	Standard plug, rated to 177°C (350°F)	
PJ20	Standard jack, rated to 177°C (350°F)	

ATEX APPROVED CONNECTION HEAD WITH WELDED PROCESS CONNECTION

How to build a part number:

To order an Applied Sensor Technologies temperature sensor, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

SENSOR TYPE	ASSEMBLY STYLE	SHEATH DIAMETER	SHEATH MATERIAL	TEMPERATURE RANGE	SHEATH LENGTH	OPTIONS

SENSOR TYPE (See page 2-3b for optional elements)

RTP1 – Platinum; DIN 0.00385; 100 ohm $\pm 0.12\%$ @ 0°C; 3-wire construction

(For dual element, add prefix "D" - e.g., DRTP1)

ASSEMBLY STYLE

22 – Sheath with cast aluminum head and 1/2" NPT welded stainless steel process connection; head ATEX approved for EEx d IIC; IP66 to 68; screw cover with chain and gasketed o-ring; meets NEMA 4X; ceramic terminal block; 3/4" NPT conduit connection; internal and external ground screws (Note: For spring-loaded fitting, see Style 75 and add optional head).

SHEATH DIAMETER (in inches) (see below for restrictions)

4 – 1/8 (0.125)

6 – 3/16 (0.188)

7 – 1/4 (0.250)

9 – 3/8 (0.375)

SHEATH MATERIAL

3 – 316 stainless steel

TEMPERATURE RANGE - Minimum and maximum operating temperatures

1 – -45 to 260°C (-50 to 500°F)

2 – -45 to 482°C (-50 to 900°F)

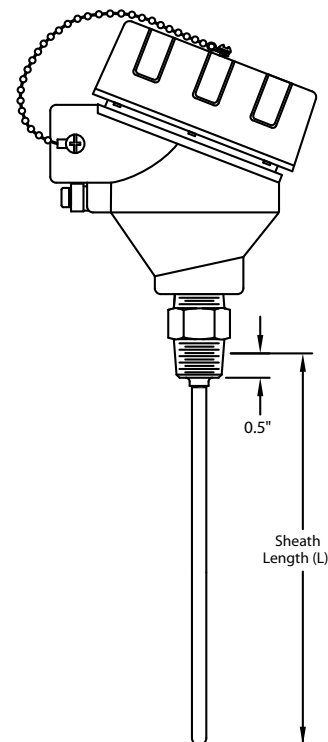
3 – -45 to 788°C (-50 to 1450°F)

4 – -200 to 260°C (-328 to 500°F)

SHEATH LENGTH (for lengths greater than L=36", consult AST)

L# – (e.g., L6 = 6 inch sheath)

OPTIONS – see page 2-19b



Smallest Diameter Sheath Available By Sensor Type and Temperature Range							
SINGLE							
Temp Range	RTP 1	RTP 1A	RTP 1AA	RTP 6	RTP 7	RTP 7A	RTP 7AA
1	1/8	1/8	1/8	1/8	3/16	3/16	3/16
2	3/16	3/16	3/16	3/16	3/16	3/16	3/16
3	3/16			3/16	3/16		
4	1/8			1/8	3/16		
DUAL							
Temp Range	DRTP 1	DRTP 1A	DRTP 1AA	DRTP 6	DRTP 7	DRTP 7A	DRTP 7AA
1	3/16	3/16	3/16	3/16			
2	1/4	1/4	1/4	3/16			
3	1/4			1/4			
4	3/16			3/16			

STYLE 22

AVAILABLE OPTIONS and MODIFICATIONS

OPTIONAL ELEMENTS		
RTDs are standardly platinum, 100-ohm, DIN-curve elements with a 0.00385 alpha.		
Option Code	Accuracy (at 0°C)	Construction
RTP1 (std.)	±0.12%	3-wire
RTP1A	±0.06%	3-wire
RTP1AA	±0.01%	3-wire
RTP6	±0.12%	2-wire
RTP7	±0.12%	4-wire
RTP7A	±0.06%	4-wire
RTP7AA	±0.01%	4-wire
Notes: 1. For dual element, add prefix "D" (e.g., DRTP6) 2. Additional materials, curves and resistance values are available - see Capabilities brochure.		
ASSEMBLY OPTIONS		
Option Code	Description	
TAG1	Stainless steel tag and wire	
PC25	1/4" NPT process connection	
PC75	3/4" NPT process connection	
CAL1	Calibration, NIST traceable calibration [specify point(s)]	
CRT1	Certificate of conformance	
TRANSMITTERS – For complete specs, see Transmitters section		
TR11	4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C)	
TR12	4-20 mA, 2-wire transmitter, single input, non-isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	
TR13	HART®/ 4-20 mA, 2-wire transmitter, single input, isolated output; specify range and units of measure (e.g., 0-200°C) and terminal head with *.	

EXPLOSION-PROOF TERMINAL HEAD OPTIONS		
Option Code	Process Connection	Conduit Connection
Same specifications as standard		
HD72	1/2"	1/2"

BAR STOCK, NPT CONNECTION, NO LAG

How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	WELL MATERIAL	OPTIONS

PROCESS CONNECTION (P)

- 1 – 1/2" NPT
- 2 – 3/4" NPT
- 3 – 1" NPT
- 5 – 1-1/2" NPT

STYLE

- S – Stepped stem (0.260" bore only; for straight stem, see Options)
- H – Tapered stem

BORE

- 260 – 0.260" bore
- 385 – 0.385" bore

WELL LENGTH (in inches)*

L# – Specify length of thermowell (e.g., L4=4")

Standard lengths:

- L4 – L=4"; U=2.5"
- L9 – L=9"; U=7.5"
- L15 – L=15"; U=13.5"
- L24 – L=24"; U=22.5"
- L6 – L=6"; U=4.5"
- L12 – L=12"; U=10.5"
- L18 – L=18"; U=16.5"

Specify other (L = U + 1.5")

WELL MATERIAL

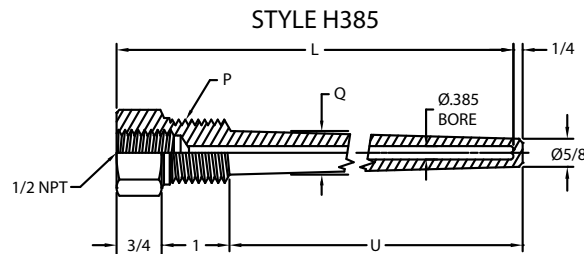
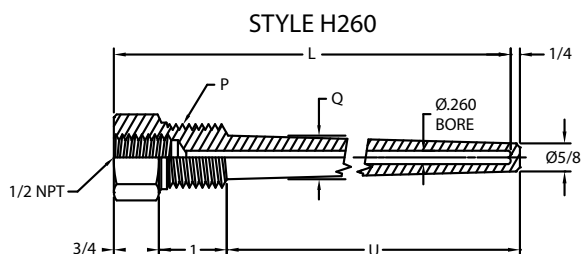
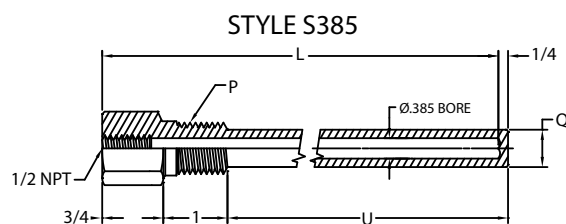
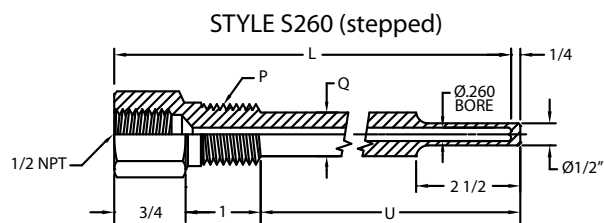
- – 304 stainless steel
- 310 – 310 stainless steel
- 316 – 316 stainless steel
- INC – Inconel 600®
- 321 – 321 stainless steel
- ALUM – Aluminum
- HAST – Hastelloy C®
- TTNM – Titanium
- 316L – 316L stainless steel
- 400 – Monel 400®
- CS – Carbon steel
- F11 – F11 carbon steel (forged)
- F22 – F22 carbon steel (forged)
- F91 – F91 carbon steel (forged)
- A20 – Alloy 20
- BRASS – Brass

OPTIONS

- TW01 – Stainless steel cap and chain assembly
- TW02 – Brass cap and chain assembly
- TAG2 – Stamped tag #
- STRT – Straight stem
- MTR1 – Material Test Report
- WFC1 – Wake Frequency Calculation

Root Diameter (Q)

Process Connection =	1/2" NPT	3/4" NPT	1" NPT	1-1/2" NPT
S260 and S385	.63"	.75"	.88"	.88"
H260 and H385	.63"	.88"	1.06"	1.63"



(*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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BAR STOCK, NPT CONNECTION WITH LAG

How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	LAG EXTENSION	WELL MATERIAL	OPTIONS

PROCESS CONNECTION (P)

- 1 – 1/2" NPT
- 2 – 3/4" NPT
- 3 – 1" NPT
- 5 – 1-1/2" NPT

STYLE

SL – NPT connection, stepped stem with lag extension (for straight stem, see Options)

HL – NPT connection, tapered stem, with lag extension

BORE

260 – 0.260" bore

385 – 0.385" bore

WELL LENGTH (in inches)*

L# – Specify length of thermowell (e.g., L9=9")

Standard lengths:

	Length (L) =	U =	
		If T = 2"	If T = 3"
L6	6"	2.5"	1.5"
L9	9"	5.5"	4.5"
L12	12"	8.5"	7.5"
L15	15"	11.5"	10.5"
L18	18"	14.5"	13.5"
L24	24"	20.5"	19.5"

Specify other (L = U+T+1.5")

LAG EXTENSION (in inches)

T# – Specify length of lagging (e.g., T2 = 2" lag)

T2 – 2" **T3** – 3"

Specify other

WELL MATERIAL

--- – 304 stainless steel

310 – 310 stainless steel

316 – 316 stainless steel

INC – Inconel 600®

321 – 321 stainless steel

ALUM – Aluminum

HAST – Hastelloy C®

TTNM – Titanium

316L – 316L stainless steel

400 – Monel 400®

CS – Carbon steel

F11 – F11 carbon steel (forged)

F22 – F22 carbon steel (forged)

F91 – F91 carbon steel (forged)

A20 – Alloy 20

BRASS – Brass

OPTIONS

TW01 – Stainless steel cap and chain assembly

TW02 – Brass cap and chain assembly

TAG2 – Stamped tag #

STRT – Straight stem

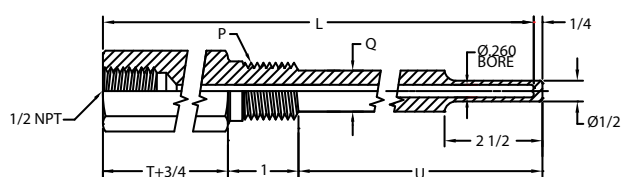
MTR1 – Material Test Report

WFC1 – Wake Frequency Calculation

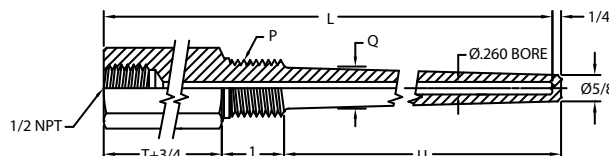
Root Diameter (Q)

Process Connection =	1/2" NPT	3/4" NPT	1" NPT	1-1/2" NPT
SL260 and SL385	.63"	.75"	.88"	.88"
HL260 and HL385	.68"	.88"	1.06"	1.63"

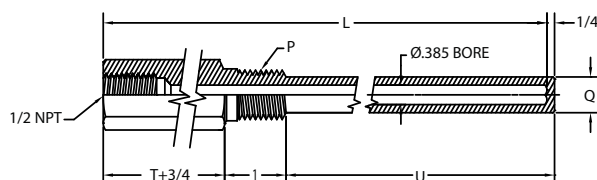
STYLE SL260



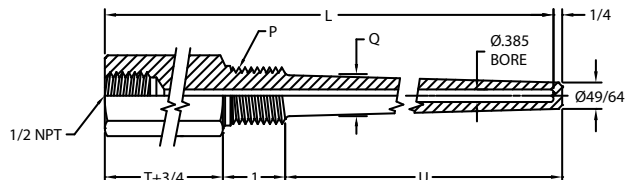
STYLE HL260



STYLE SL385



STYLE HL385



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BAR STOCK, NPT CONNECTION, LIMITED SPACE

How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL MATERIAL	OPTIONS

PROCESS CONNECTION (P)

- 1** – 1/2" NPT
- 2** – 3/4" NPT
- 3** – 1" NPT

STYLE

LS – Limited space, straight stem

BORE

- 260** – 0.260" bore
- 385** – 0.385" bore

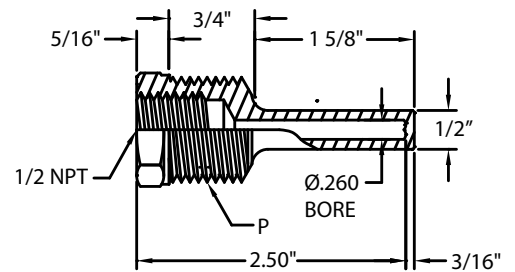
WELL MATERIAL

- | | |
|----------------------------------|--|
| --- – 304 stainless steel | 316L – 316L stainless steel |
| 310 – 310 stainless steel | 400 – Monel 400® |
| 316 – 316 stainless steel | CS – Carbon steel |
| INC – Inconel 600® | F11 – F11 carbon steel (forged) |
| 321 – 321 stainless steel | F22 – F22 carbon steel (forged) |
| ALUM – Aluminum | F91 – F91 carbon steel (forged) |
| HAST – Hastelloy C® | A20 – Alloy 20 |
| TTNM – Titanium | BRASS – Brass |

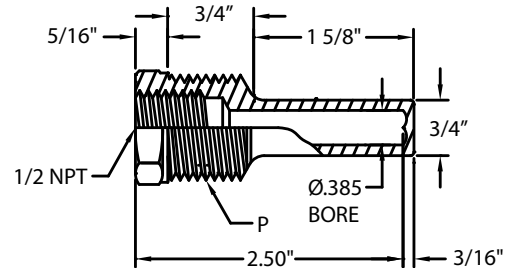
OPTIONS

- TW01** – Stainless steel cap and chain assembly
- TW02** – Brass cap and chain assembly
- TAG2** – Stamped tag #
- MTR1** – Material Test Report

STYLE LS260



STYLE LS385



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BAR STOCK, FLANGE CONNECTION

How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	BORE	INSERTION LENGTH	WELL & FLANGE MATERIAL	FLANGE SIZE	FLANGE RATING	FLANGE TYPE	OPTIONS

STYLE

F – Flanged connection, stepped stem (for straight stem, see Options)

FH – Flanged connection, tapered stem

BORE

260 – 0.260" bore

385 – 0.385" bore

INSERTION LENGTH (in inches)*

U# – Specify length below the flange (e.g., U4 = 4")

Standard lengths:

U4 – U=4"; L=6"

U7 – U=7"; L=9"

U10 – U=10"; L=12"

U13 – U=13"; L=15"

U16 – U=16"; L=18"

U22 – U=22"; L=24"

Specify other (L = U + 2")

WELL AND FLANGE MATERIAL

--- 304 stainless steel

310 – 310 stainless steel

316 – 316 stainless steel

INC – Inconel 600®

321 – 321 stainless steel

ALUM – Aluminum

HAST – Hastelloy C®

TTNM – Titanium

316L – 316L stainless steel

400 – Monel 400®

CS – Carbon steel

F11 – F11 carbon steel (forged)

F22 – F22 carbon steel (forged)

F91 – F91 carbon steel (forged)

A20 – Alloy 20

BRASS – Brass

FLANGE SIZE

1 – 1" flange

1.5 – 1.5" flange

2 – 2" flange

3 – 3" flange

4 – 4" flange

FLANGE RATING

150 – 150# rating

300 – 300# rating

600 – 600# rating

900/1500 – 900/1500# rating

FLANGE TYPE

RF – Welded, raised face (standard)

FF – Welded, flat face

RTJ – Ring type joint

OPTIONS

TW01 – Stainless steel cap and chain assembly

TW02 – Brass cap and chain assembly

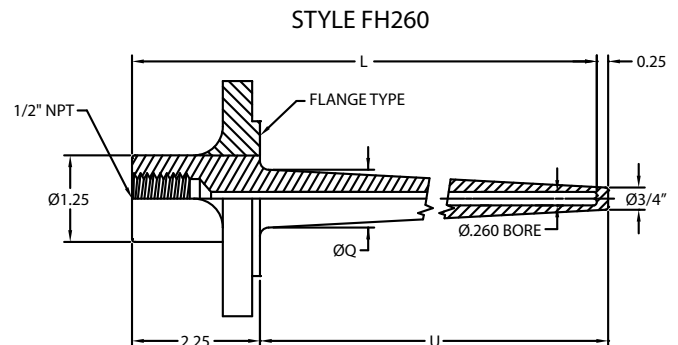
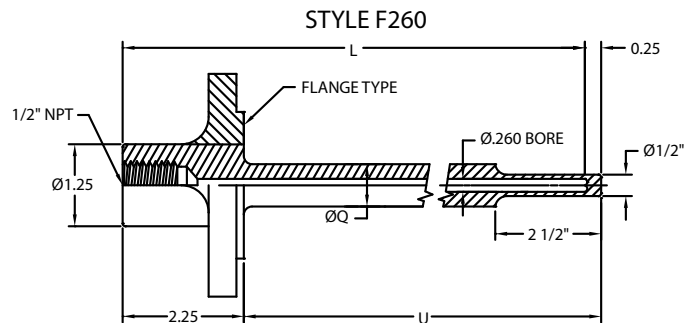
TAG2 – Stamped tag #

STRT – Straight stem

MTR1 – Material Test Report

WFC1 – Wake Frequency Calculation

TFLN – Teflon sleeve or coating



	Root Diameter (Q)
F260	0.75"
F385	0.75"
FH260 & 385	1" flange = .88" 1.5" flange = 1.06" All others = 1.25"

(*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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BAR STOCK, SOCKET-WELD CONNECTION, NO LAG

How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	WELL MATERIAL	OPTIONS

PROCESS CONNECTION (P)

- 2 – 3/4" pipe (OD = 1.05")
3 – 1" pipe (OD = 1.315")
5 – 1-1/2" pipe (OD = 1.90")

STYLE

SW – Socket-weld connection, stepped stem, no lag (for straight stem, see Options)

SWH – Socket-weld connection, tapered stem, no lag

BORE

- 260** – 0.260" bore
385 – 0.385" bore

WELL LENGTH (in inches)*

L# – Specify length of thermowell (e.g., L4 = 4")

Standard lengths:

- | | |
|-----------------------------|-----------------------------|
| L4 – L=4"; U=2.5" | L6 – L=6"; U=4.5" |
| L9 – L=9"; U=7.5" | L12 – L=12"; U=10.5" |
| L15 – L=15"; U=13.5" | L18 – L=18"; U=16.5" |
| L24 – L=24"; U=22.5" | |

Specify other (L = U+1.5")

WELL MATERIAL

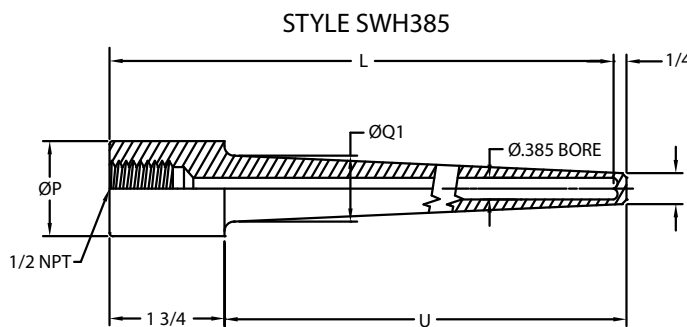
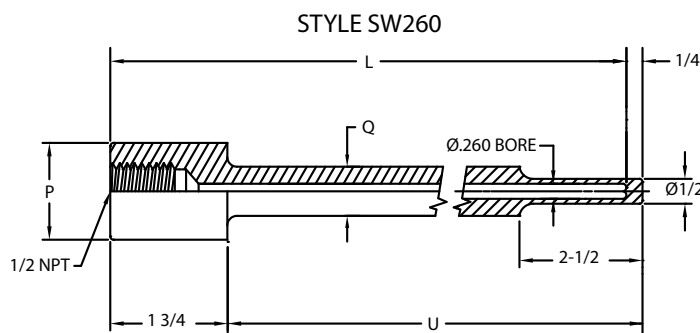
- | | |
|----------------------------------|--|
| --- – 304 stainless steel | 316L – 316L stainless steel |
| 310 – 310 stainless steel | 400 – Monel 400® |
| 316 – 316 stainless steel | CS – Carbon steel |
| INC – Inconel 600® | F11 – F11 carbon steel (forged) |
| 321 – 321 stainless steel | F22 – F22 carbon steel (forged) |
| ALUM – Aluminum | F91 – F91 carbon steel (forged) |
| HAST – Hastelloy C® | A20 – Alloy 20 |
| TTNM – Titanium | BRASS – Brass |

OPTIONS

- TW01** – Stainless steel cap and chain assembly
TW02 – Brass cap and chain assembly
TAG2 – Stamped tag #
STRT – Straight stem
MTR1 – Material Test Report
WFC1 – Wake Frequency Calculations

Root Diameter (Q)

Process Connection =	3/4" pipe	1" pipe	1.5" pipe
SW260 & 385	.75"	.88"	1.13"
SWH260 & 385	.75"	1.00"	1.25"
SWH Tip Diameter	.63"	.75"	.75"



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BAR STOCK, SOCKET-WELD CONNECTION WITH LAG

How to build a part number:

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PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	LAG EXTENSION	WELL MATERIAL	OPTIONS

PROCESS CONNECTION (P)

2 – 3/4" pipe (OD = 1.05")

3 – 1" pipe (OD = 1.315")

5 – 1-1/2" pipe (OD = 1.90")

STYLE

SWL – Socket-weld connection, stepped stem, no lag (for straight stem, see Options)

SWLH – Socket-weld connection, tapered stem, no lag

BORE

260 – 0.260" bore

385 – 0.385" bore

WELL LENGTH (in inches)*

L# – Specify length of thermowell (e.g., L9 = 9")

Standard lengths:

	Length (L) =	U =	
		If T = 2"	If T = 3"
L6	6"	2.5"	1.5"
L9	9"	5.5"	4.5"
L12	12"	8.5"	7.5"
L15	15"	11.5"	10.5"
L18	18"	14.5"	13.5"
L24	24"	20.5"	19.5"

Specify other (L = U+T+1.5")

LAG EXTENSION (in inches)

T# – Specify length of lagging (e.g., T2=2" lag)

T2 – 2" **T3** – 3" Specify other

WELL MATERIAL

--- – 304 stainless steel

310 – 310 stainless steel

316 – 316 stainless steel

INC – Inconel 600®

321 – 321 stainless steel

ALUM – Aluminum

HAST – Hastelloy C®

TTNM – Titanium

316L – 316L stainless steel

400 – Monel 400®

CS – Carbon steel

F11 – F11 carbon steel (forged)

F22 – F22 carbon steel (forged)

F91 – F91 carbon steel (forged)

A20 – Alloy 20

BRASS – Brass

OPTIONS

TW01 – Stainless steel cap and chain assembly

TW02 – Brass cap and chain assembly

MTR1 – Material Test Report

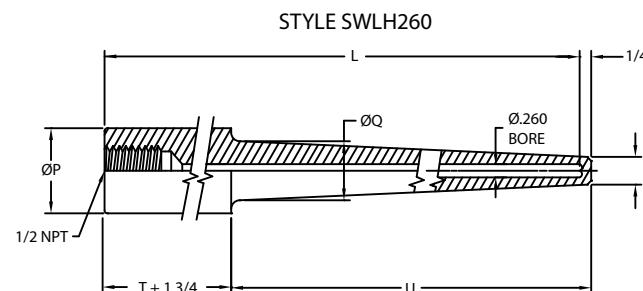
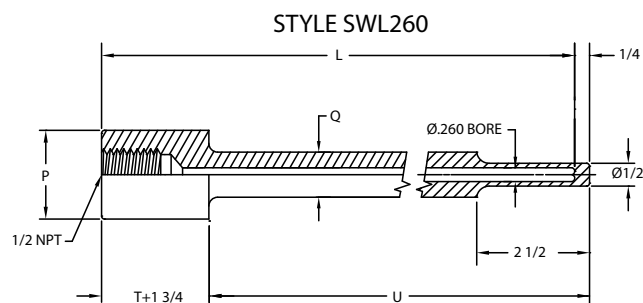
TAG2 – Stamped tag #

WFC1 – Wake Frequency Calculations

STRT – Straight stem

Root Diameter (Q)

Process Connection =	3/4" pipe	1" pipe	1.5" pipe
SWL260 & 385	.75"	.88"	1.25"
SWLH260 & 385	.75"	1.00"	1.25"
SWLH Tip Diameter	.63"	.75"	.75"



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BAR STOCK, WELD-IN CONNECTION, NO LAG

How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	WELL MATERIAL	OPTIONS

PROCESS CONNECTION (P)

- 2** – 3/4" pipe (OD = 1.05")
3 – 1" pipe (OD = 1.315")
5 – 1-1/2" pipe (OD = 1.90")

STYLE

WIH – Weld-in, tapered stem, no lag

BORE

- 260** – 0.260" bore
385 – 0.385" bore

WELL LENGTH (in inches)*

L# – Specify length of thermowell (e.g., L4 = 4")

Standard lengths:

- | | |
|-----------------------------|-----------------------------|
| L4 – L=4"; U=2.5" | L6 – L=6"; U=4.5" |
| L9 – L=9"; U=7.5" | L12 – L=12"; U=10.5" |
| L15 – L=15"; U=13.5" | L18 – L=18"; U=16.5" |
| L24 – L=24"; U=22.5" | |

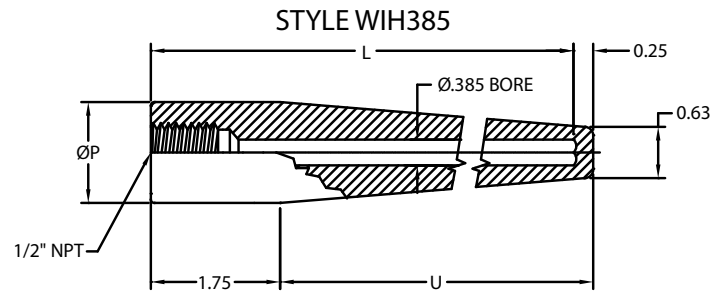
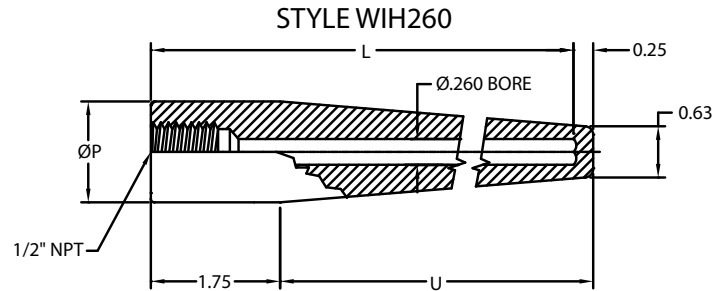
Specify other (L = U+1.5")

WELL MATERIAL

- | | |
|----------------------------------|--|
| --- 304 stainless steel | 316L – 316L stainless steel |
| 310 – 310 stainless steel | 400 – Monel 400® |
| 316 – 316 stainless steel | CS – Carbon steel |
| INC – Inconel 600® | F11 – F11 carbon steel (forged) |
| 321 – 321 stainless steel | F22 – F22 carbon steel (forged) |
| ALUM – Aluminum | F91 – F91 carbon steel (forged) |
| HAST – Hastelloy C® | A20 – Alloy 20 |
| TTNM – Titanium | BRASS – Brass |

OPTIONS

- TW01** – Stainless steel cap and chain assembly
TW02 – Brass cap and chain assembly
TAG2 – Stamped tag #
MTR1 – Material Test Report
WFC1 – Wake Frequency Calculations



(*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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BAR STOCK, WELD-IN CONNECTION WITH LAG

How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	WELL LENGTH	LAG EXTENSION	WELL MATERIAL	OPTIONS

PROCESS CONNECTION (P)

- 2 – 3/4" pipe (OD = 1.05")
3 – 1" pipe (OD = 1.315")
5 – 1-1/2" pipe (OD = 1.90")

STYLE

WIHL – Weld-in, tapered stem with lag extension

BORE

- 260** – 0.260" bore
385 – 0.385" bore

WELL LENGTH (in inches)*

L# – Specify length of thermowell (e.g., L9 = 9")

Standard lengths:

	Length (L) =	U =	
		If T = 2"	If T = 3"
L6	6"	2.5"	1.5"
L9	9"	5.5"	4.5"
L12	12"	8.5"	7.5"
L15	15"	11.5"	10.5"
L18	18"	14.5"	13.5"
L24	24"	20.5"	19.5"

Specify other (L = U+T+1.5")

LAG EXTENSION (in inches)

T# – Specify length of lagging (e.g., T2=2" lag)

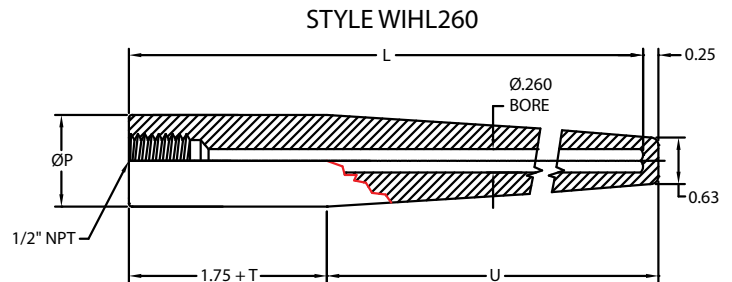
T2 – 2" **T3** – 3" **Specify other**

WELL MATERIAL

- | | |
|----------------------------------|--|
| --- – 304 stainless steel | 316L – 316L stainless steel |
| 310 – 310 stainless steel | 400 – Monel 400® |
| 316 – 316 stainless steel | CS – Carbon steel |
| INC – Inconel 600® | F11 – F11 carbon steel (forged) |
| 321 – 321 stainless steel | F22 – F22 carbon steel (forged) |
| ALUM – Aluminum | F91 – F91 carbon steel (forged) |
| HAST – Hastelloy C® | A20 – Alloy 20 |
| TTNM – Titanium | BRASS – Brass |

OPTIONS

- TW01** – Stainless steel cap and chain assembly
TW02 – Brass cap and chain assembly
TAG2 – Stamped tag #
MTR1 – Material Test Report
WFC1 – Wake Frequency Calculations



(*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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BAR STOCK, VAN STONE FLANGE CONNECTION

How to build a part number:

To order an Applied Sensor Technologies thermowell, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

PROCESS CONNECTION	STYLE	BORE	INSERTION LENGTH	WELL MATERIAL	FLANGE MATERIAL	FLANGE RATING	OPTIONS

PROCESS CONNECTION (P)

3 – 1" pipe (OD = 1.315", R = 2")

5 – 1-1/2" pipe (OD = 1.90", R = 2-7/8")

STYLE

VS – Van Stone Flange, straight stem with step

BORE

260 – 0.260" bore (Q = 3/4")

385 – 0.385" bore (Q = 7/8")

INSERTION LENGTH (in inches)*

U# – Specify length below the flange (e.g., U4 = 4")

Standard lengths:

U2 – U=2"; L=4"

U4 – U=4"; L=6"

U7 – U=7"; L=9"

U10 – U=10"; L=12"

U13 – U=13"; L=14"

U16 – U=16"; L=18"

U22 – U=22"; L=24"

Specify other (U = L-2")

WELL MATERIAL

--- – 304 stainless steel

310 – 310 stainless steel

316 – 316 stainless steel

INC – Inconel 600®

321 – 321 stainless steel

ALUM – Aluminum

HAST – Hastelloy C®

TTNM – Titanium

316L – 316L stainless steel

400 – Monel 400®

CS – Carbon steel

F11 – F11 carbon steel (forged)

F22 – F22 carbon steel (forged)

F91 – F91 carbon steel (forged)

A20 – Alloy 20

BRASS – Brass

FLANGE MATERIAL

304 – 304 stainless steel

316 – 316 stainless steel

FLANGE RATING

150 – 150# rating

300 – 300# rating

600 – 600# rating

900/1500 – 900/1500# rating

OPTIONS

TW01 – Stainless steel cap and chain assembly

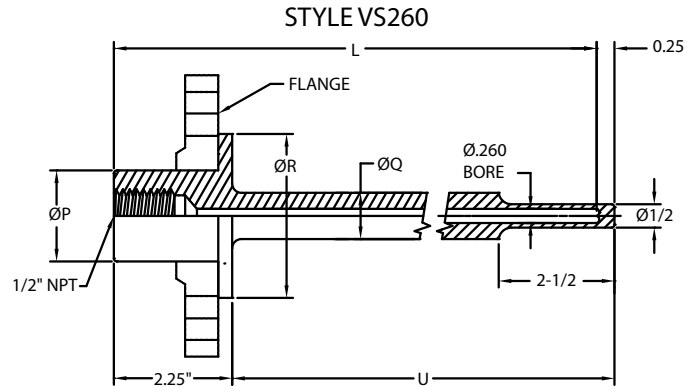
TW02 – Brass cap and chain assembly

TAG2 – Stamped tag #

MTR1 – Material Test Report

WFC1 – Wake Frequency Calculations

TFLN – Teflon coating



(*) Thermowells with an overall length of 42" or less are machined from SOLID BAR STOCK. Thermowells with an overall length greater than 42" are constructed using a welded design and are available in straight, stepped or tapered design. However, for tapered only the last 16" are tapered.

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CERAMIC TUBE, NO MOUNTING FITTING

How to build a part number:

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	TUBE DIAMETER	TUBE MATERIAL	LENGTH

STYLE

CT1 – Ceramic protection tube, no mounting fitting

TUBE DIAMETER

O.D.

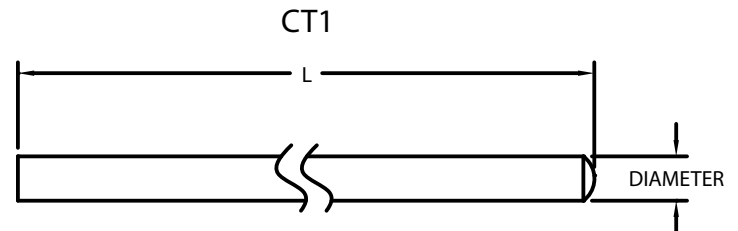
- 0** – 0.375"
- 1** – 0.5"
- 2** – 0.688"
- 3** – 0.75"
- 4** – 0.875"
- 5** – 1"
- 6** – 1.1"
- 7** – 1.25"
- 8** – 1.5"
- 9** – 1.75"

TUBE MATERIAL

- A** – Alumina
- M** – Mullite – not recommended for noble metal thermocouples
- H** – Hexalloy
- L** – LT-1
- S** – Sialon
- C** – Silicon carbide, oxide bonded

LENGTH (in inches)

L# – Specify length (e.g., L6 = 6" overall length)



CERAMIC TUBE, WITH MOUNTING FITTING OR NIPPLE

How to build a part number:

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	TUBE DIAMETER	TUBE MATERIAL	INSTRUMENT CONNECTION	PROCESS CONNECTION	CONNECTION MATERIAL	CONNECTION LENGTH	LENGTH

STYLE

CT2 – Ceramic protection tube with threaded hex fitting

CT3 – Ceramic protection tube with pipe nipple

TUBE DIAMETER

O.D.

- 0** – 0.375"
- 1** – 0.5"
- 2** – 0.688"
- 3** – 0.75"
- 4** – 0.875"
- 5** – 1"
- 7** – 1.25"

TUBE MATERIAL

- A** – Alumina
- M** – Mullite – not recommended for noble metal thermocouples
- H** – Hexalloy
- L** – LT-1

INSTRUMENT CONNECTION*

- 0** – 1/2" NPT
- 1** – 3/4" NPT
- 2** – 1" NPT
- 3** – 1-1/4" NPT

PROCESS CONNECTION*

- 0** – 1/2" NPT
- 1** – 3/4" NPT
- 2** – 1" NPT
- 3** – 1-1/4" NPT

CONNECTION MATERIAL

- Y** – 304 stainless steel
- W** – 316 stainless steel
- G** – Carbon steel

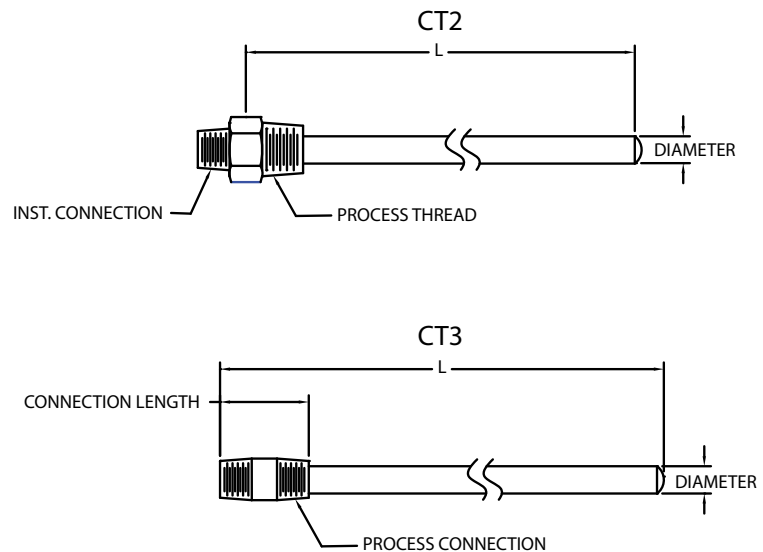
CONNECTION LENGTH

- 1** – CT2 only (hex fitting length)
- #** – CT3 only (length of nipple in inches; e.g., 6 = 6" nipple)

LENGTH (in inches)

L# – Specify length (For CT2, U is approximately L – 1"; for CT3, U is approximately L – the nipple length)

*Note: For CT3, Instrument and Process Connection sizes must be the same.



METAL TUBE, PLAIN OR WITH MOUNTING BUSHING

How to build a part number:

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	PIPE SIZE/ INSTRUMENT CONNECTION	PIPE SCHEDULE	PIPE & BUSHING MATERIAL	BUSHING SIZE	OVERALL LENGTH	INSERTION LENGTH

STYLE

MT1 – Metal protection tube, threaded, no bushing

MT2 – Metal protection tube, threaded, with bushing

PIPE SIZE/INSTRUMENT CONNECTION

Pipe Size	Connection
1 – 1/2" pipe (0.840" dia.)	1/2" NPT
2 – 3/4" pipe (1.050" dia.)	3/4" NPT
3 – 1" pipe (1.315" dia.)	1" NPT

PIPE SCHEDULE

40 – Schedule 40

80 – Schedule 80

160 – Schedule 160

PIPE AND BUSHING MATERIAL

304 – 304 stainless steel

310 – 310 stainless steel

316 – 316 stainless steel

316L – 316L stainless steel

321 – 321 stainless steel

A20 – Alloy 20

INC – Inconel 600®

400 – Monel 400®

BUSHING SIZE

1 – 1/2" NPT

2 – 3/4" NPT

3 – 1" NPT

4 – 1-1/4" NPT

5 – 1-1/2" NPT

7 – 2" NPT

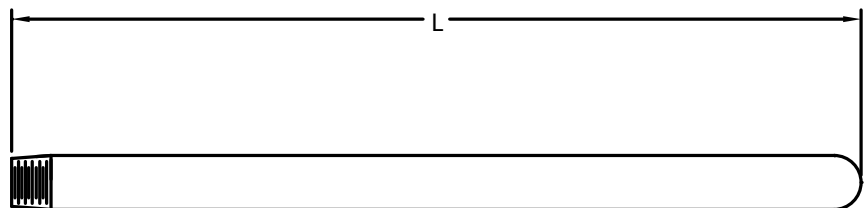
OVERALL LENGTH (in inches)

L# – Specify overall length of tube (e.g., L24 = 24" long tube)

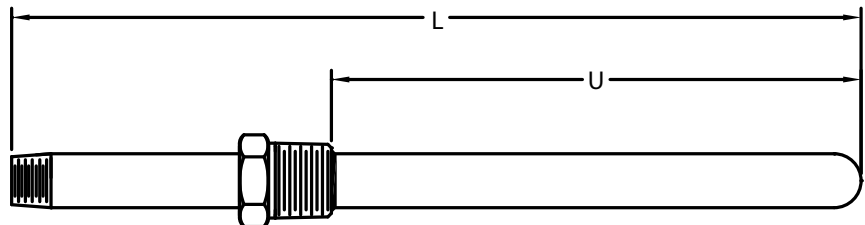
INSERTION LENGTH (MT2 only, in inches)

U# – Specify length below bushing connection (e.g., U6 = 6" below thread)

STYLE MT1



STYLE MT2



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Hastelloy® is a registered trademark of Haynes Int'l.

METAL TUBE WITH MOUNTING FLANGE

How to build a part number:

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	PIPE SIZE/ INSTRUMENT CONNECTION	PIPE SCHEDULE	PIPE & FLANGE MATERIAL	FLANGE SIZE	FLANGE RATING	FLANGE TYPE	OVERALL LENGTH	INSERTION LENGTH

STYLE

MT4 – Metal protection tube, threaded, with flange

PIPE SIZE/INSTRUMENT CONNECTION

Pipe Size	Connection
1 – 1/2" pipe (0.840" dia.)	1/2" NPT
2 – 3/4" pipe (1.050" dia.)	3/4" NPT
3 – 1" pipe (1.315" dia.)	1" NPT

PIPE SCHEDULE

40 – Schedule 40
80 – Schedule 80
160 – Schedule 160

PIPE AND FLANGE MATERIAL

304 – 304 stainless steel
310 – 310 stainless steel
316 – 316 stainless steel
316L – 316L stainless steel
321 – 321 stainless steel
A20 – Alloy 20
INC – Inconel 600®
400 – Monel 400®

FLANGE SIZE

1 – 1" flange
1.5 – 1.5" flange
2 – 2" flange
3 – 3" flange
4 – 4" flange

FLANGE RATING

150 – 150# flange rating
300 – 300# flange rating
600 – 600# flange rating
900/1500 – 900/1500# flange rating

FLANGE TYPE

RF – Raised face
FF – Flat face
RTJ – Ring type joint

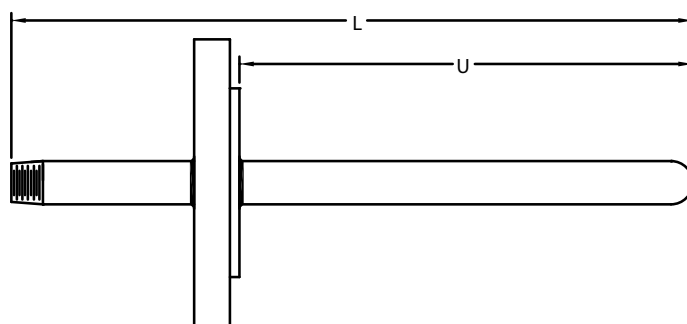
OVERALL LENGTH (in inches)

L# – Specify overall length of tube (e.g., L24 = 24" long tube)

INSERTION LENGTH (in inches)

U# – Specify length below flange (e.g., U6 = 6" below flange)

STYLE MT4



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SPECIAL SECONDARY (OUTER) TUBE WITH MOUNTING BUSHING

How to build a part number:

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	TUBE DIAMETER	TUBE MATERIAL	INSTRUMENT CONNECTION	PROCESS CONNECTION	BUSHING MATERIAL	OVERALL LENGTH

STYLE

PT2 – Outer protection tube, with bushing, to be used with inner ceramic protection tube (Style CT2 or CT3)

TUBE DIAMETER

- 3** – 3/4" O.D.
- 4** – 7/8" O.D.
- 5** – 1" O.D.
- 6** – 1-1/10" O.D.
- 7** – 1-1/4" O.D.
- 8** – 1-1/2" O.D.
- 9** – 1-3/4" O.D.

TUBE MATERIAL

- C** – Silicon carbide, oxide bonded
- S** – Sialon
- H** – Hexalloy
- L** – LT1 metal ceramic

INSTRUMENT CONNECTION

- 0** – 1/2" NPT
- 1** – 3/4" NPT

PROCESS CONNECTION

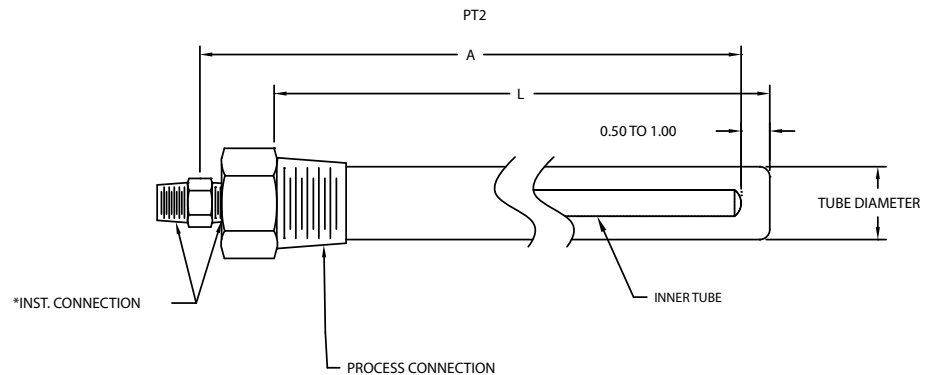
- 2** – 1" NPT
- 3** – 1-1/4" NPT
- 4** – 1-1/2" NPT
- 5** – 2" NPT

BUSHING MATERIAL

- G** – Carbon steel
- W** – 316 stainless steel

OVERALL LENGTH (in inches)

L# – Specify length of tube including threads
(e.g., L24=24" long tube)



Use CT2/CT3 spec sheet to specify inner protection tube, using appropriate O.D. from chart below:

OUTER TUBE O.D.	INNER TUBE O.D.
3/4"	.375"
7/8"	.375"
1"	.375"
1.10"	.375"
1-1/4"	.688"
1-1/2"	.688"
1-3/4"	.75"

Note: to match inner tube length to outer, inner length (A) = outer tube length (L) + 0.75"

OUTER TUBE O.D.

	PROCESS THREAD (NPT)			
CODE	2 (1")	3 (1-1/4")	4 (1-1/2")	5 (2")
3 (3/4")	H	H	H	H
4 (7/8")	LS	LS	LS	LS
5 (1")		H	H	H
6 (1-1/10")		S	S	S
7 (1-1/4")			H	H
8 (1-1/2")			H	H
9 (1-3/4")				C

Notes:

1. Not all materials and process thread sizes are compatible with all tubing O.D.'s. Use the chart below as a guide for the possible combinations. For each combination of thread and O.D., available materials are noted – Silicon Carbide (C), Sialon® (S), Hexalloy® (H) and LT1 (L).

2. Applied Sensor Technologies recommends alumina protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.

SPECIAL SECONDARY (OUTER) TUBE WITH MOUNTING FLANGE

How to build a part number:

To order an Applied Sensor Technologies protection tube, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

STYLE	TUBE DIAMETER	TUBE MATERIAL	SLIP FLANGE SIZE	OVERALL LENGTH

STYLE

PT3 – Outer protection tube, with 4-7/8" mounting flange for mounting, to be used with inner ceramic protection tube (Style CT2 or CT3)

TUBE DIAMETER

9 – 1-3/4" O.D.

TUBE MATERIAL

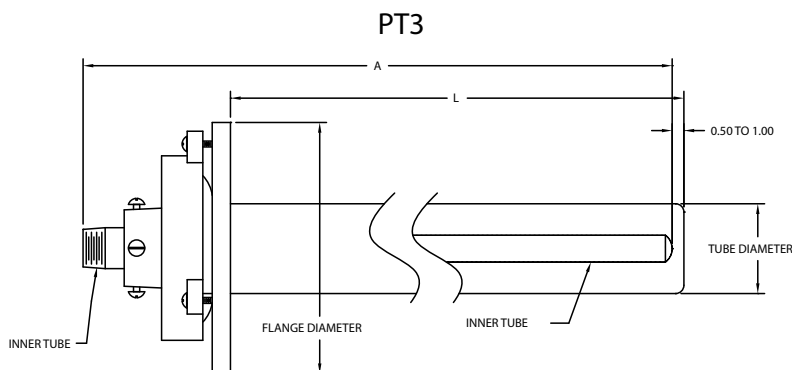
C – Silicon carbide, oxide bonded

SLIP FLANGE SIZE

5 – 4-7/8"

OVERALL LENGTH (in inches)

L# – Specify length of tube below flange
(e.g., L24=24" long tube)



Notes – when inner protection tube is required:

1. Use CT2/CT3 spec sheet to specify inner tube.
2. Style should be CT3 with a 3/4" diameter to match up with 1-3/4" outer tube.
3. Minimum nipple length should be 4" in order to extend past the collar.
4. Length of inner tube (A) should be equal to outer tube length (L) + 2.5".
5. Applied Sensor Technologies recommends alumina inner protection tubes when using platinum thermocouples. Mullite, although less expensive when compared to alumina, can contaminate the platinum, causing drift.

TEMPERATURE SENSOR ASSEMBLY SYSTEM FOR THE MAINTENANCE PROFESSIONAL

How to build a part number:

The basic Sensor Box™, part number EK1000, comes complete with the common parts listed below, along with your choice of any 6 of the sensor pods listed on this page, e.g., "EK1000 with (3) RT1260, (1) MI1113JU and (2) MI1113KU."

EK1000 Common Parts:

Part Number	Description	Quantity
HS2524	Housing, 0.250" O.D. x 24" long, 316 stainless steel	6
PH02	Aluminum terminal head for NEMA 4, 1/2" NPT process connection and 3/4" conduit connection with 4-post ceramic terminal block.	3
AC1087	Spring-loading kit for PH02 head	6
NC1002	Nipple, 1/2" NPT x 2" long, carbon steel	6
UC1011	Union, 1/2" NPT, carbon steel	3
TS1092	Wire guide grommet for housing	1 bag of 10
Tools:	Crimper, tube cutter, screwdriver, tape measure, wire stripper	1 each

Standard Sensor Pods* (pick 6, any combination)

Part Number	Description
RT1260	100-ohm platinum RTD, 3-wire, Teflon® insulation
RT1254	100-ohm platinum RTD, 3-wire, fiberglass insulation
MI1113_U	Ungrounded thermocouple, fiberglass leads, specify calibration (J, K, E, T) – e.g., MI1113JU
MI1113_G	Grounded thermocouple, fiberglass leads, specify calibration (J, K, E, T) – e.g., MI1113JG
MI1113TF_U	Ungrounded thermocouple, Teflon® leads, specify calibration (J, K, E, T) – e.g., MI1113TFJU
MI1113TF_G	Grounded thermocouple, Teflon® leads, specify calibration (J, K, E, T) – e.g., MI1113TFJG

Options:

Many parts can be added to the basic EK1000 to address specific needs. See page 4-1b for a listing of additional parts.



*Notes:

- Standard pods are 4" long and have 48" leads; designed to fit into 0.250" housings.
- Pods with fiberglass leads are rated to 900°F; those with Teflon® leads are rated to 400°F.

RTD Sensor Pods (100-ohm, Class B, 0.00385 alpha with 48" leads)	
Part Number	Description
<i>Pods for 0.250" O.D. Housings</i>	
RT1254	3-wire, fiberglass insulation (std)
RT1260	3-wire, Teflon® insulation (std)
RT1257	4-wire, Teflon® insulation
RT1276	4-wire, fiberglass insulation
<i>Pods for 0.188" O.D. Housings</i>	
RT1184	3-wire, fiberglass insulation
RT1256	3-wire, Teflon® insulation
Thermocouple Sensor Pods* (standard limits of error with 48" leads)	
<i>Pods for 0.250" O.D. Housings</i>	
MI1113_U	Ungrounded junction, fiberglass insulation (specify J, K, E or T calibration; e.g., MI1113KU)
MI1113_G	Grounded junction, fiberglass insulation (specify J, K, E or T calibration; e.g., MI1113KG)
MI1113TF_U	Ungrounded junction, Teflon® insulation (specify J, K, E or T calibration; e.g., MI1113TFJU)
MI1113TF_G	Grounded junction, Teflon® insulation (specify J, K, E or T calibration; e.g., MI1113TFJG)
<i>Pods for 0.188" O.D. Housings</i>	
MI1115_U	Ungrounded junction, fiberglass insulation (specify J, K, E or T calibration; e.g., MI1115KU)
MI1115_G	Grounded junction, fiberglass insulation (specify J, K, E or T calibration; e.g., MI1115KG)
MI1115TF_U	Ungrounded junction, Teflon® insulation (specify J, K, E or T calibration; e.g., MI1115TFJU)
MI1115TF_G	Grounded junction, Teflon® insulation, 48" long (specify J, K, E or T calibration; e.g., MI1115TFJG)
*For dual element, specify as JJ, KK, EE or TT	
Housings (stainless steel, one closed end)	
HS2512	0.250" O.D. x 12" long
HS2524	0.250" O.D. x 24" long (std. with kit)
HS2536	0.250" O.D. x 36" long
HS2548	0.250" O.D. x 48" long
HS1812	0.188" O.D. x 12" long
HS1824	0.188" O.D. x 24" long
HS1836	0.188" O.D. x 36" long
HS1848	0.188" O.D. x 48" long
Compression Fittings	
<i>For 0.250" housings</i>	
PF65	1/4" NPT, 316 stainless steel body and ferrule
PF66	1/4" NPT, 316 stainless steel body; Teflon® ferrule
PF73	1/2" NPT, 316 stainless steel body and ferrule
PF74	1/2" NPT, 316 stainless steel body; Teflon® ferrule
<i>For 0.188" housings</i>	
PF55	1/4" NPT, 316 stainless steel body and ferrule
PF56	1/4" NPT, 316 stainless steel body; Teflon® ferrule
PF59	1/2" NPT, 316 stainless steel body and ferrule
PF60	1/2" NPT, 316 stainless steel body; Teflon® ferrule
Unions (1/2" NPT)	
UC1011	Carbon steel, ordinary location
US1011	Stainless steel, ordinary location
HF1091	Plated steel, explosion-proof

THE SENSOR BOX™ EK1000

AVAILABLE ACCESSORIES

Terminal Heads with 4-Post Terminal Block Included (1/2" NPT process conn.)		
Part Number	Conduit Connection	Description
PH01	1/2"	Aluminum, ordinary locations
PH02	3/4"	Aluminum, ordinary locations (Std. with kit)
PH04	1/2"	Cast iron, ordinary locations
PH05	3/4"	Cast iron, ordinary locations
PH23	3/4"	Black polypropylene, ordinary locations
PH24	3/4"	White polypropylene, ordinary locations
PH47	3/4"	316 stainless steel, ordinary locations
PH50	1/2"	Aluminum, explosion-proof, 3-post block
PH51	3/4"	Aluminum, explosion-proof, 3-post block
Terminal Blocks		
Part Number	Description	
PH44	4-post, ceramic	
PH48	3-post, ceramic, for PH50 and PH51 heads	
Carbon Steel Nipples (1/2" NPT)		
NC1001	1" long	
NC1002	2" long	
NC1003	3" long	
NC1004	4" long	
NC1006	6" long	
Stainless Steel Nipples (1/2" NPT)		
NS1001	1" long	
NS1002	2" long	
NS1003	3" long	
NS1004	4" long	
NS1006	6" long	
Spring-Loaded Kits		
AC1088	For 0.188" housings	
AC1087	For 0.250" housings	
Spring-Loaded Hex Fittings		
PF14	Stainless steel, for 0.250" housings	
PF13	Stainless steel, for 0.188" housings	
Plugs and Jacks		
PT05-	Thermocouple plug (specify J, K, E or T); e.g., PT05-J	
PT05-3	3-pin RTD plug	
PT06-	Thermocouple jack (specify J, K, E or T); e.g., PT06-K	
PT06-3	3-pin RTD jack	
PA10	Wire clamp	
B1250	Brass crimp insert, for 0.250" housings	
B1188	Brass crimp insert, for 0.188" housings	
Strain Reliefs (Bag of 10)		
TS1092	Nylon grommet for 0.250" housings	
TS1094	Teflon® strain relief for 0.188" housings	
Armor Cable Kit		
TS1093	3' stainless armor and adaptor for 0.250" housings	

Note: Pods with fiberglass insulation are rated to 900°F; those with Teflon® leads are rated to 400°F.

Note: Many non-standard options, including additional sheath diameters and materials, may also be available – consult AST for specific requirements.

4-20 MA OUTPUT, ISOLATED

How to build a part number:

To order an Applied Sensor Technologies transmitter, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

TRANSMITTER TYPE	INPUT	RANGE	UNITS OF MEASURE	OPTION

TRANSMITTER TYPE*

UNI5-S – Isolated transmitter with single 4-20mA output for terminal head mounting

INPUT

J – J type thermocouple

K – K type thermocouple

E – E type thermocouple

T – T type thermocouple

Pt100 – 100-ohm platinum RTD

Pt250 – 250-ohm platinum RTD

Pt500 – 500-ohm platinum RTD

Pt1000 – 1000-ohm platinum RTD

R – R type thermocouple

S – S type thermocouple

B – B type thermocouple

Ni100 – 100-ohm nickel RTD

Ni500 – 500-ohm nickel RTD

Ni1000 – 1000-ohm nickel RTD

Cu10 – 10-ohm copper RTD

Cu100 – 100-ohm copper RTD

RANGE (specify minimum and maximum values, e.g., 0-100)*

– **Minimum Range Value** (temperature value that equals 4 mA)

– **Maximum Range Value** (temperature value that equals 20 mA)

UNITS OF MEASURE

Specify °F or °C

OPTION

DS01 – Downscale open circuit protection

*See chart below for available sensor ranges and minimum spans

Specifications

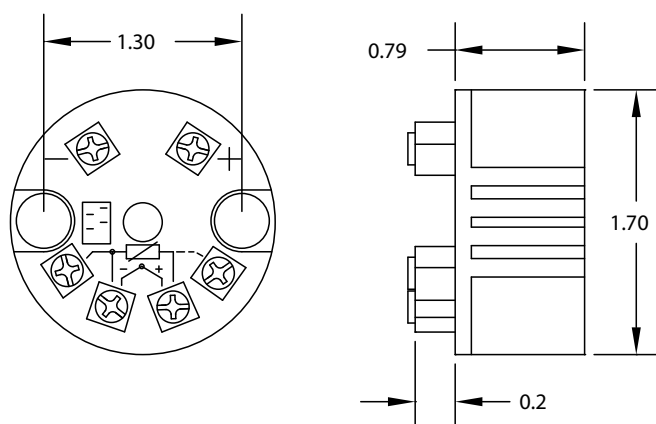
Isolation (I/O):	500 VDC
Supply Voltage:	10-40 VDC, polarity protected
Sensor Lead Resistance:	RTD: 500 ohms max. T/C: 10,000 ohms max. Effect: 0.001 °C/ohm
Maximum Load:	$R_{max} = (V_{supply} - 10V) / 20 \text{ mA}$
Stability:	Zero drift: 0.02 °C/°C Span drift: 0.01 °C/°C
Ambient Temperature:	-40 to + 85 °C
Housing:	Epoxy-coated zinc alloy
Start-up Time:	20 seconds
Warm-up Time:	5 minutes
Open Circuit Detection:	Upscale standard

*Available sensor ranges and limitations

Sensor Type	Min. Temp.	Max. Temp.	Min. Span
J T/C	-200°C	1200°C	50°C
K T/C	-270°C	1370°C	50°C
E T/C	-270°C	1000°C	50°C
T T/C	-270°C	400°C	50°C
R or S T/C	-60°C	1760°C	250°C
B T/C	0°C	1820°C	600°C
Pt100, Pt250, Pt500 and Pt1000 RTD	-200°C	850°C	25°C
Ni100, Ni500 and Ni1000 RTD	-60°C	250°C	25°C
Cu10 and Cu100 RTD	-200°C	250°C	25°C

Note: when used as an option in combination with a temperature sensor assembly, use option code **TR11** at end of assembly part #.

UNI5-S



4-20 MA/HART® OUTPUT, ISOLATED

How to build a part number:

To order an Applied Sensor Technologies transmitter, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

TRANSMITTER TYPE	INPUT	RANGE	UNITS OF MEASURE	OPTION

TRANSMITTER TYPE

UNI5-H – Isolated transmitter with single 4-20mA/HART® output for terminal head mounting

INPUT

J – J type thermocouple
K – K type thermocouple
E – E type thermocouple
T – T type thermocouple

Pt100 – 100-ohm platinum RTD
Pt250 – 250-ohm platinum RTD
Pt500 – 500-ohm platinum RTD
Pt1000 – 1000-ohm platinum RTD

R – R type thermocouple
S – S type thermocouple
B – B type thermocouple

Ni100 – 100-ohm nickel RTD
Ni500 – 500-ohm nickel RTD
Ni1000 – 1000-ohm nickel RTD
Cu10 – 10-ohm copper RTD
Cu100 – 100-ohm copper RTD

RANGE (specify minimum and maximum values, e.g., 0-100)*

– **Minimum Range Value** (temperature value that equals 4 mA)

– **Maximum Range Value** (temperature value that equals 20 mA)

UNITS OF MEASURE

Specify °F or °C

OPTION

DS01 – Downscale open circuit protection

*See chart below for available sensor ranges and minimum spans

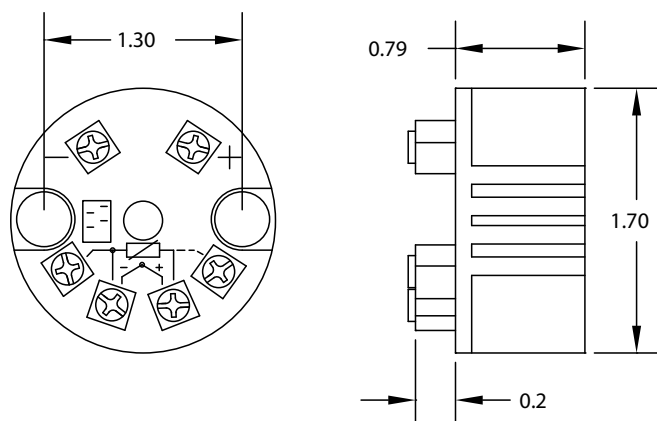
Specifications

Input:	Thermocouple or 3-wire/4-wire RTD
Isolation (I/O):	500 VDC
Supply Voltage:	10-40 VDC, polarity protected
Output:	4-20mA or 20-4 mA
Digital Output:	HART® protocol
Sensor Lead Resistance:	RTD: 500 ohms max. T/C: 10,000 ohms max.
Maximum Load:	$R_{max} = (V_{supply} - 10) / 20 \text{ mA}$
Stability:	0.005%/°C (zero & span drift)
Ambient Temperature:	-40 to + 85 °C
Housing:	Epoxy-coated zinc alloy
Open Circuit Detection:	Upscale standard

*Available sensor ranges and limitations

Sensor Type	Min. Temp.	Max. Temp.	Min. Span
J T/C	-200°C	1200°C	50°C
K T/C	-270°C	1370°C	50°C
E T/C	-270°C	1000°C	50°C
T T/C	-270°C	400°C	50°C
R or S T/C	-60°C	1760°C	250°C
B T/C	0°C	1820°C	600°C
Pt100, Pt250, Pt500 and Pt1000 RTD	-200°C	850°C	25°C
Ni100, Ni500 and Ni1000 RTD	-60°C	250°C	25°C
Cu10 and Cu100 RTD	-200°C	250°C	25°C

UNI5-H



Note: when used as an option in combination with a temperature sensor assembly, use option code **TR13** at end of assembly part #.

4-20 MA OUTPUT, NON-ISOLATED

How to build a part number:

To order an Applied Sensor Technologies transmitter, select the requirements for the categories listed below and fill in the corresponding boxes with your selection. Don't see exactly what you need? Give us a call!

TRANSMITTER TYPE	INPUT	RANGE	UNITS OF MEASURE

TRANSMITTER TYPE

TC2 – Non-isolated transmitter with thermocouple input and single 4-20 mA output for terminal head mounting

RTD2 – Non-isolated transmitter with RTD input and single 4-20 mA output for terminal head mounting

INPUT

J – J type thermocouple

K – K type thermocouple

E – E type thermocouple

T – T type thermocouple

R – R type thermocouple

S – S type thermocouple

B – B type thermocouple

Pt100 – 100-ohm platinum RTD (RTD2 only)

RANGE (specify minimum and maximum values, e.g., 0-100)*

– **Minimum Range Value** (temperature value that equals 4 mA)

– **Maximum Range Value** (temperature value that equals 20 mA)

UNITS OF MEASURE

Specify °F or °C

Specifications

Supply Voltage: 8-38 VDC, polarity protected

Maximum Load: $R_{max} = (V_{supply} - 8V) / 20 \text{ mA}$

Stability (both zero and span drift): RTD: 0.03% of span/°C (100°C span)

T/C: 0.04% of span/°C (25 mV span)

Linearity: RTD: better than +/- 0.05% of span

T/C: better than +/- 0.03% of span

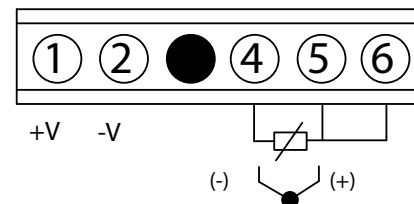
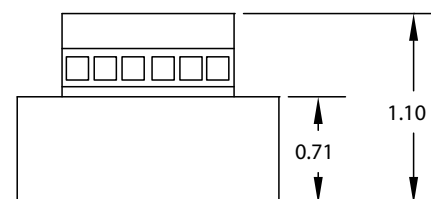
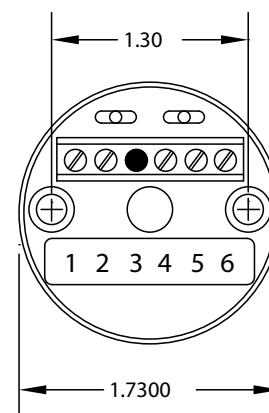
Ambient Temperature: -20 to + 70°C

Humidity: 0-95% RH, non-condensing

*Input span: RTD: 20°C min., 500°C max.

T/C: 10 mV min.

RTD2 AND TC2



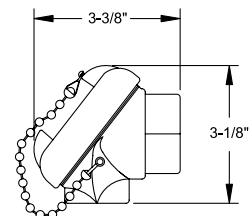
Note: when used as an option in combination with a temperature sensor assembly, use option code **TR12** at end of assembly part #.

NEMA 4 & 4X REPLACEMENT HEADS AND TERMINAL BLOCKS

CAST ALUMINUM – gasketed screw cover

NEMA 4 with gasketed screw cover and stainless steel chain;
4-post ceramic terminal block included. For epoxy-coated, NEMA
4X, add suffix-E to part#. (e.g., PH01E)

Ordering Code	Process Conn.	Conduit Conn.
PH01	1/2"	1/2"
PH02	1/2"	3/4"
PH03	3/4"	3/4"

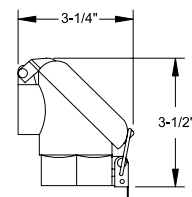


PH01 - PH06

CAST IRON – NEMA 4, gasketed screw cover

NEMA 4 with gasketed screw cover and stainless steel chain;
4-post ceramic terminal block included. For epoxy-coated, NEMA
4X, add suffix-E to part #. (e.g., PH04E)

Ordering Code	Process Conn.	Conduit Conn.
PH04	1/2"	1/2"
PH05	1/2"	3/4"
PH06	3/4"	3/4"

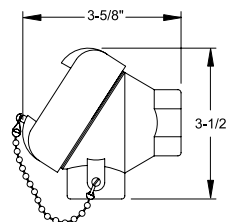


PH45

CAST ALUMINUM – flip-top cover

NEMA 4 with flip-top cover and latching closure, 4-post ceramic
terminal block included.

Ordering Code	Process Conn.	Conduit Conn.
PH45	1/2"	3/4"



PH47

316 STAINLESS STEEL – NEMA 4X, gasketed screw cover

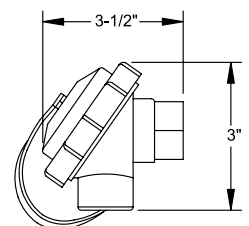
NEMA 4X with gasketed screw cover and stainless steel chain;
4-post ceramic terminal block included.

Ordering Code	Process Conn.	Conduit Conn.
PH47	1/2"	3/4"

BLACK POLYPROPYLENE – NEMA 4, gasketed screw cover

NEMA 4 with gasketed screw cover, 4-post ceramic terminal block
included.

Ordering Code	Process Conn.	Conduit Conn.
PH23	1/2"	3/4"

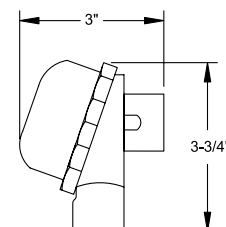


PH23 - PH24

WHITE POLYPROPYLENE – NEMA 4, gasketed screw cover

NEMA 4 with gasketed screw cover and stainless steel chain;
4-post ceramic terminal block included.

Ordering Code	Process Conn.	Conduit Conn.
PH24	1/2"	3/4"



PH26

NYLON – NEMA 4, gasketed screw cover

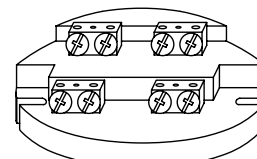
Gasketed screw cover, 4-post ceramic terminal block included.

Ordering Code	Process Conn.	Conduit Conn.
PH26	1/2"	1/2"

CERAMIC TERMINAL BLOCK REPLACEMENTS

For NEMA 4 heads, brass terminals

Ordering Code	No. of Terminals	Max. Wire Size
PH39	2	8 AWG.
PH40	3	8 AWG.
PH41	4	8 AWG.
PH42	6	14 AWG.



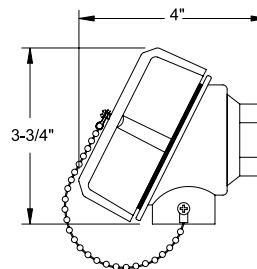
PH41

EXPLOSION-PROOF REPLACEMENT HEADS AND TERMINAL BLOCKS

CAST ALUMINUM – FM/CSA approved

FM/CSA approved for Class I, Div. 1, Groups B, C, D; Class II, Groups E, F, G; gasketed screw cover and stainless steel chain; 6-post ceramic terminal block included. For epoxy-coated, add suffix-E to part #. (e.g., PH50E)

Ordering Code	Process Conn.	Conduit Conn.
PH50	1/2"	1/2"
PH51	1/2"	3/4"
PH52	3/4"	3/4"
PH56	1/2"	1/2"
PH57	1/2"	3/4"

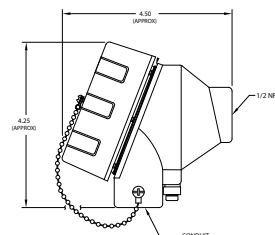


PH50-52,
PH56-57

CAST ALUMINUM – ATEX approved

ATEX approved for EEx d IIC, gasketed screw cover and stainless steel chain; 3-post ceramic terminal block included.

Ordering Code	Process Conn.	Conduit Conn.
PH53	1/2"	3/4"

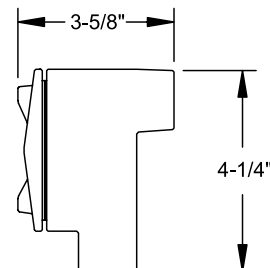


PH53

CAST ALUMINUM – UL/CSA approved

UL/CSA approved for Class I, Div. 1, Groups C, D; Class II, Groups E, F, G; screw cover; 4-post plastic terminal strip included. For epoxy-coated, add suffix-E to part #. (e.g., PH17E)

Ordering Code	Process Conn.	Conduit Conn.
PH17	1/2"	1/2"
PH18	1/2"	3/4"
PH19	3/4"	3/4"

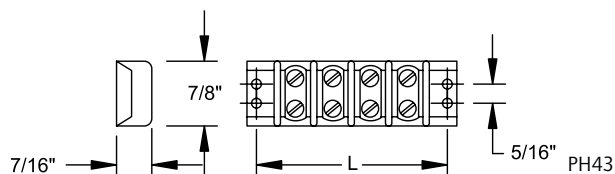


PH17-19

PLASTIC TERMINAL STRIP REPLACEMENTS

For explosion-proof heads (PH17-PH22), brass terminals

Ordering Code	No. of Terminals	Length of Strip
PH43-4	4	2.16"
PH43-6	6	2.91"

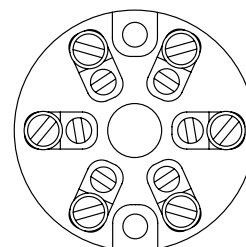


PH43

CERAMIC TERMINAL BLOCK REPLACEMENTS

For explosion-proof heads (PH50-PH52), brass terminals

Ordering Code	No. of Terminals	Max. Wire Size
PH48	3	8 AWG.
PH49	6	14 AWG.



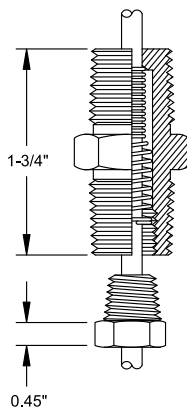
PH49

PARTS TO CONNECT TO WIRING OR THE PROCESS

COMPRESSION FITTINGS			
For 1/8" diameter sheath			
Part Number	NPT	Body/Nut	Ferrule
PF38	1/8"	304 stst	304 stst
PF39	1/8"	304 stst	Teflon®
PF40	1/4"	304 stst	304 stst
PF41	1/4"	304 stst	Teflon®
For 3/16" diameter sheath			
PF52	1/8"	304 stst	304 stst
PF53	1/8"	304 stst	Teflon®
PF54	1/8"	Brass	Brass
PF55	1/4"	304 stst	304 stst
PF56	1/4"	304 stst	Teflon®
PF59	1/2"	304 stst	304 stst
PF60	1/2"	304 stst	Teflon®
For 1/4" diameter sheath			
PF63	1/8"	304 stst	304 stst
PF65	1/4"	304 stst	304 stst
PF66	1/4"	304 stst	Teflon®
PF67	1/4"	Teflon®	Teflon®
PF68	1/4"	Brass	Brass
PF73	1/2"	304 stst	304 stst
PF74	1/2"	304 stst	Teflon®
PF75	1/2"	Brass	Brass

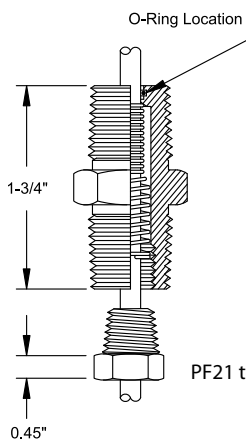


PF38 to PF75



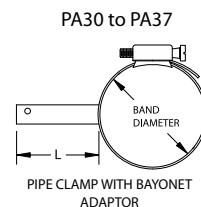
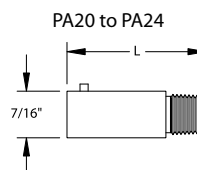
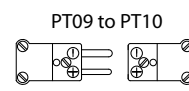
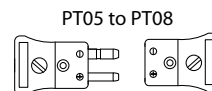
PF13 to PF18

SPRING-LOADED FITTINGS			
Standard, Non-sealed			
Part Number	Process Conn.	Conduit Conn.	Sensor Diameter
PF13	1/2" NPT	1/2" NPT	3/16"
PF14	1/2" NPT	1/2" NPT	1/4"
PF17	3/4" NPT	3/4" NPT	3/16"
PF18	3/4" NPT	3/4" NPT	1/4"
O-Ring Sealed*			
PF21	1/2" NPT	1/2" NPT	3/16"
PF22	1/2" NPT	1/2" NPT	1/4"
PF25	3/4" NPT	3/4" NPT	3/16"
PF26	3/4" NPT	3/4" NPT	1/4"
Notes:			
1. Maximum pressure rating 15 psi			
2. Buna N O-ring rated for -23 to 93°C (-10 to 200°F)			



PF21 to PF26

PLUGS AND JACKS	
(Note: specify J, K, E or T calibration. e.g., PT05-J)	
PT05	Standard plug, rated to 177°C (350°F)
PT06	Standard jack, rated to 177°C (350°F)
PT07	High Temp. plug, rated to 260° (500°F)
PT08	High Temp. jack, rated to 260° (500°F)
PT09	Miniature plug, rated to 177°C (350°F)
PT10	Miniature jack, rated to 177°C (350°F)
PA9	Rubber boot for use with PT05/PT06
PA10	Cable clamp for PT05 to PT08
PA11	Neoprene bushing for use with PA10 to prevent wire abrasion



PIPE CLAMP WITH BAYONET ADAPTOR

BAYONET ADAPTERS (PLATED STEEL)		
Part Number	Thread Size	Length (L)
PA20	1/8" - 27 NPT	7/8"
PA21	1/8" - 27 NPT	1"
PA22	1/8" - 27 NPT	1-1/2"
PA23	1/8" - 27 NPT	2"
PA24	1/8" - 27 NPT	2-1/2"
PIPE CLAMP AND BAYONET ADAPTERS		
Part Number	Band Diameter	Adapter Length (L)
PA30	1-1/4" to 2-1/4"	1"
PA31	1-1/4" to 2-1/4"	2"
PA32	2-1/4" to 3-1/4"	1"
PA33	2-1/4" to 3-1/4"	2"
PA34	3-1/4" to 4-1/4"	1"
PA35	3-1/4" to 4-1/4"	2"
PA36	4-1/4" to 5"	1"
PA37	4-1/4" to 5"	2"

THERMOCOUPLE AND EXTENSION-GRADE WIRE

THERMOCOUPLE GRADE WIRE

Used to either fabricate thermocouples by creating a junction in one end of the wire pair, or as extension wire between the thermocouple and the measuring device. The conditions of measurement determine the type of thermocouple wire and insulation that should be used. Temperature range, wire gauge, environment, protection, insulation requirements, response and service life should all be considered.

THERMOCOUPLE EXTENSION WIRE

Has approximately the same thermoelectric characteristics as thermocouple grade wire, but its purpose is only to carry the signal, not to measure temperature. Thermocouple extension wire is usually lower in cost.

Insulation Characteristics			
Description (individual conductors/overall)	Temperature Limits	Moisture Resistance	Abrasion Resistance
Teflon®/Teflon® FEP	204°C (400°F)	Excellent	Excellent
Teflon®/ Teflon® TFE or PFA Tape	260°C (500°F)	Excellent	Excellent
Fiberglass/Fiberglass	482°C (900°F)	Fair	Fair
Fiberglass (Filaflex®)/Fiberglass (Filaflex®) High Temp	760°C (1400°F)	Fair	Fair

Calibration	Part Number		
	TC Grade, Stranded Wire	TC Grade, Solid Wire	Extension Grade, Stranded
Teflon®/ Teflon® FEP insulated, 20 Gauge			
Type J	20JST58	20JS58	20JXST58
Type K	20KST58	20KS58	20KXST58
Type T	20TST58	20TS58	20TXST58
Type E	20EST58	20ES58	20EXST58
Teflon®/ Teflon® TFE Tape insulated, 20 Gauge			
Type J	20JST60	20JS60	20JXST60
Type K	20KST60	20KS60	20KXST60
Type T	20TST60	20TS60	20TXST60
Type E	20EST60	20ES60	20EXST60
Fiberglass/Fiberglass insulated, 20 Gauge			
Type J	20JST57	20JS57	20JXST57
Type K	20KST57	20KS57	20KXST57
Type T	20TST57	20TS57	20TXST57
Type E	20EST57	20ES57	20EXST57
Fiberglass (Filaflex®)/Fiberglass (Filaflex®) insulated, 20 Gauge			
Type J	20JST70	20JS70	20JXST70
Type K	20KST70	20KS70	20KXST70
Type T	20TST70	20TS70	20TXST70
Type E	20EST70	20ES70	20EXST70
Fiberglass (Filaflex®)/ Fiberglass (Filaflex®) insulated, stainless steel overbraid, 20 Gauge			
Type J	20JST71	20JS71	20JXST71
Type K	20KST71	20KS71	20KXST71
Type T	20TST71	20TS71	20TXST71
Type E	20EST71	20ES71	20EXST71

Teflon® is a registered trademark of E.I. DuPont

Filaflex® is a registered trademark of PMC Corporation

ELECTRONIC PRESSURE AND TEMPERATURE SWITCHES



FEATURES

- Large digital gauge for status, process indication & diagnostic reporting
- 100% programmable set point & deadband for easy adjustment
- Solid-state design for high-vibration applications
- Explosion-proof, intrinsically safe and non-incendive models available for hazardous locations
- Suitable for SIL 1 & 2 safety systems
- Multiple approvals including:



OVERVIEW

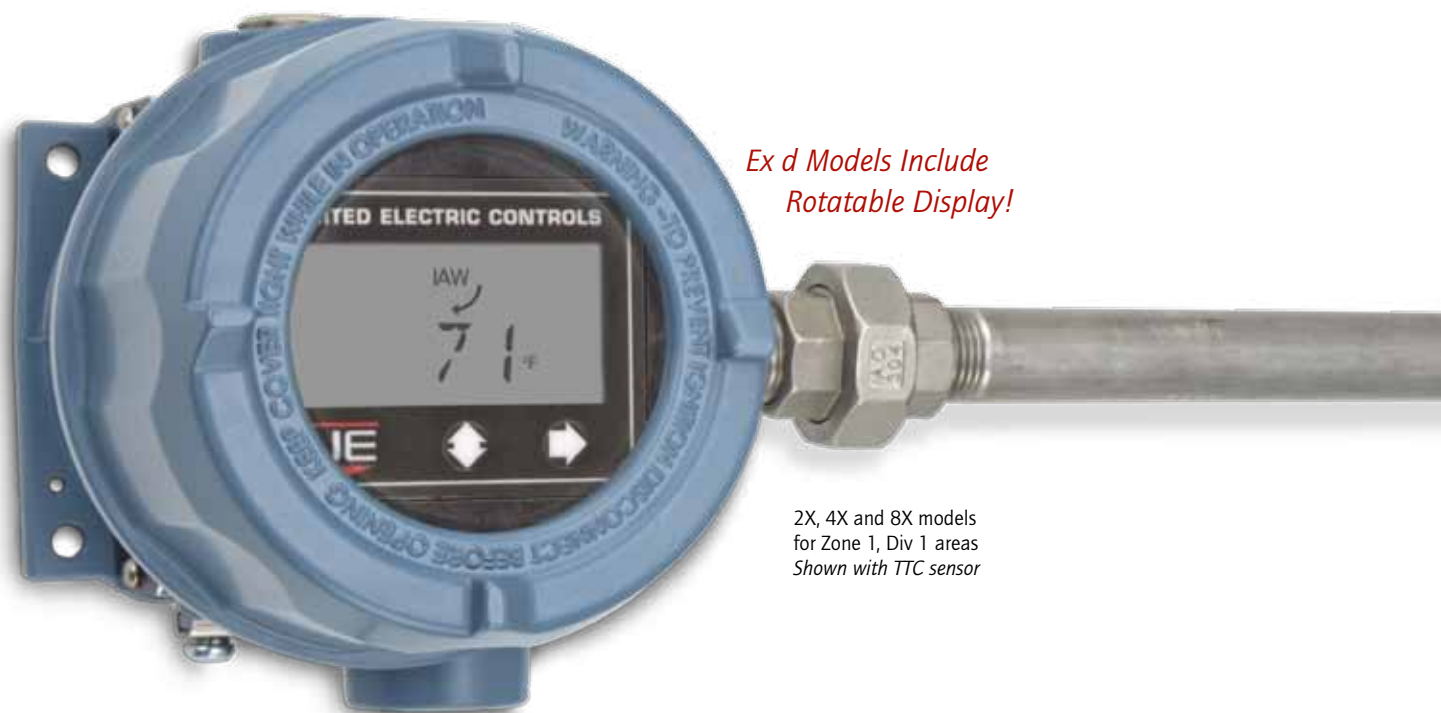
United Electric Controls (UE) is renowned for high-quality workmanship and product design, and the *One Series* carries this nearly 80-year tradition well beyond electromechanical switches. *UE's One Series* line of digital electronic pressure and temperature switches sets new standards for quality, reliability and versatility. Designed to meet the needs of harsh and hazardous applications, the *One Series'* advanced self-diagnostics and digital electronics provide the most reliable switches for a variety of diverse industries.

The *One Series* from *UE* allows you to choose from explosion-proof, intrinsically safe and non-incendive models that monitor gauge pressure, differential pressure or temperature. With up to two fully adjustable set points and deadbands, available 4-20 mA analog output, and absolutely no moving parts, these versatile instruments can now be used in a wide variety of applications where switches weren't previously considered. Featuring a solid-state design, *UE's One Series* is your best choice for tough applications with high cycle rates, vibration and shock. For plant upgrades, there are a variety of power options ranging from 2-wire discrete and analog loop-powered models to externally powered models that can switch up to 280 VAC at 10 amperes to the load.

With an integral digital display and 4-20 mA output, the *One Series* from *UE* can effectively do the job of three – replacing a switch, a gauge and a transmitter. Powerful yet easy to install, the *One Series* from *UE* features tamper-resistance, intuitive programming, and set-up that is fast and easy.

FEATURES

- Digital process display
- Programmable set point and deadband
- Self-diagnostic solid-state digital electronics
- Plug port detection
- Nuisance trip filtering
- Patented electronic IAW® self-diagnostics
- Min/Max process values memory
- 3-year warranty



*Ex d Models Include
Rotatable Display!*

2X, 4X and 8X models
for Zone 1, Div 1 areas
Shown with TTC sensor

INNOVATIVE DESIGN

The One Series' award-winning design provides numerous advances in alarm & shutdown switching technology.

POWER

Extremely low power consumption allows the One Series 2-Wire electronic switch to operate with no additional wiring or batteries. Power is obtained from the control system's discrete or analog input, making it ideal for plant upgrades from mechanical switches while using the same wiring and control schemes. For direct switching applications, powered versions of the One Series can provide 2 independent solid-state relays or handle a load of up to 10 amperes. Loop-powered models feature field-scalable 4-20 mA analog output in addition to a solid-state relay switch – a switch + gauge + transmitter all in one.

PROGRAMMABILITY

The set point and deadband settings allow for 100% adjustability, providing highly repeatable trip and reset points for your application. This feature allows the One Series to be used in pump and compressor applications where high cycle rate may shorten the life of mechanical controls. Nuisance trips, switch delay, plugged port detection and process extremes are all easily programmable, making these application challenges manageable by the instrument, with no special programming needed for the PLC.

SELF-DIAGNOSTICS

Mechanical switches have no self-diagnostic capabilities – they are blind instruments. All One Series models include the patented IAW® (I Am Working) algorithm that can detect faults before they become process control problems. Detected faults are reported on the digital display while the switch will fail safe open and the 4-20 mA analog output goes beyond 4 and 20 to provide remote fault indication. The intelligent and configurable IAW® diagnostics allow the SIL-2-suitable One Series to provide a significantly higher risk reduction factor than some safety transmitters in SIS applications.



2W, 4W and 8W models
for Zone 2, Div 2 areas
Shown with gauge sensor

APPLICATION VERSATILITY

For alarm and shutdown switching applications, there is no better choice than the *One Series* family of electronic switches from United Electric Controls. Measuring gauge pressure, differential pressure or temperature, the extremely rugged and reliable *One Series* takes all of the guess-work out of monitoring process variables to prevent injury, loss and downtime. With its large digital display, fully-adjustable deadband, and 100% solid-state design, the *One Series* is the obvious choice for plant upgrades and new construction projects. A built-in microprocessor includes digital repeatability and intelligent self-diagnostics, offering plant operators an extremely reliable and smart protection device.

Proven in use in literally thousands of diverse applications, UE has recently developed explosion-proof *One Series* models, extending this revolutionary switching technology to Zone 1 (Division 1) areas.

Here are just a few:

- Pumps and compressors – start/stop, optimizing, shutdown, staging
- Lubricating oil monitoring – sump temperature, bearing pressure, predictive maintenance
- Hydraulic oil pressure – high pressure monitoring, emergency shutdown, ram cycling
- Filter monitoring – automatic backwash, clog and change indication, proving flow
- Safety systems – safety integrity levels 1 & 2, alarm and shutdown, local switching, fast response time
- Plant upgrades – power and wastewater plant upgrades, drop-in replacement for mechanical switches



Gas Compressor Protection



Pump Emergency Shutdown



Lubrication Oil Monitoring

SPECIFICATIONS

Power input/ Switch output:

Model	Input Type (Range)	Max Switch Ratings (SPST)	Temperature Derating	Min. Load Requirement	Off State Leakage
2W2D00 2X2D00	2-Wire 24 VDC discrete input powered (12-30 VDC) @ 750 μ A (max)	12-30 VDC @ 40 mA	NA	2.3 mA	0.75 mA maximum
2W4D00 2X4D00	2-Wire 48 VDC discrete input powered (30-50 VDC) @ 750 μ A (max)	30-50 VDC @ 40 mA		2.0 mA	0.8 mA maximum
2W3A00 2X3A00	2-Wire 120 V discrete input powered (90-130 VAC/VDC) @ 1 mA	90-130 VAC/VDC @ 0.1 A		3.75 mA	1.0 mA maximum
2WLP41 2XLP41	2-Wire 24 VDC analog input loop powered (10-36 VDC) @ 4-20 mA	0-140 VAC/VDC @ 0.6 A	8% per 10°C above 21°C	0 mA	0.01 mA
2WLP43 2XLP43	2-Wire 24 VDC analog input loop powered (10-36 VDC) @ 4-20 mA	0-280 VAC/VDC @ 0.3 A			
4W3A01 4X3A01	4-Wire 120 VAC external power supply (90-130 VAC) @ 15mA	24-280 VAC @ 10 A	1.8 A per 10°C above 38°C	150 mA	0.1 mA
8W2D42 8X2D42	8-Wire 24 VDC external power supply (10-30 VDC) @ 30 mA	SW1: 75-250 VAC @ 1.5 A SW2: 75-250 VAC @ 1.5 A	10% per 10°C above 21°C	50mA	5 mA
8W2D44 8X2D44	8-wire 24 VDC external power supply (10-30 VDC) @ 30 mA	SW1: 75-250 VAC @ 1.5 A SW2: 0-140 VAC/VDC @ 0.6 A			
8W2D45 8X2D45	8-wire 24 VDC external power supply (10-30 VDC) @ 30 mA	SW1: 0-140 VAC/VDC @ 0.6 A SW2: 0-140 VAC/VDC @ 0.6 A	8% per 10°C above 21°C	0 mA	0.01 mA

Accuracy: 0.5% of full range span, at room temperature

Repeatability: 0.1% of full range span

Ambient operating temperature range:

	Approved Ambient Operating Temperature Range			
	cULus (Division System)		cULus & ATEX (Zone System)	
2W2D	-40°F (-40°C)	185°F (85°C)	-40°F (-40°C)	140°F (60°C)
2W4D	NA	NA	NA	NA
2WLP	-40°F (-40°C)	176°F (80°C)	-40°F (-40°C)	140°F (60°C)
2W3A	-40°F (-40°C)	185°F (85°C)	-40°F (-40°C)	140°F (60°C)
4W3A	-40°F (-40°C)	158°F (70°C)	-40°F (-40°C)	140°F (60°C)
8W2D	-40°F (-40°C)	176°F (80°C)	-40°F (-40°C)	140°F (60°C)
2X2D	-40°F (-40°C)	185°F (85°C)	-40°F (-40°C)	185°F (85°C)
2X4D	-40°F (-40°C)	185°F (85°C)	-40°F (-40°C)	185°F (85°C)
2XLP	-40°F (-40°C)	176°F (80°C)	-40°F (-40°C)	176°F (80°C)
2X3A	-40°F (-40°C)	185°F (85°C)	-40°F (-40°C)	185°F (85°C)
4X3A	-40°F (-40°C)	158°F (70°C)	-40°F (-40°C)	158°F (70°C)
8X2D	-40°F (-40°C)	176°F (80°C)	-40°F (-40°C)	176°F (80°C)

**Display operating
temperature range:** 10°F (-12°C) 158°F (70°C)



SPECIFICATIONS (CONTINUED)

Long-term stability:	±0.25% of range/year maximum
Temperature drift:	0.03% of full scale per °C
Switch response time:	"Change-of-output" response ≤ 60 mS (16.7 Hz) (for detection of full step change and change of output state, delay feature off)
Display response time:	400 mS (2.5 Hz)
Transient filtering:	Programmable time constants between 250 mS and 2 seconds in 2X increments
Diagnostics (IAW®):	Open or shorted sensor; plugged port; power supply out of range; over and under-range conditions; microprocessor faults/failure; keypad short; switch fault
Output states:	Field selectable for 2-state or 3-state operation. Pulse rates vary by model. Fast and slow rates are selectable. See installation manual for details.
Control modes:	Field-configuration solid-state switch action with programmable manual reset

Mode	Action	Fault
2-state		
Normally closed	Open on rising media	Open
Normally open	Close on rising media	Open
Normally closed	Open on falling media	Open
Normally open	Close on falling media	Open
3-state		
Normally closed	Pulse on rising media	Open
Normally closed	Pulse on falling media	Open

Analog output:	4-20 mA output, 700 ohms max. at 24 VDC, Field scalable, 2:1 turn down. Various faults are indicated at 0, 3.5, 22 and 24 mA. See installation manual for details. (2WLP, 2XLP, 8W2D, 8X2D models only)
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Electrical characteristics: (2-wire models only)

		Switch State (Max.)	
Model		Voltage Open	Voltage Closed
2W2D	2X2D	12-30 VDC @ 750 µA	4.7 VDC @ 40 mA
2W4D	2X4D	30-50 VDC @ 1mA	5.0 VDC @ 40 mA
2W3A	2X3A	90-130 VAC/VDC @ 1 mA	13 VAC/VDC @ 100 mA

Enclosure:	Type 4X/IP66 certified epoxy-coated aluminum construction
Faceplate:	UV-resistant pressure sensitive keypad and display overlay
Cover:	Epoxy-coated aluminum with tempered glass insert (explosion-proof models only)
Conduit:	1/2" NPT female stainless steel fitting; 3/4" NPT female aluminum casting (explosion-proof models only)

SPECIFICATIONS (CONTINUED)

Display:	<ul style="list-style-type: none"> • Local 4 digit x 0.5" LCD • IAW® (I Am Working) status • Process variable • Units of measure • Switch status • Latch status • Set point value • Deadband value • Min/Max values • Fault codes
Set point & deadband:	User-configured, 100% adjustable over entire sensor operating range
Memory:	Programming and data protected by non-volatile EEPROM
Effective transmission distance	2,000 feet at rated voltage for 2W2D/2X2D and 2W3A/2X3A
Sensors:	<p>Gauge Pressure – 316L stainless steel, welded diaphragm, 1/2" NPT (female) process connection, micro-machined piezo-resistive strain gauge silicon element, 0.25 ml silicone oil fill. Media temperature: -40 to 257°F (-40 to 125°C)</p> <p>Differential Pressure - 316L stainless steel, welded diaphragms, 1/4" NPT (male) process connections, piezo-resistive strain gauge silicon element, silicone oil fill. Media temperature: -40 to 257°F (-40 to 125°C)</p> <p>Temperature – 316 stainless steel 0.25" OD sheath containing a 100 ohm 4-wire platinum RTD element available with epoxy fill (local low temp) or powder fill (remote high temp). Media temperature: -300 to 1000°F (-184 to 538°C)</p>
Vacuum:	All pressure sensors withstand deep vacuum with no calibration effects. Vacuum ranges are not currently available.
EMI/RFI:	Compliance to CE EMC requirements: EN 55011, EN 61326, EN 61000-6-2
Emission:	EN 55011 class A; Radiated emissions EN 61000-3-2 Harmonic Current Emissions
Immunity:	EN 61000-3-3 Immunity to Voltage Fluctuations and Flicker EN 61000-4-2 Immunity to Electrostatic Discharge EN 61000-4-3 Immunity to Continuous Radiated Disturbances EN 61000-4-4 Immunity to Electrical Fast Transients EN 61000-4-5 Immunity to Surges EN 61000-4-6 Immunity to Continuous Conducted Disturbances EN 61000-4-8 Immunity to Power Frequency Magnetic Field EN 61000-4-11 Immunity to Voltage Dips and Interruptions
Weight:	2W, 4W, 8W: 1.5 - 1.9 lbs (0.7 - 0.9 kg) 2X, 4X, 8X: 4.5 - 6.0 lbs (2.0 - 2.7 kg)
Shock:	per MIL-STD-810G method 516.6 – when device is subjected to 15 g (10 mSec) and 40 g (6 mSec); 3 drops/axis Effects: less than +/- 0.40% of range
Vibration:	per IEC 61298-3 (field and pipeline applications with high vibration level, 10-1000 Hz range, 0.014" displacement peak amplitude, 5 g acceleration amplitude) Effects: less than +/- 0.40% of range

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HOW TO ORDER

Build a part number by selecting the model, sensor and options from the tables below.

Model	Description	Min. Load	Zone			Division	
			0	1	2	1	2
2W2D00	2-wire discrete input powered, 12-30 VDC, 40 mA switch (24 VDC 2-Wire)	2.3 mA	✓	✓	✓	✓	✓
2X2D00				✓	✓	✓	✓
2W4D00	2-wire discrete input powered, 30-50 VDC, 40 mA switch (48 VDC 2-Wire)	2.0 mA					
2X4D00				✓	✓	✓	✓
2W3A00	2-wire discrete input powered, 90-130 VAC or VDC, 100 mA switch (115 VAC 2-Wire)	3.75 mA			✓		✓
2X3A00				✓	✓	✓	✓
2WLP41	2-wire loop-powered or 24V external powered, 4-20 mA output, 0-140 VAC/VDC, 0.6 A SSR switching	0 mA			✓		✓
2XLP41				✓	✓	✓	✓
2WLP43	2-wire loop-powered or 24V external powered, 4-20 mA output, 0-280 VAC/VDC, 0.3 A SSR switching	0 mA			✓		✓
2XLP43				✓	✓	✓	✓
4W3A01	Supply voltage – 90-130 VAC, 24-280 VAC, 10 A SSR switching	150 mA			✓		✓
4X3A01				✓	✓	✓	✓
8W2D42	Supply voltage – 10-30 VDC, SW1 & SW2: 75-250 VAC, 1.5 A SSR, 4-20 mA output	SW1: 50 mA SW2: 50 mA			✓		✓
8X2D42				✓	✓	✓	✓
8W2D44	Supply voltage – 10-30 VDC, SW1: 75-250 VAC, 1.5 A SSR, SW2: 0-140 VAC/VDC, 0.6 A SSR, 4-20 mA output	SW1: 50 mA SW2: 0 mA			✓		✓
8X2D44				✓	✓	✓	✓
8W2D45	Supply voltage – 10-30 VDC, SW1 & SW2: 0-140 VAC/VDC, 0.6 A SSR, 4-20 mA output	SW1: 0 mA SW2: 0 mA			✓		✓
8X2D45				✓	✓	✓	✓

Sensor	Pressure Operating Range ¹ + display resolution					Maximum Over Range ²	
Gauge pressure, piezo-resistive strain gage, silicone oil fill, 316L stainless wetted materials, 1/2" NPT (female) process connection, displayed as shown.							
P10	0-5.00 psig	344,7 mbar	34.47 kPa	0.352 kg/cm ²	138.5 "wc	10 psig	690 mbar
P11	0-15.00 psig	1034 mbar	103.4 kPa	1.055 kg/cm ²	415.5 "wc	30 psig	2068 mbar
P12	0-30.00 psig	2068 mbar	206.8 kPa	2.109 kg/cm ²	831.1 "wc	60 psig	4137 mbar
P13	0-50.00 psig	3447 mbar	344.7 kPa	3.516 kg/cm ²	1385 "wc	100 psig	6895 mbar
P14	0-100.0 psig	6895 mbar	689.5 kPa	7.031 kg/cm ²	2770 "wc	200 psig	13,8 bar
P15	0-300.0 psig	20,68 bar	2068 kPa	21.09 kg/cm ²	NA	600 psig	41,4 bar
P16	0-500.0 psig	34,47 bar	3447 kPa	35.16 kg/cm ²	NA	1000 psig	68,9 bar
P17	0-1000 psig	68,95 bar	6895 kPa	70.31 kg/cm ²	NA	2000 psig	137,9 bar
P18	0-3000 psig	206,8 bar	20.68 mPa	210.9 kg/cm ²	NA	6000 psig	413,7 bar
P19	0-4500 psig	310,3 bar	31.03 mPa	316.4 kg/cm ²	NA	9000 psig	620,5 bar
P20*	0-6000 psig	413,7 bar	41.40 mPa	421.9 kg/cm ²	NA	12000 psig	827,4 bar

* (P20 range available on 2X, 4X and 8X models only)

For bar, kPa and kg/cm², the option code must be specified (see pg. 10)

HOW TO ORDER CONT.

Sensor	Pressure Operating Range ¹ + display resolution				
Differential pressure, piezo-resistive strain gage, silicone oil fill, 316L stainless wetted materials, 1/4" NPT (male) process connections, displayed as shown.					
K11	0-50.0 psid	3447 mbar	344.7 kPa	3.516 kg/cm ²	1385 "wc
K12	0-100.0 psid	6895 mbar	689.5 kPa	7.031 kg/cm ²	2770 "wc
K13	0-200.0 psid	13,8 bar	1379 kPa	14.10 kg/cm ²	NA

Sensor	Maximum Over Range ²		Maximum Working Pressure ³	
K11	100 psid	6895 mbar	500 psig	34,47 bar
K12	200 psid	13,8 bar	1500 psig	103,4 bar
K13	400 psid	27,6 bar	1500 psig	103,4 bar

1 - The pressure range that the sensor will perform within specified tolerances.

2 - The maximum pressure that can be applied without affecting sensor performance.

3 - The maximum pressure that can be applied to both ports simultaneously without affecting sensor performance. Pressure on the "H" sensor port must be \geq pressure on the "L" sensor port.

Sensor	Temperature Range	Description (see page 13 for sensor drawings)
Temperature – 4-wire RTD, 100 Ω platinum, DIN 0.00385, 0.25" OD sensor sheath, 316 stainless steel construction		
TL1	-40 to 450°F/-40 to 232°C (See page 11 fitting options)	Local (stem) mounted rigid to enclosure, 4" sheath length
TL2		Local (stem) mounted rigid to enclosure, 6" sheath length
TL3		Local (stem) mounted rigid to enclosure, 10" sheath length
TR1		Remote mounted, 6" sheath, 6' fixed-length Teflon® extension (2.5" sheath and MI extension for explosion-proof and ATEX models)
TRC*		Remote mounted, 6" sheath, 1' to 30' in 1' increments variable Teflon® extension length MUST BE SPECIFIED. Consider Option M006. (2.5" sheath and MI extension for explosion-proof and ATEX models)
TH1	-40 to 1000°F/-40 to 538°C (See page 11 fitting options)	Remote mounted, 2.5" sheath, 6' MI fixed extension length
THC*		Remote mounted, 2.5" sheath, 2W2D, 2X2D, 2W4D, 2WLP, 2XLP, 8W2D and 8X2D models only, 1' to 30' MI extension length MUST BE SPECIFIED. USE OPTION W074 ONLY.
TC1	-300 to 200°F/-184 to 93°C (See page 11 fitting options)	Remote mounted, 2.5" sheath, 6' MI fixed extension length
TCC*		Remote mounted, 2.5" sheath, 2W2D, 2X2D, 2W4D, 2WLP, 2XLP, 8W2D & 8X2D models only, 1' to 30' MI extension length MUST BE SPECIFIED. USE OPTION W074 ONLY.
TTC	-40 to 900°F/-40 to 482°C (Example: TTC-NUN6-L 10.5)	Local (stem) spring-loaded mount, NUN connection lengths: 4" – 10" in 1" increments, variable sheath (L) length up to 60", BOTH MUST BE SPECIFIED, available on 2X, 4X and 8X models only. Refer to drawing on page 13. Thermowell required, see page 11.
TU1	-300 to 200°F/-184 to 93°C	User-supplied sensor for explosion-proof models only must be a 3-wire or 4-wire RTD, 100 Ω platinum, DIN 0.00385 (response curve for RTD). Choose range expected for the application. See below to order replacement sensors. No sensor is included with TU1 - TU3 ranges. For 2X3A and 4X3A models with remote sensors, extension length must be limited to 6'.
TU2	-40 to 450°F/-40 to 232°C	
TU3	-40 to 1000°F/-40 to 538°C	
Thermowells and fittings are shown on page 11. To order spares and replacement temperature sensor assemblies, available only on explosion-proof models , provide the "TA#:" number from the product nameplate. Example: TA#: 62128723		

*Custom extension lengths are not available with 2W3A, 2X3A, 4W3A or 4X3A models.



OPTION CODES

QC1 Calibration certificate of conformance

HL1 Hazardous location certificate

M006 Add armor to temperature sensor Teflon® extension (2W, 4W, 8W, TR1 and TRC models only)

M201 Factory programmed set point, deadband and switch mode (all 3 settings are required at time of ordering - see example below)

Set Point ¹	Deadband ¹	Switch Mode
40.00	25.00	Open on rise

M202 Factory programmed set point, deadband and switch mode for two switches (all 6 settings are required at time of ordering - see example below)

Switch	Set Point ¹	Deadband ¹	Switch Mode
1	040.3	001.5	Open on fall
2	050.0	005.0	Close on rise

M270 Display units, degrees C for temperature models

M275 Display units, inches of water column (P10, P11 and K11 sensor ranges only)

M276 Display units, bar or mbar

M277 Display units, kPa or MPa

M278 Display units, kg/cm²

M406 Compliance per Russian Gosgortekhnadzor (N/A on 2W4D)

M419 ATEX approval (2W2D, 2W3A, 2WLP and 8W2D models only. N/A on 2W4D and 4W3A. Standard on explosion-proof models. 2.5" sheath and MI extension for TR1 and TRC with this option. See page 9).

M444 Paper tag

M446 Stainless steel tag

M449 Mounting adapter plate kit 62169-40 (use to match JIC form bolt pattern on 2W, 4W and 8W models only)

M550 Oxygen cleaning service

M905 1/2" NPT female conduit added to right wall of enclosure for 2W2D, 2W3A, 2W4D and 4W3A models only

M906 1/2" NPT female conduit moved to bottom wall of enclosure for 2W2D, 2W3A, 2W4D and 4W3A models only, approvals N/A, see option M449, not available with differential pressure (K) sensors

M907 1/2" NPT female conduit moved from right to top wall of enclosure for 2WLP and 8W2D models only, approvals N/A, see option M449

W073 1/2" NPT male compression fitting for use with all TL and TR sensors, see page 8 for additional information

W074 1/2" NPT male union connector for use with all TR, TH and TC sensors for 2W2D, 2X2D, 2W4D, 2WLP, 2XLP, 8W2D and 8X2D models

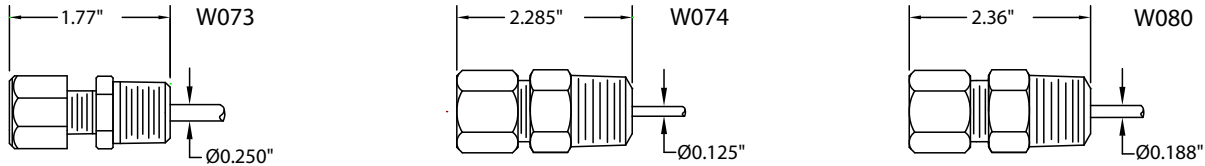
W080 1/2" NPT male union connector for use with TR1, TH1 and TC1 sensors for 2W3A, 2X3A, 4W3A and 4X3A models

W930 1/2" NPT male to G1/2 male adapter for use with gauge pressure sensors P10-P20. Use part number 6361-762 if ordered separately.

W932 1/4" NPT female to G1/2 male adapter for use with differential pressure sensors K10-K13. Use part number 6361-763 if ordered separately (2 required)

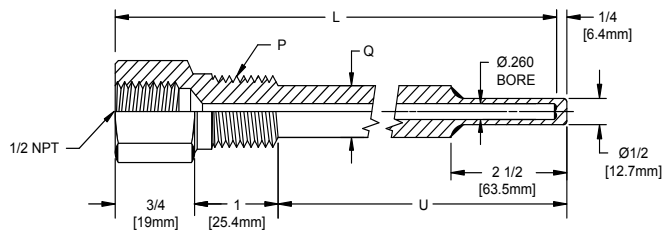
¹**Note: Four numbers must be entered for each set point and deadband. Please refer to the display resolution chart on pages 8 & 9 for the correct number of decimal places allowed for the sensor range and units of measure selected.**

TEMPERATURE SENSORS AND FITTINGS COMPATIBILITY CHART



Model (Table 1)	W073 1/2" NPT compression fitting with ferrule to fit 0.25" sensor sheath	W074 1/2" NPT union connection to fit 0.125" sensor extension cable	W080 1/2" NPT union connection to fit 0.188" sensor extension cable
2W2D, 2W4D, 2WLP, 8W2D	TLx, TRx	TRx, THx, TCx	NA
2W2D, 2WLP, 8W2D (w/ ATEX option - M419)	TLx	TRx, THx, TCx	NA
2W3A, 4W3A	TLx, TRx	TRx	TH1, TC1
2W3A (w/ ATEX option - M419)	TLx	NA	TR1, TH1, TC1
2X2D, 2X4D, 2XLP, 8X2D	TLx	TRx, THx, TCx	NA
2X3A, 4X3A	TLx	NA	TR1, TH1, TC1

*The sensor extension is mineral insulated (MI) when ATEX option M419 is specified.



Fittings for Thermowells (Table 2)

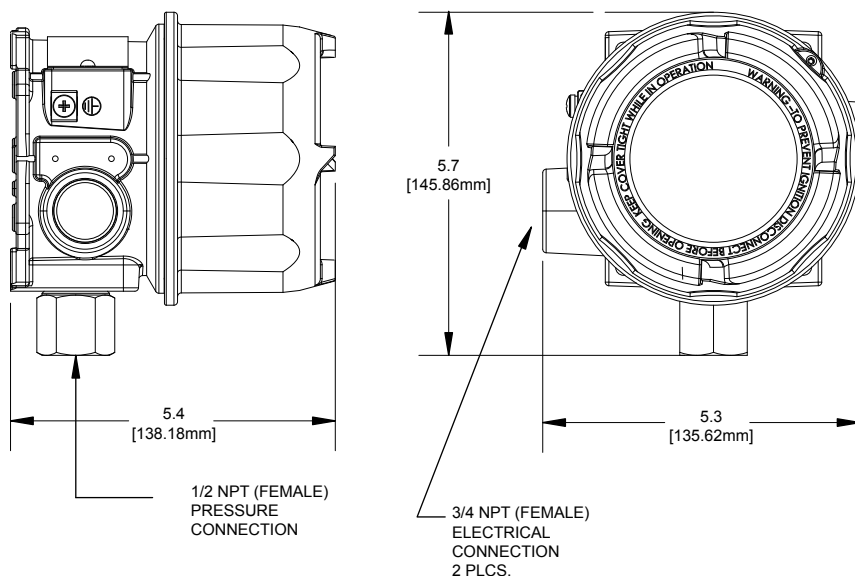
Thermowell UE Part #	Length (L) Inches	P (NPT)	Q	U	Local Temperature Sensors w/ 0.25" Sensor Sheath ¹			Remote Temperature Sensors w/ Teflon® Cable	Remote Temperature Sensors w/ 0.125" Diameter MI Cable ¹	Remote Temperature Sensors w/ 0.188" Diameter MI Cable ¹
					TL1 (4")	TL2 (6")	TL3 (10")			
1S260 L4-316	4	1/2	5/8	2.5	NA	W073	W073	W073	W074	W080
1S260 L4.5-316	4.5	1/2	5/8	3	NA	W073	W073	W073	W074	W080
1S260 L5.5-316	5.5	1/2	5/8	4	NA	NA	W073	W073	W074	W080
1S260 L6-316	6	1/2	5/8	4.5	NA	NA	W073	W073	W074	W080
1S260 L6.5-316	6.5	1/2	5/8	5	NA	NA	W073	W073	W074	W080
1S260 L9-316	9	1/2	5/8	7.5	NA	NA	NA	W074	W074	W080
1S260 L9.5-316	9.5	1/2	5/8	8	NA	NA	NA	W074	W074	W080
1S260 L12-316	12	1/2	5/8	10.5	NA	NA	NA	W074	W074	W080
1S260 L15-316	15	1/2	5/8	13.5	NA	NA	NA	W074	W074	W080
1S260 L18-316	18	1/2	5/8	16.5	NA	NA	NA	W074	W074	W080
1S260 L24-316	24	1/2	5/8	22.5	NA	NA	NA	W074	W074	W080
2S260 L4-316	4	3/4	3/4	2.5	NA	W073	W073	W073	W074	W080
2S260 L6-316	6	3/4	3/4	4.5	NA	NA	W073	W073	W074	W080
2S260 L9-316	9	3/4	3/4	7.5	NA	NA	NA	W074	W074	W080
2S260 L12-316	12	3/4	3/4	10.5	NA	NA	NA	W074	W074	W080
2S260 L15-316	15	3/4	3/4	13.5	NA	NA	NA	W074	W074	W080
2S260 L18-316	18	3/4	3/4	16.5	NA	NA	NA	W074	W074	W080
2S260 L24-316	24	3/4	3/4	22.5	NA	NA	NA	W074	W074	W080

Note: Reference (Table 1) to determine sensor sheath diameter or the diameter of the MI cable by model

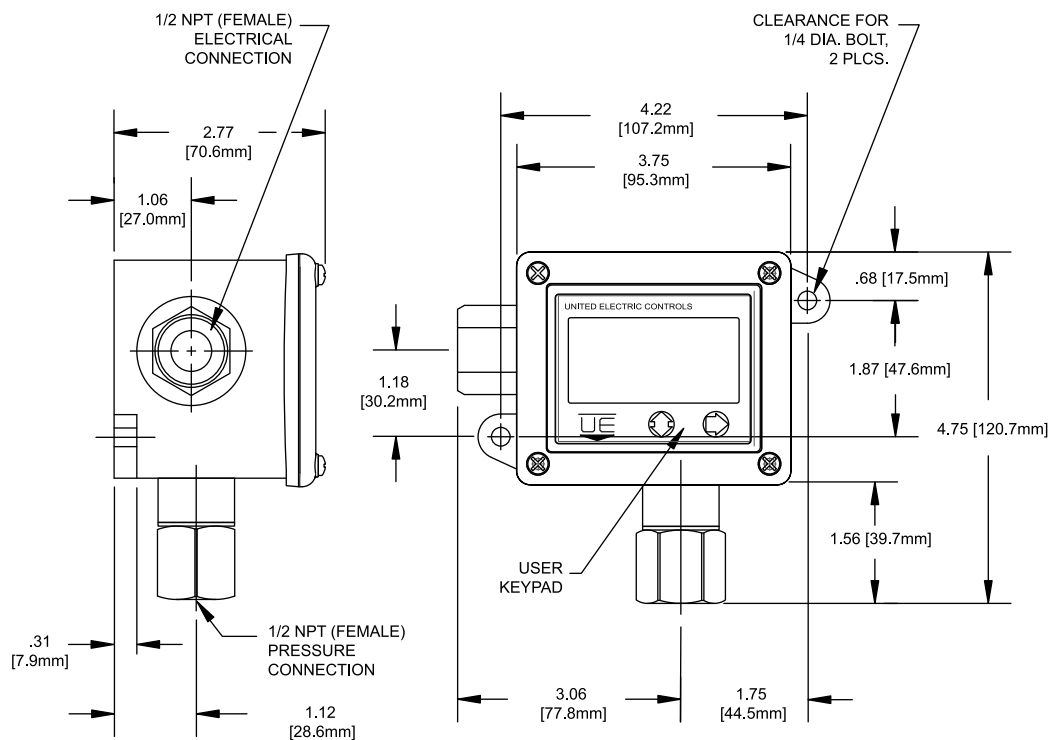
DIMENSIONAL DRAWINGS

ENCLOSURE AND SENSOR DETAILS

2X, 4X and 8X models
(Shown with gauge pressure sensor)

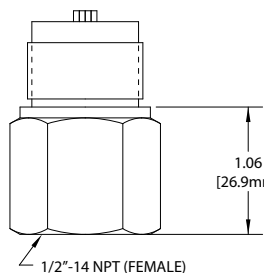
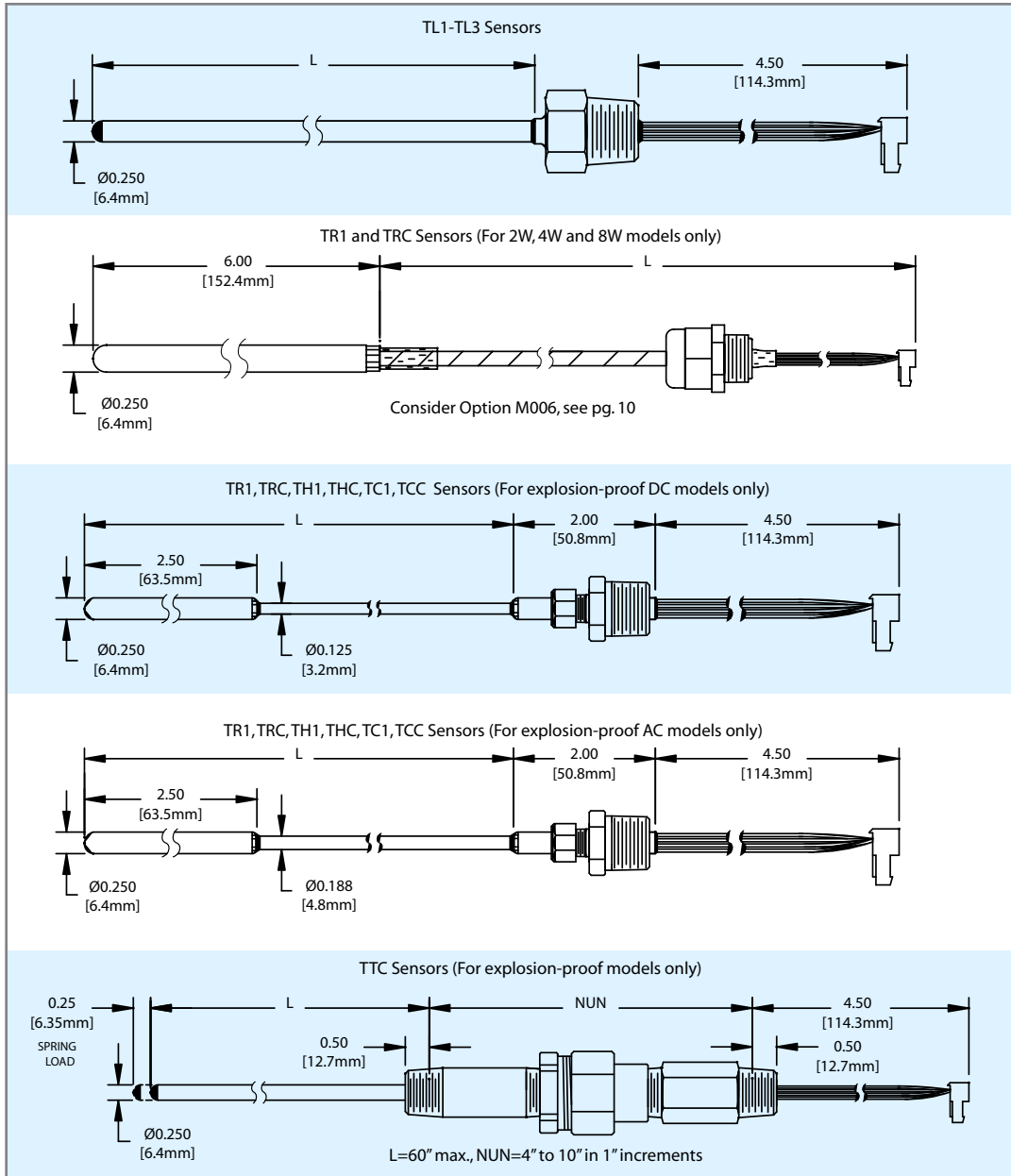


2W, 4W and 8W models
(Single conduit shown with gauge pressure sensor)

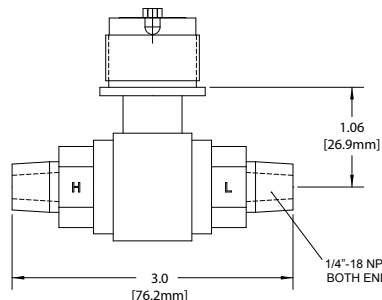


DIMENSIONAL DRAWINGS (CONTINUED)

TEMPERATURE SENSORS



GAUGE PRESSURE SENSORS



DIFFERENTIAL PRESSURE SENSORS



APPROVALS & RATINGS

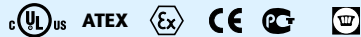
Model	N. America UL Listed, cUL Certified UL50, 508, 913, 1604 & 60079-15; CSA No. E79-0, E79-11, E60079-15, C22.2 No. 14, 157 & 213 File#E226592	Europe (select option M419) (ATEX Directive 94/9/EC) EN 60079-0, 60079-15, 50281-1-1, 50020 EMC Directive: refer to page 7	Australia IECEx Scheme	Russia (select option M406) Gosgortekhnadzor GOST R 51330.0, 5.1330.1, 51330.10, and 51330.14
2W2D Intrinsically safe when used with a safety barrier (option M036)	Class I, Div 1, Groups A, B, C & D Class II, Div 1, Groups E, F & G Class III Class I, Zone 0, AEx ia IIC T5 Class I, Zone 0, Ex ia IIC T5 Per UE drawing # A-62174-19	II 1 G EEx ia IIC T5 II 1 D T+90°C, IP66 T _{AMB} = -40°C to +60°C Per UE drawing # A-62174-20 Cert# DEMKO 03 ATEX 0322281X	N/A	OExiaIIC T5 T _{AMB} = -40°C to +85°C Cert# ROSS US.GB05. Bo2993
2W2D Non-incendive	Class I, Div 2 Groups A, B, C & D Class II, Div 2 Groups F & G Class III Class I, Zone 2, AEx nC IIC T5 Class I, Zone 2 Ex nC IIC T5	II 3 G EEx nL IIC T5 II 3 D T+90°C, IP66 T _{AMB} = -40°C to +60°C Cert# DEMKO 03 ATEX 0322281X	N/A	ExnLIIC T5 T _{AMB} = -40°C to +85°C Cert# ROSS US.GB05. Bo2993
2W3A Non-incendive	Class I, Div 2 Groups A, B, C & D Class II, Div 2 Groups F & G Class III Class I, Zone 2, AEx nC IIC T5 Class I, Zone 2 Ex nC IIC T5	II 3 G Ex nL IIC T5 II 3 D T+90°C, IP66 T _{AMB} = -40°C to +60°C Cert# DEMKO 08 ATEX 0726838X	N/A	ExnLIIC T5 T _{AMB} = -40°C to +85°C Cert# ROSS US.GB05. Bo2993
2W4D	N/A	N/A	N/A	N/A
2WLP Non-incendive	Class I, Div 2 Groups A, B, C & D Class II, Div 2 Groups F & G Class III Class I, Zone 2, AEx nC IIC T4 Class I, Zone 2 Ex nC IIC T4	II 3 G Ex nL IIC T4 II 3 D T+110°C, IP66 T _{AMB} = -40°C to +60°C Cert# DEMKO 08 ATEX 0726838X	N/A	ExnLIIC T4 T _{AMB} = -40°C to +80°C Cert# ROSS US.GB05. Bo2993
4W3A Non-incendive	Class I, Div 2 Groups A, B, C & D Class II, Div 2 Groups F & G Class III Class I, Zone 2, AEx nC IIC T4 Class I, Zone 2 Ex nC IIC T4	N/A	N/A	2ExnCIIC T4 T _{AMB} = -40°C to +70°C Cert# ROSS US.GB05. Bo2993
8W2D Non-incendive	Class I, Div 2 Groups A, B, C & D Class II, Div 2 Groups F & G Class III Class I, Zone 2, AEx nC IIC T4 Class I, Zone 2 Ex nC IIC T4	II 3 G Ex nL IIC T4 II 3 D T+110°C, IP66 T _{AMB} = -40°C TO +60°C Cert# DEMKO 08 ATEX 0726838X	N/A	ExnLIIC T4 T _{AMB} = -40°C to +80°C Cert# ROSS US.GB05. Bo2993
Model	N. America UL Listed, cUL Certified UL 50, 50E, 1203, UL/CSA 61010-1, 60079-0, 60079-1, CSA C22.2 No. 25,30 File#E226592	Europe (ATEX Directive 94/9/EC) EN 60079-0, 60079-1, 61241-0, 61241-1	Australia IECEx Scheme IEC 60079-0, 60079-1	Russia (select option M406) Gosgortekhnadzor
2X2D, 2X3A, 2X4D 2XLP, 4X3A, 8X2D Explosion-Proof/ Flameproof	Class I, Div 1, Groups A, B, C & D Class II, Div 1, Groups E, F & G Class III Class I, Zone 1, AEx nC IIC T3/T5** Class I, Zone 1 Ex nC IIC T5	II 2 G Ex d IIC T3/T5** II 2 D Ex tD A21 IP66 T+90°C Cert# DEMKO 09 ATEX 0813748X	Ex d IIC T3/T5** Cert# IECEx UL 08.0017X	1ExdIIC T3/T5** 2X2D, 2X3A and 2X4D: -40°C ≤ T _{AMB} ≤ +85°C 2XLP & 8X2D: -40°C ≤ T _{AMB} ≤ +80°C 4X3A: -40°C ≤ T _{AMB} ≤ +70°C

**T3 for pressure sensor ranges P10-P16 only. T5 for all other models.
Specifications subject to change without notice.

ADDITIONAL PRODUCTS FROM UE

Spectra 12 Series – Electro-Mechanical Pressure and Temperature Switch

- Dual seal compliant to ANSI/ISA 12.27.01
- Compact, cylindrical 316 stainless steel enclosure
- Hermetically-sealed SPDT or DPDT switch output
- Explosion-proof
- Snap-acting belleville spring mechanism to enhance vibration resistance and set point stability
- Pressure ranges to 12,500 psi; DP working pressure ranges to 2500 psid; temperature ranges to 650°F



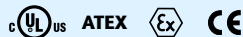
120 Series – Electro-Mechanical Pressure and Temperature Switch

- Explosion-proof line of pressure, differential pressure, and temperature models with wide selection of ranges, sensors and pressure connections
- UL, cUL, ATEX certified for hazardous locations
- Single or dual switch outputs
- Welded stainless steel diaphragm pressure sensor
- Internal or external set point adjustment



TX200 Series – Pressure Transmitters

- Welded, hermetically-sealed, 316 stainless steel construction
- Ranges 0 to 15 psi up to 0 to 25,000 psi
- Choice of field adjustable or fixed range models
- 4-20 mA, 1-5 VDC, or 0-10 VDC output



117 Series – Electro-Mechanical Pressure and Temperature Switch

- Single switch for corrosive and hazardous division 2 locations
- Compact pressure, differential pressure and temperature models
- Hermetically-sealed SPDT and DPDT switch output
- Epoxy-coated, weather-tight design houses stainless steel internal construction
- Convenient terminal block wiring



Temperature Sensors

Rugged RTDs and thermocouples for process and energy applications, available with Nema 4X and explosion-proof heads to match heat-trace, turbine, combustion, and stack-emission applications



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 36 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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EXPLOSION - PROOF PRESSURE TRANSMITTER



FEATURES

- Fixed range or field-adjustable
- 4-20 mA, 1-5 or 0-10 VDC output
- 0.25% accuracy
- Compact, 316 stainless steel, hermetically sealed enclosure
- cULus & ATEX certified for Class I, Div. 1, Zone 1
- Pressure ranges:
0 to 15 psi to 0 to 25,000 psi
(0 to 1 bar to 0 to 1723,7 bar)



OVERVIEW

United Electric's TX200™ is a compact, rugged pressure transmitter designed for process control industries worldwide, and ideally suited for petrochemical and upstream oil and gas applications. All welded, 316 stainless steel hermetic construction provides airtight and watertight protection within the harshest environments. A bonded foil strain gauge sensor or piezo-resistive strain gauge sensor provide reliability and durability.

FEATURES

- Enclosure type 4X/IP66
- Welded stainless steel wetted material
- Submersible to 100 feet
- Wide variety of pressure connections
- Non-interactive zero and span adjustment
- 5:1 pressure range turndown
- Adjustable version may be calibrated in-place
- Certificate of calibration accompanies every unit



Model TX200A is field adjustable for zero and span using external stainless steel control buttons. Each control button is 316 stainless steel, and magnetically coupled through the hermetically sealed enclosure. For ease of calibration, the transmitter does not require a calibrated pressure source and can be calibrated in-place. Model TX200A span control allows a 5:1 pressure range turndown.

Protective Shield. Affixed to the TX200 is a 316 stainless steel, rotatable protective cover, which helps protect product markings and adjustment buttons (TX200A) from the elements and tampering.

Model TX200B is a fixed range transmitter for applications where the process is consistent and field adjustability is not required or desired. The TX200B provides a cost-effective alternative to conventional process transmitters.

APPLICATIONS

cULus and ATEX approvals assure most worldwide hazardous location requirements are met. TX200 pressure transmitters are used to monitor pressure in a variety of upstream, midstream, and downstream applications.



Instrument Panels



- Offshore rigs and pumping platforms
- RTU's & SCADA systems
- Sub-sea valve monitoring
- Flow line manifold monitoring
- Oil/gas separator systems



- Gas flow monitoring
- Pipeline compressor stations for maintaining flow and pressure levels along gas pipelines
- Pipeline monitoring of both surface and subterranean pipeline's physical and mechanical integrity
- Pump monitoring



- Onshore drilling rigs
- Wellhead monitoring
- Monitoring tubing & casing pressures
- CO2 injection skids
- Blowout preventor (BOP) accumulator
- Emergency shutdown and safety monitoring

TECHNOLOGY

Pressure transmitters convert applied pressure to an electronic signal through various technologies. The TX200 pressure transmitter utilizes two of these - a piezo-resistive pressure sensor for low-pressure applications and a bonded foil strain gage pressure sensor for high-pressure applications, both using ASIC technology to provide optimum sensor signal conditioning and temperature compensation of the sensor output.



TX200
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SPECIFICATIONS

PERFORMANCE

Full Scale Pressure Range (FSPR):	0 to 15 (0 to 1,0 bar) through 0 to 25,000 psi (0 to 1723,7 bar)
Non-linearity (L):	0 to 15 (0 to 1,0 bar) typical 0.3%, 0 to 30 psi through 0 to 250 psi (0 to 17,2 bar) typical @ 0.2% FSO 0 to 500 (0 to 34,5 bar) through 0 to 25,000 psi (0 to 1723,7 bar) typical @ 0.1% FSO
Hysteresis (H) and Repeatability (R):	±0.1% FSO
Accuracy (L, H, R):	0.25% (0.5% for 15 psi range)
Full Scale Output (FSO):	16 mA (4 - 20 mA), 4 VDC (1-5 VDC), 10 VDC (0-10 VDC)
Resolution:	Infinite
Zero Balance:	± 0.5% (FSO)
Response Time:	10 mSec (typical 90% final value)
Temperature Effect on Zero:	±0.5% per 100°F (55°C)
Temperature Effect on Span:	±0.5% per 100°F (55°C)
Compensated Temperature Range:	0°F to + 176°F (-18°C to 80°C)
Media Temperature:	-40°F to 257°F (-40°C to 125°C)
Operating Temperature:	-40°F to 185°F (-40°C to 85°C) per UL, cUL -40°F to 176°F (-40°C to 80°C) per ATEX
Storage Temperature Range:	-67°F to + 221°F (-55°C to 105°C)

ELECTRICAL

Supply Voltage:	10 to 36 VDC for 4-20 mA output 10 to 30 VDC for 1-5 VDC output 14 to 30 VDC for 0-10 VDC output
Output Signal:	4-20 mA or 1-5 VDC or 0-10 VDC <i>Range adjustment/calibration for TX200A only</i> Span adjustment: rangeable down 5:1 FSPR Range calibration signal: nominal 20% of FSPR, externally switched Calibration signal accuracy: ±1.0% FSO (a certificate of calibration with the exact signal to pressure correlation is provided with each unit).
Load Impedance:	4-20 mA output: 1300 ohms max. at 36 VDC or 700 ohms max. at 24 VDC 1-5 VDC or 0-10 VDC output: 2000 ohms min.
Circuit Protection:	The TX200 input is protected against transient surges using both varistor and TVS transient voltage suppressor technology, and is reverse polarity protected.
Electrical Connection:	1/2" NPT (male), 72" 18 AWG, color coded leadwires
Wiring:	Red: +VDC Black: -VDC Green: Earth Ground Blue: 1-5 V or 0-10 V output (only)

MECHANICAL

Wetted Materials:	316, 15-5 stainless steel; Hastelloy C and Monel available, please consult UE
Pressure Connections:	1/4" NPT, 1/2" NPT, 7/16-20 SAE, G-1/4, G-1/2, and medium pressure and high pressure autoclave (see pressure connection chart page 10), 316 stainless steel
Sensors	Model 03-08, 15929: 316 stainless steel welded diaphragm, micro-machined piezo-resistive strain gauge silicon element, 0.25 ml silicon oil fill Model 09-20: 15-5 stainless steel welded diaphragm, bonded foil strain gauge element
Proof Pressure:	≤10,000 psi (689,5 bar) 3 times FSPR; ≥15,000 psi (1034,2 bar) 2 times FSPR
Burst Pressure:	15 to 2000 psi (6,9 to 137,9 bar) 10 times FSPR; 2500 to 6000 psi (172,4 to 413,7 bar) 8 times FSPR or 30,000 psi, whichever is less; 7500 to 25,000 psi (517,1 to 1723,7 bar) 4 times FSPR or 90,000, whichever is less
Shock:	200 G's, one millisecond duration
Vibration:	Tested to MIL-STD-810F, modified to 2000 Hz at 15 G's peak
Enclosure:	316 stainless steel
Enclosure Classification:	Welded, hermetically sealed, enclosure type 4X. Certified to IP66 requirements
Weight:	TX200A: approx. 1.5 lbs (.68 kg) , TX200B: approx. 1.3 lbs (.59 kg)



TX200
SERIES™

TX200
SERIES™

APPROVALS



UNITED STATES AND CANADA

Class I, Division 1 & 2, Groups A, B, C & D

Class II, Division 1 & 2, Groups E, F & G

Class III

Class I, Zone 1, Group IIC

Enclosure Type 4X

UL Listed, **cUL** Certified

UL 698, 1203, 61010-1;

CSA No. 25, 30, 61010-1 - File # E226592



EUROPEAN UNION

ATEX Directive 94/9/ EC

II 2 G Ex d IIC T5

II 2 D Ex tD A21 IP66 T+90C

Tamb = -40C to +80C

EN 60079-0, 60079-1, 61241-0, 61241-1

UL International DEMKO A/S (N.B.# 0539)

Certificate # DEMKO 08 ATEX 0810742X



Pressure Equipment Directive (PED)

(97/23/EC)

Sound Engineering Practice (SEP)

Electromagnetic Compatibility Directive (EMC)

(89/336/EEC, 92/31/EEC & 93/68/EEC)

UL International EMC Services

Certificate File # NC4525

EN 55011, 61000-6-4, 61000-6-2, 61326

PRESSURE MODEL CHART

Model	Pressure Range		Proof Pressure*		Burst Pressure**	
	psi	bar	psi	bar	psi	bar
Welded 316 stainless steel diaphragm and pressure connection (see page 9 for available connections)						
03	0 to 15	0 to 1	45	3,1	150	10,3
04	0 to 30	0 to 2,1	90	6,2	300	20,7
05	0 to 50	0 to 3,4	150	10,3	500	34,5
06	0 to 100	0 to 6,9	300	20,7	1000	68,9
07	0 to 250	0 to 17,2	750	51,7	2500	172,4
08	0 to 500	0 to 34,5	1500	103,4	5000	344,7
Welded 15-5 stainless steel diaphragm with 316 stainless steel pressure connection (see page 9 for available connections)						
09	0 to 1000	0 to 68,9	3000	206,8	10,000	689,5
17	0 to 1500	0 to 103,4	4500	310,3	15,000	1034,2
18	0 to 2000	0 to 137,9	6000	413,7	20,000	1379,0
10	0 to 2500	0 to 172,4	7500	517,1	20,000	1379,0
19	0 to 3000	0 to 206,8	9000	620,5	25,000	1723,7
11	0 to 5000	0 to 344,7	15,000	1034,2	25,000	1723,7
20	0 to 6000	0 to 413,7	18,000	1241,1	30,000	2068,4
12	0 to 7500	0 to 517,1	22,500	1551,3	30,000	2068,4
13	0 to 10,000	0 to 689,5	30,000	2068,4	40,000	2757,9
14	0 to 15,000	0 to 1034,2	30,000	2068,4	60,000	4136,9
15	0 to 20,000	0 to 1379,0	40,000	2757,9	80,000	5515,8
16	0 to 25,000	0 to 1723,7	50,000	3447,4	90,000	6205,3
316 stainless steel 1/4" NPT (female) pressure connection and welded diaphragm with 4-20 mA output (fixed range only)						
15929	0 to 300	0 to 20,7	750	51,7	2500	172,4

* **Proof Pressure:** The maximum pressure to which a pressure sensor may be occasionally subjected (e.g., start-up, testing), which causes no permanent damage. The unit may require re-calibration if subjected to pressure above proof.

** **Burst Pressure:** Pressure which may cause failure of the pressure element, resulting in permanent damage.



TX200
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HOW TO ORDER

Select letter or number codes to construct part number.

PART #	TX200	A	9	S	1	T	M446
	Type	Enclosure	Models, Range	Pressure Reference	Pressure Connection	Output Signal	Options
CODE	DESCRIPTION						
ENCLOSURE DESIGNATION							
A	Field-adjustable transmitter						
B	Fixed range transmitter						
15929 [†]	Fixed range transmitter						
MODELS, PRESSURE RANGE							
03	0 to 15						
04	0 to 30						
05	0 to 50						
06	0 to 100						
07	0 to 250						
08	0 to 500						
09	0 to 1000						
17	0 to 1500						
18	0 to 2000						
10	0 to 2500						
19	0 to 3000						
11	0 to 5000						
20	0 to 6000						
12	0 to 7500						
13	0 to 10,000						
14	0 to 15,000						
15	0 to 20,000						
16	0 to 25,000						
PRESSURE REFERENCE							
S	psi (sealed gage)						

Continued
on page 9

[†] Model incorporates enclosure, pressure range & connection, and output (see pressure model chart on page 7)

HOW TO ORDER (CONTINUED)

PART #	TX200	A	9	S	1	T	M446
	Type	Enclosure	Models, Range	Pressure Reference	Pressure Connection	Output Signal	Options

PRESSURE CONNECTION

1	1/4" NPT (female); NOT AVAILABLE MODELS 15-16
2	1/2" NPT (female); NOT AVAILABLE MODELS 14-16
3	1/2" NPT (male); NOT AVAILABLE MODELS 14-16
4	HF4 high pressure autoclave 1/4" (female); NOT AVAILABLE MODELS 03-05
5	HF6 high pressure autoclave 3/8" (female); NOT AVAILABLE MODELS 03-05
6	LF4 medium pressure autoclave 1/4" (female); NOT AVAILABLE MODELS 03-05
7	LF6 medium pressure autoclave 3/8" (female); NOT AVAILABLE MODELS 03-05
8	1/4" NPT (male); NOT AVAILABLE MODELS 15-16
9	7/16-20 SAE (female); NOT AVAILABLE MODELS 14-16
A	G-1/4 (female); NOT AVAILABLE MODELS 14-16
B	G-1/2 (female); NOT AVAILABLE MODELS 14-16
C	7/16-20 SAE (male); NOT AVAILABLE MODELS 14-16
D	HM4 high pressure autoclave 1/4" (male); NOT AVAILABLE MODELS 03-05
E	HM6 high pressure autoclave 3/8" (male); NOT AVAILABLE MODELS 03-05
F	LM4 medium pressure autoclave 1/4" (male); NOT AVAILABLE MODELS 03-05
G	LM6 medium pressure autoclave 3/8" (male); NOT AVAILABLE MODELS 03-05
H	G-1/4 (male); NOT AVAILABLE MODELS 14-16
J	G-1/2 (male); NOT AVAILABLE MODELS 14-16

OUTPUT

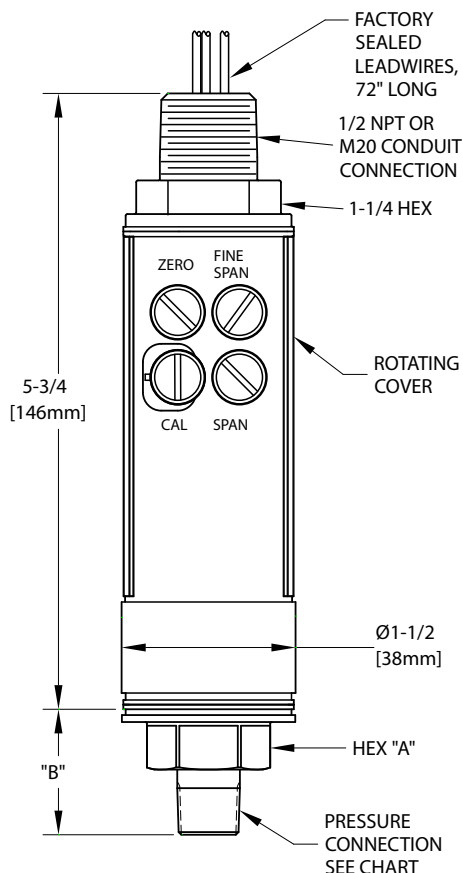
T	4-20 mA
D	1-5 VDC
P	0-10 VDC; NOT AVAILABLE MODELS 03-06

OPTIONS

M276	Pressure range markings in bar
M277	Pressure range markings in kPa
M278	Pressure range markings in Kg/cm ²
M423	ATEX flameproof compliant metallic junction box, pre-wired (not UL approved). NOT AVAILABLE ON M20 METRIC THREAD ELECTRICAL CONDUIT VERSION
M441	M20 metric thread (male) electrical connection
M444	Paper ID tag
M446	Stainless steel ID tag and wire
M460	External ground screw; required by ATEX for non-metallic conduit systems
M513	UL approved junction box, pre-wired, meets enclosure type 4. NOT ATEX COMPLIANT
M550	Oxygen service cleaning; alcohol cleaning to remove residue from the process connection

DIMENSIONAL DRAWING

Dimensional drawings for all models may be found at www.ueonline.com



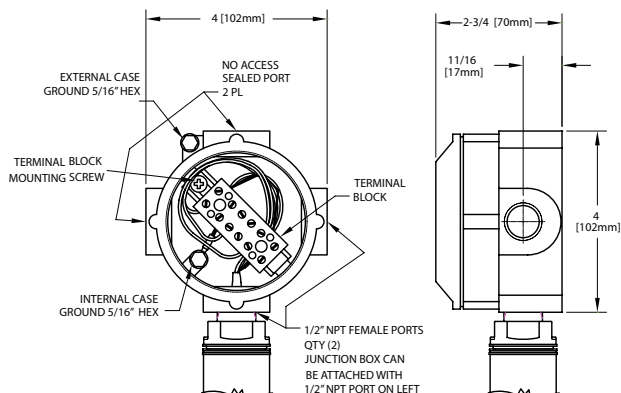
Pressure Connection Chart

Code	Description	Hex "A" in	Length "B" in [mm]
1	1/4" NPT (female)	15/16	0.54 [13.7]
2	1/2" NPT (female)	1-3/8	1.01 [25.7]
3	1/2" NPT (male)	15/16	1.26 [32.0]
4	HF4 autoclave (female)	15/16	0.54 [13.7]
5	FH6 autoclave (female)	1-3/8	0.90 [22.9]
6	LF4 autoclave (female)	15/16	0.54 [13.7]
7	LF6 autoclave (female)	15/16	0.65 [16.5]
8	1/4" NPT (male)	15/16	0.97 [24.6]
9	7/16-20 SAE (female)	15/16	0.54 [13.7]
A	G-1/4 (female)	15/16	0.54 [13.7]
B	G-1/2 (female)	1-3/8	1.01 [25.7]
C	7/16-20 SAE (male)	15/16	0.77 [19.6]
D	HM4 autoclave (male)	15/16	1.10 [27.9]
E	HM6 autoclave (male)	15/16	1.29 [32.8]
F	LM4 autoclave (male)	15/16	1.18 [30.0]
G	LM6 autoclave (male)	15/16	1.32 [33.5]
H	G-1/4 (male)	15/16	1.03 [26.2]
J	G-1/2 (male)	1-3/8	1.78 [45.2]

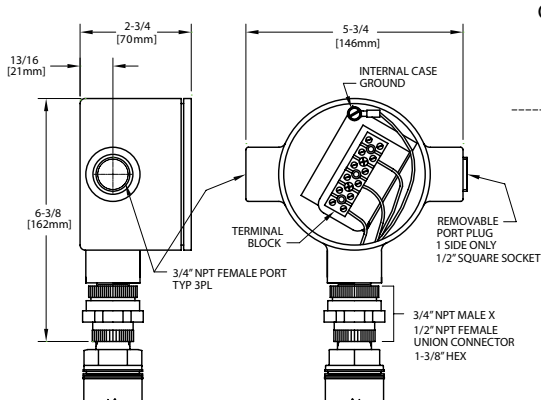
Wire Color Coding

	4-20 mA output	1-5 or 0-10 VDC output
RED	+ VDC	+ VDC
BLACK	- VDC	- VDC
GREEN	Earth Ground	Earth Ground
BLUE	N/A	Voltage Output

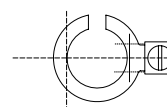
OPTION M423 ATEX JUNCTION BOX



OPTION M513 UL JUNCTION BOX



OPTION M460 EXTERNAL GROUNDING SCREW



ALTERNATIVE PRODUCTS FROM UE

Stainless Steel 12 Series

- Compact, cylindrical 316 stainless steel design
- Hermetically sealed micro-switch
- Explosion Proof
- Snap-acting belleville spring mechanism for maximum vibration resistance and set point stability
- Pressure ranges 1 to 12,500 psi;
DP working pressure ranges 0 to 2500 psid;
temperature ranges -130 to 650°F
- Dual seal compliance to ANSI/ISA 12.27.01



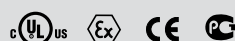
120 Series

- Explosion-proof line of pressure, differential pressure, and temperature models with wide selection of ranges, sensors and pressure connections
- UL, cUL, ATEX certified for hazardous locations
- Single or dual switch outputs
- Welded stainless steel diaphragm pressure sensor
- Internal or external set point adjustment



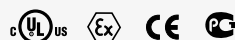
One Series for Division 1 (Zone 1)

- Electronic pressure and temperature switches with no moving parts
- Fully adjustable deadband and smart self diagnostics
- 4-20 mA output and digital process display
- Explosion-proof enclosure for Division 1 (Zone 1) hazardous areas
- 2-wire, 4-wire and loop powered models available
- Digital display and tamper-proof keypad adjustment of setpoint and deadband



One Series for Division 2 (Zone 2)

- Electronic solid-state reliability
- Two-wire operation
- Digital display with keypad set-up
- 100% of range adjustable on-off deadband
- 4-20 mA output models
- Continuous diagnostic health check



Temperature Sensors

Rugged RTDs and thermocouples for process and energy applications, available with Nema 4X and explosion-proof heads to match heat-trace, turbine, combustion, and stack-emission applications



RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure transmitters. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum pressure or temperature is acceptable on a limited basis (i.e., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. When applicable, orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- Supply voltage stated in literature and on nameplate must not be exceeded. Overload on a transmitter can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Do not mount unit in ambient temp. exceeding published limits.

LIMITED WARRANTY

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 36 months from the date of manufacture by the Seller. Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER, EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

UE specifications subject to change without notice.

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