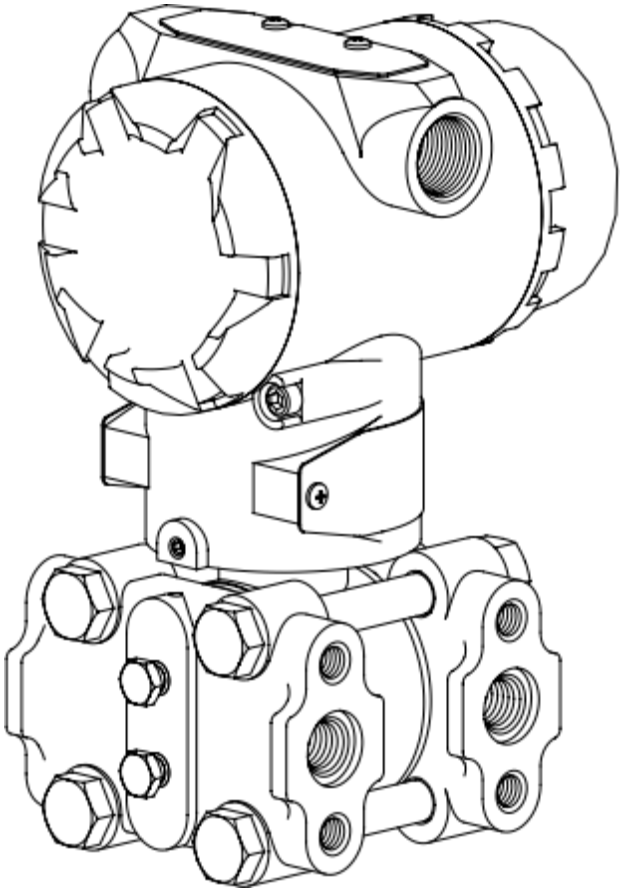
USER MANUAL

BD-FSDPT Differential Pressure Transmitter



bd flow

flow, level, pressure, temperature

Warning

1. Place the transmitter horizontally before commissioning.
2. After the micro-range transmitter is installed on site, the transmitter should be zeroed.
3. The transmitter should be installed in a dry environment and should not be washed by rain. In harsh environments, open-air installations should use a transmitter enclosure.
4. Users are prohibited from disassembling and assembling by themselves.
5. Please check whether the power supply voltage of the transmitter is stable and clean (the power supply should prevent AC interference).
6. Products that have passed the explosion-proof inspection shall not be arbitrarily replaced with components or changed in structure.
7. The external grounding screw of the transmitter must be reliably grounded.
8. The installation and use of the external safety barrier of the intrinsically safe transmitter must be carried out according to its instruction manual.
9. When the intrinsically safe explosion-proof transmitter is used in the explosion-hazardous environment area, the power transformer supplying power to the safety barrier must meet the requirements of GB3836, 4-2000 standard 8.1.
10. The S-PORT communication port must use our company's special transfer module

Please read this manual carefully after unpacking!

Introduction

Digital • Intelligent pressure/differential pressure transmitter is a multi-functional digital • intelligent, which is carefully designed on the basis of the world's advanced, mature and reliable capacitive sensor technology, combined with advanced single-chip computer technology and sensor digital conversion technology. meter.

The core component adopts 16-bit single-chip microcomputer, and its powerful function and high-speed computing capability ensure the excellent quality of the transmitter. The entire design framework focuses on reliability, stability, high precision and intelligence to meet the increasing demands of industrial field applications. Therefore, digital signal processing technology is applied in the software, so that it has excellent anti-interference ability and zero point stability, and has zero point automatic stable tracking ability (ZSC) and temperature automatic compensation ability (TSC).

The powerful interface function ensures good interactivity without the need for a communicator. The digital meter can display three physical quantities of pressure, temperature and current, and 0-100% analog indication. The key operation can easily complete basic parameters such as zero point migration, range setting, damping setting, etc. without a standard pressure source. Setting, which greatly facilitates on-site debugging.

The S-PORT serial communication port communicates directly with the computer through a dedicated transfer module, and the host computer interface can perform more functions than key operations. Connecting to a special RS485 module can realize remote transmission of digital signals, or build an RS485 industrial LAN.

Digitalization • The HART module is optional for the intelligent pressure/differential pressure transmitter. When the HART module is added to the transmitter, it has HART communication capability and can be used for general operation with a general-purpose communicator. Calibration and temperature compensation can be performed with the dedicated communication equipment and software provided by our company.

The integrated design of signal conversion, signal acquisition and processing and current output control makes the structure more compact and reliable. Sensitive parts are stable, reliable and anti-vibration

1. Overview

1.1 Overall appearance

L/W/H/Mass (without accessories): 125mm/104mm/192mm/2.9kg

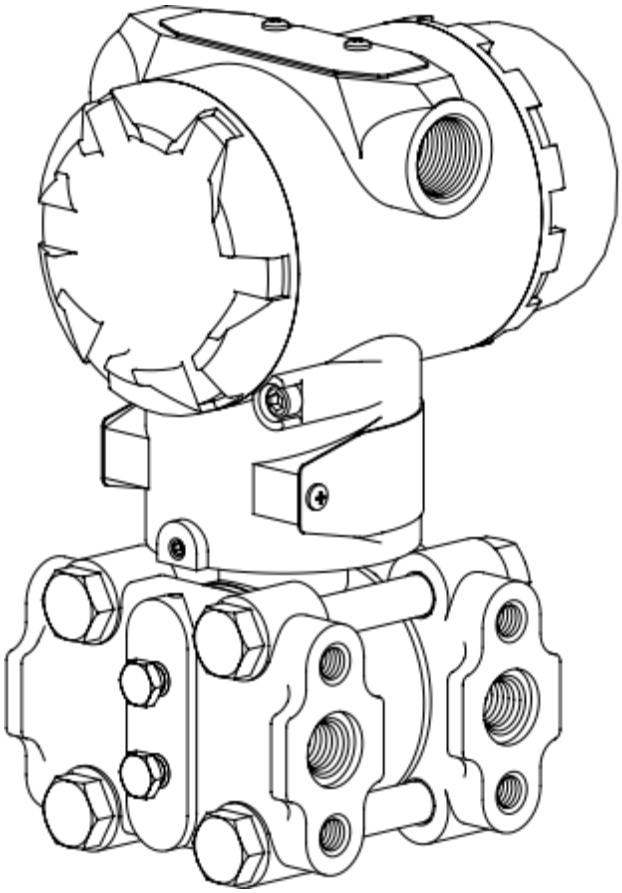


Figure 1-1

1.2 Overall structure

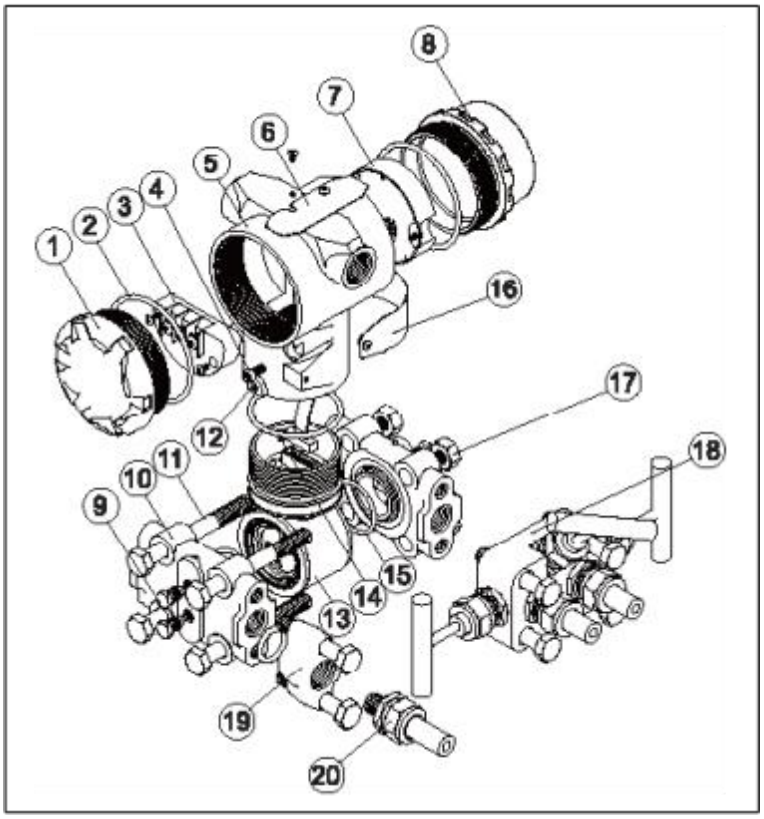


Figure 1-2

01	end cap	02	sealing ring	03	Terminals	04	lid lock screw	05	case
06	nameplate	07	header	08	head cover	09	Exhaust and drain valve	10	template
11	screw M10	12	Housing locking screw	13	sensor	14	sealing ring	15	sealing ring
16	number plate	17	nut M10	18	Integrated three valve button (optional)	19	waist flange	20	Welded pipe joint (optional)

1.3 Introduction to the working principle

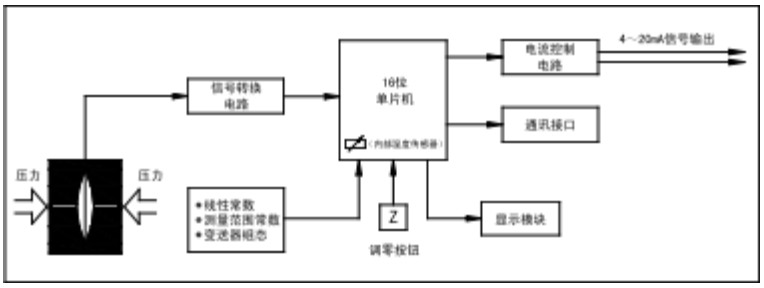


Figure 1-3

As shown in Figure 1-3 of the working principle, the pressure or differential pressure introduced from the outside will change the capacitance value of the sensor,

which will be converted into a frequency signal after digital signal conversion and sent to the microprocessor, and the microprocessor will output a current control signal after operation. It is sent to the current control circuit and converted into a 4-20mA analog current output, and the microprocessor is responsible for interactive operations (display and setting). The communication interface is used for digital communication, and the special interface of our company is used. The HART module implements transmitter HART communication.

2.Install and use

2.1 Overall dimensions of the whole machine

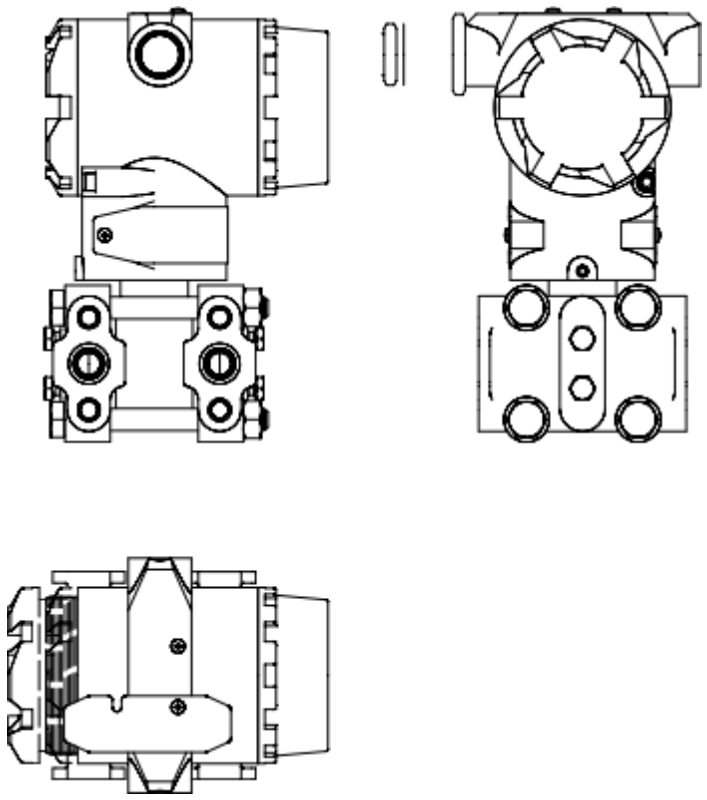


Figure 2-1

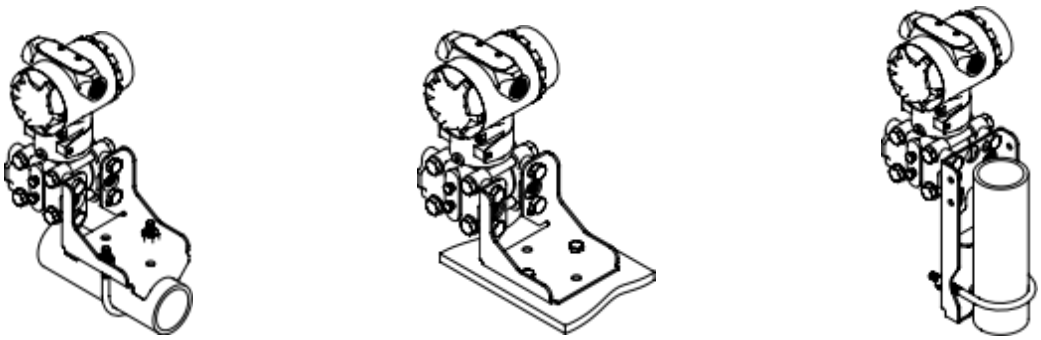
M	Model	1200	1300	1400	1500	1600	1700	1800	1900	1000
	Size(mm)	54				55.6		57.2	58.4	59.2

2.2 On-site installation

2.2.1 Installation method

The pressure transmitter produced by our company can be directly installed on the 2-inch pipe

Or directly mounted on the wall as well as on the dashboard. (As shown in Figure 2-2)



B1 Tube Bend Bracket .B2 Reel Mounted Bend Bracket. B3 Tube Mount Flat Bracket

Figure 2-2

After loosening the locking screw, the electronic compartment can be rotated 90° left and right.

Warning: Do not rotate more than 90°! So as not to break the internal cable!

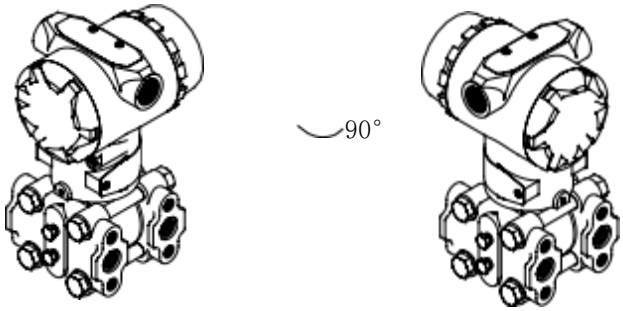


Figure 2-3

2.2.2 Pressurization method

There are three ways to induce pressure:

Waist flange method (Order code G1)

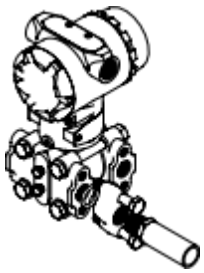


Figure 2-4

Welded pipe joint method (Order code G2)

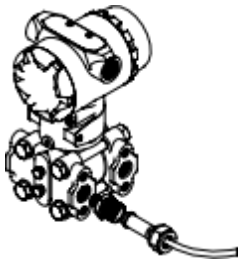


Figure 2-5

Integrated three-valve method(Order code G3)

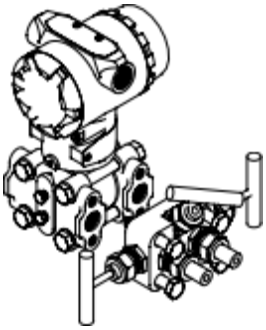


Figure 2-6

Note: The pressure transmitter uses only one end (H or L) and the other end as a reference.

2.2.3 Vent/Liquid Valve

Usually, the vent/liquid valve should be locked and only used when vent/liquid is required; our company's transmitter is equipped with standard up/down vent/liquid valve by default.

Figure 2-7

2.2.4 Lid lock

Tighten the screw to open the cover and loosen the screw to lock the cover. The cover should normally be locked to prevent damage to the inside of the transmitter.

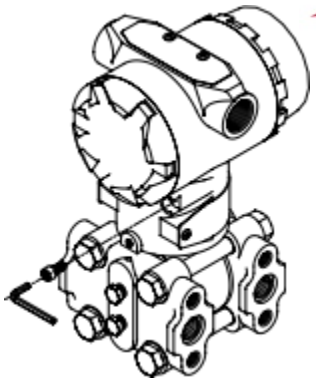


Figure 2-8

2.2.5 Adjustment of process connection hole distance

The process connection port on the pressure chamber is 1/4-18NPT. These process connection holes require thread seals. When using a waist flange joint, the transmitter can be easily removed from the production unit by simply removing the upper and lower bolts of the joint. The center-to-center distance between the connection holes of the two processes is 54mm.Rotating waist flange joint, the center distance can be changed to 50.8mm, 54mm, 57.2mm such as shown below:

Figure 2-9

2.2.6 Installation Precautions

1. Prevent the transmitter from contacting the measured medium with corrosive or high temperature (≥ 90°C).
2. To prevent dregs from depositing in the pressure guiding pipe.
3. The pressure guiding tube should be as short as possible.
4. The liquid column pressure head in the pressure guiding pipes on both sides should be balanced.
5. The pressure guiding pipe should be installed in a place with small temperature gradient and temperature fluctuation.
6. Prevent crystallization or low temperature freezing in the pressure tube.

2.3 Questions related to measurement methods

1. Liquid measurement :

When measuring the liquid flow, the pressure tap should be opened on the side of the process pipeline to avoid the sedimentation of dregs. At the same time, the transmitter should be installed next to or below the pressure taking port, so that the air bubbles can be discharged into the process pipeline.

2. Gas measurement :

When measuring the gas flow, the pressure taking port should be opened at the top or side of the process pipeline. And the transmitter should be installed beside or above the process pipeline, so that the accumulated liquid can easily flow into the process pipeline.

3. Steam measurement :

When measuring the steam flow, the pressure tap should be opened on the side of the process pipe, and the transmitter should be installed under the pressure tap so that the cold liquid can be filled in the pressure guide pipe.

It should be noted that when measuring steam or other high temperature media, its temperature should not exceed the operating limit temperature of the transmitter.

When the measured medium is steam, the pressure guiding pipe should be filled with water to prevent the steam from directly contacting the transmitter, so that when the transmitter is working, its volume

The amount of change is so insignificant that there is no need to install a condensate tank.

4. Level measurement :

Differential pressure transmitters used to measure liquid level actually measure the static pressure head of the liquid column. This pressure is determined by the liquid level and the specific gravity of the liquid, and its magnitude is equal to the height of the liquid surface above the pressure tap multiplied by the specific gravity of the liquid, regardless of the volume or shape of the container.

1) Level measurement of open containers

When measuring the liquid level in an open container, the transmitter is installed

near the bottom of the container to measure the pressure corresponding to the liquid level above it.

The pressure of the liquid level in the container acts on the high pressure side of the transmitter, while the low pressure side is open to the atmosphere. If the lowest liquid level of the measured liquid level variation range is above the transmitter installation, the transmitter must perform positive migration.

2) Level measurement in closed containers

In a closed vessel, the pressure P0 of the vessel above the liquid affects the pressure measured at the bottom of the vessel. Therefore, the pressure at the bottom of the container is equal to the liquid level multiplied by the specific gravity of the liquid plus the pressure P0 of the closed container.

To measure the true liquid level, the pressure P0 of the vessel should be subtracted from the measured pressure at the bottom of the vessel. To do this, open a pressure tap in the top of the vessel and connect it to the low pressure side of the transmitter. In this way, the pressure in the container acts on both the high and low pressure sides of the transmitter. The resulting differential pressure is proportional to the product of the liquid level and the specific gravity of the liquid.

5. Pressure guide connection

1) Dry pressure guide connection

If the gas above the liquid does not condense, the connection on the low pressure side of the transmitter remains dry. This situation is referred to as a dry pilot connection. The transmitter's measurement range is determined in the same way as the open container level.

2) Wet pressure connection

If the gas above the liquid condenses, the pressure guiding pipe on the low pressure side of the transmitter will gradually accumulate liquid, which will cause measurement errors. In order to eliminate this error, the low pressure side pressure pipe of the transmitter is filled with some liquid in advance, which is called wet pressure connection.

In the above situation, there is a pressure head on the low pressure side of the

transmitter, so negative migration must be performed.

6. Reduce errors

The impulse pipe connects the transmitter and the process piping, and transmits the pressure at the pressure port on the process pipe to the transmitter.

In the process of pressure transmission, the reasons that may cause errors are as follows:

1) Leakage;

2) Wear loss (especially when cleaning agents are used);

3) Gas in the liquid pipeline (causing head error);

4) Liquid accumulation in the gas pipeline (causing head error);

5) The density difference caused by the temperature difference between the pressure guiding pipes on both sides (causing pressure head error);

7. The methods to reduce errors are as follows:

1) The pressure guiding pipe should be as short as possible;

2) When measuring liquid or steam, the pressure guiding pipe should be connected upward to the process pipeline, and its slope should be less than 1/12;

3) For gas measurement, the pressure guiding pipe should be connected downward to the process pipeline, and its slope should not be less than 1/12;

4) The layout of the liquid pressure guiding pipe should avoid the high point in the middle, and the layout of the gas pressure guiding pipe should avoid the low point in the middle;

5) The two pressure guiding pipes should be kept at the same temperature;

6) In order to avoid the influence of friction, the pressure guiding pipe should be

7) There should be no gas in the pressure guiding pipe filled with liquid;

8) When using isolation fluid, the liquid in both pressure guiding pipes should be the same;

9) When using the cleaning agent, the connection of the cleaning agent should be close to the pressure taking port of the process pipeline. The length and diameter of the pipeline through which the cleaning agent passes should be the same, and the cleaning agent should be prevented from passing through the transmitter.

2.4 Electrical installation

System Wiring Diagram :

Figure 2-11

(Note 1: The user shall distribute the distributor or safety barrier according to the site and design requirements, please refer to the use method of the distributor and safety barrier for details.)

It is recommended to choose explosion-proof cable entry terminal for wiring, and the cable diameter is φ8 ~ φ12. There is a test terminal on the terminal, which is convenient for the operator to test online. The signal terminals are located in a separate compartment of the electrical box. Wiring can be done by unscrewing the bottom cover. The upper terminal is the signal terminal, and the lower terminal is the test meter terminal. Figure 2-11 shows the location of the terminals. The test terminals are used to connect the optional indicator head or for testing. The power supply is sent to the transmitter through the signal line, and no additional wiring is required.

! Pay attention :

Do not connect the powered signal wires to the test terminals, otherwise the diodes inside the test terminals will be destroyed.

If the diode is unfortunately damaged, the transmitter can continue to work by short-circuiting the test terminal, but it cannot be connected to the indicator of the machine.

Signal wires do not need to be shielded, but twisted wires are better. Do not arrange the signal wires together with other power wires, or close the wire hole on the transmitter housing of the strong electrical equipment. Seal or insert a sealed plug .

This is to prevent moisture from accumulating in the housing. If the wiring is not sealed, install the transmitter with the wiring hole facing down to drain water.

The signal line can be ungrounded (floating) or grounded at any point on the

signal return line. The transmitter housing can be grounded or ungrounded, and the power supply does not have to be regulated. Even if the peak-to-peak value of the power supply ripple is 1V, the output ripple of the transmitter can still be ignored. Because the transmitter is grounded by capacitive coupling, a high-voltage megohmmeter should not be used to check insulation resistance. The voltage used to check the wiring should not exceed 100V.

The transmitter circuit is designed to be intrinsically safe and the output current is limited to less than 30mA DC (35mA DC at high temperature or high supply voltage conditions).

2.5 Wiring diagram of intrinsically safe explosion-proof transmitter system

Note: ① For the definitions of Vm, Vo, Io, Po, Vi, Ii, and Pi, see GB3836, 4-2000 standard.

②The maximum allowable distributed capacitance CP of the wires or cables connected between the safety barrier and the transmitter is not more than 0.02uF, and the maximum allowable distributed inductance LP is not more than 2.0mH.

2.6 Description of explosion-proof transmitter

■ During installation of explosion-proof transmitter, attention should be paid to the protection of explosion-proof joint surface and explosion-proof measures. The end cover must be screwed to the bottom and the anti-loosening device must be locked; Injuries make the gap larger; the casing should be prevented from falling and damage, so as not to reduce the strength; after the maintenance and inspection of the instrument, all screws, casings and wiring must be tightened and not damaged, otherwise the explosion-proof performance will be lost.

■The explosion-proof transmitter is strictly prohibited to open or loosen the end cover

or shell when the power is on in the field.

■ One of the two outlet ports of the flameproof transmitter is used for wiring, and its cable joint adopts our company's special compression nut type flameproof inlet device. The tightened hollow bolts, washers and sealing rubber rings should be sleeved on the outer diameter of the cable, and the interface should be tightened. The sealing ring must be tightly wrapped on the outer diameter of the cable. The other outlet must also be equipped with a sealing rubber ring, a washer, and a solid bolt. In order to meet the explosion-proof requirements, the cable should choose the cable with the model KVVR diameter 1.5*4 core outer diameter 10mm (10.5mmMAX).

■The structure and parts of the explosion-proof transmitter have been strictly inspected and tested according to the explosion-proof explosion-proof standard.

Test, in line with the national standard GB3836.2-2000 "explosion-proof electrical equipment for explosive environments flameproof electrical equipment "d" provisions, its mark is EXdsIIBT5.

3 Commissioning and Operation

3.1 Overview

Header panel diagram (LCD display of all segments)

Figure 3-1

Display description:

- PV——transmitter is in measurement state
- SV——The transmitter is in the setting state
- Er——pressure overpressure or sensor circuit failure
- mA——indicates that the LED displays the output current value
- %——indicates the percentage of the measured pressure relative to the set range displayed by the LED
- ℃——indicates that the LED displays the average temperature of the measuring medium and the environment
- √——indicates that the output current of the transmitter is in the square root state
- kPa——indicates the pressure unit displayed by the LED
- MPa——indicates the pressure unit displayed by the LED

---- Indicates that the pressure measurement is relative to

Analog indication for setting the range

S-PORT - dedicated communication interface

3.1.1 Definition of each key

3.1.2 Function description of each key

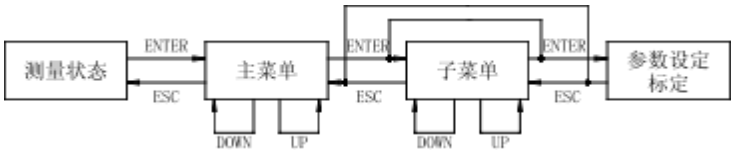
- ESC——Cancel the current operation and return to the previous operation
- MOVE——moves cursor and decimal point when entering data
- ENTER——to enter the menu and confirm the operation
- DOWN——Scroll down the menu and decrease the cursor position by one when entering data
- UP——When scrolling up the menu and entering data, the cursor digit increases by one

3.1.3 Working status display

- PV display: in measurement state
- SV display: in setting state
- Er display: signal circuit error or pressure overrun

3.1.4 menu description

Menus are built in layers, up to four levels, as follows:



Scrolling and selection of menus:

- Press the UP key to scroll through the items in ascending order
- Press the DOWN key to scroll through the items in descending order
- Press the ENTER key to enter the corresponding submenu or specific function operations
- Press ESC to return to the previous menu

As follows:

3.1.5 Input of symbols

Use UP or DOWN to adjust the highest digit (the leftmost digit of the six-digit LED), its cycle sequence: 0…9, -0, …; general digit cycle sequence: 0…9, 0…

3.1.6 Input of Integers

- When an integer input is required, the screen displays XXXXXX, and the lowest digit flashes, and the flashing digit is the cursor.
- Press the UP key to increase the number at the cursor position by one
- Press the DOWN key to decrease the number at the cursor position by one
- When entering a negative number, enter a negative sign in the highest digit
- Press the MOVE key to move the cursor to the left one position circularly
- Press ESC to return without saving

- Press ENTER to save and return

3. 1. 7 input of decimals

- When the decimal input is required, the screen will display XXX.XX (related to the number of decimal places), and the decimal place will blink, and the blinking digit is the cursor
- Press the UP key once to release the number at the cursor position and increase by one Press the DOWN key once to release the number at the cursor position to decrease by one.
- When inputting a negative number, enter a negative sign at the highest digit
- Press the MOVE key to move the cursor to the left in a circular motion, and the decimal point also moves
- Press ESC to return without saving, press ENTER to save and return
- Use UP and DOWN to adjust the highest digit and enter the minus sign

3.2 Transmitter accuracy fine-tuning

(Note: The accuracy error of the transmitter may be caused by the difference of the standard device and the acceleration of gravity of each user. The user can fine-tune the output of the transmitter through this operation to improve the accuracy of the transmitter)

1) Reset: Press and hold the UP and DOWN keys simultaneously for about 5 seconds, the transmitter will reset and the program will restart.

2) Entering the menu: Press and hold the ENTER button for about 5 seconds to enter the main menu and perform corresponding operations.

3) Calibration operation

i) Description:

1)Transmitter calibration and 3 values: zero point, migration zero point, span point.

2)Zero point: the difference is zero, that is, the pressures of the H and L chambers are the same, which is defined as the physical zero point.

3)Migration zero point: 4mA corresponds to the pressure point (possibly physical zero point), which is defined as the logical zero point.

4)Range point: 20mA corresponds to the pressure point (may be the physical zero

point).

ii) Operation

A) In the absence of standard pressure, only physical zero can be calibrated.

Method: Press and hold the housing zero button or DOWN button for about 5 seconds, after releasing it, “GOOD” will be displayed briefly, that is, the physical zero calibration is completed, and “0” will be displayed after calibration.

B) Under the condition of standard pressure source, it is possible to calibrate the migration zero point and span point. Usually, these operations cannot be performed. Only after entering the corresponding password in S UB6 and obtaining the calibration authority, can it be performed.

①When the permission is obtained and the migration zero point is not 0, the migration zero point calibration can be performed.

Method: After adding the pressure to the pressure value of the migration zero point, press and hold the DOWN key and the MOVE key at the same time for about 5 seconds and release it, and then briefly display "OO" to complete the migration zero point calibration.

②When the permission is obtained, and only the span point is not 0, span calibration can be performed.

Method: After adding the pressure to the range point and the pressure value is stable, press and hold the UP key for about 5 seconds and release it, and then briefly display "GOOD" to complete the range calibration.

3.3 Main Menu Description

The main menu has a total of 7 items scrolled in the general state, as follows:

- SUb 0: Display setting (unit setting)
- SUb 1: Zero migration
- SUb 2: Range setting
- SUb 3: Pressure port H.L end switch
- SUb 4: Communication address setting
- SUb 5: Damping setting
- SUb 6: Password verification and password setting (after verification is passed)

After entering the password and passing the verification, the menu will change to a 14-item scrolling display, and after restarting, it will return to the 7-item menu.

The first 6 items of the 14-item menu are the same as the above, and the subsequent items are as follows:

- SUb 7: Setting of current parameters (R0, R100)
- SUb 8: P100 setting (maximum rated range)
- SUb 9: Display or input differential pressure calibration point
- SUb 10: Differential pressure calibration at room temperature
- SUb 11: Reverse calibration of each differential pressure at room temperature
- SUb 12: Display or input temperature point
- SUb 13: Display or input temperature compensation value

If there is no button for 2 minutes in the main menu state, it will return to the measurement state

3.4 Detailed description of submenu operations

一、 SUb 0 display unit setting

After entering the SUb 0 menu, the current measurement value and the corresponding unit will be displayed. When the current is output in square root, it will display "√"

Unit selection menu, 6 items are scrolled and displayed, in order:

0	kPa
1	MPa
2	mA
3	%
4	√mA
5	℃

1. Press the “UP” key, the above items will be scrolled in ascending order
2. Press the “DOWN” key, the above items will be scrolled and displayed in descending order
3. Press the “ENTER” key to complete the selection, save it to the memory, and then return to the main menu

4. Press the “ESC” key to cancel the operation, the display unit remains unchanged, and return to the main menu

In this menu state, if no key is pressed for 2 minutes, the menu returns to the measurement state, and the display unit remains unchanged.

Note: The current output mode is only determined by items 2 and 4, and other options will not change the previous current output mode.

二. SUb 1 zero point migration

Entering the SUb 1 menu, the display screen will prompt to input a floating point number, which displays the previous set value, input the zero point migration value (unit kPa), and press the ENTER key. After the operation is completed, return to the main menu, and the zero point migration is completed at this time, which has no effect on the range, but the set value cannot exceed the maximum rated range.

三. SUb 2 range setting

The operation is the same as that of the SUb 1 menu, except that it is used to set the full scale and cannot exceed the maximum rated scale.

四. Switching of high and low voltage ends of SUb 3

Usually, the high and low voltage ends of the differential pressure transmitter are determined, and the factory setting is H-L, which is not allowed to be changed by the user at will.

After entering this menu, the current setting status will be displayed and cannot be changed. To reset, first enter the password in Sub 6 to obtain the calibration authority, use the UP and DOWN keys to select the setting, ENTER to confirm, and ESC to keep the original setting and return.

五. SUb 4 communication address setting

When multiple instruments are connected to communicate with the host computer, each instrument must have a different address, otherwise it will cause a conflict of responses and fail to complete the communication task. After entering this menu, an integer value is displayed, that is, the previous address value, input the new address, press ENTER key to complete the setting, and return to the main menu. Press the ESC key to save the original settings and return to the main menu.

六．SUb 5 damping setting

The operation is the same as that of SUb4, except that it is used to set the damping value (0-32 seconds or more)

七. SUb 6 password management

After entering the SUb 6 menu, enter an integer that is a password at the screen prompt, and the program will verify whether the password is correct. If the entered password is wrong, "ERROR" will be displayed, and pressing ENTER will return to the main menu. If the entered password is a pass code or a user password, the menu system will be expanded into 14 menus, allowing more operations, and the SUb 6 at this time will be used to reset the user password.

If a special password is entered, the corresponding function will be completed, described as follows:

040820: Cancel the migration of zero calibration and obtain calibration permission.

040821: Cancel span calibration and obtain calibration authority.

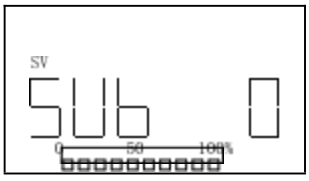
050728: Clear physical calibration.

Note: The operations of SUb 7 to SUb 13 are related to the core parameters and are prohibited from being used without authorization. These operations are also not described in this manual.

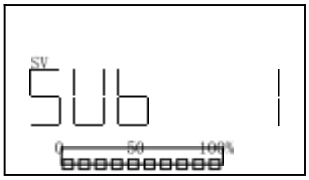
List of operations:

1) The zero point is set to -5kPa (negative input)

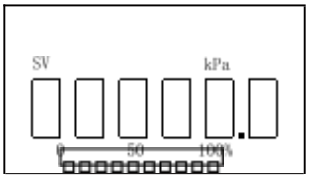
Press and hold the “ENTER” key for about 5 seconds, release it to enter the main menu, the display is as follows:



After pressing the “UP” key to scroll the menu for one continuous operation, the display is as follows:

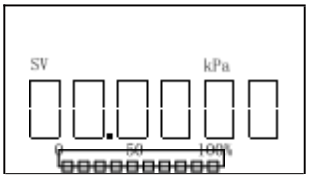


Press “ENTER” to enter the submenu, which is displayed as follows:

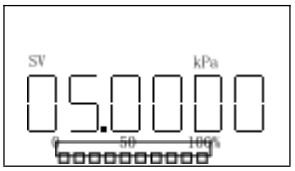


The current value is 0, the cursor blinks before the decimal point.

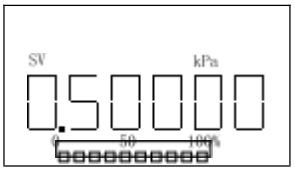
Press the “MOVE” key to move the cursor and decimal point, operate 3 times, the display is as follows:



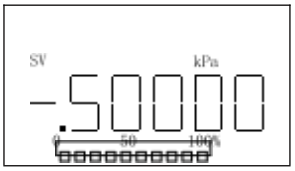
Press the “UP” key to adjust the value, operate 5 times, the display is as follows:



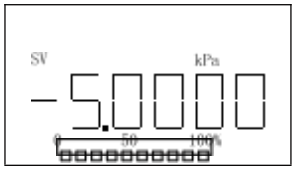
Press the “MOVE” key to move the cursor and decimal point, operate once, and the display is as follows:



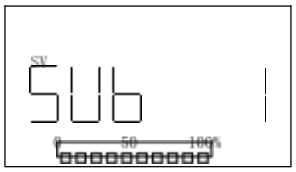
Press the “DOWN” key to enter the minus sign, and operate once, the display is as follows:



Press the “MOVE” key to move the cursor and decimal point, operate 5 times, the display is as follows:



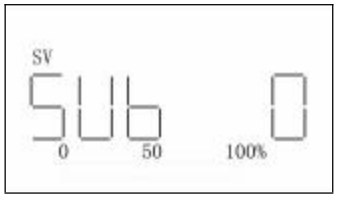
Press ENTER to save the settings and return to the main menu



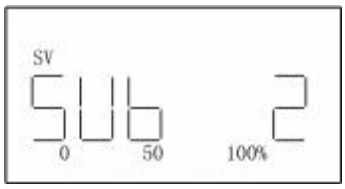
Press the ESC key to return to the measurement state.

2) The range is set to 7.2kPa (decimal input)

Press and hold the ENTER key for about 5 seconds, release it to enter the main menu, the display is as follows:



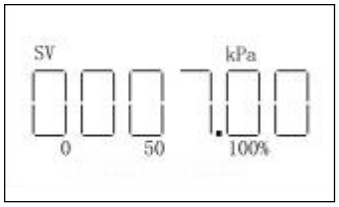
Press the “UP” key to scroll through the menu twice in a row, the display is as follows:



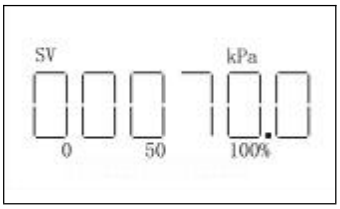
Press the “ENTER” key to enter the SUb 2 submenu, which is displayed as follows:

Display the previous value (8kPa), the cursor blinks in the one digit

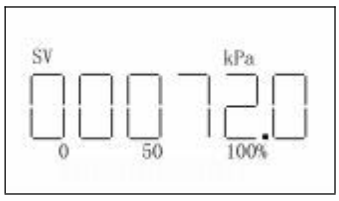
Press the “DOWN” key once to decrease the number of cursor digit, and the display is as follows:



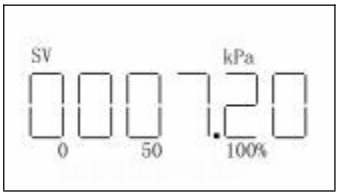
Press the “MOVE” key to move the cursor to the 2nd position from the right, as follows:



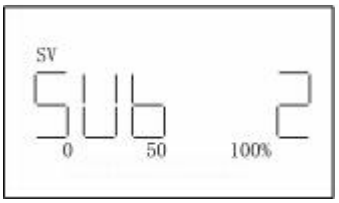
Press the “UP” key to increase the number of the cursor digit, and it will display as follows twice in a row:



Press the “MOVE” key to move the cursor to the 3rd digit from the right, the display is as follows:



Press the “ENTER” key to save the settings and return to the main menu.



Press the “ESC” key to enter the measurement state.

4.User maintenance

4.1 Overview

The digital • intelligent pressure/differential pressure transmitter produced by our company is smart and robust, and has zero automatic tracking capability (ZSC) and temperature automatic compensation capability (TSC), and seldom requires regular maintenance. In terms of function, digital and intelligent transmitter can be roughly divided into three parts: sensor assembly, main circuit board and meter head. The main circuit board and the sensor assembly are fastened with screws and coagulated with glue to form a whole. This integrated design structure stabilizes the distributed

capacitance and parasitic capacitance between the two, and the distance between the signal acquisition circuit and the signal source is stable. Zooming out reduces the impact of interference. This compact construction also makes the transmitter more robust and reliable with fewer problems. The header part is relatively independent and completely interchangeable, and it will not affect the performance after the exchange.

4.2 Soft maintenance

The digital transmitter is an intelligent product, and the parameters are open to the user. The user can adjust the zero point, set the range, set the damping, and even re-calibrate according to the actual situation. This will also cause confusion in parameter settings or soft faults caused by core parameters being modified. When the core parameters (factory calibration values) are changed, you must re-calibrate according to the operating instructions or reset the parameters by communication. When the core parameters are maintained, the soft fault can re-adjust the transmitter according to the operating instructions to make it work properly.

When the actual situation needs to be re-zeroed, open the cover of the transmitter meter, and press and hold the " " on the meter for about 5 seconds to manually adjust the zero. In addition, you can also use buttons or communication to complete other parameter setting operations.

4.3 Hard maintenance

Generally speaking, the sensor assembly, main circuit board and meter head are not repairable on site, and the user's hard fault maintenance items are limited to circuit connection inspection, transmitter cleaning, meter replacement, and terminal block inspection.

1.Test terminal

The test terminal is connected across a diode, and the signal power of the loop passes through the diode. When the indicator head or test equipment is connected to the test terminals, they short-circuit the diode. As long as the voltage between the two terminals is less than the valve voltage of the diode, no current will flow through the diode. In order to ensure that no leakage current passes through the diode when testing or connecting the indicating meter, the resistance of the test equipment or

meter should not exceed 10Ω (for 4-20mA DC type). A resistance value more than 3 times the above value will produce an error of less than 1%. There are conductive copper parts on the lower left side of the "+" and the lower right side of the "-" of the test terminal. When the transmitter is powered on, the output current can be directly tested with the mA file of the digital multimeter.

2. Header check

Unscrew the cover of the meter head, and use a Phillips screwdriver to unscrew the two M3 screws. The meter head can be taken out by hand, and the meter head can be removed by removing the cable plug and the power plug. You can check whether there is dirt on the circuit board of the meter head and whether there is any problem with the line connection seat. If there is any problem, it should be dealt with in time. Reinstallation of the header should be done in the reverse order of removal.

3. Process sensor body inspection

Note the following:

1) Before disassembling the sensor body, the transmitter should be removed from the working point

Remove.

2) Temperature and pressure cycling must be performed after reassembly to ensure accuracy. Include this in the steps to reassemble the process sensor body.

3) The pressure chamber can be removed by removing the four large bolts.

4) The isolating diaphragm can be cleaned with a soft cloth and soft detergent, and rinsed with clean water.

5) In order to facilitate installation, the pressure chamber can be rotated or installed in reverse.

4. Terminal check

Unscrew the back cover to see the terminals. Unscrew the two set screws and remove the terminal cover to see the wiring circuit board. You can check whether the connection of the wiring board is correct and reliable. Mainly focus on the assembly of feedthrough capacitors and test diodes.

4.4 Troubleshooting

一、Symptoms: Output is too high

Potential causes and troubleshooting methods:

1. Primary Components: Check the range of primary components.

2. Pressure guide tube :

1) Check for leaks and blockages.

2) Check that the shut-off valve is fully open.

3) Check gas in liquid lines and liquid in gas lines.

4) Check whether the specific gravity of the liquid in the impulse tube has changed.

5) Check for dross in the pressure chamber.

3. Transmitter electrical connection: Make sure the cable plug socket is clean.

4. Electronic part detection: Detect whether the displayed pressure value deviates too much from the actual pressure value, if so, it needs to be re-calibrated or returned to the factory for processing.

5. Circuit Check: Display whether the pressure value is consistent with the current output, if not, carry out the current readjustment.

6. Sensor Assembly: Refer to this section "Process Sensor Body Inspection".

7. Power supply: Check the output of the power supply.

二、Symptoms: Unstable output

Potential Causes and Remedies :

1. Parameter Check: Check that the zero shift and span settings are correct.

2. Loop Wiring: Check that the voltage to the transmitter is normal. Check for intermittent short circuit breaks and multipoint grounding.

3. Measured medium pulsation: Adjust the damping value.

4. Impulse Line: Check for gas in liquid lines, or liquid in gas lines.

5. Electronic part detection: Check whether the pressure value is stable through the meter, so as to determine whether the instability is caused by the sensor and the main circuit board, if so, replace the sensor and the main circuit board.

三、Symptoms: Low or no output

Potential causes and troubleshooting methods:

1.Parameter Check: Check that the zero shift and span settings are correct.

2.Primary element:

1）Check the installation and working conditions of the element.

2)Any change in the properties of the medium being measured will affect the output.

3. Loop Wiring:

1) Check that the voltage to the transmitter is normal.

2) Check for short circuits and multi-point contacts.

3) Check that the polarity is correct.

4) Check loop impedance.

4. Impulse tube:

1）Check that the pressure connection is correct.

2）Check for leaks or blockages.

3）Check the gas in the liquid line.

4) Check for dross in the pressure chamber.

5) Check whether the globe valve is fully open and the balance valve is tightly closed.

6) Check whether the density of the liquid in the impulse tube has changed.

5. Electrical Connections:

1) Check sensor assembly wiring for shorts.

2) Make sure the cable plug socket is clean.

3) Check wiring to sensor assembly.

4) Check whether the 8-pin of the plug socket is properly connected to the shell.

6. Test diode failure: Replace diode or short test terminals.

7. Transmitter electronics faulty: Test the circuit for faults with the spare board, and replace the faulty circuit board.

8. Sensor Assembly: Refer to this section "Process Sensor Body Inspection".

5 Flange transmitter installation instructions

5.1. Overview

Capacitive flange differential pressure/pressure transmitter is a transmitter connected to the measured part in the form of a flange. It is used in the following situations:

① It is necessary to isolate the high temperature medium from the transmitter;

② The measured medium is corrosive to the sensitive components of the transmitter;

③ The measured medium is a suspended liquid or has a high viscosity;

④ The measured medium is easy to solidify or crystallize due to changes in ambient temperature or process temperature;

⑤ To replace the measured medium, it is necessary to strictly purify the measuring head;

⑥ The measuring head must be kept hygienic.

Capacitive flange differential pressure and pressure transmitters are mainly used to continuously and accurately measure the differential pressure of liquids, gases, and vapors, as well as liquid level, interface, density and other parameters of liquids. In conjunction with the throttling device, it can continuously measure the flow of gas, liquid and vapor, and convert the measured signal into a 4-20m ADC two-wire signal output, which is used as the input signal of the indicator, recorder and regulator to communicate with other unit instruments or industrial control computers. Cooperate to form an industrial automation system such as automatic detection, recording, and control.

5.2. Variety and specification:

5.2.1 Flange type (single level, single plug) liquid level transmitter

5.2.1.1 Measuring range

0～1.2kPa～2.5MPa（0～120mmH_2O0～250000mmH_2O）

5.2.1.2 Working pressure (static pressure)

0.1～4MPa

5.2.1.3 Model Specifications

Table 5-1

Serial Number	Name	Model	Measuring Range	Rated Working Pressure MPa
1	Single Flat Flange Differential Pressure Transmitter	3312	0 ～ 1.2 ～ 10kPa	2.5
2		4412	0 ～ 6 ～ 40kPa	4
3		4512	0 ～ 30 ～ 180kPa	4
4		4612	0 ～ 0.16 ～ 1MPa	4
5		4712	0 ～ 0.4 ～ 2.5MPa	4
6	Single Plug Flange Differential Pressure Transmitter	3332	0 ～ 1.2 ～ 10kPa	2.5
7		4432	0 ～ 6 ～ 40kPa	4
8		4532	0 ～ 30 ～ 180kPa	4
9		4632	0 ～ 0.16 ～ 1MPa	4
10		4732	0 ～ 0.4 ～ 2.5MPa	4

5.2.1.4 Flange level transmitter (ie flat flange and insert flange)

Flange standard: (H G20592-20635-97) GB/T82.1-94

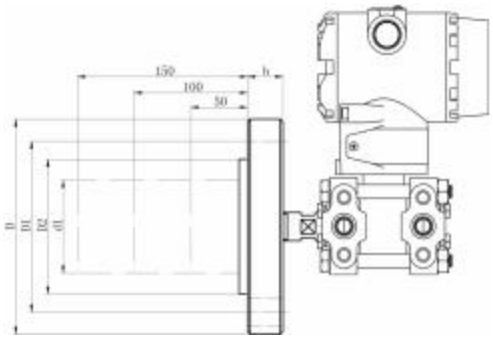
National standard (JB/T82.2-94) machine standard

The specific installation dimensions are shown in Figure 5-1 and Table 5-2:

Table 5-2 PN4.0 flange size

DN	d1	D		D1	D2	b	screw hole			insert flange Insertion depth			French On weight
		Machine logo	GB				diameter	quantity	screw				
80	78	195	200	160	120	24	18	8	M16	50	100	150	5.02 kg
100	96	230	235	190	149	26	22	8	M20	50	100	150	7.63 kg

Figure 1



5.2.1.5 Installation location:

The flanged liquid level transmitter is directly mounted on the tank or tank wall with a flange. When the pressure-transmitting diaphragm is in a vertical position, the possible zero point change is a maximum of 28mm H2O. When the diaphragm is in the horizontal position, the change of zero point is less than 100mm H2O (for the plug-in flange, an additional change of insertion length is required), but it has no effect on the range. This error can be corrected and eliminated.

5.2.2 Remote flange differential pressure and pressure transmitter

5.2.2.1 Measuring range:

Differential pressure: 0～1.2kPa～2.5MPa (0～120mmH2O～250000mmH2O)

Pressure: 0～6kPa～10MPa (0～600mmH2O～1000000mmH2O)

5.2.2.2 Working pressure (static pressure)

0.1～4MPa

5.2.2.3 Model Specifications

The model specifications of the remote flange differential pressure transmitter are shown in Table 5-3

Table 5-3

serial number	name	model	Measuring range	Rated working pressure MPa
1	Double Flat Flange Differential Pressure Transmitter	4422	0 ～ 6 ～ 40kPa	4
2		4522	0 ～ 30 ～ 180kPa	4
3		4622	0 ～ 0.16 ～ 1MPa	4
4		4722	0 ～ 0.4 ～ 2.5MPa	4
5	Double Plug Flange Differential Pressure Transmitter	4442	0 ～ 6 ～ 40kPa	4
6		4542	0 ～ 30 ～ 180kPa	4
7		4642	0 ～ 0.16 ～ 1MPa	4
8		4742	0 ～ 0.4 ～ 2.5MPa	4

Note: One level and one plug are not listed in the table

PN100-DN65 (only for 1812, 1832)

Remote capillary length: 1.5m ~ 13m

5.2.2.4 Installation dimensions

Remote flange transmitters are equipped with mounting flanges, and the installation dimensions of PU and U are shown in the figure.

5-2 and Table 5-4

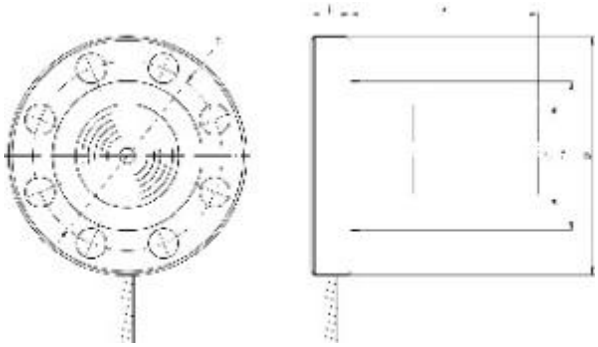


Table 5-4

PN	DN	d1	D	D1	D2	b	screw hole		screw	Insertion depth
							diameter	quantity		

4.0	80	78	200	160	120	24	18	8	M16	50 100 150
4.0	100	96	235	190	149	26	22	8	M20	50 100 150
10.0	65	62	220	170	138	32	26	8	M24	

5.2.2.5 Installation position

When the remote flange transmitter is installed, the height difference between the pressure transmitter and the flange and the height difference between the two flanges of the differential pressure transmitter are limited. See Table 5-5 for the data.

Table 5-5

Range number	allowable height difference (m)	
	Silicone oil injection	Fluorinated oil
4	3.84	1.89
5	19.2	9.48
6、7、8	without this restriction	

When the pressure transmitter and the flange or the two flanges of the differential pressure transmitter are not at the same height, the zero point will change due to the action of the liquid column in the remote capillary, so the zero point should be re-adjusted after installation.

5.2.2.6 The temperature change of the measured medium and the change of the environment will cause the zero point of the transmitter to drift, and the following methods can reduce the impact:

1. Do not let the sun shine directly on the transmitter and remote device;
2. Adjust the zero point with seasonal changes;
3. Keep the temperature of the remote capillary constant.

5.3. Adjustment of the instrument

The adjustment of the flanged transmitter is the same as that of the general transmitter in principle, except that there is a device for sealing connection with the

flange, and thus the test standard pressure is given.

5.4. How to use the instrument

5.4.1 Flange level transmitter

When using the flange level transmitter, it should be noted that the flat flange level transmitter should be used for the general viscous medium, and the flange level transmitter should be inserted into the flange level transmitter for the medium with high viscosity, easy precipitation and suspension. And the measuring diaphragm must go deep into the inner wall of the tower during installation, at least tangent to the inner wall of the tower. If the flow rate of the measured medium is large and the grinding ability is strong, the diaphragm may be worn out, and corresponding measures should be taken before it can be used. The calculation method of single-level and single-insertion flange level transmitters is the same.

5.4.1.1 Usage without migration: (see Figure 5-3)

The meter is installed at the same level as the lowest liquid level. When measuring the opening capacity, the negative pressure diaphragm of the instrument is vented to the atmosphere. When measuring the sealed container, the upper part of the container is connected to the negative pressure side diaphragm. At this time, if the negative pressure side can be kept dry, the condensing tank may not be installed, otherwise a condensing tank should be installed, and the

When the condensate is drained, the normally open valve should be closed to prevent the transmitter from being subjected to one-way pressure.

Figure 5-3 Level measurement without migration

5.4.1.2 The usage of negative migration of instrument band (see Figure 4)

If it is inconvenient to install the condensing tank, or in order to isolate the corrosive medium from entering the negative pressure side, the isolation liquid can be used as shown in Figure 4. In this case, the differential pressure of the instrument is:

$\Delta P=r_1 (H+H_0)-r_2h=r_1H-(r_2h-r_1H_0)$

H

Migration amount: $B=r_2h-r_1H_0$

Range: P=r

Example: known$r_1=1.4g/cm^3$， $r_2=0.89g/cm^3$

H=500mm, H_0=100mm, h=1700mm

Range: $\Delta P=r_1 \cdot 1=1.4\times500=2100(mmH_2O)$

Negative mobility: $B=r_2h-r_1H_0=0.8\times700-1.4\times100=1220(mmH_2O)$

Before installation, adjust the range to -1220～880 (mmH_2O)

H

5.4.1.3 Usage when the instrument belt is moving forward (see Figure 5-4)

When the installation position of the instrument is below the minimum liquid level, the usage is shown in Figure 5-5

Differential pressure:$\Delta P=（H_0+H）r$

Positive Migration:$A=H_0r$

Example: the specific gravity of the measured medium $r=1.1g/cm^3$，H=910mm，H_0=820mm

Range: $P=H\cdot r=910\times1.1=1001\approx1000mmH_2O$

Positive migration amount: $A=H_0r=820\times1.1=902\approx900mmH_2O$

The range must be adjusted to 900～1900mmH_2O before installation

5.4.1.4 Measurement of liquid interface: (see Figure 5-6)

If the viscosity of the liquid in the lower part of the container is large, it will crystallize again, but the liquid in the upper part does not crystallize or precipitate, and a single flat flange liquid level transmitter can be used for interface measurement.

Force on the positive pressure side:$PH=r_1(H_1+H-H_2)+r_2(H_2+H_0)$

Negative pressure side force: $PL=r_1(H_1+H+H_0)$

Differential pressure:$\Delta P=PH-PL=(r_2-r_1)H_0+(r_2-r_1)H_2$

Positive migration: $A=(r_2-r_1)H_0$

Range: $P=(r_2-r_1)H$

SSTCC single-insertion flange transmitter for measurement of high viscosity, easy sedimentation and suspension level, as shown in Figure 5-7

5.4.2 Remote flange transmitter

5.4.2.1 Some media can be measured by a double flange differential pressure transmitter when they are led out by a thermally insulated pressure guiding pipe and still need to be crystallized. Depending on the severity of the crystallization of the medium, the following can be used:

a. Double flat flange transmitter

b. One flat and one plug flange transmitter

c. Double insert flange transmitter for measurement as shown in Figure 5-8

Due to the height difference between the two flanges during installation, migration should be added during adjustment. The negative pressure remote flange is added with negative migration above, and the calculation method is as follows:

Range: P=r

Negative migration: $B=r_0h-rH_0$

In the formula, r - the specific gravity of the measured medium r_0 - the specific gravity of silicone oil 0.97g/cm^3

Example: Known H=800mm, H_0=250mm, h=1300mm, r=1.2g/cm^3

Range: $P=r\cdot H=1.2\times800=960mmH_2O$

Negative migration amount: $B=r_0h-r\,H_0=0.97\times1300-1.2\times250=961\approx960mmH_2O$

The range should be adjusted to -960～0mmH_2O before installation

5.4.2.2 Liquid interface measurement

Force on positive pressure side: $PH=r_1(H_0+H_1+H-H_2)+r_2(H_2+h_0)$

Negative pressure side force: $PL=r_1H_0+r_0(H_1+H+h_0)$

Differential pressure: $\Delta P=PH-PL=r_1(H_1+H)+r_2h_0-r(H_1+H+h_0)+(r_2-r_2)H_2$

Migration amount: $B=r_1(H_1+H)+r_2h_0-r_0(H_1+H+h_0)$

Range: $P=(r_2-r_2)H$

Among them, r_0—specific gravity of silicone oil ,H—highest interface height

5.4.2.3 Flow measurement with double-flange differential pressure transmitter

For the medium that cannot be led out by the pressure guiding pipe, the double flange differential pressure transmitter can be used for flow measurement. The device is shown in Figure 5-10. When measuring the horizontal pipe, the two flanges are on the same level, and there is no liquid level difference. , regardless of migration, when measuring vertical pipelines, it always bears the liquid pressure difference of (r-r0) H, so the meter should have a positive migration amount of (r-r0) H.

5.5. Instrument maintenance

5.5.1 There is filling liquid in the pressure transmission system of the flange transmitter, and the positive and negative sides of the transmitter cannot be loosened or disassembled, otherwise it will fail due to leakage of filling liquid;

5.5.2 After the instrument is running, the basic characteristics should be checked regularly, the zero point should be corrected according to the season, and the failed seals should be replaced;

5.5.3 When cleaning the flange, be careful not to bump or scratch the diaphragm, otherwise the instrument will fail.

fault phenomenon	reason	Approach
no output	1. The pressure is not introduced into the transmitter	Check whether the pressure guiding pipe is installed correctly, whether the valves are in normal working condition, and whether the pressure guiding pipe is blocked
	2. Incorrect power supply voltage and incorrect load resistance	Refer to SSTYC, SSTCC differential pressure, pressure transmitter installation and operation manual
	3.Wrong power supply polarity	correct
	4.Output circuit disconnection	turn on
Large error, output up to 100% or 0%	1. The pressure guide pipe, pressure guide valve or purge valve is blocked	All pipes should be unblocked, all valves should be in normal working condition, and all pipe joints should be sealed
	2.Incorrect measurement circuit	Check the connection between the distributor, secondary instrument, etc. and the transmitter and whether the working state is normal and troubleshoot
	3. The zero position, range and linear potentiometer are wrongly adjusted or damaged	Replace damaged components and readjust
	4. The position of the positive and negative transfer switches is wrong	correct

5.5.4 Troubleshooting of flange transmitter

5.6. Ordering instructions

5.6.1 Corrosion resistance selection:

According to different corrosive media, the transmitter isolation diaphragm and pressure transmission diaphragm can be made of materials such as 316L, Hastelloy C-276, Monel K-500, Hastelloy B-2 and 3YC25; M o2T i (3Y C-20) can be used for the structural materials of the gas discharge valve, insert cylinder and other contact media.(0Cr17Ni12Mo2Ti) AISI (316L), 316L, Hastelloy C, Monel and other

materials, the selection should be listed in the model according to the material combination specified in Table 5-6 and the corresponding anti-corrosion endnote code. See Table 5-6

Anticorrosion Endnote Code	Structural materials			
	Contact medium structure	pressure transmission diaphragm	Diaphragm seat	mounting flange
no endnotes	Mo2Ti (316)	Mo2Ti (316)	Mo2Ti (316)	1Cr18Ni9Ti
F13	316L	Hastelloy C-276	Mo2Ti (316)	1Cr18Ni9Ti
F14	316L	Monel K-500	Mo2Ti (316)	1Cr18Ni9Ti
F15	316L	Tantalum (Ta)	Mo2Ti (316)	1Cr18Ni9Ti
F22	316L	316L	Mo2Ti (316)	1Cr18Ni9Ti
F23	316L	Hastelloy C-276	Mo2Ti (316)	1Cr18Ni9Ti
F24	316L	Monel K-500	Mo2Ti (316)	1Cr18Ni9Ti
F25	316L	Tantalum (Ta)	Mo2Ti (316)	1Cr18Ni9Ti
F26	316L	Hastelloy B-2	Mo2Ti (316)	1Cr18Ni9Ti
F33	Hastelloy C	Hastelloy C-276	Mo2Ti (316)	1Cr18Ni9Ti
F35	Hastelloy C	Tantalum (Ta)	Mo2Ti (316)	1Cr18Ni9Ti
F44	Monel	Monel K-500	Mo2Ti (316)	1Cr18Ni9Ti
F47	Monel	3YC25	Mo2Ti (316)	1Cr18Ni9Ti

Table 5-6

5.6.2 Complete Flange Transmitter Models

There are no requirements for the above parts and can be omitted.

5.6.3 Other requirements:

Flange transmitter is filled with fluorine oil, no on-site meter, etc.

5.6.4 Notes not noted:

① When the nominal diameter of the flange is not noted: Provided according to DN80;

② When the depth of the inserted flange is not noted: provided as 150mm;

③ When the length of the remote transmission capillary is not noted: Provided at 3.5m;

④ Other special requirements shall be supplied according to the agreement.

Appendix

A.1 Performance Index

A.1.1 Specifications

Performance Specifications

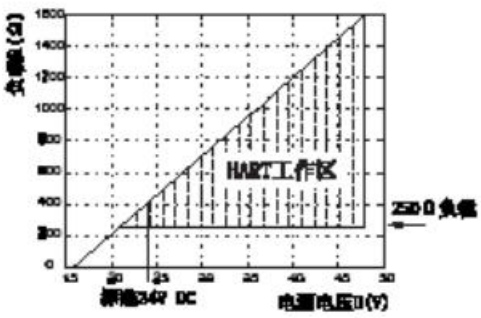
(Reference conditions: no migration state, silicone oil filling fluid, 316L isolation diaphragm)

一、Output signal: 4 ~ 20mA DC/RS485 digital communication

4 ~ 20mA DC/HART protocol digital communication (optional)

二、Transmission form: two-wire system.

Load characteristic diagram



三、Accuracy :

1. Linear output: ±0.1% (1:1 to turndown), including linearity, variation ,

repeatability composite error.

2. Square root output: ±(0.2% when the output pressure is 4 to 100% of calibration range + 0.05% upper limit).

3. Stability: For DP range codes 3, 4, 5, the highest range±0.2%, for other range codes, it is the highest range of ±0.25%.

4. Humidity: 0 to 100% relative humidity.

5. Startup time: 2 seconds maximum at minimum damping.

6. Volumetric suction: less than 0.16cm3.

7. Damping: Electrical damping is 0 to 32 seconds.

In addition, the sensing element has a constant damping time of 0.2 seconds (range 3 for 0.4 seconds).

四、Static pressure effects (DP transmitter)

1. Zero error: ±0.25% of the highest range for 14MPa a,

For range code 3, it is ±0.5% of the highest range, adjusted by zero point can be corrected.

2. Span error: every 6MPa can be corrected to ±0.25% of the input reading, or for range code 3, ±0.5%. This error can be removed by adjustment.

五、Static Pressure Effects (HP Transmitter)

Zero error: ±1.0% of the highest span for 32MPa. Pass

The zero-crossing adjustment can be corrected.

六、Temperature effect

1. Zero error at the maximum range:

±0.5% of range per 56°C. The total effect includes span and zero error: ±1.0% of span per 56°C. For range range number 3, the amount of influence is doubled.

2. Zero error at the minimum span:

±3% of range per 56°C. The total effect includes span and zero error: ±3.5% of span per 56°C. For range range number 3, the amount of influence is doubled.

1) Vibration influence: The frequency is 0 ~ 200HZ, and each g in any direction is the upper limit of ±0.05%.

2) Power supply influence: less than 0.005%/V of the calibration range.

3) The influence of the installation position: the zero drift is not greater than (0.25kPa), this error can be eliminated by calibration and has no effect on the range.

4) Influence of electromagnetic field interference/radio frequency interference: According to SAMA PMC33.1, the test is carried out from 20 to 1000MHZ, and the field strength can be as high as 30V/m.

七、 Structural specifications

Materials in contact with the medium :

1. Isolation Diaphragm: 316L Stainless Steel, Hastelloy C-276, Monel or Tantalum. (optional)

2. Vent/drain valve: 316 stainless steel, Hastelloy or Monel.

3. Process flanges and connectors: 316 stainless steel, Hastelloy or Monel.

4. O-rings in contact with the medium: fluorine rubber, nitrile rubber. (optional)

1）Filling fluid: Silicone oil.

2）Bolts: Carbon steel with cadmium plating.

3）Electronic circuit housing: low copper aluminum.

4) O-ring: Nitrile rubber, Viton. (optional)

5) Painting : Polyurethane.

5. Process connection: For transmitters with range codes 3, 4, and 5, the center connection hole distance between the two flanges is 54mm, and the holes are NPT1/4-18; for transmitters with codes 6 and 7 It is 56mm and NPT1/4-18; for the transmitter code number 8, it is 57.2mm and NP T1/4-18. For transmitters with range codes 3, 4, and 5, the pressure-inducing holes on the two connectors are NPT1/4-14, and the flange connectors can be turned over to give a center distance of 50.8mm, 54mm or 57.2mm, respectively.

6. Electrical connectors: with on-site online test terminals.

7. Weight: excluding optional parts, AP, DP, GP and HP models weigh 2.9 kg.

A.1.2 Conditions of use

1. Power supply voltage:

16V ~ 48V DC intrinsically safe explosion-proof products must be powered by the corresponding safety barrier (standard is 24VDC)

2. Product use environment

1) Operating temperature: -20℃～+80℃

2) Storage temperature: -40℃～+104℃

3) Humidity: 0 ~ 90%

3. Environmental conditions for explosion-proof products:

1) Temperature : -20℃～+40℃

2) Relative humidity: 5% ~ 95%

3) Atmospheric pressure: 86 ~ -106kPa

4. Parameters of intrinsically safe external safety barrier:

1) U0 ≤ 28V DC,

2) I0 ≤ 30mA,

3) P0 ≤ 0.84W

A.2 Random accessories

The transmitters produced by our company are randomly distributed with the following accessories for the convenience of users.

1. User Manual 1 copy

2. 1 product certificate

3. Mounting bracket 1 pair

4. 4 M10 screws

A.3 Precautions

Please read this manual carefully before installation and use. If this product is adjusted due to performance improvement, there will be no further notice.