

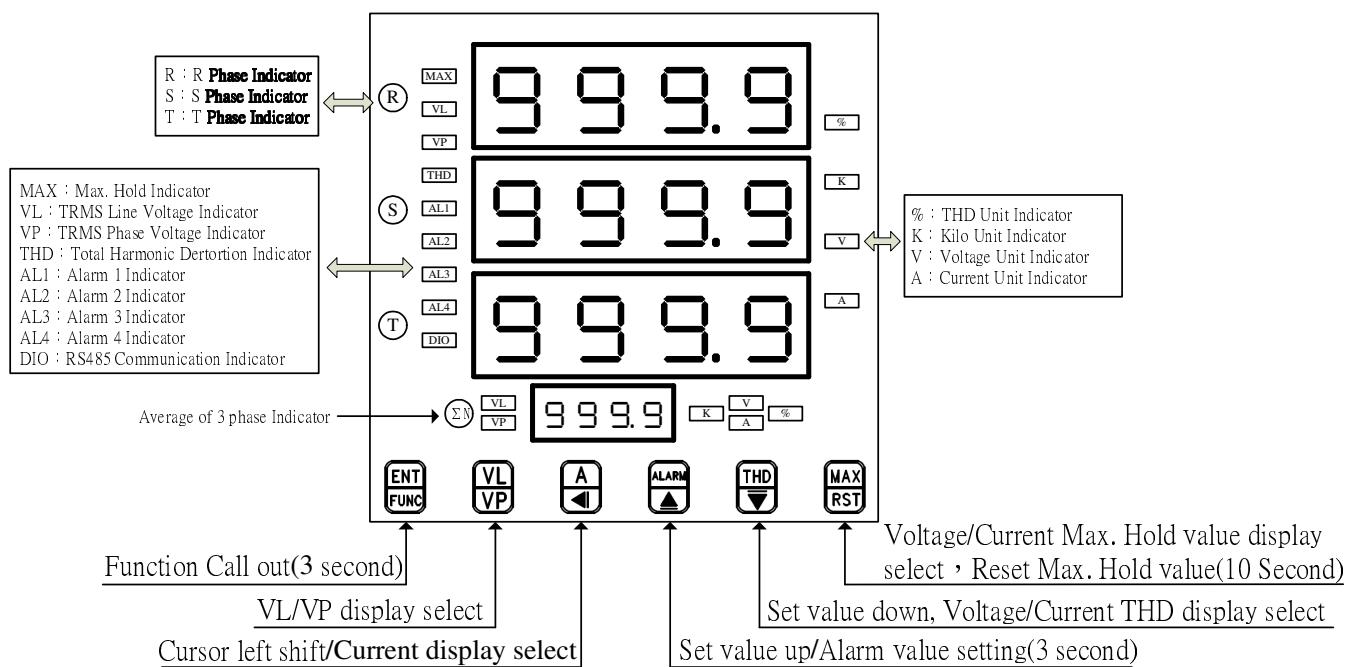
3 PHASE AC VOLTAGE/CURRENT METER

MMP-VI

■ Features

- ◎ Accuracy $\pm 0.15\%$ FS.
- ◎ Measuring ACV-line/ACV-phase/A
- ◎ Measuring ACV/ACA total harmonic distortion (THD), up to 31th harmonic
- ◎ CT rate can be modified (1~9999)
- ◎ PT rate can be modified (1.0~999.9)
- ◎ Four alarm control function (option)
- ◎ Digital RS-485 interface function (option)
- ◎ BAUD RATE:19200/9600/4800/2400
- ◎ Man-machine interface, easy to operate
- ◎ EEPROM saving, data safekeeping over 10 years
- ◎ Modified inside parameter must have pass code

■ Name Of Parts



■ Alarm Function Description

- ◎ When ACT=HI,DEL= 0 : Display value > Setting value(AL) + Hysteresis (HYS) → (Relay on)
Display value <= Setting value(AL) - Hysteresis (HYS) → (Relay off)
- ◎ When ACT=LO,DEL= 0 : Display value >= Setting value(AL) + Hysteresis (HYS) → (Relay off)
Display value < Setting value(AL) - Hysteresis (HYS) → (Relay on)
- ◎ When ACT=HI,DEL= 1 ~ 999 sec.: Display value > Setting value(AL) + Hysteresis (HYS) + Delay time(DEL) and then → (Relay on)
Display value <= Setting value(AL) - Hysteresis (HYS) → (Relay off)
- ◎ When ACT=LO,DEL= 1 ~ 999 sec.: Display value >= Setting value(AL) + Hysteresis (HYS) → (Relay off)
Display value < Setting value(AL) - Hysteresis (HYS) + Delay time(DEL) and then → (Relay on)
- ◎ When ACT=HI,DEL= -1 ~ -999 sec.: Display value > Setting value(AL) + Hysteresis (HYS) → (Relay one shoot(DEL) and then off)
Display value <= Setting value(AL) - Hysteresis (HYS) → (Relay restore normal after the procedure)
- ◎ When ACT=LO,DEL= -1 ~ -999 sec.: Display value >= Setting value(AL) + Hysteresis (HYS) → (Relay restore normal after the procedure)
Display value < Setting value(AL) - Hysteresis (HYS) → (Relay one shoot(DEL) and then off)

Key Introduce	Operation Manual
ENT/FUNC Key Function	1. In normal display, The key function is call out setting group. (press 3 sec.) 2. In parameter setting page, The key function is data enter , and goto next page
VL/VP Key Function	1. In normal display, The key function is select VP/VL display mode PS. 3φ 3L: VL=VP, 3φ 4L: VL= $\sqrt{3} * VP$
A/◀ Key Function	1. In normal display, The key function is select A display mode 2. Into parameter setting page, the parameter mark& data is alternate display, If need modify data can press shift key into setting procedure, The display is lock parameter data, this time must let off key about 0.2 sec, press again, the cursor(twinkle express)is cycle moving left/right. (Key Response about 0.2 sec)

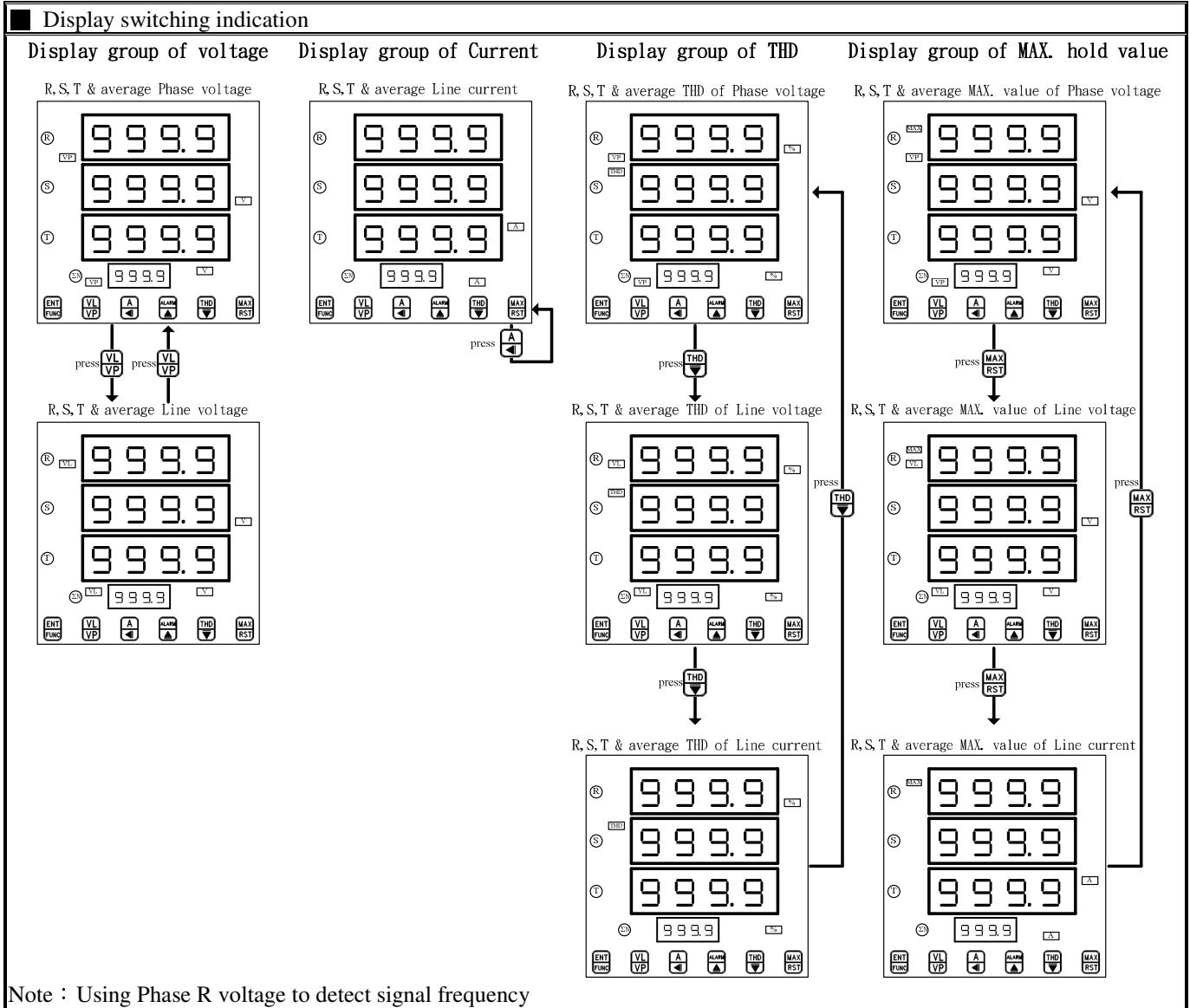
ALARM/  Key Function	1. In normal display, The key function is call out alarm value setting page.(press 3 sec.) 2. Into parameter setting page, the parameter mark& data is alternate display, If need modify data can press up key into setting procedure, The display is lock parameter data, this time must let off key about 0.2 sec, press again, the parameter data will increment. (Key Response about 0.2 sec)
THD/  Key Function	1. In normal display, The key function is select VP/VL/A total harmonic distortion(THD) display mode 2. Into parameter setting page, the parameter mark& data is alternate display, If need modify data can press down key into setting procedure. The display is lock parameter data, this time must let off key about 0.2 sec, press again the parameter data will decrement. (Key Response about 0.2 sec)
MAX/RST Key Function	1. In normal display, The key function is select VP/VL/A MAX. value display mode 2. In normal display, Press MAX/RST key more than 10S, Clear all MAX. value
 &  Key Function	In setting group or setting page, Press  &  key will return normal display, but if in setting page the modify data will lost
No Key in anything	In setting group or setting page, No key in anything about 2 min. will return normal display

■ Inside parameter operate procedure

Step	Parameter Mark Description	Parameter Mark	Operation Manual
1	Normal display	1 2 3 4	Press  /FUNC key into P.COD setting page
2	P.COD(Pass code input page) Default=0	P. C o d 0 0 0 0	1. Key in 4 digit pass code with  &  &  key 2. Press  key, the pass code is right into setting group , otherwise return normal display
3	SYS(System setting group)	S Y S	1. Select setting group with  key 2. Press  key into setting page of selection setting group
	ROP(Alarm setting group)	r o P	
	DOP(Communication setting group)	d o P	
	DSP(Display value adjust)	d S P	
4	SYS(System setting group)	S Y S	Press  key select setting group and Press  into setting group
4-1	NET(NET) Default=3φ4L	n E t 3 P 4 L	1. Decide NET with  &  key(3φ3L,3φ4L) 2. Press  key enter data and into CT rate setting page
4-2	CT.R(CT Rate) Default=1	C t. r 1	1. Decide CT rate with  &  &  key (1~9999) 2. Press  key enter data and into PT rate setting page
4-3	PT.R(PT Rate) Default=1.0	P t. r 1.0	1. Decide PT rate with  &  &  key (1.0~999.9) 2. Press  key enter data and into Σ N. S setting page
4-4	Σ N. S(Σ N Select) Default=Σ A	Σ n. S Σ A	1. Decide Σ N. S with  &  key(Σ VP or Σ VL or Σ A) 2. Press  key enter data and into CODE setting page
4-5	CODE(Code) Default=0	C o d E 0 0 0 0	1. Decide Pass code with  &  &  key (0~9999) 2. Press  key enter data and into LOCK setting page
4-6	LOCK(Panel Lock) Default=NO	L o C H n o	1. Decide panel lock with  &  key (NO or YES) 2. Press  key enter data and return SYS setting group
4-7	SYS(System setting group)	S Y S	Press  key select setting group and Press  into setting group
5	ROP(Alarm setting group)	r o P	Press  key decide ROP setting group, press  key into AL1.S setting page
5-1	AL1.S (Alarm 1 Select) Default=R-A	R L 1. S r - A	1. Decide AL1.S with  &  key (R-VP or R-VL or R-A or MAX.-VP or MAX.-VL or MAX.-A) 2. Press  key into AL2.S setting page
5-2	AL2.S (Alarm 2 Select) Default=S-A	R L 2. S S - A	1. Decide AL2.S with  &  key (S-VP or S-VL or S-A or MAX.-VP or MAX.-VL or MAX.-A) 2. Press  key into AL3.S setting page
5-3	AL3.S (Alarm 3 Select) Default=T-A	R L 3. S t - A	1. Decide AL3.S with  &  key (T-VP or T-VL or T-A or MAX.-VP or MAX.-VL or MAX.-A) 2. Press  key into AL4.S setting page
5-3	AL4.S (Alarm 4 Select) Default=Σ A	R L 4. S Σ - A	1. Decide AL3.S with  &  key(Σ VP or Σ VL or Σ A) 2. Press  key into ACT1 setting page
5-4	ACT1(Active 1) Default=HI	R C E 1 H 1	1. Decide ACT1 with  &  key (HI or LO) 2. Press  key into ACT2 setting page
5-5	ACT2(Active 2) Default=HI	R C E 2 H 1	1. Decide ACT2 with  &  key (HI or LO) 2. Press  key into ACT3 setting page

5-6	ACT3(Active 3) Default=HI	R C E 3 H I	1. Decide ACT3 with Δ & ∇ key (HI or LO) 2. Press \textcircled{N} key into ACT4 setting page
5-6	ACT4(Active 4) Default=HI	R C E 4 H I	1. Decide ACT4 with Δ & ∇ key (HI or LO) 2. Press \textcircled{N} key into HYS1 setting page
5-7	HYS1(Hysteresis 1) Default=0	H Y S 1 0 0 0 0	1. Decide HYS1 with Δ & Δ & ∇ key (0~999) 2. Press \textcircled{N} key into HYS2 setting page
5-8	HYS2(Hysteresis 2) Default=0	H Y S 2 0 0 0 0	1. Decide HYS2 with Δ & Δ & ∇ key (0~999) 2. Press \textcircled{N} key into HYS3 setting page
5-9	HYS3(Hysteresis 3) Default=0	H Y S 3 0 0 0 0	1. Decide HYS3 with Δ & Δ & ∇ key (0~999) 2. Press \textcircled{N} key into HYS4 setting page
5-10	HYS4(Hysteresis 4) Default=0	H Y S 4 0 0 0 0	1. Decide HYS4 with Δ & Δ & ∇ key (0~999) 2. Press \textcircled{N} key into DEL1 setting page
5-11	DEL1(Delay 1) Default=0	d E L 1 0 0 0 0	1. Decide DEL1 with Δ & Δ & ∇ key (0~±999S) 2. Press \textcircled{N} key into DEL2 setting page Note:-1~-999 is active time setting,0~999 is delay time setting
5-12	DEL2(Delay 2) Default=0	d E L 2 0 0 0 0	1. Decide DEL2 with Δ & Δ & ∇ key (0~±999S) 2. Press \textcircled{N} key into DEL3 setting page Note:-1~-999 is active time setting,0~999 is delay time setting
5-13	DEL3(Delay 3) Default=0	d E L 3 0 0 0 0	1. Decide DEL3 with Δ & Δ & ∇ key (0~±999S) 2. Press \textcircled{N} key into DEL4 setting page Note:-1~-999 is active time setting,0~999 is delay time setting
5-14	DEL4(Delay 4) Default=0	d E L 4 0 0 0 0	1. Decide DEL4 with Δ & Δ & ∇ key (0~±999S) 2. Press \textcircled{N} key into SDT setting page Note:-1~-999 is active time setting,0~999 is delay time setting
5-15	SDT(Start Delay Time) Default=0	S d E 0 0 0 0	1. Decide SDT with Δ & Δ & ∇ key (0~±99S) 2. Press \textcircled{N} key enter data and return ROP setting group Note:while ALx \geq SB, into alarm mode; otherwise disable alarm mode
5-16	ROP(Alarm setting group)	r o P	Press \textcircled{N} key select setting group and Press \textcircled{N} into setting group
6	DOP(Communication setting group)	d o P	Press \textcircled{N} key decide DOP setting group, press \textcircled{N} key into ADDR setting page
6-1	ADDR(Communication Address)Default=0	R d d r 0 0 0 0	1. Decide ADDR with Δ & Δ & ∇ key (0~255) 2. Press \textcircled{N} key enter data and into BAUD setting page
6-2	BAUD(Communication Baud Rate) Default=19200	b R U d 1 9 2 0 0	1. Decide BAUD with Δ & ∇ key (19200,9600,4800,2400) 2. Press \textcircled{N} key enter data and into PARI setting page
6-3	PARI(Communication Parity Check) Default=n.8.2.	P R r i n . 8 . 2 .	1. Decide PARI with Δ & ∇ key (n.8.2,n.8.1,even,odd) 2. Press \textcircled{N} key enter data and return DOP setting group
6-4	DOP(Communication setting group)	d o P	Press \textcircled{N} key select setting group and Press \textcircled{N} into setting group
7	DSP(Display value adjust)	d S P	Press \textcircled{N} key decide DSP setting group, Press \textcircled{N} key into R.V.P setting page
7-1	R.V.P(R Phase Voltage Adjust) Default=0	r u P 0 0 0 0	1. Input Max. voltage to phase R ,Adjustment display span with Δ & ∇ key 2. Press \textcircled{N} key enter data and into S.V.P setting page
7-2	S.V.P(S Phase Voltage Adjust)Default=0	S u P 0 0 0 0	1. Input Max. voltage to phase S ,Adjustment display span with Δ & ∇ key 2. Press \textcircled{N} key enter data and into T.V.P setting page
7-3	T.V.P(T Phase Voltage Adjust)Default=0	E u P 0 0 0 0	1. Input Max. voltage to phase T ,Adjustment display span with Δ & ∇ key 2. Press \textcircled{N} key enter data and into R.A setting page
7-4	R.A(R Phase Current Adjust)Default=0	r R 0 0 0 0	1. Input Max. current to phase R ,Adjustment display span with Δ & ∇ key 2. Press \textcircled{N} key enter data and into S.A setting page
7-5	S.A(S Phase Current Adjust)Default=0	S R 0 0 0 0	1. Input Max. current to phase S ,Adjustment display span with Δ & ∇ key 2. Press \textcircled{N} key enter data and into T.A setting pag

7-6	T.A(T Phase Current Adjust)Default=0	上键	1. Input Max. current to phase T ,Adjustment display span with Δ & ∇ key 2. Press ENT key enter data and return DSP setting group.
		下键	
Step	Parameter mark description	Parameter mark	Operation manual
8	Normal display	1 2 3 4	Press ALARM/ Δ about 3 sec, into AL1setting page
8-1	AL1 (Alarm value 1 setting page)Default=300.0	A L 1	1. Decide AL1 with Δ & ∇ key(0~9999) 2. Press ENT key enter data and into AL2 setting page
		3 0 0.0	
8-2	AL2 (Alarm value 2 setting page)Default=300.0	A L 2	1. Decide AL2 with Δ & ∇ key(0~9999) 2. Press ENT key enter data and into AL3 setting page
		3 0 0.0	
8-3	AL3(Alarm value 3 setting page)Default=300.0	A L 3	1. Decide AL3 with Δ & ∇ key(0~9999) 2. Press ENT key enter data and into AL4 setting page
		3 0 0.0	
8-4	AL4(Alarm value 4 setting page)Default=300.0	A L 4	1. Decide AL4 with Δ & ∇ key(0~9999) 2. Press ENT key return normal display.
		3 0 0.0	
Appendix	Error Mark Description	Error Mark	Analyze & Description
1	Display over error detect	d o F L	Display over range (9999)
2	EEPROM error detect	E - 0 0	1. External interference when EEPROM read/write 2. EEPROM write over 10 million times(guarantee 10 years)
		—	Please power reset, if still display E-00,doing following step: 1. E-00 & No alternate display for inquire reset EEPROM 2. Decide Yes with Δ & ∇ key, press ENT key return normal display 3. EEPROM was reset, Please follow step 1~8 set again
3	EEPROM error detect	E E 5	



Note1. DEL:

Active time setting:

Alarm signal active time while alarm generate

Delay time setting:

Alarm signal delay time while alarm generate

2.Relation with CT & max. display value, LCUT value, SB value & THD calculate start

CT.r	MAX. disp	LCUT Value	SB Value	THD calculate start
x 1	0.000~5.000A	0.02A	0.025A	0.5A
x 2~10	0.00~50.00A	CT.r*0.02A	0.25A	5A
x 11~100	0.0~500.0A	CT.r*0.02A	2.5A	50A
x 101~1000	0.000~5.000KA	CT.r*0.02A	0.025KA	0.5KA
x 1001~9999	0.00KA~50.00KA	CT.r*0.02A	0.25KA	5KA

3. Relation with PT & max. display value, LCUT value, SB value & THD calculate start

PT.r	MAX. disp	LCUT Value	SB Value	THD calculate start
x 1.0	0.0~500.0V	3V	0V	50V
x 1.1~10.0	0.000~5.000KV	PT.r*3V	0KV	0.5KV
x 10.1~100.0	0.00~50.00KV	PT.r*3V	0KV	5KV
x 100.1~999.9	0.0KV~500.0KV	PT.r*3V	0KV	50KV

4. LCUT(low value cut out):while display value \leq LCUT value, display value = 0

SB(start band): while ALx \geq SB, into alarm mode

MMP-VI Modbus RTU Mode Protocol Address Map

Data format 16Bit, sign Bit 0000~2710(0~10000)

Address	Name	Description	Accept
0000	ID	Judge type code MMP-VI 為 00	R
0001	STATUS	STATUS, range 0000~000F(0~15)(0:OFF,1:ON) (Bit0:AL1, Bit1:AL2, Bit2:AL3, Bit3:AL4)	R
0002	DISP-MODE	Display mode,range 0000~0008(0~8) (0:VP, 1:VL, 2:A, 3:THD_VP, 4:THD_VL, 5:THD_A, 6:MAX.VP, 7:MAX.VL, 8:MAX.A)	R/W
0003	ACT1	Active 1,Input Range 0000~0001(0~1)(0:HI,1:LO)	R/W
0004	ACT2	Active 2,Input Range 0000~0001 (0~1)(0:HI,1:LO)	R/W
0005	ACT3	Active 3,Input Range 0000~0001 (0~1)(0:HI,1:LO)	R/W
0006	ACT4	Active 4,Input Range 0000~0001 (0~1)(0:HI,1:LO)	R/W
0007	AL1.S	Alarm 1 Select,Input Range 0000~0005(0~5) (0:R-VP, 1:R-VL, 2:R-A, 3:MAX. VP, 4: MAX.VL, 5: MAX.A)	R/W
0008	AL2.S	Alarm 2 Select,Input Range 0000~0005(0~5) (0:S-VP, 1:S-VL, 2:S-A, 3:MAX. VP, 4: MAX.VL, 5: MAX.A)	R/W
0009	AL3.S	Alarm 3 Select,Input Range 0000~0005(0~5) (0:T-VP, 1:T-VL, 2:T-A, 3:MAX. VP, 4: MAX.VL, 5: MAX.A)	R/W
000A	AL4.S	Alarm 4 Select,Input Range 0000~0002(0~2) (0: Σ -VP, 1: Σ -VL, 2: Σ -A)	R/W
000B	NET	NET, range 0000~0001(0~1),(0:3 φ 3L,1:3 φ 4L)	R/W
000C	Σ N.S	Σ N Select, Input Range 0000~0002(0~2) (0: Σ -VP, 1: Σ -VL, 2: Σ -A)	R/W
000D	LOCK	Panel Lock,Input Range 0000~0001(0~1),(0:NO,1:YES)	R/W
000E	BAUD	Communication Baud Rate,Input Range 0000~0003(0~3),0:19K2,1:9600,2:4800,3:2400	R/W
000F	PARI	Communication Parity Check,Input Range 0000~0003(0~3) 0:N.8.2., 1:N.8.1., 2: EVEN, 3: ODD	R/W
0010	ADDR	Communication Address,Input Range 0000~00FF(0~255)	R/W
0011	HYS1	Hysteresis 1,Input Range 0000~03E7 (0~999)	R/W
0012	HYS2	Hysteresis 2,Input Range 0000~03E7 (0~999)	R/W
0013	HYS3	Hysteresis 3,Input Range 0000~03E7 (0~999)	R/W
0014	HYS4	Hysteresis 4,Input Range 0000~03E7 (0~999)	R/W
0015	DEL1	Delay 1,Input Range FC19~03E7(-999~999)	R/W
0016	DEL2	Delay 2,Input Range FC19~03E7(-999~999)	R/W
0017	DEL3	Delay 3,Input Range FC19~03E7(-999~999)	R/W
0018	DEL4	Delay 4,Input Range FC19~03E7(-999~999)	R/W
0019	SDT	Start Delay Time,Input Range 0000~0063(0~99)	R/W
001A	CT.R	CT Rate, Input Range 0001~270F(1~9999)	R/W
001B	PT.R	PT Rate, Input Range 000A~270F(10~9999)	R/W
001C	CODE	Pass Code Setting,Input Range 0000~270F(0~9999)	R/W
001D	AL1	Alarm value 1, Input Range 0000~270F(0~9999)	R/W
001E	AL2	Alarm value 2, Input Range 0000~270F(0~9999)	R/W
001F	AL3	Alarm value 3, Input Range 0000~270F(0~9999)	R/W
0020	AL4	Alarm value 4, Input Range 0000~270F(0~9999)	R/W
0021	DISP-RVP	R Phase, Phase Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0022	DISP-SVP	S Phase, Phase Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0023	DISP-TVP	T Phase, Phase Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0024	DISP- Σ VP	Average of Phase Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0025	DISP-RVL	R Phase, Line Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0026	DISP-SVL	S Phase, Line Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0027	DISP-TVL	T Phase, Line Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0028	DISP- Σ VL	Average of Line Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0029	DISP-RA	R Phase, Line Current, Input Range 0000~2710(0~10000) ⁽¹⁾	R
002A	DISP-SA	S Phase, Line Current, Input Range 0000~2710(0~10000) ⁽¹⁾	R
002B	DISP-TA	T Phase, Line Current, Input Range 0000~2710(0~10000) ⁽¹⁾	R
002C	DISP- Σ A	Average of Line Current, Input Range 0000~2710(0~10000) ⁽¹⁾	R

002D	THD(DISP-RVP)	R Phase, THD of Phase Voltage, Input Range 0000~3E8(0~1000)	R
002E	THD(DISP-SVP)	S Phase, THD of Phase Voltage, Input Range 0000~3E8(0~1000)	R
002F	THD(DISP-TVP)	T Phase, THD of Phase Voltage, Input Range 0000~3E8(0~1000)	R
0030	THD(DISP- Σ VP)	Average THD of Phase Voltage, Input Range 0000~3E8(0~1000)	R
0031	THD(DISP-RVL)	R Phase, THD of Line Voltage, Input Range 0000~3E8(0~1000)	R
0032	THD(DISP-SVL)	S Phase, THD of Line Voltage, Input Range 0000~3E8(0~1000)	R
0033	THD(DISP-TVL)	T Phase, THD of Line Voltage, Input Range 0000~3E8(0~1000)	R
0034	THD(DISP- Σ VL)	Average THD of Line Voltage, Input Range 0000~3E8(0~1000)	R
0035	THD(DISP-RA)	R Phase, THD of Line Current, Input Range 0000~3E8(0~1000)	R
0036	THD(DISP-SA)	S Phase, THD of Line Current, Input Range 0000~3E8(0~1000)	R
0037	THD(DISP-TA)	T Phase, THD of Line Current, Input Range 0000~3E8(0~1000)	R
0038	THD(DISP- Σ A)	Average THD of Line Current, Input Range 0000~3E8(0~1000)	R
0039	MAX(DISP-RVP)	R Phase, Max. value of Phase Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
003A	MAX(DISP-SVP)	S Phase, Max. value of Phase Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
003B	MAX(DISP-TVP)	T Phase, Max. value of Phase Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
003C	MAX(DISP- Σ VP)	Average Max. value of Phase Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
003D	MAX(DISP-RVL)	R Phase, Max. value of Line Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
003E	MAX(DISP-SVL)	S Phase, Max. value of Line Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
003F	MAX(DISP-TVL)	T Phase, Max. value of Line Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0040	MAX(DISP- Σ VL)	Average Max. value of Line Voltage, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0041	MAX(DISP-RA)	R Phase, Max. value of Line Current, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0042	MAX(DISP-SA)	S Phase, Max. value of Line Current, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0043	MAX(DISP-TA)	T Phase, Max. value of Line Current, Input Range 0000~2710(0~10000) ⁽¹⁾	R
0044	MAX(DISP- Σ A)	Average Max. value of Line Current, Input Range 0000~2710(0~10000) ⁽¹⁾	R

注(1):MODBUS range 0~2710(0~10000),display of MMP-VI range 0~270F(0~9999); while MODBUS response 0x2710, that mean MMP-VI show DOFL.