



Flow Meter / Switch

TM-FM

These units are manufactured in a wide range of sizes and specification options but all have the same basic function.

A dial and mechanical indicator continuously monitor the flow rate at any given time whilst electrical switches can be specified to signal when a particular level has been reached during increasing or decreasing flow rates. Switches are field adjustable over the full range. Where batching, trending, totalising or recording is required, all Flow-Mon units can be supplied with a 0-10V or 4-20mA output. All sizes are manufactured to the same simple design concept, the main characteristic of which ensures that the pressure drops are confined to an absolute minimum (see 'pressure drop' charts) across the vane orifice at full flow, with viscosities as high as 600cS. Sizes are defined by pipe size and / or maximum flow capacity, and every flow switch is individually calibrated so that full scale deflection is used in each application i.e. the maximum scale reading coincides with the maximum requirement of system as specified by the customer. Calibration may be in any units with single or dual scale to specification. The flow switch body houses a spring-loaded valve plate (vane) which pivots off-centre in a hemispherical cavity. Thus the vane and cavity have a variable area orifice relationship. This gives both a high flow range and a linear relationship between flow rate and vane displacement. The vane indirectly operates both the indicating needle and an adjustable cam, which in turn triggers the micro-switch at any chosen setting of flow rate. Two switches can be supplied to provide high and low (or 'low-low') flow switching.



PRINCIPLE FEATURES & BENEFITS

- All metal construction - no tubes of glass or plastic to break.
- Spring loaded mechanical design - requires no straight pipe run and not affected by orientation.
- Limited movement on internal parts - minimal wear and downtime.
- Modular design - reduces maintenance costs, down time, and production loss.
- Direct indication & field adjustable switch(es) - monitors critical flows and provides alarm(s).
- 1 % of rate repeatable switch set point - accurate & reliable through all operation cycles.
- Weatherproof enclosure box to IP65 (Nema 4).
- Flow through design - minimal pressure loss.
- Individually calibrated to customer specification - ensures accuracy.
- Adjustable under operating conditions.
- Scale is in units (e.g litres/minute).
- Large range of body materials available.
- Size range from 8mm (1/4") to 200mm (8").
- May be installed in any position.
- Orientation of enclosure box easily changed.
- High switch rating - 10 to 15 Amps.
- ATEX approved Explosion-proof models available.
- Will pass twice the maximum indicated flow.
- Acts as non-return valve



All specifications are subject to change without notice



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TM-FM-FML300

B

LP

3EE

1cS

16F10

S3

D1

SERIES AND FLOW RATE

FMC* = Low Flow
FML* = Litres / Min
FMB* = Imp. Gallons / Min
FMG* = U.S. Gallons / Min
FMM* = M3/ Hour

*Add Full Flow Rate in Units

MATERIAL OF MANUFACTURE

AL = Aluminum
B = Bronze
CI = Cast Iron
CIK = Cast Iron Nickel Plated
S = Carbon Steel
SS = Stainless Steel
PTFE* = PTFE
PVC* = PVC

*Only available up to 4" Port Connections and 100 psi / 7 bar maximum pressure.
Note: For materials and pressures not specified, please consult factory.

PRESSURE RATING

LP = 300 psi / 20 bar maximum
MP = 750 psi / 50 bar maximum
HP = 3000 psi / 200 bar maximum*

*CI, CIK, S & SS only

INDICATOR READ OUT

ME = Mechanical Pointer only
3EE = SPDT 3 Wire Switch
3EEG = SPDT 3 Wire Switch with Gold Contacts
3EE(ATEX3) = SPDT Explosion Proof Micro Switch to ATEX zone 3
3EE(ATEX2) = SPDT Explosion Proof Switch to ATEX zone 2
6EE(ATEX2) = DPDT Explosion Proof Switch to ATEX zone 2
AIR = Pneumatic Switch
POT = Potentiometer (Specify Rating)
OUT = 4-20 mAmp Output
TOT = Digital Rate Totaliser
TOTX = Digital Rate Totaliser (ATEX)

Note 1: All electrical boxes (apart from TOT & TOTX) also carry a Mechanical Pointer
Note 2: For 4 & 6 Wire Switches replace 3EE by 4EE or 6EE
Note 3: Manufactured to IP65 (NEMA 4) as standard (up to 2 1/2")

ELECTRICAL OPTIONS

CODE: 3EE

Basic single pole, double throw, 3 wire switch.
15 Amp - 125, 250 or 480VAC
0.5 Amp - 125V.DC / 0.25 Amp - 250V.DC

CODE: 4EE

Contact arrangements is single-pole, double throw, double-break.
10 Amp - 125 or 250VAC
0.3 Amp - 125V.DC / 0.15 Amp - 250V.DC

CODE: 6EE

Double-pole, double throw switches simultaneously make and break two independent circuits.
10 Amp - 125 or 250VAC
0.3 Amp - 125V.DC / 0.15 Amp - 250V.DC

CODE: AIR

This system offers an alternative safety arrangement for operation in explosive atmospheres. Compressed air can be used to transmit an on / off signal from the danger area, or to operate a klaxon inside the danger area.

CODE: POT

Remote read-out option (0-10V). Rating to customer's specification, e.g. 1K, 2K etc.

CODE: OUT

A transducer can be connected to the potentiometer to give the required 4-20 mAmp readout. Data Loggers or Recorders can be added to the system.

The 3 and 6 wire switches described above are available in ATEX approved explosion proof versions, with the appropriate enclosure box. When two or more switches are assembled in one unit, they remain independently adjustable. Re-adjustments may be carried out in the field.

FLOW DIRECTIONS

D1 = → D2 = ←
D3 = ↑ D4 = ↓

'O' RING SEAL MATERIAL

S1 = Buna (-40°C +110°C)
S2 = EPDM (-40°C +150°C)
S3 = Viton (-20°C +200°C)
S4 = PTFE (-100°C +250°C)
S5 = Perlast (-15°C +330°C)

PORT CONNECTIONS

2 = 1/4"
4 = 1/2"
6 = 3/4"
8 = 1"
10 = 1 1/4"
12 = 1 1/2"
16 = 2"

Sizes 1/4" - 2" are Screwed or Flanged.
For Flanged Bodies, add relevant code letters (shown below).

20 = 2 1/2"
24 = 3"
32 = 4"
48 = 6"
64 = 8"

Sizes 2 1/2" - 8". Standard units have Flanged Bodies - add relevant code letters (shown below).
Cast Iron and Steel mating flanges are available:
For Screwed, add - S
For Socket Weld, add - SW

Standard Threads are BSP, for NPT add - N

For Flanged Connections add one of the following codes:

F10
F16
F25
F40

Alternative Pressure Ratings in BS4504 / DIN2632-5

F150
F300
F600

Alternative Pressure Ratings in BS1560 / ANSI B16.5

FAD
FE
FF

Alternative Pressure Ratings in BS10

For special flange connections, please enquire at factory

VISCOSITY AT OPERATING TEMPERATURE

State units and scale
eg. Water is 1 Centistoke (cS)
Maximum rating should not exceed 600cS

Air & Gas Applications

The flow switches can be used to measure gas flows in exactly the same way as liquid flows. When enquiring for such an application the following information will be required:

Specific gravity of the gas
Maximum flow volume
Operating temperature
Operating pressure



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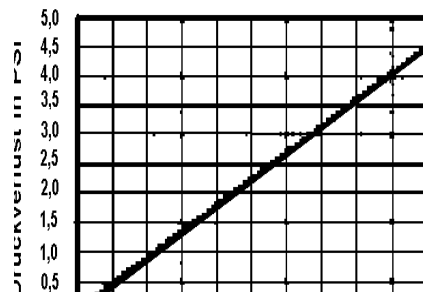
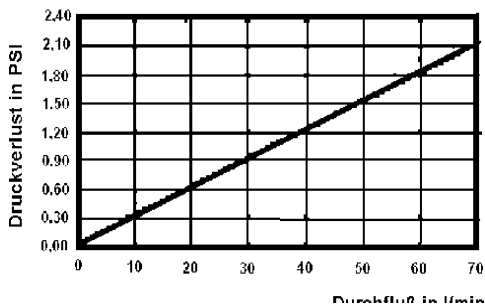
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Applications

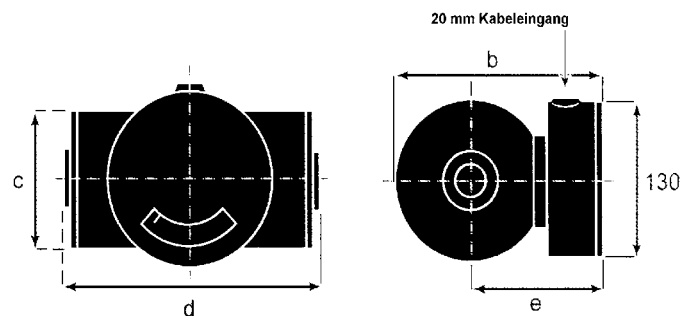
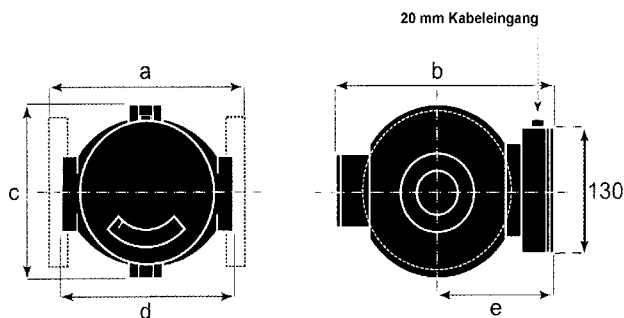
Water (clean or dirty)	Petroleum Based Oils	Solvents	
De-mineralised Water	Synthetic Based Oils	Paints	
De-ionized Water	Coolants	Corrosive Fluids	Air & Gases

Pressure drop



Screwed (with flanged outline)

* Only a unit with 0-5 l/min



Flow in l/min	Pipe- size	Dimensions (mm)					approx. weight (kg)				
		a	b	c	d	e	AL	B	Cl	S-SS	PVC
0-5*	1/4 - 1"	n/v	155	100	188	110	3	8	-	8	3
0-70	1/4 - 1"	160	145	80	130	105	1	2	2	2	1
0-500	3/4 - 2"	180	200	120	140	110	3	7	7	7	3
0-1000	3"	255	320	250	305	160	20	54	45	60	15
0-1500	4"	255	320	250	305	160	22	60	52	70	17
0-3000	6"	460	500	370	510	280	60	188	150	225	n/v
0-4500	8"	485	500	370	535	280	68	205	164	246	n/v

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