


# DS04

## Variable Area Flowmeter and Switch for High Pressure Applications

- applicable for low viscosity liquids and gases
- small mounting dimensions
- brass (nickel plated) or stainless steel version
- high switching accuracy
- robust design without a measuring glass tube
- for process pressure up to 300 bar
-  optional Ex- version acc. to ATEX
- analogue transmitter 4...20 mA available



### Description:

The flowmeter and switch model DS04 works according to a modified variable area principle.

The float is guided in an upward tapered measuring tube. 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 measuring and switching range of the meter.

### Typical application:

The variable area flowmeters and monitors DS02 are used to measure and monitor continuous flow rates of low-viscosity liquids or gaseous media.

Areas of applications are:

- cooling systems
- engineering
- medical technology
- pharmaceutical and chemical industries
- research and development

## Models:

### Measuring ranges:

water: 0,1–1,5 l/min ... 4–50 l/min  
air: 1–28 NI/min ... 200–1450 NI/min  
(referenced to 1 bar abs, 20°C)

**Materials:** brass (nickel plated) or stainless steel versions

### Technical Data:

**Max. pressure:** brass version: 200 bar  
stainless steel version: 300 bar

**Pressure loss:** 0,02–0,2 bar (for liquids)  
0,02 – 0,4 bar (for gases)

**Max. media-temperature:** 100 °C for liquids (optional 160 °C)  
80 °C for gases,  
Ex-devices acc. to. ATEX-marking

**Operating temp.:** 70 °C with analogue transmitter SU20

**Electr. Connection:** angle plug acc. to EN 155301-803,  
Form A (DIN 43650),  
Ex-contact with 2 m cable,

**optional:** cable connection  
round plug M12 x 1 acc. to EN 50044  
angle plug with LED or glow lamp

**Accuracy:** ± 5 % of full scale for liquids  
± 10 % of full scale for air

**Mounting position:** vertical

## Materials:

### Brass version (nickel plated):

Wetted parts:  
float: brass nickel plated (for liquids)  
POM (for gases)  
threaded rings: brass  
gaskets: NBR (optional FKM, EPDM)

all other wetted parts: brass nickel plated

### Stainless steel version 1.4571:

Wetted parts:  
float: stainless steel 1.4571 (for liquids)  
POM (for gases)  
gaskets: FKM  
(optional NBR, EPDM)

all other wetted parts: stainless steel 1.4571

## Order Code:

**Order Number:** DS04. 3. 1. 1. WA06. 1. 1. 1. 0

**variable area flowmeter-  
and switch**

### Connection female thread:

1 = G 1/4 1N = 1/4" NPT  
1A = G 3/8 1AN = 3/8" NPT  
2 = G 1/2 2N = 1/2" NPT  
3 = G 3/4 3N = 3/4" NPT  
4 = G 1 4N = 1" NPT

### Material:

1 = brass nickel plated  
2 = stainless steel 1.4571

### Scale:

1 = for water  
2 = for air (at 1 bar abs., 20 °C)

### Measuring ranges:

**Water** **Air**  
**DS04.1, DS04.1A und DS04.2:**

WA01 = 0,1–1,5 l/min LA01 = 1–28 NI/min  
WA02 = 0,2–3 l/min LA02 = 4–60 NI/min  
WA03 = 0,3–8 l/min LA03 = 6–160 NI/min  
WA04 = 1–12 l/min LA04 = 20–240 NI/min

### DS04.2 and DS04.3:

WA05 = 2–18 l/min LA05 = 40–360 NI/min

### DS04.3 or DS04.4:

WA06 = 3–35 l/min  
WA07 = 4–50 l/min LA07 = 60–700 NI/min

### only DS04.4:

LA08 = 200–1450 NI/min

**Addition S...= special scale**

### Flow indicator:

0 = Switch only, without flow indicator  
1 = Flowmeter and -switch, with flow indicator

### Number of contacts:

0 = without contact (only for devices with indication and/or SU20)  
1 = 1 contact  
2 = 2 contacts

### Contact function / Analogue output:

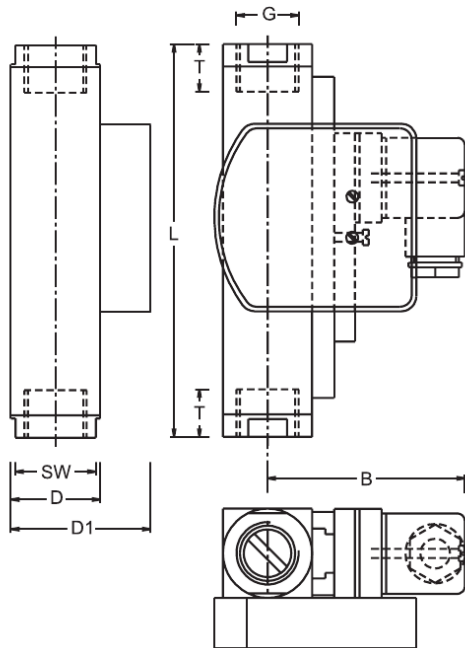
(contact or analogue transmitter available)

0 = without  
1 = N/O  
2 = SPDT  
2X = SPDT for SPS application  
3S = Ex-N/O,  
3U = Ex-SPDT  
SU20 = analogue transmitter 4...20 mA and 0...10 V

### Options:

0 = without  
1 = please specify in plain text  
HT = high temperature version 160 °C (for liquids only)  
M12 = round plug M12 x 1 acc. to EN 50044 (Tmax. 85 °C)  
Kx = cable version 1 m, 2 m, 5 m, or 10 m

## Dimensions:



**DS04 with flow indicator**

## Dimensions:

Type	Dimensions [mm]							Weight appr. [g]
	SW	D	D1	B.	G	T	L	
01 - 04	27	30	47	71	1/4	14	131	800/900
					3/8	19		
05	32	35	47	71	1/2	19	146	800/850
					3/4	17	174	960/1010
06	34	40	57	76	3/4	18	152	1350/1400
07	40	40	57	76	1	19	156	1050/1100
08	50	40	67	81	1	20	200	2750/2800

## Contacts:

The contact opens/changes, if the flow level has fallen under the adjusted value

Type	Size	Contact function	Switching capacity		
			Angle plug IP65	M12x1 plug IP67	cable connection (1 m) IP67
DS04.1	1/4"	1 = N/O	250 V / 3 A / 100 VA		
DS04.1A	3/8"	2 = SPDT	250 V / 1,5 A / 50 VA, min. load: 3 VA		
DS04.2	1/2"				
DS04.3	3/4"	2X = SPDT for SPS	250 V / 1 A / 60 VA	-/-	-/-
DS04.4	1"	3S = Ex-N/O*	-/-	-/-	250 V / 2 A / 60 VA (2 m cable)
		3U = Ex-SPDT*	-/-	-/-	250 V / 1 A / 30 VA, min load: 3 VA (2 m cable)

\* Exact max. switching capacity: see ATEX documents

## ATEX-designations:

ATEX II 2 G Ex mb II T6 & ATEX II 2 D Ex tD A21 IP67 T80 °C  
 ATEX II 2 G Ex mb II T5 & ATEX II 2 D Ex tD A21 IP67 T100 °C  
 (with cable connection, Standard 2 m only)

## Analogue transmitter SU20:

- analogue signal 4...20 mA and 0...10 V
- operating temperature up to 70 °C
- accuracy: +/- 10 % of full scale
- aluminium housing, anodized



### Technical Data:

<b>Accuracy*:</b>	+/- 10 % of full scale
<b>Operating temperature:</b>	-20...+70 °C
<b>Storage temperature:</b>	-20...+80 °C
<b>Repeatability:</b>	+/- 3 % of full scale
<b>Material housing:</b>	aluminium, blue anodized
<b>Protection class:</b>	IP67

\* Higher calibration accuracy when calibrated individually. Available on request.

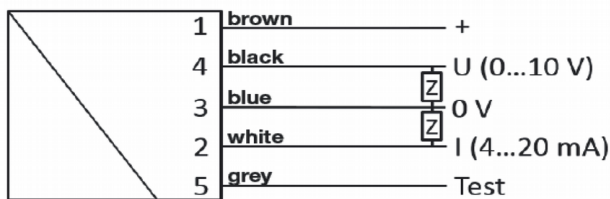
### Electrical Data:

<b>Analogue output:</b>	4...20 mA and 0...10 V
<b>Power supply:</b>	24 VCD (19...30 VDC)
<b>Power consumption:</b>	< 1 W
<b>Current output:</b>	Max. load 600 Ω
<b>Voltage output:</b>	Max. current 10 mA
<b>Connection:</b>	For round plug M12x1, 5 pin

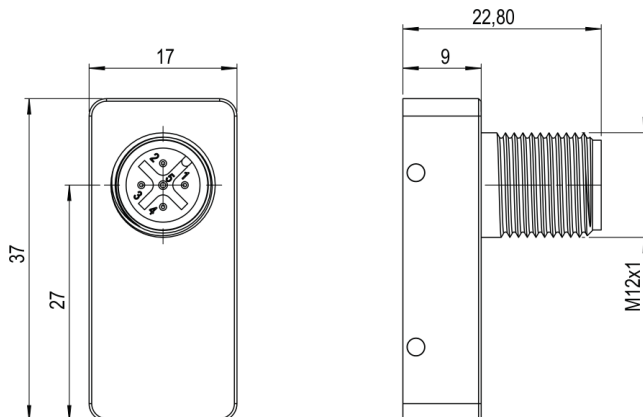
### Note:

Please note that the flowmeter and the analogue transmitter have been optimally adjusted to each other and may not be exchanged!

### Electrical connection:



### Dimensions:



## Accessories (see separate data sheets):

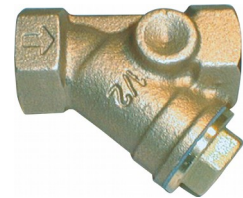
- Needle valves SNV01, SNV02



- Ball valves SKG01, SKG02



- Dirt traps SF00, SF01



- Protection relay MSR01



- M12 Plug connector PVC-cable SM12



### Notes:

The specified measuring/switching ranges apply when the instrument is installed vertically and the flow rate is from bottom to top.

Other installation positions or operating densities deviating from the specified specifications increase the specified measuring error.

Special scales for different media and operating conditions are available on request.

The specified switching points are shut-off points at falling flow rates. Please note that the switch-on points are higher due to the hysteresis.

For applications where pressure surges are to be expected, please contact PKP!

