# Intelligent Pressure/Differential Pressure Transmitter

# **Operation** Manual



Version:202304

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# **1. Product Instruction**

Intelligent pressure / differential pressure transmitter uses imported silicon piezoresistive pressure sensor and monocrystal line silicon differential pressure sensor as signal measuring element, digital modular circuit design, digital signal processing technology, which make it has excellent anti-interference ability and signal stability. Multi-parameter LCD display, the three-button operation can also easily achieve zero reset, zero point migration, range setting, damping setting and other parameters setting without the manual operator.

Intelligent pressure/differential pressure transmitter can be widely used in petroleum, chemical, steel, electric power, light industry, environmental protection and other fields,to achieve the measurement of various pressure, differential pressure, flow, liquid level and other industrial process measurement, suitable to various harsh environment and corrosive medium.

### 2. Technical Specification

#### Measuring Range :

Pressure: Gauge pressure (G): 0-2.5MPa, minimum 0-500Pa Sealed gauge pressure (S): 0-60MPa, minimum 0-3.5MPa Absolute pressure (A): 0-60MPa, minimum 0-2kPa

Negative pressure: -0.1MPa-60MPa

Differential pressure: -1MPa-1MPa

Measuring Accuracy :

Pressure: 0.25%FS 0.1%FS

Differential Pressure: 0.075%FS 0.1%FS 0.2%FS

Allow Ambient Temperature:

-40 $\sim$ 85°C, -20 $\sim$ 70°C (Display)

#### **Allowable Medium Temperature:**

-40°C~+105°C -40°C~+150°C -40°C~+250°C -40°C~+350°C

#### Allowable Storage Temperature:

-40°C~+85°C

#### **Temperature Influence:**

优于 0.2%/10℃

#### **Power Supply:**

24V DC (12 $\sim$ 30VDC )

#### **Output:**

(4~20)mA Two-wire, HART

#### Long Term Stability:

Exceeding 0.2% FS annually

#### **Process Connection Standard:**

M20 \* 1.5 or G1/2, flange, other customized

#### **Explosion Proof Grade:**

Ex d[ia Ga] IIC T6 Gb

#### **Protection Grade:**

IP67

#### Load Characteristics:

Current type:  $\leq$  {(Us-12)  $\div$  0.02}  $\Omega$  (Us=supply voltage)

# 3. Dimension:



HCDP-20 Pressure Transmitter





DP-30 Differential Pressure Transmitter

### 4. Installation

DP-20 series Pressure Transmitter, it uses  $M20 \times 1.5$  or other external thread to install on the pipe directly, tightening torque shall not exceed 40N.m.

DP-3X series Differential Pressure Transmitter, with mounting bracket, it can be installed on pipe or wall. The 3051 housing after loosening the locking screw, the head can be rotated about 90° left and right. (Don't rotate more than 90°, so as not to break the internal wiring)





5. Wiring









## 6. Operation of Zero Point Adjustment

After the instrument is installed, due to the installation position and angle, there will be deviation from the zero point. Ensure that the transmitter is in a powered on and under zero pressure status, press and hold the S and Z buttons at the same time for more than 5 seconds, and then release both at the same time, press and hold the two buttons again for about 3 seconds, the transmitter will be zeroed by the current pressure value.

| Keys' icon    | Keys' name | function   |
|---------------|------------|--|
| <b>X</b><br>S | S          | Return function in the menu status and shift<br>function in the parameter setting status, this<br>button also has the 2nd S button function. |

| н<br>М | М | Menu and parameter confirmation button   |  |
|--------|---|--|--|
| Z      | Z | Select function in the menu status, +1 function<br>in the parameter setting status, also has the<br>second Z function. |  |

## 7. Key and Menu Instructions

When you want to configure the transmitter, make sure that the transmitter is powered on and in the measurement display status, press and hold the M key for about 5 seconds to display the main menu interface, then release the key to enter the configuration menu interface, press S return to the main measurement interface, press Z to select the menu item, M key for confirmation.

When entering the specific parameter setting interface, press S to select the bit to be modified, including number, decimal point and negative sign. Press Z to modify the selected bit, the digit bit is +1, the decimal point bit is shifted cyclically, the negative sign bit is positive or negative, press M to save the modification and return to the upper level menu.

| Units/Range | units        | inH20、inHg、ftH2O、mmH2O、              |
|-------------|--------------|--------------------------------------|
|             |              | mmHg, psi, bar, mbar, g/cm2, kg/cm2, |
|             |              | Pa、kPa、Torr、atm、MPa、mH2O、            |
|             |              | mHg, m, mm, cm, %, mA, g/cm3;        |
|             | Min of range | e.g40.000Kpa                         |

Menu List and Description

|                         | Max of range                     | e.g. 40.000Kpa                   |
|-------------------------|----------------------------------|----------------------------------|
| Decimal position        | 0~4 can be set                   | 0.1.2.3.4.                       |
|                         | Proportional<br>Display Settings | Disable Enable                   |
| Proportional<br>Display | scale display min of range       | can only be modified by software |
|                         | scale display max of range       | can only be modified by software |
| Damping time            | seconds                          | 0-64 seconds                     |
|                         | Linear                           |                                  |
| characteristics         | extraction                       |                                  |
| Pressure filtered       | enabled                          |                                  |
|                         | disabled                         |                                  |
| Fixed Current           | 3.8mA                            |                                  |
|                         | 4.0mA                            |                                  |
| Write protection        | on                               |                                  |
|                         | off                              |                                  |
| Calibrate               | zero clearing                    | S:YES Z:NO                       |
|                         | Pressure correction              | S:YES Z:NO                       |
|                         | Low Point<br>Calibration         | S:YES Z:NO                       |
|                         | Full-point calibration           | S:YES Z:NO                       |
| Language                | Chinese                          |                                  |
|                         | ENGLISH                          |                                  |
| Medium density          | m,mm,cm only                     | e.g.1.000g/cm3                   |

Note: Press the S key alone to change the direction of the LCD display, 90°, 180°, 270°, 360° rotation (the main board S key is also valid).

If in the menu or parameter setting state when no key operation for about 30 seconds, the transmitter automatically exits the parameter configuration and returns to the measuring state.

### 8. Notes

8.1. All the supplied products are equipped with product certification and instructions, please check the technical parameters carefully to avoid mistakes.

8.2.Tighten the threads should be tightened slowly, pay attention to sealing, The torque cannot be applied directly to the transmitter housing, but only to the hexagon bolts of the pressure connector.

8.3. Wiring should be in strict accordance with the requirements of our company's instructions.

8.4. This product is prohibited to disassemble, collide, drop, beat, poke with sharp instruments, poke the pilot hole and all other acts that may damage the appearance and internal circuitry of the product.

8.5. Can work after power on, but the output is stable after 30 minutes of preheating.

8.6. If you find any abnormality in use, turn off the power, stop using it, and check or contact our technical department.

8.7. When transporting and storing, the package should be restored and stored in a cool, dry and ventilated warehouse.

8.8. The quality of the product itself (except for damage to the product caused by man or improper installation or selection) will get free service within 12 months.

# 9. Frequently Asked Questions and Answers

Question: What should I do if the output of the transmitter does not go up after the pressure goes up?

Answer: In this situation, first should check whether the pressure interface is leaking or blocked, if not, check the wiring, if not,check the power supply, if the power supply is normal, see if the sensor has an output at the zero position or not, or simply add pressure to see if the output change. Any change proves that the sensor is not damaged. If there is no change, the sensor is damaged. Other reasons for this situation may also be instrument damage, or other aspects problem of the whole system.

Questions:Pressure transmitter output does not change after adding pressure , if add pressure again, the transmitter output suddenly changes, and it won't return to the zero position after released.

Answer: The reason for this phenomenon is mostly caused by the pressure sensor sealing rings, generally because the sealing rings sizes (too soft or too thick), when the sensor is tightened, the sealing ring is compressed to the sensor pilot port inside and makes sensor blocked, pressurized medium can not enter, but when the pressure is very high, the sealing ring is suddenly broken open , pressure sensor detect this pressure and changes, after the pressure reduced, the sealing ring back to the position and block the port, the residual pressure can not be released, so the sensor zero position can not come down. The best way to eliminate this problem is to remove the sensor, directly to see if the zero level is normal or not, if normal , replacement the sealing ring and try again.

Question:What are the reasons for the instability of the transmitter output

signal?

Answer: The pressure source itself is an unstable pressure, the instrument or pressure sensor is not strong enough to resist interference, the sensor wiring is not secure, the sensor has strong vibration, or sensor failure.

