INTRODUCTION

Flow Network ***FM*** flow monitors combine flexibility, reliability, and quality for cost effective flow solutions in liquids, air, and gases. These flow instruments are field proven to be dependable, durable, and long lasting, even in the most difficult industrial applications. ***FM*** flow monitors provide direct reading indication of flow rate with optional electrical switches and transmitter outputs. Available in a variety of metal materials, these monitors are also offered in PVC and Teflon construction for corrosive fluids, or for use in corrosive environments.

FEATURES/BENEFITS

* ALL METAL CONSTRUCTION/ NO TUBES OF GLASS OR PLASTIC TO BREAK
* SPRING LOADED MECHANICAL DESIGN/ REQUIRES NO STRAIGHT PIPE RUN, NOT AFFECTED BY ORIENTATION
* LIMITED MOVEMENT ON INTERNAL PARTS/ MINIMAL WEAR AND DOWN TIME
* MODULAR DESIGN/ REDUCES MAINTENANCE COSTS, DOWN TIME , AND PRODUCTION LOSS
* DIRECT INDICATION & FIELD ADJUSTABLE SWITCH(ES) / MONITORS CRITICAL FLOWS AND PROVIDE ALARM
* 1% OF RATE REPEATABLE SWITCH SET POINT / ACCURATE & RELIABLE THROUGH ALL OPERATION CYCLES
* FLOW THROUGH DESIGN/MINIMAL PRESSURE LOSS
* INDIVIDUALLY CALIBRATED TO CUSTOMER SPECIFICATIONS/ENSURES ACCURACY

APPLICATIONS:

WATER
DEIONIZED WATER
PETROLEUM BASED FLUIDS
SYNTHETIC BASED FLUIDS
COOLANTS
GLYCOLS
PAINTS
SOLVENTS
CORROSIVE FLUIDS
AIR & GASES

FM flow monitors operate from two basic variable area spring loaded designs, the piston and vane styles. Both have a unique modular design for easy field installation and service. They do not require any straight pipe runs before or after the monitor thus minimizing the installation footprint. The versatile designs of the piston and vane style monitors allow for the piping orientation to be mounted in any position. Comparable to similar style devices in the industry, ***FM*** flow monitors “flow through” design offers a low-pressure loss. To ensure accuracy they are individually calibrated in any unit of measure to customer operating specifications.

Piston style monitors operate when flow enters the inlet connection and forces the piston to create a variable orifice when moving across a tapered shaft. This movement drives the indicator shaft and pointer. On a loss of flow, the spring forces the piston back across the tapered shaft reducing the flow orifice created by the shaft and piston. Piston style monitors are used for monitoring maximum full-scale flows from 50 cc/min (.75 GPH) to 1.5 GPM. (See Series Y)

Vane style monitor operates when flow is introduced through the inlet connection making direct contact with the vane that is mechanically linked to the indicator shaft. The fluid forces the vane to move through a contoured opening creating a variable orifice. The greater the flow the larger the orifice becomes for flow to pass. The vane style monitor is also spring loaded and allows the vane to return on decreasing flows. Maximum full-scale flows are available from 1 GPM to1200 GPM. (See Series U, F, and M)

For critical applications that require flow to be monitored, repeatable (1% of rate) field adjustable electrical switches are utilized. These switches are UL, CSA, and CE listed for hazardous and non-hazardous fluids, gases, or environments. For data collecting, trending, and recording applications output transmitters are also offered.

Flow Network

FM Flow Monitors

RATE INDICATORS SWITCHES TRANSMITTERS

www.Flow-Network.COM

ORDERING INFORMATION

Example Model Code: U1B5A1B2-2A1S500/.9-R1D3

Y Series

U Series

F Series

M Series

	SERIES	300 PSI Y1		2000 PSI Y2		100 PSI Y3	
U1							
B5	CONNECTION SIZE, TYPE & MAX. FLOW	NPT	ANSI FLG	NPT	ANSI FLG	NPT	ANSI FLG
	1/4" SELECT TYPE SYM. & ADD MAX FLOW 50 CCM TO 12 GPM*	B*	N*	B*	N*	B*	N*
	1/2" SELECT TYPE SYM. & ADD MAX FLOW 1.5 TO 12 GPM*	D*	M*	D*	M*	D*	M*
	3/4" SELECT TYPE SYM. & ADD MAX FLOW 1.5 TO 80 GPM*	E*	P*	E*	P*	E*	P*
	1" SELECT TYPE SYM. & ADD MAX FLOW 1.5 TO 80 GPM*	F*	R*	F*	R*	F*	R*
	1-1/4" SELECT TYPE SYM. & ADD MAX FLOW 10 TO 80 GPM*						
	1-1/2" SELECT TYPE SYM. & ADD MAX FLOW 20 TO 100 GPM*						
	2" SELECT TYPE SYM. & ADD MAX FLOW 20 TO 100 GPM*						
	3" SELECT TYPE SYM. & ADD MAX FLOW 50 TO 250 GPM*						
	4" SELECT TYPE SYM. & ADD MAX FLOW 50 TO 400 GPM*						
	6" SELECT TYPE SYM. & ADD MAX FLOW 100 TO 800 GPM*						
	8" SELECT TYPE SYM. & ADD MAX FLOW 200 TO 1200 GPM*						
	FOR ALL OTHER FLOW RANGES INCLUDING AIR, GAS & RELATED UNITS CONSULT *FILOW NETWORK*						
A	CALIBRATED UNITS FOR LIQUIDS						
	GALLONS PER MINUTE (GPM)		A		A		A
	LITERS PER MINUTE (LPM)		C		C		C
	CUBIC METERS PER HOUR (M3/HR)						
	GALLONS PER HOUR (GPH)		F		F		F
	LITERS PER HOUR (LPH)		G		G		G
	CALIBRATED UNITS FOR AIR & GASES						
	STANDARD CUBIC FEET PER MINUTE (SCFM)		N		N		
	STANDARD CUBIC METER PER HOUR (SCMH)						
	STANDARD CUBIC FEET PER HOUR (SCFH)		R		R		
1	**SEALS**						
	VITON		1		1		1
	BUNA N		2		2		2
	ETHYLENE PROPYLENE		3		3		3
	TEFLON		4		4		4
	KALREZ		5		5		5
B	**MATERIALS OF CONSTRUCTION- Includes 316L Internals (for others consult *FLOW NETWORK*)**						
	ALUMINUM	A					
	BRONZE	B					
	316L STAINLESS STEEL	C		C			
	CAST IRON	D		D			
	NICKEL PLATED CAST IRON	E		E			
	CARBON STEEL	F		F			
	PVC (up to 3" CONNECTION SIZES ONLY)					G	
	PTFE (up to 3" CONNECTION SIZES ONLY)					H	
2-1	**INDICATION & OPTIONAL CONTACT SWITCHES**						
	INDICATOR ONLY (mechanical)	1		1		1	
A	SWITCHES-Select the required switch symbol followed by a - and the Qty up to 4						
	3 WIRE SPDT	2		2		2	
	3 WIRE SPDT (gold contacts)	3		3		3	
	4 WIRE SPDT	4		4		4	
1	6 WIRE DPDT	5		5		5	
	HAZARDOUS LOCATION SWITCHES (select the applicable switch followed by the quantity- up to 2)						
	FLAMEPROOF	6		6		6	
	3 WIRE SPDT	7		7		7	
	6 WIRE DPDT	8		8		8	
	ENCLOSURE / SERVICE RATINGS						
	OIL & DUST TIGHT	A		A		A	
	WEATHER TIGHT	B		B		B	
	CORROSION RESISTANT	C		C		C	
	MOUNTING ORIENTATION / FLOW DIRECTION						
	HORIZONTAL MOUNT = LEFT TO RIGHT FLOW	1		1		1	
	HORIZONTAL MOUNT = RIGHT TO LEFT FLOW	2		2		2	
	VERTICAL MOUNT = FLOW UP	3		3		3	
	VERTICAL MOUNT = FLOW DOWN	4		4		4	

FLUID VISCOSITY & SPECIFIC GRAVITY- FOR LIQUIDS
All monitors are individually calibrated to maintain specified accuracy. To specify operating viscosity and specific gravity of fluids use the following symbols
"S" for SSU followed by operating viscosity, / specific gravity (example: -S500/.9 = 500 SSU and Specific Gravity of .9)
"C" for Centipose followed by operating viscosity, / specific gravity (example: -C50/.9 = 50 Centipose and Specific Gravity of .9)
"K" for Centistokes followed by operating viscosity, / specific gravity (example: -K5/.9 = 5 Centistokes and Specific Gravity of .9)
PRESSURE, TEMPERATURE & SPECIFIC GRAVITY- FOR AIR & GASES
All monitors are individually calibrated to maintain specified accuracy. To specify operating pressure, temperature and specific gravity use the following symbols:
"P" for PSI ("B" for Bar) followed by the system pressure, use "F" for temperature in degrees Fahrenheit ("C" for degrees Celsius), and "/" for specific gravity.
Example: P100F70/1.0 = 100 PSI, 70 degrees F and specific gravity of 1.0)

-S500/.9

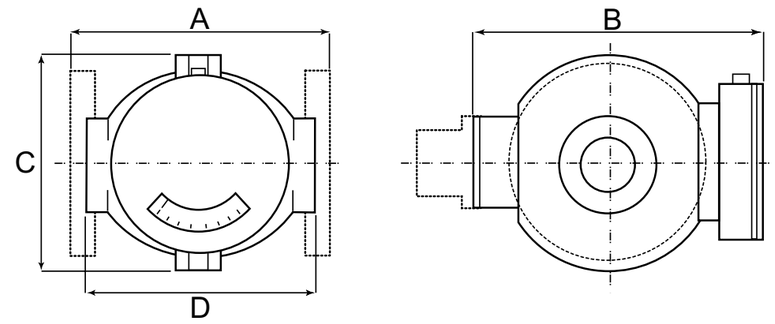
FACTORY PRE SET SWITCH POINTS
All switches are field adjustable. The switch point is the desired flow rate in the "calibrated units" that the monitor is ordered with. Example: if ordered in GPM the switch setting(s) are factory set in GPM. To order: specify the desired switch setting(s) and indicate for each switch the desired set point. Use symbol "D" for decreasing flow followed by the desired flow rate, or symbol "r" for increasing flow followed by the desired flow rate.
Example: -R20 = switch is factory set at 20 for on or all switches. For multiple set points "R20D50" = each switch is individually factory set. One switch set at 20 increasing, and the other at 50 decreasing flow.

-R1D3

We offer a wide range of additional options such as; electrical pin connectors, stainless steel instrument identification tags, glass windows, etc. For a complete list of options please contact ***Flow Network.***

300 PSI U1		2000 PSI U2		100 PSI U3		300 PSI F1		2000 PSI F2		100 PSI F3		300 PSI M1		2000 PSI M2		100 PSI M3	
NPT	ANSI FLG	NPT	ANSI FLG	NPT	ANSI FLG	NPT	ANSI FLG	NPT	ANSI FLG	NPT	ANSI FLG	NPT	DIN	NPT	DIN	NPT	DIN
B*	N*	B*	N*	B*	N*												
D*	P*	D*	P*	D*	P*												
E*	R*	E*	R*	E*	R*	E*	R*	E*	R*	E*	R*						
F*	S*	F*	S*	F*	S*	F*	S*	F*	S*	F*	S*						
						G*	T*	G*	T*	G*	T*						
						H*	U*	H*	U*	H*	U*						
						I*	V*	I*	V*	I*	V*						
												J*	W*	J*	W*	J*	W*
												K*	X*	K*	X*	K*	X*
												L*	Y*	L*	Y*		
												M*	Z*	M*	Z*		
A		A		A		A		A		A		A		A		A	
C		C		C		C		C		C		C		C		C	
E		E		E		E		E		E		E		E		E	
N		N				N		N				N		N			
P		P				P		P				P		P			
1		1		1		1		1		1		1		1		1	
2		2		2		2		2		2		2		2		2	
3		3		3		3		3		3		3		3		3	
4		4		4		4		4		4		4		4		4	
5		5		5		5		5		5		5		5		5	
A						A						A					
B						B						B					
C		C				C		C				C		C			
D		D				D		D				D		D			
E		E				E		E				E		E			
F		F				F		F				F		F			
				G						G						G	
				H						H						H	
1	1	1		1		1		1		1		1		1		1	
2	2	2		2		2		2		2		2		2		2	
3	3	3		3		3		3		3		3		3		3	
4	4	4		4		4		4		4		4		4		4	
5	5	5		5		5		5		5		5		5		5	
6	6	6		6		6		6		6		6		6		6	
7	7	7		7		7		7		7		7		7		7	
8	8	8		8		8		8		8		8		8		8	
A	A	A		A		A		A		A		A		A		A	
B	B	B		B		B		B		B		B		B		B	
C	C	C		C		C		C		C		C		C		C	
1	1	1		1		1		1		1		1		1		1	
2	2	2		2		2		2		2		2		2		2	
3	3	3		3		3		3		3		3		3		3	
4	4	4		4		4		4		4		4		4		4	

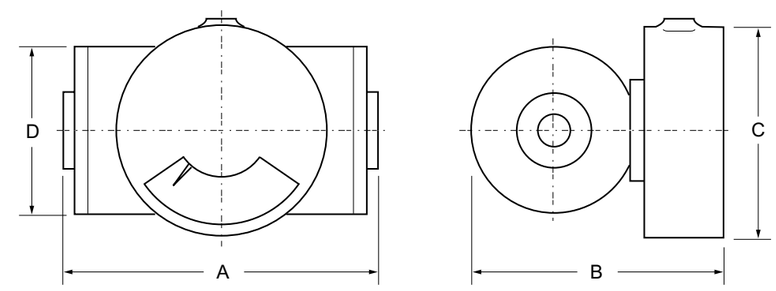
DIMENSIONS- Vane Style



Maximum Flow (GPM) Pipe Connection Size	A	B	C	D
0 to 12 GPM- 1/4” to 1”	6.3 “ (160)	5.7” (145)	5.1” (130)	5.1” (130)
10 to 100 GPM- 3/4” to 2”	7.1” (180)	7.1 (180)	5.1” (130)	5.9” (150)
50 to 150 GPM- 3”	10.0” (255)	12.6” (320)	9.8” (250)	12.0” (305)*
50 to 400 GPM- 4”	10.0” (255)	12.6” (320)	9.8” (250)	12.0” (305)*
100 to 800 GPM- 6”	18.1” (460)	19.7” (500)	14.6” (370)	20.0” (510)*
200 to 1200 GPM- 8”	19.1” (485)	19.7” (500)	14.6” (370)	21.0” (535)*

Consult ***Flow Network*** for dimensions on monitors that will be used above 300 PSI

DIMENSIONS- Piston Style



Maximum Flow (GPM) Pipe Connection Size	A	B	C	D
0 to 2 GPM- 1/4” to 1”	7.4” (188)	7.4” (188)	3.9” (100)	9.8” (250)

Note: Conduit connections are 1/2” NPT

Consult ***Flow Network*** for dimensions on monitors that will be used above 300 PSI

SPECIFICATIONS

SERIES	Y1	Y2	Y3	U1	U2	U3	F1	F2	F3	M1	M2	M3
PRESSURE	300 PSI 21 BAR	2000PSI 138 BAR	100 PSI 7 BAR	300 PSI 21 BAR	2000 PSI 138 BAR	100 PSI 7 BAR	300 PSI 21 BAR	2000 PSI 138 BAR	100 PSI 7 BAR	300 PSI 21 BAR	2000 PSI 138 BAR	100 PSI 7 BAR
CONNECTION SIZE	1/4" to 1"	1/4" to 1"	1/4" to 1"	1/4" to 1"	1/4" to 1"	1/4" to 1"	3/4" to 2"	3/4" to 2"	3/4" to 2"	3" to 8"	3" to 8"	3" to 8"
CONNECTION TYPE	NPT A.N.S.I. FLANGED	NPT A.N.S.I. FLANGED	NPT A.N.S.I. FLANGED	NPT A.N.S.I. FLANGED	NPT A.N.S.I. FLANGED	NPT A.N.S.I. FLANGED	NPT A.N.S.I. FLANGED	NPT A.N.S.I. FLANGED	NPT A.N.S.I. FLANGED	A.N.S.I. or DIN FLANGED	A.N.S.I. or DIN FLANGED	A.N.S.I. or DIN FLANGED
MAXIMUM FLOWS	50 CC/M to 1.5 GPM	50 CC/M to 1.5 GPM	50 CC/M to 1.5 GPM	1 GPM to 12 GPM	1 GPM to 12 GPM	1 GPM to 12 GPM	10 GPM to 100 GPM	10 GPM to 100 GPM	10 GPM to 100 GPM	3"= 50 to 250 GPM 4"= 50 to 400 GPM 6"= 100 to 800 GPM 8"= 200 to 1200 GPM	3"= 50 to 250 GPM 4"= 50 to 400 GPM 6"= 100 to 800 GPM 8"= 200 to 1200 GPM	3"= 50 to 250 GPM 4"= 50 to 400 GPM 6"= 100 to 800 GPM 8" = 200 to 1200 GPM
TEMPERATURE (STANDARD)	200 F 95 C	200 F 95 C	100 F 40 C	200 F 95 C	200 F 95 C	100 F 40 C	200 F 95 C	200 F 95 C	100 F 40 C	200 F 95 C	200 F 95 C	100 F 40 C
TEMPERATURE (OPTIONAL)	400 F 205 C	400 F 205 C		400 F 205 C	400 F 205 C		400 F 205 C	400 F 205 C		400 F 205 C	400 F 205 C	
PRESSURE DROP	< 4 PSID	< 4 PSID	< 4 PSID	<2 PSID	< 2 PSID	< 2 PSID	< 2 PSID	< 2 PSID	< 2 PSID	< 2 PSID	< 2 PSID	< 2 PSID
ACCURACY	5% F.S.	5% F.S.	5% F.S.	5% F.S.	5% F.S.	5% F.S.	2% F.S.	2% F.S.	2% F.S.	2% F.S.	2% F.S.	2% F.S.
REPEATABILITY	1% of RATE	1% of RATE	1% of RATE	1% of RATE	1% of RATE	1% of RATE	1% of RATE	1% of RATE	1% of RATE	1% of RATE	1% ACTUAL	1% ACTUAL
NET WEIGHTS (APPROXIMATE)												
ALUMINUM	11 LBS.	11 LBS.	11 LBS.	2.5 LBS.	2.5 LBS.		7 LBS.	7 LBS.		44 to 150	44 to 150	
BRONZE	20 LBS.	20 LBS.	20 LBS.	5 LBS.	5 LBS.		15.5 LBS.	15.5 LBS.		120 to 450	120 to 450	
316 L STAINLESS	22 LBS.	22 LBS.	22 LBS.	5 LBS.	5 LBS.		15.5 LBS.	15.5 LBS.		155 to 540	155 to 540	
CAST IRON				5 LBS.	5 LBS.		15.5 LBS.	15.5 LBS.		100 to 360	100 to 360	
NICKEL PLATED CI				5 LBS.	5 LBS.		15.5 LBS.	15.5 LBS.		100 to 360	100 to 360	
CARBON STEEL	22 LBS.	22 LBS.	22 LBS.	5 LBS.	5 LBS.		15.5 LBS.	15.5 LBS.		100 to 360	155 to 540	
PVC & TEFLON			9 LBS.			2.5 LBS.			7 LBS.			38 LBS.

***NOTES:**
Maximum flows are shown in GPM. For other units of measure including air & gas scales and ranges- consult *Flow Network*
Maximum flows of 50 cc/m to 200 cc/m require a minimum viscosity of 20 Centistokes.
Other connections available: BSP, S.A.E., and DIN Flanges.

ELECTRICAL SWITCH SPECIFICATIONS

Switch Description	Ratings	Listings
General Purpose Switches		
3 Wire S.P.D.T.	15 amp-125, 250 or 480 VAC, 0.5 amp- 125 VDC, 0.25 amp- 250 VDC	UL, CSA, CE
3 Wire S.P.D.T (Gold contacts	1 amp- 125 VDC	UL, CSA, CE
4 Wire S.P.D.T.	10 amp- 125 or 250 VAC, 0.3 amp- 125 VDC, 0.15 amp- 250 VDC	UL, CSA, CE
6 Wire D.T.D.T.	10 amp- 125 or 250 VAC, 0.3 amp- 125 VDC, 0.15 amp- 250 VDC	UL, CSA, CE
Hazardous Location Switches		
3 Wire S.P.D.T. Flameproof	5 amp- 250 VAC	BASEEFA No.: Ex831468 Eex.delIC.T6
3 Wire S.P.D.T.	15 amp- 480 VAC (resistive)	BASEEFA No.: Ex77185/B Ex.sed.IIc.T6

Notes: Switch point repeatability 1% of rate. Dead band for general purpose switches < 5% of full scale flow. For dead band on hazardous location switches please consult *SURE FLOW PRODUCTS*, division of Flow - Mon USA.

TRANSMITTER SPECIFICATIONS- Please consult *Flow Network* for more details.

APPLICATION SPECIFICATION ASSISTANCE FAX FORM

For quick application assistance please fill in or place an X for the required information indicated below. Please copy and fax the copied form to 770-917-8352. For immediate assistance please contact us at 770-917-0940. We thank you for your interest and appreciate the opportunity to quote.

Company: _____ **Contact Name:** _____
Telephone No: _____ **Fax No:** _____
E-Mail Address (optional): _____

REQUIRED SPECIFICATIONS
Fluid is: _____ Operating Viscosity: _____ Specific Gravity: _____
Gas is: _____ Specific Gravity: _____
PRESSURE
Maximum: _____ Operating: _____ Minimum: _____ PSI ___ Bar ___ Other: _____
TEMPERATURE
Max. Temperature: _____ Operating Temperature: _____ Min Temperature: _____ F____ C____
FLOW RATE
Max. Flow Rate: _____ Min. Flow Rate: _____
UNIT OF MEASURE
GPM _____ LPM _____ Other: _____

PROCESS CONNECTION SIZE:_____(Inches)
CONNECTION TYPE:
NPT _____ ANSI 150# R.F. Flanged _____ DIN Flanged _____ Specify Other: _____

Seal Material Special Request: _____

Body Material Special Request: _____
SWITCHES
Indication Only_____ Indication w/Switch_____ Indications w/Transmitter output _____

General Purpose Switch- 3 Wire S.P. D. T _____ 3 Wire S.P.D.T w/Gold Contacts _____
4 Wire S.P.D.T. _____ 6 Wire D.P.D.T. _____
Number of switches required per flow monitor:_____

Hazardous Location Switch: Flameproof_____ 3 Wire S.P. D.T. Hazardous Location _____

TRANSMITTER OUTPUT: 4-20Ma _____ Other _____
ENCLOSURE
Oil & Dust_____ Tight_____ Water Tight_____ Corrosion Resistant _____ Other: _____
MOUNTING ORIENTATION / FLOW DIRECTION
Vertical Mount Flow Up_____ Vertical Mount Flow Down _____
Horizontal Mount Flow to Right_____ Horizontal Mount Flow to Left _____

SPECIAL REQUESTS: (Fill in any) _____

Quantity: _____

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Website: Flow-Network.com

FM