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Operating Instructions

DS07

Viscosity Compensated Flowmeter
And Switch with Glass Measuring Tube

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 DS07 works according to a modified variable area principle.
The float is guided in a cylindrical measuring glass by means of a spring. The flowing medium moves the float in the flow direction. The upper edge of the float shows the momentary flow via a burnt-in scale on the measuring glass.
A specially drilled hollow float with sharp-edged orific makes the meter independent of viscosity changes from 30 to 600 cSt.

The medium must be clean, without pollution. Espacially 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 te 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 or may damage the measuring glass.

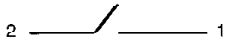
While connecting flowmeters with Reed contact make sure that the max. contact ratings on the unit are not exceeded (not even for short times), as Reed contact are very sensitive to overloads. This especially applies when inductive loads are connected. When swichint inductive loads current surges of up 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.

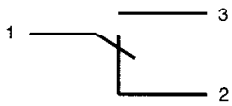
Electrical connection

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

N/O



SPDT



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 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 wether they may affect the materials of the flowmeter.

DS07

Viscosity Compensated Variable Area Flowmeter And Switch, Mounting Independent

- for viscous media up to 600 cSt
- mounts in any position without recalibration
- compact design
- materials brass or stainless steel
- high switching accuracy
- very small switch hysteresis
- measuring glass with burnt-in scale

Description:
The flowmeter and switch model DS07 works according to a modified variable area principle.
The float is guided in a cylindrical measuring glass by means of a spring. The flowing medium moves the float in the flow direction. The upper edge of the float shows the momentary flow via a burnt-in scale on the measuring glass.
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 measuring 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 DS07 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.

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5/08

Measuring Ranges:

8-27 GPH … 8-24 GPM
0.2 - 0.8 l/min … 30 - 90 l/min
for viscosities up to max. 600 cSt

Materials: brass or stainless steel

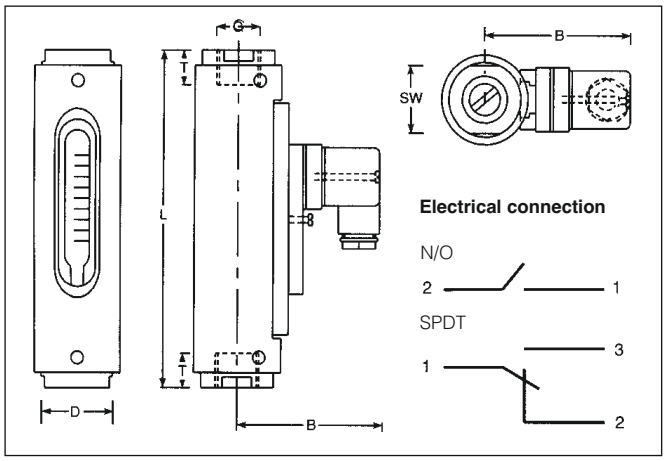
Contacts:

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 DS07.S.2/3/4...(230V, 1 A, 50 VA)
*** 250V, 1A, 50 VA (TYPE:2X)

Dimensions:

Model	Mounting dimensions in inch / mm						Weight
	SW	D	B	NPT / G	T	L	(lbs / g)
DS07.S.1	1.61 / 41	1.97 / 50	3.03 / 77	1/4"	0.67 / 17	5.71 / 145	1.87 / 850
DS07.S.2	1.61 / 41	1.97 / 50	3.03 / 77	1/2"	0.67 / 17	5.71 / 145	1.87 / 850
DS07.M.1	1.06 / 27		2.07 / 53	1/2"	0.55 / 14	4.49 / 114	0.66 / 300
DS07.S.3	1.61 / 41	1.97 / 50	3.03 / 77	3/4"	0.67 / 17	5.47 / 139	1.87 / 850
DS07.S.4	1.61 / 41	1.97 / 50	3.03 / 77	1"	0.67 / 17	6.22 / 158	1.87 / 850



Technical Specifications:

max. pressure: 232 psi / 16 bar (DS07.M)
145 psi / 10 bar (DS07.S)

pressure drop: 0.29 - 2.9 psi / 0.02 - 0.2 bar (DS07.M)
0.29 - 5.8 psi / 0.02 - 0.4 bar (DS07.S)

max. temperature: 248 °F / 120 °C
(320 °F / 160 °C on request)

materials: Measuring glass: Duran 50
Housing: anodized aluminium
O-rings: Perbunan
(optionally: Viton, EPDM)

elektr. connection: plug acc. to DIN 43650
(optionally: 1m cable connection)

accuracy: ± 10% f. s.

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

Ordering Code:

Order number: DS07. M. 2. 1. 1. 05. 1. 1. 0

Viscosity compensated variable area flowmeter and switch

Size:
M = miniature
S = standard

Connection:
1N = 1/4" NPT female
2N = 1/2" female
3N = 3/4" female
4N = 1" female
1 = G 1/4 female
2 = G 1/2 female
3 = G 3/4 female
4 = G 1 female

Material:
1 = brass, spring st. steel 1.4310
2 = all st. steel 1.4571

Scale:
1 = for viscous media

Measuring ranges:
DS07.M 1/2" only:

01U = –	01 = 0.2 - 0.8 l/min
02U = 3.2 - 15.9 GPH	02 = 0.2 - 1 l/min
03U = 8 -27 GPH	03 = 0.5 - 1.7 l/min
04U = 21 - 63 GPH	04 = 1.3 - 4 l/min
05U = 40 - 127 GPH	05 = 2.5 - 8 l/min

DS07.S 1/4" only:

06AU = 1.6 - 12.7 GPH	06 A = 0.1 - 0.8 l/min
07AU = 8 - 24 GPH	07 A = 0.5 - 1.5 l/min
08AU = 16 - 63 GPH	08 A = 1 - 4 l/min

DS07.S 1/2", 3/4", 1":

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 - 159 GPH	10 = 3 - 10 l/min
11U = 80 - 240 GPH	11 = 5 - 15 l/min
12U = 125 - 380 GPH	12 = 8 - 24 l/min

DS07.S 3/4", 1":

13U = 160 - 475 GPH	13 = 10 - 30 l/min
14U = 240 - 710 GPH	14 = 15 - 45 l/min
15U = 320 - 950 GPH	15 = 20 - 60 l/min
16U = 8 - 24 GPM	16 = 30 - 90 l/min

No. of contacts:
0 = without contact
1 = 1 contact
2 = 2 contacts

Contact function:
0 = without contact
1 = N/O
2 = SPDT
3S = Ex-N/O, not available for DS07.M (EEx m II T6)
3U = Ex-SPDT, not available for DS07.M (EEx m II T6)

Options:
0 = without
1 = please indicate

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