

SensorsX SX-PTCB Series

Direct-Mount Process Pressure Transmitter

Industrial Process Pressure Measurement | Gauge | Absolute | Level | Density



±0.075 % FS Accuracy	0.6 kPa–40 MPa Gauge Range	4-20 mA / HART / Modbus Output Signal
IP67 Ingress Protection	ATEX IS & FP Explosion Protection	9–36 V DC Power Supply

Industrial Process Pressure Measurement | Gauge | Absolute | Level | Density

■ PRODUCT OVERVIEW

The SX-PTCB series gauge and absolute pressure transmitter measures level, density, and pressure of liquids, gases, or steam, and converts them into a 4–20 mA DC HART output signal. The SX-PTCB series provides HART, Profibus PA, and RS-485 Modbus communication protocols.

Typical Measurements

- Gauge and absolute pressure measurement
- Tank and vessel level monitoring
- Density and interface measurement



■ KEY FEATURES

◆ High Accuracy ±0.075%	◆ Wide Measuring Range Gauge: 0.6 kPa–40 MPa; Absolute: 2 kPa–3 MPa
◆ Excellent Long-Term Stability ±0.15% URL / 10 years	◆ Multiple Communication Protocols 4-20 mA HART RS-485 Modbus RTU Profibus PA
◆ Hazardous Area Certified ATEX — Intrinsic Safety and Flameproof	◆ Excellent Temperature Performance –40 to +85 °C (–40 to +185 °F) operating range
◆ Flexible Process Connections ½" NPT (standard); G½, M20×1.5, KF16 vacuum fitting (adapters)	◆ Flexible Display Options LCD / OLED / None — selectable on order
◆ IP67 Ingress Protection per IEC 60529	◆ Linear or Square Root Output 4-20 mA DC, 2-wire, loop-powered

■ TYPICAL APPLICATIONS

Industries Served

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

■ PERFORMANCE SPECIFICATIONS

Measurement	
Pressure Type	Gauge (Relative) / Absolute

Measuring Range — Gauge	0–0.6 kPa to 0–40 MPa (0–0.087 to 0–5,801 psi)
Measuring Range — Absolute	0–2 kPa to 0–3 MPa (0–0.29 to 0–435 psi)
Span Adjustment	Adjustable within range limits; calibrated span $\geq$ minimum span. Recommend lowest available range code to optimize performance.
Mounting Position Effect	No zero shift for tilt parallel to diaphragm face. Tilt $> 90^\circ$: Range C < 0.25 kPa zero shift; other ranges < 0.15 kPa zero shift — correctable by zero adjustment. No span effect.
Accuracy	
Reference Accuracy	$\pm 0.075\%$ (Option: $\pm 0.1\%$) (Includes linearity from zero, hysteresis, and repeatability)
Accuracy (Turndown TD > 10)	$\pm (0.0075 \times \text{TD}) \%$
Accuracy (Range B, TD > 6)	$\pm (0.0125 \times \text{TD}) \%$
Temperature Effect (-25 to $+65^\circ\text{C}$ / -13 to $+149^\circ\text{F}$)	$\pm (0.15 \times \text{TD} + 0.05) \%$ $\times$ Span total; $\pm 0.08 \%$ per 10°C (18°F) interval at TD = 1
Temperature Effect (-40 to -25°C and $+65$ to $+85^\circ\text{C}$)	$\pm (0.20 \times \text{TD} + 0.05) \%$ $\times$ Span
Over-range Effect	$\pm 0.075 \%$ $\times$ Span
Stability	
Long-Term Stability	$\pm 0.15 \%$ URL / 10 years
Power Supply Effect	$\pm 0.001 \%$ / 10 V (12–36 V DC, negligible)
Response	
Amplifier Damping	0.1 s (adjustable); additional adjustable time constant: 0.1–60 s
Sensor Time Constant	0.1–1.6 s (depends on range and turndown ratio)
Warm-up Time	< 15 s

Measuring Range and Span — Gauge Pressure (SX-PTCBA)

Range Code	Span (kPa)	Span (bar)
B	0.6–6 kPa (range: -6 to $+6$ kPa)	6–60 mbar (range: -60 to $+60$ mbar)
C	2–40 kPa (range: -40 to $+40$ kPa)	0.02–0.4 bar (range: -0.4 to $+0.4$ bar)
D	2.5–250 kPa (range: -100 to $+250$ kPa)	0.025–2.5 bar (range: -1 to $+2.5$ bar)
F	30–3,000 kPa (range: -100 to $+3,000$ kPa)	0.3–30 bar (range: -1 to $+30$ bar)
G	0.1–10 MPa (range: -0.1 to $+10$ MPa)	1–100 bar (range: -1 to $+100$ bar)
H	0.21–21 MPa (range: -0.1 to $+21$ MPa)	2.1–210 bar (range: -1 to $+210$ bar)
I	0.4–40 MPa (range: -0.1 to $+40$ MPa)	4–400 bar (range: -1 to $+400$ bar)
J	0.6–60 MPa (range: -0.1 to $+60$ MPa)	6–600 bar (range: -1 to $+600$ bar)

Measuring Range and Span — Absolute Pressure (SX-PTCBB)

Range Code	Span (kPa)	Span (bar)
L	2–40 kPa (range: 0 to 40 kPa)	0.02–0.4 bar (range: 0 to 0.4 bar)
M	2.5–250 kPa (range: 0 to 250 kPa)	0.025–2.5 bar (range: 0 to 2.5 bar)
O	30–3,000 kPa (range: 0 to 3,000 kPa)	0.3–30 bar (range: 0 to 30 bar)

※ Span range is adjustable within the limits shown above. Calibrated span must be $\geq$ minimum span. It is recommended to select the range code with the lowest turndown ratio to optimize performance characteristics.

Overload Limits

Measuring Range (Max. Span)	Overload Limit
≤ 6 kPa (0.87 psi)	0.2 MPa (29 psi)
≤ 40 kPa (5.8 psi)	1 MPa (145 psi)
≤ 250 kPa (36.3 psi)	4 MPa (580 psi)
≤ 1 MPa (145 psi)	6 MPa (870 psi)
≤ 3 MPa (435 psi)	15 MPa (2,176 psi)
≤ 10 MPa (1,450 psi)	20 MPa (2,900 psi)
≤ 21 MPa (3,046 psi)	50 MPa (7,252 psi)
≤ 60 MPa (8,702 psi)	50 MPa (7,252 psi)

■ ELECTRICAL SPECIFICATIONS

Power

Supply Voltage (No Display)	9–36 V DC
Supply Voltage (With LCD / OLED)	13.5–36 V DC
Maximum Supply Voltage	36 V DC
Recommended Load Condition (24 V)	$R \leq (U_s - 12 \text{ V}) / I_{\text{max}}$ kΩ, where $I_{\text{max}} = 23 \text{ mA}$

Output Signal

Analog Output	4–20 mA DC, 2-wire (linear or square root selectable)
Digital Protocol	HART / RS-485 Modbus RTU / Profibus PA (select on order)
Output Signal Limits	$I_{\text{min}} = 3.9 \text{ mA}$, $I_{\text{max}} = 20.5 \text{ mA}$
Alarm — Low Mode	3.6 mA (minimum)
Alarm — High Mode	21 mA (maximum, default)
Alarm — Hold Mode	Maintains last valid output value

Electrical Connection

Cable Entry	M20×1.5 Female or ½ NPT Female (select on order)
Digital Load Range	230–600 Ω
Wiring	Terminal accepts 0.5–2.5 mm² conductors; standard M20×1.5 nylon cable gland included

Display

Display Options	LCD / OLED / None (select on order)
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Protection

Ingress Protection	IP67 (IEC 60529)
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■ ENVIRONMENTAL SPECIFICATIONS

Temperature

Ambient Operating Temperature	–40 to +85 °C (–40 to +185 °F)
— With LCD display	–20 to +65 °C (–4 to +149 °F)
Storage / Transport Temperature	–50 to +85 °C (–58 to +185 °F)
— With LCD display (storage)	–25 to +85 °C (–13 to +185 °F)

Mechanical & Environmental

Ingress Protection	IP67 (IEC 60529)
Humidity	0–100 %
Pressure Limits	Vacuum to maximum measuring range

Weight & Housing

Housing Material	Aluminium alloy (epoxy-coated exterior); 316 Stainless Steel (optional)
Enclosure O-ring	EPDM (Ethylene Propylene Diene Monomer)
Nameplate	304 stainless steel
Approx. Weight	1.6 kg (3.5 lb) — aluminium enclosure, without display, mounting bracket, or process connection

Electromagnetic Compatibility (EMC) — IEC / EN Standards

No.	Test Item	Standard (IEC / EN)	Test Condition	Performance
1	Radiated Emissions (Enclosure)	CISPR 22 / EN 55022	30 MHz–1,000 MHz	Pass
2	Conducted Emissions (DC Power Port)	CISPR 22 / EN 55022	0.15 MHz–30 MHz	Pass
3	Electrostatic Discharge (ESD) Immunity	IEC 61000-4-2	4 kV (contact), 8 kV (air)	Class B
4	Radiated RF Field Immunity	IEC 61000-4-3	10 V/m (80 MHz–1 GHz)	Class A

5	Power Frequency Magnetic Field Immunity	IEC 61000-4-8	30 A/m	Class A
6	Electrical Fast Transient / Burst Immunity	IEC 61000-4-4	2 kV (5/50 ns, 5 kHz)	Class B
7	Surge Immunity	IEC 61000-4-5	1 kV (line-line), 2 kV (line-PE) (1.2 µs/50 µs)	Class B
8	Conducted RF Immunity	IEC 61000-4-6	3 V (150 kHz–80 MHz)	Class A

Performance Class A: normal operation within specification during test. Class B: temporary degradation, self-recoverable; stored data and operational state unchanged.

■ PROCESS CONNECTIONS & WETTED MATERIALS

Process Connection

Standard Connection	½" NPT Female (internal thread) — Code 1
Adapter Options	½" NPT Male G½ Male M20×1.5 Male KF16 vacuum fitting (DIN 28403 / ISO 2861, ≤ 2.5 bar / 250 kPa only) ¼" NPT Male / Female

Materials in Contact with Medium

Diaphragm	316L stainless steel Hastelloy C
Process Connection Body	316L stainless steel

Fill Fluid

Silicone oil	Standard
Fluorine oil	Optional

Housing

Transmitter Enclosure	Aluminium alloy (epoxy-coated) 316 Stainless Steel (optional)
Enclosure Seal	EPDM O-ring

■ COMMUNICATION PROTOCOLS

4-20 mA / HART

Analog Output	4-20 mA DC, 2-wire, loop-powered
HART Protocol	HART signal superimposed on 4-20 mA loop
Output Mode	Linear or square root selectable

RS-485 Modbus RTU

Interface	RS-485
Protocol	Modbus RTU
Load Range	230–600 Ω

Profibus PA

Protocol	Profibus PA
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■ CERTIFICATIONS & APPROVALS

Explosion Protection

ATEX	Intrinsic Safety: Ex ia IIC T4...T6 Ga Flameproof: Ex d IIC T4...T6 Gb
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EMC

Standard	CISPR 22 / IEC 61000-4 series (see EMC table in Environmental Specifications)
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Ingress Protection

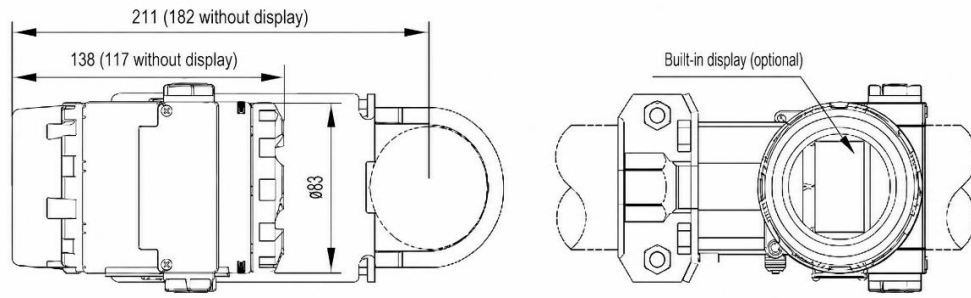
Standard	IP67 per IEC 60529
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※ Certificate numbers and exact protection codes depend on specific product configuration. Contact SensorsX Technology Inc. for the current approval certificate applicable to your order.

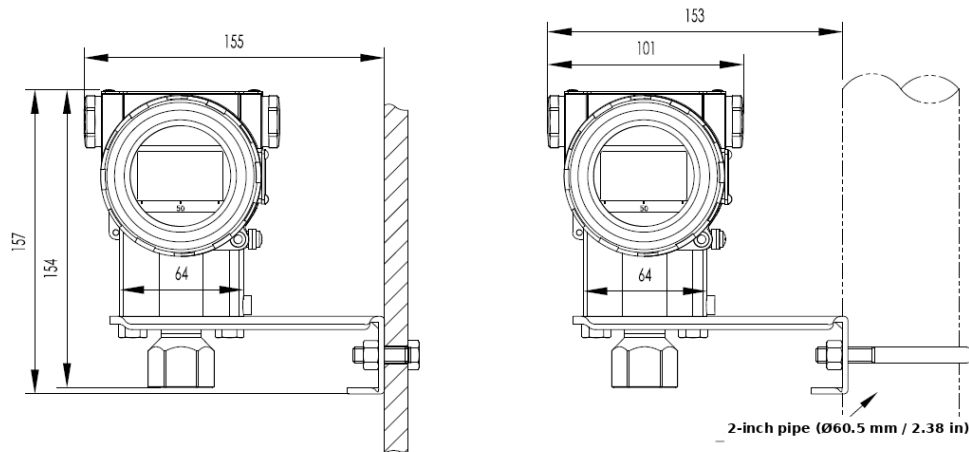
■ MECHANICAL DIMENSIONS

※ All dimensions in mm unless otherwise stated.

Transmitter Body Horizontal View

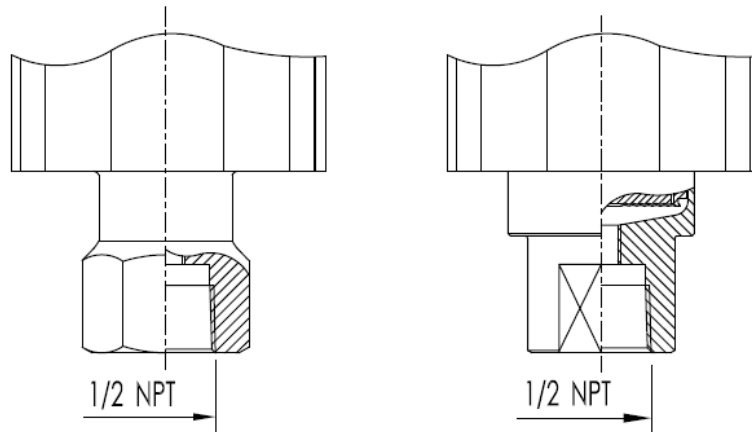


Wall Mount (left) and 2-Inch Pipe Mount (right)

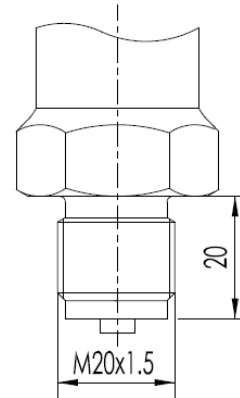
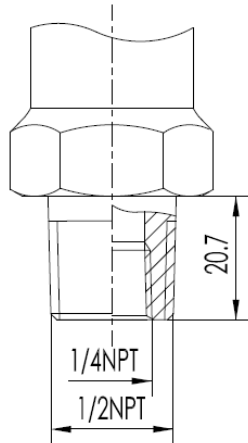


Process Connection: 1/2" NPT Female, Code 1

※ Left: large-bore ranges (D/M/F/G/H/I/K/O); Right: small-bore ranges (B/C/L).

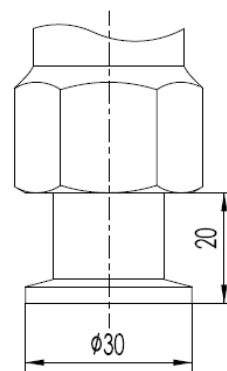
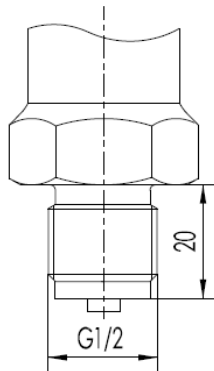


Process Connection: 1/2" NPT Male (Code 2) and M20x1.5 Male (Code 3)

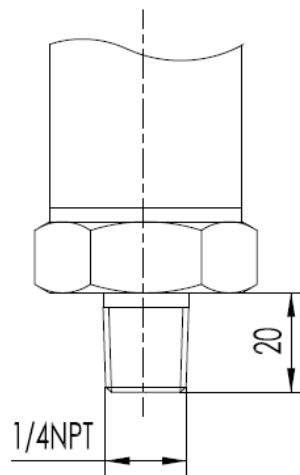


Process Connection: G $\frac{1}{2}$ Male (Code 4) and KF16 Vacuum Fitting (Code 5)

※ KF16 vacuum fitting (DIN 28403 / ISO 2861) applicable only for ranges ≤ 2.5 bar (250 kPa / 36.3 psi).

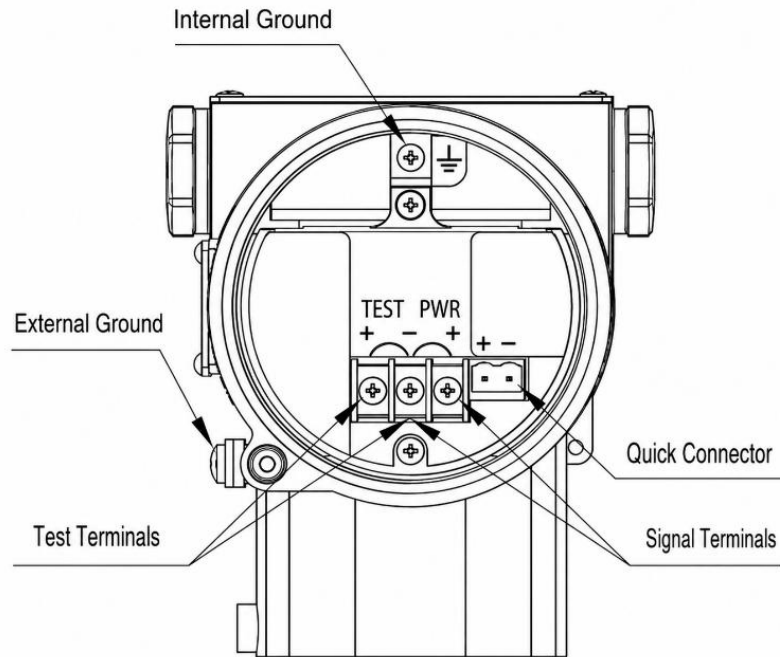


Process Connection: $\frac{1}{4}$ " NPT Male (Code 6)



■ WIRING DIAGRAM

Terminal Box Internal Layout



※ Quick Connector function is equivalent to the signal terminals.

※ Terminal accepts 0.5–2.5 mm² conductors. Standard M20×1.5 nylon cable gland included.

Terminal Assignment

TEST+ / TEST-	Loop test terminals — read mA without breaking loop
PWR+ / Signal+	Supply + / 4-20 mA signal +
PWR- / Signal-	Supply - / 4-20 mA signal -
Quick Connector	External HART / signal interface
⊥ Internal Ground	Internal chassis ground
⊥ External Ground	Protective earth terminal

■ ORDERING INFORMATION — SX-PTCB

Ordering Example: SX-PTCB-ABDANNNNNENH

Pressure Type	
A	Gauge Pressure
B	Absolute Pressure
Accuracy	
B	±0.075%
Pressure Range — Gauge Pressure	
B	0–0.6 kPa to 6 kPa
C	0–2 kPa to 40 kPa
D	0–2.5 kPa to 250 kPa
E	0–10 kPa to 1 MPa
F	0–30 kPa to 3 MPa
G	0–0.1 MPa to 10 MPa
H	0–0.21 MPa to 21 MPa
I	0–0.4 MPa to 40 MPa
Pressure Range — Absolute Pressure	
L	0–10 kPa to 40 kPa

M	0–10 kPa to 250 kPa
O	0–30 kPa to 3 MPa
Diaphragm Material & Fill Fluid	
A	316L stainless steel — Silicone oil
B	316L stainless steel — Fluorine oil
C	Hastelloy C — Silicone oil
D	Hastelloy C — Fluorine oil
E	316L stainless steel Gold-plated — Silicone oil
F	316L stainless steel Gold-plated — Fluorine oil
T	Tantalum — Silicone oil
Pressure Connection	
1	½" NPT Female
2	½" NPT Male
3	M20×1.5 Male (Adapter)
4	G½ Male (Adapter)
A	M20×1.5 Male
B	G½ Male
6	¼-18 NPT Male
7	¼-18 NPT Female
5	KF16 Vacuum Fitting DIN 28403 / ISO 2861 [Pressure Range B or C only (≤ 2.5 bar)]
9	½" NPT Female — heat-dissipation type
L	G1 Threaded Pulp Fitting
M	M44 × 1.25 Threaded Pulp Fitting
S	Ø25.8 Insert-Type Pulp Fitting
Safety Options	
N	Without
P	Lightning protection
O	Oil-free treatment (fluorine oil fill, fluoroelastomer seal, ≤ 6 MPa, ≤ 60 °C)
Mounting Bracket	
N	Without
1	Stainless Steel (SUS)
2	Galvanized Carbon Steel
Display	
N	Without
2	LED
3	OLED
Explosion Protection	
N	Without
B	Intrinsic Safety ATEX
E	Flameproof ATEX
Tag Plate	
N	Without
1	Tag number inscribed on nameplate

2	Hanging stainless steel tag plate
Manual	
E	Standard manual included
Housing & Electrical Connection	
N	Aluminium alloy — M20×1.5
T	Aluminium alloy — ½ NPT
S	316 Stainless Steel — M20×1.5
U	316 Stainless Steel — ½ NPT
Output	
H	4–20 mA / HART
M	Modbus
P	Profibus PA
Additional Options	
N	without
V	Low-voltage version
Customized	
D	Customized — specify requirements in order remarks