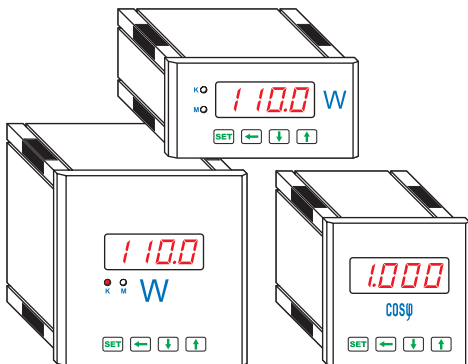


Digital Power Meter

Digital Power Factor Meter



Operational Instruction Manual

Digital Power Meter, Power Factor Meter

Please read through the manual before installment and operation

Chapter 1. Technical parameters

1.1 Measuring range:

1.1.1 Digital Active Power Meter: 0~9999W~9999KW~9999MW

1.1.2 Digital Reactive Power Meter: 0~9999Var~9999KVar~9999MVar

1.1.3 Digital Power Factor Meter: 0.000C~0.500C~1.000~0.500L~0.000L

1.2 Accuracy rating:

1.2.1 Active Power: $\pm 0.5\%FS \pm 1$ digit,

1.2.2 Reactive Power: $\pm 1.0\%FS \pm 1$ digit

1.2.3 Power Factor: ± 0.01

1.3 Signal input:

1.3.1 Voltage: AC 0~500V(PT */ 100V)

1.3.2 Current: AC 5A(CT */ 5A or 1A)

1.3.3 Frequency: 45~65Hz

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 : 0.1W, 0.1Var, 0.001PF

1.6 Input circuit consumption: current < 0.5VA, voltage < 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 Power factor meter indication for capacitive or inductive

1.11 Alarm Output: Higher and lower limit alarm output by two groups of reply, contact rating is AC 250V/2A, DC 30V/2A

1.12 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

1.13 Transmitting output load resistance: $\leq 500\Omega$

1.14 Communication interface: RS485 serial communication, applying MODBUS_RTU communication protocol

1.15 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.

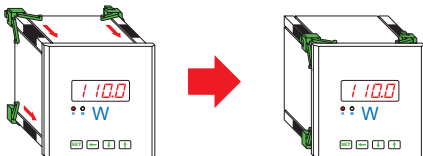
Chapter 2. Installment and connection

2.1 Shape and cutout hole dimension(unit: mm)

Shape	Panel dimension		Case dimension			Cutout hole dimension	
	W	H	W	H	D	W	H
120×120Square	120	120	110	110	83	112	112
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

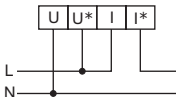
2.3.1 Terminal arrangement and function declaration of instrument(please accord to the one of instrument case)

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

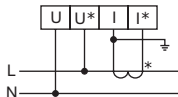
Electrical quantity signal input : I* is current live wire.

2.3.2 Typical connection

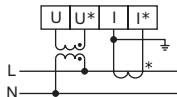
(1) Single-phase Digital power Meter,Power Factor Meter



Voltage≤600V,input directly
Current≤5A,input directly

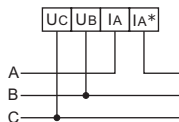


Voltage≤600V,input directly
Current>5A,input via CT

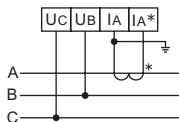


Voltage>600V,input via PT
Current>5A,input via CT

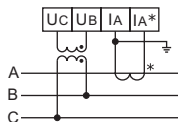
(2) Three-phase Digital Power Factor Meter



Voltage ≤ 600V, input directly
Current ≤ 5A, input directly



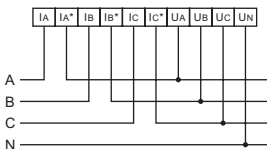
Voltage ≤ 600V, input directly
Current > 5A, input via CT



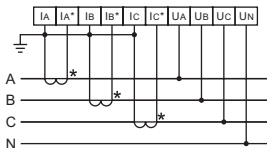
Voltage > 600V, input via PT
Current > 5A, input via CT

(3) Three-phase Digital Power Meter

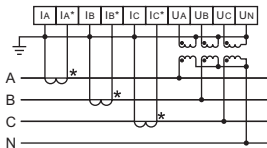
Three-phase four-wire



Voltage ≤ 600V, input directly
Current ≤ 5A, input directly

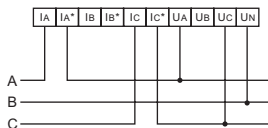


Voltage ≤ 600V, input directly
Current > 5A, input via CT

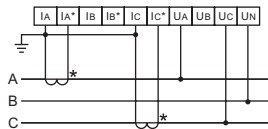


Voltage > 600V, input via PT
Current > 5A, input via CT

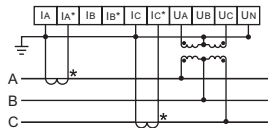
Three-phase three-wire



Voltage ≤ 600V, input directly
Current ≤ 5A, input directly



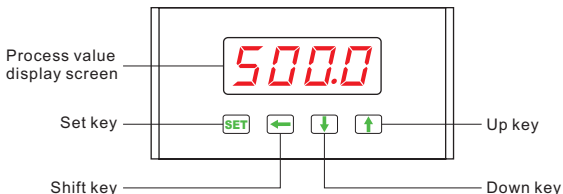
Voltage ≤ 600V, input directly
Current > 5A, input via CT







Voltage > 600V, input via PT
Current > 5A, input via CT

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 Display description

3.3.1 Digital Active Power Meter



The left picture shows:
Active Power: 110.0W



The left picture shows:
Active Power: 110.0KW



The left picture shows:
Active Power: 110.0MW

NOTE: 1MW=1000KW=1000000W

3.3.2 Digital Reactive Power Meter



The left picture shows:
Reactive Power: 110.0Var



The left picture shows:
Reactive Power: 110.0KVar



The left picture shows:
Reactive Power: 110.0MVar

NOTE: 1MVar=1000KVar=1000000Var

3.3.3 Digital Power Factor Meter



The left picture shows:
Power Factor: 1.000



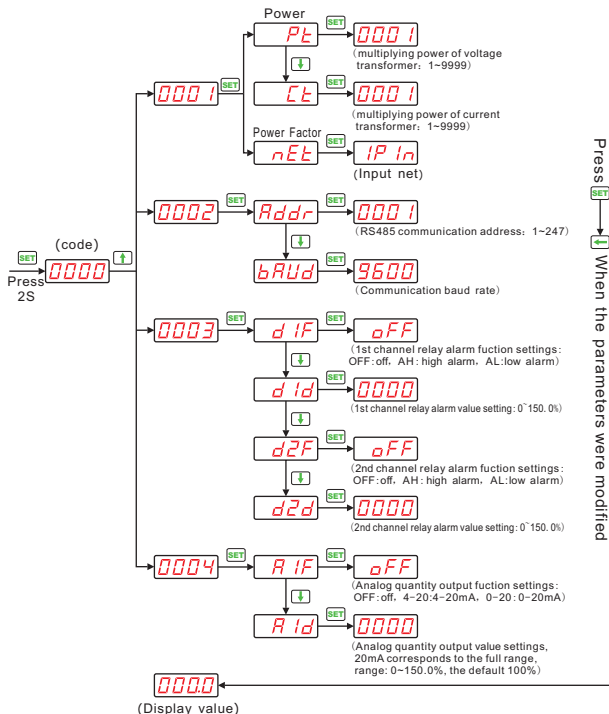
The left picture shows:
value is inductive
Power Factor: 0.885



The left picture shows:
value is capacitive
Power Factor: 0.885

**NOTE: L: the measuring value is inductive
C: the measuring value is capacitive**

3.4 Menu framework



3.5 Menu significations

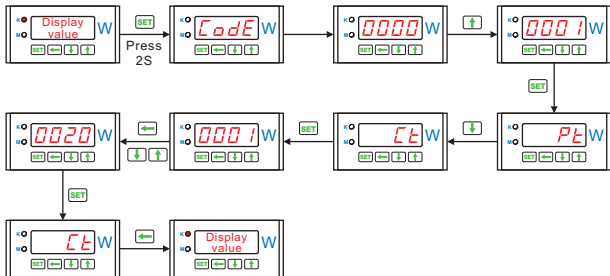
Under the programmable mode, four menu setting items including of signal input, communication, switching value output, annlog quantity output. Signal input code:**0001**;communication code:**0002**;switching value output code:**0003**; annlog quantity output:**0004**.

Menu	Parameter	Description
<i>Code</i>	0001, 0002 0003, 0004	Signal input code: 0001 ;Communication code: 0002 ; Switching value output code: 0003 ; Annlog quantity output: 0004 .
<i>Pt</i>	1~9999	Set multiplying power of voltage transformer:PT (Primary value/second value of voltage transformer) for example: PT=300A/50A=60
<i>Ct</i>	1~9999	Set multiplying power of current transformer:CT (Primary value/second value of current transformer) for example: CT=300A/50A=60
<i>net</i>	1P1N 3P3L	Signal input net: 1P1N: single-phase 3P3L: three-phase
<i>Addr</i>	1~247	RS485 communication address: 1~247
<i>baud</i>	1200, 2400 4800, 9600	Communication baud rate
<i>d1F</i>	OFF AH AL	1st channel relay alarm fuction settings: OFF: off, AH: high alarm, AL: low alarm
<i>d1d</i>	0~150.0%	1st channel relay alarm value setting: 0~150.0%
<i>d2F</i>	OFF AH AL	2nd channel relay alarm fuction settings: OFF: off, AH: high alarm, AL: low alarm
<i>d2d</i>	0~150.0%	2nd channel relay alarm value setting: 0~150.0%
<i>A1F</i>	OFF 0-20 4-20	Analog quantity output fuction settings: OFF: off, 4-20: 4~20mA, 0-20: 0~20mA
<i>A1d</i>	0~150.0%	Analog quantity output value settings, 20mA corresponds to the full scale, range: 0~150.0%, the default 100%

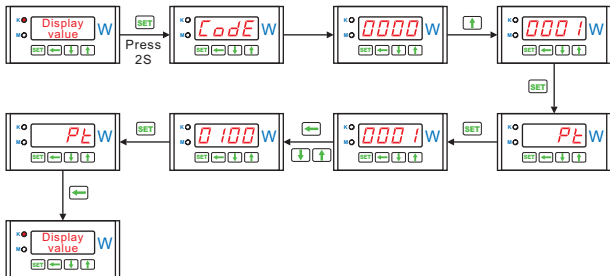
3.6 Programming operation examples

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.

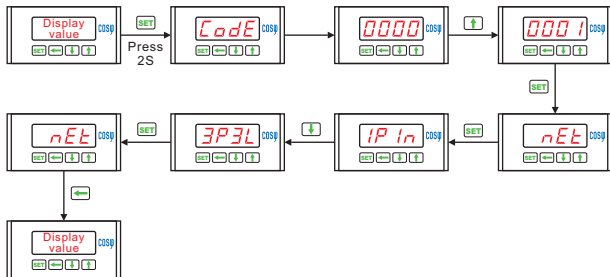
Example 1: The factory default parameter is AC 500V(PT=1),5A(CT=1); If the current transformer is 100A/5A, should modify the CT multiplying power as 20(100/5)



Example 1: The factory default parameter is AC 500V(PT=1),5A(CT=1); If the voltage transformer is 10KV/100V, should modify the PT multiplying power as 100(PT=10KV/100V=100)



Example 3 : Chang the signal input net from single-phase (1P1N) to three-phase (3P3W)



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 ≤ 85% RH.