

DR08

Paddle wheel flowsensor for low viscosity liquids

- high accuracy and resolution
- very low deviation in series production
- models in PP, brass or stainless steel
- pressure resistant up to 300 bar
- high temperature version available
- small installation dimensions
- Low-Cost alternatives available



Description:

The DR08 flowmeters are manufactured according to the turbine wheel technology.

The liquid turns a turbine wheel strictly proportional to the liquids flow. This rotation is detected either by an inductive proximity switch or a Hall sensor. An attached electronic unit computes from this a frequency output or a 4...20 mA analogue output signal. As alternative build-on electronic devices a limit transducer, programmable with up to 16 limit switching points, or a digital display unit is available. An advantage of the turbine flowmeters type DR08 is the very small deviation in series production. Therefore it is no longer necessary to recalibrate each device individually. The DR08 flowmeter is highly recommended in large series.

Applications:

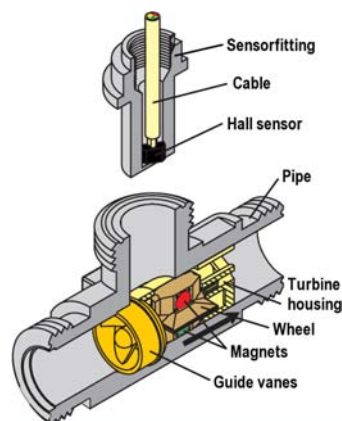
Due to the compact design, the wide measuring range, and the high accuracy these turbine wheel flowmeters type DR08 are applicable for:

- monitoring heat exchange water
- medical engineering devices
- synthetic materials industry
- solar energy plants
- machine tools
- photographic laboratory devices
- dispensing systems
- coolants
- heat quantity measurement
- ...and many other applications more

Technology

DR08.15 : Measuring range 2...20 (2...40) l/min Axial turbine flowmeter with inlet guide vanes.

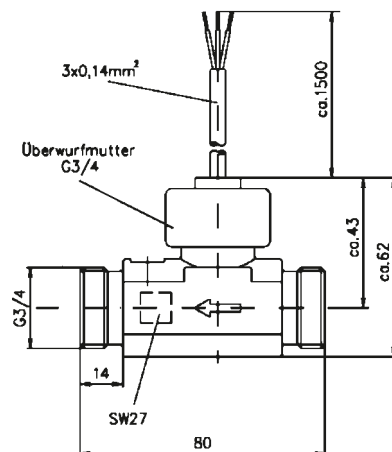
The liquid is divided in the inlet of the flowmeter in four parts by the guide vanes. These partial flows hit the



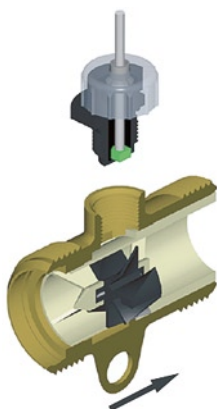
turbine wheel at four directions with nearly equal force. Therefore the rotation of the turbine is very uniform and the mechanical wear is very low.

The extreme hardness of the materials used to manufacture the bearing, sapphire and ARCAP AP1D, assure a remarkable life time and less maintenance.

Dimensions

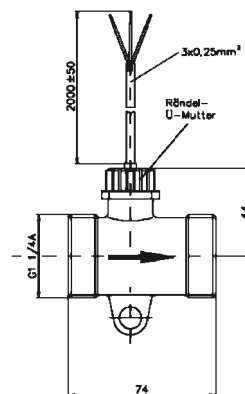


DR08.25: Measuring range 4...160 l/min Axial turbine flowmeter



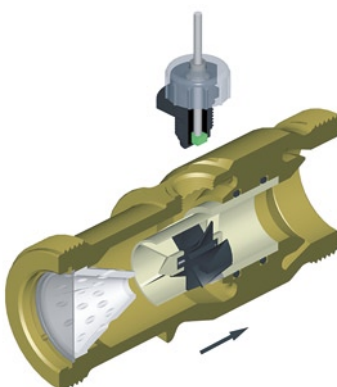
The liquid streaming into the flowmeter is turning the turbine wheel.

Due to sapphire bearings of highest quality and very low rotational speed a remarkable life time of the turbine is achieved. The rotation of the turbine is converted to a pulsating signal generating a frequency output.



DR08.40: Measuring range 0,4...25 m³/h Axial turbine flowmeter with partial flow measurement

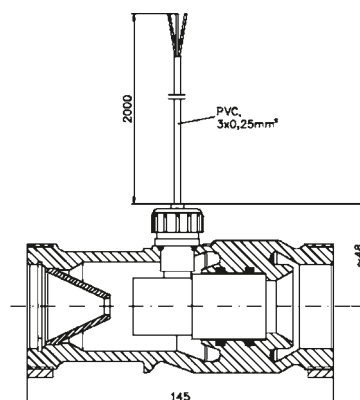
In the center of the turbine housing made of brass a polyamide turbine system is located. At the outside there is an annular gap. The liquid is divided between these two channels and



the part entering the center of the housing is turning the turbine, while the other part is passing through.

The rotational speed is converted to an electrical signal which frequency is strictly proportional to the flow rate.

Due to sapphire bearings of highest quality a remarkable life time of the turbine is achieved.



Measuring ranges, Materials, and Versions DR08.15

DR08.15	x.	x.	x.	x.	x.	x.	x.	xxx
Measuring range:								
2...40 l/min	S							
Materials:								
housing of PPO Noryl (not for high pressure version)	K							
housing of brass	M							
housing of brass	V							
Version:								
with inductive sensor			I					
with Hall sensor			H					
with Hall sensor, 300 bar, 150 °C			P					
Output signal:								
PNP (only with inductive sensor)				P				
NPN				N				
Electrical connection:								
without (only with option ...T)					0			
1,5 m PVC cable						P		
plug connector M12x1, 4 pin							S	
Additional temperature sensor:								
without							0	
PT-100 in brass shaft								1
PT-100 in stainless steel shaft								2
PT-1000 in brass shaft								3
PT-1000 in stainless steel shaft								4
Process connection:								
G 3/4 male (standard)								A
G 3/4 female (only for high pressure version in stainless steel)								I
connection fitting according to table "Connection Fittings"								x
Options:								
with integrated filter 0,5 mm (Tmax. 60 °C)								H
with build-on transmitter 4...20 mA (x = full scale value 5, 10, 20 or 40 l/min)								Ax
with build-on limit switch								VE
with build-on limit switch and additional pulse output (with 5 pin plug)								VEP
prepared for build-on electronic unit TD325 (please order separately)								T

Technical Data

Materials:

DR08.15.x.K: Housing and sensor: PPO Noryl GFN3
turbine: PEI ULTEM
O-ring: NBR, optional Viton
bearing / axle: ARCAP AP1D with hard metal pins and sapphire bearing
equipment of turbine wheel: hard ferrite and Hall sensor, stainless steel in case of inductive sensor

DR08.15.x.M: Housing: brass
sensor: PPO Noryl GFN3,
brass in case of high temperature version
turbine: PEI ULTEM
O-ring: NBR, optional Viton
bearing / axle: ARCAP AP1D with hard metal pins and sapphire bearing
equipment of turbine wheel: hard ferrite and Hall sensor, stainless steel in case of inductive sensor

DR08.15.x.V: Housing: stainless steel 1.4571
sensor: stainless steel 1.4571
Turbineneinsatz: PEI ULTEM
O-ring: Viton
bearing / axle: ARCAP AP1D with hard metal pins and sapphire bearing
equipment of turbine wheel: hard ferrite

max. Pressure:

DR08.15.x.K: 10 bar
DR08.15.x.M.I / H: 10 bar
DR08.15.x.M.P: 300 bar
DR08.15.x.V: 300 bar max.

Temperature:

DR08.15.x.K: 85 °C
DR08.15.x.M.I / H: 85 °C
DR08.15.x.M / V.P: 150 °C

Accuracy:

DR08.15.x.x.H / P: ± 1 % FS
DR08.15.x.x.I: ± 0,5 % FS

Power supply:

DR08.15.x.x.H / P: 4,5...24 VDC
DR08.15.x.x.I: 12...24 VDC

Output signal:

DR08.15.x.x.H / P: square wave pulse
855 (H) / 915 (P) ppl
NPN open collector

DR08.15.x.x.I: square wave pulse , 1795 ppl
NPN or PNP open collector

max. particle size: 0,5 mm

Measuring ranges, Materials, and Versions DR08.25

DR08.25	x.	x.	x.	x.	x.	x.	x.	xxx
Measuring range:								
4...160 l/min (permanent load 80 l/min)	S							
Materials:								
housing of PPO (not for high pressure version)	K							
housing of brass	M							
housing of stainless steel	V							
Version:								
with inductive sensor			I					
with Hall-Sensor			H					
with Hall-Sensor up to 50 bar			M					
Output signal:								
PNP (only with inductive sensor)				P				
NPN				N				
Electrical connection:								
without (only with option ...T)					0			
2 m PVC cable (only DR08.25.S.K.H or ...M.H)					P			
plug connection M12x1, 4 pin					S			
Additional temperature sensor:								
without						0		
PT-100 in brass shaft for DR08.25.K.						1		
PT-100 in stainless steel shaft for DR08.25.K.						2		
PT-1000 in brass shaft for DR08.25.K.						3		
PT-1000 in stainless steel shaft for DR08.25.K.						4		
PT-100 or PT-1000 for DR08.25.M / V see table "Connection Fittings"						5		
Process connections:								
G 1 1/4 male (Standard)							A	
Connection fitting according to table "Connection Fittings"							x	
Options:								
with filter 0,63 mm, made of stainless steel, incl. O ring EPDM								H
with build-on transmitter 4...20 mA (x = full scale value 60, 100 or 160 l/min)								Ax
with build-on limit switch								VE
with build-on limit switch and additional pulse output								VEP
prepared for build-on electronic unit TD325 (please order separately)								T

Technical Data

Materials:

DR08.25.x.K:

Housing and turbine: PP
sensor shaft: POM
turbine: PA Grivory HTV4X1
O ring: NBR
bearing / axle PA, sapphire, stainless steel
equipment of turbine wheel: permanent magnet Recona 28, nickel plated, stainless steel in case of inductive sensor

DR08.25.x.M:

Housing: brass
turbine: PP
sensor: POM, brass in case of high pressure version
turbine: PA Grivory HTV4X1
O ring: NBR, optional Viton
bearing / axle: PA, sapphire, stainless steel
equipment of turbine wheel: permanent magnet Recona 28, nickel plated
stainless steel in case of inductive sensor

DR08.25.x.V:

Housing: stainless steel 1.4571
sensor: stainless steel 1.4571
turbine: PA Grivory HTV4X1
O ring: NBR, optional Viton
bearing / axle: PA, sapphire, stainless steel
equipment of turbine wheel: permanent magnet Recona 28, nickel plated

max. Pressure:

DR08.25.x.K: 10 bar
DR08.25.x.M.I / H: 10 bar
DR08.25.x.M.M: 50 bar
DR08.25.x.V: 50 bar

max. Temperature:

DR08.25.x.K: 80 °C at 2 bar, 60 °C at 5 bar, 30 °C at 10 bar
DR08.25.x.M.I / H: 60 °C at 5 bar, 30 °C at 10 bar
DR08.25.x.M.M: 85 °C
DR08.25.x.V: 60 °C

Accuracy:

± 3 % of actual FS

Power supply:

DR08.25.x.x.H / M: 4,5...24 VDC
DR08.25.x.x.I: 10...30 VDC

Output signal:

square wave pulse, 65 ppl
NPN open collector for Hall-sensor,
PNP open collector for inductive sensor

max. Particle size:

0,5 mm

Measuring ranges, Materials, and Versions DR08.40

DR08.40	x.	x.	x.	x.	x.	x.	x.	xxx
Measuring range:								
0,4...25 m ³ /h (7...420 l/min)	S							
Materials:								
housing of brass			M					
Ausführung:								
with inductive sensor			I					
with Hall sensor			H					
with Hall sensor up to 50 bar			M					
Output signal:								
PNP (only with inductive sensor)				P				
NPN				N				
Electrical connection:								
without (only with option ...T)					0			
2 m PVC cable (only DR08.40.S.M.H)					P			
Steckeranschluss M12x1, 4-Pin					S			
Additional temperature sensor:								
PT-100 or PT-1000 for DR08.40 see table "Connection Fittings"						5		
Prozessanschluss:								
G 2 male							A	
connection fitting according table "Connection Fittings" (recom.)							x	
Options:								
with build-on transmitter 4...20 mA (x = full scale value 150, 250 or 400 l/min)								Ax
with build-on limit switch								VE
with build-on limit switch and additional pulse output								VEP
prepared for build-on electronic unit TD325 (please order separately)								T

Technical Data

Materials:

DR08.40.x.M:

Housing: brass
turbine wheel: PP
sensor: POM, brass in case of
high pressure version
Turbine system: PA Grivory
HTV4X1
O ring: NBR
bearing / axle: PA, sapphire, stainless steel
turbine wheel equipment:
Permanent magnets Recona 28,
nickel plated, stainless steel in case of
inductive sensor

max. Pressure:

DR08.40.x.M.I / H: 10 bar

DR08.40.x.M.M: 50 bar

max. Temperature:

DR08.40.x.M.H / M: 85 °C

DR08.40.x.M.I: 60 °C

Accuracy:

5 % of measured value
range 0,4...3 m³/h
± 3 % of measured value
range >3...25 m³/h

Power supply:

DR08.40.x.x.H / M: 4,5...24 VDC

DR08.40.x.x.I: 10...30 VDC

Output signal:

square wave pulse, 65 ppl
NPN open collector for Hall sensor,
PNP open collector for
inductive sensor

max. Particle size:

0,5 mm

Filter:

0,63 mm,
included in delivery

Connection Fittings

(inclusive corresponding seal)

Type	Description:	fits	T _{max.} / P _{max.}
A15ST10K	hose nozzle, PA 6.6, d = 10 mm	DR08.15	20 °C at 10 bar, 60 °C at 2,5 bar
A15ST12K	hose nozzle, PP, d = 12 mm	DR08.15	20 °C at 10 bar, 60 °C at 2,5 bar
A15ST15K	hose nozzle, HDPE, d = 15 mm	DR08.15	20 °C at 10 bar, 60 °C at 2,5 bar
A15ST19K	hose nozzle, HDPE, d = 19 mm	DR08.15	20 °C at 10 bar, 60 °C at 2,5 bar
A15STW13K	hose nozzle, PP, bent, d = 13 mm	DR08.15	60 °C, PN10
A15STW13M	hose nozzle, Ms, bent, d = 13 mm	DR08.15	90 °C, PN10
A15KM22K	glue-in connection, PVC d = 22 mm	DR08.15	20 °C at 6 bar, 60 °C at 2,5 bar
A15SN20K	weld-on connection, PP d = 20 mm	DR08.15	20 °C at 6 bar, 60 °C at 2,5 bar
A15VA10M	thread brass G 3/8 male	DR08.15	110 °C, PN16
A15VA15M	thread brass G 1/2 male	DR08.15	110 °C, PN16
A15VI10M	thread brass nickel plated G 3/8 female	DR08.15	110 °C, PN16
A15VI15M	thread brass nickel plated G 1/2 female	DR08.15	110 °C, PN16
A15KL18M	compression fitting brass for copper pipe d = 18 mm	DR08.15	110 °C, PN6
A15KL22M	compression fitting brass for copper pipe d = 22 mm	DR08.15	110 °C, PN6
A15LA15M	solder connection brass for copper pipe d = 15 mm	DR08.15	90 °C, PN16
A15LA18M	solder connection brass for copper pipe d = 18 mm	DR08.15	90 °C, PN16

Accessories

Type	Description:
DR08.Z.L3	cable with extruded mating connector M 12x1, 4 pin, shielded, L = 3 m
DR08.Z.L5	like L3 above, but L = 5 m
DR08.Z.L10	like L3 above, but L = 10 m
DR08.Z.S	mating connector M 12x1, 4 pin, without cable

Type	Description:	fits	T _{max.} / P _{max.}
A25ST25K	hose nozzle, PP, d = 25 mm	DR08.25	20 °C at 10 bar, 60 °C at 2,5 bar
A25ST30K	hose nozzle, PP, d = 30 mm	DR08.25	20 °C at 10 bar, 60 °C at 2,5 bar
A25ST32K	hose nozzle, PP, d = 32 mm	DR08.25	20 °C at 10 bar, 60 °C at 2,5 bar
A25SM25K	weld-on connection, PP, d _i = 25 mm d _a = 33 mm	DR08.25	20 °C at 10 bar, 60 °C at 2,5 bar
A25KM25K	glue-in connection PP d _i = 25 mm d _a = 33 mm	DR08.25	20 °C at 10 bar, 60 °C at 2,5 bar
A25VA25M-PT100	thread brass, with PT-100 in brass shaft, G 1 male	DR08.25	85 °C, PN16
A25VA25M-PT1000	thread brass, with PT-1000 in brass shaft G 1 male	DR08.25	85 °C, PN16
A25VA25M	thread brass, G 1 male	DR08.25	85 °C, PN16
A25VA32M*	thread brass, G 1 1/4 male	DR08.25	85 °C, PN16
A25LA28M	solder connection brass for copper pipe d = 28 mm	DR08.25	85 °C, PN16
A25VA25V	thread stainless steel, G 1 male	DR08.25	85 °C, PN16
A40VA40M-PT100	thread brass, with PT-100 in brass shaft, G 1 1/2 male	DR08.40	85 °C, PN16
A40VA40M-PT1000	thread brass, with PT-1000 in brass shaft, G 1 1/2 male	DR08.40	85 °C, PN16
A40VA40M	thread brass, G 1 1/2 male	DR08.40	85 °C, PN16
A40VA50M	thread brass, G 2 male	DR08.40	85 °C, PN16
A40LA42M	solder connection brass, for copper pipe d = 42 mm	DR08.40	85 °C, PN16

* fitting consists of one piece only

DR08...Ax F/I-Converter with analogue output

All turbine flowmeter type DR08 can be equipped with a build-on F/I converter to deliver directly a standard sensor output of 4... 20 mA instead of a pulse square wave signal.



Technical Data

Output:	4...20 mA, current limit at 26 mA
Scaling:	according to model code DR08.15, DR08.25, DR08.40, other scaling at special order
Power supply:	18...30 VDC
max. Current:	30 mA
max. Load:	250 Ohm
electr. Connection:	4 pin plug, M12x1,
max. Medium temperature:	80 °C

DR08...VE(P) Limit switch with 16 programmable switching points



- wide switching range, only 1 flow switch suitable for many applications.
- reliable monitoring of low flow rate
- absolute exactly programming of switching point
- self monitoring
- excellent price performance ratio

Description:

The core of the turbine wheel flow monitor DR08...-VE is the extremely robust miniature turbine DR08, which is applied for many years in a huge variety of large-scale production. The turbine provides a frequency signal proportional to the flow. These electrical pulses are fed into a microprocessor based electronic unit. This monitors the programmed minimal flow and if the flow falls below this limit it activates a potential free alarm contact.

Even in the case of a blocked turbine wheel the electronic unit recognises this error condition and signalises it. An additional pulse signal is also available, so the actual flow can be measured and monitored by another unit, too.

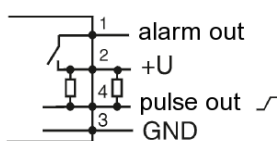
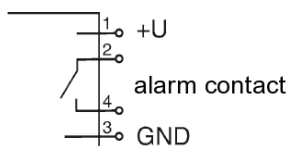
Applications:

Supervision of heat exchange systems of high grade devices like:

- Laser equipments
- HF-generators
- etc.

Electrical connections

switching contact only or switching contact and pulse output



Switch-position	Switching point in l/min					
	DR08.15		DR08.25		DR08.40	
	rising	falling	rising	falling	rising	falling
0	1	0,5	5	3	10	7
1	1,5	1	7	5	13	10
2	2	1,5	8	6	19	15
3	2,5	2	10	8	24	20
4	3	2,5	12	10	30	25
5	3,5	3	14	12	35	30
6	4	3,5	17	15	40	35
7	5	4,5	20	18	47	40
8	6	5,5	22	20	58	50
9	8	7,5	27	25	75	65
A	10	9,5	33	30	90	80
B	12	11,5	38	35	115	100
C	16	15,5	44	40	150	130
D	20	19,5	55	50	190	160
E	25	24,5	75	70	230	200
F	30	29,5	105	100	310	275

The switching points given in the table are measured with water at 20 °C. Custom specific switching points can be factory programmed from a sales volume of 25 devices and higher.

Technical Data

Switching range: see table above

Switching accuracy:
DR08.15: ± 0,2 l/min ± 2 % of switching point
DR08.25: ± 0,8 l/min ± 4 % of switching point
DR08.40: ± 2,0 l/min ± 6 % of switching point

Switching point setup: with 16 position rotary switch

Output:
switch: connecting to +Ub
max load 100 mA
pulse: frequency signal
proportional to flow rate, NPN
open collector, max. 10 mA

Display: 2 LED
yellow: flow OK
red: alarm

Electrical connection: 4 pin plug, M12x1

Power supply: 12...24 VDC, max. 10 mA

max. Media temperature: 80 °C

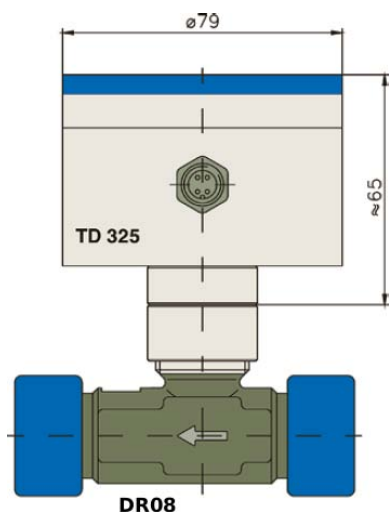
TD325 Display and Control unit to build-on at turbine flowmeter DR08

The display and control unit is suitable to evaluate the signals of the turbine flowmeter DR08. Normally it will be delivered directly mounted on a DR08 (option DR08...T).



The TD325 provides various display and control functions:

- 2 line LCD display for
 - Flow rate
 - Total (resetable)
 - Total (not resetable)
 - Temperature (optional)
 - Bargraph display 0...100 % for flow rate, Volumene (resetable) oder Temperature
- menu based programming by 2 light reflex buttons (protection index IP65)
- Keylock against unintentional operation
- Menu language german, english, french
- rotatable housing made of stainless steel
- optional analogue output, assigned to flow rate, totaliser, or temperature
- optional with 2 limit switches, assigned to flow rate, totaliser, or temperature
- optional pulse output, also with frequency divider available



The TD325 can be mounted to any DR08 flow sensor. Optional there is also a version for panel mounting available. The electrical connection is made by an extruded cable or one (resp. two) plugs M12 x 1.

Order Code

TD325	x.	xx.	xx.	xx.	x.	x.	x.
Display and controll unit for DR08							
Input signal:							
pulse from flow sensor	1						
pulse from flow sensor and PT-100 signal	2						
Analogue ooutput:							
without		0					
4...20 mA		A1					
0...20 mA		A2					
0...10 V		A3					
Frequency output:							
without			0				
according to pulse rate DR08			F1				
with frequency divider			F2				
Limit switch:							
without				0			
2 contacts				K2			
electrical connection:							
2 m PVC cable					K		
plug M12x1					S		
Mounting:							
mounted on flow sensor						1	
for panel mounting						2	
Options:							
without							0
please indicate							9

Technical Data

Signal input:

flow:

frequency signal 0,5...2000 Hz, programmable pulse rate

temperature:

PT-100, 3 wire, -10...+150 °C

Anzeige:

Programmable units:

2-line LCD display
l/min, l/h, GPM (US), GPM(UK)
l, m³, GAL(US), GAL(UK)
°C, °F

Power supply:

12...24 VDC witht integrated sensor supply 12 VDC

Ambient temperature:

-20...+60 °C

Medium temperature:

-20...+90 °C

Analogue output:

0/4...20 mA,
max. load 800 Ohm
or 0...10 V

Alarm output:

2 transistor switches,
PNP open collector
programmable as Min. or
Max. alarm, adjustable
hysteresis, quiescent or
operation current function

Frequency output:

PNP open collector, TTL,
divisor programmable

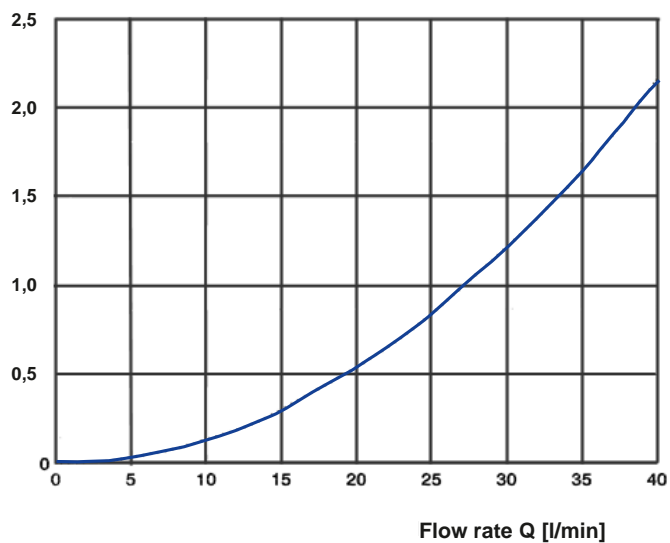
Housing:

stainless steel,
d = 80 mm, h = 55 mm,
350° rotatable

Pressure drop:

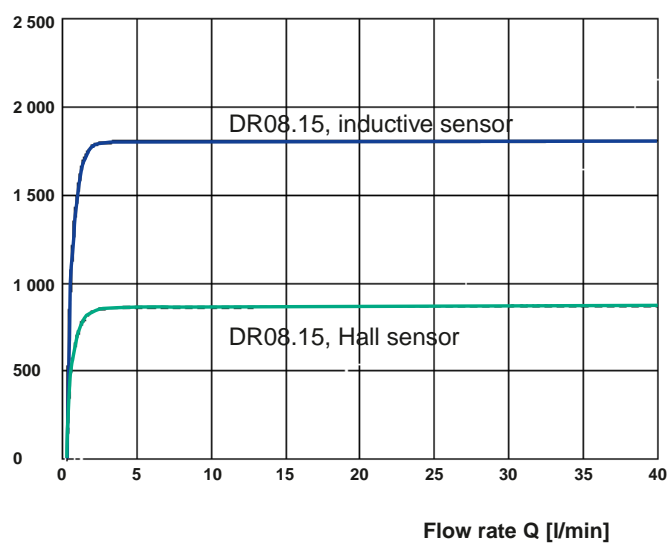
DR08.15

Pressure drop Δp [bar]



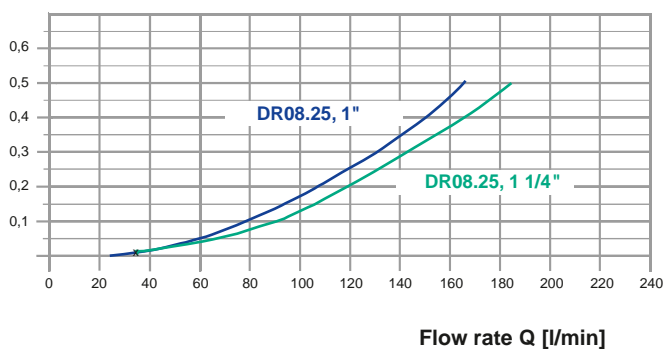
Pulse rates:

Pulse rate [1/l]

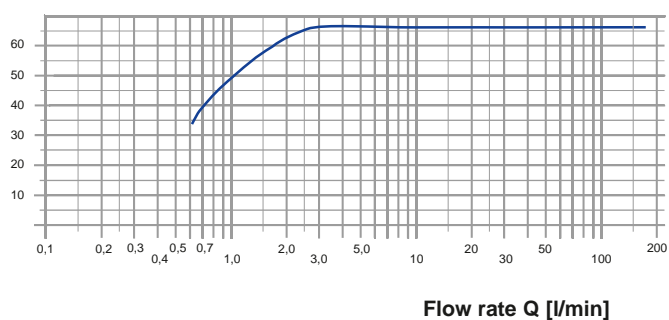


DR08.25

Pressure drop Δp [bar]



Pulse rate [1/l]



DR08.40

Pressure drop Δp [bar]

