User Manual of

Submersible pressure

level transmitter

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Version

U-SUP-P260-B-EN2

1. Function and application

The submersible liquid level transmitter uses a high-performance diffused silicon piezoresistive pressure sensor as the measuring element, which accurately measures the hydrostatic pressure proportional to the liquid level depth, and converts it into a standard (current, voltage, RS485) through a signal conditioning circuit.) signal output, establish a linear correspondence between the output signal and the liquid depth, and realize the measurement of the liquid depth. The product has high precision and small volume. It can be directly put into the liquid to measure the liquid height from the end of the transmitter to the liquid level.It is suitable for liquid level measurement and control in the fields of chemical industry, power plant, urban water supply, and hydrological exploration.

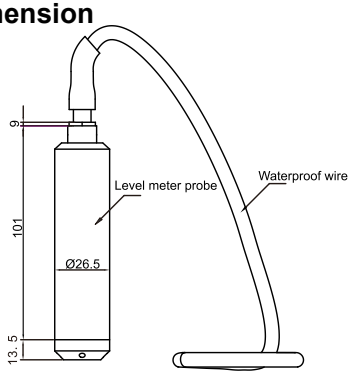
2. Features

- High performance diffusion silicon piezoresistive sensor
- Probe with submersible measurement, convenient for installation
- Multiple protection structure design, high protection capacity
- Various types, suitable for different industrial fields
- Use anti-corrosive stainless steel material, suitable for a variety of conditions

3. Parameters

Pressure type	Gage pressure
Range	0~1m...200m
Accuracy	0.5%
Output	RS485, (4~20)mA, (0~5)V, (1~5)V, (0~10)V
Supply	(4~20)mA output,(10~32)VDC；(0~10)V output, (12~32)VDC；(0~5)V, (1~5)V, RS485 output: (8~32)VDC
Stability	± 0.2% FS/year (Note: The liquid level range below 3.5m shall be increased proportionally)
Response time	Current and Voltage output: T_{90}≤110ms; RS485 output: T_{90}≤100ms
Overload pressure	150%FS
Temperature drift	1m≤Range≤6m: 2%FS (Within the temperature compensation range); Range＞6m: 1.5%FS(Within the temperature compensation range)
Compensation temperature	1m≤Range＜2.5m：（0～60）℃ 2.5m≤lRange≤6m：（0～70）℃ Range＞6m：（-10～70）℃
Insulation resistanc	20MΩ/250VDC
Operating temperature	(-20~85)℃
Storage temperature	(-40~85)℃
Medium compatibility	Various medium compatible with 316L stainless steel
Ingress Protection	IP68(sensor) ;

4. Dimension



5. Wiring

Current output:

Red	Blue
24V +	Current output +

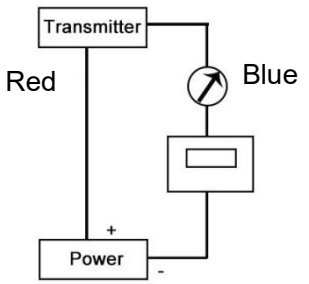
Voltage output:

Red	Blue	Yellow
24V +	24V -	Voltage output +

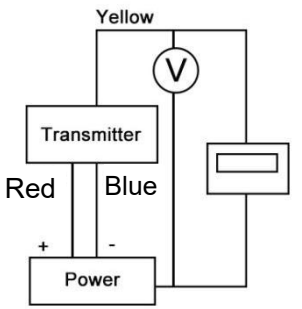
RS485 output:

Red	Black	Blue	Yellow
24V +	24V -	485A	485B

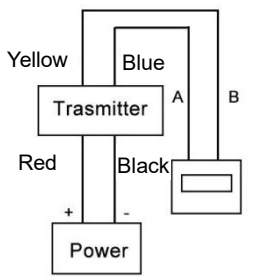
Current output, 2-wire



Voltage output, 3-wire



RS485 output



6. Installation method and precautions for use and safety

- Read wiring diagram carefully before installation.
- Turn off power and the valve of the tested medium during installing and disassembling, the pressure is reduced to atmosphere pressure to avoid accidents caused by medium ejection.
- Choose a place that is easy for operation and installation
- Make sure the transmitter is firmly connected and grounding properly during installing; avoid vibration,heat source and strong EMI environment. Need good grounding when outdoor installation, lightning protection measures should be taken to prevent lightning from damaging products.
- The metal probe on the bottom of the container during submersible level meter installation
- If the customer needs additional wires , must take waterproof measures (such as closed junction box, etc.).If it is not available or relatively simple, the wire can be bent downward and installed to prevent water inflow and avoid failure.
- The level probe is dropped into the water, preferably fixed and away from the inlet.
- To ensure the accuracy of measurement, the fluidity of the medium is needed.
- It prohibited insert hard objects into the pressure hole to prevent damage the sensor diaphragm.
- Please strictly follow the wiring method for the electrical connection, wrong wiring may cause damage to the amplifying circuit.
- Prevent the cable damages so that fluid could enter the damages and signal wire joint into transmitter cavity, which will damage the product.
- Do not use cable to lift heavy objects other than the product.
- Regular desilt the level probe to avoid blocking inlet.
- The conductor is a special waterproof cable; Wear, puncture and scratch should be avoided in the process of installation and use.If any of the above problems exist on site, protective measures should be taken for the conductor. If such problems cause faults, the manufacturer will charge for maintenance.
- Ensure right product selection and operation correctly to prevent serious personal injury and damage.
- Please contact our company if you encounter any problems in the installation and use. When the product is abnormal, please do not open it for repair without authorization.

7. Communication

The communication protocol of this instrument complies with the MODBUS-RTU communication protocol, with 1 start bit, 8 data bits, and one stop bit.
The following command definition assumes that the instrument parameters are: the instrument address is set to 1, the communication baud rate is 9600, the invalid check digit, the decimal point is 1 digit, the unit is MPa, and the instrument display value is 500.0MPa. The address and data in the read command and write command are all high byte first and low byte last; CRC check low byte first, high byte last.

【Read pressure value】

Command: 01 03 00 04 00 01 C5 CB

Instruction description: 01 (meter address) 03 (read command) 00 04 (pressure value register address) 00 01 (read a parameter) C5 CB (CRC16 verification code)

Response: 01 03 02 13 88 B5 12

Instruction description: 01 (meter address) 03 (read command) 02 (number of bytes read, 1 parameter is 2, 2 parameters are 4....) 13 88 (13 88 is the hexadecimal number 13 is The high byte 88 is the low byte converted to decimal, which is exactly 5000) B5 12 (CRC16 verification code)

【Zero drift adjustment】

Command: 01 06 00 05 00 01 58 0B

Instruction description: 01 (meter address) 06 (write command) 00 05 (meter communication address) 00 01 (Zero drift adjustment code) 58 0B (CRC16 verification code)

Response: 01 06 00 05 00 01 58 0B

Instruction description: 01 (meter address) 06 (write command) 00 05 (meter communication address) 00 01 (Zero drift adjustment code) 58 0B (CRC16 verification code)

【Read parameter value】

Command: 01 03 XX XX 00 01 CRC1 CRC2

Instruction description: 01 (meter 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 (meter address) 03 (read command) 02 (number of bytes read, 1 parameter is 2, 2 parameters are 4....) XX XX (returned parameter value: high order first, Low order after) CRC1 CRC2 (CRC16 verification code: low byte first, high byte after)

【Write parameter value】

Command: 01 06 XX XX data1 data2 CRC1 CRC2

Instruction description: 01 (meter 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 after)

Response: 01 06 XX XX data1 data2 CRC1 CRC2

Instruction description: 01 (meter address) 06 (read command) XX XX (parameter address) data1 data2 (Writing parameters: high byte first, low byte last. See Table 7) CRC1 CRC2 (CRC16 verification code: low byte first, high byte last)

Details	Function code	Address (Hex)	Data (data1，data2)
Transmitter board address	03H 06H	00 00	1~255
Transmitter board baud rate	03H 06H	00 01	1-2400 2-4800 3-9600 4-19200
Units	03H 06H	00 02	0-M 1-kPa 2-MPa 3-℃ 4-L 5-bar 6-psi 7-Pa
Number of decimal places	03H 06H	00 03	Range：0-4
Measurement output value	03H	00 04	-32768~32767
Check digit	03H	00 06	0-None 1-Odd 2--Even

Note:

（1）The unit of measurement and the number of decimal places only represent symbols, and there is no automatic conversion and conversion function. If necessary, please contact us to return to the factory for debugging.

（2）The check digit can be modified through the client software by contacting our technical staff.