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Operating Instructions

DS03

Variable Area 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 DS03 works according to the variable area principle. The meter must be mounted vertically. Flow is always from bottom to top.
The medium must be free of particles (especially ferrous particles which may cause a clogging of the measuring tube. If this is not the case we recommend the use of filters, in case of ferrous particles with a magnetic insert with a max. mesh size of 0,02 " / 0,6 mm.
All applications which deviate from the standard conditions (monitoring of continous flow) should be discussed first with our technical personnel.
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.

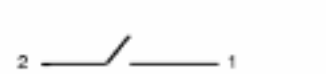
While connecting flowmeters with Reed contact make sure that the max. contact ratings on the unit are not exceeded (not even for short times), as Reed contact are very sensitive to overloads. This especially applies when inductive loads are connected. When swichint inductive loads current surges of up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

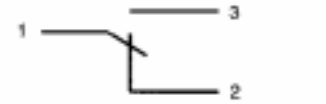
Electrical connection

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

N/O contact



SPDT contact



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.

DS03

Variable Area Flowmeter And Switch

- small mounting dimensions
- materials brass or stainless steel
- scales for water and air
- high switching accuracy
- very small switch hysteresis
- measuring glass with burnt-in scale

Description:
The flowmeter and switch model DS03 works according to a modified variable area principle.
The float is guided in a cylindrical measuring glass. 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.

Application:
The variable area flowmeter and switch model DS03 is used for measuring and monitoring the flow of low viscosity liquids and gases, i. e. in cooling cicuits of welding machines and laser systems, for pump monitoring, compressors and many other applications.

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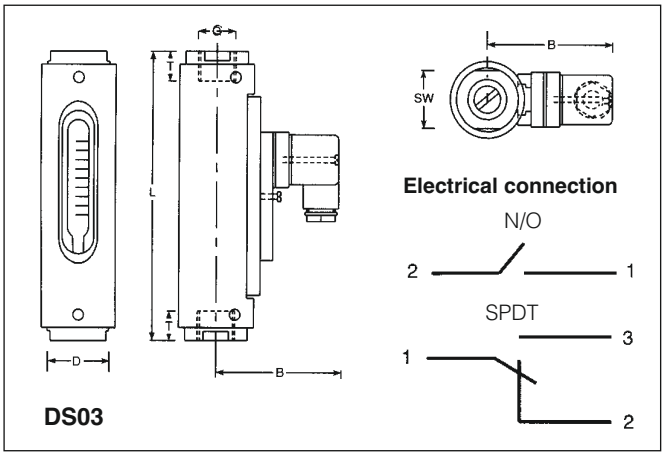
Measuring Ranges:

Water:	1.6-23.8 GPH…60…790 GPH 0.1-1.5 l/min … 4-50 l/min
Air:	6.5-63.5 SCFH…7-56.5 SCFM 3-30 Nl/min … 200-1600 Nl/min at 14.7 psia / 1.013 bar abs. and 68 °F / 20 °C
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

Dimensions:

Model	Mounting dimensions in inch / mm						Weight
	SW	D	B	NPT / G	T	L	lbs / g
DS03.1.x.x.x	1.26 / 32	1.69 / 43	2.87 / 73	1/4	0.55 / 14	5.20 / 132	1.38 / 625
DS03.2.x.x.x	1.26 / 32	1.69 / 43	2.87 / 73	1/2	0.59 / 15	5.31 / 13	1.38 / 625
DS03.2.x.x.05	1.26 / 32	1.69 / 43	2.87 / 73	1/2	0.59 / 15	6.42 / 163	1.43 / 650
DS03.3.x.x.05	1.26 / 32	1.69 / 43	2.87 / 73	3/4	0.63 / 16	6.57 / 167	1.43 / 650
DS03.3.x.x.06/07	1.61 / 41	1.97 / 50	2.99 / 76	3/4	0.71 / 18	6.46 / 164	2.21 / 1000
DS03.4.x.x.06/07	1.61 / 41	1.97 / 50	2.99 / 76	1	0.75 / 19	7.24 / 184	2.21 / 1000
DS03.4.x.x.08	1.61 / 41	1.97 / 50	2.99 / 76	1	0.79 / 20	7.87 / 200	2.43 / 1100



DS03

Technical Specifications:

max. pressure:	145 psi / 10 bar
pressure drop:	0.15-2.9 psi / 0.01-0.2 bar
max. temperature:	212 °F / 100 °C (320 °F / 160 °C optionally) for liquids, 194 °F / 90 °F for gases
materials:	Measuring glass: Duran 50 Housing: anodized aluminium O-rings: Buna, (optionally: Viton, EPDM)
electrical connections:	plug acc. to DIN 43650 (optionally: 1 m cable connection)
accuracy:	± 5% f. s.
analogue output:	see model DSxx-A in section “accessory”

Ordering Code:

Order number: DS03. | 3. | 1. | 1. | WA06. | 1. | 1. | 0

Variable area flowmeter and switch

Connection:

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

Material:
1 = brass
2 = all st. steel 316 Ti / 1.4571

Scale:
1 = for Water
2 = for air (at 14.7 psia / 1.013 bar abs., 68 °F / 20 °C)

Measuring ranges:

DS03.1 and DS03.2:

Water	WU01 = 1.6 - 23.8 GPH	WA01 = 0.1 - 1.5 l/min
	WU02 = 3.2 - 47.5 GPH	WA02 = 0.2 - 3 l/min
	WU03 = 5.0 - 127 GPH	WA03 = 0.3 - 8 l/min
	WU04 = 16 - 190 GPH	WA04 = 1 - 12 l/min
Air	LU01 = 6.5 - 63.5 SCFH	LA01 = 3 - 30 Nl/min
	LU02 = 13 - 127 SCFH	LA02 = 6-60 Nl/min
	LU03 = 13 - 340 SCFH	LA03 = 6-160 Nl/min
	LU04 = 42 - 510 SCFH	LA04 = 20-220 Nl/min

DS03.2 and DS03.3:

Water	WU05 = 32 - 285 GPH	WA05 = 2 - 18 l/min
Air	LU05 = 85 - 760 SCFH	LA05 = 40 - 360 Nl/min

DS03.3 and DS03.4:

Water	WU06 = 48 - 550 GPH	WA06 = 3 - 35 l/min
	WU07 = 60 - 790 GPH	WA07 = 4 - 50 l/min
Air	LU06 = 2.1 - 24.7 SCFM	LA06 = 60 - 700 Nl/min
	LU07 = 2,0 - 29,0 SCFM	LA07 = 60 - 825 Nl/min

DS03.4 only:

Water	LU08 = 7 - 56.5 SCFM	LA08 = 200 - 1600 Nl/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 (EEx m II T6)
3U = Ex-SPDT (EEx m II T6)

Options:
0 = without
1 = please indicate

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