

User Manual

Anti-Corrosive Pressure Transmitter

U-B-203P-EN1



Preface

- This manual is about the product's functions, wiring, setting, operation, troubleshooting, etc.

- Please read this manual carefully before operation and use this product correctly to avoid unnecessary losses due to incorrect operation.

- After you have finished reading, please keep it within your reach for reference at any time during operation.

Note:

- The contents of this manual are subject to change due to function upgrades or other updates. Please refer to the latest published version for accuracy.

- We strive to ensure the accuracy of the manual; If you find any errors, please contact us.

- Reproduction or duplication of the manual is strictly prohibited.

- Please apply the product in accordance with its explosion-proof rating and applicable national and regional legal requirements.

- The final interpretation of this manual belongs to our company.

Version

U-B-203P-EN1

Confirm the package contents

After opening the box, please confirm the contents before starting any operation. If you find that the model or quantity is incorrect or there is any physical damage on the surface, please contact us.

No.	Items	Quantity	Note
1	Anti-corrosion pressure transmitter	1	
2	Information card	1	
3	Certificate of conformity	1	

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1 Product overview

1.1 Product Introduction

This corrosion-resistant pressure transmitter is equipped with a ceramic piezoresistive sensor. Through a highly reliable amplification circuit and precise temperature compensation, the medium pressure is converted into a standard electrical signal. The combination of a high-quality sensor and refined assembly process ensures excellent product stability and performance. Built with PTFE material, the transmitter offers strong resistance to corrosive environments and is widely applied in the chemical industry, particularly for pressure measurement of acids, alkalis, and other aggressive media.

1.2 Measurement principle

The operating principle of silicon-diffused pressure sensors is based on the piezoresistive effect. When the process medium applies pressure to the sensor diaphragm, it causes a minute displacement proportional to the applied pressure. This displacement alters the resistance of the sensing element, and the electronic circuit detects the resistance change and converts it into a standard output signal that corresponds to the applied pressure.

1.3 Features

- Compact structure for easy installation.
- Resistant to corrosive media and harsh environments.
- High stability and high reliability.
- Built-in miniature amplifier; supports voltage, current, and RS485 signal output.
- Strong anti-interference capability and excellent long-term stability.
- Diverse structural options for flexible installation and applications.
- Wide measuring range, capable of measuring absolute, gauge and sealed reference pressure.

2 Technical parameters

Table 1 Technical specification

Input		
Measured variables	Gauge/ absolute/sealed pressure	
Measuring range	-100kPa~0...10kPa~ 2MPa	
Output		
Transmitter output	Output Type	Load resistance R_L
	(4~20)mA, no display	$R_L \leq (U-10V)/0.02A$
	(4~20)m A, with display	$R_L \leq (U-14V)/0.02A$
	(0 ~ 5) V	$R_L \geq 5k \Omega$
	(1 ~ 5) V	
	Note: U is the supply voltage, unit in V	
Communication	RS485 interface, Modbus	
Power supply		
Power supply	Output Type	Power supply
	(4~20)mA	(10~32)V
	(0~5)V, (1~5)V	(8~32)V
	(0~10)V	(12~32)V
	RS485, no display	(8~32)V
	RS485 output, 4-digit LCD display	(17~32)V
	RS485 output, 4-digit 8-segment display	(5~28)V
Electrical interface	Direct lead, DIN 43650-A Hirschmann connector M20×1.5 cable gland (2088 shell type)	

Performance parameters	
Accuracy	Level 0.5/1.0
Long-term stability	± 0.5 % FS/year
Response time	Current, voltage output type: $T_{90} \leq 10\text{ms}$ RS485 output type: $T_{90} \leq 100\text{ms}$
Temperature drift	10kPa \leq Span \leq 60kPa: 2%FS (within temperature compensation range) 60kPa < Span \leq 2MPa: 1.5%FS (within temperature compensation range)
Compensated temperature	10kPa \leq Span < 25kPa: (0~60) $^{\circ}\text{C}$ 25kPa \leq Span \leq 60kPa: (0~70) $^{\circ}\text{C}$ 60kPa < Span \leq 2MPa: (-10~70) $^{\circ}\text{C}$
Insulation resistance	20M Ω , 250VDC
Dielectric strength	50Hz, 500VAC
Protection level	IP65
Process conditions	
Overload pressure	200%FS
Medium temperature	(-20~85) $^{\circ}\text{C}$
Environmental conditions	
Operating temperature	(-20 ~85) $^{\circ}\text{C}$
Storage temperature	(-40 ~85) $^{\circ}\text{C}$

3 Structure and dimensions

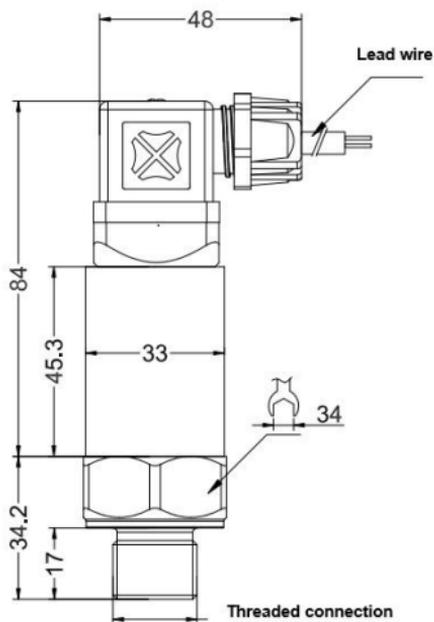


Fig. 1 Dimensions of non-display pressure transmitter (unit: mm)

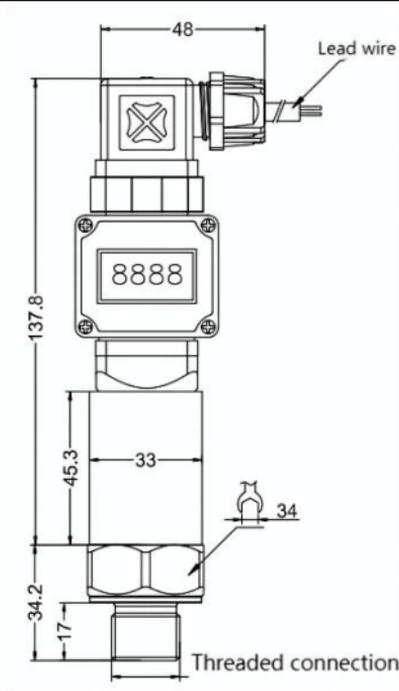


Fig. 2 Display type pressure transmitter dimensions (unit: mm)

3.1 Process connection

Process connection: M20×1.5 thread, G1/4 B thread, G1/2 B thread, NPT 1/2 thread, etc.
Special threads need to be customized.

3.2 Material

Shell material: PTFE (direct lead, Hirschmann connection)

Diaphragm material: ceramic

Process connection material: PTFE

4 Installation

4.1 Installation note

(1) Transporting and installing the meter with great care to protect it from damage to circuit performance.

(2) There is an isolation diaphragm inside the pressure inlet of the transmitter. Do not touch it with foreign objects, as deformation may damage the internal chip.

(3) Proper sealing of the outer thread is necessary to ensure stable and accurate pressure.

(4) Outdoor installation sites must be dry, well-ventilated, and shielded from direct sunlight and rain to prevent performance degradation or malfunction.

4.2 Installation condition

(1) The pressure transmitter can be installed directly at the measuring point.

(2) The transmitter's installation locations should be installed in a place with minimal temperature fluctuations and should be protected from vibration and shock. Avoid large temperature fluctuations, vibration and mechanical shocks around transmitter's installation locations

(3) Route the signal wires separately from other power lines; do not run them near high-power equipment or through the same conduits.

(4) If impulse lines are adopted, the highly corrosive or overheated media should be out of contact with the transmitter. To prevent sediment buildup, the lines are advised to be as short as possible. When measuring steam or other high-temperature media, make sure the transmitter's operating temperature is within the range. For steam applications, the impulse lines should be filled with water to guard against direct contact between the transmitter and the steam.

5 Electrical connection

(1) Current output

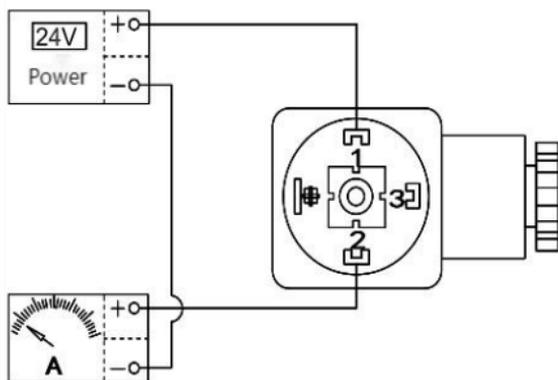


Fig. 3 Two-wire current output wiring diagram

(2) Voltage output

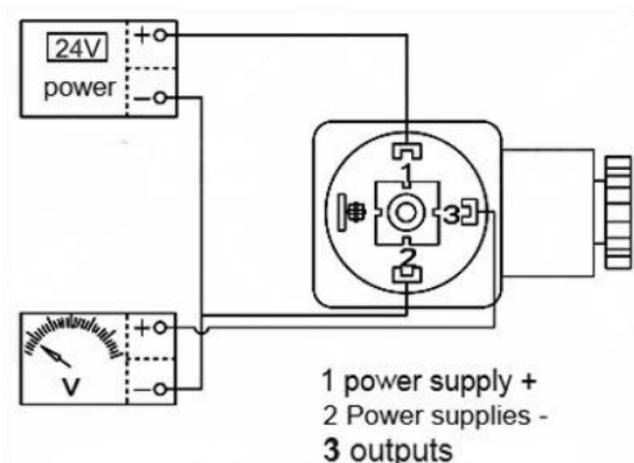


Fig. 4 Voltage output wiring diagram

(3) RS485 output

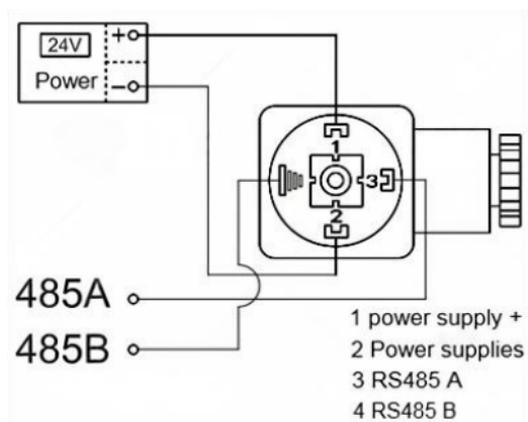


Fig. 5 RS485 output wiring diagram

6 Operation

The transmitter has 4-digit LCD display and 4-digit 8-segment digital tube display. The transmitter is configured and adjusted through the buttons on the meter head.

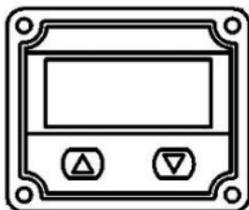


Fig. 6 Display and operating unit

6.1 Analog signal output with 4-digit LCD display

6.1.1. Display interface



Fig. 7 Main interface

6.1.2. Entering the menu

(1) Entering password input

- Short press the [▲] and [▼] keys to enter the password input state "Lock";
- Short press [▲] or [▼]
 - [▲] key moves the cursor;
 - [▼] key changes the value at the cursor.
- Enter the password "0001" to enter the setting menu.

(2) Browsing Menu Items

Short press the [▲] or [▼] key to browse the menu items.

(3) Modifying Menu Items

- To modify a menu items, short press [▲] and [▼] simultaneously to enter the

modification state.

- After finishing the modification, short press [▲] and [▼] simultaneously to return to the menu state.

6.1.3. Configuration Settings

Table 2 Setup Instructions

Symbol	Meaning	Setup Instructions
DS-L	Zero display value	Represents the pressure zero display setting
DS-H	Full scale display value	Represents the pressure full-scale display setting
DP	Decimal point selection	Sets the position of the decimal point. This only affects the display symbol and does not convert the measurement range dynamically. For example, if the factory settings are DS-L=0000, DS-H=1000, and the decimal point is set to 0.1, the full-scale display will show 100.0. If only the decimal point is changed to 0, the full-scale display will show 1000 without modifying other parameters.
UNIT	Unit Selection	Provides 7 common units: MPa, kPa, bar, psi, M, Pa, °C, or blank. This only changes the symbol and does not convert the measurement range dynamically.
LINE	Nonlinear correction	This value is the inverse of the error value of the current midpoint and is entered by the customer. The reference standard is the display value of the instrument.
FILT	Filter coefficient	Prevent display jitter caused by current fluctuation. Selectable from 0 to 9: higher values result more stable display but slower response to data changes.
ZERO	Zero suppression	Remove insignificant small signals and set as a percentage of the full scale, ranging from 0.0% to 2.0%

6.2 4-digit 8-segment display with RS485 output

6.2.1. Main page



Fig. 8 Main page

6.2.2. Enter the menu

(1) Entering the User Setting Menu

- Long press the [▲] and [▼] keys for 5 seconds to enter the password input state.
- Use the [▲] key to move the cursor and the [▼] key to change the value at the cursor.
- Enter the password "0016" to enter the user setting menu.

(2) Browsing and Modifying Menu Items

- Short press the [▲] or [▼] key to browse the menu items.
- To modify a menu item:
 - Short-press the [▲] and [▼] keys simultaneously to enter the edit mode.
 - Make the necessary changes.
 - Short-press the [▲] and [▼] keys at the same time to return to the menu.

6.2.3. Configuration Settings

Table 3 Configuration Settings

Symbol	Meaning	Setup Instructions
ADDR	Address	Range (1~247), short press [▲] or [▼] key to make changes
BAUD	Baud rate	Range (1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200), the last two 0s are not displayed, such as: 12 means 1200bps, 1152 means 115200bps, short press [▲] or [▼] key to modify
PAR	Check digit	Range (N: no parity, O: odd parity, E: even parity), short press

6 Operation

		[▲] or [▼] key to make changes
SPD	ADC rate	Unit is Hz. 10 means 10Hz, which has a slow conversion rate and stable data. 40 means 40Hz, which has a fast conversion rate but is not as stable as 10Hz. Press [▲] or [▼] to change the value.
UNIT	Unit	Range (0: Pa, 1: KPa, 2: MPa, 3: mmH ₂ O, 4: mH ₂ O, 5: bar, 6: psi, 7: atm, 8: kgf/cm ² , 9: mm, 10: m, 11: °C, 12: °F); short press the [▲] or [▼] key to make changes
DOT	Decimal places	Range (0~3), short press the [▲] or [▼] key to make changes
OFT	Offset value	The unit is UNIT, press the [▲] key to move the cursor, and press the [▼] key to change the value at the cursor.
SAVE	ESC	YES saves the settings, No does not save, and short press the [▲] [▼] keys at the same time to exit the setting state. Note: If no button is pressed for 60 seconds, the instrument will automatically exit the user settings.

6.2.4. Reset operation

(1) Entering Reset Mode

- Long press the [▲] and [▼] keys for 5 seconds to enter the password input state.
- Use the [▲] key to move the cursor and the [▼] key to adjust the value.
- Enter the password "0036" to enter the reset state.

(2) Selecting Reset Options

- Short press [▲] and [▼] keys to select:
 - ❖ "YES (confirm reset)";
 - ❖ "No (No reset)";
 - ❖ "RST (cancel reset)".
- shortly press the [▲] and [▼] keys at the same time to exit.

(3) Exit Reset Mode

Note: No pressing for 60 seconds, the meter will automatically exit the reset mode.

6.2.5. Factory Reset

(1) Entering Factory Reset Mode

- Long press the [▲] and [▼] keys for 5 seconds to enter the password input state.
- Use the [▲] key to move the cursor and the [▼] key to adjust the value.
- Enter the password "9876" and long press the [▲] and [▼] keys at the same time to restore to factory settings.

(2) Exit Reset Mode

Note: No pressing for 60 seconds, the meter will automatically exit the reset mode.

7 Precautions for use

- (1) The applicable medium for this transmitter are non-corrosive to silicon and stainless steel (or aluminum alloy).
- (2) The maximum instantaneous pressure in the measured system must be must not exceed the rated over-pressure.
- (3) The rear end of the pressure transmitter must not come into contact with conductive or corrosive liquids or gases.
- (4) Do not insert sharp and hard objects into the pressure input hole, as this may damage the core.
- (5) The rear leads of the sensor must not be exposed to water.

8 Troubleshooting

The following table lists possible problems with pressure transmitters and their solutions. If your problem is not included or the listed solution cannot solve your problem, please contact us.

Table 4 Common fault analysis and troubleshooting

Troubles	Possible causes	Troubleshooting
Pressure reading unstable	The stress source itself is unstable	Check for the pressure source
	Pressure transmitter damaged	Contact Us
Pressure reading unchanged	Pressure port clogged	Inspect the pressure port
	Zeroing performed under pressure	Re-zeroing without pressure applied
	Pressure transmitter damaged	Contact Us

9 Warranty and after-sales service

Our company promises customers that if any product quality issues arise during the warranty period, we will provide an unconditional "Three Guarantees" service, meaning free repair, replacement, or return. All non-customized products are guaranteed to be returned or exchanged within 7 days (excluding damaged products). Customized products are subject to the contractual warranty.

Disclaimer

During the warranty period, product failures caused by the following reasons are not covered by the three guarantees service:

- (1) Product malfunction caused by improper operation by the customer.
- (2) Product malfunction caused by the customer's self-disassembly, repair or modification of the product .

Appendix A Communication Protocol

The communication protocol of this instrument complies with the MODBUS-RTU communication protocol, 1 start bit, 8 data bits, and 1 stop bit.

The following command definitions assume the following instrument parameters:

Device address: 1
Baud rate: 9600
Parity: None
Decimal places: 1
Unit: MPa
Display value: 500.0 MPa

In all commands, the register address and data in read/write instructions are transmitted with the high byte first, low byte second, while the CRC checksum is transmitted with the low byte first, high byte second.

A.1 【Read parameter value】

Command: 01 03 XX XX 00 01 CRC1 CRC2

Instruction description: 01 (address) 03 (read command) XX XX (parameter address: see Table 2) 00 01 (read a parameter) CRC1 CRC2 (CRC16 verification code: low byte first, high byte last)

Response: 01 03 02 XX XX CRC1 CRC2

Instruction description: 01 (instrument address) 03 (read command) 02 (number of bytes read, 2 for 1 parameter, 4 for 2 parameters...) XX XX (returned parameter value: high bit first, low bit last) CRC1
CRC2 (CRC16 checksum: low byte first, high byte last)

A.2 【Write parameter value】

Command: 01 06 XX XX data1 data2 CRC1 CRC2

Instruction description: 01 (address) 06 (read command) XX XX (parameter address: see Table 3) data1 data2 (written parameters: high byte first, low byte last. See Table 3)

CRC1 CRC2

(CRC16 verification code: low byte first, high byte last)

Response: 01 06 XX XX data1 data2 CRC1 CRC2**Instruction description:** 01 (address) 0 6 (read command) XX XX (parameter address)
data1 data2(Written parameters: high byte first, low byte last. See Table 1) CRC1 CRC2 (CRC16
verification code: low byte first, high byte last)

Table 5 RS485 output with display

Content	Function code	Address(Hex)	Data(data1,data2)
Transmitter board address	03H 06H	00 00	1 ~ 247
Transmitter board baud rate	03 H 06H	00 01	0-1200 1-2400 2-4800 3-9600 4-19200 5-38400 6-57600 7-115200
Measurement unit	03 H 06H	00 02	0-Pa 1-kPa 2-MPa 3-mmH ₂ O 4-mH ₂ O 5-bar 6-psi

			7- atm 8-kgf/cm ² 9-mm 10-m 11- °C 12- °F
Number of decimals	03 H 06H	00 03	Value range: 0~3
Integer output value	03H	00 04	- 32768 ~ 32767
Parity	03H 06H	00 06	0- None 1- Odd 2- Even

Caution:

(1) The measurement units and decimal place setting are only symbolic and do not provide automatic conversion or calculation. If conversion is required, please contact our company for factory re-calibration.

(2) If you want to modify the parity bit via client software, please contact our technical support staff.