



Instruction Manual

DR58

Brass Paddle Wheel Flow Meter



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Safety Information

General Instructions

To ensure safe operation, the device should only be operated according to the specifications in the instruction manual. The requisite Health & Safety regulations for a given application must also be observed. This statement also applies to the use of accessories.

Every person who is commissioned with the initiation or operation of this device must have read and understood the operating instructions and in particular the safety instructions!

The liability of the manufacturer expires in the event of damage due to improper use, non-observance of this operating manual, use of insufficiently qualified personnel and unauthorized modification of the device.

Proper Usage

Series DR58 paddle wheel flow meters are designed to measure continuous flow rates of liquids which do not attack the device materials. All other usage is regarded as being improper and outside the scope of the device.

In particular, applications in which shock loads occur (for example, pulsed operation) should be discussed and checked in advance with our technical staff.

The series DR58 flow meter devices should not be deployed as the sole agents to prevent dangerous conditions occurring in plant or machinery. Machinery and plant need to be designed in such a manner that faulty conditions and malfunctions do not arise that could pose a safety risk for operators.

Dangerous substances

For dangerous media such as e.g. Oxygen, Acetylene, flammable or toxic substances as well as refrigeration systems, compressors, etc. must comply with the relevant regulations beyond the general rules.

Qualified Personnel

The DR58 devices may only be installed by trained, qualified personnel who are able to mount the devices correctly. Qualified personnel are persons, who are familiar with assembling, installation, placing in service and operating these devices and who are suitably trained and qualified.

Inward Monitoring

Please check directly after delivery the device for any transport damages and deficiencies. Additional with reference to the accompanying delivery note the number of parts must be checked.

Claims for replacement or goods which relate to transport damage can only be considered valid if the delivery company is notified without delay.

Installation

The following requirements must be strictly observed, otherwise the flow meter and/or the system may be damaged:

Installation position:

The flow sensor can be installed in any position, but we recommend horizontal installation for best ventilation. If it is installed in vertical pipes, the direction of flow from bottom to top is preferred.

The direction of flow must correspond to the marking on the body.

Process connection:

- A process connector matched to the device must be provided on-site
- Check connector size
- Check screw engagement depth
- Use a suitable sealant (N.B. fluid sealant can damage the flowmeter if it enters the measurement chamber)
- Seal correctly

Ambient conditions:

- Do not use the flowmeter as a load-bearing component in pipe structures.
- The medium must not contain solid particles. Magnetic particles gather on the magnets and impair the function.
- The formation of gas bubbles in the medium, and cavitation must be avoided
- Check the compatibility of corrosion protection and anti-freeze agents before use.
- Durability of the specified materials with regard to the chemicals you use must be guaranteed.

Installation

- External magnetic fields influence the flowmeter. Ensure sufficient distance from magnetic fields (e.g. electric motors).
- Ferro-magnetic tubes, process connectors or supports influence the magnetic field of the flowmeter. Keep a minimum clearance of 100 mm from such materials (e.g. steel).
- Ensure ventilation of the device.
- Cross-section changes, branches or bends in the piping influence the measurement accuracy. Use the following stabilizing sections (extract from DIN 1952) (d = nominal internal pipe diameter)

Electrical connection

Attention: We recommend using only shielded connection cables.

Prior to the electrical connection of the device, it must be ensured that the supply voltage matches that required:

Pulse output: 4,5...24 VDC (Push-Pull)
Analogue output: 15...24 VDC (4...20 mA-Output)
limit relays: 15...24 VDC, 1 x MAX-contact, potential free

The supply voltage must be switched off before the device is electrically connected.

Pin assignment

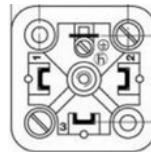
Angle plug (EN 175301-803A)

The 4...20 mA analogue output is a 2-wire circuit, therefore no connection to ground (GND) is required for all connection variants.

PIN 1: Power supply

PIN 2: Signal (Push Pull or 4...20 mA)

PIN 3: Ground (GND) (only for Push Pull)



Determination of the K-factor

K-Factor for H₂O at 21 °C at continuous flow:

Measuring range [l/min]	Connection (G or NPT female)	Pulse / l (K-factor) (approx.)
5...250	1"	54
10...400	1 1/4"	32
15...600	1 1/2"	20
20...1000	2"	10

If a medium other than H₂O and/or other temperatures or discontinuous flow is used, then it is necessary to determine the individual K-factor.

Determine the K-factor as follows:

1. Ensure that the flow meter is connected properly.
2. Ensure that sufficient medium is present.
3. Ensure that the system is free of air.
4. Place a sufficiently large, empty measuring beaker under the outlet (recommended measuring period of the K-factor > 60 seconds).
5. Start the measuring process and count the pulses (e.g. using a pulse counter).
6. Stop the measuring process and divide the number of pulses counted by the volume (converted to litres) of the drained medium:

$$\text{K - factor} = \frac{\text{counted_pulses}}{\text{measured_quantity_ [liters]}}$$

7. Repeat this process at least three times.
8. Calculate the average value from the results obtained under Point 6 (do not use runaway values).

Maintenance and care

The flowmeters require little maintenance due to the small number of moving parts. A regular function check and maintenance increases the service life and functional safety not only of the device, but also of the whole plant.

The maintenance intervals depend on:

- Contamination of the medium
- Ambient conditions (e.g. vibration)

At least the following points must be inspected during maintenance:

For maintenance please proof at least following items:

- signal output and free movement of paddle wheel:
Free movement of the paddle wheel and the output of the output signal can be tested by changing the flow and observing the signal (signal change is directly proportion to the flow).
- Leakages in the device

It is the responsibility of the operator to define suitable maintenance intervals depending on the application.

Remarks:

Flushing with clean medium provides sufficient cleaning in most cases. Commercially available cleaning agents can be used in stubborn cases (e.g. lime deposits) insofar as these materials do not attack the materials in the device.

Attention!!!: The guarantee becomes void if the device is opened.

Troubleshooting

No signal output:

1. No flow
 - ▶ Check that medium is flowing
2. Flowless than measurement range
 - ▶ Use flowmeter with different measuring range
3. Incorrectly installed or connected
 - ▶ Install according to Section Installation
4. Paddle wheel or oval wheel pair blocked (dirt)
 - ▶ Clean flowmeter according to Section Maintenance
5. Electronics defective
 - ▶ Remove the cause of the defect (e.g. short-circuit, overload)
 - ▶ Exchange flowmeter
6. Device defective
 - ▶ Send flowmeter to manufacturer for repair or calibration

Measured quantity does not agree with the actual flow:

1. Wrong K-factor
 - ▶ Determination of the K-factor
2. Paddlewheel or oval wheel pair contaminated
 - ▶ Clean flowmeter according to Section Maintenance
3. Device defective
 - ▶ Send flowmeter to manufacturer for repair or calibration

DR58

Brass Paddle Wheel Flowmeter

- for liquids
- measuring ranges:
50...3000 l/h (G ¾ male),
100...5000 l/h (G 1 male)
- robust housing made of brass
- no inlet and outlet pipe runs needed
- max. pressure: 10 bar
- max. temperature: 80 °C
- optionally with built on display and control unit



Description:

The plastic paddle wheel flow meter of the DR58 series measure the flow of water and water-like media. They consist of a sensor and an optional transmitter.

The sensor has a paddle wheel which is mounted in a housing made of POM or ECTFE and is rotated by the flowing medium. This rotary motion is picked up by a Hall sensor system and emitted as a flow-proportional frequency signal. A convenient control unit with display is available as an option, which can also be mounted on the flow meter.

Typical applications:

The DR58 impeller flow meters are very resistant to many process media due to their robust design made of brass. Almost all low-viscosity liquids can be measured reliably and cost-effectively with this device.

- cooling circuits
- osmosis plants
- electroplating / photo industry
- agriculture / gardening
- filling plants / washing plants

Models:

G ¾ male: measuring range: 50...3000 l/h*
flow range: 30...3000 l/h*

G 1 male: measuring range: 100...5000 l/h*
flow range: 50...5000 l/h*
(*water at 21 °C)

Technical Data:

Measuring range: 50...3000 l/h
(water at 21 °C) 100...5000 l/h

Accuracy: +/- 2 % of average value

Repeatability: +/- 0,8 %

Serial dispersion: Max. +/- 2 %

Max. process pressure: 10 bar

Max. process temp.: -10...80 °C

Bearing: jewel bearing with centering ring

Viscosity: 1...10 cSt

Process connection: 2 x G ¾ male or
2 x G 1 male

Materials:

housing: brass
bearing / rotor: PA 66
pivot: stainless steel
magnets: ceramic bond
gaskets: NBR

Electrical connection: angle plug acc. to
EN 175301-803A

Power supply: 4,5...24 VDC

Output signals: rectangular pulse, Push-Pull or
4...20 mA, analogue output

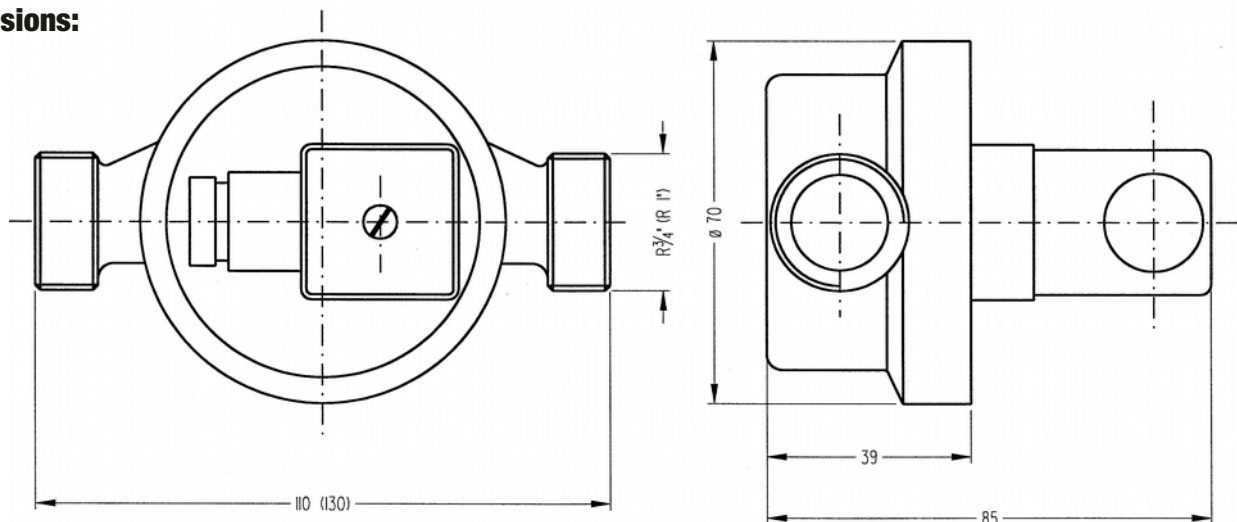
Output current: Max. 11 mA at 24 VDC

Mounting position: horizontal with plug on top,
flow direction of arrow

Weight: ca. 500 g

Protection class: IP65

Dimensions:



Order Code:

Order number: DR58. 1. P. 0

Brass paddle wheel flowmeter

Process connection / Measuring ranges:

1= G 3/4 male / 50...3000 l/h, 77,6 pulses/l
2= G 1 male / 100...5000 l/h, 45,6 pulses/l

Output signal:

P = Push-Pull (frequency output)
A = analogue output 4...20 mA
9 = prepared for control unit AZ50

Options:

0 = without
9 = please specify in plain text

Accessory:

AZ50 control unit with
comfortable display, analogue
output
switching points, etc.



AZ50 mounted on flow meter DR58