



# SW-07

## Variable Area Flowmeter and Switch



## Features

- / For viscous media from  
30 cSt up to 600 cSt
- / Any mounting position,  
no need of recalibration
- / Compact design
- / Brass and stainless steel versions
- / Highly accurate switching
- / Very low switching hysteresis
- / Non-abrasive burnt-in scale on glass

## Description:

The SW-07 series of flowmeters and switches operates according to a modified variable area principle. Using a spring, the float is introduced into a cylindrical slit nozzle. The flowing medium moves the float in the direction of flow and the upper edge of the float indicates the flowing volume on the scale mounted on the sight glass. A reed contact is situated outside the device. This reed contact is infused in a stepless adjustable housing and thus protected from external influences. When the float reaches along with its integrated magnet the position of the reed contact, the contact blades get closed. If the volume of flow is higher the float continues to move maximum up to the stopper that prevents overriding of the connecting range. This ensures a bistable switching action at any time.

## Application:

The spring action and magnetic float ensure absolute functional safety. Due to the spring mounted inside that presses the float in the opposite direction of flow into its initial position, the device can be deployed in any mounting position. No readjustment is required as the artificially matured spring is under pretension. The strong pretension of the spring in combination with an aperture in the float limit the effect of the medium's viscosity fluctuations to a minimum in comparison with other normal float flowmeters. The SW-07 series of variable area flowmeters and switches is intended for measuring and monitoring viscous fluids, for example, in centrally controlled lubrication systems, oil circulation lubrication systems, transformer oils and so on.



## Ordering Codes:

**Order number** SW-07. 1. 1. 1. 06. 1. 1. 1. 0

**SW-07 Variable Area Flowmeter and Switch**

**Process connection /**

- 1 = female thread G 1/4"
- 2 = female thread G 1/2"
- 3 = female thread G 3/4"
- 4 = female thread G 1"

**Material /**

- 1 = brass, spring made of stainless steel 1.4571
- 2 = fully stainless steel 1.4571

**Scale /**

- 1 = for viscous media from 30 cSt up to 600 cSt

**Operating ranges / deactuation flow rates\***

**SW-07.2 only (small design):**

- 03 = 0.5...1.7 l/min
- 03a = 0.8...2.5 l/min
- 04 = 1.3...4 l/min
- 05 = 2.5...8 l/min

**SW-07.1 to SW-07.4:**

- 06a = 0.1...0.8 l/min (only up to 400 cSt)
- 07 = 0.5...1.5 l/min
- 08 = 1...4 l/min
- 09 = 2...8 l/min (not 1/4")
- 10 = 3...10 l/min (not 1/4")
- 11 = 5...15 l/min (not 1/4")
- 12 = 8...24 l/min (not 1/4")
- 13 = 10...30 l/min (not 1/4" or 1/2")
- 14 = 15...45 l/min (not 1/4" or 1/2")
- 15 = 20...60 l/min (not 1/4" or 1/2")
- 16 = 30...90 l/min (not 1/4" or 1/2")

**Number of contacts /**

- 0 = no contacts
- 1 = 1 contact
- 2 = 2 contacts

**Contact function /**

- 0 = no contacts
- 1 = NO-contact
- 2 = change-over contact
- 3 = Ex m-change-over contact, operating ranges 06a-16 (always with 2 m infused cable)
- 4 = Ex m-NO-contact, operating ranges 06a-16 (always with 2 m infused cable)
- 5 = change-over contact for PLC
- 6 = Ex ib-NO contact, operating ranges 03...05 only
- 7 = Ex ib-change-over, operating ranges 03...05 only

**Electrical connection /**

- 0 = none, if no contacts
- 1 = plug conn. DIN43650 shape A, counter plug incl.
- 2 = plug M12x1, counter plug incl. (-20...+85°C)
- 3 = 1 m fused cable (2 m for Ex), (not for Ex ib-change-over contact)

**Special issues /**

- 0 = none
- 1 = please specify in detailed text

\*setpoints are valid for fluids with a specific weight of 0.9 kg/dm<sup>3</sup>

## Technical Specifications:

- Protection class /** IP65 with plug DIN43650, IP67 with cable connection or plug M12x1 (SW-07.3 and SW-07.4, else IP65)
- max. Pressure /** 16 bar operating ranges 03...05  
10 bar operating ranges 06a...16
- Pressure drop /** 0.02...0.2 bar ranges 03...05  
0.02...0.4 bar ranges 06a...16
- max. Temp. /** 120°C (160°C optional)
- El. Connection /** device plug as per DIN 43650
- Accuracy /** ±10% of full scale value
- Ranges /** 0.1...0.8 l/min to 30...90 l/min for fluids with viscosity between 30...600 cSt

## Contacts (max. V):

Contact function	
NO-contact ranges 03-05	230V, 3A, 60VA
NO-contact ranges 06a-16	250V, 3A, 100VA <sup>(1, 2)</sup>
CO-contact	250V, 1.5A, 50VA
Ex m-NO-contact ranges 06a-16	250V, 2A, 60VA <sup>(1, 2)</sup>
Ex m-CO-contact ranges 06a-16	250V, 1A, 30VA <sup>(1, 2)</sup>
CO-contact PLC	250V, 1A, 60VA <sup>(3)</sup>
NO-contact M12x1 ranges 03-05	125 V, 3A, 60VA
CO-contact M12x1 ranges 03-05	125 V, 1.5A, 50VA
NO-contact M12x1 ranges 06a-16	250 V, 3A, 100VA <sup>(1, 2)</sup>
CO-contact M12x1 ranges 06a-16	250 V, 1.5A, 50VA <sup>(1, 2)</sup>

<sup>(1)</sup> ATEX II 2 G Ex mb IIC T6 Gb & ATEX II 2 D Ex tb IIIC T80°C Db (max. Ambient temp. 75°C)

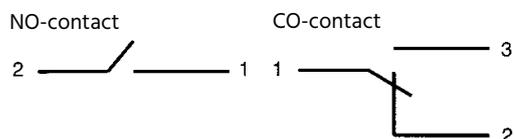
ATEX II 2 G Ex mb IIC T5 Gb & ATEX II 2 D Ex tb IIIC T100°C Db (max. Ambient temp. 90°C)

<sup>(2)</sup> Minimum load 3VA

<sup>(3)</sup> ranges 03-05 only with plug connection

The contact opens respectively changes, when the upcoming flow falls below the adjusted setpoint.

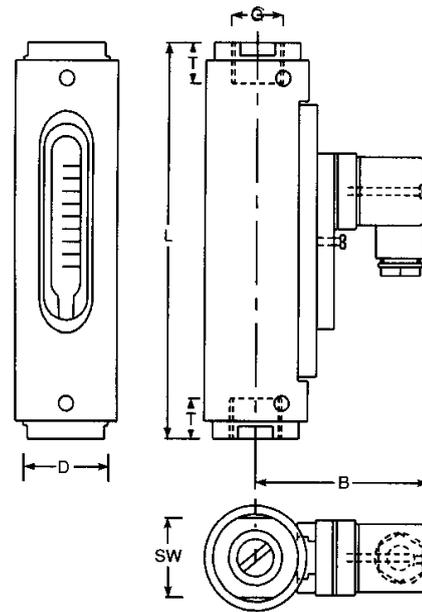
## Electrical Connection:





## Dimensions in mm:

Type	SW	D	B	G	T	L	Weight
SW-07.1.x.x.x	41	45	74	1/4"	10	144.5	850 g
SW-07.2.x.x.03-05	27	30	54	1/2"	14	114	300 g
SW-07.2.x.x.06a-12	41	45	74	1/2"	14	144.5	850 g
SW-07.3.x.x.x	41	45	74	3/4"	15	138.5	850 g
SW-07.4.x.x.x	41	45	74	1"	17	158.5	850 g



## Wetted parts:

Element	brass version	st. steel version
Magnets	hard ferrite	hard ferrite
Window	Duran® 50	Duran® 50
Spring	st. steel 1.4571	st. steel 1.4571
Seals	FKM (optional NBR, EPDM)	FKM (optional NBR, EPDM)
Other parts	brass nickel-plated	st. steel 1.4571

## Dry parts:

Element	brass version	st. steel version
shell	aluminium, anodized	aluminium, anodized

### EX ib NO contact and change-over contact

Gas			Dust		
Ui	Ii	Pi	Ui	Ii	Pi
< 12.1 V	1.0 A	3.0 W	< 12.1 V	0.25 A	0.75 W
< 20 V	0.309 A	1.55 W	< 20 V	0.25 A	0.75 W
< 25 V	0.158 A	0.99 W	< 25 V	0.25 A	0.75 W
< 30 V	0.101 A	0.76 W	< 30 V	0.25 A	0.75 W

The switching units have to be connected only to intrinsically safe circuits.

Li = 0; Ci = 0

protection class with plug DIN 43650 C or plug M12: IP65

protection class with 1 m infused cable: IP67

marking: II 2G Ex ib IIC and II 2D Ex ib IIIC

operating temperature -5°C < TService < +45°C

