

Data Sheet

H119 SERIES

Pressure & Temperature Switch



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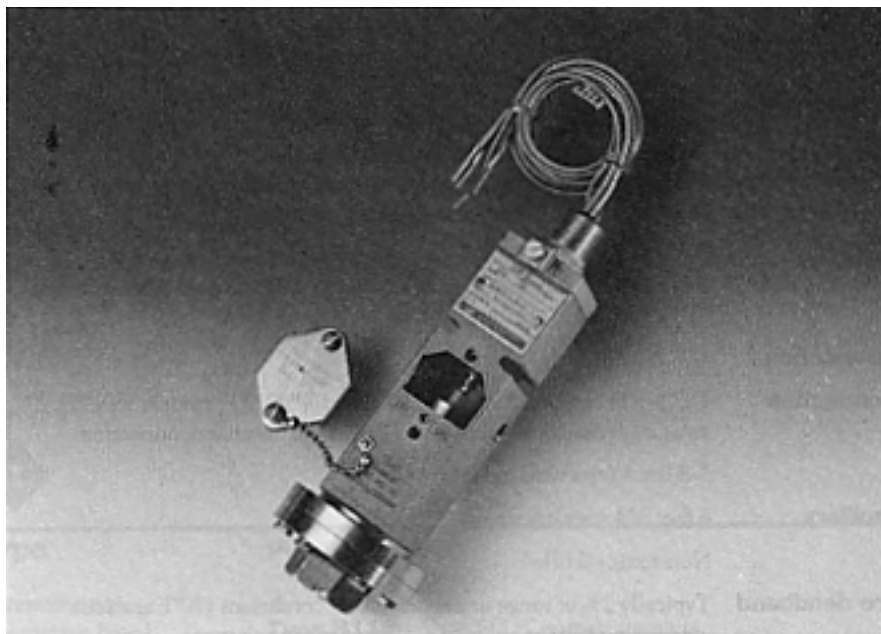
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Hazardous Locations

119 Series

Class I, II, III
Division 1 and 2, Zone 1
316 Stainless Steel

Pressure, Temperature



H119 pressure switch with corrosion resistant stainless steel sensor

- **Dual barrier/3 chamber design for sensor and electrical isolation**
- **All stainless steel construction**
- **Hermetically sealed switch capsule**
- **Adjustable ranges:**

**New "wc ranges:
300 "wc vacuum to
250 "wc pressure**

**Pressure:
1 to 3500 psi
(0,07 to 241 bar)**

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

The 119 Series offers the ultimate in corrosion resistance and safety. Its 316 stainless steel body and wetted parts enable the 119 Series to be installed directly on process lines containing reactive, corrosive, flammable or explosive media. Meets the intent of National Electrical Code (NEC) 501-5(f)3.

Applications for the 119 Series cover a broad range from petrochemical plants and refineries to offshore rigs.



Welded, stainless steel sensor eliminates O-ring design



Hermetically sealed switch capsule (SPDT or DPDT) has gold flashed contacts for intrinsically safe systems



Optional pre-wired explosion-proof junction box available



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Series 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: 0 to 160°F (-17 to 71°C) set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change; temperature models: set point typically shifts less than 3% of range for a 50°F (28°C) ambient temperature change
Set point repeatability	± 1.5% of adjustable range; temperature models, models 520-535: ± 1% of adjustable range
Shock	Set point repeats after 15 Gs, 10 millisecond duration
Vibration	Set point repeats after 2.5 Gs, 5-500 Hz
Enclosure	316 stainless steel, 316 stainless steel nameplate
Enclosure classification	Designed to meet NEMA 4X and IP66 requirements with option M300
Switch output	H119, F119: One SPDT hermetically sealed. H119A, F119A: Two SPDT for DPDT action, calibrated to activate on increasing value. Option 1195 for decreasing value
Electrical ratings	11 amps 125/250 VAC resistive and 5 amps inductive @ 28 VDC, 1 amp @ 48 VDC, 1/2 amp @ 125 VDC; switch contacts gold flashed; 1 amp 125 VAC; loads greater will burn off gold flashing
Electrical connection	1/2" NPTM with 18" leadwires
Pressure connection	1/2" NPTF; models 358-377, 700-706: 1/4" NPTF; models 560-564: 2" sanitary connection; models 565-567: 1 1/2" sanitary connection
Weight	3-8 lbs. Varies with model
Bulb and capillary	6 feet 304 stainless steel
Fill	Non-toxic oil filled
Temperature deadband	Typically 2% of range under laboratory conditions (70°F ambient circulating bath at a rate of 1/2°F per minute change)

Approvals



Snap Switch Assembly:

Class I, Divisions 1 & 2 Groups A, B, C, and D;

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

Class III

UL listed, cUL Certified
UL 894, file # E108283

119 Series:

CENELEC flame proof
construction per EEx d IIC T6
CENELEC standards 50 014 / 50 018

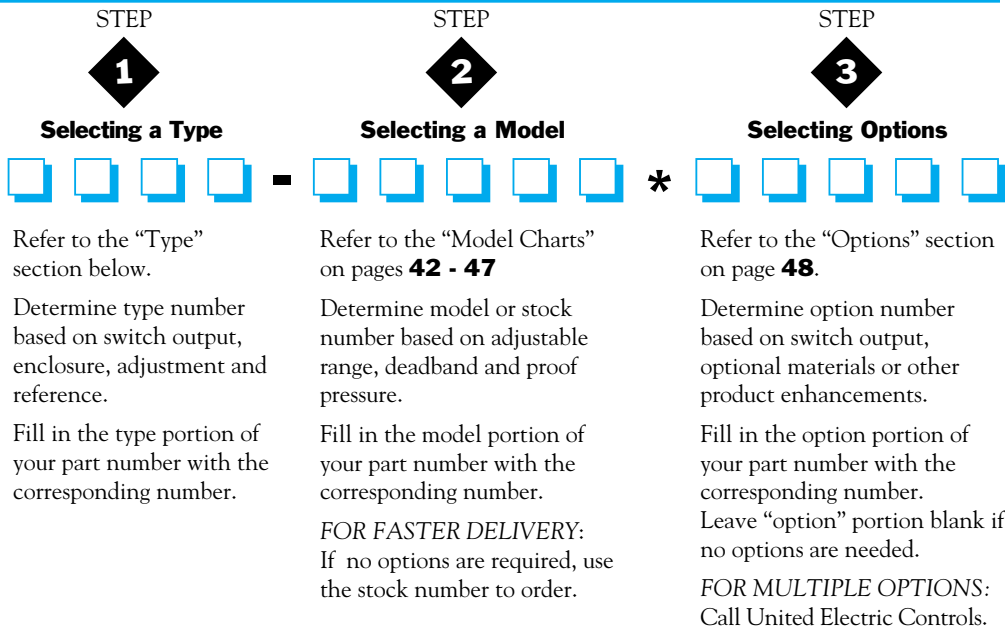
SAA Ex d II T6, IP66, Class I, Zone 1
DIP T6 IP66, Class II
(available through UE Australia)

CE Compliance to Low Voltage Directive (LVD)

Compliance to **NACE** MR-0175
(standard on welded stainless steel diaphragm sensors)

How to Order

Building your Part Number



STEP



Type

Determine type designation based on switch output, enclosure, adjustment and reference

Pressure

Type H119 - **One** SPDT output; stainless steel enclosure; internal adjustment with no reference scale

Type H119A - **Two** SPDT outputs **for DPDT**; stainless steel enclosure; internal adjustment with no reference scale

Temperature

Type F119 - Bulb and capillary; **one** SPDT output; stainless steel enclosure; internal adjustment with no reference scale

Type F119A - Bulb and capillary; **two** SPDT outputs **for DPDT**; stainless steel enclosure; internal adjustment with no reference scale

Model

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

**Type H119**

One SPDT output; stainless steel enclosure; internal adjustment with no reference scale

Pressure Model Chart

Model	Stock Number	Adjustable Set Point Range	
		"wc	mbar
Buna N diaphragm and O-ring with 1/2" NPTF epoxy coated aluminum pressure connection (Other material available, see page 48)			
520	—	300 Vac to 0	-747,24 to 0
521	—	10 Vac to 10	-24,91 to 24,91
522	—	50 Vac to 50	-124,54 to 124,54
523	—	0.5 to 5	1,25 to 12,45
524	—	2.5 to 50	6,23 to 124,54
525	—	10 to 250	24,91 to 622,70
Welded 316L stainless steel diaphragm with 1/2" NPTF 316L pressure connection			
530	—	300 Vac to 0	-747,24 to 0
531	—	10 Vac to 10	-24,91 to 24,91
532	—	50 Vac to 50	-124,54 to 124,54
533	—	0.5 to 5	1,25 to 12,45
534	—	2.5 to 50	6,23 to 124,54
535	—	10 to 250	24,91 to 622,70
		psi	bar
Welded 316L stainless steel diaphragm and pressure connection; 2" sanitary connection			
560	—	1 to 15	0,07 to 1,03
561	—	2 to 25	0,14 to 1,72
562	—	2 to 50	0,14 to 3,45
563	—	4 to 100	0,28 to 6,90
564	—	8 to 200	0,56 to 13,79
Welded 316L stainless steel diaphragm and pressure connection; 1½" sanitary connection			
565	—	5 to 30	0,34 to 2,60
566	—	10 to 100	0,69 to 6,90
567	—	15 to 300	1,03 to 20,60
Welded 316L stainless steel diaphragm with 1/2" NPTF 316L stainless steel pressure connection, large 0.72" orifice for clean-out purposes			
171	—	1 to 20	0,07 to 1,38
172	—	2 to 50	0,14 to 3,45
173	—	4 to 100	0,28 to 6,90
174	—	8 to 200	0,56 to 13,79
316 stainless steel diaphragm (*optional Hastelloy C, Monel or Tantalum); Viton GLT O-ring (optional Kalrez®, Silicone, Ethylene Propylene, Aflas®); 316 stainless steel 1/2" NPTF pressure connection (optional Hastelloy B or C, or Monel) (See "Optional Material"), large 0.72" orifice for clean-out purposes. Models 188 and 189 316L stainless steel pressure connection.			
183	—	1 to 20	0,07 to 1,38
184	—	2 to 50	0,14 to 3,45
185	—	4 to 100	0,28 to 6,90
186	—	8 to 200	0,56 to 13,79
188	—	50 to 1000	3,45 to 68,95
189	—	250 to 3500	17,24 to 241

* Use of optional diaphragm materials for models 183-189 may increase deadband.

NA = Product not available
 — = Non-stock item

Deadband		Over Range Pressure		Proof Pressure	
"wc	mbar	psi	bar	psi	bar
0.8 to 32.0	2,00 to 79,60	200	13,8	400	27,58
0.4 to 2.4	1,00 to 5,96	200	13,8	400	27,58
0.4 to 12.0	1,00 to 29,88	200	13,8	400	27,58
0.4 to 1.2	1,00 to 3,00	200	13,8	400	27,58
0.4 to 3.2	1,00 to 7,96	200	13,8	400	27,58
0.4 to 24,0	1,00 to 59,76	200	13,8	400	27,58
0.8 to 60.0	2,00 to 149,60	50	3,45	100	6,90
0.4 to 2.4	1,00 to 5,96	50	3,45	100	6,90
0.4 to 12.0	1,00 to 29,88	50	3,45	100	6,90
0.4 to 1.2	1,00 to 3,00	50	3,45	100	6,90
0.4 to 3.2	1,00 to 7,96	50	3,45	100	6,90
0.4 to 40.0	1,00 to 99,60	50	3,45	100	6,90
psi	bar	psi	bar	psi	bar
0.3 to 3	0,03 to 0,21	200	13,8	300	20,69
0.3 to 4.5	0,03 to 0,30	200	13,8	300	20,69
0.3 to 7.5	0,03 to 0,51	200	13,8	300	20,69
0.3 to 12	0,03 to 0,84	200	13,8	300	20,69
0.3 to 15	0,03 to 1,02	200	13,8	300	20,69
3 to 15	0,21 to 1,02	1000	68,9	1500	103,42
3 to 36	0,21 to 2,49	1000	68,9	1500	103,42
9 to 66	0,63 to 4,59	1000	68,9	1500	103,42
0.1 to 2	0,007 to 0,14	500	34	1000	68
0.1 to 3	0,007 to 0,20	500	34	1000	68
0.1 to 5	0,007 to 0,35	500	34	1000	68
0.1 to 9	0,007 to 0,62	500	34	1000	68
0.3 to 5	0,021 to 0,35	500	34	1000	68
0.3 to 7	0,021 to 0,48	500	34	1000	68
0.5 to 12	0,03 to 0,83	500	34	1000	68
0.5 to 17	0,03 to 1,17	500	34	1000	68
30 to 300	2,07 to 20,69	2000	137	7000	482
50 to 500	3,45 to 34,48	4000	275	7000	482

- 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.

Pressure Model Chart (continued)

Model	Stock Number	Adjustable Set Point Range	
		psi	bar
Type H119 (Continued) One SPDT output; stainless steel enclosure; internal adjustment with no reference scale			
316L stainless steel diaphragm (optional Hastelloy C, Monel or Tantalum); Viton GLT O-ring (optional Kalrez®, Silicone, Ethylene Propylene, Aflas®); 316 stainless steel 1/2" NPTF pressure connection, (optional Hastelloy B or C, or Monel), 0.06" orifice. Models 488 and 489 316L stainless steel pressure connection			
483	—	1 to 20	0,07 to 1,38
484	—	2 to 50	0,14 to 3,45
485	—	4 to 100	0,28 to 6,90
486	—	8 to 200	0,56 to 13,79
488	—	50 to 1000	3,45 to 68,95
489	—	250 to 3500	17,24 to 241
Welded 316 stainless steel diaphragm with 1/2" NPTF 316L stainless steel pressure connection, large 0.72" orifice for clean-out purposes			
190	—	5 to 30	0,34 to 2,07
191	96383	10 to 100	0,69 to 6,90
192	—	15 to 300	1,03 to 20,69
193	—	20 to 500	1,38 to 34,48
194	—	80 to 1700	5,60 to 117
Welded 316 stainless steel diaphragm with 1/2" NPTF 316L stainless steel pressure connection, 0.06" orifice			
490	—	5 to 30	0,34 to 2,07
491	—	10 to 100	0,69 to 6,90
492	—	15 to 300	1,03 to 20,69
493	—	20 to 500	1,38 to 34,48
494	—	80 to 1700	5,60 to 117
Welded 316 stainless steel bellows with 1/4" NPTF 316L stainless steel pressure connection			
358	—	15 to 200	1,03 to 13,79
361	—	20 to 300	1,38 to 20,69
376	—	25 to 500	1,72 to 34,48
Viton diaphragm and O-ring with 1/4" NPTF 316L stainless steel pressure connection			
700	—	3 to 20	0,21 to 1,38
702	—	3 to 100	0,21 to 6,90
704	—	15 to 500	1,03 to 34,48
706	—	100 to 1700	6,90 to 117

- Deadband Note: Use of optional diaphragm materials for models 483-489 may increase deadband. H119 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. Deadband shown for models 358-376, 700-706 are applicable for the full span of the pressure switch.

NA = Product not available
 — = Non-stock item

Deadband		Over Range Pressure		Proof Pressure		
psi	bar	psi	bar	psi	bar	
0.3 to 5	0,021 to 0,35	500	34	1000	68,9	
0.3 to 7	0,021 to 0,48	500	34	1000	68,9	
0.5 to 12	0,03 to 0,83	500	34	1000	68,9	
0.5 to 17	0,03 to 1,17	500	34	1000	68,9	
30 to 300	2,07 to 20,69	2000	137	7000	482	
50 to 500	3,45 to 34,48	4000	275	7000	482	
Lower 75% range span	Top 25% range span	Lower 75% range span				
psi	psi	bar				
1 to 5	7 max	0,07 to 0,48	1500	103	2500	172
1 to 15	25 max	0,07 to 1,72	1500	103	2500	172
3 to 25	35 max	0,21 to 2,41	1500	103	2500	172
4 to 35	60 max	0,28 to 4,2	1500	103	2500	172
10 to 150	200 max	0,69 to 13,79	2000	138	2500	172
1 to 5	7 max	0,07 to 0,48	1500	103	2500	172
1 to 15	25 max	0,07 to 1,72	1500	103	2500	172
3 to 25	35 max	0,21 to 2,41	1500	103	2500	172
4 to 35	60 max	0,28 to 4,2	1500	103	2500	172
10 to 150	200 max	0,69 to 13,79	2000	138	2500	172
6 to 20	0,42 to 1,38	200		800	55,16	
8 to 22	0,55 to 1,52	300		800	55,16	
10 to 28	0,69 to 1,93	500		800	55,16	
0.5 to 4	0,03 to 0,21	500	34,48	1000	68,9	
1 to 6	0,07 to 0,42	500	34,48	1000	68,9	
4 to 30	0,28 to 2,07	1000	68,95	2500	172	
4 to 80	0,28 to 5,51	2000	137	2500	172	

• Application Note: The use of metallic diaphragms where higher pressure shock or heavy cycling is expected should be avoided.
 Kalrez® is a registered trademark of E.I. DuPont; Aflas® is a registered trademark of Asahi Glass

Pressure Model Chart (continued)



Type H119A

Two SPDT output for DPDT; stainless steel enclosure; internal adjustment with no reference scale

See Type 119 for "wc models and ranges"

Multiply 119 deadband ranges by 1.5 to get ranges for 119A. Models 523 and 533 are not available in 119A configurations.

Model	Stock Number	Adjustable Set Point Range	
		psi	mbar
Welded 316L stainless steel diaphragm and pressure connection; 2" sanitary connection			
560	—	1 to 15	0,07 to 1,03
561	—	2 to 25	0,14 to 1,72
562	—	2 to 50	0,14 to 3,45
563	—	4 to 100	0,28 to 6,90
564	—	8 to 200	0,56 to 13,79
Welded 316L stainless steel diaphragm and pressure connection; 1½" sanitary connection			
565	—	5 to 30	0,34 to 2,60
566	—	10 to 100	0,69 to 6,90
567	—	15 to 300	1,03 to 20,60
Welded 316L stainless steel diaphragm with 1/2" NPTF 316 stainless steel pressure connection, large 0.72" orifice for clean-out purposes			
171	—	1 to 20	0,07 to 1,38
172	—	2 to 50	0,14 to 3,45
173	—	4 to 100	0,28 to 6,90
174	—	8 to 200	0,56 to 13,79
Welded 316 stainless steel diaphragm with 1/2" NPTF 316 stainless steel pressure connection, large 0.72" orifice for clean-out purposes			
190	—	5 to 30	0,34 to 2,07
191	—	10 to 100	0,69 to 6,90
192	—	15 to 300	1,03 to 20,69
193	—	20 to 500	1,38 to 34,48
194	—	80 to 1700	5,60 to 117
Welded 316 stainless steel diaphragm with 1/2" NPTF 316 stainless steel pressure connection, 0.06" orifice			
490	—	5 to 30	0,34 to 2,07
491	—	10 to 100	0,69 to 6,90
492	—	15 to 300	1,03 to 20,69
493	—	20 to 500	1,38 to 34,48
494	—	80 to 1700	5,60 to 117

Temperature Model Chart

Model	Stock Numbers		Adjustable Range	
	F119	F119A	°F	°C
H21BS	—	—	0 to 150	-17 to 65
H22BS	—	—	50 to 300	10 to 150
H23BS	—	—	150 to 650	65 to 340

Type F119

Bulb and capillary; one SPDT output

Type F119A

Bulb and capillary; two SPDT outputs

NA = Product not available
 — = Non-stock item

Deadband		Over Range Pressure		Proof Pressure	
psi	mbar	psi	bar	psi	bar
0.3 to 4	0,03 to 0,21	200	13,8	300	20,69
0.3 to 6	0,03 to 0,30	200	13,8	300	20,69
0.3 to 10	0,03 to 0,51	200	13,8	300	20,69
0.3 to 16	0,03 to 0,84	200	13,8	300	20,69
0.3 to 20	0,03 to 1,02	200	13,8	300	20,69
3 to 20	0,21 to 1,02	1000	68,9	1500	103,42
3 to 48	0,21 to 2,49	1000	68,9	1500	103,42
9 to 88	0,63 to 4,59	1000	68,9	1500	103,42
0.1 to 2	0,007 to 0,14	500	34	1000	68
0.1 to 3	0,007 to 0,20	500	34	1000	68
0.1 to 5	0,007 to 0,35	500	34	1000	68
0.1 to 9	0,007 to 0,62	500	34	1000	68
1 to 7	0,07 to 0,48	1500	103	2500	172
1 to 25	0,07 to 1,72	1500	103	2500	172
5 to 60	0,35 to 4,13	1500	103	2500	172
10 to 125	0,69 to 8,61	1500	103	2500	172
25 to 250	1,72 to 17,20	2000	138	2500	172
1 to 7	0,07 to 0,48	1500	103	2500	172
1 to 25	0,07 to 1,72	1500	103	2500	172
5 to 60	0,35 to 4,13	1500	103	2500	172
10 to 125	0,69 to 8,61	1500	103	2500	172
25 to 250	1,72 to 17,20	2000	138	2500	172

119
Series

Max. Temp.		Bulb Size
°F	°C	OD x Length
200	93	3/8 x 6 7/8"
350	176	3/8 x 4 7/8"
700	370	3/8 x 3 3/8"

• Application Note: The use of metallic diaphragms where higher pressure shock or heavy cycling is expected should be avoided.

Options

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

Switch and other options

Option Description Number

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; AVAILABLE ON H119A, F119A
M201	Factory set one switch
M276	Range indicated on nameplate in bars/mbars NOT AVAILABLE ON TEMPERATURE VERSIONS
M278	Range indicated on nameplate in Kg/cm ² NOT AVAILABLE ON TEMPERATURE VERSIONS
M300	NEMA 4X construction (no CENELEC approval)
M311	NEMA 4X construction with CENELEC approval (includes venting of adjustment chamber, 1/8" NPTF. Allows media to be vented to a remote reservoir in the event of a sensor rupture. Piping to this vent must be properly routed to prevent moisture from entering adjustment chamber)
M441	Metric thread (M20) on electrical connection
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M513	Explosion proof junction box, pre-wired, with (2) 3/4" electrical connections
M550	Oxygen service cleaning; internal construction may change
6361-704	Surface Mounting Hardware

Sensor option materials

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

[Additional materials available for models 183-189, 483-489. See page 9 for details.](#)

See *Options* on pages 8-13 for complete option details on:

- Flanges (150# and 300#)
- Wells
- Union connectors



Optional materials

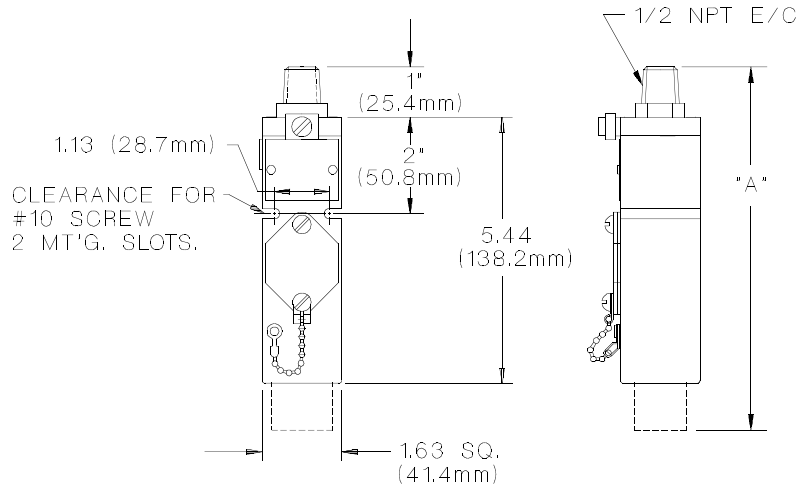


Flanges

Dimensions 119 Series
 Explosion Proof
 Class I, II, and III
 Divisions 1 and 2, Zone 1

Internal Set Point Adjustment

Types H119, H119A, F119, F119A



All dimensions stated in inches (millimeters)

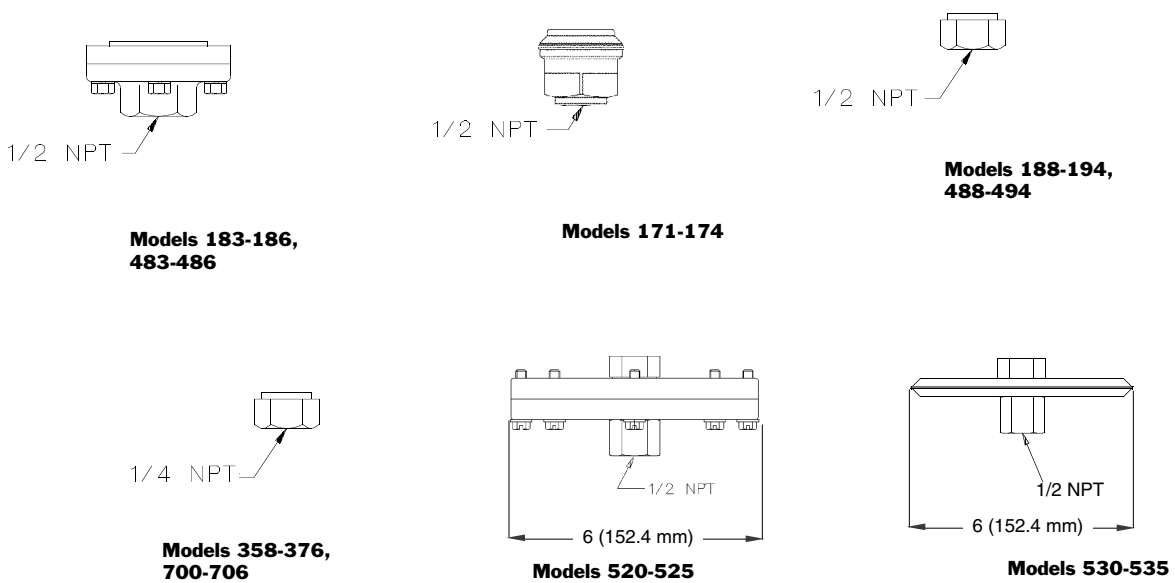
Models	Dimension A		
	Inches	mm	NPT
171-174	7.94	201,7	1/2
183-186	7.94	201,7	1/2
188, 189	7.16	182,6	1/2
190-194	7.00	179,9	1/2
358-376	7.69	195,4	1/4
483-486	7.94	201,7	1/2
488, 489	7.16	182,6	1/2
490-494	7.00	179,9	1/2
520-525	8.81	223,8	1/2
530-535	8.38	212,9	1/2
560-564	7.06	179,4	2" Sanitary fitting
565-567	7.06	179,4	1 1/2" Sanitary fitting
700-706	6.94	176,3	1/4

Models	Material	Type
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Temperature

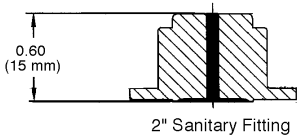
H21BS-H23BS	304 Stainless Steel	Bulb & Capillary
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Pressure Sensors

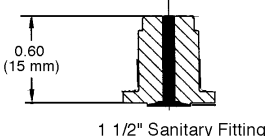


Pressure Sensors *(continue)*

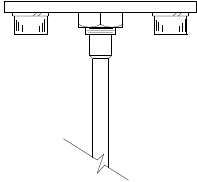
Temperature Sensors



Models 560-564



Models 565-567



Models H21BS-H23BS