SensorsX

SX-FENB Series

Electromagnetic Flowmeter

Industrial Flow | Conductive Liquids | Slurries | Corrosive Media

±0.5 % FS Accuracy	**DN10 – DN2000** Nominal Diameter Range	**4-20 mA / HART** Output Signal
IP65 / IP68 Ingress Protection (IEC 60529)	**Explosion protection options available** Optional Explosion Protection	**0.6 – 4.0 MPa** Working Pressure Range

Industrial Flow Measurement | Conductive Liquids | Slurries | Corrosive Media

■ PRODUCT OVERVIEW

The SX-FENB Series electromagnetic flowmeter consists of a flow tube and a converter. Based on Faraday's law of electromagnetic induction, it measures the volumetric flow rate of electrically conductive liquids with conductivity ≥5 μS/cm. The series is suitable for water, wastewater, corrosive liquids, acids and alkalis, mud, mineral slurries, and paper pulp. Typical applications include oil and gas, chemical processing, metallurgy, pulp and paper, food processing, municipal water supply, water conservancy, and river or canal flow measurement.

Typical Measurements

- Volumetric flow of conductive liquids (conductivity ≥ 5 μS/cm)
- Corrosive liquids including strong acids and alkalis
- Slurries, mineral slurry, and paper pulp
- Bidirectional flow measurement (forward and reverse)
- Municipal water supply and wastewater treatment

■ KEY FEATURES

◆ **High Accuracy** ±0.5 % FS; repeatability 0.25 %	◆ **Wide Flow Velocity Range** 0.3 – 12 m/s; extended range 0.1 – 15 m/s (0.98 – 49.2 ft/s)
◆ **Bidirectional Measurement** Measures both forward and reverse flow	◆ **Multiple Output Signals** Pulse, 4–20 mA, HART, Modbus
◆ **Corrosion Resistant Liners** Rubber (Neoprene), PTFE; F46 & PU available (ordering options)	◆ **Multiple Electrode Materials** 316L stainless steel, Hastelloy B/C, Tantalum, Titanium
◆ **Integral & Remote Converter** One-piece or split-type converter available	◆ **Optional Explosion Protection** Explosion protection options available
◆ **Flexible Power Supply** 220 VAC or 24 VDC selectable	◆ **High Ingress Protection** IP65 or IP68 per IEC 60529

■ TYPICAL APPLICATIONS

Typical Applications

- Oil & Gas
- Chemical Processing
- Metallurgy & Smelting
- Power Generation
- Water & Wastewater
- Pulp & Paper
- Food & Beverage
- Pharmaceutical
- Municipal Water Supply

■ PERFORMANCE SPECIFICATIONS

Measurement	
Measured Fluid	Electrically conductive liquids
Minimum Conductivity	≥ 5 μS/cm
Nominal Diameter	DN10 – DN2000 (NPS 3/8" – 79")
Flow Velocity Range	0.3 – 12 m/s (0.98 – 39.4 ft/s); extended range: 0.1 – 15 m/s (0.33 – 49.2 ft/s)
Flow Direction	Bidirectional (forward and reverse)
Accuracy	
Reference Accuracy	±0.5 % FS
Repeatability	0.25 %
Process Conditions	
Fluid Temperature	−25 °C to ≤ +180 °C (−13 °F to ≤ +356 °F)
Working Pressure	1.0 MPa, 1.6 MPa, 4.0 MPa (145, 232, 580 psi)
Measurement Tube Material	304 Stainless Steel (non-magnetic)
Electrode Type	Standard
Electrode Count	Three or more

■ ELECTRICAL SPECIFICATIONS

Power	
Supply Voltage	220 VAC ±20%, 50 Hz OR 24 VDC (select on order)
Output Signal	
Standard Output	Pulse (frequency) output
Optional Outputs	4–20 mA; HART, Modbus

Electrical Connection	
Cable Entry	2 × M20×1.5 Female
Protection	
Ingress Protection	IP65 or IP68 (IEC 60529) — select on order
Explosion Protection	Explosion protection options available
Converter Form	Integral (one-piece) or Remote (split) type

■ ENVIRONMENTAL SPECIFICATIONS

Temperature	
Ambient Operating Temperature	−25 °C to +60 °C (−13 °F to +140 °F)
Humidity	5 % – 90 % RH (non-condensing)
Mechanical & Environmental	
Ingress Protection	IP65 / IP68 (IEC 60529)
Installation	Flanged or Wafer (clamp) type

■ PROCESS CONNECTIONS & WETTED MATERIALS

Process Connection	
Connection Type	Flanged — EN 1092 / ASME B16.5, Raised Face (RF) available on request
Alternate Connection	Wafer (clamp) type; Insertion type
Nominal Diameter	DN10 – DN2000
Rated Pressure	0.6 MPa (87 psi), 1.0 MPa (145 psi), 2.5 MPa (363 psi), 4.0 MPa (580 psi)
Materials in Contact with Medium	
Measurement Tube	304 Stainless Steel
Liner Material	Rubber (Neoprene) and PTFE (Polytetrafluoroethylene)
Electrode Material	316L stainless steel | Hastelloy B | Hastelloy C | Tantalum | Titanium
Flange / Housing Material	304 stainless steel | 316L stainless steel | Carbon Steel
Grounding	Grounding electrode (DN50+) or 316L stainless steel grounding ring (DN40−)

Liner Material Selection Guide

Category	Name	Code	Properties	Max. Working Temp.	Applicable Fluids	Applicable DN Range
Rubber	Neoprene Rubber	CR	Moderate abrasion resistance; resists low-concentration acid/alkali salt corrosion	< 60 °C (< 140 °F)	Tap water, industrial water, seawater	DN50 – DN2000
	Polyurethane Rubber	PU	Excellent abrasion resistance; poor acid/alkali resistance	< 60 °C (< 140 °F)	Paper pulp, mineral slurry, slurries	DN25 – DN500
Fluoroplastic	PTFE (Polytetrafluoroethylene)	F4 (PTFE)	Excellent chemical stability; withstands boiling HCl, H_2SO_4, aqua regia, concentrated alkali	< 160 °C (< 320 °F)	Strongly corrosive acid/alkali salt liquids	DN25 – DN1600
	FEP (Fluorinated Ethylene Propylene)	F46 (FEP)	Chemical properties equivalent to F4; improved pressure resistance; superior tensile strength vs. F4	< 120 °C (< 248 °F)	Corrosive acid/alkali salt liquids	DN10 – DN200

	PFA (Perfluoroalkoxy Alkane)	PFA	Chemical properties equivalent to F46; improved pressure resistance; superior tensile strength vs. F46	< 180 °C (< 356 °F)	Corrosive acid/alkali salt liquids	DN10 – DN300

■ COMMUNICATION PROTOCOLS

Pulse (Frequency) Output [Standard]

Output	Standard pulse / frequency output

4–20 mA + HART [Optional]

Analog Output	4–20 mA
Digital Communication	HART protocol

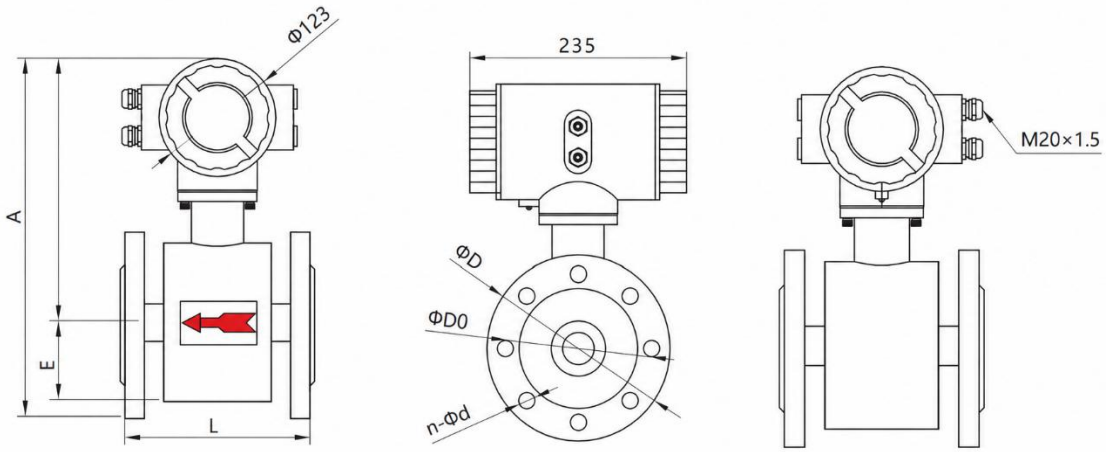
■ CERTIFICATIONS & APPROVALS

Explosion Protection (Optional)	
Explosion protection	Explosion protection options available
General Compliance	
Ingress Protection	IP65 / IP68 per IEC 60529

[Note: Certificate numbers and specific approval codes depend on product configuration. Contact SensorsX Technology Inc. for current approval certificates applicable to your order.]

■ MECHANICAL DIMENSIONS

Transmitter Body (Reference)



DN25-300 DN25-500

※ *All dimensions are for reference only. Contact SensorsX for certified dimension drawings.*

Flow Rate Reference Table — Volumetric Flow Rate (m³/h) at Given Flow Velocities

DN (mm)	0.5 m/s	1 m/s	2 m/s	3 m/s	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
10	0.14	0.28	0.57	0.85	1.1	1.4	1.7	2.0	2.3	2.5	2.8

25	0.88	1.8	3.5	5.3	7.1	8.8	11	12	14	16	17.6
50	3.5	7.1	14	21	28	35	42	49	57	64	70
80	9.0	18	36	54	72	90	109	127	145	163	180
100	14	28	57	85	113	141	170	198	226	254	282
150	32	64	127	191	254	318	382	445	509	572	636
200	57	113	226	339	452	565	678	791	904	1017	1131
300	127	254	509	763	1017	1272	1526	1780	2035	2289	2545
500	353	707	1413	2120	2826	3533	4239	4946	5652	6359	7069
1000	1413	2826	5652	8478	11304	14130	16956	19782	22608	25434	28260

※ Partial table shown for reference. Full table covers DN10–DN2000 at 0.5–10 m/s. Units: m³/h.

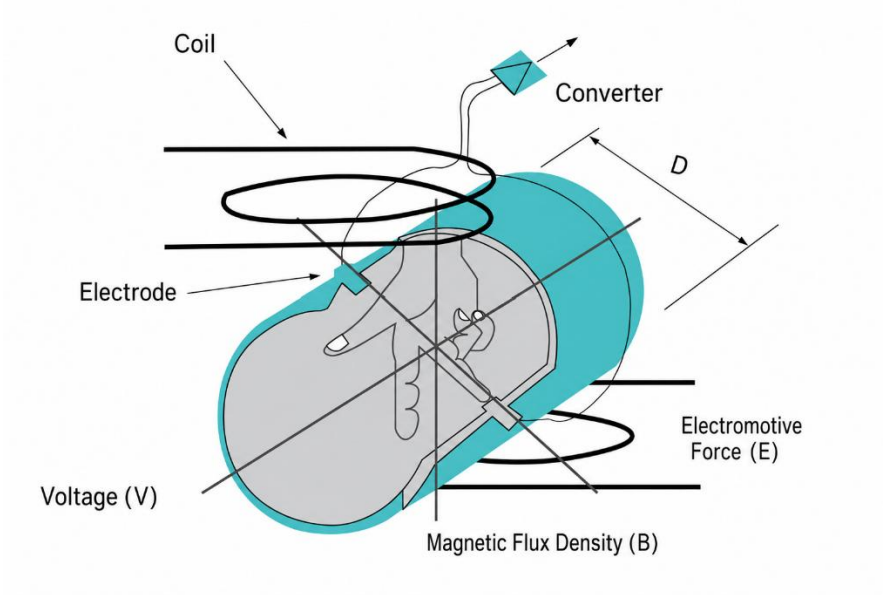
■ OPERATING PRINCIPLE

The SX-FENB series measurement principle is based on Faraday's law of electromagnetic induction. When conductive liquid flows through the measurement tube, the converter supplies excitation current to generate a magnetic field. One or more pairs of electrodes detect the induced EMF perpendicular to the flow direction:

E = K × B × V × D

K — Meter constant
B — Magnetic flux density
V — Mean flow velocity across the cross-section
D — Inner diameter of the measurement tube
Q = 0.785 × D × E / K (volumetric flow rate)

When the pipe structure, flux density, and electrode constant are fixed, volumetric flow rate is directly proportional to the induced EMF. The signal is transmitted to the converter for intelligent processing, then output via standard signals (4–20 mA / HART).



■ ORDERING INFORMATION — SX-FENB SERIES

Complete model number example: SX-FENB-NBB100ABAABAACBAA

Connection Type	
A	Wafer (Clamp) Type
B	Flanged connection; flange standard to be specified when ordering
C	Insertion Type
Nominal Diameter (DN)	
10	DN10 mm
15	DN15 mm

20	DN20 mm
25	DN25 mm
32	DN32 mm
40	DN40 mm
50	DN50 mm
65	DN65 mm
80	DN80 mm
100	DN100 mm
125	DN125 mm
150	DN150 mm
200	DN200 mm
250	DN250 mm
300	DN300 mm
350	DN350 mm
400	DN400 mm
450	DN450 mm
500	DN500 mm
600	DN600 mm
700	DN700 mm
800	DN800 mm
900	DN900 mm
1000	DN1000 mm
1200	DN1200 mm
1400	DN1400 mm
1600	DN1600 mm
1800	DN1800 mm
2000	DN2000 mm
Electrode Material	
A	316L Stainless Steel
B	Hastelloy B
C	Tantalum
D	Titanium
E	Hastelloy C
Liner Material	
A	Neoprene Rubber (Chloroprene)
B	PTFE
C	Polyurethane (PU)
D	F46 (Fluorinated Ethylene Propylene)
Flange & Housing Material	
A	304 Stainless Steel
B	Carbon Steel
C	316L Stainless Steel
Grounding Ring or Grounding Electrode	
A	Grounding Electrode — DN50 and above
B	316L stainless steel Grounding Ring — DN40 and below
C	Grounding Electrode — DN50 and below, non-316L stainless steel material

Rated Pressure Class	
A	4.0 MPa (580 psi)
B	1.0 MPa (145 psi)
C	0.6 MPa (87 psi)
D	2.5 MPa (363 psi)
Process Temperature	
A	≤ 60 °C (≤ 140 °F)
B	≤ 180 °C (≤ 356 °F)
Converter Form	
A	Integral (one-piece) Type
B	Remote (split) Type
Output Signal	
A	Pulse (Frequency) Output — Standard
B	4–20 mA
C	HART
Power Supply	
A	220 VAC ±20%, 50 Hz
B	24 VDC
Ingress Protection	
A	IP65 (IEC 60529)
B	IP68 (IEC 60529)
Explosion Protection	
A	Without (Standard)
E	With explosion protection
Customized	
D	Customized —specify requirements when ordering

Ordering Example:
SX-FENB-NBB100ABAABAACBAA → Flanged, DN100, Electrode: 316L stainless steel, Liner: PTFE, Flange: 304 stainless steel, Grounding Electrode (DN50+), Pressure: 1.0 MPa, Temp ≤ 60 °C, Integral Type, Hart, 24 VDC, IP65, No Explosion Protection