



Series V6 FLOTECT® Flow Switch

Specifications - Installation and Operating Instructions



The Series V6 FLOTECT® Flow Switch is an inexpensive, explosion-proof flow switch for use on air, water or other compatible gases and liquids. Three configurations are available - 1. Factory installed in a tee. 2. With a trimmable vane for field adjustment and installation in a suitable tee. 3. Low flow models with an integral tee and adjustable valve. All are available with an optional enclosure which is UL and CSA listed, or Directive 2014/34/EU (ATEX) compliant for CE 2813 $\text{II 2 G Ex db IIC T6 Gb}$ Process Temps $\leq 75^{\circ}\text{C}$ or IECEx compliant for Ex db IIC T6 Gb Process Temp $\leq 75^{\circ}\text{C}$.

INSTALLATION

Unpack and remove any packing material found inside lower housing or tee.

Switch can be installed in any position but the actuation/deactuation flow rates in the charts are based on horizontal pipe runs and are nominal values. For more precise settings, units can be factory calibrated to specific flow rates.

V6 Models with Tee are supplied in 1/2" - 2" NPT sizes. Install in piping with arrow pointing in direction of flow.

V6 Low Flow Models have 1/2" NPT connections and are field adjustable. Install in piping with arrow pointing in direction of flow. To adjust, loosen the four socket head cap screws on bottom. The adjustment valve rotates 90° between "O" (open) and "C" (closed). See flow charts for approximate ranges. Tighten screws once the required flow rate has been set.

V6 with Field Trimmable Vane. These models enable the installer to choose approximate actuation/deactuation points by trimming the full size vane at appropriate letter-designated marks on a removable template. Flows are defined in the following charts. Note that the charts are based on either brass or cast iron reducing tees or stainless or forged steel straight tees with bushings where necessary. Install in piping with arrow pointing in direction of flow.

When bushings are used, they must be back drilled to allow proper clearance for unrestricted vane travel. Bore the I.D. to 13/16" (20 mm) on 1/2" x 3/4" bushings or 1" (25 mm) on larger bushings. The depth of the bore must leave internal threads 9/16" (14 mm) high for proper engagement between the lower housing of the switch and the bushing. Check for proper vane travel and switch operation after installation.

SPECIFICATIONS

Service: Gases or liquids compatible with wetted materials.

Wetted Materials: Standard V6 Models: Vane: 301 SS; Lower Body: brass or 303 SS; Magnet: ceramic; Other: 301, 302 SS; Tee: brass, iron, forged steel, or 304 SS. V6 Low Flow Models: Lower Body: brass or 303 SS; Tee: brass or 304 SS; Magnet: ceramic; O-ring: Buna-N standard, Fluoroelastomer optional; Other: 301, 302 SS.

Temperature Limits: -4 to 220°F (-20 to 105°C) Standard, MT high temperature option 400°F (205°C) (MT not UL, CSA, ATEX, IECEx or KC) ATEX Compliant AT, IECEx IEC Option and KC (KC Option), Ambient Temperature -4 to 167°F (-20 to 75°C) Process Temperature: -4 to 220°F (-20 to 105°C).

Pressure Limit: Brass lower body with no tee models 1000 psig (69 bar), 303 SS lower body with no tee models 2000 psig (138 bar). Brass tee models 250 psi (17.2 bar), iron tee models 1000 psi (69 bar), forged and stainless steel tee models 2000 psi (138 bar), low flow models 1450 psi (100 bar).

Enclosure Rating: Weatherproof and Explosion-proof. Listed with UL and CSA for Class I, Groups A, B, C and D; Class II, Groups E, F, and G. (Group A on stainless steel body models only).

CE 2813 $\text{II 2 G Ex db IIC T6 Gb}$ Process Temps $\leq 75^{\circ}\text{C}$ Alternate Temperature Class T5 Process Temps $\leq 90^{\circ}\text{C}$, 115°C (T4) Process Temp $\leq 105^{\circ}\text{C}$ consult factory. EU-Type Certificate No.: KEMA 04ATEX2128.

ATEX Standards: EN 60079-0: 2011 + A11:2013; EN 60079-1: 2014.

IECEx Certified: For Ex db IIC T6 Gb Process Temps $\leq 75^{\circ}\text{C}$ Alternate Temperature Class T5 Process Temps $\leq 90^{\circ}\text{C}$, 115°C (T4) Process Temps $\leq 105^{\circ}\text{C}$ consult factory.

IECEx Certificate of Conformity: IECEx DEK 11.0039; IECEx Standards: IEC 60079-0: 2011; IEC 60079-1: 2014; Korean Certified (KC) for: Ex d IIC T6 Gb Process Temps $\leq 75^{\circ}\text{C}$; KTL Certificate Number: 12-KB4BO-0091.

Switch Type: SPDT snap switch standard, DPDT snap switch optional.

Electrical Rating: UL models: 5 A @ 125/250 VAC. CSA, ATEX and IECEx models: 5 A @ 125/250 VAC (V~); 5 A res., 3 A ind. @ 30 VDC (V=). MV option: 0.1 A @ 125 VAC (V~). MT option: 5 A @ 125/250 VAC (V~). [MT option not UL, CSA, ATEX or IECEx].

Electrical Connections: UL models: 18 AWG, 18" (460 mm) long. ATEX/CSA /IECEx models: terminal block.

Upper Body: Brass or 303 stainless steel.

Conduit Connections: 3/4" male NPT standard, 3/4" female NPT on junction box models. M25 x 1.5 with BSPT option.

Process Connection: 1/2" male NPT on models without a tee.

Mounting Orientation: Switch can be installed in any position but the actuation/deactuation flow rates in the charts are based on horizontal pipe runs and are nominal values.

Set Point Adjustment: Standard V6 models none. Without tee models vane is trimmable. Low flow models are field adjustable in the range shown. See set point charts on opposite page.

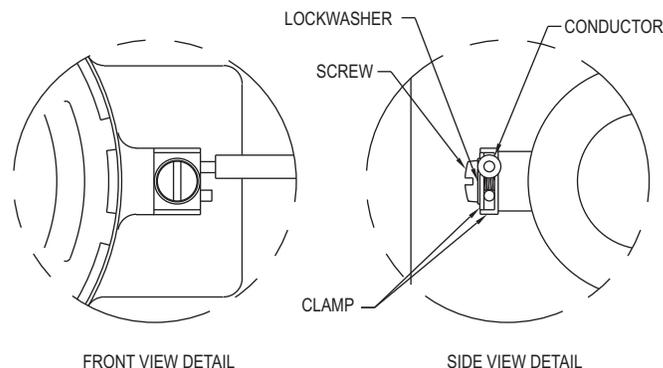
Weight: 2 to 6 lb (.9 to 2.7 kg) depending on construction.

Options not Shown: Custom calibration, bushings, PVC tee, reinforced vane, DPDT relays.

ELECTRICAL CONNECTIONS

Connect wire leads in accordance with local electrical codes and switch action required. N.O. contacts will close and N.C. contacts will open when flow increases to the actuation point. They will return to "normal" condition when flow decreases to the deactuation point. Black = Common, Blue = Normally Open and Red = Normally Closed.

For units supplied with both internal ground and external bonding terminals, the ground screw inside the housing must be used to ground the control. The external bonding screw is for supplementary bonding when allowed or required by local code. When external bonding conductor is required, conductor must be wrapped a minimum of 180° about the external bonding screw. See below. Some CSA listed models are furnished with a separate green ground wire. Such units must be equipped with a junction box, not supplied but available on special order.



EU-Type Certificate, IECEx and KC Installation Instructions:

Cable Connection

The cable entry device shall be certified in type of explosion protection flameproof enclosure "d", suitable for conditions of use and correctly installed. For Ta ≥ 65°C cable and cable gland rated ≥ 90°C shall be used.

Conduit Connection

An Ex d certified sealing device such as a conduit seal with setting compound shall be provided immediately to the entrance of the valve housing. For Ta ≥ 65°C wiring and setting compound, in the conduit seal, rated ≥ 90°C shall be used.

Note: ATEX, IECEx and KC units only: The temperature class is determined by the maximum ambient and or process temperature. Units are intended to be used in ambient of -20°C ≤ Tamb ≤ 75°C. Units may be used in process temperatures up to 105°C providing the enclosure and switch body temperature do not exceed 75°C. The standard Temperature Class is T6 Process Temp ≤ 75°C. Alternate Temperature Class of T5 Process Temp ≤ 90°C and 115°C (T4) Process Temp ≤ 105°C are available consult factory.

Refer to Certificate No: IECEx DEK 11.0039 for conditions of safe use for IECEx compliant units.

All wiring, conduit and enclosures must meet applicable codes for hazardous areas. Conduits and enclosures must be properly sealed. For outdoor or other locations where temperatures vary widely, precautions should be taken to prevent condensation inside switch or enclosure. Electrical components must be kept dry at all times.

CAUTION: To prevent ignition of hazardous atmospheres, disconnect the device from the supply circuit before opening. Keep assembly tightly closed when in use.

MAINTENANCE

Inspect and clean wetted parts at regular intervals. The cover should be in place at all times to protect, the internal components from dirt, dust and weather and to maintain hazardous location ratings. Disconnect device from the supply circuit before opening to prevent ignition of hazardous atmosphere. Repairs to be conducted by Dwyer Instruments, Inc. Units in need of repair should be returned to the factory prepaid.

Example	V6	EP	BB	D	1	B	AT	Series V6EPB-B-D-1-B-AT Flotect® Mini-Size Flow Switch, brass body, DPDT, 1/2" brass tee, with ATEX approval.
Series	V6							Flotect® Mini-Size Flow Switch
Construction		EP						Explosion Proof
Body			BB					Brass Stainless Steel
Switch Type				D				DPDT SPDT
Tee Connection Size					1 2 3 4 5 6 LF 1E 2E 3E 4E 5E 6E LFE			1/2" NPT 3/4" NPT 1" NPT 1-1/4" NPT 1-1/2" NPT 2" NPT Low Flow with 1/2" NPT Inlet and Outlet 1/2" BSPT ++ 3/4" BSPT ++ 1" BSPT ++ 1-1/4" BSPT ++ 1-1/2" BSPT ++ 2" BSPT ++ Low Flow with 1/2" BSPT Inlet and Outlet ++
Tee Type and Material						B S O		Brass Stainless Steel NO Tee with Field Trimmable Vane
Options							18 20 22 022A 31 AT BUSH2 BUSH3 BUSH4 BUSH5 BUSH6 BUSH7 BUSH8 BUSH9 BUSH10 BUSH11 CSA CV FTR GL ID IEC JCTLH KC MT MV NN ORFB ORFS PT RV ST TBC VIT	0.018 Spring for Low Flow .020 Spring for Low Flow .022 Spring for Low Flow .022 Spring for Low Flow with Alnico Magnet .031 Spring for Low Flow ATEX Approval 1/2" NPT x 3/4" NPT Bushing 1/2" NPT x 1" NPT Bushing 1/2" NPT x 1-1/4" NPT Bushing 1/2" NPT x 1-1/2" NPT Bushing 1/2" NPT x 2" NPT Bushing 1/2" BSPT x 3/4" BSPT Bushing, M25 X 1.5 Conduit Connection ++ 1/2" BSPT x 1" BSPT Bushing, M25 X 1.5 Conduit Connection ++ 1/2" BSPT x 1-1/4" BSPT Bushing, M25 X 1.5 Conduit Connection ++ 1/2" BSPT x 1-1/2" BSPT Bushing, M25 X 1.5 Conduit Connection ++ 1/2" BSPT x 2" BSPT Bushing, M25 X 1.5 Conduit Connection ++ CSA* Custom Vane Flow Test Report Ground Lead* Custom Nameplate IECEx Approval Junction Box with Left Side Conduit Korean Certified* High Temperature* Gold Contacts No Nameplate* Brass Orifice Stainless Steel Orifice Paper Tag Reinforced Vane Stainless Steel Tag Terminal Block Connector* Flouroelstomer Seals

*O ptions that do not have ATEX or IECEx
++ BSPT options not compatible with KC option

V6 With Tee

Cold Water - Factory Installed Tee

Approximate actuation/deactuation low Rates

GPM upper, M³/HR lower

1/2" NPT	3/4" NPT	1" NPT	1-1/4" NPT	1-1/2" NPT	2" NPT
1.5 1.0	2.0 1.25	3.0 1.75	4.0 3.0	6.0 5.0	10.0 8.5
0.34 0.23	0.45 0.28	0.68 0.40	0.91 0.68	1.36 1.14	2.27 1.93

Air-Factory Installed Tee

Approximate actuation/deactuation flow rates

SCFM upper, NM³/M lower

1/2" NPT	3/4" NPT	1" NPT	1-1/4" NPT	1-1/2" NPT	2" NPT
6.5 5.0	10.0 8.0	14 12	21 18	33 30	43 36
.18 .14	.28 .23	.40 .34	.59 .51	.93 .85	1.19 1.02

V6 Low Flow, Field Adjustable

Cold Water - Low Flow Models

Approximate actuation/deactuation flow rates

GPM upper, M³/HR lower

Minimum	Maximum
.04 .03	.75 0.60
.009 .007	0.17 0.14

Air - Low Flow Models

Approximate actuation/deactuation flow rates

SCFM upper, NM³/M lower

Minimum	Maximum
.18 .15	2.70 2.0
.005 .004	.08 .06

Attention: Units without the "AT" suffix are not Directive 2014/34/EU (ATEX) compliant. These units are not intended for use in potentially hazardous atmospheres in the EU. These units may be CE marked for other Directives of the EU.

V6 With Field Trimmable Vane
Cold Water - Brass or Cast Iron Reducing Tee
 Approximate actuation/deactuation flow rates
 GPM upper, M³/HR lower

Air - Brass or Cast Iron Reducing Tee
 Approximate actuation/deactuation flow rates
 SCFM upper, NM³/M lower

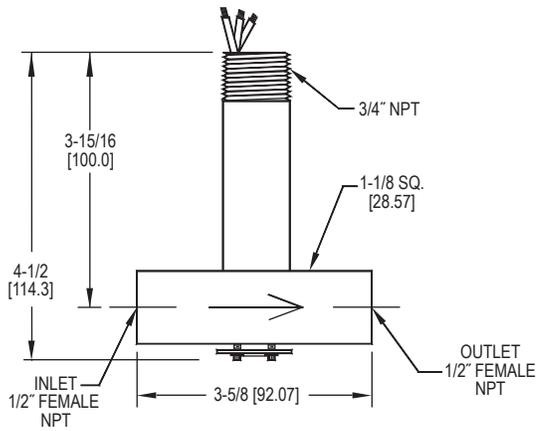
Vane	1/2" NPT	3/4" NPT	1" NPT	1-1/4" NPT	1-1/2" NPT	2" NPT	1/2" NPT	3/4" NPT	1" NPT	1-1/4" NPT	1-1/2" NPT	2" NPT
Full Size						9.0 8.5						39.0 37.0
a						2.0 1.9						1.10 1.05
						9.5 9.0						40.0 38.0
						2.2 2.0						1.13 1.08
b						10.0 9.3						42.0 40.0
						2.3 2.1						1.19 1.13
c						11.0 10.0						50.0 44.0
						2.5 2.3						1.42 1.25
d					6.2 5.5	12.0 10.0					27.0 25.0	55.0 46.0
					1.4 1.2	2.7 2.3					0.76 0.71	1.56 1.30
e					7.0 6.5	13.0 11.0						30.0 28.0
					1.6 1.5	3.0 2.5						0.85 0.79
f				4.3 3.9	7.6 7.1	14.0 12.0				20.0 18.0	32.0 30.0	
				1.0 0.9	1.7 1.6	3.2 2.7				0.57 0.51	0.91 0.85	
g				4.9 4.4	8.0 7.3					21.0 19.0	34.0 32.0	
				1.1 1.0	1.8 1.7					0.59 0.54	0.96 0.91	
h				5.5 5.0	9.0 8.2					23.0 21.0	37.0 34.0	
				1.2 1.1	2.0 1.9					0.65 0.59	1.05 0.96	
i		3.5 3.1	6.0 5.6	10.0 9.0				16.0 15.0	24.0 22.0	39.0 36.0		
		0.8 0.7	1.4 1.3	2.3 2.0				0.45 0.42	0.68 0.62	1.10 1.02		
j		4.0 3.5	7.0 6.6	13.0 11.0				18.0 16.0	28.0 25.0	51.0 45.0		
		0.9 0.8	1.6 1.5	3.0 2.5				0.51 0.45	0.79 0.71	1.44 1.27		
k		4.6 4.2	8.0 7.6	15.0 13.0				19.0 17.0	33.0 30.0	69.0 57.0		
		1.04 0.95	1.8 1.7	3.4 3.0				0.54 0.48	0.93 0.85	1.95 1.61		
l		2.6 2.3	5.6 5.2	10.0 9.0				13.0 12.0	22.0 20.0	38.0 35.0		
		0.6 0.5	1.3 1.2	2.3 2.0				0.37 0.34	0.62 0.57	1.08 0.99		
m	1.6 1.3	3.5 3.1	6.3 6.1	12.0 10.0				6.4 3.8	15.0 14.0	25.0 23.0	45.0 42.0	
	0.4 0.3	0.8 0.7	1.43 1.39	2.7 2.3				0.18 0.11	0.42 0.40	0.71 0.65	1.27 1.19	
n	2.2 1.8	4.3 3.8	8.0 7.5					10.0 7.0	20.0 16.0	32.0 28.0		
	0.5 0.4	1.0 0.9	1.8 1.7					0.28 0.20	0.57 0.45	0.91 0.79		
o	3.0 2.4							12.0 9.0				
	0.7 0.5							0.34 0.25				

Cold Water - Stainless or Forged Steel Straight Tee and Bushing
 Approximate actuation/deactuation flow rates
 GPM upper, M³/HR lower

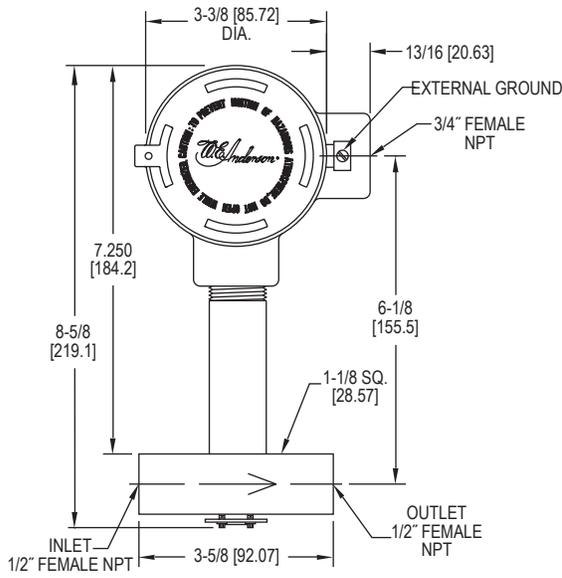
Air - Stainless or Forged Steel Straight Tee and Bushing
 Approximate actuation/deactuation flow rates
 SCFM upper, NM³/M lower

Vane	1/2" NPT	3/4" NPT	1" NPT	1-1/4" NPT	1-1/2" NPT	2" NPT	1/2" NPT	3/4" NPT	1" NPT	1-1/4" NPT	1-1/2" NPT	2" NPT
Full Size				5.0 4.5	8.5 7.8					21.0 18.0	33.0 30.0	
a				1.1 1.0	1.9 1.8					0.59 0.51	0.93 0.85	
				5.5 5.0	9.2 8.6					22.0 20.0	39.0 36.0	
				1.2 1.1	2.1 2.0					0.62 0.57	1.10 1.02	
b				6.2 5.7	9.8 9.0					24.0 22.0	42.0 38.0	
				1.4 1.3	2.2 2.0					0.68 0.62	1.19 1.08	
c				6.8 6.3	12.0 10.0					28.0 26.0	51.0 46.0	
				1.5 1.4	2.7 2.3					0.79 0.74	1.44 1.30	
d		2.8 2.4	8.5 7.8	13.0 11.0				12.0 10.0	33.0 30.0	55.0 50.0		
		0.6 0.5	1.9 1.8	3.0 2.5				0.34 0.28	0.93 0.85	1.56 1.42		
e		3.4 3.0	10.0 9.2					14.0 12.0	37.0 34.0			
		0.8 0.7	2.3 2.1					0.40 0.34	1.05 0.96			
f		4.0 3.6	12.0 10.0					16.0 14.0	43.0 40.0			
		0.91 0.82	2.7 2.3					0.45 0.40	1.22 1.13			
g	2.0 1.5	5.0 4.5						8.0 6.5	19.0 17.0			
	0.5 0.3	1.1 1.0						0.23 0.18	0.54 0.48			
h	2.5 2.0	6.5 6.1						11.0 10.0	26.0 24.0			
	0.6 0.5	1.48 1.39						0.31 0.28	0.74 0.68			
i	3.5 3.0	9.0 8.2						14.0 13.0	32.0 30.0			
	0.8 0.7	2.0 1.9						0.40 0.37	0.91 0.85			
j	7.0 5.5							27.0 24.0				
	1.6 1.2							0.76 0.68				
k	10.0 8.0							39.0 36.0				
	2.3 1.8							1.10 1.02				

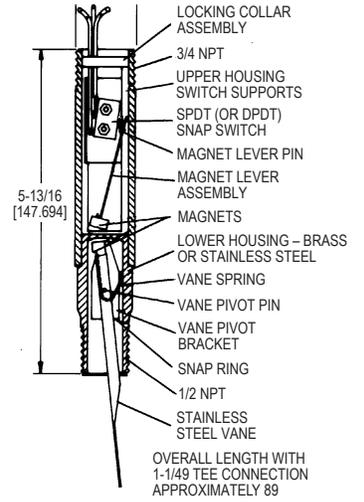
DIMENSIONS
Series V6 FLOTECT® Flow Switch



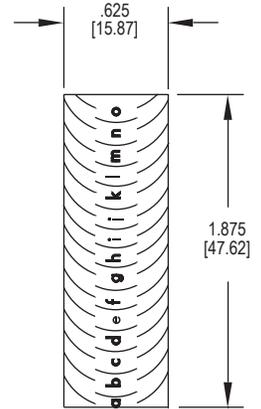
V6 Low Flow



V6 Low Flow with CSA, IECEx, ATEX Conduit Enclosure

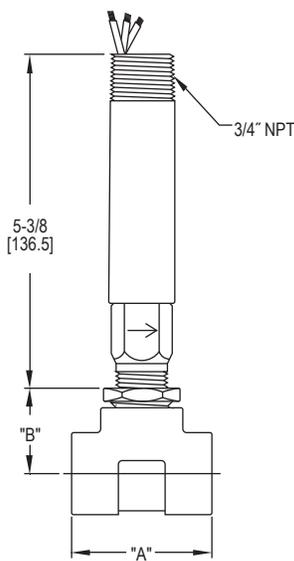


V6 with Field Trimable Vane

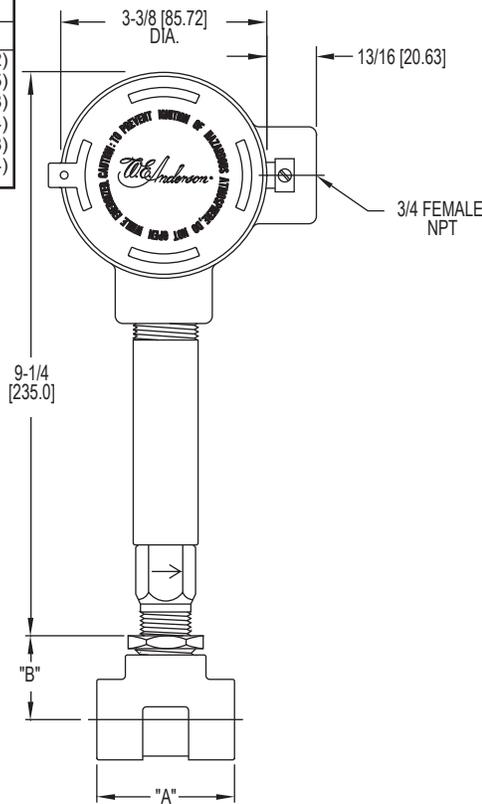


Trimmable Vane

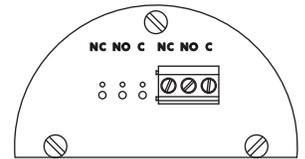
Pipe Size	Brass/Ductile Iron		Forged/Stainless Steel		Malleable Iron	
	Dim. A	Dim. B	Dim. A	Dim. B	Dim. A	Dim. B
1/2"	2-1/4 (57)	1-1/8 (29)	2-1/4 (57)	1-1/8 (29)	2-1/2 (64)	1-1/4 (32)
3/4"	2-3/8 (60)	1-1/4 (32)	2-5/8 (67)	1-7/8 (47)	2-5/8 (67)	1-3/8 (35)
1"	2-1/2 (64)	1-3/8 (35)	3 (76)	2-1/8 (54)	2-7/8 (73)	1-1/2 (38)
1-1/4"	2-5/8 (67)	1-1/2 (38)	3-1/2 (89)	2-1/2 (64)	3 (76)	1-3/4 (44)
1-1/2"	2-7/8 (73)	1-5/8 (41)	4 (102)	2-3/4 (70)	3-1/4 (83)	1-7/8 (48)
2"	3 (76)	1-7/8 (48)	4-3/4 (121)	3-1/8 (79)	3-1/2 (89)	2-1/8 (54)



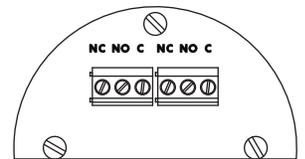
V6 with Tee



V6 with Tee and CSA, IECEx, ATEX Conduit Enclosure



SPDT



DPDT

**Terminal Connections
 CSA, IECEx, ATEX Enclosures**