

# DR04

## Paddle Wheel Flowmeter, switch and monitor also for high pressure

- for liquids
- robust and compact flow sensor
- large material variety
- position-independent
- measuring range ratios up to 40:1
- no inlet and outlet sections required
- measuring ranges: 0,5...1,5 l/min up to 6...100 l/min
- high process pressures up to 100 bar
- max. temperature 100 °C



### Description:

The impeller flowmeters of the DR04 series consist of a sensor and an optional transmitter. The sensor has an impeller which is mounted in a housing made of PPS, PVDF, MS or stainless steel and is rotated by the flowing medium. Depending on the material version, this rotary motion is measured inductively or by a Hall sensor system and output as a flow-proportional frequency signal. A transmitter integrated in the housing with various output signals is optionally available for evaluating the signal.

### Typical Applications:

The DR04 impeller flowmeters are a versatile measuring and monitoring system for all low-viscosity liquids, which do not attack the materials used, due to their design. The metal version allows high process pressures up to 100 bar, therefore the instruments can also be used under difficult process conditions.

## Models:

DR04.1: PPS housing, inductive tap (10 st. st. clamps)  
 DR04.2: PVDF housing, inductive tap (10 st. st. clamps)  
 DR04.3: brass housing, hall sensor (5 magnets)  
 DR04.4: st. steel housing, hall sensor (5 magnets)

## Technical Data:

**Max. pressure:** DR04.1/2: 16 bar  
 DR04.3/4: 100 bar

**Max. temperature:** DR04.1/2: 60 °C  
 DR04.3/4: 100 °C

**Accuracy:** ± 3 % of measured value

## Process connection:

	housing size 50 x 50 mm	housing size 70 x 70 mm
pipe size 3/8"	G 3/8 female G 3/8 male hose nozzle (Ø 11 mm)	
pipe size 1"		G 1 female G 1 male hose nozzle (Ø 30 mm)

## Materials:

	DR04.1	DR04.2	DR04.3	DR04.4
<b>Housing</b>	PPS	PVDF	brass, nickel plated	st. steel 1.4305
<b>Cover</b>	PSU transparent	PVDF	brass (optional Makrolon)	1.4305 (optional Makrolon)
<b>Connection</b>	PVDF (optional brass, st. steel)	PVDF (optional brass, st. steel)	brass (optional flange)	1.4305 (optional flange)
<b>Rotor</b>	PVDF with 1.4310 st. steel clamps (titan on request)	PVDF with 1.4310 st. steel clamps (titan on request)	PVDF with 5 magnets	PVDF with 5 magnets
<b>Axle</b>	ceramic	ceramic	ceramic	ceramic
<b>Bearing</b>	Iglidur x (optional ceramic)	Iglidur x (optional ceramic)	Iglidur x (optional ceramic)	Iglidur x (optional ceramic)
<b>Magnets</b>	---	---	5xSm2Co5 (bonded with epoxy resin)	5xSm2Co5 (bonded with epoxy resin)
<b>O-Ring</b>	FKM (optional EPDM / NBR)	FKM (optional EPDM / NBR)	FKM (optional EPDM / NBR)	FKM (optional EPDM / NBR)

## Measuring Range / Impulses:

Code	Measuring range [l/min] H <sub>2</sub> O	Impulses/l DR04.1/2	Impulses/l DR04.3/4	Pipe size
1.	0,5...1,5	10200	4955	3/8"
2.	2...10	3345	1632	3/8"
3.	2...12	1755	860	3/8"
4.	3...30	1216	544	1"
5.	5...60	607	295	1"
6.	6...100	252	126	1"

## Electrical Data:

**Power supply:** 10–30 VDC  
 NAMUR: 7...12 VDC

**Current input:** DR04.1/2: 10 mA,  
 NAMUR: max. 7 mA  
 DR04.3/4: 30 mA

**Output current max.:** DR04.1/2: 200 mA,  
 NAMUR: max. 7 mA  
 DR04.3/4: 100 mA

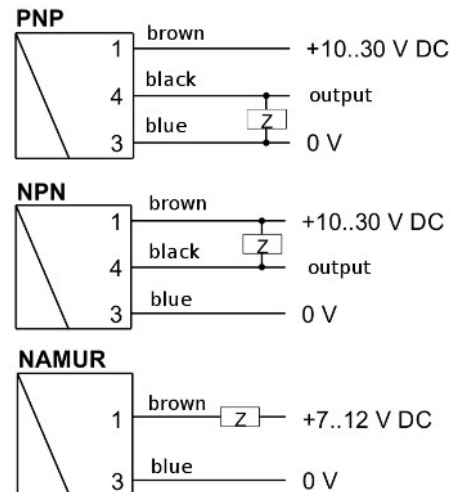
**Output signal:** square wave signal

**Output:** DR04.1/2: PNP, NPN, or NAMUR  
 DR04.3/4 Push-Pull

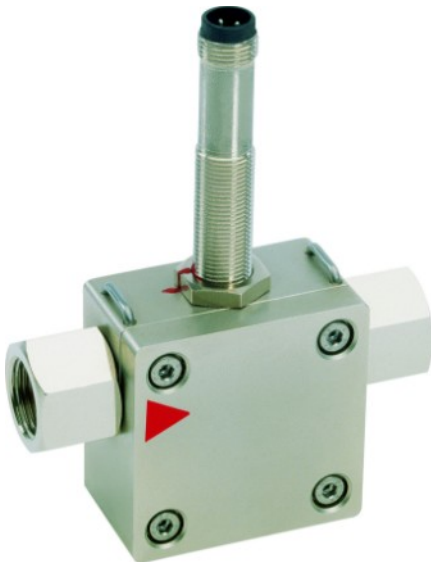
**Connection:** 2 m cable or M12x1, 4-pin

**Protection class:** IP67

## Electrical Connection:



**Flow meter with transmitter  
(integrated in connection housing):**



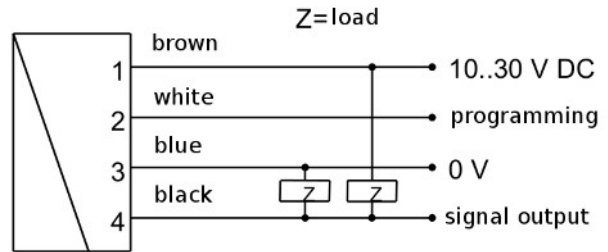
**Measuring Range:**

Code	Measuring range [l/min] water	Qmax [l/min] water	Pipe size
1M.	0,1...1,5	1,8	3/8"
2M.	0,2...10	12,0	3/8"
3M.	0,4...12	14,4	3/8"
4M.	2...30	36	1"
5M.	3...60	72	1"
6M.	4...100	120	1"

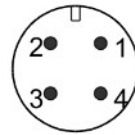
**Technical Data:**

- Power supply:** 10..30 V DC  
with voltage output. 10 V: 15..30 VDC
- Power consumption:** < 1 W (with unloaded outputs)
- Source data:** all outputs are short-circuit proof and reverse polarity protected
- MI current output:** 4...20 mA
- MU voltage output:** 0..10 V current output max. 20 mA
- MF frequency output:** transistor output "Push-Pull"  
I<sub>out</sub> = 100 mA max. output frequency depending on measuring range, standard 500 Imp/l (corresponds to 666,7 Hz at 80 l/min) small quantity range: 5000 Imp/l (corresponds to 500 Hz at 6 l/min) (other frequencies on request)
- MZ counting pulse:** transistor output "Push-Pull"  
I<sub>out</sub> = 100 mA max.  
pulse width 50 ms  
pulse/quantity is to be indicated with the order
- MS switching output:** transistor output „Push-Pull“  
I<sub>out</sub> = 100 mA max.
- Electr. connection:** for round plug M12x1, 4-pole.
- Display:** yellow LED shows  
MI / MU: operating voltage  
MF / MZ: initial state  
MS: ON = normal / OFF = alarm  
(fast flashing = programming)
- Protection class:** IP67

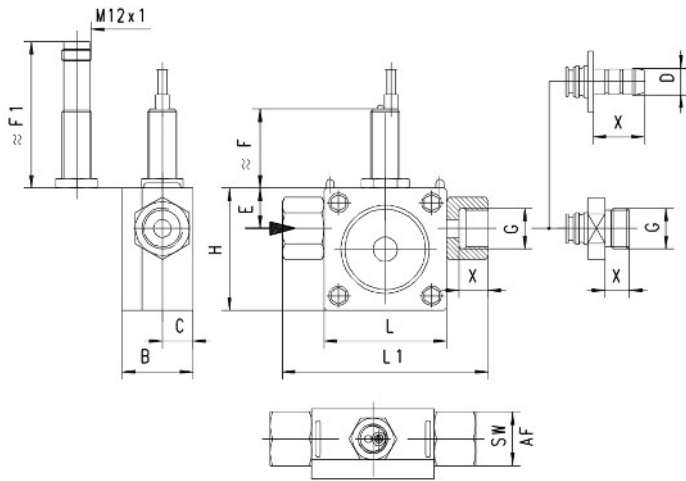
**Connection Diagram:**



connection example: PNP NPN



## Dimensions:



Con- nection	H/L	L1	B	C	E	F*	F1	X	SW
<b>G 3/8 f</b>	50	84	29	12,5	16,5	33	60	12	22
<b>G 3/8 m</b>								14	
<b>G 1 f</b>	70	110	53	23	27,5	28	55	18	38
<b>G 1 m</b>		122							
<b>Hose nozzle plastic housing:</b>									
<b>Ø 11</b>	50	96	11	12,5	16,5	32	60	21	--
<b>Ø 30</b>	70	176	30	23	27,5	27	55	45	--
<b>Hose nozzle metal housing:</b>									
<b>Ø 11</b>	50	96	29	12,5	16,5	33	60	21	--
<b>Ø 30</b>	70	176	53	23	27,5	28	55	45	--

All dimensions in mm

\*with integrated transmitter dimension for F:

¾" or hose nozzle Ø 11 mm: **56 mm**

1" or hose nozzle Ø 30 mm: **51 mm**

## Accessory:



Order code: **SM12. 4. 2. G. 0**

### M12-plug with PVC cable

#### Number of pins:

4 = 4-pin

#### Cable length:

0 = without cable for self assembly  
 2 = 2 m PVC cable (standard)  
 5 = 5 m PVC cable  
 10 = 10 m PVC cable

#### Version:

G = straight  
 W = angled

#### Options:

0 = without  
 9 = please specify in plain text

## Order Code:

Order number: **DR04. 1. 2. 1. 4. 1. 1. 0**

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### Models:

- 1 = with PPS housing, inductive tap (10 stainless steel clamps)
- 2 = with PVDF housing, inductive tap (10 stainless steel clamps)
- 3 = with brass housing (nickel plated), hall sensor
- 4 = with st. steel housing, hall sensor

### Housing- / pipe sizes

- 1 = 50 x 50 mm, for 3/8" pipe size
- 2 = 70 x 70 mm, for 1" pipe size

### Process connection:

- 1 = female thread G (standard)
- 2 = male thread G
- 3 = hose nozzle
- 9 = special connection, please specify in plain text

### Measuring range (valid for water):

DR04.x.1 (3/8" connection) only:

- 1 = 0,5...1,5 l/min
- 2 = 2...10 l/min
- 3 = 2...12 l/min

DR04.x.2 (1" connection) only:

- 4 = 3...30 l/min
- 5 = 5...60 l/min
- 6 = 6...100 l/min

### for devices with integrated transmitter:

DR04.x.1 (3/8" connection) only:

- 1M = 0,1...1,5 l/min
- 2M = 0,2...10 l/min
- 3M = 0,4...12 l/min

DR04.x.2 (1" connection) only:

- 4M = 2...30 l/min
- 5M = 3...60 l/min
- 6M = 4...100 l/min

### Electrical connection:

- 1 = 2 m cable (standard for devices without transmitter)
- 2 = plug connection M12 x 1, 4-pin, without mating connector (standard for devices with transmitter)

### Output:

- 1 = PNP (standard)
- 2 = NPN

### Output with transmitter

- MI = 4...20 mA
- MU = 0...10 V
- MF\* = frequency output 2000 Hz (factory-set adjustable on request)
- MZ\* = counting pulse (factory-set adjustable)
- MS = switching output (Push-Pull)

### Options:

- 0 = without
- 9 = please specify in plain text

\*For frequency output and counting pulse please specify desired data.