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Operating Instructions

DS08

*Viscosity Compensated Flowmeter
for high pressure applications*

General

1. Before installation, make sure that the materials of the flowmeter are suitable for the medium to be measured.

Installation

The flowmeter and switch model DS08 works according to a modified variable area principle.

The float is guided in a cylindrical measuring tube by means of a spring. The flowing medium moves the float in the flow direction.

A specially drilled hollow float with sharp-edged orifices makes the meter independent of viscosity changes from 30 to 600 cSt.

The medium must be clean, without pollution. Especially ferritic particles may cause problems. In this case we recommend the use of magnetic filters model SF01.

Flow meters with Reed contact may not be used within an inductive or strong magnetic field. All standard threads are made according to DIN 2999 Part 1. Please make sure that only appropriate counter threads and sealing material is used for installation, in order to ensure proper function and tightness.

To avoid measurement errors, straight pipe runs of 10 x D upstream and 5 x D downstream of the meter should be installed.

While mounting the flowmeter the fittings have to be countered by means of a suitable wrench. If this is not done the fitting may rotate within its aluminium housing which in turn may cause the flowmeter to leak.

While connecting flowmeters with Reed contact make sure that the max. contact ratings on the unit are not exceeded (not even for short times), as Reed contacts are very sensitive to overloads. This especially applies when inductive loads are connected. When switching inductive loads current surges of up to 10 times the rated value of the coil may occur. In such cases we recommend the use of a contact protection relay.

The Reed contacts are coated with tungsten, gold or rhodium and may therefore be connected directly to a PLC without any problems.

Electrical connection

The drawing shows the Reed contacts in the no-flow position.

N/O 2 ——— / ——— 1

SPDT 1 ——— / ——— 3
 | 2

Adjustment of switch point

The contact is open in the no-flow position. With flow, the contact will close

1. Loosen the tightening screws of the switch housing and move the housing all the way down.
2. Increase the flow until the upper edge of the float shows the desired min. flow rate (contact is now closed)
3. Move the switch housing upwards until the contact opens. Increase the flow the normal flow rate (the contact is now closed).

Maintenance

The flowmeter and switch has only very few moving parts. Therefore maintenance is limited to occasional cleaning and a function check of the unit. With corrosion inhibitors or additives in the medium please check whether they may affect the materials of the flowmeter.

DS08

Viscosity Compensated Variable Area Flowmeter And Switch For High Pressure Applications, Mounting Independent

- for viscous media up to 600 cSt
- mounts in any position without recalibration
- small mounting dimensions
- materials brass or stainless steel
- high switching accuracy
- very small switch hysteresis
- robust design without glass measuring tube
- suitable for pressures up to 5000 psi / 350 bar



Description:

The flowmeter and switch model DS08 works according to a modified variable area principle.

The float is guided in a cylindrical measuring tube by means of a spring. The flowing medium moves the float in the flow direction. An externally mounted pointer indicator is magnetically coupled to the float and thus, following the float position, indicates the flow rate on a scale.

A Reed contact is mounted outside the meter in a sealed housing. When the float reaches the position of the Reed contact the switch will close. With higher flows the float moves further upward until it reaches a built-in float stop, still keeping the switch closed. This ensures a bistable switch function at any time.

The Reed contact is adjustable over the full switching range of the meter.

Viscosity compensation, mounting position and reliability:

The built-in spring and the magnetic float guarantee an absolute reliability of the meter. This spring, which pushes the float back towards its zero position against the flow makes it possible to use the meter in any mounting position. The spring is artificially aged, thus eliminating the need for recalibration to the different mounting positions.

The strong spring and an orifice in the float work together to limit the effects of viscosity changes to an absolute minimum compared to regular variable area flowmeters.

Application:

The variable area flowmeter and switch model DS08 is used for measuring and monitoring the flow of viscous liquids, i. e. in central lubricating systems, any other lubricating circuitry, hydraulics, transformer oils etc.

Versions:

- flow switch only with Reed contact
- optionally as flow meter and switch with external pointer indicator and contact

Measuring ranges: 1.6-12.7 GPH ... 9.5-29 GPM
0.1-0.8 l/min ... 35-110 l/min
for viscosities up to 600 cSt

Materials: brass or st. Steel

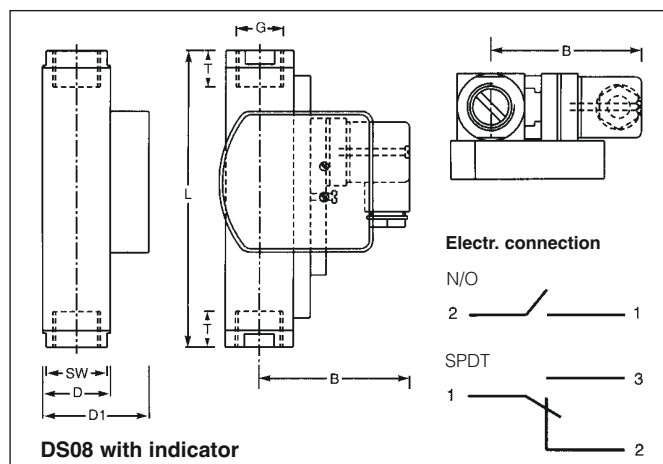
Contacts: N/O: 250 V, 3 A, 100 VA**
SPDT: 250 V, 1.5 A, 50 VA***
Ex-N/O*: 250 V, 2 A, 60 VA
Ex-SPDT*: 250 V, 1 A, 30 VA

* according to Atex 100a Ex II 2 G, EEx m II T6 and II 2D IP67 T80 °C

** for DS08.S...(230V, 1 A, 50 VA) ***250V, 1A, 50 VA (TYPE:2X)

Dimensions:

Model	Mounting dimensions in inch / mm							Weight (lbs / g)	
	SW	D	D1	B	NPT/G	T	L	without indication	with indication
DS08.M	1.06 / 27	1.22 / 31	1.89 / 48	1.89 / 48	1/2"	0.55 / 14	3.54 / 90	0.77 / 350	-
DS08.S	1.57 / 40	1.57 / 40	2.24 / 57	2.68 / 68	1"	0.67 / 17	5.12 / 130	2.20 / 1000	2.31 / 1050
Special connection									
DS08.M					1/4"	0.55 / 14	3.86 / 98	0.88 / 400	-
					3/8"	0.55 / 14	4.25 / 108	0.99 / 450	-
DS08.S					1/4"	0.83 / 21	5.98 / 152	2.42 / 1100	2.53 / 1150
					1/2"	0.83 / 21	5.98 / 152	2.42 / 1100	2.53 / 1150
					3/4"	0.83 / 21	5.98 / 152	2.42 / 1100	2.53 / 1150



Technical Specifications:

max pressure:

brass version: 4350 psi / 300 bar (DS08.M),
3600 psi / 250 bar (DS08.S)

st. steel version: 5000 psi / 350 bar (DS08.M),
4350 psi / 300 bar (DS08.S)

pressure drop: 0.29-5.8 psi / 0.02-0.4 bar (DS08.M),
0.29-2.9 psi / 0.02-0.2 bar (DS08.S)

max. temp.: 248 °F / 120 °C, 320 °F / 160 °C optionally

materials: wetted parts:

brass version: nickel plated brass

st. steel version: stainless steel 316 Ti / 1.4571

O-rings (for DS08.-.xR... only):

DS08.x.x 1: Buna, optionally: EPDM, Viton

DS08.x.x.2: Viton, optionally: EPDM, Buna

electrical connection: plug acc.to DIN 43650 (optionally: 1m cable connection) (optionally: circular plug M 12x1 to EN 50044)

accuracy: ± 10% f. s.

analog output: see model DSxx-A in section "accessory"

Ordering Code:

Order number: DS08.S.4.1.1.06.1.1.1.0

All metal viscosity compensated variable area flowmeter and switch

Size:

M = miniature

S = standard

Connection:

1RN = reduction to 1/4" NPT female
1R = reduction to G 1/4 female

2RN = reduction to 1/2" NPT female, for DS08.S only
2R = reduction to G 1/2 female

3RN = reduction to 3/4" NPT female, for DS08.S only
2 = G 1/2 female
3R = reduction to G 3/4 female

4 = G 1 female

Material:

1 = brass, spring st. steel 304 / 1.4310

2 = all st. steel 316 Ti / 1.4571

Scale:

1 = for viscous media up to 600 cSt

Measuring ranges:

DS08.M. only

01U = 1.6-12.7 GPH 01 = 0.1 - 0.8 l/min

03U = 8.0-25.5 GPH 03 = 0.5 - 1.6 l/min

04U = 13-48 GPH 04 = 0.8 - 3 l/min

05U = 32-111 GPH 05 = 2 - 7 l/min

DS08.S. only

06U = 1.6-12.7 GPH 06 = 0.1 - 0.8 l/min

07U = 8-24 GPH 07 = 0.5 - 1.5 l/min

08U = 16-63 GPH 08 = 1 - 4 l/min

09U = 32-127 GPH 09 = 2 - 8 l/min

10U = 48-160 GPH 10 = 3 - 10 l/min

11U = 80-240 GPH 11 = 5 - 15 l/min

12U = 125-380 GPH 12 = 8 - 24 l/min

12AU = 15-320 GPH 12A = 1 - 20 l/min

13U = 160-480 GPH 13 = 10 - 30 l/min

13AU = 60-630 GPH 13A = 4 - 40 l/min

14U = 240-710 GPH 14 = 15 - 45 l/min

14AU = 80-790 GPH 14A = 5 - 50 l/min

15U = 320-950 GPH 15 = 20 - 60 l/min

15AU = 130-950 GPH 15A = 8 - 60 l/min

16U = 8.0-24.0 GPM 16 = 30 - 90 l/min

16AU = 3.2-18.5 GPM 16A = 12 - 70 l/min

17U = 9.5-29.0 GPM 17 = 35 - 110 l/min

17AU = 4.0-21.1 GPM 17A = 15 - 80 l/min

Version:

0 = switch only, without flow rate indication

1 = flow meter and switch, with side indicator (for DS08.S only)

No. of contacts:

0 = without contact (for flowmeters with indicator only)

1 = 1 contact

2 = 2 contacts

Contact function:

0 = without contact (for flowmeters with indicator only)

1 = N/O

2 = SPDT

3U = Ex-N/O, not available for DS08.M (EEx m II T6)

3S = Ex-SPDT, not available for DS08.M (EEx m II T6)

Options:

0 = without

1 = please indicate

attention: Please indicate flow-direction and mounting position.

Analog output 4-20 mA for DS08.S on request.

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