

DR12

Precision Turbine Flowmeter

- for low viscous media
- wetted parts all stainless steel
- accuracy: $\pm 0,5 \%$ and $\pm 1\%$ of measured value
- for pipe diameters from DN 10 to DN 400 for flow rates up to 4000 m³/h
- available for pressures up to 400 bar and temperatures up to 150 °C
- version with thread or flange connection
- measuring ranges: 0,055...0,275 up to 800...4000 m³/h
- P_{max}: 400 bar, T_{max}: 110 °C



Description:

The flowmeters of the DR12 series are robust measuring turbines for mobile or stationary use. An axial flow turbine wheel rotates proportionally to the average flow velocity in the pipeline.

The turbine wheel is scanned by an inductive sensor (coil) without contact. The resulting output frequency is a measure of the flow rate.

The turbine body and measuring insert are made of stainless steel, the bearings optionally of tungsten carbide or PTFE. The instruments can be supplied with external thread (up to 2") or flange connection (up to DN 400).

Typical applications:

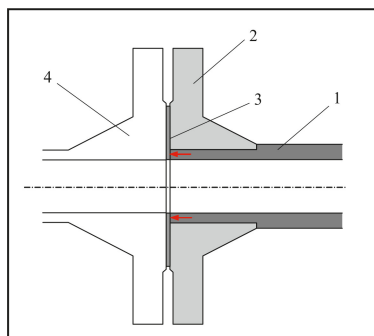
The DR12 turbine flowmeters are mainly used for the detection and measurement of low-viscosity media. The materials used, the high compressive strength and the wide measuring range allow the use of these devices in a wide variety of applications in mechanical engineering, chemicals, pharmaceuticals, food technology and much more.

Models:

The DR12 turbine flowmeters are always supplied with a 1.4541 stainless steel body.

For nominal sizes up to DN 80, the rotor is made of stainless steel 1.4034, for larger nominal sizes of stainless steel 1.4541.

The bearings are made of hard metal (wolfram carbide), PTFE bearings are optionally available.



In the flange version, the flanges are made of 1.1106 steel as standard, stainless steel flanges made of 1.4541 can be supplied as an option, The flanges are welded to the base body in such a way that they do not come into contact with the medium.

- 1 = stainless steel housing DR12
- 2 = steel flange
- 3 = seal
- 4 = counterflange

Sensor Systems:

The following sensor systems are available for the DR12:

- **coil with preamplifier**
output: square wave signal, 3-wire,
PNP open collector, short-circuit proof
supply: 4,5...28 VDC
- **coil with preamplifier according to NAMUR**
output: pulses, 2-wire
supply: 8 VDC

Output Signal:

The DR12s provide an output frequency proportional to the flow rate, which is converted into a typical number of pulse liters for each measuring range (see table “Measuring ranges”).

Due to manufacturing, the final number of pulses per liter can differ by up to 10 % for the same measuring ranges. Each turbine is therefore calibrated before delivery and provided with an individual number of impulses liters.

Application Notes:

When using DR12 turbine flow meters, a number of factors must be taken into account to ensure trouble-free operation:

Chemical resistance:

The DR12 can be used for all liquids that do not attack the stainless steel used or the material of the bearings.

Viscosity:

Turbine flowmeters are generally viscosity dependent. Due to their design, however the DR12 can be used for media with a viscosity of max. 15 cST without any problems. The additional error due to the increased viscosity is less than 0,5 %.

Gas inclusions:

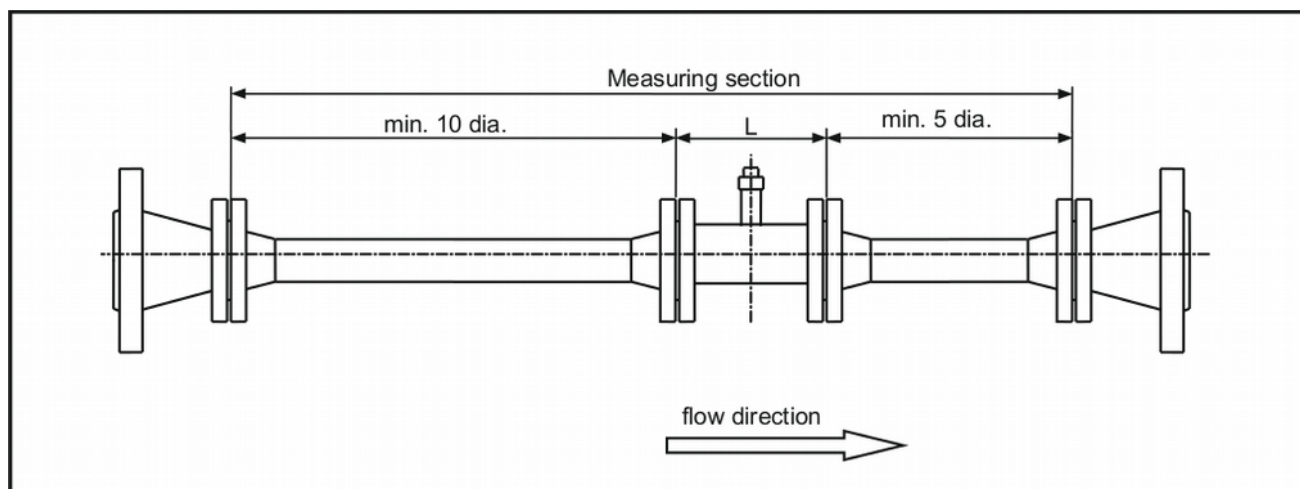
Air bubbles in the medium should be avoided at all costs. You can introduce an additional error into the measurement, which corresponds approximately to the volume of the air bubbles transported by the liquid.

Contamination:

The solids content in the medium can be up to 50 g/m³ without affecting the measuring accuracy or the service life of the system. 80 % of the solids should not exceed a particle size of 50 µm, the remaining 20 % should be less than 500 µm.

Filamentous impurities in the medium must be avoided under all circumstances as they can lead to blockage of the rotor.

Installation Note:



Measuring Ranges:

Code	Measuring range [m³/h] water	Inner diameter [mm]	Pulses per liter	Pressure loss [bar]	Signal level (coil) [mV _{eff}]
01	0,055...0,275	6	17000	0,4	40
02	0,11...0,55	6	8500	0,4	40
03	0,22...1,1	12	4090	0,35	60
04	0,44...2,2	15	1960	0,35	80
05	0,8...4	15	1080	0,35	80
06	1,6...8	18	562	0,35	200
07	3,2...16	25	259	0,3	200
08	6,8...34	37	95,3	0,3	250
09	13,6...68	50	60,88	0,3	300
10	27...135	75	16	0,3	400
11	54...270	100	12	0,25	200
12	110...550	150	5,236	0,25	200
13	220...1100	200	3,109	0,25	200
14	380...1900	250	1,8	0,25	200
15	540...2700	300	1,267	0,25	200
16	800...4000	400	0,9	0,25	200

Process Connections:

inner diameter [mm]	connection type		
	male thread G or NPT	flange connection	
		DIN	ANSI
6	3/8"	DN 10	3/8" RF
12	1/2"	DN 15	1/2" RF
15	5/8"	DN 15	1/2" RF
18	3/4"	DN 20	3/4" RF
25	1"	DN 25	1" RF
37	1 1/2"	DN 40	1 1/2" RF
50	2"	DN 50	2" RF
75	-	DN 80	3" RF
100	-	DN 100	4" RF
150	-	DN 150	6" RF
200	-	DN 200*	8" RF*
250	-	DN 250*	10" RF*
300	-	DN 300*	12" RF*
400	-	DN 400*	16" RF*

* with steel flange only

Pressure Stages:

nominal size	pressure stages		
	thread G or NPT [bar]	DIN flange [PN]	ANSI flange [lbs.]
DN 10 / 3/8" - DN 15 / 5/8"	250 (160 für 5/8")	40 / 160 / 250 150 / 300 320 / 400	150 / 300 600 / 900 1500 / 2500
DN 20 / 3/4"	100	40	150 / 300
DN 25 1" - DN 40 / 1 1/2"	100	40 / 160 250 / 320 / 400	150 / 300 600 / 900 1500 / 2500
DN 50 / 2"	100	40 / 64 100 / 160 / 250 320 / 400	150 / 300 600 / 900 1500 / 2500
DN 80 / 3"	-	10 / 40 64 / 100 / 160 250 / 320 / 400	150 / 300 600 / 900 1500 / 2500
DN 100 / 4"	-	16 / 40 64 / 100 160 / 250	150 / 300 600 / 900 1500 / 2500
DN 150 / 6"	-	16 / 40 64 / 100 160	150 / 300 600 / 900 1500
DN 200 / 8" - DN 400 / 16"	-	16 / 40 64	150 / 300 600 / 900

Order Code:

Order number:	DR12.	V.	09.	050D40.	H.	V.	0
Precision turbine flowmeter							
Models:							
R = stainless steel housing, threaded connection							
S = stainless steel housing, steel flanges							
V = stainless steel housing, stainless steel flanges							
Measuring range:							
01...16 = see table „Measuring ranges“							
Process connection:							
see separate order code „Process connection“							
Bearing:							
H = carbide bearing (not for measuring range 01 + 02)							
P = PTFE bearing							
Sensor system with connector plug EN 175301-803:							
V = coil with preamplifier, 3-wire, 4,5...28 VDC (standard)							
N = coil with preamplifier according to NAMUR, 8 VDC							
Options:							
0 = without							
9 = please specify in plain text							

Order Code Process Connection:

Connection code:	050	D	40.
Nominal size:			
010 = DN 10 / 3/8"			
015 = DN 15 / 1/2"			
018 = DN 15 / 5/8"			
020 = DN 20 / 3/4"			
025 = DN 25 / 1"			
040 = DN 40 / 1 1/2"			
050 = DN 50 / 2"			
080 = DN 80 / 3"			
100 = DN 100 / 4"			
150 = DN 150 / 6"			
200 = DN 200 / 8"			
250 = DN 250 / 10"			
300 = DN 300 / 12"			
400 = DN 400 / 16"			
Connection type (see table „Process connection“):			
G = male thread G			
N = male thread NPT			
D = DIN flange			
A = ANSI flange			
S = special connection			

Pressure stages (see table „Pressure stages“):

10...400 = 10...400 bar
150...2500 = 150...2500 lbs. (for ANSI flanges only)
320 = special version for threads up to 320 bar
(only with metric high pressure fitting „S“
for measuring ranges 01...07)

Technical Data:

Materials:

base body:	stainless steel 1.4571
rotor:	up to DN 80: stainless steel 1.4034 from DN 100: stainless steel 4541
bearings:	tungsten carbide, optional PTFE
flanges:	steel 1.1106, optional stainless steel 1.4541

Max. pressure: according to table „Pressure stages“ and order code

Media temperature: -40...+110 °C with plug acc. to EN 175301-803, form A

Ambient temperature: -40...+60 °C

Accuracy:

DR12.x.01...03:	± 1 % of measured value
DR12.x.04...16:	± 0,5 % of measured value

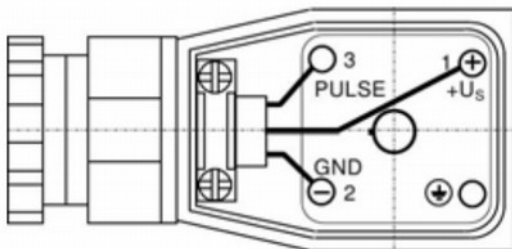
Power supply:

DR12...V:	coil with preamplifier: 4,5...28 VDC
DR12...N:	coil with preamplifier according to NAMUR: 8 VDC

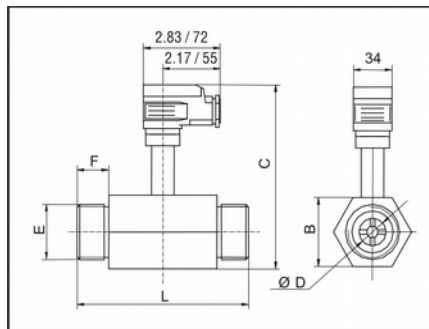
Electrical Connection:

Connector plug EN 175301-803, form A

3-wire with preamplifier



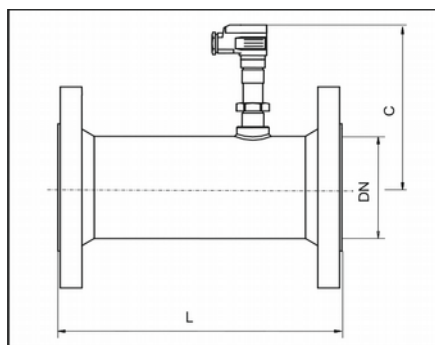
Dimensions:



Threaded connection:

Inner diameter ØD [mm]	B [mm]	C [mm]	L [mm]	E (male thread G or NPT)	F [mm]
6	25	82	50,8	3/8"	12,7
12	25	86	63,5	1/2"	19
15	25	87	63,5	5/8"	19
18	38	89	82,6	3/4"	22
25	38	92	89	1"	23
37	56	99	114	1 1/2"	28
50	70	104	133	2"	29,5

Dimensions for metric high pressure couplings on request



Flange connection

Inner diameter ØD [mm]	C [mm]	L [mm]	Inner diameter ØD [mm]	C [mm]	L [mm]
6	95	114	80	140	228
12	102	127	100	154	355
15	115	127	150	180	368
18	115	141	200	236	458
25	126	153	250	265	458
37	126	179	300	290	458
50	132	198	400	345	610

Dimensions valid for DIN flanges, ANSI flanges on request