DR04

Turbine flow meter, switch and indicator modular design

- Compact, heavy-duty flow sensor
- Large choice of materials
- Universal mounting
- Turndown ratios to 40:1
- No inlet or outlet pipe runs needed
- Different transmitters available for direct attachment or mounting on DIN rail

Description

Model DR04 turbine flow meters consist of a sensor and an optional transmitter. The sensor has a turbine, fitted in a housing made of PPS, PVDF, brass or stainless steel and rotated by the flowing liquid being monitored. This rotary motion is scanned depending on the device material by an inductive, optical or Hall sensor system and output as a frequency signal proportional to the flow rate. Three different transmitters are available for processing the signal, which can be supplied as a plug-in module or in a separate housing for DIN rail mounting.

Typical Applications:

Due to their modular design, the DR04 turbine flow meters are a versatile measuring and monitoring system for all low-viscosity liquids, which do not attack the device materials.

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A. Flowsensor

Models:

DR04.1: PPS housing, inductive scan
DR04.2: PVDF housing, optical scan
DR04.3: brass housing, Hall sensor
DR04.4: stainless steel housing, Hall sensor

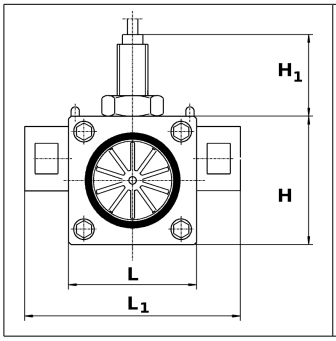
Housing sizes and process connections:

DR04.x.1: for low flow rates, 3/8" fitting
DR04.x.2: for mean flow rates, 1" fitting

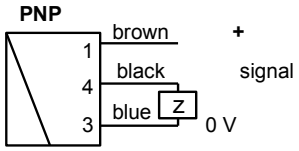
The process adapters can be either a female or male-threaded fitting (G) or a hose nipple (for PVDF housing only).

Dimensions:

Type	H (mm)	H1 (mm)	L (mm)	L1 (mm)	Weight (kg)
DR04.1.1	50	19	50	85	0,2
DR04.1.2	70	24	70	110	0,5
DR04.2.1	50	42	50	85	0,2
DR04.2.2	70	47	70	110	0,5
DR04.3.1	50	42	50	85	0,6
DR04.3.2	70	47	70	110	1,8
DR04.4.1	50	42	50	85	0,6
DR04.4.2	70	47	70	110	1,8



Electrical connection:



Optional:
NPN,
NAMUR (DR04. 1/3/4 only)

Electrical Specifications:

Supply voltage:
DR04.1: 5–30 VDC
DR04.2: 24 VDC ±10 %
DR04.3 / 4: 10–30 VDC

max. power consumption: 30 mA (DR04.1: 10 mA)

max. output current: 100 mA (DR04.1: 200 mA)

Output: Rectangular pulse signal
DR04.1: 4–29V
DR04.2: 9–23V
DR04.3/ 4: 4–23V

Output circuit: PNP or NPN, (DR04.1/3/4 also NAMUR)

Connection: 2 m cable or plug connector

Protection type: IP 67

Model Coding:

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

Flow sensor with turbine

Model:
1 =with PPS housing, inductive scan
2 =with PVDF housing, optical scan
3 =with brass housing, Hall sensor
4 =with stainless steel housing, Hall sensor

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

Type of connection:
1 =female threaded fitting G
2 =male-threaded fitting G
3 =hose nipple
9 =special-order connection, please specify in writing

Device range (valid for water):
DR04.x.1 only:
1 =0.1 to 1.5 l/min
2 =0.2 to 10 l/min
3 =0.4 to 12 l/min

DR04.x.2 only:
4 =2 to 30 l/min
5 =3 to 60 l/min
6 =4 to 100 l/min

Electrical connection:
0 =None (for sensor with connected electronics only)
1 =2 m cable (standard)
2 =plug connector

Output circuit:
1 =PNP (standard)
2 =NPN
3 =NAMUR (DR04.1/3/4 only)

Technical Specifications:

max. pressure:

DR04.1/2: 16 bar
DR04.3/4: 100 bar

max. temperature:

DR04.1/2: 60 °C
DR04.3/4: 100 °C

Materials:

	DR04.1	DR04.	DR04.3	DR04.4
Housing	PPS (opt. PVDF)	PVDF	Brass	1.4305 (opt. 1.4571)
Cover	Questra/PPS (opt. PVDF, Macrolon)	PVDF	Brass (opt. macrolon)	Brass (opt. 1.4571, macrolon)
Fitting	PVDF (opt. brass, SS, flange)	PVDF (opt. brass, SS)	Brass (opt. Macrolon)	1.4305 (opt. flange)
Rotor	PVDF with SS caps (option titanium caps)	PVDF	PVDF	PVDF
Axleshaft	ceramic	ceramic	ceramic	ceramic
Bearing	Iglidur (opt. ceramic)	Iglidur (opt. ceramic)	Iglidur (opt. ceramic)	Iglidur (opt. ceramic)
Magnets	---	---	5xSm2Co17 (opt. 2 or 10 magnets)	5xSm2Co17 (opt. 2 or 10 magnets)
O-Ring	Viton (opt. EPDM)	Viton (opt. EPDM)	Viton (opt. EPDM)	Viton (opt. EPDM)

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C. Transmitter (OEM)

Models:

DR04.M5: Frequency converter
The sensor receives a frequency signal proportional to the flow and converts it to the output frequency. A yellow LED indicates the output state, that is, it flashes at the same frequency as the output frequency.

DR04.M5: Limit contact sensor
The sensor receives a frequency signal proportional to the flow and evaluates it. If the flow rate drops below the set limit value an alarm signal is output and the yellow LED in the plug connector is de-energized.

DR04.M5: Frequency / analog converter
The sensor receives a frequency signal proportional to the flow and converts it to an analog 0(4) - 20 mA current signal.

Model Coding:

Order number: **DR04. M7. 4. 1. 2. 1.**

Transmitter for flow sensor with turbine

Model:
M5 = frequency converter
M6 = limit contact sensor
M7 = frequency / analog converter

Case design:
4 = integrated in the sensor housing

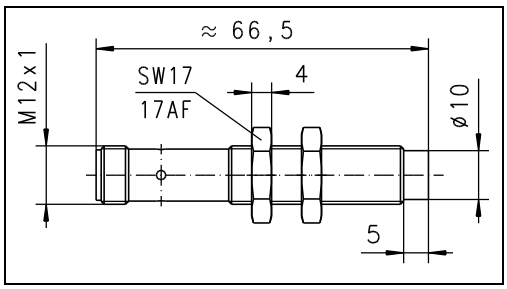
Supply voltage:
1 = 24 VDC
2 = 230 V when electronics module is detached

Output:
1 = 0-10 V (M7U)
2 = 4-20 mA (M7I)
3 = frequency output (M5 only)
4 = switched output (M6 only)

Electrical connection:
3 = M12x1 round plug connector, 4-pin

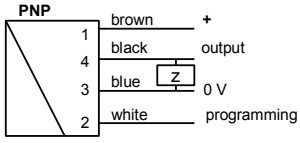
Additional specifications:
DR04.M4 + M7: flow rate at 20 mA
DR04.M5: output frequency at desired flow rate Output NPN or PNP
DR04.M6: setpoint (can be programmed on site) Output NPN or PNP

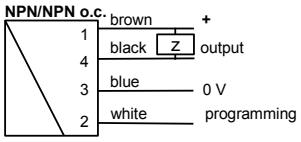
Dimensions:

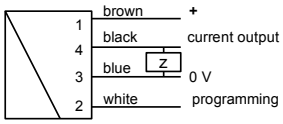


Electrical Connection

DR04.M5 and M6







Technical Specifications:

Supply voltage:	10-30 VDC
Power consumption:	< 20 mA (no load)
Input frequency:	4-10,000 Hz
Output:	
DR04.M5:	10-2,000 Hz
DR04.M6:	transistorized output, max. 200 mA
DR04.M7:	current output, (0) 4-20 mA
Electrical connection:	M12 x 1 round plug connector, 4-pin
Housing material:	nickel-plated brass
Protection type:	IP 65
Operating temperature:	0-70 °C
Weight: approx.	25 g

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Frequency / Analog Converter IFMA

- Converts an input frequency range to an analog signal
- Adjustable frequency range from 0 -1 Hz to 0 - 25 kHz
- Input and output INFO LED
- Four output ranges: 0-5V, 0-10V, 0-20mA, 4-20mA
- All sensors can be set-up via DIP switch
- AC or DC power supply
- Threefold electrical isolation power supply/input/output
- Easy mounting on C or DIN rail

The IFMA frequency analog converter processes an input frequency ranging from 0 - 1 Hz to 0 - 25 kHz and converts it in to an analog signal. You can easily program and monitor the device with a 7-pin DIP switch, a BCD rotary dip switch, a pushbutton and 2 LEDs. It is simply snapped onto the DIN or C rail.

Inputs: You be can adapt all standard sensors (PNP, NPN, permanent magnet, relay, CMOS or TTL) for use via 3 DIP switches.
PNP: 1 kOhm pull-down resistor, max.12mA at 12 volt.
NPN: 3.9 kOhm pull-up resistor, max.3mA.
Low trigger hysteresis: V = 0.25 V; V = 0.75 V.
High trigger hysteresis V = 2.5V; V = 3.0 V.
Max. input voltage: +/- 90 V; max. 2.75 mA (DIP switches 1 and 3 to OFF).

Measurement technique: period measurement.

Frequency range: 0 - 1 Hz to 0 - 25 kHz can be selected by applying signals or can be set with BCD switch.

Response time: can be selected from 5ms + 1 period to 10s + 1 period.

Output: voltage: 0 - 10 VDC or 0 - 5 VDC/10 mA, current: 0 - 20 mA or 4 - 20mA. load: 500Ohm at 10VDC.

Indication: red LED lights up when the output is energized. Green LED lights up when signals are received.

Power supply: 9 – 32 VDC or 85 – 250 VAC.

Sensor supply: AC model only:+12VDC 25%, max. 60mA.

Accuracy: 0.1% of operating range (0.2 % for the range 0 – 5 VDC).

Resolution: voltage: 3.5mV min., current: 8A min.

Temperature: operation 0°C to +50°C. storage: -40 to +80°C.

Electromagnetic compatibility CE compliant:
- interference emission: EN 50 081-2
- noise immunity: EN 50 082-2.

Approvals: UL approval (Underwriters Laboratories) for the US and Canada.

Connection: via screw terminals.

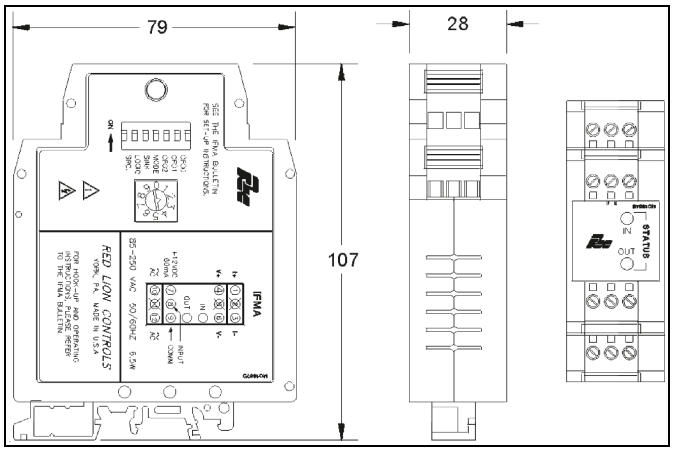
Housing: solid plastic housing.

Insulation: 2.2 kV between power supply and input and between power supply and output. 500 V between input and output for one minute.

Dimensions: B 28mm x H 107mm x T 79mm.

Weight: approx. 170 g.

Supply scope: device, instruction manual.



Dimensions (in mm)

Termination

1	+output current
2	N.C.
3	-output current
4	+output voltage
5	N.C.
6	output voltage
7	sensor supply
8	input signal
9	ground input
10	depends on device model: 85 - 250 VAC or 9 - 32 VDC
11	N.C.
12	depends on device model: 85 - 250 VAC or ground

Setup
Device is programmed with 1 button and 2 LEDs:
1. operating range:
   0-5 VDC, 0 - 10 VDC, 0 - 20mA or 4 - 20 mA.
2. Scaling: by applying a signal or can be set with BCD switch: 0 - 1 Hz to 0 - 25 kHz.
3. min. response time:
   5, 10, 20, 50, 100, 200, 500 ms, 1, 5, 10 s.
4. max. response time:
   5, 10, 20, 50, 100, 200, 500 ms, 1, 5, 10 s

Ordering Information

Model	Order no.
Frequency /analog converter IFMA - with 85 - 250 VAC power supply IFMA0065 - with 9 - 32 VDC power supply IFMA0035	 IFMA0065 IFMA0035

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