SensorsX

SX-FULB Series

Clamp-on Ultrasonic Flowmeter

High Accuracy · No Contamination · Non-Invasive Installation



±1 % F.S. Accuracy	**DN8 – DN20 (¼" – ¾")** Pipe Size Range	**RS485 Modbus RTU / 4–20 mA** Output
IP54 Ingress Protection	**TFT-LCD (4-way rotatable)** Display	**20–30 V DC** Power Supply

High Accuracy · No Contamination · Non-Invasive Installation · No Pipe Cutting · Clamp-on

■ PRODUCT OVERVIEW

The SX-FULB Series clamp-on ultrasonic flowmeter is a non-contact, non-invasive liquid flow measurement device. Based on the ultrasonic transit-time principle, it measures liquid flow inside the pipe without cutting the pipe or interrupting the process. The clamp-on design provides no pressure loss and no process-fluid contact, making it suitable for flow monitoring and management in industrial applications.

Typical Measurements

- Instantaneous flow rate
- Accumulated flow total
- Flow velocity
- Signal quality



**1 Guaranteed values are based on calibrated flow test equipment. Deviations may occur depending on pipe type, condition, fluid type, fluid temperature, and zero cutoff set value.*

**2 The liquid used must be able to propagate ultrasonic waves and must not contain large quantities of air bubbles.*

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Non-standard pipe materials (e.g. lined pipe or other non-single-material pipe) may cause unstable detection.

**3 For measurements above 85 °C (185 °F), consult SensorsX.*

NOTE: The SX-FULB series is NOT intended for trade metering or other commercial billing purposes.

■ KEY FEATURES

◆ Non-Contact, Non-Invasive
No pipe cutting or wall damage required; clamp-on installation with a single screwdriver

◆ Transit-Time Ultrasonic Principle
Rapidly and accurately measures liquid flow inside the pipe without interrupting the process

◆ High Accuracy & Repeatability
Accuracy ±1 % F.S.; repeatability 0.15 % F.S.

◆ No Pressure Loss, No Contamination
Completely external installation; no contact with process fluid

◆ One Clamp, Two Pipe Sizes
Reversing the base bracket 180° selects between two supported pipe diameters

◆ Multiple Alarm Output Modes
Instantaneous flow mode, zone mode, and totalizer mode

◆ Rotatable TFT-LCD Display
Screen supports 4 orientation directions, allowing multiple installation positions

◆ Compatible Pipe Materials
Metal pipe (stainless steel, carbon steel, copper) and plastic pipe (PVDF, PVC, PPR, PPH, PFA, HDPE)

◆ Multiple Measurable Media
Water, chemical liquids, organic liquids, and oils

◆ Multiple Output Options
RS-485 / Modbus RTU, 4–20 mA, and NPN/PNP discrete output

■ TYPICAL APPLICATIONS

Typical Applications

- Photovoltaic
- Environmental
- Liquid Cooling
- Semiconductor
- Agriculture & Animal Husbandry
- Food Processing
- Li-ion Battery
- Pharmaceutical

■ PERFORMANCE SPECIFICATIONS

Pipe Size and Flow Range

Pipe Size	Nominal Size	Installation OD (mm)	Installation OD (in)	Flow Range (L/min)
DN8	¼"	12 – 14	0.47 – 0.55	1.0 – 20
DN10	⅜"	14 – 18	0.55 – 0.71	1.0 – 30
DN15	½"	18 – 23	0.71 – 0.91	2.5 – 60
DN20	¾"	23 – 28	0.91 – 1.10	2.5 – 100

General Specifications

Measurement	
Measurement Principle	Ultrasonic transit-time
Pipe Size Range	DN8 to DN20 (NPS ¼" to ¾")
Pipe Materials	Metal pipe; Resin (plastic) pipe
Measurable Media	Water; chemical liquids; organic liquids; oils
Accuracy	
Accuracy	±1 % F.S. *1
Repeatability	0.15 % F.S. *1
Display	
Display Type	TFT-LCD; rotatable
Display Update Rate	0.25 s
Display Resolution	0.01 / 0.1 / 1 (default: 0.1)

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Displayed Variables	Instantaneous flow rate; accumulated flow total; signal quality; flow velocity
Flow Units	
Available Units	L/min | m³/h | L/h
Menu Language	
Languages	Chinese / English (switchable)

■ ELECTRICAL SPECIFICATIONS

Power Supply	
Supply Voltage	20–30 V DC
Output Signal	
Digital Output	RS485 Modbus RTU
Analog Output	4–20 mA (0–24 mA / 0–20 mA adjustable)
Discrete Output	NPN / PNP
Alarm Output Modes	
Available Modes	Instantaneous flow mode; totalizer mode; zone mode
Electrical Connection	
Connector	M12 × 1
Cable	
Cable Length	2,000 mm (78.7 in)
Sensor Type	
Type	Integral (one-body)

■ ALARM OUTPUT MODES

1. Instantaneous Flow Mode	Triggered when the instantaneous flow rate exceeds the set threshold. Enable this mode when a signal is required for high-flow or low-flow conditions.
2. Zone Mode	Triggered when the instantaneous flow rate deviates outside a defined range. Enable this mode when the flow must be kept within a specified band.
3. Totalizer Mode	Triggered when the accumulated flow reaches a preset value. Enable this mode when a signal is needed after a set volume has accumulated.

■ DISPLAY INTERFACE

Display Zone	Content	Description
Upper zone	Signal strength / Alarm / Status icon	Signal strength indicator — re-installation recommended when fewer than 3 bars. Alarm indication; status icon shown when no alarm is acti.
Middle zone	Flow rate	Instantaneous flow rate
Lower zone	Flow velocity / Totalizer	Flow velocity value; totalizer — up to 6 digits; overflow displays 'error' and requires manual reset

The screen supports 4 orientation directions, allowing multiple installation configurations.

■ ENVIRONMENTAL SPECIFICATIONS

Temperature	
Liquid Temperature	0 to +85 °C (32 to +185 °F) (non-freezing) *3
Ambient Temperature	−10 to +60 °C (+14 to +140 °F) (non-freezing)

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Humidity	
Relative Humidity	35–85 % RH (non-condensing)
Mechanical	
Ingress Protection	IP54 (IEC 60529)
Vibration Resistance	10–150 Hz; acceleration 2 m/s² (0.20 g); X, Y, Z axes — 2 hours each
Housing & Materials	
Housing Material	Aluminium alloy
Sensor Material	PEEK
Sensor Type	Integral (one-body)

■ PROCESS CONNECTIONS & WETTED MATERIALS

Installation Method	
Type	Clamp-on (non-invasive; sensor mounts on pipe exterior only — no process fluid contact)
Installation Tool	Single screwdriver
Compatible Pipe Materials	
Metal Pipe	Stainless steel, carbon steel, copper
Plastic Pipe (Resin)	PVDF, PVC, PPR, PPH, PFA, HDPE
Wetted Materials	
Sensor Contact Material	PEEK (outer pipe surface contact only — no contact with process fluid)
Installation Notes	
Bracket	Reversing the base bracket 180° accommodates two different pipe diameters
Lined / Non-standard Pipe	Monitoring may be unstable — consult SensorsX *2
Flexible Hose	Consult SensorsX before installation

■ INSTALLATION

Three-Step Installation (single screwdriver required)

Step 1	Adjust the direction of the base bracket according to the pipe size. The base bracket can be reversed 180° to select the appropriate pipe diameter. Match the pipe diameter in use with the supported diameter value marked on the side of the bracket. Note: Align correctly so that the upper bracket fully covers the lower bracket.
Step 2	Secure the bracket onto the pipe. Note: Fix the bracket evenly to avoid uneven installation.
Step 3	Secure the sensor onto the bracket. Note: Fix the sensor firmly and evenly to avoid uneven installation. Consult SensorsX when installing on flexible hose.

■ COMMUNICATION PROTOCOLS

RS485 / Modbus RTU

Interface	RS-485 (2-wire)
Protocol	Modbus RTU

■ MECHANICAL DIMENSIONS

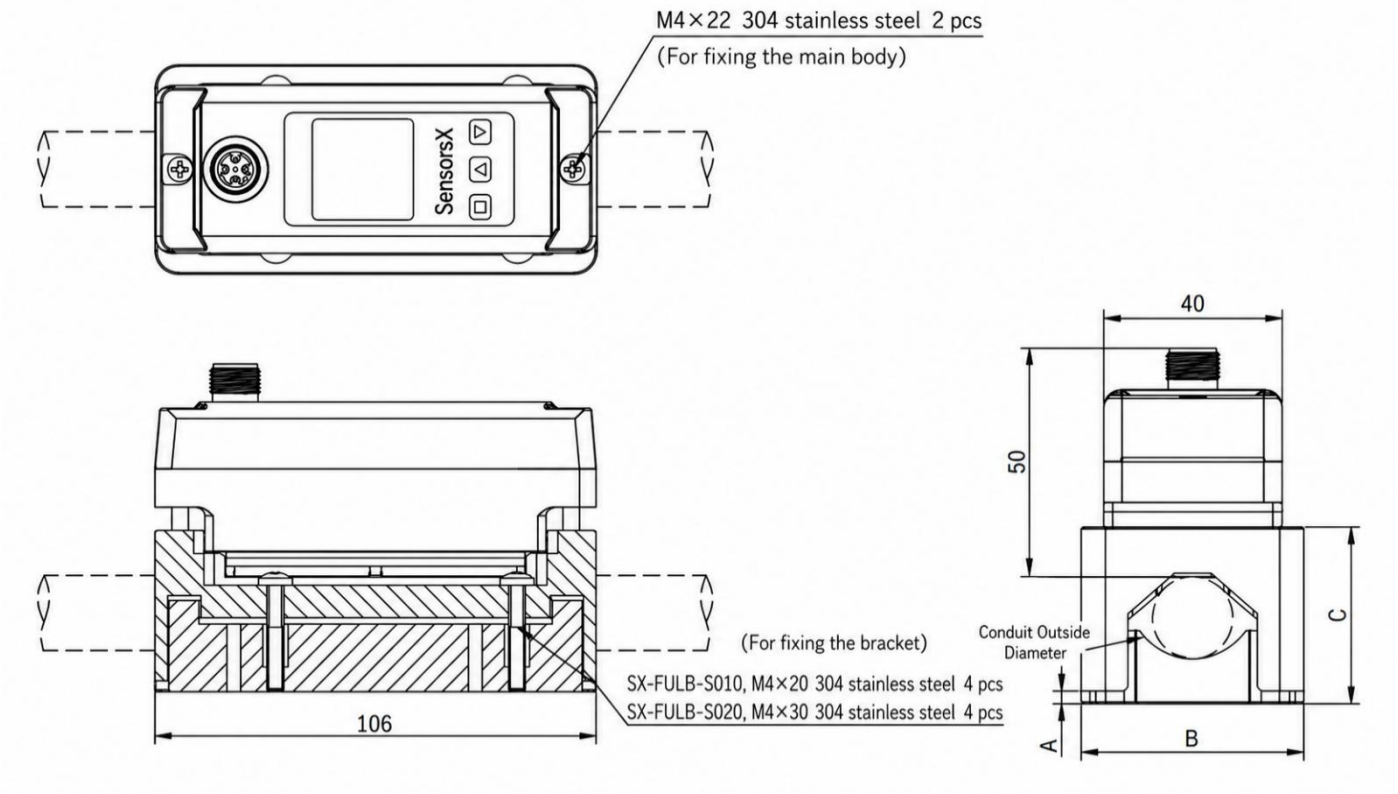
Dimension Table (all dimensions in mm; inch equivalents added)

Source Model (ref.)	Dim A — max pipe OD	Dim B	Dim C

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SX-FULB-S010	8 mm max (0.31 in)	50 mm (1.97 in)	30 mm (1.18 in)
SX-FULB-S020	14.3 mm max (0.56 in)	50 mm (1.97 in)	39 mm (1.54 in)

Dimension Drawing



Fasteners: M4×22 304 stainless steel screws (×2) for main body; M4×20 304 stainless steel screws or M4×30 304 stainless steel screws (×4) for bracket (varies by model).

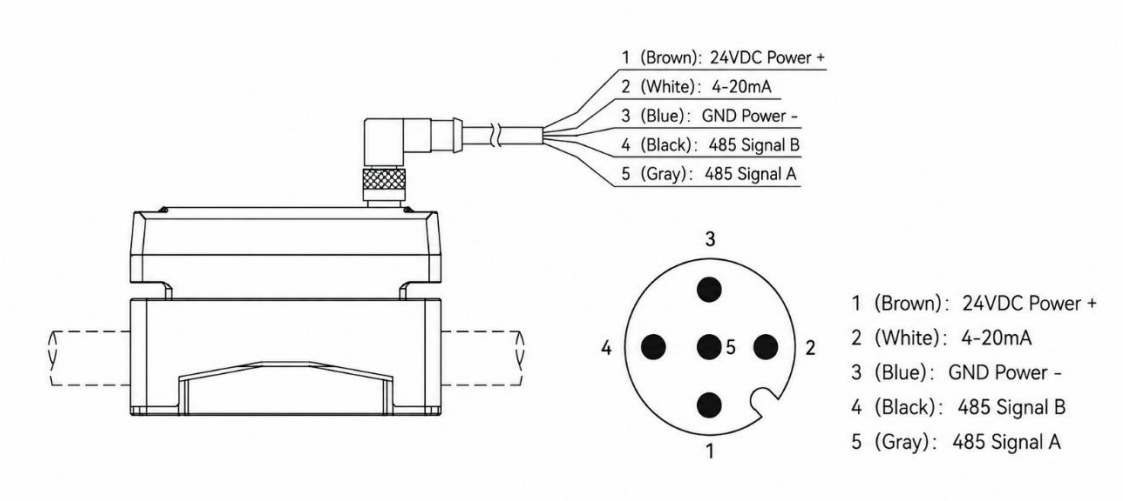
■ WIRING DIAGRAM

M12 × 1 Connector — Pin Assignment by Output Variant

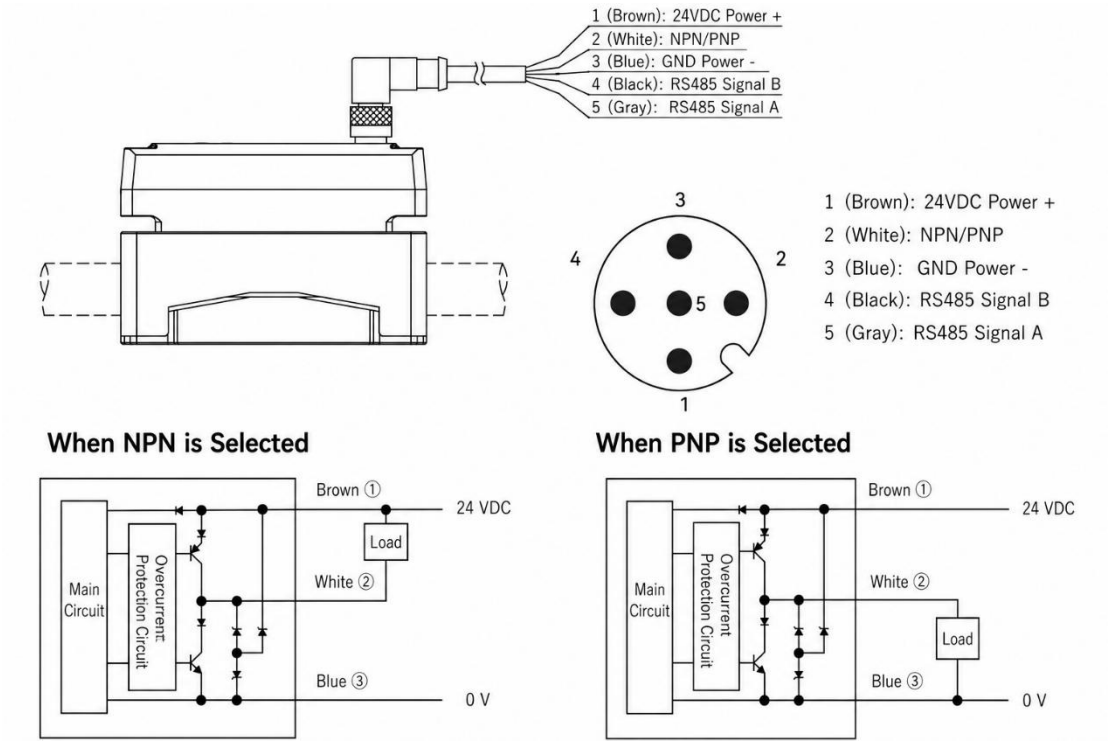
Pin	Color	RS485 / 4-20 mA	RS485 / NPN/PNP	4-20 mA / NPN/PNP
1	Brown	24 V DC +	24 V DC +	24 V DC +
2	White	4–20 mA	NPN / PNP	4–20 mA
3	Blue	GND −	GND −	GND −
4	Black	RS485 Signal B	RS485 Signal B	NC
5	Grey	RS485 Signal A	RS485 Signal A	NPN / PNP

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Variant 1 — RS485 / 4-20 mA Output

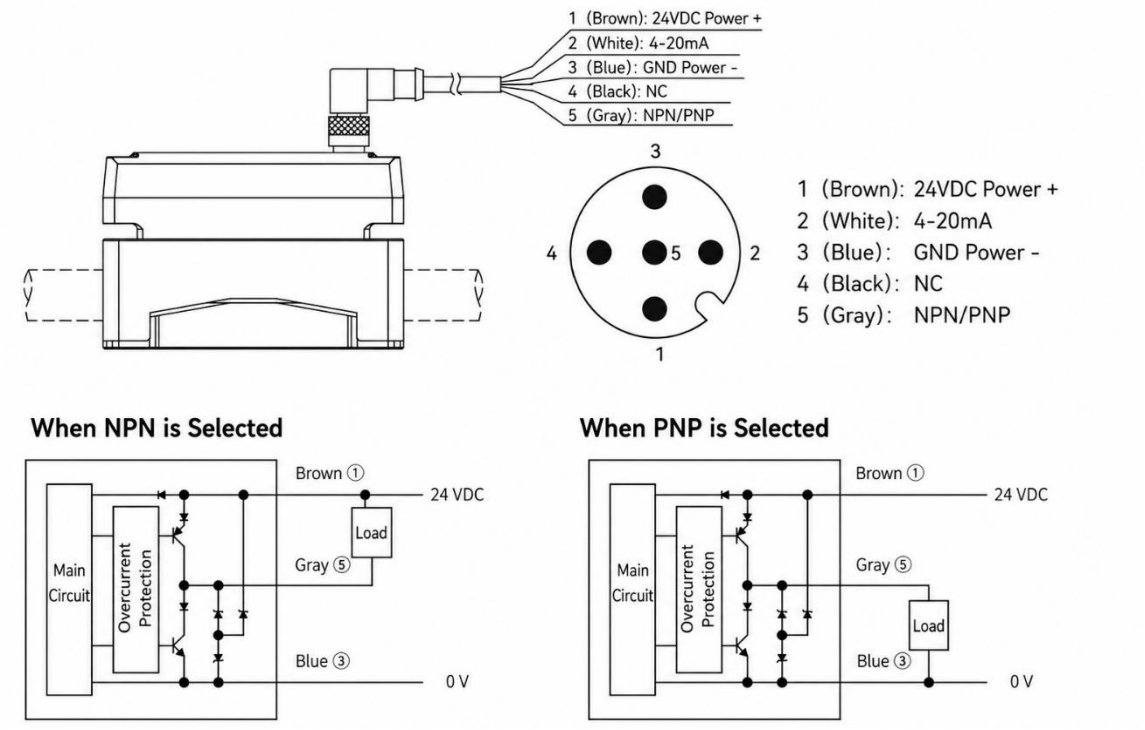


Variant 2 — RS485 / NPN/PNP Output



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Variant 3 — 4-20 mA / NPN/PNP Output



NPN Discrete Output — Connection Notes	
NPN circuit	Connect brown ① (24 V DC +) through over-current protection circuit to load; grey ⑤ (signal) to load; blue ③ (GND −) to 0 V
PNP Discrete Output — Connection Notes	
PNP circuit	Connect brown ① (24 V DC +) through over-current protection circuit; grey ⑤ (signal) to load positive; blue ③ (GND −) to 0 V

■ ORDERING INFORMATION

Complete model number example: SX-FULB-S010R

Application Type	
S	**Standard**
Flow Range	
008	**DN8 (NPS ¼") | 1.0–20 L/min**
010	**DN10 (NPS ⅜") | 1.0–30 L/min**
015	**DN15 (NPS ½") | 2.5–60 L/min**
020	**DN20 (NPS ¾") | 2.5–100 L/min**
025	**DN25 (NPS 1") | 5.0-200L/min**
030	**DN32 (NPS 1¼") | 5.0-300L/min**
040	**DN40 (NPS 1½") | 25.0-400L/min**
050	**DN50 (NPS 2") | 25.0-500L/min**
Output	
R	**RS485 Modbus RTU + 4–20 mA (0–24 mA / 0–20 mA adjustable)**
A	**4–20 mA (0–24 mA / 0–20 mA adjustable) + NPN / PNP discrete output**
B	**RS485 Modbus RTU + NPN / PNP discrete output**

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Customized	
D	Customized —specify requirements when ordering

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