Operating Instructions

for

Paddle Bellows Flow Monitor

Model: FPS-P...

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2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.
The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EC-machine guidelines.

as per PED 2014/68/EU
for FPS-11

In acc. with Article 4 Paragraph (3), "Sound Engineering Practice", of the PED 2014/68/EU no CE mark.
Diagram 8, Pipe, Group 1 dangerous fluids

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition.
Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:
The standard delivery includes:
- Flow Monitor Model: FPS

4. Regulation Use

The model FPS is installed for monitoring flow of liquid medias in pipes with diameter between 1/2" and 8".
The instrument is provided with an adjustable limit switch.
Only media may be monitored, which does not affect the materials used in the instrument. This device shall not be used in hazardous areas or for flammable liquids.

Material-combinations

	FPS-1115 P, FPS-1120 P	**FPS-2100 P / FPS-3100 P FPS-5100 P / FPS-6100 P**	**FPS-2200 P / FPS-3200 P FPS-5200 P / FPS-6200 P**
Housing:	Basic plate zinc plated / cover ABS		
Paddle:	st. steel		
Lever Arm	brass Ms 58	brass Ms 58	st. steel AISI 316 L
Connection	brass Ms 58	brass Ms 58	st. steel AISI 316 L
T-peace	cast iron	---	---

Switch points (adjustable)

pipe-diameter	**Qmax. m³/h recommended H_2O**	**Switching value FPS-2100 P / FPS-2200 P FPS-5100 P, FPS-5200 P (m³/h water)**		**Switching value FPS-3100 P/ FPS-3200 P FPS-6100 P / FPS-6200 P (m³/h water)**	
		decreasing flow	**increasing flow**	**decreasing flow**	**increasing flow**
25*	3.6	0,6 – 2	1,0 – 2,1	0,2 – 1	0,6 – 1,1
32	6.0	0,8 – 2,8	1,3 – 3	0,25 – 1,4	0,9 – 1,6
40	9.0	1,1 – 3,7	1,7 – 4	0,5 – 1,6	1,2 – 2,2
50	15,0	2,2 – 5,7	3,1 – 6,1	0,9 – 3,6	2,3 – 4,1
65	24.0	2,7 – 6,5	4,0 – 7,0	1,2 – 4,9	3,1 – 5,5
80	36.0	4,3 – 10,7	6,2 – 11,4	2,1 – 7,4	4,9 – 8,2
100	60.0	11,4 – 27,7 (6,1 – 17,3)	14,7 – 29,0 (8,0 – 18,4)	4,9 – 17,1 (3,3 – 11,6)	11,3 – 19,1 (7,7 – 13,0)
125	94	22,9 – 53,3 (9,3 – 25,2)	28,4 – 55,6 (12,9 – 26,8)	3,7 – 34,0 (5,0 – 17,5)	22,4 – 37,9 (11,5 – 19,6)
150	120	35,9 – 81,7 (12,3 – 30,6)	43,1 – 85,1 (16,8 – 32,7)	13,6 – 47,6 (6,1 – 21,4)	31,5 – 53,1 (14,1 – 23,9)
200	240	72,6 – 165,7 (38,6 – 90,8)	85,1 – 172,5 (46,5 – 94,2)	25,7 – 90,1 (21,7 – 55,3)	59,6 – 100,7 (36,5 – 61,8)

* For DN 25 a fitting is required in which the paddle can move freely. The values in brackets apply when using the supplied long paddle, which is shortened for service in NW 100 to NW 150 and which must be mounted together with the three short paddles.

		Switching value (L/h water)	
Model	**diameter**	**decreasing flow**	**increasing flow**
FPS-1115 P	15	174 - 846	480 – 948
FPS-1120 P	20	138 – 768	408 - 858

5. Operating Principle

The KOBOLD flow monitor FPS operates according to the proven paddle bellows principle. The flowing medium acts on the paddle thus actuating a microswitch. Switching point can be freely adjusted and the device mated to different nominal pipe sizes by means of the replaceable paddle in conjunction with the additional adjustment features. The electrical device section is separated hermetically from the process fluid by means of a bellows.
The special version of the flow monitor has been specially designed for minimum switching values. See table for switching values. The devices can be installed in any position.

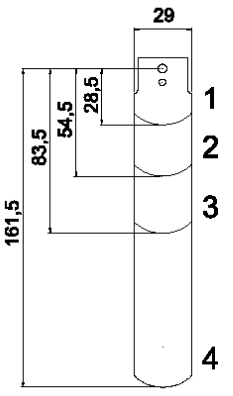
6. Mechanical Connection

Before installation

- Please ensure whether the actual flow matches the switching range of the instrument
- Please ensure whether the allowable maximum operating pressure and operating temperature of the instruments will not be exceeded.
- Please ensure whether a straight run of 5 x pipe diameters at inlet and outlet is being observed.

Installation

- Select the paddle to suit the pipe internal diameter. To ensure stability the shorter paddle should always be left on. Make sure that the paddle can move freely in the pipeline and that it does not stick to the pipe wall.



PADDLES (models without "T" pipe fitting)

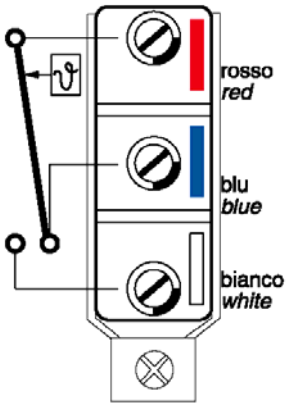
PIPE	PADDLES
1"	1
1 1/4"	1
1 1/2"	1
2"	1,2
2 1/2"	1,2
3"	1,2,3
4"	1,2,3
4" Z	1,2,3,4
5"	1,2,3
5" Z	1,2,3,4
6"	1,2,3
6" Z	1,2,3,4
8"	1,2,3
8" Z	1,2,3,4

- Using sealing tape screw the flow monitor into a T piece according to DIN 2950 with 1“ outlet. The arrow on the housing must point in the direction of flow.
- The unit can be fitted in any position. If the unit is installed in a vertical pipe the weight of the paddle and the lever must be compensated with the range screw. This leads to changes in switching values (see Sec. Setting The Limit Contact).
- A suitable filter must be connected upstream for soiled media. This applies especially to fibrous soiling.

7. Electrical Connection

- Make sure that the voltage and current values in your plant do not exceed the respective voltage and current values specified for the flow monitor.
- Make sure that the electrical supply lines are de-energized.
- Remove the flow monitor housing by undoing the four screws.
- Connect the flow monitor as shown in the wiring diagram.
- Red-white opens if the flow rate drops to the set value. Red-blue close simultaneously and can be used as a signal contact

The unit is ready for operation when you have connected your external devices to the limit contact.



8. Setting the Limit Contact

The units are delivered with an adjustable microswitch.
The contact is a changeover contact that can be wired for use as a N/O or N/C contact.
The units are set to the minimum switch-off value at the factory.
The switch-off value can be set to a higher value by rotating the range screw clockwise.

9. Maintenance

In cases where the flow medium is uncontaminated, the FPS will remain maintenance-free. Large dirt particles can block the beam.
Depending on the amount of dirt present in the medium, we recommend that the Instrument is checked at regular intervals.

10. Technical Information

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

11. Order Codes

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

12. Dimensions

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

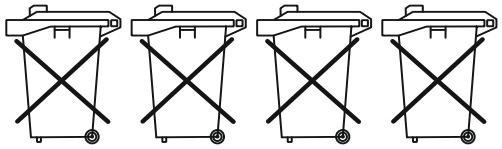
13. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

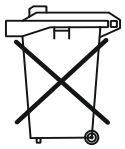
Batteries

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment



14. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Paddle Bellows Flow Monitor Model: FPS-...

to which this declaration relates is in conformity with the following EU directives stated below:

2014/30/EU	**EMC Directive**
2014/35/EU	**Low Voltage Directive**
2011/65/EU	**RoHS** (category 9)
2015/863/EU	Delegated Directive (RoHS III)

Also, the following standards are fulfilled:

EN 60730-2:15:2010
Automatic electrical controls for household and similar use - Part 2-15: Particular requirements for automatic electrical air flow, water flow and water level sensing controls

EN 50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Hofheim, 10 October 2023

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