

## Paddle Bellows Flow Monitor for Liquids

- Measuring ranges:  
1-5 l/min to 900-3600 m<sup>3</sup>/h water
- Measurement accuracy:  
±3 to ±5% f.s.
- Connection: G 3/8 to G 2,  
3/8 NPT to 2 NPT  
flange: DN 10 to DN 50  
ANSI 3/8" to 2"
- Weld-on flange for  
pipe cross-section:  
DN 40 to DN 500
- Material: brass, PVC  
or stainless steel



- p<sub>max</sub>: PN 16, t<sub>max</sub>: 100 °C
- for fouled media
- Universal mounting



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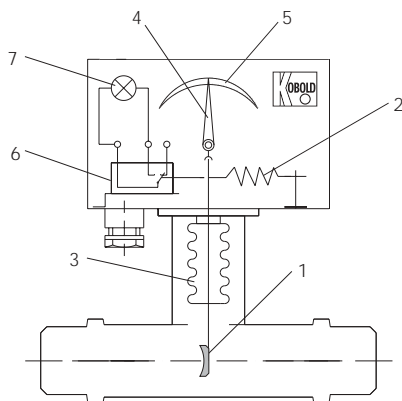
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**Model:**  
DWU



### Description

The new KOBOLD flow indicator and monitor DWU works according to the diaphragm plate principle. 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 baffle (1) to the measuring section.

The actual flow rate is displayed in l/min or m<sup>3</sup>/h on the dial (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 undershot. Thus the change in flow is clearly signalled locally by the switching point pilot lamp (illuminates for undershooting). 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	7
Device part			
T piece	Brass	Stainless steel	PVC
Connecting thread	Brass	Stainless steel	PVC
Connecting flange	Steel zinc-plated	Stainless steel	PVC
Weld-on flange	Steel sprayed	Stainless steel	Boring pipe box PVC
Paddle system	Brass	Stainless steel	Stainless steel
Bellows	Stainless steel	Stainless steel	Stainless steel
Seals	FPM	FPM	FPM
Case meas. section	Stainless steel	Stainless steel	Stainless steel
Covering hood	Polycarbonate	Polycarbonate	Polycarbonate
t <sub>max</sub> *	100 °C	100 °C	20 °C (60 °C)
p <sub>max</sub> *	16 bar	16 bar	16 bar (2 bar)

\*Higher upon request

- Flow ratio: thread connection: max. 1 : 5  
 Weld-on flange: max. 1 : 4
- Repeat accuracy: up to 20 l/min.: ± 5 %  
 21 - 200 l/min.: ± 4 %  
 201 and more l/min.: ± 3 %  
 (based on the calibration position and medium 20 °C)
- Pressure loss: 0.1 - 0.3 bar  
 (average pressure loss, value upon request)
- Switching hysteresis: up to 2 bar 10 %  
 (> 2 bar pressure dependable)
- Ambient temperature: max. 70 °C
- Electrical switching capacity: 250 V / 10 A (standard)  
 250 V / 5 A (Ex-contact)
- Pilot lamp: 230 V<sub>AC</sub>, 110 V<sub>AC</sub> or 24 V<sub>DC</sub>
- Protection type: IP 55 (IP 65 upon request)
- EX design: option X: II 2GD c IIB T4 IP65 T125 °C  
 option G: gold-plated contact for intrinsically safe operation

A transistor relay is required for the intrinsically safe (circuit) operation, for example: KOBOLD REL-6000 (see brochure Z2)

### 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: DWU-15 R10 0 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 (and 1:4 for type DWU-3...)

Flow monitor model DWU-1.. with male thread connection

Flow range (l/min.)		Material combination (bellows/T piece)			Connection male thread	Pilot lamp	Direction of flow	Location of indicator	Option
min. water	max. water	st. steel/brass	st. steel/st. steel	st. steel/PVC					
1	25	DWU-15..	DWU-16..	DWU-17..	R10 = G 3/8 N10 = 3/8 NPT	0 = 230 V <sub>AC</sub> 1 = 110 V <sub>AC</sub> 3 = 24 V <sub>DC</sub> X = 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 lead R = right of lead L = left of lead	0 = without D = with damping G = gold-pl. contacts X = ex contact 2 = Twin contact  * at Ex-contact without pilot lamp
1	55	DWU-15..	DWU-16..	DWU-17..	R15 = G 1/2 N15 = 1/2 NPT				
5	100	DWU-15..	DWU-16..	DWU-17..	R20 = G 3/4 N20 = 3/4 NPT				
6	150	DWU-15..	DWU-16..	DWU-17..	R25 = G 1 N25 = 1 NPT				
10	250	DWU-15..	DWU-16..	DWU-17..	R32 = G 1 1/4 N32 = 1 1/4 NPT				
20	400	DWU-15..	DWU-16..	DWU-17..	R40 = G 1 1/2 N40 = 1 1/2 NPT				
50	600	DWU-15..	DWU-16..	DWU-17..	R50 = G 2 N50 = 2 NPT				

Flow monitor model DWU-2.. with flange connection

Flow range (l/min.)		Material combination (bellows/T piece)			Connection flange	Pilot lamp	Direction of flow	Location of indicator	Option
min. water	max. water	st. steel/brass	st. steel/st. steel	st. steel/PVC					
1	25	DWU-25..	DWU-26..	-	F10 = DN 10 A10 = 3/8" ANSI	0 = 230 V <sub>AC</sub> 1 = 110 V <sub>AC</sub> 3 = 24 V <sub>DC</sub> X = 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 lead R = right of lead L = left of lead	0 = without D = with damping G = gold-pl. contacts X = ex contact 2 = Twin contact  * at Ex-contact without pilot lamp
1	55	DWU-25..	DWU-26..	-	F15 = DN 15 A15 = 1/2" ANSI				
5	100	DWU-25..	DWU-26..	-	F20 = DN 20 A20 = 3/4" ANSI				
6	150	DWU-25..	DWU-26..	DWU-27..	F25 = DN 25 A25 = 1" ANSI				
10	250	DWU-25..	DWU-26..	DWU-27..	F32 = DN 32 A32 = 1 1/4" ANSI				
20	400	DWU-25..	DWU-26..	DWU-27..	F40 = DN 40 A40 = 1 1/2" ANSI				
50	600	DWU-25..	DWU-26..	DWU-27..	F50 = DN 50 A50 = 2" ANSI				

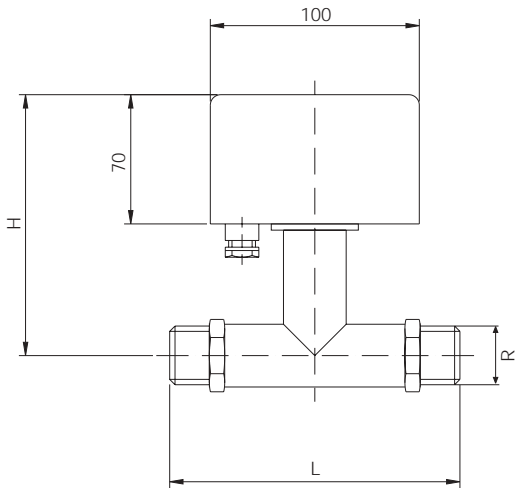
Flow monitor model DWU-35../DWU-36.. with weld-on flange / DWU-37.. with boring pipe box

Flow range (m³/h)		Material combination (bellows/connecting piece)			For pipe cross-section	Pilot lamp	Direction of flow	Location of indicator	Option
min. water	max. water	st. steel/steel	st. steel/st. steel	st. steel/PVC					
1.2	24	DWU-35..	DWU-36..	DWU-37..	W40 = DN 40	0 = 230 V <sub>AC</sub> 1 = 110 V <sub>AC</sub> 3 = 24 V <sub>DC</sub> X = 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 lead R = right of lead L = left of lead	0 = without D = with damping G = gold-pl. contacts X = ex contact 2 = Twin contact  * at Ex-contact without pilot lamp
3.0	36	DWU-35..	DWU-36..	DWU-37..	W50 = DN 50				
4.8	60	DWU-35..	DWU-36..	DWU-37..	W65 = DN 65				
7.2	90	DWU-35..	DWU-36..	DWU-37..	W80 = DN 80				
12	144	DWU-35..	DWU-36..	DWU-37..	W1H = DN 100				
18	225	DWU-35..	DWU-36..	DWU-37..	W1Z = DN 125				
24	330	DWU-35..	DWU-36..	DWU-37..	W1F = DN 150				
42	600	DWU-35..	DWU-36..	DWU-37..	W2H = DN 200				
72	900	DWU-35..	DWU-36..	-	W2F = DN 250				
102	1200	DWU-35..	DWU-36..	-	W3H = DN 300				
150	1800	DWU-35..	DWU-36..	-	W3F = DN 350				
180	2400	DWU-35..	DWU-36..	-	W4H = DN 400				
300	3600	DWU-35..	DWU-36..	-	W5H = DN 500				



**Dimensions**

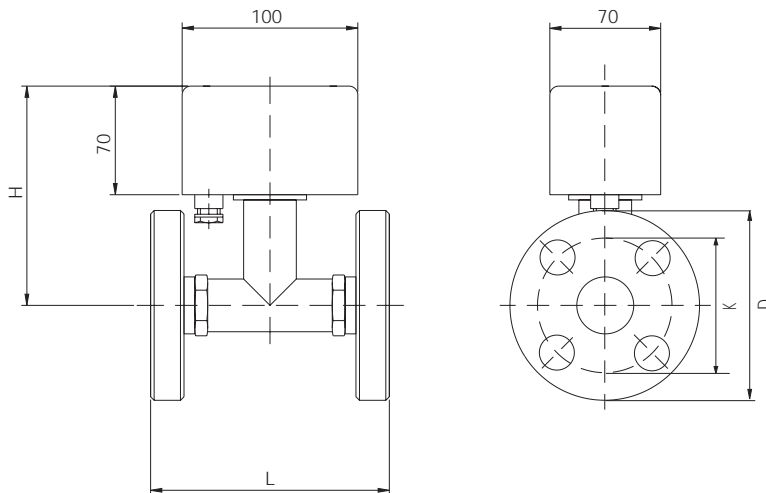
**DWU-1.. with thread connection**



R	H (mm)	L (mm)
3/8	145+1	135+1
1/2	145+1	135+1
3/4	145+1	135+1
1	145+1	135+1
1 1/4	150+2	170+2
1 1/2	155+2	170+2
2	160+2	170+2

We kindly ask you to provide us with a separate inquiry for the exact dimensions of the material combination 7 (PVC).

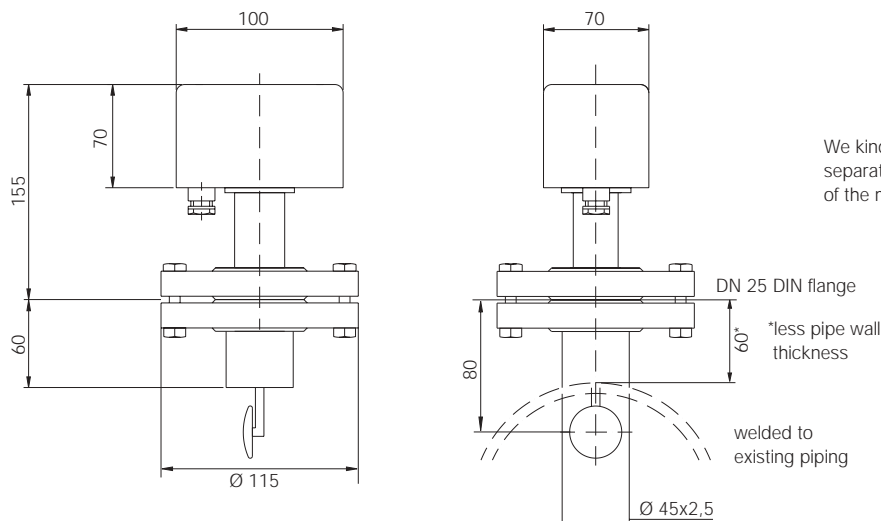
**DWU-2.. with flange connection**



DN	D (mm)	K (mm)	H (mm)	L (mm)
10	90	60	145+1	155+2
15	95	65	145+1	155+2
20	105	75	145+1	160+2
25	115	85	145+1	160+2
32	140	100	150+2	190+2
40	150	110	155+2	190+2
50	165	125	160+2	190+2

We kindly ask you to provide us with a separate inquiry for the exact dimensions of the material combination 7 (PVC).

**DWU-3.. with weld-on flange**



We kindly ask you to provide us with a separate inquiry for the exact dimensions of the material combination 7 (PVC).