

Pressure transmitter

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U-SUP-P300/P310-EN6

Preface

Thank you for purchasing pressure transmitter. Please read this manual carefully before operating and using it correctly to avoid unnecessary losses caused by false operation.

Note

- Modification of this manual's contents will not be notified as a result of some factors, such as function upgrading.
- We try our best to guarantee that the manual content is accurate, if you find something wrong or incorrect, please contact us.
- This product is forbidden to use in explosion-proof occasions.

Version

U-SUP-P300/P310-EN6

Disclaimer

- The company does not make any guarantees for the terms outside the scope of this product warranty.
- This company is not responsible for damage to the instrument or loss of parts or unpredictable damage caused directly or indirectly by improper operation of the user.

No.	Name	Quantity	Note
1	Pressure transmitter	1	
2	Manual	1	
3	Certificate	1	

After opening the box, please confirm the package contents before starting the operation. If you find that the model and quantity are incorrect or there is physical damage in appearance, please contact us.

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1 Introduction

Imported high precision and high stability pressure sensitive chips are selected for diffused silicon pressure transmitter. Sensitive chips are fabricated by advanced micro-mechanical etching process, which forms Wheatstone bridge by diffusing four high-precision resistors with temperature compensation on silicon wafers. Because of piezoresistive effect, there are some changes on the resistance values of the four bridge arm resistance, so as to make the bridge unbalanced, and then the sensor outputs an electric signal corresponding to the change of pressure. The output electric signal is compensated by amplification and non-linear correction circuit, which generates voltage and current signals which correspond linearly to the input pressure.

2 Characteristics

- (1) Compact structure and easy to install.
- (2) Advanced diaphragm/oil-filled isolation technology.
- (3) High stability and reliability.
- (4) Seismic resistance and anti-radio frequency interference.
- (5) 316L stainless steel isolation diaphragm structure.
- (6) High precision, all stainless steel structure.
- (7) Micro-amplifier, voltage and current signal output.
- (8) Strong anti-interference and long-term stability.
- (9) Variety of process connections are available.
- (10) Wide range of measurement. It can measure absolute pressure, gauge pressure and sealing reference pressure.
- (11) Anti-vibration and anti-impact.

3 Parameters

Table 1 Technical parameters

Measured variables	Gauge pressure, adiabatic pressure and sealed pressure
Measuring range	-100kPa~0...10kPa~60MPa
Analog output	P300, PX300, P300G, PX300G, P310: (4~20)mA output (without display), $R_L \leq (U-10V)/0.02A$; (4~20)mA output (with display), $R_L \leq (U-14V)/0.02A$; (0~5)V, (1~5)V, (0~10)V, $R_L \geq 5k\Omega$
	P400, PX400, P400G: (4~20)mA output (without display), $R_L \leq (U-9V)/0.02A$; (4~20)mA output (with display), $R_L \leq (U-13V)/0.02A$; (0~5)V, (1~5)V, (0~10)V, $R_L \geq 5k\Omega$
	Note: U is power supply voltage, unit: V
Communication output	RS485, Modbus communication protocol.
Power supply	P300, PX300, P300G, PX300G, P310: (4~20)mA output: (10~32)V (0~5)V, (1~5)V output: (8~32)V (0~10)V output: (12~32)V RS485 output (4-LCD): (17~32)V

3 Parameters

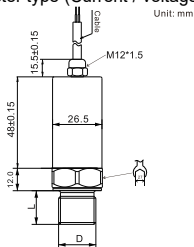
	P400, PX400, P400G: (4~20)mA output: (9~32)VDC (4~20)mA output with display: (8~32)VDC (0~5)V, (1~5)V,(0~10)V output: (12~32)VDC (4~20)mA + RS485 output: (12~32)VDC
Power consumption	Current output: $\leq 0.6W@24VDC$ Voltage output: $\leq 0.15W@24VDC$ RS485 output: $\leq 0.2W@24VDC$
Accuracy	0.2%FS / 0.25%FS / 0.5%FS
Stability	$\pm 0.2\%$ FS/year. Note: The pressure range below 35kPa shall be increased proportionally.
Response time	Current and Voltage output: $T_{90} \leq 110ms$ RS485 output: $T_{90} \leq 100ms$
Temperature drift	10kPa $\leq$ Range $\leq$ 60kPa: 2%FS (Within the temperature compensation range) 60kPa < Range $\leq$ 60MPa: 1.5%FS (Within the compensation temperature range)
Compensation temperature	10kPa $\leq$ Range < 25kPa: (0~60) $^{\circ}C$ 25kPa $\leq$ Range $\leq$ 60kPa: (0~70) $^{\circ}C$ 60kPa < Range $\leq$ 60MPa: (-10~70) $^{\circ}C$
Insulation	20M Ω , 250VDC
Insulation strength	50Hz, 500VAC
Ingress protection	Normal type: IP65 (Hirschmann connector, display part: IP50), Waterproof type: IP68
Overload pressure	(0.035~10)MPa: 150%FS

	(10~60)MPa: 125%FS
Medium temperature	(-20~85)℃
Working temperature	(-20~85)℃
Storage temperature	(-40~85)℃

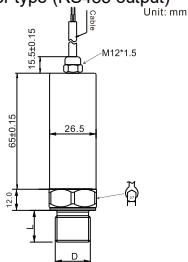
4 Dimensions

4.1 Dimensions of P300

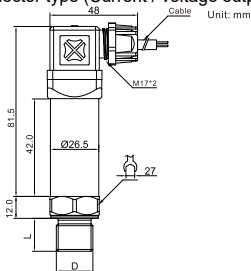
- Cable connector type (Current / voltage output)



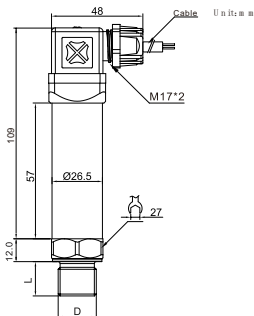
- Cable connector type (RS485 output)



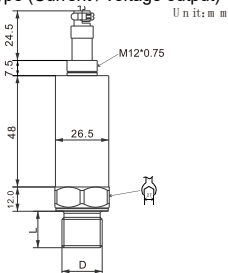
- Hirschmann connector type (Current / voltage output)



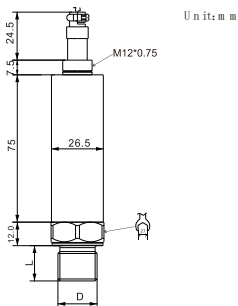
- Hirschmann connector type (RS485 output)



- M12 connector type (Current / voltage output)

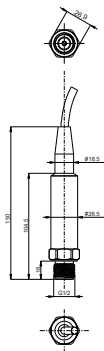


- M12 connector type (RS485 output)



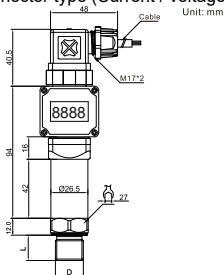
- Waterproof type

Unit: mm

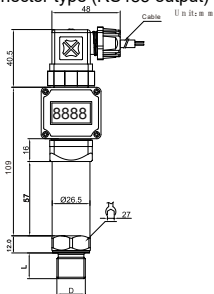


4.2 Dimensions of PX300

- Hirschmann connector type (Current / voltage output)

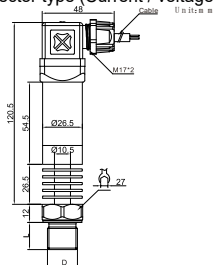


- Hirschmann connector type (RS485 output)

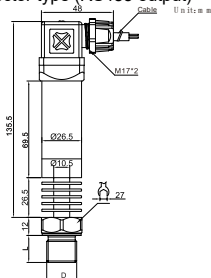


4.3 Dimensions of P300G

- Hirschmann connector type (Current / voltage output,)

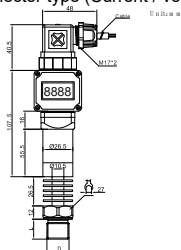


- Hirschmann connector type (RS485 output)

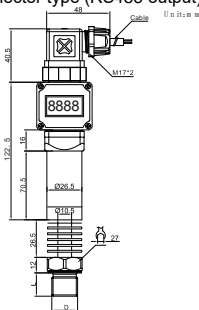


4.4 Dimensions of PX300G

- Hirschmann connector type (Current / voltage output,)

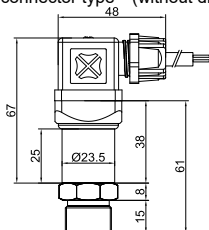


- Hirschmann connector type (RS485 output)

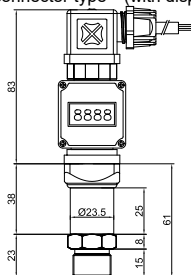


4.5 Dimensions of P310

- Hirschmann connector type (without display)

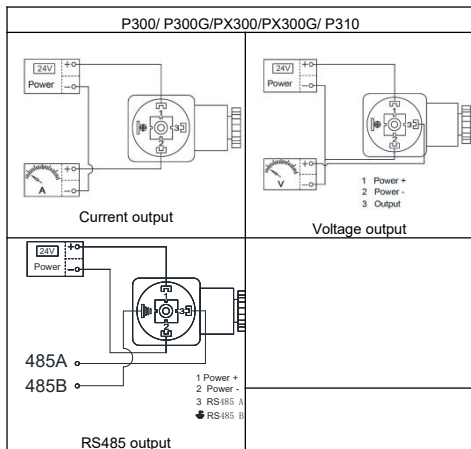


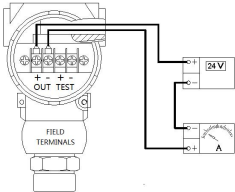
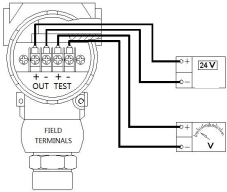
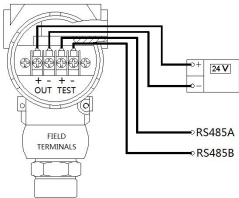
- Hirschmann connector type (with display)



5 Wiring

5.1 Connector type



P400/PX400/P400G	
	
Current output	Voltage output
	
RS485 output	

5.2 Cable type

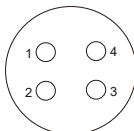
Wiring of normal cable connector type as follows:

Current:	Red Wire: 24V +
	Green Wire: Current Output
Voltage:	Red Wire: 24V +
	Green Wire: 24V -
	Yellow Wire: Voltage Output
RS485:	Red Wire: 24V +
	White Wire: 24V -
	Green Wire: RS485+
	Yellow Wire: RS485-

Wiring of waterproof cable connector type as follows:

Current:	Red Wire: 24V +
	Blue Wire: Current Output
Voltage:	Red Wire: 24V +
	Blue Wire: 24V -
	Yellow Wire: Voltage Output
RS485:	Red Wire: 24V +
	Black Wire: 24V -
	Blue Wire: RS485+
	Yellow Wire: RS485-

5.3 M12 connector type



Wiring of normal cable connector type as follows:

Current output:	1: 24V + 3: Current Output
Voltage output:	1: 24V + 2: 24V - 3: Voltage Output
RS485 output:	1: 24V + 2: GND 3: RS485 A 4: RS485 B

6 Function & Setting (PX300/PX300G/P310)

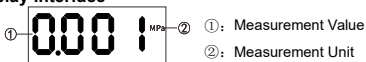
Note: For P310, only the RS-485 output version is equipped with a display.

The digital pressure transmitter features a four-digit LCD display or a four-digit 8-segment LED display. It is configured and adjusted via keys on the panel.



6.1 Analog Signal Output with Four-Digit LCD Display

6.1.1 Display Interface



6.1.2 Accessing the Menu

Press both the **【▲】** and **【▼】** keys simultaneously to enter the password input state "Lock". Press the **【▲】** or **【▼】** keys to move the cursor or change the value at the cursor, respectively. Enter the password "0001" to access the settings menu. Press the **【▲】** or **【▼】** keys briefly to scroll through the menu items. To modify a specific menu item, press both **【▲】** and

【▼】 keys simultaneously to enter the modification mode.

Once the modifications are completed, press both keys simultaneously again to return to the menu state.

6.1.3 Configuration Settings

Table 2

Symbol	Meaning	Setting Explanation
DS-L	Zero Display Value	Sets the zero position display for pressure
DS-H	Full Scale Display Value	Sets the full scale display for pressure
DP	Decimal Point Selection	Sets the decimal point position; symbol only, no dynamic range conversion. For example, factory settings DS-L = 0000, DS-H = 1000, if decimal point is set to 0.1, full scale display will show 100.0. If no other parameters are changed, only the decimal point setting changed to 0, the full scale will display as 1000.
UNIT	Unit Selection	Provides seven common units "MPa, kPa, bar, psi, M, Pa, °C, blank", symbol

Symbol	Meaning	Setting Explanation
		only, no dynamic range conversion.
LINE	Non-linear Correction	Inverse value of the midpoint error in current, input by user. Reference standard is the meter display value.
FILT	Filter Coefficient	Prevents display fluctuations due to current variations. Selectable from 0 to 9, higher coefficients yield more stable display but slower data changes.
ZER	Zero Suppression	Removes insignificant small signals, settable from 0.0% to 2.0% of the range.

6.2 RS485 Output with Four-Digit 8-Segment LED Display

6.2.1 Main Interface



6.2.2 Accessing the Menu

Press and hold both the **【▲】** and **【▼】** keys for 5 seconds to enter the password input mode. Use the **【▲】** key to move the cursor and the **【▼】** key to change the value at the cursor position. Enter the password "0016" to access the user settings

menu.

Press the **【▲】** or **【▼】** keys briefly to scroll through the menu items. To modify a particular menu item, press both **【▲】** and **【▼】** keys simultaneously to enter the modification mode.

Once modifications are completed, press both keys simultaneously again to return to the menu state.

6.2.3 Configuration Settings

Table 3

Symbol	Meaning	Setting Explanation
ADDR	Address Setting	Range (1~247), adjust using the 【▲】 or 【▼】 keys.
BAUD	Baud Rate Setting	Range (1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps). The last two zeros are not displayed, e.g., 12 represents 1200 bps, 1152 represents 115200 bps. Adjust using the 【▲】 or 【▼】 keys.
PAR	Parity Setting	Options (N: none, O: odd, E: even). Adjust using the 【▲】 or 【▼】 keys.
SPD	ADC Speed	Unit Hz, 10 represents 10Hz (slow

Symbol	Meaning	Setting Explanation
		conversion rate, stable data), 40 represents 40Hz (faster conversion rate, but less stable than at 10Hz). Adjust using the 【▲】 or 【▼】 keys.
UNIT	Unit Setting	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). Adjust using the 【▲】 or 【▼】 keys.
DOT	Decimal Places Setting	Range (0~3). Adjust using the 【▲】 or 【▼】 keys.
OFT	Offset Value Setting	Set by UNIT. Move cursor with 【▲】 , change value with 【▼】 .
SAVE	Exit	Save settings with YES, do not save with NO, exit settings mode by simultaneously pressing 【▲】 【▼】 Note: If no button is pressed for 60 seconds, the device automatically

Symbol	Meaning	Setting Explanation
		exits user settings.

6.2.4 Zeroing Operation

Press and hold the 【▲】 and 【▼】 keys simultaneously for 5 seconds to enter the password input mode. Use the 【▲】key to move the cursor and the 【▼】 key to change the value at the cursor. Enter the password "0036" to initiate the zeroing state. Press the 【▲】and 【▼】keys to select "YES" (confirm zeroing), "NO" (do not zero), or "RST" (cancel zeroing). Press both keys simultaneously to exit.

Note: If no button is pressed for 60 seconds, the device automatically exits zeroing mode.

6.2.5 Factory Reset

Press and hold the 【▲】 and 【▼】 keys simultaneously for 5 seconds to enter the password input mode. Use the 【▲】key to move the cursor and the 【▼】 key to change the value at the cursor. Enter the password "9876" and then press both 【▲】 and 【▼】 keys simultaneously to perform the factory reset.

Note: If no button is pressed for 60 seconds, the device automatically exits.

7 Installation

- (1) Pressure transmitter should be installed as far as possible in the place where temperature fluctuation is small, while avoiding vibration and shock.
- (2) The pressure transmitter can be directly installed at the measuring point. Connection threads: M20*1.5 or 1/2-NPT. Flange Interfaces of various specifications for special purposes.
- (3) Transmitter is suitable for measuring the pressure of various general corrosive liquids and gas. Transmitters manufactured according to explosion-proof requirements can be used in different explosive environments according to the explosion-proof grade of products, and their related equipment should also have explosion-proof function. For strong corrosive medium (such as acid, alkali) and corrosion resistant structure, the orders should be placed according to special requirements.
- (4) Do not route the signal line through the conduit or the open cable with the power line, or near high-power equipment.
- (5) If the pressure pipes are used in the transmitter, attention should be paid to that the strong corrosive or superheated media should not contact the transmitter, so as to prevent the sediment from precipitating in the pressure pipes, and the pressure pipes should be as

short as possible. When measuring steam or other high temperature medium, the working temperature of the transmitter should not exceed the limit. When used for steam measurement, the pressure pipes should be filled with water to prevent the transmitter from contacting directly with the steam.

8 Safety instructions

- (1) The cap must be tightened by hand, and the connection hole must be sealed with suitable seals to prevent water accumulation in the shell.
- (2) The transmitter shall not be loosened at the sealing joint and must be kept reliable.
- (3) Transmitters must be used according to specifications, and different types cannot be interchanged.
- (4) Transmitter range can be reduced, but the upper limit of range must not be exceeded 1.5 times of the range.

9 Cautions

- (1) The transmitter is used in a medium without corrosion to silicon and stainless steel (or aluminium alloy).
- (2) The maximum pressure of the measured system may not exceed the rated value of 150% FS at the moment of instantaneous occurrence.
- (3) The back end of the pressure transmitter should not be in contact with conductive, corrosive liquids or gases.
- (4) It is not possible to insert a sharp object into the pressure input hole in order to prevent damage to the core.
- (5) The water can not enter the back-end lead of the sensor.
- (6) When using, please strictly follow the precautions, otherwise the consequences are at your own risk.