

FLS F3.00

PADDLEWHEEL FLOW SENSOR



The simple and reliable paddlewheel flow sensor type F3.00 is designed for use with every kind of solid-free liquids. The sensor can measure flow from 0.15 m/s (0.5 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 dedicated electronic, with a push-pull output, is available for a safe connection to any kind of PLC/Instrument digital input.

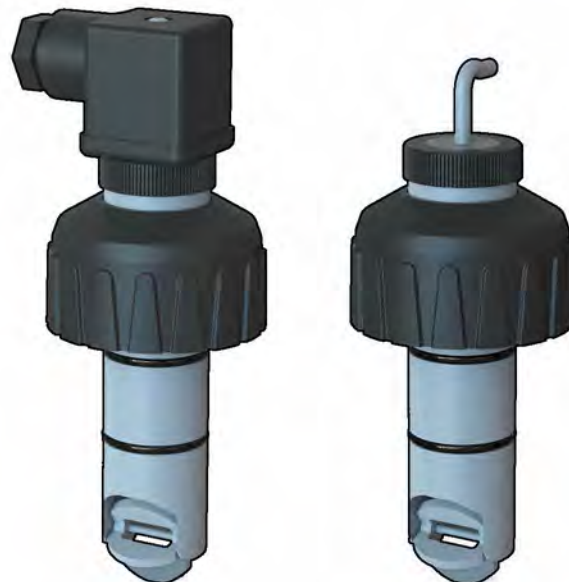
A specially designed family of fittings ensures an easy and quick installation into all pipe materials in sizes from DN15 to DN600 (0.5" to 24").

APPLICATIONS

- Water treatment and regeneration
- Industrial wastewater treatment and recovery
- Textile finishing
- Water distribution
- Processing and manufacturing industry
- Filtration systems
- Chemical production
- Liquid delivery systems
- Cooling water monitoring
- Heat Exchangers
- Swimming pools
- Pump protection

MAIN FEATURES

- C-PVC, PVDF or Stainless Steel sensor body
- Two sensor lengths to cover from DN15 up to DN600
- Easy insertion system
- IP65 or IP68 protection class
- Measurement range over 50:1
- High chemical resistance
- Version for battery powered system
- Push-Pull output for universal electrical connection



TECHNICAL DATA

General

- Pipe Size Range: DN15 to DN600 (0.5" to 24")
- Please refer to Installation Fittings section for more details
- Flow Rate Range: 0.15 to 8 m/s (0.5 to 25 ft./s)
- Linearity: $\pm 0.75\%$ of full scale
- Repeatability: $\pm 0.5\%$ of full scale
- Minimum Reynolds Number Required: 4500
- Enclosure: IP68 or IP65
- Wetted Materials:
- sensor Body: C-PVC, PVDF or 316L SS
- o-rings: EPDM or FPM
- rotor: ECTFE (Halar®)
- shaft: Ceramic (Al_2O_3)/316L SS (for metal sensors)
- bearings: Ceramic (Al_2O_3), none (for metal sensor)

Specific for F3.00.H

- Supply voltage: 5 to 24 VDC $\pm 10\%$ regulated
- Supply current: $< 30\text{ mA}$ @ 24 VDC
- Output signal:
- square wave
- frequency: 45 Hz per m/s nominal (13.7 Hz per ft/s nominal)
- type: transistor NPN open collector
- output current: 10 mA max
- Cable length: 8 m (26.4 ft) standard, 300 m (990 ft) maximum

Specific for F3.00.C

- Supply voltage: 3 to 5 VDC regulated or 3.6 Volt Lithium battery
- Supply current: $< 10\ \mu\text{A}$ max
- Output signal:

- square wave
- frequency: 45 Hz per m/s nominal (13.7 Hz per ft/s nominal)
- min. input impedance: 100 K Ω
- Cable length: 8 m (26.4 ft) standard, 16 m (52.8 ft) maximum

Specific for F3.00.P

- Supply voltage: 12 to 24 VDC $\pm 10\%$ regulated
- Supply current: $< 30\text{ mA}$ @ 24 VDC
- Output signal:
- square wave
- frequency: 45 Hz per m/s nominal (13.7 Hz per ft/s nominal)
- type: Push-Pull (for connection to NPN and PNP inputs)
- output current: 20 mA max
- Cable length: 8 m (26.4 ft) standard, 300 m (990 ft) maximum

Standards & Approvals

- Manufactured under ISO 9001
- Manufactured under ISO 14001
- CE
- RoHS Compliant
- EAC
- FDA on request for paddlewheel in C-PVC/EPDM, PVDF/EPDM, SS316L/EPDM.

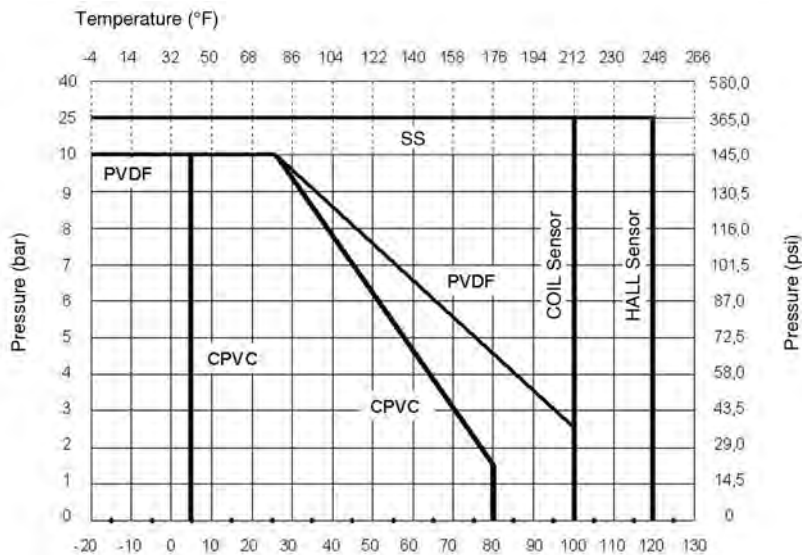
Maximum Operating Pressure / Temperature (25 years lifetime)

F3.00.H or F3.00.P Sensor

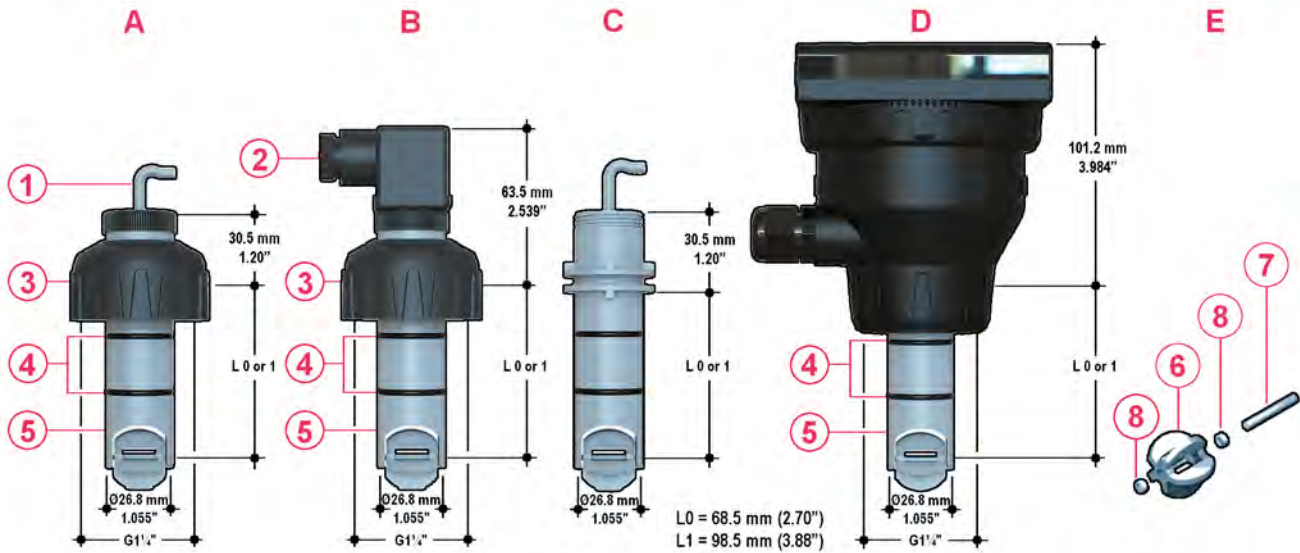
- C-PVC body:
- 10 bar (145 psi) @ 25°C (77°F)
- 1,5 bar (22 psi) @ 80°C (176°F)
- PVDF body:
- 10 bar (145 psi) @ 25°C (77°F)
- 2,5 bar (36 psi) @ 100°C (212°F)
- SS body:
- 25 bar (363 psi) @ 120°C (248°F)

F3.00.C Sensor

- C-PVC 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) @ 100°C (212°F)



DIMENSIONS



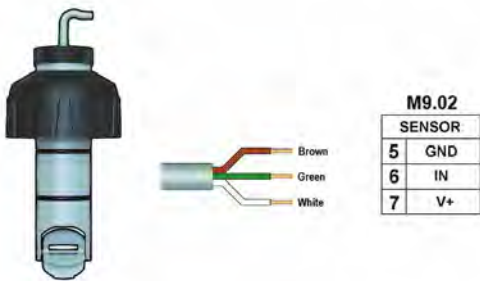
- A F3.00 IP68 Remote Sensor
- B F3.00 IP65 Remote Sensor
- C F3.01 Compact Sensor
- D F3.01 Compact Sensor + Transmitter (sold separately)
- E Paddlewheel system

- 1 Electrical cable: 8 m. (26.4 ft) standard
- 2 4 pole cable plug according to DIN 43650-B/ISO 6952
- 3 U-PVC cap for installation into fittings (SS 316L for metal sensor)
- 4 O-Ring seals available in EPDM or FPM

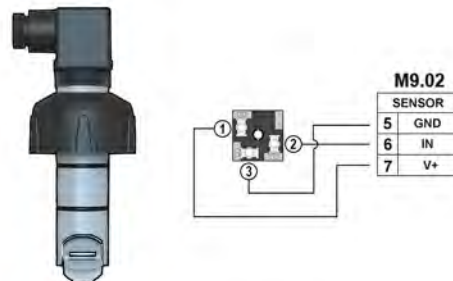
- 5 C-PVC, PVDF or Stainless Steel sensor body
- 6 ECTFE Halar® (registered trademark of Ausimont-Solvay) Open-cell rotor (SS 316L for metal sensor)
- 7 Ceramic shaft (SS 316L for metal sensor)
- 8 Ceramic bearings (none for metal sensor)

WIRING CONNECTIONS

F3.00.H IP68 Sensor wiring connection



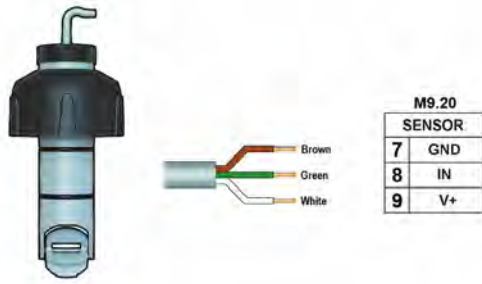
F3.00.H IP65 Sensor wiring connection



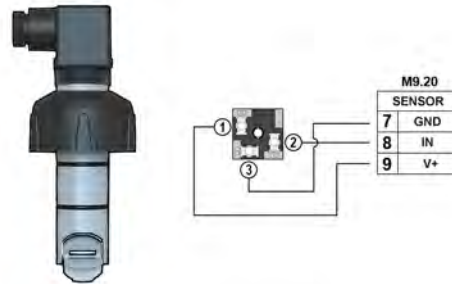
Wiring connections of F3.00.H to the other monitors

	M9.00	M9.50	M9.03	M9.07	M9.08	M9.10
GND	7	30	30	16	16	37
IN	8	28	28	14	14	36
V+	9	27	27	13	13	35

F3.00.C IP68 Sensor wiring connection



F3.00.C IP65 Sensor wiring connection



ORDERING DATA

F3.00.H.XX Paddlewheel Flow Sensor (Remote version)							
Part No.	Version	Power supply	Length	Main wetted materials	Enclosure	Flow Rate Range	Weight (gr.)
F3.00.H.01	Hall	5 - 24 VDC	L0	C-PVC/ EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.H.02	Hall	5 - 24 VDC	L0	C-PVC/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.H.03	Hall	5 - 24 VDC	L1	C-PVC/ EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.H.04	Hall	5 - 24 VDC	L1	C-PVC/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.H.05	Hall	5 - 24 VDC	L0	PVDF/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.H.06	Hall	5 - 24 VDC	L0	PVDF/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.H.07	Hall	5 - 24 VDC	L1	PVDF/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.H.08	Hall	5 - 24 VDC	L1	PVDF/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.H.09	Hall	5 - 24 VDC	L0	316SS/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.H.10	Hall	5 - 24 VDC	L0	316SS/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.H.11	Hall	5 - 24 VDC	L1	316SS/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.00.H.12	Hall	5 - 24 VDC	L1	316SS/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.00.H.13	Hall	5 - 24 VDC	L0	C-PVC/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.H.14	Hall	5 - 24 VDC	L0	C-PVC/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.H.15	Hall	5 - 24 VDC	L1	C-PVC/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.H.16	Hall	5 - 24 VDC	L1	C-PVC/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.H.17	Hall	5 - 24 VDC	L0	PVDF/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.H.18	Hall	5 - 24 VDC	L0	PVDF/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.H.19	Hall	5 - 24 VDC	L1	PVDF/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.H.20	Hall	5 - 24 VDC	L1	PVDF/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.H.21	Hall	5 - 24 VDC	L0	316SS/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.H.22	Hall	5 - 24 VDC	L0	316SS/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.H.23	Hall	5 - 24 VDC	L1	316SS/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.00.H.24	Hall	5 - 24 VDC	L1	316SS/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	650

ORDERING DATA

F3.00.C.XX Paddlewheel Flow Sensor (Remote version for Battery powered monitor M9.20)							
Part No.	Version	Power supply	Length	Main wetted materials	Enclosure	Flow Rate Range	Weight (gr.)
F3.00.C.01	Coil	3 - 5 VDC	L0	C-PVC/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.C.02	Coil	3 - 5 VDC	L0	C-PVC/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.C.03	Coil	3 - 5 VDC	L1	C-PVC/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.C.04	Coil	3 - 5 VDC	L1	C-PVC/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.C.05	Coil	3 - 5 VDC	L0	PVDF/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.C.06	Coil	3 - 5 VDC	L0	PVDF/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.C.07	Coil	3 - 5 VDC	L1	PVDF/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.C.08	Coil	3 - 5 VDC	L1	PVDF/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.C.09	Coil	3 - 5 VDC	L0	316SS/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.C.10	Coil	3 - 5 VDC	L0	316SS/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.C.11	Coil	3 - 5 VDC	L1	316SS/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.00.C.12	Coil	3 - 5 VDC	L1	316SS/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.00.C.13	Coil	3 - 5 VDC	L0	C-PVC/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.C.14	Coil	3 - 5 VDC	L0	C-PVC/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.C.15	Coil	3 - 5 VDC	L1	C-PVC/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.C.16	Coil	3 - 5 VDC	L1	C-PVC/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.C.17	Coil	3 - 5 VDC	L0	PVDF/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.C.18	Coil	3 - 5 VDC	L0	PVDF/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.C.19	Coil	3 - 5 VDC	L1	PVDF/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.C.20	Coil	3 - 5 VDC	L1	PVDF/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.C.21	Coil	3 - 5 VDC	L0	316SS/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.C.22	Coil	3 - 5 VDC	L0	316SS/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.C.23	Coil	3 - 5 VDC	L1	316SS/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.00.C.24	Coil	3 - 5 VDC	L1	316SS/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	650

ORDERING DATA

F3.00.P.XX Paddlewheel Flow Sensor (for direct connection to PLC)							
Part No.	Version	Power supply	Length	Main wetted materials	Enclosure	Flow Rate Range	Weight (gr.)
F3.00.P.01	Push-Pull	12 - 24 VDC	L0	C-PVC/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.P.02	Push-Pull	12 - 24 VDC	L0	C-PVC/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.P.03	Push-Pull	12 - 24 VDC	L1	C-PVC/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.P.04	Push-Pull	12 - 24 VDC	L1	C-PVC/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.P.05	Push-Pull	12 - 24 VDC	L0	PVDF/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.P.06	Push-Pull	12 - 24 VDC	L0	PVDF/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.P.07	Push-Pull	12 - 24 VDC	L1	PVDF/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.P.08	Push-Pull	12 - 24 VDC	L1	PVDF/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.P.09	Push-Pull	12 - 24 VDC	L0	316SS/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.P.10	Push-Pull	12 - 24 VDC	L0	316SS/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.P.11	Push-Pull	12 - 24 VDC	L1	316SS/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.00.P.12	Push-Pull	12 - 24 VDC	L1	316SS/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.00.P.13	Push-Pull	12 - 24 VDC	L0	C-PVC/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.P.14	Push-Pull	12 - 24 VDC	L0	C-PVC/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.P.15	Push-Pull	12 - 24 VDC	L1	C-PVC/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.P.16	Push-Pull	12 - 24 VDC	L1	C-PVC/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.P.17	Push-Pull	12 - 24 VDC	L0	PVDF/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.P.18	Push-Pull	12 - 24 VDC	L0	PVDF/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.00.P.19	Push-Pull	12 - 24 VDC	L1	PVDF/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.P.20	Push-Pull	12 - 24 VDC	L1	PVDF/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.00.P.21	Push-Pull	12 - 24 VDC	L0	316SS/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.P.22	Push-Pull	12 - 24 VDC	L0	316SS/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.00.P.23	Push-Pull	12 - 24 VDC	L1	316SS/EPDM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.00.P.24	Push-Pull	12 - 24 VDC	L1	316SS/FPM	IP65	0.15 to 8 m/s (0.5 to 25 ft./s.)	650

INSERTION FLOW SENSORS

ORDERING DATA

F3.01.X.XX Paddlewheel Flow Sensor (Compact version)							
Part No.	Version	Power supply	Length	Main wetted materials	Enclosure	Flow Rate Range	Weight (gr.)
F3.01.H.01	Hall	5 - 24 VDC	L0	C-PVC/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.01.H.02	Hall	5 - 24 VDC	L0	C-PVC/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.01.H.03	Hall	5 - 24 VDC	L1	C-PVC/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.01.H.04	Hall	5 - 24 VDC	L1	C-PVC/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.01.H.05	Hall	5 - 24 VDC	L0	PVDF/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.01.H.06	Hall	5 - 24 VDC	L0	PVDF/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.01.H.07	Hall	5 - 24 VDC	L1	PVDF/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.01.H.08	Hall	5 - 24 VDC	L1	PVDF/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.01.H.09	Hall	5 - 24 VDC	L0	316SS/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.01.H.10	Hall	5 - 24 VDC	L0	316SS/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.01.H.11	Hall	5 - 24 VDC	L1	316SS/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.01.H.12	Hall	5 - 24 VDC	L1	316SS/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.01.C.01	Coil	3 - 5 VDC	L0	C-PVC/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.01.C.02	Coil	3 - 5 VDC	L0	C-PVC/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.01.C.03	Coil	3 - 5 VDC	L1	C-PVC/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.01.C.04	Coil	3 - 5 VDC	L1	C-PVC/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.01.C.05	Coil	3 - 5 VDC	L0	PVDF/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.01.C.06	Coil	3 - 5 VDC	L0	PVDF/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	250
F3.01.C.07	Coil	3 - 5 VDC	L1	PVDF/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.01.C.08	Coil	3 - 5 VDC	L1	PVDF/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	300
F3.01.C.09	Coil	3 - 5 VDC	L0	316SS/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.01.C.10	Coil	3 - 5 VDC	L0	316SS/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	600
F3.01.C.11	Coil	3 - 5 VDC	L1	316SS/EPDM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	650
F3.01.C.12	Coil	3 - 5 VDC	L1	316SS/FPM	IP68	0.15 to 8 m/s (0.5 to 25 ft./s.)	650