

SensorsX SX-PDCB Series

Industrial Process Differential Pressure Transmitter

Industrial Process Measurement | Pressure | Level | Flow | Density



±0.075 % FS Accuracy	0.2 kPa – 3 MPa Differential Pressure	4-20 mA / HART / Modbus Output
IP67 Ingress Protection	ATEX (option) Explosion Proof	12 – 42 V DC Power Supply

Industrial Process Measurement | Pressure | Level | Flow | Density

■ PRODUCT OVERVIEW

The SX-PDCB series smart differential pressure transmitter is engineered for high-precision process measurement in demanding industrial environments. Built on silicon piezoresistive MEMS sensing technology and a rugged industrial housing, it delivers outstanding accuracy, long-term stability, and wide-range adaptability. The SX-PDCB series is ideal for a wide range of industrial applications, providing reliable 4–20 mA HART output with optional Modbus RTU and Profibus PA communication.

Typical Measurements

- Differential pressure measurement of liquids, gases, and steam
- Tank and vessel level monitoring
- Flow measurement (differential pressure method)
- Density and interface measurement



■ KEY FEATURES

◆ High Accuracy $\pm 0.075\%$ FS; $\pm(0.0075 \times \text{TD})\%$ FS when TD > 10	◆ Wide Differential Pressure Range 0.2 kPa to 3 MPa span, bidirectional range
◆ Excellent Long-Term Stability Code A: $\pm 0.5\%$ / yr; Code B: $\pm 0.2\%$ / yr; Code C/D/E: $\pm 0.1\%$ / yr	◆ Multiple Communication Protocols HART Modbus RTU Profibus PA
◆ Multiple Diaphragm Materials 316L stainless steel Hastelloy C Tantalum Gold-plated FEP-coated	◆ Hazardous Area Certified Intrinsic Safety ATEX Flameproof ATEX (optional)
◆ Flexible Drain/Vent Options Without, rear, upper-side, lower-side, or vertical-mount drain valve	◆ Rugged Industrial Housing Aluminum alloy or 316 stainless steel; IP67

■ TYPICAL APPLICATIONS

Industries Served

• Oil & Gas	• Power Generation	• Food & Beverage
• Petrochemical & Chemical	• Water & Wastewater	• Pharmaceutical
• Metal Smelting	• Pulp & Paper	• Marine & Offshore

■ PERFORMANCE SPECIFICATIONS

Measurement

Pressure Type	Differential pressure
Measuring Range (Span)	Code A: Span 0.1–1 kPa Range –1 to +1 kPa Code B: Span 0.2–6 kPa Range –6 to +6 kPa Code C: Span 0.4–40 kPa Range –40 to +40 kPa Code D: Span 2.5–250 kPa Range –250 to +250 kPa Code E: Span 20–2000 kPa Range –500 to +2000 kPa (–5 to +20 bar) Code F: Span 30–3000 kPa Range –300 to +3000 kPa (–3 to +30 bar)
Maximum Static Pressure	16 MPa / 25 MPa / 40 MPa (selectable)
Sensor Technology	Silicon piezoresistive (MEMS)
Turndown Ratio	Adjustable within range code limits

Accuracy

Reference Accuracy	$\pm 0.075\%$ FS (standard); $\pm (0.0075 \times \text{TD})\%$ FS when TD > 10
Square Root Output Accuracy	1.5 × reference accuracy

Temperature Effect (–20 to +65 °C)

Code A	$\pm (0.45 \times \text{TD} + 0.25)\% \times \text{Span}$
Code B	$\pm (0.30 \times \text{TD} + 0.20)\% \times \text{Span}$
Code C/D/E	$\pm (0.20 \times \text{TD} + 0.10)\% \times \text{Span}$

Temperature Effect (–40 to –20 °C and 65 to 85 °C)

Code A	$\pm (0.45 \times \text{TD} + 0.25)\% \times \text{Span}$
Code B	$\pm (0.30 \times \text{TD} + 0.20)\% \times \text{Span}$
Code C/D/E	$\pm (0.20 \times \text{TD} + 0.10)\% \times \text{Span}$
Overpressure Effect	$\pm 0.075\% \times \text{Span}$

Stability

Long-Term Stability

Code A	$\pm 0.5\% \times \text{Span} / \text{year}$
Code B	$\pm 0.2\% \times \text{Span} / \text{year}$
Code C/D/E	$\pm 0.1\% \times \text{Span} / \text{year}$

Static Pressure Effect

Code A	$\pm (0.15\% \text{ URL} + 0.10\% \text{ Span}) / 4 \text{ MPa}$
Code B	$\pm (0.10\% \text{ URL} + 0.075\% \text{ Span}) / 16 \text{ MPa}$
Code C/D/E	$\pm (0.05\% \text{ URL} + 0.05\% \text{ Span}) / 16 \text{ MPa}$

Overpressure Effect

Code A	$\pm 0.2\% \times \text{Span} / 4 \text{ MPa}$
Code B	$\pm 0.2\% \times \text{Span} / 16 \text{ MPa}$
Code C/D/E	$\pm 0.1\% \times \text{Span} / 16 \text{ MPa}$

Response

Response Time	Amplifier damping: 0.1 s; sensor time constant: 0.1–1.6 s (range-dependent); additional adjustable damping: 0.1–60 s
Warm-up Time	< 15 s

■ ELECTRICAL SPECIFICATIONS

Power

Supply Voltage	12–42 V DC (15 V DC minimum with backlit LCD display)
Power Consumption	< 0.8 W typical

Output Signal

Analog Output	4–20 mA, 2-wire, loop-powered; linear or square-root selectable
Output Limits	I _{min} = 3.9 mA / I _{max} = 20.5 mA
Alarm Current — Low	3.7 mA
Alarm Current — High	21 mA
Alarm Current — Hold	Holds last valid output value
Default Alarm Mode	High (max.)
Digital Communication	HART Modbus RTU (485) Profibus PA (select on order)

Electrical Connection

Cable Entry	M20×1.5 or ½ NPT (select via Housing Materials code)
Wire Cross-Section	0.5–2.5 mm ²
Digital Comm. Load	250–600 Ω

Protection

Power Supply Effect	±0.001 % / 10 V (12–42 V DC), negligible
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■ ENVIRONMENTAL SPECIFICATIONS

Temperature

Ambient Operating Temperature	–40 to +85 °C (–40 to +185 °F)
— With LCD display or FKM seal	–20 to +65 °C (–4 to +149 °F)
Storage / Transport Temperature	–50 to +85 °C; –40 to +85 °C with LCD

Process Working Pressure

Rated Working Pressure	16 MPa / 25 MPa / 40 MPa (selectable)
Static Pressure Limit	3.5 kPa absolute to rated pressure; protection pressure up to 1.5× rated pressure (applied simultaneously to both sides)
One-Side Overload Limit	Up to rated working pressure

Mechanical & Environmental

Ingress Protection	IP67 (IEC 60529)
Installation Position Effect	No span effect; zero offset < 0.4 kPa if mounted > 90° from diaphragm plane — correctable via zero adjustment

EMC Specifications

No.	Test Item	Basic Standard	Test Condition	Performance Level
1	Radiated Interference (housing)	EN 55022 / CISPR 22	30 MHz – 1000 MHz	Pass
2	Conducted Interference (DC power port)	EN 55022 / CISPR 22	0.15 MHz – 30 MHz	Pass
3	Electrostatic Discharge (ESD) Immunity	IEC 61000-4-2	4 kV (contact) / 8 kV (air)	B
4	Radiated RF Electromagnetic Field Immunity	IEC 61000-4-3	10 V/m (80 MHz – 1 GHz)	A
5	Power Frequency Magnetic Field Immunity	IEC 61000-4-8	30 A/m	A
6	Electrical Fast Transient / Burst (EFT) Immunity	IEC 61000-4-4	2 kV (5/50 ns, 5 kHz)	B
7	Surge Immunity	IEC 61000-4-5	1 kV (line-to-line) / 2 kV (line-to-earth) (1.2 μs/50 μs)	B
8	Conducted RF Disturbance Immunity	IEC 61000-4-6	3 V (150 kHz – 80 MHz)	A

(1) Performance Level A: During testing, performance is normal within the limits of the technical specification.

(2) Performance Level B: During testing, function or performance is temporarily degraded or lost, but self-recovers; actual operating state, stored data and configuration are not changed.

Weight & Housing

Housing Material	Aluminum alloy (epoxy coated) or 316 stainless steel (select on order)
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Nameplate	304 stainless steel
Approx. Weight	3.3 kg (without LCD, bracket, or process connection accessories)

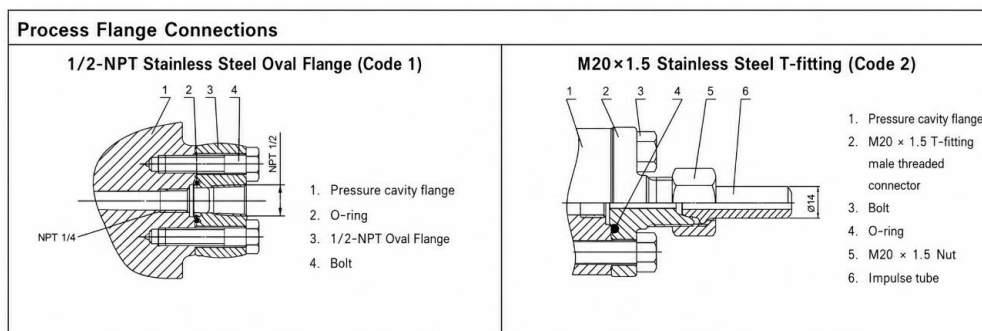
■ PROCESS CONNECTIONS & WETTED MATERIALS

Process Connection	
Thread (both sides)	¼" NPT female & 7/16" UNF female threaded ports on process flange
Drain / Vent Valve	Without Rear flange face Upper side Lower side Vertical mount with valve

Materials in Contact with Medium	
Measuring Cell	316L stainless steel
Diaphragm	316L stainless steel 316L stainless steel Gold-plated 316L stainless steel FEP-plated Hastelloy C Tantalum
Process Flange	304 stainless steel
Fasteners	SUS (A4) stainless steel
Fill Fluid	Silicone oil Fluorine oil (select via Diaphragm code)
Sealing Material	NBR FKM PTFE (select on order)
Housing Seal	NBR

Pressure Connection Accessories	
Optional	½" NPT female SS oval flange M20×1.5 male SS T-fitting Without

Process Flange Connection Accessories



■ COMMUNICATION PROTOCOLS

HART (4-20 mA / HART) — Output Code H

Protocol Version	HART
Configuration	Via HART handheld communicator or AMS / PACTware
Output Mode	Linear or square-root selectable

Modbus RTU — Output Code M

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

Profibus PA — Output Code P

Profile	Profibus PA
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■ CERTIFICATIONS & APPROVALS

Explosion Protection	
Intrinsic Safety ATEX	Available — select Code B in Explosion Proof field
Flameproof ATEX	Available — select Code E in Explosion Proof field

General Compliance	
Ingress Protection	IP67 (IEC 60529)
EMC	EN 55022 / IEC 61000-4 series / IEC 61326 (CE Marking — 2014/30/EU EMC Directive)

Standards

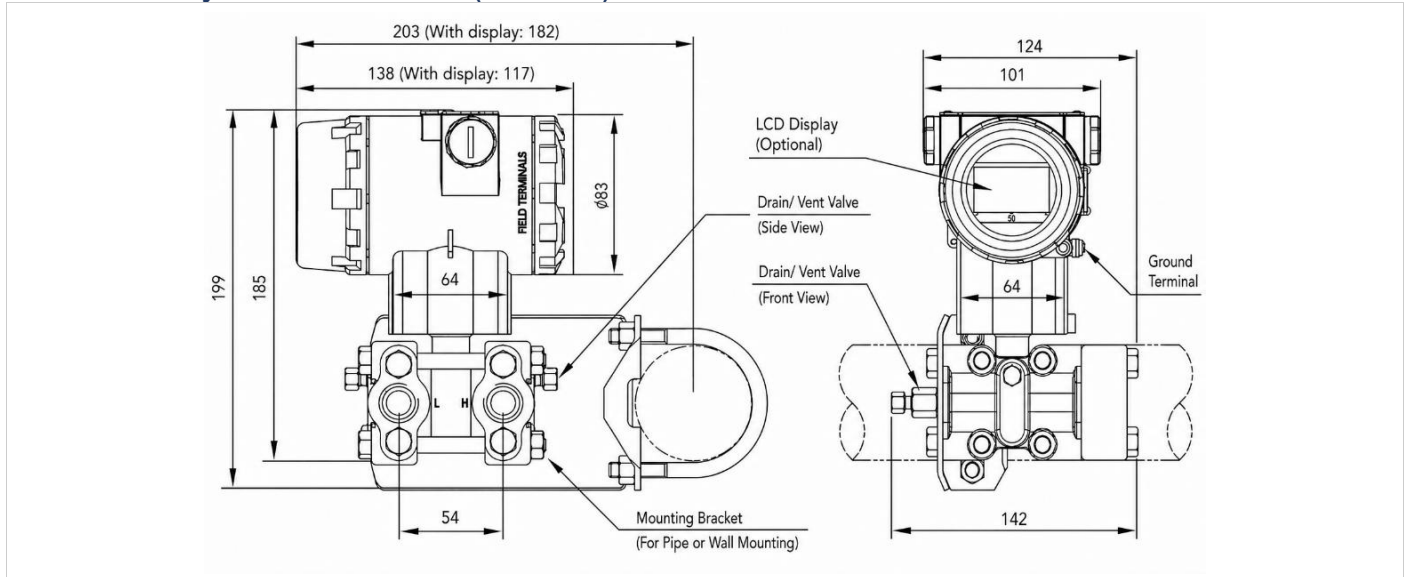
Pressure Standard

IEC 60770-1

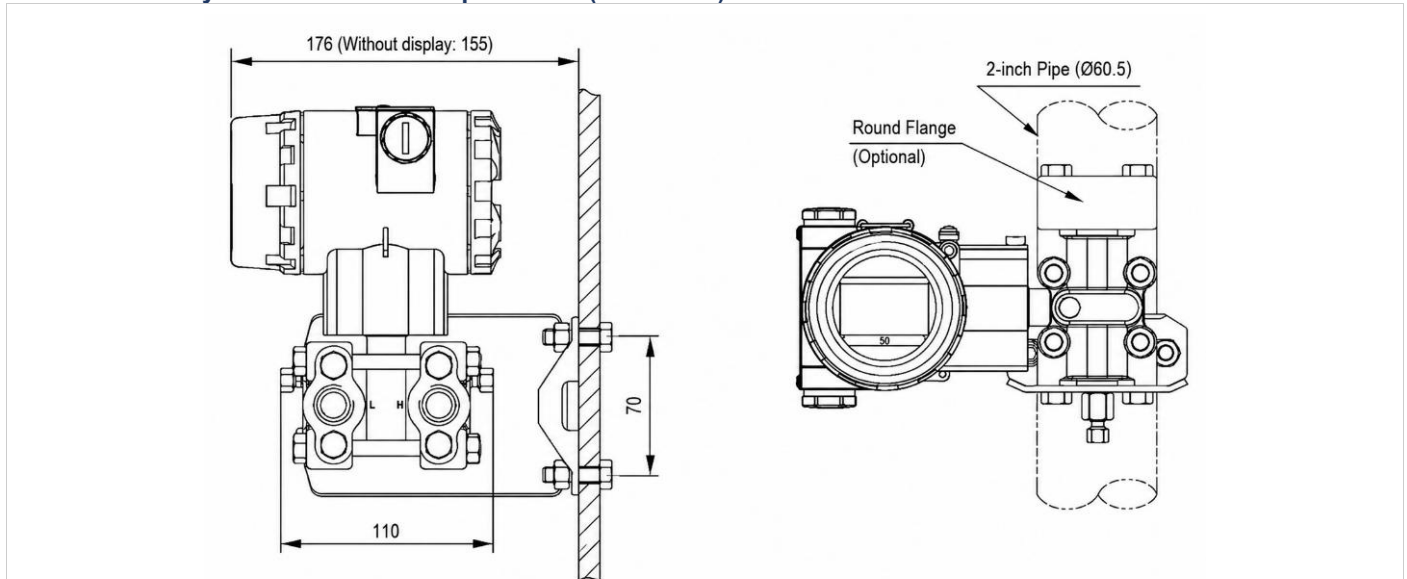
※ Certificate numbers and exact protection codes depend on specific product configuration. Contact SensorsX Technology Inc. for the current approval certificate applicable to your order.

MECHANICAL DIMENSIONS

Transmitter Body — Horizontal View (units: mm)

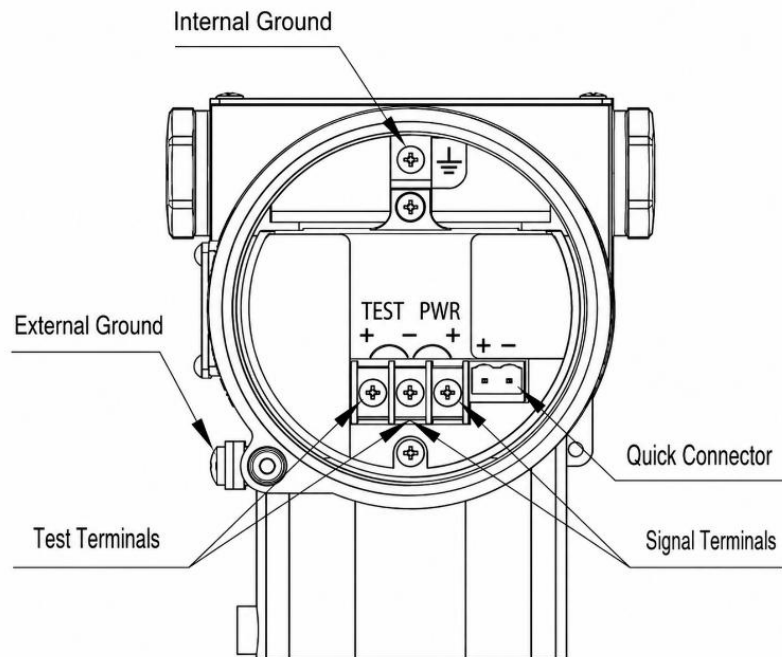


Transmitter Body — Wall Mount & Pipe Mount (units: mm)



WIRING DIAGRAM

4-20 mA / HART Loop Wiring



※ Quick-connect port has equivalent function to signal terminals.

Terminal Assignment

Terminal (+) PWR / Signal +	Power / Loop + (4–20 mA)
Terminal (–) PWR / Signal –	Power / Loop – (4–20 mA)
TEST+ / TEST–	Loop test terminals (read mA without breaking loop)
⏏ Internal Ground	Internal chassis ground
⏏ External Ground	External protective earth terminal

※ Use shielded twisted-pair cable. Ground shield at one end only. Minimum loop supply: 12 V DC.

■ ORDERING INFORMATION — SX-PDCB SERIES

Complete model number example: SX-PDCB-BCOA1BNNNN2NNENH

Suffix "-D" appended only when customization is required.

Accuracy	
B	±0.075 % FS
Differential Pressure Range	
A	0–100 Pa to 0–1 kPa (custom range , accuracy ±0.1 % FS)
B	0–200 Pa to 0–6 kPa (0–20 to 600 mmH ₂ O / 0–2 to 60 mbar)
C	0–400 Pa to 0–40 kPa (0–40 to 4000 mmH ₂ O / 0–4 to 400 mbar)
D	0–2.5 kPa to 0–250 kPa (0–0.25 to 25 mH ₂ O / 0–25 to 2500 mbar)
E	0–10 kPa to 0–1 MPa (0–1 to 100 mH ₂ O / 0–0.1 to 10 bar)
F	0–30 kPa to 0–3 MPa (0–3 to 300 mH ₂ O / 0–0.3 to 30 bar)
Static Pressure	
0	Without
Diaphragm Material and Filling Fluid	
A	316L stainless steel with Silicone oil
B	316L stainless steel with Fluorine oil
C	Hastelloy C with Silicone oil
D	Hastelloy C with Fluorine oil
E	316L stainless steel Gold-plated with Silicone oil

F	316L stainless steel Gold-plated with Fluorine oil
G	316L stainless steel FEP-plated with Silicone oil
T	Tantalum with Silicone oil
Maximum Working Pressure	
1	16 MPa
2	25 MPa
3	40 MPa
Pressure Connection	
N	¼" NPT & 7/16" UNF threaded ports — without drain/vent valve
B	¼" NPT & 7/16" UNF threaded ports — drain/vent valve on rear flange face
U	¼" NPT & 7/16" UNF threaded ports — drain/vent valve on upper flange side
D	¼" NPT & 7/16" UNF threaded ports — drain/vent valve on lower flange side
V	Vertical mounting flange, ¼" NPT & 7/16" UNF threaded ports, with drain/vent valve
Sealing Material	
N	NBR
F	FKM
P	PTFE
Safety Options	
N	Without
P	Lightning protection
O	Oil-free treatment (oxygen measurement; fluorine oil fill fluid, FKM seal, <6 MPa, <60 °C; integrated type only)
F	Square root output
Mounting Bracket	
N	Without
1	Stainless steel (SUS)
2	Galvanized carbon steel
Pressure Connection Accessories	
N	Without
1	½" NPT female stainless steel oval flange
2	M20×1.5 male stainless steel T-fitting
Display	
N	Without
2	LED backlit LCD (min. ambient -20 °C)
3	OLED display (min. ambient -40 °C)
Explosion Proof	
N	Without
B	Intrinsic safety ATEX
E	Flameproof ATEX
Tag Plate	
N	Without
1	Tag number on nameplate
2	Hanging stainless steel tag plate
Manual	

E	Standard (English)
Housing Material	
N	Aluminum alloy with M20×1.5
T	Aluminum alloy with NPT 1/2
S	316 stainless steel with M20×1.5
U	316 stainless steel with NPT 1/2
Output / Power Supply	
H	4–20 mA / HART
M	Modbus
P	Profibus PA
Additional Options	
N	without
V	Low-voltage version (reduced supply voltage; specify required voltage range in order remarks)
Customized	
D	Customized — specify requirements in order remarks

※ For pressure connection accessories or mounting brackets, please contact SensorsX Technology Inc.