



F3.10 Paddlewheel Flow Sensor

INSTRUCTION MANUAL

EN 10-11

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1. Introduction



1.1. Safety Instructions

General Statements

- ❑ The sensor F3.10.H.0X has only been designed to measure the flow of liquids.
- ❑ Do not install and service the sensor without following the Instruction Manual.
- ❑ This sensor 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.
- ❑ Sensor installation and wiring connections should only be performed by qualified staff.
- ❑ Do not modify product construction.

Installation and Commissioning Statements

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

- F3.10 Paddlewheel Flow Sensor
- Instruction Manual for F3.10 Flow Sensor

2. Description

2.1. Design

The simple and reliable paddlewheel flow sensor type F3.10 is designed for use with every kind of solid-free liquids. The sensor can measure flow from 0.25 m/s (0.8 ft/s) producing a frequency output signal highly repeatable. A rugged construction and a proven technology guarantee exceptional performances with little or no maintenance required. A specially designed family of fittings ensures an easy and quick installation into all pipe materials in sizes from DN15 to DN40 (0.5 to 1.5 in.).

2.2. Connections to FlowX3 Instruments

Sensore FlowX3	Strumento FlowX3						
	F9.00	F9.01	F9.02	F9.03	F9.20	F9.50	F9.51
F3.10.H	X	X	X	X		X	X

3. Specifications

3.1. Technical Data

General

Pipe Size Range: DN15 to DN40 (0.5 to 1 1/2 in.). Refer to Installation Fittings section for more details

Flow Rate Range: 0.25 to 4 m/s (0.8 to 12,5 ft./s)

Linearity: ± 1 % of full scale

Repeatability: ± 0.5 % of full scale

Minimum Reynolds Number Required: 4500

Enclosure: IP68

Operating Pressure :

max 10 bar (145 psi) @ 20 °C (68°F)

max 2 bar (30 psi) @ 70 °C (158°F)

Wetted Materials:

Sensor Body: ABS

O-rings: EPDM or FPM

Rotor: ABS

Shaft: AISI 316L

Electrical

Supply voltage: 5 to 24 VDC regulated

Supply current: < 30 mA @ 24 VDC

Output signal:

- square wave
- Output frequency: 15 Hz per m/s nominal (4,6 Hz per ft/s nominal)
- Output type: transistor NPN open collector
- Output current: 10 mA max.

Cable length: 2 m (6,5 ft) standard, 300 m (990 ft) maximum

Standards & Approvals

Manufactured under ISO 9002 and 14001

CE

3.2. Dimensions



F3.00 IP68 Remote Sensor

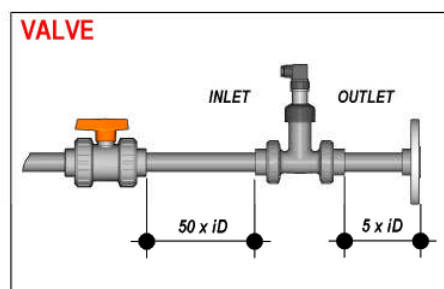
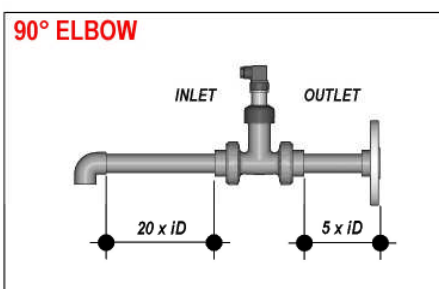
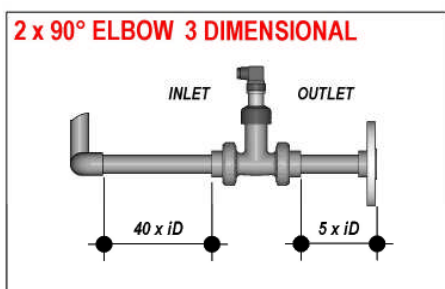
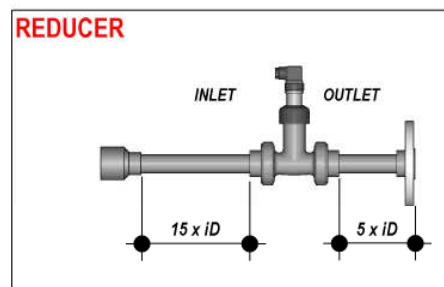
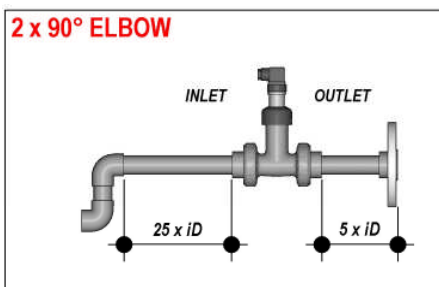
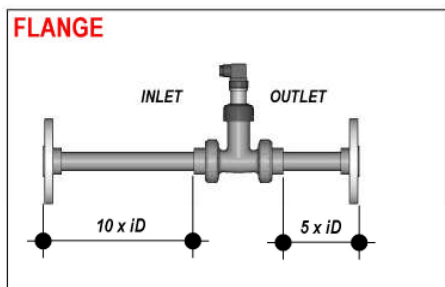
Length = 41 mm (1,6")
Width = 20 mm (0,8")
Cap = 3/4"

4. Installation

4.1. Location

Different pipe configurations and obstacles in the flow line such as valves, elbows, pipe bends and strainers create variations on the flow profile.

Whenever possible follow the EN ISO 5167-1 installation recommendations to locate the sensor.



Always maximize distance between flow sensor and pump.

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 sensor in any orientation. Upward flow is preferred to ensure full pipe.

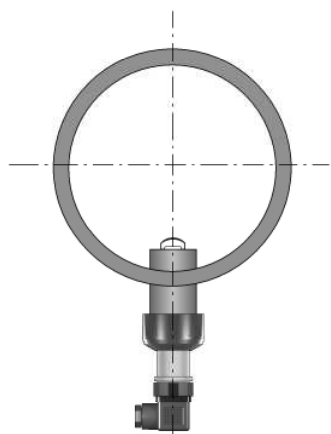


Fig. 1

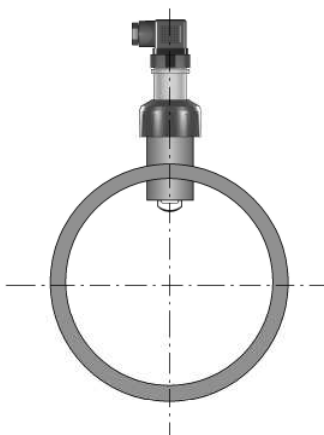


Fig. 2

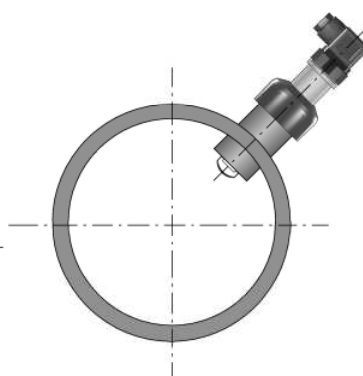
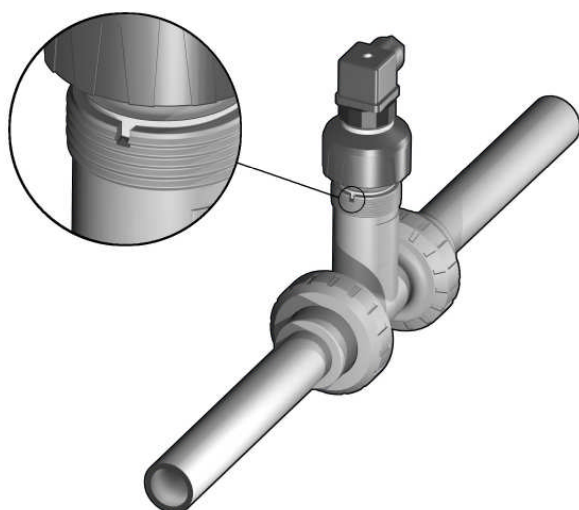


Fig. 3

4.3. Process Connection



1. Lubricate the sensor O-rings with a silicone lubricant. Do not use any petroleum based lubricant that may damage the O-rings.
2. Lower the sensor 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.

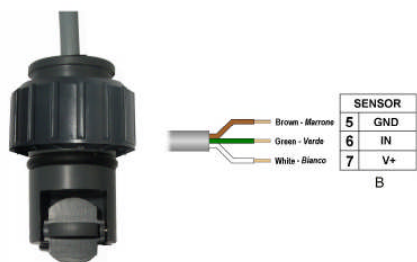
N.B The plastic Tees must be installed with the arrow in according to the flow direction.



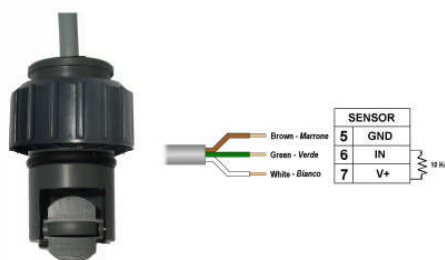
4.4. Wiring

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

F3.10.H IP68 Sensor Connection to FlowX3 Instruments



F3.10.H IP68 Sensor Connection to Other Brand Instruments



- 2 to 10Kohm Pull-up resistor may be required.

5. Installation Fittings

	Type	Description
	Plastic Tees	<ul style="list-style-type: none"> • Size: D20 to D50 (0.5" to 1.5") • Materials: PVC, CPVC

6. K-Factor Tables

K-Factor is the number of pulses a sensor produces for one liter of fluid measured. Here all K-Factors for water at ambient temperature are listed.

K-Factor values can depend upon the installation conditions.

Please contact your dealer for K-Factor values not included in the tables.

Installation on PVC pipes

ISO Metric PVC Tee Fittings for ISO SDR 21 pipes (female ends for solvent welding)			
Part No.	DN	d	K-Factor
TMIV20	15	20	113,61
TMIV25	20	25	61,06
TMIV32	25	32	35,56
TMIV40	32	40	20,44
TMIV50	40	50	11,78

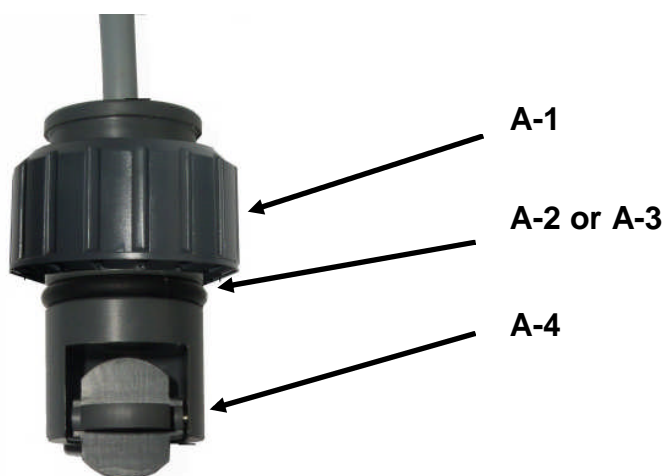
7. Ordering Data

FlowX3 F3.00.X.XX (Remote version)

Part No.	Version	Power supply	Length	Body	O-rings	Enclosure
F3.10.H.01	Hall	5 - 24 VDC	41 mm	ABS	EPDM	IP68
F3.10.H.02	Hall	5 - 24 VDC	41 mm	ABS	FPM	IP68

Spare Parts

Item	Part No.	Name	Description
A-1	F3.SP2.1	Sensor Cap	Gray Sensor Cap
A-2	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	ABS rotor with AISI 316L Shaft
	F3.SP5.1	Sensor Plug	ABS Sensor Plug
	F3.SP6	Electrical cable	Cable (per meter), 3 cond., 22AWG



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