



400 Series

400 Series

PRESSURE, VACUUM, DIFFERENTIAL PRESSURE AND TEMPERATURE SWITCHES



FEATURES

- 1, 2 & 3 Switch Output
- Epoxy Coated Enclosure and Stainless Steel Component Parts
- 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 414 bar)
 - Differential pressure: 1" wcd to 200 psid (2.5 mbar to 13,8 bar)
 - Temperature: -180 to 650 °F (-117.7 to 343.3 °C)

400 Bull - 00



UNITED ELECTRIC
CONTROLS

Uncontrolled if printed

OVERVIEW

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

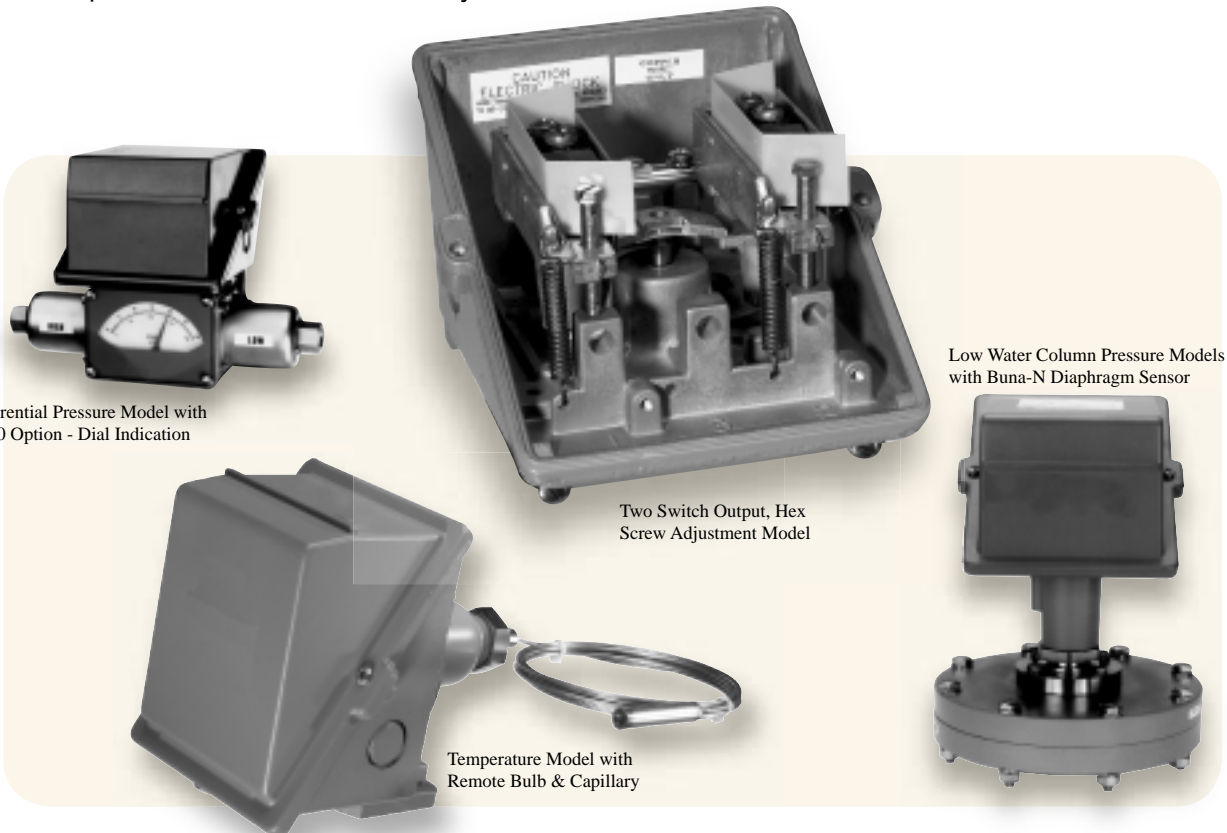
It is available in both hex screw adjustment and dial set point adjustment versions, and has a wide variety of available options.

Triple switch J403's have been used for liquid level control. In this application, three pressure settings correspond to "pumping out" elevations in a sump pump.

The 400 Series continues to be widely used throughout the process industries, from industrial gas production, energy generation, and pulp and paper, to applications including pumps turbines, compressors and heavy equipment, providing threshold protection and control for many critical functions.

FEATURES

- One, two or three switch output may be separated up to 100% of range
- Setting via reference dial or hex screw adjustment
 - Adjustable ranges:
 - "WC ranges: -300 "wc Vac to 250 "WC pressure (-746,7 to 622,3 mbar)
 - Pressure: 30 "Hg vac to 6000 psi (-1 to 414 bar)
 - Differential Pressure: 1" wcd to 200 psid (0 to 13,8 bar)
 - Temperature: -180 to 650°F (-115 to 340°C)
- Wide variety of available options and pressure sensor modules
- Designed to meet NEMA 4X requirements
- Most models available for immediate delivery



Differential Pressure Model with M210 Option - Dial Indication

Two Switch Output, Hex Screw Adjustment Model

Temperature Model with Remote Bulb & Capillary

Low Water Column Pressure Models with Buna-N Diaphragm Sensor

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 adjustable range Pressure: models 126-376, 520-535, 540-547, 570-572: ± 2 % of adjustable range; models 440-457, 550-559: ± 1% of adjustable range; models 610-614: ± 3% 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 NEMA 4X requirements with option M900 (watertight electrical connection)
SWITCH OUTPUT	One, two or three SPDT; switches may be separated up to 100% of range; 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
WEIGHT	Approx. 3 to 7.5 lbs.; varies with model
ELECTRICAL CONNECTION	Three 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 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 1½% 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



UL listed
 Temperature: UL 873, file # E10667
 Pressure: UL 508, file # E42272 (available types 400 and 402)



UL Recognized
 Temperature: UL 873, file # E10667
 Pressure: UL 508, file # E42272 (available type 403)



CSA certified
 Temperature: CSA C22.2, no. 24 file # LR7814
 Pressure: CSA C22.2, no. 14 file # LR39690



FM Approval 3510, 3530, 3531 (see models below)



CE Compliance with Low Voltage Directive (LVD)
CE Compliance to Pressure Equipment Directive (PED 97/23/EC)

FM APPROVAL

The following products are available with FM approval.

MODEL	TYPE
126, 134, 137, 144, 146	J400, J402, J403, H400, H402, H403
S126B, S134B, S137B, S144B, S146B	J400, J402, J403, H400, H402, H403
358	J400, J402, J403, H400, H402, H403
440-443	J400, H400
448	J400, J402, J403, H400
449	J400, J402, J403
570, 571, 572	J400, J402, J403
350-454	J400, J402, J403, H400, H402, H403
520-525	J402
530-535	J402
550, 552-555	J400, J402, J403, H400, H402, H403
551	J400, J402, J403, H400
610-612	J400, J402, J403

PRESSURE MODEL CHART

400 Series

Hex Screw Adjustment Versions

Types J400, J402, J403

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**	
	"wc	mbar	"wc	mbar	psi	bar	psi	bar
Buna-N diaphragm and O-Ring with 1/2" NPT (female) epoxy coated aluminum pressure connection†								
520	-300 to 0	-746,7 to 0	0.2 to 12	0,5 to 29,9	200	13,8	400	27,6
521	-10 to 10	-24,9 to 24,9	0.1 to 1	0,2 to 2,5	200	13,8	400	27,6
522	-50 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 with 1/2" NPT (female) 316L pressure connection								
530	-300 to 0	-746,7 to 0	0.2 to 15.0	0,5 to 37,3	50	3,4	100	6,9
531	-10 to 10	-24,9 to 24,9	0.1 to 1	0,2 to 2,5	50	3,4	100	6,9
532	-50 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	0,2 to 24,9	50	3,4	100	6,9
316L stainless steel diaphragm, Viton® O-Ring with 1/4" NPT (female) 316L stainless steel pressure connection								
	psi	bar	psi	bar(mbar)	psi	bar	psi	bar
570	0 to 20	0 to 1,4	0.2 to 4	(14 to 275)	20	1,4	225	15,5
571	0 to 50	0 to 3,4	0.7 to 6	(48 to 410)	50	3,4	225	15,5
572	0 to 100	0 to 6,9	1 to 7	(69 to 480)	100	6,9	225	15,5
Welded 316L stainless steel bellows with 1/2" NPT (female) pressure connection								
S126B	30 "Hg Vac to 0 psi	-1 to 0	0.2 to 0.9 "Hg	(7 to 30,5)	0	0	30 "Hg Vac	-1
S134B	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	(7 to 40,6)	20	1,4	25	1,7
S137B	0 to 80 "wc	0 to 200 mbar	2 to 6 "wc	(5 to 15)	80 "wc	200 mbar	5	0,3
S144B	0 to 20	0 to 1,4	0.1 to 0.5	(6,9 to 34,5)	20	1,4	25	1,7
S146B	0 to 30	0 to 2,1	0.1 to 0.6	(6,9 to 41,4)	30	2,1	40	2,8
S156B	0 to 100	0 to 6,9	0.2 to 0.8	(13,8 to 55,2)	100	6,9	200	13,8
S164B	0 to 200	0 to 13,8	0.3 to 2	(20,7 to 138)	200	13,8	200	13,8
Welded 316L stainless steel bellows with 1/4" NPT (female) pressure connection								
358	0 to 200	0 to 13,8	1.5 to 8	0,1 to 19,9	200	13,7	250	17,2
361	0 to 300	0 to 20,7	2 to 9	0,1 to 22,4	300	20,7	350	24,1
376	0 to 500	0 to 34,5	3 to 12	0,2 to 29,9	500	34,5	575	39,6
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 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	1,000	68,9	10,000	690
612	200 to 3,000	13,8 to 207	40 to 250	2,8 to 17,2	3,000	207	10,000	690
614	500 to 6,000	34,5 to 414	50 to 400	3,4 to 27,6	6,000	414	10,000	690

†NOTE: Other wetted materials available. See OPTIONS.

*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, testing).

Viton® is a registered trademark of Dupont Dow Elastomers.

PRESSURE MODEL CHART

Hex Screw Adjustment Versions

Types J400, J402, J403

Model	Adjustable Set Point Range		Deadband		Over Range Pressure*		Proof Pressure**		
	psi (unless noted)	bar (mbar)	psi (unless noted)	bar (mbar)	psi	bar	psi	bar	
Low end of range on fall ; High end of range on rise		Deadband doubles for 2 and 3 switch types							
Brass bellows with 1/4" NPT (female) nickel-plated brass 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 0.9 "Hg	(7 to 30,5)	0	0	30 "Hg Vac	-1	
134	30 "Hg Vac to 20 psi	-1 to 1,4	0.2" to 1.2 "Hg	(7 to 40,6)	20	1,4	25	1,7	
137	0 to 80 "wc	(0 to 200)	2 to 6 "wc	(5 to 15)	80 "wc	(200)	5	0,3	
144	0 to 20	0 to 1,4	0.1 to 0.5	(6,9 to 34,5)	20	1,4	25	1,8	
146	0 to 30	0 to 2,1	0.1 to 0.6	(6,9 to 41,4)	30	2	40	2,8	
156	0 to 100	0 to 6,9	0.2 to 0.8	(13,8 to 55,2)	100	6,9	125	8,6	
164	0 to 200	0 to 13,8	0.3 to 2.0	(20,7 to 138)	200	13,8	200	13,8	
Phosphor bronze bellows with 1/4" NPT (female) nickel-plated brass pressure connection									
270	0 to 200	0 to 13,8	1.5 to 8	0,1 to 19,9	200	13,8	250	17,2	
274	0 to 300	0 to 20,7	2 to 10	0,1 to 24,9	300	20,7	350	24,1	
Buna-N diaphragm and O-Ring with 1/4" NPT (female) aluminum pressure connection and cap									
440†	0 to 2 "wc	(0 to 5)	0.07 to 0.25 "wc	(0,2 to 0,6)	3	0,2	225	15,5	
441†	0 to 10 "wc	(0 to 25)	0.15 to 0.3 "wc	(0,4 to 0,7)	3	0,2	225	15,5	
442†	0 to 20 "wc	(0 to 50)	0.2 to 0.5 "wc	(0,5 to 1,2)	3	0,2	225	15,5	
443†	0 to 80 "wc	(0 to 200)	0.5 to 1.8 "wc	(1,2 to 4,5)	3	0,2	225	15,5	
448	80 to 0 "wc Vac	(-200 to 0)	1 to 3 "wc	(2,5 to 7,5)	3	0,2	225	15,5	
449	0 to 20 "wc	(0 to 50)	1 to 2 "wc	(2,5 to 5,0)	3	0,2	225	15,5	
450	30 "Hg Vac to 0 psi	-1 to 0	0.1 to 0.4 "Hg	(3,4 to 13,5)	3	0,2	225	15,5	
451	0 to 80 "wc	(0 to 200)	1 to 3 "wc	(2,5 to 7,5)	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)	20	1,4	225	15,5	
453	0 to 20	0 to 1,4	0.05 to 0.2	(3,4 to 13,8)	20	1,4	225	15,5	
454	0 to 30	0 to 2,1	0.05 to 0.3	(3,4 to 20,7)	30	2,1	225	15,5	
Teflon® diaphragm and O-Ring with 1/4" NPT (female) 316L stainless steel 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)	0	0	225	15,5	
551	0 to 80 "wc	(0 to 200)	1.5 to 3.5 "wc	(3,7 to 8,7)	80"wc	(200)	225	15,5	
552	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1 "Hg	(6,8 to 33,9)	20	1,4	225	15,5	
553	0 to 20	0 to 1,4	0.05 to 0.3	(3,4 to 20,7)	20	1,4	225	15,5	
554	0 to 30	0 to 2,1	0.1 to 0.4	(6,9 to 27,6)	30	2,1	225	15,5	
555	0 to 100	0 to 6,9	0.25 to 0.75	(17,2 to 51,7)	100	6,9	225	15,5	

†No switch options available for these models
Teflon® is a registered trademark of E.I. DuPont.

PRESSURE MODEL CHART

Dial Adjustment Versions

Types H400, H402, H403

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(mbar)	psi (Unless noted)	bar(mbar)	psi	bar	psi
Welded 316L stainless steel bellows with 1/2" NPT (female) pressure connection							
S126B	30 "Hg Vac to 0 psi	-1 to 0	0.2 to 0.9 "Hg	(7 to 30,5)	30 "Hg Vac	-1	0.5 "Hg
S134B	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	(7 to 40,6)	25	1,7	1" Hg & 0.5 psi
S137B	0 to 80 "wc	(0 to 200)	2 to 6 "wc	(5 to 15)	5	0,3	2 "wc
S144B	0 to 20	0 to 1,4	0.1 to 0.5	(6,9 to 34,5)	25	1,7	0.5
S146B	0 to 30	0 to 2,1	0.1 to 0.6	(6,9 to 41,4)	40	2,78	0.5
S156B	0 to 100	0 to 6,9	0.2 to 0.8	(13,8 to 55,2)	200	13,8	2
S164B	0 to 200	0 to 13,8	0.3 to 2	(20,7 to 138)	200	13,8	5
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 19,9	250	17,2	5
361	0 to 300	0 to 20,7	2 to 9	0,1 to 22,4	350	24,1	10
376	0 to 500	0 to 34,5	3 to 12	0,2 to 29,9	575	39,6	10
Brass bellows with 1/4" NPT (female) nickel-plated brass pressure connection; Models 126 and 134 have zinc-plated steel spring in media							
126	30 "Hg Vac to 0 psi	-1 to 0	0.2 to 0.9 "Hg	(7 to 30,5)	30 "Hg Vac	-1	0.5 "Hg
134	30 "Hg Vac to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	(7 to 40,6)	25	1,7	1"Hg & 0.5 psi
137	0 to 80 "wc	(0 to 200)	2 to 6 "wc	(5 to 15)	5	0,3	2 "wc
144	0 to 20	0 to 1,4	0.1 to 0.5	(6,9 to 34,5)	25	1,7	0.5
146	0 to 30	0 to 2,1	0.1 to 0.6	(6,9 to 41,4)	40	2,8	0.5
156	0 to 100	0 to 6,9	0.2 to 0.8	(13,8 to 55,2)	125	8,6	2
164	0 to 200	0 to 13,8	0.3 to 2	(20,7 to 138)	200	13,8	5
Phosphor bronze bellows with 1/4" NPT (female) nickel plated brass pressure connection							
270	0 to 200	0 to 13,8	1.5 to 8	1 to 19,9	250	17,2	5
274	0 to 300	0 to 20,7	2 to 10	0,1 to 24,9	350	24,1	10

***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, testing).

PRESSURE MODEL CHART

Dial Adjustment Versions

Types H400, H402, H403

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
	psi(Unless noted)	bar(mbar)	psi(Unless noted)	bar(mbar)			
Buna-N diaphragm and O-Ring with 1/4" NPT (female) aluminum pressure connection and cap							
440†	0 to 2 "wc	(0 to 5)	0.07 to 0.25 "wc	(0,2 to 0,6)	225	15,5	0.1 "wc
441†	0 to 10 "wc	(0 to 25)	0.15 to 0.3 "wc	(0,4 to 0,7)	225	15,5	0.5 "wc
442†	0 to 20 "wc	(0 to 50)	0.2 to 0.5 "wc	(0,5 to 0,12)	225	15,5	1 "wc
443†	0 to 80 "wc	(0 to 200)	0.5 to 1.8 "wc	(1,2 to 4,5)	225	15,5	5 "wc
448	80 "wc Vac to 0	(-200 to 0)	1 to 3 "wc	(2,5 to 7,5)	225	15,5	5 "wc
450	30 "Hg Vac to 0	-1 to 0	0.1 to 0.4 "Hg	(3,4 to 13,5)	225	15,5	0.5 "Hg
452	30 "Hg Vac to 20	-1 to 1,4	0.1 to 1 "Hg	(3,4 to 33,9)	225	15,5	0.5 "Hg & 0.5 "psi
453	0 to 20	0 to 1,4	0.05 to 0.2	(3,4 to 13,8)	225	15,5	0.5
454	0 to 30	0 to 2,1	0.05 to 0.3	(3,4 to 20,7)	225	15,5	0.5
Teflon® diaphragm, O-Ring with 1/4" NPT (female) 316L stainless steel pressure connection and cap							
550	30" Hg Vac to 0	-1 to 0	0.1 to 0.6 "Hg	(3,4 to 20,3)	225	15,5	0.5 "Hg
551	0 to 80 "wc	(0 to 200)	1.5 to 3.5 "wc	(3,7 to 8,7)	225	15,5	5 "wc
552	30 "Hg Vac to 20	-1 to 1,4	0.2 to 1 "Hg	(6,8 to 33,9)	225	15,5	0.5 "Hg & 0.5 "psi
553	0 to 20	0 to 1,4	0.05 to 0.3	(3,4 to 20,7)	225	15,5	0.5
554	0 to 30	0 to 2,1	0.1 to 0.4	(6,9 to 27,6)	225	15,5	0.5
555	0 to 100	0 to 6,9	0.25 to 0.75	(17,2 to 51,7)	225	15,5	2

†NO SWITCH OPTIONS ARE AVAILABLE FOR THESE MODELS

**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, testing).

Teflon® is a registered trademarks of E.I. DuPont.

DIFFERENTIAL PRESSURE MODEL CHART

Hex Screw Adjustment Versions

Types J400K, J402K

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(mbar)	psi (Unless noted)	bar(mbar)	psi	bar	psi	bar
Welded 316L stainless steel bellows with 1/2" NPT (female) pressure connections								
S147B	3 to 30	0,2 to 2,1	0.5 to 2	(34,5 to 138)	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 207)	30 "Hg Vac to 180	-1 to 12,4	300	20,7
Brass bellows with 1/4" NPT (female) nickel-plated brass pressure connections								
147	3 to 30	0,2 to 2,1	0.5 to 2	(34,5 to 138)	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 207)	30 "Hg Vac to 150	-1 to 10,3	180	12,4
Buna-N diaphragm and O-Ring with 1/4" NPT (female) aluminum pressure connections								
455	5 to 80 "wcd	(12 to 200)	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
Kapton® diaphragms, Buna-N sealing diaphragms and 1/8" NPT (female) pressure connections								
540	1 to 7 "wcd	(2,5 to 17,4)	0.1 to 0.5 "wc	(0,2 to 1,2)	200	13,8	400	27,6
541	2 to 20 "wcd	(5 to 49,8)	0.5 to 2 "wc	(1,2 to 5)	200	13,8	400	27,6
542	5 to 50 "wcd	(12,4 to 124,5)	0.5 to 5 "wc	(1,2 to 12,4)	200	13,8	400	27,6
543	15 to 100 "wcd	(37,3 to 249)	0.5 to 7 "wc	(1,2 to 17,4)	200	13,8	400	27,6
544	2 to 20	0,1 to 1,4	1 to 2.5	0,1 to 0,2	1200	82,7	2500	172,4
545	5 to 50	0,3 to 3,4	1 to 3	0,1 to 0,2	1200	82,7	2500	172,4
546	10 to 100	0,7 to 6,9	1 to 5	0,1 to 0,3	1200	82,7	2500	172,4
547	20 to 200	1,4 to 13,8	1 to 7	0,1 to 0,5	1200	82,7	2500	172,4
Teflon® and Buna-N diaphragms and 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	(14 to 69)	30 "Hg Vac to 225	-1 to 15,5	225	15,5
Types	H400K	H402K	Dial Adjustment Versions					
Buna-N diaphragm and O-Ring with 1/4" NPT (female) aluminum pressure connections								
455	5 to 80 "wcd	(12 to 200)	1 to 4 "wc	(2 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	(7 to 21)	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	(7 to 28)	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	14 to 69	30" HgVac 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 provided the difference in pressure between them does not exceed the designated adjustable range.

Kapton® and Teflon® are registered trademarks of E.I. DuPont.

TEMPERATURE MODEL CHART

Model	Adjustable Set Point Range		Max. Temp.		Scale Division		Bulb or Stem Size
	°F	°C	°F	°C	°F	°C	OD x Length
Types B400 B402 B403							
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
Types C400 C402 C403							
120	0 to 225	-17.8 to 107.2	275	135	N/A		9/16" x 1 7/8" nickel plated-brass
121	200 to 425	93.3 to 218.3	475	246.1	N/A		9/16" x 1 7/8" nickel plated-brass
Types E400 E402 E403							
2BSA	-120 to 100	-84.4 to 37.8	150	65.5	10	5	3/8 x 2 5/8"
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	65.5	5	2	3/8 x 6 3/4"
2BSB	30 to 250	-1.1 to 121.1	300	148.9	10	5	3/8 x 2 5/8"
3BS	100 to 400	37.8 to 204.4	450	232.2	10	10	3/8 x 2 1/8"
8BS	350 to 640	176.7 to 337.8	690	365.6	10	10	3/8 x 3 1/4"
Types F400 F402 F403							
1BS	-180 to 120	-115 to 48.9	170	76.6	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	287.7	N/A		3/8 x 2 1/8"
4BS	-40 to 120	-40 to 48.9	170	76.6	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	148.8	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"

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". (Pages 5-10)

Determine model or stock number 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. (Page 12)

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 adjustment with no reference dial

Type J402 - Two SPDT outputs; internal adjustment with no reference dial

Type J403 - Three SPDT outputs; internal adjustment with no reference dial

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 adjustment with no reference dial

Type J402K - Two SPDT outputs; internal adjustment with no reference dial

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 adjustment with no reference dial

Type C402 - Immersion stem; two SPDT outputs; internal adjustment with no reference dial

Type C403 - Immersion stem; three SPDT outputs; internal adjustment with no reference dial

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 adjustment with no reference dial

Type F402 - Bulb and capillary; two SPDT outputs; internal adjustment with no reference dial

Type F403 - Bulb and capillary; three SPDT outputs; internal adjustment with no reference dial

HOW TO ORDER OPTIONS

SWITCH OPTIONS	DESCRIPTION
	NO SWITCH OPTIONS ARE AVAILABLE FOR PRESSURE MODELS 440 TO 443
0140	Gold contacts, 1 A 125 VAC resistive
0500	Close deadband, 5 A 125/250 VAC resistive
1010	DPDT switch, 10 A 125/250 VAC resistive. NOT AVAILABLE TEMPERATURE VERSIONS OR TYPE J403 AND MODELS 448-449, 520-535, 540-547, 570-572
1070	10 A 125 VDC resistive; deadband and minimum set point will increase. NOT AVAILABLE TYPES B, E OR MODELS 448-449, 520-535, 540-547, 570-572
1520	Adjustable deadband, 15 A 125/250/277 VAC resistive. NOTE: FOR TYPE J403, NOT AVAILABLE ON MIDDLE SWITCH. NOT AVAILABLE TYPES B, E, H, C403, F403 OR MODELS 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 TYPE 403 OR MODELS 520-535, 570-572
1535	High ambient, 15 A 125/250 VAC resistive; temperatures up to 250°F/145°C. NOT AVAILABLE MODELS 520-535
1537	Vapor-sealed 15 A 125/250 VAC resistive. NOT AVAILABLE MODELS 520-535
1539	Fungus resistant case, 15 A 125/250 VAC resistive. NOT AVAILABLE MODELS 520-535
2000	20 A 125/250 VAC resistive. NOT AVAILABLE MODELS 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
M202	Factory set two switches. NOT AVAILABLE SINGLE 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. NOT AVAILABLE SINGLE OR DUAL SWITCH VERSIONS
M210	Differential pressure indication. AVAILABLE J400K AND J402K, MODELS 147,S147B,157 & S157B
M276	Range indicated on nameplate in bars or mbars. 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
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M504	316L Stainless steel immersion temperature stem. AVAILABLE MODELS 120, 121 ONLY
M540* (see below)	Viton [®] construction; wetted parts include Viton [®] diaphragm and/or O-Ring plus standard connection material; Deadbands increase approximately 15% and low end of range will increase 10%. AVAILABLE MODELS 448-457, 610-614, 540-547
M550	Oxygen service cleaning; internal construction may change. NOT AVAILABLE MODELS 440-443
M900	Watertight conduit fitting; converts 7/8" hole to 1/2" NPT fitting. Required for product to meet NEMA 4X
6361-704	Surface Mounting Hardware required for models 520-535, 540-547

OPTIONAL MATERIAL FOR "WC SENSORS:

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

***M540:** Viton construction (deadbands and low end of range may increase slightly. Consult factory.) Wetted parts include Viton diaphragm and/or O-Ring plus standard pressure connection material. Available models 448-457, 610-614 and 540-547.

Kapton[®] and **Teflon[®]** are registered trademarks of E.I. DuPont.
Lexan[®] is a registered trademark of General Electric Company
Viton[®] is a registered trademark of Dupont Dow Elastomers.

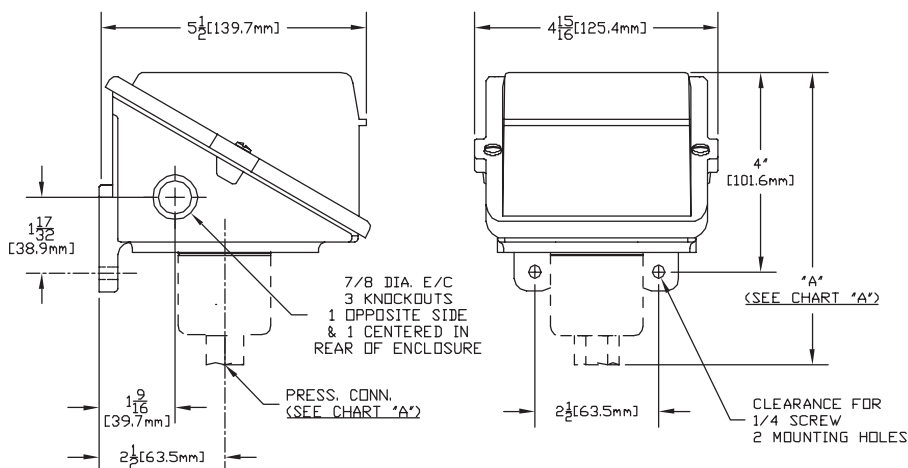
DIMENSIONAL DRAWINGS

Internal 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



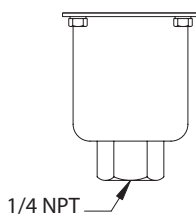
Models	Dimension A		
	Inches	mm	NPT
Pressure			
126-164	5.81	146,84	1/4
S126B-S164B	6.19	157,16	1/2
270-376	5.50	139,70	1/4
440-443, 449, 451, 453, 454	4.28	108,74	1/4
448, 450, 452	5.03	127,79	1/4
520-525	8.25	209,6	1/2
530-535	8.12	206,20	1/2
551, 553-555	4.56	115,88	1/4
550, 552	5.03	127,79	1/4
570-572	4.56	115,8	1/4
610-614	6.44	163,58	1/4
Differential Pressure			
147-157	6.13	155,57	1/4
S147B-S157B	6.13	155,57	1/2
455-559	7.00	178,05	1/4
540-543	7.97	202,4	1/8
544-547	8.03	204,0	1/8

Models	Dimension A		
	Inches	mm	NPT
Temperature			
120,121	10.88	193,68	Immersion stem
1B5-8B5	7.00	178,05	Bulb & capillary

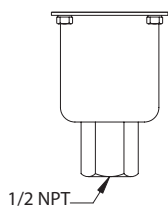
All dimensions stated in inches (millimeters)

Pressure Sensors

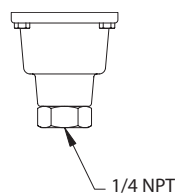
Models 126-164



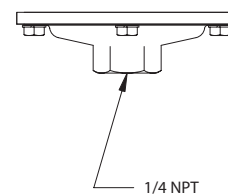
Models S126B-S164B



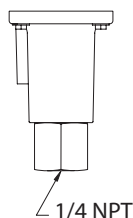
Models 270-376



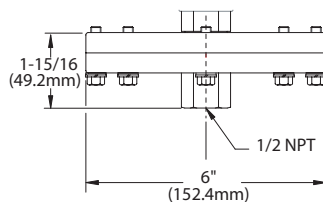
Models 440-454,
550-555, 570-572



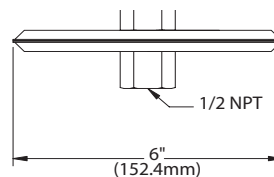
Models 610-614



Models 520-525



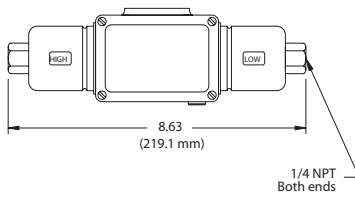
Models 530-535



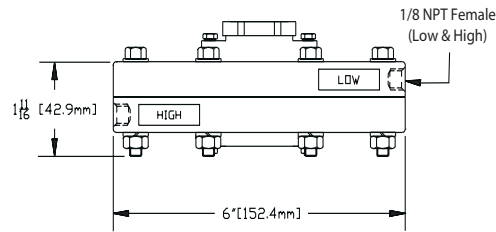
DIMENSIONAL DRAWINGS

Differential Pressure Sensors

Models 147-157

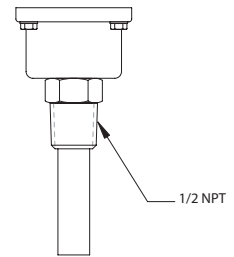


Models 540-543



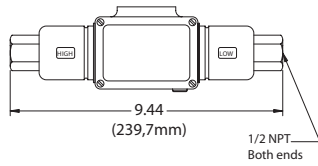
Temperature Sensors

Models 120-121

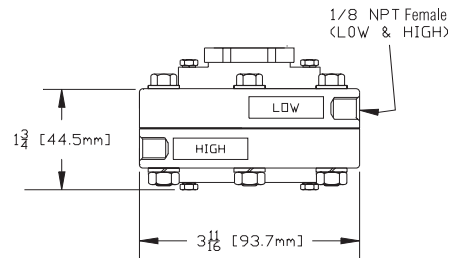


Local mount temperature version

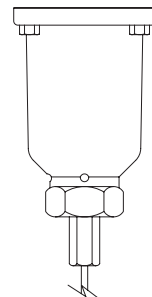
Models S147B-S157B



Models 544-547

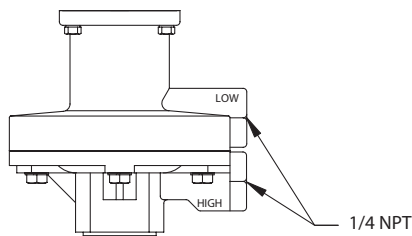


Models 1BS-8BS



Remote mount temperature version

Models 455-559



ALTERNATIVE PRODUCTS FROM UE

100 Series Single Switch Weather-Tight

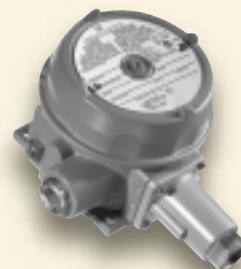
- Compact pressure, differential pressure and temperature models with internal adjustment
- Optional adjustable deadband switch output
- Nema 4X epoxy-coated enclosure, designed for easy access to wire and adjust setpoints
- Temperature ranges -180 to + 650°F

**ONE Series Electronic Pressure & Temperature Switches**

- Solid-state reliability with health-checking diagnostics
- Enclosure type 4X design, approved for Class I, Division 2 and intrinsically safe hazardous locations
- Digital display with tamper-proof keypad adjustment of setpoint and deadband
- Available with innovative low power "Two-Wire" model for discreet input to PLC's or DCS ; or models to switch 115/230 VAC loads
- Optional dual switch or 4-20 mA analog output

**120 Series Broad line of Explosion-Proof Switches**

- Wide selection of explosion-proof pressure, differential pressure and temperature models
- UL, cUL, Cenelec EE xd certified for hazardous locations
- Ranges 0 to 6,000 psi
- Convenient wiring to terminal blocks
- Enclosure type 4X epoxy-coated enclosure
- Single or dual switch output
- Internal or external set point adjustment

**460 Series Pressure Transmitters for Hazardous Locations**

- Welded, #316 Stainless steel construction
- CSA, NRTL/C, Cenelec EE xd certified for hazardous locations
- Ranges 0 to 15,000 psi
- Choice of field or factory-sealed zero and span calibration
- 4-20 mA or 0-4 VDC



For more information, request Bulletins or visit www.ueonline.com

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 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. 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.
- 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 (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. 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.

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