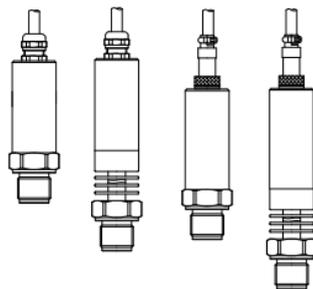


User Manual

Pressure Transmitter

U-D-G003P/D-003P-EN2



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-D-G003P/D-003P-EN2

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	User 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

1.1. Overview

This pressure transmitter features a high-precision, high-stability diffused silicon sensing element imported from a leading manufacturer. The sensor integrates an internal electronic amplifier that converts the detected pressure signal into a standardized output — available in current and voltage formats. It is widely used in industries such as petroleum, chemical processing, steel, electric power, light manufacturing, and environmental protection, providing accurate measurement and control of gauge, absolute, or sealed pressure in various fluid systems.

1.2. Measurement Principle

The diffused silicon pressure sensor operates based on the piezoresistive effect. When pressure is applied by the measured medium, it causes a slight deformation of the sensor diaphragm. This deformation leads to a change in the electrical resistance within the sensing element. The internal circuitry detects this resistance change and converts it into a standardized output signal that corresponds to the applied pressure.

1.3. Features

- (1) Compact structure and ease for installation.
- (2) Advanced diaphragm/oil-filled isolation technology.
- (3) High stability and reliability.
- (4) Vibration resistance and resistant to electromagnetic (RF) interference.
- (5) 316L stainless steel insulation diaphragm structure.
- (6) High precision with an all stainless steel structure.
- (7) Micro-amplifier, voltage, current and RS-485 signal output.
- (8) Strong anti-interference and long-term stability.
- (9) Versatile form factors for flexible installation.
- (10) Wide measuring range. It can measure absolute pressure, gauge pressure and sealed reference pressure.

2. Technical Parameters

Table 1 Technical parameters

Input		
Measured variables	Gauge/absolute/sealed pressure	
Measuring range	-100kPa~0...10kPa~60MPa	
Output		
Transmitter output	Output type	Load resistance R_L
	(4~20)m A	$R_L \leq (U-10V)/0.02A$
	(0 ~ 5) V	$R_L \geq 5k \Omega$
	(1 ~ 5) V	
	(0~10)V	
	Note: U is the supply voltage, unit is V	
Communication	RS-485 interface; Modbus	
Power supply		
Power supply	Output type	Power supply range

2 Technical Parameters

	(4~20)mA	(10~32)V
	(0~5)V, (1~5)V	(8~32)V
	(0~10)V	(12~32)V
	RS-485 output	(8~32)V
Power consumption	1) Power consumption of current output type $\leq 0.6W@24VDC$ 2) Power consumption of voltage output type $\leq 0.05W@24VDC$ 3) Power consumption of RS-485 type $\leq 0.2W@24VDC$	
Electrical interface	Direct lead, GX12 aviation connector, DIN 43650 type A Hirschmann connector	
Performance parameters		
Accuracy	0.2/ 0.25/ 0.5 level	

Long-term stability	$\pm 0.2\%FS/year$ Note: The pressure range below 35kPa is increased proportionally
Response time	Current, voltage output: $T_{90} \leq 10ms$ RS-485 output: $T_{90} \leq 10ms$
Temperature drift	$10kPa \leq span \leq 60kPa$: 2%FS (within temperature compensation range) $60kPa < span \leq 60MPa$: 1.5%FS (within temperature compensation range)
Compensated temperature	$10kPa \leq span < 25kPa$: (0~60) $^{\circ}C$ $25kPa \leq span \leq 60kPa$: (0~70) $^{\circ}C$ $60kPa < span \leq 60MPa$: (-10~70) $^{\circ}C$
Insulation resistance	20M Ω , 250VDC
Dielectric strength	50Hz, 500VAC
Protection level	Standard type: IP65

2 Technical Parameters

	Waterproof type: IP68
Process conditions	
Overload pressure	(0.035~10) MPa : 150%FS (10 ~60) MPa : 125%FS
Medium temperature	(-20~85) °C
Environmental conditions	
Operating temperature	(-20 ~85) °C
Storage temperature	(-40 ~85) °C

3. Structure and Dimensions

3.1. Dimensions of Ambient Temperature Pressure Transmitter (Direct-Wired)

- Direct-Wired Type Pressure Transmitter

Unit in mm

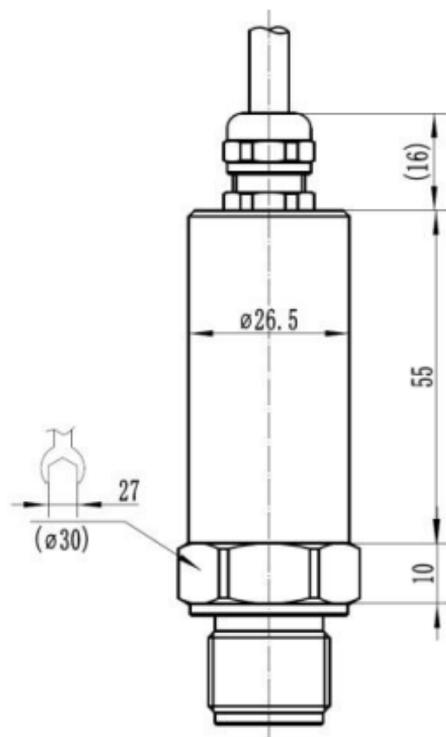


Fig. 1 Direct-wired type (voltage/current output)

Unit in mm

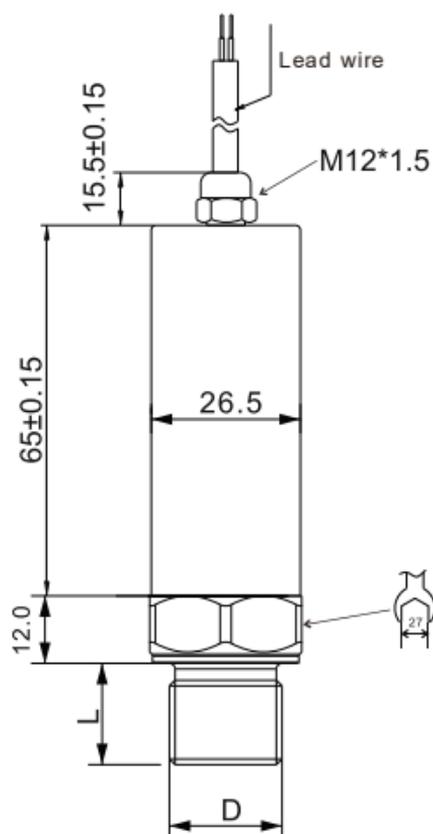


Fig. 2 Direct-wired type (RS-485 output)

3.2. Dimensions of Ambient Temperature Pressure Transmitter (Aviation Connector)

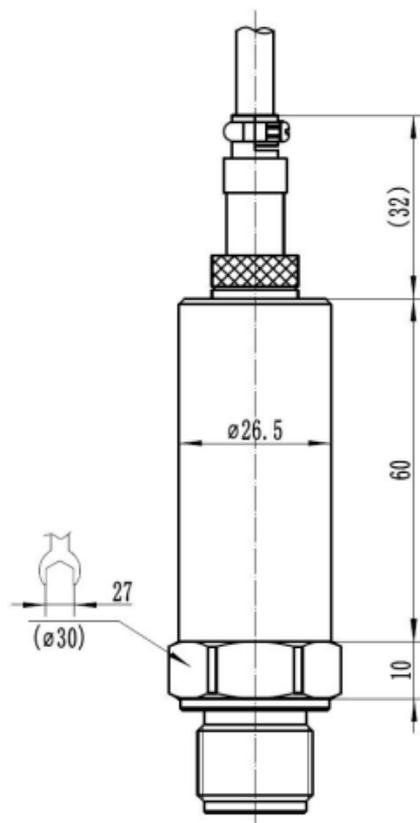


Fig. 3 Aviation connector type (current/voltage output)

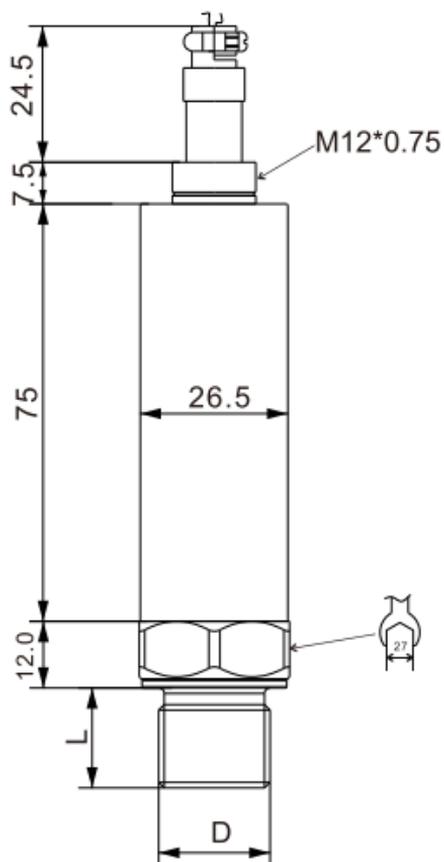


Fig. 4 Aviation connector type (RS-485 output)

3.3. Dimensions of Ambient Temperature Hirschmann Pressure Transmitter

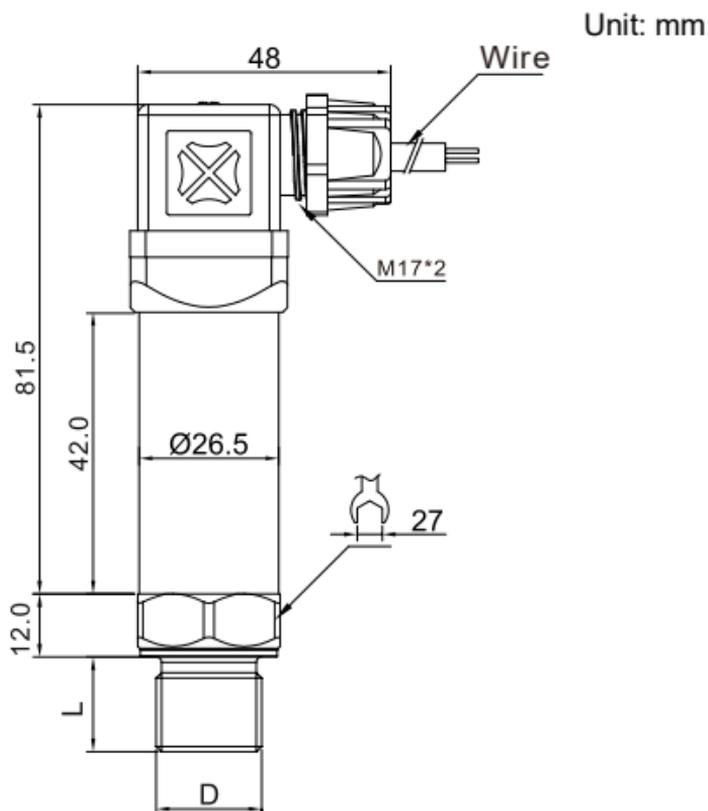


Fig. 5 Hirschmann type (current/voltage output)

Unit: mm

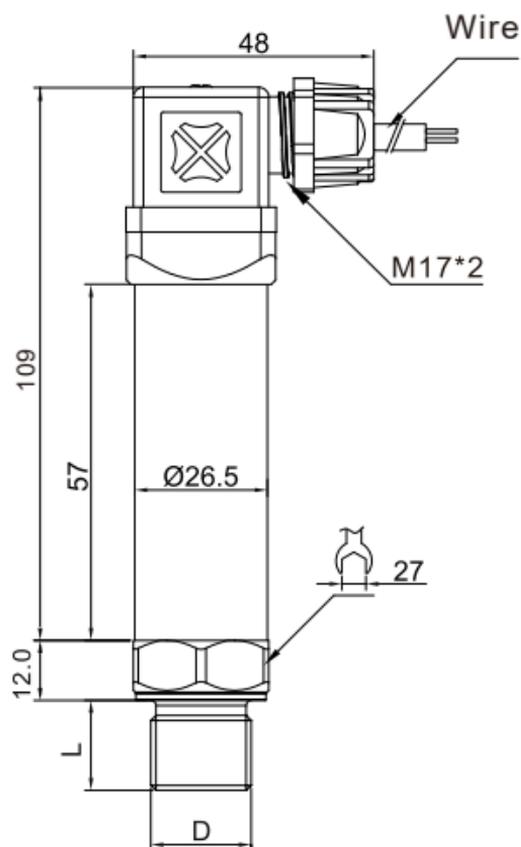


Fig. 6 Hirschmann type (RS-485 Output)

3.4. High Temperature Pressure Transmitter (Direct-Wired)

Unit in mm

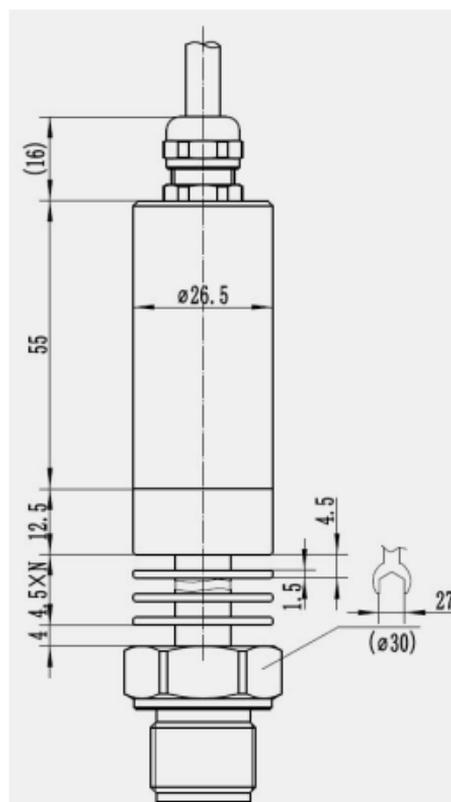


Fig. 7 Direct-wired type (3 heat sinks; voltage/current output)

Unit in mm

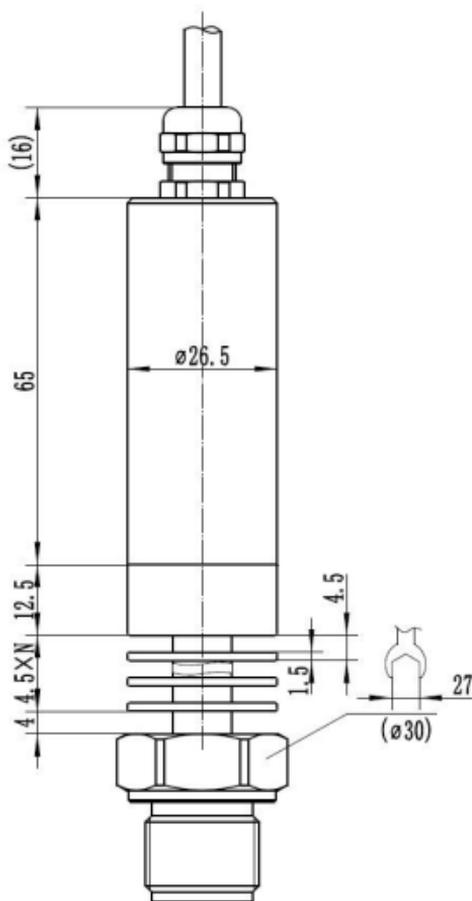


Fig. 8 Direct-wired type (3 heat sinks; RS-485)

3.5. High Temperature Pressure Transmitter (Aviation Connector)

Unit: mm

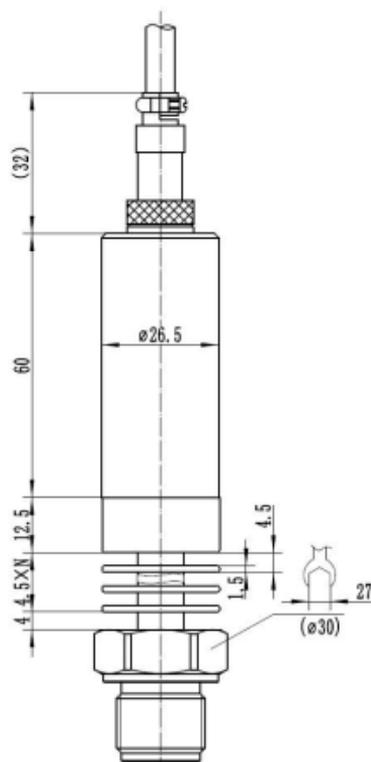


Fig. 9 Aviation connector type (3 heat sinks; voltage/current output)

Unit: mm

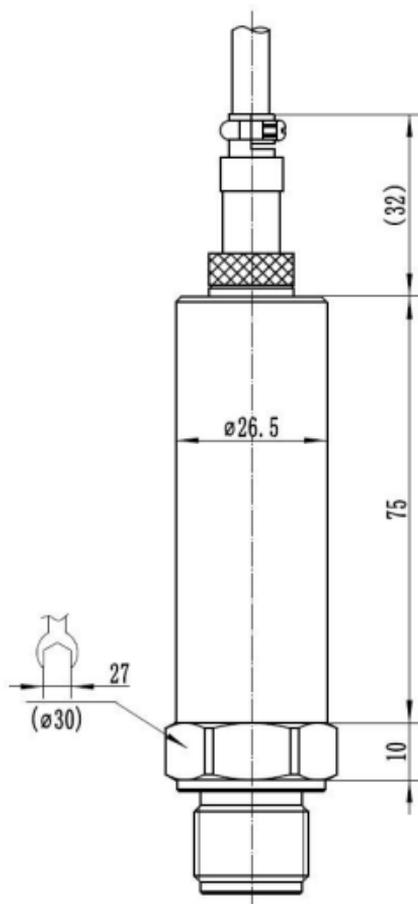


Fig. 10 Aviation connector type (3 heat sinks; RS-485 output)

3.6. Dimensions of High Temperature Hirschmann Pressure Transmitter

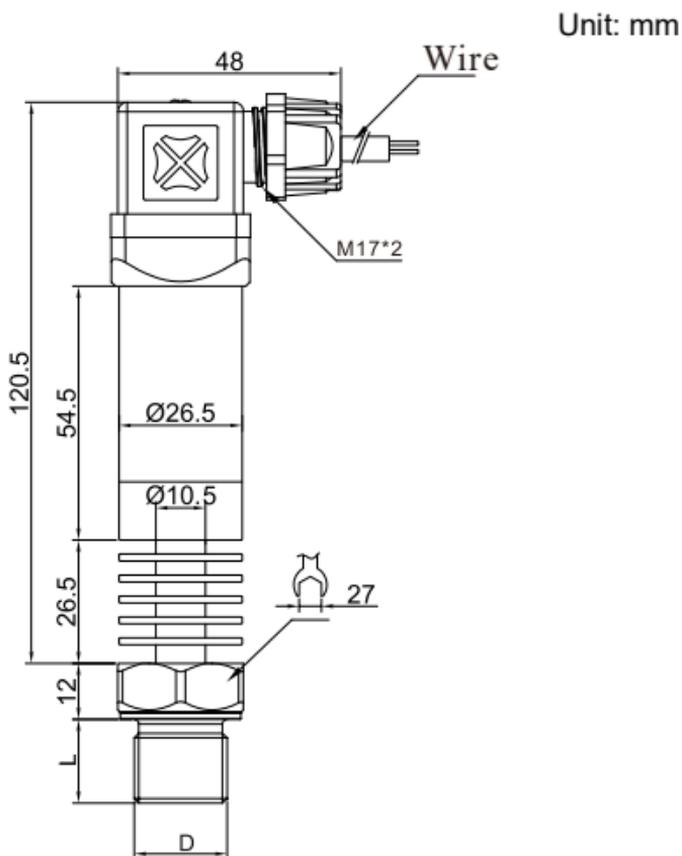


Fig. 11 Hirschmann type (Current/voltage output; 5 heat sinks)

Unit: mm

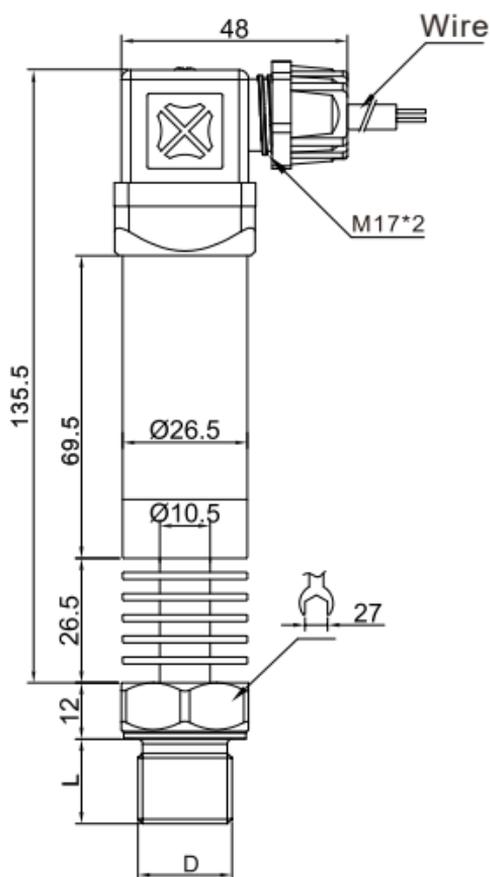


Fig. 12 Hirschmann type (RS485 output; 5 heat sinks)

3.7. Dimensions of Waterproof Type Pressure Transmitter

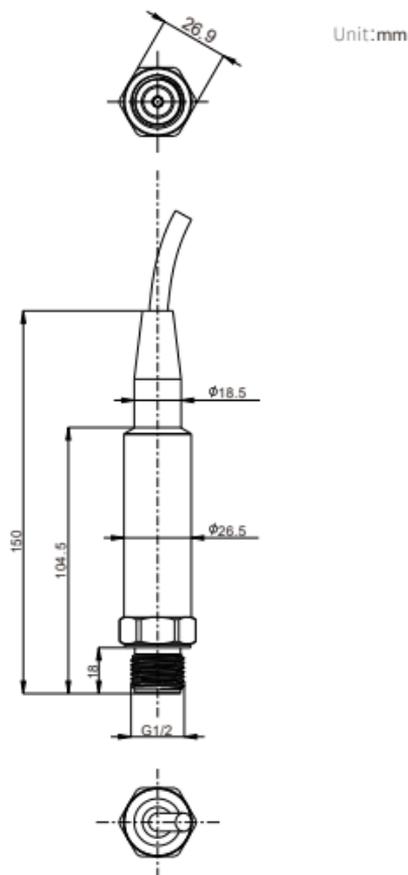


Fig. 13 Waterproof type

3.8. Process Connection

Process connection: M20×1.5 thread, G1/4 thread, G1/2 thread, NPT 1/4 thread, NPT 1/2 thread, M14×1.5 thread, etc. Other thread sizes need to be customized.

Table 2 Thread size

Unit in mm

M20×1.5 thread	G1/4 thread	G1/2 thread
NPT 1/4 thread	NPT 1/2 thread	M14×1.5 thread

3.9. Material

Shell material: 304SS or 316LSS

Diaphragm material: 316LSS

Process connection material: 304SS or 316LSS

4. Installation

4.1. Installation Precautions

- (1) Handle the transmitter with care during transport and installation to prevent physical shocks that may affect circuit performance.
- (2) The pressure inlet contains a sensitive isolation diaphragm. Do not insert any objects into the port, as this may deform the diaphragm and damage the internal sensing element.
- (3) Ensure that the external threaded connection is properly sealed. Inadequate sealing can result in inaccurate or unstable pressure readings.
- (4) For outdoor installations, the transmitter should be positioned in a well-ventilated and dry location. Avoid direct exposure to intense sunlight or rain, as such conditions may degrade performance or cause malfunction.

4.2. Installation Requirements

- (1) The pressure transmitter can be mounted directly at the measurement point.
- (2) It should be installed in an area with minimal temperature fluctuations, and protected from vibration or mechanical impact.
- (3) Signal cables should not share conduits or cable trays with power lines, and should be routed away from high-power equipment to avoid electromagnetic interference.
- (4) If a pressure guide (impulse) tube is required, ensure that highly corrosive or overheated media do not come into direct contact with the transmitter. The tube should be kept as short as possible to reduce sediment buildup. When measuring steam or other high-temperature media, avoid exposing the transmitter to temperatures beyond its rated limit. For steam applications, the impulse line must be filled with water to prevent direct contact between the transmitter and steam.

5. Wiring

5.1. Direct Lead Type

5.1.1. Standard Type

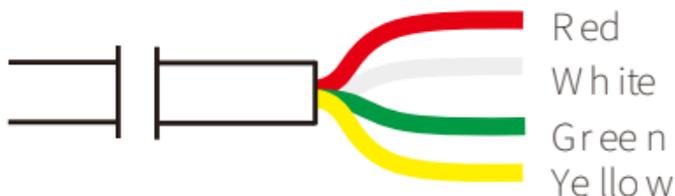


Fig. 14 Cable diagram of standard type

Table 3 Wiring definitions

Current output	Voltage output	RS485 output
Red: Power + Green: current output	Red: Power + Green: Power- Yellow: voltage output	Red: Power+ White: Power- Green: RS485-A Yellow: RS485-B

5.1.2. Waterproof Type

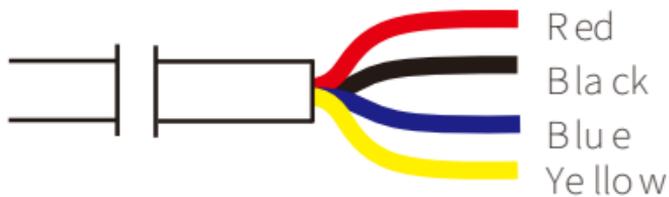


Fig. 15 Cable diagram of waterproof type

Table 4 Wiring definitions

Current output	Voltage output	RS485 output
Red: 24VDC Blue: current output	Red: 24VDC Blue: Power- Yellow: voltage output	Red: 24VDC Black: Power- Blue: RS485-A Yellow: RS485-B

5.2. Aviation Connector Type

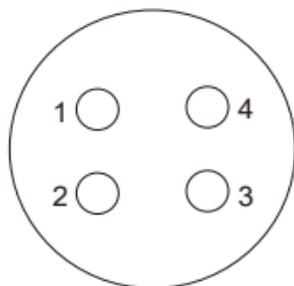


Fig. 17 Aviation connector diagram

Table 5 Wiring definition

Current output	Voltage output	RS-485
1: Power + 3: Current output	1: Power + 2: Power supply - 3: Voltage output	1: VCC 2: GND 3: RS485-A 4: RS485-B

5.3. Electrical Connection of Hirschmann Structure

(1) Current output

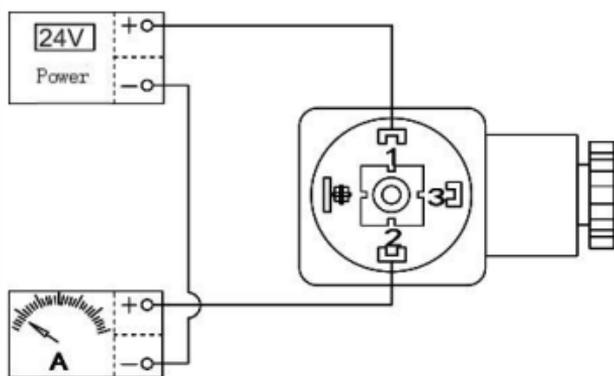


Fig. 18 Wiring diagram of 2-wire current output

(2) Voltage output

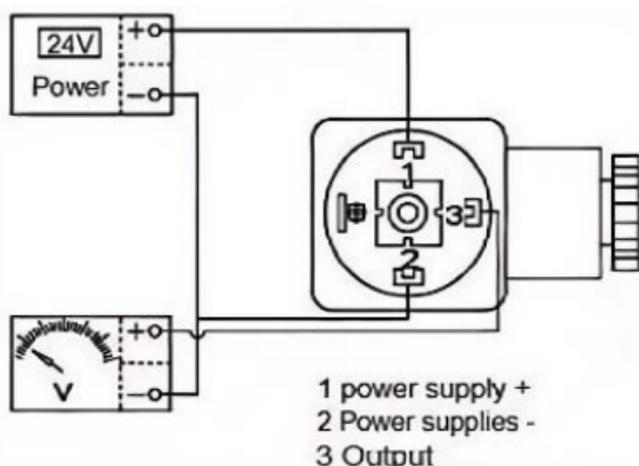


Fig. 19 Wiring diagram of voltage output

(3) RS-485 Output

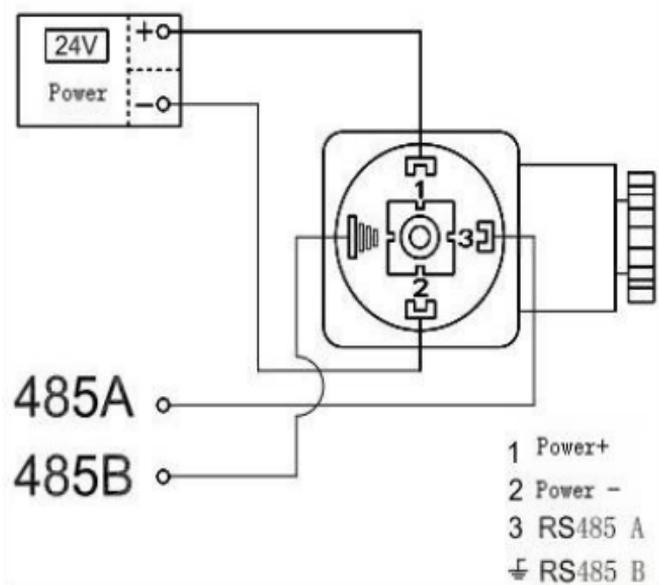


Fig. 20 Wiring diagram of RS485 output

6. Precautions for Use

- (1) The transmitter is commonly applied in the medium that are non-corrosive to silicon and stainless steel (or aluminum alloy).
- (2) The maximum pressure that may occur instantaneously in the measured system shall not exceed the load pressure rating.
- (3) The rear part of the transmitter should be kept away from corrosive or conductive liquid or gases.
- (4) Do not insert sharp or hard objects into the pressure input hole, as this may damage the sensor core.
- (5) The rear lead wire of the sensor should **Not** be exposed to water.

7. Fault Analysis and Troubleshooting

The following table details troubles that may occur and solutions. If your troubles fails to be listed or solutions cannot resolve your troubles, please contact us.

Table 6 Common trouble analysis and troubleshooting

Troubles	Possible causes	Troubleshooting
Unstable pressure readings	The stress source itself is unstable	Check for stress source
	Pressure transmitter damaged	Contact Us
Pressure does not change	Pressure hole blocked	Check the pressure hole
	Pressure zeroing causes	Re-zeroing without pressurization
	Pressure transmitter damaged	Contact Us

8. Warranty & After-Sales Service

We promise that during the warranty period, any product with quality issues will be covered under our unconditional warranty service of repair, replacement, and refund. All non-customized products are eligible for return or exchange within 7 days (excluding products damaged by misoperation). For customized products, the warranty terms will be based on the agreement specified in the contract.

Disclaimer:

During the warranty period, product malfunction caused by the following reasons is not in the scope of the warranty service of repair, replacement, and refund:

- (1) Product malfunction resulting from improper use by customers.
- (2) Quality issues caused by disassembly, repairing, and refitting the product.

Appendix A Communication Protocol

A.1 Protocol Overview

The pressure transmitter can be optionally equipped with MODBUS RS485 communication. For wiring details, please refer to the Electrical Connections section.

The default MODBUS-RTU communication parameters are shown in the table below.

Table 8 Default communication parameters

Device address	1
Baud rate	9600
Data bits	8-bit
Stop bit	1 person
Parity check	none
Data transmission format	1-0-3-2

A.2 Function Codes

Table 9 Function code

Function code	Description
0x03	Read register data; error response code 0x83
0x06	Write to a single register; error return code 0x86.
0x10	Write to multiple registers; error return code 0x90.

A.3 Register Address

Table 10 Register Address

Address	Name	Data type	Register #	Byte #	R/W	Description
0x1100	Device address	uint8_t	1	2	R/W	1 ~ 247, default 1
0x1101	Baud rate	uint8_t	1	2	R/W	1 = 2400 2 = 9600 (default) 3 = 14400 4 = 19200 5 = 38400

Address	Name	Data type	Register #	Byte #	R/W	Description
						6 = 57600 7 = 115200 8 = 1200 9 = 4800
0x1102	Serial port format	uint8_t	1	2	R/W	1 = N81 (default) 2 = N82 3 = E81 4 = O81 N: No parity E: Even O: Odd 8: Data bits (8 bits) 1: Stop bit 1 2: Stop bit 2
0x1201	Measurement parameter type	uint16	1	2	OR	This register is fixed at 0x34xx: The high byte 34 indicates that the

Address	Name	Data type	Register #	Byte #	R/W	Description
						parameter type is pressure ; The low byte represents the unit, see Table 10. The unit can be set via 0x2600.
0x1202	Lower limit of measuring range	float	2	4	OR	Lower limit of pressure range
0x1204	Upper limit of measuring range	float	2	4	OR	Upper limit of pressure range
0x2002	Pressure measurement value	float	2	4	OR	Pressure measurement value
0x2100	Original pressure measurement	float	2	4	OR	Pressure original measurement

Appendix A Communication Protocol

Address	Name	Data type	Register #	Byte #	R/W	Description
0x2300	Factor	float	2	4	R/W	Pressure factors
0x2302	Deviation	float	2	4	R/W	Pressure deviation
0x240b	Filter coefficients	uint16_t	1	2	R/W	0~100, 0 has no filtering
0x2410	Factory reset	uint16_t	1	2	OW	Write 1 to restore factory settings.
0x2600	Unit	Uint16_t	1	2	R/W	0: Pa 1: kPa 2: MPa 3: mmH ₂ O 4: mH ₂ O 5: bar 6: PSI 7: atm 8: kg f/cm ² 9: mm 10: m 11: °C

Appendix A Communication Protocol

Address	Name	Data type	Register #	Byte #	R/W	Description
						12: °F Unit settings greater than or equal to 9 do not enable numerical conversion.
Clear register						
0x3001	Pressure reset	uint8_t	1	2	R/W	Write 1 to start clearing.
0x3003	Reset status	uint8_t	1	2	OR	0x0000: Successfully cleared 0x0001: Zeroing not yet complete 0x0003: Signal is unstable or out of range 0x0004: Exceeding

Address	Name	Data type	Register #	Byte #	R/W	Description
						allowed range
0x3004	Exit the reset	uint8_t	1	2	OW	Write 1, exit, the zeroing, and save.
0x3106	Cutoff value at zero point	float	2	4	OR	Measured pressure value A

Table 11 Units

Units	ID
°C	0x00
°F	0x01
kPa	0x19
MPa	0x1B
PSI	0x1D
bar	0x1E
kgf/cm ²	0x1F
m	0x20
mm	0x22
Pa	0x30
mmH ₂ O	0x31

Units	ID
mH ₂ O	0x32
atm	0x33

A.4 Examples of Communication

Example 1: Reading pressure measurement values

Command sent: 01 03 20 02 00 02 6E 0B

Explanations: 01: Device address

03: Read the command

20 02: Register address

02: Number of registers

6E 0B: CRC16 checksum

Return command: 01 03 04 8E 52 40 68 40 BD

Explanations: 01: Device address

03: Read the command

04: 4 bytes

8E 52 40 68: Received data, converted to

little-endian byte order: 52 8e 68 40,

float type date: 3.63369

40 BD: CRC16 checksum

Example 2: Pressure zeroing

This operation sets the current pressure value as the lower range limit.

- (1) Write 0x01 to 0x3001 to start zeroing the pressure.

Send: 01 06 30 01 00 01 16 CA

Received: 01 06 30 01 00 01 16 CA

- (2) Read the calibration status from register 0x3003

Send: 01 03 30 03 00 01 7B 0A

Received: 01 03 0 2 00 00 B8 44

Status value 00 00 indicates calibration completed.

- (3) Write to register 0x3004 to exit calibration and save the corresponding data.

Send: 01 06 30 04 00 01 06 CB

Received: 01 06 30 04 00 01 06 CB