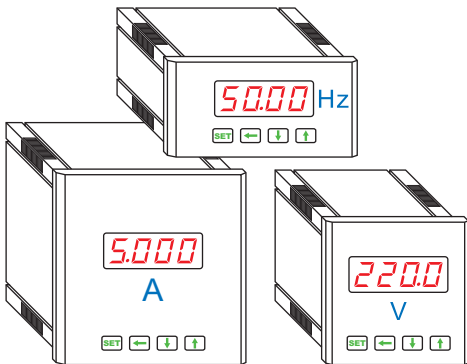


# Digital Ammeter Digital Voltmeter Digital Frequency Meter



## Operational Instruction Manual

# Digital Ammeter,Voltmeter,Frequency Meter

Please read through the manual before installment and operation

## Chapter 1. Technical parameters

### 1.1 Measuring range :

#### 1.1.1 Digital AC Voltmeter

Direct measurement: AC 0~600V

Accessory device: AC 0~9999KV(PT \*/ 100V)

#### 1.1.2 Digital DC Voltmeter

Direct measurement: DC 0~600V

#### 1.1.3 Digital AC Ammeter

Direct measurement: AC 0~10A

Accessory device: AC 0~9999A(CT \*/ 5A)

#### 1.1.4 Digital DC Ammeter

Direct measurement: DC 0~10A

DC 0~9999A(Shunt \*/ 75mV)

#### 1.1.5 Digital Frequency Meter: 30. 00~99. 99Hz

### 1.2 Accuracy rating: voltage&current: $\pm 0.5\%$ FS $\pm 1$ digit, frequency: 0. 1Hz

### 1.3 Sampling rate: about 1 times/s

### 1.4 Measuring display mode: RMS measurement, four-digit LED nixietube display

### 1.5 Display resolution: Max. display resolution : 0.001A,0.1V,0.01Hz

### 1.6 Input circuit consumption: current<0.5VA,voltage&frequency<1VA

### 1.7 Auxiliary power supply: AC 220V,50/60Hz(Can customize other values)

### 1.8 Auxiliary supply consumption:< 3VA

### 1.9 Overflow indication: Displaying character"HHHH"

### 1.10 AlarmOutput: Higher and lower limit alarmoutput by two groups of reply, contact rating is AC250V/2A、DC30V/2A

### 1.11 Transmitting output: can be set freely as DC 0~10mA、0~20mA or 4~20mA, accuracy rating is $\pm 0.5\%$ FS,electrical isolation between the signal input and auxiliary power supply

### 1.12 Transmitting output load resistance: $\leq 500\Omega$

### 1.13 Communication interface: RS485 serial communication, applying MODBUS\_RTU communication protocol

### 1.14 Operational environment: free of corrosive gas with temperature of -10~50°C , and humidity 85%RH

**Note: communication output, alarm output, transmitting output are additional functions.**

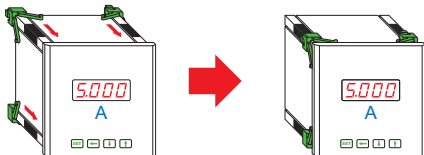
## Chapter 2. Installment and connection

### 2.1 Shape and cutout hole dimension(unit: mm)

| Shape            | Panel dimension |    | Case dimension |    |    | Cutout hole dimension |    |
|------------------|-----------------|----|----------------|----|----|-----------------------|----|
|                  | W               | H  | W              | H  | D  | W                     | H  |
| 96×96Square      | 96              | 96 | 90             | 90 | 83 | 92                    | 92 |
| 80×80Square      | 80              | 80 | 74             | 74 | 83 | 76                    | 76 |
| 72×72Square      | 72              | 72 | 66             | 66 | 83 | 68                    | 68 |
| 48×48Square      | 48              | 48 | 44             | 44 | 73 | 45                    | 45 |
| 96×48Rectangular | 96              | 48 | 90             | 44 | 83 | 92                    | 45 |

### 2.2 Method of installation

Choose the corresponding hole cutout dimension from the table above , make a hole in the installation screen, insert the instruments into the hole, place the four clamping pieces into the clamping holder and push and tighten them by hand.



### 2.3 Wiring instructions

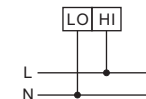
2.3.1 Terminal arrangement and function declaration of instrument(please accord to the one of instrument case)

Auxiliary power supply (POWER): AC 220V,50/60Hz(Can customize other values)

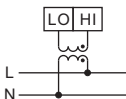
Electrical quantity signal input (INPUT):HI represents "+"port of DC input signal,live wire terminal of AC voltage input signal and inlet wire terminal of AC current input signal.

#### 2.3.2 Typical connection

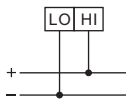
(1) Digital Voltmeter, Frequency Meter



Voltage≤600V,input directly

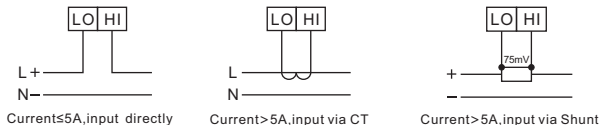


Voltage>600V,input via PT



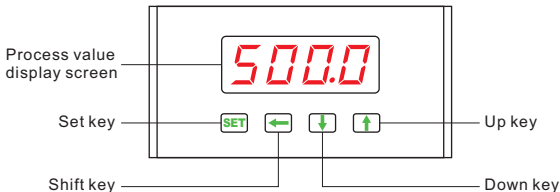
Voltage≤600V,input directly

## (2) Digital Ammeter



## Chapter 3. Programming and usage

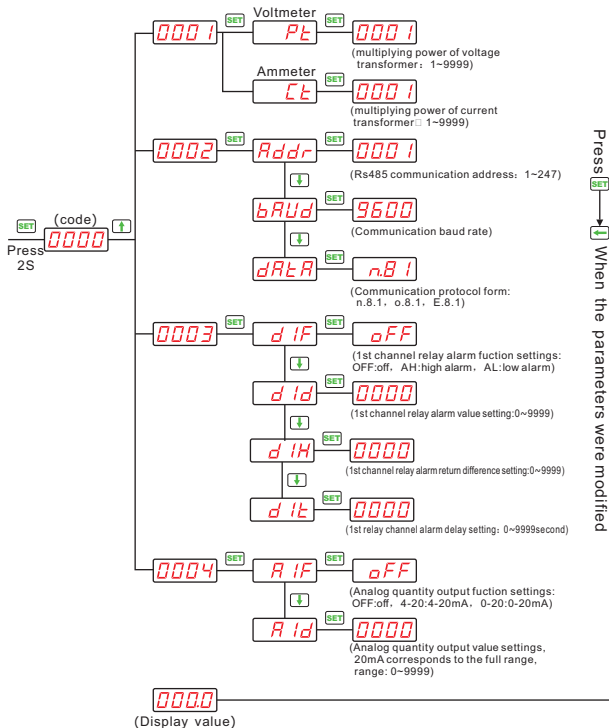
### 3.1 Panel description



### 3.2 Key function

-  **Set key:** Press this key 2s to enter the programmable mode; Under the programmable mode, it is used to save and return to the menu.
-  **Shift key:** Under the programmable mode, it is used to left shift the cursor one digit, and quit the programmable mode and return to the measuring value display interface.
-  **Down key:** under the programmable mode, it is used for degression of parameter value or enter the next menu;
-  **Up key:** under the programmable mode, it is used for progressive increase of parameter value or enter the previous menu;

### 3.3 Menu framework



### 3.4 Menu significations

Under the programmable mode, four menu setting items including of signal input, communication, switching value output, annlog quantity output. Signal input code:**0001**;communication code:**0002**;switching value output code:**0003**; annlog quantity output:**0004**.

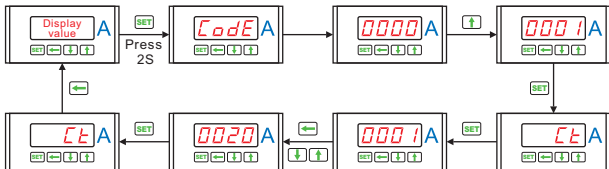
| Menu        | Parameter                | Description                                                                                                                                                                                 |
|-------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Code</i> | 0001, 0002<br>0003, 0004 | Signal input code: <b>0001</b> ;Communication code: <b>0002</b> ;<br>Switching value output code: <b>0003</b> ;<br>Annlog quantity output: <b>0004</b> .                                    |
| <i>Pt</i>   | 1~9999                   | Set multiplying power of voltage transformer:PT<br>(Primary value/second value of voltage transformer)<br>for example: PT=35KV/100V=350                                                     |
| <i>Ct</i>   | 1~9999                   | Set multiplying power of current transformer:CT<br>(Primary value/second value of current transformer)<br>for example: CT=300A/5A=60                                                        |
| <i>Addr</i> | 1~247                    | RS485 communication address: 1~247                                                                                                                                                          |
| <i>BAUD</i> | 1200, 2400<br>4800, 9600 | Communication baud rate                                                                                                                                                                     |
| <i>data</i> | n.8.1<br>o.8.1<br>E.8.1  | Protocol form      n.8.1: n-no check, 8-eight data bits, 1-one stop bit<br>o.8.1: o-odd check, 8-eight data bits, 1-one stop bit<br>E.8.1: o-even check, 8-eight data bits, 1-one stop bitt |
| <i>d1F</i>  | OFF<br>AH<br>AL          | 1st channel relay alarm fuction settings:<br>OFF: off, AH: high alarm, AL: low alarm                                                                                                        |
| <i>d1d</i>  | 0~9999                   | 1st channel relay alarm value setting: 0~9999                                                                                                                                               |
| <i>d1H</i>  | 0~9999                   | 1st channel relay alarm return difference setting: 0~9999                                                                                                                                   |
| <i>d1t</i>  | 0~9999                   | 1st channel relay alarm delay setting: 0~9999second                                                                                                                                         |
| <i>d2F</i>  | OFF<br>AH<br>AL          | 2nd channel relay alarm fuction settings:<br>OFF: off, AH: high alarm, AL: low alarm                                                                                                        |

|             |                     |                                                                                                |
|-------------|---------------------|------------------------------------------------------------------------------------------------|
| <i>d2d</i>  | 0~9999              | 2nd channel relay alarm value setting: 0~9999                                                  |
| <i>d2H</i>  | 0~9999              | 2nd channel relay alarm return difference setting:0~9999                                       |
| <i>d2t</i>  | 0~9999              | 2nd channel relay alarm delay setting:0~9999second                                             |
| <i>R 1F</i> | OFF<br>0-20<br>4-20 | Analog quantity output function settings:<br>OFF:off, 4-20:4-20mA, 0-20: 0-20mA                |
| <i>R 1d</i> | 0~9999              | Analog quantity output value settings,<br>20mA corresponds to the full scale,<br>range: 0~9999 |

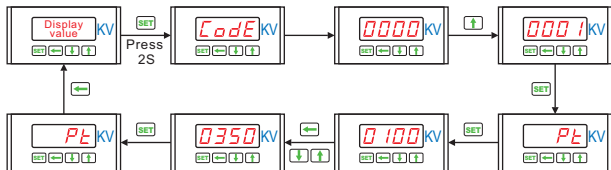
### 3.5 Programming operation examples

The measuring range of instruments has been set as the same parameters provided by users at the factory. Users should check if the input network, voltage/ current measuring range and transformer multiplying power are consistent with the actual input again before use.

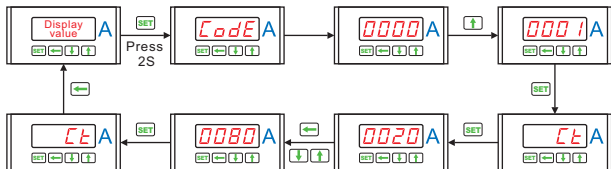
Example 1: The factory default parameter is AC 5A(CT=1); If the current transformer is 100A/5A, should modify the CT multiplying power as 20(100/5)



Example 2: The factory default parameter is AC 10KV/100V(PT=10KV/100V=100); If the voltage transformer is 10KV/100V, should modify the PT multiplying power as 350(PT=35KV/100V=350)



Example 3: The factory default parameter is DC 100A/75mV( $CT=100/5=20$ ); If the SHUNT is 400A/75mV, should modify the CT multiplying power as 80( $CT=400/5=80$ )



## Chapter 4. Cautions

- 4.1 Please confirm if the power supply, input signal and each terminal wiring of the meter are correct and reliable before applying the power.
- 4.2 The instrument must be preheated for 15 minutes to guarantee the precision of measurement.
- 4.3 The instrument should not be rapped, knocked and vibrate excessively and its using environment should meet the technical requirements.
- 4.4 The meter has been calibrated according to the measuring range required by the customer upon order. The user should check once again if the measuring range of the meter is fit with the specifications of the transformer and set the measuring range again if not.

## Chapter 5. Packing and Storage

The instrument and accessories with packing should keep storage conditions cool and dry and free of wet and corrosive gas with temperature not more than 70°C and not less than -40°C, and relative humidity  $\leq 85\%RH$ .