RusAutomation

Bulletin E-22

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 Ex 2 G Ex d C T6 Gb
Process Temp≤75°C or ECEx compliant for Ex d C 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 nstall in piping with arrow pointing in direction of flow

V6 Low Flow Models have 1/2″ NPT connections and are field adjustable nstall 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 nstall 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 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

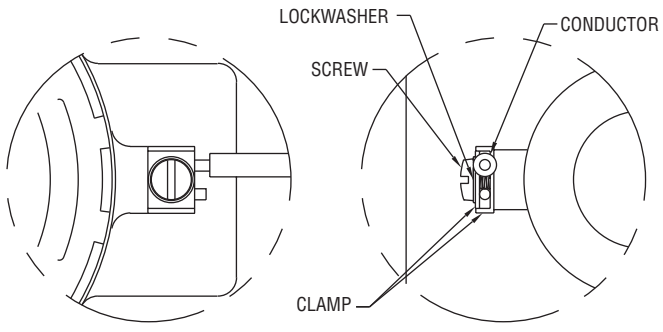
SPECIFICATIONS

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 ECEx or KC) ATEX Compliant AT ECEx EC 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 Groups A B C and D Class Groups E F and G (Group A on stainless steel body models only)
CE 0518 Ex 2 G Ex d C T6 Gb Process Temp≤75°C Alternate Temperature Class T5 Process Temp≤90°C 115°C (T4) Process Temp ≤105°C consult factory EC-type Certificate No KEMA 04ATEX2128
ATEX Standards EN 60079-0 2009 EN 60079-1 2007
IECEx Certified: For Ex d C T6 Gb Process Temp≤75°C Alternate Temperature Class T5 Process Temp≤90°C 115°C (T4) Process Temp≤105°C consult factory
IECEx Certificate of Conformity: ECEx DEK 11 0039 ECEx Standards EC 60079-0 2007 EC 60079-1 2007 Korean Certified (KC) for Ex d C T6 Gb Process Temp≤75°C KTL Certificate Number 2012-2454-75
Switch Type: SPDT snap switch standard DPDT snap switch optional
Electrical Rating: UL models 5 A @125/250 VAC CSA ATEX and ECEx 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 ECEx]
Electrical Connections: UL models 18 AWG 18″ (460 mm) long ATEX/CSA / ECEx 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
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



FRONT VIEW DETAIL SIDE VIEW DETAIL

EC-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 ECEx 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 ECEx DEK 11 0039 for conditions of safe use for ECEx 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
nspect 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 nstruments nc Units in need of repair should be returned to the factory prepaid

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

Example	V6	EP	B	B	S	2	B	MT		V6EPB-B-S-2-B-MT flow switch brass upper housing brass lower housing brass tee with 3/4″ NPT connections SPDT snap switch and high temperature option
Series	V6									Series V6 flow switch
Construction		EP								Explosion Proof and Weatherproof
Upper Body Material			B S							Brass 303 Stainless Steel
Lower Body Material				B S						Brass 303 Stainless Steel
Circuit (Switch) Type					S D					SPDT DPDT
Process Connection Size						1 2 3 4 5 6 LF				1/2″ NPT 3/4″ NPT 1″ NPT 1-1/4″ NPT 1-1/2″ NPT 2″ NPT Low Flow Model (1/2″ NPT connections)
Process Connection Type							0 B FS M PVC PVCSW S S150			No Tee Male NPT Connection Field Trimmable Vane Brass Tee Forged Steel Tee ron Tee PVC Tee with NPT* PVC Tee with sweat joints* 304 Stainless Steel Tee 304 Stainless Steel 150# Tee (For LF Model no tee material chosen tee material matches lower housing choice)
Switch Options								MV MT		Gold Contacts on snap switch for dry circuits (see specifications for ratings) High Temperature switch rated 400°F (205°C) (see specifications for ratings)*
Options									AT CSA EC KC CV FTR GL D JCTLH ORFB ORFS RV TBC V T 018 020 022 022A 031	ATEX approved construction (weatherproof and explosion-proof junction box) CSA approved construction (weatherproof and explosion-proof junction box)* ECEx approved construction (weatherproof and explosion-proof junction box) Korean certified (KC) approved construction (with junction box standard) Custom Vane Flow Test Report Ground Lead* Customer nformation on standard nameplate Weatherproof and explosion-proof junction box left side Orifice Brass Orifice Stainless Steel Reinforced Vane Terminal Block Connector* Viton® O-rings in place of Buna-N on low flow models 018 Spring 020 Spring 022 Spring 022 Spring with Alnico® magnet 031 Spring

* Options that do not have ATEX ECEx or KC
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

Vane	1/2″ NPT	3/4″ NPT	1″ NPT	1-1/4″ NPT	1-1/2″ NPT	2″ NPT
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

1/2″ NPT	3/4″ NPT	1″ NPT	1-1/4″ NPT	1-1/2″ NPT	2″ NPT
					39.0 37.0 1.10 1.05
					40.0 38.0 1.13 1.08
					42.0 40.0 1.19 1.13
					50.0 44.0 1.42 1.25
				27.0 25.0 0.76 0.71	55.0 46.0 1.56 1.30
				30.0 28.0 0.85 0.79	
			20.0 18.0 0.57 0.51	32.0 30.0 0.91 0.85	
			21.0 19.0 0.59 0.54	34.0 32.0 0.96 0.91	
			23.0 21.0 0.65 0.59	37.0 34.0 1.05 0.96	
		16.0 15.0 0.45 0.42	24.0 22.0 0.68 0.62	39.0 36.0 1.10 1.02	
		18.0 16.0 0.51 0.45	28.0 25.0 0.79 0.71	51.0 45.0 1.44 1.27	
		19.0 17.0 0.54 0.48	33.0 30.0 0.93 0.85	69.0 57.0 1.95 1.61	
	13.0 12.0 0.37 0.34	22.0 20.0 0.62 0.57	38.0 35.0 1.08 0.99		
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		
10.0 7.0 0.28 0.20	20.0 16.0 0.57 0.45	32.0 28.0 0.91 0.79			
12.0 9.0 0.34 0.25					

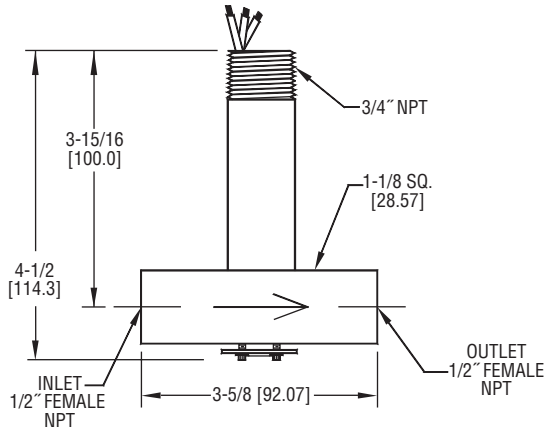
Cold Water - Stainless or Forged Steel Straight Tee and Bushing
Approximate actuation/deactuation flow rates
GPM upper **M³/HR** lower

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 4.5 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				

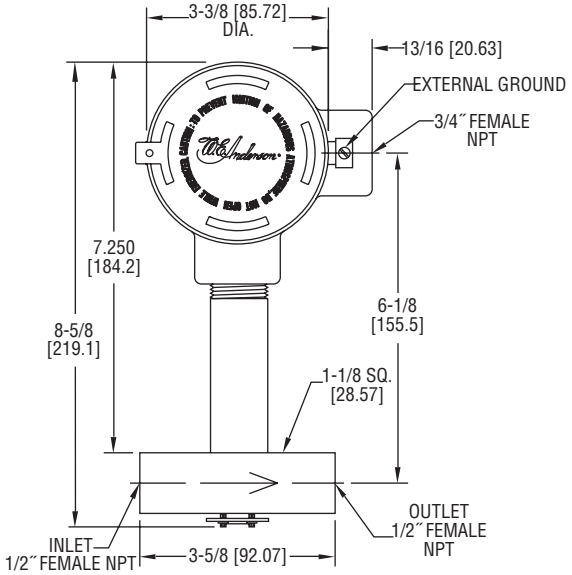
Air - Stainless or Forged Steel Straight Tee and Bushing
Approximate actuation/deactuation flow rates
SCFM upper **NM³/M** lower

1/2″ NPT	3/4″ NPT	1″ NPT	1-1/4″ NPT	1-1/2″ NPT	2″ NPT
			21.0 18.0 0.59 0.51	33.0 30.0 0.93 0.85	
			22.0 20.0 0.62 0.57	39.0 36.0 1.10 1.02	
			24.0 22.0 0.68 0.62	42.0 38.0 1.19 1.08	
			28.0 26.0 0.79 0.74	51.0 46.0 1.44 1.30	
		12.0 10.0 0.34 0.28	33.0 30.0 0.93 0.85	55.0 50.0 1.56 1.42	
		14.0 12.0 0.40 0.34	37.0 34.0 1.05 0.96		
		16.0 14.0 0.45 0.40	43.0 40.0 1.22 1.13		
	8.0 6.5 0.23 0.18	19.0 17.0 0.54 0.48			
	11.0 10.0 0.31 0.28	26.0 24.0 0.74 0.68			
	14.0 13.0 0.40 0.37	32.0 30.0 0.91 0.85			
	27.0 24.0 0.76 0.68				
	39.0 36.0 1.10 1.02				

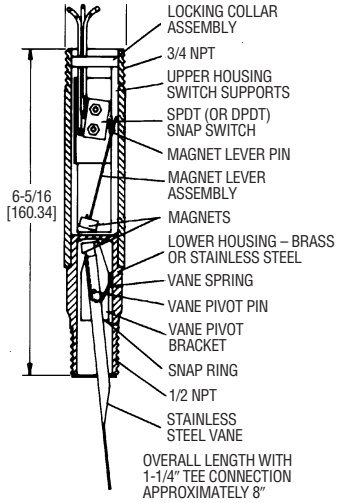
DIMENSIONS
Series V6 FLOTECT® Flow Switch



V6 Low Flow

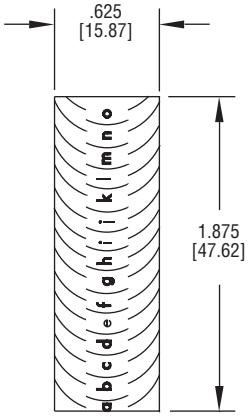


V6 Low Flow with CSA, ATEX Conduit Enclosure

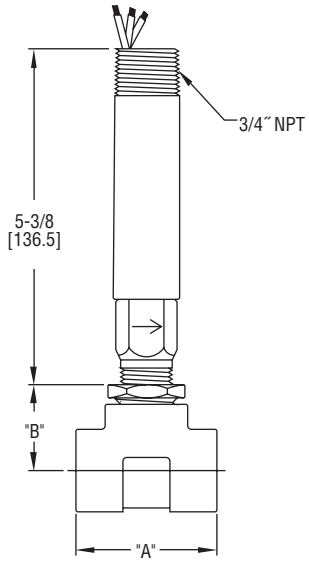


V6 with Field Trimmable Vane

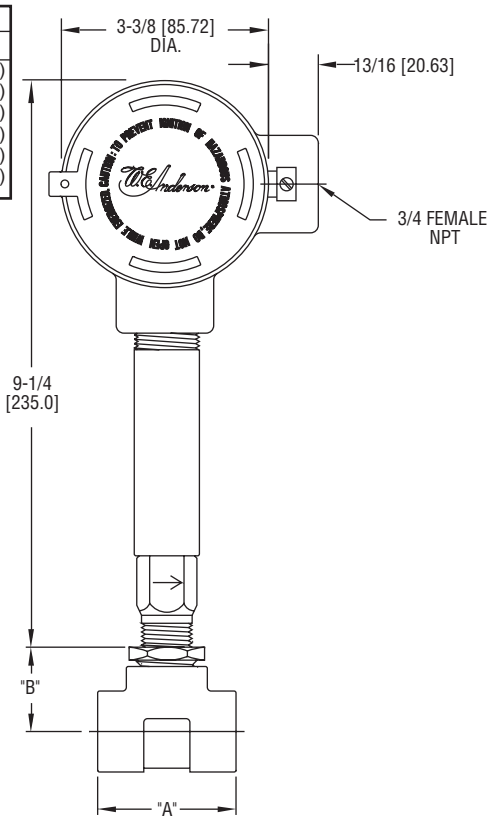
Pipe Size	Brass/Ductile Iron		Forged/Stainless Steel		Malleable Iron	
	Dim. A	Dim. B	Dim. A	Dim. B	Dim. A	Dim. B
1/2″	2-1/4 (57)	1-1/8 (29)	2-1/4 (57)	1-1/8 (29)	2-1/2 (64)	1-1/4 (32)
3/4″	2-3/8 (60)	1-1/4 (32)	2-5/8 (67)	1-7/8 (47)	2-5/8 (67)	1-3/8 (35)
1″	2-1/2 (64)	1-3/8 (35)	3 (76)	2-1/8 (54)	2-7/8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



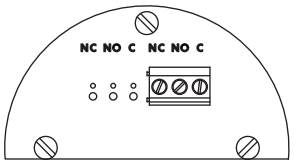
Trimmable Vane



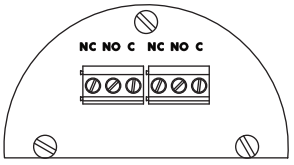
V6 with Tee



V6 with Tee and CSA, ATEX Conduit Enclosure



SPDT



DPDT

Terminal Connections CSA, ATEX Enclosures

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Printed in U S A 4/16

FR# 82-440805-00 Rev 13

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