4 DIGITAL MULTIFUNCTION POWER METER with 2 ALARMS / RS-485

APM

FEATURES

- Measuring power parameters: V, A, W, Q (Var), S (VA), PF, Hz, KWH, KQH, DM (Demand)
- 1P2W / 1P3W / 3P3W / 3P4W system programmable
- Display range: -9999~9999; decimal point selectable
- 2 Alarms output or 2 Digital input / 2 Pulses output for forward KWH & reverse KWH
  RS-485 communication optional (The above option can be exist together)
- DIN case: 96 x 96 mm
- High stability, non-flammable case (PC), high safety

ORDER INFORMATION: APM - Code 1 Code 2 - Code 3 - Code 4 Code 5 Code 6

Code 1	Input Volt
2	0~600V
O	Option

Code 2	Input Amp
2	0~5A
O	Option

Code 3	Aux. Power
A	AC/DC 100~240V
D	AC/DC 22~60V

Code 4	Alarm Output
N	None
R2	2 Relays

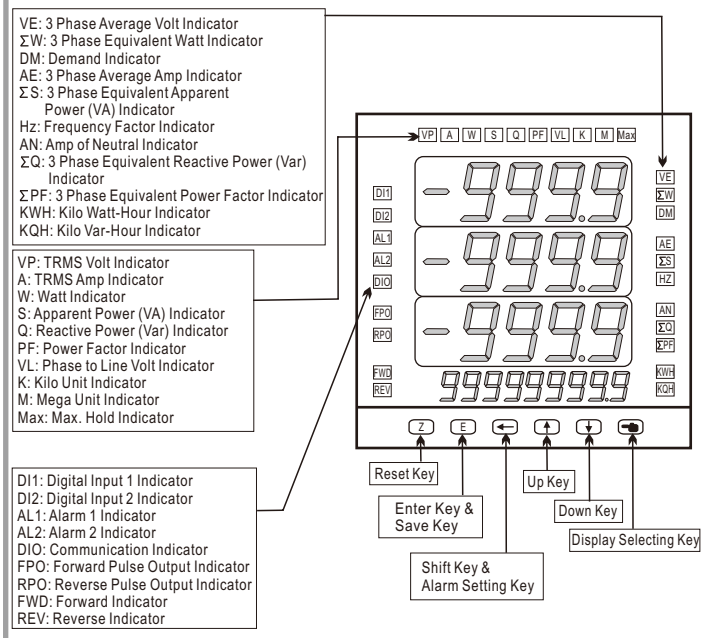
Code 5	Pulse Output
N	None
Y	Yes

Code 6	Communications
N	None
Y	Rs485
Z	Zigbee

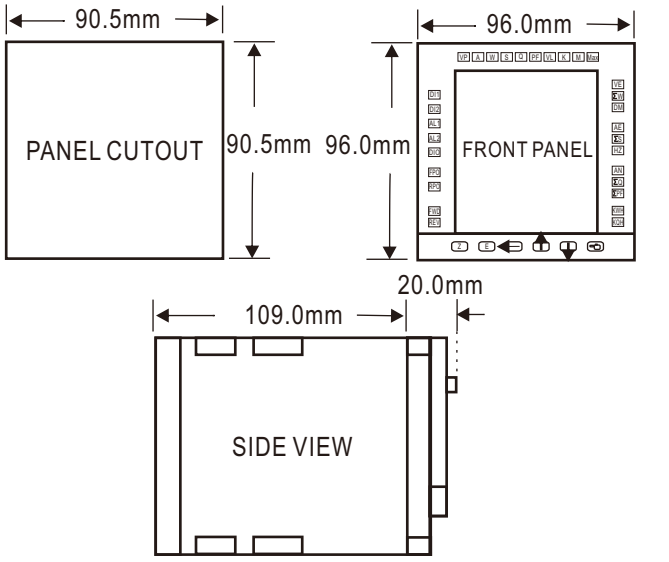
SPECIFICATION

♦ Accuracy:	±0.25% for VL-N: V1, V2, V3, VE
	±0.25% for VL-L: V12, V23, V13, VE
	±0.25% for A: A1, A2, A3, AE
	±0.5% for W (Watt): W1, W2, W3, ΣW
	±0.5% for Q (Var): Q1, Q2, Q3, ΣQ
	±0.5% for S (VA): S1, S2, S3, ΣS
	±0.5% for PF: PF1, PF2, PF3, ΣPF
	±0.1% for Hz
	±0.5% for KWH
	±0.5% for KQH
	±0.5% for DM (Demand)
♦ Measuring Range:	1P2W, 1P3W, 3P3W, 3P4W systems
	Voltage: 0~600Vac
	Current: 0~5Aac
	Frequency: 50/60 Hz
♦ Display Screen:	High brightness LED; 14.22mm (0.56")
	High brightness LED; 10.2mm (0.4")
♦ Sampling Time:	1 cycle / sec
♦ Display Range:	-9999~9999
	0~999999999 for KWH & KQH
♦ Parameters Setting:	Push buttons
♦ Back Up Memory:	EEPROM
♦ Alarm Action:	"≧(Hi) on" or "< (Lo) on"
♦ Alarm Run Delay Time:	0~99 sec
♦ Relay Contact:	AC 277V / 7A; DC 30V / 7A
♦ Communication:	RS-485 Modbus RTU mode
♦ Baud Rate:	19200 / 9600 / 4800 / 2400 bps
♦ Temperature Coefficient:	100ppm / ℃ (0~60℃)
♦ Operating Temperature:	0~60℃
♦ Operating Humidity:	20~90% RH (non-condensing)
♦ Storage Temperature:	-10~70℃
♦ Storage Humidity:	20~90% RH (non-condensing)
♦ Power Supply:	AC 100~240V; DC 24 / 30~90V
♦ Power Consumption:	10VA (all functions output)
♦ Surge Test:	1KVac / 1min (Input / Power)
	3KVac / 1min (Terminals / Case)
♦ Insulation Resistance:	>100MΩ with 500Vdc
♦ Input Impendence:	Voltage: >2V for 20KΩ / V; ≦2V for >200MΩ
	Current: ≧0.2A at 100mV; <0.2A at 1V
♦ Safety:	IEC 61000-4-2
	IEC 61000-4-3
	IEC 61000-4-4
	IEC 61000-4-5
	IEC 61000-4-6
	IEC 61000-4-8
	IEC 61000-4-11

FRONT PANEL & KEY FUNCTIONS

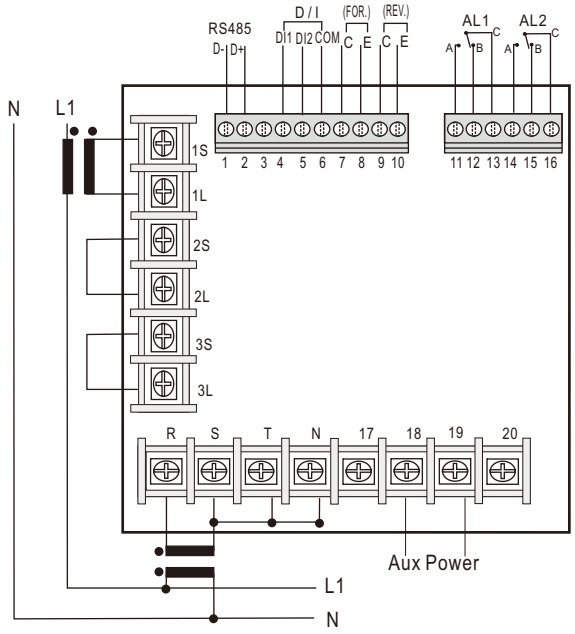


DIMENSION

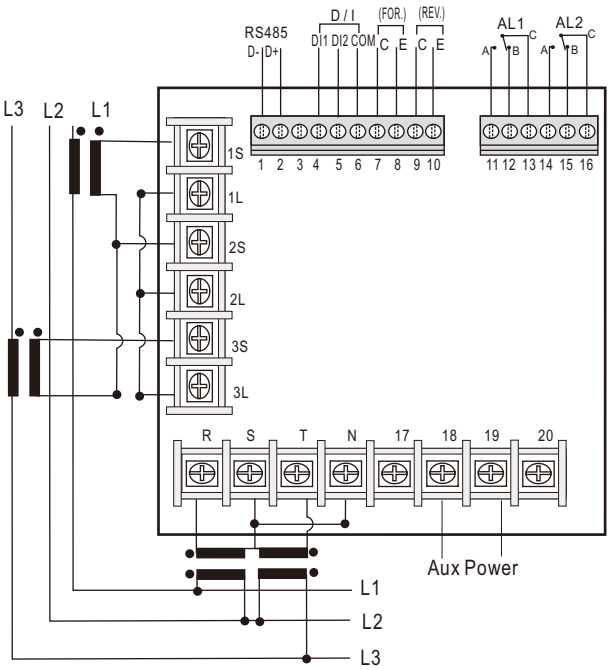


■ WIRING CONNECTION

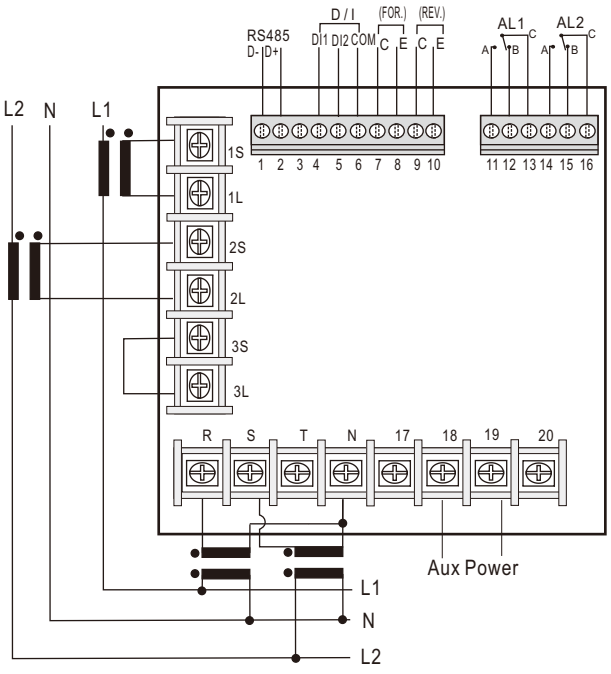
● 1∅2 W



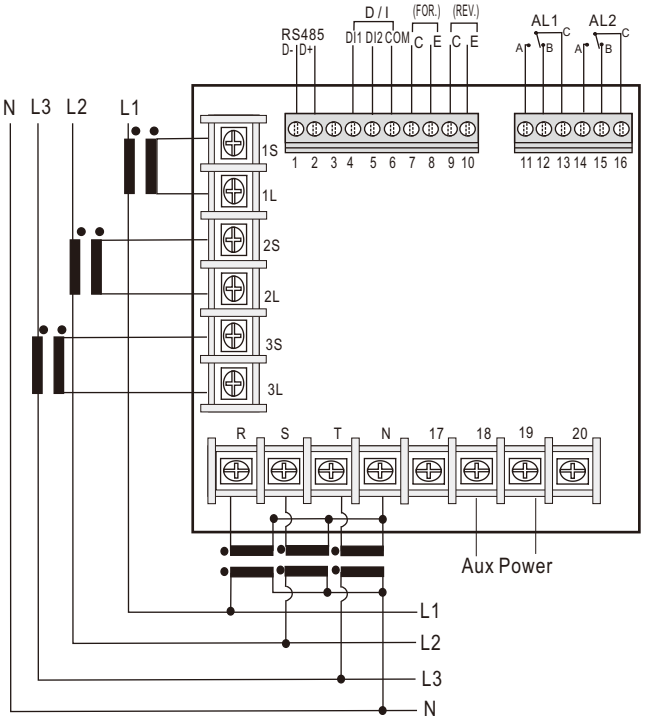
● 3∅3 W



● 1∅3 W



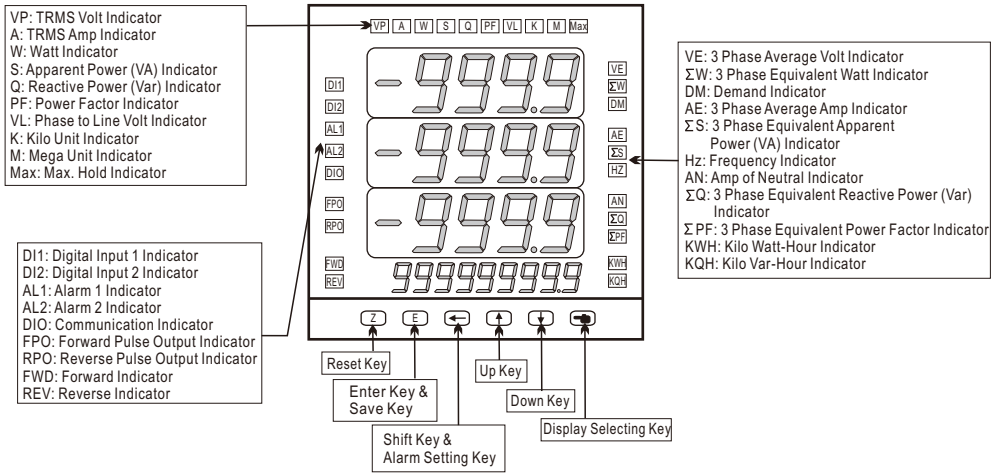
● 3∅4 W



APM — 4 DIGITAL MULTIFUNCTION POWER METER with 2 ALARMS / RS-485 — MANUAL

✻ Please understand key indicators & functions at the first operation.

FRONT PANEL & KEY FUNCTIONS



Key Name	Symbol	Descriptions
Reset Key	Z	1. Press this key to enable the reset function for total value and max. value.
Enter Key & Save Key	E	1. In the measuring status, press this key can enter to parameter pages. 2. In the parameter setting, press this key can save the value & go to next parameter.
Shift Key & Alarm Setting Key	←	1. In the measuring page, press this key for 3 sec can enter to alarm setting page (The selecting digit will be flashed) 2. In the parameter setting , press this key can move the cursor left.
Up Key	↑	1. In the parameter setting, press this key can increase the digits.
Down Key	↓	1. In the parameter setting , press this key can decrease the digits.
Display Switching Key	⇥	1. In the measuring page, press this key can switch the display pages.

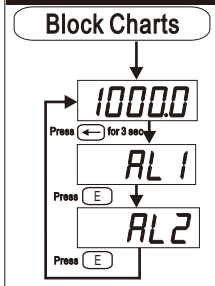
**1. The following block charts are parameters codes, parameter codes & parameters will alternate flashing if the parameters can be modified.

2. To modify the parameters, please press E ← ↑, and press E to save the parameter after the modification.

3. Please don't forget the new pass code after modification.

4. In any pages, press ↑&↓, or don't press any keys for 2 minutes that will back to measuring status.

GENERAL MODE OPERATING PROCEDURES



Display	Descriptions	Default
	Alarm Setpoint	
Measuring Status	Present value for measurement	
Alarm 1 Setpoint (AL1)	Press E ← ↑ to modify alarm 1 setpoint. P.S.: Alarm value is set by the Secondary value.	00000
Alarm 2 Setpoint (AL2)	Press E ← ↑ to modify alarm 2 setpoint. P.S.: Alarm value is set by the Secondary value.	00000

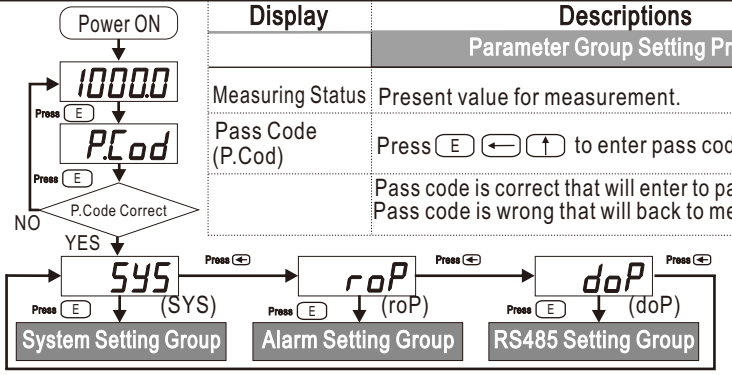
Remark: 1. There are 3 parameter groups of "System Setting Group(SYS)", "Alarm Setting Group(roP)", "RS485 Setting Group(doP)" for modification.

2. Press ← to select each group page, and press E to enter each group or parameter page for modification or saving the parameters.

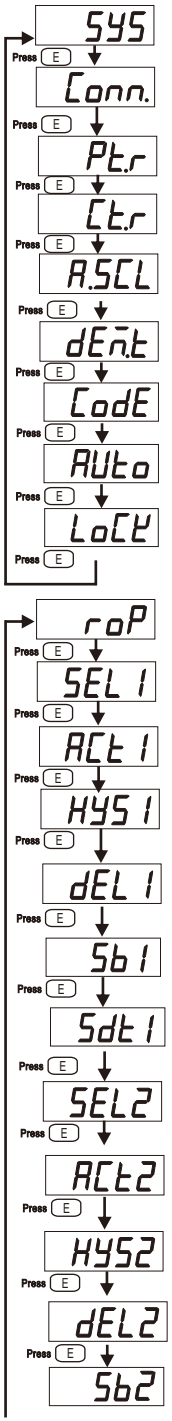
3. Some of optional functions of parameter pages still exist, but the functions are disable.

4. The data catch by RS-485 must use K factor for Bit Conversion table to convert the Secondary value of each power parameters.

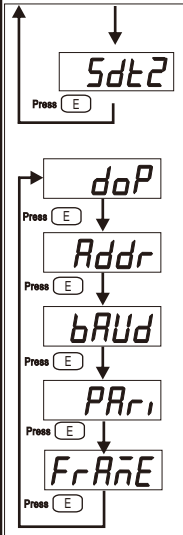
PROGRAMMING MODE OPERATING PROCEDURES



Display	Descriptions	Default
	Parameter Group Setting Procedures	
Measuring Status	Present value for measurement.	
Pass Code (P.Cod)	Press E ← ↑ to enter pass code.	00000
	Pass code is correct that will enter to parameter groups. Pass code is wrong that will back to measuring status.	



Display	Descriptions	Default
System Setting Page (SYS)	**System Setting Group Procedures**	
System Connection Setting (Conn.)	Press ↑ ↓ to select system connection. (3P4W, 3P3W, 1P3W, 1P2W)	3P4W
PT Ratio Setting (Pt.r)	Press E ← ↑ to modify PT ratio (1~9999).	1
CT Ratio Setting(Ct.r)	Press E ← ↑ to modify PT ratio (1~9999).	1
Amp Scale Setting (A.SCL)	Press ↑ ↓ to select volt scale (5A, 1A).	5A
Demand Time Setting (dEM.t)	Press E ← ↑ to modify demand time (1~60 min).	1
Pass Code Setting (CodE)	Press E ← ↑ to modify pass code (0~19999). PS: Please don't forget the new pass code after modification.	00000
Auto Display Switching Setting (Auto)	Press ↑ ↓ to select auto display switching off (YES) or on (NO). (Display period: 10sec per page)	no
Key Lock Setting (LoCK)	Press ↑ ↓ to lock the keys, using key lock function only can view the parameters, but cannot modify any values. PS: no (unlock) ,YES ("ENT" unlock , others lock).	no
	Alarm Setting Group Procedures	
Alarm Setting Page (roP)	**The following steps are only available for alarm output.**	
Alarm 1 Selection Setting (SEL1)	Press ↑ ↓ to select alarm 1 selection . (VE, AE, AN, ΣW, ΣQ, ΣS, ΣPF, DEMA, MAX.D)	uE
Alarm 1 Action Setting (ACt1)	Press ↑ ↓ to modify alarm value that is ≧(Hi) or <(Lo) for alarm action.	Hi
Alarm Hysteresis Setting (HYS1)	Press E ← ↑ to modify the value, when alarm runs lower or higher display value (depends on alarm action). Alarm setpoint ±this value (0~99) will turn off the alarm.	00000
Alarm Run Delay Setting (dEL1)	Press E ← ↑ to modify the value, when the display value reach the alarm value that need to wait for this time (0~99 sec) for alarm action.	00000
Alarm Start Band Setting (Sb1)	Press ↑ ↓ to modify the value (-99~+99), if the display value don't over this range; the alarm will not be act.	00000
Alarm Start Band Time Setting (Sdt1)	Press E ← ↑ to modify the value (0~99 sec), if the display value reach alarm start band value; the alarm will be act after this value (sec).(The function is used with "Sb" function.)	00000
Alarm 1 Selection Setting (SEL2)	Press ↑ ↓ to select alarm 2 selection . (VE, AE, AN, ΣW, ΣQ, ΣS, ΣPF, DEMA, MAX.D)	uE
Alarm 1 Action Setting (ACt2)	Press ↑ ↓ to modify alarm value that is ≧(Hi) or <(Lo) for alarm action.	Hi
Alarm Hysteresis Setting (HYS2)	Press E ← ↑ to modify the value, when alarm runs lower or higher display value (depends on alarm action). Alarm setpoint ±this value (0~99) will turn off the alarm.	00000
Alarm Run Delay Setting (dEL2)	Press E ← ↑ to modify the value, when the display value reach the alarm value that need to wait for this time (0~99 sec) for alarm action.	00000
Alarm Start Band Setting (Sb2)	Press ↑ ↓ to modify the value (-99~+99), if the display value don't over this range; the alarm will not be act.	00000



Display	Descriptions	Default
Alarm Start Band Time Setting (Sdt2)	Press E ← ↑ to modify the value (0~99 sec), if the display value reach alarm start band value; the alarm will be act after this value (sec).(The function is used with "Sb" function.)	00000
	RS485 Setting Group Procedures	
RS485 Setting Page (doP)	**The following steps are only available for RS-485.**	
Address Setting (Addr)	Press E ← ↑ to modify address (0~255).	00000
Baud Rate Setting (bAUd)	Press ↑ ↓ to select baud rate (19K2/9600/4800/2400).	19K2
Parity Setting (PAri)	Press ↑ ↓ to select parity (n.8.2/n.8.1/even/odd).	n.8.2
Frame Setting (FrAmE)	Press ↑ ↓ to select frame type. (NO:Hi→Lo , YES:Lo→Hi)	no

Error Code of Self-Diagnosis

Display	Descriptions
oFL	Input signal is over 120% of input range.
-oFL	Input signal is under -20% of input range.
AdEr	Input signal is over 180% of input range or meter error.
doFL	Input signal is over display range (99999)
-doFL	Input signal is under display range (-19999)
E-00	EEPROM reading/writing suffers the interference (about 1 million times).

**Please check the wiring connection is correct first, if the problem still exist, please return the meter to the factory.

Modbus RTU Mode Protocol Address Table

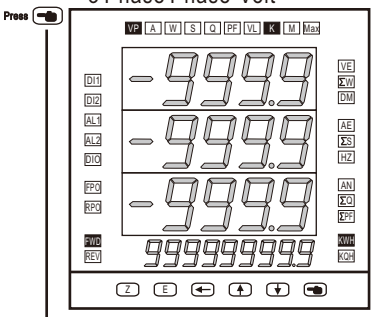
Data: 16Bit / 32Bit, +/- is 8000~7FFF (-32768~32767), 80000000~7FFFFFFF(-2147483648~2147483647)

Modbus	HEX	Name	Descriptions	Act
40001	0000	ID	Model number identification; APM is "14"	R
40002	0001	STATUS	Current status display; range: 0000~00FF(0~254) (0:OFF, 1:ON) (Bit7:AL2, Bit6: AL1, Bit5:OC2, Bit4:OC1, Bit3:DI2, Bit2:DI1)	R
40003	0002	INDEX	Page index setting; range 0000~004D(0~77)	R/W
40004	0003	ACT	Alarm act setting; range 0000~0010(0~16) 0:Hi, 1:Lo (Bit0:ACT1, Bit4:ACT2)	R/W
40005	0004	FUNC	Frame /Auto display switching setting; range: 0000~0010 (0~16) Bit0:Frame, Bit1:Auto	R/W
40006	0005	LOCK	Key lock setting; range: 0000~0001 (0~1) 0:NO, 1:YES	R/W
40007	0006	CONN	System connection setting; range: 0000~0003 (0~3) 0:3P4W,1:3P3W, 2:1P3W, 3:1P2W	R/W
40008	0007	SEL1	Alarm 1 selection setting; range: 0000~0008 (0~8) 0:VE, 1:AE, 2: AN, 3:∑W, 4:∑Q, 5:∑S, 6:∑PF, 7:DMEA, 8:MAX.D	R/W
40009	0008	SEL2	Alarm 2 selection setting; range: 0000~0008 (0~8) 0:VE, 1:AE, 2: AN, 3:∑W, 4:∑Q, 5:∑S, 6:∑PF, 7:DMEA, 8:MAX.D	R/W
40010	0009	V.SCL	Volt scale setting; range: 0000~0002 (0~2) 0:150V, 1:300V, 2:600V	R/W
40011	000A	A.SCL	Amp scale setting; range: 0000~0001 (0~1) 0:5A, 1:1A	R/W
40012	000B	BAUD	Baud rate setting; range: 0000~0003 (0~3) 0:19200, 1:9600, 2:4800, 3:2400	R/W
40013	000C	PARI	Parity setting; range: 0000~0003 (0~3), 0:N.8.2., 1:N.8.1., 2:EVEN, 3:ODD	R/W
40014	000D	DEMT	Demand time setting; range: 0001~003C (1~60)	R/W
40015	000E	HYS1	Alarm 1 hysteresis setting; range: 0000~0063 (0~99)	R/W
40016	000F	HYS2	Alarm 2 hysteresis setting; range: 0000~0063 (0~99)	R/W
40017	0010	DEL1	Alarm 1 act delay time setting; range: 0000~0063 (0~99)	R/W
40018	0011	DEL2	Alarm 2 act delay time setting; range: 0000~0063 (0~99)	R/W
40019	0012	SB1	Alarm 1 start band setting; range: FF9D~0063 (-99~99)	R/W
40020	0013	SB2	Alarm 2 start band setting; range: FF9D~0063 (-99~99)	R/W
40021	0014	SDT1	Alarm 1 start delay time setting; range: 0000~0063 (0~99)	R/W
40022	0015	SDT2	Alarm 2 start delay time setting; range: 0000~0063 (0~99)	R/W
40023	0016	ADDR	Address setting; range: 0000~00FF (0~255)	R/W
40024	0017	CODE	Pass code setting; range: 0000~4E1F (0~19999)	R/W
40025	0018	PTR	PT ratio setpoint setting; range: 0001~270F(1~9999)	R/W
40026	0019	CTR	CT ratio setpoint setting; range: 0001~270F(1~9999)	R/W
40027	001A	AL1	Alarm 1 setpoint setting; range: D8F1~270F (-9999~9999)	R/W
40028	001B	AL2	Alarm 2 setpoint setting; range: D8F1~270F (-9999~9999)	R/W
40029	001C	MAX VE	Max. 3 Phase average volt setting; range: 0000~3A98 (0~15000)	R/W
40030	001D	MAX AE	Max. 3 Phase average amp setting; range: 0000~411A (0~16666)	R/W
40031	001E	MAX AN	Max. 3 Phase average amp of neutral setting; range: 0000~411A (0~16666)	R/W
40032	001F	MAX W	Max. 3 Phase equivalent watt setting; range: 8AD0~7530 (-30000~30000)	R/W
40033	0020	MAX Q	Max. 3 Phase equivalent var setting; range: 8AD0~7530 (-30000~30000)	R/W

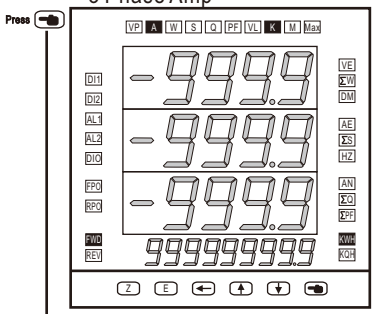
Modbus	HEX	Name	Descriptions	Act
40034	0021	MAX S	Max. 3 Phase equivalent apparent power setting; range: 0000~7530 (0~30000)	R/W
40035	0022	MAX PF	Max. 3 Phase equivalent power factor setting; range: D8F0~2710 (-10000~10000)	R/W
40036	0023	MAX Hz	Max. frequency setting; range: 0000~0460 (0~1120)	R/W
40037	0024	MAX DEM	Max. demand setting; range: 0000~7530 (0~30000)	R/W
40038	0025	FWD KWH	Forward kilo watt-hour setting; range: 00000000~FFFFFFFF (0~4294967295) Hi Bit	R/W
40039	0026		Forward kilo watt-hour setting; range: 00000000~FFFFFFFF (0~4294967295) Low Bit	R/W
40040	0027	REV KWH	Reverse kilo watt-hour setting; range: 00000000~FFFFFFFF (0~4294967295) Hi Bit	R/W
40041	0028		Reverse kilo watt-hour setting; range: 00000000~FFFFFFFF (0~4294967295) Low Bit	R/W
40042	0029	FWD KQH	Forward kilo var-hour setting; range: 00000000~FFFFFFFF (0~4294967295) Hi Bit	R/W
40043	002A		Forward kilo var-hour setting; range: 00000000~FFFFFFFF (0~4294967295) Low Bit	R/W
40044	002B	REV KQH	Reverse kilo var-hour setting; range: 00000000~FFFFFFFF (0~4294967295) Hi Bit	R/W
40045	002C		Reverse kilo var-hour setting; range: 00000000~FFFFFFFF (0~4294967295) Low Bit	R/W
40046	002D	R A	R phase amp display; range: 0000~411A (0~16666)	R
40047	002E	S A	S phase amp display; range: 0000~411A (0~16666)	R
40048	002F	T A	T phase amp display; range: 0000~411A (0~16666)	R
40049	0030	R VP	R phase phase-volt display; range: 0000~3A98 (0~15000)	R
40050	0031	S VP	S phase phase-volt display; range: 0000~3A98 (0~15000)	R
40051	0032	T VP	T phase phase-volt display; range: 0000~3A98 (0~15000)	R
40052	0033	R VL	R phase line-volt display; range: 0000~657C (0~25980)	R
40053	0034	S VL	S phase line-volt display; range: 0000~657C (0~25980)	R
40054	0035	T VL	T phase line-volt display; range: 0000~657C (0~25980)	R
40055	0036	R W	R phase watt display; range: D8F0~270F (-10000~10000)	R
40056	0037	S W	S phase watt display; range: D8F0~270F (-10000~10000)	R
40057	0038	T W	T phase watt display; range: D8F0~270F (-10000~10000)	R
40058	0039	R Q	R phase var display; range: D8F0~270F (-10000~10000)	R
40059	003A	S Q	S phase var display; range: D8F0~270F (-10000~10000)	R
40060	003B	T Q	T phase var display; range: D8F0~270F (-10000~10000)	R
40061	003C	R S	R phase apparent power display; range: 0000~270F (0~10000)	R
40062	003D	S S	S phase apparent power display; range: 0000~270F (0~10000)	R
40063	003E	T S	T phase apparent power display; range: 0000~270F (0~10000)	R
40064	003F	R PF	R phase power factor display; range: D8F0~270F (-10000~10000)	R
40065	0040	S PF	S phase power factor display; range: D8F0~270F (-10000~10000)	R
40066	0041	T PF	T phase power factor display; range: D8F0~270F (-10000~10000)	R
40067	0042	AVG V	3 phase average volt amp display; range: 0000~657C (0~25980)	R
40068	0043	AVG A	3 phase average amp display; range: 0000~411A (0~16666)	R
40069	0044	AVG AN	Amp of neutral display; range: 0000~411A (0~16666)	R
40070	0045	∑W	3 phase equivalent watt display; range: 8AD0~7530 (-30000~30000)	R
40071	0046	∑Q	3 phase equivalent var display; range: 8AD0~7530 (-30000~30000)	R
40072	0047	∑S	3 phase equivalent apparent power display; range: 0000~7530 (0~30000)	R
40073	0048	∑PF	3 phase equivalent power factor display; range: D8F0~270F (-10000~10000)	R
40074	0049	HZ	Frequency display; range: 0~460 (0~1120)	R
40075	004A	DEMAND	Demand display; range: 0~7530 (0~30000)	R

DISPLAY SWITCHING INDICATION

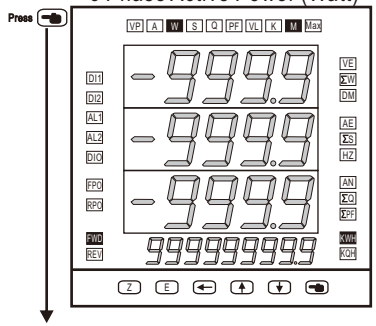
● 3 Phase Phase-Volt



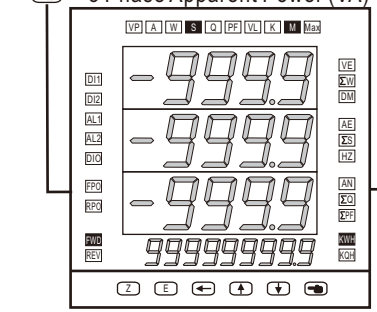
● 3 Phase Amp



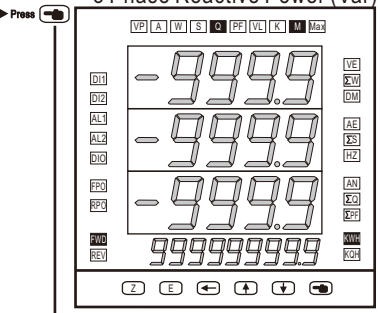
● 3 Phase Active Power (Watt)



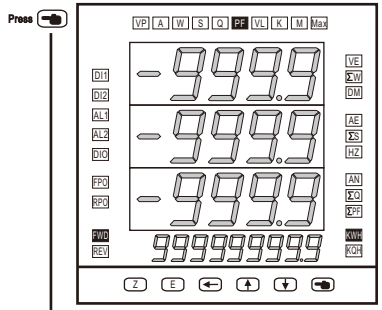
● 3 Phase Apparent Power (VA)



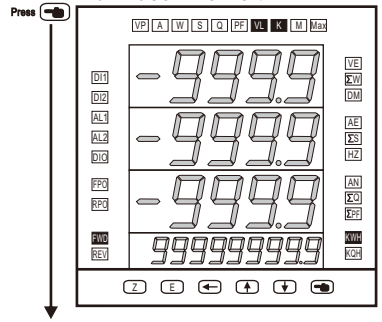
● 3 Phase Reactive Power (Var)



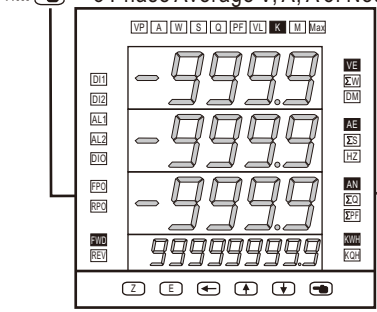
● 3 Phase Power Factor



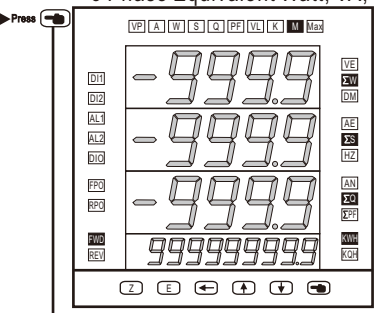
● 3 Phase Line-Volt



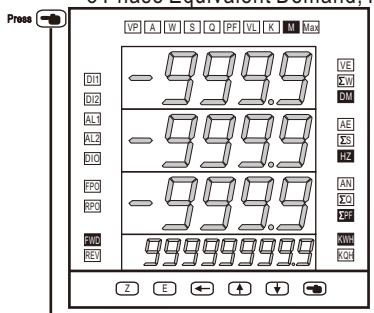
● 3 Phase Average V, A, A of Neutral



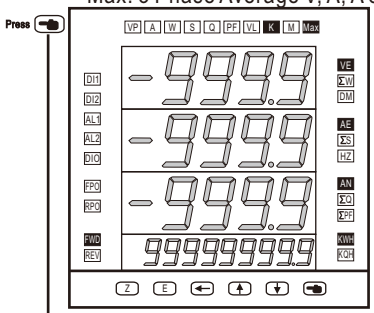
● 3 Phase Equivalent Watt, VA, Var



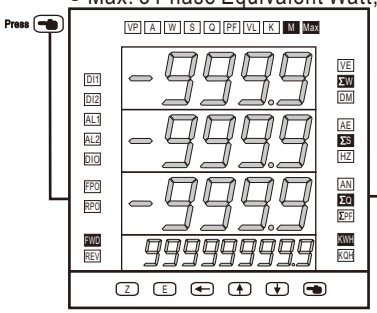
● 3 Phase Equivalent Demand, Hz, PF



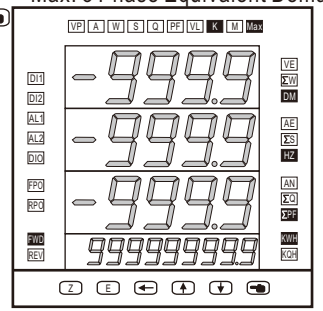
● Max. 3 Phase Average V, A, A of Neutral



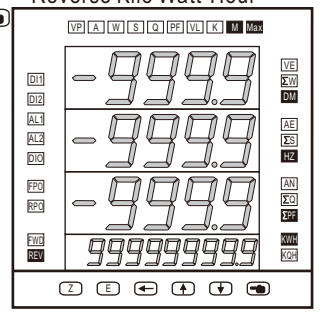
● Max. 3 Phase Equivalent Watt, VA, Var



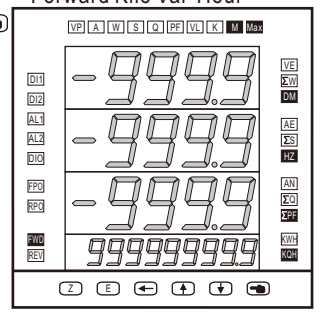
● Max. 3 Phase Equivalent Demand, Hz, PF



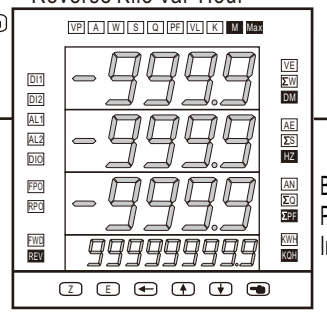
● Reverse Kilo Watt-Hour



● Forward Kilo Var-Hour



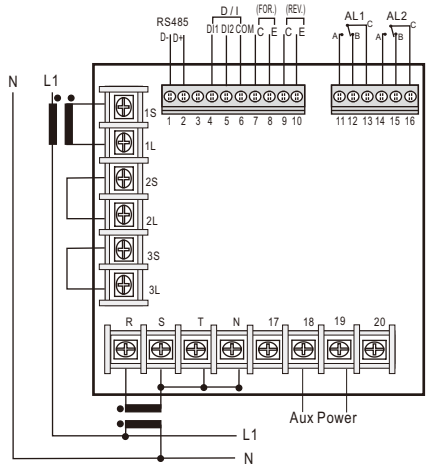
● Reverse Kilo Var-Hour



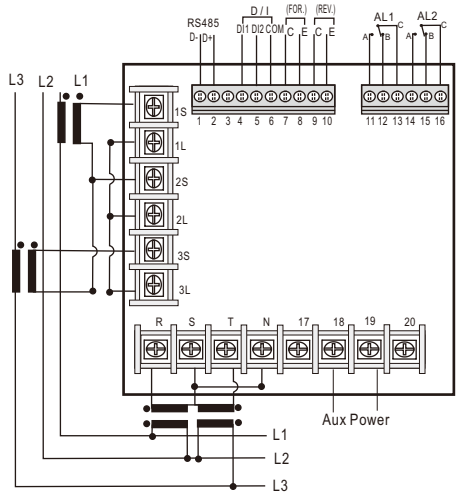
Back to 3 phase Phase-Volt Indication

WIRING CONNECTION

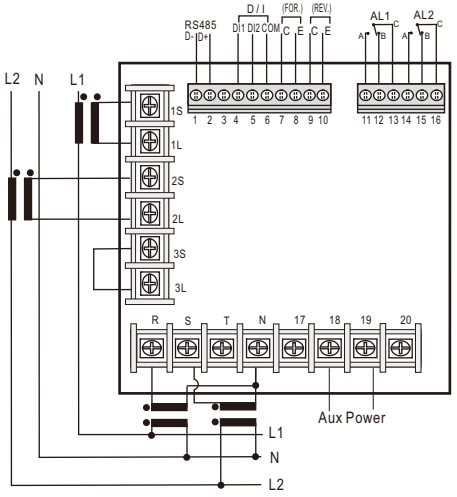
● 1φ2 W



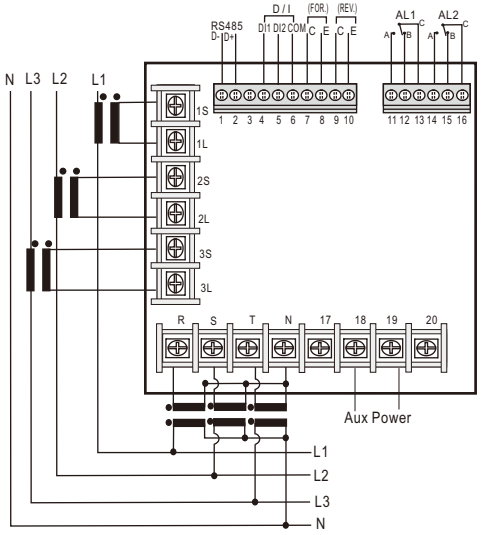
● 3φ3 W



● 1φ3 W



● 3φ4 W



K Factors for Bit Conversion

Parameter	K Factor	Parameter	K Factor
Phase Volt	600V: 0.04 300V: 0.02 150V: 0.01	Phase Amp	5A: 0.0003 1A: 0.00006
Frequency (Hz)	0.0625	Power Factor (PF)	0.0001
Phase Watt (W)	600 V / 5 A = 2000 W: 0.2 300 V / 5 A = 1000 W: 0.1 150 V / 5 A = 500 W: 0.05		600 V / 1 A = 400 W: 0.04 300 V / 1 A = 200 W: 0.02 150 V / 1 A = 100 W: 0.01
Equivalent Watt (ΣW)	600 V / 5 A = 6000 W: 0.4 300 V / 5A = 3000 W: 0.2 150 V / 5A = 1500 W: 0.1		600 V / 1 A = 1200 Var: 0.08 300 V / 1 A = 600 Var: 0.04 150 V / 1 A = 300 Var: 0.02
Phase Var (Q)	600 V / 5 A = 2000 Var: 0.2 300 V / 5 A = 1000 Var: 0.1 150 V / 5 A = 500 Var: 0.05		600 V / 1 A = 400 Var: 0.04 300 V / 1 A = 200 Var: 0.02 150 V / 1 A = 100 Var: 0.01
Equivalent Var (ΣQ)	600 V / 5 A = 6000 Var: 0.4 300 V / 5A = 3000 Var: 0.2 150 V / 5A = 1500 Var: 0.1		600 V / 1 A = 1200 Var: 0.08 300 V / 1 A = 600 Var: 0.04 150 V / 1 A = 300 Var: 0.02
Phase VA (S)	600 V / 5 A = 2000 VA: 0.2 300 V / 5 A = 1000 VA: 0.1 150 V / 5 A = 500 VA: 0.05		600 V / 1 A = 400 VA: 0.04 300 V / 1 A = 200 VA: 0.02 150 V / 1 A = 100 VA: 0.01
Equivalent VA (ΣS)	600 V / 5 A = 6000 VA: 0.4 300 V / 5A = 3000 VA: 0.2 150 V / 5A = 1500 VA: 0.1		600 V / 1 A = 1200 VA: 0.08 300 V / 1 A = 600 VA: 0.04 150 V / 1 A = 300 VA: 0.02
Forward KWH Reverse KWH	600 V / 5 A = 6000 W: 0.4 300 V / 5A = 3000 W: 0.2 150 V / 5A = 1500 W: 0.1		600 V / 1 A = 1200 W: 0.08 300 V / 1 A = 600 W: 0.04 150 V / 1 A = 300 W: 0.02
Forward KQH Reverse KQH	600 V / 5 A = 6000 Var: 0.4 300 V / 5A = 3000 Var: 0.2 150 V / 5A = 1500 Var: 0.1		600 V / 1 A = 1200 Var: 0.08 300 V / 1 A = 600 Var: 0.04 150 V / 1 A = 300 Var: 0.02
Forward KWH P/O Reverse KWH P/O	600 V / 5A = 6000 W: 0.4 1 KWH = 2500 pulse 300 V / 5A = 3000 W: 0.2 1 KWH = 5000 pulse 150 V / 5 A = 1500 W: 0.1 1 KWH = 10000 pulse		600 V / 1 A = 1200 W: 0.08 1 KWH = 12500 pulse 300 V / 1 A = 600 W: 0.04 1 KWH = 25000 pulse 150V / 1A = 300 W: 0.02 1 KWH = 50000 pulse