

3 INPUT DC MULTIFUNCTION POWER METER with 2 ALARMS / RS-485

GPVA

FEATURES

- Measuring DC power parameters: V, A, W, KWH
- 3 input DC Volt / Current available
- Display range: -19999~99999; decimal point selectable
- 2 Alarms output / 2 Pulses output for 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: GPVA- [Code 1] [Code 2] - [Code 3] - [Code 4] [Code 5] [Code 6]

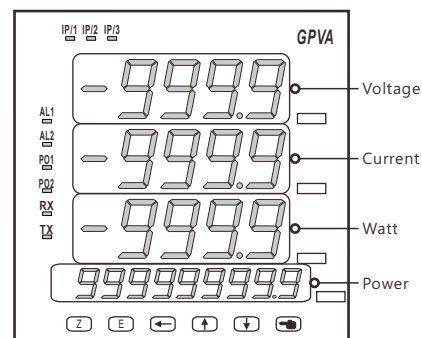
Code 1	Input Volt	Code 2	Input Amp	Code 3	Aux. Power	Code 4	Alarm Output	Code 5	Pulse Output	Code 6	RS-485
1	0~150V	1	0~50mV	A	AC/DC 100~240V	N	None	N	None	N	None
2	0~300V	2	0~10V	D	AC/DC 22~60V	R2	2 Relays	Y	Yes	Y	Yes
3	0~600V										
0	Option	0	Option								

SPECIFICATION

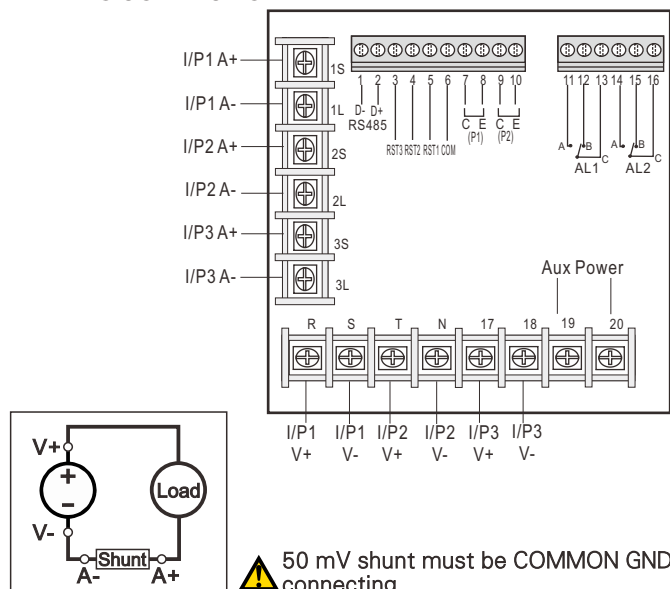
- ◆ Accuracy:
 - ±0.1% for DCV
 - ±0.1% for DCA
 - ±0.1% for DCKWH
- ◆ Display Screen:
 - High brightness LED; 14.22mm (0.56")
 - High brightness LED; 10.2mm (0.4")
- ◆ Sampling Time: 1 cycle / sec
- ◆ Display Range:
 - 9999~9999
 - 0~999999999 for KWH & KQH
- ◆ Parameters Setting: Push buttons
- ◆ Back 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 / °C (0~60°C)
- ◆ Operating Temperature: 0~60°C
- ◆ Operating Humidity: 20~90% RH (non-condensing)
- ◆ Storage Temperature: -10~70°C
- ◆ Storage Humidity: 20~90% RH (non-condensing)
- ◆ Power Supply: AC/DC 100~240V; AC/DC 22~60V
- ◆ Power Consumption: 10VA (all functions output)
- ◆ Surge Test:
 - 1KVac / 1min (Input / Power)
 - 3KVac / 1min (Terminals / Case)
- ◆ Insulation Resistance: >100MΩ with 500Vdc
- ◆ Input Impedence:
 - Voltage: >2V for 20KΩ / V; ≤2V for >200MΩ
 - Current: ≥0.2A at 100mV; <0.2A at 1V

FRONT PANEL & KEY FUNCTIONS

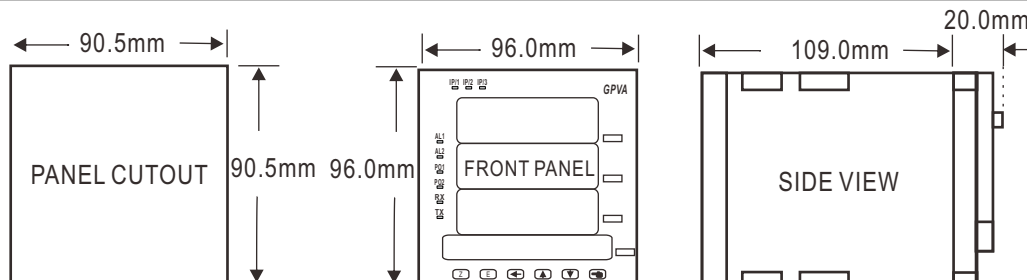
- IP/1: Input 1 Indicator
 - IP/2: Input 2 Indicator
 - IP/3: Input 3 Indicator
 - AL1: Alarm 1 Indicator
 - AL2: Alarm 2 Indicator
 - PO1: Pulse 1 Output Indicator
 - PO2: Pulse 2 Output Indicator
 - RX: RX Indicator
 - TX: TX Indicator
- [Z] Reset Key
 - [E] Enter Key
 - [←] Shift Key/Alarm Setting Key
 - [↑] Up Key
 - [↓] Down Key
 - [⏻] Page Key



WIRING CONNECTION



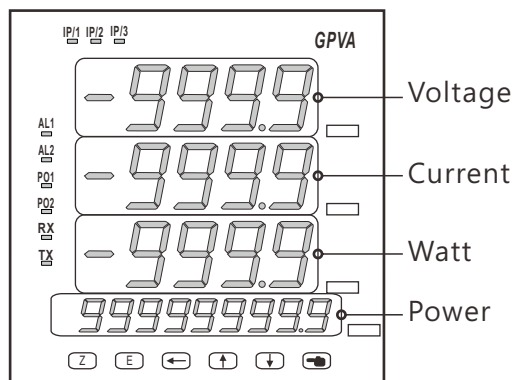
DIMENSION



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

FRONT PANEL & KEY FUNCTIONS

IP/1: Input 1 Indicator
IP/2: Input 2 Indicator
IP/3: Input 3 Indicator
AL1: Alarm 1 Indicator
AL2: Alarm 2 Indicator
PO1: Pulse 1 Output Indicator
PO2: Pulse 2 Output Indicator
RX: RX Indicator
TX: TX Indicator



Key Name	Symbol	Descriptions
Reset Key		1. Press this key to enable the reset function for KWH value.
Enter Key		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.
Page 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 , and press 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

Block Charts	Display	Descriptions	Default
		Alarm Setpoint	
Measuring Status	10000	Present value for measurement	
Alarm 1 Setpoint (AL1)	AL 1	Press to modify alarm 1 setpoint.	00000
Alarm 2 Setpoint (AL2)	AL 2	Press to modify alarm 2 setpoint.	00000

DISPLAY VALUE ADJUSTING PROCEDURES

Block Charts	Name	Descriptions	Default
	Measuring Status	Present value for measurement	
	Display Value of Zero Voltage Adjustment	Adjust the zero voltage display value. Note, shift the setting digit to speed up the adjustment.	00000
	Display Value of Span Voltage Adjustment	Adjust the span voltage display value. Note, shift the setting digit to speed up the adjustment.	00000
	Display Value of Zero Current Adjustment	Adjust the zero current display value. Note, shift the setting digit to speed up the adjustment.	00000
	Display Value of Span Current adjustment	Adjust the span current display value. Note, shift the setting digit to speed up the adjustment.	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 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.

PROGRAMMING MODE OPERATING PROCEDURES

Display	Descriptions	Default
	Parameter Group Setting Procedures	
Measuring Status	Present value for measurement.	
Pass Code (P.Cod)	Press 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.	
System Setting Group	Alarm Setting Group	RS485 Setting Group

Display	Descriptions	Default
System Setting Group Procedures		
545 Press (E) → dPv	Volt Decimal Point Setting (dPv) Press (↑) (↓) to select volt decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	Customers specify
dSPLv Press (E) → dSPHv	Volt Low Scale Setting (dSPLV) Press (E) (←) (↑) to modify volt low scale for the input signal zero value.	Customers specify
dSPHv Press (E) → dPA	Volt Hi Scale Setting (dSPHV) Press (E) (←) (↑) to modify volt hi scale for the input signal zero value.	Customers specify
dPA Press (E) → dSPLA	Amp Decimal Point Setting (dPA) Press (↑) (↓) to select amp decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	Customers specify
dSPLA Press (E) → dSPHA	Amp Low Scale Setting (dSPLA) Press (E) (←) (↑) to modify amp low scale for the input signal zero value.	Customers specify
dSPHA Press (E) → dPW	Amp Hi Scale Setting (dSPHA) Press (E) (←) (↑) to modify amp hi scale for the input signal zero value.	Customers specify
dPW Press (E) → dSPLW	Watt Decimal Point Setting (dPW) Press (↑) (↓) to select watt decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	Customers specify
dSPLW Press (E) → dSPHW	Watt Low Scale Setting (dSPLW) Press (E) (←) (↑) to modify watt low scale for the input signal zero value.	Customers specify
dSPHW Press (E) → dPWH	Watt Hi Scale Setting (dSPHW) Press (E) (←) (↑) to modify watt hi scale for the input signal zero value.	Customers specify
dPWH Press (E) → Avg	WH Decimal Point Setting (dPWH) Press (↑) (↓) to select watt-hour decimal point (0~9). EX: if the value shows "0.00" that means the decimal point is 2 digits.	Customers specify
Avg Press (E) → LCutv	Display Average Setting (Avg) Press (E) (←) (↑) to modify display average (1~99). PS: Please use this function for stable display value when input signal is unstable.	00005
LCutv Press (E) → LCuTA	Volt Low Cut Setting (LCUtv) Press (E) (←) (↑) to modify volt low cut to 0 (0~99).	00000
LCuTA Press (E) → Code	Amp Low Cut Setting (LCuTA) Press (E) (←) (↑) to modify amp low cut to 0 (0~99).	00000
Code Press (E) → Auto	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 Press (E) → LoCK	Auto Display Switching Setting (Auto) Press (↑) (↓) to select auto display switching off (YES) or on (NO). (Display period: 10sec per page)	no
LoCK Press (E) → LoCK	Z Key Function Setting (LoCK) Press (↑) (↓) to select Z key function (All: clear all KWH, C.P.O.: clear current page only)	ALL
LoCK Press (E) → LoCK	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		
noP Press (E) → SEL1	Alarm Setting Page (roP) The following steps are only available for alarm output.	
SEL1 Press (E) → ACT1	Alarm 1 Selection Setting (SEL1) Press (↑) (↓) to select alarm 1 selection. (V1, V2, V3, A1, A2, A3, W1, W2, W3)	u1
ACT1 Press (E) → HYS1	Alarm 1 Action Setting (ACT1) Press (↑) (↓) to modify alarm value that is ≥(Hi) or <(Lo) for alarm action.	Hi
HYS1 Press (E) → HYS1	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

Display	Descriptions	Default
dEL1 Press (E) → Sb1	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
Sb1 Press (E) → Sdt1	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
Sdt1 Press (E) → SEL2	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
SEL2 Press (E) → ACT2	Alarm 2 Selection Setting (SEL2) Press (↑) (↓) to select alarm 2 selection. (V1, V2, V3, A1, A2, A3, W1, W2, W3)	u2
ACT2 Press (E) → HYS2	Alarm 1 Action Setting (ACT2) Press (↑) (↓) to modify alarm value that is ≥(Hi) or <(Lo) for alarm action.	Hi
HYS2 Press (E) → dEL2	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
dEL2 Press (E) → Sb2	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
Sb2 Press (E) → Sdt2	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
Sdt2 Press (E) → PSEL1	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
PSEL1 Press (E) → PSEL2	Pulse 1 Selection Setting (PSEL1) Press (↑) (↓) to select pulse1 selection. (WH1, WH2, WH3)	uH1
PSEL2 Press (E) → PSEL2	Pulse 2 Selection Setting (PSEL1) Press (↑) (↓) to select pulse2 selection. (WH1, WH2, WH3)	uH2
RS485 Setting Group Procedures		
doP Press (E) → Addr	RS485 Setting Page (doP) The following steps are only available for RS-485.	
Addr Press (E) → bAUd	Address Setting (Addr) Press (E) (←) (↑) to modify address (0~255).	00000
bAUd Press (E) → PAR1	Baud Rate Setting (bAUd) Press (↑) (↓) to select baud rate (19K2/9600/4800/2400).	19K2
PAR1 Press (E) → FrAmE	Parity Setting (PAR1) Press (↑) (↓) to select parity (n.8.2/n.8.1/even/odd).	n8.2
FrAmE Press (E) → FrAmE	Frame Setting (FrAmE) Press (↑) (↓) to select frame type. (NO:Hi→Lo, YES:Lo→Hi)	no

Error Code of Self-Diagnosis			
Display	Descriptions	Display	Descriptions
1 oFL	Input signal is over 120% of input range.	-1 oFL	Input signal is under -20% of input range.
doFL	Input signal is over display range (99999)	-doFL	Input signal is under display range (-19999)
AdEr	Input signal is over 180% of input range or meter error.		
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; GPVA 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		R/W
40004	0003	DPV	Volt decimal point setting; range: 0000~0004 (0~4) 0:10 ⁰ , 1:10 ¹ , 2:10 ² , 3:10 ³ , 4:10 ⁴	R/W
40005	0004	DPA	Amp decimal point setting; range: 0000~0004 (0~4) 0:10 ⁰ , 1:10 ¹ , 2:10 ² , 3:10 ³ , 4:10 ⁴	R/W
40006	0005	DPW	Watt decimal point setting; range: 0000~0004 (0~4) 0:10 ⁰ , 1:10 ¹ , 2:10 ² , 3:10 ³ , 4:10 ⁴	R/W
40007	0006	DPWH	Watt-Hour decimal point setting; range: 0000~0009 (0~9) 0:10 ⁰ , 1:10 ¹ ~ 9:10 ⁹	R/W
40008	0007	AUTO	Auto display switching setting; range: 0000~0001 (0~1) 0:NO, 1:YES	R/W
40009	0008	Z.KEY	Z key function setting; range: 0000~0001 (0~1) 0:ALL, 1:C.P.O.	R/W
40010	0009	LOCK	Key lock setting; range: 0000~0001 (0~1) 0:NO, 1:YES	R/W
40011	000A	SEL1	Alarm 1 selection setting; range: 0000~0008 (0~8) 0:V1, 1:V2, 2:V3, 3:A1, 4:A2, 5:A3, 6:W1, 7:W2, 8:W3	R/W
40012	000B	SEL2	Alarm 2 selection setting; range: 0000~0008 (0~8) 0:V1, 1:V2, 2:V3, 3:A1, 4:A2, 5:A3, 6:W1, 7:W2, 8:W3	R/W
40013	000C	ACT1	Alarm 1 act setting; range 0000~0001(0~1) 0:Hi, 1:Lo	R/W
40014	000D	ACT2	Alarm 2 act setting; range 0000~0001(0~1) 0:Hi, 1:Lo	R/W
40015	000E	PSEL1	Pulse 1 selection setting; range 0000~0002(0~2) 0:WH1, 1:WH2, 2:WH3	R/W
40016	000F	PSEL2	Pulse 2 selection setting; range 0000~0002(0~2) 0:WH1, 1:WH2, 2:WH3	R/W
40017	0010	FRAME	Frame setting; range 0000~0001(0~1) 0:NO, 1:YES	R/W
40018	0011	BAUD	Baud rate setting; range: 0000~0003 (0~3) 0:38400, 1:19200, 2:9600, 3:4800	R/W
40019	0012	PARI	Parity setting; range: 0000~0003 (0~3), 0:N.8.2., 1:N.8.1., 2:EVEN, 3:ODD	R/W
40020	0013	AVG	Display average setting; range: 0001~0063 (1~99)	R/W
40021	0014	LCUTV	Volt low cut setting; range: 0000~0063 (0~99)	R/W
40022	0015	LCUTA	Amp low cut setting; range: 0000~0063 (0~99)	R/W
40023	0016	ADDR	Address setting; range: 0000~00FF (0~255)	R/W
40024	0017	DEL1	Alarm 1 act delay time setting; range: 0000~0063 (0~99)	R/W
40025	0018	DEL2	Alarm 2 act delay time setting; range: 0000~0063 (0~99)	R/W
40026	0019	SDT1	Alarm 1 start delay time setting; range: 0000~0063 (0~99)	R/W
40027	001A	SDT2	Alarm 2 start delay time setting; range: 0000~0063 (0~99)	R/W
40028	001B	SB1	Alarm 1 start band setting; range: FF9D~0063 (-99~99)	R/W
40029	001C	SB2	Alarm 2 start band setting; range: FF9D~0063 (-99~99)	R/W
40030	001D	HYS1	Alarm 1 hysteresis setting; range: 0000~0063 (0~99)	R/W
40031	001E	HYS2	Alarm 2 hysteresis setting; range: 0000~0063 (0~99)	R/W
40032	001F	CODE	Pass code setting; range: 0000~4E1F (0~19999)	R/W
40033	0020	DSPLV	Volt display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40034	0021		Volt display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W

Modbus	HEX	Name	Descriptions	Act
40035	0022	DSPLA	Amp display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40036	0023		Amp display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40037	0024	DSPLW	Watt display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40038	0025		Watt display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40039	0026	DSPHV	Volt display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40040	0027		Volt display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40041	0028	DSPHA	Amp display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40042	0029		Amp display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40043	002A	DSPHW	Watt display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40044	002B		Watt display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40045	002C	AL1	Alarm 1 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40046	002D		Alarm 1 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40047	002E	AL2	Alarm 2 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40048	002F		Alarm 2 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40049	0030	RATEV1	Volt 1 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40050	0031		Volt 1 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40051	0032	RATEV2	Volt 2 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40052	0033		Volt 2 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40053	0034	RATEV3	Volt 3 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40054	0035		Volt 3 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40055	0036	RATEA1	Amp 1 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40056	0037		Amp 1 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40057	0038	RATEA2	Amp 2 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40058	0039		Amp 2 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40059	003A	RATEA3	Amp 3 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40060	003B		Amp 3 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40061	003C	RATEW1	Watt 1 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40062	003D		Watt 1 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40063	003E	RATEW2	Watt 2 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40064	003F		Watt 2 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40065	0040	RATEW3	Watt 3 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40066	0041		Watt 3 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40067	0042	RATEWH1	Watt-Hour 1 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40068	0043		Watt-Hour 1 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40069	0044	RATEWH2	Watt-Hour 2 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40070	0045		Watt-Hour 2 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40071	0046	RATEWH3	Watt-Hour 3 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40072	0047		Watt-Hour 3 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R