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Operating Instructions

DS02

Miniature Variable Area Flow Switch

General

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

Installation

A spring, integrated in the measuring tube, makes the flow switch widely independent of the mounting position. The medium flow is always from the lowest to the highest scale value.
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 switches 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 flowmete the max. thread length has to be observed. Using to long a thread may cause the flow switch to leak or even to be damaged.

While connecting the 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.

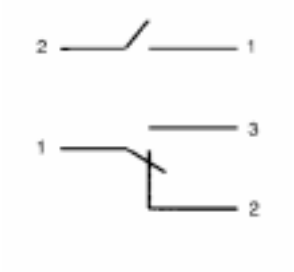
The Reed contacts are coated with tungsten, gold or rhodium and may therefore be connected directly to a PLC without any problems.

Electrical connection

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

N/O contact

SPDT contact



Adjustmend of switch point

The switching point is adjusted by means of the scale on the flow switch housing. The markings on the scale always define the N/O position. This means that with falling flow the Reed contact will open at the respective flow rate; it is closed while the flow is above the set flow rate.

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.

DS02

Miniature Variable Area Flow Switch

- small mounting dimensions
- materials brass or stainless steel
- scales for water and air
- universal mounting position
- high switching accuracy
- very small switch hysteresis

Description:
The flow switch model DS02 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 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.

Application:
The variable area flow switch model DS02 is used for 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.

Switching hysteresis:
By careful selection of the Reed contacts the swiching hysteresis could be reduced to only 0.02" - 0.06" / 0.5 - 1.5 mm float movement.

PKP PROCESS INSTRUMENTS

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4/08

Measuring Ranges:

Water: 0.08 - 0.95 GPH … 16 - 40 GPM
5 - 60 ml/min … 60 -150 l/min
Air: 0.4 - 2.75 SCFH … 7.0 - 22.0 SCFM
0.6 -2.2 Nl/min … 200 - 650 Nl/min
(at 14.7 psia / 1.013 bar abs. and 68 °F / 20 °C)

Materials:
brass or stainless steel

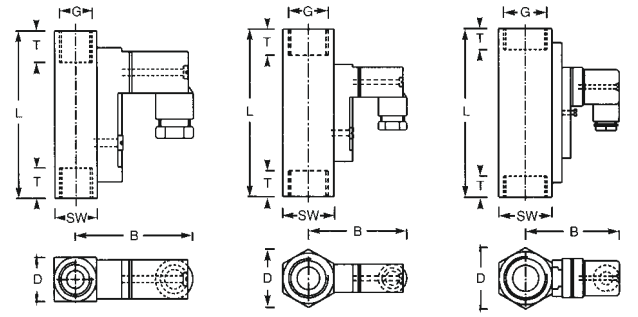
Contacts:

Contact function	DS02.1	DS02.2	DS02.3 / DS02.4
N/O	200 V, 1A, 20 VA	230 V, 3A, 60 VA	250 V, 3 A, 100 VA
SPDT	200 V, 1A, 20 VA	250 V, 1.5 A, 50 VA	250 V, 1.5 A, 50 VA
N/O*			250 V, 2A, 60VA
Ex-SPDT*			250 V, 1A, 30 VA

* according to Atex 100a Ex II 2 G, EEx m II T6

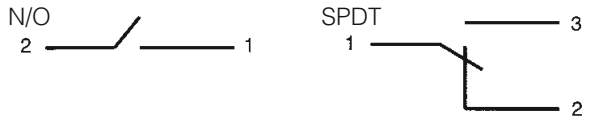
Dimensions:

Model	Mounting dimensions in inch / mm						Weight
	SW	D	B	NPT / G	T	L	(lbs / g)
DS02.1	0.67 / 17	0.67 / 17	1.85 / 47	1/4	0.39 / 10	2.56 / 65	0.31 / 140
DS02.2	1.06 / 27	1.22 / 31	2.05 / 52	1/2	0.55 / 14	3.53 / 90	0.77 / 350
DS02.3	1.61 / 41	1.85 / 47	2.99 / 76	3/4	0.83 / 21	5.98 / 152	2.43/1100
DS02.4	1.61 / 41	1.85 / 47	2.99 / 76	1	0.67 / 17	5.12 / 130	2.65/1200



DS02.1 DS02.2 DS02.3 / DS02.4

Electrical connection



Technical Specifications:

max. pressure: DS02.1/2 4350 psi / 300 bar (brass), 5000 psi / 350 bar (stainless steel) DS02.3/4 3600 psi / 250 bar (brass), 4350 psi / 300 bar (stainless steel)

pressure drop: DS02.1: 0.29-2.9 psi / 0.02-0.2 bar DS02.2: 0.29-4.35 psi / 0.02-0.3 bar DS02.3/4: 0.29-5.8 psi / 0.02-0.8 bar

max. temperature: 212 °F / 100 °C (optionally 320 °F / 160 °C) for liquids, 194 °F / 90 °C for gases

materials:
brass version: housing: nickel plated brass
st. steel version: stainless steel: 316 Ti / 1.4571

electr. connection: plug acc. to DIN 43650 (optionally: 1m cable connection for DS02.1, N/O only)

accuracy: ± 10% f.s.

analog output: see model DSxx-A in section “accessory”

Ordering Code:

Order number: DS02. | 1. | 1. | 1. | W13 | 1. | 1. | 0

Miniature variable area flow switch

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

Material:
1 = brass, spring of st. steel 304 / 1.4310
2 = all stainless steel 316 Ti / 1.4571

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

Measuring ranges:

DS02.1 only:

Water:	WU101	= 0.08-0.95 GPH	W101	= 5-60 ml/min
	WU102	= 0.65-2.05 GPH	W102	= 40-130 ml/min
	WU106	= 1.6-9.5 GPH	W106	= 0.1-0.6 l/min
	WU11	= 3-19 GPH	W11	= 0.2-1.2 l/min
	WU12	= 6.5-41.5 GPH	W12	= 0.4-2 l/min
	WU13	= 8.0-48.0 GPH	W13	= 0.5-3 l/min
	WU15	= 16.0-80.0 GPH	W15	= 1.0-5 l/min
Air:	LU1002	= 1.30-4.70 SCFH	L1002	= 0.6-2.2 Nl/min
	LU1006	= 3.50-12.70 SCFH	L1006	= 1.7-6.0 Nl/min
	LU1008	= 5.3-17.0 SCFH	L1008	= 2.5-8.0 Nl/min
	LU1012	= 6.5-25.5 SCFH	L1012	= 3-12 Nl/min
	LU1022	= 6.0-47.0 SCFH	L1022	= 3-22 Nl/min
	LU1024	= 15.0-51.0 SCFH	L1024	= 7-24 Nl/min
	LU1034	= 25.0-72.0 SCFH	L1034	= 12-34 Nl/min
	LU1056	= 34-119 SCFH	L1056	= 16-56 Nl/min
	LU1080	= 42-170 SCFH	L1080	= 20-80 Nl/min

DS02.2 only:

Water:	WU202	= 0.30-3.35 GPH	W202	= 0.02-0.2 l/min
	WU206	= 3.20-9.50 GPH	W206	= 0.2-0.6 l/min
	WU21	= 6.5-28.5 GPH	W21	= 0.4-1.8 l/min
	WU23	= 13.0-51.0 GPH	W23	= 0.8-3.2 l/min
	WU27	= 32.0-111 GPH	W27	= 2-7 l/min
	WU213	= 48.0-205 GPH	W213	= 3-13 l/min
	WU220	= 65.0-315 GPH	W220	= 4-20 l/min
	WU230	= 130-480 GPH	W230	= 8-30 l/min
Air:	LLU2010	= 5.5-21.0 SCFH	L2010	= 2.5-10 Nl/min
	LU2020	= 12.0-42.0 SCFH	L2020	= 5.5-20 Nl/min
	LU2030	= 17.0-64.0 SCFH	L2030	= 8-30 Nl/min
	LU2035	= 21.0-74.0 SCFH	L2035	= 10-35 Nl/min
	LU2090	= 50.0-190 SCFH	L2090	= 24-90 Nl/min
	LU2220	= 115-465 SCFH	L2220	= 55-220 Nl/min
	LU2240	= 140-510 SCFH	L2240	= 65-240 Nl/min
	LU2300	= 170-640 SCFH	L2300	= 80-300 Nl/min
	LU2525	= 5.00-18.50 SCFM	L2525	= 140-525 Nl/min

DS02.3 or DS02.4:

Water:	WU3030	= 160-480 GPH	W3030	= 11-30 l/min
	WU3045	= 240-710 GPH	W3045	= 15-45 l/min
	WU3060	= 320-950 GPH	W3060	= 20-60 l/min
	WU3090	= 8.00-24.0 GPM	W3090	= 30-90 l/min
Air:	LU30180	= 125-380 SCFH	L30180	= 60-180 Nl/min
	LU30300	= 210-635 SCFH	L30300	= 100-300 Nl/min
	LU30650	= 7.00-23.0 SCFM	L30650	= 200-650 Nl/min

DS02.4 only:

Water:	WU3150	= 16.0-40.0 GPM	W3150	= 60-150 l/min

No. of contacts:
1 = 1 contact
2 = 2 contacts

Contact function:
1 = N/O
2 = SPDT
3S = Ex-N/O (EEx m II T6), DS02.3, DS02.4 only
3U = Ex-SPDT (EEx m II T6), DS02.3, DS02.4 only

Options:
0 = without
1 = please indicate

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