

**aobo**

*instrument*

**2023  
PRODUCT  
INTRODUCTION**

**FLOW  
TOTALIZER**

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## **I.Summary**

Mc51-y2 intelligent flow totalizer is a general-purpose Flow Totalizer with 16 bit ultra-low power MCU as the core and intelligent Chinese menu configuration. It can complete the flow calculation function of steam, gas and liquid with the fastest calculation speed, lower power consumption and more reliable working performance. It can compensate the temperature and pressure of fluid in real time and online, and receive flow, temperature, pressure and other signals at the same time, The signal can be of frequency, current, differential pressure, resistance and other types. The signal processing adopts the technology of no switch contact and no potentiometer adjustable parts, which makes the measurement more accurate and reliable.

The watchdog technology is adopted in the instrument, which can effectively prevent the phenomenon of crash and non operation in industrial occasions.

With the new flash technology, the instrument data can be stored for more than 10 years after power failure.

Modbus communication technology with rs232/485 interface can be used to network with various networks or industrial buses to realize remote meter reading.

## **II.Technical indicators**

1. Flow input signal:

Frequency signal: such as vortex street, turbine, etc;

4 ~ 20mA current signal: such as electromagnetic, ultrasonic, etc; Differential pressure signal: such as orifice plate, V-cone, etc.

Note: ① standard of frequency signal: voltage pulse, V low  $\leq$  1V, v high  $\geq$  5V, receiving

frequency range: 0 ~ 5000Hz;

② The receiving type of differential pressure signal is 4 ~ 20mA current, and the differential pressure signal without square root.

2. Pressure input signal:

4 ~ 20mA current signal.

Note: steam pressure compensation range: saturated steam 0 ~ 2.0MPa;

Superheated steam: 0 ~ 4.5MPa (usually 0 ~ 3.0MPa).

3. Temperature input signal:

PT100 platinum resistance, 4 ~ 20mA current output temperature transmitter signal.

Note: steam range: 0 ~ 600 degrees (usually 0 ~ 400 degrees).

4. Measurement accuracy: grade 0.5

5. Communication function (to be equipped according to the user's order requirements):rs232 or 485 interface, MODBUS protocol.

6. Display function:

Instantaneous, cumulative, pressure, temperature, frequency, current, differential pressure, density, power failure, record, date, time, last power failure time.

7. Automatic diagnosis function:

During steam measurement, the temperature and pressure compensation is automatically judged. When the on-site temperature is lower than the saturated steam temperature corresponding to the pressure, the compensation is carried out according to the saturated steam working mode; Otherwise, it is compensated according to superheated steam.

8. Small signal removal function:

In the environment of slight vibration or interference, the interference signal can be cut off, which improves the measurement stability of the instrument.

9. Power failure protection function:

The calculation results in the machine and the data set by the user will not be lost in case of power failure, and the storage time is more than 10 years.

10. Working power supply: ac:220v ± 15%; Power consumption: less than 5W

Dc:12v ± 5%

11. Output power supply: there are two groups in total, one group is 12v/30ma, and the other group is 24v/200ma.

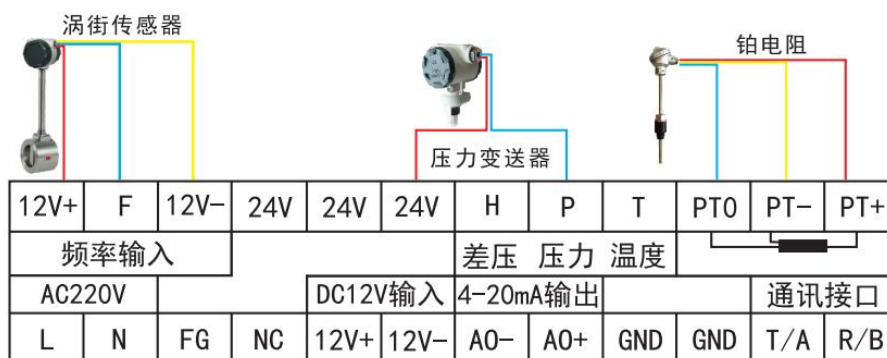
12. Working environment: temperature: -10 ~ 60 °C; Humidity: 5 ~ 85% RH

13. Installation method: Horizontal

14. Opening size: 152 ± 0.5 × 76 ± 0.5 (width × Height in mm)

15. Overall dimension: 160 × eighty × 120 (width × high × Depth in mm)

### III. Wiring diagram



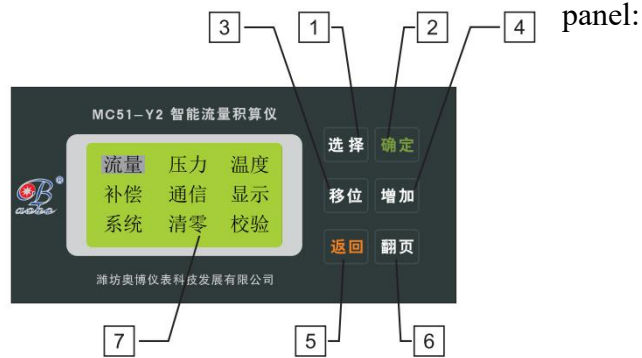
Feed output Description: all 12V and GND are the same set of power output, and 24V and GND are the same set of power output.

## IV. Structure

Standard snap in type.

## V. Display function

### 1. Instrument



### Panel Description:

| Label | name          | content   |
|-------|---------------|---|
| 1     | Selection key | Parameter setting selection key   |
| 2     | OK key        | Enter instrument parameter setting<br>Can confirm the changed set value<br>Used to enter the current fixed item when changing the setting |
| 3     | Shift key     | Used to move the setting cursor position when changing the setting  |
| 4     | add keys      | Used to increase the value when changing the number<br>Used to select the content of the current setting item when changing the setting   |
| 5     | Return key    | Used to exit the current setting item when changing the setting   |
| 6     | Page key      | It is used for calling display screen when working condition is displayed   |

|   |                |  |
|---|----------------|--|
|   |                | Used to change the current setting when changing the setting   |
| 7 | display screen | Display real-time measured value (fixed display or patrol display)<br>In the parameter setting state, the setting parameters are displayed |

Working condition display interface:

Press the "page turning" key to turn the page to display the required content. Each display screen can be summoned and displayed at any time through the panel keyboard, and can also be programmed to automatically cycle or freeze frame display. The working condition display screens are as follows:

|    |           |
|----|-----------|
| 流量 | 8.24 t/h  |
| 压力 | 0.852 MPa |
| 温度 | 230.2 °C  |
| 累积 | 567.8 t   |

|    |           |
|----|-----------|
| 频率 | 232.84Hz  |
| 电流 | 0.000mA   |
| 差压 | 0.000kPa  |
| 密度 | 4.271kg/m |

Picture one picture two

Current flow: 8.24 t/h current frequency: 232.84hz

Current pressure: 0.852 MPa current current: 0.000ma

Current temperature: 230.2 °C current differential pressure: 0.000kpa

Current accumulation: 567.8t current density: 4.271kg/m<sup>3</sup>

|   |          |           |
|---|----------|-----------|
| ↓ | 10-05-08 | 10:21     |
| ↑ | 10-05-08 | 10:32     |
| Σ |          | 12=023:15 |
|   | 10-05-09 | 14:23     |

Screen 3

Last power failure time: 10:21, May 8, 2010

Last power on time: 10:32, May 8, 2010

Total times and time of power failure: 12 times, 23 hours and 15 minutes

System real time date and time: 14:23, May 9, 2010

## VI. Instrument programming method

As this instrument is a multi-functional programmable intelligent instrument, the user must program and operate the instrument to determine which flow sensor is used and the type of sensor output signal, etc. before access and use; Determine the measuring range, flow range, instrument coefficient, etc. of each measuring sensor.

### 1. User programming

In the working condition display interface, press the "OK" key to enter the programming. The programming is completed by the Chinese prompt. First, enter the programming password, which is 2917 (Figure 1); Press the "shift" and "increase" keys to input numbers. After the password is correct, press the "OK" key to enter the main menu (Figure 2).



Figure 1 Figure 2

On the main menu display page, use the "select" key to select "flow", then press the "OK" key to enter the "flow setting" submenu (Figure 3), press the "return" key to exit the current item, return to the previous menu, and press the "page turning" key to enter the next submenu.





Figure 3 Figure 3-1

## 2. Flow setting

The "fluid medium" setting can be selected from steam / gas / liquid, press the "add" key to select, and press the "OK" key to save.

Flow signal" setting can be selected from frequency / current / differential pressure, press "increase" key to select, and press "OK" key to save (Figure 3-1).



Figure 3-2 Figure 3-3

UOM" can be set in kg, t, M<sup>3</sup>、 Select from L, when kg and T are selected, measure the mass flow, and select M<sup>3</sup>、 When l, measure the volume flow, press the "increase" key to select, and press the "OK" key to save (Fig. 3-2).

Instrument coefficient" setting, frequency signal is 2 decimal places, differential pressure signal is 3 decimal places, press "shift" key to select data bits, press "increase" key to input numbers, and press "OK" key to save (Figure 3-3).

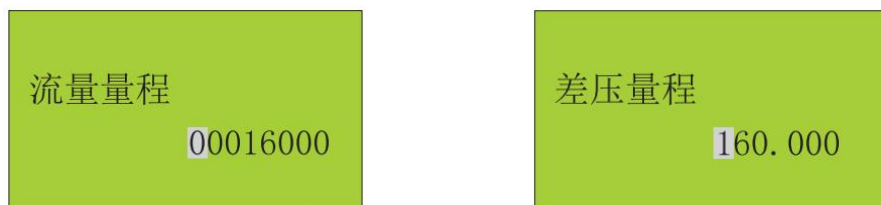


Figure 3-4 figure 3-5

Flow range" setting is required when connecting current signal. Press the "shift" key to select data bits, press the "increase" key to input numbers, and press the "OK" key to save

(Fig. 3-4).

"Differential pressure range" setting is required when connecting to differential pressure signal. Press the "shift" key to select data bits, press the "increase" key to enter numbers, and press the "OK" key to save (Fig. 3-5).



Figure 3-6 figure 3-7

"Damping coefficient" setting refers to the time of software digital smoothing filtering. The coefficient is selected between 0 and 9. Our factory setting is 3. Press the "add" key to enter the number, and press the "OK" key to save (Figure 3-6).

"Cut off frequency" setting, small flow cut-off signal, press the "shift" key to select data bits, press the "increase" key to input numbers, and press the "OK" key to save (Figure 3-7).



Figure 3-8

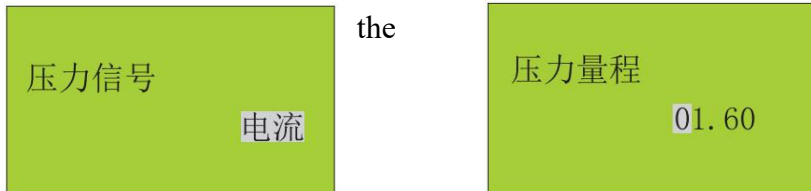
"Output range" setting, press the "shift" key to select data bits, press the "increase" key to input numbers, and press the "OK" key to save (Figure 3-8).

### 3. Pressure setting

Use the "select" key to select "pressure" on the main menu display page, and then press the "OK" key to enter the "pressure setting" submenu (Figure 4). Press the "back" key to exit

the current item, return to the previous menu, and press the "page turning" key to enter the next menu.

Pressure signal" setting, press the "increase" key to select "current" or "setting", and press



the "OK" key to save.

Figure 4 Figure 4-1

Pressure range" setting: input the range value when the pressure signal selects current, press the "shift" key to select data bits, press the "increase" key to enter numbers, and press the "OK" key to save (Figure 4-1).

Damping coefficient" setting refers to the time of digital smoothing filtering. The coefficient is selected between 0-9. Our factory setting is 3. Press the "add" key to input the number, and press the "OK" key to save (Figure 4-2).



Figure 4-2 Figure 4-3

Set pressure" setting, pressure signal selection timing setting, press the "shift" key to select data bits, press the "increase" key to input numbers, and press the "OK" key to save (Figure 4-3).

#### 4. Temperature setting

On the main menu display page, use the "select" key to select "temperature", and then

press the "OK" key to enter the "temperature setting" submenu (Figure 5). Press the "return" key to exit the current item, return to the previous menu, and press the "page turning" key to enter the next menu.

The "temperature signal" setting can be selected between resistance / current / setting, press the "increase" key to select, and press the "OK" key to save.

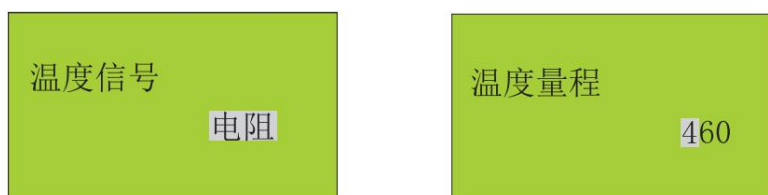


Figure 5 Figure 5-1

"Temperature range" setting: input the range value when selecting the current signal for the temperature signal, press the "shift" key to select the data bit, press the "increase" key to input the number, and press the "OK" key to save (Figure 5-1).

The setting of "damping coefficient" refers to the time of software digital smoothing filtering. The coefficient is selected between 0-9, and the factory setting is 3. Press the "add" key to input the number, and press the "OK" key to save (Figure 5-2).



Figure 5-2 figure 5-3

"Set the temperature" setting, select the timing setting for the temperature signal, press the "shift" key to select data bits, press the "increase" key to input numbers, and press the "OK" key to save (Figure 5-3).

## 5. Compensation settings

On the main menu display page, use the "select" key to select "compensation", and then press the "OK" key to enter the "compensation setting" submenu (Figure 6). Press the "return" key to exit the current item, return to the previous menu, and press the "page turning" key to enter the next menu.

The "compensation mode" setting can be selected from the temperature and pressure automatic / pressure compensation / temperature compensation / set density, press the "increase" key to select, and press the "OK" key to save.



Figure 6 figure 6-1

Set density" setting, compensation mode or when setting density, press "shift" key to select data bits, press "increase" key to enter numbers, and press "OK" key to save (Fig. 6-1).

## 6. Communication settings

On the main menu display page, use the "select" key to select "communication", then press the "OK" key to enter the "communication settings" submenu (Figure 7), press the "back" key to exit the current item, return to the previous menu, and press the "page turning" key to enter the next menu.

Communication address" setting refers to the communication address of the instrument. Press the "shift" key to select data bits, press the "increase" key to input numbers, and press the "OK" key to save.

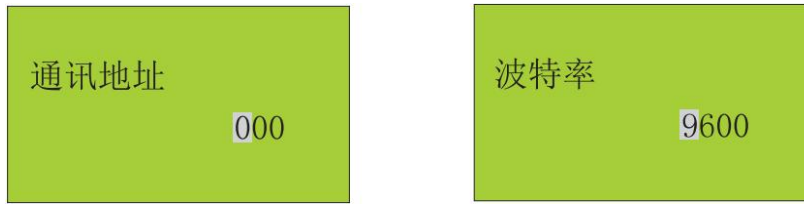


Figure 7 Figure 7-1

Baud rate" setting can be selected between 9600/4800/2400/1200, press "add" key to select, and press "OK" key to save (Figure 7-1).

#### 7. Display settings

On the main menu display page, use the "select" key to select "display", and then press the "OK" key to enter the "display settings" submenu (Figure 8). Press the "back" key to exit the current item, return to the previous menu, and press the "page turning" key to enter the next menu.

The "display mode" setting can be selected between fixed display and cyclic display. Fixed display refers to the fixed display of the instrument working condition interface, and cyclic display refers to the cyclic display of the three working condition display interfaces. Press the "add" key to select, and press the "OK" key to save.

Backlight time" setting refers to controlling the backlight time of LCD screen, pressing the "shift" key to select data bits, pressing the "increase" key to enter numbers, and pressing the "OK" key to save (Figure 8-1).



Figure 8 figure 8-1

## 8. System settings

On the main menu display page, use the "select" key to select "system", then press the "OK" key to enter the "system setting" submenu (Figure 9), press the "back" key to exit the current item, return to the previous menu, and press the "page turning" key to enter the next menu.

Set the "system date" in the format of 13-06-18, set according to the actual date, press the "shift" key to select data bits, press the "add" key to select, and press the "OK" key to save.

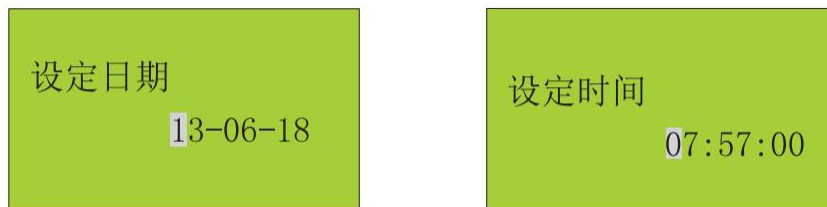


Figure 9 figure 9-1

"Set time" is set in the format of 07:57:00, set according to the actual time, press the "shift" key to select data bits, press the "increase" key to select, and press the "OK" key to save (Figure 9-1).

"Programming password" setting, the initial password is 2917, press the "shift" key to select data bits, press the "increase" key to input numbers, and press the "OK" key to save (Figure 9-2).



Figure 9-2

## 9. Reset setting

On the main menu display page, use the "select" key to select "reset", then press the "OK" key to enter the "reset setting" submenu, press the "return" key to exit the current item, return to the previous menu, and press the "page turning" key to enter the next menu.

Cumulative reset" is set. The password is 1688. Press the "shift" key to select data bits, press the "increase" key to input numbers, and then press the "OK" key to reset the cumulative quantity (10-1, 10-2).

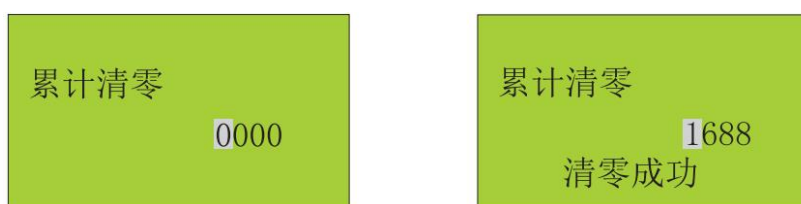


Figure 10-1 figure 10-2

Power failure reset" setting, password is 2688, press the "shift" key to select data bits, press the "increase" key to input numbers, and press the "OK" key after the input is correct, the total power failure times and time will be reset (Fig. 10-3, 10-4).



Figure 10-3 figure 10-4

Programming reset" setting, password is 3688, press the "shift" key to select data bits, press the "increase" key to input numbers, after input is correct, press the "OK" key, the programming times will be reset (Fig. 10-4, 10-5).





Figure 10-5 figure 10-6

**Note: the calibration settings have been debugged before leaving the factory. Non professionals are not allowed to operate them. They need to return to the factory for calibration!**

**Menu setting table**

Table 1

| Set item | Project content     | Settable value        | Function and significance  | Remarks  |
|----------|---------------------|-----------------------|--|--|
| flow     | Fluid medium        | steam                 |  |  |
|          |                     | Gas                   |  |  |
|          |                     | liquid                |  |  |
|          | Flow signal         | frequency             | Frequency input, such as vortex flowmeter                                |  |
|          |                     | current               | Flow is proportional to input current, such as electromagnetic flowmeter |  |
|          |                     | differential pressure | The flow is square with the input current, such as orifice plate         |  |
|          | Unit of measurement | Kg                    |  | The default mass measurement unit is kg and the volume |
|          |                     | T                     |  |  |
|          |                     | M <sup>3</sup>        |  |  |
|          |                     | L                     |  | measurement unit is m <sup>3</sup>                     |

|          |                             |                            |  |   |
|----------|-----------------------------|----------------------------|--|---|
|          | Instrument factor           | 000000.00                  |  | 2 decimal places for frequency signal and 3 decimal places for differential pressure signal |
|          | Flow range                  | 00000000 (M <sup>3</sup> ) | Flow range corresponding to analog current input               | Setting is required when connecting current signal  |
|          | Differential pressure range | 000.000                    | Differential pressure range kPa                                | Need to be set when connecting differential pressure signal                                 |
|          | Damping coefficient         | 1~9                        | Time of software digital smoothing filtering                   | Ex works 3  |
|          | Cut signal                  | 00.00                      | When the flow signal is current, the cut-off signal is current |   |
|          | Output range                | 000000000                  | Flow range of analog current output                            |   |
| pressure | Pressure signal             | current                    | Analog current input (4~20ma)                                  |   |
|          |                             | setting                    | Set pressure   |   |
|          | Pressure range              | 00.00                      | Set pressure range   | 1.6Mpa set 1.6 value  |
|          | Damping coefficient         | 1~9                        | Time of software digital smoothing filtering                   | Ex works 3  |
|          | Set pressure                | 00.00                      | Set pressure value   | Used when selecting pressure setting  |

|               |                     |                                    |   |   |
|---------------|---------------------|------------------------------------|---|---|
| temperature   | Temperature signal  | resistance                         | Platinum resistance input                           |   |
|               |                     | current                            | Standard current input of temperature transmitter   |   |
|               |                     | setting                            | setting temperature                                 |   |
|               | Temperature range   | 000                                | Set temperature range                               |   |
|               | Damping coefficient | 1~9                                | Time of software digital smoothing filtering        | Ex works 3                              |
|               | setting temperature | 000                                | Set temperature value                               | Used when selecting temperature setting |
| compensate    | Compensation mode   | Temperature and pressure automatic |   |   |
|               |                     | Pressure compensation              |   |   |
|               |                     | temperature compensation           |   |   |
|               |                     | Set density                        |   |   |
|               | Set density         | 000.000                            |   |   |
| communication | Mailing address     | 000                                | Set the instrument communication address            |   |
|               | Baud rate           | 1200                               | Select to set the baud rate of the instrument (BPS) |   |
|               |                     | 2400                               |   |   |

|         |                        |               |  |  |
|---------|------------------------|---------------|--|--|
|         |                        | 4800          |  |  |
|         |                        | 9600          |  |  |
| display | Display mode           | Fixed display | Fixed display of a working condition interface   |  |
|         |                        | Xun Xian      | Three interface cyclic display of working condition display                                    |  |
|         | backlight time         | 00            | Control LCD backlight on time  |  |
| system  | Set date               | 10-06-24      | system date  |  |
|         | Set time               | 09:12:24      | system time  |  |
|         | Programming password   | 2917          | Change programming password  |  |
| Clear   | Cumulative reset       | 1688          | Enter this password and press the "OK" key to clear the accumulated quantity                   |  |
|         | Power failure clearing | 2688          | Enter this password and press the "OK" key to clear the total number and time of power failure |  |
|         | Programming reset      | 3688          | Enter this password and press "OK" to reset the editing times                                  |  |
| check   |                        |               |  | Note: the calibration settings have been debugged before |

|  |  |  |  |   |
|--|--|--|--|---|
|  |  |  |  | leaving the factory, and<br>non professionals are<br>not allowed to operate<br>them |
|--|--|--|--|---|

## VII. Programming examples

Example 1:

Measured medium: superheated steam

Supporting instrument: pulse output vortex sensor DN100

The instrument coefficient is 1198.6, and the lower cut-off frequency is 5Hz.

Pressure transmitter range (0 ~ 1.6Mpa), output current (4 ~ 20mA), PT100 platinum resistance.

Secondary instrument analog output: (4 ~ 20) MA corresponding to upper limit flow 7500kg/h

The parameters are set as follows:

| Set item | Project content     | Settable value |
|----------|---------------------|----------------|
| flow     | Fluid medium        | steam          |
|          | Flow signal         | frequency      |
|          | Unit of measurement | Kg             |
|          | Instrument factor   | 1138.6         |
|          | Cut signal          | 05             |
|          | Output range        | 7500           |

|             |                    |                                    |
|-------------|--------------------|------------------------------------|
| pressure    | Pressure signal    | current                            |
|             | Pressure range     | 1.6                                |
| temperature | Temperature signal | resistance                         |
| compensate  | Compensation mode  | Temperature and pressure automatic |

Example 2:

Measured medium: compressed carbon dioxide gas

Supporting instruments: pulse output vortex street sensor DN80, instrument coefficient 2248.5, lower cut-off frequency 7Hz.

Pressure transmitter range (0 ~ 2.5) MPa, output current (4 ~ 20) MA

Temperature transmitter range (0 ~ 100) °C, output current (4 ~ 20) MA

Tip: CO2 density 1.829kg/m<sup>3</sup>

According to the above conditions, set the parameters as follows:

| Set item    | Project content     | Settable value |
|-------------|---------------------|----------------|
| flow        | Fluid medium        | Gas            |
|             | Flow signal         | frequency      |
|             | Unit of measurement | Kg             |
|             | Instrument factor   | 2348.5         |
|             | Cut signal          | 07             |
| pressure    | Pressure signal     | current        |
|             | Pressure range      | 2.5            |
| temperature | Temperature signal  | current        |
|             | Temperature range   | 100            |
| compensate  | Compensation mode   | Set density    |

|  |             |       |
|--|-------------|-------|
|  | Set density | 1.829 |
|--|-------------|-------|

## VIII. Communication function

This instrument has standard Modbus protocol, RS485 or RS232 communication interface, and can carry out data communication. It can be directly transmitted by GPRS wireless transmission or used for bus mode transmission. When using bus mode system, each instrument must be set with a different instrument number and select the appropriate baud rate. The instrument number and baud rate are set in the communication setting menu.

## IX. Instrument accuracy verification

1. The frequency measurement of this instrument does not need adjustment, but is determined by the instrument crystal oscillator.

2. Analog quantity adjustment adopts full range and zero point of electric adjustment, which is convenient and fast. According to the prompts in the calibration menu, the calibration of instrument analog quantity can be completed.

**Note: the company can also provide a complete set of equipment including UPS power supply and rechargeable battery, which are installed in a box together with the totalizer.**

## X. Instrument calculation model

1. Frequency sensor

$$Q = 3600 \times \frac{F \cdot d}{k}$$

2. Equipped with current type sensor

$$Q = \frac{(I-4)}{16} \times Q_{\max} \cdot d$$

3. Equipped with differential pressure sensor

3.1 mass flow

$$Q = U \sqrt{\Delta P} \times d$$

3.2 volume flow

$$Q = U \sqrt{\Delta P \div d}$$

4. Calculation of differential pressure value

$$\Delta P = \frac{(I-4)}{16} \times \Delta P_{\max}$$

5. Calculation of density

5.1 steam density: automatic temperature and pressure compensation

5.2 gas density:

$$\text{Standard condition bulk density} = \frac{(\text{压力} + 0.101325) \times 293.15}{0.101325 \times (\text{温度} + 273.15)}$$

Standard condition mass density = standard condition bulk density × Set density

Where:

F: Sensor output frequency, unit: Hz

Q: Instantaneous mass flow



D: Medium density, unit:  $\text{kg/m}^3$

I: Actual current in Ma

K: Instrument factor,  $\text{n/m}^3$

U: Orifice coefficient

Qmax: maximum value of instrument setting, unit:  $\text{M}^3/\text{H}$

$\Delta P$ : differential pressure value, unit: kPa

## **XI. Communication protocol**

The instrument adopts Modbus communication protocol, and the instrument acts as a slave device to respond to the query command of the master device.

### 1、 Instrument communication features

1. Byte bit format: 1-bit start bit, 8-bit data bit, 1-bit stop bit, no check bit;

2. Baud rate: 1200  $\sim$  9600, programmable;

3. Instrument address: 0  $\sim$  255, programmable, transmission in the communication line is 0x00  $\sim$  0xff.

### 2、 Format of query command initiated by master device

From the device address (HEX) + 0x03+ register high address (HEX) + register low address (HEX) + number of registers high byte (HEX) + number of registers low byte (HEX) + LRC, for example: query the 4-byte data starting from the 00 register of instrument 10, and the main device sends the command format:

0x0a, 0x03,0x00,0x00,0x00,0x04,0x11 (the command is sent in consecutive bytes without an intermediate ",").

3、 The data format returned by the instrument after responding to the query command of the master device

Meter address (HEX) + 0x03+ register high address (HEX) + register low address (HEX) + number of registers high byte (HEX) + number of registers low byte (HEX) + data packet of the meter +lrc, for example, table 10 returns after responding to master device commands 0x0a, 0x03,0x00,0x00,0x00,0x04,0x11:

0x0a, 0x03,0x00,0x00,0x00,0x04,0x00,0x00,0x23,0x52,0x86 (data is sent in consecutive bytes, without intermediate ",").

#### 4、 Register content definition

| Register  | Data content  | Number  | data type | decimal   |
|-----------|---------------|---------|-----------|-----------|
| 0x00~0x03 | Instantaneous | 4 bytes | Long      | 2 decimal |
| 0x04~0x07 | pressure      | 4 bytes | Long      | 3 decimal |
| 0x08~0x09 | temperature   | 2 bytes | Int       | 1 decimal |
| 0x0a~0x0d | Cumulative    | 4 bytes | Long      | 1 decimal |
| 0x0e~0x0f | frequency     | 2 bytes | Int       | 1 decimal |
| 0x10~0x11 | current       | 2 bytes | Int       | 3 decimal |
| 0x12~0x15 | differential  | 4 bytes | Long      | 3 decimal |
| 0x16~0x19 | density       | 4 bytes | Long      | 3 decimal |

If the address of the read register is out of the range, the instrument will return error

information or unpredictable error data.

## XII. Pre sales and after sales service

1. Provide free technical consultation and help users select models,
2. Guide the installation and commissioning. The warranty period is one year. During the warranty period, the "Three Guarantees" are implemented, and one free return to Guangzhou for repair and verification can be carried out. Life long service beyond the warranty period can be provided.

### Attachment: vortex flow sensor ordering consultation table

|                    |   |   |  |           |                   |
|--------------------|---|---|--|-----------|-------------------|
| Ordering unit      |   | Mailing address   |  | telephone |                   |
|                    |   |   |  | Zip code  |                   |
| User               |   | Mailing address   |  | telephone |                   |
|                    |   |   |  | Zip code  |                   |
| Pipeline condition | Outer diameter x wall thickness = XMM   | Media name  |  | density   | kg/m <sup>3</sup> |
| Media status       | Gaseous <input type="checkbox"/> liquid <input type="checkbox"/> saturated steam <input type="checkbox"/> superheated steam <input type="checkbox"/>  |   |  |           |                   |
| Flow range         | Minimum () maximum () common () t/h <input type="checkbox"/> m <sup>3</sup> /h <input type="checkbox"/> standard operating conditions <input type="checkbox"/> <input checked="" type="radio"/> |   |  |           |                   |
| Liquid pressure    | Minimum () maximum () common () MPa gauge pressure <input type="checkbox"/> absolute pressure <input type="checkbox"/>  |   |  |           |                   |
| Fluid temperature  | Minimum () maximum () common () °C  | Installation position high temperature <input type="checkbox"/> wet <input type="checkbox"/> explosive <input type="checkbox"/> |  |           |                   |
| Installation       | Indoor installation <input type="checkbox"/> outdoor installation <input type="checkbox"/> overhead installation <input type="checkbox"/> underground <input type="checkbox"/>                  |   |  |           |                   |

|  |   |
|--|---|
| position   | installation <input type="checkbox"/> <input checked="" type="radio"/>        |
| Selected model: mc51- () intelligent flow totalizer quantity () sets   |   |
| <p>Supporting instruments:</p> <p>Lugb- () number of vortex flow sensors () sets</p> <p>Yby type diffused silicon pressure transmitter () set, PH100 thermal resistance () piece</p> <p>Other requirements:</p>  |   |
| Notes:   |   |
| <p>1. Please fill in this form carefully and tick <math>\sqrt{\quad}</math> in <input type="checkbox"/>.</p> <p>2. This form is in duplicate. Please fill in and seal it and send it back to our company together with the contract (please keep one copy).</p> <p>3. This form can be copied.</p> | <p>User completed by:</p> <p>Date:</p> <p>Supplier reviewer:</p> <p>Date:</p> |