



F3.05 Paddlewheel Flow Switch

INSTRUCTION MANUAL

EN 05-03

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1. Introduction



CAUTION

1.1. Safety Instructions

General Statements

- ❑ The flow switch F3.05.XX has only been designed to check the flow of liquids.
- ❑ Do not install and service the instrument without following the Instruction Manual.
- ❑ This switch is designed to be connected to other instruments which can be hazardous if used improperly. Read and follow all associated instrument manuals before using with this sensor.
- ❑ Flow switch installation and wiring connections should only be performed by qualified staff.
- ❑ Do not modify product construction.

Installation and Commissioning Statements

- ❑ Remove power to the instrument before wiring any connection.
- ❑ Depressurize and vent the system before installing or removing the instrument.
- ❑ Check and confirm the chemical compatibility of the materials in contact with the liquid.
- ❑ Do not exceed maximum temperature/pressure data.
- ❑ To clean the flow switch, use only chemical compatible products.

1.2. Unpacking

Please verify that the product is complete and without any damage. The following items must be included:

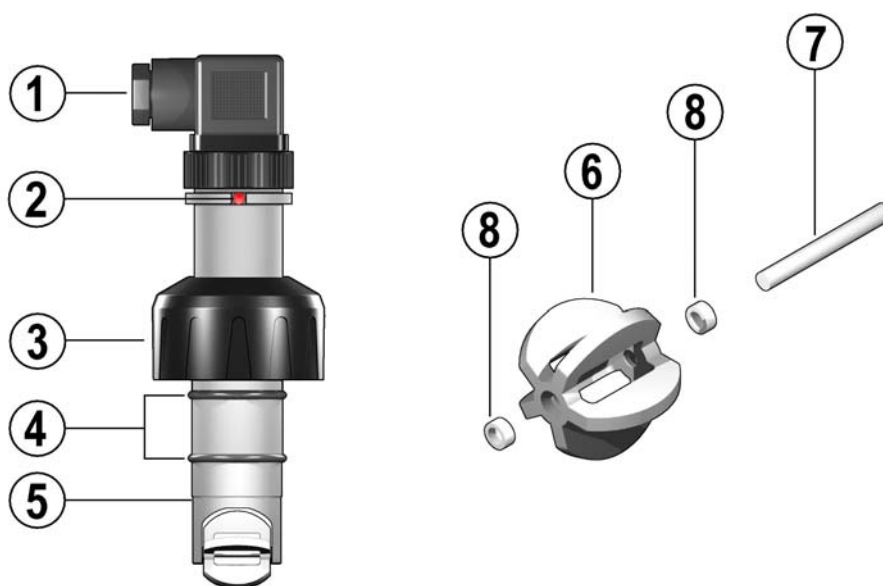
- F3.05 Paddlewheel Flow Switch
- Instruction Manual for F3.05 Flow Switch

2. Description

2.1. Design

The simple insertion paddlewheel flow switch type F3.05 is designed to protect a pump from running dry or pumping against a closed valve. It is equipped with a mechanical SPDT contact activated when the flow velocity drops below the factory preset value of 0.15 m/s (0.5 ft/s). A specially designed family of fitting ensures an easy and quick installation into all pipe materials in sizes from DN15 to DN600 (0.5 to 24 in.).

2.2. Technical Features



- 1) 4-pole cable plug according to DIN 43650-B/ISO 6952
- 2) Local Bicolour Status LED
- 3) PVC nut for installation into fittings
- 4) O-Ring seals available in EPDM or FPM
- 5) CPVC, PVDF or Stainless Steel sensor body
- 6) ECTFE (Halar[®]) Open-cell rotor
- 7) Ceramic shaft
- 8) Ceramic bearings

Halar[®] is a registered trademark of Ausimont-Solvay.

2.3. Operating Principle

The flow switch consists of a transducer and a five-blade open cell paddlewheel using insertion technology. The paddlewheel is equipped with a permanent magnet integrated into each blade. As the magnet passes close to the transducer an output pulse is generated. That pulse is monitored by a missing signal circuit, that trips an internal relay when the pulse frequency drops below the factory preset frequency of 0.15 m/s (0.5 ft/s). The switch is installed into the pipe using a wide range of insertion type fittings supplied by the flow switch manufacturer.

3. Specifications

3.1. Technical Data

Pipe Size Range: DN15 to DN600 (0.5 to 24 in.). Please refer to Installation Fittings section for more details

Supply voltage: 12 to 24 VDC regulated

Supply current: < 50 mA

Relay Output: mechanical SPDT contact, 1A @ 24 VDC, 0.1A @ 230 VAC

Local Status Indicator: GREEN Led = Flow RED Led = No Flow

No-Flow Rate Point: 0.15 m/s (0.5 ft./s)

Enclosure: IP65

Wetted Materials:

Sensor Body: CPVC or PVDF or 316L SS

O-rings: EPDM or FPM

Rotor: ECTFE (Halar[®])

Shaft: Ceramic (Al₂O₃)

Bearings: Ceramic (Al₂O₃)

Standards & Approvals

Manufactured under ISO 9002

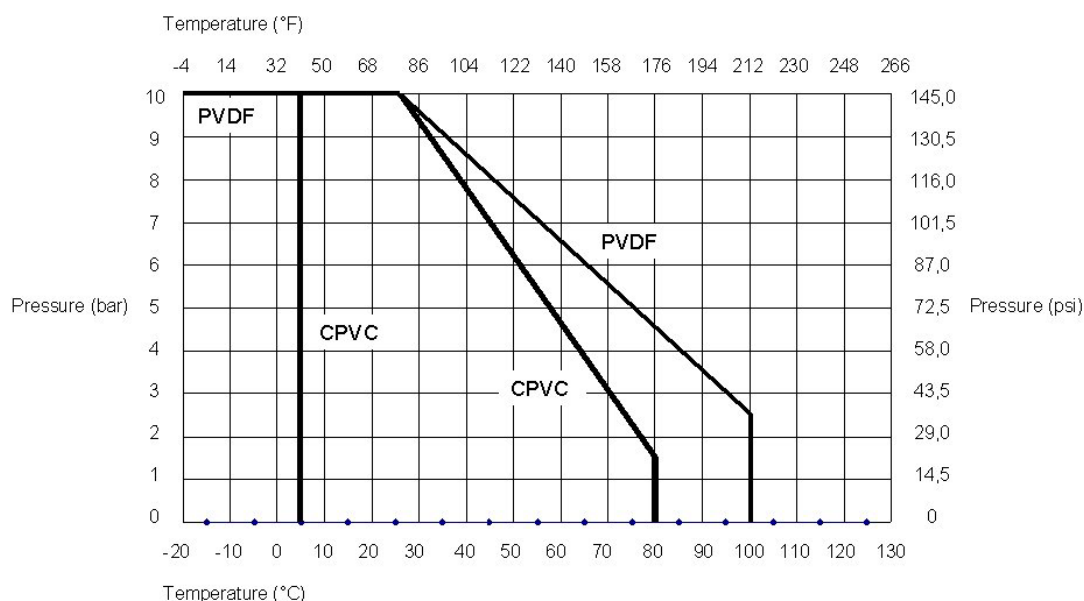
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3.2. Maximum Operating Pressure / Temperature (25 years lifetime)

CPVC body: 10 bar (145 psi) @ 25°C (77°F)
1,5 bar (22 psi) @ 80° C (176°F)

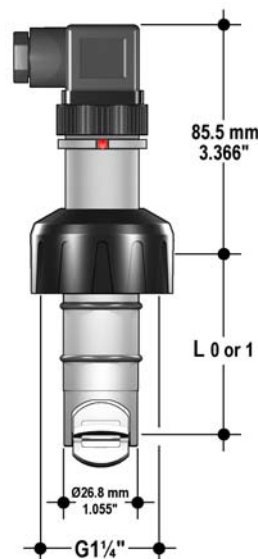
PVDF body: 10 bar (145 psi) @ 25°C (77°F)
2,5 bar (36 psi) @ 100°C (212°F)

SS body: 25 bar (363 psi) @ 120°C (248°F)



3.3. Dimensions

L0 = 68.3 mm (2.69 in)
L1 = 98.5 mm (3.88 in).



4. Installation

4.1. Location

- The flow switch can be installed in any position, both horizontally or vertically.
- No special installation configurations are required to install the sensor downstream of valves, fittings or any kind of obstacles.

4.2. Mounting Position

Make sure the pipeline is always full.

- Horizontal pipe runs:
 - Fig. 1: installation with no sediments present
 - Fig. 2: installation with no air bubbles present
 - Fig. 3: installation if sediments or air bubbles may be present
- Vertical pipe runs:
 - Install the flow switch in any orientation.

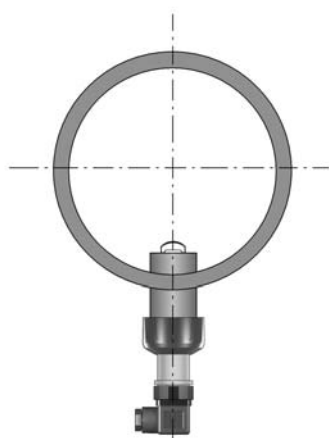


Fig. 1

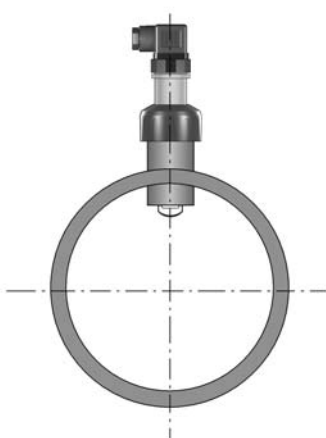


Fig. 2

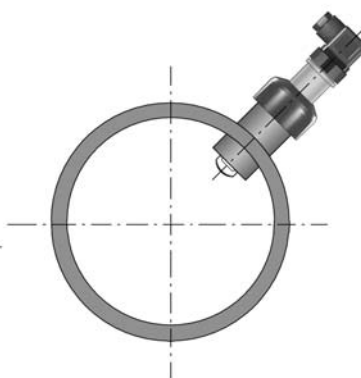
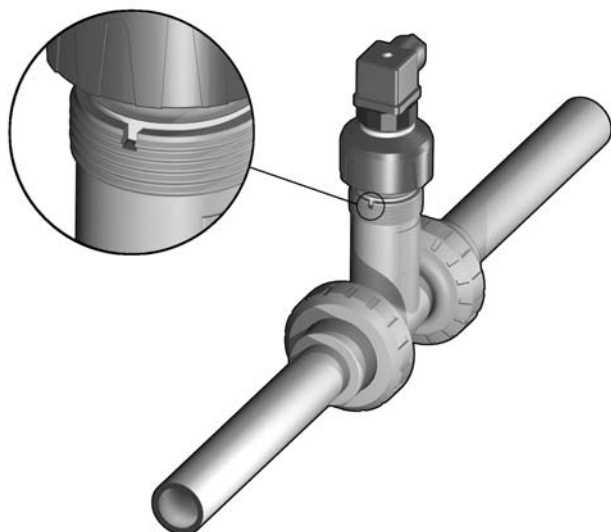


Fig. 3

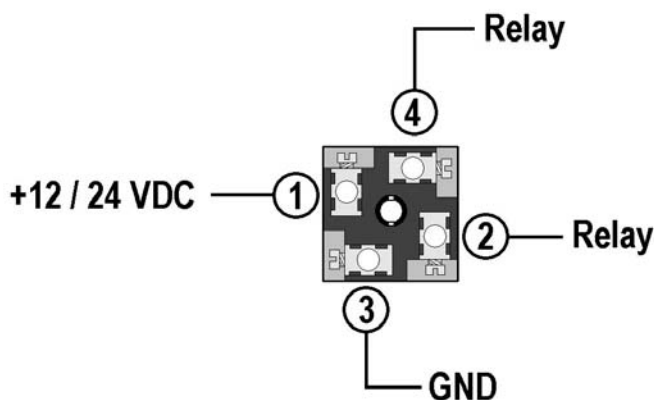
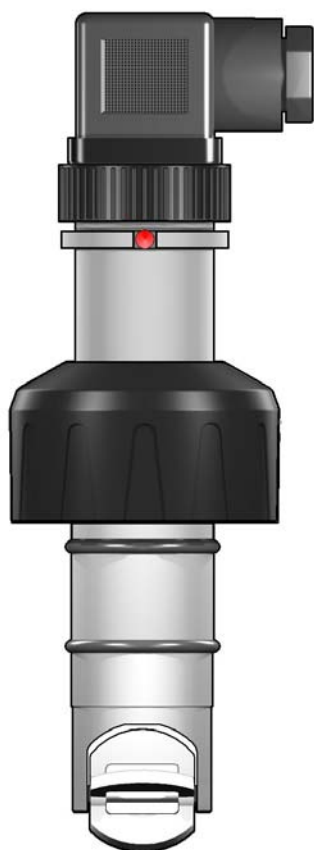
4.3. Process Connection



1. Lubricate the body O-rings with a silicone lubricant. Do not use any petroleum based lubricant that may damage the O-rings.
2. Lower the flow switch into the fitting making sure the alignment tab is seated in the fitting notch.
3. Hand tighten the sensor cap. Do not use any tool otherwise cap and/or fitting threads may be damaged.

4.4. Wiring

- ❑ Always ensure the power supply is switched off before working on the sensor.
- ❑ Always use a high quality (regulated) DC voltage supply.



5. Installation Fittings

	Type	Description
	Plastic Tees	<ul style="list-style-type: none"> • Size: D20 to D50 (0.5 to 1.5 in.) • Materials: PVC, CPVC, PP, PVDF
	CPVC Clamp Saddles	<ul style="list-style-type: none"> • Size: D63 to D225 (2 to 8 in.) • Insert Materials: CPVC, PVDF
	PP Clamp Saddles	<ul style="list-style-type: none"> • Size: D250 to D315 (10 to 12 in.) • Insert Material: CPVC
	PVC Wafer Fittings	<ul style="list-style-type: none"> • Size: D280 and D315 (10 and 12 in.) • Insert Material: CPVC
	GR-PP Wafer Fittings	<ul style="list-style-type: none"> • Size: D280 and D315 (10 and 12 in.) • Insert Material: CPVC
	Plastic Weld-on Adapters	<ul style="list-style-type: none"> • Size: D63 to D315 • Materials: PVC, CPVC, PP, PE
	316L SS Tees	<ul style="list-style-type: none"> • Size: D25 to D40 • BSP Female Threaded
	Metal Strap-on Saddles	<ul style="list-style-type: none"> • Size: DN80 to DN450 • Insert Material: CPVC • Special order for other sizes
	316L SS Weld-on Adapters	<ul style="list-style-type: none"> • Size: D50 to D600 (1.5 to 24 in)

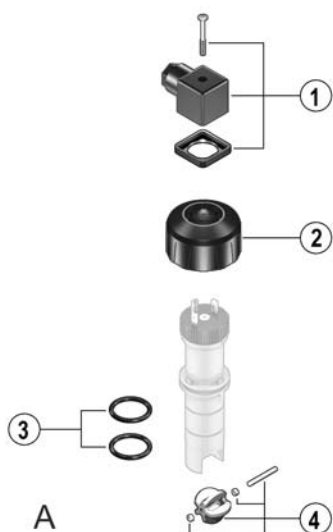
6. Ordering Data

FlowX3 F3.05.XX

Part No.	Power Supply	Length	Body	O-rings	Enclosure
F3.05.01	12 to 24 VDC	L0	CPVC	EPDM	IP65
F3.05.02	12 to 24 VDC	L0	CPVC	FPM	IP65
F3.05.03	12 to 24 VDC	L1	CPVC	EPDM	IP65
F3.05.04	12 to 24 VDC	L1	CPVC	FPM	IP65
F3.05.05	12 to 24 VDC	L0	PVDF	EPDM	IP65
F3.05.06	12 to 24 VDC	L0	PVDF	FPM	IP65
F3.05.07	12 to 24 VDC	L1	PVDF	EPDM	IP65
F3.05.08	12 to 24 VDC	L1	PVDF	FPM	IP65
F3.05.09	12 to 24 VDC	L0	316 SS	EPDM	IP65
F3.05.10	12 to 24 VDC	L0	316 SS	FPM	IP65
F3.05.11	12 to 24 VDC	L1	316 SS	EPDM	IP65
F3.05.12	12 to 24 VDC	L1	316 SS	FPM	IP65

Spare Parts

Item	Part No.	Name	Description
A-1	F3.SP1	4-pole Cable Plug	Cable Plug according to DIN 43650
A-2	F3.SP2.1	Sensor Nut	Black Sensor Nut for connection to fittings
A-3	F3.SP3.1	O-Rings	EPDM Sensor body O-rings
A-3	F3.SP3.2	O-Rings	FPM Sensor body O-rings
A-4	F3.SP4	Rotor KIT	ECTFE (Halar) rotor with Ceramic Shaft and Bearings
	F3.SP5.1	Sensor Plug	CPVC Sensor Plug
	F3.SP5.2	Sensor Plug	PVDF Sensor Plug
	F3.SP5.3	Sensor Plug	Stainless Steel Sensor Plug



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