



Instruction Manual

DP02

Paddle type flow switch with cable



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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 meters of the DP02 series are used for reliable switching point monitoring of low-viscosity liquids. 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 DP02 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 DP02 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 Instructions

Mounting position

DP02 flow monitors are installed directly in the pipeline. The devices can generally be mounted in any position. If the switching point has already been set, a change in the mounting position, especially for devices with larger nominal pipe diameters, can lead to small switching point deviations.

Flow direction

Due to the measuring principle used, the devices are only functional if the direction of flow was taken into account during installation. This is indicated by arrows on the device.

Choice of installation location

The following points must be observed:

In order to avoid damage to the measuring system, the greatest possible distance from solenoid and ball valves must be maintained. If these are necessary, the valves must be installed downstream of the flow monitor. To avoid pressure surges, it is important that the valves are opened as slowly as possible.

In order to ensure that the units function correctly, a straight calming distance of approx. 10xd on the inlet side and 5xd on the outlet side should be maintained. (d = inner pipe diameter)

Installation Types

Screw-in version

The device must be screwed into a 1/2" threaded socket. Make sure that the measuring disc is completely in the flow.

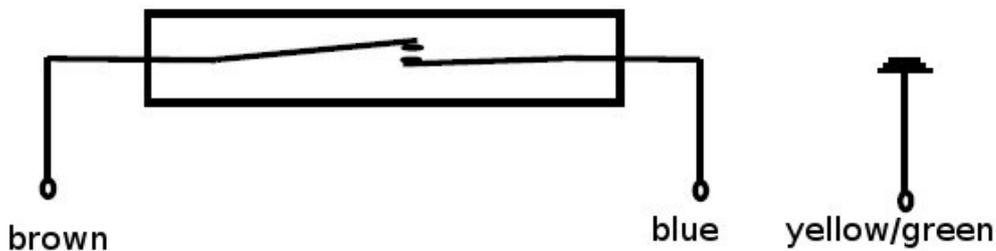
Threaded connection

The pipe is connected directly to the device. Only sealing tape may be used to seal the threaded fitting.

Electrical connection

In the switching tube there is a potted reed contact, which is magnetically actuated without contact.

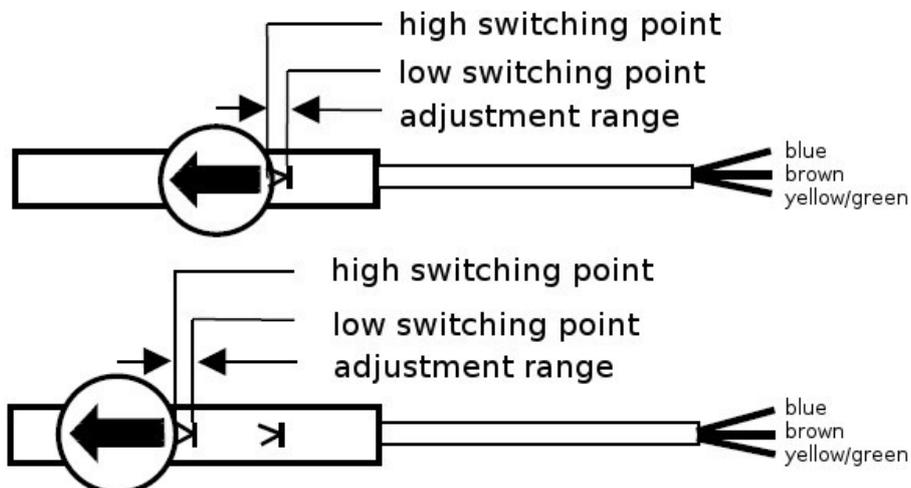
The electrical connection is made according to the wiring diagram. None of the electrical connection values printed on the label may be exceeded.



Setting the switching point

The contact is closed when the switching point is exceeded when the switching tube is set to the right arrow (cable right).

It is open when the switching point is exceeded, when the switching tube is set to the left arrow. The tip of the arrow corresponds to the lowest switching point, the end of the arrow to the highest.



Connecting devices equipped with Reed switches

Reed switches are basically designed for small contact ratings. To connect a load with higher power consumption it is indispensable to use a contact protection relay (e.g. our series MSR01).

If you connect directly a load to a Reed contact the following recommendations should be considered.

None of the contact rating values printed on the switching unit must not to be exceeded, even momentarily. This is valid for each of the given values individually: voltage, current, power. The Reed contact integrated in the switching unit is very sensible to electrical overload.

Danger of overload is given by the following applications:

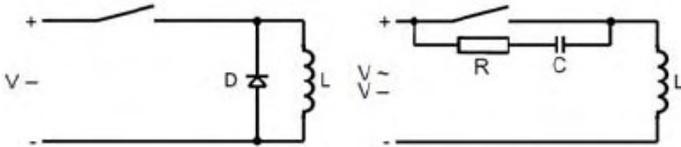
- inductive load
- capacitive load
- lamp load

Inductive Load

Inductive loads consist e.g. of relay, contactors, solenoid valves, motors, electric engines, etc.

⚠ WARNING: Voltage spikes at shut down (up to 10 times of nominal voltage)

Protective measures: (examples)



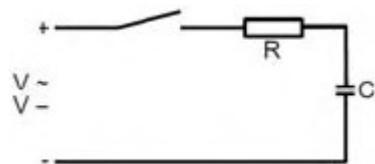
(Flyback diode, e.g. type 1N4007)

Capacitive Load

Capacitive loads consist e.g. of long connection cables or capacitive consumers.

⚠ WARNING: High current spikes at switching on (this will exceed the nominal current)

Protective measures: (examples)



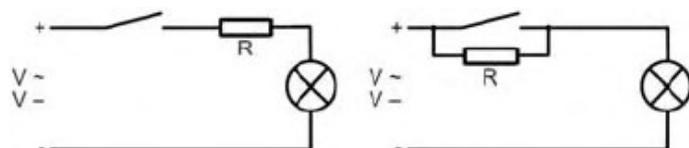
Limitation of current by a resistor

Lamp Load

Lamp loads consist e.g. by light bulbs, starting motors.

⚠ WARNING: High current spikes at switching on, because the glowing spiral has low resistance at low temperature.

Protective measures: (examples)



Limitation of current by a resistor or preheating of the glowing spiral.

Connecting to a PLC

There is no need for protective measures by connecting the Reed switch to a PLC. The Reed contacts are plated by tungsten, gold, and rhodium located in a protective atmosphere. They can be directly connected to the input terminals of a PLC without problems.

RC-Circuits as protective measures (Boucherot cell, Snubber)

In practice the following values of resistor/capacitor cells give good results. Nevertheless, the values given in the following tables are only recommendations for general purposes. But it cannot be guaranteed that for specific applications more adequate Boucherot cells may exist.

For Reed switches of 10 – 40 VA

Voltage [V]	Resistance [Ohm]	Capacitance [nF]
230	1500	330
115	470	330
48	220	330
24	100	330

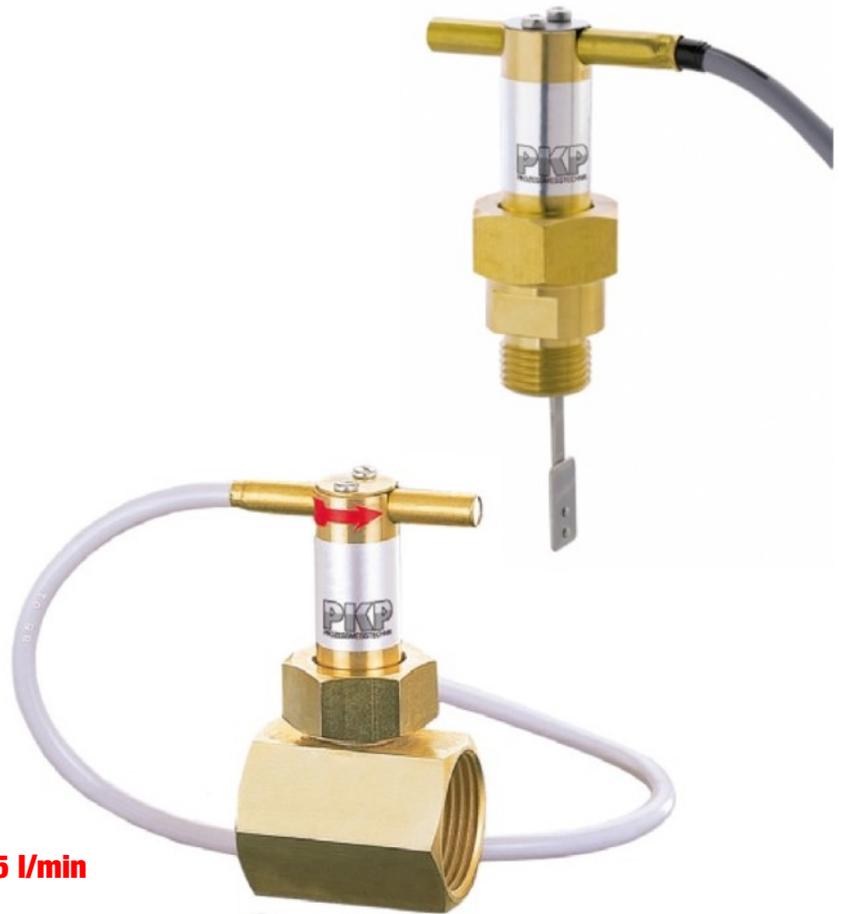
For Reed switches of 40 – 100 VA

Voltage [V]	Resistance [Ohm]	Capacitance [nF]
230	1000	330
115	470	330
48	100	330
24	47	330

DP02

Paddle-Type Flow Switch with Cable Connection

- for liquids
- with and without T-fitting, for piping 3/8" to 6"
- design in brass, stainless steel or T-fitting of PVC
- causes only slight pressure drop
- pendulum system of stainless steel
- max. pressure: PN 10
max. temperature: 110 °C
- switching ranges: 2,7...4,5 to 440...655 l/min



Description:

The flow switch model DP02 works according to the proven paddle- principle. The flowing liquid pushes against the surface area of a paddle mounted at the end of a pivoting arm. The dynamic pressure against the plate deflects the arm. Then a permanent magnet which is attached on the other end of the arm switches an adjustable reed contact. By moving the reed contact different switching points can be set.

Typical application:

The DP02 paddle flow switch is suitable for monitoring the switching point of low viscosity liquids. The setting of the switching point takes place within the process.

Models, Switching ranges:

Nominal Size DN	Switch on at [l/min] H ₂ O	Switch off at [l/min] H ₂ O	Qmax. [l/min] H ₂ O
DP02.1-4: with brass, stainless steel or PVC T-fitting			
10	2,7...4,5	1,7...3,5	40
15	4,5...6,5	3...5,5	45
20	8,5...12	6,6...11	80
25	13...20	11...19	130
32	17...26	15...25	160
40	28...45	27...43	300
50	45...58	43...56	500
DP02.5-7: with screw in thread made of brass or stainless steel			
50	44...65	40...60	500
65	75...115	70...105	750
80	120...175	110...165	1.400
100	190...285	175...265	2.500
125	310...450	280...420	2.900
150	440...655	410...600	3.300

Dimensions:

Nominal size DN	Connection Rp	SW [mm]	Z [mm]	I [mm]
DP02.1/2: with T-fitting made of brass/ brass nickel plated				
10	3/8	30	50	11
15	1/2	30	50	11
20	3/4	30	50	11
25	1	37	50	15
32	1 1/4	46	50	15
40	1 1/2	52	50	15
50	2	-	120	15
DP02.3: with stainless steel T-fitting				
10	3/8	30	50	11
15	1/2	30	50	11
20	3/4	30	50	11
25	1	-*	80	15
32	1 1/4	-*	95	15
40	1 1/2	-*	115	15
50	2	-	120	15
DP02.4: with PVC T-fitting				
10	-	-	54	16
15	-	-	54	16
20	-	-	66	19
25	-	-	79	22
32	-	-	96	26
40	-	-	116	31
50	-	-	143	38

* round housing

Order Code:

Order number:

DP02. 1. 10. 0

Paddle-type Flow Switch with cable connection

Model:

- 1 = T-fitting made of brass with female thread R
- 2 = T-fitting made of brass nickel plated with female thread R
- 3 = T-fitting made of stainless steel with female thread R
- 4 = T-fitting made of PVC (glued in connection)
upper part made of stainless steel
- 5 = screw in thread G 1/2 male, made of brass
- 6 = screw in thread G 1/2 male, made of brass nickel plated
- 7 = screw in thread G 1/2 male, made of stainless steel

Nominal size:

DP02.1-4:

- 10 = 3/8"
- 15 = 1/2"
- 20 = 3/4"
- 25 = 1"
- 32 = 1 1/4"
- 40 = 1 1/2"
- 50 = 2"

DP02.5-7:

- 00 = screw in thread G 1/2 suitable for all nominal sizes from DN 50

Options:

- 0 = without
- SPFxx = adjusted set point decreasing flow
- SPSxx = adjusted set point increasing flow
- 9 = please specify in plain text

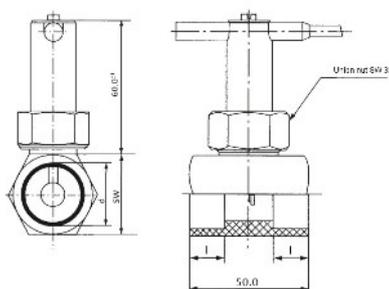
Technical Data:

Max pressure:	PN 10 (brass and st. steel) 2,5 bar (PVC)
Max. medium-temperature:	110 °C (brass and st. steel) 60 °C (PVC)
Reed contact:	N/C, N/O, adjustable (standard / factory setting N/O, rising level)
Contact rating:	230 VAC/ 1,5 A, 80 W, 90 VA max.
Hysteresis:	5 %
Connection cable:	1,5 m length PVC
On request:	soldered version

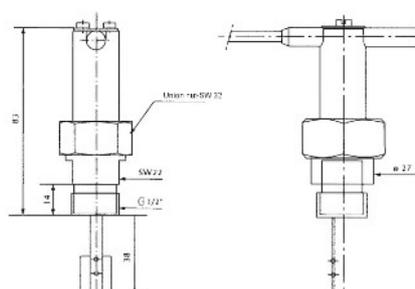
Materials:

T-fitting:	brass, st. steel 1.4571 or PVC
Paddle:	st. steel 1.4410
Union nut:	brass nickel plated
Magnet:	Ferrite OX 300

Standard version



Screw-in version



T-fitting PVC

