

# Flow switches

## Model BM, BGM, GABM, GK-BM

WIKA data sheet FL 70.01

### Applications

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

### Special features

- Proven design for liquids
- Line size 15 ... 300 mm
- Robust construction

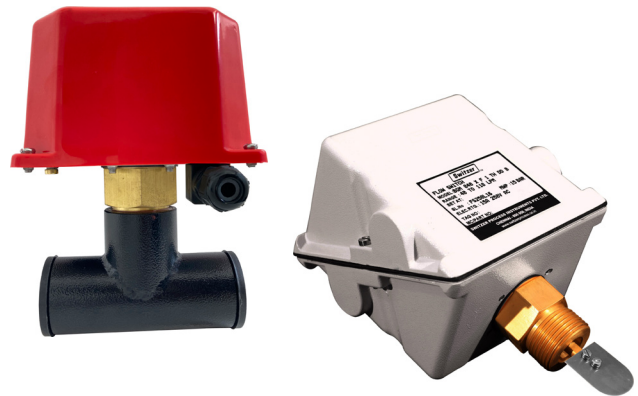


Fig. Left: Flow switch, model BM

Fig. Right: 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.

## Specifications

Basic information	
Case type	<ul style="list-style-type: none"> <li>■ BM: ABS plastic, weatherproof to IP65</li> <li>■ BGM: GM style aluminium pressure die cast weatherproof to IP66</li> <li>■ GABM4 / GABM6: "GA" style stainless steel casting weatherproof to IP66</li> <li>■ GK-BM: GK style aluminium pressure die cast, weatherproof to IP66 and flameproof to Group IIC as per IS/IEC 60079-1</li> </ul>
Case material	<ul style="list-style-type: none"> <li>■ Die cast aluminium epoxy powder coated enclosure with ABS plastic cover</li> <li>■ Aluminium pressure die cast</li> </ul>
Sensor element	
Type	<ul style="list-style-type: none"> <li>■ 316 SS paddle and phosphor bronze bellows</li> <li>■ 316 SS paddle and 316L SS bellows</li> </ul>
Wetted parts	<ul style="list-style-type: none"> <li>■ Brass</li> <li>■ 316L SS</li> </ul>
Output signal	
Setting ranges	→ See table "Setting range"
Differential	<ul style="list-style-type: none"> <li>■ ≤25% of maximum flow for 15 NB line with SPDT</li> <li>■ ≤37% of maximum flow for 15 NB line with DPDT</li> <li>■ ≤10% of maximum flow for all other line sizes with SPDT</li> <li>■ ≤15% of maximum flow for all other line sizes with DPDT</li> </ul>
Setpoint repeatability	± 2% of FSR
Switching function	Instrument quality SPDT microswitch
Maximum line pressure	<ul style="list-style-type: none"> <li>■ 15 bar for brass body</li> <li>■ 30 bar for SS body</li> </ul>
Electrical connection	
Conduit type	<ul style="list-style-type: none"> <li>■ M16 Nylon cable gland suitable for 8 mm OD cable for model BM</li> <li>■ 1/2" NPTF for model BGM, GABM, GK-BM</li> </ul>
Process connection	
BM – Threaded	<ul style="list-style-type: none"> <li>■ Integral Tee for line size upto 1"</li> <li>■ Above 1" line size 1" BSPM standard</li> </ul>
BM – Flanged	1½" or 2" ANSI #150RF flanges are available from the line size 40 ... 300 mm
Sealing	Buna-N
Mounting – on line	
Type	<ul style="list-style-type: none"> <li>■ Horizontal</li> <li>■ Vertical (flow must be bottom to top only)</li> </ul>
Operating condition	
Ambient temperature range	-10°C ... +60°C [14 ... 140°F]
Medium temperature range	-10 ... +110°C [14 ... 230°F] for brass -10...+170°C [14....338°F] for SS
Storage temperature range	-10°C ... +60°C [14 ... 140°F]
Pressure loss	60 ... 80 mbar at maximum flow
Ingress protection	IP65: BM IP66 per IS/IEC 60529: BGM, GABM4, GABM6, GK-BM

## Ordering matrix

### Switch enclosure

ABS plastic enclosure weatherproof to IP65	BM
GM style aluminium pressure die cast, weatherproof to IP66	BGM
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 60079-1	GK-BM

### Line size(Refer Table-3 and 4)

Specify nominal line size in "mm" [Eg. 015 for 15 mm NB]	015
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### Range code

Refer Table-3 and 4	<input type="checkbox"/>
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### Switch actuation

Raising	R
Falling	F

### Wetted parts

Brass body, phosphor bronze bellows & 316 SS paddle (not possible with GK-BM)	1
304 SS body, 316L SS bellows & 316 SS paddle	4
316 SS body, 316L SS bellows & 316 SS paddle	2
316L SS body, 316L SS bellows & teflon coated 316 SS paddle	3

### Process connection

#### For line size up to 25 mm

Integral Tee, BSPF Threads (upto 1" line size)	SL
Integral Tee, NPTF threads (upto 1" line size)	SM
Flanged integral Tee, 1" 150 RF	FL

#### For line size from 32 ... 300 mm

Threaded 1" BSPM	TH
Threaded 1" NPTM	TN
Flanged to 1½" ANSI 150 RF for line size 40 mm and above	FA
Flanged to 2" ANSI 150 RF for line size 40 mm and above	FB
Flanged to 1½" ANSI 300 RF for line size 40 mm and above	FC
Flanged to 2" ANSI 300 RF for line size 40 mm and above	FD
Special process connection	S3

### Process connection material

Mild steel (for line size 15, 20, 25 NB with integral tee) (not possible with GK-BM)	C
Brass (not possible with GK-BM)	1
304 SS	4
316 SS	2
316L SS	3

### Switch code and rating

Refer Table-1	<input type="checkbox"/>
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### Electrical entry code

Refer Table-2	<input type="checkbox"/>
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### For available other options refer below

- NACE preparation (available only with wetted parts 316L SS body, 316L SS bellows & teflon coated 316 SS paddle)
- Viton seal 'O' ring
- EPDM seal 'O' ring
- Teflon seal 'O' ring (not applicable for GK-BM)
- Integral tee for line size 32 ... 50 mm

**Table 1: Switch code, rating and availability**

Switch code		Contact version	AC rating	DC rating in Ampere					
SPDT	DPDT			Resistive			Inductive		
				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	-	-	3.0	-	-	1.0
G	GG	Hermetically sealed, inert gas filled with gold plated contact	-	-	-	1.0	-	-	0.25

**Table 2: Electrical entry**

Size *	BM		BGM		GABM4 / GABM6		GKBM	
	Single	Dual	Single	Dual	Single	Dual	Single	Dual
1/2" NPT(F) per ASME B1.20.1	-	-	A	N	A	N	A	N
3/4" NPT(F) per ASME B1.20.1 through adaptor	-	-	L	O	L	O	L	O
M20 x 1.5 per ISO724 **	-	-	P	PE	P	PE	E	EB
M16 Nylon elbow cable gland	F	FB	-	-	-	-	-	-
7 pin plug through connector ***	-	-	C	-	-	-	-	-
9 pin plug through connector ***	-	-	D	-	-	-	-	-

- \* Cable gland available on request
- \*\* Possible in GK-BM enclosure as direct. Others through adaptor.
- \*\*\* Possible only in BGM enclosure.

**Table 3**

Line size NB mm	Falling		Rising		Maximum flow (LPM water)
	Code	Description (LPM)	Code	Description (LPM)	
015	L007	3 ... 9	L015	8 ... 12	21
020	L010	4 ... 11	L016	9 ... 14	38
025	L017	10 ... 30	L024	16 ... 33	60
032	L021	13 ... 50	L028	23 ... 52	100
040	L025	16 ... 60	L029	30 ... 70	150
050	L033	36 ... 90	L073	60 ... 95	250
065	L037	45 ... 120	L044	85 ... 135	400
080	L043	65 ... 175	L047	120 ... 200	600
100	L051	190 ... 460	L053	290 ... 500	1000
	L046	100 ... 280	L050	190 ... 310	1000
125	L056	380 ... 890	L058	530 ... 930	1500
	L048	150 ... 420	L054	300 ... 470	1500
150	L059	600 ... 1360	L061	800 ... 1400	2000
	L052	200 ... 510	L057	400 ... 600	2000
200	L063	1210 ... 2760	L065	1580 ... 2900	3700
	L060	650 ... 1510	L062	1020 ... 1700	3700
250	L067	1970 ... 3830	L069	2600 ... 4200	6000
	L064	1240 ... 2410	L066	1850 ... 2800	6000
300	L070	2600 ... 4830	L072	3500 ... 5300	8500
	L068	2000 ... 3080	L071	2800 ... 3600	8500

BM / BGM / GABM / GK-BM instruments are suitable up to 100 CST only.

**Table 4**

Line size NB mm	Range code	Switching range (LPM)	Maximum flow (LPM water)
		On falling flow code 'F'	
020	L016	9 ... 14	38
025	L148	30 ... 60	100
025	L155	22 ... 50	60
025	L109	25 ... 50	60
025	L112	22 ... 50	60
025	L113	10 ... 36	60
025	L116	60 ... 100	150
032	L148	30 ... 60	100
032	L141	50 ... 85	120
032	L149	50 ... 90	120
040	L114	40 ... 100	150
040	L077	40 ... 76	150
040	L150	40 ... 170	250
040	L151	100 ... 180	250
050	L115	80 ... 160	250
050	L151	80 ... 240	250
050	L079	100 ... 170	250
050	L162	100 ... 240	250
050	L142	250 ... 320	420
050	L116	50 ... 100	250
065	L116	50 ... 100	400
065	L115	80 ... 160	400
065	L045	100 ... 200	400
065	L143	140 ... 220	400
065	L152	120 ... 260	400
065	L153	150 ... 300	400
080	L111	125 ... 300	600
080	L144	100 ... 400	600
100	L117	200 ... 525	1000
100	L145	190 ... 660	1000
100	L137	240 ... 810	1000
100	L163	350 ... 800	1000
25...100 *	L135	10 ... 460	60 ... 1000
000 **	---	---	---

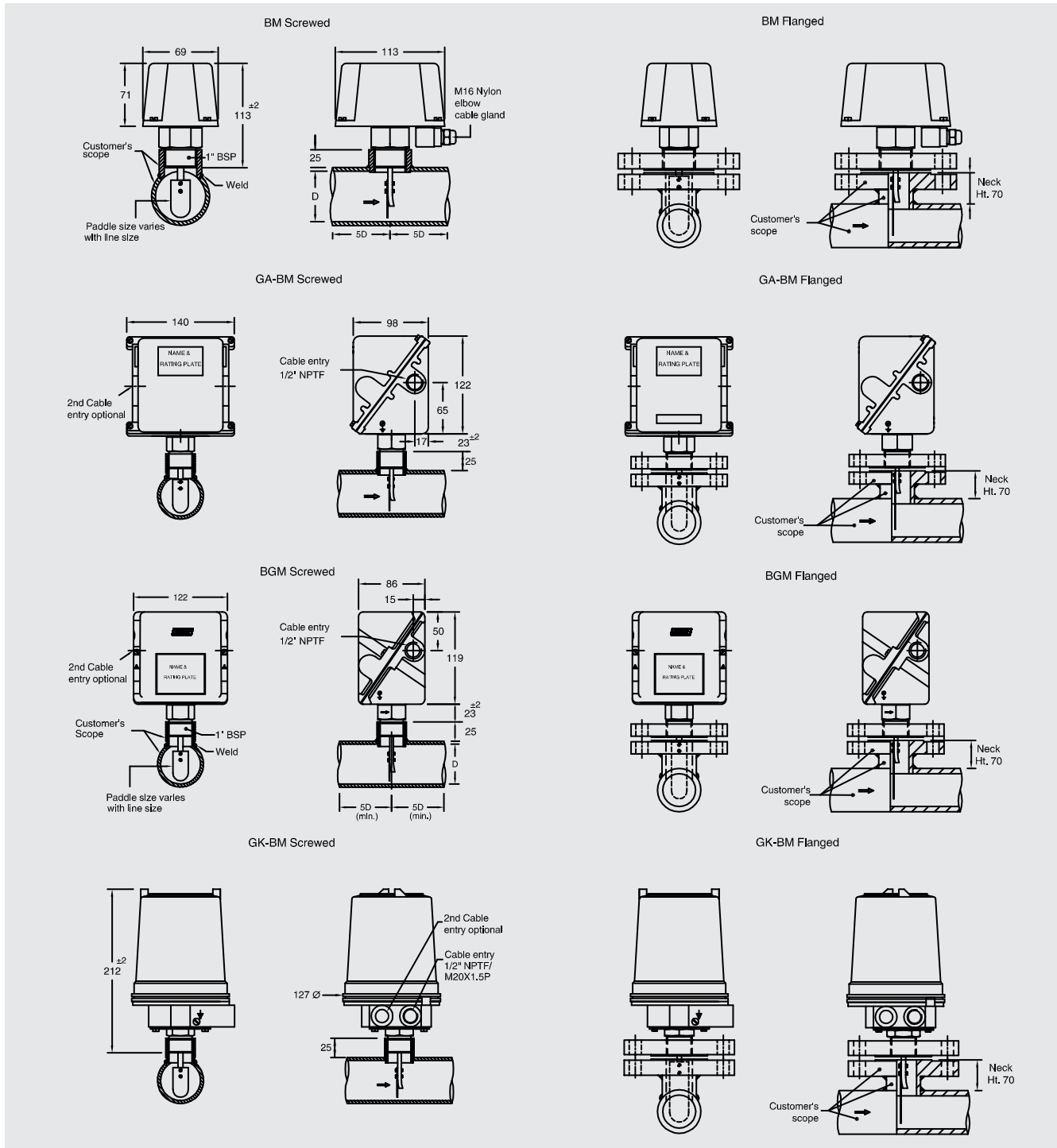
\* For range code L135 all set of paddles shall be supplied along with the instrument, to be used in the line size between 25 ... 100 mmNB

\*\* For line size "000" all set of paddles shall be supplied along with the instrument, to be used in the line size between 25 ... 300 mmNB

## Notes

1. Gr.IIC of IS/IEC:60079-1 is 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. 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 NM<sup>3</sup>/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.*
6. 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.*
7. DPDT action is achieved by two SPDT switches synchronized to practical limits i.e.,  $\pm 2\%$  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.
9. Contact life of microswitches are  $5 \times 10^5$  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  $\pm 5\%$ .**

# Dimensions in mm



## Ordering information

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

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