CPM-10 Economical Multifunction Power Meter

Operation manual

Rev1.0
2015-10

CPM-10 Economical Multifunction Power Meter

DESCRIPTION

CPM-10 Multifunction meter product single phase, three phases high accuracy measurement of parameters such as voltage, current, active power, reactive power, apparent power, power factor, frequency, effective energy, with display and remote communication function. Option 1 set relay output, 1 analogue and 1 RS485 (Modbus RTU Mode) or 1 pulse output Most suitable for power management, remote input/output, alarm and remote signal control uses needs. Having case depth 120mm only, easy panel mounting installation.

FEATURE

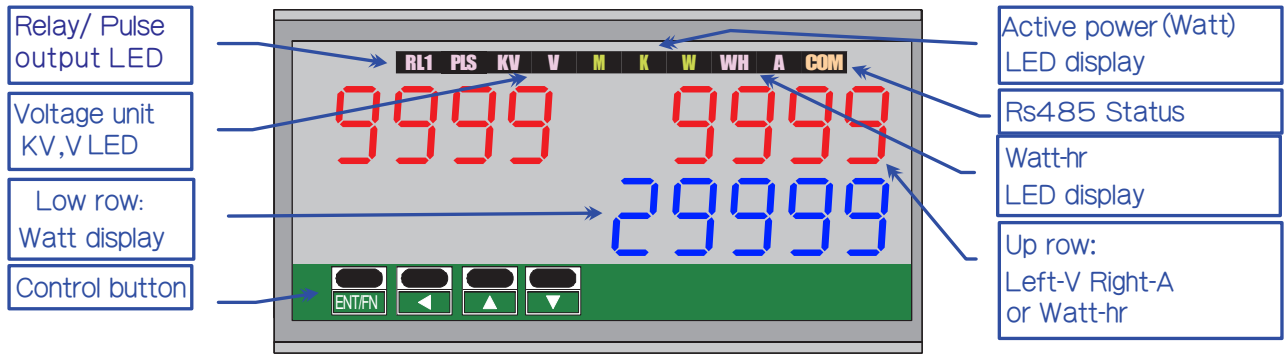
Input 1P2W,1P3W,3P3W,3P4W Unbalanced or balanced load system's active power, reactive power, apparent power and electric energy (Watts-Hr) etc parameters.
Dual display, upper row 4 digits for voltage/ 4 digits for current (or 10 digits Watts-Hr),lower row 4 1/2 digits Watts.
1 set relay(SPDT) output, with 3 variable setting (R1.1/R1.2/R1.3), each react to setting parameters V.AVG/I.AVG/FREQ/P.TL/Q.TL/ S.TL / PF.AVG / AE.TL / RE.TL / VA / VB / VC / IA / IB / IC / PF-A / PF-B / PF-C / P-A / P-B / P-C / Q-A / Q-B / Q-C / S-A / S-B / S-C, having relay function : Hi / Lo / Hi Hold / Lo Hold / Do / OFF; further advance function , start delay, hysteresis, time delay, reset delay etc
1 analogues output same as relay setting parameters.
Output range: Current 0~10mA / 0~20 mA / 4~20 mA / 4~±20 mA / ±10 mA / ±20 mA
(Default 4-20mA)
Output range: Voltage 0~5V / 1~5 V / 0~10 V / 0~±5 V / 1~±5 V / 0~±10 V / ±5 V / ±10 V
(Default 0-10V)
Option pulse and RS 485 communication output.

Application

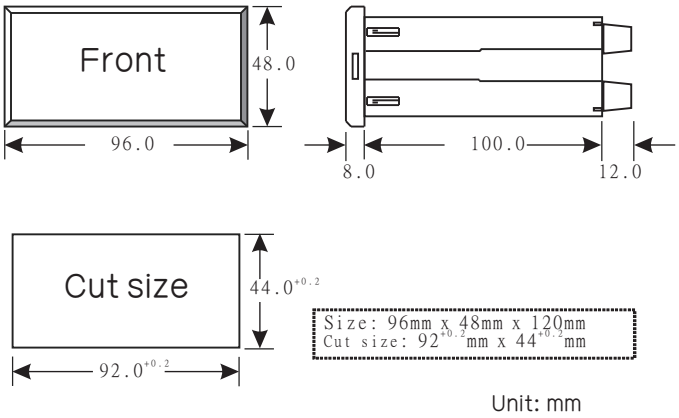
Motor control/ panel power monitoring/power consumption monitor and control/power distribution system /intelligent building & automation power management system/ power testing equipment

The CPM-10 system (SCADA) monitoring as a power front-end measurement unit, for volume measurement and control of remote power. Industry-standard RS-485 communication interface and MODBUS protocol, making connecting to the network easily convenient, want to choose the management of the SCADA system.。

Front panel and button



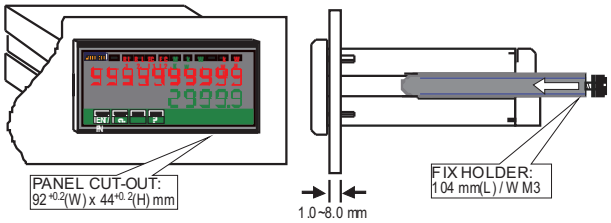
Dimension



Unit: mm

Installation

This meter is installed does not exceed the maximum operating temperature and humidity environment.



Operation button

4 Control button Enter / Shift / Up / Down

- Enter/Fun key: Enter setting / save changes and enter next parameters
- Shift key: Change decimal / back to previous or escape setting
- Up key: Increase / back to previous
- Down key: Decrease / to next

LED Unit

- KV / V: Voltage unit LED: 2 rectangular red LED indicate KV or V, on when display select V-A
- M / K / W: Watt unit LED: 3 Rectangular green LED, on when display select KWH, automatic switch KW or MW units
- WH: Watt-hr LED: 1 rectangular red LED, on when select KWH display, only display WH, K/M unit follow Watt.
- A: Current unit LED: 1 rectangular red LED, on when select display V-A

Display digits

PV values: 5 digits; 0.28" (0.71cm) red LED
Accumulative values 10 digits; 0.28" (0.71cm)

LED status

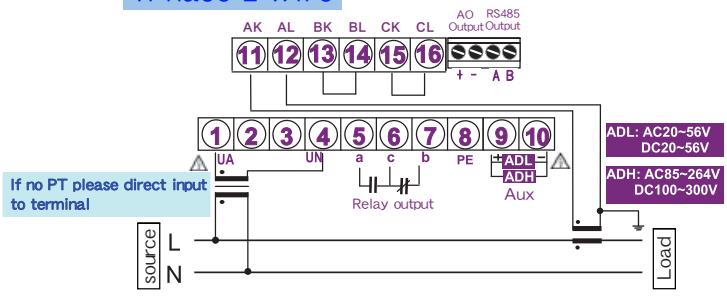
- PLS: Pulse output: 1 rectangular red LED, when pulse output LED blink; blink faster mean more watt-hr used.
- COM: RS 485 Com.: 1 rectangular orange LED, when Rs485 send/receive data, LED blink' blink faster mean data transfer
- RL1: Relay: 1 rectangular red LED, LED light when relay energized ECI input

Output wiring

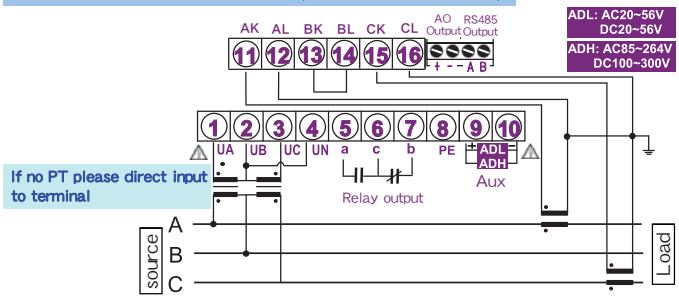
Please check if the voltage is correct and connect to the right terminal number when wiring

■With CLAMP CT, the secondary side do not ground, otherwise the meter burned

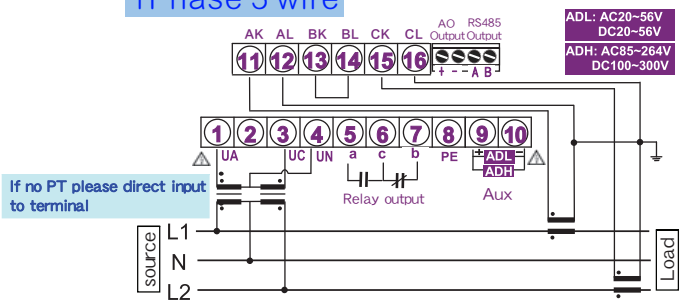
1Phase 2 wire



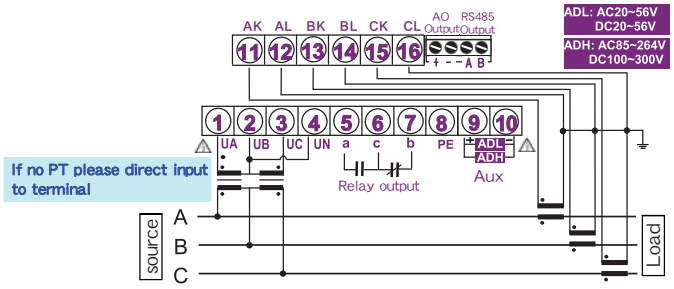
3Phase 3wire 2CT (Unbalanced)



1Phase 3 wire



3Phase 3wire 3CT (Unbalanced)



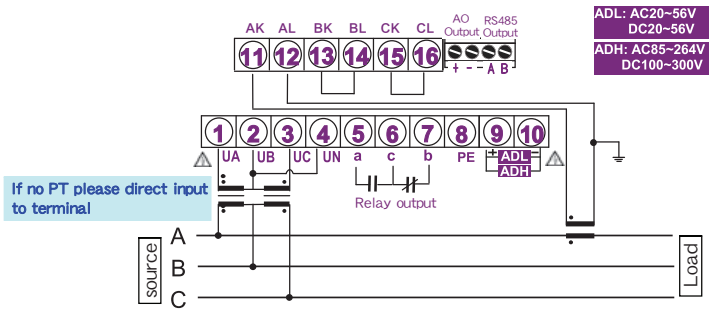
■With CLAMP CT, the secondary side do not ground, otherwise the meter burned

Output wiring

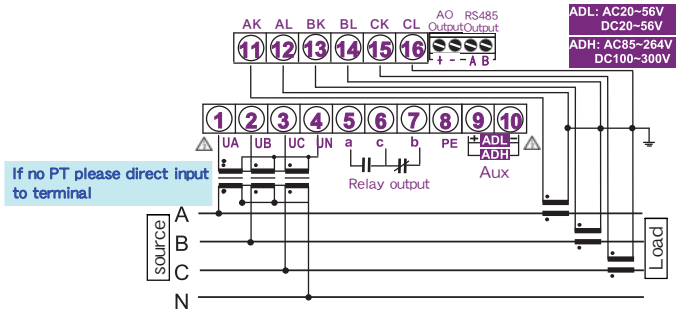
When wiring, be sure to confirm that the supply voltage is correct and access the correct terminal number.

Equipment and instrumentation safety, it is recommended to install the fuse or no fuse switch in the instrument before ◦ ■With CLAMP CT, the secondary side do not ground, otherwise the meter burned

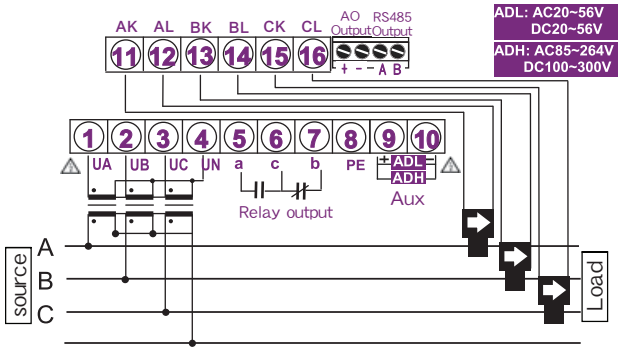
3Phase 3wire 1CT (Balanced)



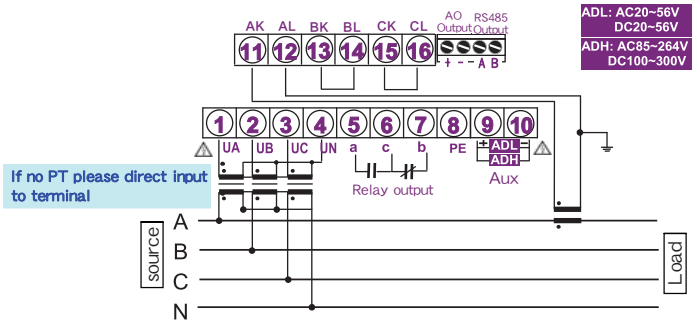
3Phase 4wire 3CT (Unbalanced)



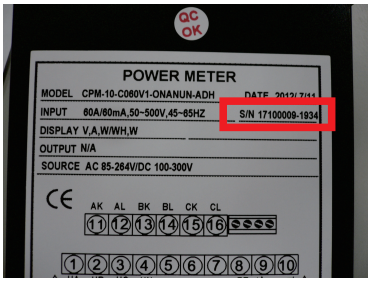
■Example
With CLAMP CT, the secondary side do not ground , otherwise the meter burned



3Phase 4wire 1CT (Balanced)



Clamp CT

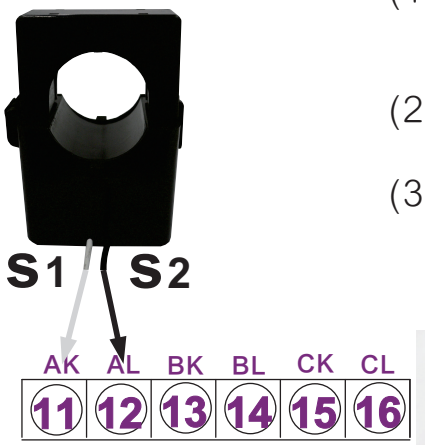


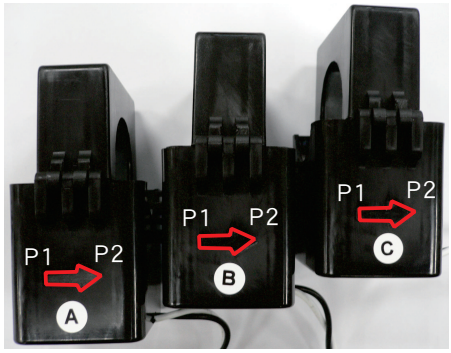
Optional of Clamp CT, make sure

(1)CT of the SN number with the CPM-10 SN number, as shown

(2)On the label A:A-Phase; B:B-Phase ; C:C-Phase ; According to the phase matching

(3)S1 (white) connected" K" side;
S2 (black)connected "L" side
(A.B.C Phase are the same then the law)



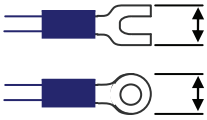


Direction of the arrow indicates the direction for the primary current through P1-P2

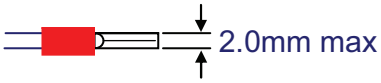
Analogue output

Wire terminal

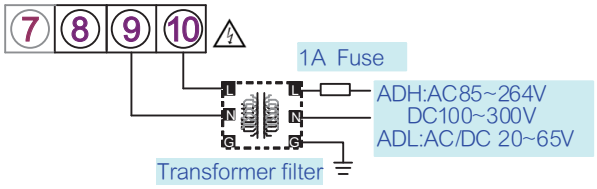
Terminal:A1~A16: 20A/600Vac, M3.5, 22~12AWG;
Max Torque:13Kg-cm



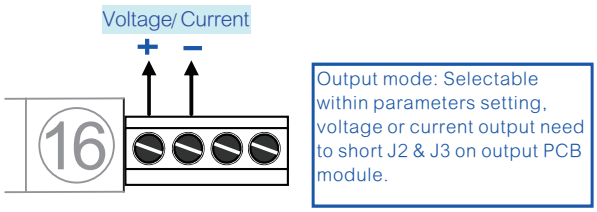
Output Terminal:10A 300Vac, M2.6, 22~16AWG,
Max Torque: 5Kg-cm
Please use flat Pin



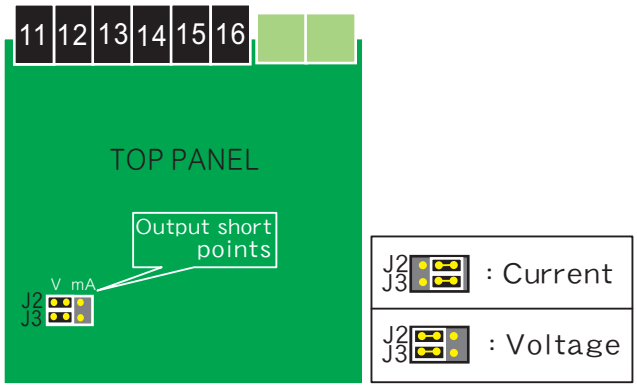
AUX



Analogue output

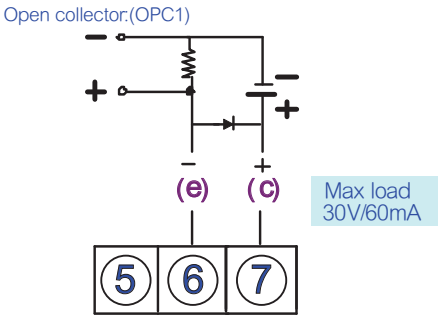


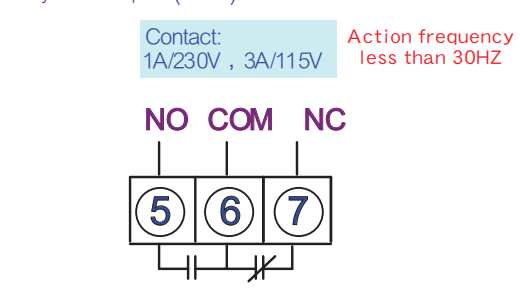
Analogue output



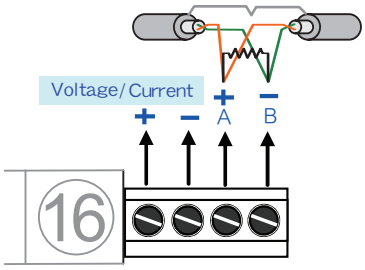
Pulse output

Due to limitation on number of terminal , pulse and relay output is having same terminal, choose either one

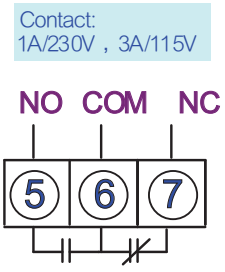




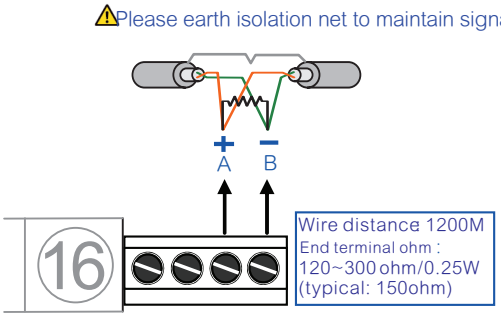
Analogue + RS485



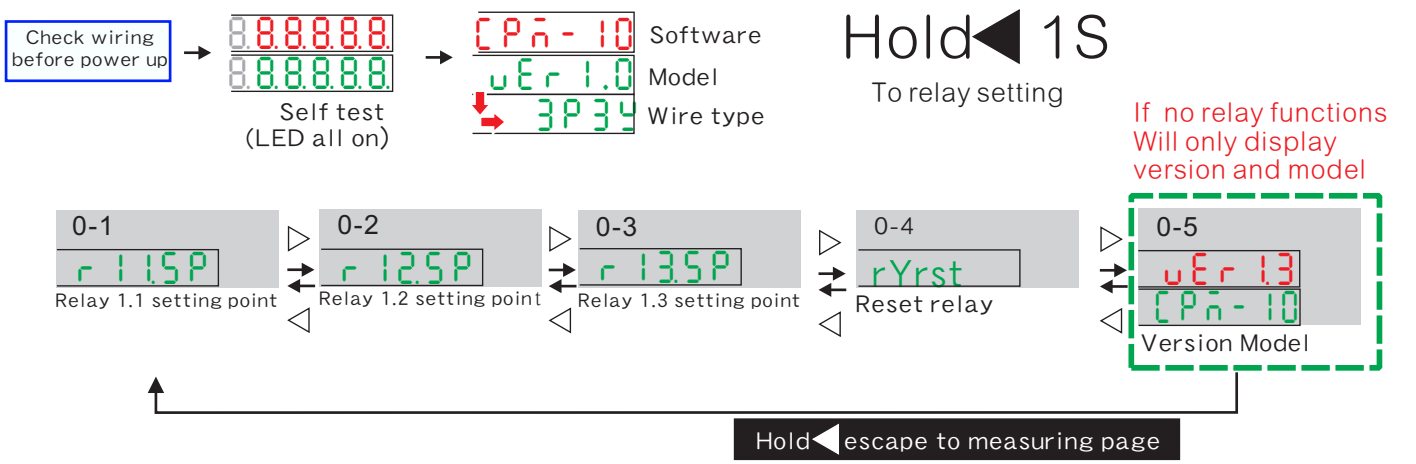
Alarm Relay output:(OR1)

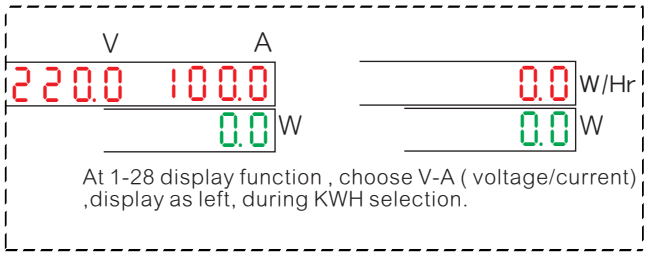


RS485 Com.



Operation flow chart:





Press▼
Measuring page

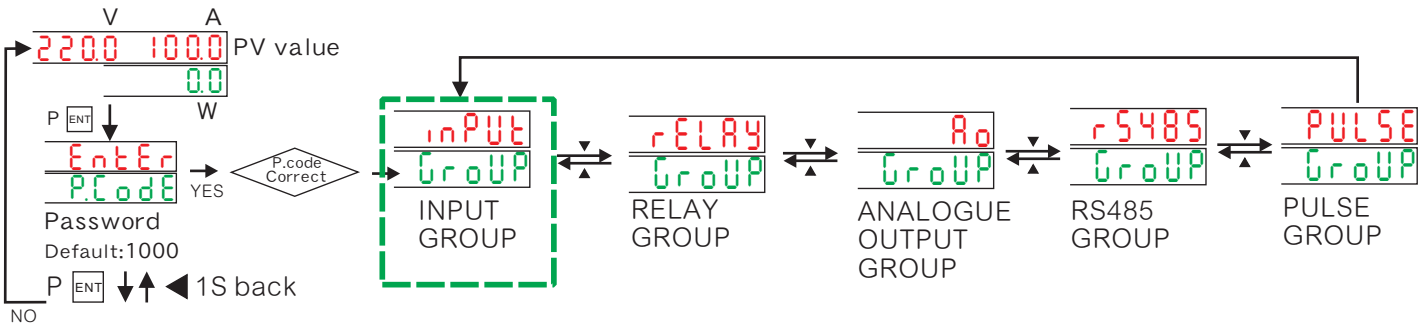
Parameter setting(A-1),connection different.will have a different display(tick shown)

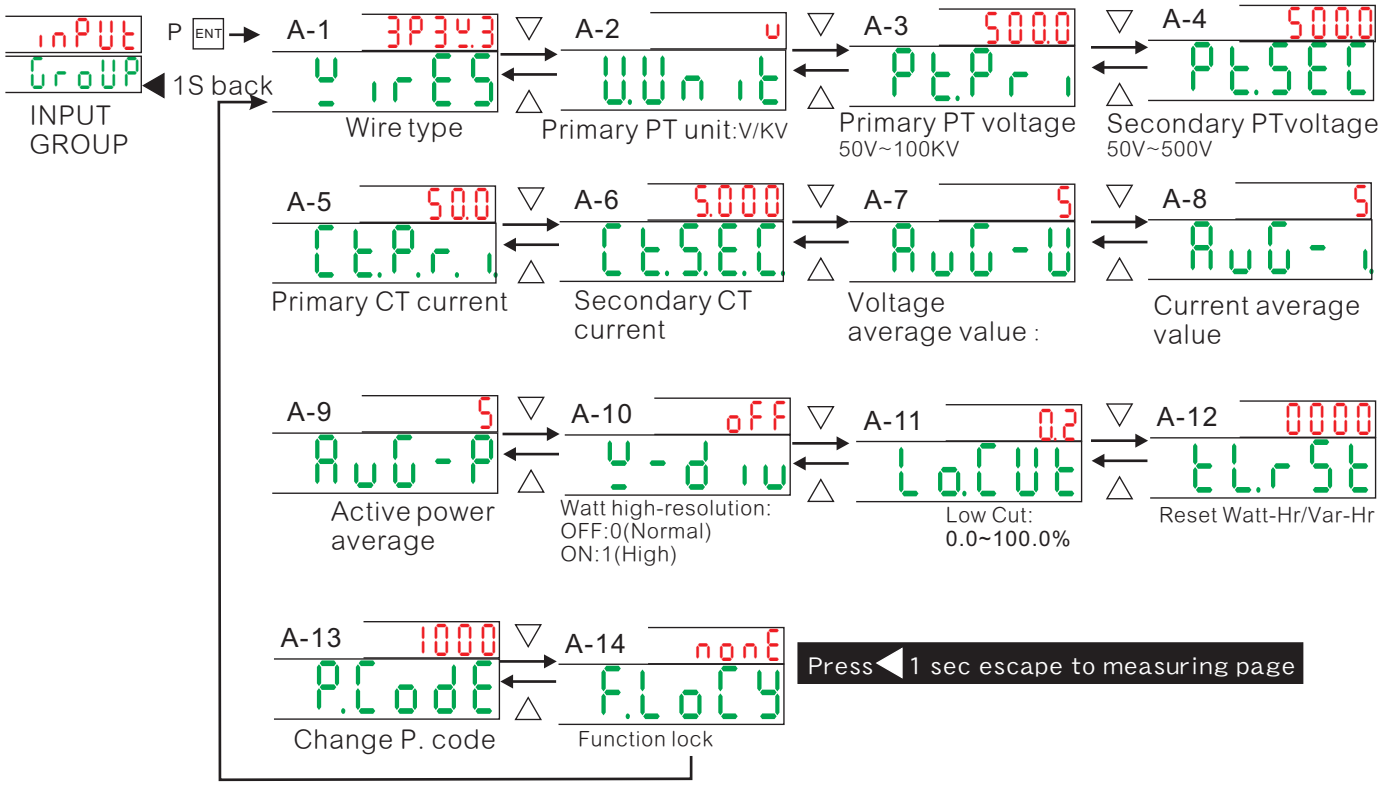
	1P2W	1P3W	3P3W.1	3P3W.2	3P3W.3	3P4W.1	3P4W.3
V.AVG	v	v	v	v	v	v	v
I.AVG	v	v	v	v	v	v	v
FREQ	v	v	v	v	v	v	v
P.TL	v	v	v	v	v	v	v
Q.TL	v	v	v	v	v	v	v
S.TL	v	v	v	v	v	v	v
PF.AVG	v	v	v	v	v	v	v
AE.TL	v	v	v	v	v	v	v
RE.TL	v	v	v	v	v	v	v

	1P2W	1P3W	3P3W.1	3P3W.2	3P3W.3	3P4W.1	3P4W.3
VA			v	v	v	v	v
VB			v	v	v	v	v
VC			v	v	v	v	v
IA		v	v	v	v		v
IB				v	v		v
IC		v		v	v		v
PF-A			v	v	v	v	v
PF-B							v
PF-C				v	v		v

	1P2W	1P3W	3P3W.1	3P3W.2	3P3W.3	3P4W.1	3P4W.3
P-A			v	v	v	v	v
P-B							v
P-C				v	v		v
Q-A			v	v	v	v	v
Q-B							v
Q-C				v	v		v
S-A			v	v	v	v	v
S-B							v
S-C				v	v		v

Engineer level

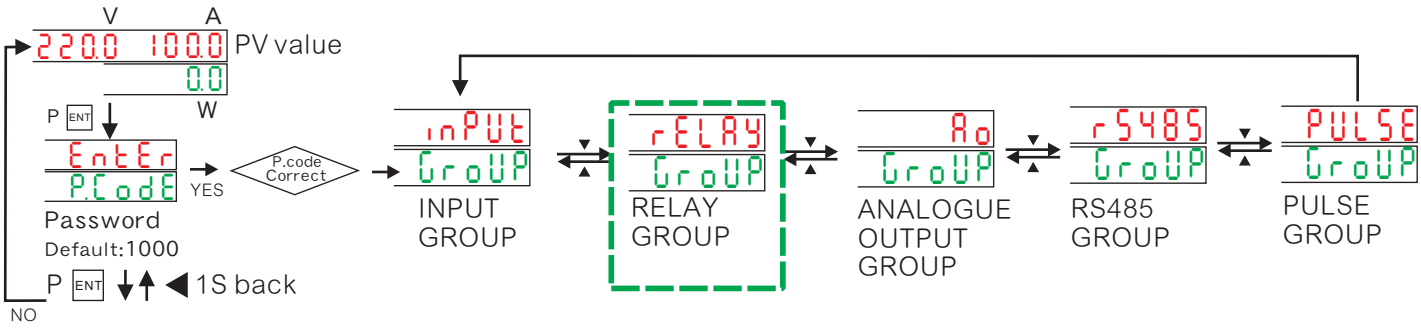


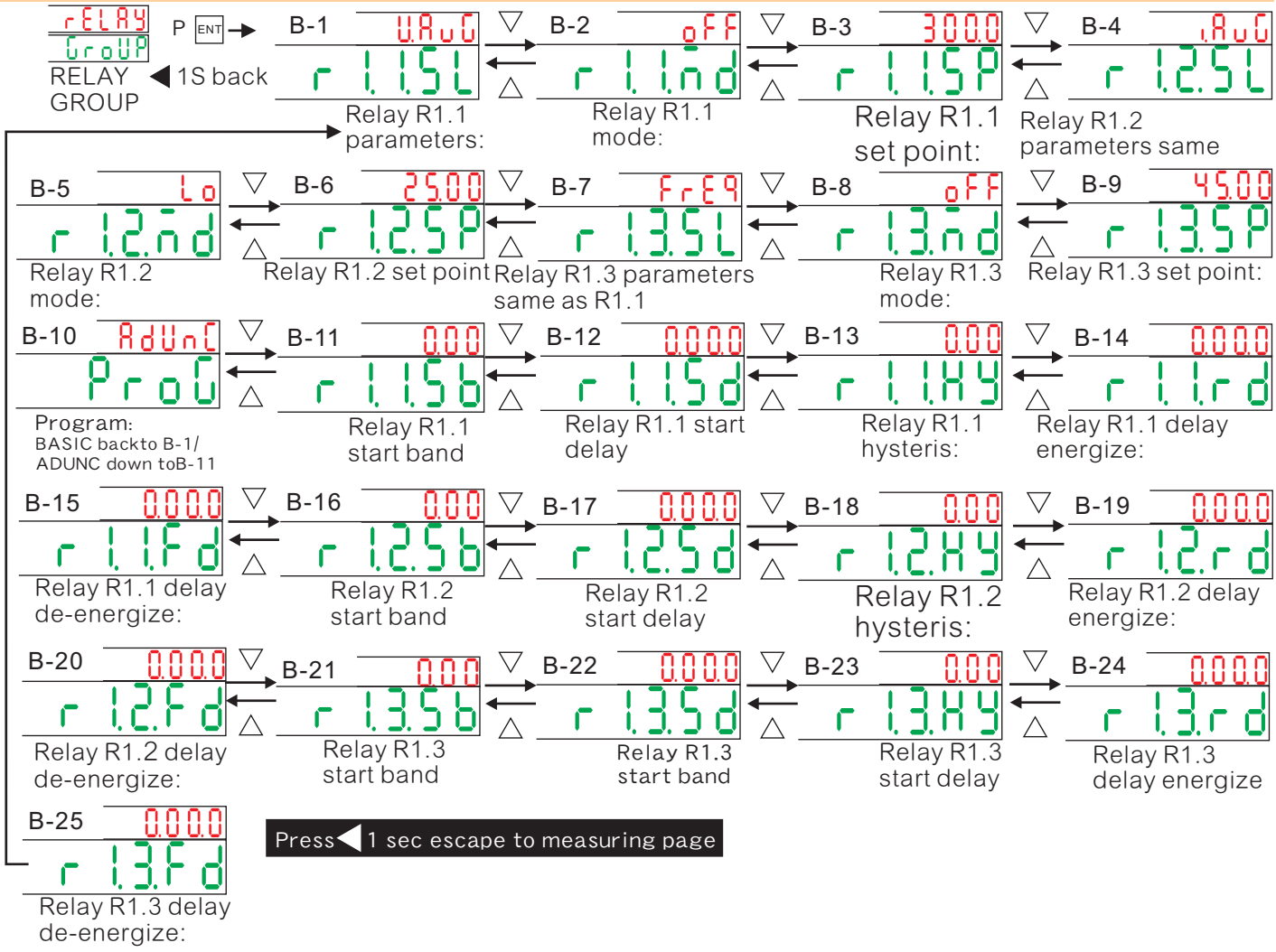


Parameter Description

Index	Explain	Index	Explain
A-1	Wiring:1P2W / 1P3W/3P3W.1 / 3P3W.2/	A-7	Voltage average value :Range 2~99
A-2	Primary PT unit:V/KV	A-8	Current average value : Range 2~99
A-3	Primary PT voltage 50.0V~100KV	A-9	Active power average : Range 2~99
A-4	Secondary PTvoltage 50.0V~500V	A-12	Reset Watt-Hr/Var-Hr: 0~9999
A-5	Primary CT current 1.0A~2999.9A	A-13	Change P. code: 0000~9999
A-6	Secondary CT current	A-14	Function lock:NONE/USER/ENG/ALL

Engineer level





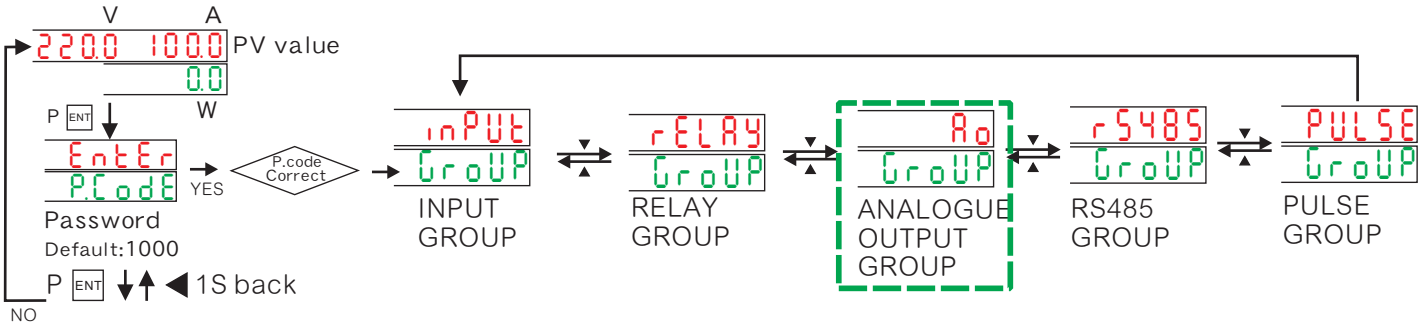
Parameter Description

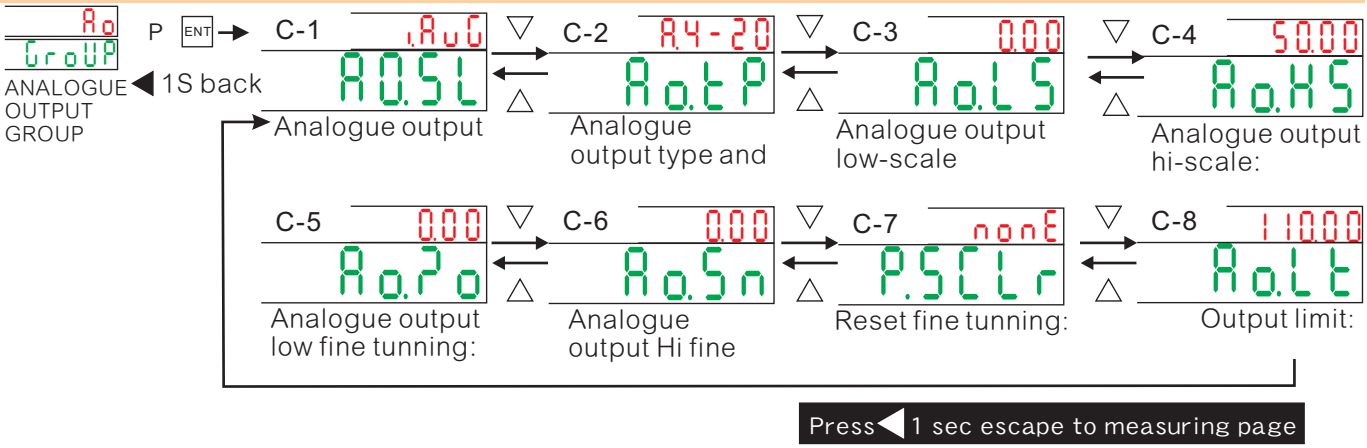
Index	Explain	
B-1 B-4 B-7	Parameter settings: uAuG :3 Phase average voltage iAuG :3 Phase apparent power FrEq :Frequency P.tL :3 Phase active power q.tL :3 Phase reactive power S.tL :3 Phase apparent power PF.AuG :3 Phase average power factor uA :Phase A voltage ub :Phase B voltage uC :Phase C voltage iA :Phase A current ib :Phase B current iC :Phase C current	Parameter settings: PF-A :Phase A power factor PF-b :Phase B power factor PF-C :Phase C power factor P-A :Phase A active power factor P-b :Phase B active power factor P-C :Phase C active power factor q-A :Phase A reactive power q-b :Phase B reactive power q-C :Phase C reactive power S-A :Phase A apparent power S-b :Phase B apparent power S-C :Phase C apparent power

Parameter Description

Index	Explain	
B-2 B-5 B-8	Relay mode: LO/HI/LO.HLD/ HI.HLD/DO/OFF	Lo(Low Level Energized) : When the displayed value is lower than the set value (PV <Set point), the relay action ◦ Hi(High Level Energized) : When the displayed value is higher than the set value (PV> Set point), the relay action ◦ Lo.hld: (Low Level energized hold) : Displayed value lower than set value action, and continued to maintain action. HI.HLD: (High Level energized hold) : Displayed value higher than the set value, the action, and continued to maintain action. ◦ DO:(Digital Output) : With RS485 function, the relay can be used as a function of DO force the relay action from the RS485 command ◦
B-3 B-6 B-9	Relay set point range: -199.99~299.99	B-11 B-16 B-21 Relay start band:0.00~99.99 (count)
B-12 B-17 B-22	Relay start delay times: 0.00.00~9.59.9(min/sec/0.1s)	B-13 B-18 B-23 Relay hysteris:0.00~50.00(count)
B-14 B-19 B-24	Relay delay energize: 0.00.0~9.59.9(min/sec/0.1s)	B-15 B-20 B-25 Relay delay de-energize: 0.00.0~9.59.9(min/sec/0.1s)

Engineer level

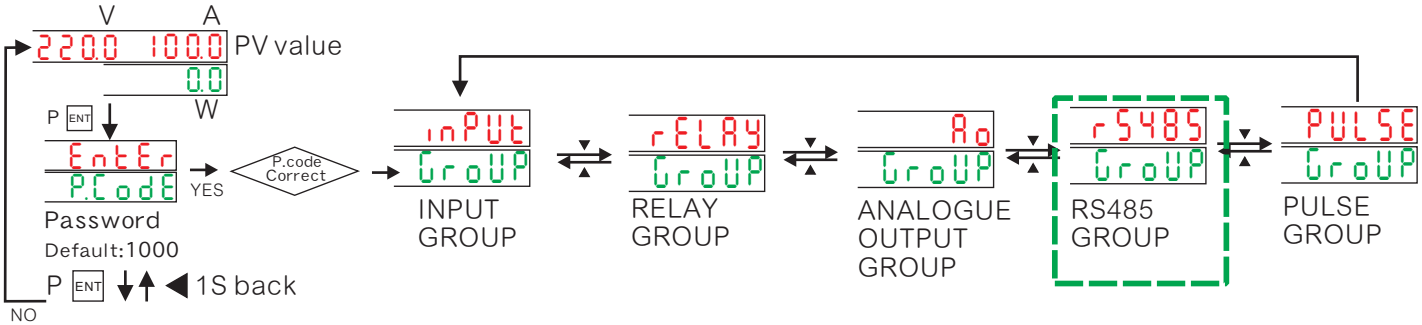


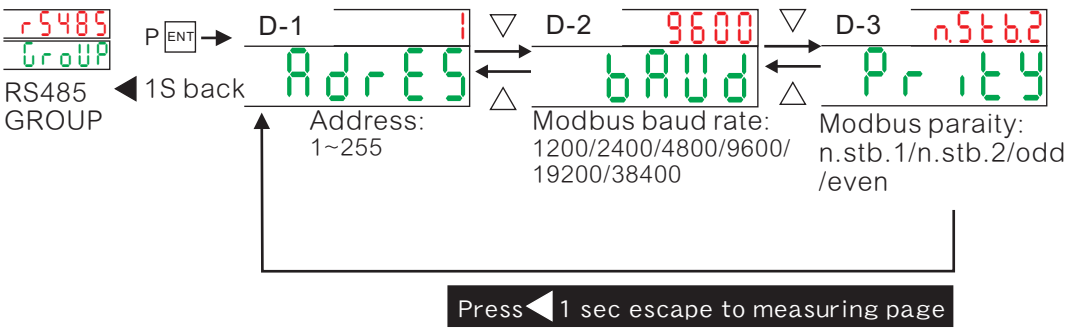


Parameter Description

Index	Explain	
C-1	AO corresponding the parameters: U.AuG :3 Phase average voltage I.AuG :3 Phase apparent power FrEq :Frequency P.tL :3 Phase active power q.tL :3 Phase reactive power S.tL :3 Phase apparent power PF.AuG :3 Phase average power factor uA :Phase A voltage ub :Phase B voltage uC :Phase C voltage iA :Phase A current ib :Phase B current iC :Phase C current	AO corresponding the parameters: PF-A :Phase A power factor PF-b :Phase B power factor PF-C :Phase C power factor P-A :Phase A active power factor P-b :Phase B active power factor P-C :Phase C active power factor q-A :Phase A reactive power q-b :Phase B reactive power q-C :Phase C reactive power S-A :Phase A apparent power S-b :Phase B apparent power S-C :Phase C apparent power
C-2	Output signal of type and range : A.0-10/A.0-20/A.4-20/ A.4B.20/A.B.10/A.B.20/ V.0-5/V.1-5/V.0-10/V.0B.5/	Current: A0-10:0~10A A0-20:0~20A A.4-20:4~20A A.4B20:4~12~20A Ab10:±10A Ab20:±20A Voltage: V0-5:0~5V V1-5:1~5V V0-10:0~10V V0B5:0~2.5~5V V1B5:1~3~5V V0B10:0~5~10V Vb5:±5V Vb10:±10V
C-3	Analogue output low-scale: -19999~29999	C-4 Analogue output hi-scale: -19999~29999
C-5	Analogue output low fine tunning::	C-6 Analogue output Hi fine tunning: -32768~32767
C-7	Reset fine tunning: NONE/AO.ZRO/AO.SPN/BOTH	nonE (NONE): Does not clear the correction Ao.Pro (Ao.Zro): Clear the lower limit of fine-tuning Ao.SPn (Ao.SPn): Clear upper limit of fine-tuning botH (both): Clear the lower limit, upper limit of fine-tuning correction
C-8	Output limit:0~110 %	

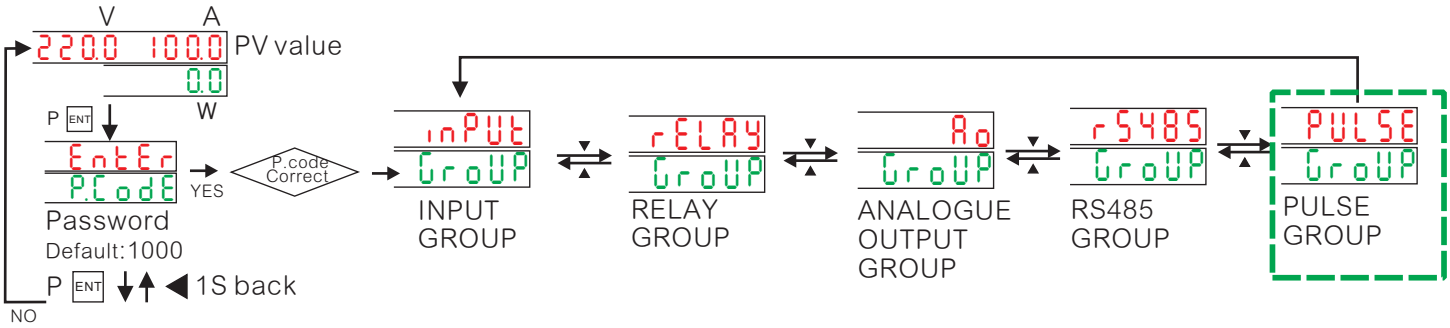
Engineer level

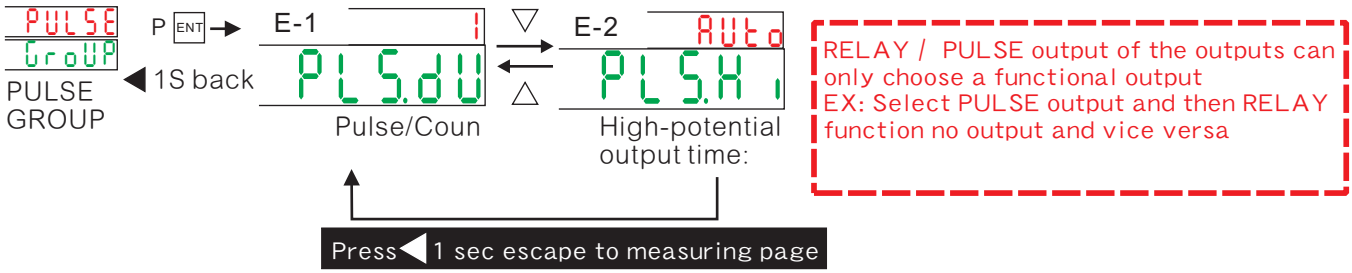




Press◀ 1 sec escape to measuring page

Engineer level





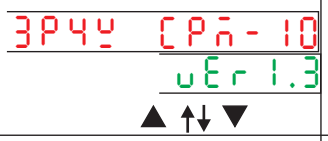
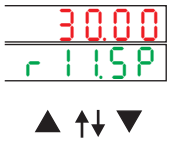
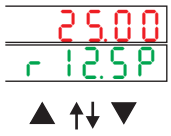
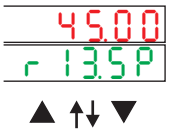
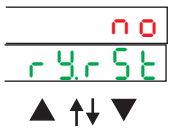
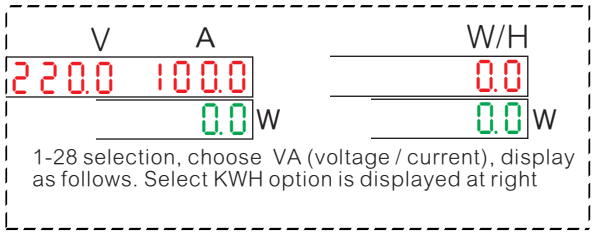
RELAY / PULSE output of the outputs can only choose a functional output
EX: Select PULSE output and then RELAY function no output and vice versa

Parameter Description

Index	Explain	
E-1	Pulse output/Count setting:1~9999	※When set 1,mean 1 count watt hr give 1 pulse: When set 1000, mean 1000 count watt hr give 1 pulse ,
E-2	Hi-voltage output time:0(AUTO)~5000	※When set 0, mean Duty cycle.is 50% ; setting 1~5000(x4ms.) time length , please beware at long time length, high frequency the output may remain at H-voltage and not completing a full pulse cycle, resulting data not readable.

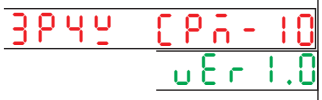
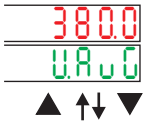
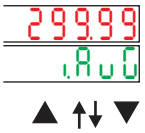
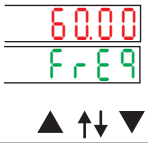
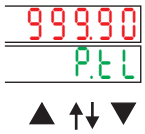
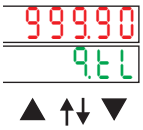
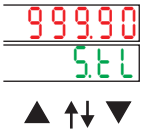
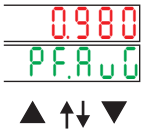
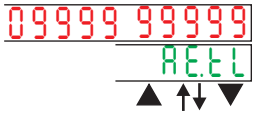
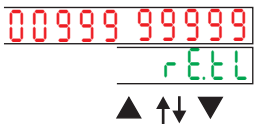
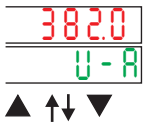
■Operating Steps

User Level

Parameters	Display	Setting	Operation
Power on Check the wiring 	Self test LED all on		No need to set
	Wiring Model Version	Press ◀ 1Sec Into the relay function	
0-1 	Relay 1.1 funtion setting	Relay R1.1 value range:-199.99~299.99	Shift Increase Decrease Enter Press ENTER values blink,press ▲&▼change value or selection when done press ENTER to next setting or hold ◀ 1 sec to previous selection list.
0-2 	Relay 1.2 funtion setting	Relay R1.2 value range:-199.99~299.99	Shift Increase Decrease Enter Press ENTER values blink,press ▲&▼change value or selection when done press ENTER to next setting or hold ◀ 1 sec to previous selection list.
0-3 	Relay 1.3 funtion setting	Relay R1.3 value range:-199.99~299.99	Shift Increase Decrease Enter Press ENTER values blink,press ▲&▼change value or selection when done press ENTER to next setting or hold ◀ 1 sec to previous selection list.
0-4 	Reset relay function	Select:YES /no	Shift Increase Decrease Enter Press ENTER values blink,press ▲&▼change value or selection when done press ENTER to next setting or hold ◀ 1 sec to previous selection list.
0-5 	Version Model	There is no relay functions Will only display version	View only Press▼ 1 sec escape to begining page Press◀ 1sec escape to measuring page.
Back to 0-1			
 1-28 selection, choose VA (voltage / current), display as follows. Select KWH option is displayed at right			

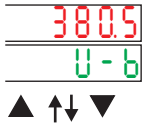
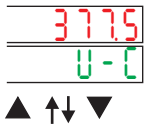
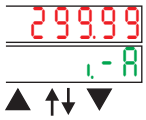
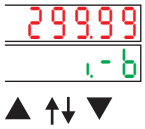
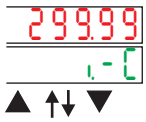
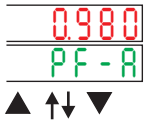
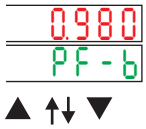
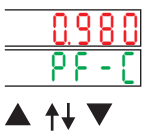
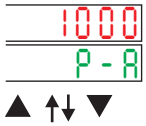
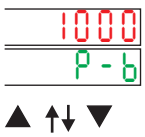
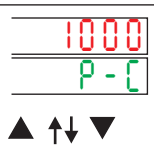
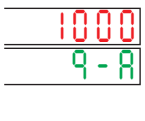
■Operating Steps

User Level

Parameters	Display	Setting	Operation
Power on Check the wiring 	Self test LED all on		No need to set
	Wiring Model Version	Press ◀ 1Sec Into the measurement menu	
1-1 	3 Phase voltage average value	View only	The average voltage is the average of the voltage relative N。V.AVG=(Van+Vbn+Vcn)/3Voltage readings need to be interpreted in conjunction with voltage unit V or KV。
1-2 	3 Phase current average value	View only	The average current is the average flowing through the line current。I.AVG=(Ia+Ib+Ic)/3 Displayed as the current units of ampere。
1-3 	Frequency	View only	Frequency is taken between the Van voltage frequency。Range:45.00~75.00 Hzexceed Frequency range will affect the other parameters the accuracy of the reading。
1-4 	3 Phase power factor total	View only	The total effective power is the sum of each phase effective power。 The power of reading needs with the unit MW, KW or W。
1-5 	3 Phase reactive power	View only	Total invalid power is the power of total。 The power of reading needs with the unit MW, KW or W。
1-6 	3 Phase active power	View only	The power of reading needs with the unit MW, KW or W。
1-7 	3 Phase power factor average	View only	Total power factor (PF) = total effective power (P) / total apparent power (S)
1-8 	3 Phase total energy Watt-hr	View only Parameter based on Po 15L corresponding display	The only 5-digit display, but the cumulative number of bits to 8 digits, so into the down 4-digit "-9999", and the up 4 digits "9999 -" The 2 show。Reading needs with the unit MW, KW or
1-9 	3 Phase reactive energy Var-hr	View only Parameter based on Po2.5L corresponding display	The only 5-digit display, but the cumulative number of bits to 8 digits, so into the down 4-digit "-9999", and the up 4 digits "9999 -" The 2 show。Reading needs with the unit MW, KW or
1-10 	A Phase voltage	View only	

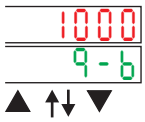
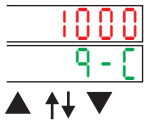
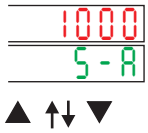
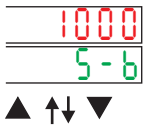
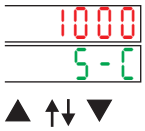
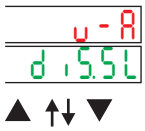
■Operating Steps

User Level

Parameters	Display	Setting	Operation
1-11 	B Phase voltage	View only	Each phase voltage refers to the relative N and white voltage。Va(Vb、Vc)with Vn voltage。3P4W wiring, only to show the line voltage of N, if you want to understand the line to line voltage, is only the value multiplied by 1.732.。 3P3W wiring, S need to short circuit and N, so the only Vab and Vca value and read value is the line voltage。 Reading needs with the unit KV or V。
1-12 	C Phase voltage	View only	
1-13 	A Phase current	View only	Each phase current is flowing through the line current。Ia、Ib、Ic current。 Current unit is ampere。
1-14 	B Phase current	View only	
1-15 	C Phase current	View only	
1-16 	A Phase power factor	View only	3P3W system, the system in “a phase current lag behind voltage 30 degree angle, "and" c phase current leads the voltage 30 degree angle ", so the total power factor of 1.00, PF-A will be = 0.866, PF-C will be = -0.866, so the display is a normal phenomenon。
1-17 	B Phase power factor	View only	
1-18 	C Phase power factor	View only	
1-19 	A Phase active power	View only	Reading needs with the unit MW, KW or W。
1-20 	B Phase active power	View only	
1-21 	C Phase active power	View only	
1-22 	A Phase reactive power	View only	

■Operating Steps

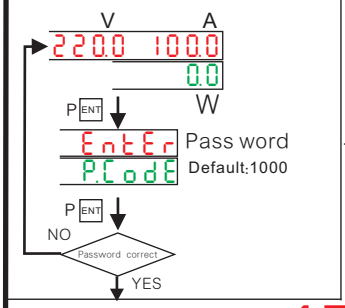
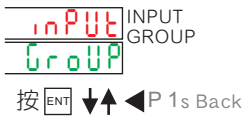
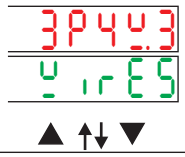
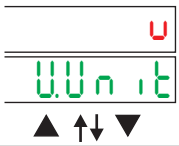
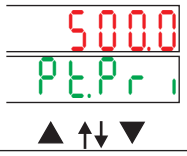
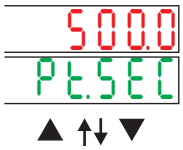
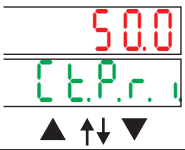
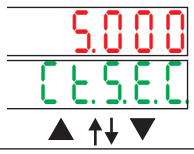
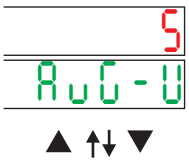
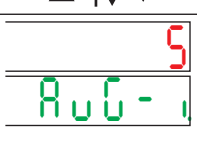
User Level

Parameters	Display	Setting	Operation
1-23 	B Phase reactive power	View only	Reading needs with the unit M、K or None(var)。
1-24 	C Phase reactive power	View only	
1-25 	A Phase apparent power	View only	Reading needs with the unit M、K or None(var)。
1-26 	B Phase apparent power	View only	
1-27 	C Phase apparent power	View only	
1-28 	Select V-A/KWH	V-A/KWH	Press ENTER values blink,press, ▲&▼ change value or selection when done press ENTER to next setting or hold ◀ 1 sec. to previous selection list ◀ Shift ▲ Increase ▼ Decrease ENTER Enter
Back to 1-1	Press ◀ 1 sec to measuring page		

■Operating Steps

Engineer level

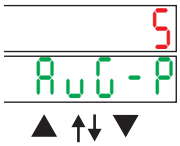
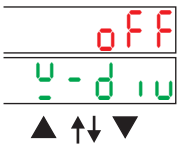
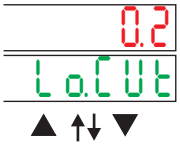
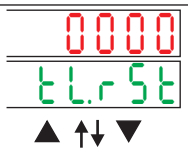
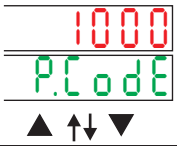
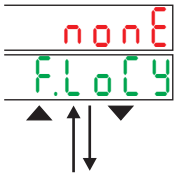
Shift Increase Decrease Enter

Parameters	Display	Setting	Operation
	Measurement Display		
RELAY / PULSE output of the outputs can only choose a functional output EX: Select PULSE output and then RELAY function no output and vice versa			
			
	INPUT GROUP Display		
A-1 	Input system selection:WIRES	Range: 1P2W/1P3W/3P3W.1/ 3P3W.2/3P3W.3/ 3P4W.1/3P4W.3	1P2W:1Phase 2 Wire 1P3W:1Phase 3 Wire 3P3W.1:3Phase 3 Wire 1CT(balanced)、 3P3W.2:3Phase 3 Wire 2CT、 3P3W.3:3Phase 3 Wire 3CT、 3P4W.1:3Phase 4 Wire 1CT(balanced)、 3P4W.3:3Phase 4 Wire 3CT。
A-2 	Primary PT voltage unit:V.Unit	V / KV	Range :ᴜ /ᴋᴜ Press ENT values blink,press, ▲&▼ change value or selection when done press ENT to next setting or hold ◀ 1 sec. to previous selection list
A-3 	Primary voltage setting range	Setting range:50.0V~100KV	Shift Increase Decrease Enter ※Please note that this setting is the choice of the corresponding primary voltage units. For example, if Vunit kv, while this pTpri set to 45) 0, then the set primary voltage for 450.0KV。
A-4 	Secondary voltage setting range	Setting range:50.0V~500V	Press ENT values blink,press, ▲&▼ change value or selection when done press ENT to next setting or hold ◀ 1 sec. to previous selection list
A-5 	Primary CT setting range	Setting range:1.0A~2999.9A	Shift Increase Decrease Enter
A-6 	Secondary CT setting range	(VIEW ONLY)	Press ENT values blink,press, ▲&▼ change value or selection when done press ENT to next setting or hold ◀ 1 sec. to previous selection list
A-7 	Average voltage setting:	Setting range:2~99	Shift Increase Decrease Enter ※System may have interference or signal unstable sometimes, causing display unstable: This function help to decrease rapid change on the display. Increasing average value make display more stable,
A-8 	Average current setting:	Setting range:2~99	Shift Increase Decrease Enter ※System may have interference or signal unstable sometimes, causing display unstable: This function help to decrease rapid change on the display. Increasing average value make display more stable,

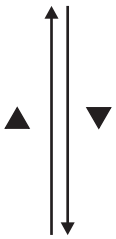
■Operating Steps

Engineer level

Shift Increase Decrease Enter

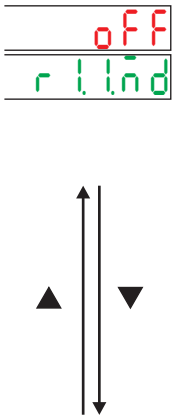
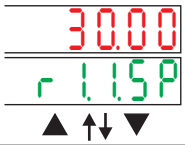
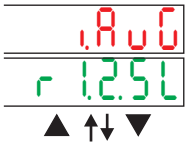
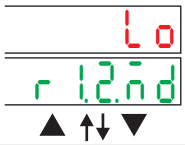
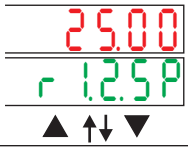
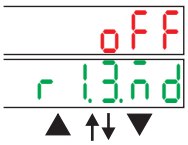
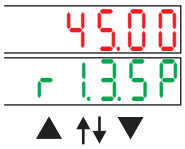
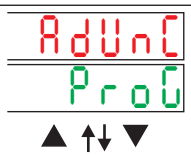
Parameters	Display	Setting	Operation
A-9 	Active power average value setting range:	Setting range:2~99	Shift Increase Decrease Enter ※System may have interference or signal unstable sometimes, causing display unstable: This function help to decrease rapid change on the display. Increasing average value make display more stable,
A-10 	Watt high-resolution	Setting range: OFF:0(Normal) ON:1(High) ※Default:OFF	Shift Increase Decrease Enter Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
A-11 	Low Cut	Setting range:0.0~100.0% ※Default:0.2	Shift Increase Decrease Enter Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
A-12 	Reset watt-hr/var-hr to zero	Password:0~9999 Rs485 Key in 0 to reset。	Shift Increase Decrease Enter Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
A-13 	Change parameters level password:	Password:0000~9999	Shift Increase Decrease Enter Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
A-14  Return to A-1	Press ◀ 1 sec to measuring page	Function lock select: NONE/USER/ENG/ALL	Shift Increase Decrease Enter nonE(None): No function lock, user can enter and change setting USEr (User Level):User level lock,can view setting cant change parameters value EnG (Programming Level): Parameters setting lock ,can view setting cant change parameters value ALL (All Level): All level lock，can view setting cant change parameters value

Engineer level (Raely Output)

Parameters	Display	Setting	Operation
 RELAY GROUP 按 ENT ▼▲◀ P 1s Back	RELAY GROUP Display		Press ◀ 1 sec [rELAY GroUP]
B-1  	Relay R1.1 parameters page:	Reference to corresponding table(table B-1) Default:V.AVG u.AuG 3 Phase average voltage i.AuG 3 Phase average current FrEq Frequency P.tL 3 Phase active power q.tL 3 Phase reactive power S.tL 3 Phase apparent power PF.AuG 3 Phase power factor AE.tL 3 Phase Watt-hr rE.tL 3 Phase Var-hr u-A A Phase voltage u-b B Phase voltage u-C C Phase voltage i-A A Phase current i-b B Phase current i-C C Phase current PF-A A Phase power factor PF-b B Phase power factor PF-C C Phase power factor P-A A Phase active power P-b B Phase active power P-C C Phase power factor q-A A Phase reactive power q-b B Phase reactive power q-C C Phase reactive power S-A A apparent power S-b B apparent power S-C C apparent power	Shift Increase Decrease Enter Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list Note: R1.1/R1.2/R1.3 is only one relay output function, but three mode (.1/.2./.3-) group can be set to function In (.1/.2./.3) group within any parameters set the conditions for the establishment of the relay action. But when the three groups of conditions have not set up the relay is still conduction until three parameter is not set up until reversion EX: the R1.1 setting parameters for u.AuG , when the R1.2 setting parameters to set parameters for i.AuG , R1.3 FrEq . Only R1.1 current average set point is reached, the relay actionuntil below the set point automatically reset. When the three set parameters set point is reached, if only to exclude the R1.1 set point, then the relay is still action, until the R1.2 with R1.3 setpoint exclusion will revert to.

■Operating Steps

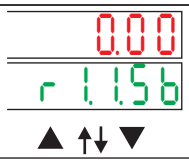
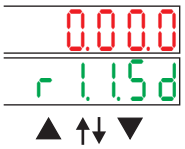
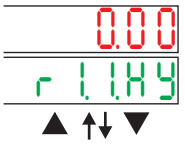
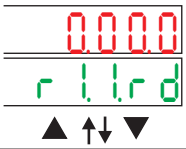
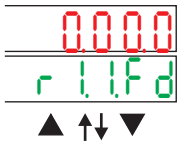
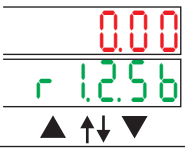
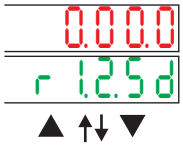
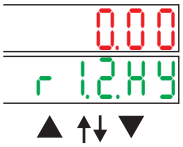
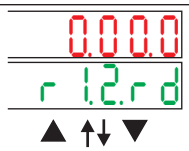
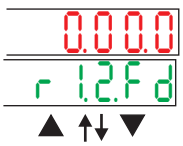
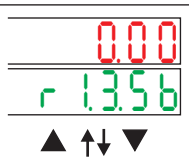
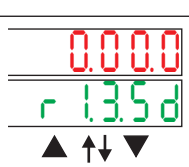
Engineer level (Raely Output) — Shift | Increase | Decrease | Enter

Parameters	Display	Setting	Operation
B-2 	Relay R1.1	Setting type: Lo. /Hi /Lo.HLd /Hi.HLd / do. /oFF.	Shift Increase Decrease Enter Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list Lo : PV＜Setpoint，relay energized。 Hi : PV＞Setpoint，relay energized。 Lo.HLd : Display＜Setpoint，relay energized, and hold energized status。 Hi.HLd : Display＞Setpoint，relay energized, and hold energized status。 do : Using Rs485 communication,relay can act as DO,command relay to energized.。 oFF : Close relay function,when relay is off ,relay remain open, LED will not light。
B-3 	Relay R1.1 value setting:	Setting range: -199.99~299.99	Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
B-4 	Relay R1.2 Mode:	Relay R1.2 setting type :same R1.1	Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
B-5 	Relay R1.2 Mode:	Setting type: Lo. /Hi /Lo.HLd /Hi.HLd / do. /oFF.	Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
B-6 	Relay R1.2 value setting:	Setting range: -199.99~299.99	Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
B-7 	Relay R1.3 Mode:	Relay R1.3 setting type:same R1.1	Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
B-8 	Relay R1.3 Mode:	Setting type: Lo. /Hi /Lo.HLd /Hi.HLd / do. /oFF.	Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
B-9 	Relay R1.3 value setting:	Setting range: -199.99~299.99	Press values blink,press, & change value or selection when done press to next setting or hold 1 sec. to previous selection list
B-10 	Program selection:	prog (Programming for basic or advance setting):	Shift Increase Decrease Enter In parameters setting level, default is basic，during setting , it only show common functions,advance functions is hidden.User can change setting in each group , [ProG] set it AdvnC (advance) to show all functions.

■Operating Steps

Engineer level (Raely Output)

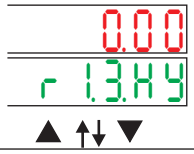
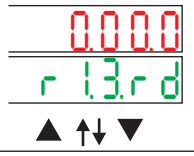
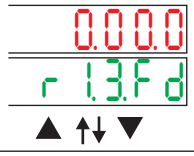
Shift Increase Decrease Enter

Parameters	Display	Setting	Operation
B-11 	Relay R1.1 stard band:	Setting range:00.00~99.99	Shift Increase Decrease Enter When display exceed set start band and after Start delay time ,then relay compare PV value, energized.
B-12 	Relay R1.1 start delay time:	Setting range: 0.00.00~9.59.9	Press Enter values blink,press, ▲&▼ change value or selection when done press Enter to next setting or hold ◀ 1 sec. to previous selection list
B-13 	Relay R1.1 hysteresis time:	Setting range:0.00~50.00	Press Enter values blink,press, ▲&▼ change value or selection when done press Enter to next setting or hold ◀ 1 sec. to previous selection list
B-14 	Relay R1.1 start delay time:	Setting range: 0.00.0~9.59.9	Press Enter values blink,press, ▲&▼ change value or selection when done press Enter to next setting or hold ◀ 1 sec. to previous selection list
B-15 	Relay R1.1 de-energized delay time:	Setting range: 0.00.0~9.59.9	Press Enter values blink,press, ▲&▼ change value or selection when done press Enter to next setting or hold ◀ 1 sec. to previous selection list
B-16 	Relay R1.2 start band:	Setting range: 0.00~99.99	Shift Increase Decrease Enter When display exceed set start band and after Start delay time ,then relay compare PV value, energized.
B-17 	Relay R1.2 start delay time	Setting range: 0.00.00~9.59.9	Press Enter values blink,press, ▲&▼ change value or selection when done press Enter to next setting or hold ◀ 1 sec. to previous selection list
B-18 	Relay R1.2 hysteresis time:	Setting range:0.0~50.00	Press Enter values blink,press, ▲&▼ change value or selection when done press Enter to next setting or hold ◀ 1 sec. to previous selection list
B-19 	Relay R1.2 start delay time:	Setting range: 0.00.0~9.59.9	Press Enter values blink,press, ▲&▼ change value or selection when done press Enter to next setting or hold ◀ 1 sec. to previous selection list
B-20 	Relay R1.2 de-energized delay time:	Setting range: 0.00.0~9.59.9	Press Enter values blink,press, ▲&▼ change value or selection when done press Enter to next setting or hold ◀ 1 sec. to previous selection list
B-21 	Relay R1.3 start delay time:	Setting range:0.00~99.99	Shift Increase Decrease Enter When display exceed set start band and after Start delay time ,then relay compare PV value, energized.
B-22 	Relay R1.3start delay time:	Setting range: 0.00.00~9.59.9	Press Enter values blink,press, ▲&▼ change value or selection when done press Enter to next setting or hold ◀ 1 sec. to previous selection list

■Operating Steps

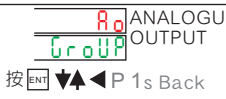
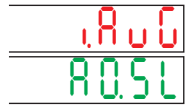
Engineer level (Raely Output)

Shift Increase Decrease Enter

Parameters	Display	Setting	Operation
B-23 	Relay R1.3 hysteresis time:	Setting range:0.00~50.00	Press ENTER values blink,press, ▲&▼ change value or selection when done press ENTER to next setting or hold ◀ 1 sec. to previous selection list
B-24 	Relay R1.3 start delay time:	Setting range: 0.00.0~9.59.9	Press ENTER values blink,press, ▲&▼ change value or selection when done press ENTER to next setting or hold ◀ 1 sec. to previous selection list
B-25 	Relay R1.3 de-energized delay time:	Setting range: 0.00.0~9.59.9	Press ENTER values blink,press, ▲&▼ change value or selection when done press ENTER to next setting or hold ◀ 1 sec. to previous selection list
Return to B-1	Press ◀ 1 sec to measuring page		

Engineer level (AO Output)

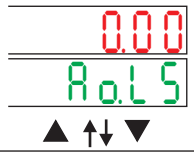
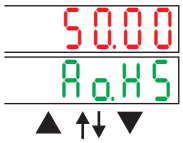
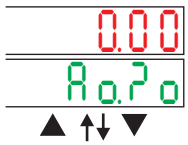
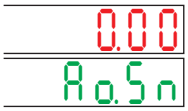
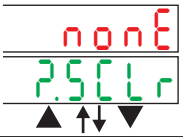
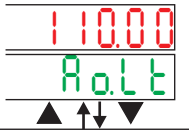
Shift Increase Decrease Enter

Parameters	Display	Setting	Operation
 按 ENT ▼▲◀ P 1s Back	ANALOGUE OUTPUT Display		Press ◀ 1 sec to [Ao GroUP]
C-1  	Analogue output parameters setting:	u.AuG 3 Phase average voltage i.AuG 3 Phase average current Fr.EQ Frequency P.tL 3 Phase active power q.tL 3 Phase reactive power S.tL 3 Phase apparent power PF.AuG 3 Phase power factor AE.tL 3 Phase Watt-hr rE.tL 3 Phase Var-hr u-A A Phase voltage u-b B Phase voltage u-C C Phase voltage i-A A Phase current i-b B Phase current i-C C Phase current PF-A A Phase power factor PF-b B Phase power factor PF-C C Phase power factor P-A A Phase active power P-b B Phase active power P-C C Phase power factor q-A A Phase reactive power q-b B Phase reactive power q-C C Phase reactive power S-A A apparent power S-b B apparent power S-C C apparent power	Press ENTER values blink,press, ▲&▼ change value or selection when done press ENTER to next setting or hold ◀ 1 sec. to previous selection list
C-2  	Analogue output range	Setting range:Voltage/Current	Shift Increase Decrease Enter Voltage: A0-10:0~10A A0-20:0~20A A.4-20:4~20A A.4b20:4~12~20A Ab10:±10A Ab20:±20A Current: u0-5:0~5V u.1-5:1~5V u0-10:0~10V u0b5:0~2.5~5V u.1b5:1~3~5V u0b10:0~5~10V ub5:±5V ub10:±10V

■Operating Steps

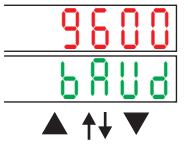
Engineer level(AO Output)

Shift Increase Decrease Enter

Parameters	Display	Setting	Operation
C-3 	A/O Low scale range:	Setting range: -199.99~299.99	Shift Increase Decrease Enter Ex: When A/O set 4-20(4~20mA) display value as 0~199.99 user may set [Ao.LS] (Ao.LS) 5 so when, display value is 5 , A/O will give 4mA output
C-4 	A/O high scale range:	Setting range: -199.99~299.99	Shift Increase Decrease Enter Ex: When A/O set 4-20(4~20mA) display value as 0~199.99 user may set [Ao.HS] (Ao.HS)15so when, display value is 1 5 , A/O will give 20mA output
C-5 	A/O signal zero fine tunning:	Setting range: -32768~32767	Shift Increase Decrease Enter When A/O low value is different from display (low),fine tunning can be done from front panel. During tunning please connect a higher accuracy meter, to measure output signal, so as calibration is within accuracy
C-6 	A/O signal span fine tunning:	Setting range: -32768~32767	Shift Increase Decrease Enter When A/O high value is different from display (high),fine tunning can be done from front panel. During tunning please connect a higher accuracy meter, to measure output signal, so as calibration is within accuracy。
C-7 	Clear fine tunning value:	Setting range: NONE/AO.ZRO/AO.SPN/BOTH	Cycle Enter nonE: None None clear Ao.Zro: Ao.Zro Zero clear Ao.SPn: Ao.SPn Span clear both: both Zero 、 span clear
C-8 	A/O range limit:	Setting range in %:0.00~110.00%	Shift Increase Decrease Enter Press Enter values blink,press, & change value or selection when done press Enter to next setting or hold 1 sec. to previous selection list
Back to C-1	Press 1 sec to measuring page		

Engineer level (RS485 Output)

Shift Increase Decrease Enter

Parameters	Display	Setting	Operation
 RS485 GROUP 按 ENT ▼▲◀ P 1s Back	RS485 GROUP Display		Press 1 sec to [rS485 GroUP]
D-1 	Address setting:	Setting range:1~255	Press Enter values blink,press, & change value or selection when done press Enter to next setting or hold 1 sec. to previous selection list
D-2 	Modbus Baud rate:	Setting range: 1200/2400/4800/9600/ 19200/38400	Press Enter values blink,press, & change value or selection when done press Enter to next setting or hold 1 sec. to previous selection list
D-3 	Modbus pairty bit:	Setting range: n.stb.1/.stb.2/odd/even	Cycle Enter n.Stb.1 (n.Stb.1): None, 1 stop bit n.Stb.2 (n.Stb.2): None, 2 stop bit odd (odd): odd EuEn (EvEn): Even
Back to D-1	Press 1 sec to measuring page		

■Operating Steps

Engineer level (Pulse Output)

Shift Increase Decrease Enter

Parameters	Display	Setting	Operation
PULSE GROUP 按 ENT ▲▼ ◀ P 1s Back	PULSE GROUP Display		Press ◀ 1 sec to [PULSE GroUP]
E-1 1 PLS.dU ▲ ▼	Pulse output /Count setting:	Setting range:1~9999	Shift Increase Decrease Enter ※When set 1,mean 1 count watt hr give 1 pulse: When set 1000, mean 1000 count watt hr give 1 pulse ,
E-2 AUto PLS.H 1 ▲ ▼ Back to E-1	Hi-voltage output time:	Setting range: 0(AUTO)~5000 (x 4ms)	Shift Increase Decrease Enter ※When set 0, mean Duty cycle.is 50% ; setting 1~5000(x4ms.) time length , please beware at long time length, high frequency the output may remain at H-voltage and not completing a full pulse cycle, resulting data not readable.
	Press ◀ 1 sec to measuring page		RELAY / PULSE output of the outputs can only choose a functional output EX: Select PULSE output and then RELAY function no output and vice versa

CPM-10 MODBUS ADDRESS TABLE**Address number are Hexadecima

Name	Modbus Address	Address	Range	Explain	Initial	Read/White
AE.tL	40001	0000h	0~9999999999	Active Energy (High word)		R
	40002	0001h		Active Energy (Mid word)		R
	40003	0002h		Active Energy (low word)		R
rE.tL	40004	0003h	0~9999999999	Re-Active Energy (High word)		R
	40005	0004h		Re-active Energy (Mid word)		R
	40006	0005h		Re-active Energy (low word)		R
u.Au.G	40007	0006h	0~29999	Average Voltage		R
i.Au.G	40008	0007h	0~29999	Average Current		R
Fr.E9	40009	0008h	0~9999	Frequency		R
P.tL	40010	0009h	-19999~29999	Total Active Power		R
9.tL	40011	000Ah	-19999~29999	Total Re-active Power		R
S.tL	40012	000Bh	-19999~29999	Total Apparent Power		R
PF.Au.G	40013	000Ch	-1000~1000	Average Power Factor		R
u.A	40014	000Dh	0~9999	Phase-A Voltage		R
u.b	40015	000Eh	0~9999	Phase-B Voltage		R
u.C	40016	000Fh	0~9999	Phase-C Voltage		R
i.A	40017	0010h	0~9999	Phase-A Current		R
i.b	40018	0011h	0~9999	Phase-B Current		R
i.C	40019	0012h	0~9999	Phase-C Current		R
PF.A	40020	0013h	-1000~1000	Phase-A Power Factor		R
PF.b	40021	0014h	-1000~1000	Phase-B Power Factor		R
PF.C	40022	0015h	-1000~1000	Phase-C Power Factor		R
P.A	40023	0016h	-1999~9999	Phase-A Active Power		R
P.b	40024	0017h	-1999~9999	Phase-B Active Power		R
P.C	40025	0018h	-1999~9999	Phase-C Active Power		R
9.A	40026	0019h	-1999~9999	Phase-A Re-active Power		R
9.b	40027	001Ah	-1999~9999	Phase-B Re-active Power		R
9.C	40028	001Bh	-1999~9999	Phase-C Re-active Power		R
S.A	40029	001Ch	0~9999	Phase-A Apparent Power		R
S.b	40030	001Dh	0~9999	Phase-B Apparent Power		R
S.C	40031	001Eh	0~9999	Phase-C Apparent Power		R
i.dP	40032	001Fh	0~2	DP of Current 0:0.000A 1:00.00A 2:000.0A		R
U.dP	40033	0020h	0~3	DP of Voltage 0:000.0V 1:0000V 2:00.00kV 3:000.0kV		R
Y.dP	40034	0021h	0~6	DP of Active Power 0:0.1W 1:1W 2:0.01KW 3:0.1KW 4:1KW 5:0.01MW 6:0.1MW 7:1MW		R
Y.rES	40035	0022h	0~3	Wiring of Voltage & Current Input 0: 1P2W 1: 1P3W 2: 3P3W.1 3: 3P3W.2 4:3P3W.3 5: 3P4W.1 6:3P4W.3	3	R/W
u.Un.it	40036	0023h	0~1	Unit for Primary Voltage of PT 0: V 1: kV	0	R/W
Pt.Pr.i	40037	0024h	500~29999	Primary Voltage of PT	3000	R/W
Pt.SEC	40038	0025h	500~5000	Secondary Voltage of PT	3000	R/W
Ct.Pr.i	40039	0026h	10~29999	Primary Current of CT	500	R/W
Ct.SEC	40040	0027h	1000/5000	Secondary Current of CT	5000	R
Au.G.u	40041	0028h	2~99	Average Display for Voltage	5	R/W
Au.G.i	40042	0029h	2~99	Average Display for Current	5	R/W
Au.G.P	40043	002Ah	2~99	Average Display for Power	5	R/W
tL.rSt	40044	002Bh	0~1	The Reset for Energy 0:No Clear values 1:Clear values	0	R/W
P.CodE	40045	002Ch	0000~9999	Pass Code	1000	R/W
F.LoCK	40046	002Dh	0~3	Function Lock 0: none 1: User Level 2: Engineer Level 3: All	0	R/W
Y.d.iu	40047	002Eh	0~1	Watt high-resolution 0: OFF(Normal) 1: ON(High)	0	R/W
Lo.CUt	40048	002Fh	0~1000	Low Cut	2	R/W

CPM-10 MODBUS ADDRESS TABLE**Address number are Hexadecima

Name	Modbus Address	Address	Range	Explain	Initial	Read/White
r1SL	40050	0031H	0~24	The parameter relative to Relay 1.1 0: Average Voltage 1: Average Current 2: Frequency 3: Total Active Power 4: Total Re-active Power 5: Total Apparent Power 6: Average Power Factor 7: Phase-A Voltage 8: Phase-B Voltage 9: Phase-C Voltage 10: Phase-A Current 11: Phase-B Current 12: Phase-C Current 13: Phase-A Power Factor 14: Phase-B Power Factor 15: Phase-C Power Factor 16: Phase-A Active Power 17: Phase-B Active Power 18: Phase-C Active Power 19: Phase-A Re-active Power 20: Phase-B Re-active Power 21: Phase-C Re-active Power 22: Phase-A Apparent Power 23: Phase-B Apparent Power 24: Phase-C Apparent Power	0	R/W
r1Md	40051	0032H	0~5	Relay 1.1 Energized Mode 0: No Use 1: Low Energized 2: High Energized 3: Low Energized Hold 4: High Energized Hold 5: Digital Output	2	R/W
r1SP	40052	0033H	-19999~29999	Relay 1.1 Set Point	3000	R/W
r2SL	40053	0034H	0~24	The parameter relative to Relay 1.2 0: Average Voltage 1: Average Current 2: Frequency 3: Total Active Power 4: Total Re-active Power 5: Total Apparent Power 6: Average Power Factor 7: Phase-A Voltage 8: Phase-B Voltage 9: Phase-C Voltage 10: Phase-A Current 11: Phase-B Current 12: Phase-C Current 13: Phase-A Power Factor 14: Phase-B Power Factor 15: Phase-C Power Factor 16: Phase-A Active Power 17: Phase-B Active Power 18: Phase-C Active Power 19: Phase-A Re-active Power 20: Phase-B Re-active Power 21: Phase-C Re-active Power 22: Phase-A Apparent Power 23: Phase-B Apparent Power 24: Phase-C Apparent Power	1	R/W
r2Md	40054	0035H	0~5	Relay 1.2 Energized Mode 0: No Use 1: Low Energized 2: High Energized 3: Low Energized Hold 4: High Energized Hold 5: Digital Output	2	R/W
r2SP	40055	0036H	-19999~29999	Relay 1.2 Set Point	5000	R/W
r3SL	40056	0037H	0~24	The parameter relative to Relay 1.3 0: Average Voltage 1: Average Current 2: Frequency 3: Total Active Power 4: Total Re-active Power 5: Total Apparent Power 6: Average Power Factor 7: Phase-A Voltage 8: Phase-B Voltage 9: Phase-C Voltage 10: Phase-A Current 11: Phase-B Current 12: Phase-C Current 13: Phase-A Power Factor 14: Phase-B Power Factor 15: Phase-C Power Factor 16: Phase-A Active Power 17: Phase-B Active Power 18: Phase-C Active Power 19: Phase-A Re-active Power 20: Phase-B Re-active Power 21: Phase-C Re-active Power 22: Phase-A Apparent Power 23: Phase-B Apparent Power 24: Phase-C Apparent Power	3	R/W
r3Md	40057	0038H	0~5	Relay 1.3 Energized Mode 0: No Use 1: Low Energized 2: High Energized 3: Low Energized Hold 4: High Energized Hold 5: Digital Output	2	R/W
r3SP	40058	0039H	-19999~29999	Relay 1.3 Set Point	4500	R/W
r1Sb	40059	003AH	0~9999	Start Band of input for Relay1.1 energized	0	R/W
r1Sd	40060	003BH	0~5999 (0.1second)	Start Delay Time of input for Relay1.1 energized	0	R/W
r1HY	40061	003CH	0~5000	Hysteresis of Relay 1.1	0	R/W
r1rd	40062	003DH	0~5999 (0.1second)	Energized Delay Time of Relay 1 1	0	R/W
r1Fd	40063	003EH	0~5999 (0.1second)	De-Energized Delay Time of Relay 1.1	0	R/W
r2Sb	40064	003FH	0~9999	Start Band of input for Relay1.2 energized	0	R/W
r2Sd	40065	0040H	0~5999 (0.1second)	Start Delay Time of input for Relay1.2 energized	0	R/W
r2HY	40066	0041H	0~5000	Hysteresis of Relay 1.2	0	R/W
r2rd	40067	0042H	0~5999 (0.1second)	Energized Delay Time of Relay 1.2	0	R/W
r2Fd	40068	0043H	0~5999 (0.1second)	De-Energized Delay Time of Relay 1.2	0	R/W
r3Sb	40069	0044H	0~9999	Start Band of input for Relay1.3 energized	0	R/W
r3Sd	40070	0045H	0~5999 (0.1second)	Start Delay Time of input for Relay1.3 energized	0	R/W
r3HY	40071	0046H	0~5000	Hysteresis of Relay 1.3	0	R/W
r3rd	40072	0047H	0~5999 (0.1second)	Energized Delay Time of Relay 1.3	0	R/W
r3Fd	40073	0048H	0~5999 (0 1second)	De-Energized Delay Time of Relay 1.3	0	R/W
Relay Status	40074	0049H	0~7	bit0~bit2: Relay1.1~Relay1.3; 0=Relay off 1=Relay on	0	R/W

CPM-10 MODBUS ADDRESS TABLE**Address number are Hexadecima

Name	Modbus Address	Address	Range	Explain	Initial	Read/White
Ao.SL	40078	004DH	0~24	The parameter relative to Analog Output 1 0: Average Voltage 1: Average Current 2: Frequency 3: Total Active Power 4: Total Re-active Power 5: Total Apparent Power 6: Average Power Factor 7: Phase-A Voltage 8: Phase-B Voltage 9: Phase-C Voltage 10: Phase-A Current 11: Phase-B Current 12: Phase-C Current 13: Phase-A Power Factor 14: Phase-B Power Factor 15: Phase-C Power Factor 16: Phase-A Active Power 17: Phase-B Active Power 18: Phase-C Active Power 19: Phase-A Re-active Power 20: Phase-B Re-active Power 21: Phase-C Re-active Power 22: Phase-A Apparent Power 23: Phase-B Apparent Power 24: Phase-C Apparent Power	0	R/W
Ao.tP	40079	004EH	0~13	Analog Output 1 Type 0: V.0-5 1: V.1-5 2: V.0-10 3: V.0.b.5 4: V.1.b.5 5:V.0.b.10 6: V.b.5 7: V.b.10 8: A.0-10 9: A.0-20 10: A.4-20 11: A.4.b.20 12: A.b.10 13: A.b.20	10	R/W
Ao.LS	40080	004FH	-19999~29999	Analog Output 1 Low scale	0	R/W
Ao.HS	40081	0050H	-19999~29999	Analog Output 1 High scale	3000	R/W
Ao.Po	40082	0051H	-32168~32767	Analog Output Zero adjustment	0	R/W
Ao.Sn	40083	0052H	-32168~32767	Analog Output Span adjustment	0	R/W
PSCLr	40084	0053H	0~3	The clear of Analog Output Zero and Span	0	R/W
Ao.Lt	40085	0054H	0~11000	Analog Output High Limit	1100	R/W

Name	Modbus Address	Address	Range	Explain	Initial	Read/White
AdrES	40113	0070H	1~255	RS485 address	1	R/W
bAUd	40114	0071H	0~5	RS485 baud rate 0: 1200 1: 2400 2: 4800 3: 9600 4: 19200 5: 38400	3	R/W
Pr tY	40115	0072H	0~3	RS485 parity 0: n-8-1 1: n-8-2 2: odd 3: even	1	R/W

Name	Modbus Address	Address	Range	Explain	Initial	Read/White
PLSdv	40125	007CH	1~9999	Pulse Devider	1	R/W
PLSH t	40126	007DH	0~5000	The Period of Pulse Output High 0(Auto)/~1~5000*4mSec	0	R/W