



Make a difference

DIGITAL MULTIFUNCTION METER

User Manual

MT-DP96MFA



Version 1.0

Thanks for choosing our product – MT-DP96MFA, Please read this manual carefully and pay attention to below caution matters.

CAUTION

- ✓ This product should be installed and maintained by professional person
- ✓ Before operating this product inside or outside, please cut off the input signal and power supply;
- ✓ Please make sure all parts of the product don't have voltage by suitable voltage detection device
- ✓ The power supply should be within the rated range

The below situation will result in device damage and abnormal working

- × Auxilliary power source voltage over range
- × Distribute system frequence over range
- × Current, vottage input polarity incorrect
- × Disconnect the communication plug under charged situation
- × No according requirement to connect termial



Please don't touch the terminals when the meter is in operation!

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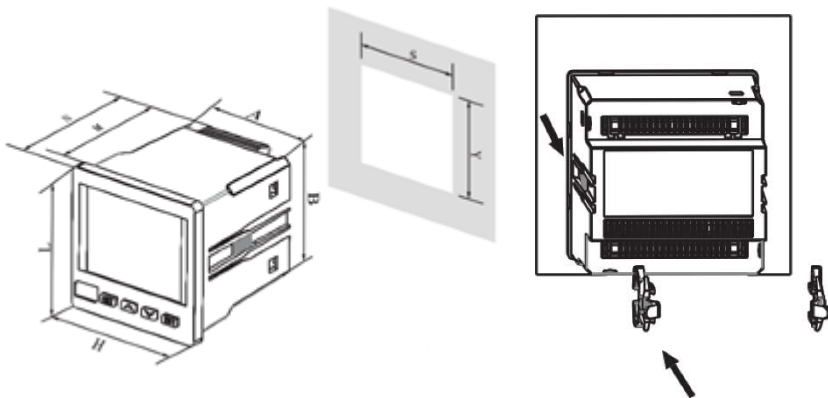
1. Function introduce

Measure function		Remark
Realtime measure	Three phase voltage (L-L, L-N)	Basic function/
	Three phase current and neutral current	
	System Frequency	
	P, Q, S, PF (per phase & total)	
Electric energy	KWh import	
	KVARh import	
	KWh export, KVARh export	
Communication	RS485 Port MODBUS-RTU	
Maximum Demand/	U,I,P,Q	Expanded option/
Analog output/	0-20mA/ 4-20mA/ 0-5V/ 0-10V	
Digital input/	Dry contact type/	
Relay output/	AC250V 5A Remote/ Alarm	
Display type/		LCD

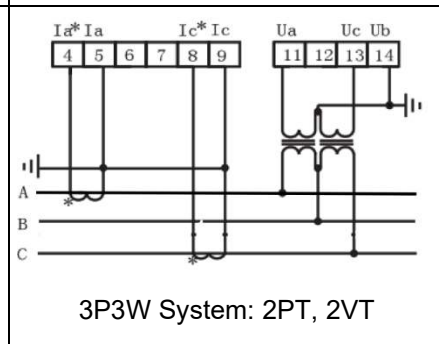
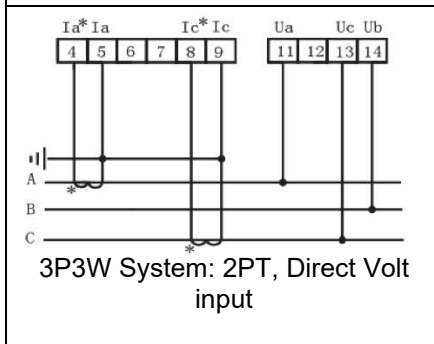
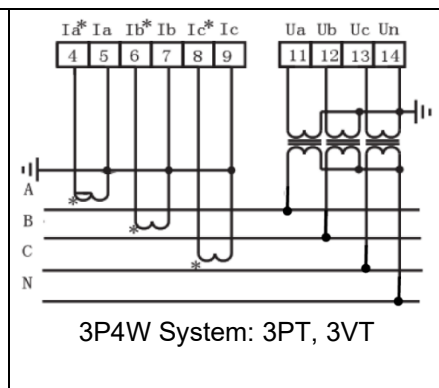
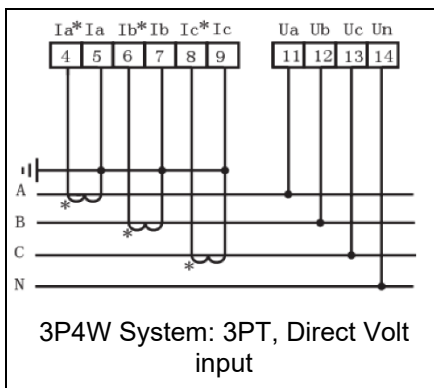
2. Technical parameter

		Parameter	
Signal Input/	Connection system		3P3W/ 3P4W
	Voltage	Measurement range	450V L-L
		Over load	Continous: 1.2 Vn; Instantaneous: 2Vn
		Power consumption	< 1VA
	Current	Measurement range	5A/ 1A
		Over load	Continous: 1.2In; Instantaneous: 2In
		Power consumption	< 1VA
Frequence		45 - 65Hz	
Auxiliary power suply		AC85-265V DC100-300V	
Communication		RS485 communication port, physical layer isolation. According international standard MODBUS-RTU agreement. Communication speed 1200-38400 (Default 9600) Test type N81, E81, 081 (Default N81)	
Analog output		0-20mA/ 4-20mA/ 0-5V/ 0-10V	
Relay output		Programme remote/ Alarm switching output Capacity 5A at 250VAC/ 30VDC	
Digital input		Remote switch input signal, dry contact input. Program relate alarm output	
Measure class		Current, Voltage: 0.5S Frequency: ± 0.1 Hz Active power: 0.5S Reactive power: 2S Active Energy: 0.5S; Reactive En.: 2S	
IP protection		IP53 for indoor type and PI65 for outdoor type	
Evernionment		Working temperature: $-10\div 55^{\circ}\text{C}$ Store temperature: $-20\div 75^{\circ}\text{C}$ Relative Humidity: <80%RH	
Safe		Isolation: Signal, auxiliary power suply, output terminal crust resistance $>5\text{M}\Omega$ and withstand voltage pulse $>\text{AC}2\text{KV}$	

3. Installation and correction

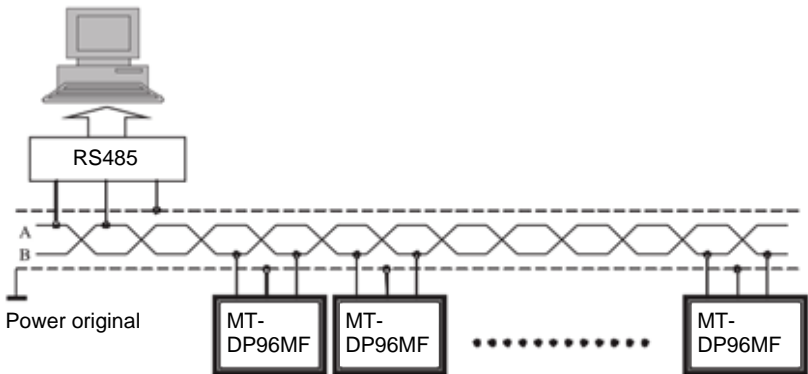


LxH (mm)	AxB (mm)	SxY (mm)	SxY (mm) IP65	N (mm)	M (mm)
96x96	90.5x90.5	91x91	91.5x91.5	94	88

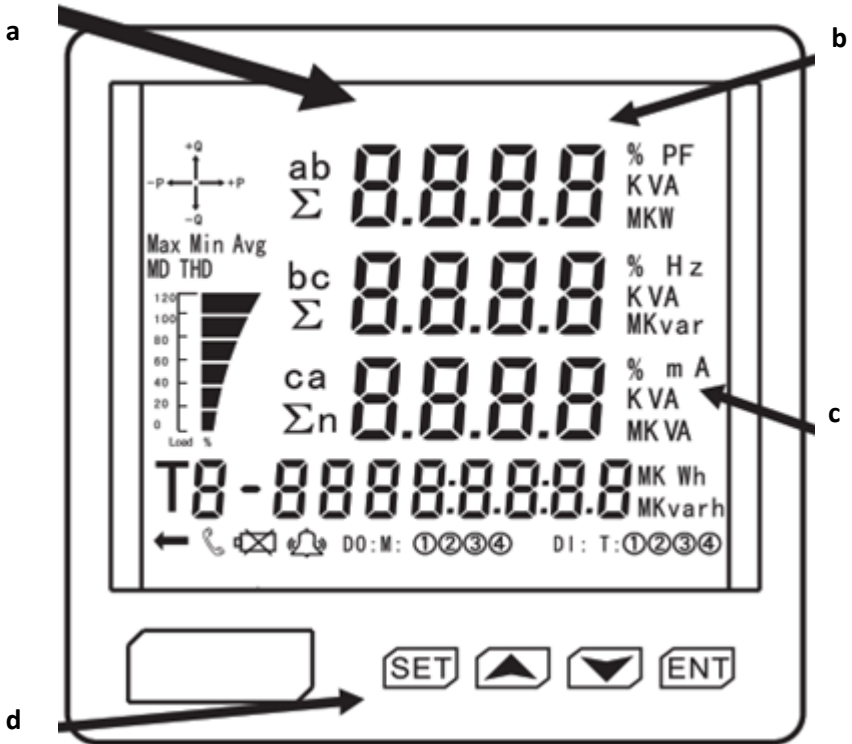


Active Pulse		Reactive Pulse		RS485		Aux. Power Suply	
Ep-	Ep+	Ep-	Ep+	B	A	N(V-)	L(V+)
48	47	50	49	59	58	2	1

Relay Output				Digital input				Analog output									
DO1	DO2	DO3	DO4	COM	DI1	DI2	DI3	DI4	A0-	A01+	A02+	A03+	A04+				
15	16	17	18	19	20	21	22	70	71	72	73	74	30	31	32	33	34



4. Display & Buttons



- Four lines digital display measure information: Three phase voltage, three phase current, active power, reactive power, power factor, frequency, switch input, output, other switch input, two way active power, two way reactive power, analog input, demand
- K is light mean practice value is display value is 1.000 times. M is light mean practice value is display value is 1.000.000 times
- Measure item unit or characterise: three phase voltage V, three phase current A, active power W, reactive power VAR...
- Buttons use in change or programme set:



is change page button or value increase or decrease button


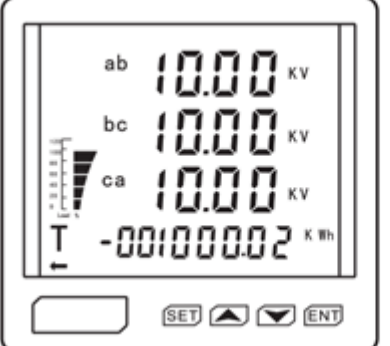




is enter programme status





is select confirm button

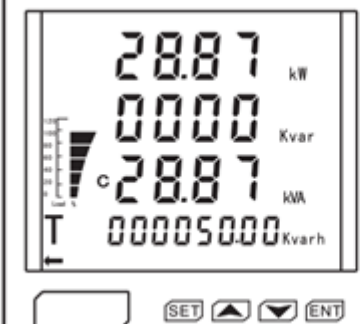
If there is no relative symbol display or the set data not working, It means the product without the relative function

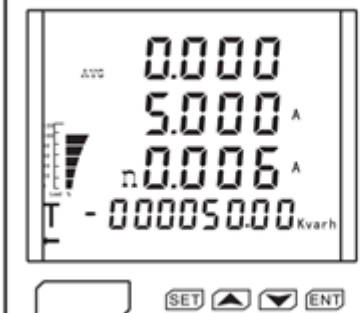
Board	Content	Explain
<p>DISP=1</p> <p>-Three phase voltage</p> <p>-Forward active energy Kwh</p>	 <p>The display shows three phase voltages: 'a' 5774 V, 'b' 5774 V, and 'c' 5774 V. Below them is the forward active energy 'T' 00290805 KWh. The display also features a bar graph on the left and control buttons (SET, up, down, ENT) at the bottom.</p>	<p>Seperate display voltage Ua, Ub, Uc (in the 3P4W)</p> <p>In left fig. Ua=5774V Ub=5774V Uc=5774V</p> <p>Forward active energy = 2908.05KWh</p>
<p>DISP=2</p> <p>-Three phase voltage</p> <p>-Reverse active energy Kwh</p>	 <p>The display shows three phase voltages: 'ab' 10.00 KV, 'bc' 10.00 KV, and 'ca' 10.00 KV. Below them is the reverse active energy 'T' -00100002 KWh. The display also features a bar graph on the left and control buttons (SET, up, down, ENT) at the bottom.</p>	<p>Seperate display voltage Uab, Ubc, Uca (in the 3P4W)</p> <p>In left fig. Uab=10KV Ubc=10KV Uac=10KV</p> <p>Reverse active energy =1000.02Kwh</p>
<p>DISP=3</p> <p>-Three phase current</p> <p>-Forward reactive energy Kvarh</p>	 <p>The display shows three phase currents: 'a' 5.000 A, 'b' 5.000 A, and 'c' 5.000 A. Below them is the forward reactive energy 'T' 00005000 Kvarh. The display also features a bar graph on the left and control buttons (SET, up, down, ENT) at the bottom.</p>	<p>Seperate display current Ia, Ib, Ic (in the 3P4W)</p> <p>In left fig. Ia=5A Ib=5A Ic=5A</p> <p>Reverse reactive energy = 50Kvarh</p>

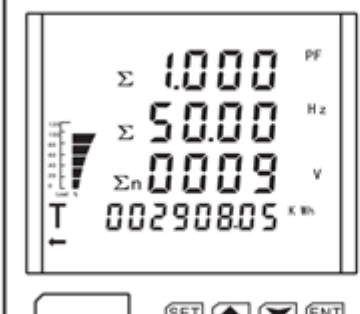
<p>DISP=4</p> <p>-Total active power</p> <p>-Total reactive power</p> <p>-Total apparent power</p>	 <p>The display shows a bar graph on the left and four rows of data: Σ 86.60 kW, Σ 0000 Kvar, Σ 86.60 kVA, and T - 000100.08 Kvarh. At the bottom are buttons for SET, up arrow, down arrow, and ENT.</p>	<p>Total active power = 86.6KW</p> <p>Total reactive power = 0000Kvar</p> <p>Total apparent power =86.6KVA</p> <p>Reverse reactive energy =100.08Kvarh</p>
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<p>DISP=5</p> <p>- Active power phase A</p> <p>-Reactive power phase A</p> <p>-Apparent power phase A</p>	 <p>The display shows a bar graph on the left and four rows of data: a 28.87 kW, 0000 Kvar, 28.87 kVA, and T 002908.05 K Wh. At the bottom are buttons for SET, up arrow, down arrow, and ENT.</p>	<p>Active power of phase A = 28.87KW</p> <p>Reactive power of phase A = 0000Kvar</p> <p>Apparent power of phase A =28.87KVA</p> <p>Forward active energy =2908.05KWh</p>
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<p>DISP=6</p> <p>- Active power phase B</p> <p>-Reactive power phase B</p> <p>-Apparent power phase B</p>	 <p>The display shows a bar graph on the left and four rows of data: b 28.87 kW, 0000 Kvar, 28.87 kVA, and T -001000.02 K Wh. At the bottom are buttons for SET, up arrow, down arrow, and ENT.</p>	<p>Active power of phase B = 28.87KW</p> <p>Reactive power of phase B = 0000Kvar</p> <p>Apparent power of phase B =28.87KVA</p> <p>Reverse active energy =1000.02KWh</p>
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<p>DISP=7</p> <ul style="list-style-type: none"> - Active power phase C -Reactive power phase C -Apparent power phase C 		<p>Active power of phase C = 28.87KW</p> <p>Reactive power of phase C = 0000Kvar</p> <p>Apparent power of phase C = 28.87KVA</p> <p>Forward reactive energy = 50.00KVARh</p>
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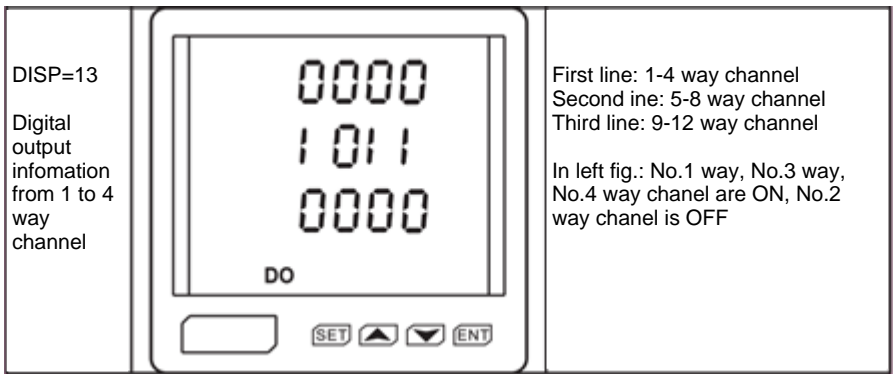
<p>DISP=8</p> <ul style="list-style-type: none"> - Average current -Zero sequence current 		<p>Average current = 5A</p> <p>Zero sequence current = 0.06A</p> <p>Reverse reactive energy = 50.00KVARh</p>
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<p>DISP=9</p> <ul style="list-style-type: none"> - Three phase total power factor -Frequency -Voltage unbalance 		<p>Three phase total power factor = 1.000</p> <p>Frequency = 50Hz</p> <p>Voltage unbalancedness = 9V</p> <p>Forward active energy = 2908.05KWh</p>
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<p>DISP=10</p> <p>Split phase power factor</p>	 <p>The display shows three lines of power factor (PF) for phases a, b, and c, each reading 0.999. Below these is a fourth line showing reverse active energy as -001000.02 KWh. The display also features a bar graph on the left and control buttons (SET, up, down, ENT) at the bottom.</p>	<p>Power factor of phase A =0.999 (inductive load)</p> <p>Power factor of phase B =0.999 (inductive load)</p> <p>Power factor of phase C =0.999 (inductive load)</p> <p>Reverse active energy =1000.02KWh</p>
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<p>DISP=11</p> <p>Residual current</p>	 <p>The display shows three lines of zeros (0000) and a fourth line showing 10.09 mA. The display also features a bar graph on the left and control buttons (SET, up, down, ENT) at the bottom.</p>	<p>Residual current = 10.09mA</p>
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<p>DISP=12</p> <p>Digital input information from 1 to 12 way channel</p>	 <p>The display shows three lines of digital input information: 0000, 1101, and 0000. The label 'DI' is visible at the bottom of the display area. The display also features a bar graph on the left and control buttons (SET, up, down, ENT) at the bottom.</p>	<p>First line: 1-4 way channel Second line: 5-8 way channel Third line: 9-12 way channel</p> <p>In left fig.: No.5 way, No.6 way, No.8 way channel are ON, other way channel is OFF</p>
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5. Programme operation

In programme status, digital interface adopt layers structure menu type, meter supply three lines number display (se fig. 5)

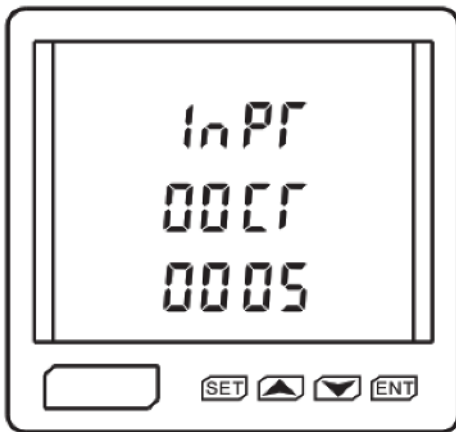


Fig.5

No.1 line is first layer menu information;

No.2 line is second layer menu information;

No.3 line is third layer menu information;

Exp: The fig.5 shown: No.1 layer: INPT = Signal input; No.2 layer: CT = current transformer; No.3 layer: current value is 5, It means ratio of CT is 25/5A.

The digital display interface menu has the following organizational structure, the user can choose the appropriate setting parameters according to the actual situation.

No.1 Layer	No.2 Layer	No.3 Layer	Description
System SET	Display DISP	0000-0017	0000 mean automatic cycling display. Each board connect see table 6
	DISL	0001-0003 or 0000-0120	0000-0120 is keeping time of LCD back light. 0000 means the backlight keeping ON
	Data clear CLr. E	1111	1111 means the data clear other value is invalid

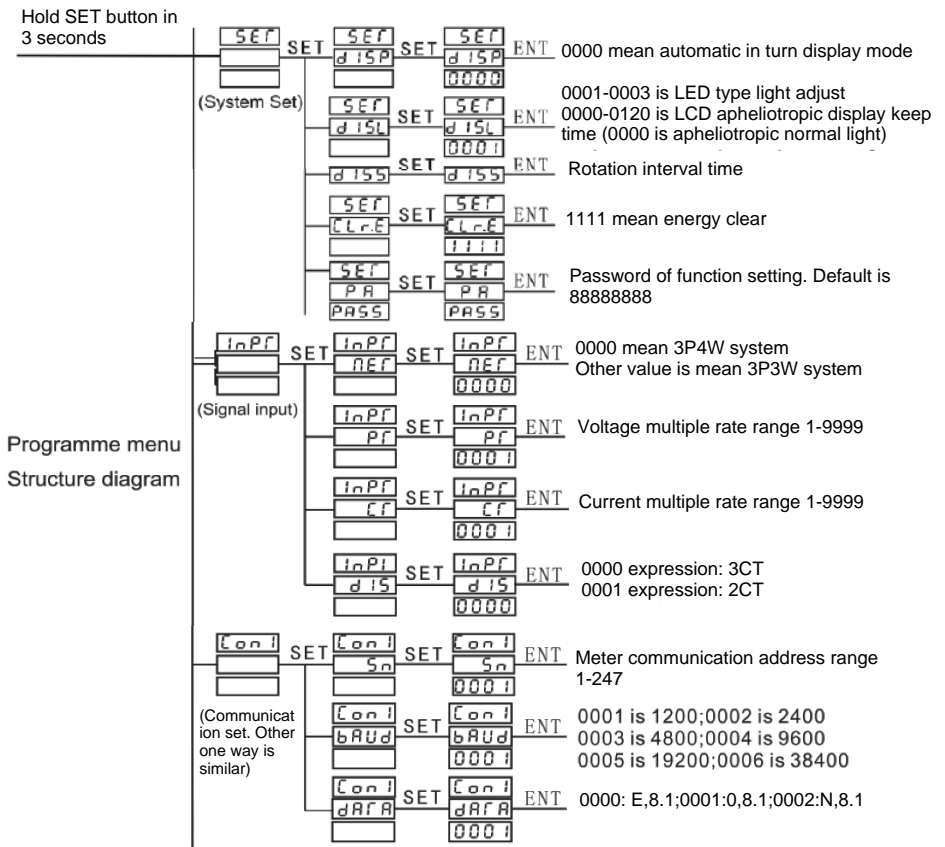
Signal Input INPT	Wiring type Net	0000 or other value	0000 mean 3P4W system. Other value is mean 3P3W system
	Voltage trans. ratio PT	1~9999	PT value= PT primary value/ secondary value
	Current trans. ratio PT	1~9999	CT value= CT primary value/ secondary value

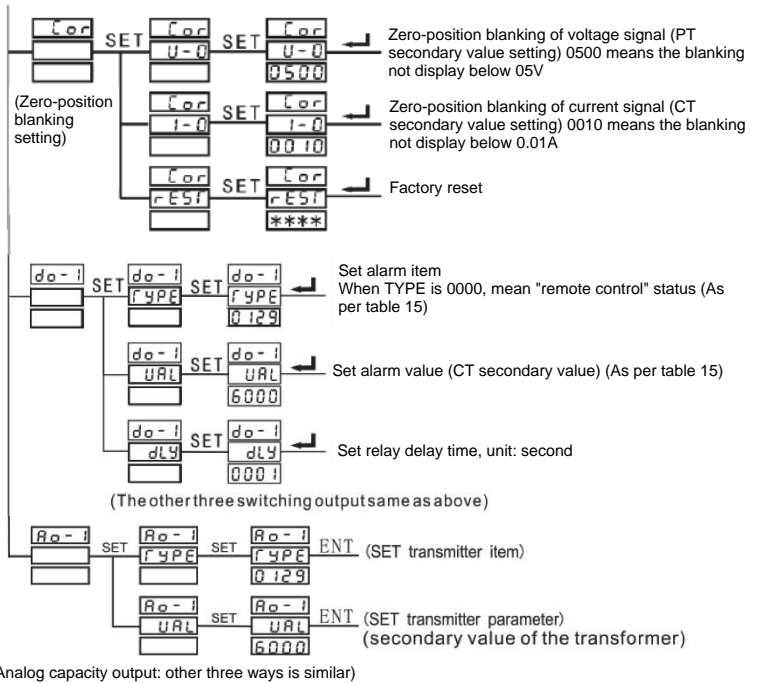
Communication Set CON i (i is 1~2)	Address SN	1~247	Meter address range 1 to 247
	Communication speed BAUD	0001~0004	0001 is 1200; 0002 is 2400; 0003 is 4800; 0004 is 9600; 00005 is 9200; 00006 is 38400
	Data format DATA	0001~0003	0000 is E,8, 1; 0001 is 0,8,1; 00002 is N,8,1

Digital output Set DO-i (i is 1~4)	Choose alarm item or close alarm	Set alarm item's specific threshold value	Choose alarm item, and set relative threshold value (when alarm item is digital value, no need set threshold value), once meet alarm condition, switch output working
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<p>Analog output Set</p> <p>AO-i (i is 1~4)</p>	<p>Chosen transmitter item or close analog output (refer to 8.2 analog output)</p>	<p>Set the full scale value of analog item</p>	<p>Choose transmitter item's and relative electrical parameter (0-20mA, 4-20mA, 4-12-20mA) For example, set "AO-1" TYPE"0135" UAL"5000", which means A phase current 0-5A corresponds to the transmitter output signal of first loop 4-20mA</p>
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Note: The above menu is applied to the product with complete functions. If you find there is no such menu in the product or the menu is not working, It means the product not supporting the function.





(Analog capacity output: other three ways is similar)