Instruction Manual

DV01

Gear wheel flow sensor for viscous liquids

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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

The float-type flow meters DS10 are designed to monitor continuous flow rates of liquids or gases 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 gear wheel flow sensors of the DV01 series are characterised by reliable function and simple operation. The devices of the DV01 series are mainly used for consumption measurements and for the control of filling processes as well as for lubrication point monitoring. 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 DV01 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.

General Information

Please observe all instructions in this operating manual to ensure trouble-free operation of the flow sensors. PKP accepts no liability for damage caused by non-compliance with these instructions.
The devices my only be opened within the warranty period after consultation and approval by PKP.

Functional Description

Inside the DV01 there are two gear wheels, which are low-friction mounted. They are driven by the liquid flow during operation. This gear wheel movement is sensed contactlessly by a sensor located in the cover and converted into electrical signals. These signals are transmitted to the connected display unit via a preamplifier plugged into the housing cover.

1. Cover

2. Housing

3. Gear wheel

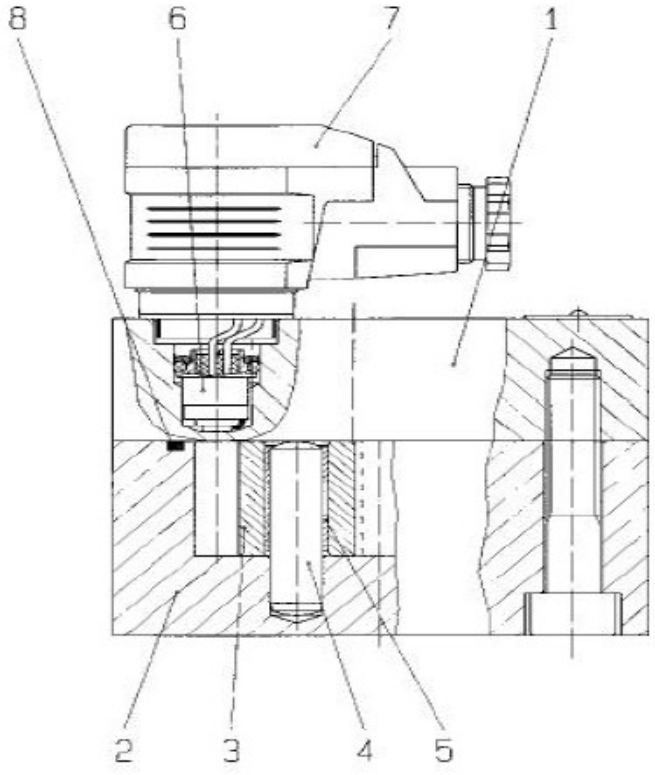
4.bearing journal

5. Bearing bush

6. Sensor

7. Plug with preamplifier

8. O-ring



Installation and Removal

The gear wheel flow meter has been tested at the factory before delivery and is ready for operation immediately after installation and connection of the electrical cables. The built-in meter should be accessible for visual inspection at any time during operation.

Attention: In the event of damage to the gear wheel flow meter, a pressure safety device must be provided in the system to prevent the maximum permissible pressure of the volume sensor or other components in the system from being exceeded (pressure relief valves). It must be ensured that the flow meters are only held by the housing during installation and transport, never by the plug.

Commissioning

Depending on the type of connection, the device is connected to the system via a connection plate or by means of pipe connections located in the housing.

Attention: Only pipes and connections that are approved for the expected pressure range may be used. The instructions of the respective manufacturer must be observed.

The device must be installed in such a way that it is not subjected to any impermissible vibrations.

Installation above hot parts is not permitted as any leaking liquids may ignite. During commissioning, the device must be checked for leaks under operating conditions.

Pipe and Plate Connection

- Thoroughly clean the piping system before installing the gear wheel flow meter.
- Connect the piping to the inlet and outlet of the meter. Follow the instructions of the respective manufacturer.
- During installation, make sure that no sealant enters the inside of the pipes.

Attention: The gear wheel flow meter must not be braced during installation.

- After commissioning the system, check all connections for leaks.

Plate connection

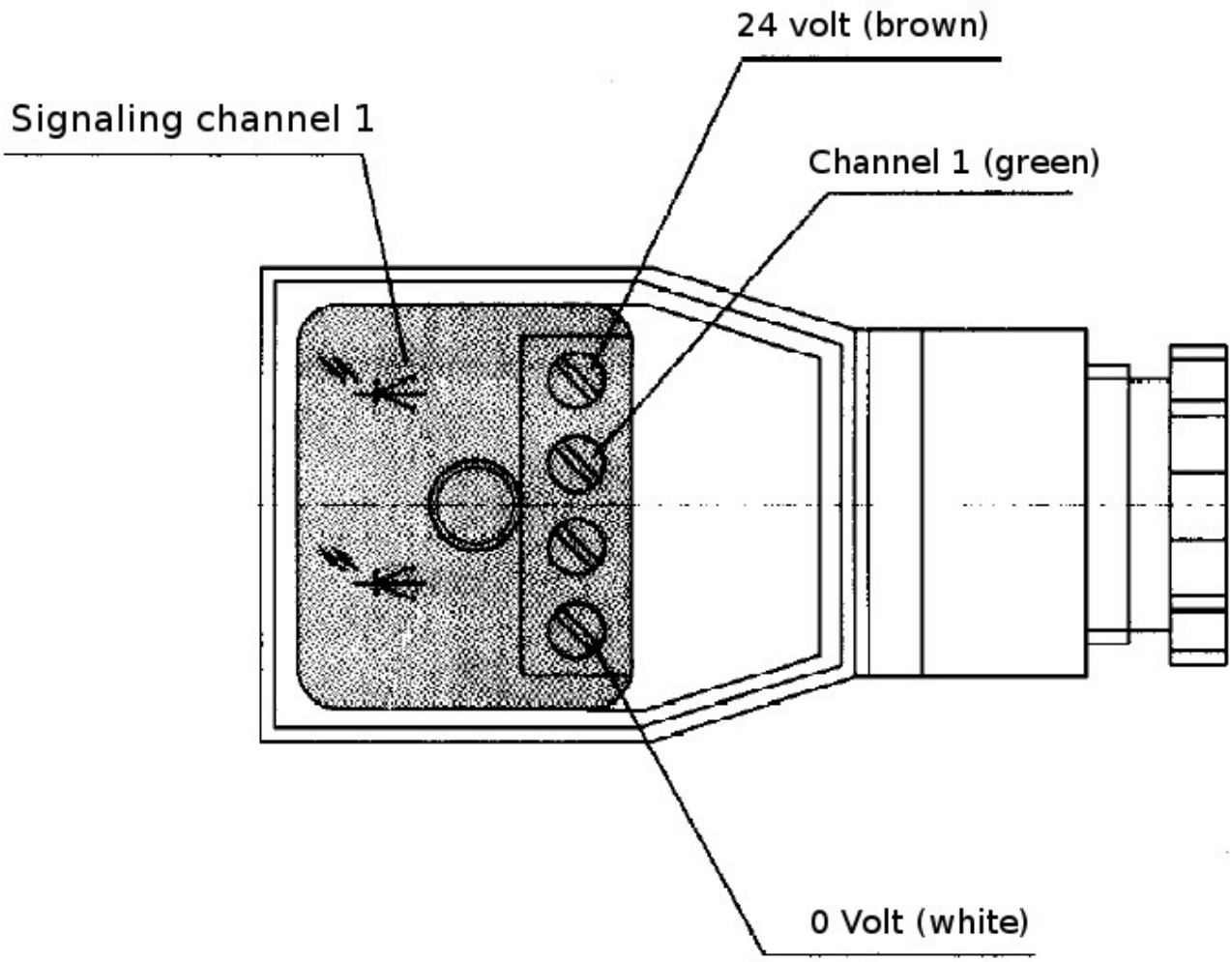
- Before mounting the gear wheel flow meter, sufficiently clean the piping system.
- Attach the connection plate to the intended position in the system.

Attention: Make sure that the seals are seated correctly! The connection surface must be free of dirt, paint residues etc. during installation!

Tightening Torques for the Connection Plates

Nominal size	DV01.1A/E	DV01.3A	DV01.4A
Tightening torque Nm	-	120	-

Electrical Connection



Maintenance and Filtration

To avoid problems with contamination, we recommend the installation of a fine filter unit of 20 µm.
The DV01 volume sensors are basically maintenance-free. However, it is advisable to send the devices to the factory for inspection at certain intervals, especially in the case of critical avoidance with high viscosity or very high loads. This avoids major damage, which could be causes, for example, by blocking the bearings.

Return Shipment

When returning devices to the factory, please note that inspections and repairs will only be carried out if a safety data sheet of the medium used is enclosed and the devices have been flushed beforehand.
In case of non-observance, the goods will be returned carriage forward.
These precautions are taken to protect our personnel. Thank you for your understanding.

DV01

Gear Wheel Flow Sensor for Viscous Liquids for OEM Applications

- **for media with viscosities between 20-4000 cSt**
- **low-cost version**
- **aluminium- or stainless steel version**
- **low pressure loss**
- **high compressive strength**
- **small mounting dimensions**
- **any flow direction**
- **measuring ranges: 0,02...4 l/min up to 1...200 l/min**
- **P_{max}: 240 bar, T_{max}: 80 °C**

Description:

The DV01 measuring system consists of a pair of gearwheels which, according to the gear wheel pump principle are rotated by the flowing liquid.
The gear wheel bearings are constructed as radial and axial plain bearings (in the case of the DV01.1 and DV01.3, the DV01.2 uses ball bearings). A magneto resistive measuring system hermetically sealed from the measuring chamber senses the rotation of the gear wheels and converts it into a pulse train. The gear wheel flow meter DV01 causes a very low pressure drop and makes especially little noise.

Typical applications:

The gear wheel flow meters DV01 are mainly used for consumption measurement, the control of dosing applications and for monitoring lubricating points. Because of their small dimensions and their low price they are especially suited for all kinds of OEM applications.

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Models and Measuring Ranges:

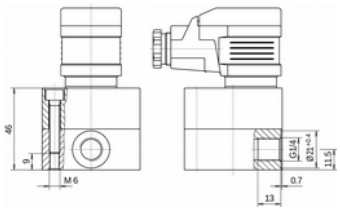
Type	Measuring range [l/min]	Viscosity range [cSt]	Connection	Measuring volume [ml/pulse]	Resolution [pulse/l]
DV01.0	0,02- 4	20…4000	G 1/4 female	0,04	25000
DV01.1	0,25…10	20…4000	G 3/8 female	0,2	5.000
DV01.2	0,16…16	20…3000	G 3/8 female	0,245	4.082
DV01.3	1…65	20…4000	G 3/4 female	2	500
DV01.4	1…200	20…4000	G 1 female	5,2	191,5

Material:

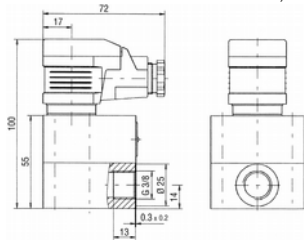
Type	Housing	Gear wheels	Bearings
DV01.0A	aluminium anodized	stainless steel 1.4462	ball bearings
DV01.0E	stainless steel 1.4404	stainless steel 1.4462	ball bearings
DV01.1A	aluminium (anodized)	steel	plastic plain bearings
DV01.1E	stainless steel 1.4404	stainless steel 1.4462	plastic plain bearings
DV01.2A	aluminium (anodized)	steel	ball bearings
DV01.3A	aluminium	steel	multilayer plain bearing
DV01.4A	aluminium	steel	ball bearings

Dimensions:

DV01.0A / DV01.0E: b = 55 mm, t = 55 mm, h = 46 mm

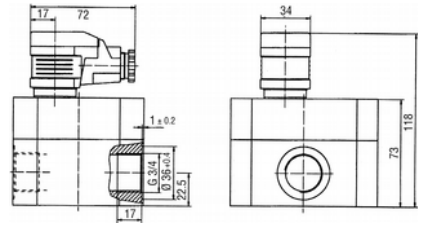


DV01.1A und DV01.1E: b = 55 mm, t = 65 mm, h = 108 mm

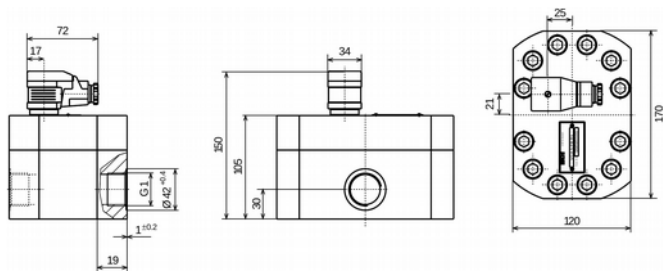


(DV01.2A: like DV01.1A, but housing b = 55 mm, t = 65 mm, h = 108 mm)

DV01.3A: b = 90 mm, t = 100 mm, h = 73 mm



DV01.4A: b = 120 mm ; t = 170 mm ; h = 105 mm



Order Code:

Order number: DV01. 1A. 0. 0

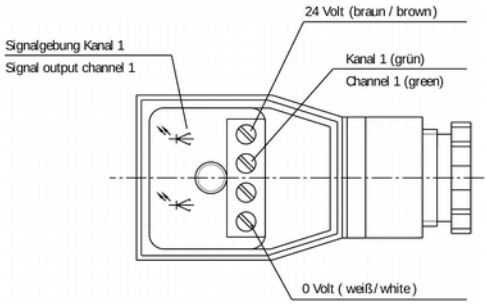
Gear wheel flow sensor

Measuring ranges:
0A = 0,02…4 l/min, aluminium
0E = 0,02…4l/min, stainless steel
1A = 0,25…10 l/min, aluminium
1E = 0,25…10 l/min, stainless steel
2A = 0,16…16 l/min, aluminium
3A = 1…65 l/min, aluminium
4A = 1…200 l/min, aluminium

Display:
0 = without display
DVA= prepared for plug-on display DVA
(data sheet on the following pages)

Options:
0 = without
1 = please specify in plain text

Electrical Connection:



Technical Data:

Max. pressure:

DV01.0A:	240 bar
DV01.0E:	160 bar
DV01.1A	200 bar
DV01.1E:	160 bar
DV01.2A:	200 bar
DV01.3A:	200 bar
DV01.4A:	100 bar

Medium temperature range: –10 °C…+80 °C

Accuracy:

DV01.0A and DV01.0E:	±2 %
DV01.1A and DV01.1E:	±3 %
DV01.2A:	±0,3 %
DV01.3A:	±2,5 %
DV01.4A:	±1 %

Weight:

DV01.0A and DV01.0E:	0,5 kg
DV01.1A and DV01.1E:	0,5 kg
DV01.2A:	0,7 kg
DV01.3A:	1,9 kg
DV01.4A:	6 kg

Supply voltage: 12…30 VDC, protected polarity

Power consumption: 0,9 W

Output signal: square wave pulses, min. 0,8 x UB, duty cycle 1:1 (±15 %)

Protection class: IP65

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