

Operating Instructions
for
Paddle Flowswitch
Model: PSR-..., PS-...



1. Note

Please read and take note of these operating instructions before unpacking and commissioning. The instruments may only be used, maintained and installed by personnel familiar with the operating instructions and the applicable Health and Safety Requirements.

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3. Declaration of Conformance

We, KOBOLD-Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Paddle Flowswitch : PSR-... , PS-...

to which this declaration relates is in conformity with the standards noted below:

EN 61010-1

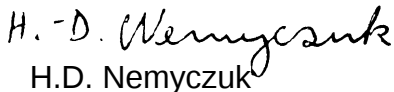
Safety requirements for electr. equipment for measurement, control and laboratory use.

EN 60529, DIN VDE 0470-1

Degrees of protection provided by enclosures (IP-code)

following the provision of European Directives:

73/23/EWG

Signed 
H.D. Nemyczuk

Date: 24.01.1997

Manufactured and sold by:

Kobold Messring GmbH Tel.: 06192-2990
Nordring 22-24 Fax: 06192-23398
D-65719 Hofheim

4. Specific Application

The Type PSR is installed for the purposes of monitoring flow throughputs. The instrument is provided with an adjustable limit switch. It is suitable for low viscosity fluids which have no effects on the instrument materials used. If using higher viscosity media, large deviations will occur to the specified switch range. The instruments are relatively insensitive to dirt, however large particles can cling to the paddle and lead to false alarm conditions. Likewise, ferritic particles may build up on the magnet and lead to faulty operation. In case of doubt, please contact the supplier.

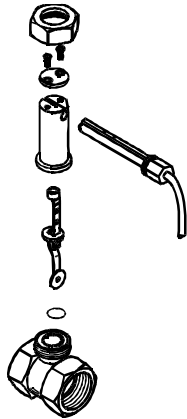
Material Combinations

	Material comb.: brass	Material comb.:st.steel
Housing	Brass (CuZn 39 Pb 3)	Stainless steel (1.4301)
Paddle	Stainless steel (1.4301)	Stainless steel (1.4301)
Leafspring	Stainless steel (1.4310)	Stainless steel (1.4310)
Beam	Stainless steel (1.4310)	Stainless steel (1.4310)
Upper housing	Brass (CuZn 39 Pb 3)	Stainless steel (1.4301)
Mounting plate	Brass (CuZn 39 Pb 3)	Brass (CuZn 39 Pb 3)
Magnet	Ceramic oxide	Ceramic oxide
Contact housing	Polyamide, glass-fibre	Polyamide, glass-fibre
Connecting cable	PVC	PVC
O-ring	Perbunan	Viton

Switching ranges

Type	d ₁	Standard -switching ranges		Type	d ₁	Special -switching ranges	
		increasing flow l/min. H ₂ O	decreasing flow l/min. H ₂ O			increasing flow l/min. H ₂ O	decreasing flow l/min. H ₂ O
PSR-..05/3	G 1/4"	3,2-5,0	2,1-4,7	PSR-..05/2 PSR-..05/1	G 1/4"	4,7-6,5 5,7-7,7	3,4-6,1 4,5-7,6
PSR-..10/3	G 3/8"	3,7-5,9	2,6-5,6	PSR-..10/2 PSR-..10/1	G 3/8"	5,5-7,1 6,6-8,7	4,4-6,9 5,6-8,5
PSR-..15/3	G 1/2"	5,1-7,8	3,9-7,7	PSR-..15/2 PSR-..15/1	G 1/2"	8,3-10,7 9,2-12,4	7,0-10,3 8,0-11,8
PSR-..20/6	G 3/4"	11,5-15,0	8,5-11,5	PSR-..20/5 PSR-..20/4 PSR-..20/1	G 3/4"	17,8-24,9 20,4-30,0 34,6-48,3	14,9-23,3 16,3-28,3 30,6-46,7
PSR-..25/8	G 1"	12,0-19,0	9,0-17,0	PSR-..25/7 PSR-..25/5 PSR-..25/4 PSR-..25/1	G 1"	17,7-26,8 26,0-36,3 29,8-42,8 47,6-67,2	12,8-24,7 21,4-34,1 24,7-40,9 43,9-64,9
PSR-..32	G 1 1/4"	18,6-32,0	14,4-29,6	on request on request			
PSR-..40	G 1 1/2"	35,0-57,0	30,0-54,0				

5. Operating Principles



A paddle is mounted on one end of a beam with a permanent magnet at the other end. The beam is manufactured from high grade stainless spring steel and is fixed to a mounting plate. The lower part of the beam with the paddle is positioned in a pipe fitting in the flowing medium. Sealing is by means of a metal sleeve housing which contains the reed contact, external to the flowing medium. The paddle is moved proportionally to the flowrate or flow velocity and deflects the magnet across the response range of the reed contact. When the flow decreases or stops, the leafspring returns the paddle towards its no-flow position.

6. Instrument Inspection

The instruments are inspected before dispatch and sent out in perfect condition. Should damage to the instrument be visible, we recommend close inspection of the delivery package. In cases of damage, please immediately inform the forwarder as he is liable for any damage in transit.

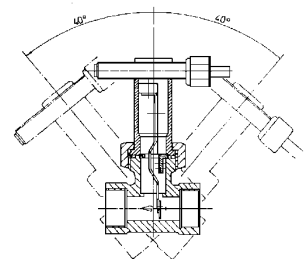
Scope of Supply

- All parts belonging to the standard scope of supply are attached to the instrument.

7. Mechanical Connection

Before installation

- Please ascertain whether the actual flow throughput matches the switch range of the instrument.
- Please ascertain whether the allowable maximum operating pressure and operating temperature of the instruments will not be exceeded.
- Remove all transport packing and ascertain that no packing material is left in the instrument.
- The instrument may be installed in any position (PSR-..32 / PSR-..40 only for horizontal tube lines). It must be ensured that the top half of the paddle switch is positioned vertically in relation to the pipe axis. The arrow on the thread fitting must match the flow direction.
- For dirty media, it is recommended the upper half is installed as far as possible in the vertical position and in case, not more than 40° from the vertical. This will prevent dirt being deposited in the upper half. Where it is not possible, we recommend that the instrument is cleaned more regularly (see maintenance).
- Sealing of the connection threads should be carried out with Teflon tape or similar.
- Check that the connection thread to pipe is fully sealed.

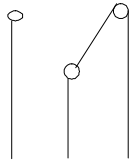


8. Electrical Connection

N/O-contact



SPDT-contact



bn sw bl

Warning! Make sure that the supply voltage to the instrument conforms with the value given on the equipment label.

- Ensure that the power is disconnected during connection of the cable.
- Connect the connection cable with the power supply cable in accordance with the connection diagram alongside.
- The contact housing is made of glass-fibre reinforced plastic. It is insulated in accordance with VDI 0720 Class 11; separate insulation measures are not necessary.

After connection of your external equipment at the connection points the instrument is ready for operation.

9. Limit Switches

The instrument is supplied with an adjustable switch. The standard switch, depending on positioning, operates as either a normally open or normally closed contact. The instrument is supplied ex works as a normally open contact. As an option, the instrument can be fitted with a changeover switch.

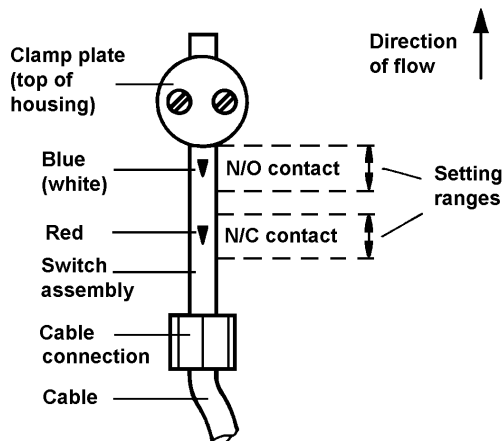
Contact type

Depending on the positioning of the adjustable standard switch unit, the following contact types are available.

- **Normally open**
The contact closes when the flow increases and the set point value is reached or exceeded. The switch opens again with falling flow at the minimum value influenced by the switch hysteresis.
- **Normally closed**
The contact opens when the flow increases and the set point value is reached or exceeded. The switch closes again with falling flow at the minimum value influenced by the switch hysteresis.
- **Option: Changeover Switch**
The normally open and normally closed options are simultaneously available for the same positioning. When retrofitting the standard design with a changeover switch, the upper sleeve housing must be exchanged at the same time.

Switch Point Adjustment

When adjusting the switch point, the clamp plate in the upper half must be loosened, enabling the switch unit to be moved. For ease of adjustment, the switch unit is marked with a blue, white or red arrow (not with the changeover switch option). The front edge of the clamp plate serves as the adjustment marker.



- **Normally open contact (ex works standard)**

The switch range is adjustable in the area of the red arrow. By sliding the switch unit in the direction of flow, the minimum switch value given in the table is achieved. By sliding the switch unit in the opposite direction to flow, the maximum switch value from the table is achieved.

- **Normally closed contact**

The switch range is adjustable in the area of the blue (white) arrow. By sliding the switch unit in the direction of flow, the minimum switch value ranges given in the table is achieved. By sliding the switch unit in the opposite direction to flow, the maximum switch value from the table is achieved.

- **SPDT contact**

For instruments with changeover contact no adjustment marker (arrow) is provided on the switch housing.

To make sure, that the changeover contact works under optimum conditions, please pay attention, that the label on the changeover contact shows always upwards, which will mean to the clamp plate.

The following options for connection are available:

Black and brown cable: contact opens at reducing flow.

Black and blue cable: contact closes at reducing flow.

After successful adjustment, tighten the clamp plate by means of the screws.

Hysteresis

Defined as the difference between the opening and closing flow values of a contact.

For example, the model PSR ..05, set at 3.2 l/min increasing set point will reset at 2.1 l/min decreasing (at minimum set point and increasing flow). Contact hysteresis = 1.1 l/min.

Contact protection

The reed contact may be damaged if the switch ratings are exceeded, especially while switching inductive or capacitive loads. This can cause dangerous situations. By the use of a contact protection relay, this problem can be overcome and the lifespan and switch rating of the reed contact can be greatly increased. (eg: Type MSR 10).

10. Technical Details

Max. switch current:	N/O: 1,5 A	SPDT: 0,5 A
Max. switch voltage:	N/O: 250 V	SPDT: 150 V
Max. Power :	N/O: 50 VA / Watt	SPDT: 20 VA / Watt
Connection cable length:	1,5 m	
Protection:	N/O: IP 65	SPDT: IP 67
Max. operating pressure:	brass : 100 bar, st.steel 250 bar 25 bar (for PSR-..32 and PSR-..40)	
Max. medium temperature: ..	110° C	

11. Recommended Spare Parts

- | | |
|---|-------------------------------|
| 1) Beam with paddle | |
| 2.1) Spare Normally open contact | 2.2) Spare Changeover contact |
| 3.1) Perbunan O-rings | |
| 4.1) Conversion set for changeover contact
(consisting of st.steel upper sleeve and 1 changeover switch) | |
| 4.2) Conversion set of changeover switch | |

12. Maintenance

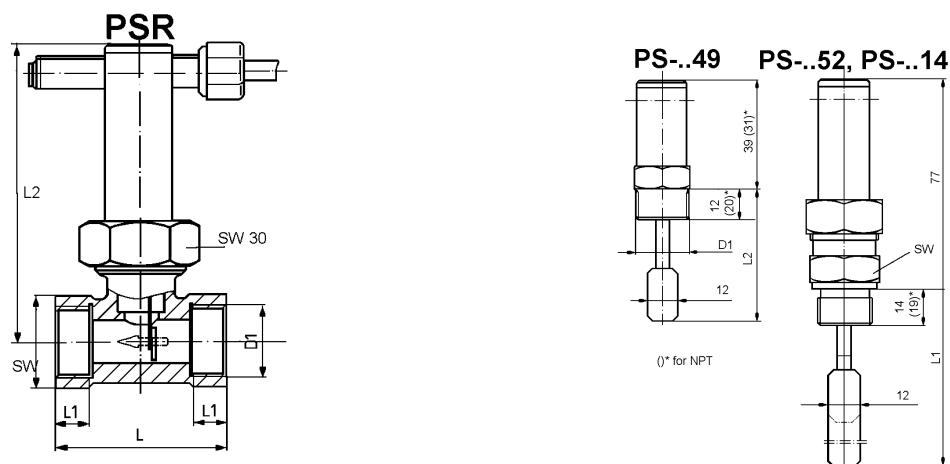
In cases where the flow medium is uncontaminated, the PSR will remain maintenance-free. In particular, any ferritic particles present in the medium may be deposited on the magnet, which can lead to problems. Large dirt particles can be deposited on the beam. In order to avoid such problems, we recommend the installation of a magnet filter, eg: Magnet Filter Type MF-R.

Depending on the amount of dirt present in the medium, we recommend that the Instrument is checked at regular intervals.

Cleaning of the instrument

- Isolate the flow through the instrument.
- Check that no flow is passing through the pipe and that the pipe is empty of medium and not under pressure.
- Loosen the nut with an open-ended spanner.
- The upper sleeve housing and beam can then be removed for cleaning.
- When cleaning the beam, check that the leafspring is not damaged or bent.
- Prior to reinstallation, check that the O ring sits correctly in the lower half seat. Dirt particles on the O ring will lead to sealing problems.
- Insert the beam into the lower half and replace the upper sleeve on top. The mounting plate of the beam must be positioned in the recess of the lower half and must be positioned in the recesses of the upper and lower halves of the sleeve.
- Replace and retighten the mounting nut. Check that the upper half does not turn with the nut.
- Check seal tightness.

13. Dimensions



Type	D1	L	L1* (mm)	L2 (mm)	SW (mm)
PSR-..05	G 1/4 (1/4" NPT)	50	10 (12)	80	27
PSR-..10	G 3/8 (3/8" NPT)	50	10 (14)	80	27
PSR-..15	G 1/2 (1/2" NPT)	50	10 (14)	80	27
PSR-..20	G 3/4 (3/4" NPT)	52	15 (17)	81,5	32
PSR-..25	G 1 (1" NPT)	56	15 (17)	84	39
PSR-..32	G 1 1/4	50	15	112	46
PSR-..40	G 1 1/2	50	15	119	55

Type	D1	L2 (mm)	SW (mm)
PS- ..49	G 1/2 (1/2" NPT)	49	27
PS- ..52	G 1/2 (1/2" NPT)	52	27
PS-..14	G 1/2 (1/2" NPT)	114	27

* dimensions for NPT-connection in brackets