

MIDWEST SIGHT FLOW INDICATORS

Inexpensive Protection for Expensive Equipment and Systems

MODEL CHART						
SFI-100 & SFI-300 - WINDOW STYLE WITH THREADED CONNECTIONS						
Example	SFI	-300	SS	-2	-G2	SFI-300SS-2-G2
Model Designator	SFI					Sight flow indicator
Body Style		100 300 350 360				Single window, bronze body, ABS impeller Double window, bronze body, ABS impeller Double window, bronze body, no moving indicator Double window, bronze body, 304SS flapper
Body Options			SS MP			316SS body option for 300, 350, 360 150 psig maximum pressure option, includes fluoroelastomer gaskets
Body Size				1/4 3/8 1/2 3/4 1 1-1/4 1-1/2 2		1/4 inch connection size 3/8 inch connection size 1/2 inch connection size 3/4 inch connection size 1 inch connection size 1-1/4 inch connection size 1-1/2 inch connection size 2 inch connection size
Options					W2 G1 G2 S2 S3 I1 I2 I3 F1 BSPT BSPP	Plexiglass window PTFE gasket Fluoroelastomer gasket 316SS shaft (not on 350 model) Monel shaft (not on 350 model) ABS impeller with bronze bushing (not on 350, 360) 316SS impeller (not on 350, 360) No impeller (100 only) 316SS flapper (360 only) BSPT threads BSPP threads
Note: Maximum flow on impeller models: 5 FPS with liquids, 5000 FPM with gases						

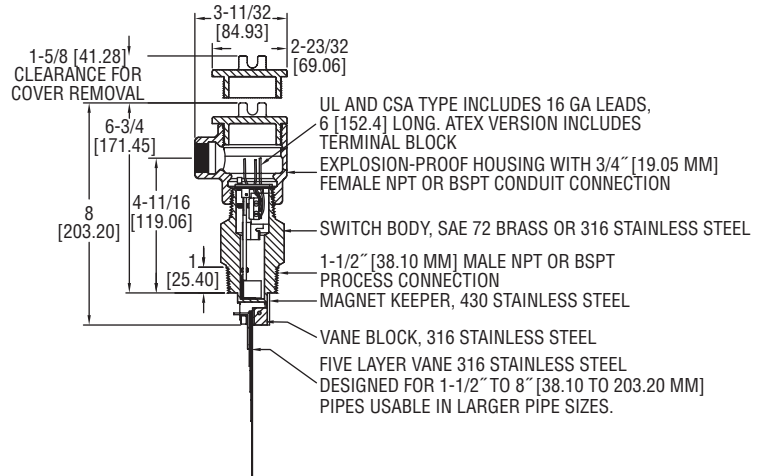
MODEL CHART				
SFI-400 - TUBE STYLE WITH THREADED OR FLANGED CONNECTIONS				
Example	SFI	-400SS	-1-1/2	SFI-400SS-1-1/2
Model Designator	SFI			Sight flow indicator
Body Style		400CI 400SS 400F		Female NPT connections, cast iron body (only for 1 through 2 inch sizes) Female NPT connections, 316SS body Raised face flange connection, 316SS body (only for 1 inch and up sizes)
Body Size			1/2 3/4 1 1-1/4 1-1/2 2 3 4	1/2 inch connection size 3/4 inch connection size 1 inch connection size 1-1/4 inch connection size 1-1/2 inch connection size 2 inch connection size 3 inch connection size 4 inch connection size
Note: Best for use in vertical pipelines where there are no mechanical strains				

MODEL CHART					
SFI-300F - WINDOW STYLE WITH FLANGED CONNECTIONS					
Example	SFI	-360FSS	-1-1/2	-G1	SFI-360FSS-1-1/2-G1
Model Designator	SFI				Sight flow indicator
Body Style		350FCS 350FSS 360FCS 360FSS			Carbon steel body, no moving indicator 316SS body, no moving 316SS indicator Carbon steel body, 316SS flapper 316SS body, 316SS flapper
Body Size			1-1/2 2 3 4 6		1-1/2 inch raised face flange connection size 2 inch raised face flange connection size 3 inch raised face flange connection size 4 inch raised face flange connection size 6 inch raised face flange connection size
Options				G1 G2	PTFE gasket Fluoroelastomer gasket

MODEL CHART					
SFI-700 - TUBE STYLE WITH THREADED CONNECTIONS					
Example	SFI	-700SS	-1-1/2	-BSPT	SFI-700SS-1-1/2-BSPT
Model Designator	SFI				Sight flow indicator
Body Style		700 700SS			Brass body 316SS body
Body Size			1/4 3/8 1/2 3/4 1 1-1/4 1-1/2		1/4 inch female NPT connection size 3/8 inch female NPT connection size 1/2 inch female NPT connection size 3/4 inch female NPT connection size 1 inch female NPT connection size 1-1/4 inch female NPT connection size 1-1/2 inch female NPT connection size
Options				BSPT BSPP	BSPT threads BSPP threads

FLOTECT® VANE OPERATED FLOW SWITCH

Field Adjustable — Dependable Protection Against Flow Variation or Stopping in Pipelines for Fluids, Gases and Flowing Solids



The **SERIES V4** Flotect® Flow Switches is rugged and reliable, ideal for automatically protecting equipment and pipeline systems against damage from reduction or loss of flow. Time tested in thousands of pipeline installations and processing plants around the world this Series is Weatherproof, designed to meet NEMA 4 and Explosion-proof (listing included in specifications). This series can be used in pipes 1-1/2" (38.10 mm) and up.

FEATURES/BENEFITS

- Unique magnetically actuated switching design gives superior performance
- Features a free-swinging vane which attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm with no bellows, springs, or seals to fail
- Leak proof body machined from bar stock
- Electrical assembly can be easily replaced without removing the unit from installation so that the process does not have to be shut down
- Installs directly and easily into pipeline with a thredolet, tee, or flange (see application drawings)
- High pressure rating of 1000 psig (69 bar) with the brass body and 2000 psig (138 bar) with the 316 SS body
- Choice of custom vane calibrated for your application, Model V4, or field adjustable multilayer vane, Model V4-2-U (see set point chart)

APPLICATIONS

- Protects pumps, motors and other equipment against low or no flow
- Controls sequential operation of pumps
- Automatically starts auxiliary pumps and engines
- Stops liquid cooled engines, machines and processing when coolant flow is interrupted
- Shuts down burner when air flow through heating coil fails
- Controls dampers according to flow

MODEL CHART

Model	Description	Connection Type
V4-2-U	Brass body, universal vane	NPT
V4-SS-2-U	316SS* body, universal vane	NPT
V4-2-U-NH**	Brass body, universal vane, no housing	NPT
V4	Brass body, custom vane	NPT
V4-SS	316SS* body, custom vane	NPT
V4-NH**	Brass body, custom vane, no housing	NPT
V4-SS-2-U-BSPT	316SS* body, universal vane	BSPT
V4-2-U-BSPT	Brass body, universal vane, no housing	BSPT
V4-BSPT	Brass body, custom vane	BSPT
V4-SS-BSPT	316SS* body, custom vane	BSPT

Note: Consult factory for price and availability of fittings for V4 installation. Thredolets, bushings, and tees are available in a variety of sizes and materials.

Note: For custom vane models, please supply factory with following information: pipe size, flow direction (horizontal, up), mounting, pressure, temperature, specific gravity, flow rates (maximum normal, actuation/deactuation†), etc.

*316SS body with 430SS magnet keeper

**No housing option (-NH) has no approvals

†When both values are supplied, note which is critical

SPECIFICATIONS

Service: Gases or liquids compatible with wetted materials.

Wetted Materials: Vane: 316 SS; Body: Brass or 316 SS standard; Magnet Keeper: 430 SS standard, 316 SS optional; Options: Other materials also available, consult factory (e.g. PVC, Hastelloy, Nickel, Monel, Titanium).

Temperature Limit: -4 to 275°F (-20 to 135°C) standard, MT high temperature option 400°F (205°C) [MT option not UL, CSA, ATEX or IECEx] ATEX and IECEx options, ambient temperature -4 to 163°F (-20 to 73°C); Process temperature -4 to 163°F (-20 to 73°C).

Pressure Limit: Brass body 1000 psig (69 bar), 316 SS body 2000 psig (138 bar), optional 5000 psig (345 bar) available with 316 SS body and SPDT switch only.

Enclosure Rating: Weatherproof and Explosion-proof. **Listed with UL and CSA for Class I, Groups C and D; Class II, Groups E, F, and G.

ATEX 0344 II 2 G Ex d IIB T6 Gb -20°C ≤ Tamb ≤ 73°C.

-20°C ≤ Process Temp ≤ 73°C.

EC-Type Certificate No.: KEMA 03 ATEX 2383.

ATEX Standards: EN60079-0: 2009;

EN60079-1: 2007.

IECEx Certified: For Ex d IIB T6 Gb

-20°C ≤ Tamb ≤ 73°C. -20°C ≤ Process Temp ≤ 73°C.

**No housing option (-NH) has no approvals

IECEx Certificate of Conformity: IECEx DEK 11.0071.

IECEx Standards: IEC 60079-0: 2007; IEC 60079-1: 2007.

Zone I. Also FM approved.

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

Electrical Rating: UL, FM, ATEX and IECEx models 10 A @ 125/250 VAC (V~). CSA models: 5 A @ 125/250 VAC (V~); 5 A res., 3 A ind. @ 30 VDC (V---). MV option: 1 A @ 125 VAC (V~); 1 A res., .5 A ind. @ 30 VDC (V---). MT option: 5 A @ 125/250 VAC (V~). [MT and MV option not UL, CSA, FM, ATEX or IECEx].

Electrical Connections: UL and CSA models: 16 AWG, 6" (152 mm) long. ATEX and IECEx unit: Terminal block.

Conduit Connection: 3/4" female NPT or 19.05 mm standard or M25 with -BSPT option.

Process Connection: 1-1/2" male NPT or 1-1/2" male BSPT or 38.10 mm.

Mounting Orientation: Within 5° of vertical for proper operation. Units for horizontal installation (vertical pipe with up flow) available.

Set Point Adjustment: For universal vane: five vane combinations.

Weight: 4 lb 8 oz (1.9 kg).

Agency Approvals: ATEX, CE, CSA, FM, IECEx, UL**.

OPTIONS

To order add suffix:	Description
-D	DPDT contacts
-MV	Gold plated contacts, options for dry circuits*
-MT	High temperature, option rated 400°F (204°C)*
-TRI	Increasing flow time delay relay option with 2 SPDT contacts, adjustable from 0-1 to 0-31 minutes*
-TRD	Decreasing flow time delay relay option with 2 SPDT contacts, adjustable from 0-1 to 0-31 minutes*
-316	316 SS magnet keeper, option to replace standard 430 SS
-V	Vertical up flow, option for upward flow in vertical pipe
-AT	ATEX compliant construction
-IEC	IECEx certified construction
-BSPT	Female BSPT process connection and M25 conduit connection

*See electrical rating in specification, no listings or approvals

FLOTECT® VANE OPERATED FLOW SWITCH

Field Adjustable — Dependable Protection Against Flow Variation or Stopping in Pipelines for Fluids, Gases and Flowing Solids

V4 UNIVERSAL VANE FLOW CHARTS

Values shown in both charts are nominal. If normal flows exceed actuation rates by less than 10%, custom vanes are recommended. Figures are based on standard vertical installation in a 1-1/2" threaded branch connection in a horizontal run of pipe.

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)												
Vane Layers	1.5" Pipe	2" Pipe	3" Pipe	4" Pipe	6" Pipe	8" Pipe	10" Pipe	12" Pipe	14" Pipe	16" Pipe	18" Pipe	20" Pipe
1	7-3 (26.67-11.67)	15-8 (56.7-30)	45-22 (167-83.3)	95-40 (367-150)	210-120 (800-450)	375-175 (1417-667)	600-300 (2267-1133)	900-450 (3400-1700)	1200-600 (4550-2267)	1400-800 (5300-3033)	2000-1000 (7567-3783)	2400-1200 (9083-4550)
1&2		7-4 (26.7-15)	23-14 (86.7-53.3)	50-35 (190-132)	130-90 (500-333)	230-150 (867-567)	450-250 (1700-950)	650-350 (2467-1317)	900-500 (3400-1900)	1200-650 (4550-2467)	1450-800 (5483-3033)	1800-1000 (6817-3783)
1,2,&3			11-7 (41.7-26.7)	27-19 (102-71.7)	80-60 (300-233)	160-115 (600-433)	300-180 (1133-683)	450-275 (1700-1033)	600-350 (2267-1317)	750-450 (2750-2083)	1000-600 (3783-2267)	1200-700 (4550-2650)
1,2,3,&4				17-12 (65-45)	60-45 (233-167)	120-90 (450-333)	230-150 (867-567)	310-200 (1167-750)	430-280 (1633-1067)	550-360 (2083-1367)	700-450 (2650-1700)	850-550 (3217-2083)
1,2,3,4,&5					40-30 (152-113)	80-65 (300-250)	135-100 (517-383)	200-140 (750-533)	290-200 (1100-750)	360-250 (1367-950)	460-325 (1733-1233)	575-400 (2183-1517)

Actuation rates are based on cold water at a specific gravity of 1.0.

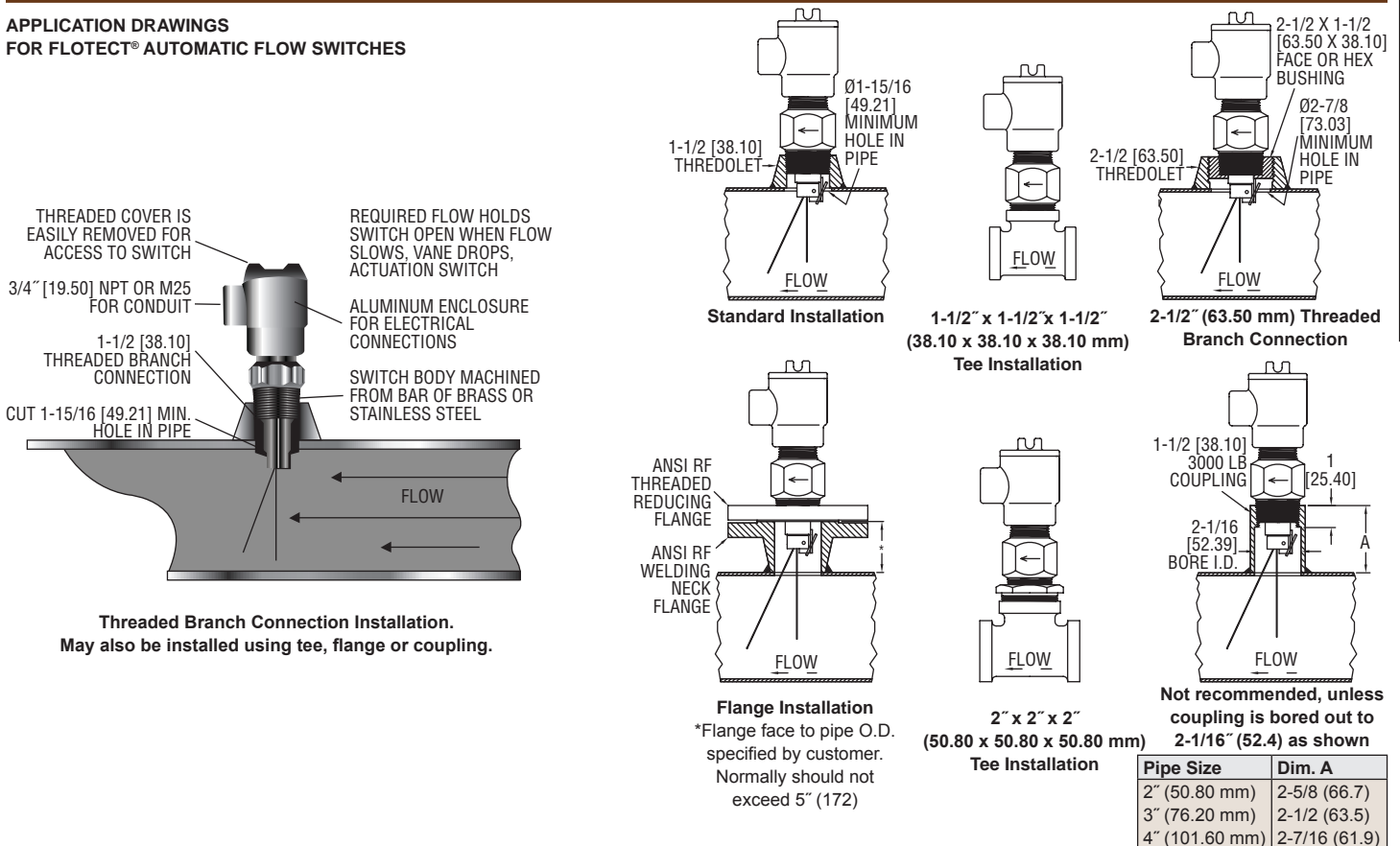
For fluids of different specific gravity, actuation rates may be approximated by dividing the rate shown by the square root of the specific gravity.

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD AIR; SCFM (LPS)												
Vane Layers	1.5" Pipe	2" Pipe	3" Pipe	4" Pipe	6" Pipe	8" Pipe	10" Pipe	12" Pipe	14" Pipe	16" Pipe	18" Pipe	20" Pipe
1	32-17 (15-8)	65-32 (30-20)	210-105 (100-50)	400-200 (190-90)	950-475 (450-220)	1550-850 (730-400)	2400-1300 (1100-600)	3450-1900 (1600-900)	4700-2600 (2200-1200)	6400-3500 (3000-1700)	8000-4400 (3800-2100)	10000-5500 (4700-2600)
1&2		23-13 (10-6)	120-70 (60-30)	195-140 (90-70)	550-375 (260-180)	1100-700 (520-330)	1850-1200 (870-570)	2700-1750 (1300-800)	3400-2200 (1600-1000)	4800-3100 (2300-1500)	6000-3900 (2800-1800)	7400-4800 (3500-2300)
1,2,&3			60-48 (30-20)	135-100 (60-50)	375-265 (180-130)	725-500 (340-240)	1200-850 (570-400)	1850-1300 (870-610)	2600-1800 (1200-800)	3350-2350 (1600-1100)	4300-3000 (2000-1400)	5300-3700 (2500-1700)
1,2,3,&4				65-50 (30-20)	260-200 (120-90)	500-400 (240-190)	875-700 (410-330)	1250-1000 (590-470)	1900-1500 (900-710)	2500-2000 (1200-900)	3100-2500 (1500-1200)	3900-3100 (1800-1500)
1,2,3,4,&5					130-100 (60-50)	310-250 (150-120)	650-525 (310-250)	1000-800 (470-380)	1600-1250 (760-590)	2200-1750 (1040-830)	2800-2250 (1300-1100)	3550-2850 (1700-1300)

Actuation rates are based on air at standard conditions.

For gases at other pressures, temperatures, or specific gravities, consult factory for equivalent flow approximations.

APPLICATION DRAWINGS FOR FLOTECT® AUTOMATIC FLOW SWITCHES

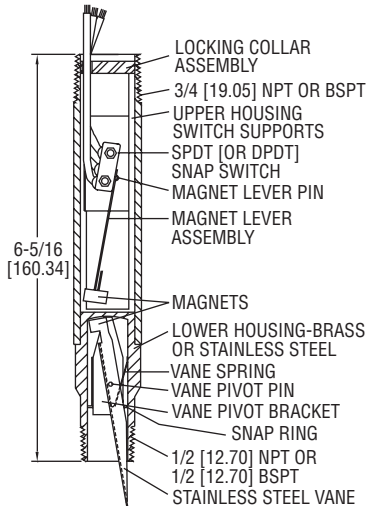


FLOTECT® MINI-SIZE FLOW SWITCHES

Monitor Flow in 1/2" to 2" (12.70 to 50.80 mm) Pipe, Explosion-Proof, Compact



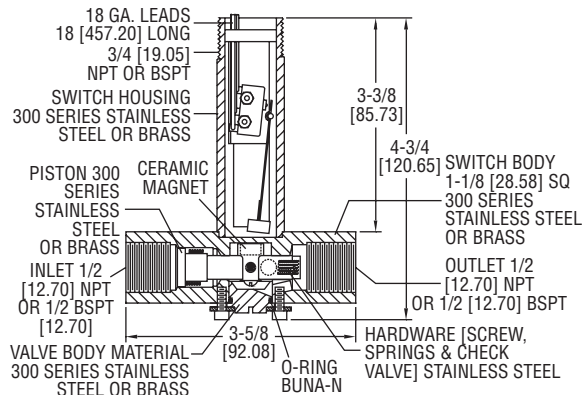
V6 with Tee



OVERALL LENGTH WITH 1-1/4" TEE CONNECTION APPROXIMATELY 8" [31.75 to 203.20 MM]



V6 Low Flow



The **SERIES V6** Flotect® Flow Switches is surprisingly compact, and specifically engineered to monitor liquid, gas, or air flows. Time tested in thousands of pipeline installations and processing plants around the world, this Series is Weatherproof, designed to meet NEMA 4 and Explosion-proof (listing included in specifications). Tees are available for installation in pipelines from 1/2" to 2" (12.70 to 50.80 mm). With bushings added the unit is easily adapted to 1/4" and 3/8" (6.35 and 9.53 mm) piping.

FEATURES/BENEFITS

- Unique magnetically actuated switching design gives superior performance
- Features a free-swinging vane which attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm with no bellows, springs, or seals to fail
- Leak proof body machined from bar stock
- Electrical assembly can be easily replaced without removing the unit from installation so that the process does not have to be shut down
- Choice of models in a tee with calibrated vane or field adjustable trimmable vane
- Easy installation with simple pipe insert via tee and simple electrical switch connections
- High pressure rating of 1000 psig (69 bar) with the brass body and 2000 psig (138 bar) with the 316 SS body
- Low flow model offers field adjustable set point

APPLICATIONS

- Protects pumps, motors and other equipment against low or no flow
- Controls sequential operation of pumps
- Automatically starts auxiliary pumps and engines
- Stops liquid cooled engines, machines and processing when coolant flow is interrupted
- Shuts down burner when air flow through heating coil fails
- Controls dampers according to flow
- Signals alarm when emergency shower or eyewash station in use

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).

ATEX 0344 II 2 G Ex d IIC 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 IIC T6 Gb Process Temps ≤75°C Alternate Temperature Class T5 Process Temp ≤90°C, 115°C (T4) Process Temp ≤105°C consult factory.

IECEx Certificate of Conformity: IECEx DEK 11.0039;

IECEx Standards: IEC 60079-0: 2007; IEC 60079-1: 2007;

Korean Certified (KC) for: Ex d IIC 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 IECEx models: 5 A @ 125/250 VAC (V~); 5 A res., 3 A ind. @ 30 VDC (V---). MV option: .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" (457.20 mm) long. ATEX/CSA / IECEx models: terminal block.

Upper Body: Brass or 303 stainless steel.

Conduit Connections: 3/4" (19.05 mm) male NPT standard, 3/4" (19.05 mm) female NPT or M25 with BSPT option on junction box models.

Process Connection: 1/2" (12.70 mm) male NPT or 1/2" (12.70 mm) male BSPT 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.

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.

Agency Approvals: ATEX, CE, CSA, IECEx, KTL, UL.

● Set Point Charts: See page 289 (Series V6)

FLOTECT® MINI-SIZE FLOW SWITCHES

Monitor Flow in 1/2" to 2" (12.70 to 50.80 mm) Pipe, Explosion-Proof, Compact

MODEL CHART									
Example	V6	EP	B-B	-S	-2	-B	-MT	V6EPB-B-S-2-B-MT	
Series	V6							Flow switch	
Construction		EP						Explosion proof	
Body			B-B S-S					Brass SS	
Circuit (Switch)				S D				SPDT DPDT	
Tee Connection Size					1 2 3 4 5 6 LF LF			1/2" (12.70 mm) 3/4" (19.50 mm) 1" (25.40 mm) 1-1/4" (31.75 mm) 1-1/2" (38.10 mm) 2" (50.80 mm) Low flow model (1/2" connection-brass) Low flow model (1/2" connection-SS)	
Process Connection						- E		NPT BSPT	
Tee Material						MI FS B S O		Iron Forged steel Brass SS No tee, field trimmable vane** (For LF model no tee material chosen, tee material matches body choice)	
Options							CSA AT IEC MV MT VIT	CSA approved construction with junction box* ATEX compliant construction with junction box IECEx certified construction with junction box Gold contacts on snap switch for dry circuits (see specifications for ratings) High temperature option rated 400°F (205°C) (see specifications for ratings)* Fluoroelastomer O-rings in place of Buna-N on low flow models	

*Options that do not have ATEX.

**Vane will be trimmed to the connection size. If full field trimmable vane is desired, must select with tee connection size 6.

MODEL CHART			
Model	Size/Connection	Body	Tee
V6EPB-B-S-1-B	1/2" (12.70 mm) NPT	Brass	Brass
V6EPB-B-S-2-B	3/4" (19.50 mm) NPT	Brass	Brass
V6EPB-B-S-3-B	1" (25.40 mm) NPT	Brass	Brass
V6EPB-B-S-4-B	1-1/4" (31.75 mm) NPT	Brass	Brass
V6EPB-B-S-5-B	1-1/2" (38.10 mm) NPT	Brass	Brass
V6EPB-B-S-6-B	2" (50.80 mm) NPT	Brass	Brass
V6EPB-B-S-1-MI	1/2" (12.70 mm) NPT	Brass	Iron
V6EPB-B-S-2-MI	3/4" (19.50 mm) NPT	Brass	Iron
V6EPB-B-S-3-MI	1" (25.40 mm) NPT	Brass	Iron
V6EPB-B-S-4-MI	1-1/4" (31.75 mm) NPT	Brass	Iron
V6EPB-B-S-5-MI	1-1/2" (38.10 mm) NPT	Brass	Iron
V6EPB-B-S-6-MI	2" (50.80 mm) NPT	Brass	Iron
V6EPS-S-S-1-FS	1/2" (12.70 mm) NPT	SS	FS
V6EPS-S-S-2-FS	3/4" (19.50 mm) NPT	SS	FS
V6EPS-S-S-3-FS	1" (25.40 mm) NPT	SS	FS
V6EPS-S-S-4-FS	1-1/4" (31.75 mm) NPT	SS	FS
V6EPS-S-S-5-FS	1-1/2" (38.10 mm) NPT	SS	FS
V6EPS-S-S-6-FS	2" (50.80 mm) NPT	SS	FS
V6EPS-S-S-1-S	1/2" (12.70 mm) NPT	SS	SS
V6EPS-S-S-2-S	3/4" (19.50 mm) NPT	SS	SS
V6EPS-S-S-3-S	1" (25.40 mm) NPT	SS	SS
V6EPS-S-S-4-S	1-1/4" (31.75 mm) NPT	SS	SS
V6EPS-S-S-5-S	1-1/2" (38.10 mm) NPT	SS	SS
V6EPS-S-S-6-S	2" (50.80 mm) NPT	SS	SS
V6EPB-B-S-6-0	No tee	Brass	None
V6EPS-S-S-6-0	No tee	SS	None
V6EPB-B-S-LF	1/2" (12.70 mm) NPT	Brass	LF, brass
V6EPS-S-S-LF	1/2" (12.70 mm) NPT	SS	LF, SS
V6EPB-B-S-LFE	1/2" (12.70 mm) BSPT	Brass	Brass
V6EPB-B-S-1E-B	1/2" (12.70 mm) BSPT	Brass	Brass
V6EPB-B-S-2E-B	3/4" (19.50 mm) BSPT	Brass	Brass
V6EPB-B-S-3E-B	1" (25.40 mm) BSPT	Brass	Brass
V6EPB-B-S-4E-B	1-1/4" (31.75 mm) BSPT	Brass	Brass
V6EPB-B-S-5E-B	1-1/2" (38.10 mm) BSPT	Brass	Brass
V6EPB-B-S-6E-B	2" (50.80 mm) BSPT	Brass	Brass
V6EPB-B-S-6E-0	No tee	Brass	Brass
V6EPS-S-S-LFE	1/2" (12.70 mm) BSPT	SS	SS
V6EPS-S-S-1E-S	1/2" (12.70 mm) BSPT	SS	SS
V6EPS-S-S-2E-S	3/4" (19.50 mm) BSPT	SS	SS
V6EPS-S-S-3E-S	1" (25.40 mm) BSPT	SS	SS
V6EPS-S-S-4E-S	1-1/4" (31.75 mm) BSPT	SS	SS
V6EPS-S-S-5E-S	1-1/2" (38.10 mm) BSPT	SS	SS
V6EPS-S-S-6E-S	2" (50.80 mm) BSPT	SS	SS
V6EPS-S-S-6E-0	No tee	SS	SS

V6 SET POINT CHARTS - FACTORY INSTALLED TEE

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR AIR; SCFM (LPM)		
Pipe Size	Actuate	Deactuate
1/2"	6.50 (180)	5.00 (120)
3/4"	10.0 (300)	8.00 (240)
1"	14.0 (420)	12.0 (360)
1-1/4"	21.0 (600)	18.0 (540)
1-1/2"	33.0 (960)	30.0 (840)
2"	43.0 (1200)	36.0 (1020)

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)		
Pipe Size	Actuate	Deactuate
1/2"	1.50 (5.667)	1.00 (3.83)
3/4"	2.00 (7.5)	1.25 (4.67)
1"	3.00 (11.33)	1.75 (6.67)
1-1/4"	4.00 (15.17)	3.00 (11.3)
1-1/2"	6.00 (22.67)	5.00 (18.9)
2"	10.00 (37.83)	8.50 (32.2)

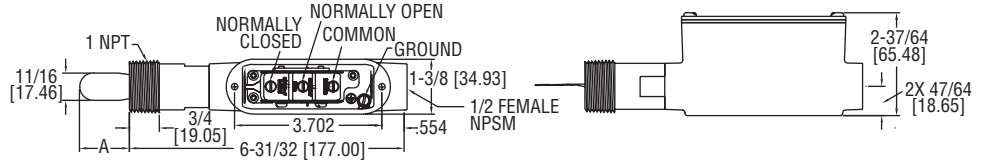
V6 LOW FLOW SET POINT CHART

MIN-MAX FLOW RATES IN 1/2" PIPE		
Media	Actuate	Deactuate
GPM-water	.04-0.75	.03-0.60
LPM-water	.15-2.84	.11-2.27
SCFM-air	.18-2.70	.15-2.0
LPS-air	.09-1.3	.07-.95

Pressure drop (head loss) is a function of both set point and flow rate. Typically, pressure drop at actuation flow rate listed will be 5-10 psid (.34-.69 bar). Pressure drops at other flow rates will vary in proportion to the (change in flow).

FLOTECT® VANE OPERATED FLOW SWITCH

Magnetic Linkage, UL Approved



Pipe Size	Dim. A	Pipe Size	Dim. A
1	1-17/64 [32.15]	2	2-11/64 [55.17]
1-1/4	1-19/32 [40.48]	3	2-11/64 [55.17]
1-1/2	1-53/64 [46.43]	4	2-11/64 [55.17]

The **SERIES V7** FloTECT® Flow Switch is an inexpensive range switch for use with compatible liquids to start or stop electronic operated equipment when flow or no-flow conditions occur. Design is standard weatherproof, meeting NEMA 4X.

FEATURES/BENEFITS

- Magnetically actuated switching design gives superior performance
- Features a free-swinging vane which attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm with no bellows, springs, or seals to fail
- Lower body is machined solid metal bar stock assuring no leak points, no matter how long the unit is in service
- Robust vane design is rigid and field trimmable for set point adjustment

APPLICATIONS

- Proof of boiler flow
- Shuts down burner when air flow through heating coil fails
- Protects pumps, motors and other equipment against low or no flow
- Stops liquid cooled engines, machines and processing when coolant flow is interrupted

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)

Pipe Size	Actuate	Deactuate
1"	7.5 (28.4)	6.8 (25.7)
1-1/4"	8.1 (30.8)	7.6 (28.9)
1-1/2"	11.7 (44.1)	10.9 (41.3)
2"	16.9 (64.0)	15.6 (59.1)
2-1/2"	19.6 (74.2)	18.1 (68.5)
3"	31.6 (120)	29.6 (112)
4"	58.0 (218)	52.0 (197)

Contact the factory for different actuation-deactuation rates.

SPECIFICATIONS

Service: Liquids compatible with wetted materials that are non-coating and non-crystallizing.
Wetted Materials: Vane: 301 SS; Process connection: Brass or 316 SS; Magnet: Ceramic; Other: 301, 302 SS.
Upper Body Material: Die cast aluminum.
Temperature Limits: -40 to 250°F (-40 to 121°C).
Pressure Limits: 250 psi (17.2 bar).
Enclosure Rating: Weatherproof, meets NEMA 4X (IP66).
Switch Type: SPDT snap switch.
Electrical Rating: 10 A @ 125, 250, 480 VAC; 1/8 hp @ 125 VAC, 1/4 hp @ 250 VAC.
Electrical Connections: 3 screw type, common, normally open and normally closed.
Conduit Connection: 1/2" NPSM.
Process Connection: 1" male NPT. Contact factory for optional tees.
Pipe Size: 1" to 4".
Mounting Orientation: Horizontal or vertical (actuation flow rates are based on horizontal pipe runs in the vertical position). Will not work in vertical pipe with down flow.
Set Point Adjustment: Vane is trimmable, see set point chart.
Weight: 1 lb 2 oz (500 g).
Agency Approvals: CE, UL.

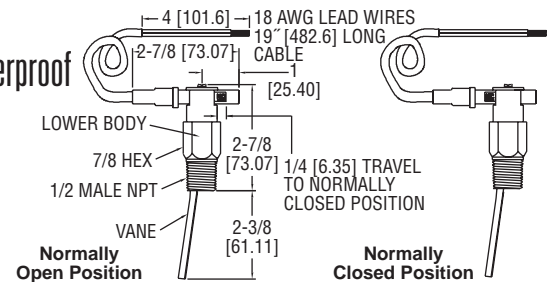
MODEL CHART

Model	Body Material
V7-WBS-30N	Brass
V7-WSS-30N	316 SS

SERIES V10 | W. E. ANDERSON BY DWYER

FLOTECT® MINI-SIZE FLOW SWITCH

Proof of Flow or No Flow in 1/2 to 2" Pipe, Cost Effective, Leak Proof Body, Weatherproof



The **SERIES V10** FloTECT® Mini-Size Flow Switches is designed to provide inexpensive, reliable monitoring of the presence or absence of flow in a system. This series is available for field installation in pipelines from 1/2 to 2" diameter and available in brass or 303 SS body.

FEATURES/BENEFITS

- Magnetically actuated switching design gives superior performance with rugged, hermetically sealed reed switch
- Simple field switch adjustment allows user to toggle between Normally Open (NO) or Normally Closed (NC) with no change in the electrical connection
- Switch housing is located outside the process media, allowing simple switch change-over or maintenance without interruption of process flow
- Full size, field trimmable stainless steel vane provided with removable template calibrated for brass or ductile iron reducing tees with forged steel straight tee/bushing combinations

APPLICATIONS

- Proving flow in boilers, hot water heaters, and chillers
- Protects pumps, motors and other equipment against low or no flow
- Automatically starts auxiliary pumps and engines

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)				APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR AIR; SCFM (LPM)			
Pipe Size	Trim	N.O.	N.C.	Pipe Size	Trim	N.O.	N.C.
1/2"	L	2.6/2.3 (9.8/8.7)	2.6/2.5 (9.8/9.5)	1/2"	L	10.3/8.8 (291.7/250)	10.2/9.2 (288/260)
3/4"	J	3.1/2.7 (11.7/10.2)	3.1/2.8 (11.7/10.6)	3/4"	J	13/11.6 (368.3/328)	12.9/11.6 (365/328)
1"	H	4.8/4.5 (18.2/17)	4.8/4.4 (18.2/16.7)	1"	H	19.2/17.6 (543.3/498)	18.9/17.6 (535/498)
1-1/4"	E	6.2/5.6 (23.5/21.2)	6.1/5.6 (23.1/21.2)	1-1/4"	E	24.8/22.2 (701.7/628)	24.5/22.5 (693/637)
1-1/2"	C	8.2/7.7 (31/29.1)	8.2/7.7 (31/29.1)	1-1/2"	C	33.4/31.2 (946.7/883)	33/30.6 (935/867)
2"	Full	9.5/9.1 (36/34.4)	9.5/9 (36/34.1)	2"	Full	50.2/48.4 (1422/1370)	50.2/47.7 (1422/1352)

SPECIFICATIONS

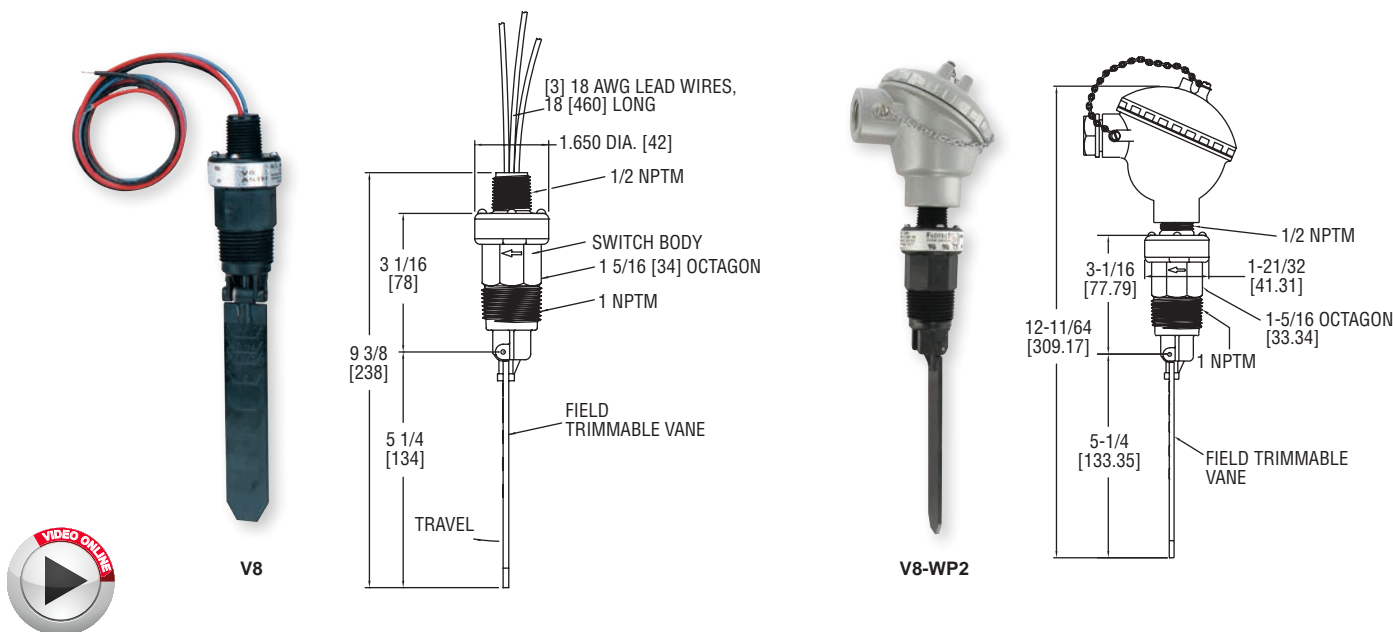
Service: Compatible gases or liquids.
Wetted Materials: Vane: 301 SS; Body: Brass or 303 SS; Pin and Magnet: Ceramic 8.
Temperature Limit: 200°F (93°C).
Pressure Limit: Brass body: 1000 psig (69 bar); 303 SS body: 2000 psig (138 bar).
Enclosure Rating: Weatherproof, meets NEMA 4X (IP66).
Switch Type: SPST hermetically sealed reed switch. Field adjustable for normally open or normally closed.
Electrical Rating: 0.5 A @ 120 VAC; 1.5 A @ 24 VDC res.; 0.001 A @ 200 VDC res.
Electrical Connections: 18 AWG, 19" (483 mm) long, PVC jacket. Rated 221°F (105°C).
Process Connection: 1/2" male NPT or 1/2" male BSPT.
Mounting Orientation: Switch can be installed in any position but the actuation/deactuation flow rates are based on horizontal pipe runs and are nominal values.
Set Point Adjustment: Vane is trimmable.
Weight: 5.5 oz (0.16 kg).
Agency Approvals: CE, CSA, UR.
Switch Enclosure: Nylon.

MODEL CHART

Model	Body Material	Connection Type	Switch Configuration
V10	Brass	NPT	Normally open or closed
V10SS	303SS	NPT	Normally open or closed
V10-BSPT	Brass	BSPT	Normally open or closed
V10SS-BSPT	303SS	BSPT	Normally open or closed

FLOTECT® VANE OPERATED FLOW SWITCH

Field Adjustable — 1 to 6 Inch Pipe, Leak Proof Body, Chemical Resistance



The **SERIES V8** Flotect® Vane Operated Flow Switches is ideal for protecting unattended equipment from damage or loss of production. This Series is available for installation in a 1 to 6" pipe with operating pressures up to 150 psig (10 bar) and temperatures to 212°F (100°C).

FEATURES/BENEFITS

- UL recognized as an industrial motor controller per UL standard 508, suitable for mounting in a protected environment
- Magnetically actuated switching design gives superior performance with free-swinging vane which attracts a magnet within the switch body, actuating a snap switch with no bellows, springs, or seals to fail
- Leak proof body and vane constructed of tough durable polyphenylene sulfide which has excellent chemical resistance
- A full size trimmable vane is provided with molded-in graduations

APPLICATIONS

- Chemical processing
- Air conditioning
- Refrigeration
- Heating systems
- Cooling lines
- Machinery
- Liquid transfer systems
- Water treatment
- Food processing
- Machine tools

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR COLD WATER; GPM (LPM)	
Pipe Size	Actuate/Deactuate
1"	10.8/9.1 (40.9/34.6)
1-1/4"	9.8/8.3 (37.2/31.4)
1-1/2"	8.6/6.8 (32.4/25.7)
2"	10.9/8.8 (41.2/33.4)
3"	12.9/8.9 (48.8/33.5)
4"	21.1/13.8 (79.7/52.2)
6"	45/33 (170.2/124.7)

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR AIR; SCFM (LPM)	
Pipe Size	Actuate/Deactuate
1"	39/32.6 (1105/923)
1-1/4"	37.5/32.2 (1062/912)
1-1/2"	33.4/26.7 (945/757)
2"	43/36.8 (1218/1042)
3"	52.7/38.9 (1493/1100)
4"	87.6/63.6 (2482/1802)
6"	168.6/137.4 (4775/3890)

SPECIFICATIONS

Service: Compatible gases or liquids.
Wetted Materials: Vane and body: Polyphenylene Sulfide (PPS); Pin and spring: 316 SS or Inconel®; Magnet: Ceramic 8.
Temperature Limit: 212°F (100°C).
Pressure Limit: 150 psig (10.34 bar).
Enclosure Rating: General purpose, WP/WP2 option is weatherproof.
Switch Type: SPDT snap switch, MV option: SPDT gold contact snap switch.
Electrical Rating: 5 A @ 125/250 VAC, 5 A resistive, 3 A inductive @ 30 VDC; MV option: 1 A @ 125 VAC, 1 A resistive, 0.5 A inductive @ 30 VDC.
Electrical Connections: 18 AWG, 18" (460 mm) long.
Conduit Connection: 1/2" male NPT, 1/2" female NPT on WP and WP2.
Process Connection: 1" male NPT.
Mounting Orientation: Actuation/deactuation flow rates are based on horizontal pipe runs and are nominal values. Unit cannot be used with vertical down flow.
Set Point Adjustment: Vane is trimmable.
Weight: 4.5 oz (0.13 kg).
Agency Approvals: CE, cURus.

MODEL CHART

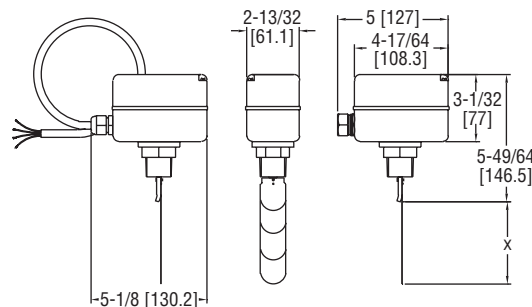
Model	Description
V8	Flow switch

OPTIONS

To order add suffix:	Description
-MV	Gold plated contacts, for dry circuits; rated 1A @ 125 VAC; 1A resistive, 0.5A inductive @ 30 VDC
Example: V8-MV	
-INC	Inconel® alloy option; Inconel® alloy replaces standard 316 SS wetted parts; wetted parts are Inconel® alloy, ceramic 8, and polyphenylene sulfide
Example: V8-INC	
-WP	Weatherproof enclosure; optional housing is phenylpolioxide and provides weatherproof protection for electrical wiring; not UL approved
Example: V8-WP	
-WP2	Optional housing is aluminum and provides weatherproof protection for electrical wiring; not UL approved
Example: V8-WP2	

VANE FLOW SWITCH

Low Cost, Field Adjustable Set Point and Paddle



Shown with conduit connection option

The **SERIES FS-2** Vane Flow Switches offers an economical flow proving solution. The FS-2 paddles are adjustable to fit 1 to 8" size pipe.

FEATURES/BENEFITS

- Field adjustable set point adjustment screw allows for easy flow switch modification
- Custom application set points enabled by field adjustable vane layers
- Aluminum weatherproof housing permits outdoor installation

APPLICATIONS

- Boiler flow proving
- Hot water heaters
- Chillers
- Cooling lines
- Machinery
- Liquid transfer systems

APPROXIMATE ACTUATION/DEACTUATION FLOW RATES FOR WATER; GPM (LPM)

Pipe Size	Blade Vane Length in (mm) Dim. X	Minimum Setting		Maximum Setting	
		Actuate	Deactuate	Actuate	Deactuate
1"	1.34 (34)	4.0 (15.0)	1.8 (6.7)	8.8 (33.3)	6.6 (25.0)
1-1/4"	1.34 (34)	5.3 (20.0)	2.6 (10.0)	11.4 (43.3)	8.4 (31.7)
1-1/2"	2.24 (57)	7.0 (26.7)	4.0 (15.0)	14.5 (55.0)	11.4 (43.3)
2"	2.24 (57)	14.1 (53.3)	9.7 (36.7)	31.3 (118.3)	22.5 (85.0)
2-1/2"	3.46 (88)	18.5 (70.0)	15.4 (58.3)	35.2 (133.3)	30.8 (116.7)
3"	3.46 (88)	27.7 (105.0)	25.1 (95.0)	52.8 (200.0)	46.2 (175.0)
4"	3.46 (88)	59.4 (225.0)	52.8 (200.0)	123.3 (466.7)	114.5 (433.3)
5"	6.57 (167)	52.8 (200.0)	39.6 (150.0)	132.1 (500.0)	123.3 (466.7)
6"	6.57 (167)	75.7 (286.7)	52.8 (200.0)	154.1 (583.3)	140.9 (533.3)
8"	6.57 (167)	184.9 (700.0)	158.5 (600.0)	396.3 (1500.0)	374.2 (1416.7)

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Bellow: Tin-bronze; Vane: SS; Body: Forged brass.
Temperature Limit: 230°F (110°C).
Pressure Limit: 145 psig (10 bar).
Enclosure Rating: NEMA 4 (IP64).
Switch Type: SPDT snap switch.
Electrical Rating: 10 A res, 3 A ind @ 250 VAC.
Electrical Connection: Cable gland with attached wire leads or optional conduit connection.

Process Connection: 1" male NPT or BSPT.
Mounting Orientation: Switch must be installed vertically on horizontal pipe runs.
Set Point Adjustment: Four vane combinations and an adjustment screw.
Enclosure: Die-cast aluminum alloy.
Weight: 28.22 oz (0.8 kg).
Agency Approvals: CE.

MODEL CHART

Model	Description
FS-2	Paddle flow switch

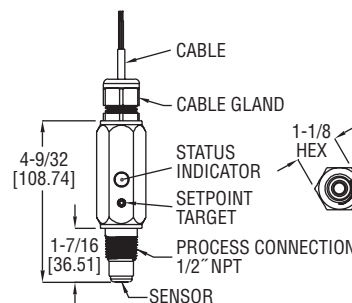
OPTIONS

To order add suffix:	Description
-BSPT	Process connection
Example: FS-2-BSPT	
-CND	Conduit connection, 1" NPT female conduit connection with no wire leads.
Example: FS-2-CND	

SERIES TDFS | W. E. ANDERSON BY DWYER

THERMAL DISPERSION FLOW SWITCH

Non-Mechanical, Low Pressure Drop



The **SERIES TDFS** Thermal Flow Switch uses impulse thermal dispersion measurement technique to indicate whether the flow rate is above or below a user set flow rate. It provides NO and NC NPN outputs and two LED, one green and one red for high and low set point indication.

FEATURES/BENEFITS

- Better long term reliability and life expectancy than mechanical flow switches with no paddles or vanes to wear or break, no jams in the paddle movement, and no seals on movement assembly to wear or leak
- Not affected by empty pipe detection and avoids overheating by actively heating above the process temperature and then cooling down to process temperature
- Set point is easily field set by taping the included magnet on the set point target three times at the desired flow rate
- LED status indicators provide visual switch indication of set point
- Low pressure drop, only needs to be 10% into the flow (e.g. 1/8" for 3/4" schedule 40 pipe)

APPLICATIONS

- Boiler flow proving
- Hot water heaters
- Chillers
- Liquid transfer systems

SPECIFICATIONS

Service: Compatible water-based fluids.
Wetted Materials: 316 SS, Polysulfone, and FKM.
Setpoint Range: 0.5 to 10 ft/s (0.15 to 3.0 m/s).
Repeatability: 0.07 ft/s +3% of setpoint.
Typical Deadband: 0.1 ft/s +15% of setpoint.
Temperature Limits: Process: 5 to 185°F (-15 to 85°C) (non-freezing); Ambient: 5 to 167°F (-15 to 75°C).
Storage: -40 to 185°F (-40 to 85°C).
Pressure Limits: 300 psig (20.67 bar), max. momentary surge: 500 psig (34.47 bar).
Response Time: Approximately 8 s.
Power Requirement: 9 to 24 VDC.

Switching Current: 400 mA, derate 5 mA/°C above 23°C.
Current Consumption: Average: 93 mA, Peak: 300 mA.
Electrical Connection: 4 conductor 22 AWG, 6' (1.83 m) long with cable gland.
Process Connection: 1/2" NPT male.
Enclosure Rating: NEMA 4X (IP65).
Housing Materials: 316 SS, 416 SS, polycarbonate, neoprene, and acrylated urethane.
Switch Type: 1 NO NPN, 1 NC NPN.
Input Power and Protection: 0.5A fuse (resettable) reverse polarity protected.
Switched Output Protection: 0.5A fuse (resettable) reverse polarity protected.
Agency Approvals: CE.

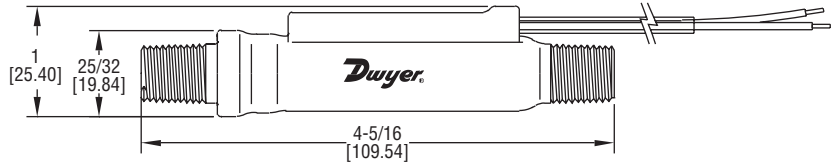
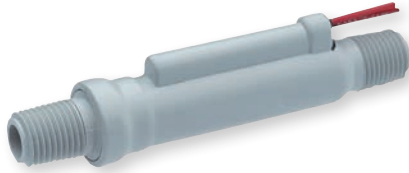
MODEL CHART

Model	Description
TDFS-1-P-06	Thermal flow switch, 6' cable with cable gland
Note: Consult factory for longer cable lengths	



FLOW SWITCH

Ideal for Air and Post-Filtered Water Applications, Fixed Set Point, FDA Compliant



The **SERIES P2** Flow Switches utilize a piston-type design for both air and pure water applications. The switches have preset actuation points from 0.05 to 1.0 GPM for water and 25 CFH to 5 CFM for air. The P2 is comprised of PPE & PS (polyphenylene ether and polystyrene) housing and piston and 316 SS spring and stop pin.

FEATURES/BENEFITS

- Piston design incorporates a hermetically sealed SPST magnetic reed switch
- All wetted parts are FDA compliant
- Economical design

APPLICATIONS

- Pure water equipment
- Filter life monitoring
- Heat exchangers
- Cooling applications

MODEL CHART

Model	Media	Actuation Set Point	Model	Media	Actuation Set Point
P2-11	Liquids	.05 GPM (.19 LPM)	P2-15	Gases @ 5 psi	.42 CFM (11.9 LPM)
P2-12	Liquids	.25 GPM (.95 LPM)	P2-16	Gases @ 5 psi	1.0 CFM (28.3 LPM)
P2-13	Liquids	.50 GPM (1.89 LPM)	P2-17	Gases @ 5 psi	2.5 CFM (70.8 LPM)
P2-14	Liquids	1.0 GPM (3.79 LPM)	P2-18	Gases @ 5 psi	5.0 CFM (141.6 LPM)

SPECIFICATIONS

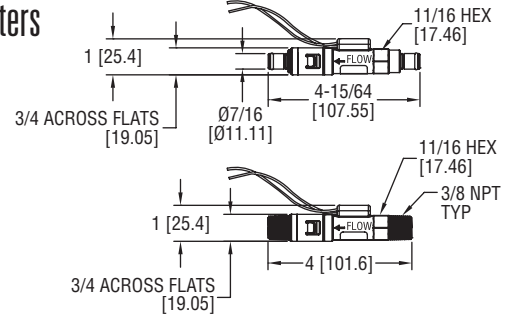
Service: Compatible liquids or gases.
Wetted Materials: Housing: PPE & PS (polyphenylene ether and polystyrene); Piston: PPE & PS and epoxy; Spring and stop pin: 316 SS.
Temperature Limits: 0 to 212°F (-18 to 100°C).
Pressure Limits: 150 psig (10.3 bar) @ 70°F (21°C); 50 psig (3.4 bar) @ 212°F (100°C).
Switch Type: SPST, N.O.

Electrical Rating: .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC.
Electrical Connection: 22 AWG, 18" (45.7 cm), PVC lead wires.
Process Connection: 1/4" male NPT.
Mounting Orientation: Any position. Set points shown are based on vertical, inlet down position.
Required Filtration: 50 microns or better.
Weight: 2 oz (.06 kg).
Agency Approvals: CE.

SERIES P3

POLYPROPYLENE FLOW SWITCH

Fixed Set Points from 0.25 to 2.0 GPM, 3/8" NPT or "Quick Disconnect" Adapters



The **SERIES P3** Flow Switches fit almost any piping requirements with compatible liquids. Choose the inlet and outlet port to be 3/8" male NPT or 1/4" male "Quick Disconnect" then select a quick disconnect acetal adapter for straight through flow or with a shut off valve.

FEATURES/BENEFITS

- Piston design incorporates a hermetically sealed SPST magnetic reed switch
- Easy integration to existing piping with a variety of fitting options
- Selectable shut off valve will stop line flow when the adapter is removed from the switch
- Economical design

APPLICATIONS

- Pure water equipment
- Filter life monitoring
- Heat exchangers
- Cooling applications

MODEL CHART

Model	Connection	Actuation Set Point
P3-31	3/8" NPT	0.25 GPM (.95 LPM)
P3-32	3/8" NPT	0.50 GPM (1.89 LPM)
P3-33	3/8" NPT	1.0 GPM (3.79 LPM)
P3-34	3/8" NPT	1.5 GPM (5.68 LPM)
P3-35	3/8" NPT	2.0 GPM (7.57 LPM)
P3-41	Quick disconnect	0.25 GPM (.95 LPM)
P3-42	Quick disconnect	0.50 GPM (1.89 LPM)
P3-43	Quick disconnect	1.0 GPM (3.79 LPM)
P3-44	Quick disconnect	1.5 GPM (5.68 LPM)
P3-45	Quick disconnect	2.0 GPM (7.57 LPM)

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Housing: Polypropylene; Piston: PPS composite; Spring: 316SS; O-ring: Fluorocarbon.
Temperature Limits: 0 to 212°F (-18 to 100°C).
Pressure Limits: 125 psig (8.6 bar) @ 70°F (21°C); 50 psig (3.4 bar) @ 212°F (100°C).
Accuracy: 20% of set point.
Repeatability: ±1%.
Switch Type: SPST, NO.

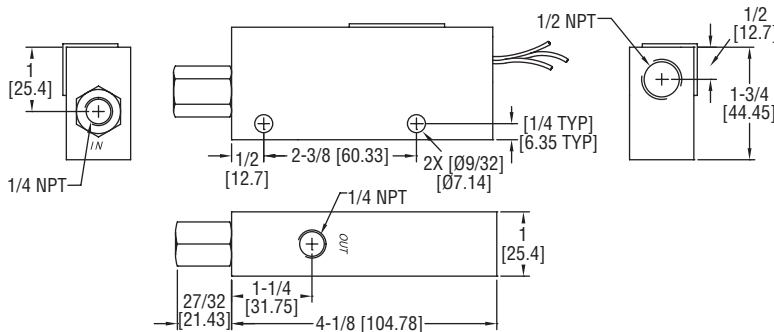
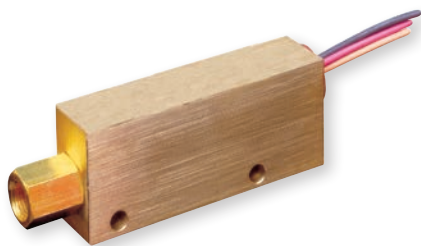
Electrical Rating: .08 A @ 120 VAC.
Electrical Connection: 24" (60.96 cm), polymeric wire leads, 22 AWG.
Process Connection: 3/8" male NPT or 1/4" quick disconnect.
Mounting Orientation: Any position. Set points shown are based on vertical, inlet down position.
Required Filtration: 100 microns or better.
Weight: 5 oz (0.14 kg).
Agency Approvals: CE.

ADAPTERS

Model	Connection
P3-801	Quick disconnect straight through 1/4" NPT
P3-802	Quick disconnect straight through 1/4" BSPT
P3-804	Quick disconnect straight through 3/8" BSPT
P3-807	Quick disconnect straight through 1/4" ID tubing
P3-901	Quick disconnect straight through 1/4" NPT w/shut-off valve
P3-902	Quick disconnect straight through 1/4" BSPT w/shut-off valve
P3-907	Quick disconnect straight through 1/4" ID tubing w/shut-off valve

BRASS FLOW SWITCH

Fixed Setpoints, Flow Rates from 0.10 to 1.5 GPM



The **SERIES P1** Brass Flow Switch utilizes a piston-type design for accurate detection of excessive or insufficient liquid flow rates. The switches have preset actuation points from 0.10 to 1.5 GPM for liquid flow.

FEATURES/BENEFITS

- Piston-type operation yields accurate detection of low flow rates
- The piston magnetically actuates a hermetically sealed SPST reed switch

APPLICATIONS

- Industrial cleaning equipment
- Detecting loss of fluid in hydraulic systems
- Assuring proper coolant flow in semiconductor processing

MODEL CHART

Model	Actuation Set Point* GPM (LPM)
P1-011	0.10 (.38)
P1-012	0.25 (.95)
P1-013	0.50 (1.89)
P1-014	0.75 (2.84)
P1-015	1.00 (3.79)
P1-016	1.50 (5.68)

*Calibrated for water at standard conditions.

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials: Housing: Brass; Piston: Polysulfone; Spring: 316SS; O-ring: Fluoroelastomer; Other: Epoxy.

Temperature Limits: -20 to 225°F (-29 to 107°C).

Pressure Limits: 1000 psig (68.9 bar).

Accuracy: ±10% of set point.

Repeatability: ±1%.

Switch Type: SPDT.

Electrical Rating: .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC.

Electrical Connection: 18 AWG, 24" (60.96 cm), polymeric lead wires.

Process Connection: 1/4" female NPT.

Mounting Orientation: Any position. Set points shown are based on vertical, inlet down position.

Required Filtration: 50 microns or better.

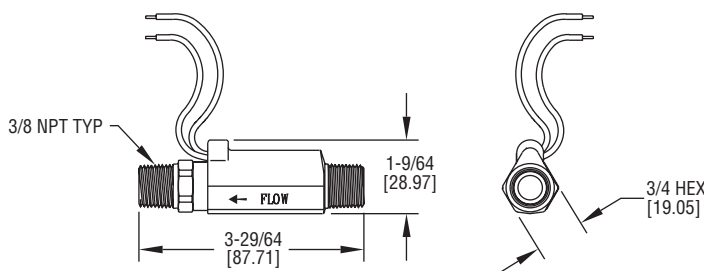
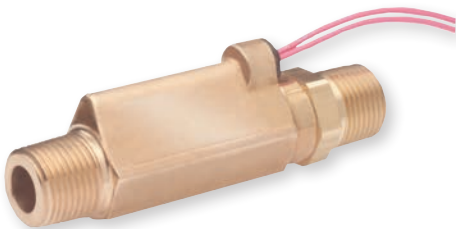
Weight: 0.66 lb (301 g).

Agency Approvals: CE.

SERIES P8

HIGH PRESSURE BRASS FLOW SWITCH

Up to 1500 psi, Fixed Setpoint, Up to 2.0 GPM, Rugged Brass Body



The **SERIES P8** High Pressure Brass Flow Switches are ideal for high in-line pressures. Set points range from 0.25 to 2.0 GPM for liquid flow.

FEATURES/BENEFITS

- Integrates a one-piece magnetic PPS composite piston to handle pressure up to 1500 psi
- Less susceptible to clogging than other high in-line pressure switches with 100 micron filtration

APPLICATIONS

- Industrial cleaning equipment
- High pressure lubrication systems

MODEL CHART

Model	Actuation Set Point GPM (LPM)
P8-11	0.25 (.95)
P8-12	0.50 (1.89)
P8-13	1.0 (3.79)
P8-14	1.5 (5.68)
P8-15	2.0 (7.57)

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials: Housing: Brass; Piston: PPS composite, epoxy; Spring: 316 SS; O-ring: Fluorocarbon.

Temperature Limits: -20 to 275°F (-28 to 135°C).

Pressure Limits: 1500 psi (103.4 bar).

Accuracy: ±20% of set point.

Switch Type: SPST, NO.

Electrical Rating: .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC.

Electrical Connection: No. 22 AWG, 24" (61 cm), polymeric leads.

Process Connections: 3/8" male NPT.

Mounting Orientation: Any position. Set points shown are based on vertical, inlet down position.

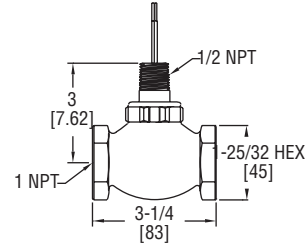
Required Filtration: 100 microns or better.

Weight: 6 oz (.17 kg).

Agency Approvals: CE.

GLOBE VALVE SWITCH

Adjustable Set Point, Rugged Bronze Construction, Straight Through Flow



The **SERIES GVS** Globe Valve Switches offer accurate flow detection with 1% repeatability and external adjustability over a broad range of flow settings for compatible liquids.

FEATURES/BENEFITS

- Externally adjustable flow set point
- Durable construction delivers long-life reliability in either water or oil
- Ample space for flow to pass keep pressure drop low

APPLICATIONS

- Detection of improper flow rates in high volume lubrication
- Low flow detection in cooling lines
- Flow detection in process systems

MODEL CHART	
Model	Actuation Set Point Range GPM (LPM)
GVS-111	1.0 to 6.0 (3.8 to 22.7)
GVS-112	5.0 to 15.0 (18.9 to 56.8)
GVS-113	2.0 to 8.0 (7.6 to 30.3)

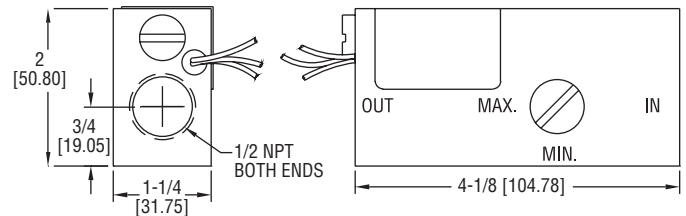
SPECIFICATIONS

Service: Compatible liquids. Wetted Materials: Housing: Bronze; Shuttle: TFE; Bonnet: Bronze; Spring: 316SS.; Other: Fluoroelastomer, ceramic. Temperature Limits: -20 to 200°F (-29 to 93°C). Pressure Limits: 400 psig (27 bar) @ 100°F (38°C). Accuracy: ±10%. Repeatability: 1% maximum deviation. Switch Type: SPDT.	Electrical Rating: .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC. Electrical Connections: 18 AWG, 24" (61 cm), polymeric lead wires. Process Connections: 1" female NPT. Mounting Orientation: Any position. Set points shown are based on horizontal, lead wires up positional. Required Filtration: 150 microns or better. Weight: 2 lb, 8 oz (1.16 kg). Agency Approvals: CE.
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SERIES AFS

ADJUSTABLE FLOW SWITCH

For Oils, Water and Gases, Infinite Adjustments



The **SERIES AFS** Adjustable Flow Switches are externally adjustable piston-type flow switches for oils, liquids and gases. This Series offers an infinite number of flow settings from 0.5 to 20 GPM.

FEATURES/BENEFITS

- Externally adjustable flow set point
- Offers a number of flow settings at pressures up to 1000 psig, with low pressure drop and precise repeatability

APPLICATIONS

- Protecting machine tools from coolant flow failure
- Protecting bearings from loss of lubricant
- Assuring proper air flow
- Water or compatible liquid control
- Oil flow control
- Control of gas flows

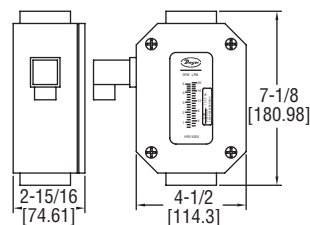
MODEL CHART				
Model	Media	Electrical Connection	Piston	Housing
AFS-131	Oil	Wire leads	Brass	Brass
AFS-141	Water	Wire leads	Polysulfone	Brass
AFS-151	Liquids	Wire leads	316 SS	316 SS
AFS-231	Gases	Wire leads	Brass	Brass
AFS-251	Gases	Wire leads	316 SS	316 SS
AFS-132	Oil	1/2" NPT conduit	Brass	Brass
AFS-142	Water	1/2" NPT conduit	Polysulfone	Brass
AFS-152	Liquids	1/2" NPT conduit	316 SS	316 SS
AFS-232	Gases	1/2" NPT conduit	Brass	Brass
AFS-252	Gases	1/2" NPT conduit	316 SS	316 SS

SPECIFICATIONS

Service: Compatible gases or liquids. Wetted Materials: Housing and Piston: See model chart; Spring: 316SS; O-ring: Fluoroelastomer; Other: Epoxy. Temperature Limits: -20 to 300°F (-29 to 149°C), -20 to 225°F (-29 to 107.2°C) with polysulfone piston. Pressure Limit: 1000 psi (68 bar). Accuracy: ±10% of setpoint. Repeatability: ±1% maximum deviation. Switch Type: SPDT.	Electrical Rating: .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC. Electrical Connections: 18 AWG, 24" (61 cm), polymeric lead wires, optional 1/2" male NPT conduit connection. Process Connection: 1/2" female NPT ports. Mounting Orientation: Any. Set Point Adjustment: Liquids: 0.5 to 20 GPM (1.9 to 75.7 LPM); Gases: 1.0 to 75 SCFM (28 to 2124 LPM) at 5 psig. Required Filtration: 50 microns or better. Weight: 2 lb, 11 oz (1.22 kg). Agency Approvals: CE.
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IN-LINE FLOW ALARMS

Latching Alarm Capabilities, For Air, Water or Caustic Fluids, Unrestricted Mounting



The **SERIES HFO** In-Line Flow Alarms provide continuous monitoring and control of flow rate levels. The flow alarm can be configured to open or close a contact for an increasing or decreasing set point. Available in 1/4", 1/2", 1" or 1-1/2" female NPT process connections, in aluminum, brass or 304 SS body.

FEATURES/BENEFITS

- Provides two 10 A SPDT limit switches with field adjustable alarm settings for application control and integral direct reading scale provides local indication of flow rate
- Increased application versatility with no inlet or outlet straight plumbing requirement and can be mounted horizontally, vertically, or inverted
- Outdoor or harsh environment installation capable with rugged cast aluminum construction and NEMA 4X (IP65) enclosure

APPLICATIONS

- Waste water processing
- Lubrication systems
- Process control
- Solar systems
- Drain lines
- Pump testing

MODEL CHART - DUAL SCALE RANGE

Model	Connection Size	Range, Air: SCFM, SLPS	Body Material
HFO-21112	1/4" female NPT	2 to 12, 1 to 5.5	Aluminum
HFO-21123	1/4" female NPT	4 to 23, 2 to 10	Aluminum

SPECIFICATIONS

Service: Compatible gases or liquids. Wetted Materials: Body: Aluminum, brass or 304 SS; Seals: Buna-N or fluoroelastomer; Magnet: PTFE coated Alnico; Other internal parts: 304 SS. Viscosity: 500 SSU. Temperature Limits: 170°F (76°C). Pressure Limits: Aluminum body: 600 psig (41 bar); Brass body: 3500 psig (240 bar); 304 SS body: 6000 psig (413 bar).	Enclosure Rating: NEMA 4X (IP66). Accuracy: ±2% FS. Repeatability: ±1% of FS. Switch Type: SPDT, 10 A @ 250 VAC; 0.5 A @ 125 VDC, (resistive). Shipping Weight: 1/4 to 1/2" female NPT models: 3 lb (1.4 kg); 3/4 to 1" female NPT models: 4.5 lb (2.0 kg); 1-1/2" female NPT models: 12 lb (5.4 kg).
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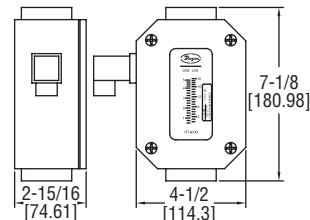
MODEL CHART

Model	Connection Size	Range, Water: GPM, LPM	Body Material
HFO-22205	1/2" female NPT	0.5 to 5.0, 2 to 19	Brass
HFO-22315	3/4" female NPT	1 to 15, 5 to 55	Brass
HFO-22320	3/4" female NPT	2 to 20, 10 to 74	Brass
HFO-22440	1" female NPT	4 to 40, 20 to 150	Brass
HFO-22550	1-1/2" female NPT	6 to 50, 20 to 190	Brass
HFO-23202	1/2" female NPT	.2 to 2, 1 to 8	304 SS
HFO-23210	1/2" female NPT	1 to 10, 3 to 37.5	304 SS

SERIES HFT

IN-LINE FLOW TRANSMITTERS

Local Flow Indication, Unrestricted Mounting, 4-20 mA, 0-5 V, and 1-5 V Output



The **SERIES HFT** In-Line Transmitters provide continuous monitoring of flow rate levels via a direct reading in-line flowmeter with electronics to provide proportional 4-20 mA, 0-5 and 1-5 VDC analog outputs.

FEATURES/BENEFITS

- Provides analog output to monitor application flow and integral direct reading scale to provide local indication of flow rate
- Increased application versatility with no inlet or outlet straight plumbing requirement and can be mounted horizontally, vertically, or inverted
- Outdoor or harsh environment installation capable with rugged cast aluminum construction and NEMA 4X (IP65) enclosure

APPLICATIONS

- Waste water processing
- Lubrication systems
- Process control
- Solar systems
- Drain lines
- Pump testing
- Drive data acquisition devices, meters or analog input cards

MODEL CHART - DUAL SCALE RANGE

Model	Connection Size	Range, Air: SCFM, SLPS	Body Material
HFT-1112	1/4" female NPT	2 to 12, 1 to 5.5	Aluminum
HFT-1123	1/4" female NPT	4 to 23, 2 to 10	Aluminum

OPTION

Use order code:	Description
NISTCAL-FT1	NIST traceable calibration certificate

SPECIFICATIONS

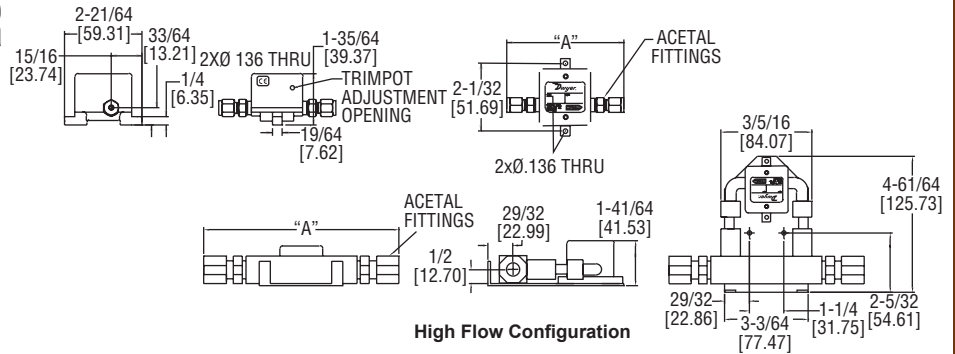
Service: Compatible gases or liquids. Wetted Materials: Body: Aluminum, brass or 304 SS; Seals: Buna-N or Fluoroelastomer; Magnet: PTFE coated Alnico; Other internal parts: 304 SS. Viscosity: 500 SSU. Temperature Limits: 170°F (76°C). Pressure Limits: Aluminum body: 600 psig (41 bar); Brass body: 3500 psig (240 bar); 304 SS body: 6000 psig (413 bar).	Power Requirements: 12 to 35 VDC. Enclosure Rating: NEMA 4X (IP66). Accuracy: ±2% FS. Repeatability: ±1% of FS. Response Time: < 100 msec. Output Signal: 4 to 20 mA; 0 to 5 V; 1 to 5 V. Shipping Weight: 1/4 to 1/2" female NPT models: 3 lb (1.4 kg); 3/4 to 1" female NPT models: 4.5 lb (2.0 kg); 1-1/2" female NPT models: 12 lb (5.4 kg).
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MODEL CHART

Model	Connection Size	Range, Water: GPM, LPM	Body Material
HFT-2205	1/2" female NPT	0.5 to 5.0, 2 to 19	Brass
HFT-2315	3/4" female NPT	1 to 15, 5 to 55	Brass
HFT-2320	3/4" female NPT	2 to 20, 1 to 75	Brass
HFT-2440	1" female NPT	4 to 40, 15 to 150	Brass
HFT-2550	1-1/2" female NPT	6 to 50, 20 to 190	Brass
HFT-3202	1/2" female NPT	.2 to 2, 1 to 8	304 SS
HFT-3210	1/2" female NPT	1 to 10, 3 to 3.75	304 SS

GAS TURBINE FLOW METER

PPS Body, 0 to 5 VDC Output



The **SERIES TFP-GV** Gas Flowmeters utilize a turbine wheel and electro-optical detection to convert flow rates into a linear 0 to 5 VDC output signal for recording and data logging. Couple this unit with a Series FIV Flow Totalizer for a remote flow monitoring display. A power adapter or mating cable assembly is required for operation.

FEATURES/BENEFITS

- Corrosion resistant PPS body
- High repeatability with patented microturbine design
- Design accurately measures flow rates with no zero drift and no required maintenance

APPLICATIONS

- Industrial flow monitoring
- Commercial systems
- Laboratory equipment

MODEL CHART			
Model	Range	Connection	"A" (in)
TFP-GV03	.042 to .21 SCFH (.02 to .1 LPM)	1/8" OD	3-27/64
TFP-GV04	.085 to .42 SCFH (.04 to .2 LPM)	1/8" OD	3-27/64
TFP-GV05	.21 to 1.1 SCFH (.1 to .5 LPM)	1/8" OD	3-27/64
TFP-GV06	.42 to 2.1 SCFH (.2 to 1 LPM)	1/8" OD	3-27/64
TFP-GV07	.85 to 4.2 SCFH (.4 to 2 LPM)	1/4" OD	3-13/16
TFP-GV08	2.1 to 11 SCFH (1 to 5 LPM)	1/4" OD	3-13/16
TFP-GV09	4.2 to 21 SCFH (2 to 10 LPM)	1/4" OD	3-13/16
TFP-GV10*	8.5 to 42 SCFH (4 to 20 LPM)	3/8" OD	7-7/64
TFP-GV11*	21 to 110 SCFH (10 to 50 LPM)	3/8" OD	7-7/64
TFP-GV12*	42 to 210 SCFH (20 to 100 LPM)	1/2" OD	7-1/2
TFP-GV13*	85 to 420 SCFH (40 to 200 LPM)	1/2" OD	7-1/2

*These models come in high flow configuration

SPECIFICATIONS

Service: Clean dry gases compatible with wetted materials.
Wetted Materials: PPS, acetal, sapphire, glass, epoxy, and fluoroelastomer.
Accuracy: $\pm 3\%$ of FS.
Linearity: $\pm 3\%$ of FS.
Repeatability: $\pm 0.5\%$ of FS.
Temperature Limits: 41 to 131°F (5 to 55°C); Storage: 32 to 158°F (0 to 70°C); Sensitivity: $\pm 0.2\%$ of FS per °C.
Pressure Limits: 40 psig (2.8 bar).
Process Connection: Compression fitting, see model table.
Power Requirements: 11.5 to 15 VDC.
Power Consumption: 35 mA @ 12 VDC.
Output Signal: 0 to 5 VDC; Minimum 2.5 kΩ load.
Electrical Connections: Four-pin power and signal connector. A power adapter or mating cable required for operation. See accessories table.
Enclosure Rating: IP10 (NEMA 1).
Weight: 0.16 lb (75 g).
Agency Approvals: CE.

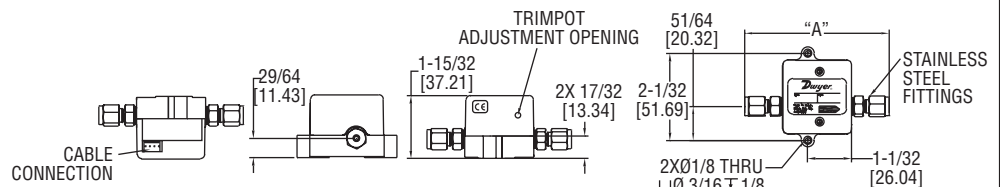
ACCESSORIES

Model	Description
A-454	115 VAC power adapter and signal cable
A-455	230 VAC power adapter and signal cable
A-456	36" mating cable with spliced leads

SERIES TFM-LP

LIQUID TURBINE FLOW METER

316SS Body, 0 to 5 VDC and Pulse Outputs



The **SERIES TFM-LP** Liquid Flowmeters utilize a turbine wheel and electro-optical detection to convert flow rates into a linear 0 to 5 VDC and pulsed output signal for recording and data logging. Couple this unit with a Series FIV Flow Totalizer for a remote flow monitoring display. A power adapter or mating cable assembly is required for operation.

FEATURES/BENEFITS

- Rugged 316 SS body
- High repeatability with patented microturbine design
- Design accurately measures flow rates with no zero drift and no required maintenance

APPLICATIONS

- Industrial flow monitoring
- Commercial systems
- Laboratory equipment

MODEL CHART			
Model	Range	Connection	"A" (in)
TFM-LP03	.21 to 1.6 GPH (.013 to .1 LPM)	1/8" OD	3-27/64
TFM-LP04	.32 to 3.2 GPH (.02 to .2 LPM)	1/4" OD	3-53/64
TFM-LP05	.79 to 7.9 GPH (.05 to .5 LPM)	1/4" OD	3-53/64
TFM-LP06	1.6 to 16 GPH (0.1 to 1 LPM)	1/4" OD	3-53/64
TFM-LP07	3.2 to 32 GPH (.2 to 2 LPM)	1/4" OD	3-53/64
TFM-LP08	7.9 to 79 GPH (.5 to 5 LPM)	3/8" OD	4-1/8
TFM-LP09	16 to 160 GPH (1 to 10 LPM)	3/8" OD	4-1/8

SPECIFICATIONS

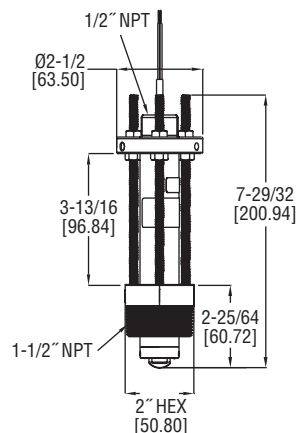
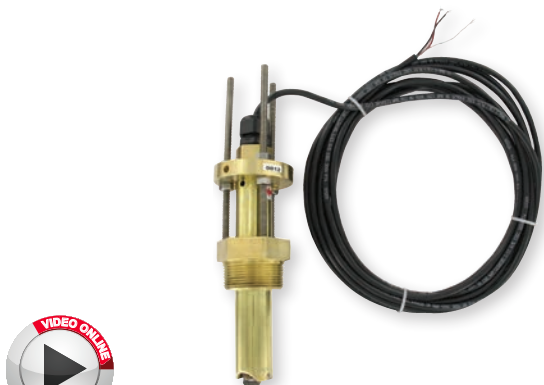
Service: Clean liquids compatible with wetted materials.
Wetted Materials: 316 SS, acetal, sapphire, glass, epoxy, and fluoroelastomer.
Accuracy: $\pm 1\%$ of FS.
Linearity: $\pm 1\%$ of FS.
Repeatability: $\pm 0.2\%$ of FS.
Temperature Limits: 41 to 131°F (5 to 55°C); Storage: 32 to 158°F (0 to 70°C); Sensitivity: $\pm 0.2\%$ of FS per °C.
Pressure Limits: 500 psig (34.5 bar).
Process Connection: Compression fitting, see model table.
Power Requirements: 11.5 to 15 VDC.
Power Consumption: 35 mA @ 12 VDC.
Output Signal: 0 to 5 VDC; Minimum 2.5 kΩ load; Pulse: 7.5 VDC peak buffered square wave.
Electrical Connections: Four-pin power and signal connector. A power adapter or mating cable required for operation. See accessories table.
Enclosure Rating: IP10 (NEMA 1).
Weight: 0.86 lb (390 g).
Agency Approvals: CE.

ACCESSORIES

Model	Description
A-454	115 VAC power adapter and signal cable
A-455	230 VAC power adapter and signal cable
A-456	36" mating cable with spliced leads

PADDLEWHEEL FLOW SENSOR

Non-Magnetic Sensing, Adjustable for 1-1/2 to 40" (38.1 to 1016 mm) Pipe, Pulse or 4 to 20 mA



The **SERIES PFT** Insertion Paddlewheel Flowmeters are used to monitor liquid flow rates in pipes from 1-1/2 to 40" and is available in brass or 316 SS body. The unit outputs a frequency proportional pulsed or 4 to 20 mA output. The pulse models are a square wave output signal with frequency proportional to the flow velocity and the 4 to 20 mA models have a linear output of the velocity with 4 mA equal to 0 ft/s and 20 mA equal to 25 ft/s.

FEATURES/BENEFITS

- Bearings and shaft offer excellent wear protection even in applications with particulate for long life
- Weatherproof and submersible rated for irrigation applications
- One unit adjustable over a large pipe size range
- Multiple wetted material choices offer application versatility
- Integral 4 to 20 mA output with no need for additional external components
- Sensor technology uses inductive sensing to sense the blades of the impeller therefore does not use magnets allowing low flow rate monitoring with no concerns regarding magnetic material in the flow

APPLICATIONS

- Irrigation
- Ground water remediation
- Cooling systems
- Pump protection
- Leak detection
- Filtration systems

SPECIFICATIONS

Service: Water-based fluids.

Range: 1.2 to 25 ft/s (0.37 to 7.62 m/s).

Wetted Materials: Body and fitting: Brass or 316 SS; fitting O-ring: FKM standard, silicone or Buna-N optional; impeller: 316 SS; shaft: Tungsten carbide standard or 316 SS optional; bearing: PTFE standard.

Linearity: $\pm 1.0\%$ of FS.

Repeatability: $\pm 0.5\%$ of FS.

Temperature Limits: -40 to 212°F (-40 to 100°C).

Pressure Limits: 400 psig (27.6 bar) @ 100°F (37.8°C), 325 psig (22.4 bar) @ 212°F (100°C).

Process Connection: 1-1/2" NPT male or 1-1/2" BSPT male standard, 2" NPT male or 2" BSPT male optional.

Output: Pulse: NPN open collector with square wave output, rated 60 V @ 50 mA max; Frequency: 3.2 to 200 Hz. Pulse Width: 2.5 msec $\pm 25\%$; 4 to 20 mA: 4 mA is 0 ft/s, 20 mA is 25 ft/s.

Power Requirement: 10 to 35 VDC.

Power Consumption: 40 mA (max.).

Electrical Connection: 22 AWG shielded UL type PTLT rated 105°C, 20' (6.1 m) long with cable gland. Can be extended up to 2000' (609 m) with similar cable. Optional UL listed burial rated cable.

Enclosure Rating: NEMA 6P (IP67)*.

Housing Materials: Brass or 316 SS.

Weight: 3 lb (1.36 kg).

Agency Approvals: CE.

*Brass units IP67 only.

MODEL CHART

Model	Body Material	Output	Description
PFT-IAN-B111-S	Brass	4 to 20 mA	1-1/2" NPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IAN-S111-S	316 SS	4 to 20 mA	1-1/2" NPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IDN-B111-S	Brass	Pulse	1-1/2" NPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IDN-S111-S	316 SS	Pulse	1-1/2" NPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IAN-B311-S	Brass	4 to 20 mA	1-1/2" BSPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IAN-S311-S	316 SS	4 to 20 mA	1-1/2" BSPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IDN-B311-S	Brass	Pulse	1-1/2" BSPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable
PFT-IDN-S311-S	316 SS	Pulse	1-1/2" BSPT connection, FKM seals, tungsten-carbide shaft, PTFE bearing, 20' of cable

Consult factory for longer cable lengths, burial rated cable, 2" NPT connection, or other wetted materials.

ACCESSORY

Model	Description
SDF	Saddle fitting available for securing unit in pipe size ranging from 3 to 24".

PADDLEWHEEL FLOW SENSOR

Low Friction Bearings, Long Life, 1/2 to 8" Pipe (12.7 to 203 mm)



PWF-B-PXX



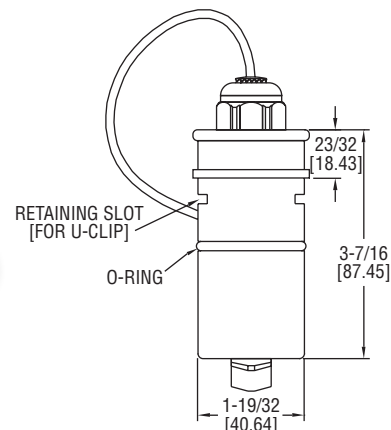
PWF-S-BXX



PWF-S-DXX



PWF-T-SFT-SS



The **SERIES PDWS** Insertion Paddlewheel Flowmeters are designed for pipe size ranges from 1/2 to 8" with available materials of brass, stainless steel, PVC, and polypropylene. The Series PDWS is intended to be used with the Series PWF, a wide variety of custom tee, saddle, or welded fittings that come in bronze, PVC, and stainless steel.

FEATURES/BENEFITS

- The bearings are made from ruby jewel to reduce the coefficient of friction and maintain high accuracy
- PVC and polypropylene body material offers resistance against corrosive media

APPLICATIONS

- Industrial water & wastewater treatment
- Cooling water monitoring
- Industrial fluid control
- Chemical proportioning
- Fluctuating fluid conductivity applications

SPECIFICATIONS

Service: Compatible clean liquids.
Range: 0.3 to 30 ft/s (0.09 to 9.14 m/s).
Wetted Materials: Sensor: Brass, 316 SS, PVC, or polypropylene; Rotor: PVDF; Shaft: Nickel-bonded tungsten carbide (ceramic optional); Bearings: Ruby jewel; O-ring: EPDM (fluoroelastomer optional).
Accuracy: $\pm 1.5\%$ FS.
Temperature Limits: Brass, 316 SS: 200°F (93°C); PVC, Polypropylene: 130°F (55°C).

Pressure Limits: Brass: 200 psi (14 bar); 316 SS: 250 psi (17 bar); PVC, polypropylene: 175 psi (12 bar) @ 75°F (24°C); High pressure option: 400 psi (28 bar) (SS only).
Process Connection: See page reference 1 below.
Output: Current sinking, square wave pulse, opto-isolated.
Power Requirements: 6 to 24 VDC, 2 mA (max. 20 mA).
Electrical Connection: #22 AWG, 3 conductor, 18' (5.5 m) cable (max. 2000' run).
Enclosure Rating: NEMA 4X (IP66).
Weight: 2 lb (907 g).

MODEL CHART

Example	PDWS	-1B	-CRS	PDWS-1B-CRS
Series	PDWS			Insertion paddlewheel flow sensor
Size/ Material		1B 1S 1P 1Y 2B 2S 2P 2Y		1/2 to 3", brass 1/2 to 3", 316 SS 1/2 to 3", PVC 1/2 to 3", polypropylene 4 to 8", brass 4 to 8", 316 SS 4 to 8", PVC 4 to 8", polypropylene
Options			CRS IMM FOR HPO	Ceramic shaft Immersible (urethane potted electrical connection) Fluoroelastomer O-ring High pressure options (Use with SS only)

Note: Need to purchase with Series PWF fitting for proper installation.

ACCESSORIES

Series	Description
BAT	Blind analog transmitter; converts pulse output to 4 to 20 mA analog output; unit is loop powered, fits on the enclosure of the meter, and is field spannable.
RTI2	Rate total indicator; converts pulse output to 4 to 20 mA analog output with local flow rate and totalization display; unit is loop powered, can fit on the enclosure of the meter, and provides a high/low flow alarm.
PWD	Pulse divider, for use with pacing electronic metering pumps; unit divides the input frequency to any number from 1 to 9999 with the use of rotary switches to suit a number of metering pump inputs. (See website)

MODEL CHART - TEE FITTING

		PDWS-1XX						
Model	Description	1/2"	3/4"	1"	1-1/2"	2"	3"	4"
		-0050	-0075	-0100	-0150	-0200	-0300	-0400
PWF-T-BFS	Bronze/female sweat (for copper tubing)	X	X	X	X	X	X	X
PWF-T-BFT	Bronze/female thread	X	X	X	X	X	X	X
PWF-T-PME	PVC/male stub end	X	X	X	X	X		
PWF-T-CFT	Carbon steel/female thread	X	X	X	X	X		
PWF-T-SFT	304 SS/female thread	X	X	X	X	X		
-SS	All 316 SS option	X	X	X	X	X		
-HP	High pressure option (SS or CS only)	X	X	X	X	X		

MODEL CHART - SADDLE FITTING

Model	Description	PDWS-1XX		PDWS-2XX	
		3"	4"	6"	8"
		-0300	-0400	-0600	-0800
PWF-S-DXX	Ductile iron	X	X	X	X
PWF-S-PXX	PVC	X	X	X	X
PWF-S-BXX	Bronze	X	X	X	X
-LPS	Installed on 16" long pipe stub option (PVC only)	X	X	X	X

MODEL CHART - WELD/BRAZE FITTING

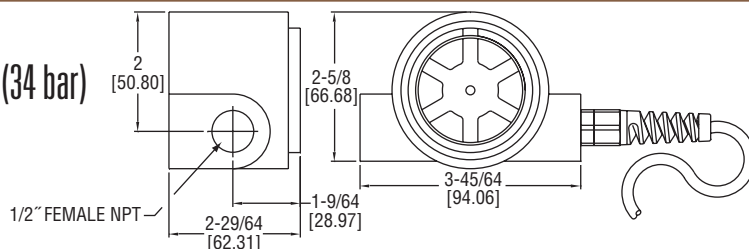
Model	Description	PDWS-1XX		PDWS-2XX	
		3"	4"	6"	8"
		-0300	-0400	-0600	-0800
PWF-W-BXX	Bronze	X	X	X	X
PWF-W-CXX	Carbon steel	X	X	X	X
PWF-W-SXX	316 stainless steel	X	X	X	X
-HP	High pressure option (SS or CS only)	X	X	X	X

Example: PWF-T-CFT-0050-SS

To order an all 316 SS female thread 1/2" tee for Series PDWS-1XX Paddlewheel Flow Meter.

SIGHT FLOW TRANSMITTER

±2% FS Accuracy, 4 to 20 mA Output, Pressure up to 500 psig (34 bar)



The **SERIES SF** Sight Flow Transmitter is a Series of sight indicators which can display flow or contents of pipelines and provide an analog 4 to 20 mA signal proportional to the flow rate. It is available with a 316 SS or clear polycarbonate cover.

FEATURES/BENEFITS

- Integrates tangential turbine technology with hermetically sealed circuitry to provide accurate flow measurement and control in the harshest environments
- 2-wire loop-powered design transmits a 4 to 20 mA signal proportional to flow rate for remote flow monitoring
- Clear polycarbonate viewing cover option for visible indication of flow
- 316 SS cover offers added protection with pressure limit up to 500 psig (34 bar)
- LED power indication, adjustable zero and span, polarity protection and over current limiting
- Accurately measures flow in both directions and can be mounted in any orientation

APPLICATIONS

- Cooling and lubrication circuits
- HVAC systems
- Aggressive chemical metering
- Batching systems

OPTION

Use order code:	Description
NISTCAL-FT1	NIST traceable calibration certificate

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: 316 SS shaft and case, Iglide® bearings, Buna-N seal and acetal copolymer, (polycarbonate cover on Model SF11).
Flow Range: 0.5 to 15 GPM (2 to 60 LPM).
Accuracy: ±2% FS.
Repeatability: 0.5% FS.
Temperature Limits: 20 to 225°F (-7 to 107°C).

Pressure Limits: 500 psig (34 bar) Model SF10; 200 psig (14 bar) Model SF11.
Response Time: 2 seconds to 90% (step change in flow rate).
Supply Voltage: 12 to 35 VDC.
Output: 4 to 20 mA.
Loop Resistance: 1150 Ω max.
Process Connection: 1/2" female NPT.
Electrical Connection: Wire leads: 22 AWG x 9' (2.7 m).
Max. Particle Size: 100µm.
Agency Approvals: CE.

MODEL CHART

Model	Cover Material
SF10	316 SS
SF11	Clear polycarbonate

Iglide® is a registered trademark of Igus GMBH

SERIES SF2

SIGHT FLOW METERS

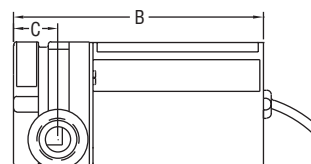
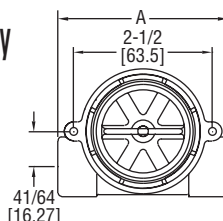
SPDT or Pulse Output, Visual Flow Confirmation, Brass Body



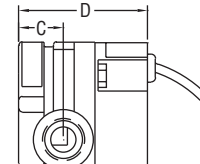
SF2-1



SF2-2



Side View VAC Switch Models



Side View VDC Switch and Transmitter Models

DIMENSIONS in [mm]									
Model	A	B	C	D	Model	A	B	C	D
SF2-104	3-1/64 [76.6]	-	7/8 [22.23]	2-21/64 [59.13]	SF2-134	3-61/64 [100.41]	-	1-1/16 [26.99]	2-61/64 [75]
SF2-101	3-1/64 [76.6]	4-1/2 [114.3]	7/8 [22.23]	-	SF2-131	3-61/64 [100.41]	4-49/64 [121.05]	1-1/16 [26.99]	-
SF2-114	3-1/64 [76.6]	-	7/8 [22.23]	2-21/64 [59.13]	SF2-204	3-1/64 [76.6]	-	13/16 [20.64]	2-21/64 [59.13]
SF2-111	3-1/64 [76.6]	4-1/2 [114.3]	7/8 [22.23]	-	SF2-214	3-1/64 [76.6]	-	13/16 [20.64]	2-21/64 [59.13]
SF2-124	3-61/64 [100.41]	-	1-1/16 [26.99]	2-61/64 [75]	SF2-224	3-61/64 [100.41]	-	1-1/16 [26.99]	2-61/64 [75]
SF2-121	3-61/64 [100.41]	4-49/64 [121.05]	1-1/16 [26.99]	-	SF2-234	3-61/64 [100.41]	-	1-1/16 [26.99]	2-61/64 [75]

The **SERIES SF2** Sight Flow Transmitters combine visual confirmation of flow with a relay or pulse output. The SF2-1 offers a SPDT relay output and the SF2-2 offers a pulse output proportional to the rate of flow. The 4.5 to 24 VDC pulse output is compatible with most digital logic families.

FEATURES/BENEFITS

- Brass, solid body construction, one piece composite rotor, and ceramic shaft delivers durability with broader chemical, temperature, and pressure capabilities
- Set points are fully adjustable over the specified flow range
- The dynamic operation of the rotor guards against jamming and false actuation

APPLICATIONS

- Cooling and lubrication circuits
- HVAC systems
- Aggressive chemical metering
- Batching systems

SPECIFICATIONS

Service: Liquids compatible with wetted parts.
Wetted Materials: Brass body, ceramic pin, PPS rotor, Polysulfone lens and fluoroelastomer O-ring.
Accuracy: Relay output: ±5%; Pulsed output: ±7% for ranges up to 5.0 GPM, ±15% for ranges up to 60.0 GPM.
Temperature Limits: -20 to 212°F (-29 to 100°C).
Pressure Limit: 200 psig (13.8 bar) @ 70°F.
Power Requirements: See table.

Output: SPDT: 1 Amp, 24 VDC resistive; 0.3 Amp, 110 VAC or 4.5 VDC to 24 VDC pulse depending on model.
Electrical Connections: Relay output models: 20AWG PVC-jacketed, 24" cable; Pulsed output models: 22AWG PVC-jacketed, 24" cable.
Process Connections: See table.
Set Point Differential: 15% max for relay output models.
Maximum Viscosity: 200 SSU.
Agency Approvals: CE.

MODEL CHART - SPDT RELAY OUTPUT

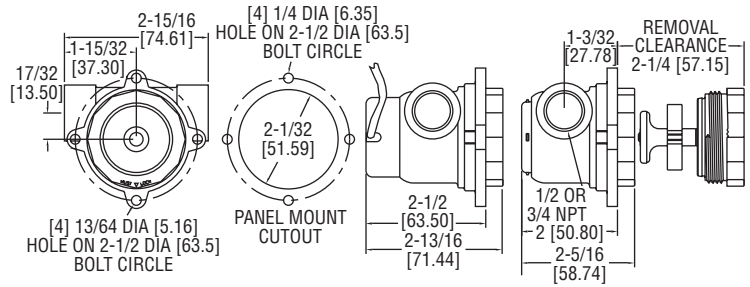
Model	Range (GPM)	Power	Connection
SF2-104	0.5 to 5.0	24 VDC	1/4" female NPT
SF2-101	0.5 to 5.0	110 VAC	1/4" female NPT
SF2-114	4.0 to 20.0	24 VDC	1/2" female NPT
SF2-111	4.0 to 20.0	110 VAC	1/2" female NPT
SF2-124	5.0 to 30.0	24 VDC	3/4" female NPT
SF2-121	5.0 to 30.0	110 VAC	3/4" female NPT
SF2-134	8.0 to 60.0	24 VDC	1" female NPT
SF2-131	8.0 to 60.0	110 VAC	1" female NPT

MODEL CHART - PULSED OUTPUT

Model	Range (GPM)	Power	Connection
SF2-204	0.5 to 5.0	4.5 to 24 VDC	1/4" female NPT
SF2-214	4.0 to 20.0	4.5 to 24 VDC	1/2" female NPT
SF2-224	5.0 to 30.0	4.5 to 24 VDC	3/4" female NPT
SF2-234	8.0 to 60.0	4.5 to 24 VDC	1" female NPT

SIGHT FLOW INDICATOR/TRANSMITTER

Low Cost, Optional Output for Flow Rate and Totalization UV Stabilized Polycarbonate Model



SFI with A-711 Option

SFI Model Only

The **SERIES SFI-800** Sight Flow Indicators & Transmitters is a low cost, durable rotor style flow indicator with optional Hall Effect magnetic output packages to combine visual confirmation of flow with optional remote flow monitoring. There are three output sensors available, the A-711 offering two pulsed voltage signals proportional to flow rate, the A-712 which outputs a linear 1 to 10 VDC signal proportional to flow rate, and the A-713 which offers two programmable open collector switch outputs.

The Model A-711 is a unique and patent pending sensor that outputs two pulsed voltage signals with one providing a 5 VDC pulse and the other a pulse of the input supply voltage used, ranging from 8 to 18 VDC.

The Model A-712 is a sensor that outputs a linear 1 to 10 VDC signal proportional to flow rate.

The Model A-713 is a sensor with two programmable open collector switch outputs with one output closed above the set point and the other output closed below the set point ideal for low flow or high flow indication.

FEATURES/BENEFITS

- Constructed of clear plastic enabling 360° viewing of the rotor for easy flow indication
- SFI-800 models are constructed of Polysulfone with excellent chemical compatibility, high pressure and temperature ratings, and all wetted materials are FDA/NSF ratable for potable water applications
- SFI-801 models are constructed of UV stabilized Polycarbonate making them ideal for outdoor applications and easy view bright red impeller
- All three output packages can be installed or replaced in the field without any tools and without removing the body from the process line
- Units are weather-tight for outdoor or wash-down area use
- A-713 features a user-friendly set point button which is set at the desired flow rate with red LED indication of switch status

APPLICATIONS

- Cooling and lubrication circuits
- HVAC systems
- Aggressive chemical metering
- Batching systems

MODEL CHART - SENSOR ONLY

Model	Description
A-711	Pulsed output
A-712	1 to 10 VDC
A-713	Two open collectors
*Sensor only, not attached to the flow indicator body.	

MODEL CHART - BODY ONLY

Polysulfone Body Model	Description	Range GPM (LPM)	Connection Female NPT
SFI-800-1/2	Indicator only	2 to 20 (7.6 to 75.5)	1/2"
SFI-800-3/4	Indicator only	3 to 35 (11.4 to 132.5)	3/4"
SFI-800-1/2-LF	Indicator only	0.5 to 6.5 (1.9 to 24.6)	1/2"
Polycarbonate Body Model	Description	Range GPM (LPM)	Connection Female NPT
SFI-801-1/2	Indicator only	2 to 20 (7.6 to 75.5)	1/2"
SFI-801-3/4	Indicator only	3 to 35 (11.4 to 132.5)	3/4"
SFI-801-1/2-LF	Indicator only	0.5 to 6.5 (1.9 to 24.6)	1/2"

SPECIFICATIONS

Service: Compatible fluids.

Wetted Materials: Body: SFI-800: Polysulfone; SFI-801: UV stabilized polycarbonate; Window: SFI-800: Polysulfone; SFI-801: UV stabilized polycarbonate; Rotor: SFI-800: White polysulfone; SFI-801: Red UV stabilized PBT; Rotor Pin: 316 SS; Thrust washers: 300 Series SS; O-ring: SFI-800: Fluoroelastomer (NSF grade); SFI-801: Buna-N.

Temperature Limits: SFI-800: -20 to 212°F (-29 to 100°C); SFI-801: -20 to 130°F (-29 to 55°C).

Pressure Limits: SFI-800: 150 psi (10.34 bar); SFI-801: 125 psi (8.62 bar).

Viscosity Max: 200 SSU.

Weight: SFI-800: 3.35 oz (95 g); SFI-800-A711: 5.0 oz (142 g).

Agency Approvals: CE.

ELECTRICAL SPECIFICATIONS (for A-711 Option Only)

Temperature Limits: -20 to 212°F (-29 to 100°C).

Power Requirements: 8 to 28 VDC.

Output Signal: White lead: 5 VDC; Green lead: 8 to 28 VDC equal to supply voltage. Pulsed output with frequency rate proportional to flow rate.

Accuracy: ±5% FS.

Frequency Output Range: 0 to 100 Hz.

Electrical Connections: Black lead - ground; White lead: 5 VDC out pulse; Green lead: 8 to 28 VDC out pulse; Red lead: 8 to 28 VDC supply.

ELECTRICAL SPECIFICATIONS (for A-712 option only)

Temperature Limits: -20 to 212°F (-29 to 100°C).

Power Requirements: 15 to 28 VDC.

Output Signal: White lead: 1 to 10 VDC.

Accuracy: ±5% FS.

Electrical Termination: Black lead: Ground; Red lead: 15 to 28 VDC input; White lead: 1 to 10 VDC output.

ELECTRICAL SPECIFICATIONS (for A-713 option only)

Temperature Limits: -20 to 212°F (-29 to 100°C).

Power Requirements: 8 to 28 VDC.

Output Signal: White lead: Normally open switch; Green lead: Normally closed switch. Both open collector, 100 mA max, 28 VDC max.

Electrical Connections: Black lead: Ground; White lead: Normally open; Green lead: Normally closed; Red lead: 8 to 28 VDC.

OPTIONS - BODY AND SENSORS ATTACHED

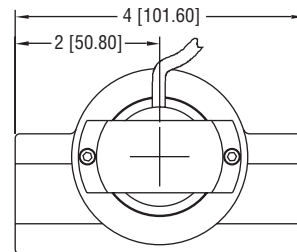
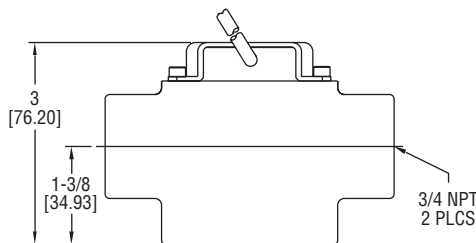
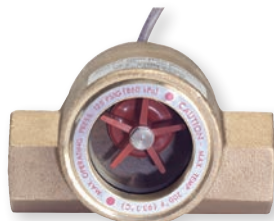
To order add suffix:	Description
-A711	A-711 attached to flow indicator body
Example: SFI-800-1/2-A711	
-A712	A-712 attached to flow indicator body
Example: SFI-800-1/2-A712	
-A713	A-713 attached to flow indicator body
Example: SFI-800-1/2-A713	

Dwyer

SERIES SFI-100T | W. E. ANDERSON BY DWYER

SIGHT FLOW INDICATOR/TRANSMITTER

Output for Flow Rate and Totalization



The **SERIES SFI-100T** Sight Flow Indicators & Transmitters is a low cost and durable flow transmitter that combines our popular 100 Series Sight Flow Indicator with our A-711T output sensor for visual and remote monitoring of flow. The A-711T output sensor has two pulsed voltage signals with one providing a 5 VDC pulse, the other a pulse of the input supply voltage used, ranging from 8 to 28 VDC and a pulsed output with a frequency change proportional to the flow rate.

FEATURES/BENEFITS

- Constructed of a robust, solid brass body and a tempered glass window
- Bright red impeller yields great visual indication of flow through the window
- Front window can be easily unscrewed to clean out the sight flow indicator
- Ideal for outdoor applications with weatherproof body that is unaffected by UV light

APPLICATIONS

- Cooling and lubrication circuits
- HVAC systems
- Monitoring chilled or hot water flow
- Monitoring water flow in chillers

MODEL CHART

Model	Description	Range GPM (LPM)	Connection Female NPT
SFI-100T-1/2-A711T	Brass indicator with A-711T sensor	2 to 20 (7.6 to 75.5)	1/2"
SFI-100T-3/4-A711T	Brass indicator with A-711T sensor	3 to 35 (11.4 to 132.5)	3/4"
A-711T	Output sensor package	-	-

SPECIFICATIONS

Service: Compatible fluids.
Wetted Materials: Body: Brass; Window: Tempered glass; Rotor: Red UV stabilized PBT; Rotor pin: 316 SS; Thrust washers: 300 series SS; Gasket: Buna-N.
Temperature Limits: -20 to 200°F (-29 to 93°C).
Pressure Limits: 125 psi (8.62 bar).
Viscosity Max: 200 SSU.
Weight: SFI only: 1.5 lb (0.7 kg); with A-711T: 1.8 lb (0.8 kg).

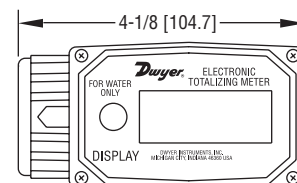
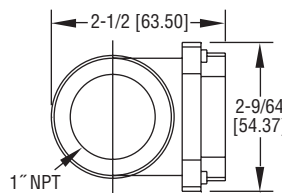
ELECTRICAL SPECIFICATIONS

Temperature Limits: -20 to 212°F (-29 to 100°C).
Power Requirements: 8 to 28 VDC.
Output Signal: White lead: 5 VDC. Green lead: 8 to 28 VDC equal to supply voltage. Pulsed output with frequency rate proportional to flow rate.
Accuracy: ±5% FS.
Frequency Output Range: 0 to 100 Hz.
Mounting Orientation: Horizontal.
Electrical Connections: Black lead: Ground; White lead: 5 VDC out pulse; Green lead: 8 to 28 VDC out pulse; Red lead: 8 to 28 VDC supply.

SERIES TTM

ELECTRONIC TOTALIZING METER

Batch or Cumulative Totals, Easy-to-Read LCD Display, ±5% Accuracy



The **SERIES TTM** Electronic Totalizing Meter measures batch and cumulative totals in liquid transfer systems in Nylon or Aluminum for water or fuels. The meter is designed for any pump, pressure, or gravity feed system with a 3 to 30 GPM (10 to 100 LPM) flow range.

FEATURES/BENEFITS

- Easily view batch and cumulative totals on the large 4-digit LCD display
- Resettable batch totals ideal for totalizing a single use
- Cumulative total will automatically reset to zero when a maximum reading of 9999 is obtained
- Models designed for use in water applications are constructed of Nylon® and rated to 150 psig (10.3 bar)
- Aluminum models are calibrated for fuels and rated to 300 psig (20.7 bar)

APPLICATIONS

- Petrochemical
- Cooling towers
- De-icing in airports
- Pest control dispensing
- Chemical blending
- Onsite add water for concrete trucks

MODEL CHART

Model	Application	Body Material	Units
TTM10	Water*	Nylon	Gallons
TTM11	Water*	Nylon	Liters
TTM20	Fuels†	Aluminum	Gallons
TTM21	Fuels†	Aluminum	Liters

*Calibrated for use with water

†Calibrated for use with gasoline, diesel fuel and kerosene

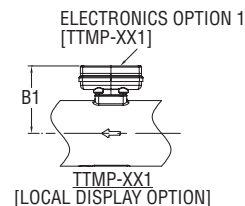
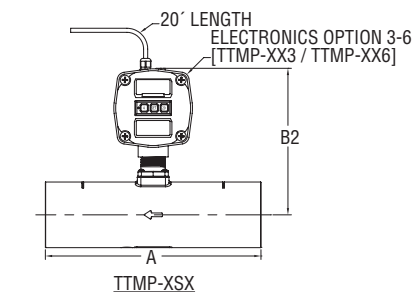
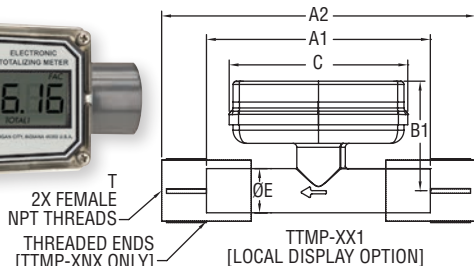
SPECIFICATIONS

Service: Compatible liquids.
Flow Range: 3 to 30 GPM (10 to 100 LPM).
Wetted Materials: Bearings: Ceramic; Shaft: Tungsten carbide; Rotor: Nylon 6-6; Rings: 316 SS; Body: TTM10, 11: Nylon 6-6, TTM20, 21: Aluminum; Other: TTM20, 21: Ceramic magnet.
Accuracy: ±5%.
Batch Total Maximum: 9999.
Cumulative Total Maximum: 9999.
Temperature Limits: 14 to 130°F (-10 to 54°C).
Pressure Limits: Nylon models: 150 psig (10 bar); Aluminum models: 300 psig (20 bar).
Pressure Drop: 2 psi (0.14 bar) @ 30 GPM (100 LPM).
Maximum Particulate Size: 350 microns.
Display: 4-digit LCD, 5/8" H.
Auto Shut-off: After 1 minute.
Connections: 1" female NPT.
Power Requirements: (2) AAA alkaline batteries, installed functional, user replaceable.
Battery Life: Approx. 9000 hours.
Weight: Nylon models: 0.4 lb (190 g); Aluminum models: 0.7 lb (340 g).
Agency Approvals: CE.



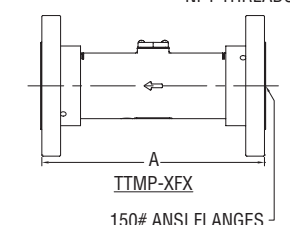
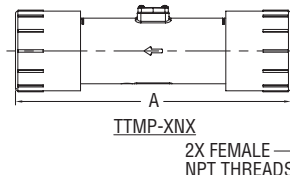
PVC ELECTRONIC TOTALIZING METER

Batch or Cumulative Totals, Easy-to-Read LCD Display



Model	Dimensions (in [mm])					
	A1	A2*	B1**	C	ØE	T*
TTMP-1XX	4-3/8 [111.00]	6-1/32 [153.16]	2-1/8 [54.10]	3-7/16 [87.38]	ø27/32 [21.34]	1/2" NPT
TTMP-2XX	4-31/64 [113.79]	6-3/16 [156.97]	2-3/16 [55.63]	3-7/16 [87.38]	ø1-3/64 [26.67]	3/4" NPT
TTMP-3XX	4-9/16 [116.08]	6-37/64 [167.13]	2-19/64 [58.42]	3-7/16 [87.38]	ø1-5/16 [33.53]	1" NPT
TTMP-4XX	5-7/16 [138.18]	7-11/16 [195.33]	2-39/64 [66.29]	3-7/16 [87.38]	ø1-29/32 [48.26]	1-1/2" NPT
TTMP-5XX	5-37/64 [141.73]	7-15/16 [201.68]	2-7/8 [72.90]	3-7/16 [87.38]	ø2-3/8 [60.45]	2" NPT
TTMP-6XX	11-5/8 [295.40]	14-29/32 [378.71]	3-9/16 [90.42]	3-7/16 [87.38]	ø3-1/2 [88.90]	3" NPT
TTMP-7XX	13-17/32 [343.66]	16-31/32 [431.04]	4-1/16 [103.12]	3-7/16 [87.38]	ø4-1/2 [114.30]	4" NPT

*TTMP-XXN only; **TTMP-XX1 only



Model	Dimensions (in [mm])		
	A	B1**	B2***
TTMP-6SX	11-17/32 [292.89]	3-9/16 [90.42]	7-51/64 [198.04]
TTMP-6NX	14-29/32 [378.62]	3-9/16 [90.42]	7-51/64 [198.04]
TTMP-6FX	12-1/32 [305.59]	3-9/16 [90.42]	7-51/64 [198.04]
TTMP-7SX	13-17/32 [343.69]	4-1/16 [103.12]	8-19/64 [210.74]
TTMP-7NX	16-31/32 [431.01]	4-1/16 [103.12]	8-19/64 [210.74]
TTMP-7FX	14-1/32 [356.39]	4-1/16 [103.12]	8-19/64 [210.74]

TTMP-XX1 only; *TTMP-XX3/TTMP-XX6

The **SERIES TTMP** PVC Electronic Totalizing Meters offer batch and cumulative flow totals in a PVC construction for 1/2" to 4" pipe sizes with spigot, NPT or flange connections.

FEATURES/BENEFITS

- Compact modular design ideal for easy portability
- Easily alternate display from flow rate, batch or cumulative totals in one low cost unit
- Easy to read LCD display provides instantaneous local indication
- Included batteries featuring a 5 year life span with no added costs
- Immediate push button, field calibration eliminates downtime

APPLICATIONS

- Irrigation
- Municipal water monitoring

MODEL CHART			
Example	TTMP	-1 N 1	TTMP-1N1*
Series	TTMP		PVC electronic totalizing meter
Pipe Size		1 2 3 4 5 6 7	1/2" 3/4" 1" 1-1/2" 2" 3" 4"
Fitting Type		S N N N N N N N F F	Spigot NPT female 1/2" size NPT female 3/4" size NPT female 1" size NPT female 1-1/2" size NPT female 2" size NPT female 3" size NPT female 4" size 150# ANSI flange 3" size 150# ANSI flange 4" size
Electronics		1 2 3 4 5 6	Local display Pulse output 4 to 20 mA output, no display** Pulse output, with display** 4 to 20 mA output, with display** Scaled pulse output**

*1/2" NPT PVC flowmeter with 2 button field configured computer

**Option only available in 3" and 4" options

SPECIFICATIONS

Service: Compatible fluids.

Flow Range: See flow chart.

Wetted Materials: 1/2 to 2": PVC housing, ceramic bearings, tungsten carbide shaft, PVDF rotor, 316 stainless steel rings; 3 to 4": PVC housing, PEEK® bearings, 316 stainless steel shaft & thrust washers, Acetal rotor & nose cone, ferrite signal generator.

Accuracy: 1/2" to 2": ±3% of reading; 3" and 4": ±2% of reading.

Batch Total Maximum: 999,999.

Cumulative Total Maximum: 99,999,900.

Temperature Limits: Process: 32 to 140°F (0 to 60°C); Storage: -40 to 158°F (0 to 70°C).

Pressure Limits: 1/2" to 2": 225 psig (15 bar) @ 73°F; 3" and 4": 135 psig (9.3 bar) @ 73°F.

Display: 6-digit LCD, 3/4" H.

Process Connections: See model chart.

Power Requirements: TTMP-XX1: (2) 3V primary lithium metal batteries, installed functional, user replaceable; TTMP-XX3 to TTMP-XX6: (1) 9V primary lithium metal battery, installed functional, user replaceable or 7V to 30V external power.

Battery Life: TTMP-XX1: Approximately 5 years; TTMP-XX3 to TTMP-XX6: Approximately 4 years.

Weight: See weight chart.

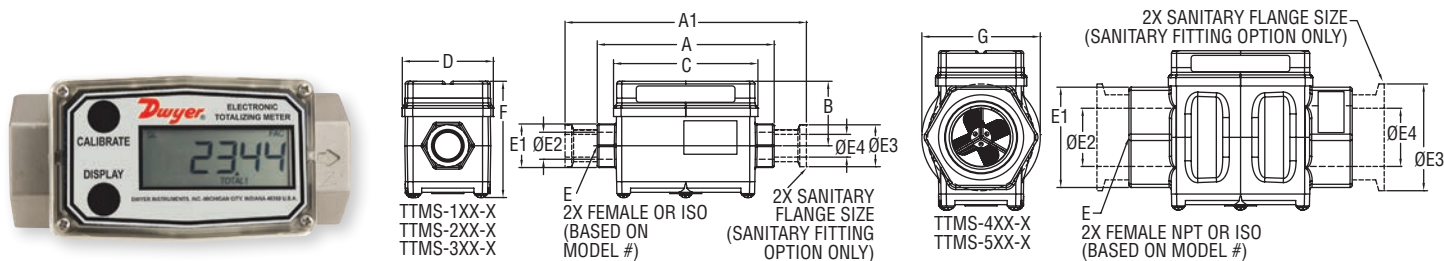
Agency Approvals: CE.

Connection	Flow Range GPM (LPM)	Pressure Drop @ Max Flow Rate (Bar)	Weight lb (kg)
1/2" spigot	1-10 (3.8-37.9)	14 psi (0.97)	0.38 (0.17)
3/4" spigot	2-20 (7.6-75.7)	7.5 psi (0.52)	0.43 (0.20)
1" spigot	5-50 (18.9-189)	15 psi (1.03)	0.49 (0.22)
1-1/2" spigot	10-100 (37.9-379)	3 psi (0.21)	0.66 (0.30)
2" spigot	20-200 (75.7-758)	4 psi (0.28)	0.78 (0.35)
3" spigot	40-400 (152-1516)	3 psi (0.21)	2.4 (1.09)
4" spigot	60-600 (227-2274)	5 psi (0.34)	3.7 (1.68)
1/2" female NPT	1-10 (3.8-37.9)	14 psi (0.97)	0.55 (0.25)
3/4" female NPT	2-20 (7.6-75.7)	7.5 psi (0.52)	0.67 (0.30)
1" female NPT	5-50 (18.9-189)	15 psi (1.03)	0.49 (0.22)
1-1/2" female NPT	10-100 (37.9-379)	3 psi (0.21)	1.38 (0.63)
2" female NPT	20-200 (75.7-758)	4 psi (0.28)	1.78 (0.81)
3" female NPT	40-400 (152-1516)	3 psi (0.21)	3.9 (1.77)
4" female NPT	60-600 (227-2274)	5 psi (0.34)	6.1 (2.77)
3" ANSI flange	40-400 (152-1516)	3 psi (0.21)	5.8 (2.63)
4" ANSI flange	60-600 (227-2274)	5 psi (0.34)	9.2 (4.17)

PEEK® is a registered trademark of Victrex.

METAL ELECTRONIC TOTALIZING METER

Batch or Cumulative Totals, Easy-to-Read LCD Display



Model	Dimensions (in [mm])						ISO Sizes						Weight lb (kg)	Flow Range GPM (LPM)
	A	A1	B	C	D	E	E1	E2	E3	E4	F	G		
TTMS-1RX-X	4-5/32	5	1-31/64	3-7/16	2-11/64	1/2"	1-1/32	35/64	63/64	35/64	2-45/64	2-11/64	1.8	1-10
	[105.66]	[127.00]	[37.59]	[87.38]	[55.12]		[26.01]	[13.72]	[25.02]	[13.72]	[68.58]	[55.12]	(0.82)	(3.8-37.9)
TTMS-2RX-X	4-1/4	5	1-19/32	3-7/16	2-11/64	3/4"	1-17/64	43/64	1-63/64	43/64	2-29/32	2-11/64	2.0	2-20
	[107.95]	[127.00]	[40.39]	[87.38]	[55.12]		[32.00]	[17.15]	[50.29]	[17.15]	[73.91]	[55.12]	(0.91)	(7.6-75.7)
TTMS-3RX-X	4-1/2	5-1/2	1-51/64	3-7/16	2-11/64	1"	1-39/64	7/8	1-63/64	7/8	3-13/64	2-11/64	2.4	5-50
	[114.30]	[139.70]	[45.72]	[87.38]	[55.12]		[41.00]	[22.23]	[50.29]	[22.23]	[81.28]	[55.12]	(1.09)	(18.9-189)
TTMS-4RX-X	5-1/4	6-1/2	2	3-7/16	2-11/64	1-1/2"	2-23/64	1-3/8	2-33/64	1-3/8	3-45/64	2-27/32	4.0	10-100
	[133.35]	[165.10]	[50.80]	[87.38]	[55.12]		[59.89]	[34.93]	[63.75]	[34.93]	[94.23]	[72.14]	(1.81)	(37.9-379)
TTMS-5RX-X	6-1/4	7	2-7/32	3-7/16	2-11/64	2"	3	1-3/4	2-33/64	1-3/4	4-3/16	3-3/8	6.3	20-200
	[158.75]	[177.80]	[56.39]	[87.38]	[55.12]		[76.15]	[44.45]	[63.75]	[44.45]	[106.43]	[85.85]	(2.86)	(75.7-757)

The **SERIES TTMS 316 SS** Electronic Totalizing Meters offer batch and cumulative flow totals in a stainless steel construction for 1/2" to 2" pipe sizes with ISO, NPT, or sanitary fitting connections.

FEATURES/BENEFITS

- Compact modular design ideal for easy portability
- Easily alternate display from flow rate, batch or cumulative totals in one low cost unit
- Easy to read LCD display provides instantaneous local indication
- Included batteries featuring a 5 year life span with no added costs
- Immediate push button, field calibration eliminates downtime

APPLICATIONS

- Chemical batching
- Petrochemical
- Food & beverage liquid flow monitoring
- Municipal water monitoring

MODEL CHART					
Example	TTMS	-1	R	N	-CE TTMS-1RN-CE*
Series	TTMS				Metal electronic totalizing meter
Pipe Size		1			1/2"
		2			3/4"
		3			1"
		4			1-1/2"
		5			2"
Material			R		Stainless steel
Fitting Type				I N S	ISO female NPT female Sanitary fitting
Approval					CE

*1/2" NPT stainless steel flowmeter with 2 button field configured computer

SPECIFICATIONS

Service: Compatible liquids.

Flow Range: 1/2": 1 to 10 gpm (3.8 to 37.9 lpm); 3/4": 2 to 20 gpm (7.6 to 75.7 lpm); 1": 5 to 50 gpm (18.9 to 190 lpm); 1-1/2": 10 to 100 gpm (38 to 380 lpm); 2": 20 to 200 gpm (76 to 760 lpm).

Wetted Materials: Bearings: Ceramic; Shaft: Tungsten carbide; Rotor: PVDF; Rings: 316 SS; Body: SS.

Accuracy: ±2.0% of reading.

Repeatability: ±0.1%.

Batch Total Maximum: 999,999.

Cumulative Total Maximum: 99,999,900.

Temperature Limits: Computer: 0 to 140°F (-18 to 60°C); No computer: -40 to 250°F (-40 to 121°C).

Pressure Limits: NPT: 1500 psig (102 bar); Sanitary fitting: 100 psig (6.9 bar).

Display: 6-digit LCD, 3/4" H.

Connections: ISO, NPT or sanitary fitting options.

Power Requirements: (2) 3V lithium, installed functional, user replaceable.

Battery Life: 5 years.

Weight: 1/2": 2.36 lb (1.07 kg); 3/4": 2.74 lb (1.24 kg); 1": 4.00 lb (1.81 kg); 1-1/2": 4.76 lb (2.16 kg); 2": 6.52 lb (2.96 kg).

Agency Approvals: CE.

DIGITAL PADDLEWHEEL FLOW TRANSMITTER

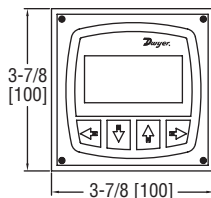
Flow and Total Indication, Easy to Read LCD Display, 4 to 20 mA or Pulse Output



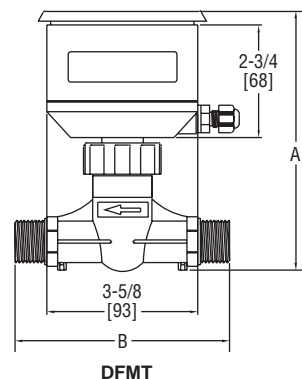
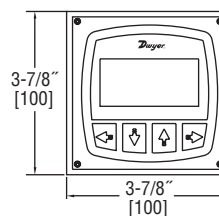
DFMT



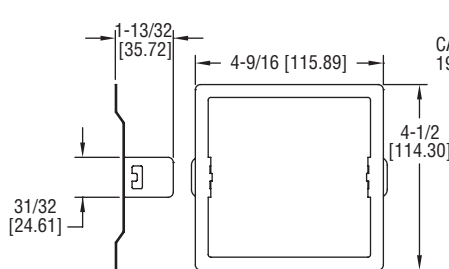
DFMT2



Connection	A	B
3/8"	6" (152 mm)	4-3/4" (121 mm)
1/2"	6" (152 mm)	5-1/8" (130 mm)
3/4"	6-1/4" (158 mm)	5-5/8" (142 mm)
1"	6-1/4" (158 mm)	5-1/2" (141 mm)
1-1/2"	6-5/8" (168 mm)	6-7/8" (175 mm)
2"	7-1/4" (184 mm)	6-7/8" (175 mm)

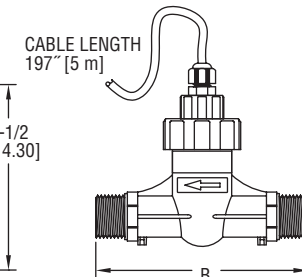


DFMT



Remote Mounting Bracket
(Stainless Steel)

DFMT2



The **SERIES DFMT** Digital Paddlewheel Flow Transmitter provides instantaneous, as well as totalizing flow monitoring. The unit offers a user selectable 4 to 20 mA or pulse output with compact display.

FEATURES/BENEFITS

- The large backlit LCD display defines instantaneous as well as cumulative flow with visual indication bar designating percent of max flow
- Long operation life with high accuracy paddlewheel technology and corrosion resistant PVDF sensor
- Totalizer is user resettable at any time ideal for single batch totalization
- Security password protecting prevents any unauthorized changes

APPLICATIONS

- Cooling towers
- Chemical proportioning or blending
- Industrial water & wastewater treatment
- Cooling water monitoring
- Fluctuating fluid conductivity applications
- Reverse osmosis systems

The **SERIES DFMT2** Remote Digital Paddlewheel Flow Transmitter provides instantaneous, as well as totalizing flow monitoring. The unit offers a user selectable 4 to 20 mA or pulse output with remote display.

FEATURES/BENEFITS

- Two piece design allows the user to separate the control display from the application, making it ideal in areas where space is limited
- The large backlit LCD display defines instantaneous as well as cumulative flow with visual indication bar designating percent of max flow
- Long operation life with high accuracy paddlewheel technology and corrosion resistant PVDF sensor
- Totalizer is user resettable at any time ideal for single batch totalization
- Security password protecting prevents any unauthorized changes

APPLICATIONS

- Reverse osmosis systems
- Remote flow monitoring
- Cooling towers
- Chemical proportioning or blending
- Industrial water & wastewater treatment
- Cooling water monitoring
- Fluctuating fluid conductivity applications

SPECIFICATIONS

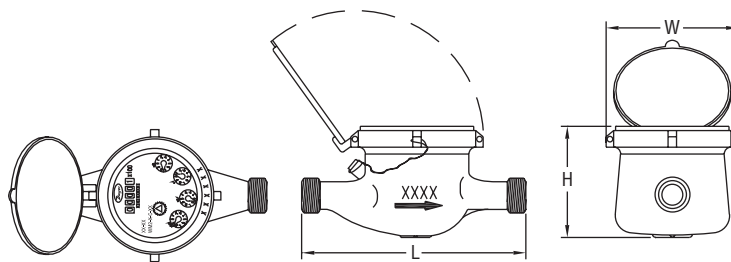
Service: Compatible clean liquids.
Range: See model chart.
Wetted Materials: Sensor and impeller: PVDF; Shaft: Ceramic; O-rings: Fluoroelastomer.
Accuracy: $\pm 1.5\%$ FS.
Repeatability: $\pm 0.5\%$ FS.
Output: Analog: 4 to 20 mA (750 Ω max. loop resistance); Pulse: NPN square wave output; Frequency: 0 to 2 kHz (adjustable); Pulse width: 0 to 1000 ms (adjustable).
Electrical Connections: Removable screw terminal.
Temperature Limits: Process: -4 to 194°F (-20 to 90°C); Ambient: -4 to 149°F (-20 to 65°C).
Pressure Limit: 145 psi (1.0 MPa).
Power Requirements: 12 to 24 VDC.
Power Consumption: 2 W.
Display: 2.38 x 1.25" (60.33 x 31.75 mm) LCD.
Totalizing Display Maximum: 9,999,999,999.
Process Connection: See model chart.
Enclosure Rating: IP65.
Enclosure Material: ABS plastic.
Weight: See model chart.

MODEL CHART			
Model	Range GPM (m³/h)	Connection	Weight lb (kg)
DFMT-10A	0.44 to 7.93 (0.1 to 1.8)	3/8" NPT	1.06 (0.48)
DFMT-15A	0.88 to 17.61 (0.2 to 4)	1/2" NPT	1.10 (0.5)
DFMT-20A	1.32 to 26.42 (0.3 to 6)	3/4" NPT	1.15 (0.52)
DFMT-25A	2.20 to 52.83 (0.5 to 12)	1" NPT	1.23 (0.56)
DFMT-40A	6.61 to 105.67 (1.5 to 24)	1-1/2" NPT	1.46 (0.66)
DFMT-50A	8.81 to 176.11 (2 to 40)	2" NPT	1.68 (0.76)

MODEL CHART			
Model	Range GPM (m³/h)	Connection	Weight lb (kg)
DFMT2-10A	0.44 to 7.93 (0.1 to 1.8)	3/8" NPT	1.76 (0.8)
DFMT2-15A	0.88 to 17.61 (0.2 to 4)	1/2" NPT	1.81 (0.82)
DFMT2-20A	1.32 to 26.42 (0.3 to 6)	3/4" NPT	1.85 (0.84)
DFMT2-25A	2.20 to 52.83 (0.5 to 12)	1" NPT	1.94 (0.88)
DFMT2-40A	6.61 to 105.67 (1.5 to 24)	1-1/2" NPT	2.20 (1.0)
DFMT2-50A	8.81 to 176.11 (2 to 40)	2" NPT	2.43 (1.1)

MULTI-JET WATER METER

Economical, Brass Body, Dry Dial



Size in (mm)	Spud NPSM (BSPP)	Length 'L' in (mm)	Width 'W' in (mm)	Height 'H' in (mm)	Weight lb (kg)
5/8 x 1/2 (15)	3/4" (3/4")	6-1/2 (165)	3-45/64 (94)	4-15/64 (107.5)	3.75 (1.7)
5/8 x 3/4	1" (1")	7-1/2 (190)	3-45/64 (94)	4-15/64 (107.5)	3.97 (1.8)
3/4 (20)	1" (1")	7-1/2 (190)	3-45/64 (94)	4-15/64 (107.5)	4.9 (2.2)
1 (25)	1-1/4" (1-1/4")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	6.4 (2.9)
1-1/4 (32)	1-1/2" (1-1/2")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	8.2 (3.7)
1-1/2 (40)	2" (2")	11-13/16 (300)	4-51/64 (122)	5-9/16 (141.5)	13.52 (6.17)
2 (50)	2-1/2" (2-1/2")	11-13/16 (300)	5-45/64 (145)	6-31/32 (177)	18.74 (8.5)

The **SERIES WM2** Multi-Jet Water Meters is a series of mechanical, water totaling meters that display the total water usage in Gallons or m³. They are available in a range of body sizes and include NPT or BSPT couplings.

FEATURES/BENEFITS

- Multi-jet design allows for simplicity and accuracy with wide flow ranges, even in low flow applications
- Magnetically driven, hermetically sealed register does not leak or fog and is completely separated from the water
- Designed for long service life and maintenance-free operation, even under harsh conditions
- Integral strainer that protects meter from particulate damage
- Easy installation with included coupling adapters

APPLICATIONS

- Irrigation
- Cooling systems
- Filtration systems
- Water monitoring

MODEL CHART						
Model	Size	Coupling Size	Max Flow	Nominal Flow Range	Transitional Flow	Display Max (Gallons)
			GPM (Gallons Per Minute)			
WM2-A-C-01	5/8 x 1/2"	1/2" NPT	20	1 to 20	0.25	9,999,999.99
WM2-A-C-02	5/8 x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99
WM2-A-C-03	3/4"	3/4" NPT	30	2 to 30	0.5	99,999,999.9
WM2-A-C-04	1"	1" NPT	50	3 to 50	0.75	99,999,999.9
WM2-A-C-06	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	99,999,999.9
WM2-A-C-07	2"	2" NPT	160	8 to 160	2	99,999,999.9

MODEL CHART						
Model	Size	Coupling Size	Max Flow	Nominal Flow Range	Transitional Flow	Display Max (m ³)
			m ³ /h			
WM2-B-C-08	15 mm	1/2" BSPT	3	0.12 to 1.5	0.03	99,999.9999
WM2-B-C-10	20 mm	3/4" BSPT	5	0.2 to 2.5	0.05	99,999.9999
WM2-B-C-11	25 mm	1" BSPT	7	0.28 to 3.5	0.07	99,999.9999
WM2-B-C-12	32 mm	1-1/4" BSPT	12	0.48 to 6	0.12	99,999.9999
WM2-B-C-13	40 mm	1-1/2" BSPT	20	0.8 to 10	0.2	999,999.9999
WM2-B-C-14	50 mm	2" BSPT	30	1.2 to 15	0.3	999,999.9999

SPECIFICATIONS

Service: Water.

Wetted Materials: Body: Brass, polyethylene; Couplings: Brass; Measuring Chamber: Polyethylene, ABS plastic, ferrite, acetal.

Flow Range: See model chart.

Accuracy: Transitional flow: $\pm 5\%$; Nominal flow: $\pm 2\%$.

Temperature Limit: 104°F (40°C).

Pressure Limit: 232 psi (16 bar).

Pressure Drop: See service manual.

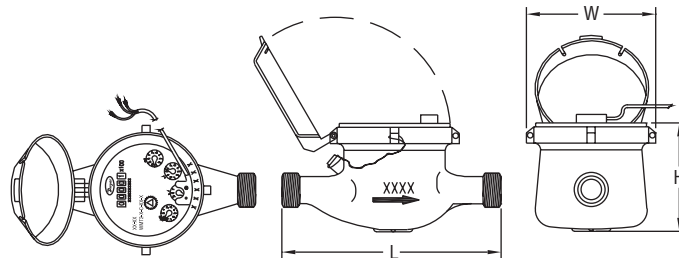
Totalizing Display Maximum: See model chart.

Mounting Orientation: Horizontal.

Weight: See dimension chart.

MULTI-JET WATER METER WITH PULSED OUTPUT

Economical, Brass Body, Dry Dial, Pulsed Output



Size in (mm)	Spud NPSM (BSPP)	Length 'L' in (mm)	Width 'W' in (mm)	Height 'H' in (mm)	Weight lb (kg)
5/8 x 1/2 (15)	3/4" (3/4")	6-1/2 (165)	3-45/64 (94)	4-15/64 (107.5)	3.75 (1.7)
5/8 x 3/4	1" (1")	7-1/2 (190)	3-45/64 (94)	4-15/64 (107.5)	3.97 (1.8)
3/4 (20)	1" (1")	7-1/2 (190)	3-45/64 (94)	4-15/64 (107.5)	4.9 (2.2)
1 (25)	1-1/4" (1-1/4")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	6.4 (2.9)
1-1/4 (32)	1-1/2" (1-1/2")	10-1/4 (260)	3-55/64 (98)	4-5/8 (117.5)	8.2 (3.7)
1-1/2 (40)	2" (2")	11-13/16 (300)	4-51/64 (122)	5-9/16 (141.5)	13.52 (6.17)
2 (50)	2-1/2" (2-1/2")	11-13/16 (300)	5-45/64 (145)	6-31/32 (177)	18.74 (8.5)

The **SERIES WMT2** Multi-Jet Water Meters is a series of mechanical, water totaling meters that display the total water usage in gallons or m³ and provide a reed switch output proportional to flow rate. They are available in a range of body sizes and include NPT or BSPT couplings.

FEATURES/BENEFITS

- Multi-jet design allows for simplicity and accuracy with wide flow ranges, even in low flow applications
- Magnetically driven, hermetically sealed register does not leak or fog and is completely separated from the water
- Designed for long service life and maintenance-free operation, even under harsh conditions
- Integral strainer that protects meter from particulate damage
- Easy installation with included coupling adapters
- Pulsed output proportional to flow allows for remote flow totalization

APPLICATIONS

- Irrigation
- Cooling systems
- Filtration systems
- Water monitoring

SPECIFICATIONS

Service: Water.

Wetted Materials: Body: Brass, polyethylene; Couplings: Brass; Measuring chamber: Polyethylene, ABS plastic, ferrite, acetal.

Flow Range: See model chart.

Accuracy: Transitional flow: ±5%; Nominal flow: ±2%.

Temperature Limit: 104°F (40°C).

Pressure Limit: 232 psi (16 bar).

Pressure Drop: See service manual.

Totalizing Display Maximum: See model chart.

Output Signal: Pulse output with frequency proportional to flow rate.

Pulse Options: 0.1 gal, 1 gal, 10 gal, 100 gal per pulse (1 L, 10 L, 100 L per pulse).

Electrical Rating: 0.01 A @ 24 VAC/DC.

Electrical Connections: Color-coded lead wires, 4.5' (1.5 m) long.

Mounting Orientation: Horizontal.

Weight: See dimension chart.

MODEL CHART

Model	Size	Coupling Size	Max Flow GPM (Gallons Per Minute)	Nominal Flow Range	Transitional Flow	Display Max (Gallons)	Pulse Rate (Gal./Pulse)
WMT2-A-C-01	5/8 x 1/2"	1/2" NPT	20	1 to 10	0.25	9,999,999.99	0.1
WMT2-A-C-02	5/8 x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	0.1
WMT2-A-C-03	3/4"	3/4" NPT	30	2 to 30	0.25	9,999,999.99	0.1
WMT2-A-C-04	1"	1" NPT	50	3 to 50	0.75	99,999,999.9	0.1
WMT2-A-C-01-1	5/8 x 1/2"	1/2" NPT	20	1 to 10	0.25	9,999,999.99	1
WMT2-A-C-02-1	5/8 x 3/4"	3/4" NPT	20	1 to 20	0.25	9,999,999.99	1
WMT2-A-C-03-1	3/4"	3/4" NPT	30	2 to 30	0.25	9,999,999.99	1
WMT2-A-C-04-1	1"	1" NPT	50	3 to 50	0.75	99,999,999.9	1
WMT2-A-C-06-10	1-1/2"	1-1/2" NPT	100	5 to 100	1.5	99,999,999.9	10
WMT2-A-C-07-10	2"	2" NPT	160	80 to 160	2	99,999,999.9	10
WMT2-A-C-04-100	1"	1" NPT	50	3 to 50	0.75	99,999,999.9	100
WMT2-A-C-07-100	2"	2" NPT	160	80 to 160	2	99,999,999.9	100

MODEL CHART

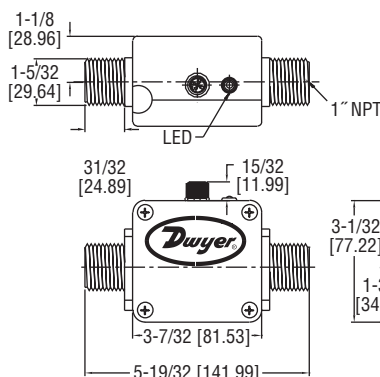
Model	Size	Coupling Size	Max Flow m³/h	Nominal Flow Range	Transitional Flow	Display Max (m³/h)	Pulse Rate (L/Pulse)
WMT2-B-C-08-1	15 mm	1/2" BSPT	3	0.12 to 1.5	0.03	99,999.9999	1
WMT2-B-C-10-1	20 mm	3/4" BSPT	5	0.2 to 2.5	0.05	99,999.9999	1
WMT2-B-C-11-1	25 mm	1" BSPT	7	0.25 to 3.5	0.07	99,999.9999	1
WMT2-B-C-12-1	32 mm	1-1/4" BSPT	12	0.48 to 6	0.12	99,999.9999	1
WMT2-B-C-08-10	15 mm	1/2" BSPT	3	0.12 to 1.5	0.03	99,999.9999	10
WMT2-B-C-12-10	32 mm	1-1/4" BSPT	12	0.48 to 6	0.12	99,999.9999	10
WMT2-B-C-14-10	50 mm	2" BSPT	30	1.2 to 15	0.3	999,999.9999	10
WMT2-B-C-12-100	32 mm	1-1/4" BSPT	12	0.48 to 6	0.12	99,999.9999	100
WMT2-B-C-14-100	50 mm	2" BSPT	30	1.2 to 15	0.3	999,999.9999	100

MAGNETIC INDUCTIVE FLOW SENSOR

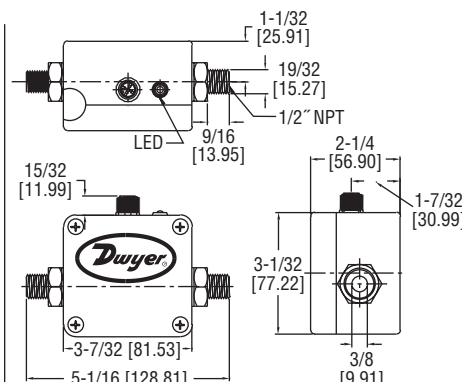
No Moving Parts, Frequency and 4 to 20 mA Output, Maintenance-Free



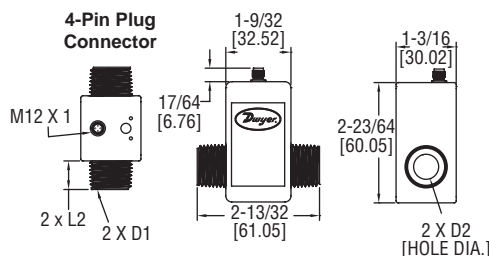
MFS



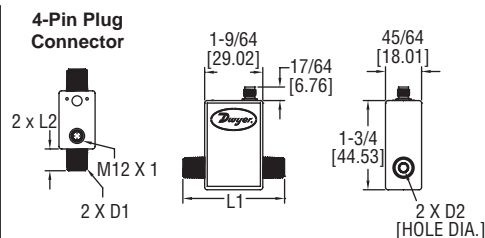
MFS-31 & MFS-32

MFS-11 & MFS-12
MFS-21 & MFS-22

Model	L1	L2	D1	D2
MFS2-1	4"	0.86"	1/2-14" NPT	0.31"
MFS2-2	4"	0.86"	1/2-14" NPT	0.31"
MFS2-3	4.02"	0.86"	3/4-14" NPT	0.55"
MFS2-4	4.41"	1.04"	1-11.5" NPT	0.71"
MFS2-5	4.41"	1.04"	1-11.5" NPT	0.71"
MFS2-6	4.81"	1.13"	1-1/4-11.5" NPT	0.98"



MFS2-6



MFS2-1/5



The **SERIES MFS & MFS2** Electromagnetic Flow Transmitters is a compact, 316 SS body, in line flowmeter with pulse and optional analog 4 to 20 mA output. It is available in a variety of flow ranges from 0.25 to 52.8 GPM (1 to 200 LPM) and process connection sizes of 1/2" and 1" NPT.

FEATURES/BENEFITS

- Long life cycle with no moving parts to wear or break
- Can be applied in applications dealing with contaminated media with no mechanical component in the flow
- Obstruction free pipe cross-section yields low pressure drop
- Unaffected by change in temperature, density, viscosity or concentration

APPLICATIONS

- Contaminated liquid flow monitoring
- Flow of conductive liquids
- Water & wastewater treatment
- Industrial systems
- Irrigation applications

SPECIFICATIONS

Service: Compatible, non-coating, conductive liquids.

Range: See model chart.

Wetted Materials: Electrodes: 316 SS; Process connections: MFS: 316 SS; MFS2: PVDF; Measuring pipe: MFS: PEEK-GF30; Gasket: EPDM.

Accuracy: MFS: $\pm 2\%$ of reading; MFS2: $\pm 1\%$ or reading.

Repeatability: 1%.

Temperature Limits: MFS: Process: 32 to 194°F (0 to 90°C); Ambient: 41 to 158°F (5 to 70°C); MFS2: Process: 14 to 140°F (-10 to 60°C); Ambient: 41 to 140°F (5 to 60°C).

Pressure Limits: MFS: 232 psi (16 bar); MFS2: 145 psi (10 bar) @ 68°F (20°C); 116 psi (8 bar) @ 104°F (40°C); 87 psi (6 bar) @ 140°F (60°C).

Response Time: < 500 ms; MFS2: < 100 ms.

Power Requirements: 24 VDC $\pm 10\%$.

Power Consumption: 0.6 W.

Output: Frequency: Square-wave, NPN or PNP; Analog: 4 to 20 mA.

Loop Resistance: 250 Ω .

Current Consumption: Max 80 mA.

Minimum Conductivity of Medium: 50 $\mu\text{S/cm}$.

Flow Indication: LED green, flow proportional blinking.

Enclosure Rating: NEMA 4 (IP65).

Process Connection: See model chart.

Electrical Connection: Plug connector M12x1.

Weight: MFS-1X: 1.5 lb (0.68 kg); MFS-2X: 1.7 lb (0.77 kg); MFS-3X: 1.9 lb (0.87 kg); MFS2-1, -2, -3, -4, -5: 8 oz (226.8 g); MFS2-6: 1 lb (0.45 kg).

Agency Approvals: CE.

MODEL CHART

Model	Range GPM (LPM)	Minimum Output Signal GPM (LPM)	Process Connection	Output
MFS-11	0.25 to 5.3 (1 to 20)	0.13 (0.5)	1/2" NPT	Frequency
MFS-21	0.5 to 10.5 (2 to 40)	0.25 (1)	1/2" NPT	Frequency
MFS-31	2.5 to 52.8 (10 to 200)	1.3 (5)	1" NPT	Frequency
MFS-12	0.25 to 5.3 (1 to 20)	0.13 (0.5)	1/2" NPT	Frequency & analog
MFS-22	0.5 to 10.5 (2 to 40)	0.25 (1)	1/2" NPT	Frequency & analog
MFS-32	2.5 to 52.8 (10 to 200)	1.3 (5)	1" NPT	Frequency & analog

MODEL CHART

Model	Range GPM (LPM)	Process Connection	Output
MFS2-1	0.07 to 1.3 (0.25 to 5)	1/2" male NPT	Frequency
MFS2-2	0.26 to 5.3 (1.0 to 20)	1/2" male NPT	Frequency
MFS2-3	0.66 to 13.2 (2.5 to 50)	3/4" male NPT	Frequency
MFS2-4	1.3 to 26.4 (5.0 to 100)	1" male NPT	Frequency
MFS2-5	2.6 to 52.8 (10 to 200)	1" male NPT	Frequency
MFS2-6	3.3 to 66.0 (12.5 to 250)	1-1/4" male NPT	Frequency

ACCESSORIES

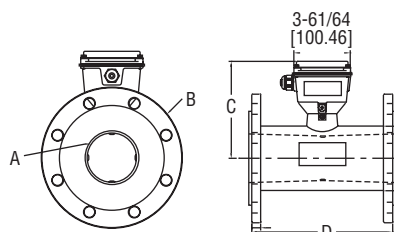
Model	Description
MFS-C3	4 pin cable socket M12x1 connect, 9.8 ft (3 m)
MFS-C5	4 pin cable socket M12x1 connect, 16.4 ft (5 m)
MFS-C10	4 pin cable socket M12x1 connect, 32.8 ft (10 m)



MFS-X 4 Pin Cable

FLANGED ELECTROMAGNETIC FLOW SENSOR

No Moving Parts, Minimal Straight Pipe Requirement, Unobstructed Flow



Dimension	A	B	C	D
FLMG-04-XX-XXX-X	Ø 3.12" [Ø 79 mm]	9" [229 mm]	7" [178 mm]	10.24" [260 mm]
FLMG-06-XX-XXX-X	Ø 5.05" [Ø 128 mm]	11" [279 mm]	8.1" [206 mm]	12.27" [312 mm]
FLMG-08-XX-XXX-X	Ø 6.44" [Ø 164 mm]	13.5" [330 mm]	9.1" [231 mm]	14.24" [362 mm]
FLMG-10-XX-XXX-X	Ø 8.61" [Ø 219 mm]	16" [406 mm]	10.1" [257 mm]	18.18" [462 mm]

The **SERIES FLMG** Flanged Electromagnetic Flow Transmitters is a flanged, in-line flowmeter designed for use in 4 to 10" (10 to 25 cm) pipes. This series displays flow rate and total with selectable pulse rate output.

FEATURES/BENEFITS

- Long life cycle and less frequent maintenance with no moving parts to wear or break and electrodes that discourage fouling
- Minimum space requirement between the meter and a pipe elbow
- Rate and total indication are standard on large LCD display
- Obstruction free pipe cross-section yields low pressure drop
- Unaffected by change in temperature, density, viscosity or concentration
- Pulse output for use with a variety of displays and controllers for remote reading
- Backup battery power to provide auxiliary power during power failures

APPLICATIONS

- Contaminated liquid flow monitoring
- Flow of conductive liquids
- Water & wastewater treatment
- Industrial systems
- Irrigation applications
- Telemetry applications

SPECIFICATIONS

Service: Compatible non-coating conductive liquids.

Range: See chart.

Wetted Materials: Liner: Dual durometer rubber; Electrodes: 316 SS.

Accuracy: ±1% (10% to 100% of FS max. flow), ±2% (min. to 10% FS).

Temperature Limits: Process: 10 to 130°F (-12 to 54°C); Ambient: -40 to 158°F (-40 to 70°C).

Pressure Limits: 150 psi (10.3 bar).

Mounting Orientation: Horizontal or vertical.

Process Connection: 150# drilling ANSI flange.

Display: Rate: 5 digits; Total: 8 digits LCD.***

Output: Current sinking square wave pulse, opto-isolated.

Power Requirements: 7 to 32 VDC @ 30 mA and (2) 3.6 V AA lithium metal batteries, installed and functional, user replaceable for backup power.

Battery Life: 2 months with power failure; 10 years with power.

Electrical Connection: #22 AWG, 3 conductor length (18' (5.5 m) (2000' max.).

Conductivity: ≥20 microSiemens.

Empty Pipe Detection: Hardware/software, conductivity-based.

Enclosure Materials: Body: Epoxy-coated welded steel; Housing: Powder-coated diecast aluminum;

Enclosure Rating: NEMA 4X (IP66).

Weight: 4": 32 lb (14515 g); 6": 47 lb (21319 g); 8": 69 lb (31298 g); 10": 125 lb (56699 g).

ACCESSORIES

Series	Description
BAT	Blind analog transmitter; converts pulse output to 4 to 20 mA analog output; unit is loop powered, fits on the enclosure of the meter, and is field spannable. (BAT-W option only)
RTI2	Rate total indicator; converts pulse output to 4 to 20 mA analog output with local flow rate and totalization display; unit is loop powered, can fit on the enclosure of the meter, and provides a high/low flow alarm. (RTI-P & RTI-W options only)
PWD	Pulse divider, for use with pacing electronic metering pumps; unit divides the input frequency to any number from 1 to 9999 with the use of rotary switches to suit a number of metering pump inputs. (See website)

MODEL CHART

Example	FLMG	-04	-GM	-GAL	-H	-15	FLMG-04-GM-GAL-H-15
Series	FLMG						Flanged electromagnetic flow sensor
Power/Size		04 06 08 10					DC powered 4" pipe DC powered 6" pipe DC powered 8" pipe DC powered 10" pipe
Rate/Measurement			GM LM LS FM MH GD LD				Gallon/minute Liter/minute Liter/second Cubic foot/minute Cubic meter/day Million gallon/day Mega liter/day
Total Measurement				GAL GLX LIT LTX MLT CMT CMX CFT CFX			Gallon Gallon x 1000 Liter Liter x 1000 Mega liter Cubic meter Cubic meter x 1000 Cubic feet Cubic feet x 1000
Pulse Rate					H 1 2 4		High frequency* required with use with Series BAT and RTI 10 units*/pulse 100 units*/pulse 1000 units*/pulse
Options						15 30 45 60 DL	Factory-installed power/output cable, 15 m (50 ft)** Factory-installed power/output cable, 30 m (100 ft)** Factory-installed power/output cable, 45 m (150 ft)** Factory-installed power/output cable, 60 m (200 ft)** Internal data logger

*Units: Gal or liter depending on (rate/total unit) selection rate measurement

**20-foot (6 m) cable standard

***Display is standard

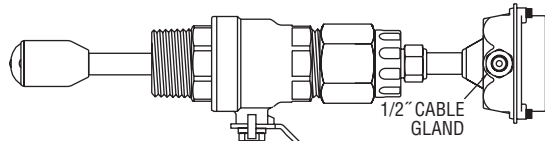
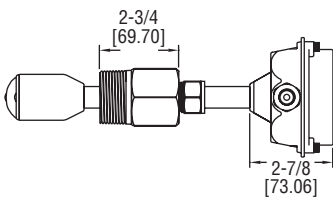
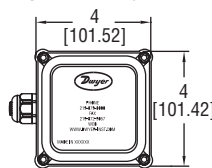
	4"		6"		8"		10"	
	Gal/Min	Liter/Sec	Gal/Min	Liter/Sec	Gal/Min	Liter/Sec	Gal/Min	Liter/Sec
Minimum	12	.75	32	2	60	3.8	95	6
Maximum	500	31.5	1200	75.7	2200	138.8	3500	220.8

INSERTION ELECTROMAGNETIC FLOW SENSOR

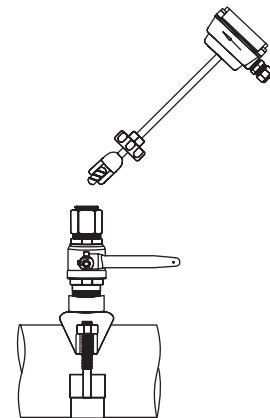
No Moving Parts, Hot-Tap Option, 3 to 48" (76 to 1219 mm) Field Adjustable Insertion



SDF-I-XX



Hot-Tap Option

Hot-Tap Option
(Shown installed on pipe)

The **SERIES IEFS** Insertion Electromagnetic Flow Transmitters is an adjustable, insertion flowmeter designed for use in 3 to 48" (7.6 to 122 cm) pipes. This series provides a pulse rate output of the flow.

FEATURES/BENEFITS

- Long life cycle and less frequent maintenance with no moving parts to wear or break and electrodes that discourage fouling
- Unaffected by change in temperature, density, viscosity or concentration
- Pulse output for use with a variety of displays and controllers for remote reading
- Easy meter mount display and transmitter accessories for local indication and analog 4 to 20 mA output

APPLICATIONS

- Contaminated liquid flow monitoring
- Flow of conductive liquids
- Water & wastewater treatment
- Industrial systems
- Irrigation applications
- Telemetry applications

The **SERIES SDF** Saddle Fitting are available for pipe sizes ranging from 3 to 24" and securely attach Series IPFS, IEFS or any other 1-1/2" or 2" size connection to the process application. Fittings are available in PVC, ductile iron, and bronze materials.

FEATURES/BENEFITS

- Simple installation with provided O-rings

APPLICATIONS

- Irrigation
- Ground water remediation
- Cooling systems
- Pump protection
- Leak detection
- Filtration systems

MODEL CHART					
Example	IEFS	-0SB	-BAF	IEFS-0SB-BAF	
Series	IEFS			Insertion electromagnetic flow sensor	
Size/ Material		0SB 0SS 0LB 0LS 1SB 1SS 1LB 1LS		Size	Hot-Tap
				3 to 10"	No hot-tap
				3 to 10"	No hot-tap
				10 to 48"	No hot-tap
				10 to 48"	No hot-tap
				3 to 10"	Hot-tap
				3 to 10"	Hot-tap
				10 to 48"	Hot-tap
				10 to 48"	Hot-tap
Options					
			BAT	Blind analog transmitter	
			BAF	2" brass adapter fittings (IEFS-0XX only)	
			SAF	2" SS adapter fittings (IEFS-0XX only)	
			SVA	316 SS valve assembly (IEFS-1XX only)	
			NVA	No valve assembly (deduct price) (IEFS-1XX only)	
			RFO	Reverse flow output	
			BPT	1-1/2" brass BPT adapter (2 piece) (IEFS-0XX only)	
			SPT	1-1/2" SS BPT adapter (2 piece) (IEFS-0XX only)	
			IMM	Immersible (urethane potted electrical components)	
			LOP	Low power (12 to 25 VDC @ 40 mA)	
			EXT	12" extension (IEFS-XLX only)	

*SS is stem and fitting. For SS valve order SVA option.

MODEL CHART			
Stocked Model	Description	Pipe Size	Material
IEFS-0SB	Adjustable insertion electromagnetic flow sensor	3 to 10"	Brass
IEFS-0SS	Adjustable insertion electromagnetic flow sensor	3 to 10"	SS

SPECIFICATIONS

Service: Compatible clean or dirty non-coating, conductive liquids.
Range: 0.28 to 20 ft/s (0.08 to 6.09 m/s).
Wetted Materials: Body shaft/fitting: 316 SS or brass; Electrodes: Hastelloy®; Electrode cap: PVDF; Valve assembly: (IEFS-1XX) Bronze (SS optional) with bronze ball valve; O-ring: EPDM.
Accuracy: ±1% FS.
Temperature Limits: Process: 32 to 200°F (0 to 93°C); Ambient: 0 to 160°F (-17 to 72°C).
Process Connection: IEFS-0XX: 1-1/2" male NPT; IEFS-1XX: 2" male NPT.

Pressure Limit: 200 psi (13.8 bar).
Output: Current sinking, square wave pulse, opto-isolated, 550 Hz @ 20 ft/s, 30 VDC @ 6 mA max.
Power Requirements: 12 to 25 VDC @ 250 mA; Low Power: 12 to 25 VDC @ 40 mA.
Electrical Connection: Terminal block.
Conductivity: ≥ 20 microSiemens/cm.
Enclosure Material: Housing: Die-cast powder-coated aluminum.
Enclosure Rating: NEMA 4X (IP66).
Weight: IEFS-0SX: 6 lb (2721 g); IEFS-0LB: 12 lb (5443 g); IEFS-1XX: 15 lb (6804 g).

ACCESSORIES

Series	Description
BAT®	Blind analog transmitter; converts pulse output to 4 to 20 mA analog output; unit is loop powered, fits on the enclosure of the meter, and is field spannable.
RTI2®	Rate total indicator; converts pulse output to 4 to 20 mA analog output with local flow rate and totalization display; unit is loop powered, can fit on the enclosure of the meter, and provides a high/low flow alarm.
PWD	Pulse divider, for use with pacing electronic metering pumps; unit divides the input frequency to any number from 1 to 9999 with the use of rotary switches to suit a number of metering pump inputs. (See website)

MODEL CHART					
Example	SDF	-I	-03	-15	SDF-I-03-15
Series	SDF				Saddle fittings
Material		I			Iron
Pipe Size			03 06 08 10 12 14 16 18 20 22 24		3" 6" 8" 10" 12" 14" 16" 18" 20" 22" 24"
Thread Size				15 20	For Series IEFS, IPFS, TBS non hot-tap models (1-1/2" male NPT) For Series IEFS, IPFS, TBS hot-tap models (2" male NPT)

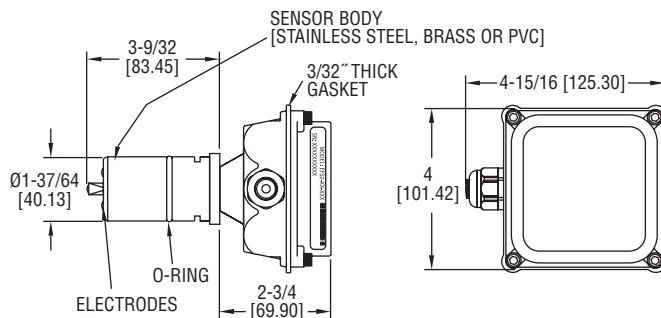
Hastelloy® is a registered trademark of Hanes International

® See page 320 (Series BAT)

® See page 320 (Series RTI)

INSERTION ELECTROMAGNETIC FLOW SENSOR

No Moving Parts, Durable, Easy Installation & Maintenance, 1 to 12" Pipe (25 to 305 mm)



The **SERIES EFS2** Insertion Electromagnetic Flow Transmitters is an economical, fixed insertion flowmeter designed for use with the Series EFF fittings and tees to fit in pipe sizes ranging from 1 to 12" (2.5 to 30.5 cm) pipes. This series provides a pulse rate output of the flow.

FEATURES/BENEFITS

- Long life cycle and less frequent maintenance with no moving parts to wear or break and electrodes that discourage fouling
- Unaffected by change in temperature, density, viscosity or concentration
- Pulse output for use with a variety of displays and controllers for remote reading
- Easy meter mount display and transmitter accessories for local indication and analog 4 to 20 mA output

APPLICATIONS

- Contaminated liquid flow monitoring
- Flow of conductive liquids
- Water & wastewater treatment
- Industrial systems
- Irrigation applications
- Telemetry applications

SPECIFICATIONS

Service: Compatible clean or dirty non-coating, conductive liquids.
Range: 0.28 to 20 ft/s (0.08 to 6.09 m/s).
Wetted Materials: Sensor: 316 SS, brass or PVC; Electrodes: Hastelloy®, metal; Electrode Cap: PVDF; O-ring: EPDM (fluoroelastomer optional).
Accuracy: ±1% FS.
Temperature Limits: Process: Brass/SS: 32 to 200°F (0 to 93°C); PVC: 32 to 130°F (0 to 55°C); Ambient: 0 to 160°F (-17 to 72°C).
Pressure Limits: Brass/SS: 200 psi (13.8 bar); PVC: 150 psi (10 bar).
Process Connection: See page reference 1 below.
Output: Current sinking, square wave pulse, opto-isolated, 550 Hz @ 20 ft/s.
Power Requirements: 12 to 25 VDC @ 250 mA; (12 to 25 VDC @ 40 mA (max. 250 mA) - LOP option).
Electrical Connection: Terminal block.
Conductivity: 20 microSiemens/cm.
Enclosure Material: Housing: Die-cast powder-coated aluminum.
Enclosure Rating: NEMA 4X (IP66).
Weight: 3 lb (1361 g).

MODEL CHART				
Example	EFS2	-1P	-RFO	EFS2-1P-RFO
Series	EFS2			Insertion electromagnetic flow sensor
Size/ Material		1P		1 to 3" pipe, PVC
		1B		1 to 3" pipe, brass
		1S		1 to 3" pipe, 316 SS
		2P		4 to 10" pipe, PVC
		2B		4 to 10" pipe, brass
		2S		4 to 10" pipe, 316 SS
		3P		12" pipe, PVC
		3B		12" pipe, brass
		3S		12" pipe, 316 SS
Options			BAT	Blind analog transmitter
			RFO	Reverse flow output
			IMM	Immersible (urethane potted electrical connection)
			FOR	Fluoroelastomer O-ring
			LOP	Low power (12 to 25 VDC @ 40 mA) (max 250 mA)

Note: Need to purchase with Series EFF fitting for proper installation.

MODEL CHART			
Stocked Model	Description	Pipe Size	Material
EFS2-1P	Insertion electromagnetic flow sensor	1 to 3"	PVC
EFS2-1B	Insertion electromagnetic flow sensor	1 to 3"	Brass
EFS2-1S	Insertion electromagnetic flow sensor	1 to 3"	SS
EFS2-2B	Insertion electromagnetic flow sensor	4 to 10"	Brass
EFS2-3B	Insertion electromagnetic flow sensor	12"	Brass

ACCESSORIES	
Series	Description
BAT	Blind analog transmitter; converts pulse output to 4 to 20 mA analog output; unit is loop powered, fits on the enclosure of the meter, and is field spannable.
RTI2	Rate total indicator; converts pulse output to 4 to 20 mA analog output with local flow rate and totalization display; unit is loop powered, can fit on the enclosure of the meter, and provides a high/low flow alarm.
PWD	Pulse divider, for use with pacing electronic metering pumps; unit divides the input frequency to any number from 1 to 9999 with the use of rotary switches to suit a number of metering pump inputs. (See website)

Hastelloy® is a registered trademark of Hanes International

●Process Connection: See page 312 (Series EFF)

●See page 320 (Series BAT)

●See page 320 (Series RTI)

FITTINGS AND TEES

Saddles, Tees & Weld/Braze Fittings for Series EFS2



EFF-S-PXX



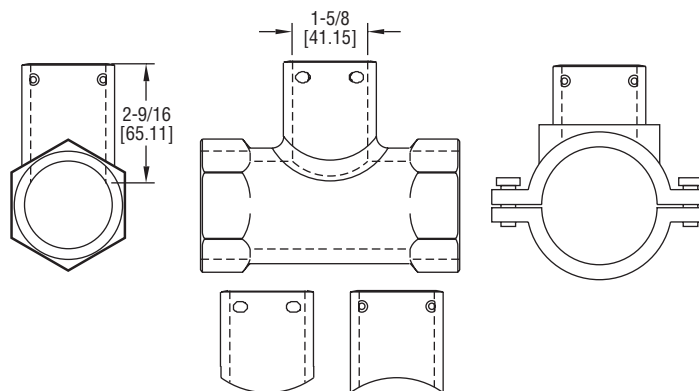
EFF-S-BXX



EFF-S-DXX



EFF-T-SFT-SS



The **SERIES EFF** Fittings & Tees is to be used with the Series EFS2 Insertion Electromagnetic Flow Sensors. The Series EFF allows for accurate sensor insertion of the Series EFF in a wide range of pipe sizes. These fittings and tees are available in bronze, 304 SS, 316 SS, and PVC, further expanding application prospects.

FEATURES/BENEFITS

- Multiple end connections are available to allow for easy installation in a variety of applications

APPLICATIONS

- Contaminated liquid flow monitoring
- Flow of conductive liquids
- Water & wastewater treatment
- Industrial systems
- Irrigation applications
- Telemetry applications

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials: See model chart.

Temperature Limits: Flow meter dependent.

Pressure Limits: Flow meter dependent.

Connections: 1/2 to 12".

Weight: Consult factory.

MODEL CHART - TEE FITTING

Model	Description	EFS2-1XX				
		1"	1-1/2"	2"	3"	4"
		-0100	-0150	-0200	-0300	-0400
EFF-T-BFT	Bronze/female thread	X	X	X	X	X
EFF-T-BFS	Bronze/female sweat (for copper tubing)	X	X	X	X	X
EFF-T-PME	PVC/male stub end	X	X	X		
EFF-T-CFT	Carbon steel/female thread	X	X	X		
EFF-T-SFT	304 SS/female thread	X	X	X		
-SS	All 316 SS option	X	X	X		

MODEL CHART - SADDLE FITTING

Model	Description	EFS2-1XX		EFS2-2XX			EFS2-3XX
		3"	4"	6"	8"	10"	12"
		-0300	-0400	-0600	-0800	-1000	-1200
EFF-S-DXX	Ductile iron	X	X	X	X	X	X
EFF-S-PXX	PVC (See note 2)	X	X	X	X		
EFF-S-BXX	Bronze	X	X				
-LPS	Installed on 16" long pipe stub option (PVC only)	X	X	X	X		

MODEL CHART - WELD/BRAZE FITTING

Model	Description	EFS2-1XX		EFS2-2XX			EFS2-3XX
		3"	4"	6"	8"	10"	12"
		-0300	-0400	-0600	-0800	-1000	-1200
EFF-W-BXX	Bronze	X	X	X	X	X	X
EFF-W-CXX	Carbon steel	X	X	X	X	X	X
EFF-W-SXX	316 SS	X	X	X	X	X	X

Example: EFF-T-CFT-0100-SS

To order an all 316 SS female thread 1" tee for Series EFS2-1XX Electromagnetic Flow Sensor.

ULTRASONIC FLOWMETER SET

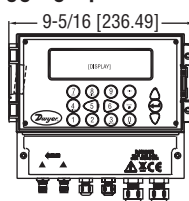
Non-Invasive Pipe Flow Measurement, Easy Operation and Data Logging Option



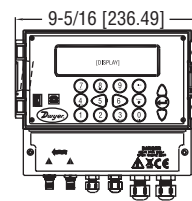
UFB



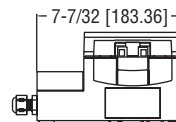
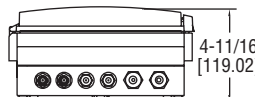
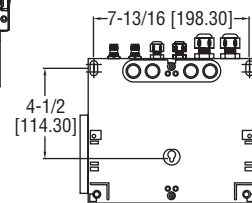
UFC



UFB



UFC



The **SERIES UFB & UFC** Ultrasonic Flowmeter Sets utilize the transit-time difference for measuring flow rates in pipes. These units are permanent mount, where the converters can be mounted on a surface or pipe with a 4 to 20 mA and pulse output capabilities for pipe sizes from 1/2 to 79" (13 to 2000 mm). The Series UFC offers the same features plus data logging capability.

FEATURES/BENEFITS

- Non-invasive pipe measurement
- Easy-to-use compact and lightweight design, intended for homogeneous liquids that contain no air
- Simple installation with all necessary components included such as converter, sensor, cables and mounting accessories
- Sturdy IP65 rating, protecting it from dust and direct water contact

APPLICATIONS

- Water treatment
- Industrial systems
- Irrigation applications
- Treated water flow
- River water
- Sea water
- Potable water
- Demineralized water
- Glycol/Water mix
- Hydraulic system
- Diesel oil
- Water use data logging

KIT INCLUDES

- Converter
- Set of transducers
- Ruled guide rail
- Steel banding
- Banding clips
- Set of transducer cables
- Set of high temperature interface cables
- Ultrasonic coupling grease

MODEL CHART - STANDARD VERSION		
Model	Pipe Size Range in (mm)	Power Supply
UFB-122	0.5 to 4.5 (13 to 115)	86 to 264 VAC
UFB-123	2 to 79 (50 to 2000)	86 to 264 VAC
UFB-222	0.5 to 4.5 (13 to 115)	24 VAC/VDC
UFB-223	2 to 79 (50 to 2000)	24 VAC/VDC

MODEL CHART - DATA LOGGING VERSION		
Model	Pipe Size Range in (mm)	Power Supply
UFC-122	0.5 to 4.5 (13 to 115)	86 to 264 VAC
UFC-123	2 to 79 (50 to 2000)	86 to 264 VAC
UFC-222	0.5 to 4.5 (13 to 115)	24 VDC/VAC
UFC-223	2 to 79 (50 to 2000)	24 VDC/VAC

SPECIFICATIONS

Service: Homogeneous liquids that do not contain more than 3% of air bubbles or particulate and capable of ultrasonic wave propagation.

Inputs: TNC cable from sensors.

Range: 0.33 to 33 ft/s (0.1 to 10 m/s).

Display: 240 x 64 pixel graphic display, high contrast black on white with backlight; Languages: English, French, German, Swedish, Italian, Spanish, Portuguese, Russian, Norwegian, and Dutch; 5" W x 1.3" H (5 x 33.02 mm).

Accuracy: ± 0.5 to $\pm 2\%$ of flow reading of flow rate > 0.03 ft/s (0.01 m/s) and pipe OD > 3.0 in (75 mm); $\pm 3\%$ of flow reading for flow rate > 0.03 ft/s (0.01 m/s) and pipe OD 0.5 to 3 in (13 to 75 mm); $\pm 6\%$ of flow reading for flow rate < 0.03 ft/s (0.01 m/s).

Power Requirements: 86 to 264 VAC (50 to 60 Hz) or 24 VAC/VDC (1 A max).

Power Consumption: 10.5 W.

Temperature Limits: Transducer: -4 to 275°F (-20 to 135°C); Controller: -4 to 122°F (-20 to 50°C).

Outputs: Analog 1 opto-isolated output: 4 to 20 mA, 0 to 16 mA or 0 to 20 mA (selectable); Error current: 0 to 26 mA (selectable); Load resistance: 620 Ω max; Alarm: 2 opto-isolated MOSFET NO relays, 48 V at 500 mA, maximum 200 Hz; Pulsed: 1 opto-isolated MOSFET relay, 48 V at 500 mA, 1 to 250 pps; Pulse width: 2 to 500 ms (selectable).

Serial Communications: USB (UFC only).

Enclosure Rating: IP65 when using TNC connector; Transducers IP54.

Materials: Plastic ABS and aluminum.

Repeatability: $\pm 0.5\%$ of measured value or 0.03 ft/s (0.01 m/s).

Electrical Connections: Removable screw-in type terminal block.

Mounting: Wall mounted using 3 type M4 screws.

Turbidity: $< 3\%$ by volume of particulate content.

Permissible Air Content: $< 3\%$ by volume.

Response Time: < 500 ms.

Weight: Unit not including accessories: 2.80 lb (1.26 kg); Unit including accessories: 9.92 lb (4.5 kg).

Agency Approvals: CE.

ADDITIONAL SPECIFICATIONS

Applicable Pipe Material: Carbon steel, SS, copper, UPVC/PVDF, concrete, mild steel, glass, brass.

Applicable Pipe Lining: Rubber, glass, concrete, epoxy, steel, other*.

Pipe Wall Thickness: 0.04 to 3" (1 to 75 mm).

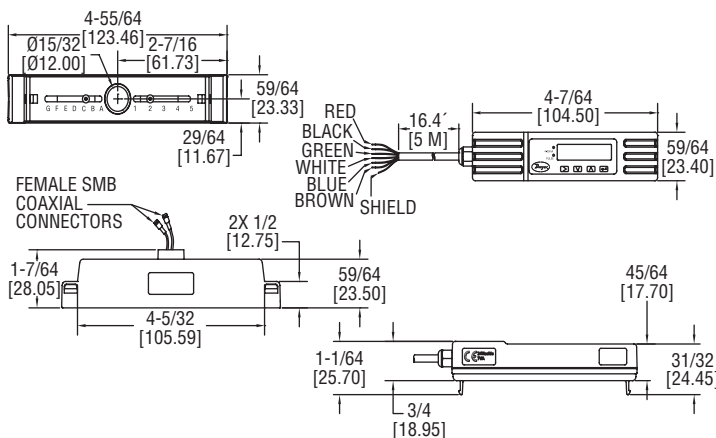
Pipe Lining Thickness: $< 1"$ (< 25 mm).

*Selectable option for special material with known propagation rate of lining material.

OPTION	
Use order code:	Description
NISTCAL-FU	NIST traceable calibration certificate

COMPACT ULTRASONIC FLOWMETER

Cost Effective, Compact & Adjustable Design, Non-Invasive



The **MODEL UFM** Compact Ultrasonic Flowmeters is an economical, clamp-on, ultrasonic flowmeter. The Model UFM implements the transit-time difference to measure flow rates in pipes and can measure velocity and flow in pipes with outside diameters ranging from 0.98 to 4.62" (24.89 to 117.35 mm). This model comes with a volume pulse and 4 to 20 mA flow rate output.

FEATURES/BENEFITS

- Non-invasive pipe measurement
- Simple installation with all necessary components included such as converter, sensor, cables and mounting accessories
- Compact and lightweight design, featuring an easily installed, all in one clamp-on unit intended for homogeneous liquids that contain no air
- Screen offers easy to read text displaying both flow rate and total with a convenient backlight for visual comfort

APPLICATIONS

- Flow measurement for heat metering
- Chilled water metering & monitoring
- Potable water metering & monitoring
- Process water metering & monitoring

KIT INCLUDES

- Converter with adjustable guiderail
- Set of 1.81 to 2.75" (46 to 70 mm) clamps
- Set of 2 to 5" (51 to 127 mm) clamps
- Set of small pipe adaptor circle clamps
- Set of small pipe adaptor V clamps
- Ultrasonic coupling grease

MODEL CHART

Model	Description
UFM-1	Compact ultrasonic flowmeter

SPECIFICATIONS

Service: Clean water with < 3% by volume of particulate content. Range: 0.33 to 32.8 ft/s (0.1 to 10 m/s). Display: Backlit: 3.27" H x 0.74" W (83.1 mm x 18.8 mm), 2 line x 16 characters. Accuracy: ±3% of flow reading for > 0.98 ft/s (> 0.3 m/s). Power Requirements: 12 to 24 VDC or VAC. Power Consumption: 7 W max. Temperature Limits: Process: 32 to 185°F (0 to 85°C); Ambient: 32 to 122°F (0 to 50°C). Outputs: Analog: 1 opto-isolated: 4 to 20 mA; Error current: 3.5 mA; Load resistance: 620 Ω max; Pulse: 1 opto-isolated MOSFET relay, 500 mA max, 166 pps max, 200 Hz max.	Enclosure Rating: IP54. Enclosure Material: Plastic polycarbonate. Repeatability: ±0.5% of measured value. Electrical Connections: 16.4" (5 m) cable. Response Time: < 1 s. Weight: 2.9 lb (1.315 kg). Agency Approvals: CE.
ADDITIONAL SPECIFICATIONS Applicable Pipe Material: Steel, copper, or plastic. Pipe Outside Diameter: 0.98 to 4.62" (24.89 to 117.35 mm). Applicable Pipe Lining: None. Pipe Wall Thickness: 0.02 to 0.39" (0.5 to 10 mm).	

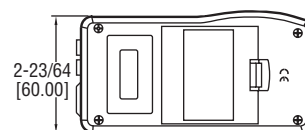
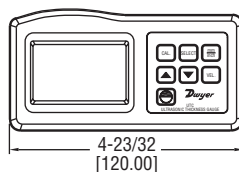
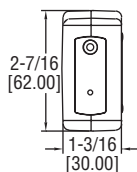
OPTION

Use order code:	Description
NISTCAL-FU	NIST traceable calibration certificate

MODEL UTG

ULTRASONIC THICKNESS GAGE

Ideal For Use with Ultrasonic Flow Transmitters, Adjustable Sound Velocity



The **MODEL UTG** Ultrasonic Thickness Gages measures the thickness of a variety of materials. The UTG works on a variety of parallel surface material ranging from 0.05 to 7.9" (1.2 to 200 mm).

FEATURES/BENEFITS

- Non-invasive thickness measurement
- Reads in inches or millimeters and features an adjustable sound velocity to allow for an array of materials to be measured
- Allows the user to find the wall thickness of the pipe when programming an ultrasonic transmitter without cutting or removing a section of the pipe to measure it
- Ideal for monitoring corrosion in closed vessels such as boilers and chemical tanks and with any ultrasonic flow transmitter

APPLICATIONS

- Pipe thickness measurement
- Finding wall thickness
- Monitoring corrosion in closed vessels
- Industrial applications
- Automotive
- HVAC
- Plumbing

SPECIFICATIONS

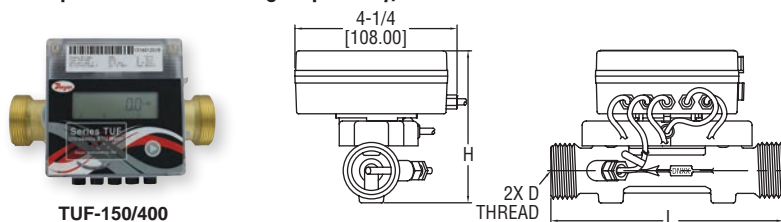
Service: Steel, cast iron, aluminum, red copper, brass, zinc, quartz glass, polyethylene, PVC, gray cast iron, nodular cast iron, other. Selectable option for special materials with known sound propagation rate. Range: 0.047 to 7.874" (1.2 to 200 mm). Accuracy: ±0.5%. Resolution: 0.001" / 0.1 mm. Sound Velocity: 1118 to 20132 mph (500 to 9000 m/s).	Temperature Limits: 32 to 122°F (0 to 50°C). Humidity Limit: < 80%. Display: 4 digits, 0.394" (10 mm) LCD. Power Requirement: (4) 1.5 V AAA alkaline batteries, not included, user replaceable. Weight: 5.78 oz (164 g). Agency Approvals: CE.
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MODEL CHART

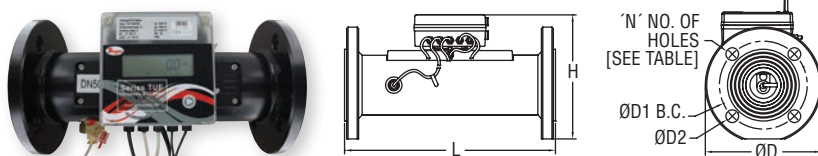
Model	Description
UTG	Ultrasonic thickness gage

ULTRASONIC ENERGY METER

Flow & Temperature Monitoring Capability, Modbus® & BACnet Communication



TUF-150/400



TUF-500



DIMENSIONS in [mm]				
Model	L	D	H	
TUF-150-XX	4-21/64 [110.00]	G3/4B	3-31/32 [101.00]	
TUF-200-XX	5-1/8 [130.00]	G1B	3-31/32 [101.00]	
TUF-250-XX	6-19/64 [160.00]	G11/4B	4-11/64 [106.00]	
TUF-320-XX	7-3/32 [180.00]	G11/2B	4-29/64 [113.00]	
TUF-400-XX	7-7/8 [200.00]	G2B	4-49/64 [121.00]	

DIMENSIONS in [mm]						
Model	L	ØD	H	ØD1	ØD2	N
TUF-500-XX	11-13/16 [300.00]	6-1/2 [165.00]	6-57/64 [175.00]	4-59/64 [125.00]	45/64 [18.00]	4
TUF-650-XX	11-13/16 [300.00]	7-9/32 [185.00]	7-23/32 [196.00]	5-45/64 [145.00]	45/64 [18.00]	4
TUF-800-XX	13-25/32 [350.00]	7-7/8 [200.00]	8-1/2 [216.00]	6-19/64 [160.00]	45/64 [18.00]	8
TUF-1000-XX	13-25/32 [350.00]	8-21/32 [200.00]	9-11/64 [233.00]	7-3/32 [180.00]	45/64 [18.00]	8
TUF-1250-XX	13-25/32 [350.00]	9-27/32 [250.00]	10-25/64 [264.00]	8-17/64 [210.00]	45/64 [18.00]	8

The **SERIES TUF** Ultrasonic Energy Meter is a highly accurate and stable energy meter that utilizes ultrasonic technology to measure heating and cooling energy consumption. The Series TUF is a compact meter with a flowmeter and energy calculator in one, making it great for installation on chillers and boilers.

FEATURES/BENEFITS

- Lower maintenance costs with local parameter display and no moving parts
- Serial communication output allows for easy transfer of data
- Flow and temperature monitor in one unit eliminates the need for multiple units

APPLICATIONS

- Heat metering
- Utilities billing
- Tenant billing
- Monitoring of water heating or cooling: radiators, fan coils

INSTRUCTIONS FOR ORDERING

- Choose 1 ultrasonic energy meter model (includes 2 BSPP pipe fittings, 2 tightening nuts, 2 o-rings, and 1 thermowell with welding collar)
- Choose 1 pipe fitting model given the appropriate fitting size if NPT or BSPT connections are required (for DN15 to DN40 only)*

Example: TUF-150-MD, Fitting Size: A, select pipe fitting Model WM-ACC-C01 or WM-ACC-C11.

SPECIFICATIONS

Service: Clean, compatible liquids. Wetted Materials: Brass and 316L SS. Range: See chart. Display: 8-digit LED. Accuracy: BTU: EN1434/CJ128 Class 2; Flow: $\pm(2+(0.02 Q_p / Q))\%$; Temperature: $\pm 0.1^\circ\text{C}$. Power Requirements: 24 VDC or 3.6 V ER26500 lithium metal battery, user supplied and installed, battery acts as back-up if power is lost. Power Consumption: 1 W. Temperature Limits: Ambient: 41 to 131°F (5 to 55°C); Process: 36 to 203°F (2 to 95°C). Humidity Limit: < 93%.	Pressure Limits: 232 psi (16 bar) for DN15 to DN40; 362 psi (25 bar) for >DN50. Pressure Drop: < 1.5 psi (10 kPa). Process Connection: See chart. Serial Communications: Modbus® RTU or BACnet® MSTP (selectable)**. Enclosure Rating: IP65. Enclosure Material: Plastic. Repeatability: Flowmeter: 1%. Electrical Connections: 3 ft (0.91 m) 4x0.2 mm2 cable with terminal block. Flow Direction: Unidirectional. Mounting Orientation: Horizontal or vertical. Weight: See chart. Agency Approvals: CE.
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**M-BUS available upon request.

MODEL CHART									
Ultrasonic Energy Meter Model	Body Size†	Pipe Size		Fitting Size	Communication	Meter Connection	GPM (LPM)		
		in	mm				Min Flow (Qi)	Nominal Flow Range (Qp)	Max Flow (Qs)
TUF-150-MD	DN15	1/2	15	A	Modbus®	G-3/4	0.1 (0.5)	6.6 (25)	13 (50)
TUF-200-MD	DN20	3/4	20	B	Modbus®	G1	0.2 (0.8)	11 (42)	22 (83)
TUF-250-MD	DN25	1	25	C	Modbus®	G1-1/4	0.3 (1.2)	15 (58)	31 (117)
TUF-320-MD	DN32	1-1/4	32	D	Modbus®	G1-1/2	0.5 (2)	26 (100)	53 (200)
TUF-400-MD	DN40	1-1/2	40	E	Modbus®	G2	0.9 (3)	44 (167)	88 (333)
TUF-500-MD*	DN50	2	50	-	Modbus®	Flange	1.3 (5)	66 (250)	132 (500)
TUF-650-MD	DN65	2-1/2	65	-	Modbus®	Flange	2.2 (8.3)	110 (417)	220 (833)
TUF-800-MD	DN80	3	80	-	Modbus®	Flange	3.5 (13.3)	176 (667)	352 (1333)
TUF-1000-MD	DN100	4	100	-	Modbus®	Flange	5.3 (20)	264 (1000)	528 (2000)
TUF-1250-MD	DN125	5	125	-	Modbus®	Flange	8.8 (33)	440 (1667)	881 (3333)
TUF-150-BN	DN15	1/2	15	A	BACnet	G-3/4	0.1 (0.5)	6.6 (25)	13 (50)
TUF-200-BN	DN20	3/4	20	B	BACnet	G2	0.2 (0.8)	11 (42)	22 (83)
TUF-250-BN	DN25	1	25	C	BACnet	G1-1/4	0.3 (1.2)	15 (58)	31 (117)
TUF-320-BN	DN32	1-1/4	32	D	BACnet	G1-1/2	0.5 (2)	26 (100)	53 (200)
TUF-400-BN	DN40	1-1/2	40	E	BACnet	G2	0.9 (3)	44 (167)	88 (333)
TUF-500-BN*	DN50	2	50	-	BACnet	Flange	1.3 (5)	66 (250)	132 (500)
TUF-650-BN	DN65	2-1/2	65	-	BACnet	Flange	2.2 (8.3)	110 (417)	220 (833)
TUF-800-BN	DN80	3	80	-	BACnet	Flange	3.5 (13.3)	176 (667)	352 (1333)
TUF-1000-BN	DN100	4	100	-	BACnet	Flange	5.3 (20)	264 (1000)	528 (2000)
TUF-1250-BN	DN125	5	125	-	BACnet	Flange	8.8 (33)	440 (1667)	881 (3333)

*A pipe fitting is required to use the DN15 to DN40 energy meters. The DN50 has a flange connection and does not require a pipe fitting.
†For additional sizes up to 8" (203.2 mm) contact factory.

MODEL CHART							
Fitting Size	Pipe Fitting Model*	Process Connection Size	Weight lb (kg)	Fitting Size	Pipe Fitting Model*	Process Connection Size	Weight lb (kg)
A	WM-ACC-C01	1/2" NPT	0.6 (0.3)	C	WM-ACC-C13	1" BSPT	1.8 (0.8)
A	WM-ACC-C11	1/2" BSPT	0.6 (0.3)	D	WM-ACC-C04	1-1/4" NPT	2.3 (1.1)
B	WM-ACC-C02	3/4" NPT	1.2 (0.5)	D	WM-ACC-C14	1-1/4" BSPT	2.3 (1.1)
B	WM-ACC-C12	3/4" BSPT	1.2 (0.5)	E	WM-ACC-C05	1-1/2" NPT	4.4 (2)
C	WM-ACC-C03	1" NPT	1.8 (0.8)	E	WM-ACC-C15	1-1/2" BSPT	4.4 (2)

*Each model includes 1 fitting.

Modbus® is a registered trademark of Schneider Automation, Inc.

PORTABLE ULTRASONIC FLOWMETER KIT

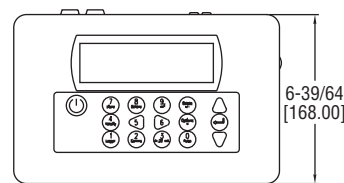
Portable, Non-Invasive and Data Logging Option



PUB



PUF



The **SERIES PUB & PUF** Portable Ultrasonic Flowmeter Sets utilize the transit-time difference for measuring flow rates in pipes non-invasively. Units offer flow rate local display with analog and pulsed outputs. The Series UFC offers the same features plus data logging capability.

FEATURES/BENEFITS

- Non-invasive pipe measurement
- Compact and lightweight
- Incorporate the latest electronics and signal processing technologies realizing high performance and easy operation
- Ideal for on-the-go flow monitoring, capable of 20 hours continuous operation with built-in, rechargeable battery
- Easy to read graphic display with convenient backlight for visual comfort
- Efficient layout of the function keys for easy to use programming
- PUB features rugged carrying case with molded foam inserts
- PUF boasts an IP67 rated case to hold and protect all equipment conveniently

APPLICATIONS

- Water treatment
- Industrial systems
- Irrigation applications
- Treated water flow
- River water
- Sea water
- Potable water
- Demineralized water
- Glycol/water mix
- Hydraulic system
- Diesel oil
- Water use data logging

KIT INCLUDES

- Converter
- Set of transducers
- Transducer holders
- Set of transducer cables (6.56 ft (2 m))
- 4 to 20 mA communication cables
- 12 VDC power supply
- Ultrasonic coupling grease
- Set of chains
- Ruled guide rail
- Test block
- Carrying case

MODEL CHART - STANDARD VERSION

Model	Pipe Size Range in (mm)
PUB-10	0.5 to 4.5 (13 to 115)
PUB-20	2 to 40 (50.7 to 1016)

MODEL CHART - DATA LOGGING VERSION

Model	Pipe Size Range in (mm)
PUF-1001	0.5 to 78 (13 to 2000)
PUF-1002	0.5 to 4.5 (13 to 115)
PUF-1003	2 to 78 (50 to 2000)

SPECIFICATIONS

Service: Homogeneous liquids that do not contain air bubbles capable of ultrasonic wave propagation.

Inputs: Lemo connector cable from sensors.

Range: 0.33 to 65.62 ft/s (0.1 to 20 m/s).

Display: 240 x 64 pixel graphic display, high contrast black on white with backlight; Languages: English, French, German, Swedish, Italian, Spanish, Portuguese, Russian, Norwegian, and Dutch; 5.2" W x 1.5" H.

Accuracy: ± 0.5 to 2% of flow reading for flow rate > 0.66 ft/s (0.2 m/s) and pipe ID > 2.95 in (75 mm); $\pm 3\%$ of flow reading for flow rate > 0.66 ft/s (0.2 m/s) and pipe ID in range 0.512 to 2.95" (13 to 75 mm); $\pm 6\%$ of flow reading for flow rate < 0.66 ft/s (0.2 m/s).

Power Requirements: 9 to 24 VDC, (1) 5-Cell NiMH battery, internal, factory replaceable (continuous operation time: 20 hours with back-light and output off) (recharging time: 6.5 hours, power adapter used).

Power Consumption: 10.5 W.

Power Adapter: 110/240 VAC adapter. UK, US, European adapters included.

Temperature Limits: -4 to 275°F (-20 to 135°C).

Outputs: Analog: 1 opto-isolated output: 4 to 20 mA, 0 to 16 mA or 0 to 20 mA (selectable); Error current: 0 to 26 mA (selectable); Load resistance: 620 Ω max; Pulse: 1 opto-isolated MOSFET relay, 150 mA max, 500 pps max, 200 Hz max.

Serial Communications: USB; RS-232 (PUF only).

Enclosure Rating: Converter: IP54; Transducers: IP51.

Materials: Flame retardant injection molded ABS plastic.

Repeatability: ± 0.5 % of measured value or ± 0.066 ft/s (0.02 m/s).

Electrical Connections: Multi-pin Lemo plugs.

Turbidity: $< 3\%$ by volume of particulate content.

Permissible Air Content: $< 3\%$ by volume.

Response Time: < 500 ms.

Weight: Unit without accessories: 2.3 lb (1.06 kg); Unit with accessories in carrying case: 13.23 lb (6.0 kg).

Agency Approvals: CE.

ADDITIONAL SPECIFICATIONS

Applicable Pipe Material: Carbon steel, SS, copper, UPVC/PVDF, concrete, galvanized steel, mild steel, glass, brass.

Applicable Pipe Lining: Rubber, glass, concrete, epoxy, steel, other*.

Pipe Wall Thickness: 0.04 to 3" (1 to 75 mm).

Pipe Lining Thickness: $< 1"$ (< 25 mm).

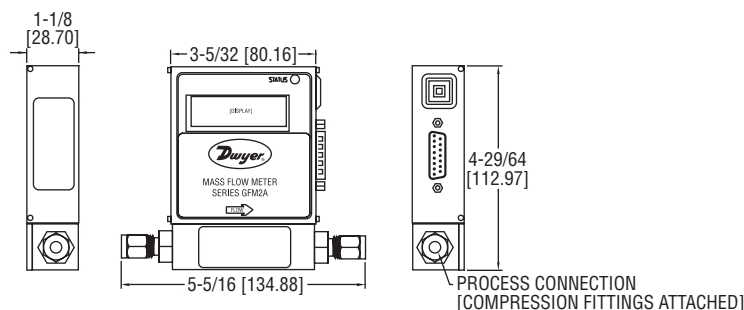
*Selectable option for special material with known propagation rate of lining material.

OPTION

Use order code:	Description
NISTCAL-FU	NIST traceable calibration certificate

GAS MASS FLOW METER

±1% FS, Programmable Relays



The **SERIES GFM2** Gas Mass Flow Meters is an ideal choice for the measurement of flow rates of a wide variety of gases. Unit can be calibrated for a variety of gases with user selectable 0 to 5 VDC or 4 to 20 mA and two relay outputs and programmable totalizer that indicates total gas quantity.

FEATURES/BENEFITS

- Utilizes a straight tube sensor with a restrictor flow element to provide a high ±1% FS accuracy and ±0.25% FS repeatability
- Gas flow can be displayed in 23 different engineering units on an optional 2x16 character LCD display with internal conversion factors for up to 32 gases
- Digital RS-232 or RS-485 interfaces allow for easy communication and for multi-drop capability of up to 256 units (RS-485 only)
- User-friendly interface allows for the programming of high and low gas flow alarms, along with two user-programmable electromechanical SPDT relays with latch options
- Stores calibration information for up to 10 different gases, internal or user-specific K-factors
- Automatic sensor zero offset adjustment (via digital interface or local push button)
- NIST traceable certificate included
- Self-diagnostic tests

APPLICATIONS

- Gas flow measurement
- Gas flow control
- Operating pumps and valves
- Process equipment
- Vacuum processes
- Glass and metal coating
- Film deposition

SPECIFICATIONS

Service: Clean gases compatible with wetted parts.

Wetted Materials: GFM2-X-X-A: Anodized aluminum, brass, 316 SS fluoroelastomer O-rings; GFM2-X-X-S: 316 SS, and fluoroelastomer O-rings; Buna-N, EPD and PTFE O-rings optional.

Accuracy: ±1% FS.

Repeatability: ±0.25% FS.

Response Time: 2 seconds to within ±2% of actual flow.

Output Signal: Linear 0 to 5 VDC (3000 Ω min. load impedance) and 4 to 20 mA (500 Ω max. loop resistance).

Relay Rating: 1 A @ 24 VDC.

Max. Particulate Size: 5 microns.

Temperature Limits: 32 to 122°F (0 to 50°C).

Power Supply: 11 to 26 VDC.

Process Connections: 1/8" compression fitting for flow rates ≤ 10 L/min; 1/4" for ≤ 50 L/min; 3/8" for ≤ 100 L/min.

Display: 2 x 16 character LCD (optional).

Pressure Limits: 500 psig (34.5 bar).

Leak Integrity: 1 x 10⁻⁹ sml/sec of helium.

Weight: 1.05 lb (0.48 kg).

MODEL CHART									
Example	GFM2	-AIR	-010	-A	-V	-A	-N	-A	-2
Series	GFM2								
									Gas mass flow meter
Specialty Gas & K-Factor		AIR AR C2H2 C3H8 C4H10 CH4 CO CO2 HF HE H2 N2 NH3 O2 SO2							Air 1.0000 Argon 1.4573 Acetylene 0.5829 Propane 0.3500 Butane 0.2631 Methane 0.7175 Carbon monoxide 1.0000 Carbon dioxide 0.7382 Hydrogen fluoride 0.9998 Helium 1.4540 Hydrogen 1.0106 Nitrogen 1.0000 Ammonia 0.7310 Oxygen 0.9926 Sulfur dioxide 0.6900
Body Size			010 050 100						Low flow Medium flow High flow
Body Material				A S					Aluminum Stainless steel: Body size = 010 Body size = 050 Body size = 100
Seal Material					V B E T				Fluoroelastomer Buna-N EPD PTFE
Fittings						A B D			1/4" compression (low) 1/8" compression (medium) 3/8" compression (high)
Display							N L		No display LED display
Output Signal								A B	0 to 5 VDC 4 to 20 mA
Digital Interface									2 5 9 RS232 RS485 PROFIBUS

MAXIMUM FLOW RANGE (l/min)							
Body Size	AIR	AR	C2H2	C3H8	C4H10	CH4	CO
010	10	10	5	2	2	5	10
050	50	50	20	10	5	30	50
100	100	100	50	30	20	60	100

MAXIMUM FLOW RANGE (l/min)							
Body Size	CO2	HE	H2	N2	NH3	O2	SO2
010	5	10	10	10	5	10	5
050	30	50	50	50	30	50	30
100	60	100	100	100	60	100	60

FLOW RANGES	
ml/min	l/min
10	2
20	5
50	10
100	20
200	30
500	40
1000	50
	60
	80
	100
Note: Specify flow range at time of order	

ACCESSORY	
Model	Description
A-110NA12	110 VAC power supply, 12 VDC with communication interface branch

GAS MASS FLOW METER

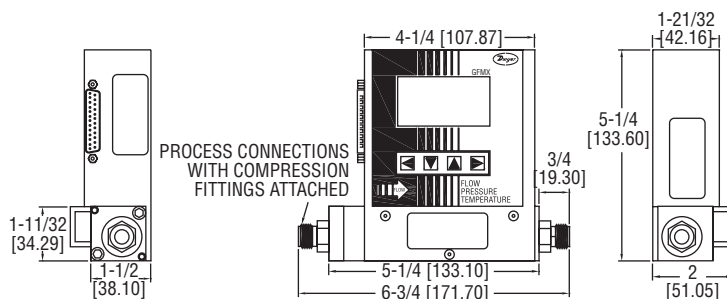
Flow Monitoring, Push-Button Configuration



GFM3



GFM4



The **SERIES GFM3 & GFM4** Gas Mass Flow Meters are an ideal choice for the measurement of flow rates of a wide variety of gases. Unit can be calibrated for a variety of gases via push-button with 0 to 5 VDC, 0 to 10 VDC or 4 to 20 mA and relay outputs.

FEATURES/BENEFITS

- Multi parameter flow meter supports various functions such as flow totalizer, flow, temperature, and pressure alarms, and is available in a choice of 0 to 5 VDC, 0 to 10 VDC, or 4 to 20 mA output signals
- Set alarms remotely via digital interface for flow, pressure, and temperature to alert user of high or low thresholds being exceeded
- Programmable 12-digit totalizer for total gas volume indication, and is available in the choice of 0 to 5 VDC, 0 to 10 VDC, or 4 to 20 mA output signals
- Standard four button keypad and large 128 x 64 graphical LCD with backlight allows easy access to the many features
- Digital interface operates through available RS-485 or RS-232, providing access to internal data parameters and multi-drop capability of up to 255 units (RS-485 only)
- Set alarms remotely via digital interface for flow to alert user of high or low thresholds being exceeded
- Internal conversion factors for up to 32 gases
- NIST traceable certificate included
- Automatic zero adjustment
- Self-diagnostic tests

SPECIFICATIONS

Service: Clean gases compatible with wetted parts.
Wetted Materials: 316 SS, 416 SS; Fluoroelastomer, Buna-N, EPR or PTFE O-rings.
Accuracy: $\pm 1\%$ FS.
Repeatability: $\pm 0.25\%$ FS.
Response Time: 0.6 to 1.0 s to within $\pm 2\%$ of setpoint over 20 to 100% FS.
Output Signal: Linear 0 to 5 VDC (3000 Ω min. load impedance); 0 to 10 VDC (6000 Ω min. load impedance); 4 to 20 mA (500 Ω max. loop resistance).
Relay Rating: 1 A @ 24 VDC.
Max. Particulate Size: 5 microns.

Temperature Limits: Ambient: 32 to 122°F (0 to 50°C); Dry Gases: 14 to 122°F (-10 to 50°C).
Power Supply: 12 VDC; 15 VDC; ± 24 VDC.
Process Connections: 1/8" compression fitting for flow rates ≤ 10 L/min; 1/4" for ≤ 50 L/min; 3/8" for ≤ 100 L/min.
Pressure Limits: 500 psia (35 bar).
Leak Integrity: 1×10^{-9} smL/sec of helium.
Display: 128 x 64 graphic LCD with backlight.
Weight: 1 lb (.45 kg).

APPLICATIONS

- Gas flow measurement
- Gas flow control
- Operating pumps and valves
- Process equipment
- Vacuum processes
- Glass and metal coating
- Film deposition

MODEL CHART

Example	GFM3	-AIR	-010	-5	-E	-B	-L	-B	-C	-2	GFM3-AIR-010-5-E-B-L-B-C-2
Series	GFM3 GFM4										Gas mass flow meter Gas mass flow meter with temperature
Specialty Gas & K-Factor		AIR AR C2H2 C3H8 C4H10 CH4 CO CO2 HF HE H2 N2 NH3 O2 SO2									Air 1.0000 Argon 1.4573 Acetylene 0.5829 Propane 0.3500 Butane 0.2631 Methane 0.7175 Carbon monoxide 1.0000 Carbon dioxide 0.7382 Hydrogen fluoride 0.9998 Helium 1.4540 Hydrogen 1.0106 Nitrogen 1.0000 Ammonia 0.7310 Oxygen 0.9926 Sulfur dioxide 0.6900
Body Size			010 050 100								Low flow Medium flow High flow
Power Supply				5 2 4							± 15 VDC 12 VDC 24 VDC
Seal Material					V B E T						Fluoroelastomer Buna-N EPR PTFE
Fittings						A B D					1/4" compression (low) 1/8" compression (medium) 3/8" compression (high)
Display							L				LED display
Flow Output Signal								A B G			0 to 5 VDC 4 to 20 mA 0 to 10 VDC
Temperature & Pressure Output Signal									A B C D E F G H I J		N.A./N.A. 0 to 5 VDC/0 to 5 VDC 0 to 5 VDC/4 to 20 mA 0 to 5 VDC/0 to 10 VDC 4 to 20 mA/0 to 5 VDC 4 to 20 mA/4 to 20 mA 4 to 20 mA/0 to 10 VDC 0 to 10 VDC/0 to 5 VDC 0 to 10 VDC/4 to 20 mA 0 to 10 VDC/0 to 10 VDC
Digital Interface										2 5 9	RS232 RS485 PROFIBUS

Note: Specify flow range at time of order

ACCESSORIES

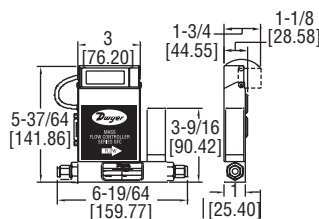
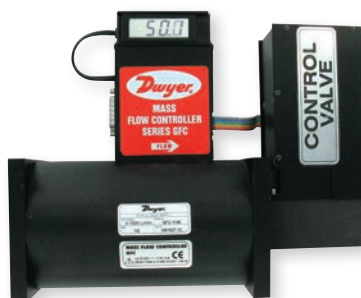
Model	Description
A-110N12	110 VAC power supply, 12 VDC standard interface
A-110N24	110 VAC power supply, 24 VDC standard interface
A-110NA15	110 VAC power supply, 15 VDC standard interface

Flow Range Chart: See page 317 (Series GFM2)

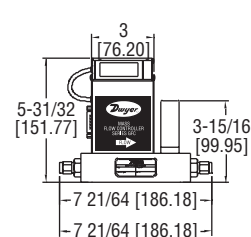
Max Flow Range Chart (per body size for the given gases): See page 317 (Series GFM2)

GAS MASS FLOW CONTROLLERS

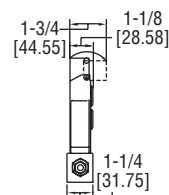
Flow Range Up to 1000 L/min, Pressures Up to 500 psi, NIST Traceable



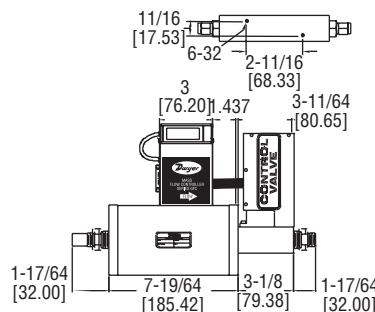
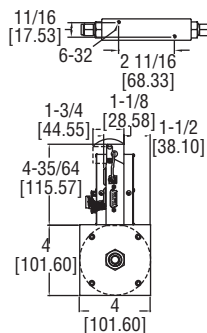
Model GFC-1101 Thru GFC-1111
& GFC-2101 Thru GFC-2111



Model GFC-1130 Thru GFC-1133
& GFC-2130 Thru GFC-2133



Model GFC-1140 Thru
GFC-1142 & GFC-2140
Thru GFC-2142



Model GFC-1143 Thru GFC-1145
& GFC-2143 Thru GFC-2145

The **SERIES GFC** Gas Mass Flow Controllers combines a straight tube sensor with a restrictor flow element. It is available for flow ranges up to 1000 L/min and offered in aluminum or 316 SS in 1/4", 3/8", 1/2" and 3/4" sizes.

FEATURES/BENEFITS

- Provides high accuracy and repeatability
- Flow rates are virtually unaffected by temperature and pressure variations
- Utilizes an electromagnetic valve and PID electronics to maintain continuous control by comparing measured sensor signal set to flow rates
- Set points can be adjusted with local potentiometers or remotely via 0 to 5 VDC or 4 to 20 mA analog signal
- Actual gas flow is displayed in engineering units on a 3-1/2 digit, 90° tiltable LCD readout
- Can be used with Series GFT2 Flow Totalizer for applications requiring totalization
- NIST traceable certificate included

APPLICATIONS

- Gas flow measurement
- Gas flow control
- Operating pumps and valves
- Process equipment
- Vacuum processes
- Glass and metal coating
- Film deposition

SPECIFICATIONS

Service: Clean gases compatible with wetted parts.
Wetted Materials: GFC-1XXX: Anodized aluminum, brass, 316 SS and fluoroelastomer O-rings; GFC-2XXX: 316 SS and fluoroelastomer O-rings.
Accuracy: ±1% FS including linearity over 59 to 77°F (5 to 25°C) and 5 to 60 psia (0.34 to 4 bar); Series GFC X143, X144, X145, ±1.5% FS.
Repeatability: ±0.25% FS.
Response Time: 2 s to within ±2% of actual flow.
Output: Linear 0 to 5 VDC and 4 to 20 mA.
Max. Particulate Size: 5 microns.
Temperature Limits: 32 to 122°F (0 to 50°C).
Power Supply: ±12 VDC.
Process Connections: 1/4" compression fitting for flow rates ≤50 L/min; 3/8" for 100 and 200 L/min; 1/2" for 500 L/min; 3/4" for 1000 L/min.
Pressure Limits: 1000 psig (68.9 bar); Series GFC-X143, X144, X145, 500 psig (34.5 bar).
Leak Integrity: 1 x 10⁻⁹ sccs of He.
Display: 90° tiltable, 3-1/2 digit.
Agency Approvals: CE.

MODEL CHART

Aluminum Model	SS Model	Flow Range	Process Connector Compression Fitting
GFC-1101*	GFC-2101*	0 to 10 mL/min	1/4"
GFC-1102*	GFC-2102*	0 to 20 mL/min	1/4"
GFC-1103*	GFC-2103*	0 to 50 mL/min	1/4"
GFC-1104*	GFC-2104*	0 to 100 mL/min	1/4"
GFC-1105*	GFC-2105*	0 to 200 mL/min	1/4"
GFC-1106*	GFC-2106*	0 to 500 mL/min	1/4"
GFC-1107*	GFC-2107*	0 to 1000 mL/min	1/4"
GFC-1108*	GFC-2108*	0 to 2 L/min	1/4"
GFC-1109*	GFC-2109*	0 to 5 L/min	1/4"
GFC-1111*	GFC-2111*	0 to 15 L/min	1/4"
GFC-1131*	GFC-2131*	0 to 30 L/min	1/4"
GFC-1133*	GFC-2133*	0 to 50 L/min	1/4"
GFC-1142*	GFC-2142*	0 to 100 L/min	3/8"
GFC-1143*	GFC-2143*	0 to 200 L/min	3/8"
GFC-1144*	GFC-2144*	0 to 500 L/min	1/2"
GFC-1145*	GFC-2145*	0 to 1000 L/min	3/4"

*Specified flow ranges are for an equivalent flow of nitrogen at 70°F (21°C) @ 760 mm Hg

ACCESSORIES

Model	Description
GFC-110P	110 V power supply
GFC-220PE	220 V power supply
GFC-CBL1	8' cable with 15-pin connector
GFC-CBL3	3' extension cable for LCD readout

RATE/TOTAL INDICATOR

Loop Powered, Converts Pulse Frequency to 4 to 20 mA, High/Low Flow Alarm



The **SERIES RTI2** Rate & Total Indicator is an indicator/transmitter that takes the pulse output signal from compatible flowmeters, displays flow rate and total, and provides output signals. It is compatible with the Series EFS2, IEFS, PDWS, and FLMG.

FEATURES/BENEFITS

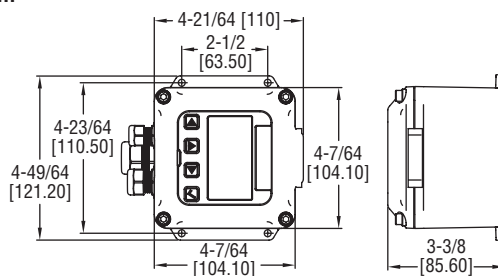
- Can be mounted on a wall or mounted on the flowmeter for added flexibility
- Accessory mounting kits make it easy to change the mounting orientation
- High environmental protection with semi-flexible urethane potted electrical components
- Provides a pulse, 4 to 20 mA and dual-relay output

APPLICATIONS

- Water treatment
- Water utilities
- Industrial chemical handling

MODEL CHART	
Model	Description
RTI2-W	Wall-mounted
RTI2-M	Meter-mounted
RTI2-P	Panel-mounted

ACCESSORIES	
Model	Description
MMK2	Meter mounting kit
WMK2	Wall mounting kit



SPECIFICATIONS

Input: 5 V pulse or contact closure; 1 to 15 pulses/s.

Temperature Limits: Process: -32 to 131°F (0 to 55°C); Storage: -40 to 158°F (-40 to 75°C).

Output: Current sinking square wave pulse: Scaled pulse output (0.1 s duration 6.1 Hz max. or high alarm output or low alarm output), sensor pass-through pulse output (un-scaled); Pulse output range: 0.1 to 999999.9 units/pulse; Analog: 4 to 20 mA, 24 to 30 VDC.

Power Requirements: 7 to 30 VDC @ 4 mA (4 to 20 mA when loop-powered).

Display: Rate: 8 digits, 1/2" H LCD; Total: 8 digits, 5/16" character height.

K-Factor Range: 0.001 to 99999.999.

Flow Alarm Output Range: 0.1 to 99999.99.

Enclosure Material Housing: Die-cast powder-coated aluminum; Faceplate #HP92W Lexan.

Enclosure Rating: NEMA 4X (IP67).

Electrical Connection: Terminal blocks, #22 AWG, 3 conductor 18' (5.5 m) cable (2000' max.).

Mounting: See model chart.

Weight: 3 lb (1361 g).

SERIES BAT

BLIND ANALOG TRANSMITTER

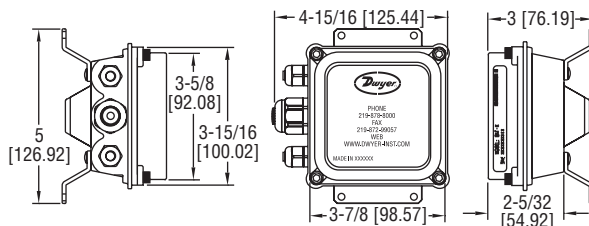
Converts Pulse Frequency to 4 to 20 mA, Loop Powered



BAT-M shown installed on Series EFS2 meter. Meter sold separately.



BAT-W



The **SERIES BAT** Analog Transmitters is a 4 to 20 mA transmitter for use with the Series EFS2, IEFS, PDWS, PFT and FLMG.

FEATURES/BENEFITS

- Easy to set up and can be either wall or meter mounted
- Takes a pulse frequency output from the compatible flow meters and converts it into a continuous 4 to 20 mA analog output signal
- The frequency for the flowmeter output signal can be adjusted using four rotary switches on the back of the transmitter and a microcontroller automatically scales all other values accordingly
- The microcontroller averages inputs for more stable reading outputs and is adjustable from 2 to 16 seconds
- Loop powered, 2 wire connection
- High environmental protection with semi-flexible urethane potted electrical components

APPLICATIONS

- Telemetry applications
- Data logging
- Distributed control systems
- Chart recording

MODEL CHART	
Model	Description
BAT-M	Blind analog transmitter, meter-mounted*
BAT-W	Blind analog transmitter, wall-mounted

*Compatible Series: EFS2, IEFS, PDWS, TBS and FLMG.

ACCESSORIES	
Model	Description
MMK	Meter mounting kit
WMK	Wall mounting kit

SPECIFICATIONS

Input: Open-collector solid state sensor. Averaging: 2, 4, 8, 16 s (DIP switch selectable); Pulse Frequency: Min. 10 Hz @ 20 mA; Max. 999.9 Hz (rotary DIP switch selectable).

Temperature Limits: 32 to 130°F (0 to 55°C).

Output: 4 to 20 mA.

Power Requirements: 24 to 36 VDC @ 4 to 20 mA when loop powered.

Response Time: 2 to 60 s; 90% FS (depends on input averaging).

Loop Resistance: 0 to 1300 Ω max. ●

Enclosure Material: Die-cast powder-coated aluminum.

Enclosure Rating: NEMA 4X (IP66).

Electrical Connections: Terminal block.

Mounting: See model chart.

Weight: 3 lb (1361 g).

SELECTION GUIDE

pages 322-325

TYPICAL APPLICATIONS

pages 326-327



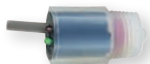
Level Indicators
pages 328-329



Water Leak Detectors
page 330



Level Switches, Float
pages 331-341



Level Switches, Optical
page 342



Level Switches, Displacer
page 342



Level Switches, Conductivity
page 343



Level Switches, Tilt
page 344



Level Switches, Capacitive
pages 345-346



Level Switches, Vibrating Rod
page 346



Level Switches, Tuning Fork
page 347



Level Switches, Paddle
pages 348-349



Level Switches, Diaphragm
pages 350-351



Level Transmitters, Submersible
pages 352-355



Level Transmitters, Capacitive
page 356



Level Transmitters, Float
page 357



Level Transmitters, Ultrasonic
pages 358-359



Level/Pump Controllers
pages 360-362



Bin Vibrators/Aerators
pages 363-364

FEATURED PRODUCTS

FLUSH TIP SUBMERSIBLE LEVEL TRANSMITTER

SERIES FBLT | page 355



- Flush Diaphragm tip will not clog in harsh applications
- Slim body design allows for easy placement into stilling wells and other narrow installations

PADDLE LEVEL SWITCH


SERIES PLS | page 349



- Magnetic drive isolates and completely seals the control head from the process and environment preventing material or dust from entering the control head
- Motor shuts-off when paddle stalls, increasing motor life, preventing motor burnout, and decreasing power usage

LIQUID

Level Switches

				
SERIES	L4 - page 331	L6 - page 332	L8 - page 333	L10 - page 334
Service	Liquids	Liquids	Liquids	Liquids
Wetted Materials	316 SS	304 SS	316 SS	304 SS
Temperature Limits	275°F (135°C)	220°F (105°C)	212°F (100°C)	200°F (93°C)
Pressure Limits	2000 psig with option bar	2000 psi (138 bar)	150 PSIG (10.34 bar)	2000 (137.137.8 bar)
Process Connection	1-1/2" or 2-1/2" male NPT	1" male NPT or 1" female NPT with external float	1" male NPT	1" male NPT
Min. Specific Gravity	0.7	0.9	0.6	0.9
Output	SPDT or DPDT	SPDT or DPDT	SPDT	SPST
Mounting Orientation	Horizontal with optional vertical	Horizontal	Horizontal	Horizontal
Agency Approvals	ATEX, CE, CSA, FM, IECEx, UL	ATEX, CE, CSA, FM, IECEx, KTL, UL	CE, cURus	CSA, UR

LIQUID



Level Switches

					
SERIES	F7-MS - page 339	123 - page 340	102 - page 340	CFS2 - page 341	FSW2 - page 341
Service	Liquids	Liquids	Liquids	Liquids	Liquids
Wetted Materials	Brass or 316 SS	304 SS	Cast iron	Polypropylene	Polypropylene
Temperature Limits	Buna-N floats: 180°F (82.2°C) in oil, 230°F (110°C) in water; SS floats: 300°F (148.9°C)	365°F (185°C)	425°F (218°C)	122°F (50°C)	122°F (50°C)
Pressure Limits	750 psi (51.7 bar)	150 psig (10.34 bar)	400 psig (27.6 bar)	14.5 psi (1 bar)	29 psi (2 bar)
Process Connection	1/2", 1-1/4", 2", or 3" 150# flange	1" female NPT	1" female NPT	N/A	N/A
Min. Specific Gravity	0.55	0.88	0.6	0.6	0.6
Output	SPST or SPDT	SPDT, DPDT or (2) SPDT	SPDT, DPDT or (2) SPDT	SPST or SPDT	SPST or SPDT
Mounting Orientation	Vertical ±30°	Vertical	Vertical	Horizontal	Vertical
Agency Approvals	N/A	CSA, UL	UL	CE, UL/CSA	CE

These Selection Guides are for quick comparison of similar products. Please refer to the catalog page number referenced for complete product information and specifications.

LIQUID






Level Switches

				
SERIES	F7-MLK - page 334	F6 & F7 - page 335	F6 & F7 - page 336	F7-MM - page 338
Service	Liquids	Liquids	Liquids	Liquids
Wetted Materials	Buna-N/Brass	Polypropylene, 316 SS, or Buna-N*	Polypropylene, 316 SS, or Buna-N*	Brass or 316 SS
Temperature Limits	221°F (105°C)	176°F (80°C) or higher*	176°F (80°C) or higher*	180°F (82.2°C) or higher*
Pressure Limits	150 psig (10 bar)	50 psig (3 bar) or higher*	15 psig (1 bar) or higher*	1000 psi (68.95 bar)
Process Connection	2" male NPT	M16x2, 18" male NPT, 1/2" male NPT, 3/4" female NPT, or 3/8"-24" UNF-2A*	1/8" or 1/4" male NPT*	1/8", 3/4", or 1" male NPT, 3-5/8" flange, 1-5/16-12UNF-2A, 3/8"-24 thread, or 2" male NPT with 1/2" conduit
Min. Specific Gravity	0.45	0.45 or higher*	0.45 or higher*	0.45
Output	SPST	SPST	SPST	SPST
Mounting Orientation	Vertical	Horizontal	Vertical	Vertical
Agency Approvals	N/A	N/A	CE, UL*	N/A

*Varies per product

LIQUID

Level Switches

					
SERIES	OLS - page 342	B-190 - page 342	DPL110 - page 343	CLS2 - page 345	CLS1 - page 346
Service	Liquids	Liquids	Liquids	Liquids, powder, bulk materials	Solids, liquids, slurries
Wetted Materials	316 SS, Polysulfone or PFA	316 SS	316 SS	316 SS	CPVC
Temperature Limits	200°F (93.3°C)	200°F (93.3°C)	212°F (100°C)	185°F (85°C)	240°F (116°C)
Pressure Limits	1000 psig (69 bar)	125 psig (8.6 bar)	30 psig (2.06 bar)	365 psi (25 bar)	30 psig (2.06 bar)
Process Connection	1/2" male NPT	4" 125 # cast iron flange	1" male NPT	3/4", 1", or 1-1/2" male NPT or BSPT or 1-1/2" or 2" sanitary clamp	1" male NPS
Min. Specific Gravity	N/A	0.5	N/A	N/A	N/A
Output	NPN open collector	SPST or SPDT	SPDT	DPDT	SPDT
Mounting Orientation	Any position	Vertical	Vertical	Vertical or horizontal	Vertical or horizontal
Agency Approvals	N/A	UL	N/A	CE, cULus	N/A

These Selection Guides are for quick comparison of similar products. Please refer to the catalog page number referenced for complete product information and specifications.

BULK Level Switches

					
SERIES	LTC/LTS - page 344	CLS2 - page 345	CLS1 - page 346	VRLS - page 346	TFLS - page 347
Service	Powder and bulk	Liquids, powder and bulk	Liquids, slurries, powder and bulk	Powder and bulk	Powder and bulk
Wetted Materials	Steel or SS	316 SS	CPVC	304 SS	316 SS
Temperature Limits	150°F (66°C)	185°F (85°C)	240°F (116°C)	176°F (80°C)	176°F (80°C)
Pressure Limits	N/A	365 psi (25 bar)	30 psig (2.06 bar)	150 psi (10 bar)	145 psig (10 bar)
Process Connection	N/A	3/4", 1", or 1-1/2" male NPT or BSPT or 1-1/2" or 2" sanitary clamp	1" male NPS	1" male NPT	1-1/2" male NPT
Output	SPST or DPDT	DPDT	SPDT	SPDT	SPDT
Mounting Orientation	Vertical	Vertical or horizontal	Vertical or horizontal	Vertical or horizontal	Vertical or horizontal
Agency Approvals	N/A	CE, cULus	N/A	N/A	N/A

SUBMERSIBLE Level Transmitters

				
SERIES	SBLT2/SBLTX - page 352	MBLT - page 353	PBLT2/PBLTX - page 354	FBLT - page 355
Service	Liquids	Liquids	Liquids	Liquids
Wetted Materials	316 SS	316 SS	316 SS	316 SS
Temperature Limits	150°F (66°C)	176°F (80°C)	PBLT2: 180°F (82°C), PBLTX: 176°F (80°C)	176°F (80°C)
Pressure Limits	2x FS	2x FS	2x FS	2x FS
Accuracy	±0.25% FS	±0.25% FS	±0.25% FS	±0.25% FS
Range	0 to 300 psi (10 to 693 ft w.c) (3.2 to 211 m w.c)	0 to 300 psi (10 to 693 ft w.c) (3.2 to 211 m w.c)	0 to 300 psi (10 to 693 ft w.c) (3.2 to 211 m w.c)	0 to 300 psi (10 to 693 ft w.c) (3.2 to 211 m w.c)
Output	4 to 20 mA	4 to 20 mA or 0 to 5 V	4 to 20 mA	4 to 20 mA

These Selection Guides are for quick comparison of similar products. Please refer to the catalog page number referenced for complete product information and specifications.





BULK

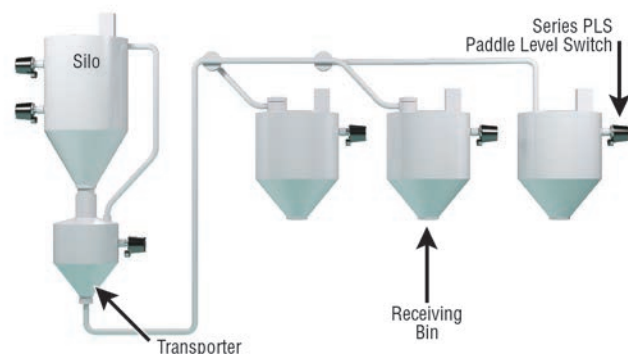
Level Switches

					
SERIES	CTF - page 347	DBLM - page 348	PLS2 - page 348	PLS - page 349	ULTRA MAG - pages 350-351
Service	Powder and bulk	Powder and bulk	Powder and bulk	Powder and bulk	Powder and bulk
Wetted Materials	304 SS	Polycarbonate	304 SS	316 SS	Aluminum or 304 SS with Urethane, Buna-N, PTFE, Silicone Rubber, Polyester, Fluoroelastomer, White Buna-N or EPDM diaphragm
Temperature Limits	212°F (100°C)	140°F (60°C)	176°F (80°C)	300°F (148.9°C)	350°F (176°C)
Pressure Limits	600 psi (40 bar)	N/A	11.6 psi (0.8 bar)	30 psig (2.07 bar)	60 psig (4.14 bar)
Process Connection	1" male NPT	3/4" male NPT, optional flange and 1-1/4" to 3/4" reducer	1-1/4" male NPT	1-1/4" male NPT, optional flange	8-3/8" (212.73 mm) diameter bolt hole circle
Output	PNP/NPN	SPDT	SPDT	SPDT or DPDT	SPDT
Mounting Orientation	Vertical or horizontal	Vertical or horizontal	Vertical or horizontal	Vertical or horizontal	Vertical
Agency Approvals	N/A	CE	CE, FM	cUL	CSA, UL

CAPACITIVE, ULTRASONIC & FLOAT

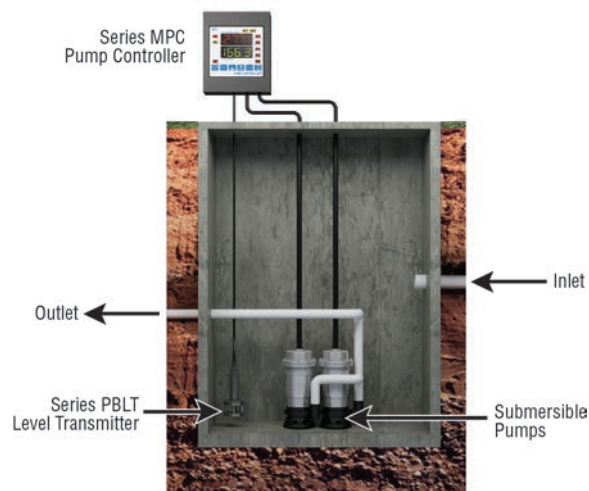
Level Transmitters

				
SERIES	CRF2 - page 356	CLT - page 357	ULT - page 358	ULSS/ULSM/ULSL - page 359
Service	Liquids, powders, bulk material	Liquids	Liquids	Fluids/liquids
Wetted Materials	316 SS	Brass	303 SS	PVDF, FKM
Temperature Limits	Ambient: 185°F (85°C), Process: 250°F (121°C)	180°F (82°C) in water, 230°F (110 °C) in oil, 230°F (110°C) SS floats	140°F (60°C)	140°F (60°C)
Pressure Limits	100 psi (6.9 bar)	150 psig (10 bar)	30 psi (2 bar)	30 psi (2 bar)
Accuracy	±0.25% FS	±1 mm	±0.2% FS	ULSS: ±0.125" (3 mm); ULSM/ULSL: ±0.2% FS
Range	12 to 30 ft (3.7 to 9.1 m)	Options from .5 to 68" (0.01 to 1.73 m)	0 to 24.6 ft (0 to 7.5 m) or 0 to 32.8 ft (0 to 10 m)	ULSS: 0 to 4.1 ft (0 to 1.25 m); ULSM: 0 to 9.8 ft (0 to 3 m); ULSL: 0 to 18 ft (0 to 5.5 m)
Output	4 to 20 mA	4 to 20 mA or 0 to 5 V	4 to 20 mA	4 to 20 mA



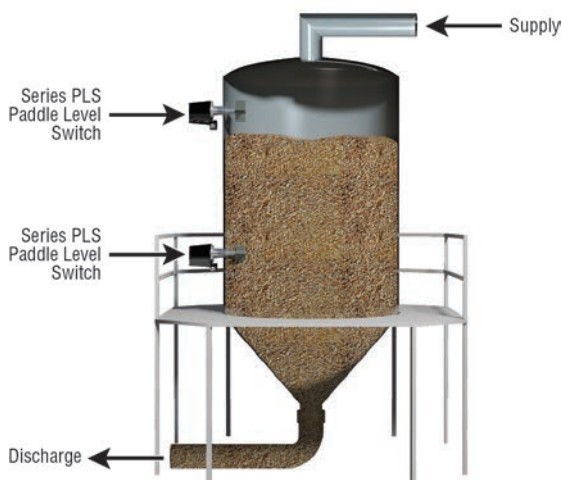
Proximity™ Series PLS is used to indicate level status in pneumatic conveying systems.

Pneumatic conveying systems use air to transport powder and dry bulk solids through conveying lines. The air is pressurized by positive pressure or vacuum to move the product through the lines into and out of silos, transporters, and receivers. Typical applications have high and low level indication in the storage bins to control the flow of product in or out. The PLS is perfect for level use in these storage bins. It has a rotating paddle that is inserted into the bin. As the product level builds up in the bin it stops the paddle from rotating and triggers the level output. The PLS is great for this application as it is not affected by pressure changes in the bin.



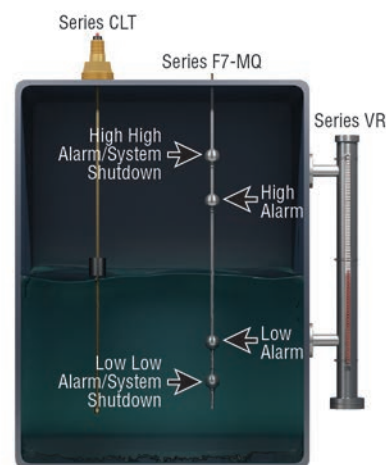
Mercoid® pump controller with level transmitter control pumps in wastewater lift stations.

Lift stations are used to transmit wastewater to the treatment facility. Wastewater is transmitted by gravity feed so it has to be continually elevated to provide height to generate the flow. Lift stations are pits located at points in the wastewater system to collect the wastewater that usually have two submersible pumps. Wastewater in the lift station is pumped out to a higher level from where it can flow on to the next lift station or to the treatment facility. The Mercoid® Series MPC pump controller is used with the Series PBLT level transmitter to control the level in the lift station. The PBLT is a level transmitter that is submersed in the tank and sends a linear output of the height of wastewater above it. The MPC takes the height input and controls the pumps according to how it has been programmed.



Grain hopper level controlled by Series PLS Paddle Level Switch.

The supply of grain pneumatically conveyed to this dispensing hopper is controlled by two Proximity® Series PLS paddle level switches. When the grain level falls to the low limit switch, the supply is turned on until the hopper fills to the level of the high limit switch which turns off the supply. Since grain dust is explosive, the explosion-proof Series PLS provides the required safety protection. The PLS is a paddle level switch and is not affected by the varying pressure in the hopper due to the cycling of the pneumatic conveying system.



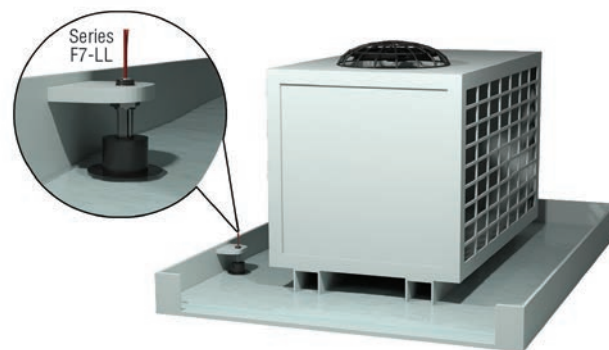
Custom level sensing devices are built to meet each customer's specific requirements, providing visual indication, continuous measurement, and point level control.

To meet various tank level measuring needs, Dwyer Instruments, Inc. offers custom-configured products built to customer specifications that provide visual indication, continuous level measurement, and multiple point level measurement. Series VR or MVR View-Rite Level Indicators are a safe way to keep the process isolated while providing true visible indication. Unlike sight glasses, which can crack or break, View-Rite Indicators contain liquids entirely within their stainless steel enclosure. For continuous level measurement needs, the Series CLT uses reed switch technology to offer a more economical solution than expensive ultrasonic, submersible or RT transmitters. Lastly, the Series F7-MQ can be used in virtually any tank to indicate high and low alarms or to control pumps and valves.



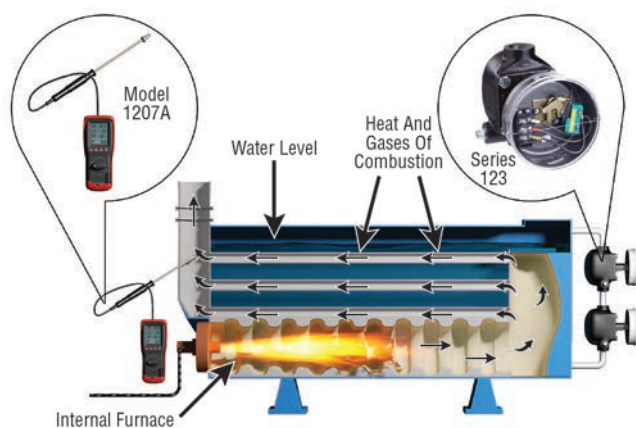
Mercoid® displacer type level control is ideal for controlling industrial sump pumps.

Industrial sumps and other underground tanks are ideal applications for top-mounted Mercoid® displacer type level controls. Easily installed, these controls use porcelain displacers that do not float on the surface of liquids, but are suspended on a coil spring and cable. As the liquid in the tank reaches the level of the upper displacers, their weight decreases by an amount equal to the liquid displaced, allowing the spring to move the cable upward, actuating the switch and the pump is turned on. As the liquid level falls below the upper displacers they move only a small amount, staying within the switch deadband until the liquid level falls to the center of the bottom displacer. At this point the switch is deactivated stopping the pump. The pump will remain deactivated until the water level rises to the upper displacers, repeating the cycle. The displacers are not affected by turbulence, pressure or chemicals and are excellent for tanks with viscous or dirty liquids. The level differential is easily adjusted by repositioning of the displacers on the 316SS cable.



Low level float switch enables sensing in air conditioner drip pans and other shallow level applications.

Standard float switches require at least an inch of liquid to attain enough buoyancy to switch. This can be a problem in applications where low level sensing is required. The hat-shaped design of W.E. Anderson's F7-LL provides necessary buoyancy for switching in only 5/8" of water. This is essential for air conditioner drip pans, low level sumps, and drains. The F7-LL is also ideal for low alarms, where running the process dry can result in catastrophic failure.



Mercoid® Model 123 level controls provide high and low alarm on large de-aerator tank.

Liquid level in the external piping equals level in the tank. When level rises to high limit, float in upper Model 123 is lifted, actuating switch to sound high level alarm. When level drops to low limit, lower Model 123 sounds low level alarm.

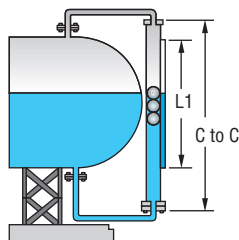


W.E. Anderson® Series OLS indicates level in heavy equipment radiator.

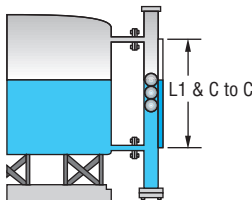
Many types of heavy industrial equipment use a liquid cooling system for the motor. A vibratory trench roller is a machine that compacts sub-bases for roads, parking lots, etc., and is an example of the type of equipment that would utilize this system. This machine incorporates a radiator cooling system. In the system, cooling liquid circulates through the engine preventing it from over heating. As the engine is cooled the cooling fluid heats up. The fluid returns to the radiator to cool down before being circulated through again. If there is not enough cooling fluid in the system the engine will not be cooled enough and damage will occur. A W.E. Anderson® Series OLS optical level switch is installed as a low level alarm. The level alarm is signaled by the OLS before the cooling fluid gets to a critical low level, warning the operator of the problem. The OLS uses an optical detection system superior for this application as float controls may trip from machine vibration. Also the compact insertion length is ideal for a small radiator.

VIEW-RITE LEVEL INDICATOR

Customized to Fit Any Application, Durable, 316 SS Housing and Float



Top & Bottom



Side & Side

TYPICAL MEASUREMENTS

C to C = L1 + 10.25" (260.35 mm) C to C = L1

The **SERIES VR** View-Rite Level Indicators provide customized level indication to meet a variety of application requirements. Specify any indication length up to 96" (244 cm) and the View-Rite level indicators incorporate a pressure tight housing with internal float that magnetically activates external level indication flags, switches, or transmitter.

FEATURES/BENEFITS

- Low maintenance with all 316 L SS wetted material
- Environmentally friendly with process liquid contained inside a pressure-tight housing
- Durable 316 L SS provides maintenance-free operation
- Requires no external power to operate
- Brightly colored flags are easy to read even at long distances

APPLICATIONS

- Pharmaceuticals
- Oil & gas
- Medical equipment
- Food and beverages
- Semiconductor manufacturing
- Boilers

SPECIFICATIONS

Service: Clean, low viscosity liquids.

Pressure Limits: 275 psi (18.9 bar), 225 psi (15.5 bar) @ 100°F (37.8°C), 215 psi (14.8 bar) @ 300°F (148.9°C), 195 psi (13.4 bar) @ 400°F (204.4°C).

Tube Diameter: 2-1/2" (64 mm).

MODEL CHART

Example	VR	-S	SS	1	-TP	D	-0.8	-150	-090	-080	P	1	-I	VR-SSS1-TPD-0.8-150-090-080P1-I
Construction	VR													View-rite level indicator
Wetted Materials		S												316 L SS, fluoroelastomer O-ring
Configuration			TB SS											Top/bottom connections Side/side connections
Process Connection				1 2 4 5 6 7										1/2" NPT (female on TB; male on SS configuration) 1" NPT (female on TB; male on SS configuration) 1" 150# RF flange 2" 150# RF flange 1" 300# RF flange 2" 300# RF flange
Float Access					TP BM TB									Top Bottom Top and bottom (only with SS configuration)
Drain and Vent					N D V B									None Drain, 1/2" female NPT (only with SS configuration) Vent, 1/2" female NPT (only with SS configuration) Drain and vent (only with SS configuration)
Specific Gravity						0.0								Specific gravity of fluid: Minimum is 0.8
Operating Pressure							000							Operating pressure in psi: Maximum is 275 psi (18.9 bar)
Operating Temperature								000						Operating temperature of fluid in °F: Maximum is 400°F (204°C)
Indicating Length, L1										000				Indicator length in whole inches: Maximum of 240" (6.1 m); Minimum of 6" (15.25 cm)
Indicating Flags											P A			Plastic, white and orange [300°F (149°C) maximum] Aluminum, silver and black
Visual Indicating Scale											N 1 2			None Feet and inches Inches only
Output Options												I V		4 to 20 mA transmitter of level [300°F (149°C) maximum] 0 to 5 VDC transmitter of level

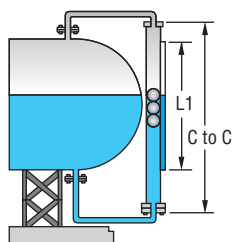
Note: Models are built to your specifications

OPTIONAL SWITCH MODULES

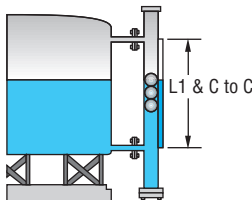
Model	Description
VR-S1	Maximum temperature is 300°F (148.9°C). Polysulfone with 1/4" female NPT conduit connection.
VR-S2	Maximum temperature is 750°F (399°C). 316 SS with 1/2" male NPT conduit connection.
VR-S3	Maximum temperature is 750°F (399°C). Explosion-proof terminal box with 1/2" female NPT conduit connection.
Clamp onto the level indicator. SPST, rated .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC.	

MINI VIEW-RITE LEVEL INDICATOR

Customized, Visual Level Indication, Compact Size



Top & Bottom



Side & Side

TYPICAL MEASUREMENTS	
C to C = L1 + 7.72" (196.09 mm)	C to C = L1

The **SERIES MVR** Mini View-Rite Level Indicators provide customized level indication to meet a variety of application requirements in a 1-1/4" (32 mm) housing. Specify any indication length up to 96" (244 cm) and the Mini View-Rite level indicators incorporate a pressure tight housing with internal float that magnetically activates external level indication flags, switches, or transmitter.

SPECIFICATIONS

Service: Clean, low viscosity liquids.
Pressure Limits: ≤300°F, 400 psi (27.6 bar); ≥ 300°F, 373 psi (25.7 bar).
Tube Diameter: 1-1/4" (32 mm).

FEATURES/BENEFITS

- Low maintenance with all 316 L SS wetted material
- Environmentally friendly with process liquid contained inside a pressure tight housing
- Durable 316 L SS provides maintenance-free operation
- Requires no external power to operate
- Brightly colored flags are easy to read even at long distances

APPLICATIONS

- Pharmaceuticals
- Medical equipment
- Food and beverages
- Semiconductor manufacturing
- Boilers

MODEL CHART													
Example	MVR	-S	SS	1	-TP	D	-0.8	-150	-090	-080	P	1	-I
Construction	MVR												MVR-SSS1-TPD-0.8-150-090-080P1-I
Wetted Materials		S											Mini view-rite level indicator
Configuration			TB SS										316 L SS housing, 316 L SS float, fluoroelastomer O-ring
Process Connection				1 3									Top/bottom connections Side/side connections
Float Access					TP BM TB								1/2" NPT (female on TB; male on SS configuration) 1/2" 150# RF flange
Drain and Vent						N D V B							Top Bottom Top and bottom (only with SS configuration)
Specific Gravity							0.0						None Drain, 1/2" female NPT (only with SS configuration) Vent, 1/2" female NPT (only with SS configuration) Drain and vent (only with SS configuration)
Operating Pressure								000					Specific gravity of fluid: Minimum is 0.8
Operating Temperature									000				Operating pressure in psi: Maximum is 400 psi (27.6 bar)
Indicating Length, L1										000			Operating temperature of fluid in °F: Maximum is 400°F (204°C)
Indicating Flags											P A		Indicator length in whole inches: Maximum of 240" (6.1 m); Minimum of 6" (15.25 cm) Plastic, white and orange [300°F (149°C) maximum] Aluminum, silver and black
Visual Indicating Scale												N 1 2	None Feet and inches Inches only
Output Options												I V	4 to 20 mA transmitter of level [300°F (149°) maximum] 0 to 5 VDC transmitter of level

Note: Models are built to your specifications

OPTIONAL SWITCH MODULES	
Model	Description
MVR-S1	Maximum temperature is 300°F (148.9°C). Polysulfone with 1/4" female NPT conduit connection.
MVR-S2	Maximum temperature is 750°F (399°C). 316 SS with 1/2" male NPT conduit connection.
MVR-S3	Maximum temperature is 750°F (399°C). Explosion-proof terminal box with 1/2" female NPT conduit connection.
Clamp onto the level indicator. SPST, rated .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC.	

WATER LEAK DETECTOR

Battery or External Powered, SPST or DPDT Relays



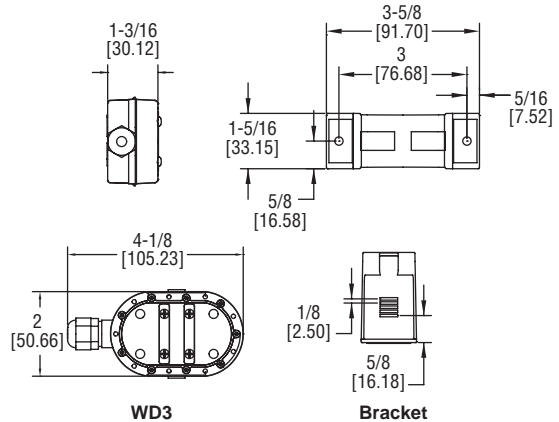
WD3-BP



WD3-LP



Bracket



WD3

Bracket

The **SERIES WD3** Water Leak Detectors protect equipment from water damage by detecting the presence of water. Model WD3-BP-D1-A is battery powered, all other is requires AC or DC supply voltages.

FEATURES/BENEFITS

- Audible and visual alerts provide local indication of the alarm condition and internal switch will give remote indication or control to prevent further buildup of water
- Sensing height can be adjusted as low as 1/32" (0.79 mm) using the included adjustable mounting bracket
- Mounting bracket can attach to any flat surface by either using the attached adhesive strips or mounting screws for easy installation

APPLICATIONS

- AHU drip pans
- Radiant floors
- Data centers
- Sump pumps
- Drains

MODEL CHART

Model	Output	Power	Audible Alarm
WD3-BP-D1-A	SPST NO SSR	Battery	Yes
WD3-LP-D2	DPDT relay	11 to 27 VAC/DC	No
WD3-LP-D2-A	DPDT relay	11 to 27 VAC/DC	Yes

ACCESSORY

Model	Description
A-WD3-BRK	Replacement mounting bracket

SPECIFICATIONS

Service: Water or conductive fluids.

Minimum Sensing Gap: 1/32".

Switch Type: Battery powered model: SPST NO SSR; External powered models: DPDT relay.

Electrical Ratings: Battery powered model: Pilot duty rating 250 mA @ 24 VDC; External powered models: 1 A @ 24 VAC/DC.

Audible Alarm: At least 85 dB @ 1' distance (depends on model).

Visual Alarm: Red LED for water level; Yellow LED for low battery (battery powered model only); Green LED for power condition (external powered models only).

Temperature Limits: 32 to 122°F (0 to 50°C).

Power Requirements: Battery powered model: 3V CR2450 lithium metal battery, installed functional, user replaceable; External powered models: 24 VAC (±10%) or 11 to 27 VDC.

Power Consumption: Battery powered model: 0.9 mA steady state / 3.0 mA during alarm condition; External powered models: 30 mA steady state / 85 mA during alarm condition.

Battery Life: 5 years steady state / 48 hours during alarm condition.

Electrical Connections: 4.9' (1.5 m), 22 AWG, PVC, UL plenum rated cable.

Enclosure Material: ABS and polycarbonate with flammability classification UL 94 V-0.

Enclosure Rating: Audible alarm models: Watertight up to 3/4 of the body height; Non-audible alarm models: NEMA 6P (IP 68) submersible.

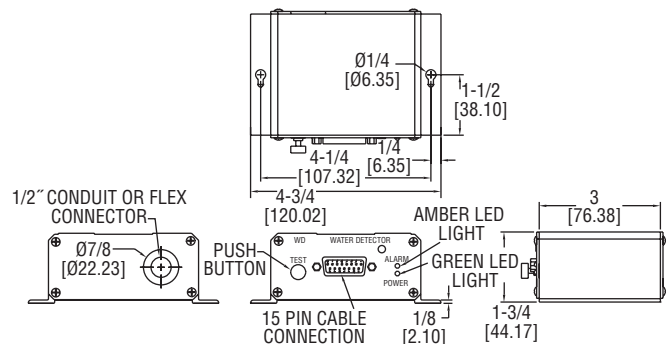
Weight: 4.85 oz (137.5 g).

Agency Approvals: CE, RoHS.

SERIES WD | W.E. ANDERSON BY DWYER

WATER DETECTOR AND SENSOR TAPE

Detects Low Levels Of Conductive Liquids, Large Measuring Area



The **SERIES WD** Water Detectors and Sensor Tapes is designed for dependable detection of water presence even of low conductive liquids. The water sensing tape attaches to module and if any liquid comes in contact with the tape the resistance is changed and the alarm will be triggered. The sensing tape is 1" wide and can be bought in lengths of 5, 10, 15 and 25' and is powered by 24 VAC or 24 to 30 VDC.

FEATURES/BENEFITS

- Sturdy and reliable aluminum enclosure
- Hydrophobic tape does not absorb any liquid allowing for faster drying time and faster return to service after water leak
- Multiple tapes can be connected together to extend the coverage area

APPLICATIONS

- Drip pans under HVAC equipment
- Computer rooms
- Telecommunication facilities
- Leak detection around water pumps

SPECIFICATIONS

Service: Conductive liquid.

Switch Type: DPDT.

Electrical Rating: 1 A @ 24 VAC/VDC.

Power Requirements: 24 VAC, 24 to 30 VDC.

Power Consumption: 35 mA maximum.

Electrical Connections: Screw terminals.

Conduit Connections: Hole for 1/2" conduit.

Enclosure: Extruded aluminum.

Sensor Tape: 1" (25.4 mm) wide and 5', 10', 15' or 25' long.

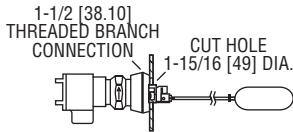
Weight: 8 oz (.23 kg).

MODEL CHART

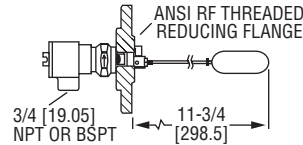
Model	Description
WD	Water module
TP05	5' (1.52 m) tape
TP10	10' (3.05 m) tape
TP15	15' (4.57 m) tape
TP25	25' (7.62 m) tape

FLOTECT® FLOAT SWITCH

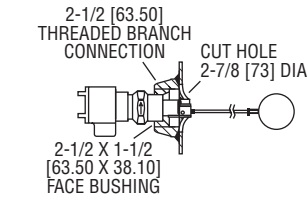
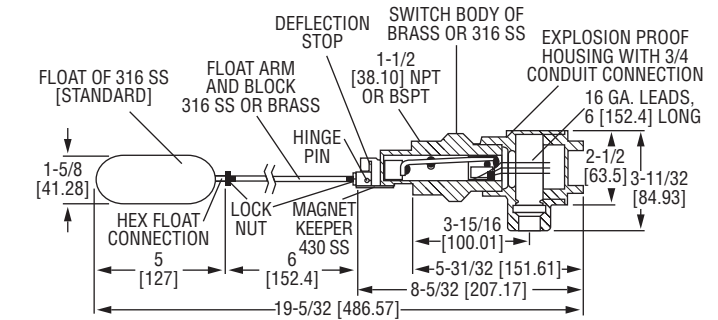
Magnetically Operated Switch, Leak Proof Body, Explosion-Proof



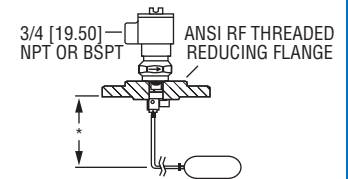
Standard Installation



Horizontal, Flange Installation



Horizontal, 2-1/2 Threaded Branch Connection Installation with Optional 2-1/2 [64] Spherical Float



Vertical, Flange Installation



The **SERIES L4** Flotect® Float Switches is a rugged and reliable float switch which operates automatically to indicate tank level.

FEATURES/BENEFITS

- Unique magnetically actuated switching design gives superior performance
- No bellows, springs, or seals to fail
- Free-swinging float attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm
- Float arm hinge design limits the arm angle to prevent vertical hang up

APPLICATIONS

- Direct pump control for maintaining level
- Automatic tank dump operations
- Level control
- Valve control
- Level alarm in sumps, scrubber systems, hydro-pneumatic tanks, boilers, and water/wastewater treatment processes

OPTIONS	
To order add suffix:	Description
-D	DPDT contacts
-MV	Gold plated contacts for dry circuits (see electrical rating in specifications, no listings or approvals)
-MT	High temperature rated 400°F (204°C) (see electrical rating in specifications, no listings or approvals)
-TRI	Time delay relay with 2 SPDT contacts, adjustable from 0-1 to 0-31 minutes (increasing flow)
-TRD	Time delay relay with 2 SPDT contacts, adjustable from 0-1 to 0-31 minutes (decreasing flow) (no listings or approvals)
-316	*316 SS magnet keeper option to replace standard 430 SS
-AT	ATEX compliant construction
-IEC	IECEx certified construction
-TOP	Top mounted for vertical flange installation [distance from flange face to centerline of float to be specified, 20" (508 mm) max]
-50	Optional float (2-1/2" spherical) 304 SS rated 50 psig (3.5 bar) and 0.5 min. s.g.
-150	Optional float (2-1/2" spherical) 316 SS rated 150 psig (10.3 bar) and 0.7 min. s.g.
-300	Optional float (2-1/2" spherical) 304 SS rated 300 psig (20.7 bar) and 0.7 min. s.g.
-BSPT	1-1/2" female BSPT process connection

*316SS body and float with 430SS magnet keeper (wetted part).
Consult factory for price and availability of fittings for L4 installation.
Threaded branch connection, bushings, and flanges are available in a variety of sizes and materials.

SPECIFICATIONS

Service: Liquids compatible with wetted materials.
Wetted Materials: Float and Rod: 316 SS; Body: Brass or 316 SS standard; Magnet Keeper: 430 SS standard, 316 SS or nickel optional.
Temperature Limits: 4 to 275°F (-20 to 135°C) standard, MT high temperature option 400°F (205°C) [MT option not UL, CSA, ATEX or IECEx]. ATEX and IECEx options: Ambient temperature -4 to 163°F (-20 to 73°C); Process temperature -4 to 163°F (-20 to 73°C).
Pressure Limit: Brass body 1000 psig (69 bar), 316 SS body 2000 psig (138 bar). Standard float rated 100 psig (6.9 bar). For other floats, see options.
Enclosure Rating: Weatherproof and Explosion-proof. **Listed with UL and CSA for Class I, Groups C and D; Class II, Groups E, F, and G. ATEX **CE** 0344 **Ex** II 2 G Ex d IIB T6 Gb -20°C≤Tamb≤73°C. -20°C≤Process Temp≤73°C.
 EC-Type Certificate No.: KEMA 03 ATEX 2383.
 ATEX Standards: EN60079-0: 2009; EN60079-1: 2007.
 IECEx Certified: For Ex d IIB T6 Gb -20°C≤Tamb≤73°C. -20°C≤Process Temp≤73°C.
 IECEx Certificate of Conformity: IECEx DEK 11.0071.
 IECEx Standards: IEC 60079-0: 2007; IEC 60079-1: 2007.
Switch Type: SPDT snap switch standard, DPDT snap switch optional.
Electrical Rating: UL, FM, ATEX and IECEx models: 10 A @ 125/250 VAC (V-). CSA models: 5 A @ 125/250 VAC (V-); 5 A res., 3 A ind. @ 30 VDC (V---). MV option: 1 A @ 125 VAC (V-); 1 A res., .5 A ind. @ 30 VDC (V---). MT option: 5 A @ 125/250 VAC (V-). [MT and MV option not UL, CSA, FM, ATEX or IECEx].
Electrical Connections: UL and CSA models: 16 AWG, 6" (152 mm) long. ATEX and IECEx unit: terminal block.
Conduit Connection: 3/4" (19.05 mm) female NPT standard or M25 with -BSPT option.
Process Connection: 1-1/2" (38.10 mm) male NPT or 1-1/2" (38.10 mm) male BSPT standard, 2-1/2" (63.50 mm) male NPT or 2-1/2" (63.50 mm) male BSPT standard optional floats.
Mounting Orientation: Horizontal installation standard, optional vertical top mount.
Dead Band: 3/4" (19 mm) for standard float.
Specific Gravity: 0.7 minimum with standard float. For other floats see model chart.
Weight: 4 lb 9 oz (2.07 kg).
Agency Approvals: ATEX, CE, CSA, FM, IECEx, UL**.
 **No housing option (-NH) has no approvals.

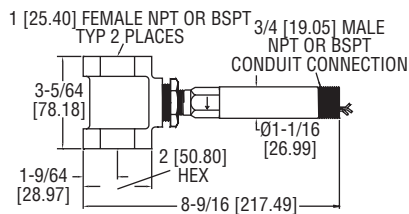
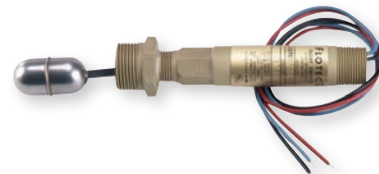
MODEL CHART

Model	Description	Process Connection
L4	Brass body, side wall mounting	NPT
L4-NH**	Brass body, side wall mounting, no housing	NPT
L4-SS	316SS* body, sidewall mounting	NPT
L4-SS-NH**	316SS* body, sidewall mounting, no housing	NPT
L4-BSPT	Brass body, side wall mounting	BSPT
L4-SS-BSPT	316SS* body, sidewall mounting	BSPT

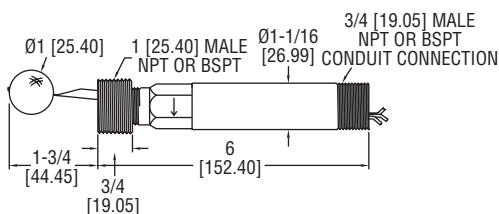
*316SS body and float with 430SS magnet keeper (wetted part).
 **No housing option (-NH) has no approvals.

FLOTECT® LIQUID LEVEL SWITCH

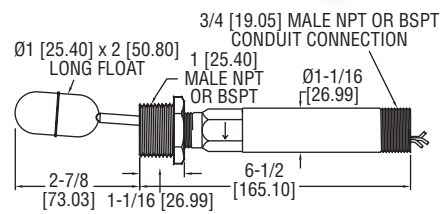
Easy In-wall or External Installation, Up to 2000 psig (138 bar), Compact Size



Model L6 with External Float Chamber



Model L6 with Spherical Float



Model L6 with Cylindrical Float



The **SERIES L6** FloTECT® Float Switches is a rugged and reliable float switch which operates automatically to indicate tank level. It is offered with a 303 SS or brass body with spherical or cylindrical float options.

FEATURES/BENEFITS

- Compact design is built for years of trouble-free service
- Simple and dependable operation with no mechanical linkage
- Float lever pivoted within the body moves when the process liquid displaces the float and magnet on the opposite end of the float lever controls a second magnet on the switch actuating lever located in the switch housing
- Leak proof lower body machined from bar stock
- Side wall or direct tee mounting options available to act as an external float chamber
- Weatherproof and explosion-proof body for demanding outdoor applications
- Electrical assembly can be easily replaced without removing the unit from the installation so that the process does not have to be shut down
- Sensitive to level changes of less than 1/2" (12 mm)

APPLICATIONS

- Direct pump control for maintaining level
- Automatic tank dump operations
- Level control
- Valve control
- Level alarm in sumps, scrubber systems, hydro-pneumatic tanks, boilers, and water/wastewater treatment processes

OPTIONS

To order add suffix:	Description
-MV	Gold plated contacts for dry circuits (see electrical rating in specifications)
-MT	High temperature rated 400°F (204°C) (see electrical rating in specifications, no listings or approvals, only available on models with stainless steel floats)
-CSA	CSA and UL approved construction, includes weatherproof and explosion-proof junction box
-AT	ATEX compliant construction includes, weatherproof and explosion-proof, junction box
-IEC	IECEx certified construction

DPDT Contacts

Note: To order, change seventh character in model number to "D".

Example: L6EPB-B-D-3-O

Options Not Shown: 1-1/2" and 2" (38.10 and 50.80 mm) male NPT or 1-1/2" and 2" (38.10 and 50.80 mm) male BSPT process connection, 2" female NPT or 2" female BSPT.

MODEL CHART

Model	Body	Installation	Float Material	Process Connection	Max. Pressure psig (bar)	Min. S.G.
L6EPB-B-S-3-O	Brass	Side wall mounting	Polypropylene spherical	NPT	1000 (69)	0.9
L6EPB-B-S-3-A	Brass	Side wall mounting	304 SS cylindrical	NPT	200 (13.8)	0.5
L6EPB-B-S-3-C	Brass	Side wall mounting	304 SS spherical	NPT	350 (24.1)	0.7
L6EPB-B-S-3-B	Brass	Brass external float chamber (tee)	Polypropylene spherical	NPT	250 (17.2)	0.9
L6EPB-B-S-3-H	Brass	Brass external float chamber (tee)	304 SS spherical	NPT	250 (17.2)	0.7
L6EPS-S-S-3-O	303 SS	Side wall mounting	Polypropylene spherical	NPT	2000 (138)	0.9
L6EPS-S-S-3-A	303 SS	Side wall mounting	304 SS cylindrical	NPT	200 (13.8)	0.5
L6EPS-S-S-3-C	303 SS	Side wall mounting	304 SS spherical	NPT	350 (24.1)	0.7
L6EPS-S-S-3-S	303 SS	304 SS external float chamber (tee)	Polypropylene spherical	NPT	2000 (138)	0.9
L6EPS-S-S-3-L	303 SS	304 SS external float chamber (tee)	304 SS spherical	NPT	350 (24.1)	0.7

BSPT process connection and M25 conduit connection. **Note:** To order, change eighth character in model to "4". **Example:** L6EPB-B-S-4-A

SPECIFICATIONS

Service: Liquids compatible with wetted materials.

Wetted Materials: Float: Solid polypropylene or 304 SS; Lower Body: Brass or 303 SS; Magnet: Ceramic; External Float Chamber (Tee): Matches lower body choice of brass or 303 SS; Other: Lever Arm, Spring, Pin, etc.: 301 SS.

Temperature Limit: -4 to 220°F (-20 to 105°C) Standard, MT high temperature option 400°F (205°C) (MT not UL, CSA, ATEX, IECEx and KC). ATEX compliant AT, IECEx IEC and KC option ambient temperature -4 to 167°F (-20 to 75°C) process temperature: -4 to 220°F (-20 to 105°C).

Pressure Limits: See model chart.

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).

ATEX 0344 II 2 G Ex d IIC T6 Gb Process Temps 75°C.

EC-Type Certificate No.: KEMA 04ATEX2128.

ATEX Standards: EN 60079-0: 2009; EN 60079-1: 2007.

IECEx Certified: For Ex d IIC T6 Gb Process Temps 75°C.

IECEx Certificate of Conformity: IECEx DEK II.0039.

IECEx Standards: IEC 60079-00: 2007; IEC 60079-1: 2007.

Korean Certified (KC) for Ex d IIC T6 Gb Process Temps 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 (V~). CSA, ATEX and IECEx models: 5 A @ 125/250 VAC (V~); 5 A res., 3 A ind. @ 30 VDC (V---). MV option: .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" (457.20 mm) long. ATEX/CSA/IECEx models: terminal block.

Upper Body: Brass or 303 SS.

Conduit Connection: 3/4" (19.05 mm) male NPT standard, 3/4" (19.05) female NPT or M25 with BSPT option on junction box models.

Process Connection: 1" (25.40 mm) male NPT or 1" (25.40 mm) male BSPT on models without external float chamber, 1" (25.40 mm) female NPT or 1" (25.40 mm) female BSPT on models with external float chamber.

Mounting Orientation: Horizontal with index arrow pointing down.

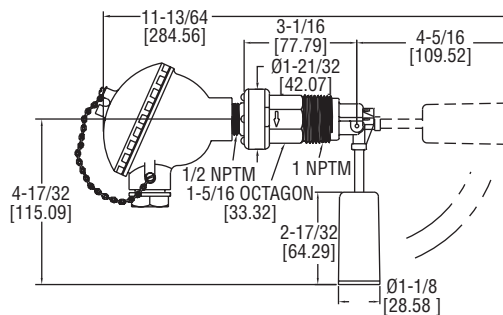
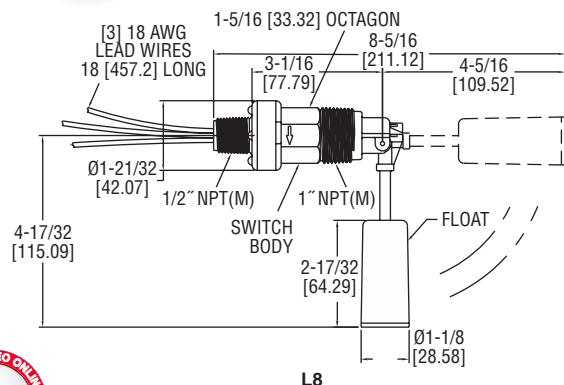
Specific Gravity: See chart.

Weight: Approximately 1 lb (.5 kg) without external float chamber, 1.75 lb (.8 kg) with external float chamber.

Agency Approvals: ATEX, CE, CSA, IECEx, KTL, UL.

FLOTECT® LIQUID LEVEL SWITCH

Low Cost, Leak Proof Body, Excellent Chemical Resistance



L8

L8-WP2

The **MODEL L8** Flotect® Liquid Level Float Switches is a float switch constructed of polyphenylene sulfide, Ceramic 8 and 316 SS. This liquid level switch provides accurate set point control of liquids with specific gravities as low as 0.6.

FEATURES/BENEFITS

- Features a leak proof body and float constructed from tough, durable polyphenylene sulfide which has excellent chemical resistance
- Liquid level snap switch is magnetically actuated with no direct mechanical linkage to leak or fail, assuring longer life and decreased maintenance costs
- Quick and easy installation with simple placement of the unit in a horizontal position with the index arrow pointing down
- UL recognized as an industrial motor controller per UL standard 508, suitable for mounting in a protected environment

APPLICATIONS

- Environmental control
- Waste water
- Scrubber systems
- Holding tanks
- Cooling towers
- Chemical/petroleum processing
- Plating and washing tanks
- Sewage treatment
- Car washes
- Remediation systems
- Thermal storage systems
- HVAC and building automation systems

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials: Float and body: Polyphenylene sulfide (PPS); Pin and spring: 316 SS or Inconel®; Magnet: Ceramic 8.

Temperature Limit: 212°F (100°C).

Pressure Limit: 150 psig (10.34 bar).

Enclosure Rating: General purpose. WP/WP2 option is weatherproof.

Switch Type: SPDT snap switch. MV option is a SPDT gold contact snap switch.

Electrical Rating: 5 A @ 125/250 VAC, 5 A resistive, 3 A inductive @ 30 VDC. MV option: 1 A @ 125 VAC, 1 A resistive, 0.5 A inductive @ 30 VDC.

Electrical Connections: 18 AWG, 18" (460 mm) long.

Conduit Connection: 1/2" male NPT, 1/2" female NPT on WP and WP2.

Process Connection: 1" male NPT.

Mounting Orientation: Horizontal with index arrow pointing down.

Weight: 5 oz (0.142 kg).

Specific Gravity: 0.6 minimum.

Agency Approvals: CE, cURus.

MODEL CHART

Model	Description
L8	Level switch

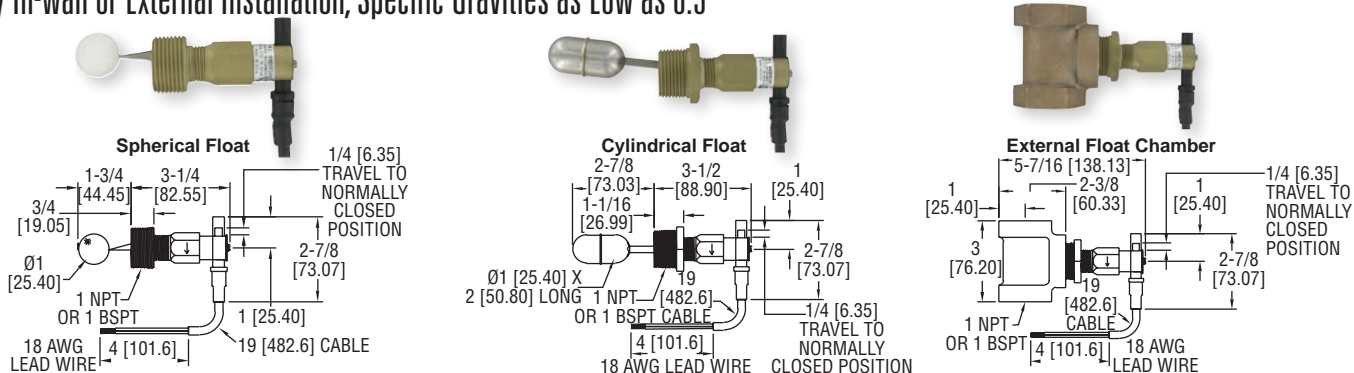
OPTIONS

To order add suffix:	Description
-MV	Gold plated contacts for dry circuits. Rated 1 A @ 125 VAC; 1 A resistive, 0.5 A inductive @ 30 VDC
Example: L8-MV	
-INC	Inconel® alloy. Inconel® alloy replaces standard 316 SS wetted parts. Wetted parts are Inconel® Alloy, Ceramic 8, and Polyphenylene Sulfide.
Example: L8-INC	
-WP	Weatherproof enclosure. Optional housing is phenylpolyoxide and provides weatherproof protection for electrical wiring. (Not UL approved)
Example: L8-WP	
-WP2	Weatherproof enclosure. Optional housing is aluminum and provides weatherproof protection for electrical wiring. (Not UL approved)
Example: L8-WP2	

Inconel® is a registered trademark of Huntington Alloys Corporation

FLOTECT® MINI-SIZE LEVEL SWITCH

Easy In-wall or External Installation, Specific Gravities as Low as 0.5



The **SERIES L10** FloTECT® Mini-Size Float Switches is a series of economical, compact liquid level floats. It is offered in brass or 303 SS bodies and external tees as well as polypropylene or 304 SS floats with 1" NPT male threads, for direct side mounting through a half coupling, or with factory installed tee for external mounting. This series can be used in liquids with specific gravities as low as 0.5.

FEATURES/BENEFITS

- Hermetically sealed, magnetically actuated SPST reed switch which is encapsulated in a polypropylene housing
- Simple field switch adjustment allows user to toggle between normally open (NO) or normally closed (NC) with no change in the electrical connection
- Switch is easily replaced without affecting process installation for quick and low cost maintenance
- Combines low cost with top quality materials and construction for great value and years of reliable liquid level control

APPLICATIONS

- Direct pump control for maintaining level
- Automatic tank dump operations
- Level control
- Valve control

MODEL CHART

Model	Installation	Float Material	Process Connection	Max. Pressure psig (bar)	Min. S.G.
L10-B-3-O	Side wall mounting	Polypropylene spherical	NPT	1000 (69)	0.9
L10-B-3-A	Side wall mounting	304 SS cylindrical	NPT	200 (13.8)	0.5
L10-B-3-C	Side wall mounting	304 SS spherical	NPT	350 (24.1)	0.7
L10-B-3-B	Brass tee	Polypropylene spherical	NPT	250 (17.2)	0.9
L10-B-3-H	Brass tee	304 SS spherical	NPT	250 (17.2)	0.7

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Float: Solid polypropylene or 304 SS; Body: Brass or 303 SS; Magnet: Ceramic; External float chamber (tee): None, brass, or 304 SS; Other: Lever arm, pin, spring, etc.: 301 SS, 302 SS, 316 SS.
Temperature Limit: 200°F (93°C).
Pressure Limit: Brass body: See chart; 303 SS body: Polypropylene float: 2000 psig (137.8 bar), Cylindrical float: 200 psig (13.8 bar), Spherical float: 350 psig (24.1 bar).
Enclosure Rating: Weatherproof, meets NEMA 4X (IP66).
Switch Type: SPST hermetically sealed reed switch. Field adjustable for NO or NC.
Electrical Rating: 1.5 A @ 24 VDC res., 0.001 A @ 200 VDC res., 0.5 A @ 125 VAC.

Electrical Connections: 18 AWG, 19" (483 mm) long, PVC jacket. Rated 221°F (105°C).
Process Connection: 1" male NPT or 1" male BSPT on models without external float chamber. Change 3 in model number to 4 for 1-1/4", to 5 for 1-1/2", or 6 for 2". 1" female NPT or 1" female BSPT on models with external float chamber.
Mounting Orientation: Horizontal with index arrow pointing down.
Specific Gravity: See chart.
Switch Enclosure: Nylon.
Weight: Approximately 10 oz (0.283 kg) without external float chamber, 2.32 lb (1.05 kg) with external float chamber.
Agency Approvals: CSA, UR.

OPTIONS

BSPT Process Connection and M25 Conduct Connection

Note: To order, add "-BSPT" to the end of the model number.
Example: L10-B-3-0-BSPT

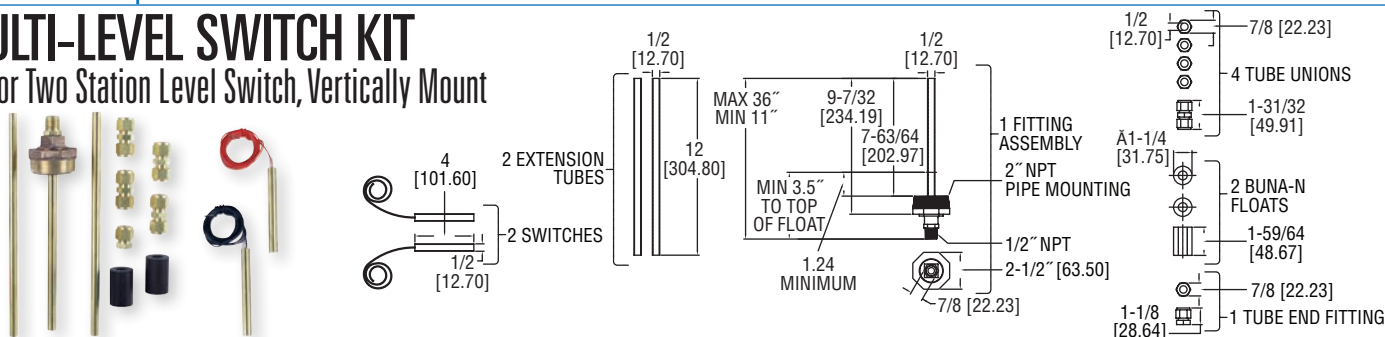
303 SS Body

Note: To order, change fourth character to "S".
Example: L10-S-3-0

MODEL F7-MLK | W.E. ANDERSON BY DWYER

MULTI-LEVEL SWITCH KIT

One or Two Station Level Switch, Vertically Mount



The **MODEL F7-MLK** Multi-Level Switch Kit provides a customized level system to suit specific application requirements. The F7-MLK Multi-Level Switch Kit contains all the components necessary for the design and fabrication of a 1 or 2 station level switch for pipe plug mounting.

FEATURES/BENEFITS

- Customize stem length (maximum: 36"; minimum: 11"), actuation point, distance between floats, and lead wire lengths
- Includes two level stations (switch, tube, and Buna-N float), two brass extension tubes 12" length, four brass tube unions, one end fitting, and one mounting plug

APPLICATIONS

- General purpose level monitoring
- Low specific gravity applications
- Gas and oil

MODEL CHART

Model	Description
F7-MLK	Multi-level switch kit
Note: 316 SS version also available, please see F7-MLK2 on Dwyer website.	

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials (Float/Stem): Buna-N/Brass.
Temperature Limits: 221°F (105°C).
Pressure Limits: 150 psig (10 bar).
Switch Type: SPST, normally open or normally closed.
Electrical Rating: 60 Watts: 0.4 A @ 220 VAC, 0.5 A @ 110 VAC, 0.2 A @ 120 VDC, 0.5 A @ 24 VDC.
Electrical Connections: 22 AWG x 72" (183 cm) leads.
Process Connection: 2" male NPT pipe plug.
Mounting Orientation: Up to 30° angle from vertical.
Stem Length: 36" (91 cm) maximum; 11" (27.94 cm) minimum.
Tube/Fitting Size: 1/2" OD.
Minimum Specific Gravity: 0.45.
Weight: 3.5 lb (1.6 kg).
Note: Top floats 3.5" (8.89 cm) minimum distance.

LEVEL SWITCHES - HORIZONTAL/SPECIALTY

Low Cost, Hermetically Sealed Contacts

HORIZONTAL



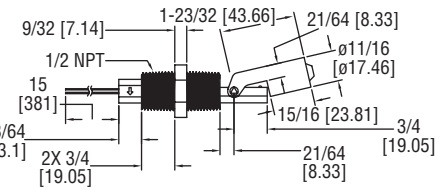
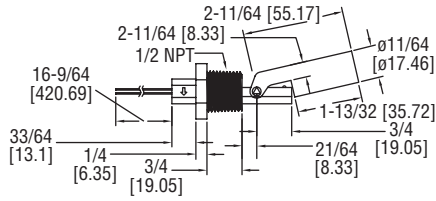
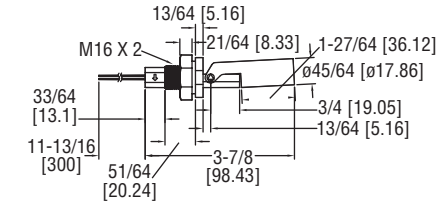
F6-HPS-11



F6-HPS-21



F6-HPS-31



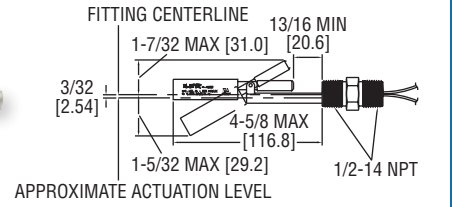
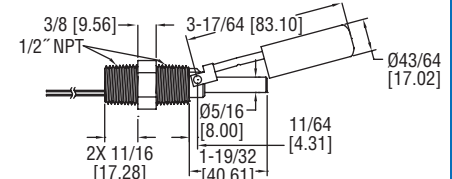
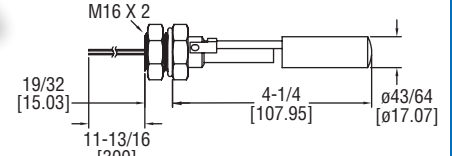
F6-MHS



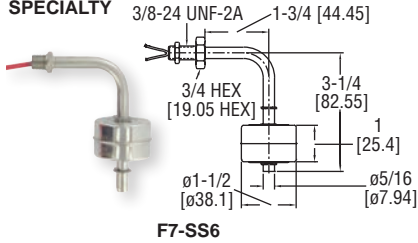
F6-MHS2



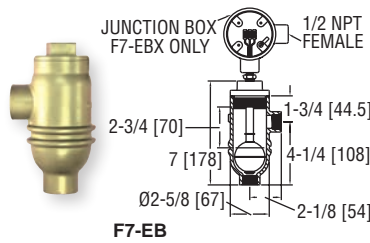
F6-HSS



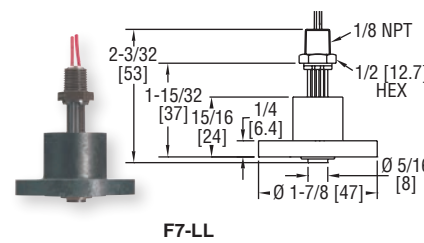
SPECIALTY



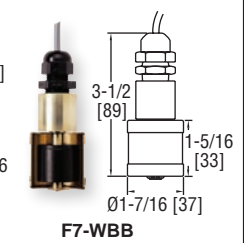
F7-SS6



F7-EB



F7-LL



F7-WBB

The **SERIES F6 & F7** Horizontal and Specialty Float Switches are designed to mount through the walls of tanks or other vessels and unique applications to provide point level indication.

FEATURES/BENEFITS

- Hermetically sealed reed switches are actuated by magnets permanently bonded inside the float arm and can be easily adapted to open or close a circuit on rising or falling levels

APPLICATIONS

- Water level monitoring
- Oil level control
- Chemical level indication
- Sumps
- Stand pipes
- Tank level control

MODEL CHART									
Model	Applications	Material Float/Stem	Temperature Limits	Pressure Limits	Min. S.G.	Electrical Rating	Wire Leads	Mtg	Weight oz (g)
F6-HPS-11	Water, oils, chemicals	Polypropylene/polypropylene	176°F (80°C)	116 psig (8 bar)	0.60	20 VA: 0.08 A @ 240 VAC	20 AWG, 11.8" (30 cm)	M16 x 2	1.23 (38)
F6-HPS-21	Water, oils, chemicals	Polypropylene/polypropylene	176°F (80°C)	116 psig (8 bar)	0.60	20 VA: 0.08 A @ 240 VAC	20 AWG, 11.8" (30 cm)	1/2" NPT	1.23 (38)
F6-HPS-31	Water, oils, chemicals	Polypropylene/polypropylene	176°F (80°C)	116 psig (8 bar)	0.60	20 VA: 0.08 A @ 240 VAC	20 AWG, 11.8" (30 cm)	1/2" NPT	1.41 (40)
F6-MHS	Corrosives	304 SS/304 SS	257°F (125°C)	218 psig (15 bar)	0.85	20 VA: 0.08 A @ 240 VAC	22 AWG, 11.8" (30 cm)	M16 x 2	3.35 (95)
F6-MHS2	Water, oils, chemicals	304 SS/304 SS	257°F (125°C)	363 psig (25 bar)	0.85	70 VA: 0.7 A @ 250 VAC	22 AWG, 11.8" (30 cm)	1/2" NPT	4.8 (136)
F7-HSS†	High temp/pressure, corrosive, expl.	316 SS/316 SS	392°F (200°C)	300 psig (20.7 bar)	0.60	30 VA: 0.14 A @ 220 VAC	22 AWG, 24" (61 cm)	1/2" NPT (int/ext)	3 (94)
Model	Style/Applications	Material Float/Stem	Temperature Limits	Pressure Limits	Min. S.G.	Electrical Rating	Wire Leads	Mtg	Weight oz (g)
F7-SS6	Bent stem/liquids with metal particles	316 SS/316 SS	300°F (149°C)	100 psig (7 bar)	0.70	20 VA: 0.08 A @ 220 VAC N.O. operation	22 AWG, 24" (61 cm)	3/8"-24" UNF-2A	2 (58)
F7-SS6B	Bent stem/liquids with metal particles	316 SS/316 SS	300°F (149°C)	100 psig (7 bar)	0.70	20 VA: 0.08 A @ 220 VAC N.C. operation	22 AWG, 24" (61 cm)	3/8"-24" UNF-2A	2 (58)
F7-EB‡**	Non-intrusive bottle type/Outside tank mounting	Brass/316 SS (Brass housing)	300°F (149°C)	500 psig (34 bar)	0.75	20 VA: 0.08 A @ 240 VAC	18 AWG, 24" (61 cm)	3/4" NPT female	5 lb 5 oz (2.4 kg)
F7-LL	Vertical/detect levels as low as 5/8"	Polysulfone/Buna-N	180°F (82°C)	50 psig (3 bar)	—	20 VA: 0.08 A @ 240 VAC	22 AWG, 72" (182 cm)	1/8" NPT male	2 (58)
F7-WBB	25' cable, sloop shield/Sumps, stand pipes	Brass/Buna-N	180°F (82°C)	150 psig (10 bar)	0.45	20 VA: 0.08 A @ 240 VAC	22 AWG, 25" (7.6 m)	—	10.8 (310)

† F7-HSS is rated explosion-proof for Class I, Groups A, B, C, D; Class II, Groups E, F, G; Class III.

‡ Explosion proof model available with DPDT switch. **Example:** F7-EBX

** Model available with normally closed switch. **Example:** F7-EBNC

LEVEL SWITCHES - VERTICAL

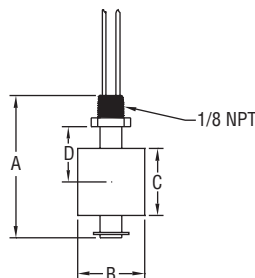
Low Cost, Reliable and Compact, Hermetically Sealed Contacts



F7-SB



F7-ST713



DIMENSIONS in Inches (mm)				
Model	(A) Stem Length	(B) Float Diameter	(C) Float Height	(D) Actuation from Hex ^①
F7-SB	2.75 (70)	1.38 (35)	1.13 (29)	1.2 (31)
F7-SS2	2.06 (52)	1.0 (25)	1.0 (25)	0.73 (19)
F6-SS	2.17 (55)	1.11 (28)	1.11 (28)	—
F7-MPP	1.63 (41)	0.63 (16)	0.63 (16)	0.47 (12)
F7-PP	2.18 (55)	1.18 (30)	1.0 (25)	0.69 (18)
F7-BT	2.18 (55)	1.18 (30)	1.0 (25)	0.69 (18)
F7-K	2.13 (54)	1.0 (25)	1.0 (25)	0.65 (17)
F7-C11	2.06 (52)	1.0 (25)	1.0 (25)	0.56 (14)
F7-C21	2.06 (24)	1.0 (25)	1.0 (25)	0.56 (14)
F7-PVC	3.44 (87)	1.5 (38)	1.81 (46)	0.75 (19)
F7-T1	3.47 (88)	2.13 (54)	1.94 (49)	0.92 (22)
F7-ST713	3.38 (86)	2.06 (52)	2.06 (52)	1.09 (28)
F7-ST714	3.38 (86)	2.06 (52)	2.06 (52)	1.09 (28)

^①Distance between hex and liquid (S.G. = 1.0) level at actuation point will vary with specific gravity changes.

The **SERIES F6 & F7** Vertical Float Switches are designed to be mounted at the maximum or minimum level point to provide level indication and control. Models are shipped with normally open switch contacts which close as the float rises toward the mounting threads.

FEATURES/BENEFITS

- Combine low cost and reliability with fast, simple installation
- Hermetically sealed reed switches are actuated by magnets permanently bonded inside the float and can be easily adapted to open or close a circuit on rising or falling levels
- Easily reverse switch action by removing the float, rotating it end-for-end and replacing it on the stem
- Vertical models mount internally, oriented within 30° of vertical, or select optional fittings for external mounting
- Switch ratings are suitable for many solid state control systems and monitors or alarms
- Simple relay interfaces can be used for higher current applications

APPLICATIONS

- Water level monitoring
- Oil level control
- Chemical level indication
- Sumps
- Stand pipes
- Tank level control
- High viscosity liquids

ACCESSORIES - FOR EXTERNAL MOUNTING OF VERTICAL MODELS

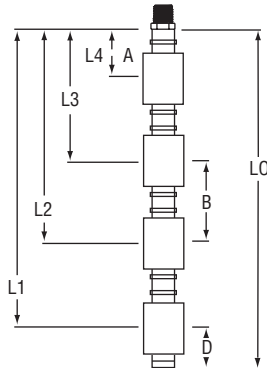
Model	Description
A-347	1/8" x 1-1/4" NPT carbon steel adapter
A-347-SS	1/8" x 1-1/4" NPT 316 SS adapter
A-348	1/8" x 1-1/2" NPT carbon steel adapter

MODEL CHART								
Model	Applications	Material Float/Stem	Temp. Limits	Pressure Limits	Min. S.G.	Electrical Rating	Wire Leads	Mtg NPT (M)
F7-SB*	General purpose	Buna-N & epoxy/ 316 SS	220°F (105°C)	150 psig 10 bar	0.60	25 VA: 1 A @ 220 VAC	22 AWG 18" (45 cm)	1/8"
F7-SS2*	High temp/pressure, corrosives	316 SS (CYC)/ 316 SS	300°F (149°C)	450 psig 31 bar	0.75	25 VA: 1 A @ 200 VAC	22 AWG 18" (45 cm)	1/8"
F6-SS	Corrosives	316 SS/ 316 SS	257°F (125°C)	218 psig 15 bar	0.65	20 VA: 0.08 A @ 240 VAC	20 AWG 11.8" (30 cm)	1/8"
F7-MPP**	Broad chemical compatibility	Polypropylene/ polypropylene	180°F (82°C)	100 psig 6.89 bar	0.90	10 VA: 0.1 A @ 100 VAC	22 AWG 24" (61 cm)	1/8"
F7-MPP-NO**	Broad chemical compatibility	Polypropylene/ polypropylene	176°F (80°C)	100 psig 6.89 bar	0.90	50 VA: 0.2 A @ 240 VAC	22 AWG 24" (61 cm)	1/8"
F7-PP*	Broad chemical compatibility	Polypropylene & epoxy/polypropylene	220°F (105°C)	100 psig 6.89 bar	0.60	30 VA: 0.14 A @ 220 VAC	22 AWG 24" (61 cm)	1/8"
F7-BT*	Oils & fuels	Buna-N & epoxy/ PBT***	220°F (105°C)	150 psig 10 bar	0.45	30 VA: 0.14 A @ 220 VAC	22 AWG 24" (61 cm)	1/8"
F7-K*	Food/beverage, corrosives	PVDF/ PVDF	180°F (82°C)	100 psig 6.89 bar	1.00	50 VA: 0.25 A @ 150 VAC	22 AWG 24" (61 cm)	1/8"
F7-C11	General purpose	Buna-N/ brass	180°F (82°C)	150 psig 10 bar	0.45	20 VA: 0.08 A @ 240 VAC	22 AWG 24" (61 cm)	1/8"
F7-C21*	Oils & water, general purpose	Buna-N/ 316 SS	180°F (82°C)	150 psig 10 bar	0.45	20 VA: 0.08 A @ 240 VAC	22 AWG 24" (61 cm)	1/8"
F7-PVC	Chemical & plating	CPVC/ CPVC	180°F (82°C)	15 psig 1 bar	0.85	20 VA: 0.08 A @ 240 VAC	22 AWG 24" (61 cm)	1/4"
F7-T1	Viscous, sticky or corrosive liquids	PTFE/ TFE	300°F (149°C)	30 psig 2 bar	0.80	20 VA: 0.08 A @ 240 VAC	22 AWG 24" (61 cm)	1/4"
F7-ST713	Oils, water & chemicals	316 SS/ 316 SS	300°F (149°C)	750 psig 52 bar	0.80	20 VA: 0.08 A @ 240 VAC	22 AWG 24" (61 cm)	1/4"

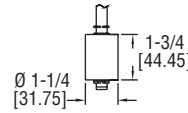
*UL listed **F7-MPP is normally closed/F7-MPP-NO is normally open ***PBT-Polybutylene terephthalate

QUICK-SHIP MULTI-STATION LEVEL SWITCH

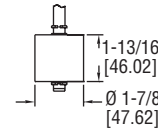
Fast Delivery, Customized, Up to Four Actuation Levels



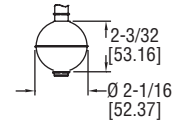
ACTUATION LEVELS		
A	B	D
1-1/2" (38.10 mm)	3" (76.20 mm)	2" (50.80 mm)
Each switching point requires one float.		
A=Minimum distance from actuation point to bottom of mounting		
B=Minimum distance between actuation levels		
D=Minimum distance from end of unit to lowest actuation point		



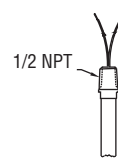
F1 Float Dimensions



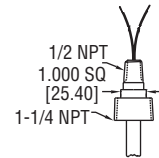
F2 Float Dimensions



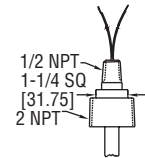
F3 Float Dimensions



Type 1 Mounting Dimensions



Type 2 Mounting Dimensions



Type 3 Mounting Dimensions

The **SERIES F7-MQ** Quick-Ship Multi-Station Level Switches provides a customized level switch to meet application requirements. Switches can be configured with up to four different control points and stem lengths up to 72" (1.82 m). Stems and floats are available in 316 SS or brass, SPST or SPDT switches, and choice of mountings.

FEATURES/BENEFITS

- Customized level indication quickly and affordably
- Rugged construction with multiple options yielding exceptional versatility
- Capable of supporting larger, more buoyant floats
- Durable construction asserts long reliability in contaminated or turbulent media

APPLICATIONS

- Water level monitoring
- Oil level control
- Tank level control
- Diesel level monitoring

SPECIFICATIONS

Service: Compatible liquids.

Temperature Limits: F1 and F2 with water: 0 to 180°F (-18 to 82°C); Oil: -40 to 230°F (-40 to 110°C); F3: -40 to 300°F (-40 to 149°C).

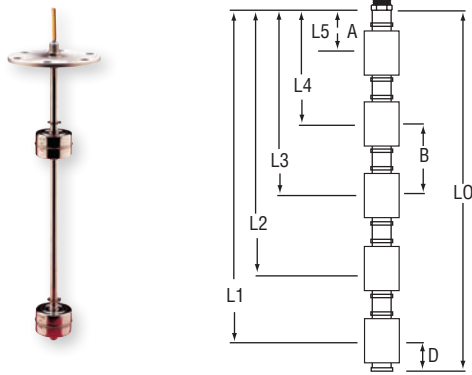
Electrical Connections: 24" (61 cm) free leads; #22 AWG TFE and #18 AWG polymeric.

Mounting Orientation: Vertical ±30°.

MODEL CHART																									
Example	F7-MQ	B	1	-4	F3	3	-07.00	-11.00	-15.00	-20.00	-24.00	J	F7-MQB1-4F33-07.00-11.00-15.00-20.00-24.00-J												
Construction	F7-MQ												Multi-station level, 1 to 4 switch points												
Stem & Connection Material		B S											Brass with beryllium copper stops 316SS with SS ARMCO PH-15-7MO stops												
Connection Type			1 2 3										1/2" NPT (float F2, F3 only) 1-1/4" NPT (float F1 only) 2" NPT (float F2, F3 only)												
Switch Points				#									Put 1 to 4 for the number of switch points desired												
Float Type					F1 F2 F3								<table><tr><th>Material</th><th>Min. s.g.</th><th>Max. Pressure</th></tr><tr><td>Buna-N</td><td>0.75</td><td>150 psi (10.3 bar)</td></tr><tr><td>Buna-N</td><td>0.55</td><td>150 psi (10.3 bar)</td></tr><tr><td>316SS</td><td>0.75</td><td>750 psi (51.7 bar)</td></tr></table>	Material	Min. s.g.	Max. Pressure	Buna-N	0.75	150 psi (10.3 bar)	Buna-N	0.55	150 psi (10.3 bar)	316SS	0.75	750 psi (51.7 bar)
Material	Min. s.g.	Max. Pressure																							
Buna-N	0.75	150 psi (10.3 bar)																							
Buna-N	0.55	150 psi (10.3 bar)																							
316SS	0.75	750 psi (51.7 bar)																							
Switch Type*					1 3								SPST, .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC SPDT, .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC												
Set Point Distance, L4†						00.00							In inches referenced from bottom of process connection												
Set Point Distance, L3†							00.00						In inches referenced from bottom of process connection												
Set Point Distance, L2†								00.00					In inches referenced from bottom of process connection												
Set Point Distance, L1†									00.00				In inches referenced from bottom of process connection												
Overall Length, L0											00.00		Min. length is L1+D; Max. length with connection length is 72" (1.82 m)												
Options												J	Junction box for wire leads, NEMA 4 (not available with connection type 1)												
*NO switch is standard. For NC place an "4**" after the corresponding set point distance in the model number.																									
†No numbers needed beyond the number of switches specified.																									
Note: Models are built to your specifications																									

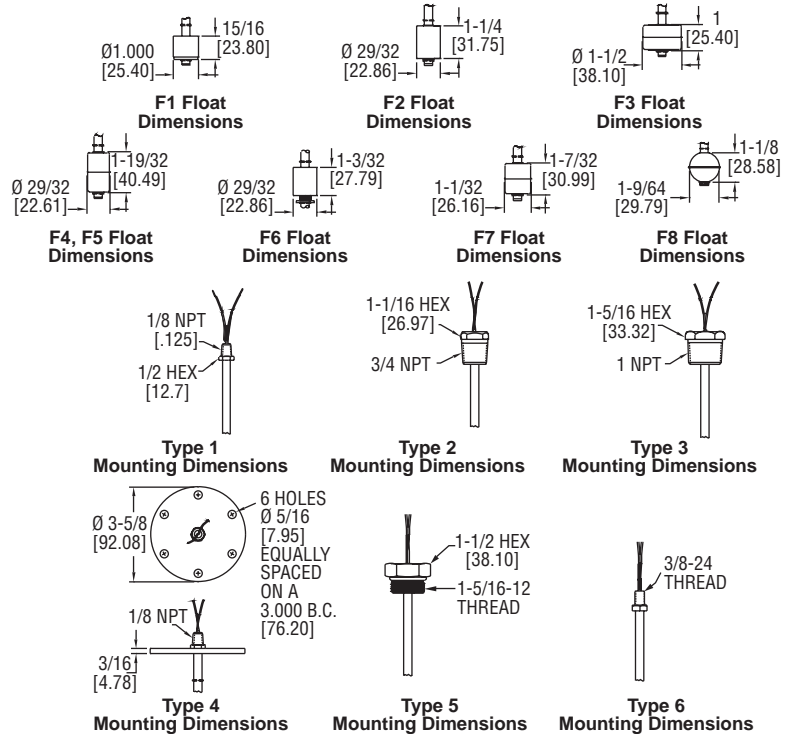
MINIATURE MULTI-STATION LEVEL SWITCH

Custom, Lightweight, Low Cost, 316 SS or Buna-N Floats



ACTUATION LEVELS			
Float Type	A	B	D
F1	7/8"	1-3/4"	3/4"
F2	3/4"	1-7/8"	1-1/16"
F3	3/4"	1-13/16"	15/16"
F4	13/16"	2-7/16"	1-7/16"
F5	9/16"	2-7/16"	1-3/4"
F6	15/16"	1-7/8"	7/8" (NO); 1-3/16" (NC)
F7	13/16"	2"	1-1/8"
F8	3/4"	1-7/8"	1-1/16"

Each switching point requires one float.
 A=Minimum distance from actuation point to bottom of mounting
 B=Minimum distance between actuation levels
 D=Minimum distance from end of unit to lowest actuation point



The **SERIES F7-MM** Miniature Multi-Station Level Switches provides a customized level switch to meet application requirements in a miniature size. Control up to five different level points across a maximum length of 48" (121 cm). Stems and mounting fixtures are available in 316 SS or brass.

FEATURES/BENEFITS

- Customized miniature level indication in a compact, lightweight design ideal for tanks less than 4' (1.2 m) deep
- Rugged construction with multiple options yielding exceptional versatility
- Miniature custom level switches are sturdy, compact and lightweight yet still rugged and durable

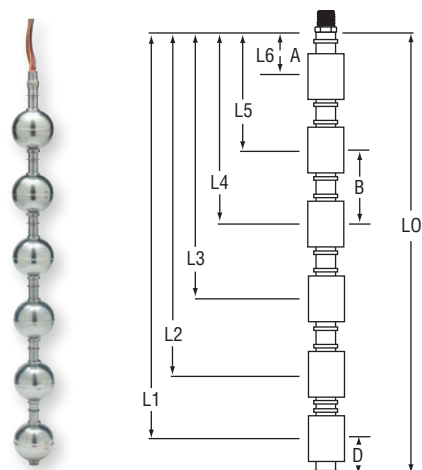
APPLICATIONS

- Water level monitoring
- Oil level control
- Tank level control
- Diesel level monitoring

MODEL CHART																																								
Example	F7-MM	B	1	-5	F1	1	-03.00	-07.00	-11.00	-15.00	-20.00	-25.00	F7-MMB1-5F11-03.00-07.00-11.00-15.00-20.00-25.00																											
Construction	F7-MM												Multi-station level, 1 to 5 switch points																											
Stem & Connection Material		B S											Brass with beryllium copper stops 316SS with SS ARMCO PH-15-7MO stops																											
Connection Type			1 2 3 4 5 6										1/8" NPT 3/4" NPT (cannot be used with float F1, F3, F7 and F8) 1" NPT (cannot be used with float F3) 3-5/8" flange [maximum pressure is 50 psi (3.45 bar)] 1-5/16-12UNF-2A (cannot be used with float F3) 3/8-24																											
Switch Points				#									Put 1 to 5 for the number of switch points desired																											
Float Type					F1 F2 F3 F4 F5 F6 F7 F8								<table><tr><th>Material</th><th>Min. s.g.</th><th>Max. Pressure</th></tr><tr><td>Buna-N</td><td>0.45</td><td>300 psi (20.68 bar)</td></tr><tr><td>Buna-N</td><td>0.60</td><td>250 psi (17.24 bar)</td></tr><tr><td>316SS</td><td>0.70</td><td>100 psi (6.89 bar)</td></tr><tr><td>316SS</td><td>0.85</td><td>150 psi (10.34 bar)</td></tr><tr><td>316SS</td><td>1.10</td><td>400 psi (27.58 bar)</td></tr><tr><td>PTFE</td><td>0.65</td><td>1000 psi (68.95 bar)</td></tr><tr><td>316SS</td><td>0.85</td><td>275 psi (18.96 bar)</td></tr><tr><td>316SS</td><td>0.90</td><td>600 psi (41.37 bar)</td></tr></table>	Material	Min. s.g.	Max. Pressure	Buna-N	0.45	300 psi (20.68 bar)	Buna-N	0.60	250 psi (17.24 bar)	316SS	0.70	100 psi (6.89 bar)	316SS	0.85	150 psi (10.34 bar)	316SS	1.10	400 psi (27.58 bar)	PTFE	0.65	1000 psi (68.95 bar)	316SS	0.85	275 psi (18.96 bar)	316SS	0.90	600 psi (41.37 bar)
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316SS	0.90	600 psi (41.37 bar)																																						
Switch Type*					1 2								SPST, .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC SPST, .8 A @ 120 VAC, .4 A @ 240 VAC																											
Set Point Distance, L5†						00.00							In inches referenced from bottom of process connection																											
Set Point Distance, L4†							00.00						In inches referenced from bottom of process connection																											
Set Point Distance, L3†								00.00					In inches referenced from bottom of process connection																											
Set Point Distance, L2†									00.00				In inches referenced from bottom of process connection																											
Set Point Distance, L1†										00.00			In inches referenced from bottom of process connection																											
Overall Length, L0											00.00		Min. length is L1+D; Max. overall length is 48" (121 cm)																											
*NO switch is standard. For NC place an "N" after the corresponding set point distance in the model number.																																								
†No numbers needed beyond the number of switches specified.																																								
Note: Models are built to your specifications																																								

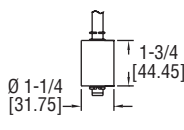
MULTI-STATION LEVEL SWITCH

Customize To Fit Application, Up to Six 316 SS or Buna-N Floats

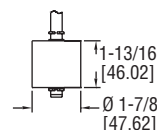


ACTUATION LEVELS

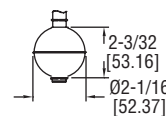
A	B	D
1-1/2" (38.10 mm)	3" (76.20 mm)	2" (50.80 mm)
Each switching point requires one float. A=Minimum distance from actuation point to bottom of mounting B=Minimum distance between actuation levels D=Minimum distance from end of unit to lowest actuation point		



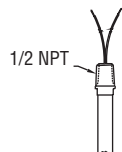
F1 Float Dimensions



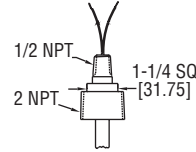
F2 Float Dimensions



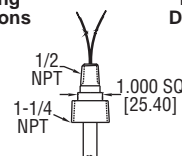
F3 Float Dimensions



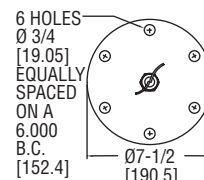
Type 1 Mounting Dimensions



Type 3 Mounting Dimensions



Type 2 Mounting Dimensions



Type 4, 5 Mounting Dimensions

The **SERIES F7-MS** Multi-Station Level Switches provides a customized level switch to meet application requirements. Switches can be configured with up to six different control points and stem lengths up to 140" (3.56 m). Stems and floats are available in 316 SS or brass, SPST or SPDT switches, and choice of mountings.

FEATURES/BENEFITS

- Customized level indication quickly and affordably
- Rugged construction with multiple options yielding exceptional versatility
- Capable of supporting larger, more buoyant floats
- Durable construction asserts long reliability in contaminated or turbulent media

APPLICATIONS

- Water level monitoring
- Oil level control
- Tank level control
- Diesel level monitoring

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Stem, connection, and float.
Temperature Limits: Buna-N floats: 180°F (82.2°C) in water, -40 to 230°F (-40 to 110°C) in oil; SS floats: -40 to 300°F (-40 to 148.9°C).
Wire Leads: 24" (61 cm) free leads; #22 AWG, TFE jacketed, and #18 AWG polymeric.
Mounting Orientation: Vertical ±30°.

MODEL CHART

Example	F7-MS	B	1	-5	F3	1	-04.00	-07.00	-11.00	-15.00	-20.00	-24.00	J	F7-MSB1-5F31-04.00-07.00-11.00-15.00-20.00-24.00-J												
Construction	F7-MS													Multi-station level, 1 to 6 switch points												
Stem & Connection Material		B												Brass with beryllium copper stops 316SS with SS ARMCO PH-15-7MO stops												
Connection Type			1 2 3 4 5											1/2" NPT (float F2, F3 only) 1-1/4" NPT (float F1 only) 2" NPT 3" 150# flange carbon steel (conn. material S only, float F2, F3 only) Max. pressure: 150 psi (10.3 bar) 3" 150# flange 316SS (conn. material S only, float F2, F3 only) Max. pressure: 150 psi (10.3 bar)												
Switch Points				#										Put 1 to 6 for the number of switch points desired												
Float Type					F1 F2 F3									<table><tr><th>Material</th><th>Min. s.g.</th><th>Max. Pressure</th></tr><tr><td>Buna-N</td><td>0.75</td><td>150 psi (10.3 bar)</td></tr><tr><td>Buna-N</td><td>0.55</td><td>150 psi (10.3 bar)</td></tr><tr><td>316SS</td><td>0.75</td><td>750 psi (51.7 bar); Units >72": 300 psi (20.7 bar)</td></tr></table>	Material	Min. s.g.	Max. Pressure	Buna-N	0.75	150 psi (10.3 bar)	Buna-N	0.55	150 psi (10.3 bar)	316SS	0.75	750 psi (51.7 bar); Units >72": 300 psi (20.7 bar)
Material	Min. s.g.	Max. Pressure																								
Buna-N	0.75	150 psi (10.3 bar)																								
Buna-N	0.55	150 psi (10.3 bar)																								
316SS	0.75	750 psi (51.7 bar); Units >72": 300 psi (20.7 bar)																								
Switch Type*					1 2 3									SPST, .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC SPST, .8 A @ 120 VAC, .4 A @ 240 VAC SPDT, .17 A @ 120 VAC, .08 A @ 240 VAC, .13 A @ 120 VDC, .06 A @ 240 VDC												
Set Point Distance, L6†						00.00								In inches referenced from bottom of process connection												
Set Point Distance, L5†							00.00							In inches referenced from bottom of process connection												
Set Point Distance, L4†								00.00						In inches referenced from bottom of process connection												
Set Point Distance, L3†									00.00					In inches referenced from bottom of process connection												
Set Point Distance, L2†										00.00				In inches referenced from bottom of process connection												
Set Point Distance, L1†											00.00			In inches referenced from bottom of process connection												
Overall Length, L0												00.00		Min. length is L1+D; Max. length with connection type 1: 36" (91.4 cm), type 2: 60" (152.4 cm) and types 3, 4, 5: 140" (355.6 cm)												
Options													J	Junction box for wire leads, NEMA 4 (not available with connection type 1)												

*NO switch is standard. For NC place an "N" after the corresponding set point distance in the model number.

†No numbers needed beyond the number of switches specified.

Note: Models are built to your specifications

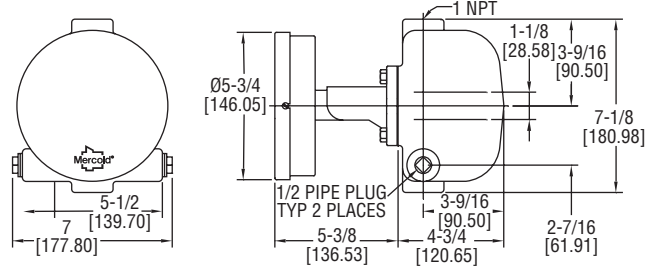


SERIES 123 & 125 | MERCOID BY DWYER



BOILER WATER LEVEL CONTROL

Heavy Duty, Cast Iron Chamber



The **SERIES 123 & 125** Boiler Water Level Controls are designed for boiler applications, the Model 123 is primarily used for low water cut-off or feed-water control. The 125 offers the same long lasting service with a direct action mercury switch movement that provides a close deadband where needed.

FEATURES/BENEFITS

- Special snap action switch mechanism options eliminates frequent operation due to surging water level
- Transparent cover provides convenient visible operation of the switch
- Flanged chamber for easy clean out and replacement of float or switch mechanism without removing the unit from piping

APPLICATIONS

- Boiler low water cut-off
- Boiler feed-water control
- Condensate tanks
- Deaerators

MODEL CHART	
Model	Switch Type
123-153	SPDT mercury
123-7000-153	SPDT snap

SPECIFICATIONS

Service: Compatible liquids. Cast iron is not for use with lethal or flammable substances either liquid or gaseous.
Wetted Materials: Body: Cast iron; Float: 304 SS; Trim and packing gland: Brass; Packing: Carbon; Body gasket: Carbon.
Temperature Limit: 365°F (185°C).
Pressure Limit: 150 psig (10.34 bar).
Enclosure Rating: General purpose. Optional weatherproof.
Switch Type: SPDT snap switch or mercury switch. Optional DPDT or two stage.

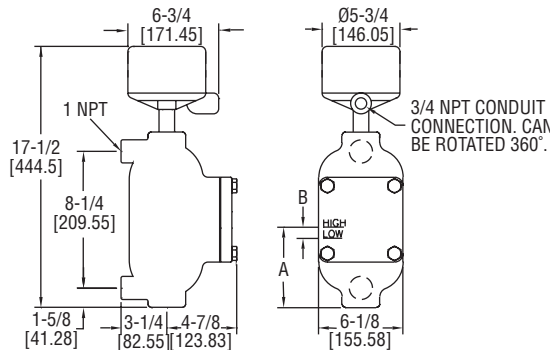
Electrical Rating: Snap switch: 15 A @ 120/240/480 VAC, 0.5 A @ 120 VDC resistive, 0.25 A @ 240 VDC resistive; Mercury switch: 4 A @ 120 VAC/DC, 2 A @ 240 VAC/DC.
Electrical Connections: Screw terminal. Conduit Connection: 7/8" (22.23 mm) hole for 1/2" (12.7 mm) conduit.
Process Connections: 1" female NPT.
Mounting Orientation: Vertical.
Deadband: Approximately 1-1/2" (38.1 mm).
Specific Gravity: 0.88 min.
Options: Manual reset.
Weight: 20 lb (9.1 kg).
Agency Approvals: CSA, UL. (Snap switch is not rated).

SERIES 102 & 1102 | MERCOID BY DWYER



FLANGED CHAMBER TYPE LEVEL CONTROL

Operating Pressures to 300 PSIG



Specific Gravity	A	B
1.0	5-1/16" [129 mm]	3/4" [19 mm]
0.6	5-13/16" [148 mm]	1" [25.4 mm]

The **SERIES 102 & 1102** Flanged Chamber Type Level Controls are external cage type level switches which are self-contained in a side mount body. The 102 series will operate to a minimum specific gravity of 0.60 and the 1102 series will operate to a specific gravity of 0.40. These series contain a stainless steel float and offer a choice of cast iron, cast steel, or cast 316 SS float chamber.

FEATURES/BENEFITS

- Unique design allows the simple removal of four bolts from the inspection plate to examine the float and chamber for cleaning or wear without disconnecting the piping or electrical circuitry
- Electrical enclosures provide general purpose, weatherproof, explosion-proof or explosion-proof/vapor proof capability as well as cost effective cast 316SS float chamber option
- Electrical circuits using hermetically sealed snap action or mercury contacts are available in a variety of actions including SPST, SPDT, DPDT and DPST combinations
- The 102 design features three 1" NPT process connections for side/side or side/bottom piping allowing the bottom 1" NPT connection to be used as a drain when using the side/side process connection

APPLICATIONS

- Pressure or vacuum vessels
- Chemical processing plants
- Steam and electric generating stations
- Hydraulic accumulators
- Vapor-liquid separators
- Scrubbers
- Oil refineries
- Storage tanks

SPECIFICATIONS

Service: Compatible liquids. Cast iron is not for use with lethal or flammable substances either liquid or gaseous.
Wetted Materials: Body: Cast iron. Optional cast steel or 316 SS; Float and trim: 303 SS, 304 SS, 316 SS, and 430 SS. Option of all 316 SS; Body gasket: Carbon.
Temperature Limit: 425°F (218°C).
Pressure Limit: 300 psig (20.7 bar). Optional rating to 400 psig (27.6 bar).
Enclosure Rating: NEMA 4X (IP66). Optional general purpose or explosion-proof.
Repeatability: ±1/4" (6.4 mm).
Switch Type: SPDT snap switch, hermetically sealed snap switch, or mercury switch. Optional DPDT or two stage.

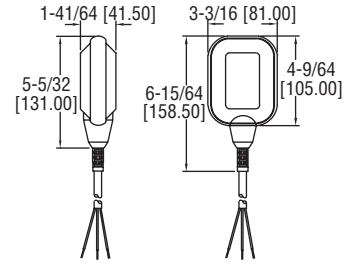
Electrical Rating: Snap switch: 12 A @ 120 VAC, 5 A @ 240 VAC, 0.5 A @ 125 VDC resistive, 0.25 A @ 250 VDC resistive; Hermetically sealed snap switch: 5 A @ 125 VAC, 5 A @ 240 VAC, 5 A @ 30 VDC resistive; Mercury switch: 4 A @ 120 VAC/DC, 2 A @ 240 VAC/DC. Higher contact ratings available for the mercury switch.
Electrical Connections: Screw terminal. Conduit Connection: 3/4" female NPT.
Process Connections: 1" female NPT.
Mounting Orientation: Vertical.
Set Point Adjustment: ±1" (25.4 mm).
Specific Gravity: 0.6 min.
Weight: 35 lb (15.9 kg).
Agency Approvals: UL.

MODEL CHART

Model	Switch Type
102-WT-4810-C-60	SPDT mercury
102-WT-7810-C-60	SPDT snap
102-WT-7810HM-C-60	SPDT hermetically sealed snap

CABLE FLOAT SWITCH

Mercury-Free, UL/CSA Approved Options



The **SERIES CFS2** Cable Float Switches is a mechanically actuated floating switch intended to activate electrical components, such as pumps, to start and stop automatically. Optional cables are available. Contact factory for cable length options ranging from 10 to 70' (3 to 21 m).

FEATURES/BENEFITS

- High reliability with mercury-free, magnetic, mechanical internal design
- Economical pricing with multiple option available for increased versatility
- Easy installation with counterweights and cable hangers to suit a variety of mounting applications

APPLICATIONS

- Water level monitoring
- Tank level control
- High or low level alarm
- Municipal water control
- Industrial water control
- Filling or draining reservoirs and tanks
- Pump automation

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Enclosure: Polypropylene; Cable: See model chart.
Temperature Limits: 32 to 122°F (0 to 50°C).
Pressure Limits: 14.5 psi (1 bar).
Enclosure Rating: IP68.
Switch Type: See model chart.

Electrical Rating: CFS2-XXBXX-XX: 10 (8) A @ 250 VAC; CFS2-XXDXX-XX: 1 HP @ 125 VAC 16 FLA; 2 HP @ 250 VAC 12 FLA.
Shipping Weight: Enclosure: 5.43 oz (154 g); Cable: 0.77 oz (21.27 g) per ft.
Agency Approvals: See model chart.

ACCESSORIES

Model	Description
A-457	7.76 oz (220 g) counterweight
A-459	Cable hanger

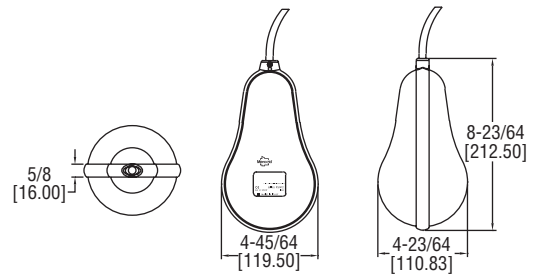
MODEL CHART

Model	Cable Type	Approvals	Switch Type	Cable Length	Model	Cable Type	Approvals	Switch Type	Cable Length
CFS2-ONBPN-20	PVC	CE	SPST NO	20 ft (6.10 m)	CFS2-DNBPN-40	PVC	CE	SPDT	40 ft (12.19 m)
CFS2-ONBPN-30	PVC	CE	SPST NO	30 ft (9.14 m)	CFS2-DNBPN-50	PVC	CE	SPDT	50 ft (15.24 m)
CFS2-ONBPN-40	PVC	CE	SPST NO	40 ft (12.19 m)	CFS2-DNBPN-60	PVC	CE	SPDT	60 ft (18.29 m)
CFS2-ONBPN-50	PVC	CE	SPST NO	50 ft (15.24 m)	CFS2-DNBPN-80	PVC	CE	SPDT	80 ft (24.38 m)
CFS2-CNBPN-20	PVC	CE	SPST NC	20 ft (6.10 m)	CFS2-DNBPN-100	PVC	CE	SPDT	100 ft (30.48 m)
CFS2-CNBPN-30	PVC	CE	SPST NC	30 ft (9.14 m)	CFS2-OGDSN-20	SJOW	UL/CSA	SPST NO	20 ft (6.10 m)
CFS2-CNBPN-40	PVC	CE	SPST NC	40 ft (12.19 m)	CFS2-OGDSN-30	SJOW	UL/CSA	SPST NO	30 ft (9.14 m)
CFS2-CNBPN-50	PVC	CE	SPST NC	50 ft (15.24 m)	CFS2-OGDSN-40	SJOW	UL/CSA	SPST NO	40 ft (12.19 m)
CFS2-DNBPN-7	PVC	CE	SPDT	7 ft (2.13 m)	CFS2-OGDSN-50	SJOW	UL/CSA	SPST NO	50 ft (15.24 m)
CFS2-DNBPN-10	PVC	CE	SPDT	10 ft (3.05 m)	CFS2-CGDSN-20	SJOW	UL/CSA	SPST NC	20 ft (6.10 m)
CFS2-DNBPN-15	PVC	CE	SPDT	15 ft (4.57 m)	CFS2-CGDSN-30	SJOW	UL/CSA	SPST NC	30 ft (9.14 m)
CFS2-DNBPN-20	PVC	CE	SPDT	20 ft (6.10 m)	CFS2-CGDSN-40	SJOW	UL/CSA	SPST NC	40 ft (12.19 m)
CFS2-DNBPN-30	PVC	CE	SPDT	30 ft (9.14 m)	CFS2-CGDSN-50	SJOW	UL/CSA	SPST NC	50 ft (15.24 m)

SERIES FSW2 | MERCOID BY DWYER

FREE-FLOATING LEVEL SWITCH

Designed for Industrial Applications, Mercury-Free, Self Counter-Weighted



The **SERIES FSW2** Free-Floating Cable Float Switches is a self-counterweighted, mechanically actuated floating switch intended to activate electrical components, such as pumps, to start and stop automatically. Optional cables are available. Contact factory for cable length options ranging from 10 to 70' (3 to 21 m).

FEATURES/BENEFITS

- Body is free of any irregularities allowing substances to effortlessly glide off and consists of a double airtight chamber with high-pressure melted polypropylene re-injection sealing to ensure a perfect seal reducing maintenance events
- High reliability with mercury-free, magnetic, mechanical internal design
- Economical pricing with multiple option available for increased versatility
- Seamless installation with self-counterweighted body and cable hangers to suit a variety of mounting applications

APPLICATIONS

- Wastewater level monitoring
- Tank level control
- High or low level alarm
- Municipal wastewater control
- Industrial wastewater control

ACCESSORY

Model	Description
A-459	Cable hanger

SPECIFICATIONS

Service: Compatible liquids, slurries.
Wetted Materials: Enclosure: Polypropylene; Cable: PVC.
Operating Temperature: 32 to 122°F (0 to 50°C).
Pressure Limits: 29 psi (2 bar).
Enclosure Rating: IP68.

Switch Type: See model chart.
Electrical Rating: 10 (8) A @ 250 VAC.
Mounting Orientation: Vertical.
Shipping Weight: Enclosure: 2.4 lb (1100 g); Cable: 0.77 oz (21.27 g) per ft.
Agency Approvals: CE.

MODEL CHART

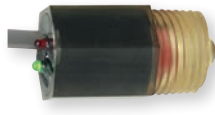
Model	Switch Type	Cable Length ft (m)	Model	Switch Type	Cable Length ft (m)
FSW2-ONPN-20	SPST NO	20 (6.10)	FSW2-DNPN-10	SPDT	10 (3.05)
FSW2-ONPN-30	SPST NO	30 (9.14)	FSW2-DNPN-15	SPDT	15 (4.57)
FSW2-ONPN-40	SPST NO	40 (12.19)	FSW2-DNPN-20	SPDT	20 (6.10)
FSW2-ONPN-50	SPST NO	50 (15.24)	FSW2-DNPN-30	SPDT	30 (9.14)
FSW2-CNPN-20	SPST NC	20 (6.10)	FSW2-DNPN-40	SPDT	40 (12.19)
FSW2-CNPN-30	SPST NC	30 (9.14)	FSW2-DNPN-50	SPDT	50 (15.24)
FSW2-CNPN-40	SPST NC	40 (12.19)	FSW2-DNPN-60	SPDT	60 (18.29)
FSW2-CNPN-50	SPST NC	50 (15.24)	FSW2-DNPN-80	SPDT	80 (24.38)
			FSW2-DNPN-100	SPDT	100 (30.48)

OPTICAL LEVEL SWITCH

Low Cost, Compact, LED Indication, No Moving Parts



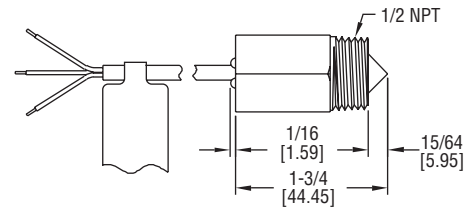
OLS-10



OLS-11



OLS-12



The **SERIES OLS** Optical Level Switches is a low cost, rugged optical level switch that indicate the presence or absence of liquid via infrared light that is reflected back through the prism lens. This series offers three optional materials, 316 SS, polysulfone and PFA.

FEATURES/BENEFITS

- Provides rapid response while employing no moving parts for stable process control
- Bright red and green LED's indicate the presence or absence of liquid for true, local indication
- Three optional materials, 316 SS, polysulfone and PFA provide application flexibility
- Compact switch can be quickly mounted horizontally or vertically for each installation

APPLICATIONS

- Food and beverage systems
- Liquid holding tanks
- Hydraulic reservoirs
- Pharmaceutical systems
- Air conditioning systems
- Sumps

SPECIFICATIONS

Service: Noncoating compatible liquids.
Wetted Materials: See model chart.
Temperature Limit: Process: OLS-10, 11: 200°F (93.3°C), OLS-12: 120°F (48.9°C); Ambient: OLS-10, 11: 175°F (79.4°C), OLS-12: 120°F (48.9°C).
Pressure Limit: OLS-11, 12: 200 psig (13.8 bar); OLS-10: 1000 psig (69 bar).
Repeatability: ±0.02" (0.5 mm).
Switch Type: NPN open collector.
Power Requirements: 10 to 28 VDC.

Output Signal: Vout (max) = 28 VDC, Isink (max) = 100 mA.
Current Consumption: 35 mA max.
Electrical Connections: 38" (965.2 mm) 3 conductor cable, 22 AWG wire.
Process Connection: 1/2" male NPT.
Mounting Orientation: Can be mounted in any position.
Specific Gravity: No minimum.
Weight: 3 oz (0.085 kg).

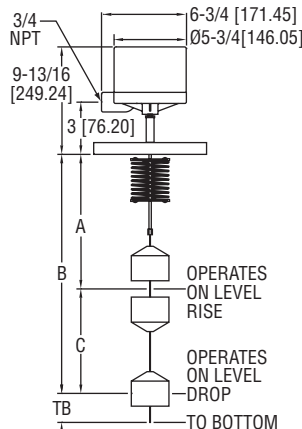
MODEL CHART

Model	Wetted Materials
OLS-10	316 SS/polysulfone
OLS-11	Polysulfone
OLS-12	PFA

SERIES B-190 | MERCOID BY DWYER

LIQUID LEVEL SWITCHES-CONTROLS

Top Mounted Displacer Type, Adjustable Setpoints, Magnetic Operation, Optional Hermetically Sealed Snap Switch



DIMENSIONS FOR 1.0 S.G. @ 100°F (38°C)

A		C		TB	B
Max.	Min.	Max.	Min.	Max.	Min.
116-1/2"	6-1/2"	114"	6-3/4"	2-1/2"	122-1/4"
(2.66 m)	(165 mm)	(2.9 m)	(172 mm)	(64 mm)	(3.1 m)

The **SERIES B-190** Liquid Level Switches and Controls is a top mount displacer type level control. They work on the principle that submerged solids weigh less in liquids, and as the liquid level rises and their weight decreases, the tension on the spring by which they are suspended is decreased. This Series is offered in a range of cable lengths, specific gravities, circuit types and enclosure ratings.

FEATURES/BENEFITS

- Extremely versatile design
- Displacers are suspended on a coil spring and do not float on the surface of liquids and are unaffected by turbulence or pressure
- Excellent for applications with viscous or dirty liquids

APPLICATIONS

- Pumping stations
- Foaming liquids
- Sanitary/sewage treatment
- Paints & varnishes
- Agitated or turbulent fluids
- Heavy oil refineries
- Chemical plants
- Power generating stations
- Viscous or dirty liquids

MODEL CHART

Model	Switch Type
B190-WT-4810-P-A-1.0-2	SPDT mercury
B190-WT-7810-P-A-1.0-2	SPDT snap
B190-WT-7810HM-P-A-1.0-2	SPDT hermetically sealed snap

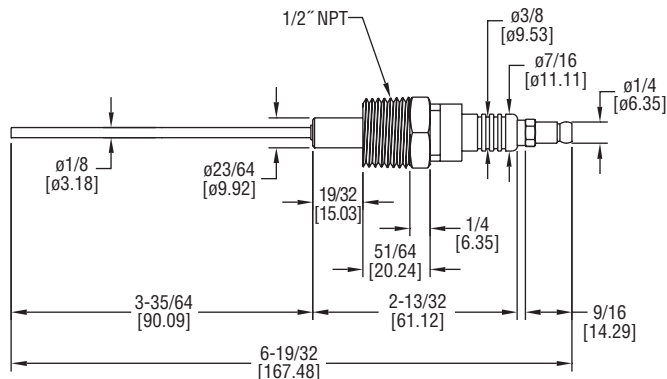
SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Cable, spring and stops: 316 SS; Optional Inconel® spring; Displacers: Porcelain; Optional 304 SS, 316 SS, or carbon graphite.
Temperature Limits: 32 to 200°F (0 to 93.3°C). Higher ratings available.
Pressure Limit: 125 psig (8.6 bar). Higher ratings available.
Enclosure Rating: NEMA 4X. Optional general purpose or explosion-proof.
Switch Type: SPDT snap switch, hermetically sealed snap switch, or mercury switch. Optional DPDT or two stage.
Electrical Rating: Snap switch: 12 A @ 120 VAC, 5 A @ 240 VAC, 0.5 A @ 125 VDC resistive, 0.25 A @ 250 VDC resistive; Hermetically sealed snap switch: 5 A @ 120 VAC, 5 A @ 240 VAC, 5 A @ 30 VDC resistive; Mercury switch: 4 A @ 120 VAC/DC, 2 A @ 240 VAC/DC. Higher contact ratings available for the mercury switch.

Electrical Connections: Screw terminal.
Conduit Connection: 3/4" female NPT.
Process Connections: 4" 125 cast iron flange. Other material, size, and rating flanges are available.
Mounting Orientation: Vertical.
Set Point Adjustment: Adjustable by moving displacers see dimension chart for minimum and maximum values.
Deadband: Adjustable by moving displacers see dimension chart for minimum and maximum values.
Specific Gravity: Standard is 1.0. Specify when ordering by replacing 1.0 in model number with specific gravity setting desired. Settable range is 0.5 to 1.2.
Cable Length: 10' (3 m) standard. Optional up to 100' (30.5 m).
Weight: 25 lb (11.34 kg).
Agency Approvals: UL (None on HM switch).

CONDUCTIVITY LEVEL PROBE

Low Cost, Compact Design



The **MODEL CLP** Conductivity Level Probe is used to determine the presence of a conductive liquid at a set level by sensing conductivity between the probe fitting and end. The Series CLP can be coupled with the Series TSWB Temperature Level Controller for a complete level control system.

FEATURES/BENEFITS

- Mount in any orientation in a tank, tee fitting, or any compatible threaded port for easy installation
- Probe end is solid stainless steel allowing substantial resistance to heat and corrosion
- Ceramic insulator allows for high degree of isolation

APPLICATIONS

- Water level monitoring
- Tank level control
- Process automation
- Single point level service
- Open tanks
- Closed vessels

SPECIFICATIONS

Service: Conductive liquids compatible with wetted materials.
Wetted Materials: Probe end: 430SS; Insulator: Ceramic; Fitting: Nickel-plated iron; Seal: Silicone.
Temperature Limits: 392°F (200°C).
Pressure Limits: 87 psi (6 bar).
Electrical Connections: Snap-type post.
Process Connection: 1/2" NPT.
Mounting: Threaded port, any orientation.
Weight: 2 oz (57 g).

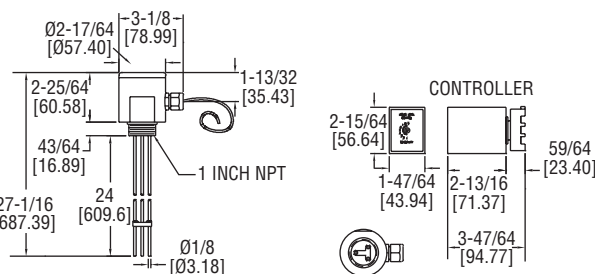
MODEL CHART

Model	Description
CLP-1	Conductivity level probe, 1/2" NPT

MODEL DPL110 | PROXIMITY BY DWYER

DUAL POINT LEVEL SWITCH

Tank High/Low Control, Conductivity Technology, Up to 72" Probes



The **MODEL DPL110** Dual Point Level Switches maintain liquid level high and low limits by sensing the process liquids conductivity and can be used for single or dual point level control.

FEATURES/BENEFITS

- Contains no moving parts to get stuck or wear out
- Easily adjustable sensitivity for added application flexibility
- DIN rail-mountable socket mount for easy install
- Standard 24" (61 cm) electrodes can be cut by the end-user to a shorter length or lengthened by adding up to two 24" (61 cm) extensions (sold separately) to reach the maximum recommended length of 72" (183 cm)

APPLICATIONS

- Food and beverage
- Caustics and acids
- Sumps
- Reservoirs
- Pharmaceuticals
- Boilers and steam generators
- Ponds
- Sewage and wastewater

SPECIFICATIONS

Electrodes: 1/8" dia, 24" (609.6 mm) L, standard.
Wetted Materials: 316 SS, polypropylene.
Mounting, Sensor Head: 1" male NPT.
Pressure Limits: 30 psig (2.06 bar).
Temperature Limits: 212°F (100°C).
Probe Enclosure: NEMA 6 (IP67).
Maximum Probe Length: 72" (1.8 m) with optional extensions.
Connecting Cable, Probe to Controller: 10' (3.0 m).
Sensing Voltage: 12 VAC.
Power Supply: 120 VAC 50/60 Hz.
Output: SPDT, 5 A @ 240 VAC.
Mounting, Controller: Standard octal socket or 35 mm DIN rail.
Weight: Controller: 1.0 lb (0.45 kg); Probe Assembly: 1.5 lb (0.68 kg).

MODEL CHART

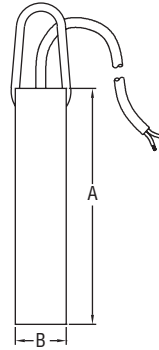
Model	Description
DPL110	Dual point level switch

ACCESSORY

Model	Description
DPL5	Electrode extensions includes three 24" (610 mm) electrode extensions and mounting hardware

TILT SWITCH PROBE

Non-Mercury Probes



Probe Type	A in [cm]	B in [cm]
Standard	9 [22.86]	1-7/8 [47.63]
Compact	6 [15.24]	1-7/16 [36.51]

The **SERIES LTS** Tilt Switch Probes is able to sense either the presence or absence of material in applications where other sensors fail due to bin vibration, or absence of area to mount other measuring units. The probes are designed for use where the bulk material to be sensed is exposed or open. Use with Series LTC Tilt Switch Control Unit for complete control output solution.

FEATURES/BENEFITS

- All probe models are airtight, dust tight, and waterproof
- Compact probe should be used for applications where space is limited and standard, heavy duty probe should be used for applications where an abrasion resistant probe is necessary

APPLICATIONS

- Large hoppers
- Silos
- Crushers
- Trippers
- Stackers
- Conveyors

SPECIFICATIONS

Service: Powder and bulk.
Temperature Limit: -4 to 104°F (-20 to 40°C).
Switch Type: SPST, normally closed.
Electrical Rating: < 50 mA @ 12 VDC as supplied by Series LTC controller.
Electrical Connection: 3-wire +12 VDC (supplied by controller).
Cable Length: 25' (7.6 m) unless otherwise specified.
Probe Length: Standard: 9" (23 cm); Compact: 6" (15 cm).

Contact Rating: When not used with LTC controller: 60 V max., 0.25 A max.
Actuation Angle: 25° from vertical.
Material: Steel or 302/304 SS.
Switch Surrounding: Epoxy encapsulated.
Mounting Orientation: Vertical.
Weight: Standard: 4.75 lb (2.15 kg); Compact: 2.5 lb (1.13 kg).
Features: Fittings for hangers.
Agency Approvals: Meets NEMA 4.

MODEL CHART

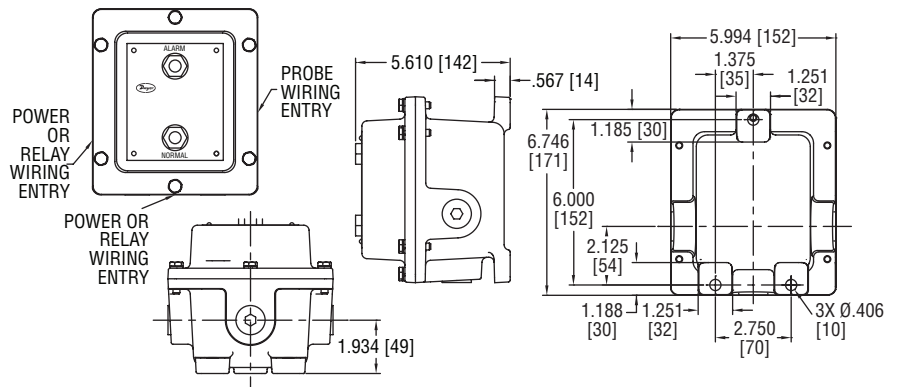
Model	Size	Probe Material
LTS-N11G-025	Standard	Steel
LTS-N21G-025	Compact	Steel
LTS-N12G-025	Standard	SS
LTS-N22G-025	Compact	SS

Consult factory for custom cable lengths.

MODEL LTC2

TILT SWITCH CONTROL UNIT

Adjustable Time Delay



The **MODEL LTC2** Tilt Switch Control Units offers a complete level control solution when used with a tilt switch probe such as the Series LTS. It offers a DPDT switch output as well as indicator lights to provide visual and output control of the level probe status.

FEATURES/BENEFITS

- Adjustable time delay feature may be assigned to either the vertical or the tilt position to prevent false signals
- Logic selector switch determines when the output relay actuates and deactuates, thus while in position one, the relay is energized when the probe is in the vertical position and de-energizes when the probe is in the tilted position, and while in position two, the actions are opposite
- Relay assumes the de-energized position upon reaching the end of the delay period as well as upon failure of power to the controller

APPLICATIONS

- Large hoppers
- Silos
- Crushers
- Trippers
- Stackers
- Conveyors

SPECIFICATIONS

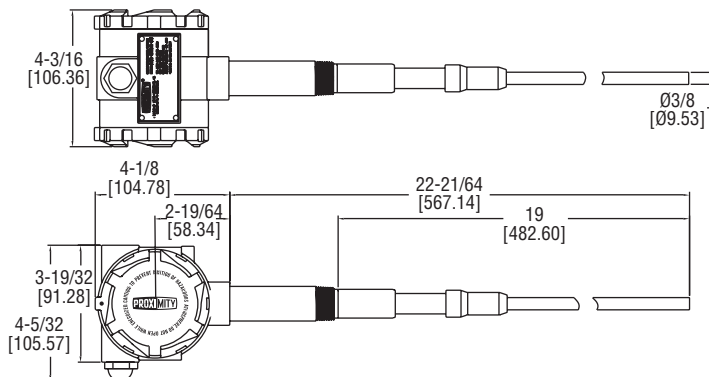
Temperature Limit: -4 to 104°F (-20 to 40°C).
Power Requirements: 115 VAC @ 50/60 Hz.
Power Consumption: 10W.
Switch Type: DPDT.
Electrical Rating: 5 A @ 120 VAC; 5 A @ 240 VAC.
Enclosure: Cast aluminum.
Enclosure Rating: None or NEMA 4, 4X.
Electrical Connections: No suffix: 120 VAC; B suffix: 240 VAC.
Conduit Connections: 3/4 NPT: 2 power/relay & 1 probe.
Indicator Light: Green (when relay is energized and probe vertical); Red (when relay is de-energized and probe tilted), LED lamps.
Time Delay: 0.1 to 35 sec; Adjustment will delay output relay action.

MODEL CHART

Model	Enclosure
LTC2	NEMA 4X

CAPACITIVE LEVEL SWITCH

Powder, Bulk, or Liquids, Auto-Calibration



The **SERIES CLS2** Capacitive Level Switches is a capacitive technology level switch which can be used for liquids, powders and bulk materials. It is offered with PVDF and 316 SS wetted material, weatherproof enclosure, DPDT output and a variety of process connections.

FEATURES/BENEFITS

- No moving parts permitting for no jams, no wear, nothing to break, and no maintenance
- Impulse RF admittance measurement combined with an active guard, provides excellent level measurement and stability while being insensitive to material buildup
- Immune to external RF sources like walkie-talkies and cell phones as well as minimal interference with radio communication or other electronic systems
- Automatic calibration with no need to turn calibration pots, just push the calibration button and an external magnet to activate the calibration without having to open the enclosure saving time
- Coat guard probe is not affected by sticky, dusty, or clingy materials that coat or build preventing false alarms
- Status indication via an ultra-high brightness external red LED switch status indicator, and internal indicators for power, sensor, and switch status that can be seen externally with window cap option (external LED on weatherproof model only)
- Can be used for liquid interface applications to detect the level of two immiscible liquids that have different dielectric constants such as oil and water
- Failsafe setting with output switches that can be set for NO or NC condition on loss of power
- Time delay prevents false alarms from material splashing, agitation, etc.
- Removable terminal block snaps in and out enabling easy wiring outside of the enclosure
- Universal power supply with one model that works from 12 to 240 VAC/DC without any jumpers or change of setting
- Wetted materials of PVDF and 316 SS assure great chemical compatibility and meet food grade requirements

APPLICATIONS

- Sewage and wastewater
- Food and beverage
- Pharmaceuticals
- Sumps
- Level monitoring in receivers
- Boilers and steam generators
- Caustics and acids
- Reservoirs
- Level indication in silos
- Transporters in pneumatic conveying systems

SPECIFICATIONS

Service: Liquids, powder, and bulk materials compatible with wetted materials.
Wetted Materials: 316 SS and polyvinylidene fluoride (PVDF).
Temperature Limits: Ambient: -40 to 185°F (-40 to 85°C), -4 to 185°F (-20 to 85°C) with under 24 VAC/DC power supply; Process: -40 to 250°F (-40 to 121°C).
Pressure Limit: 365 psi (25 bar).
Enclosure Rating: Weatherproof, NEMA 4X (IP66).
Switch Type: DPDT (two form C).
Electrical Rating: 8 A @ 120/240 VAC res., 30 VDC. 1/2 hp @ 120 VAC and 1/4 hp @ 240 VAC ind.
Power Requirements: 12 to 240 VAC/DC.
Power Consumption: 2.8 watts max.
Electrical Connection: 1/2" NPT conduit opening, screw termination with removable terminal block.
Process Connection: See model chart.
Mounting Orientation: Vertical or horizontal.
Set Point Adjustment: Trips when product touches probe. Cut or extend probe to length of desired trip point. Can be cut as short as 1" and can be extended by welding on to probe. (Minimum length will be effected by material being sensed.)
Response Time: 0.2 seconds.
Time Delay: Adjustable, 0 to 60 seconds.
Spark/Static Protection: 10 M Ω dissipation resistance with spark gap. Surge current to 100A max.
Sensitivity: 8 selectable settings, 1, 2, 4, 6, 8, 10, 14, 20 pF (at 30 pF nominal free capacitance).
Agency Approvals: CE, cULus.

MODEL CHART

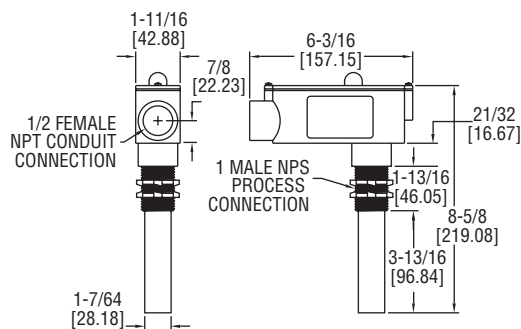
Example	CLS2	-W	1	1	R	K	1	-019	-M20	CLS2-W11RK1-019-M20
Series	CLS2									Capacitive level switch
Enclosure		W								Weatherproof
Switch			1							DPDT rated 8 A @ 12/240 VAC, 30 VDC res.
Power Supply				1						12-240 VAC/DC
Probe Type					R T C					Standard rod: 316 SS, .375" diameter Threaded rod: 316 SS (can attach 47" (1.2 m) field extensions.*) Cable: 316 SS with weight
Insulator Material						K				PVDF
Process Connection							1 2 3 4 5 6 8 9			3/4" male NPT 1" male NPT 1-1/2" male NPT 3/4" BSPT 1" BSPT 1-1/2" BSPT 1-1/2" sanitary clamp 2" sanitary clamp
Probe Length								XXX		Insertion length in inches. Example 019 is 19" length. (Minimum length is 6", with 3/4" sensing tip)
Options									M20 WC	M20 conduit connection with cable gland Window cap

Example: CLS2-W11RK1-019.

*Extension rods sold separately.

CAPACITANCE LEVEL SWITCH

For Solids, Liquids or Slurries, Fail-Safe Protection, <1 pF Sensitivity



The **MODEL CLS1** Capacitance Level Switches provides reliable point level measurement of solids, liquids and slurries in metallic or non-metallic tanks and vessels. It detects the presence or absence of material in contact with the probe by sensing a change in the capacitance.

FEATURES/BENEFITS

- Electronics provide highly sensitive measurement detection (requires less than a 1 picofarad shift from ambient)
- State of the art technology ignores material build-up on the vessel sidewall or along the probe assembly
- One time calibration is simple with a single multi-turn potentiometer
- Red LED on housing indicates sensor status
- Adjustable 1-30 second time delay and a 5 A, SPDT fail-safe relay output
- Added installation flexibility with vertically or horizontally mounting

APPLICATIONS

- High or low level detection
- Bins
- Silos
- Tanks
- Hoppers
- Chutes

SPECIFICATIONS

Service: Solids, liquids, or slurries.
Wetted Material: CPVC.
Temperature Limits: Process: -40 to 240°F (-40 to 116°C); Ambient: -40 to 185°F (-40 to 85°C).
Enclosure Rating: NEMA 4X (IP66), PVC, dust tight, water resistant.
Switch Type: SPDT.
Electrical Rating: 5 A @ 250 VAC.

Power Requirements: 120 VAC, 1.5 VA.
Conduit Connection: 3/4" female NPT.
Process Connection: 1" male NPS.
Mounting Orientation: Vertical or horizontal.
Sensitivity: Adjustable to < 1 pF.
Fail-Safe: Switch selectable, high/low.
Time Delay: Adjustable 1 to 30 s.
Weight: 2.0 lb (0.91 kg).

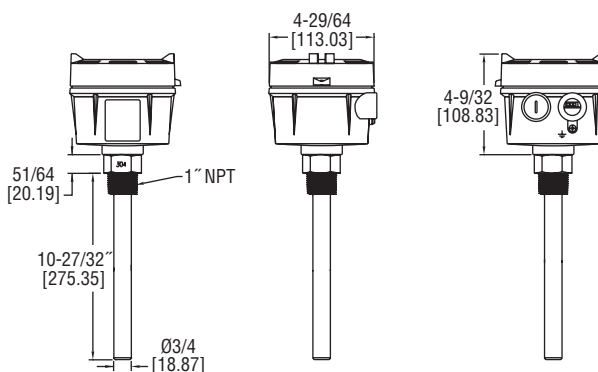
MODEL CHART

Model	Description
CLS1	Capacitance level switch

MODEL VRLS | PROXIMITY BY DWYER

VIBRATING ROD LEVEL SWITCH

Economical, No Material Build Up, For Powder or Bulk Solids



The **MODEL VRLS** Vibrating Rod Level Switches is economical choice in level detection of powders and bulk solids. The VRLS incorporates a piezoelectric crystal that vibrates the rod at its natural frequency, when contact material is present it dampens the vibrations and the switch changes state.

FEATURES/BENEFITS

- Probe design allows for self-cleaning, ensuring no build-up or bridging of material and accurate detection
- No mechanical moving parts with no routine maintenance required
- Sensitivity is adjustable for detection ranging from large granular material to small powders with low bulk densities.
- The failsafe mode can be set for failure on high level or failure on low level using a selector switch in the enclosure
- Unaffected by the dielectric constant of the sensed material, making it superior to a capacitance level switch for applications where the dielectric constant is too low, where there is more than one material being used in one vessel, and when material moisture content can change
- Ideal for applications where the bulk density is too low for a rotating paddle level switch

APPLICATIONS

- Pulp and paper processing
- Mining
- Food and beverage
- Silos
- Hoppers

SPECIFICATIONS

Service: Dry powder or bulk materials compatible with wetted materials.
Sensitivity: Min. bulk density of 20 lb/ft³ (320 kg/m³).
Wetted Materials: 304 SS.
Temperature Limits: Ambient: -40 to 140°F (-40 to 60°C); Process: -40 to 176°F (-40 to 80°C).
Pressure Limit: 150 psi (10 bar).
Power Requirement: 20 to 250 VAC/VDC, 50/60 Hz.
Power Consumption: 15 VA.
Enclosure: Aluminum, painted.

Enclosure Rating: IP65.
Switch Type: SPDT.
Electrical Rating: 5 A @ 250 VAC.
Electrical Connections: Screw terminals.
Conduit Connection: 1/2" female NPT x 2.
Process Connection: 1" male NPT.
Indication Lights: Internal: green and red LED.
Sensing Delay: 0 to 6 s.
Weight: 4.4 lb (2.0 kg).

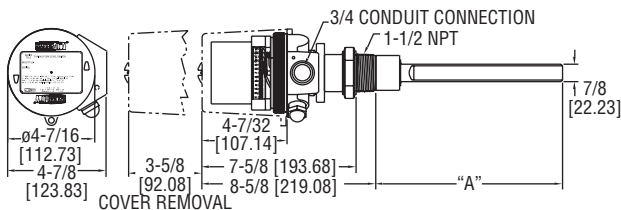
MODEL CHART

Model	Description
VRLS-01	Vibrating rod level switch



TUNING FORK LEVEL SWITCH

Perfect for Sensing Low Bulk Density or Low Dielectric Materials



Extension Length	DIM "A"
None	9-1/4 (234.95)
6 in	15-7/8 (403.23)
12 in	21-7/8 (555.63)
18 in	27-7/8 (708.03)
24 in	33-7/8 (860.43)
36 in	45-7/8 (1165.23)
48 in	57-7/8 (1470.03)

The **SERIES TFLS** Tuning Fork Level Switches is ideal for level control of powders and fine grained solids, especially those with a low bulk density. The TFLS incorporates a piezoelectric crystal that vibrates the fork at its natural frequency, when contact material is present it dampens the vibrations and the switch changes state.

FEATURES/BENEFITS

- Status indication with external LED switch indicator, and internal indicators for normal and alarm status
- No calibration required for quick and easy installation
- No mechanical moving parts with no routine maintenance required
- Unaffected by the dielectric constant of the sensed material, making it superior to a capacitance level switch for applications where the dielectric constant is too low, where there is more than one material being used in one vessel, and when material moisture content can change
- Vibrating fork design is ideal for low bulk density and low dielectric constant products, detecting products down to 1.8 lb/ft³ (30 g/l)
- Ideal for applications where the bulk density is too low for a rotating paddle level switch
- Adjustable sensitivity can be set to ignore lighter bulk density products and only detect heavier products, such as sand, gravel, or polyester chips in water
- Unit is not affected by vibration from conveying systems, motors, or the movement of material
- Mounted in any position and is available with factory built extensions for mounting on the top of the storage vessel
- Failsafe setting with output switch that can be set for NO or NC condition on loss of power
- Time delay prevents false alarms from material surges
- Universal power supply yields one model which works with 90 to 265 VAC and 24 VDC

APPLICATIONS

- Chemical processing
- Pulp and paper processing
- Mining
- Food and beverage
- Lime, styrofoam, tobacco, dry cereals, sugar, animal feed, milk powder, flour, insulation, cement, paper shavings, plastic granules, sawdust, carbon black, light fibers, detergent powders, dyes, chalk, silica, sand, wood chips

SPECIFICATIONS

Service: Dry powder or bulk materials compatible with wetted materials. Can detect bulk materials submerged in liquid.
Sensitivity: Minimum bulk density of 1.8 lb/ft³ (30 g/l), max particle size 0.4' (10 mm).
Wetted Materials: 316 SS.
Temperature Limits: Ambient: -4 to 140°F (-20 to 60°C); Process: -4 to 176°F (-20 to 80°C).
Pressure Limit: 145 psig (10 bar).
Power Requirement: 90 to 265 VAC, 50/60 Hz; 24 VDC.
Power Consumption: 4 VA.
Enclosure: Aluminum, powder coated.
Enclosure Rating: Weatherproof, NEMA 4X (IP66).
Switch Type: SPDT.
Electrical Rating: 5 A @ 230 VAC.
Electric Connections: Screw terminals.
Conduit Connection: 3/4" female NPT.
Process Connection: 1-1/2" male NPT.
Indication Lights: External: Red LED; Internal: Green and red LED's.
Sensing Delay: (Max) covered probe: 2 seconds; Uncovered probe: 3 to 7 seconds.
Time Delay: Separate settings for covering and uncovering the probe. Adjustable from 2 to 20 s.
Weight: 5.5 lb (2.5 kg).

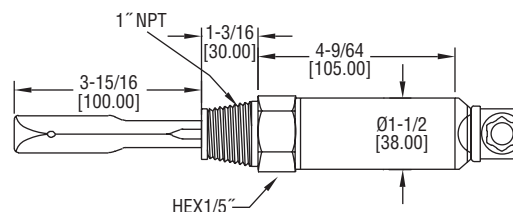
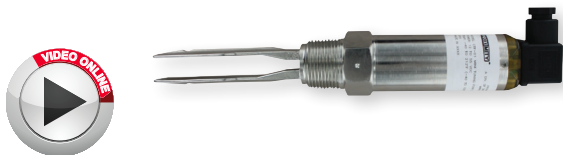
MODEL CHART

Model	Description
TFLS-W11SR1	Tuning fork level switch
Contact factory for fork extension options in stainless steel.	

MODEL CTF | PROXIMITY BY DWYER

MINI TUNING FORK LEVEL SWITCH

Compact, Cost Effective, DIN Connection



The **MODEL CTF** Mini Tuning Fork Level Switches is an ideal choice for level control of powders. The CTF incorporates a piezoelectric crystal that vibrates the fork at its natural frequency, when contact material is present it dampens the vibrations and the switch changes state. This series offers a PNP/NPN configurable output.

FEATURES/BENEFITS

- DIN connection and compact size allows for application in places a larger tuning fork level switch may not be suitable, providing great versatility
- No mechanical moving parts with no routine maintenance required
- Unaffected by the dielectric constant of the sensed material, making it superior to a capacitance level switch for applications where the dielectric constant is too low, where there is more than one material being used in one vessel, and when material moisture content can change
- Ideal for applications where the bulk density is too low for a rotating paddle level switch

APPLICATIONS

- Chemical processing
- Pulp and paper processing
- Mining
- Food and beverage

SPECIFICATIONS

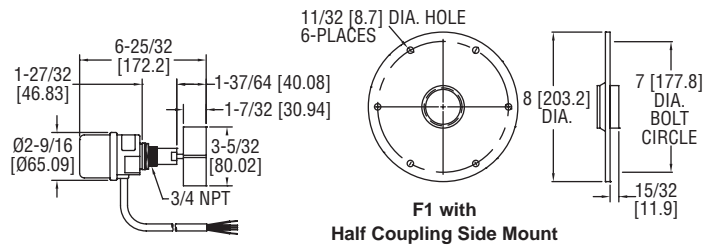
Service: Dry powder compatible with wetted materials.
Sensitivity: Min. bulk solid density: 4.4 lb/ft³ (70 g/l).
Wetted Materials: Tuning Fork: 316 L SS; Process connection: 304 SS.
Temperature Limits: Ambient: -40 to 140°F (-40 to 60°C); Process: -40 to 212°F (-40 to 100°C).
Pressure Limit: 600 psi (40 bar).
Power Requirement: 12 to 55 VDC.
Power Consumption: 10 mA @ 12 to 24 VDC; 0.5 W (max.).
Enclosure: Aluminum, painted.
Enclosure Rating: IP65.
Switch Type: 3-wire PNP/NPN output.
Electrical Rating: 350 mA (max) @ 12 to 55 VDC.
Conduit Connection: Valve plug DIN 43650.
Process Connections: 1" male NPT.
Indication Lights: External red LED.
Sensing Delay: Max. covered probe: 1 to 3 s.; Uncovered probe: 1 to 3 s.
Weight: 2.2 lb (1.0 kg).

MODEL CHART

Model	Description
CTF-01	Mini tuning fork level switch

MINI-BIN DRY BULK LEVEL MONITOR

Compact, 4-Vane Paddle



The **MODEL DBLM** Mini-Bin Dry Bulk Level Monitors provides reliable level sensing for dry bulk solids where mounting space is limited. Model DBLM Mini-Bin operates by using a 1 rpm synchronous motor to rotate a four vane, plastic paddle, and when material surrounds paddle and impedes rotation, the motor is de-energized and triggers a SPDT snap switch. Mount the Mini-Bin with optional 1-1/4" to 3/4" reducer to replace standard size units.

FEATURES/BENEFITS

- Compact, side mount control reports high, intermediate, and low level conditions, eliminating overflows, choking, clogs or empty vessels
- Unaffected by the dielectric constant of the sensed material, making it superior to a capacitance level switch for applications where the dielectric constant is too low, where there is more than one material being used in one vessel, and when material moisture content can change

APPLICATIONS

- Mining
- Food and beverage
- Grain silos
- Hoppers

MODEL CHART

Model	Power Supply
DBLM3040	110 VAC
DBLM3140	220 VAC

SPECIFICATIONS

Service: Dry bulk solids.
Wetted Materials: Polycarbonate paddle, SS shaft, PTFE washer.
Temperature Limits: -4 to 140°F (-20 to 60°C).
Enclosure Rating: Polycarbonate, NEMA 1 (IP10).
Switch Type: SPDT snap switch.
Electrical Rating: 3 A @ 250 VAC.
Power Requirements: 110 VAC, 50/60 Hz, 220 VAC optional, consult factory.

Power Consumption: 1.5 Watts.
Electrical Connections: 18 AWG, 12" leads wrapped in conduit.
Process Connection: 3/4" male NPT, optional flange and 1-1/4" to 3/4" reducer.
Mounting Orientation: Side mount.
Weight: 0.77 lb (350 g).
Agency Approvals: CE.

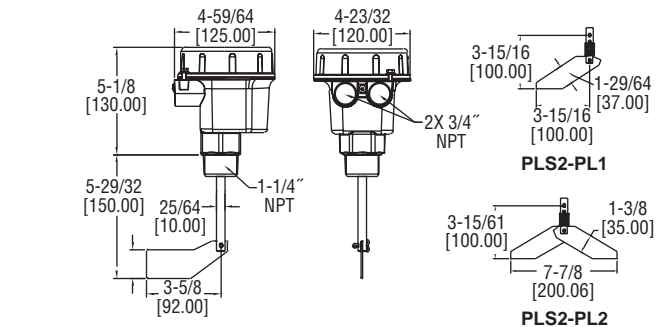
ACCESSORIES

Model	Description
F1	8" x 1-1/4" NPT flexible carbon steel mounting flange
A-335	1-1/4" to 3/4" reducer 220

SERIES PLS2 | PROXIMITY BY DWYER

PADDLE LEVEL SWITCH

3 Sensitivity Settings, Top or Side Mounting



The **SERIES PLS2** Paddle Level Switches is an electromechanical level switch designed for level monitoring of bulk materials. The rotating measuring vane is driven by a brushless synchronous motor at one revolution per minute and as product builds up, the paddle rotation is impeded and the resulting motor torque activates the output switch and stops the motor. The PLS2 is designed with the industry standard 1-1/4" male NPT connection and unit can be side or top mounted.

FEATURES/BENEFITS

- Torque adjusting mechanism eliminates the need for different sized paddles
- 3 sensitivity settings for spring force can be set for light to very sticky materials
- Brushless synchronous motor assures long term reliability and efficiency
- Motor shuts ceases operation when paddle stalls
- Screw cover for easy access with no worries about losing bolts or screws
- Top or side mountable for added installation flexibility
- Unaffected by the dielectric constant of the sensed material, making it superior to a capacitance level switch for applications where the dielectric constant is too low, where there is more than one material being used in one vessel, and when material moisture content can change

APPLICATIONS

- Mining
- Food and beverage
- Silos
- Hoppers

MODEL CHART

Model	Description
PLS2-E-1-1	Explosion-proof paddle level switch, 115 VAC power supply
PLS2-E-1-2	Explosion-proof paddle level switch, 230 VAC power supply
PLS2-E-1-3	Explosion-proof paddle level switch, 24 VDC power supply

Note: Models include single sided non-spring paddle.

SPECIFICATIONS

Service: Dry powder or bulk materials compatible with wetted materials.
Wetted Materials: Paddle: 304 SS; Exposed shaft: 303 SS; Shaft seal: NBR; Process connection: Aluminum.
Temperature Limits: Process: -13 to 176°F (-25 to 80°C); Ambient: -4 to 140°F (-20 to 60°C).
Pressure Limit: 11.6 psi (0.8 bar).
Power Requirement: Select by model number: 115 VAC, 230 VAC or 24 VDC.
Power Consumption: AC versions: 4 VA; DC version: 2.5 watt.
Enclosure: Aluminum, powder coated.
Enclosure Rating: NEMA 4 (IP66); Rated for Class II & III, Div. 1, Group E, F, G.

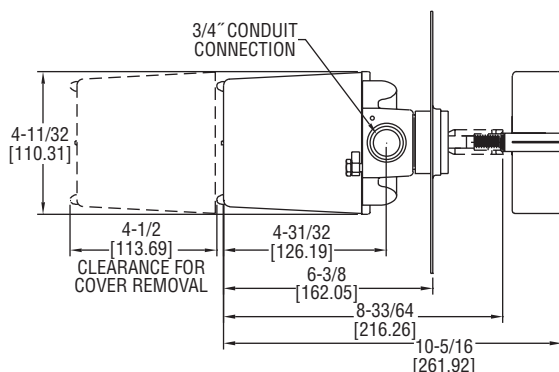
Switch Type: SPDT micro switch.
Electrical Rating: 5 A @ 250 VAC, 3 A @ 30 VDC.
Electric Connections: Screw terminals.
Conduit Connection: 3/4" female NPT.
Process Connection: 1-1/4" male NPT.
Mounting Orientation: Side or top mounting.
Sensitivity: Min. material density of 6 lb/ft³ (96 kg/m³).
Permitted Mechanical Loading: Standard shaft: 67 lbf (300 N) max; Optional extension: 22 lbf (100 N) max.
Weight: 2.6 lb (1.2 kg).
Agency Approvals: CE, FM.

ACCESSORIES

Model	Description
PLS2-PL1	Single sided spring paddle
PLS2-PL2	Double sided spring paddle
PLS2-EX1	8.5" shaft extension
PLS2-EX2	19.6" shaft extension
PLS2-EX3	39.4" shaft extension
PLS2-EX4	78.7" shaft extension

PADDLE LEVEL SWITCH

Weatherproof and Explosion Proof Option, Rotary Paddle Level Control, Top or Side Mounting for Dry Bulk Materials



Side Mount



PDL-1
Minimum bulk density
of 5 lb/ft³ (80 kg/m³).



PDL-2
Minimum bulk density
of 30 lb/ft³ (481 kg/m³).



PDL-3
Minimum bulk density of 30 lb/
ft³ (481 kg/m³). Fits through a
1-1/4" coupling eliminating the
need for a mounting flange.



PDL-4
Minimum bulk density of 70 lb/
ft³ (1122 kg/m³). Fits through
1-1/4" coupling eliminating the
need for a mounting flange.



The **SERIES PLS** Paddle Level Switches uses a 1 rpm synchronous motor to rotate a paddle and sense the presence of dry powder or bulk materials. Movement is impeded when product comes into contact with the paddle and the resulting motor torque activates the output switches and stops the motor. The PLS is designed with the industry standard 1-1/4" male NPT connection and mounting flanges.

FEATURES/BENEFITS

- Magnetic drive isolates and completely seals the control head from the process and environment preventing material or dust from entering the control head
- Motor shuts-off when paddle stalls increasing motor life, preventing motor burnout, and decreasing power usage
- Slip clutch design enabled by the magnetic drive that prevents damage to motor and drive mechanism from sudden or excessive loading on the paddle
- Status indication light on weatherproof models
- Screw cover on the enclosure for easy access with no worries about losing bolts or screws
- Modular design to allow field installation of any paddle, flanges, shaft extensions, or shaft guards
- Flexible coupling available for protection of the paddle and drive from side loads, surges or impacts. Recommended for top mount applications with shaft extension and applications with large or heavy materials

APPLICATIONS

- Mining
- Food and beverage
- Silos
- Hoppers

SPECIFICATIONS

Service: Dry powder or bulk materials compatible with wetted materials.

Sensitivity: Min material density of 5 lb/ft³ (80 kg/m³), max of 200 lb/ft³ (3200 kg/m³).

Wetted Materials: Paddles: 316 SS; Exposed shaft: 316 SS; Shaft seal: PTFE; Mounting boss: Aluminum; Flexible coupling: 316 SS; Mounting flanges: Carbon steel or 316 SS; Shaft extension and shaft guards: Galvanized steel or 316 SS.

Temperature Limits: Standard construction: Process: -40 to 300°F (-40 to 148.9°C); Ambient: -40 to 185°F (-40 to 85°C); High temperature option: Process: -40 to 500°F (-40 to 260°C); Ambient: -40 to 185°F (-40 to 85°C).

Pressure Limit: 30 psig (2.07 bar) max for .5 micron or larger material.

Power Requirement: Select by part number: 110 to 120 VAC, 230 VAC, 24 VAC, 48 VAC or 12 VDC.

Power Consumption: Weatherproof models: 5 watts; Explosion-proof models: 3 watts.

Enclosure: Aluminum, powder coated.

Enclosure Rating: Weatherproof (W, WH construction): NEMA 4X (IP66); Explosion-proof (E, EH construction): NEMA 4X (IP66) and rated for Class I, Div. 1 & 2, Groups C & D, Div. 1 & 2, Groups E, F, & G.

Switch Type: SPDT or optional DPDT snap switch.

Electrical Rating: 15 A @ 120/230 VAC, 5 A @ 24 VDC.

Electric Connections: Screw terminals.

Conduit Connection: 3/4" female NPT.

Process Connection: 1-1/4" male NPT. Optional flange.

Indication Light: Red LED that activates when switch is made or when switch is not made with RL option (Not available on explosion-proof models).

Options: Time delay relay, high temperature construction, top mount, shaft extensions, shaft shields, flexible couplings, other power voltages, reversed light.

Agency Approvals: cUL approved as an auxiliary device or as an auxiliary device for hazardous locations.

Weight: Control head only: 4 lb (1.81 kg).

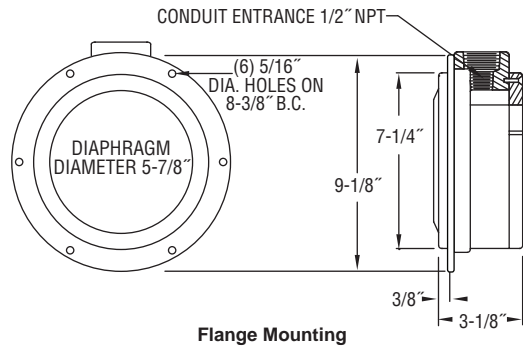
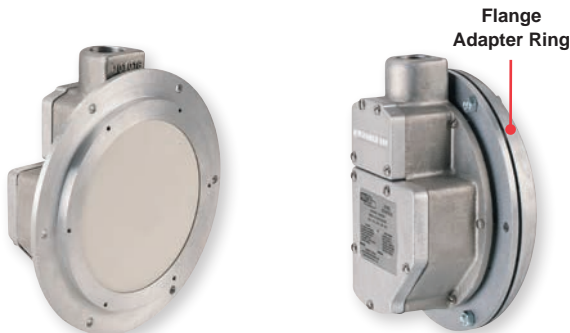
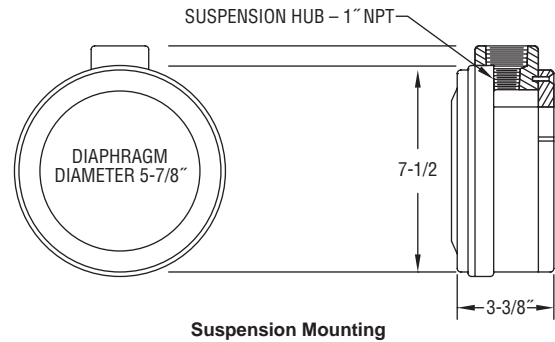
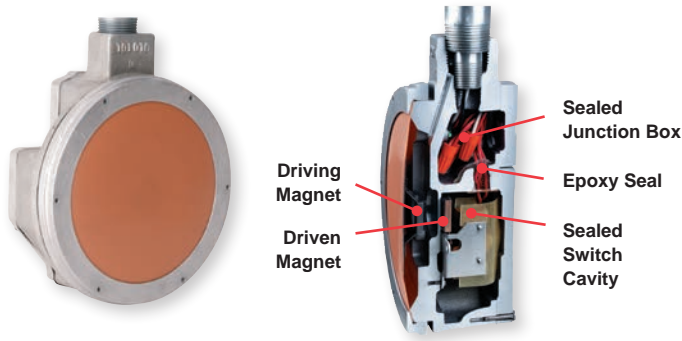
MODEL CHART		
Paddle Model	Flange Model	Description
PDL-1	FLG-CSH	Carbon steel with half coupling
PDL-2	FLG-CSF	Carbon steel with full coupling
PDL-3	FLG-SSH	316 SS with half coupling
PDL-4	FLG-SSF	316 SS with full coupling

Note: Contact the factory for pricing of shaft extensions, protective shields, and other options. More detailed information available in our Measurement & Control for Powder, Dust, and Bulk Materials Catalog.

MODEL CHART - CONTROL ASSEMBLIES	
Model	Description
PLS-W-S-1-0-0-0-0	Weatherproof construction, SPDT switch, 120 VAC power supply. Order paddles and flanges separately.
PLS-W-S-1-3-0-0-0	Weatherproof construction, SPDT switch, 120 VAC power supply, includes PDL-3 paddle.
PLS-W-S-1-2-CSH-0-0	Weatherproof construction, SPDT switch, 120 VAC power supply, includes PDL-2 paddle and FLG-CSH flange.

*316 SS mounting boss available.

EXPLOSION-PROOF LEVEL SWITCHES FOR POWDER & BULK SOLIDS



The **SERIES E, G, & P Ultra Mag™** is an explosion-proof series of level switches for powder and bulk solids that utilize a unique magnetic linkage and diaphragm design to sense the presence of powder and bulk solids in a variety of bins, vessels, and hoppers.

FEATURES/BENEFITS

- Uses a unique magnetic linkage which isolates the electrical compartment from controlled product, reducing maintenance and improving sensitivity
- Sealed switch compartment and sealed leads yield the exceptionally reliable operation
- A wide selection of diaphragms and switches is available with choices of flange or suspension mounting to fit a specific application
- Extremely sensitive indication and very economical
- Magnetic linkage makes this simple explosion-proof diaphragm switch the most rugged and reliable level control for a variety of products

APPLICATIONS

- Mining
- Food and beverage
- Silos
- Hoppers

MOUNTING SELECTION

A choice of either suspension or flange mounting is available to match your application. Flange mounting is the best choice for control of low or intermediate level in vessels containing granular product that does not "bridge", "rathole", or otherwise build up on vessel walls. Choose suspension mounting for high level in vessels and for better operation with "bridging" product. ①

Note: The mounting configuration is represented by the letter "S" for suspension or "F" for flange which is the second digit in the part number. ②

SPECIFICATIONS

Service: Compatible powder or bulk solids.

Wetted Materials: Mounting Flange: See model chart. Aluminum or 304 SS; Diaphragm: See model chart. Urethane, Buna-N, PTFE, silicone rubber, polyester, fluoroelastomers, white Buna-N (food grade), or EPDM.

Temperature Limits: Depends on diaphragm material, see model chart. Standard switch: -40 to 185°F (-40 to 85°C); High temperature switch: -40 to 350°F (-40 to 176°C).

Pressure Limit: 60 psig (4.14 bar).

Enclosure Rating: General purpose or weatherproof and explosion-proof. See model chart.

Switch Type: See model chart.

Electrical Rating: See model chart.

Electrical Connections: 18 gage solid core, 600 volt TEW 105°C, style 1015. Epoxy sealed at conduit entrance. 12" (304.8 mm) long.

Conduit Connection: 1/2" female NPT.

Process Connection: For flanged models standard is 8-3/8" (212.725 mm) diameter bolt hole circle.

Mounting Orientation: Flange mount or suspend depending on model.

Set Point Adjustment: Internal screw.

Options: Suspension kits and flange adapter rings.

Weight: 7 lb (3.18 kg).

Agency Approvals: CSA and UL.

DIAPHRAGM SELECTION

A wide variety of diaphragms are available to match product bulk density, flowability, abrasiveness and temperature requirements while providing maximum sensitivity. The best choice for vessels subject to pressure or vacuum is "breathable" fabric (P Series), requiring no venting. Non-porous elastomer (G Series) type diaphragms are the best choice for more abrasive product and broader temperature range applications. Venting is always required with the G series and if used in pressurized vessels, venting to the tank atmosphere is required to allow pressure equalization. A slide rule "Diaphragm Selector" is available from the factory to help you choose the diaphragm best suited to your application.

①Suspension and Flange Mounting Kits: See page 351 (Ultra Mag™)

②Part Number: See page 351 (Ultra Mag™)

EXPLOSION-PROOF LEVEL SWITCHES FOR POWDER & BULK SOLIDS

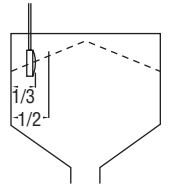
DIAPHRAGM SELECTION GUIDE

Product	Suggested Diaphragm*	Product	Suggested Diaphragm*
Abrasive	3D	Polypropylene Powder	7A
Aggregate	3D	Polypropylene Resin	17
Alumina	3D	Polystyrene Beads	3D
Ash, Dry	3D	Pot Ash	3D
Baking Powder	7B	Powdered Metal	3D
Baking Soda	7B	Powdered Ore	3D
Barite	3D	PVC Powder	7A
Bark, Ground	6G	PVC Resin	17
Barley, Ground or Meal	17	Rice	17
Barley, Whole	4B	Rye	3D
Beans, Edible	4B	Salt	3D
Bentonite	3D	Sand, Dry	3D
Bond, Foundry	17	Sand, Dry Silica	3D
Carbon Black	7A	Sand, Foundry Prepared	5A
Cement, Klinker	8A	Sand, Shake Out	3D
Cement, Portland	4B	Sawdust, Dry	6G
Chips, Hogged Fuel	6G	Sea Coal	3D
Coal	3D	Sesame Seed	3D
Compost	5A	Shale, Crushed	3D
Core Sand, Foundry	3D	Silica, Flour	3D
Corn, Shelled	8A	Sludge, Sewage Dried	1A
Diatomaceous Earth	7A	Sludge, Sewage, Ground	1A
Drill Mud	3D	Soda Ash	3D
Flour	7B	Soybeans, Cracked	3D
Fly Ash	3D	Soybean, Flake	7A
Glass Batch	3D	Soybean, Flour	7A
Gravel	3D	Soybean Meal	3D
Iron Ore, Crushed	3D	Soybean, Whole	3D
Kaolin Clay	3D	Sugar Beets, Whole	6H
Lime, Hydrated	5A	Sugar Refined	7B
Lime, Stone	3D	Sunflower Seed	7A
Oats	4B	Taconite Pellets	3D
Peanuts in Shell	7A	Talcum Powder	3D
Peanuts, Shelled	3D	Walnut Shells, Crushed	3D
Perlite	7A	Wheat	8A
Phosphate, Rock	3D	Wheat, Wet	5A
Polyethylene Powder	7A	Wood, Chips	6G
Polyethylene Resin	17	Wood, Dust	6G
Polypropylene Fluff	7A		

*Diaphragm codes become 4th and 5th characters in model number

SUSPENSION MOUNTING

Suspension mounting is normally used for high level monitoring in vessels. For product over 20 lb/ft³, the level switch (diaphragm face) should be located about 1/3 of the distance from the vessel wall to the point of entry of the product. For product less than 20 lb/ft³, the unit should be located closer to the point of entry of the product, about 1/2 the distance from the vessel wall to the point of entry. Pressure required to depress the diaphragm and trip the switch is in the range of 5 to 15 oz in the horizontal direction (perpendicular to the diaphragm). Suspension mounting provides the easiest vertical adjustment capability, greatest sensitivity and best maintenance conditions.



SUSPENSION ASSEMBLY KITS

Pre-assembled kits are available from the factory, or you can build your own kits using standard pipe fittings shown in our Proximity Bill of Materials (Form No. 101). Pipes and fittings are normally galvanized steel, but aluminum and SS pipes and fittings are available. Units are secured to a steel cover plate that rests on a rectangular steel flange welded into the top of the vessel. Aluminum and stainless coverplates and flanges are also available. Standard 48" L x 1" pipe provides working depth (WD) up to 48". Longer pipe (to provide greater WD) is available. GS Series switches have upper (L1 = 28" standard) and lower (L2 = 20" standard) 1" pipes, with a tee (for stilling pot) in between. A stilling pot is required to equalize pressure and keep dirt from building up behind the diaphragm. PS series require a 1/2" conduit in 1" suspension pipe for explosion-proof applications. The 1/2" conduit (56" standard length) is a standard part of the GS series assembly.

MODEL CHART - ALUMINUM FLANGE ADAPTER RINGS

Model	Tank Outside Diameter	Model	Tank Outside Diameter
126-009	15"	126-016	84"
126-010	30"	126-017	96"
126-011	36"	126-018	10"
126-012	42"	126-019	12"
126-013	48"	126-020	14"
126-014	60"	126-021	24"
126-015	72"		

MODEL CHART - "P" AND "G" SERIES SUSPENSION ASSEMBLY KITS

Model	Description
901-409	"P" Series suspension assembly includes 1/2" pipe (56" std length), 1" pipe (48" std length), 1" pipe coupling, 1-1/2 NPT strain relief on 1" pipe. Galvanized mild steel pipe, explosion proof, standard.
901-412	"G" Series suspension assembly includes 1/2" pipe (56" std length), watertight strain relief and 1" coupling, upper 1" pipe (28" std length), lower 1" pipe (20" std length), strain relief with 1-1/2" NPT, 1"x1"x1" Tee, 1" street ell and 1" pipe-4" long stilling pot. Galvanized steel pipe, explosion proof, standard.

Note: Specials include aluminum or stainless steel assemblies. Flange port and cover assemblies are sold separately. Consult factory for details.

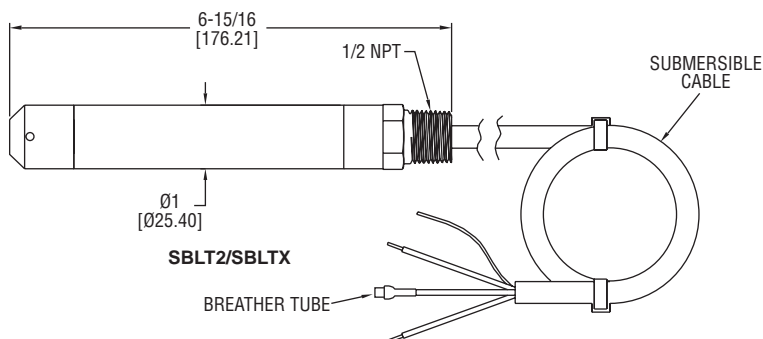
MODEL CHART									
Example	E	-X	-G	-S	-D	-3D	-A	E-X-G-S-D-3D-A*	
Certification 1	E							Explosion-proof ultra mag™ level switches	
Certification 2		EX						Explosion-proof (UL & CSA) Class I, Div I & II, Groups C & D; Class II, Div I & II, Groups E, F, & G Explosion-proof (CSA) Class II, Div I & II, Groups F & G General purpose (no code)	
Basic Magnetic Pressure Sensing Series			G	P				Elastomeric diaphragm-venting required*. (Diaphragms 1A - 8A) Breathable fabric diaphragm-no venting required. (Diaphragms 16 & 17 only)	
Mounting (Top = Suspension/ Side = Flanged)				S	F	T		Suspended (G series require suspension vent fittings)* Subtract 10 lbs./cu. ft.-greater sensitivity Flanged, aluminum standard Flanged, 304 SS	
Housing Material					D	A	E	Aluminum Aluminum, anodized Aluminum, epoxy coated	
Diaphragm Material (Temperature) (Bulk Density)						3D		Urethane, .031" thick, (10 to 150°F), (> 30 lb/ft ³)	
						3E		Urethane, orange, .062" thick, (10 to 150°F), (> 90 lb/ft ³)	
						4B		Buna-N, black, .020" thick, (-20 to 212°F), (20 to 90 lb/ft ³)	
						5A		PTFE/glass on silicone rubber, .024" thick, (-40 to 350°F), (> 35 lb/ft ³)	
						6D		Silicone rubber, gray, .062" thick, (-40 to 350°F), (15 to 30 lb/ft ³)	
						6E		Silicone rubber on glass, red, .032" thick, (-40 to 350°F), (> 90 lb/ft ³)	
						6G		"6C" w/urethane overlay, (-40 to 350°F), (wood chips diaphragm with "A2")	
						7A		Silicone rubber on glass (White), .015" thick, (-40 to 350°F), (5 to 40 lb/ft ³)	
						7B		Buna-N (food applications-white), .060" thick, (-20 to 212°F), (30 to 90 lb/ft ³)	
						8A		EPDM, black, .036" thick, (-40 to 275°F), (40 to 90 lb/ft ³)	
						16		Polyester filter fabric, white, 150 micron permeability, (-30 to 275°F), (30 to 90 lb/ft ³)	
						17		Polyester nitex, white, 15 micron permeability (-30 to 275°F), (30 to 90 lb/ft ³)	
Switch Type							A	Standard, SPDT, 15 A @ 125, 250 VAC	
							T	High temp, SPDT, 5 A @ 125, 250 VAC; 24 VDC**	
							V	High vibration, SPDT, 15 A @ 125, 250 VAC	
							G	Gold contacts, SPDT, 1 A @ 125 VAC, 1/2 A @ 24 VDC	
Special Controls							A2	Wood chip control (with "6G" diaphragm only)	
							A3	High sensitivity actuator (for very light product)	

*GS - G series suspended controls require suspension vent fittings. **Non-UL/CSA listed

Note: The "EX" prefix must be added to the 6-digit model number for "explosion-proof standard". General purpose units do not require the "EX" or other prefix.

SUBMERSIBLE LEVEL TRANSMITTERS

Perfect for Ground Water and Wells, Lightning Protected



The **SERIES SBLT2 & SBLTX** Submersible Level Transmitters are manufactured for years of trouble free service. These series measure the height of liquid above the position in the tank referenced to atmospheric pressure. The transmitter consists of a piezoresistive sensing element, encased in a 316 SS housing.

FEATURES/BENEFITS

- Slim design for tight applications with bullet nose design which protects the diaphragm from damage
- Incorporates lightning and surge protection utilizing dual arrestor technology, grounded to case, eliminating both power supply surges and lightning ground strike transients (surge protection is not guaranteed and is not covered by warranty) on SBLT2 models
- Maintenance free filter eliminates particulate or water droplets from entering the transducer
- UL approved intrinsically safe on SBLTX models for use in hazardous locations when used with proper barrier
- 270 lb tensile strength shielded and vented cable
- Excellent chemical compatibility
- NPT connection allows the unit to be rigidly installed in a pipe/conduit, or the addition of a A-625 hanging loop for attaching a chain for pulling out of the installation

APPLICATIONS

- Well monitoring
- Ground water monitoring
- Environmental remediation
- Surface water monitoring
- Down hole
- Water tanks

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: 316 SS, 316L SS, epoxy; Cable: Polyurethane or ETFE; Bullet nose: PVC.
Accuracy: $\pm 0.25\%$ FS.
Temperature Limit: SBLT2: 0 to 150°F (-18 to 66°C); SBLTX: 0 to 176°F (-18 to 80°C).
Compensated Temperature Range: SBLT2: 0 to 140°F (-18 to 60°C); SBLTX: 0 to 176°F (-18 to 80°C).
Thermal Effect: $\pm 0.02\%$ FS/°F.
Pressure Limit: 2X FS.
Power Requirement: SBLT2: 10 to 30 VDC (≤ 1000 ft (305 m) of cable); SBLTX: 10 to 28 VDC.
Output Signal: 4 to 20 mA DC, 2-wire.
Response Time: 50 ms.
Max. Loop Resistance: 900 Ω at 30 VDC.
Electrical Connections: Wire pigtail.
Mounting Orientation: Suspended in tank below level being measured.
Electrical Protection: SBLT2: Lightning and surge protection; SBLTX: None.
Weight: 2.2 lb (1.0 kg).
Agency Approvals: SBLT2: CE; SBLTX: CE, cULus intrinsically safe for Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III Div. 1. (according to control drawing 01-700797-00)*.

*Up to 196 ft (59.5 m) for ETFE cable; Up to 333 ft (101.5 m) for polyurethane cable

MODEL CHART

Model	Range psi* (ft w.c.) [m w.c.]	Cable Length ft (m)	Cable Type
SBLT2-5-40-ETFE	5 (11.54) [3.52]	40 (12.2)	ETFE
SBLT2-10-40-ETFE	10 (23.09) [7.04]	40 (12.2)	ETFE
SBLT2-15-60-ETFE	15 (34.63) [10.56]	60 (18.3)	ETFE
SBLT2-20-60-ETFE	20 (46.18) [14.08]	60 (18.3)	ETFE
SBLT2-5-40	5 (11.54) [3.52]	40 (12.2)	Polyurethane
SBLT2-10-40	10 (23.09) [7.04]	40 (12.2)	Polyurethane
SBLT2-15-60	15 (34.63) [10.56]	60 (18.3)	Polyurethane
SBLT2-20-60	20 (46.18) [14.08]	60 (18.3)	Polyurethane
SBLT2-3.5M-5M	4.97 (11.48) [3.5]	16.40 (5)	Polyurethane
SBLT2-5M-10M	14.21 (32.81) [10]	32.81 (10)	Polyurethane
SBLT2-10M-18M	25.58 (59.06) [18]	59.06 (18)	Polyurethane

*Configured ranges below 5 psi (11.54 ft w.c.) (3.52 m w.c.) $\pm 1\%$ FS accuracy

Note: For intrinsically safe approval, change model number from SBLT2 to SBLTX. For custom ranges or cable lengths, contact factory.

ACCESSORIES

Model	Description
MTL5041	Intrinsically safe galvanic isolator
MTL7706	Intrinsically safe zener barrier
A-297	Dessicant filter for vent tube. Removes humidity for protection of the sensor. Changes color to show saturation
A-625	316 SS cable hanger use with NPT option for attaching chain for easy pulling out of application



A-297

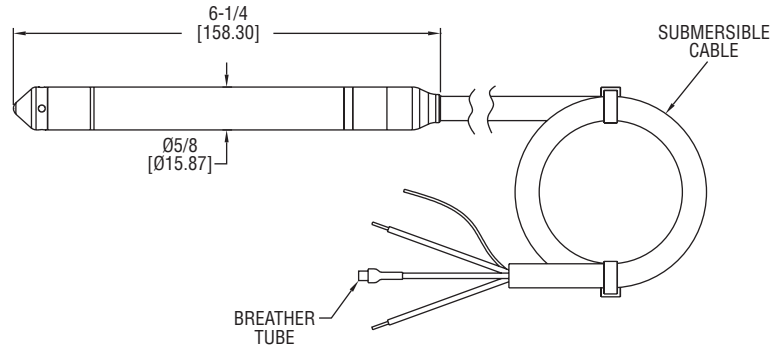
A-625

MINIATURE SUBMERSIBLE LEVEL TRANSMITTER

Only 0.63" (16 mm) in Diameter, Perfect for Wells and Boreholes, Up to $\pm 0.10\%$ Accuracy, Low Power Models for Telemetry Systems



NEW!
Low Power Models



The **SERIES MBLT** Miniature Submersible Level Transmitters measure the height of liquid above the position in the tank referenced to atmospheric pressure. The transmitter consists of a piezoresistive sensing element, encased in a 0.63" (16 mm) diameter 316 SS housing.

FEATURES/BENEFITS

- Slender 0.63" (16 mm) diameter design fits in narrow openings
- Constructed for years of trouble free service with welded 316 SS body and 316 SS nose cap
- Body top is 316 SS and tapered to prevent damage or snares when pulling the unit out of the installation
- $\pm 0.10\%$ or $\pm 0.25\%$ FS accuracy output is better than BFSL or BSL rated outputs used by most competitors
- Maintenance free filter eliminates particulate or water droplets from entering the transducer
- Comes with a choice of polyether polyurethane or ETFE cable materials for excellent chemical compatibility
- Incorporates lightning and surge protection, eliminating both power supply surges and lightning ground strike transients (surge protection is not guaranteed and is not covered by warranty)

APPLICATIONS

- Ballast tanks
- Ground water monitoring
- Surface water monitoring
- Dewatering
- Down hole
- Remote telemetry
- Remote flood monitoring
- Narrow conduit or pipe installations
- Remediation and environmental monitoring

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Body and nose: 316 SS; Cable: Polyether polyurethane or ETFE; Seals: Fluoroelastomer; Label: Polyolefin.
Accuracy: $\pm 0.25\%$ or $\pm 0.10\%$ FS**.
Temperature Limits: -4 to 176°F (-20 to 80°C).
Compensated Temperature Limits: 0.25%: (0 to 70°C); 0.10%: (0 to 60°C).
Thermal Effect: 0.25%: $\pm 0.45\%$ FS TEB; 0.10%: $\pm 0.30\%$ FS TEB.
Pressure Limit: 2x FS.
Power Requirements: Current output: 10 to 33 VDC; Voltage output: 8 to 33 VDC; 5 mA max (no load).

Output Signal: 4 to 20 mA DC 2-wire or 0 to 5 V* (model depending).
Response Time: < 50 ms.
Max Loop Resistance: 1000 Ω @ 30 VDC (current output).
Voltage Output Impedance: 10 Ω + 4.4 Ω / 100' cable (voltage output).
Electrical Connections: Wire pigtail.
Mounting Connection: Suspended below point being monitored.
Electrical Protection: Surge/lightning protected per EN61000-4-5, Class 5.
Weight: Body: 0.235 lb (0.107 kg); Cable: 0.037 lb (0.017 kg) per foot.
Agency Approvals: CE.

*Consult factory for additional outputs.

**4.3 to 4.9 psi (10 to 11.54 in w.c.) configured ranges $\pm 0.30\%$ FS accuracy

OPTIONS

For custom ranges, cable lengths, or ETFE cable, contact the website.

ACCESSORY

Model	Description
A-297	Dessicant filter for vent tube. Removes humidity for protection of the sensor. Changes color to show saturation

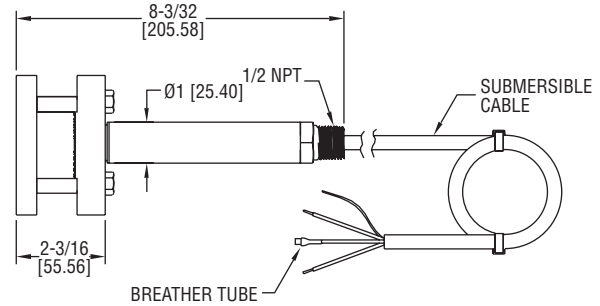
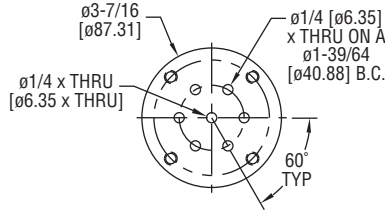
A-297

MODEL CHART					
4 to 20 mA output Model $\pm 0.10\%$	4 to 20 mA output Model $\pm 0.25\%$ **	0 to 5 V output Model $\pm 0.25\%$ **	Range psi (' w.c.) [m w.c.]	Cable Length	Cable Type
-	MBLT-2SC-IVPP-5-40	MBLT-2SC-VVPP-5-40	5 (11.54) [3.52]	40 ft	Polyether polyurethane
-	MBLT-2SC-IVPF-15-40	MBLT-2SC-VVPF-15-40	6.50 (15) [4.57]	40 ft	Polyether polyurethane
-	MBLT-2SC-IVPM-5-12.2	MBLT-2SC-VVPM-5-12.2	7.10 (16.40) [5]	12.2 m	Polyether polyurethane
-	MBLT-2SC-IVPM-10-30**	MBLT-2SC-VVPM-10-30**	14.22 (32.84) [10]	9.14 m	Polyether polyurethane
MBLT-2SB-IVPF-20-40	MBLT-2SC-IVPF-20-40	MBLT-2SC-VVPF-20-40	8.66 (20) [6.10]	40 ft	Polyether polyurethane
MBLT-2SB-IVPF-30-50	MBLT-2SC-IVPF-30-50	MBLT-2SC-VVPF-30-50	12.99 (30) [9.14]	50 ft	Polyether polyurethane
MBLT-2SB-IVPM-10-15.2	MBLT-2SC-IVPM-10-15.2	MBLT-2SC-VVPM-10-15.2	14.21 (32.81) [10]	15.2 m	Polyether polyurethane
MBLT-2SB-IVPF-50-70	MBLT-2SC-IVPF-50-70	MBLT-2SC-VVPF-50-70	21.65 (50) [15.24]	70 ft	Polyether polyurethane
MBLT-2SB-IVPM-20-26	MBLT-2SC-IVPM-20-26	MBLT-2SC-VVPM-20-26	28.42 (65.62) [20]	26 m	Polyether polyurethane
MBLT-2SB-IVPM-30-36	MBLT-2SC-IVPM-30-36	MBLT-2SC-VVPM-30-36	42.63 (98.43) [30]	36 m	Polyether polyurethane
MBLT-2SB-IVPF-100-120	MBLT-2SC-IVPF-100-120	MBLT-2SC-VVPF-100-120	43.31 (100) [30.48]	120 ft	Polyether polyurethane
MBLT-2SB-IVPM-40-46	MBLT-2SC-IVPM-40-46	MBLT-2SC-VVPM-40-46	56.83 (131.23) [40]	46 m	Polyether polyurethane
MBLT-2SB-IVPF-150-170	MBLT-2SC-IVPF-150-170	MBLT-2SC-VVPF-150-170	64.96 (150) [45.72]	170 ft	Polyether polyurethane
MBLT-2SB-IVPM-60-66	MBLT-2SC-IVPM-60-66	MBLT-2SC-VVPM-60-66	85.25 (196.85) [60]	66 m	Polyether polyurethane
MBLT-2SB-IVPF-200-220	MBLT-2SC-IVPF-200-220	MBLT-2SC-VVPF-200-220	86.62 (200) [60.96]	220 ft	Polyether polyurethane
MBLT-2SB-IVPF-350-370	MBLT-2SC-IVPF-350-370	MBLT-2SC-VVPF-350-370	151.58 (350) [106.68]	370 ft	Polyether polyurethane
MBLT-2SB-IVPM-100-106	MBLT-2SC-IVPM-100-106	MBLT-2SC-VVPM-100-106	142.09 (328.08) [100]	106 m	Polyether polyurethane
MBLT-2SB-IVPM-200-206	MBLT-2SC-IVPM-200-206	MBLT-2SC-VVPM-200-206	284.18 (656.17) [200]	206 m	Polyether polyurethane
MBLT-2SB-IVPF-690-710	MBLT-2SC-IVPF-690-710	MBLT-2SC-VVPF-690-710	298.83 (690) [210.31]	710 ft	Polyether polyurethane

**4.3 to 4.9 psi (10 to 11.54 in w.c.) configured ranges $\pm 0.30\%$ FS accuracy

SUBMERSIBLE LEVEL TRANSMITTERS

Perfect for Sludge and Slurries, Lightning Protected



PBLT2/PBLTX



The **SERIES PBLT2 & PBLTX** Submersible Level Transmitters are manufactured for years of trouble free service in the harshest applications. These Series measure the height of liquid above the position in the tank referenced to atmospheric pressure. The transmitter consists of a piezoresistive sensing element, encased in a 316 SS housing with cage and large diameter 316 SS diaphragm seal.

FEATURES/BENEFITS

- Durable cage design with large diameter 316 SS diaphragm seal that is non-clogging and damage resistant to floating solids
- Incorporates lightning and surge protection utilizing dual arrestor technology, grounded to case, eliminating both power supply surges and lightning ground strike transients (surge protection is not guaranteed and is not covered by warranty) on PBLT2 models
- Maintenance free filter eliminates particulate or water droplets from entering the transducer
- UL approved intrinsically safe on PBLTX models for use in hazardous locations when used with proper barrier
- 270 lb tensile strength shielded and vented cable
- Excellent chemical compatibility
- NPT connection allows the unit to be rigidly installed in a pipe/conduit, or the addition of a A-625 hanging loop for attaching a chain for pulling out of the installation

APPLICATIONS

- Wastewater
- Sludge pits, clarifiers, digesters
- Alum tanks
- Chemical storage tanks
- Oil tanks
- Lime slurry
- Sumps
- Reservoirs

SPECIFICATIONS

Service: Compatible liquids.

Wetted Materials: 316 SS, 316L SS, epoxy, cable: ETFE or polyurethane.

Accuracy: $\pm 0.25\%$ FS (includes linearity, hysteresis, and repeatability).

Temperature Limit: PBLT2: 0 to 200°F (-18 to 93°C); PBLTX: 0 to 176°F (-18 to 80°C).

Compensated Temperature Range: PBLT2: 0 to 180°F (-18 to 82°C); PBLTX: 0 to 176°F (-18 to 80°C).

Thermal Effect: $\pm 0.02\%$ FS/°F.

Pressure Limit: 2X FS.

Power Requirement: PBLT2: 13 to 30 VDC, PBLTX: 10 to 28 VDC.

Output Signal: 4 to 20 mA DC, two wire.

Response Time: 50 ms.

Loop Resistance: 900 Ω .

Electrical Connection: Wire pigtail.

Mounting Orientation: Suspended in tank below level being measured.

Electrical Protection: PBLT2: Lightning and surge protection, PBLTX: none.

Weight: 4.3 lb (2.0 kg).

Agency Approvals: PBLT2: CE, PBLTX: CE, cULus intrinsically safe for Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III, Div. 1. (According to control drawing 01-700797-00)*.

*Up to 196 ft (59.5 m) for ETFE cable; Up to 333 ft (101.5 m) for polyurethane cable

MODEL CHART

Model	Range psi* (ft w.c.) [m w.c.]	Cable Length ft (m)	Cable Type
PBLT2-5-40	5 (11.54) [3.52]	40 (12.2)	ETFE
PBLT2-10-40	10 (23.09) [7.04]	40 (12.2)	ETFE
PBLT2-15-60	15 (34.63) [10.56]	60 (18.3)	ETFE
PBLT2-20-60	20 (46.18) [14.08]	60 (18.3)	ETFE
PBLT2-5-40-PU	5 (11.54) [3.52]	40 (12.2)	Polyurethane
PBLT2-10-40-PU	10 (23.09) [7.04]	40 (12.2)	Polyurethane
PBLT2-15-60-PU	15 (34.63) [10.56]	60 (18.3)	Polyurethane
PBLT2-20-60-PU	20 (46.18) [14.08]	60 (18.3)	Polyurethane
PBLT2-3.5M-5M-PU	4.97 (11.48) [3.5]	16.40 (5)	Polyurethane
PBLT2-5M-10M-PU	7.10 (16.38) [5]	32.81 (10)	Polyurethane
PBLT2-10M-18M-PU	14.21 (32.78) [10]	59.06 (18)	Polyurethane

*Configured ranges below 5 psi (11.54 ft w.c.) (3.52 m w.c.) $\pm 1\%$ FS accuracy

Note: For intrinsically safe approval, change model number from PBLT2 to PBLTX. For custom ranges or cable lengths, contact factory.

ACCESSORIES

Model	Description
MTL5041	Intrinsically safe galvanic isolator
MTL7706	Intrinsically safe zener barrier
A-297	Dessicant filter for vent tube. Removes humidity for protection of the sensor. Changes color to show saturation
A-625	316 SS cable hanger use with NPT option for attaching chain for easy pulling out of application



A-297

A-625

FLUSH TIP SUBMERSIBLE LEVEL TRANSMITTER

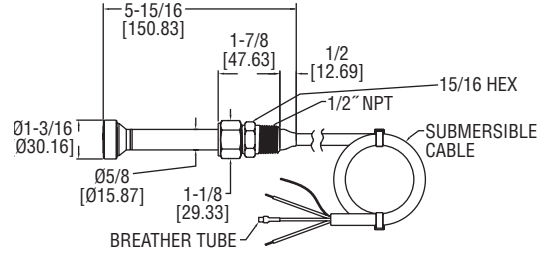
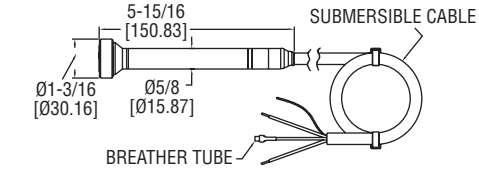
Perfect for Sludge and Slurries, Lightning Protected, $\pm 0.25\%$ Accuracy, Slim Body



FBLT



FBLT with NPT Option



NPT Option

The **SERIES FBLT** Flush Submersible Level Transmitters measure the height of liquid above the position in the tank referenced to atmospheric pressure. The transmitter consists of a piezoresistive sensing element, encased in a narrow 316 SS housing with PTFE coated flush diaphragm tip.

FEATURES/BENEFITS

- Flush diaphragm tip will not clog in harsh applications
- Maintenance free filter eliminates particulate or water droplets from entering the transducer
- Comes with a choice of polyether polyurethane or ETFE cable materials for excellent chemical compatibility
- Incorporates lightning and surge protection, eliminating both power supply surges and lightning ground strike transients (surge protection is not guaranteed and is not covered by warranty)
- Narrow body design allows the FBLT to fit into stilling wells and narrow installations
- Robust FKM fluoroelastomer diaphragm that is PTFE coated for a stick resistant surface holds up in aggressive fluids
- Diaphragm cavity is filled with a gel that will not leak out versus oil or grease
- Optional NPT connection allows the unit to be rigidly installed in a pipe/conduit, or the addition of the A-625 hanging loop for attaching a chain for pulling out of the installation

APPLICATIONS

- Sewage lift stations
- Industrial slurries
- Industrial sumps
- Landfill leachate
- Reservoirs
- Sludge pits
- Oil tanks

MODEL CHART			
Model	Range psi (' w.c.) [m w.c.]	Cable Length	Cable Type
FBLT-2SC-IVPF-10-20*	4.33 (10) [3.05]	20'	Polyurethane
FBLT-2SC-IVPF-10-30*	4.33 (10) [3.05]	30'	Polyurethane
FBLT-2SC-IVPP-5-40	5 (11.54) [3.52]	40'	Polyurethane
FBLT-2SC-IVPF-10-40*	4.33 (10) [3.05]	40'	Polyurethane
FBLT-2SC-IVPF-15-40	6.50 (15) [4.57]	40'	Polyurethane
FBLT-2SC-IVPF-20-40	8.66 (20) [6.10]	40'	Polyurethane
FBLT-2SC-IVPF-30-50	12.99 (30) [9.14]	50'	Polyurethane
FBLT-2SC-IVPE-5-40	5 (11.54) [3.52]	40'	ETFE
FBLT-2SC-IVEF-15-40	2.82 (15) [4.57]	40'	ETFE
FBLT-2SC-IVEF-20-40	8.66 (20) [6.10]	40'	ETFE
FBLT-2SC-IVEF-30-50	12.99 (30) [9.14]	50'	ETFE
FBLT-2SC-IVPE-10-40	10 (32.09) [7.04]	40'	ETFE
FBLT-2SC-IVPE-15-60	15 (34.63) [10.56]	60'	ETFE
FBLT-2SC-IVPP-10-40	10 (32.09) [7.04]	40'	Polyurethane
FBLT-2SC-IVPP-10-60	10 (32.09) [7.04]	60'	Polyurethane
FBLT-2SC-IVPP-15-60	15 (34.63) [10.56]	60'	Polyurethane
FBLT-2SC-IVPF-35-60	15.16 (35) [10.67]	60'	Polyurethane
FBLT-2SC-IVPP-20-60	20 (196.85) [60]	60'	Polyurethane

*4.3 to 4.9 psi (10 to 11.54 in w.c.) configured ranges $\pm 0.30\%$ FS accuracy

Note: Cables can be ordered shorter or longer in polyurethane or ETFE. Other ranges are available and can be ordered in psi, ft w.c., or m w.c. Please see website.

SPECIFICATIONS

Service: Compatible liquids.
Wetted Materials: Body: 316 SS; Cable: Polyether polyurethane or ETFE; Diaphragm: PTFE coated FKM fluoroelastomer; Label: Polyethylene polyamid.
Accuracy: $\pm 0.25\%$ FS (10' w.c. range is $\pm 0.30\%$ FS).
Temperature Limits: -4 to 176°F (-20 to 80°C).
Compensated Temperature Limits: 32 to 140°F (0 to 60°C).
Thermal Effect: $\pm 0.0075\%/^{\circ}\text{F}$ ($\pm 0.0135\%/^{\circ}\text{C}$).
Pressure Limit: 2x range.
Power Requirements: 10 to 33 VDC.
Output Signal: 4 to 20 mA DC 2-wire.
Response Time: < 50 ms.
Max Loop Resistance: 1000 Ω @ 30 VDC.
Electrical Connections: Wire pigtail.
Mounting Connection: Suspended below point being monitored.
Electrical Protection: Surge/lightning protected per EN61000-4-5, Class 5.
Weight: Body: 0.3 lb (0.136 kg); Cable: 0.037 lb (0.009 kg) per foot.
Agency Approvals: CE.

OPTIONS

To order add suffix:	Description
-NPT	1/2" NPT connection to connect conduit, piping, or cable hanger. All 316 SS
-FC	Factory calibration certificate

Example: FBLT-2SC-IVPF-20-40-FC

ACCESSORIES

Model	Description
A-297	Dessicant filter for vent tube. Removes humidity for protection of the sensor. Changes color to show saturation
A-625	316 SS cable hanger use with NPT option for attaching chain for easy pulling out of application



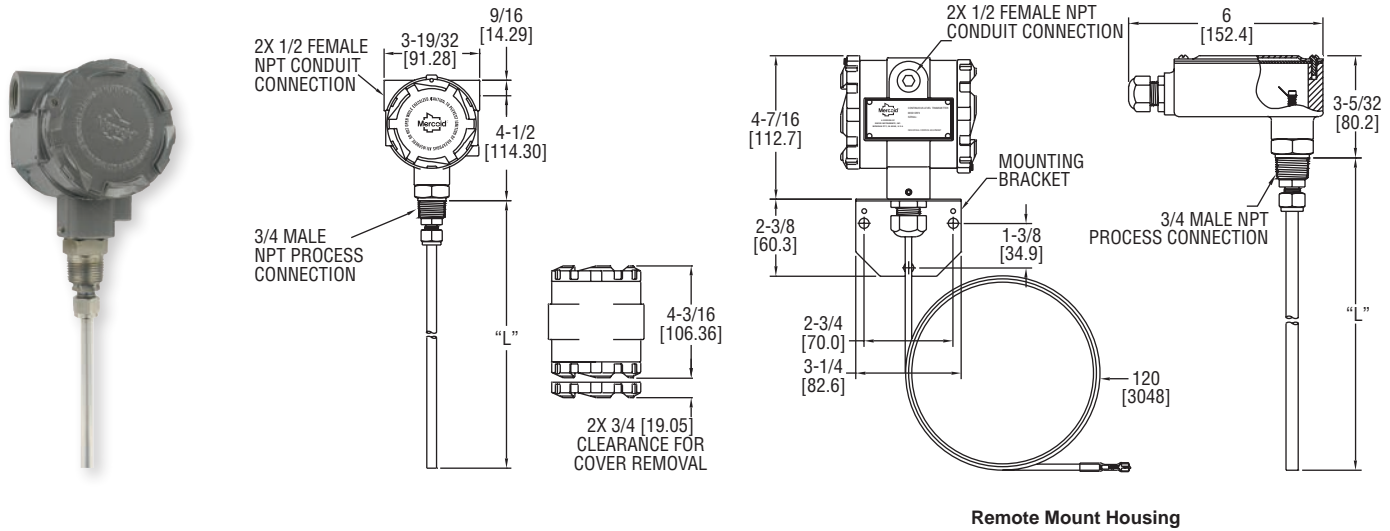
A-297



A-625

CAPACITIVE LEVEL TRANSMITTER

Powder, Bulk or Liquids, No-Moving Parts, Excellent Chemical Resistance



The **SERIES CRF2** Capacitive Level Transmitters provide a two-wire 4 to 20 mA output to indicate level of liquids, powders and bulk materials. The CRF2 senses capacitance changes resulting from the height of the material in the tank between the probe and the tank wall. In non-metallic tanks or tanks that do not have the wall parallel to the probe a ground reference must be used.

FEATURES/BENEFITS

- State of the art sensing technology, uses impulse RF admittance measurement which provides excellent accuracy and stability
- Comes with either a rigid or flexible probe depending on application installation need and probe length required
- Easy push button calibration of zero and span
- Any length probe can be customer ordered for any specific application
- FEP covered probe is ideal for use with corrosive media
- Immune to external RF sources like walkie-talkies and cell phones as well as minimal interference with radio communication or other electronic systems

APPLICATIONS

- Pulp and paper processing
- Chemical processing
- Food and beverage
- Aggregates
- Plastics
- Mining

SPECIFICATIONS

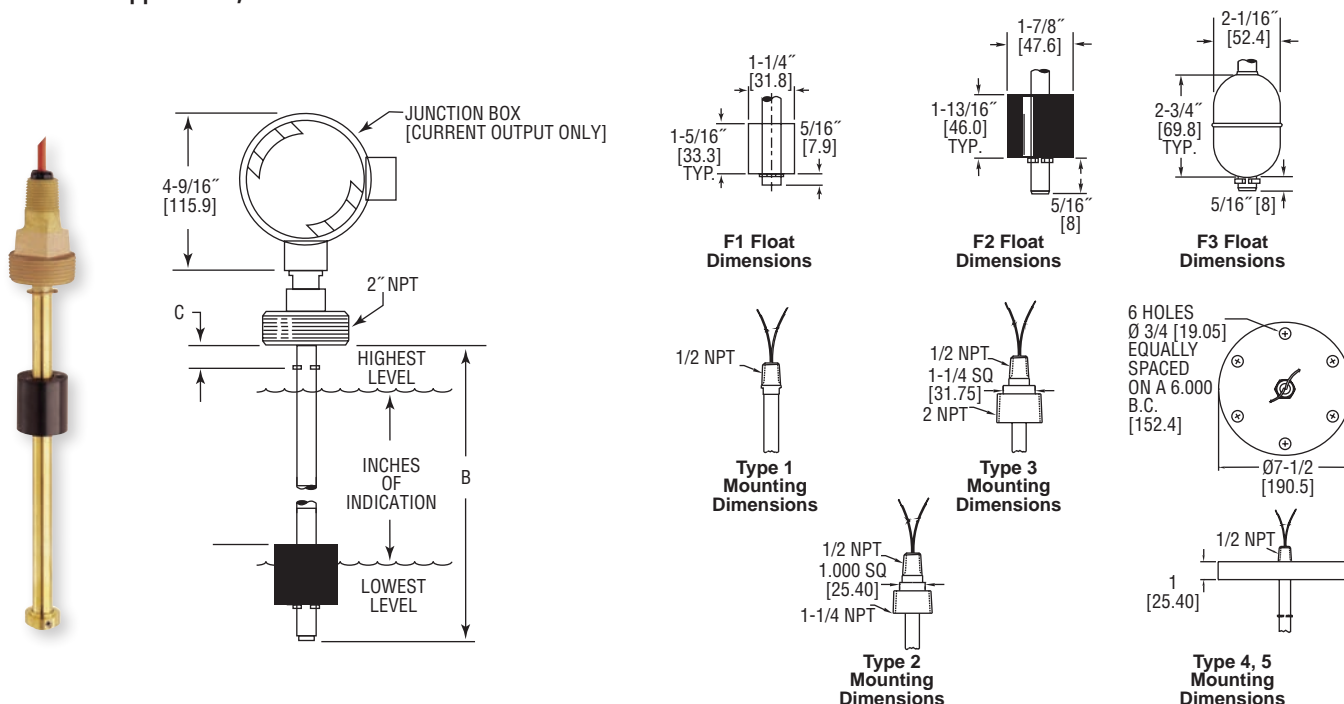
Service: Liquids, powders, and bulk materials compatible with wetted materials.
Wetted Materials: Standard: Rod/cable: FEP, Connection: 316 SS; Ground option: Rod/cable and connection: 316 SS; Cable spacers: PVC; Flange option: Material of flange.
Capacitance Range: 0 to 2000 pF.
Sensitivity: 0.15 pF.
Minimum Span: 8 pF.
Accuracy: ± 0.5 pF or $\pm 0.25\%$ of span, whichever is greater.
Repeatability: ± 0.25 pF or $\pm 0.1\%$ of span, whichever is greater.
Temperature Limits: Ambient: -40 to 185°F (-40 to 85°C); Process: -40 to 250°F (-40 to 121°C).
Pressure Limit: 100 psi (6.9 bar).
Power Requirements: 12 to 35 VDC.
Output Signal: 4 to 20 mA or 20 to 4 mA, 2 wire.
Response Time: 0.5 s.
Electrical Connection: Screw terminal.
Conduit Connection: 1/2" NPT female.
Process Connection: Standard: 3/4" NPT male; Optional: See model chart.
Enclosure Rating: NEMA 4X (IP66) weather tight/corrosion resistant.
Spark/Static Protection: $10^6 \Omega$ dissipation resistance with spark gap. Surge current to 100 A max.
Calibration: Zero, span, 4 mA, 20 mA.
Mounting Orientation: Vertical.
Weight: 6 ft rod type: 3.6 lb (1.63 kg).

MODEL CHART

Example	CRF2	-W	R	0	1T	-048	-M20	CRF2-WR01T-048-M20
Series	CRF2							Capacitive level transmitter
Enclosure		W	R					Weatherproof Remote mount weatherproof housing
Probe Type			R					Rod Cable
Ground			C					None included Attached ground rod (3" or 4" flange process connection types only) Unattached ground rod
Process Connection				0	1T			3/4" NPT male
				A	2T			1" NPT male
				U	3T			1-1/2" NPT male
					1B			3/4" BSPT
					2B			1" BSPT
					3B			1-1/2" BSPT
					1S			1" sanitary clamp
					2S			1-1/2" sanitary clamp
					3S			2" sanitary clamp
					1F			2" 150# flange, 316 SS
					2F			2" 150# flange, PVC
					3F			3" 150# flange, 316 SS
					4F			3" 150# flange, PVC
					5F			4" 150# flange, 316 SS
					6F			4" 150# flange, PVC
Probe Length					XXX			Insertion length in inches. Example 048 is 48" length. Rod type min: 24", max: 144"; Cable type min: 24", max: 360"
Options						M20		M20 conduit connection with cable gland
Examples: CRF2-WR01T-072; CRF2-WR01T-096								

CONTINUOUS LEVEL TRANSMITTER

Customize To Fit Application, 316 SS or Buna-N Floats



The **SERIES CLT** Continuous Level Transmitter provides up to the minute tank level monitoring with a customized level transmitter. Transmitters can be configured for 4 to 20 mA or proportional voltage output, 316 SS or Buna-N stem and floats, and lengths up to 72" (183 cm).

FEATURES/BENEFITS

- Customized stem length, actuation point, distance between floats, and lead wire lengths
- 4 to 20 mA or proportional voltage output outputs continuous level indication

APPLICATIONS

- General purpose level monitoring
- Low specific gravity applications
- Gas and oil

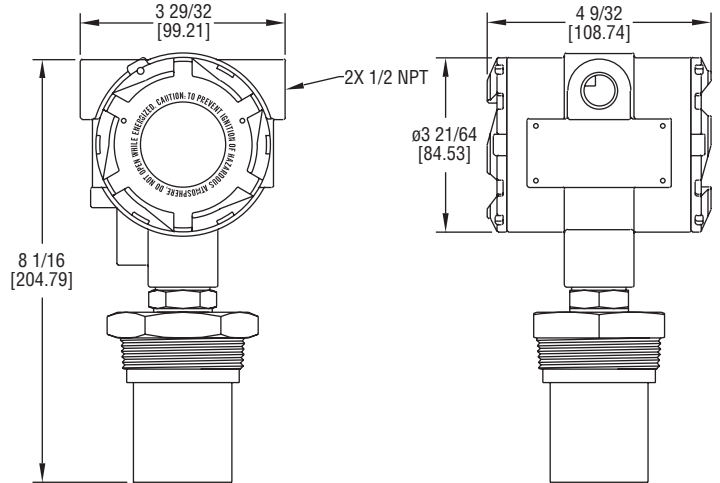
SPECIFICATIONS

Service: Compatible liquids.
Resolution: 1/4" (6.35 mm).
Temperature Limits: Buna-N floats: 180°F (82°C) in water, -40 to 230°F (-40 to 110°C) in oil; SS floats: -40 to 230°F (-40 to 110°C).
Pressure Limits: Buna-N floats: 150 psig (10 bar); SS floats: 300 psig (21 bar).
Power Requirements: Proportional voltage output models: 10 to 30 VDC; 4 to 20 mA output models: 10 to 40 VDC.
Loop Resistance: 1.4k Ω max.
Electrical Connections: Proportional voltage output: 24" (61 cm) free leads #22 AWG, TFE jacketed; 4 to 20 mA output: Junction box.
Enclosure Rating: 4 to 20 mA models, NEMA 4 (IP56) junction box.
Mounting Orientation: Vertical ±20°.

MODEL CHART																									
Example	CLT	-V	S	5	F3	-20.25	-02.00	-25.75	CLT-VS5F3-20.25-02.00-25.75																
Construction	CLT								Continuous level transmitter																
Output		V C							Voltage, proportional signal of 0 to supply voltage 4 to 20 mA (junction box provided)																
Stem & Connection Material			B S						Brass with beryllium copper stops 316 SS with SS ARMCO PH-15-7MO stops																
Connection Type				1 2 3 4 5					1/2" NPT (output type V only) 1-1/4" NPT (float F1 only) 2" NPT 3" 150# flange, carbon steel (connection material S only) [max. pres. 150 psi (10.3 bar)] 3" 150# flange, 316 SS (connection material S only) [max. pres. 150 psi (10.3 bar)]																
Float Type					F1 F2 F3				<table><tr><th>Material</th><th>Min. s.g.</th><th>Max. Pressure</th><th>Float Factor</th></tr><tr><td>Buna-N</td><td>0.55</td><td>150 psi (10.3 bar)</td><td>2.0" (50.8 mm)</td></tr><tr><td>Buna-N</td><td>0.55</td><td>150 psi (10.3 bar)</td><td>2.5" (63.5 mm)</td></tr><tr><td>316SS</td><td>0.75</td><td>300 psi (20.7 bar)</td><td>3.5" (52.4 mm)</td></tr></table>	Material	Min. s.g.	Max. Pressure	Float Factor	Buna-N	0.55	150 psi (10.3 bar)	2.0" (50.8 mm)	Buna-N	0.55	150 psi (10.3 bar)	2.5" (63.5 mm)	316SS	0.75	300 psi (20.7 bar)	3.5" (52.4 mm)
Material	Min. s.g.	Max. Pressure	Float Factor																						
Buna-N	0.55	150 psi (10.3 bar)	2.0" (50.8 mm)																						
Buna-N	0.55	150 psi (10.3 bar)	2.5" (63.5 mm)																						
316SS	0.75	300 psi (20.7 bar)	3.5" (52.4 mm)																						
Indication Length						00.00			Length that the unit sends an output for level, maximum is 68" (173 cm)																
Top Float Stop "C" Dimension Overall							00.00		Distance from bottom of mounting connection to upper float stop, minimum is 1/4" (6.4 mm)																
Length "B"								00.00	To calculate overall length, add indication length, top float, stop dimension "C", and float factor, maximum length is 72" (1.82 m)																
Note: Models are built to your specifications																									

ULTRASONIC LEVEL TRANSMITTER

Explosion-Proof, Mapping Software, 3" (76.2 mm) Measuring Column



The **SERIES ULT** Ultrasonic Level Transmitter provides non-contact measurement of liquid levels in an explosion-proof body. It is capable of measuring up to 32.8' (10 m) with a PVDF sensor and 4 to 20 mA output.

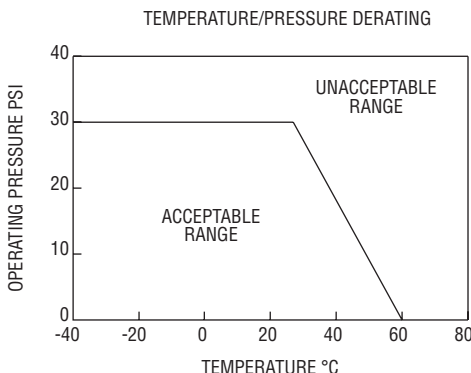
FEATURES/BENEFITS

- Provides reliable, accurate, and non-contact level measurement of compatible liquids
- Non-contact technology offers no moving parts to wear, jam, corrode, or get coated like contact technologies
- Mapping software makes effective measuring surface only a 3" (76.2 mm) diameter column with no concerns of ladders, pipes, or other tank intrusions in the remaining sound cone
- FM approved explosion-proof making it ideal for use in hazardous locations
- Easy programming with 6 digit LCD display and simple menu structure
- Output range is adjustable with choices of inputting tank dimensions or by filling and emptying the tank while calibrating and it automatically and scaling to levels it senses
- Window cover allows easy viewing of display
- Fail-safe output options and diagnostic capabilities

APPLICATIONS

- Water and wastewater
- Pulp and paper processing
- Chemical processing
- Food and beverage

MODEL CHART	
Model	Range
ULT-11	24.6' (7.5 m)
ULT-21	32.8' (10 m)

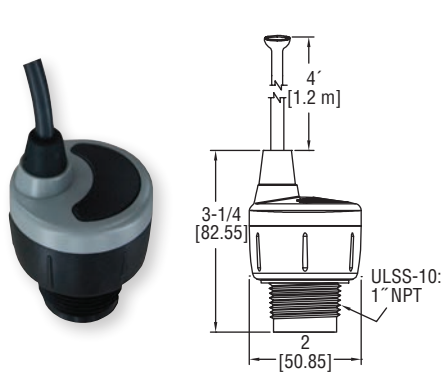


SPECIFICATIONS

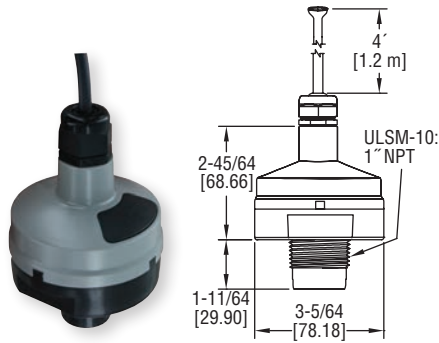
Service: Compatible fluids. Not for use with powder and bulk solids.
Wetted Materials: Sensor: PVDF; Process connection: 303 SS; O-ring: Fluoroelastomer.
Ranges: 24.6' (7.5 m), 32.8' (10 m).
Accuracy: ±0.2% FS.
Resolution: 0.079" (2 mm).
Blind Zone: Under 8" (20 cm).
Beam Width: 3" (7.6 cm) diameter.
Temperature Limits: Ambient: -40 to 140°F (-40 to 60°C); Process: -4 to 140°F (-20 to 60°C).
Temperature Compensation: -40 to 140°F (-40 to 60°C).
Pressure Limits: 30 psi (2 bar) up to 25°C (77°F). Above 25°C (77°F), rating decreases 1.667 psi per 1°C increase. See chart.
Power Requirement: 18 to 28 VDC (two-wire).
Output Signal: 4 to 20 mA or 20 to 4 mA (two-wire).
Max. Loop Resistance: 250 Ω at 24 VDC.
Electrical Connections: Screw terminal.
Conduit Connection: 1/2" NPT female (two) or optional M20.
Process Connection: 2" NPT male or optional BSPT.
Enclosure Rating: Weather-proof meets NEMA 4X (IP66), explosion-proof rated Class I, Div. 1, Groups B, C, D; Class II/III, Div. 1, Groups E, F, G.
Mounting Orientation: Vertical.
Failsafe: On lost echo after 30 seconds, user selectable to 4, 20, 21, 22 mA or last signal.
Memory: Non-volatile.
Display: 6 character LCD.
Units: In, cm, ft, m, percent.
Memory: Non-volatile.
Programming: 4 button.
Weight: 4.0 lb (1.8 kg).
Agency Approvals: CE, FM.

ULTRASONIC LEVEL SENSOR

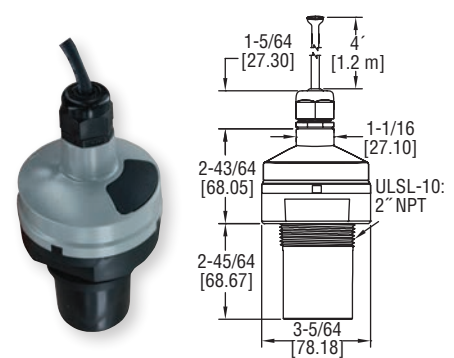
Non-Contact Transmitter, SPST Programmable Relays



ULSS



ULSM



ULSL



The **SERIES ULSS** Ultrasonic Level Sensors provides non-contact, continuous ultrasonic level measurement of fluids for short range applications. It has a 4.1' (1.2 m) measuring range with a 0.125" (3 mm) accuracy.

The **SERIES ULSM** Ultrasonic Level Sensors provides non-contact, continuous ultrasonic level measurement of fluids for medium range applications. It has a 9.8' (3 m) measuring range with a $\pm 0.2\%$ of range accuracy.

The **SERIES ULSL** Ultrasonic Level Sensors provides non-contact, continuous ultrasonic level measurement of fluids for tall range applications. It has a 18' (5.5 m) measuring range with a $\pm 0.2\%$ of range accuracy.

FEATURES/BENEFITS

- Via free software, units can be programmed to transmit an output signal and operate four relays for control applications
- Provides reliable, accurate, and non-contact level measurement of compatible liquids
- Non-contact technology offers no moving parts to wear, jam, corrode, or get coated like contact technologies
- Mapping software makes effective measuring surface only a 3" (76.2 mm) diameter column with no concerns of ladders, pipes, or other tank intrusions in the remaining sound cone
- Ultrasonic technology paired with automatic temperature compensation provides accurate and reliable measurements in almost all conditions
- Fail-safe logic is easily configured to custom applications via free software removing the need for target calibration
- Full NEMA 6P submersible enclosure rating to ensure excellent product durability

APPLICATIONS

- Water and wastewater
- Pulp and paper processing
- Sump and process tanks
- Chemical processing
- Food and beverage

MODEL CHART	
Model	Range
ULSS-10	4.1' (1.25 m)
ULSM-10	9.8' (3 m)
ULSL-10	18' (5.5 m)

Note: USB adapter necessary for calibration. One adapter can program multiple units.

SPECIFICATIONS

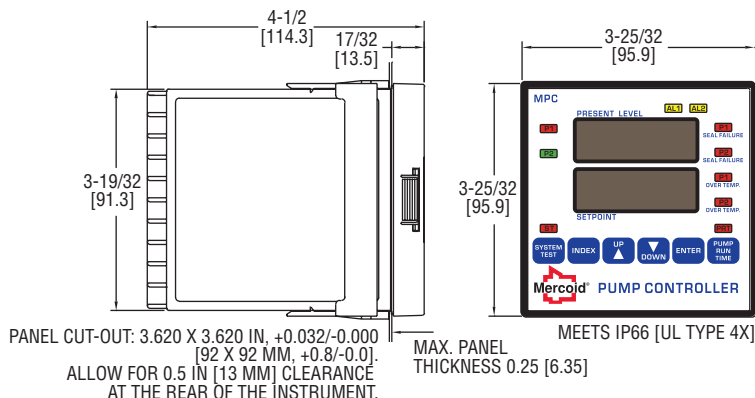
Service: Compatible fluids.
Wetted Materials: Sensor: PVDF; O-ring: FKM.
Ranges: See chart.
Accuracy: ULSS: 0.125" (3 mm); ULSM & ULSL: $\pm 0.2\%$ of range.
Resolution: ULSS: 0.019" (0.5 mm); ULSM: 0.039" (1 mm); ULSL: 0.079" (2 mm).
Blind Zone: ULSS: 2" (5 cm); ULSM: 4" (10 cm); ULSL: 8" (20 cm).
Beam Width: ULSS & ULSM: 2" (5 cm); ULSL: 3" (7.62 cm).
Temperature Limits: Process: 20 to 140°F (-7 to 60°C); Ambient: -31 to 140°F (-35 to 60°C).
Temperature Compensation: Automatic.
Pressure Limit: 30 psi (2 bar).
Power Requirement: 12 to 28 VDC.
Output Signal: 4 to 20 mA, 2-wire; Invert: 4 to 20 mA or 20 to 4 mA; Fail-safe: 4 mA, 20 mA, 21 mA, 22 mA, or hold last.
Loop Resistance: 400 Ω max.
Electrical Connections: 4' (1.2 m) 9 conductor shielded cable.
Contact Type: 4 SPST relays.
Contact Rating: 1 A max @ 28 VDC max.
Deadband: Selectable (no hysteresis, 1/4", 1/2", 1", 1/2 cm, 1 cm, 2 cm, 5 cm or not available).
Process Connection: 1" NPT, 1" BSPP (optional).
Enclosure Rating: NEMA 6P (IP68).
Enclosure Material: Polycarbonate; Gland: TPE.
Mounting Orientation: Vertical.
Memory: Non-volatile.
Failsafe: Contact: Power loss: Holds last contact; Power on: Open, close, or last contact.
Programming: Free PC software download (USB adapter required).
Weight: 1 lb (0.45 kg).
Agency Approvals: CE, RoHS.

ACCESSORIES

Model	Description
ULS-ACC-USB	USB adapter for calibration, PVC
ULS-ACC-121	2" x 1" NPT reducer bushing fitting (sch. 40), PVC
ULS-ACC-122	2" x 1" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-131	3" x 2" NPT reducer bushing fitting (sch. 40), PVC
ULS-ACC-132	3" x 2" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-142	4" x 2" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-221	2" socket x 1" NPT reducer bushing fitting (sch. 40), PVC
ULS-ACC-222	2" socket x 1" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-231	3" socket x 2" NPT reducer bushing fitting (sch. 40), PVC
ULS-ACC-232	3" socket x 2" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-241	4" socket x 2" NPT reducer bushing fitting (sch. 40), PVC
ULS-ACC-242	4" socket x 2" NPT reducer bushing fitting (sch. 80), PVC
ULS-ACC-510	1" NPT polypropylene side mount bracket
ULS-ACC-520	2" NPT polypropylene side mount bracket

PUMP CONTROLLER

One or Two Pump Control with Built-In Alternation, Over Temperature Protection and Seal Failure Monitoring



The **SERIES MPC** Pump Controllers provides versatile level control in a standard 1/4 DIN package. Designed for use with almost any style level transmitter the unit displays the present level and main set point value. Incorporated in the MPC is programmable level differential for on/off control of one or two pumps, valves, or other devices through two SPDT relays.

FEATURES/BENEFITS

- Selectable pump alternation when used with two pumps to minimize pump wear, with alternation "on" a seal failure or over temperature condition will force the non-failed pump to lead status and stop alternation
- Alarms can be programmed for output indication of pump seal failure or over temperature
- Selectable time delay, for pump two, on power up to prevent both pumps from starting at the same time
- In the event of power loss, upon regaining power a time delay of up to 60 seconds can be selected to prevent excessively large current draw
- Integral 24 VDC power supply to power level transmitter
- Displays pump run time from a front panel button
- Test system function simulates the process input to ensure the pumps are operating or to test programming
- User selectable security lock-out of programming and/or set points
- Process input retransmission as a current (4 to 20 mA) or voltage (2 to 10 VDC) analog signal (standard model MPC is set for current retransmission. For voltage retransmission add suffix "-RV")
- Two additional programmable alarm contacts with front alarm light indication
- Front panel face meets NEMA 4X for outdoor panel mounting
- User-friendly programming menu

APPLICATIONS

- Water and wastewater
- Sump and sludge pits, clarifiers, digesters
- Chemical storage tanks
- Oil tanks
- Reservoirs

SPECIFICATIONS

Inputs: 4 (or 0) to 20 mA DC or 2 (or 0) to 10 VDC selectable.
Input Impedance: Current = 10 Ω ; Voltage = 100 K Ω .
Output Ratings: Control relays: SPDT, rated 10 A @ 240 VAC res., 1/4 hp @ 120 VAC, 1/3 hp @ 240 VAC; Alarm relays: SPST, 3 A @ 240 VAC res., 1/10 hp @ 120 VAC.
Control Type: On/off, reverse (pump out) or direct (pump in) acting.
Power Requirements: 100 to 240 VAC nominal, +10%-15%, 50 to 400 Hz, single phase; 132 to 240 VDC nominal, +10%-15%.
Power Consumption: 7.5 VA maximum.
Accuracy: $\pm 0.25\%$ of span, ± 1 least significant digit.
Display: Two 4 digit, 7 segment 0.56" high LED's.
Display Resolution: 1 count.
Memory Backup: Nonvolatile memory (no batteries required).
Serial Communications: Optional RS-232 or RS-485 with Modbus[®] protocol.
Ambient Operating Temperature/RH: 14 to 131°F (-10 to 55°C)/0 to 90% up to 104°F (40°C) non-condensing, 10 to 50% at 131°F (55°C) non-condensing.
Front Panel Rating: Meets UL Type 4X (IP66).
Loop Power Supply (Isolated): 24 VDC @ 50 mA, regulated.
Seal Failure (Moisture Sensor): Power: 2.5 VDC; Search current: 3 micro amps; Resolution: 10K to 500K Ω in 10K Ω steps.
Weight: 16 oz (454 g).
Agency Approvals: CE, cULus.

MODEL CHART

Model	Description
MPC	Pump controller

OPTIONS

To order add suffix:	Description
-232	RS-232 Modbus [®] RTU serial communications
-485	RS-485 Modbus [®] RTU serial communications

ACCESSORY

Weatherproof Enclosures, NEMA 4X (IP66). 

A-901

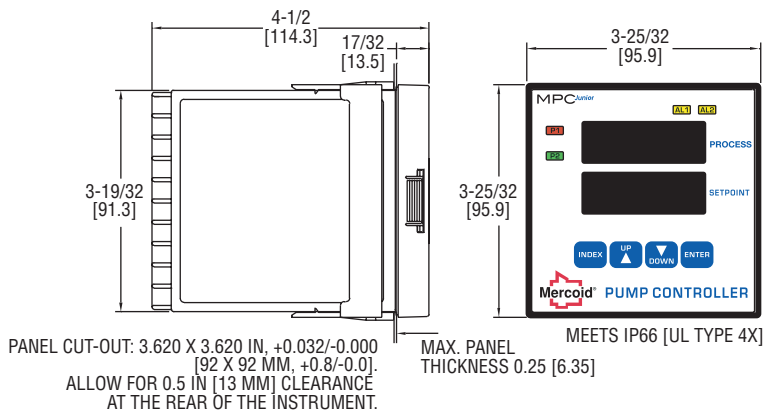
Modbus[®] is a registered trademark of Schneider Automation, Inc.

Compatible Level Transmitters: See page 352 (Series SBLT2)
See page 354 (Series PBLT2)

Additional Digital Control Panel Meters: See page 376 (Series APM/MPM/PPM)
See page 362 (Series A-900 & A-901)

PUMP CONTROLLER

One or Two Pump Control with Built-In Alternation



The **SERIES MPC JR** Pump Controllers provides versatile level control in a standard 1/4 DIN package. Designed for use with almost any style level transmitter the unit displays the present level and main set point value. Incorporated in the MPC JR is programmable level differential for on/off control of one or two pumps, valves, or other devices through two SPDT relays.

FEATURES/BENEFITS

- Selectable pump alternation when used with two pumps to minimize pump wear
- Integral 24 VDC power supply for transmitter
- User selectable security lock-out of programming and/or set points
- Optional process input retransmission as a current (4 to 20 mA) or voltage (2 to 10 VDC) analog signal
- Analog output on pump "on" condition for activation of separate pump run time meters

APPLICATIONS

- Water and wastewater
- Sump and sludge pits, clarifiers, digesters
- Chemical storage tanks
- Oil tanks
- Reservoirs

SPECIFICATIONS

Inputs: 4 (or 0) to 20 mA DC or 2 (or 0) to 10 VDC selectable.
Input Impedance: Current = 10 Ω ; Voltage = 5 K Ω .
Output Ratings: Control relays: SPDT, rated 10 A @ 240 VAC res., 1/4 hp @ 120 VAC, 1/3 hp @ 240 VAC; Alarm relays: SPST, 3 A @ 240 VAC res., 1/10 hp @ 120 VAC; Others: 15 VDC @ 20 mA for output one and output two.
Control Type: On/off, reverse (pump out) or direct (pump in) acting.
Power Requirements: 100 to 240 VAC nominal, +10%-15%, 50 to 400 Hz, single phase; 132 to 240 VDC nominal, +10%-15%.
Power Consumption: 7.5 VA maximum.
Accuracy: $\pm 0.25\%$ of span, ± 1 least significant digit.
Display: Two 4-digit, 7 segment 0.56" high LED's.
Display Resolution: 1 count.
Memory Backup: Nonvolatile memory (no batteries required).
Serial Communications: Optional RS-232 or RS-485 with Modbus[®] protocol.
Ambient Operating Temperature/RH: 14 to 131°F (-10 to 55°C)/0 to 90% up to 104°F (40°C) non-condensing, 10 to 50% at 131°F (55°C) non-condensing.
Front Panel Rating: Meets UL Type 4X (IP66).
Loop Power Supply (Isolated): 24 VDC @ 50 mA, regulated.
Weight: 16 oz (454 g).
Agency Approvals: CE, cULus.

MODEL CHART	
Model	Description
MPCJR	Pump controller

OPTIONS	
To order add suffix:	Description
-RC	Retransmission of input, 4 to 20 mA
-RV	Retransmission of input, 0 to 10 VDC
-232	RS-232 Modbus [®] RTU serial communications
-485	RS-485 Modbus [®] RTU serial communications

ACCESSORY	
Weatherproof Enclosures, NEMA 4X (IP66). ^①	



A-901

Modbus[®] is a registered trademark of Schneider Automation, Inc.

Compatible Level Transmitters: See page 352 (Series SBLT2)

See page 354 (Series PBLT2)

^①See page 362 (Series A-900 & A-901)