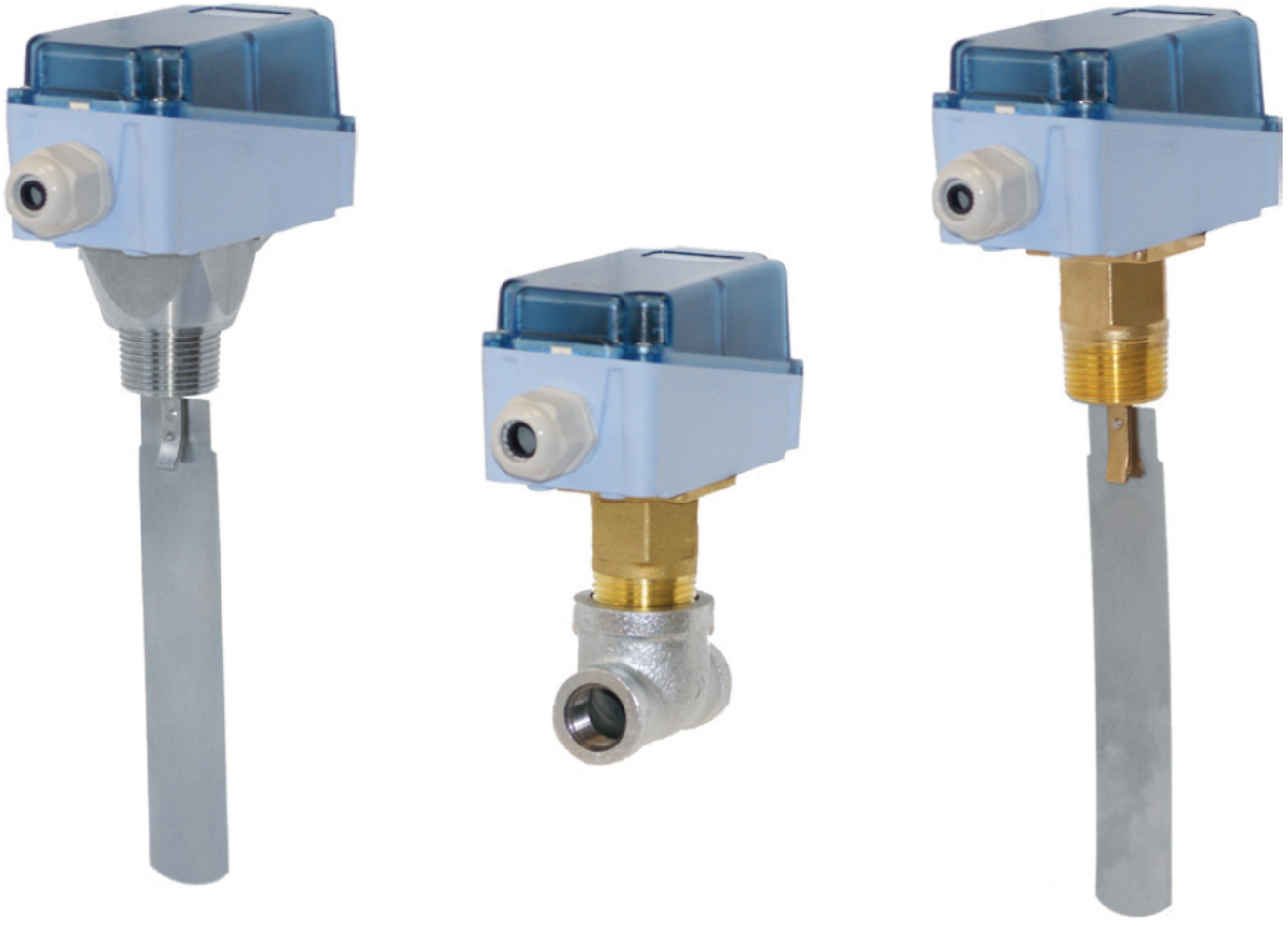
# Operating Instruction
# Flow Monitor DPP 06

Paddle switches for liquids



- Low sensitivity to dirt
- High switch rating
- Suitable for open ducts

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**1 Preface**
The flowmonitors type DPP06 prove themselves through reliability and simple handling. To use the advantages of the instrument to the full extent, please take notice of the following:
**Every person, in charge of commissioning and operating this instrument, must have read and understand this operating instruction and specially the safety hints!**

**2 Safety hints**
**2.1 General hints**
These instructions must be followed to ensure a safe operation of the instrument. Further, the additional legal- and safety regulations for the individual application must be observed. Accordingly this applies for the use of accessories as well.

**2.2 Application as directed**
The instruments type DPP06 serve as monitors for the continuous flow of liquids. Any other use is a non-directed use. If not stated otherwise, the adjustment values for the instruments represent those for water. Special applications, where intermittent loads (e.a. cyclic operation) could occur, should be discussed and checked with our technical staff.
The instruments type DPP06 must not be used as single source to avoid dangerous situations on machinery and in plants. Machinery and plants must be constructed in that way, that faulty conditions do not lead the operators into dangerous situations.

**2.3 Qualified personnel**
The instruments type DPP06 must only be installed by qualified personnel, which is capable of using these instruments in a professional manner. Qualified personnel are such persons, who are familiar with the erection, installation, commissioning and operation of these instruments and who held a corresponding qualification for this function.

**3 Functional description**
The devices of the series DPP06 work on the principle the spring-supported paddle with mechanical activation of a microswitch. The installation position is arbitrary. The devices are set for the floe in horizontal pipes. For other mounting positions, it may be come to deviations due to the weight of the paddle.

**4. Installation**
**4.1 Process connection**
Caution! To avoid the damage of the flowmonitor or the installation the following requirements must be fulfilled under any circumstances:




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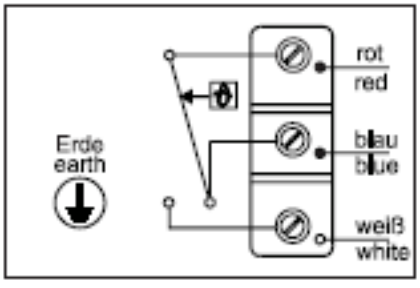
- Suitable process connection has to be provided (T-fitting according to DIN 2950 with 1“ connection)
- Connection size to be checked
- Thread depth to be checked (Paddle length)
- Suitable sealing material to be used (liquid sealing material will damage the flowmonitor, if it gets inside)
- Professional sealing
- Note direction of flow (arrow)

**4.2 Enviroment conditions**
- The flowmonitor must not be used as a supporting part in a pipe construction.
- The medium must not contain any solid particles
- Check corrosion and antifreeze for compatibility before use.

Warning! The following requirements must be adhered to, otherwise the function of the flowmonitor will be affected or the measuring results will be wrong:
- The accuracy is influenced by cross-section changes, branches or elbows in the pipe. Provide a straightening section of 5 x DN upstream and 5 x DN downstream of the instrument. Never reduce the pipe diameter direct ahead of the instrument!
- With liquids ensure the deareation of the instrument through suitable steps.

**5 Electrical connection**
The microswitches are potential free and do not need any power supply.

**5.1 Standard switch contact**





**Attention: To connect follow ONLY the above illustration and the sticker on the device.**

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| Summary of Types | | | | |
|---|---|---|---|---|
| **Type** | **Overall dimensions [mm]** | | **Material** | **Weight Approx. [g]** |
| | **Pipe size G** | **$P_{max}$ bar** | | |
| DPP06-15 | ½“ | 11 | Brass | 950 |
| DPP06-20 | ¾“ | 11 | Brass | 950 |
| DPP06-25 | 1“ – 8“ | 11 | Brass | 950 |
| DPP06-25 VA | 1“ – 8“ | 30 | Stainless steel[1] | 950 |
| DPP06-25R | 1“ – 8“ | 11 | Brass[1] | 950 |
| DPP06-25R VA | 1“ – 8“ | 30 | Stainless steel[1] | 950 |

| Paddle lengths Paddle material | | | |
|---|---|---|---|
| **Paddle** | **length L** | | **Material** |
| | | | |
| 1 | Standard (from DN 50):[2] | 28,5 | Stainless steel[1] |
| 2 | Standard: | 54,5 | Stainless steel[1] |
| 3 | Standard: | 83,5 | Stainless steel[1] |
| 4 | Standard (from DN 175): | 161,5 | Stainless steel[1] |
| | Special length for DN 100:[3] | 92 | Stainless steel[1] |
| | Special length for DN 125:[3] | 117 | Stainless steel[1] |
| | Special length for DN 150:[3] | 143 | Stainless steel[1] |

(1) Stainless steel AISI 316L
(2) For DN 25 the paddle must be cut to size.
(3) By shortening the standard paddle, the user can obtain the special lengths.

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**Switching values for $H_2O$**

| Types | | | | | DPP06-25<br>DPP06-25 VA | | DPP06-25R<br>DPP06-25R VA | |
|---|---|---|---|---|---|---|---|---|
| DN | Fitted paddle | | | | Switch-off value<br>m³/h | Switch-on value<br>m³/h | Switch-off value<br>m³/h | Switch-on value<br>m³/h |
| 25 | 1 | | | | 0,6 - 2 | 1 – 2,1 | 0,2 - 1 | 0,6 – 1,1 |
| 32 | 1 | | | | 0,8 – 2,8 | 1,3 – 3 | 0,25 – 1,4 | 0,9 – 1,6 |
| 40 | 1 | | | | 1,1 – 3,7 | 1,7 – 4 | 0,5 – 1,6 | 1,2 – 2,2 |
| 50 | 1 | 2 | | | 2,2 – 5,7 | 3,1 – 6,1 | 0,9 – 3,6 | 2,3 – 4,1 |
| 65 | 1 | 2 | | | 2,7 – 6,5 | 4 – 7 | 1,2 – 4,9 | 3,1 – 5,5 |
| 80 | 1 | 2 | 3 | | 4,3 – 10,7 | 6,2 – 11,4 | 2,1 – 7,4 | 4,9 – 8,2 |
| 100 | 1 | 2 | 3 | | 11,4 – 27,7 | 14,7 – 29 | 4,9 – 17,1 | 11,3 – 19,1 |
| 100 | 1 | 2 | 3 | 4 | 6,1 – 17,3 | 8 – 18,4 | 3,3 – 11,6 | 7,7 – 13 |
| 125 | 1 | 2 | 3 | | 22,9 – 53,3 | 28,4 – 55,6 | 9,7 – 34 | 22,4 – 37,9 |
| 125 | 1 | 2 | 3 | 4 | 9,3 – 25,2 | 12,9 – 26,8 | 5 – 17,5 | 11,5 – 19,6 |
| 150 | 1 | 2 | 3 | | 35.9 – 81,7 | 43,1 – 85,1 | 13,6 – 47,6 | 31,5 – 53,2 |
| 150 | 1 | 2 | 3 | 4 | 12,3 – 30,6 | 16,8 – 32,7 | 6,1 – 21,4 | 14,1 – 23,9 |
| 200 | 1 | 2 | 3 | | 72,6 – 165,7 | 85,1 – 172,5 | 25,7 – 90,1 | 59,6 – 100,7 |
| 200 | 1 | 2 | 3 | 4 | 38,6 – 90,8 | 46,5 – 94,2 | 21,7 – 55,3 | 36,5 – 61,8 |

**Connection to PLC**
Microswitches with gold contacts should be used for connection to high impedance loads (eg PLC).

**6 Setting the switching point**
- By default, the switching point is set to the lowest sensitivity (minimum switch-off value).
- Open the housing.
- Turn adjusting screw clockwise (+). (see illustration page 3)




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Hints:
- The set switching point corresponds to the switch-off point of the microswitch with decreasing flow.
- The current state of the microswitch may e.g. be determined with a continuity tester.
- The states of the microswitch refer to the NO contact (N.O.).

**7 Maintenance and Care**
Due to the small number of moving parts, the devices require very low maintenance. However, regular function checks and maintenance do not only increase service life and the functional safety of the device, but of the whole plant.

The maintenance intervals depend on
Pollution of the medium
Environmental conditions (e.g. vibration)

During maintenance at least the following points have to be checked:
- Function of the microswitch
- Tightness of the device

It is up to the operator to determine appropriate maintenance intervals depending on the application.

Hints:
- The movement of the paddle and the function of the microswitch can be checked by changing the flow and monitoring the switching state of the microswitch.
- For cleaning, flushing with clean medium is sufficient in most cases. In hard-stained cases (such as limescale), it may be cleaned with commercially available cleaners, provided they do not attack the materials of the equipment.




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## 8 Notes for troubleshooting

**The microswitch does not switch:**
**The microswitch is constantly at rest**

1. **No flow**
   - ▶ Check, if medium is flowing
2. **Flow too low or microswitch set too high**
   - ▶ Set the microswitch to lower flow
   - ▶ Replace paddle
3. **Wrong reduced (too small cable cross-section)**
   - ▶ Adjust paddle
4. **Paddle is stuck (pollution)**
   - ▶ Clean the device and make the paddle workable
5. **Microswitch does not work**
   - ▶ Eliminate the cause of the defect (short circuit, overload)
   - ▶ Exchange the device

**The microswitch is constantly switched**

1. **Flow too high or microswitch set too low**
   - ▶ Reduce the flow
   - ▶ Set the microswitch to a higher flow
2. **Paddle is stuck (pollution)**
   - ▶ Clean the device and make the paddle workable
3. **Microswitch does not work**
   - ▶ Eliminate the cause of the defect (short circuit, overload)
   - ▶ Exchange the device

**The switching point does not match the actual flow**

1. **Wrong reduced**
   - ▶ Adjust paddle
2. **Device dirty**
   - ▶ Clean the device
3. **Device defective**
   - ▶ Exchange the device




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### 9 Technical Data

| **Operating data** | |
|---|---|
| Operating pressure max. | 11 bar (brass version)<br>30 bar (stainless steel version) |
| Medium temperature | -40 °C – 120 °C |
| Ambient temperature | -40 °C – 85 °C |
| Housing temperature max. | 65°C |
| Electrical data | dust-sealed microswitch / potential-free changeover contact |
| IP65 | 15 (8) A, 24 - 250 V |
| Output | The contact changes when the flow rate falls below the set switching point. |
| Power supply | Not needed |
| Cable diameter for IP65 | 6 – 8 mm |
| Pollution degree | 2 (EN 61058-1) |

| **Material** | **Brass** | **Stainless steel** |
|---|---|---|
| Body (touching the media) | Brass | 316 L |
| Paddle (touching the media) | 316 L | |
| Housing (not touching the media) | Base plate galvanized steel / ABS cover | |
| Housing (N) (not touching the media) | Lacquered aluminum base / ABS cover | |




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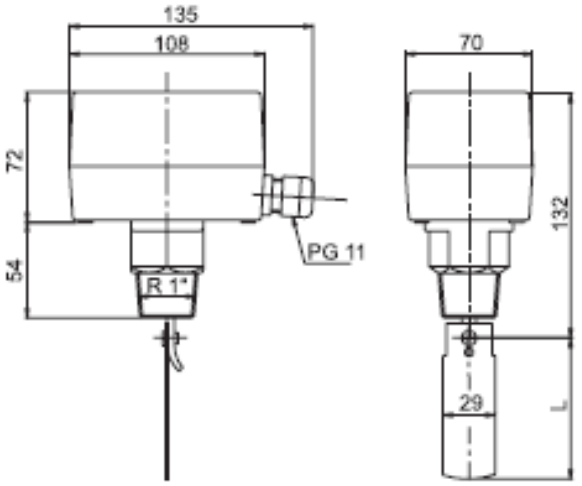
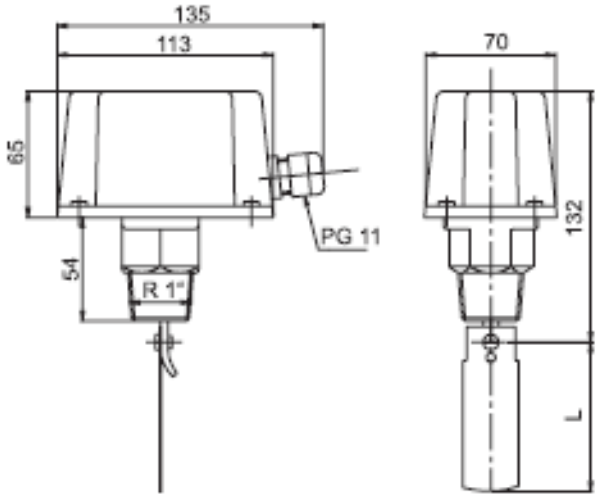
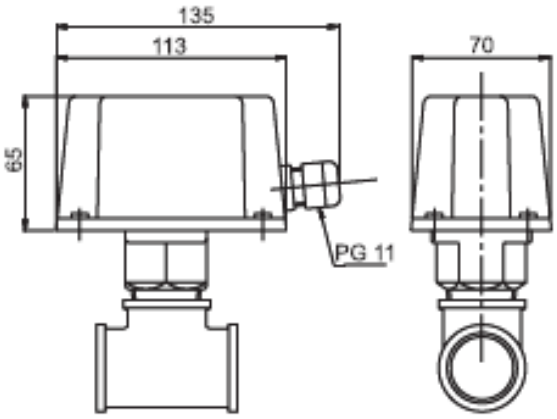
**10 Overall dimensions (mm)**




DPP06 25/N




DPP06 25

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## Important notes!
Technical changes and errors excepted.

These operating instructions are an integral part of the device and must be kept accessible to the personnel in the immediate vicinity of the device at all times. Persons who install, operate or service this device must read and understand these operating instructions carefully before starting any work. All safety instructions and instructions in this manual must be adhered to. In addition, the local accident prevention regulations and general safety regulations for the area of application of the device as well as all national and international legal regulations and technical standards apply.

All illustrations in this operating manual serve the basic understanding. Photos can be examples of a variant. The illustrations may differ from the actual design of the units. No claims can be deduced from any deviations.

The device has been designed and constructed exclusively for the intended use described here.

Persons installing, operating or maintaining this device must be technically qualified personnel and must comply with the applicable accident prevention regulations.

**limitations of liability**
All information and instructions in this operating manual have been compiled taking into account the applicable standards and regulations, the state of the art as well as our many years of knowledge and experience. Schmidt Mess- und Regeltechnik accepts no liability for damage due to

- Failure to observe this manual
- Improper use of the device
- Working by untrained personnel with this device
- Unauthorized modifications or technical modifications not approved by the manufacturer
- Use of unauthorized spare parts




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