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Operating Instructions

DS20

Variable area flowmeter for low flows

1. Mechanical Operation

Mounting Position:

Vertical with upward flow. Avoid pipe vibrations!

Prior to installation:

Before installing the flowmeter make sure that there is no packing material left in the flow meter.
If there is the possibility of dirt build-up in the flow meter we recommend to install a bypass pipe in order to be able to dismout the flowmeter without stopping the process

Prior to operation:

Check wether the float (1) movement is unimpeded by carefully pushing the float upward in the measuring tube (2). If the float is blocked the measuring tube and float assembly must be cleaned.
The pointer indicator must follow the float movement freely, if it does not contact PKP for an exchange of the indicator assembly (28).

Maintenance:

The variable area flowmeter DS20 is maintenance-free.

Disassembly of measuring tube:

For cleaning the measuring tube (2) and the float (1) the following steps have to be taken:

1. Remove flowmeter from pipe system
2. Remove the snap ring at the top (30)
3. Remove the float stop (29)
4. Take out the float (1)
5. Clean float and measuring tube (1+2)

With model DS20... (version with valve) a screw plug must be removed instead of the snap ring. For better cleaning of the valve the complete valve set may be pulled out after loosening a headless pin.

Caution: Manipulations at the flowmeter may only be done with an empty and pressure-less unit. Make sure that when the valve is installed the safety pin is correctly fastened.

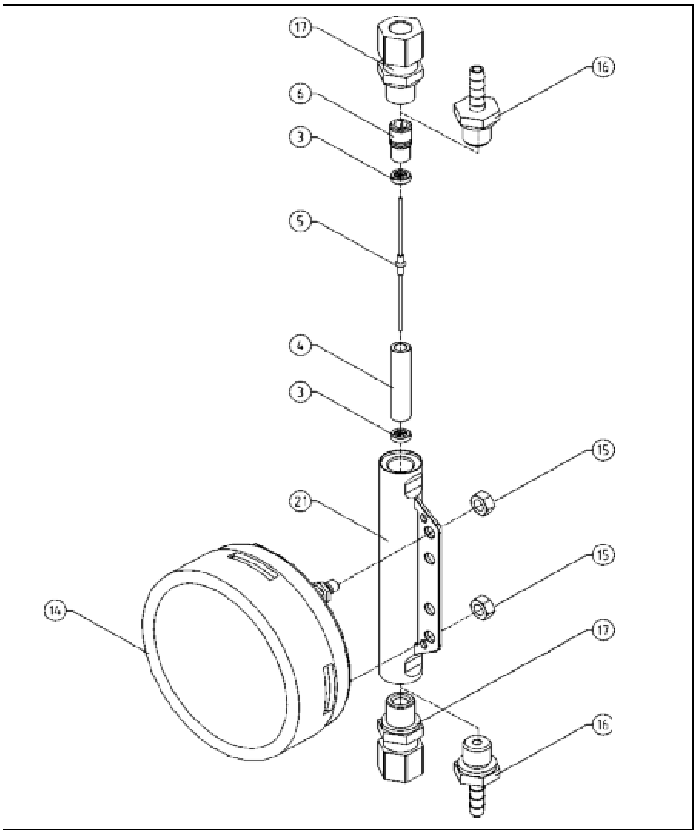
If there is a defect in the display unit the cover may be removed by loosening the four cover screws. With an exchange of the display unit a new calibration is necessary.

Assembly of measuring tube:

6. Insert the float (1)
   Caution: The float must glide freely into the orifice. Check by observing the display.
7. Insert the float stop (29)
8. Attach the snap ring (30)
9. Install the flowmeter into pipe

Caution: Until commissioning the flowmeter must be stored in a clean and dry room to avoid any kind of soiling, especially of the inside of the mesuring tube.

DS20 - Parts Drawing



Pos.	Pieces	Description
21	1	Metering tube
20	2	Screwing
19	2	Nozzle
18	1	Controller
17	2	Screwing
16	2	Nozzle
15	2	Screw nut
14	1	Indicator
13	1	Valve button
12	1	Valve spindle
11	1	Packing bolt
10	1	Screw sealing
9	1	Packing box
8	1	Screw sealing plug
7	1	Gasket
6	1	Threaded bolt
5	1	Float
4	1	Cone
3	2	Float stop
2	1	Socket
1	1	Tube with valve

Analogue Output (Option)

Supply voltage:	13.5-30 VDC
Current consumption:	<= 21.5 mA
Max. load R_i:	(U-13,5V) / 20 mA
Max. voltage:	U_{max} = 30 V
Output current:	4-20 mA

The output signal is not linear to the flow and, if necessary, must be linearized.

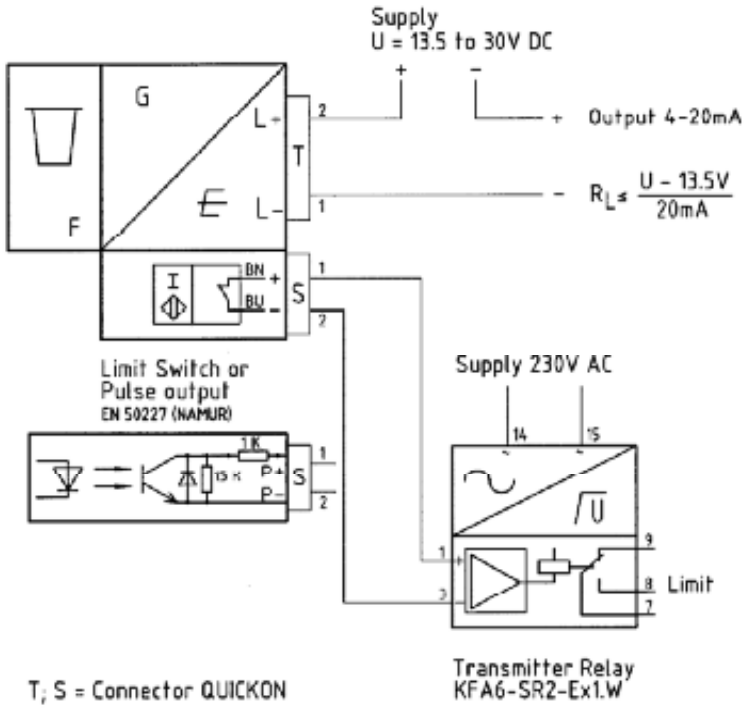
Electrical connection:	PG7
Cable diameter:	4-6 mm
Max. wire cross-section:	0.34...0.75 mm²

Limit Switches (Option)

Model:	Induktive switch
Ambient temperature:	-25°C to +100°C
Rated voltage:	8 VDC (R_i = 1 kOhm)
Output signal:	<= 1 mA = 0; >= 3 mA = 1

Transistor relay for voltage supply of limit switches

Model:	Transistor rely acc. to DIN 19234 (NAMUR)
Supply voltage:	230 VAC, 115 VAC, 24 VDC
Relay output:	1 or 2 potential free SPDT contacts
Contact rating:	Max. 250 VAC, max. 4 A, max. 500 VA
Control circuit:	Intrinsically safe [EEx ia] IIC



Regulator (Option)

Caution: Differential pressure regulators may be used to keep a constant flow with variable operating pressure.
They are **not** pressure reduction valves.

The regulators DS20....1 and DS20...2 (Upstream regulator) are used for liquids with variable up- or downstream pressure and for gases with variable upstream and constant dowstream pressure.
The regulators DS20...3 and DS20...4 (downstream regulator) are used for gases with variable downstream pressure only.

Max. flow for liquids:	100 l/h
Max. flow for gases:	3000 l/h
Max. pressure:	40 bar
Min. differential pressure:	>400 mbar

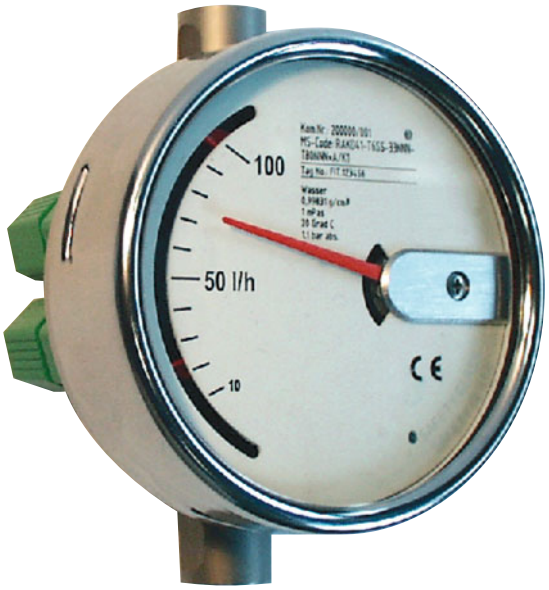
Materials:

Housing	**Membrane**	**Springs**
St. steel	PTFE	St. steel
Brass	Buna	St. steel

DS20

Float-Type Flow Meter
For low flow volumes
Compact construction

- For liquids and gases
- Maximum process pressure: 160 bar, Maximum operating temperature: 200°C
- Scales for all operating conditions designed as required
- Local display, min./max. contacts or analog output
- Measuring tube completely of stainless steel 1.4571
- Optionally available with valve



Description

Model series DS20 flow meters work according to the suspended-float principle of measurement. The device has a cone-shaped float that moves within a cylindrical measuring tube. The flowing gas or liquid moves the float in the direction of flow. The movement of the float is transmitted magnetically to a dial indicator mounted outside the measuring tube. The indicator is fitted with a scale appropriate for the operating range encountered. If necessary, the indicator can also be fitted with contacts or an analog output.

Applications

Model series DS20 flow meters are intended to measure and monitor gases or low-viscosity liquids, such as those found in applications like cooling systems for welding machines, laser and tube systems, pump monitoring, compressors, etc. Since all parts coming in contact with the medium being monitored are made of high-quality stainless steel 1.4571, this device is also suitable for use with caustic/corrosive media.

PKP PROCESS INSTRUMENTS

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Versions

- Flow meter with local dial indicator display
- Dial indicator display, 1 MIN contact
- Dial indicator display, 1 MAX contact
- Dial indicator display, 1 MIN contact, 1 MAX contact
- Dial indicator display, analog output: 4 to 20 mA

Process connections

Version without needle valve (connection at top/bottom):
All threaded connections as per model coding, PN 100 (standard) or PN 160, all flange connections

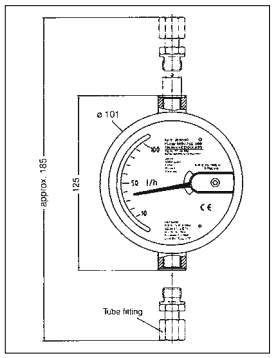
Version with needle valve (connection at back):
All threaded connections as per model coding, PN 40 (standard) or PN 100, flange connections not possible

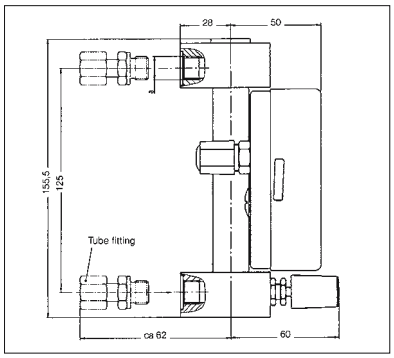
Measuring Ranges and Process Connection

Measuring Range Number	Water, 20°C (l/h)	Air, 0°C, 1,013 bar abs. (Nl/h)	Pressure loss (mbar)
1	0.1...1	4...40	6
2	0.16...1.6	6...60	6
3	0.25...2.5	10...100	6
4	0.4...4	15...150	6
5	0.6...6	20...200	6
6	1...10	32.5...325	8
7	1.6...16	50...500	8
8	2.5...25	80...800	8
9	4...40	140...1400	11
10	6...60	200...2000	11
11	10...100	325...3250	11
12	16...160	500...5000	13
13	25...250	800...8000	13

Caution: On versions without valve, measuring ranges 12 and 13 come with 3/8" threaded connections (Code 42...)

Dimensions





Technical Details

Materials:
Parts coming in contact with media are made of stainless steel 1.4571, Housing made of stainless steel 1.4301

Maximum pressure:
20 mA (???)
PN 100 (standard), PN 10, 40, 160 as per model coding

Maximum temperature:

Local display:	-80°C to + 200°C (+150°C with valve)
With contacts:	-40°C to +150°C
With analog output:	-40°C to +150°C

Protection type: IP 65

Accuracy: ± 4% of measured range value

Model coding

Order number: **DS20. | 41G4. | 6. | 0. | 1. | 0**

Float-type flow meter

Process connection:
41G4 = G 1/4 female thread, PN40
41G6 = G 1/4 female thread, PN100
41G7 = G 1/4 female thread, PN160
41T4 = 1/4" NPT female thread, PN40
41T6 = 1/4" NPT female thread, PN100
41T7 = 1/4" NPT female thread, PN160
53C4 = Tube fitting, 6 mm, PN40
53C6 = Tube fitting, 6 mm, PN100
53C7 = Tube fitting, 6 mm, PN160
53P1 = Hose nipple, 6 mm, PN10
54C4 = Tube fitting, 8 mm, PN40
54C6 = Tube fitting, 8 mm, PN100
54C7 = Tube fitting, 8 mm, PN160
54P1 = Hose nipple, 8 mm, PN10
55C4 = Tube fitting, 10 mm, PN40
55C6 = Tube fitting, 10 mm, PN100
55C7 = Tube fitting, 10 mm, PN160
56C4 = Tube fitting, 12 mm, PN40
56C6 = Tube fitting, 12 mm, PN100
56C7 = Tube fitting, 12 mm, PN160
01D4 = Flanges, DN15, PN40
02D4 = Flanges, DN25, PN40
01A1 = Flanges, ANSI 1/2", 150 lbs RF
02A1 = Flanges, ANSI 1", 150 lbs RF
01A2 = Flanges, ANSI 1/2", 300 lbs RF
02A2 = Flanges, ANSI 1", 300 lbs RF

Measuring range:
1 to 13 = According to table
99 = Special measuring range

Valve:
0 = None
1 = Valve on input side, silver valve seat
2 = Valve on input side, PCTFE valve seat
3 = Valve on output side, silver valve seat
4 = Valve on output side, PCTFE valve seat

Display:
1 = Local dial indicator display
2 = Local dial indicator display, 1 MIN contact
3 = Local dial indicator display, 1 MAX contact
4 = Local dial indicator display, 1 MIN contact, 1 MAX contact
5 = Local dial indicator display, analog output 4 to 20 mA

Options:
0 = None
9 = Please specify in writing

Contacts

Type:	Inductive (NAMUR as defined per EN 50227)
Nominal voltage:	8 VDC Recommended for operating the contacts: isolation and switch unit SKF (see data sheet SKF)

Analog output

Power supply:	13.5…30 VDC
Output:	4…20 mA
Load impedance:	(U-13.5V)/20 mA
Electrical connection:	QUIKON quick connects

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