



## Paddle Bellows Flow Meter and Monitor for Liquids



measuring  
•  
monitoring  
•  
analysing

### DPU

- Measuring ranges:  
3-55 L/min ... 50-600 L/min water
- Accuracy:  
 $\pm 3 \dots \pm 5$  % of full scale
- Connection:  
G 1/2 female... G 2 female,  
R 1/2 male... R 2 male,  
1/2" NPT ... 2" NPT  
flange:  
DN 15 ... DN 50  
ASME 1/2" ... 2"
- Material: brass  
or stainless steel
- $p_{\max}$ : 16 bar;  $t_{\max}$ : 100 °C
- for polluted media
- Universal mounting



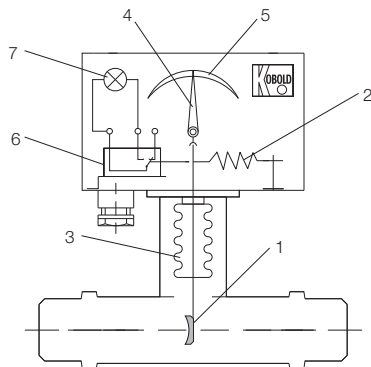
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**Description**

The new KOBOLD flow meter and monitor DPU works according to the paddle bellows system. Baffle/paddle (1) is deflected in the flow direction against the force of the spring (2) by the flowing medium. A stainless steel bellows (3) seals off the system hermetically between medium and measuring unit/indicator.



The motion is transferred positively from the paddle (1) to the measuring section. The actual flow rate is displayed in L/min or m<sup>3</sup>/h on the scale (5) by the pointer (4). In the measuring section a microswitch (6) and a pilot lamp (7) are operated as soon as the set switching point is exceeded or falls short of. Thus the change in flow is clearly signalled locally by the switching point pilot lamp (illuminates if below switch point). At the same time switching operations are triggered by the microswitch, designed as a 3-pole changeover contact. The displacement-deflection technique is one of the most secure systems available as motion is transferred positively from the baffle plate to the measuring section. With these flow monitors if the T piece becomes clogged up with lime, foreign objects or dirt, the system responds with "no flow". It is practically impossible for the system to hang up in a position that indicates flow when there is in fact no flow.

**Recommended inlet and outlet pipe section**

Upstream of measuring instrument linear flow = 10 x d  
 Downstream of measuring instrument linear flow = 5 x d  
 d = effective pipe cross-section

**Areas of Application**

- Heavy goods industry
- Rolling mills and mill trains
- Chemicals and pharmaceuticals industries
- Drinks and semi-luxury food industry
- General mechanical engineering and capital equipment
- Measurement and monitoring of product, cooling and lubricant circuits

**Technical Details**

Material combination	5	6
Device part		
T piece	Brass	Stainless steel
Connecting thread	Brass	Stainless steel
Connecting flange	-	Stainless steel
Paddle system	Stainless steel	Stainless steel
Bellows	Stainless steel	Stainless steel
Seals	FPM	FPM
Connection plate display	Aluminium	Aluminium
Covering hood	Polycarbonate	Polycarbonate
t <sub>max</sub>	100 °C	100 °C
p <sub>max</sub>	16 bar	16 bar

- Turndown ratio: threaded connection: max. 1 : 5  
(Ex-contact 1 : 4)
- Repeat accuracy: up to 20 L/min: ±5 % of full scale  
21-200 L/min: ±4 % of full scale  
201 and more L/min: ±3 % of full scale (based on the calibration position and medium 20 °C)
- Pressure loss: 0.1 - 0.3 bar
- Switching hysteresis: up to 2 bar 10 %  
>2 bar pressure dependable
- Ambient temperature: max. 70 °C
- Electrical switching capacity: 250 V / 10 A
- Pilot lamp: 230 V<sub>AC</sub>, 110 V<sub>AC</sub> or 24 V<sub>DC</sub>
- Protection type: IP 55
- EX design**
- Option E: in preparation
- Option G: gold-plated contact for intrinsically safe operation

**Mounting position**

Due to the positive indication and transmission, the devices can be mounted in all mounting positions – however they must be calibrated for the chosen position. The devices should therefore be mounted in the mounting and calibration position specified on the nameplate, whereby the mounting position refers to the piping run.

Installing the devices in positions other than those specified on the nameplate causes measurement inaccuracies. The direction of flow is indicated on the device. Should the medium flow in the opposite direction the device will not operate correctly.



Order details (Example: DPU-15 W R15 S R T 0)

We require the following details as well as the order number: medium, viscosity, service temperature, operating pressure, flow range within the values detailed below with the ratio min/max 1:5

Flow meter/monitor model DPU-1.. with thread connection

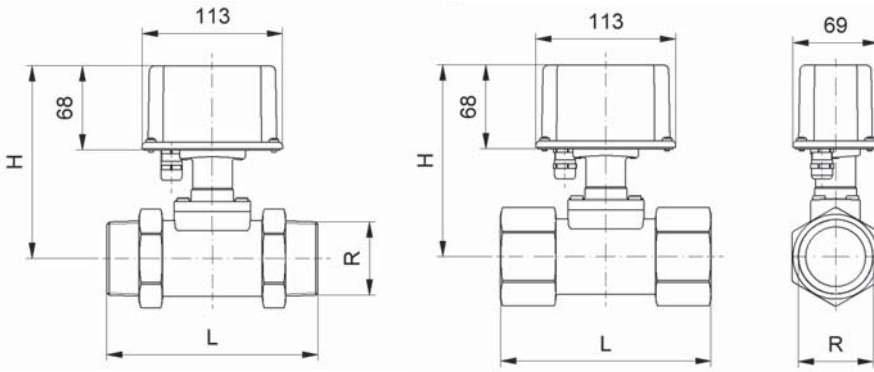
Material combination (bellows/T piece)		Flow range [L/min]		Connection		Pilot lamp	Direction of flow	Location of indicator	Option
st. steel/ brass	st. steel/ st. steel	min. water	max. water	male thread	female thread (only brass T piece)				
meter/ monitor DPU- 15M..  monitor DPU- 15W..	meter/ monitor DPU- 16M..  monitor DPU- 16W..	3	55	R15 = R 1/2 N15 = 1/2 NPT	G15 = G 1/2 M15 = 1/2 NPT	S = 230 V <sub>AC</sub> 1 = 110 V <sub>AC</sub> 3 = 24 V <sub>DC</sub> 4 = without pilot lamp	R = from right to left  L = from left to right  T = from top to bottom  B = from bottom to top	T = above pipe  R = right of pipe  L = left of pipe	0 = without  G = gold-plated contacts  E = Ex-contact (only without pilot lamp)  2 = Twin contact  X = special
		5	100	R20 = R 3/4 N20 = 3/4 NPT	G20 = G 3/4 M20 = 3/4 NPT				
		6	150	R25 = R 1 N25 = 1 NPT	G25 = G 1 M25 = 1 NPT				
		10	250	R32 = R 1 1/4 N32 = 1 1/4 NPT	G32 = G 1 1/4 M32 = 1 1/4 NPT				
		20	400	R40 = R 1 1/2 N40 = 1 1/2 NPT	G40 = G 1 1/2 M40 = 1 1/2 NPT				
		50	600	R50 = R 2 N50 = 2 NPT	G50 = G 2 M50 = 2 NPT				

Flow meter/monitor model DPU-3.. with flange connection

Material combination (bellows/T piece)		Flow range [L/min]		Connection flange*	Pilot lamp	Direction of flow	Location of indicator	Option
st. steel/ st. steel	st. steel/ st. steel	min. Wasser	max. Wasser					
meter/monitor DPU-36M..  monitor DPU-36W..		3	55	F15 = DN 15 A15 = 1/2" ASME	S = 230 V <sub>AC</sub> 1 = 110 V <sub>AC</sub> 3 = 24 V <sub>DC</sub> 4 = without pilot lamp	R = from right to left  L = from left to right  T = from top to bottom  B = from bottom to top	T = above pipe  R = right of pipe  L = left of pipe	0 = without  G = gold-plated contacts  E = Ex-contact (only without pilot lamp)  2 = Twin contact  X = special
		5	100	F20 = DN 20 A20 = 3/4" ASME				
		6	150	F25 = DN 25 A25 = 1" ASME				
		10	250	F32 = DN 32 A32 = 1 1/4" ASME				
		20	400	F40 = DN 40 A40 = 1 1/2" ASME				
		50	600	F50 = DN 50 A50 = 2" ASME				

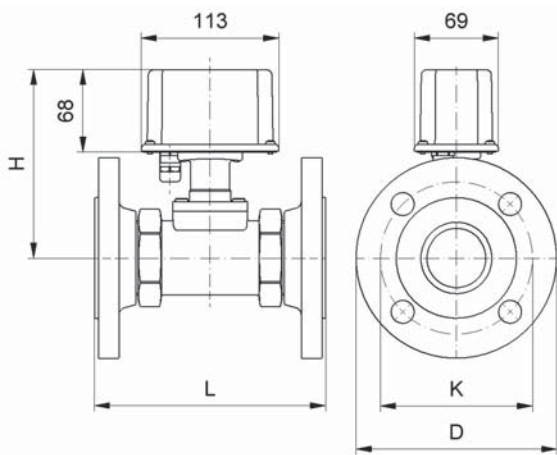
\* ..F.. according to DIN EN 1092-1, ..A.. ASME B 16.5

Dimensions [mm]  
DPU-1.. with thread connection



R/G/ NPT	H [mm]	L [mm]
½"	142+1	135+1
¾"	142+1	135+1
1"	142+1	135+1
1 ¼"	145+2	170+2
1 ½"	149+2	170+2
2"	155+2	170+2

DPU-3.. with flange connection



DIN 1092-1 flanges

DN	D [mm]	K [mm]	H [mm]	L [mm]
15	95	65	142+1	155+2
20	105	75	142+1	160+2
25	115	85	142+1	160+2
32	140	100	145+2	190+2
40	150	110	149+2	190+2
50	165	125	155+2	190+2

ASME flanges

ASME	D [mm]	K [mm]	H [mm]	L [mm]
½"	90	60.3	142+1	155+2
¾"	100	69.9	142+1	160+2
1"	110	79.4	142+1	160+2
1 ¼"	115	88.9	145+2	190+2
1 ½"	125	98.4	149+2	190+2
2"	150	120.7	155+2	190+2