



Dwyer E-22 Series V6 Flotect Flow Switch Instruction Manual

[Home](#) » [Dwyer](#) » Dwyer E-22 Series V6 Flotect Flow Switch Instruction Manual 

Contents

- 1 Dwyer E-22 Series V6 Flotect Flow Switch
- 2 INSTALLATION
- 3 ELECTRICAL CONNECTIONS
- 4 SPECIFICATIONS
 - 4.1 EU-Type Certificate, IECEx and KC Installation Instructions:
- 5 MAINTENANCE
 - 5.1 V6 With Tee
 - 5.2 V6 With Field Trimmable Vane
- 6 DIMENSIONS
- 7 Documents / Resources
 - 7.1 References
- 8 Related Posts



Dwyer E-22 Series V6 Flotect Flow Switch



The Series V6 Flotec® 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 2813 II 2 G Ex db IIC T6 Gb
Process Temp ≤ 75°C or IECEx compliant for Ex db IIC T6 Gb Process Temp ≤ 75°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.

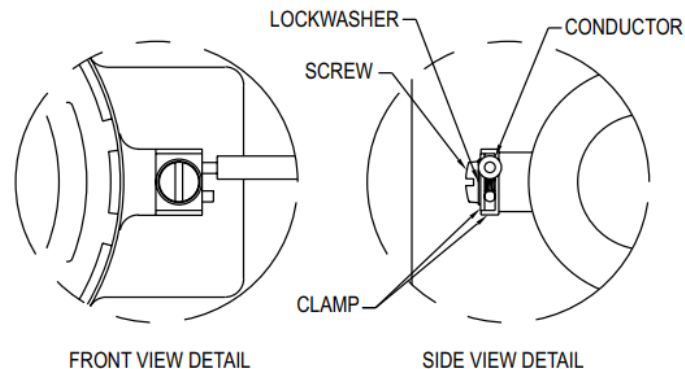
ELECTRICAL CONNECTIONS

- 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.

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 SS 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 SS body models only). 2813 II 2 G Ex db IIC T6 Gb Process Temp≤75°C Alternate Temperature Class T5 Process Temp≤90°C, 115°C (T4) Process Temp≤105°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 Temp≤75°C Alternate Temperature Class T5 Process Temp≤90°, 115°C (T4) Process Temp≤105°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 Temp≤75°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 SS.
- **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.



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 $T_a \geq 65^\circ\text{C}$ cable and cable gland rated $\geq 90^\circ\text{C}$ 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 $T_a \geq 65^\circ\text{C}$ wiring and setting compound, in the conduit seal, rated $\geq 90^\circ\text{C}$ 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 $-20^\circ\text{C} \leq T_{\text{amb}} \leq 75^\circ\text{C}$. 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 $\leq 75^\circ\text{C}$. Alternate Temperature Class of T5 Process Temp $\leq 90^\circ\text{C}$ and 115°C (T4) Process Temp $\leq 105^\circ\text{C}$ 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.

MODEL CHART

Example	V6	EP	-B B	-D	-1	-B	-AT	V6EPB-B-D-1-B-AT
Series	V6							Flotect® mini-size flow switch
Construct ion		EP						Explosion proof
Body			BB SS					Brass Stainless steel
Switch Ty pe				D S				DPDT SPDT
Tee Conn ection Siz e					1 2 3 4 5 6 LF 1E 2E 3E 4E 5E 6E LF E			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 Mater ial						B S O		Brass Stainless steel No tee with field trimmable vane

Options							18	
							20	
							22	0.018 spring for low flow
							022A	.020 spring for low flow
							31	.022 spring for low flow
							AT BU	
							SH2 B	.022 spring for low flow with alnico magnet
							USH3	
							BUSH	.031 spring for low flow ATEX approval
							4 BUS	1/2" NPT x 3/4" NPT bushing 1/2" NPT x 1" NPT
							H5 BU	bushing 1/2" NPT x 1-1/4" NPT bushing 1/2" NPT x 1-1/
							SH6 B	2" NPT bushing 1/2" NPT x 2" NPT bushing
							USH7	
							BUSH	1/2" BSPT x 3/4" BSPT bushing, M25 X 1.5 conduit con
							8 BUS	nection** 1/2" BSPT x 1" BSPT bushing, M25 X 1.5 con
							H9 BU	duit connection** 1/2" BSPT x 1-1/4" BSPT bushing, M2
							SH10	5 X 1.5 conduit connection** 1/2" BSPT x 1-1/2" BSPT b
							BUSH	ushing, M25 X 1.5 conduit connection** 1/2" BSPT x 2"
							11 CS	BSPT bushing, M25 X 1.5 conduit connection** CSA*
							A	
							CV FT	Custom vane Flow test report Ground lead*
							R GL I	
							D IEC	Custom nameplate IECEx approval
							JCTLH	Junction box with left side conduit Korean certified
							KC	High temperature* Gold contacts
							MT M	No nameplate* Brass orifice Stainless steel orifice
							V NN	Paper tag Reinforced vane Stainless steel tag
							ORFB	
							ORFS	Terminal lock connector* Fluoropolymer seals
							PT RV	
							ST TB	
							C VIT	
<p>*Options that do not have ATEX or IECEx.</p> <p>**BSPT options not compatible with KC option.</p>								

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 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 0.34 0.23	2.0 1.25 0.45 0.28	3.0 1.75 0.68 0.40	4.0 3.0 0.91 0.68	6.0 5.0 1.36 1.14	10.0 8.5 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 .18 .14	10.0 8.0 .28 .23	14 12 .40 .34	21 18 .59 .51	33 30 .93 .85	43 36 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

V6 With Field Trimmable Vane

- **Cold Water – Brass or Cast Iron Reducing Tee**

Approximate actuation/deactuation flow rates GPM upper, M3/HR lower

Vane	1/2" NPT	3/4" NPT	1" NPT	1-1/4" NPT	1-1/2" NPT	2" NPT
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Full Size						9.0 8.5 2.0 1.9
a						9.5 9.0 2.2 2.0
b						10.0 9.3 2.3 2.1
c						11.0 10.0 2.5 2.3
d					6.2 5.5 1.4 1.2	12.0 10.0 2.7 2.3
e					7.0 6.5 1.6 1.5	13.0 11.0 3.0 2.5
f				4.3 3.9 1.0 0.9	7.6 7.1 1.7 1.6	14.0 12.0 3.2 2.7
g				4.9 4.4 1.1 1.0	8.0 7.3 1.8 1.7	
h				5.5 5.0 1.2 1.1	9.0 8.2 2.0 1.9	
i			3.5 3.1 0.8 0.7	6.0 5.6 1.4 1.3	10.0 9.0 2.3 2.0	
j			4.0 3.5 0.9 0.8	7.0 6.6 1.6 1.5	13.0 11.0 3.0 2.5	

k			4.6 4.2 1.04 0.95	8.0 7.6 1.8 1.7	15.0 13.0 3.4 3.0	
l		2.6 2.3 0.6 0.5	5.6 5.2 1.3 1.2	10.0 9.0 2.3 2.0		
m	1.6 1.3 0.4 0.3	3.5 3.1 0.8 0.7	6.3 6.1 1.43 1.39	12.0 10.0 2.7 2.3		
n	2.2 1.8 0.5 0.4	4.3 3.8 1.0 0.9	8.0 7.5 1.8 1.7			
o	3.0 2.4 0.7 0.5					

• **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
Full Size						39.0 37.0 1.10 1.05
a						40.0 38.0 1.13 1.08
b						42.0 40.0 1.19 1.13
c						50.0 44.0 1.42 1.25
d					27.0 25.0 0.76 0.71	55.0 46.0 1.56 1.30

e					30.0 28.0 0.85 0.79	
f				20.0 18.0 0.57 0.51	32.0 30.0 0.85 0.79	
g				21.0 19.0 0.59 0.54	32.0 30.0 0.91 0.85	
h				23.0 21.0 0.65 0.59	34.0 32.0 0.96 0.91	
i			16.0 15.0 0.45 0.42	24.0 22.0 0.68 0.62	37.0 34.0 1.05 0.96	
j			18.0 16.0 0.51 0.45	28.0 25.0 0.79 0.71	39.0 36.0 1.10 1.02	
k			19.0 17.0 0.54 0.48	33.0 30.0 0.93 0.85	51.0 45.0 1.44 1.27	
l		13.0 12.0 0.37 0.34	22.0 20.0 0.62 0.57	38.0 35.0 1.08 0.99	69.0 57.0 1.95 1.61	
m	6.4 3.8 0.18 0.11	15.0 14.0 0.42 0.40	25.0 23.0 0.71 0.65	45.0 42.0 1.27 1.19		
n	10.0 7.0 0.28 0.20	20.0 16.0 0.57 0.45	32.0 28.0 0.91 0.79			
o	12.0 9.0 0.34 0.25					

• **Cold Water – Stainless or Forged Steel Straight Tee and Bushing**

Approximate actuation/deactuation flow rates GPM upper, M3/HR lower

Vane	1/2" NPT	3/4" NPT	1" NPT	1-1/4" NPT	1-1/2" NPT	2" NPT
Full Size				5.0 4.5 1.1 1.0	8.5 7.8 1.9 1.8	
a				5.5 5.0 1.2 1.1	9.2 8.6 2.1 2.0	
b				6.2 5.7 1.4 1.3	9.8 9.0 2.2 2.0	
c				6.8 6.3 1.5 1.4	12.0 10.0 2.7 2.3	
d			2.8 2.4 0.6 0.5	8.5 7.8 1.9 1.8	13.0 11.0 3.0 2.5	
e			3.4 3.0 0.8 0.7	10.0 9.2 2.3 2.1		
f			4.0 3.6 0.91 0.82	12.0 10.0 2.7 2.3		
g		2.0 1.5 0.5 0.3	5.0 3.6 1.1 1.0			
h		2.5 2.0 0.6 0.5	6.5 6.1 1.48 1.39			
i		3.5 3.0 0.8 0.7	9.0 8.2 2.0 1.9			
j		7.0 5.5 1.6 1.2				

k		10.0 8.0 2.3 1.8				
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• **Air – Stainless or Forged Steel Straight Tee and Bushing**

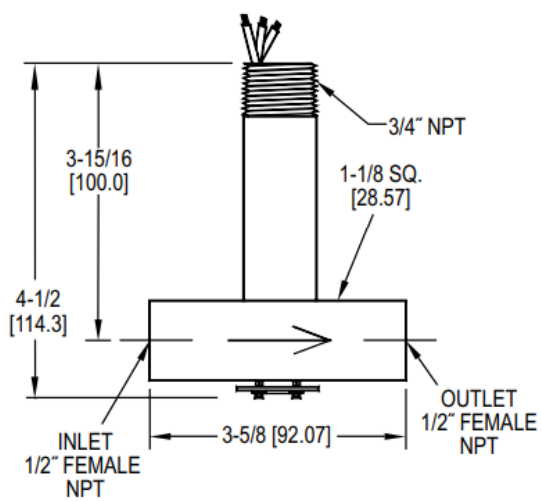
Approximate actuation/deactuation flow rates SCFM upper, NM3/M lower

Vane	1/2" NPT	3/4" NPT	1" NPT	1-1/4" NPT	1-1/2" NPT	2" NPT
Full Size				21.0 18.0 0.59 0.51	33.0 30.0 0.93 0.85	
a				22.0 20.0 0.62 0.57	39.0 36.0 1.10 1.02	
b				24.0 22.0 0.68 0.62	42.0 38.0 1.19 1.08	
c				28.0 26.0 0.79 0.74	51.0 46.0 1.44 1.30	
d			12.0 10.0 0.34 0.28	33.0 30.0 0.93 0.85	55.0 50.0 1.56 1.42	
e			14.0 12.0 0.40 0.34	37.0 34.0 1.05 0.96		
f			16.0 14.0 0.45 0.40	43.0 40.0 1.22 1.13		
g		8.0 6.5 0.23 0.18	19.0 17.0 0.54 0.48			
h		11.0 10.0 0.31 0.28	26.0 24.0 0.74 0.68			

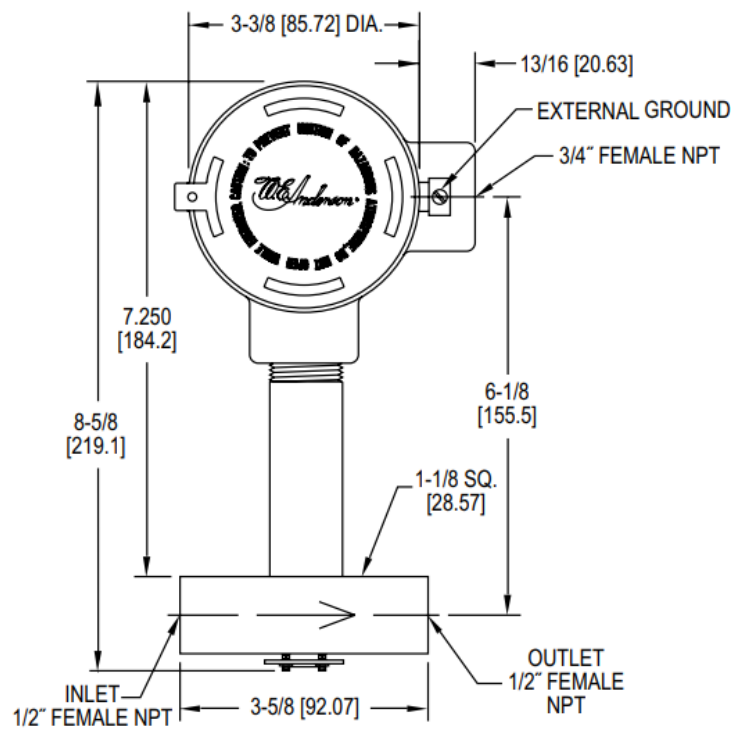
i		14.0 13.0 0.40 0.37	32.0 30.0 0.91 0.85			
j		27.0 24.0 0.76 0.68				
k		39.0 36.0 1.10 1.02				

DIMENSIONS

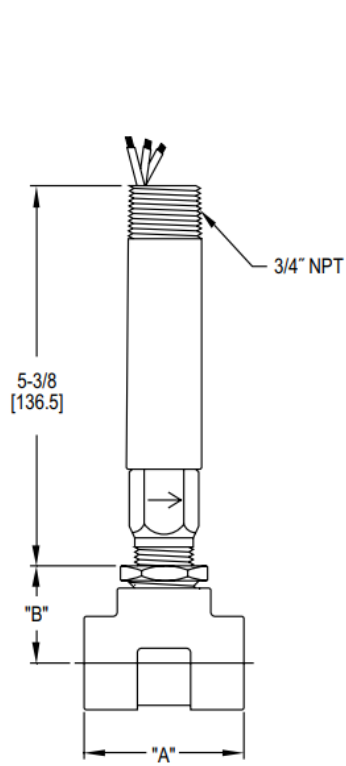
Series V6 Flotect® Flow Switch



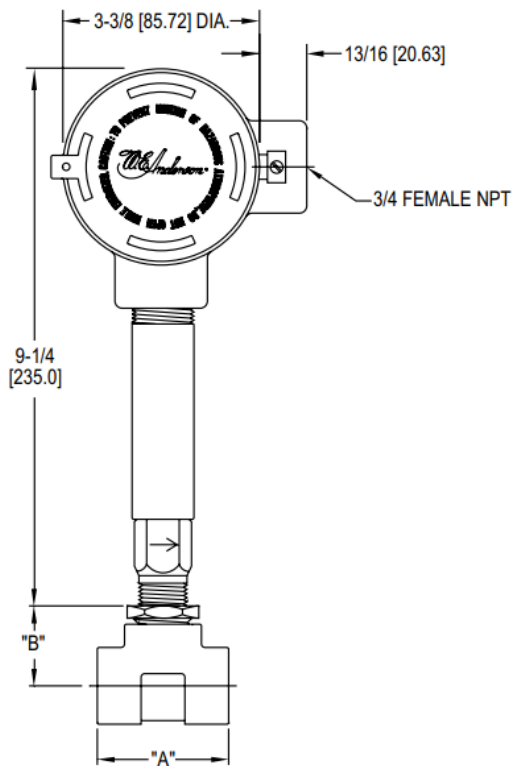
V6 low flow



V6 low flow with CSA, IECEx, ATEX conduit enclosure

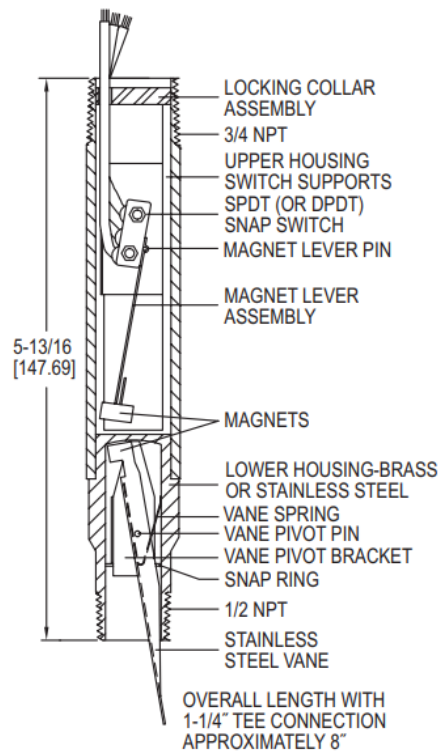


V6 with tee

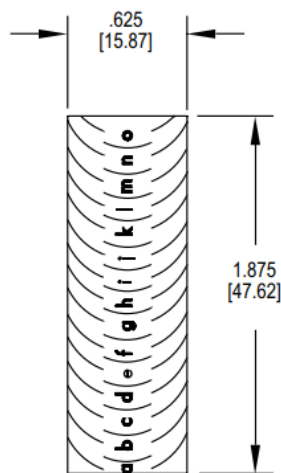


V6 with tee and CSA, IECEx, ATEX
conduit enclosure

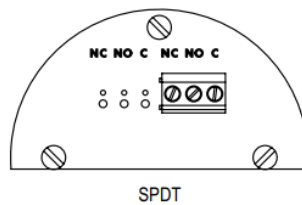
Pipe Size	Brass/Ductile Iron		Forged/Stainless Steel		Malleable Iron	
	Dim. A	Dim. B	Dim. A	Dim. B	Dim. A	Dim. B
1/2"	2-1/4 [57]	1-1/8 [29]	2-1/4 [57]	1-1/8 [29]	2-1/2 [64]	1-1/4 [32]
3/4"	2-3/8 [60]	1-1/4 [32]	2-5/8 [67]	1-7/8 [47]	2-5/8 [67]	1-3/8 [35]
1"	2-1/2 [64]	1-3/8 [35]	3 [76]	2-1/8 [54]	2-7/8 [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]



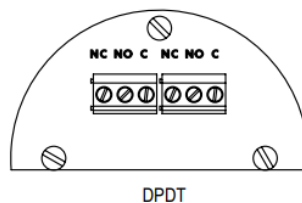
V6 with field trimmable vane



Trimmable vane




SPDT



DPDT

**Terminal connections
CSA, IECEx, ATEX enclosures**

	<p>Dwyer E-22 Series V6 Flotect Flow Switch [pdf] Instruction Manual</p> <p>E-22, Series V6 Flotect Flow Switch, E-22 Series V6 Flotect Flow Switch, V6 Flotect Flow Switch, Flotect Flow Switch, Flow Switch, Switch</p>
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References

- [Dwyer Home](#)