

**Intelligent Pressure  
Transmitter Setting  
Instruction**

ZAX TECH

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## **1. Overview**

- Fully intelligent two-wire 4-20mA working mode, 5-bit LCD/LED display.
- The sensor is excited by constant current and constant voltage, with constant current of 0.4mA and constant voltage of 2.5VDC.
- The ADC input amplitude is  $\pm 5\text{mv} \sim \pm 80\text{mv}$ , providing 24-bit kernel resolution and 18 bits of useful bits. The built-in amplification factor of the circuit board is 12~200 times. It supports automatic polarity conversion of sensor signals.
- Suitable for diffusion silicon pressure sensor, ceramic pressure sensor.
- It provides the function of resetting the main variables, active and passive migration, 19 kinds of unit conversion, 6 kinds of display modes, display resolution adjustment, factory data recovery and so on, which is suitable for the special needs of all

kinds of customers.

- The nonlinear correction function of 2~5 points eliminates the nonlinear error of the sensor.
- Full digital calibration, no moving potentiometer, lower temperature drift.
- The enhanced anti-interference design is suitable for various industrial environments with harsh electromagnetic environment.

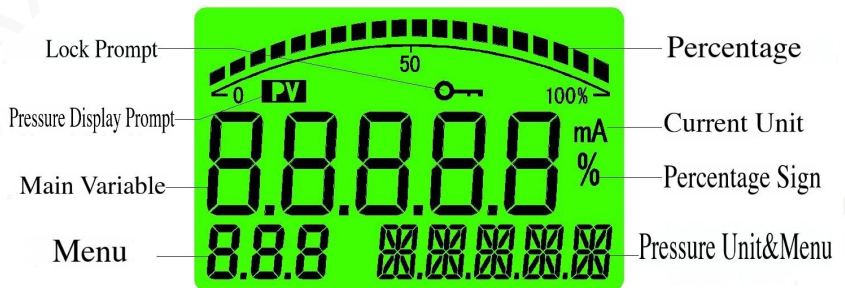
## **2. Main parameters and indicators**

- Power supply voltage: 12~30VDC, recommended 24VDC. Power supply change has no effect.
- Signal range: the circuit board is  $\pm 5\text{mv} \sim \pm 80\text{mv}$ , corresponding to 1.5mA diffusion silicon sensor output can reach up to 320mv.
- Constant current excitation: 0.4mA, suitable for constant current power supply sensors (3~8k $\Omega$ ).
- Constant pressure excitation: 2.5VDC/0.5mA,

suitable for ceramic piezoresistive sensors.

- Working environment: temperature-30~80 °C , humidity <85%, dry and non-corrosive environment.
- Size: 53\*53\*23.
- Load resistance: (VCC-9)/20mA
- Current output resolution: about 1uA
- Temperature drift coefficient: <35ppm/°C
- Display range: -19999~99999

## Display area description

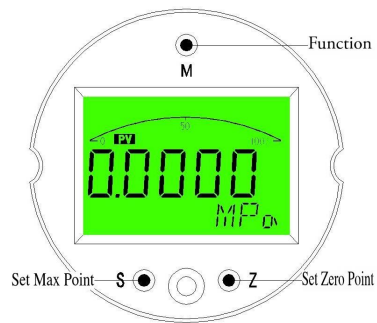


## 3. Key function description

## function key

### "M"

- In the measurement mode, short press to open and enter the password setting.



- In measurement mode, long press for 5 seconds to enter the main variable zero (i.e., PV zero).
- In the setting mode, short press to modify the enabled parameter. The modified parameter will flash. Short press again to confirm the parameter modification, and the modified parameter will stop flashing.

### Turn the key "S" on

- In measurement mode, short press is used to modify the display mode function.
- In the measurement mode, long press for 5 seconds

to enter the adjustment function (i.e., calibrate the transmitter full point).

- In the setting mode, the function of adding one to the setting parameter is added, and the continuous shift is added when it is long.

### **Zero key "Z"**

- In measurement mode, short press is used to modify the display mode function.
- In the measurement mode, long press for 5 seconds to enter the zeroing function (i.e., calibrate the transmitter zero point).
- In the setting mode, the setting parameter shift and minus one function are set. When the time is long, the shift or minus one is continuous.

## **4. Overview of key functions**

- The shift key and the increase key of the instrument have the function of variable rate.

- The instrument has both shift and incremental input methods. For menus that require a large number of numerical modifications, the shift method is used, and for menus that require continuous data input, the incremental method is adopted.
- The instrument will stop the simulation output when it is set, so if the user does not operate the instrument within 60 seconds, it will automatically exit to the measurement state.
- All the parameters of the setting are saved only when the instrument exits the menu normally.

## **5. Shortcut functions**

- The instrument has three quick functions: main variable zero, zero point source migration and full point source migration, which is convenient for users to set quickly on site.
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## 6. Reset the main variables

The main variable reset, or PV reset, refers to the zero point relative to atmospheric

pressure, not the zero point of the sensor's range.

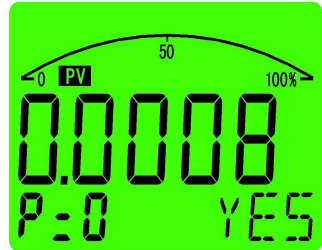
When the transmitter is placed directly under atmospheric pressure and the 'M' key is pressed for more than 5 seconds, the main variable reset

function is activated. As shown in the figure on the right, the menu area displays 'P=0'. Use the 'S' and 'Z' keys to select the desired operation, and the prompt area will display:

"NO" does not reset the chief editor;

"YES" to reset the chief editor;

"RESET" restores the zero point before the reset operation;



If no key is pressed within 30 seconds, the instrument will return to measurement mode. This function is not allowed in the production process and is suitable for field use.

## 7. Zero point active migration

Zero-point active migration involves setting the current pressure as the



transmitter's zero output. Apply zero point pressure to the transmitter by holding down the 'Z' key for more than 5 seconds. The instrument will alternately display the current pressure value and the zero output current value, as shown in the figure on the right. The menu area displays 'LSt'. Use the 'S' and 'Z' keys to select the desired operation, with the prompt area displaying:

"NO" does not perform zero point active migration;

"YES" to perform zero-point active migration;

If no key is pressed within 30 seconds, the instrument will return to measurement mode. This function is not allowed in production and is suitable for field use.

## 8. Full point active migration

Full-scale active

migration involves

setting the transmitter's

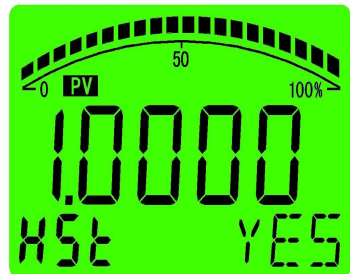
current pressure to its full-scale output and

applying full-scale pressure to the transmitter.

Long press the 'S' key for more than 5 seconds,

and the instrument will alternately display the

current pressure value and the full-scale output



current value, as shown in the figure on the right.

The menu area will display 'HSt'. Use the 'S' and

'Z' keys to select the desired operation, and the

prompt area will display:

"NO" does not perform full point active migration;

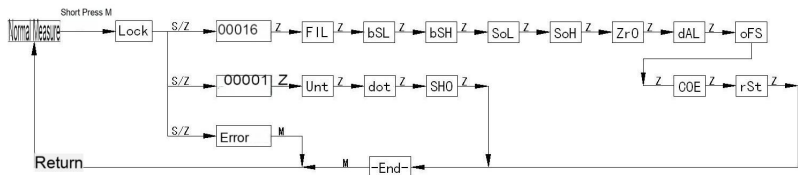
"YES" to perform full point active migration;

If no key is pressed within 30 seconds, the instrument will return to measurement mode. This

function is not allowed in production and is suitable for field use.

## 9. Set up the block diagram

Note: "M": "S": "Z" refer to keys (Buttons)



## 10. Menu description

The menu of this instrument is divided into two levels: "Advanced user menu" and "General user menu", which are distinguished by the password for entering each level of menu.

➤ "Advanced user menu"

The password "00016" is used when some special Settings are made for the on-site use of the transmitter.

➤ "General user menu"

Enter the password "00001" to set the display unit, display resolution, and display mode.

**Note: When the advanced user and user menu are set, if there is no key operation within 60 seconds, the setting will be automatically exited and returned to the measurement mode.**

## **11. Password Settings menu**

Loc: Password input menu, which can set the range (19999~99999), and the menu prompt is "PIN"

Set the menu entry password. If the password is incorrect or no key operation is performed within 30 seconds, it will automatically return to the measurement mode.

## **12. General user menu**

Unt: User unit setting, which can be set within the range of (0~18). The menu prompt is the set units

There are 19 units set, which are "MPa", "KPa", "Pa", "bar", "mbar", "PSI", "mH<sub>2</sub>O", "mmH<sub>2</sub>O", "InH<sub>2</sub>O", "ftH<sub>2</sub>O", "mHg", "mmHg", "InHg", "Kg/cm<sup>2</sup>", "atm", "Torr", "m", "cm", "mm"

Dot: Display precision setting, the range can be set (0~4), the menu prompt is the current pressure unit

The display resolution refers to the number of

decimal places shown in measurement mode. Users can set this according to their on-site requirements. More decimal places are not always better; stability of the display value should be prioritized. Additionally, this menu setting is limited by the transmitter's maximum display value during calibration. If the set decimal places exceed the 5-digit range when the transmitter's maximum display value is reached, the decimal places will be adjusted to ensure the maximum display value is displayed correctly.

For example, if the transmitter calibration range is 0.0000~20.000MPa, the display accuracy setting range is (0~3). If the display accuracy setting value is 4, the maximum display value will exceed the maximum 5-bit display range

SHO: Display mode setting, set range (0~5)

"0" --displays the main variable with the prompt

"-PV-"

"1" --Display the current with the prompt

"-mA-"

"2" --Displays the percentage and prompts "-%-"

"3" --The main variable and current are displayed alternately, with the prompt "PV-mA"

"4" --The main variable and percentage are displayed alternately, with the prompt "PV--%"

"5" --Current and percentage are displayed alternately, with the prompt "mA--%"

### **13. Advanced user menu**

FIL: Filter constant setting, set range (0~2)

"0" -low filter, prompt "LOW"

"1" --Filter, prompt "MId"

"2" --high filter, prompt "HIg"

The larger the filter constant value is set, the

stronger the ability to suppress interference will be, but the sensitivity will decrease. The default value of this menu value in production calibration is "1" for medium filter effect, which can adapt to most application occasions.

B: Set the lower limit of the variable transmission range, which can be set within the range (-19999~99999). The menu prompt displays the current pressure unit.

This function can realize the zero point passive migration of the transmitter output. The set pressure value will correspond to the current value set in the "SoL" zero point current menu. In order to facilitate user setting, the decimal place position in this menu can be set by pressing the button, so that users can quickly set the required value.

The minimum range of the transmitter can be compressed according to the sensor range of 3:1, and the maximum range can be set according to the sensor range of 1:1. Exceeding this range will affect the output accuracy of the transmitter.

B5H: The upper limit of the variable transmission range can be set (from -19999 to 99999), and the menu prompt displays the current pressure unit.

This function can realize the full point passive migration of the transmitter output. The set pressure value will correspond to the full point current menu setting value of "SoH". In order to facilitate the user setting, the decimal point position in this menu can be set by pressing the button, so that the user can quickly set the required value.

The minimum range of the transmitter can be

compressed according to 3:1 of the sensor range, and the maximum range can be set according to 1:1 of the sensor range. Exceeding this range will affect the output accuracy of the transmitter.

SoL: Zero current fine-tuning, set range (-150~200)

When setting this menu, the instrument alternates between displaying the factory-set zero current value and the zero current D/A fine-tuning value. The transmitter outputs the set current value. When the set zero output current value is displayed, the menu prompt shows "L-OUT". When displaying the zero current D/A fine-tuning value, the menu prompt shows "L-D/A". If there is an error in the zero current value during the use of the transmitter, a current meter can be connected in series with the transmitter's power circuit to fine-tune the zero

current value using "S" and "Z". The range for fine-tuning the current is approximately  $\pm 0.2\text{mA}$ .

SoH: Full point current fine-tuning, set range (-150~200)

When setting this menu, the instrument alternates between displaying the factory-set full-scale current value and the full-scale current D/A fine-tuning value. The transmitter outputs the set current value. When displaying the set full-scale output current value, the menu prompt displays "H-OUT". When displaying the full-scale current D/A fine-tuning value, the menu prompt displays "H-D/A". If the full-scale current value output by the transmitter is inaccurate, a current meter can be connected in series with the transmitter's power circuit. The

full-scale current value can be fine-tuned using the "S" and "Z" keys, with a fine-tuning range of approximately  $\pm 0.2\text{mA}$ .

ZrO: Zero full shielding coefficient, set range (0.00~1.00), menu prompt "%"

The menu setting value indicates the shielding range of zero point and full point. For example, if the menu value is set to 0.10, the transmitter output will automatically stabilize at zero point or full point when the transmitter output is close to zero point or 0.10% of the transmitter range at full point, and there will be no output jump due to interference.

dAL: Over-range alarm switch, which can be set to range (0~1)

This set value indicates that the display will flash when the pressure value exceeds 125% of the

upper limit of the sensor range or is less than 25% of the lower limit of the range.

"0" -Turn off the alarm function and prompt "NO"

"1" -Turn on the alarm function and prompt "YES"

oFS: Display the offset value, which can be set within the range (-19999~99999), and the menu prompt displays the current pressure unit

By setting this menu value, the transmitter display and output values can be offset. The default value of this menu is 0, and generally there is no need to set this menu value.

COE: sensor sensitivity correction coefficient, which can be set in the range (0.0001~1.9999), menu prompt "GAIN"

During the use of the transmitter, if the sensor's

sensitivity changes, you can adjust it using this menu. Before adjusting the transmitter's sensitivity, first use the main variable zero (PV zero) function to correct the transmitter's zero error, ensuring that the transmitter's linearity remains normal after the sensitivity adjustment. The default value for this menu is "1.0000".

For example, if the transmitter's calibration range is 0.0000~20.000MPa, and after some time of use, the zero point changes to "0.0050MPa" and the full scale changes to "20.160MPa". At this point, both the zero point and sensitivity of the transmitter have changed. To correct these changes, first use the main variable reset function to clear the zero point error. After resetting the main variable, the transmitter's zero point should be "0.0000MPa" and the full scale

should be "20.110MPa". Then, calculate the theoretical full scale divided by the actual full scale value to adjust the sensitivity, which is  $20.000\text{MPa} / 20.110\text{MPa} = 0.9945$ . Set the sensor sensitivity correction coefficient to "0.9945" to correct the sensitivity change.

rSt: Restore factory data, set range (0~1)

This menu function restores the transmitter data to the factory state. This function is only valid when exiting the setting and saving the data.

"0" --Close the recovery factory function and prompt "NO"

"1" --Open the factory function and prompt "YES"