Flow switches Model BM, BGM, GABM, GK-BM

Switzer data sheet FS-BM

Applications

- Lube oil skids
- Water treatment
- Furnace
- Pumps
- Fire fighting

Special features

- Proven design for liquids
- Line size 15 ... 300 mm
- Robust construction
- Only for water flow measurement



Fig. top: Flow switch, model BM Fig. bottom: Flow switch, model BGM

Description

Style BM / BGM / GABM / GK-BM flow switches are versatile instruments designed to accept different paddle sizes to handle any line size. Materials of construction and glandless design render the switches compatible with most of the corrosive and toxic fluids. The easy-to-fix design reduces installation costs and time. Simple mechanical parts ensure high reliability and near-zero failures.

The microswitch of the instrument is operated by the deflection of the paddle assembly due to velocity of flowing fluid against the restraining force of the range spring through a bellows sealed lever at a pre-determined flow rate.





Standard version

Model

- BM: ABS plastic, weatherproof to IP65
- BGM: GM style aluminium pressure die cast weatherproof to IP66
- GABM4 / GABM6: "GA" style stainless steel casting weatherproof to IP66
- GK-BM: GK style aluminium pressure die cast, weatherproof to IP66 and flameproof to Group IIC as per IS/IEC 60079

Sensor

316 SS paddle and phosphor bronze bellows

Wetted parts

Brass

Ranges

Refer tables

Differential

- ≤25% of maximum flow for 15 NB line with SPDT
- ≤37% of maximum flow for 15 NB line with DPDT
- ≤10% of maximum flow for all other line sizes with SPDT
- ≤15% of maximum flow for all other line sizes with DPDT

Repeatability

±2% FSR

Switching

Instrument quality SPDT microswitch

Maximum line pressure

- 15 bar for Brass body
- 30 bar for SS body

Permissible ambient temperature

 $-10 \dots 60^{\circ}C$

Permissible medium temperature

−10 ... 110°C for brass
−10 ... 170° C for SS

Pressure loss

60 ... 80 mbar at maximum flow

Process connection

BM – Threaded

- Integral Tee for line size upto 1"
- Above 1" line size 1" BSPM standard

BM – Flanaged

1½" or 2" ANSI #150RF flanges are available from the line size 40 ... 300 mm

Process connection sealing

Buna-N

Ingress protection

- IP65: BM
- IP66: BGM, GABM4, GABM6, GK-BM

Electrical connection

- M16 Nylon cable gland suitable for 8 mm OD cable for model BM
- 1/2" NPTF for model BGM, GABM, GK-BM

Mounting

- Horizontal
- Vertical (flow must be top to bottom only)

Options

- 304 and 316 SS body
- PVC paddle
- 316L SS bellows
- Dual cable entry in BGM, GABM and GK-BM
- 7 pin plug for BGM and GABM
- 9 pin plug for BGM and GABM
- M20 × 1.5 for BGM, GABM and GK-BM
- 3/4" NPTF and M16 × 1.5 cable entries through adaptors for BGM and GABM
- NACE preparation
- Viton seal 'O' ring
- EPDM seal 'O' ring
- Teflon seal 'O' ring

Ordering matrix

Switch enclosure	
ABS plastic enclosure weatherproof to IP65	
GM style aluminium pressure die cast weatherproof to IP66	
GA style 304 stainless steel casting weatherproof to IP66	GABM4
GA style 316 stainless steel casting, weatherproof to IP66	GABM6
GK style aluminium pressure die cast, weatherproof to IP66 and	
flameproof to group IIC as per IS/IEC 600079	GK-BM
Line size(Befer Table-3 and 4)	
Specify nominal line size in "mm"	
[Eq. 015 for 15 mm NB (or 150 for 150 mm NB)]	
Range code	
Refer Table-3 and 4	
Switch actuation	
Raising	R
Falling	F
Wetted parts	
Brass body, phosphor bronze bellows & 316 SS paddle	1
304 SS body, 316L SS bellows & 316 SS paddle	4
316 SS body, 316L SS bellows & 316 SS paddle	2
316LSS body, 316LSS bellows & PVC paddle	3
Process connection	
For line size up to 25 mm	
Integral Tee BSPE Threads (unto 1" line size)	SI
Integral Tee, NPTE threads (unto 1" line size)	SM
For line size from 32 300 mm	
Threaded 1" BSPM	тн
Threaded 1" NPTM	
Elanged to 11/2" ANSI 150 BE for line size 40 mm and above	FA
Elanged to 2" ANSI 150 RE for line size 40 mm and above	FB
Elanged to 11/2" ANSI 300 BE for line size 40 mm and above	FC
Flanged to 2" ANSI 300 BE for line size 40 mm and above	FD
Process connection material	
Mild steel	C
304 SS	4
316 SS	2
316L SS	3
Switch code and rating	
Refer Table-1	
Electrical entry code	
Refer Table-2	d
	_
Options	
NACE preparation (available only with code '3')	SC
Seal 'O' ring Viton	OV
Seal 'O' ring EPDM	OE
Seal 'O' ring Teflon —	ОТ
Integral tee for line size 32 50 mm	ST

Table 1: Switch code, rating and availability

Switch code				DC rating in Ampere					
epnt	прот	Contact version	AC rating	Resistive			Inductive		
	וסיוס			220V	110V	24V	220V	110V	24V
D	DD	General purpose	15A 250, 125V	0.2	0.4	6.0	0.02	0.05	5.0
9	99	Hermetically sealed, inert gas filled with Silver alloy contact	1A 115V, 400 Hz	N.A	N.A	3.0	N.A	N.A	1.0
G	GG	Hermetically sealed, inert gas filled with gold plated contact	N.R.	N.R.	N.R.	1.0	N.R.	N.R.	0.25
J	JJ	Argon sealed micro switch with silver contact	15A 250V	N.A.	N.A.	2.0	N.A.	N.A.	N.A.
К	KK	Argon sealed micro switch with gold contact	1A 125V 0.5A 250V	N.A.	N.A.	0.5	N.A.	N.A.	N.A

Table 2: Electrical entry

	Single entry		Dual entry				
Size ★	BGM / GABM4 / GABM6	GK-BM	ВМ	BGM / GABM4 / GABM6	GK-BM		
1/2" NPTF	В	В		Ν	Ν		
3/4" NPTF	С			0			
M20 × 1.5	D	D		Ρ	Р		
M16 × 1.5	E			Q			
M16 Nylon elbow cable gland			F				
Through connector							
7 pin plug	3						
9 pin plug	4						

* Cable gland available on request.

Table 3

Line	Range code	Switch	Max.			
size NB		On falling flow code 'F'		On rising flow code 'R'		flow (LPM
mm		Min.	Max.	Min.	Max.	water)
15	А	3	9	8	12	21
20	А	4	11	9	14	38
25	А	10	30	16	33	60
32	А	13	50	23	52	100
40	А	16	60	30	70	150
50	А	36	90	60	95	250
65	А	45	120	85	135	400
80	А	65	175	120	200	600
100	А	190	460	290	500	1000
	В	100	280	190	310	1000
105	А	380	890	530	930	1500
125	В	150	420	300	470	1500
150	А	600	1360	800	1400	2000
150	В	200	510	400	600	2000
200	А	1210	2760	1580	2900	3700
	В	650	1510	1020	1700	3700
250	А	1970	3830	2600	4200	6000
	В	1240	2410	1850	2800	6000
200	А	2600	4830	3500	5300	8500
300	В	2000	3080	2800	3600	8500

 $\rm BM$ / $\rm BGM$ / $\rm GABM$ / $\rm GK\text{-}BM$ instruments are suitable up to 100 CST only.

Other Models Available

Models	Details
HR	For viscous and high pressure
НМ	All plastic version for corrosive chemicals
CM–G	OEM version, high range
CM–S	Sprinkler application
UZ	Flow switch with 6" Dial Indicator
HRM	Flow switch with indicator of 6" Dial Indicator of 2½" dial

For further details consult Sales.

Table 4

Line Range LPM		Switching range LPM	Max. flow	
NB mm	code	On falling flow code 'F'	(LPM water)	
20	L16	9 14	38	
25	L154	30 60	60	
25	L155	20 40	60	
25	L109	25 50	60	
25	L112	22 55	60	
25	L113	10 36	60	
25	L116	50 100	100	
32	L148	15 60	100	
32	L141	35 85	100	
32	L149	40 90	100	
40	L114	40 110	150	
40	L77	40 76	150	
40	L150	30 180	180	
40	L151	80 240	240	
50	L115	80 160	250	
50	L151	80 240	250	
50	L79	100 170	250	
50	L142	135 420	420	
50	L116	50 100	250	
65	L116	50 100	400	
65	L115	80 160	400	
65	L45	100 200	400	
65	L143	140 220	400	
65	L152	120 260	400	
65	L153	150 300	400	
80	L37	45 120	600	
80	L111	125 300	600	
80	L144	100 400	600	
100	L117	200 525	1000	
100	L145	190 660	1000	
100	L146	210 1250	1250	
100	L147	230 770	1000	
100	L137	240 810	1000	
25100 *	L135	10 460	60 1000	

★ For range code L135 all set of paddles shall be supplied along with the instrument, to be used in the line size between 25 ... 100 mmNB

Notes

- 1. Gr.IIC of IS/IEC:60079-1is equivalent to NEC CL.1, Gr.A, B, C & D.
- 2. The maximum line pressure is the limiting value for flanged versions irrespective of the flange ratings. The flange is not integral, but screwed on to the body with a lock nut. Flange mounting is not available upto 32 mm.
- 3. Accuracy & Repeatability are one and the same for all blind switches. Settings will slightly shift with varying temperature.
- 4. Instruments can be supplied with hermetically sealed microswitches other than Code 'D' general purpose microswitch. On-off differentials will be different. *Consult sales*.
- 5. All the ranges are in LPM water. For calculating equivalent airflow in NM³/Hr. consult sales. For any liquid other than water, the setting range depends on the specific gravity of the fluid at flow conditions. To get equivalent ranges for such liquids, a specific gravity correction factor has to be applied. *Consult sales*.
- Maximum flow setting range is referred to as FSR herein. The maximum flow value mentioned in the table 3 and 4 are based on a nominal flow velocity of 2.0 metre/

second. The instrument can handle higher flow if the process flow velocity is more than 2.0 metre/second. For special ranges, *consult sales*.

- DPDT action is achieved by two SPDT switches synchronized to practical limits i.e., ±2% of FSR. ON-OFF differentials of DPDT contacts are 1.5 times than that of SPDT as force required to actuate the contacts are more.
- 8. MWP : The value mentioned herein is the highest permissible pressure that can be applied. Cannot be proof tested for any higher pressure value.
- Contact life of microswitches are 5 × 10⁵ switching cycles for nominal load. To quench DC sparks, use a diode in parallel with inductance, ensuring polarity. A 'R–C' network is also recommended with 'R' value in Ohms equal to coil resistance and 'C' value in micro Farads equal to holding current in Amps.
- 10. Different lengths of paddles are used for different line sizes and ranges. Refer Instruction Manual for details.
- 11. Accuracy figures are exclusive of test equipment tolerance on the claimed values.
- 12. All performance data are guaranteed to ± 5 %.

Dimensions in mm



Ordering information

Switch enclosure / Line size / Range code / Switch actuation / Wetted parts / Process connection / Switch code and rating / Electrical entry code / Options

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