



*PKP Prozessmesstechnik GmbH*

*Borsigstrasse 24*

*D-65205 Wiesbaden-Nordenstadt*

*Tel: 06122 / 7055 - 0*

*Fax: 06122 / 7055 – 50*

# **Operating Instructions**

## **DP01**

*Paddle Flow Switch*

## **General**

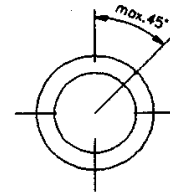
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1. Before installation check whether the material of the flow switch is suitable for the medium to be monitored-

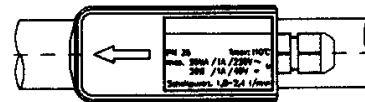
## **Hints for Installation**

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1. If possible mount the flow switch into horizontal pipe.
2. The switch has to be installed vertically, with a max. deviation of 45° (fig.1)
3. The brass or st. steel capnut should be tightened with a max. torque of 30 Nm.
4. The plastic capnut (PA 6.6) should be tightened by hand or with a suitable tool with a max. torque of 8 Nm.
5. The switch must be installed so that the arrow on top is parallel to the pipe axis and points into the flow direction (fig. 2)
6. Make sure that before the installation the pipe system is cleaned and free of ferrous particles.
7. Straight pipe runs before and after the flow switch should be a minimum of 5 pipe diameters.



**Abb. 1**



**Abb. 2**

## **Flow Switches for Direct Mounting (Models DP01.4, DP01.5, and DP01.6)**

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1. The models DP01.4 und DP01.5 are designed for mounting into a boss with a G 1/2 female thread.
2. Model DP01.6 will be supplied with a brass solder connection or a st. steel weld-on connection incl. an o-ring seal..
3. Model DP01.6 must be installed in horizontal pipes only
4. Make sure that after installation the paddle does not touch the inner pipe wall.

## **Flow Switches with T-Piece (Models DP01.1, DP01.2, and DP01.3)**

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1. The t-piece of the flow switch has to be mounted into an existing pipe system..
2. The switching range is indicated in the data sheet of the respective model.

## Contacts

The contact of the flow switch may be set to two different functions::

1. N/O contact - red arrow on switch housing
2. N/C contact - white arrow on switch housing

The following table shows the different contact functions for rising and falling flow:

| Marking     | Flow    | Contact function |
|-------------|---------|------------------|
| red arrow   | rising  | N/O              |
|             | falling | N/C              |
| white arrow | rising  | N/C              |
|             | falling | N/O              |

The factory setting is to the red arrow which means that the contact will open if the flow falls below the set point.

## Changing the Set Point (Fig. 3 to 5)

To change the set point the hood of the switch housing must be removed (fig. 3). Then loosen the fixing screw and move the switch so that either the red or the white arrow is just visible on the switch housing (fig. 4 and fig. 5). After setting the switch point the fixing screw has to be tightened again. Put the hood back onto the switch housing. This procedure does not have to be carried out if the switch was already set to a customer defined set point in the factory.

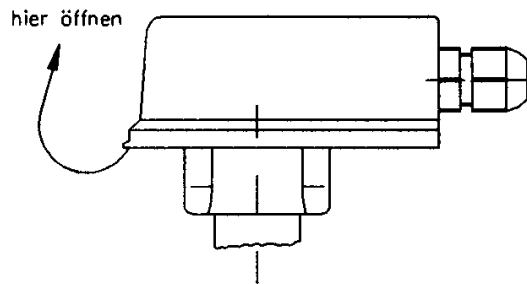


Abb.3

### Arbeitskontakt (roter Pfeil)

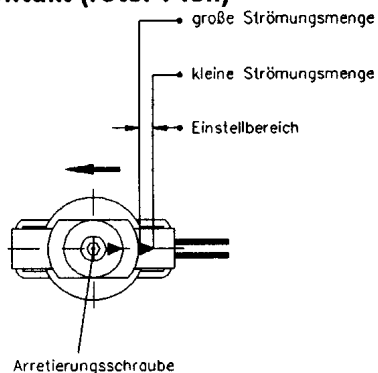


Abb.4

### Ruhekontakt (weißer Pfeil)

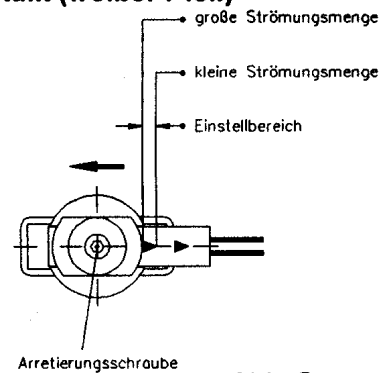
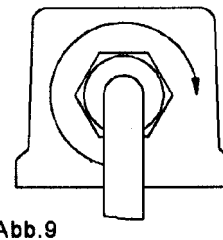
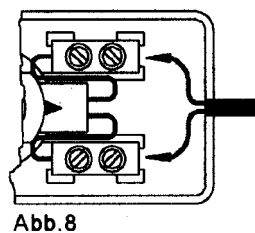
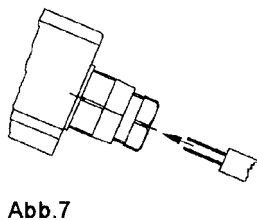
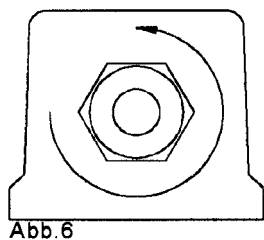


Abb. 5

## Electrical Connection

1. Open the cable gland (fig. 6)
2. Remove hood of switch housing (fig. 3)
3. Pull cable through cable gland (fig. 7)
4. Connect the wires to the terminal connector (fig. 8) and retighten the terminal connector screws.
5. Put hood back onto switch housing.
6. Tighten the cable gland (fig. 9).



To ensure the electrical protection IP 65 to EN 60529 the connecting cable must have an outer diameter of 3 to 6.5 mm<sup>2</sup>.

Also make sure that the o-ring in the switch housing is installed correctly.

## Technical Specifications

Material of wetted parts

| Part Name                          | DP01.1.1<br>DP01.3.1<br>DP01.4.1<br>DP01.5.1<br>DP01.6.1 | DP01.1.2<br>DP01.4.2<br>DP01.5.2<br>DP01.6.2 | DP01.2.3                       |
|------------------------------------|--|--|--------------------------------|
| Flow switch and process connection | 2.0401   | 1.4571                                       | PPO (Noryl GFN3)               |
| Paddle                             | 2.0401   | 1.4571                                       | PPO (Noryl GFN3)               |
| Rivet                              | 2.0321   | 1.4303                                       | -----                          |
| Bearing                            | PPO (Noryl GFN3)   | PVDF   | PPO (Noryl GFN3)               |
| Axle                               | 1.4571   | 1.4571                                       | 1.4571                         |
| T-piece                            | 2.0402   | 1.4571                                       | PVC                            |
| Seal                               | NBR  | NBR  | NBR                            |
| V-Seal                             | -----  | -----  | EPDM                           |
| Magnet                             | Ceramic ferrite<br>(DIN 17410)                           | Ceramic ferrite<br>(DIN 17410)               | Ceramic ferrite<br>(DIN 17410) |

All other relevant technical data (i. e. ordering code, max. pressure and temperature, contact rating and switching ranges) may be found in the data sheet DP01

# DP01

## Paddle-type flow switch

- With and without T fitting, for piping from 1/4" to 6"
- Constructed of brass, stainless steel and with T fitting of PVC
- Upper part with T fitting can be removed, allowing cleaning or replacement without requiring readjustment
- Causes only slight pressure loss
- Available with reed contact or microswitch
- Switching function depends only on flow, not on pressure and temperature of fluid



### Description:

The flow switches model DP01 operate according to the 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. This motion causes a permanent magnet attached on the other end of the arm to switch an adjustable reed contact located outside the liquid being monitored. By moving the reed contact, different switching points can be set.

### Fields of application:

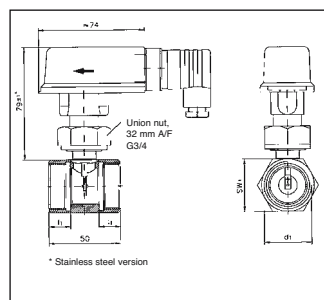
The DP01 paddle flow switch is suitable for monitoring the switching point of low-viscosity liquids. The switching point is normally set as required for the specific process. However, fixed switching points for increasing or decreasing flow rate can also be preset at the factory, if necessary.

## Designs, switching ranges and dimensions:

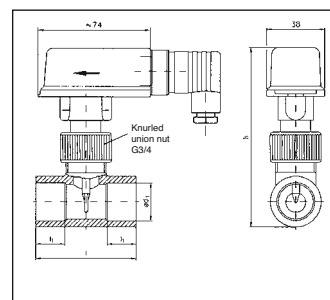
| Nominal size (DN)   | Connection (G)      | Switch on at (l/min H <sub>2</sub> O)  | Switch off at (l/min H <sub>2</sub> O)              | Max. flow rate (l/min H <sub>2</sub> O) | I <sub>1</sub> (mm) | Size A/F 1 brass (mm) | Size A/F 1 stainless steel (mm) |
|---|---------------------|--|---|---|---------------------|-----------------------|---------------------------------|
| <b>DP01.1: with brass or stainless steel T fitting and reed contact</b> |                     |  |   |   |                     |                       |                                 |
| 8   | 1/4                 | 2.1...2.7                              | 1.8...2.4   | 45                                      | 11                  | 27                    | 27                              |
| 10  | 3/8                 | 2.5...3.2                              | 2.2...2.9   | 60                                      | 11                  | 19                    | 27                              |
| 15  | 1/2                 | 3.4...4.2                              | 3.0...3.8   | 67                                      | 11                  | 19                    | 27                              |
| 20  | 3/4                 | 7.0...9.1                              | 6.4...8.2   | 180                                     | 15                  | 27                    | 32                              |
| 25  | 1                   | 13.5...17                              | 12...15.5   | 195                                     | 15                  | 32                    | 41                              |
| 32  | 1 1/4               | 15.5...20.5                            | 14.5...19   | 240                                     | 15                  | 46                    | 46                              |
| 40  | 1 1/2               | 26.5...34.5                            | 25.5...32.5   | 400                                     | 15                  | 55                    | 55                              |
| 50  | 2                   | 39.5...51                              | 39...50   | 400                                     | 15                  | 70                    | 70                              |
| <b>DP01.2: with PVC T fitting and reed contact</b>                      |                     |  |   |   |                     |                       |                                 |
|   |                     |  |   |   | I <sub>1</sub> (mm) | l (mm)                | h (mm)                          |
| 15  | DN15                | 5.1...6.9                              | 4.9...6.5   | 50                                      | 16                  | 54                    | 113                             |
| 20  | DN20                | 9.4...12.3                             | 9.1...11.9  | 100                                     | 19                  | 66                    | 118                             |
| 25  | DN25                | 10.7...15.2                            | 10.4...14.8   | 100                                     | 22                  | 78                    | 127                             |
| 32  | DN32                | 17.0...22.6                            | 16.8...22.5   | 150                                     | 26                  | 98                    | 155                             |
| 40  | DN40                | 21.8...30.1                            | 21.6...40.8   | 200                                     | 31                  | 118                   | 166                             |
| 50  | DN50                | 29.0...40.0                            | 28.6...49.8   | 260                                     | 38                  | 144                   | 180                             |
| <b>DP01.3: with brass T fitting and microswitch</b>                     |                     |  |   |   |                     |                       |                                 |
| Nominal size (DN)   | Connection (G)      | Switch off at (l/min H <sub>2</sub> O) | Max. flow rate (m <sup>3</sup> /h H <sub>2</sub> O) | I (mm)                                  | H (mm)              |                       |                                 |
| 10  | 3/8 female thread   | 4.0...5.0                              | 10  | 50                                      | 85.5                |                       |                                 |
| 15  | 1/2 female thread   | 5.0...6.0                              | 20  | 50                                      | 85.5                |                       |                                 |
| 15  | 1/2 male thread     | 4.0...5.0                              | 20  | 60                                      | 85.5                |                       |                                 |
| 20  | 3/4 female thread   | 8.0...10.0                             | 40  | 50                                      | 85.5                |                       |                                 |
| 25  | 1 female thread     | 17.0...20.0                            | 60  | 50                                      | 92.5                |                       |                                 |
| 32  | 1 1/4 female thread | 24.0...28.0                            | 100   | 50                                      | 95                  |                       |                                 |
| 40  | 1 1/2 female thread | 43.0...50.0                            | 150   | 50                                      | 97.5                |                       |                                 |
| 50  | 2 female thread     | 69.0-83.0                              | 250   | 50                                      | 108                 |                       |                                 |

| Nominal size (DN)  | Switch on at (l/min H <sub>2</sub> O) | Switch off at (l/min H <sub>2</sub> O) | Max. flow rate (l/min H <sub>2</sub> O) | I <sub>3</sub> (mm) |
|--|---------------------------------------|--|---|---------------------|
| <b>DP01.4: without T fitting, 1/2" male thread, installation length 51 mm, reed contact</b>            |                                       |  |   |                     |
| 50   | 1.9...2.7                             | 1.8...2.6                              | 30                                      | 51 +/- 1            |
| 80   | 5.0...8.0                             | 4.9...7.9                              | 80                                      | 51 +/- 1            |
| 100  | 8.3...12.5                            | 8.2...12.4                             | 150                                     | 51 +/- 1            |
| 150  | 17.5...25.0                           | 17.4...24.9                            | 200                                     | 51 +/- 1            |
| <b>DP01.5: without T fitting, 1/2" male thread, installation length, reed contact</b>                  |                                       |  |   |                     |
| 100  | 5.7...6.3                             | 5.6...6.2                              | 100                                     | 111 +/- 1           |
| 150  | 11.0...13.0                           | 10.9...12.9                            | 150                                     | 111 +/- 1           |
| 200  | 25.0...27.0                           | 24.9...26.9                            | 200                                     | 111 +/- 1           |
| <b>DP01.6: without T fitting, soldering or welding nipple, installation length 24 mm, reed contact</b> |                                       |  |   |                     |
| 50   | 3.8...4.9                             | 3.7...4.8                              | 30                                      | 24 +/- 1            |
| 80   | 9.0...14.3                            | 8.9...14.2                             | 100                                     | 24 +/- 1            |
| 100  | 13.0...18.8                           | 12.7...18.4                            | 150                                     | 24 +/- 1            |
| 150  | 33.0...46.0                           | 32.9...45.9                            | 200                                     | 24 +/- 1            |

DP01.1



DP01.2



## Ordering Code:

Order number: **DP01. 1. 2. 25. 0. 0**

### Paddle-type flow switch

#### Version:

- 1 = With T fitting, brass or stainless steel
- 2 = With PVC T fitting
- 3 = With brass T fitting and microswitch
- 4 = With 1/2" male thread, brass or stainless steel, installation length 51 mm
- 5 = With 1/2" male thread, brass or stainless steel, installation length 111 mm
- 6 = With soldering connector (brass) or welding connector (stainless steel), installation length 24 mm

#### Material:

- 1 = Brass (not DP01.2)
- 2 = Stainless steel (not DP01.2, DP01.3)
- 3 = PVC (DP01.2 only)

#### Nominal size:

##### DP01.1 only

08 = 1/4"

##### DP01.1 and DP01.3

10 = 3/8"

##### DP01.3 only

14 = 1/2" male thread

##### DP01.1, DP01.2, DP01.3

15 = 1/2"

20 = 3/4"

25 = 1"

32 = 1 1/4"

40 = 1 1/2"

50 = 2"

##### DP01.4, DP01.5 and DP01.6

00 = All nominal sizes from 2" to 6" as per table

#### Preset switching point:

- 0 = None
- 1 = Factory-set switching point (increasing)
- 2 = Factory-set switching point (decreasing)

#### Options:

- 0 = None
- 1 = Please specify in writing

## Technical Specifications:

**Max. pressure:** 10 bar\* (brass and stainless steel)  
2.5 bar (PVC)  
\* reduced pressure stage equipment with cooper pipe section

**Max. temperature:** 110°C (brass and stainless steel)  
100°C (DP01.3)  
60°C PVC

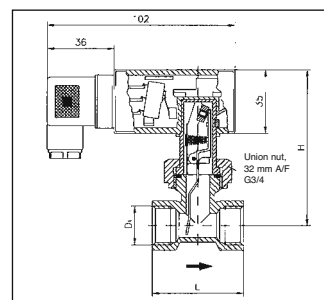
#### Reed contact:

Contact operation: NC contact/NO contact  
Switching capacity: 230 VAC / 48 VDC, 1A, 20W/26 VA

#### Microswitch:

Contact operation: Changeover contact  
Switching capacity: 250 VA, 5A, 1250 VA

DP01.3



DP01.4 / DP01.5 / DP01.6

