

Type F3.00/F3.01 Flow Sensors

The Type F3.00/F3.01 Paddle Wheel Flow Sensors are the core items in the Digiflow® FlowX3 line. A square wave output signal is generated with frequency proportional to rate of rotor rotation and flow velocity. This pulse output is normally fed to a FlowX3 flow monitor/transmitter, blind transmitter, batch controller or adjustable flow switch. It can also be fed to other brand instruments or PLC's.

Three types of sensors are available, Hall Effect which requires a 5 to 24 VDC power supply, Coil Effect which operates with less power, 3 to 5 VDC and Push-pull sensors for safe connection to any NPN or PNP inputs. Coil is required with the battery powered flow monitor. Hall Effect signals may be transmitted up to 300 meters (984 ft.) without the need for conditioning whereas Coil Effect signals may be transmitted up to 16 m (52.5 ft.) without conditioning.

Body Materials: CPVC, PVDF, 316L Stainless Steel, Brass

Rotor: ECTFE (Halar®)

Shaft & Bearings: Ceramic

Seals: EPDM, Viton®

Pipe Sizes: 1/2"– 24" in two sensor lengths, L0 or L1
See Installation Fittings (pages 39-41)

Flow Ranges: See page 45

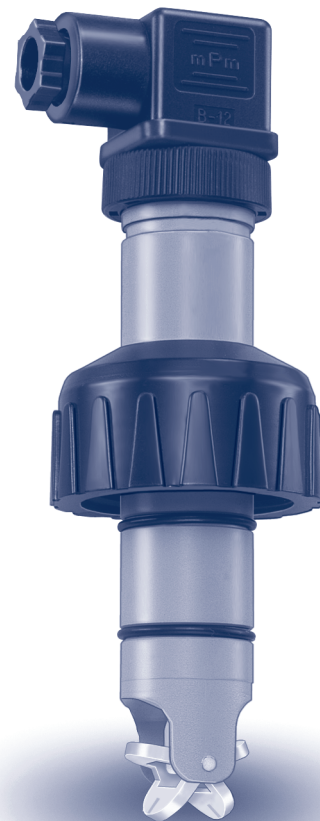
■ Features

- **Ceramic Shaft and Bearings** – For longer life on services containing grit
- **Self Cleaning Design** – Lower maintenance
- **Submersible Sensors Available** – NEMA 6, 6P (IP68) models are available for outdoor or submersible installation

■ Connectable FlowX3 Instruments

Sensor Type	Sensor No.	Instrument Mounting	FlowX3 Instruments*
Hall	F3.01.H	Direct	F9.00, F9.02,
	F3.00.H	Panel or Wall	F9.03, F9.50, F9.51
Coil	F3.01.C	Direct	F9.20
	F3.00.C	Panel or Wall	
Push-pull	F3.00.P	–	NPN or PNP Inputs

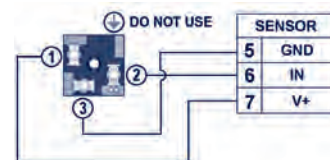
* Power supply is normally fed from FlowX3 instruments.



■ Wiring

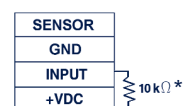
Sensor Connections to Instruments

NEMA 4, 4X (IP65) Sensor

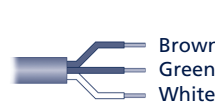


FlowX3 Instruments

Other Brand Instruments

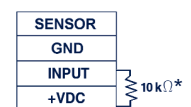


NEMA 6, 6P (IP68) Sensor



FlowX3 Instruments

Other Brand Instruments



* 10 kΩ pull-up resistor may be required when Hall sensors are connected to other brand instruments. Resistor is not required for the F3.00.P sensors.

New

Type F3.00/F3.01 Flow Sensors



■ Technical – General

- Output Signal:** Square wave (pulse)
- Output Frequency:** 45 Hz per m/s nominal (13.7 Hz per ft./sec.)
- Electrical Class:** NEMA 6, 6P (IP68) – F3.00 only
NEMA 4, 4X (IP65) – F3.00 and F3.01
- Accuracy:** $\pm 1\%$ of reading value after field calibration or $\pm 0.75\%$ of full scale
- Repeatability:** $\pm 0.5\%$ of full scale
- Velocity Range:** 0.15 to 8 m/s (0.5 to 25 ft./sec.).
See page 46 for corresponding flow ranges.
- Viscosity Range:** 0.5 to 20 centistokes. Field calibration is required if outside this range, up to 40 centistokes maximum.
- Maximum % Solids:** 10% with particle size not exceeding 0.5 mm cross section or length
- Max. Operating Pressure/Temperature:** See chart on page 45
- Cable (where supplied):** 22 AWG, 3 conductors

■ Technical – F3.00.H and F3.01.H Hall Sensors

- Supply Voltage*:** 5 to 24 VDC regulated
- Supply Current:** <math>< 30\text{ mA}</math> @ 24 VDC
- Output Type:** Transistor NPN open collector
- Output Current:** 10 mA max.
- Max. Cable Length:** Max. 300 m (984 ft.) recommended without signal conditioning

■ Technical – F3.00.C and F3.01.C Coil Sensor

- Power Supply:** Normally 2 x 3.6 V Lithium batteries located in the F9.20 flow monitor or 3 to 5 VDC regulated
- Supply Current:** <math>< 10\ \mu\text{A}</math>
- Min. Input Impedance:** 100 k Ω
- Max. Cable Length:** Max. 16 m (52.5 ft.) recommended without signal conditioning

■ Technical – F3.00.P Push-pull Sensors

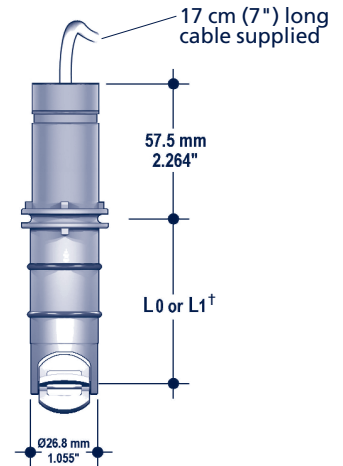
- Supply Voltage:** 12 to 24 VDC regulated
- Supply Current:** <math>< 30\text{ mA}</math> @ 24 VDC
- Output Type:** Push-pull for connection to NPN and PNP inputs
- Output Current:** 20 mA max.
- Max. Cable Length:** Max. 300 m (984 ft.) recommended without signal conditioning

* Supply voltage is normally fed from FlowX3 instruments.

■ Installation

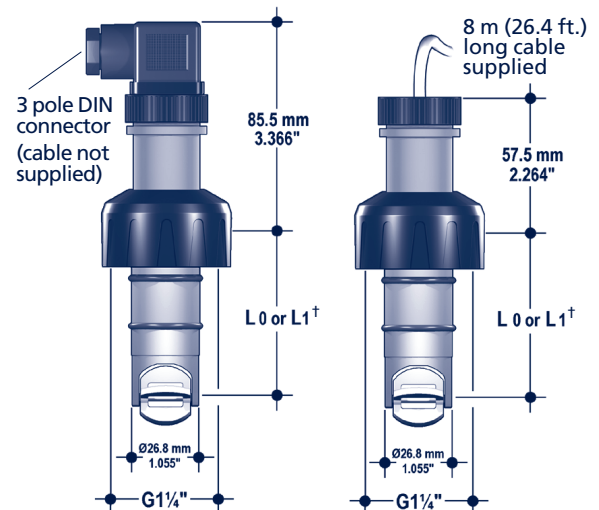
- See page 44 for guidelines on installation in piping systems
- See pages 39 to 41 for installation fittings

F3.01 For Direct Connection to Instruments



NEMA 4, 4X (IP65)*

F3.00 For Remote Connection to Instruments



NEMA 4, 4X (IP65)

NEMA 6, 6P (IP68)

L0 = 68.3 mm (2.69")
L1 = 98.5 mm (3.88")

* F3.01 sensor is NEMA 6, 6P but when instrument is attached, unit becomes NEMA 4, 4X.

† Required sensor length (L0 or L1) depends on choice of installation fittings. See pages 39 to 41.

Type F3.00/F3.01 Flow Sensors



■ Item Numbers

**Hall Effect Sensors – For Connection to F9.0 and F9.5 Series FlowX3 Instruments
For Direct Mounting to Instruments**

Electrical Class	O-Ring	Sensor Length†	Body Material			
			CPVC	PVDF	316L SS	Brass
NEMA 4, 4X (IP65)	EPDM	L0	F3.01.H.01	F3.01.H.05	F3.01.H.09	F3.01.H.25
	Viton®	L0	F3.01.H.02	F3.01.H.06	F3.01.H.10	F3.01.H.26
	EPDM	L1	F3.01.H.03	F3.01.H.07	F3.01.H.11	F3.01.H.27
	Viton®	L1	F3.01.H.04	F3.01.H.08	F3.01.H.12	F3.01.H.28

For Connection to Panel or Wall Mount Instruments

Electrical Class	O-Ring	Sensor Length†	Body Material			
			CPVC	PVDF	316L SS	Brass
NEMA 6, 6P (IP68)	EPDM	L0	F3.00.H.01	F3.00.H.05	F3.00.H.09	F3.00.H.25
	Viton®	L0	F3.00.H.02	F3.00.H.06	F3.00.H.10	F3.00.H.26
	EPDM	L1	F3.00.H.03	F3.00.H.07	F3.00.H.11	F3.00.H.27
	Viton®	L1	F3.00.H.04	F3.00.H.08	F3.00.H.12	F3.00.H.28
NEMA 4, 4X (IP65)	EPDM	L0	F3.00.H.13	F3.00.H.17	F3.00.H.21	F3.00.H.29
	Viton®	L0	F3.00.H.14	F3.00.H.18	F3.00.H.22	F3.00.H.30
	EPDM	L1	F3.00.H.15	F3.00.H.19	F3.00.H.23	F3.00.H.31
	Viton®	L1	F3.00.H.16	F3.00.H.20	F3.00.H.24	F3.00.H.32

**Coil Effect Sensors – For Connection to F9.20 FlowX3 Instrument
For Direct Mounting to Instruments**

Electrical Class	O-Ring	Sensor Length†	Body Material			
			CPVC	PVDF	316L SS	Brass
NEMA 4, 4X (IP65)	EPDM	L0	F3.01.C.01	F3.01.C.05	F3.01.C.09	F3.01.C.25
	Viton®	L0	F3.01.C.02	F3.01.C.06	F3.01.C.10	F3.01.C.26
	EPDM	L1	F3.01.C.03	F3.01.C.07	F3.01.C.11	F3.01.C.27
	Viton®	L1	F3.01.C.04	F3.01.C.08	F3.01.C.12	F3.01.C.28

For Connection to Panel or Wall Mount Instruments

Electrical Class	O-Ring	Sensor Length†	Body Material			
			CPVC	PVDF	316L SS	Brass
NEMA 6, 6P (IP68)	EPDM	L0	F3.00.C.01	F3.00.C.05	F3.00.C.09	F3.00.C.25
	Viton®	L0	F3.00.C.02	F3.00.C.06	F3.00.C.10	F3.00.C.26
	EPDM	L1	F3.00.C.03	F3.00.C.07	F3.00.C.11	F3.00.C.27
	Viton®	L1	F3.00.C.04	F3.00.C.08	F3.00.C.12	F3.00.C.28
NEMA 4, 4X (IP65)	EPDM	L0	F3.00.C.13	F3.00.C.17	F3.00.C.21	F3.00.C.29
	Viton®	L0	F3.00.C.14	F3.00.C.18	F3.00.C.22	F3.00.C.30
	EPDM	L1	F3.00.C.15	F3.00.C.19	F3.00.C.23	F3.00.C.31
	Viton®	L1	F3.00.C.16	F3.00.C.20	F3.00.C.24	F3.00.C.32

**Push-pull Sensors – For Connection to NPN or PNP inputs
For Connection to Panel or Wall Mount Instruments**

Electrical Class	O-Ring	Sensor Length†	Body Material			
			CPVC	PVDF	316L SS	Brass
NEMA 6, 6P (IP68)	EPDM	L0	F3.00.P.01	F3.00.P.05	F3.00.P.09	F3.00.P.25
	Viton®	L0	F3.00.P.02	F3.00.P.06	F3.00.P.10	F3.00.P.26
	EPDM	L1	F3.00.P.03	F3.00.P.07	F3.00.P.11	F3.00.P.27
	Viton®	L1	F3.00.P.04	F3.00.P.08	F3.00.P.12	F3.00.P.28
NEMA 4, 4X (IP65)	EPDM	L0	F3.00.P.13	F3.00.P.17	F3.00.P.21	F3.00.P.29
	Viton®	L0	F3.00.P.14	F3.00.P.18	F3.00.P.22	F3.00.P.30
	EPDM	L1	F3.00.P.15	F3.00.P.19	F3.00.P.23	F3.00.P.31
	Viton®	L1	F3.00.P.16	F3.00.P.20	F3.00.P.24	F3.00.P.32