

3 PHASE VOLTAGE & CURRENT PROTECTION RELAY with 2 ALARMS / RS-485

GRVA

FEATURES

- Measuring 3 phase Volt, Current, Phase Sequence Status, Phase Failure Indicator
- Display range: -19999~99999; decimal point selectable
- Alarm functions for Over Voltage / Under Voltage / Over Current / Under Current
- 2 Alarms output / RS-485 communication optional (The above option can be exist together)
- Alarm Latch / Phase Sequence Detection / Phase Failure Detection function available
- DIN case: 96 x 96 mm
- High stability, non-flammable case (PC), high safety



ORDER INFORMATION: GRVA- [Code 1] [Code 2] [Code 3] - [Code 4] - [Code 5] [Code 6] [Code 7] [Code 8]

Code 1	Connection	Code 2	Input Volt	Code 3	Input Amp	Code 4	Aux. Power	Code 5	Alarm Output	Code 6	Phase Sequence Output	Code 7	Phase Sequence Output	Code 8	RS-485
1	3 ϕ Voltage	N	None	N	None	A	AC/DC 100~240V	N	None	N	None	N	None	N	None
2	3 ϕ Current	1	0~150V	1	0~5A	B	AC/DC 22~60V	R1	1 Relay	Y	Yes	Y	Yes	Y	Yes
3	3 ϕ Voltage & Current	2	0~300V	O	Option			R2	2 Relays						
		3	0~600V												
		O	Option												

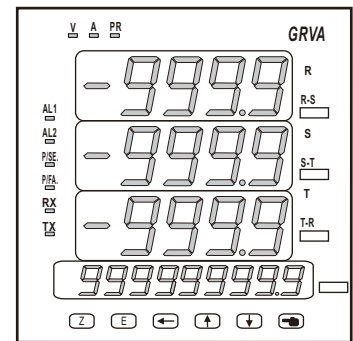
SPECIFICATION

- Accuracy: $\pm 0.25\%$ for V
 $\pm 0.25\%$ for A
- Measuring Range: 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: -19999~99999
- Display Phase Sequence: "R S T" or "R T S"
- Parameters Setting: Push buttons
- Back Up Memory: EEPROM
- Alarm Action: " $\geq$ (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 / $^{\circ}\text{C}$ (0~60 $^{\circ}\text{C}$)
- Operating Temperature: 0~60 $^{\circ}\text{C}$
- Operating Humidity: 20~90% RH (non-condensing)
- Storage Temperature: -10~70 $^{\circ}\text{C}$
- 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: >100M Ω with 500Vdc
- Input Impedence: Voltage: >2V for 20K Ω / V; $\leq 2\text{V}$ for >200M Ω
Current: $\geq 0.2\text{A}$ at 100mV; <0.2A at 1V
- Safety: IEC 61000-4-2

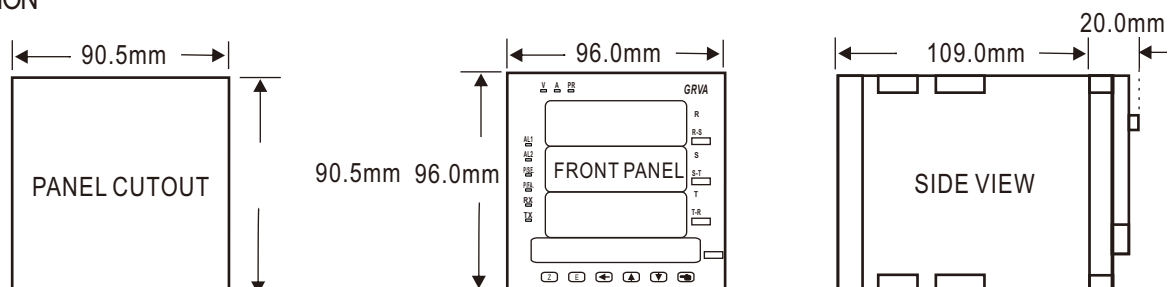
FRONT PANEL & KEY FUNCTIONS

V: Voltage Indicator
A: Current Indicator
PR: Protection Acting Indicator
AL1: Alarm 1 Indicator
AL2: Alarm 2 Indicator
P/SE: Phase Sequence Indicator
P/FA: Phase Failure Indicator
RX: RX Indicator
TX: TX Indicator

- [Z] Latch Reset Key
- [E] Enter Key & Save Key
- [←] Shift Key & Alarm Setting Key
- [↑] Up Key & Display Setting
- [↓] Down Key
- [↻] Display Selecting Key

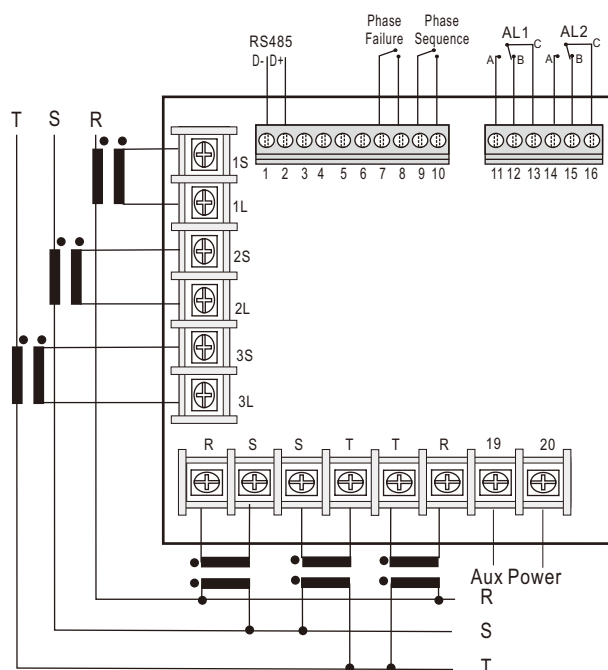


DIMENSION

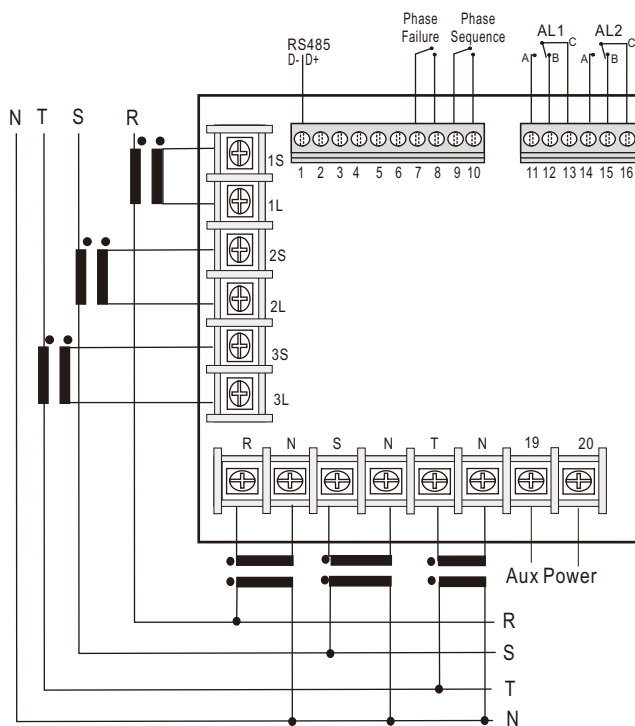


WIRING CONNECTION

● 3 ϕ 3 W



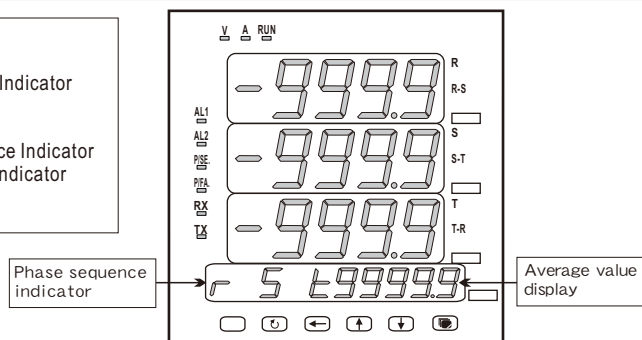
● 3 ϕ 4 W



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

FRONT PANEL & KEY FUNCTIONS

V: Voltage Indicator
A: Current Indicator
PR: Protection Acting Indicator
AL1: Alarm 1 Indicator
AL2: Alarm 2 Indicator
P/SE.: Phase Sequence Indicator
P/FA.: Phase Failure Indicator
RX: RX Indicator
TX: TX Indicator



Key Name	Symbol	Descriptions
Reset Key		1. Press this key to enable the reset function for total value and max. value.
Enter Key & Save 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. next parameter.
Shift Key & Alarm Setting Key		1. In the measuring page, press this key for 3 sec can enter to alarm setting page . 2. In the parameter setting , press this key can move the cursor left.
Up Key & Display Setting Key		1. In the measuring page, press this key for 3 sec can enter to display setting page. 2. 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 , 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.

ALARM POINT SETTING PROCEDURES

Block Charts	Name	Descriptions	Default
Power ON ↓ 	Measuring Status	Present value for measurement	
Press for 3 sec ↓ 	Alarm 1 Setpoint (AL1)	Press to modify alarm 1 setpoint.	00000
Press ↓ 	Alarm 2 Setpoint (AL2)	Press to modify alarm 2 setpoint.	00000

DISPLAY VALUE ADJUSTING PROCEDURES

Block Charts	Name	Descriptions	Default
Power ON ↓ 	Measuring Status	Present value for measurement	
Press for 3 sec ↓ 	Display Value of Zero Voltage Adjustment	Adjust the zero voltage display value. Note, shift the setting digit to speed up the adjustment.	00000
Press ↓ 	Display Value of Span Voltage Adjustment	Adjust the span voltage display value. Note, shift the setting digit to speed up the adjustment.	00000
Press ↓ 	Display Value of Zero Current Adjustment	Adjust the zero current display value. Note, shift the setting digit to speed up the adjustment.	00000
Press ↓ 	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		
Power ON ↓ 	Measuring Status	Present value for measurement.
Press ↓ 	Pass Code (P.Cod)	Press to enter pass code.
Press ↓ 	Pass code is correct that will enter to parameter groups. Pass code is wrong that will back to measuring status.	
NO ↓ 	System Setting Group	
YES ↓ 	Alarm Setting Group	
Press ↓ 	RS485 Setting Group	

Display	Descriptions	Default
System Setting Group Procedures		
System Setting Page (SYS)		
Press	Volt Decimal Point Setting (dPv)	Customers specify
Press	Volt Low Scale Setting (dSPLV)	Customers specify
Press	Volt Hi Scale Setting (dSPHV)	Customers specify
Press	Amp Decimal Point Setting (dPA)	Customers specify
Press	Amp Low Scale Setting (dSPLA)	Customers specify
Press	Amp Hi Scale Setting (dSPHA)	Customers specify
Press	Display Average Setting (AvG)	00005
Press	Volt Low Cut Setting (LCUtv)	00000
Press	Amp Low Cut Setting (LCUta)	00000
Press	Pass Code Setting (CodE)	00000
Press	Auto Display Switching Setting (Auto)	no
Press	Key Lock Setting (LoCK)	no
Alarm Setting Group Procedures		
Alarm Setting Page (roP)	The following steps are only available for alarm output.	
Press	Alarm 1 Selection Setting (SEL1)	u1
Press	Alarm 1 Action Setting (ACT1)	Hi
Press	Alarm Hysteresis Setting (HYS1)	00000
Press	Alarm Run Delay Setting (dEL1)	00000
Press	Alarm Start Band Setting (Sb1)	00000
Press	Alarm Start Band Time Setting (Sdt1)	00000
Press	Alarm 2 Selection Setting (SEL2)	u2

	Display	Descriptions	Default
	Alarm 1 Action Setting (ACT2)	Press to modify alarm value that is $\geq$ (Hi) or $<$ (Lo) for alarm action.	Hi
	Alarm Hysteresis Setting (HYS2)	Press to modify the value, when alarm runs lower or higher display value (depends on alarm action). Alarm setpoint $\pm$ this value (0~99) will turn off the alarm.	00000
	Alarm Run Delay Setting (dEL2)	Press 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
	Alarm Start Band Time Setting (Sdt2)	Press 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 Latch Setting (LACT1)	Press to select alarm 1 latch function. (NO: do not open; YES: Open)	no
	Alarm 2 Latch Setting (LACT2)	Press to select alarm 2 latch function. (NO: do not open; YES: Open)	no
	Test Run Setting (tEST)	Press to modify the test run (0~99).	00000
	Test Time Setting (t-tiM)	Press to modify the test time (0~99 sec).	00000
	RS485 Setting Group Procedures		
	RS485 Setting Page (doP)	The following steps are only available for RS-485.	
	Address Setting (Addr)	Press 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).	n8.2
	Frame Setting (FrAmE)	Press to select frame type. (NO:Hi $\rightarrow$ Lo , YES:Lo $\rightarrow$ Hi)	no

Error Code of Self-Diagnosis

Display	Descriptions	Display	Descriptions
	Input signal is over 120% of input range.		Input signal is under -20% of input range.
	Input signal is over 180% of input range or meter error.		
	Input signal is over display range (99999)		Input signal is under display range (-19999)
	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; GRVA 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	AUTO	Auto display switching setting; range: 0000~0001 (0~1) 0:NO, 1:YES	R/W
40007	0006	LOCK	Key lock setting; range: 0000~0001 (0~1) 0:NO, 1:YES	R/W
40008	0007	SEL1	Alarm 1 selection setting; range: 0000~0005 (0~5) 0:V1, 1:V2, 2:V3, 3:A1, 4:A2, 5:A3	R/W
40009	0008	SEL2	Alarm 2 selection setting; range: 0000~0005 (0~5) 0:V1, 1:V2, 2:V3, 3:A1, 4:A2, 5:A3	R/W
40010	0009	ACT1	Alarm 1 act setting; range 0000~0001(0~1) 0:Hi, 1:Lo	R/W
40011	000A	ACT2	Alarm 2 act setting; range 0000~0001(0~1) 0:Hi, 1:Lo	R/W
40012	000B	LATCH1	Alarm latch 1 setting; range 0000~0001(0~1) 0:NO, 1:YES	R/W
40013	000C	LATCH2	Alarm latch 2 setting; range 0000~0001(0~1) 0:NO, 1:YES	R/W
40014	000D	FRAME	Frame setting; range 0000~0001(0~1) 0:NO, 1:YES	R/W
40015	000E	BAUD	Baud rate setting; range: 0000~0003 (0~3) 0:19200, 1:9600, 2:4800, 3:2400	R/W
40016	000F	PARI	Parity setting; range: 0000~0003 (0~3), 0:N.8.2., 1:N.8.1., 2:EVEN, 3:ODD	R/W
40017	0010	AVG	Display average setting; range: 0001~0063 (1~99)	R/W
40018	0011	LCUTV	Volt low cut setting; range: 0000~0063 (0~99)	R/W
40019	0012	LCUTA	Amp low cut setting; range: 0000~0063 (0~99)	R/W
40020	0013	ADDR	Address setting; range: 0000~00FF (0~255)	R/W
40021	0014	TEST	Test setting; range: 0000~0063 (0~99)	R/W
40022	0015	T.TIME	Test time setting; range: 0000~0063 (0~99)	R/W
40023	0016	DEL1	Alarm 1 act delay time setting; range: 0000~0063 (0~99)	R/W
40024	0017	DEL2	Alarm 2 act delay time setting; range: 0000~0063 (0~99)	R/W
40025	0018	SDT1	Alarm 1 start delay time setting; range: 0000~0063 (0~99)	R/W
40026	0019	SDT2	Alarm 2 start delay time setting; range: 0000~0063 (0~99)	R/W
40027	001A	SB1	Alarm 1 start band setting; range: FF9D~0063 (-99~99)	R/W
40028	001B	SB2	Alarm 2 start band setting; range: FF9D~0063 (-99~99)	R/W
40029	001C	HYS1	Alarm 1 hysteresis setting; range: 0000~0063 (0~99)	R/W
40030	001D	HYS2	Alarm 2 hysteresis setting; range: 0000~0063 (0~99)	R/W
40031	001E	CODE	Pass code setting; range: 0000~4E1F (0~19999)	R/W
40032	001F	DSPLV	Volt display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40033	0020		Volt display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40034	0021	DSPLA	Amp display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W

Modbus	HEX	Name	Descriptions	Act
40035	0022		Amp display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40036	0023	DSPHV	Volt display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40037	0024		Volt display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40038	0025	DSPHA	Amp display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40039	0026		Amp display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40040	0027	AL1	Alarm 1 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40041	0028		Alarm 1 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40042	0029	AL2	Alarm 2 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40043	002A		Alarm 2 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40044	002B	RATEV1	Volt 1 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40045	002C		Volt 1 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40046	002D	RATEV2	Volt 2 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40047	002E		Volt 2 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40048	002F	RATEV3	Volt 3 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40049	0030		Volt 3 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40050	0031	RATEA1	Amp 1 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40051	0032		Amp 1 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40052	0033	RATEA2	Amp 2 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40053	0034		Amp 2 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40054	0035	RATEA3	Amp 3 display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40055	0036		Amp 3 display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40056	0037	RATEVE	VE display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40057	0038		VE display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40058	0039	RATEAE	AE display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40059	003A		AE display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R