



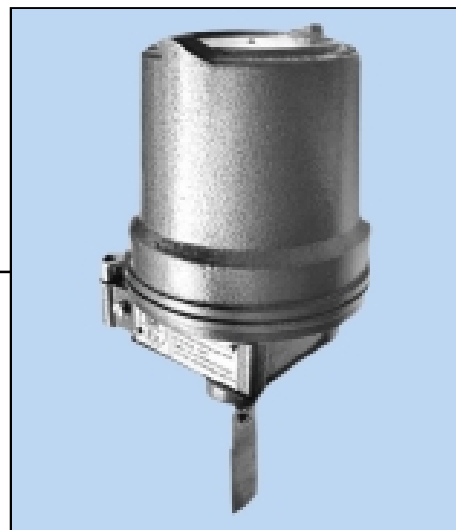
# FLOW SWITCHES

**BM, BGM,  
GK - BM & AM**

- BELLOWS SEALED ● INTERCHANGEABLE PADDLES ●
- WEATHERPROOF / FLAMEPROOF ● COMPACT SIZE ●
- 15 MM TO 300 MM LINES OR DUCTS ●



**MODEL BM**



**MODEL GK-BM**

SWITZER style BM/BGM/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.

SWITZER style AM flow switch is similar in design to style BM but without bellows seal. It senses air flow or no flow responding only to the velocity of air movement in a duct. Provides a positive signal to detect change or loss of air flow velocity caused by a closed damper, a loose fan wheel, a slipped or broken fan belt, a dirty or clogged filter or even an overload to a fan motor. Large paddles are used for reliable switching.

## GENERAL SPECIFICATION

<b>Enclosure</b>		<b>Max. Working Temp.</b>	70°C for <b>AM</b> version 100°C for Brass body 170°C for SS body
<b>BM &amp; AM</b>	ABS plastic weatherproof to IP:65	<b>Pressure Loss</b>	60 to 80 mbar at maximum flow
<b>BGM</b>	Pressure die cast Aluminium, weatherproof to IP:66	<b>Connection</b>	
<b>GK-BM</b>	Die cast Aluminium, weatherproof to IP:66 & flameproof to Gr.IIA,IIB or IIC for H <sub>2</sub> Gas <i>(Note 1)</i>	<b>Process</b>	For <b>AM</b> version, Fixing plate—Std. For <b>BM</b> threaded version, Integral Tee is std upto 1" line size. For other line sizes, 1" BSPM is std. For <b>BM</b> flanged version, 1-1½" or 2" ANSI # 150 RF are available <i>(Note 2)</i>
<b>Sensor &amp; Wetted Parts</b>	Refer ordering matrix	<b>Electrical</b>	For AM & BM – M16 PVC gland. For BGM & GK—BM, ¾" ET std & ½" NPTF optional; dual entry on request. For Gr.IIC enclosure, ½" NPTF – dual entry is standard.
<b>Ranges</b>	Refer Tables 1 & 2	<b>Mounting</b>	Horizontal or Vertical (For vertical pipes, flow should be from bottom to top only)
<b>Repeatability</b>	± 2% FSR <i>(Note 3)</i>		
<b>Switching</b>	Instrument quality SPDT microswitch <i>(Note 8)</i>		
<b>Differential</b>	≤ 25% of Max. flow for 15 NB line ≤ 10% for all other line sizes		
<b>Max. Line Pressure</b>	15 bar for Brass body 30 bar for SS body 0.2 bar for Duct mount <b>AM</b> model		

# ORDERING MATRIX

## BM / BGM / GK-BM / AM Flow Switches

Example:

**BM 015 M SL 3**

### BASIC MODEL NO.

Weatherproof switches for circular pipes with ABS plastic enclosure and threaded / flanged / integral tee connection ————— **BM**

Weatherproof switches for circular pipes with pressure die cast Al. enclosure and threaded / flanged / integral tee connection ————— **BGM**

Flameproof switches for circular pipes with die cast Al. enclosure and threaded / flanged / integral tee connection ————— **GK-BM**

Non-weatherproof switches for square / rectangular ducts with ABS plastic enclosure and MS fixing plate ————— **AM**

### LINE SIZE

For Duct (Model AM only) ————— **000**

For other models specify nominal line size in "mm"

Eg. 015 for 15 mm NB (or 150 for 150 mm NB) ————— **015**

Standard line sizes are 15,20,25,32,40,50,65,80,100,125,150,200,250 & 300 NB

### WETTED PARTS

Brass body, MS fixing plate & 316 SS paddle (for model AM only) ————— **S**

Brass body, Ph. Bronze bellows & 316 SS paddle (for all except AM) ————— **M**

316 SS body, 316L SS bellows & 316 SS paddle (for all except AM) ————— **K**

### PROCESS CONNECTION

Fixing plate (Model AM only) ————— **PP**

Integral Tee, Mild steel (upto 1" line size) ————— **SL**

Integral Tee, 304 SS (upto 1" line size) ————— **S4**

Integral Tee, 316 SS (upto 1" line size) ————— **S6**

Threaded to 1" BSPM ————— **TH**

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 non-standard size for line size 40 mm and above ————— **FX**

### SWITCH CODE, RATING & AVAILABILITY

Code 3, D — For general purpose usages

Code 4 — Gold Alloy contact

Code 9 — Hermetically sealed, inert gas filled with Silver Alloy contact

Code G — Hermetically sealed, inert gas filled Gold plated contact  
*(Note 5)*

SWITCH CODE (SPCO)	AC RATING	DC RATING IN AMPS						AVAILABILITY OF SPDT IN MODELS	AVAILABILITY OF DPDT IN MODELS
		RESISTIVE			INDUCTIVE				
		220V	110V	24V	220V	110V	24V		
3	15A 250/125V	NOT SUITABLE FOR D.C.						AM, BM, BGM & GK-BM	AM, BM & BGM
D	15A 250/125V	0.2	0.4	6.0	0.02	0.05	5.0		
4	1A 125V	N.A.	0.5	0.5	N.A.	0.25	0.25	BM, BGM & GK-BM	---
9	1A 115V	N.A.	N.A.	3.0	N.A.	N.A.	1.0		
G	N.R.	N.R.	N.R.	1.0	N.R.	N.R.	0.25		

For DPCO, change switch code '3' to '33' & 'D' to 'DD' while ordering

**Table 1 :**

LINE SIZE NB mm	SWITCHING RANGE-LPM				MAX FLOW (LPM WATER)
	ON FALLING FLOW		ON RISING FLOW		
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	
15	3	9	8	12	21
20	4	11	9	14	38
25	10	30	16	33	60
32	13	50	23	52	100
40	16	60	30	70	150
50	36	90	60	95	250
65	45	120	85	135	400
80	65	175	120	200	600
100	190	460	290	500	1000
	100	280	190	310	1000
125	380	890	530	930	1500
	150	420	300	470	1500
150	600	1360	800	1400	2000
	200	510	400	600	2000
200	1210	2760	1580	2900	3700
	650	1510	1020	1700	3700
250	1970	3830	2600	4200	6000
	1240	2410	1850	2800	6000
300	2600	4830	3500	5300	8500
	2000	3080	2800	3600	8500

**Table 2 :**

FLOW RANGES FOR AM		
PADDLE SIZE mm	ADJ.RANGE INC.FLOW AT VELOCITY Mtr/Sec.	ADJ.RANGE DEC.FLOW AT VELOCITY Mtr/Sec.
175 x 80	2.0 to 5.0	1.0 to 4.0
175 x 54	3.5 to 9.0	2.5 to 8.0
<b>Max. recommended flow velocity -- 10 Mtr/Sec</b>		

**Other Models Available :**

- HR** : For high pressure.
- FM** : Low flow and small line sizes with fixed setting.
- PM** : OEM version, low range with adjustable setting.
- CM** : OEM version, high range.
- SM** : Water sprinkler application.
- UZ** : Flow switch with indicator.

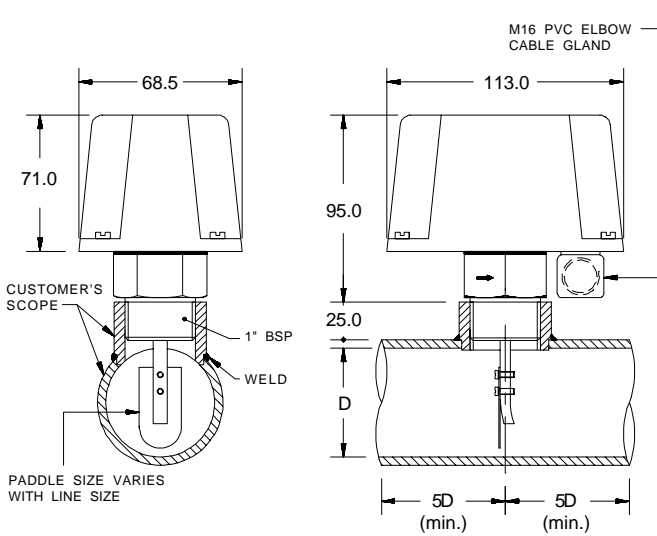
For further details consult Sales H.O. / Branch.

**NOTES**

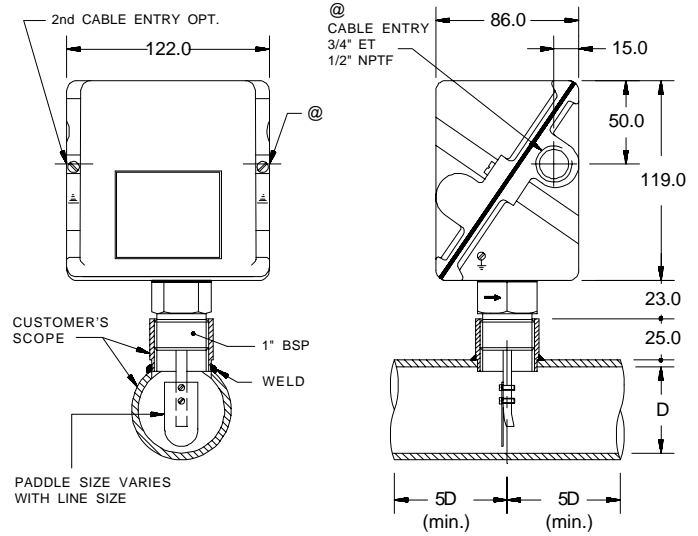
- Gr.IIA & IIB of IS:2148 is equivalent to NEC CL.1, Gr.C & D. Gr.IIC of IS:2148 is equivalent to NEC CL.1, DIV.1, Gr.A&B.
- The maximum line pressure is the limiting value for flanged versions irrespective of the flange ratings. The flange is not integral, but screwed on to the body with a lock nut. Flange mounting is not available upto 32 mm.
- Accuracy & Repeatability are one and the same for all blind switches. Settings will slightly shift with varying temperature.
- All models can be supplied with PVC paddles instead of 316SS paddles if required. Add suffix 'X' in the model number.
- Instruments can be supplied with hermetically sealed microswitches other than Code 3 general purpose microswitch. On-off differentials will be different. Consult factory.
- All the ranges are in LPM water. For equivalent airflow in NM<sup>3</sup>/hour at NTP, multiply the above figures by 0.9. For any liquid other than water, the setting range depends on the viscosity and specific gravity of the fluid at flow conditions. To get equivalent ranges for such liquids, a viscosity correction factor has to be applied. Consult factory.
- Maximum flow setting range is referred to as FSR herein. The maximum flow value mentioned in the table 1 is 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 factory.
- 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.
- Contact life of microswitches are 5 X 10<sup>5</sup> 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 microfarads equal to holding current in Amps.

# MOUNTING DIMENSIONS

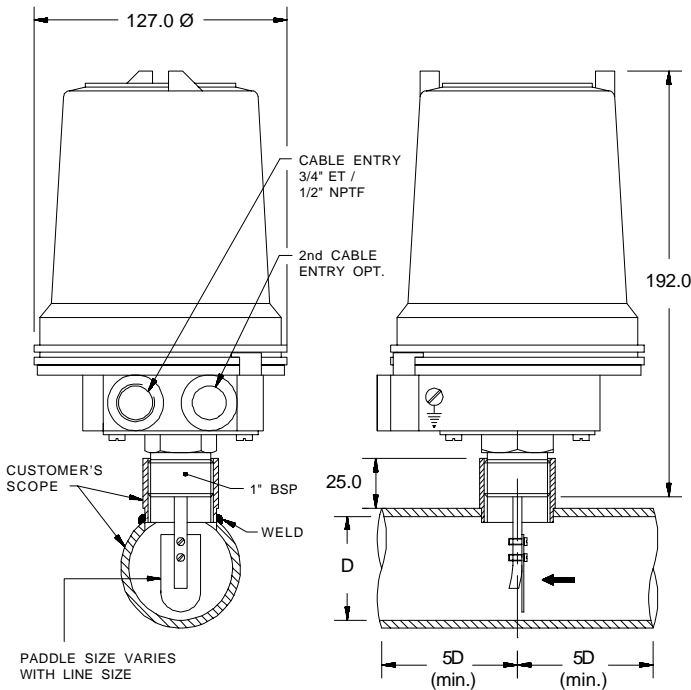
**BM**



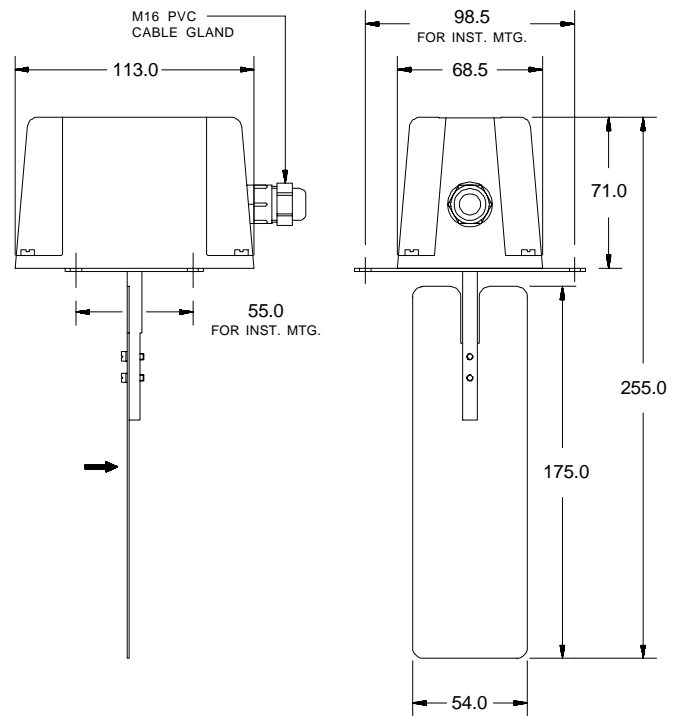
**BGM**



**GK-BM**



**AM**



All dimensions are in mm

*Prior notification of changes in specification is impracticable due to continuous development.*

FOR **SWITZER'S** OFFICES IN INDIA

CHECK AT:

<http://www.switzerinstrument.com/offices.htm>