INSTRUCTION MANUAL

POWER LINE SUPER MULTI-METER

SQLC-110L

[1φ2W / 1φ3W / 3φ3W Analog Output]

Hardware Model G

DAIICHI ELECTRONICS CO., LTD.

Thank you for purchase of DAIICHI ELECTRONICS product.
Please read this instruction manual carefully before use.

Safety precautions

■ Usage environment and product conditions

Please be sure to use this product in a place that meets the following conditions.
In places that do not meet this condition, it may cause malfunction or failure and product life decline.

- Within the range of ambient temperature -10 to +55 ℃, humidity 85% RH or less.
- Place free of dust, corrosive gas, salt and oily smoke. (Corrosive gas : SO_2 / H_2S, etc.)
- Location that is not affected by vibration and shock.
- Location that is not affected by external noise.
- Altitude 1000m or less.
- If this unit directly measures an inverter output of cycle control, SCR phase angle control or PWM control, an error may increase due to its operation principle.

■ Outdoor use conditions

- These products are not a dustproof, waterproof, and splash proof construction.
  Please avoid the place with much dust. Moreover, please install in the place not exposed to rain nor water drop.
- Please do not install in the place where sunlight hits directly.
  Discoloration and degradation of a name plate, and deformation of the case by the surface temperature rise may occur.

■ Mounting and wiring

Please refer to this instruction manual for mounting and the wiring.

⚠CAUTION	● Please refer to connection diagram for the wiring. ● Please avoid a hot line work. ● Please use an electrical wire size suitable with the rated current. ● Please check the tightening of the screw.

■ Preparation

This product must be set before use. Please set correctly after reading this instruction manual.

■ About dew condensation

If the temperature and humidity of an installation change rapidly when a product is a non-energization, the waterdrop by dew condensation may adhere to a display inner side. (The display filter and the LCD surface stick and the pattern of the shape of a circle or an ellipse occur.)
This phenomenon does not cause any trouble. Disappears when control power is applied for 2 hours.

■ Maintenance and inspection

- Inspection in energized state is dangerous.
- No replacement in periodic inspection.
- After wiring change and maintenance, attach the terminal cover.
- Please wipe off lightly with the dry soft cloth. Please do not use the organic solvent, chemicals, cleaners, etc., such as an alcohol, for cleaning.
  The LCD may light up during cleaning on the LCD screen. This is a phenomenon that static electricity occurs in the filter. There is no problem with the product. Leave the unit as it is for a while, and the display goes out due to natural discharge.
  Do not press the LCD screen strongly. Pressing the LCD screen may cause the filter and the liquid crystal surface to remain in contact (such as a round pattern).

■ Storage

Please store in a place that meets the following conditions.

- The ambient temperature is within -25 to +70 ℃ (storage temperature).
- Daily average temperature 40 ℃ or less.
- Location corresponding to the usage environment and use conditions.
- Aluminum electrolytic capacitors are used for products. Please energize the power supply within one year after purchase.

■ Countermeasures against troubles.

If this product breaks down within the warranty period, it will be repaired by DAIICHI ELECTRONICS.

■ Disposal

Please dispose this product as industrial waste (non-combustible).
Mercury parts and a nickel-cadmium battery are not used for this product.

■ Warranty period.

The warranty period of the product is one year after the date of delivery.

■ Operation

Be careful with the following cautions during use.

- Use the input within the rated range. Be careful since negligence of this caution may cause troubles of the unit.
- There is a function to hold the maximum value and the minimum value in this product.
  The blackout this value will not be cleared by a power supply reset. However, the minimum value may be updated in case input is not applied to a power up. For this reason, in order to recover previous minimum value, please apply input within 1 second after switching on a power supply.
- The maximum value, a minimum value measurement element

Measurement elements	Maximum value measurement	Minimum value measurement
Voltage, Current, Demand current, Active power, Demand active power, Reactive power, Power factor, Frequency	○	○
Current leakage , Harmonic (Distortion factor , Effective value , Content)	○	×

⚠CAUTION	● Be careful not to touch any terminal when power is applied to the unit. ● Don’ t disassemble or modify this unit without any previous permission of our company, otherwise the warranty does not apply to the unit any more. Also, modifications may cause troubles, a fire, or other accidents. For specifications change, etc., please contact us.

■ Setting

This unit requires setting and confirmation of the measuring range, etc. before use.
Wrong setting, if any, causes malfunction of the unit. If setting should be wrong, neither measurement nor output becomes correct. Carefully read the instruction manual before setting the unit.

■ Default setting.

The default setting values are as specified below at the delivery time. Set them according to the working conditions. The input circuit of this product is the common use of 3-phase 3-wire (3φ3W), single-phase 2-wire (1φ2W), and single-phase 3-wire (1φ3W). In case an input circuit is designated at the case of an order, it is shipped by the default value of the designated input circuit. And, in case it does not do designation of the input circuit (with no designation), it is shipped by the default value of 3-phase 3-wire.
The unit will be delivered with your specified setting values, if so specified.

① Voltage, current input (1/2)

No.	Setting item				3-phase 3-wire			Single-phase 3-wire	Single-phase		
					110V input	220V input	440V input		110V input	220V input	440V input
1	Display combination		Pattern		Pattern 1			Pattern 1	Pattern 1		
			Main monitor		A(L2)			A(L1)	A		
			Sub-monitor (Left)		V(L1L2)			V(L1N)	V		
			Sub-monitor (Center)		W			W	W		
			Sub-monitor (Right)		Wh			Wh	Wh		
			Bar graph		A(L2)			A(L1)	A		
2	Alarm output (1)	Alarm 1	Element		DA			DA	DA		
			Reset form		AUTO			AUTO	AUTO		
			Contact delay time		0 second			0 second	0 second		
			Test		－			－	－		
		Alarm 2	Element		DA			DA	DA		
			Reset form		AUTO			AUTO	AUTO		
			Contact delay time		0 second			0 second	0 second		
			Test		－			－	－		
3	Demand detection	Demand current	Upper limit value		80.0A			400A	40.0A		
			Interval		0 second			0 second	0 second		
		Demand active power	Upper limit value		OFF			OFF	OFF		
			Interval		0 second			0 second	0 second		
			Operation form		Operating system according with bimetallic type.			Operating system according with bimetallic type.	Operating system according with bimetallic type.		
			Power factor operation form		Instant measurement			Instant measurement	Instant measurement		
4	Harmonic detection	Current	Distortion-factor upper limit		OFF			OFF	OFF		
			5th conversion content rate upper limit		OFF			OFF	OFF		
			n-th content rate	Element	5th			5th	5th		
				Upper limit	OFF			OFF	OFF		
		Voltage	Distortion-factor upper limit		OFF			OFF	OFF		
			5th conversion content rate upper limit		OFF			OFF	OFF		
			n-th content rate	Element	5th			5th	5th		
				Upper limit	OFF			OFF	OFF		
		5th conversion detection characteristics			Inverse-time-delay mode			Inverse-time-delay mode	Inverse-time-delay mode		
		Average value time limit			0 minute			0 minute	0 minute		
5	Instant measurement detection	Voltage upper limit value			OFF			OFF	OFF		
		Voltage lower limit value			OFF			OFF	OFF		
6	Leakage detection (1)	Rated sensitivity current			0.1A			0.1A	0.1A		
		Element switching			Io			Io	Io		
		Circuit switching			1 phase grounding			1 phase grounding	1 phase grounding		
		Use ZCT selection			Type 0			Type 0	Type 0		
7	Backlight	Action			AUTO			AUTO	AUTO		
		Brightness			3 (Middle)			3 (Middle)	3 (Middle)		
8	Measurement range	Voltage range			6600V	220V	440V	110.0V	3300V	220V	440V
		Current range			100.0A			500A	50.0A		
		Current display intrinsic sensitivity			100.0A			500A	50.0A		
		Active power polarity			One-side swing			One-side swing	One-side swing		
		Active power display intrinsic sensitivity			1200kW	40.0kW	80.0kW	100.0kW	150.0kW	10.00kW	20.00kW
		Reactive power display intrinsic sensitivity			600kvar	20.00kvar	40.0kvar	50.0kvar	75.0kvar	5.00kvar	10.00kvar
		Power factor range			LEAD 0.500 to 1.000 to LAG 0.500			LEAD 0.500 to 1.000 to LAG 0.500	LEAD 0.500 to 1.000 to LAG 0.500		
		Frequency range			45.0 to 65.0Hz			45.0 to 65.0Hz	45.0 to 65.0Hz		

Note(1) A setting item is not displayed in case there is no corresponding option.

① Voltage, current input (2/2)

No.	Setting item			3-phase 3-wire			Single-phase 3-wire	Single-phase		
				110V input	220V input	440V input		110V input	220V input	440V input
9	Analog output (2)	Output element 1		A(L2)			A(L1)	A		
		Output element 2		V(L1L2)			V(L1N)	V		
		Output element 3		W			W	W		
		Output element 4		cosφ			cosφ	cosφ		
		Output intrinsic sensitivity	Current	100.0%			100.0%	100.0%		
			Active power	100.0%			100.0%	100.0%		
			Reactive power	50.0%			50.0%	50.0%		
		Low input cut		OFF			OFF	OFF		
10	Pulse output (2)	Output 1	Element	Wh			Wh	Wh		
			Pulse unit	10kWh/p	0.1kWh/p	0.1kWh/p	1kWh/p	1kWh/p	0.1kWh/p	0.1kWh/p
		Output 2	Element	Wh			Wh	Wh		
			Pulse unit	10kWh/p	0.1kWh/p	0.1kWh/p	1kWh/p	1kWh/p	0.1kWh/p	0.1kWh/p
11	External operation input (2)	Input 1 function		Alarm reset			Alarm reset	Alarm reset		
		Input 2 function		Max./Min. reset			Max./Min. reset	Max./Min. reset		
12	Measurement display ON/OFF	Voltage		ON			ON	ON		
		Current		ON			ON	ON		
		Active power		ON			ON	ON		
		Reactive power		ON			ON	ON		
		Power factor		ON			ON	ON		
		Frequency		ON			ON	ON		
		Watt-hour of power receiving		ON			ON	ON		
		Watt-hour of power transmission		ON			ON	ON		
		var-hour of power receiving		ON			ON	ON		
		var-hour of power transmission		ON			ON	ON		
		Harmonic current		ON			ON	ON		
		Harmonic voltage		ON			ON	ON		
		Current leakage (2)		ON			ON	ON		
13	Input circuit	Phase line change (4)		3φ3W			1φ3W (L1-N-L3)	1φ2W		
		Input voltage (5)		110V	220V	440V	300V	110V	220V	440V
14	Measurement	Dead band		0.0%			0.0%	0.0%		
		Tidal current measurement		General measurement			General measurement	General measurement		
15	Analog output specification (2)(3)			1 to 5V			1 to 5V	1 to 5V		
16	Analog output adjustment (2)	Output 1	Bias adjustment	0.0%			0.0%	0.0%		
			Span adjustment	100.0%			100.0%	100.0%		
		Output 2	Bias adjustment	0.0%			0.0%	0.0%		
			Span adjustment	100.0%			100.0%	100.0%		
		Output 3	Bias adjustment	0.0%			0.0%	0.0%		
			Span adjustment	100.0%			100.0%	100.0%		
		Output 4	Bias adjustment	0.0%			0.0%	0.0%		
			Span adjustment	100.0%			100.0%	100.0%		

Note(2) A setting item is not displayed in case there is no corresponding option.
The external operation input constitutes default value with an alarm output option.
It becomes the next function in case there is no alarm output option.
Input 1 function：Max. / Min. reset, Input 2 function：Measurement element change.

Note(3) A setting item is not displayed if analog output is except DC0 to 5V (or DC1 to 5V) specification,
And analog output insulation product does not display a setting item.

Note(4) When the setting of phase line change of an input circuit is changed, it will return to the default value of phase line which all set value changed.

Note(5) When phase line change setting of an input circuit is set as 3φ3W (or 1φ2W) and the input voltage setting is changed, the voltage range returns to the default value of the phase line.
(For example：In case of 3φ3W, 6600V at the case of 110V setting, 300V at the case of 220V setting.)
Setting item is not displayed at the case of 440V input.

② Current input

No.	Setting item				3-phase 3-wire	Single-phase 3-wire	Single-phase
1	Display combination		Pattern		Pattern 15	Pattern 15	Pattern 15
			Main monitor		A(L2)	A(L1)	A
			Sub-monitor (Left)		A(L1)	A(L3)	－
			Sub-monitor (Center)		A(L3)	A(N)	－
			Sub-monitor (Right)		－	－	－
			Bar graph		A(L2)	A(L1)	A
2	Alarm output (6)	Alarm 1	Element		DA	DA	DA
			Reset form		AUTO	AUTO	AUTO
			Contact delay time		0 second	0 second	0 second
			Test		－	－	－
		Alarm 2	Element		DA	DA	DA
			Reset form		AUTO	AUTO	AUTO
			Contact delay time		0 second	0 second	0 second
			Test		－	－	－
3	Demand detection	Demand current	Upper limit value		80.0A	400A	40.0A
			Interval		0 second	0 second	0 second
4	Harmonic detection	Current	Distortion-factor upper limit		OFF	OFF	OFF
			5th conversion content rate upper limit		OFF	OFF	OFF
			n-th content rate	Element	5th	5th	5th
				Upper limit	OFF	OFF	OFF
		5th conversion detection characteristics			Inverse-time-delay mode	Inverse-time-delay mode	Inverse-time-delay mode
		Average value time limit			0 minute	0 minute	0 minute
5	Leakage detection (6)		Rated sensitivity current		0.1A	0.1A	0.1A
			Element switching		Io	Io	Io
			Circuit switching		1 phase grounding	1 phase grounding	1 phase grounding
			Use ZCT selection		Type 0	Type 0	Type 0
6	Backlight		Action		AUTO	AUTO	AUTO
			Brightness		3 (Middle)	3 (Middle)	3 (Middle)
7	Measurement range		Current range		100.0A	500A	50.0A
			Current display intrinsic sensitivity		100.0A	500A	50.0A
8	Analog output (6)		Output element 1		A(L2)	A(L1)	A
			Output element 2		A(L1)	A(L3)	－
			Output element 3		A(L3)	A(N)	－
			Output element 4		－	－	－
			Output intrinsic sensitivity	Current	100.0%	100.0%	100.0%
			Low input cut		OFF	OFF	OFF
9	External operation input (6)		Input 1 function		Alarm reset	Alarm reset	Alarm reset
			Input 2 function		Max./Min. reset	Max./Min. reset	Max./Min. reset
10	Measurement display ON/OFF		Current		ON	ON	ON
			Harmonic current		ON	ON	ON
			Current leakage (6)		ON	ON	ON
11	Input circuit		Phase line change (8)		3φ3W	1φ3W (L1-N-L3)	1φ2W
12	Measurement		Dead band		0.0%	0.0%	0.0%
			Tidal current measurement		General measurement	General measurement	General measurement
13	Analog output specification (6)(7)				1 to 5V	1 to 5V	1 to 5V
14	Analog output adjustment (6)		Output 1	Bias adjustment	0.0%	0.0%	0.0%
				Span adjustment	100.0%	100.0%	100.0%
			Output 2	Bias adjustment	0.0%	0.0%	0.0%
				Span adjustment	100.0%	100.0%	100.0%
			Output 3	Bias adjustment	0.0%	0.0%	0.0%
				Span adjustment	100.0%	100.0%	100.0%
			Output 4	Bias adjustment	0.0%	0.0%	0.0%
				Span adjustment	100.0%	100.0%	100.0%

Note(6) A setting item is not displayed in case there is no corresponding option.
The external operation input constitutes default value with an alarm output option.
It becomes the next function in case there is no alarm output option.
Input 1 function：Max. / Min. reset, Input 2 function：Measurement element change.

Note(7) A setting item is not displayed if analog output is except DC0 to 5V (or DC1 to 5V) specification,
And analog output insulation product does not display a setting item.

Note(8) When the setting of phase line change of an input circuit is changed, it will return to the default value of phase line which all set value changed.

③ Voltage input

No.	Setting item				3-phase 3-wire			Single-phase 3-wire	Single-phase		
					110V input	220V input	440V input		110V input	220V input	440V input
1	Display combination		Pattern		Pattern 16			Pattern 16	Pattern 16		
			Main monitor		V(L1L2)			V(L1N)	V		
			Sub-monitor (Left)		V(L2L3)			V(L3N)	—		
			Sub-monitor (Center)		V(L3L1)			V(L1L3)	—		
			Sub-monitor (Right)		Hz			Hz	Hz		
			Bar graph		V(L1L2)			V(L1N)	V		
2	Alarm output (1)	Alarm 1	Element		V			V	V		
			Reset form		AUTO			AUTO	AUTO		
			Contact delay time		0 second			0 second	0 second		
			Test		—			—	—		
		Alarm 2	Element		V			V	V		
			Reset form		AUTO			AUTO	AUTO		
			Contact delay time		0 second			0 second	0 second		
			Test		—			—	—		
3	Harmonic detection	Voltage	Distortion-factor upper limit		OFF			OFF	OFF		
			5th conversion content rate upper limit		OFF			OFF	OFF		
			n-th content rate	Element	5th			5th	5th		
				Upper limit	OFF			OFF	OFF		
		5th conversion detection characteristics			Inverse-time-delay mode			Inverse-time-delay mode	Inverse-time-delay mode		
		Average value time limit			0 minute			0 minute	0 minute		
4	Instant measurement detection		Voltage upper limit value		OFF			OFF	OFF		
			Voltage lower limit value		OFF			OFF	OFF		
5	Leakage detection (9)		Rated sensitivity current		0.1A			0.1A	0.1A		
			Element switching		Io			Io	Io		
			Circuit switching		1 phase grounding			1 phase grounding	1 phase grounding		
			Use ZCT selection		Type 0			Type 0	Type 0		
6	Backlight		Action		AUTO			AUTO	AUTO		
			Brightness		3 (Middle)			3 (Middle)	3 (Middle)		
7	Measurement range		Voltage range		6600V	220V	440V	110.0V	3300V	220V	440V
			Frequency range		45.0 to 65.0Hz			45.0 to 65.0Hz	45.0 to 65.0Hz		
8	Analog output (9)		Output element 1		V(L1L2)			V(L1N)	V		
			Output element 2		V(L2L3)			V(L3N)	—		
			Output element 3		V(L3L1)			V(L1L3)	—		
			Output element 4		Hz			Hz	Hz		
			Low input cut		OFF			OFF	OFF		
9	External operation input (9)		Input 1 function		Alarm reset			Alarm reset	Alarm reset		
			Input 2 function		Max./Min. reset			Max./Min. reset	Max./Min. reset		
10	Measurement display ON/OFF		Voltage		ON			ON	ON		
			Frequency		ON			ON	ON		
			Harmonic voltage		ON			ON	ON		
			Current leakage (9)		ON			ON	ON		
11	Input circuit		Phase line change (11)		3φ3W			1φ3W (L1-N-L3)	1φ2W		
			Input voltage (12)		110V	220V	440V	300V	110V	220V	440V
12	Measurement		Dead band		0.0%			0.0%	0.0%		
			Tidal current measurement		General measurement			General measurement	General measurement		
13	Analog output specification (9)(10)				1 to 5V			1 to 5V	1 to 5V		
14	Analog output adjustment (9)		Output 1	Bias adjustment	0.0%			0.0%	0.0%		
				Span adjustment	100.0%			100.0%	100.0%		
			Output 2	Bias adjustment	0.0%			0.0%	0.0%		
				Span adjustment	100.0%			100.0%	100.0%		
			Output 3	Bias adjustment	0.0%			0.0%	0.0%		
				Span adjustment	100.0%			100.0%	100.0%		
			Output 4	Bias adjustment	0.0%			0.0%	0.0%		
				Span adjustment	100.0%			100.0%	100.0%		

Note(9) A setting item is not displayed in case there is no corresponding option. The external operation input constitutes default value with an alarm output option. It becomes the next function in case there is no alarm output option. Input 1 function：Max. / Min. reset, Input 2 function：Measurement element change.

Note(10) A setting item is not displayed if analog output is except DC0 to 5V (or DC1 to 5V) specification, And analog output insulation product does not display a setting item.

Note(11) When the setting of phase line change of an input circuit is changed, it will return to the default value of phase line which all set value changed.

Note(12) When phase line change setting of an input circuit is set as 3φ3W (or 1φ2W) and the input voltage setting is changed, the voltage range returns to the default value of the phase line.
(For example：In case of 3φ3W, 6600V at the case of 110V setting, 300V at the case of 220V setting.)
Setting item is not displayed at the case of 440V input.

Content

1. Product outline

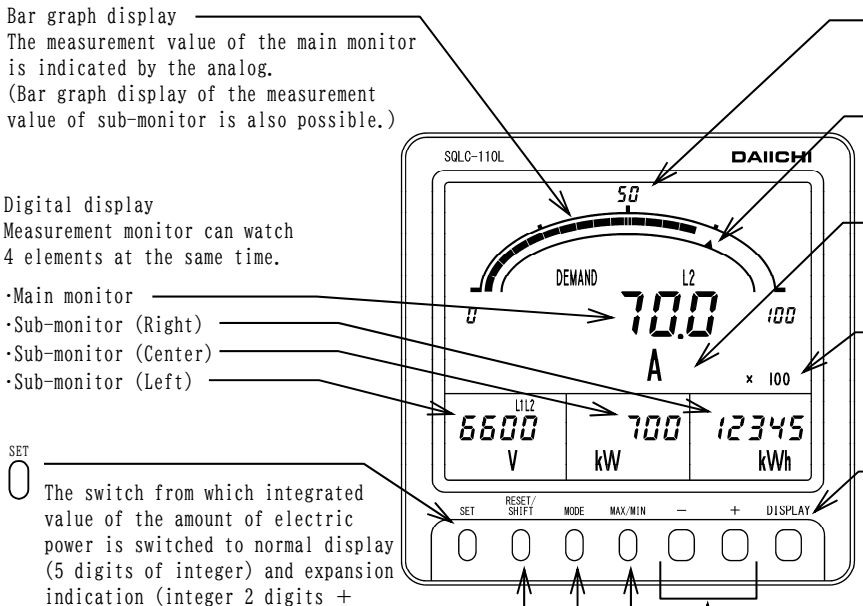
1.1 Usage of product

This single unit can measure and monitor demand-current ×3, voltage ×3, current ×3, demand active power, active-power, reactive-power, power factor, frequency, watt-hour, var-hour, harmonic(voltage, current) and current leakage.
From a low tension circuit to a high tension circuit, it is adapted for various usages, such as a measurement monitor of a power receiving circuit, an energy conservation power monitor, a demand current measurement monitor, and a harmonic monitor, a leakage monitor.
The intensive monitor united with the system is made in an addendum of analog output and a pulse output.

1.2 Features of product

- A 3-phase 3-wire, single-phase, and single-phase 3-wire common type.
- Bar graph 1 measurement and digital 4 measurement are displayed simultaneously.
- Analog output 4 circuit and contact-output 2 circuit can be taken out. (Option)
  A contact output can be selected from a pulse output, an alarm output, and a CPU error output. (Please designate it during an order.) And, an output element can be selected by setting.
- Two external operation inputs are possible. (Option)
  And, selection of reset input and a display change input is possible at setting.
- Power supply is AC85 to 264V, DC80 to 143V (for both AC and DC uses).
- The mounting method of this unit is compatible with the mounting method of conventional 110 square mechanical meter. This unit is mounted at 2 diagonal points.
- Integrated value of Wh and varh can indicate expansion to 3 decimal places.
- Analog output is with a lower limit limiter.
- A tidal current measurement (output 2 quadrant) change is possible for var and $\cos\phi$.
- Current-leakage measurement corresponds to both Io and Ior.
- A backlight function is equipped. Selection of backlight-on, backlight-off, and auto backlight-off and setting of brightness are possible. Automatic turning off the lights at the time of non-operation can be set.
  LED：White.
- The product with analog output can be selected from between analog output insulation type and the analog output non-insulation type. (Please specify at the time of an order.)

2. The name and function of each part



Bar graph display
The measurement value of the main monitor is indicated by the analog.
(Bar graph display of the measurement value of sub-monitor is also possible.)

Digital display
Measurement monitor can watch 4 elements at the same time.

- ·Main monitor
- ·Sub-monitor (Right)
- ·Sub-monitor (Center)
- ·Sub-monitor (Left)

Scale markings
Scale markings is automatically set in a measurement range.

Upper limit (or lower limit) setting index
An upper limit (or lower limit) setting value is displayed.

Unit display
Unit display is automatically set in a measurement range.

Multiplying factor display
Multiplying factor is displayed at the time of an Wh and varh display.

SET
The switch from which integrated value of the amount of electric power is switched to normal display (5 digits of integer) and expansion indication (integer 2 digits + 3 decimal places) variously.
If it is not operated for 10 minutes after a display change, it will usually return to a display. It is used also as a switch which changes to setting mode. If it continues pushing 3 seconds or more, it will change to setting mode.
In setting mode, it is used as a switch that determines a setting value.

DISPLAY
This is a switch which changes the phase (line) display of current (voltage).
If it is not operated for 10 minutes after a display change, it returns to the original phase (line) display. In setting mode, it is used as a switch that terminates setting mode.

− +
The switch to which measurement displays element of main monitor is changed.
If it is not operated for 10 minutes after a display change, it returns to the original measurement display element. In set mode, it is used as a switch that changes a setting value.

RESET/ SHIFT
This switch resets various alarms.
And, in the maximum and the minimum measurement display, it is used as a switch that resets the maximum and the minimum value.
In setting mode, it is used as a switch to which a setting item is shifted.

MAX/MIN
The switch to which general measurement display (usually) and the maximum minimum measurement display are changed.

MODE
The switch to which general measurement display (usually) and the harmonic measurement (voltage and current) display are changed.
In set mode, it is used as a switch that changes a setting item.

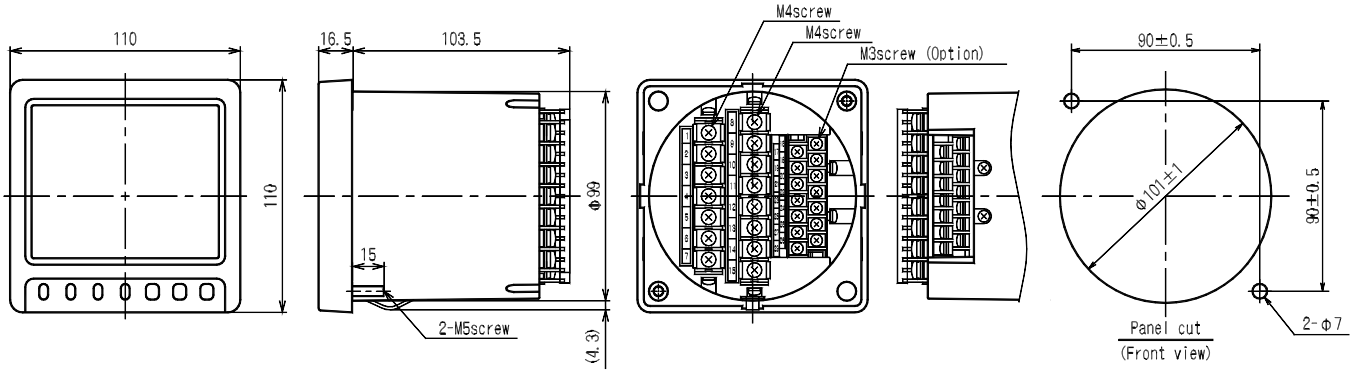
3. Preparation

3.1 Installation

Mount the unit by the attached M5 nuts to a panel of thinner than 10mm, referring to the following external dimensions drawing and panel cutout. Fasten these nuts with tightening torque 2.0 to 2.5N·m.

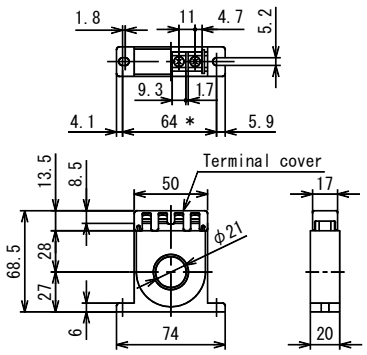
● Dimension diagram

(1) Multi-meter

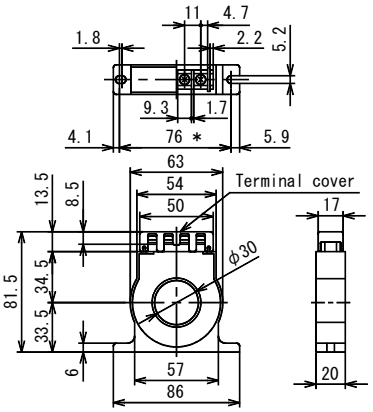


(2) Correspondence ZCT (Our company recommendation) ZCT is not attached with leakage measurement.

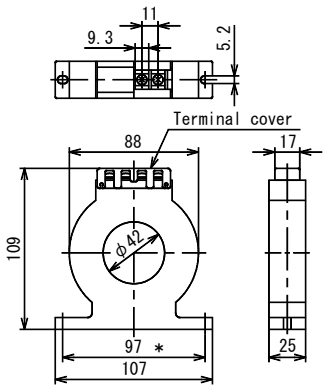
50A OTG-LA21 (OMRON Corporation)



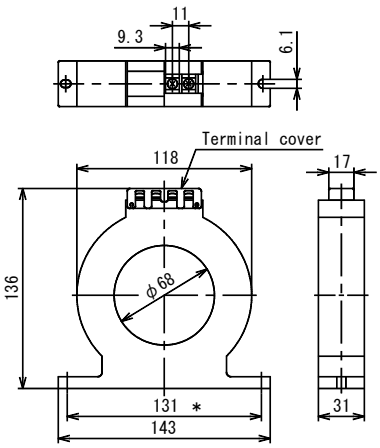
100A OTG-LA30 (OMRON Corporation)



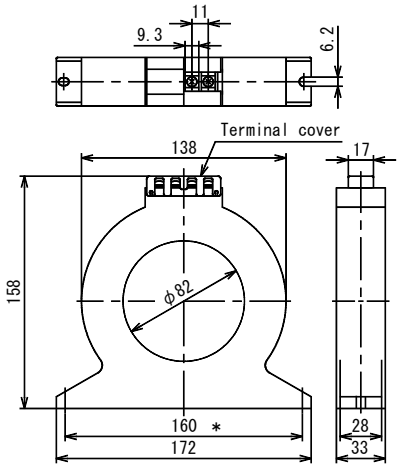
200A OTG-LA42 (OMRON Corporation)



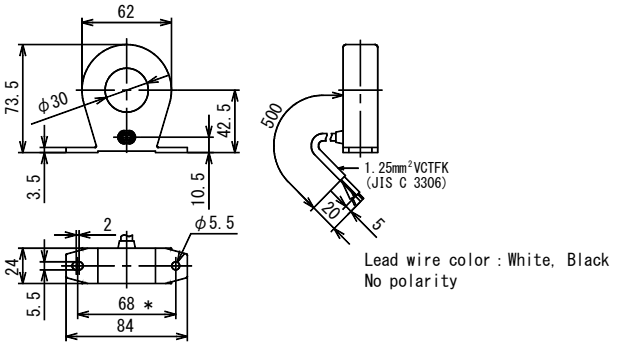
400A OTG-LA68 (OMRON Corporation)



600A OTG-LA82 (OMRON Corporation)



100A(For outdoor) OTG-LA30W (OMRON Corporation)



* Installation pitch

This product also corresponds to the next ZCT.

TAIWA ELECTRIC INDUSTRIES CO.,LTD.
: Zero-phase current transformer for low voltage (Through-type) TYPE : ZB-□, ZD-□

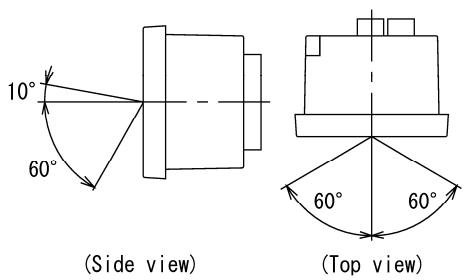
Hitachi, Ltd. : Through-type ZCT ZR series TYPE : ZR-□

Please consult, in case you use other ZCT.

● Caution on handling

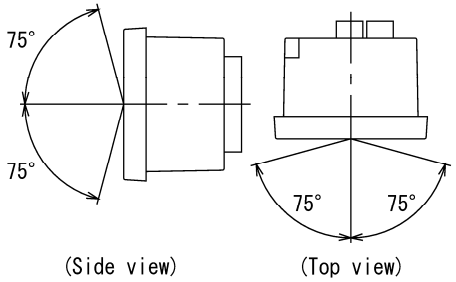
Mount the LCD to obtain an optimum angle, since the contrast changes according to the monitoring angle.

(1) For upper installation model



(Side view) (Top view)

(2) For wide viewing angle model

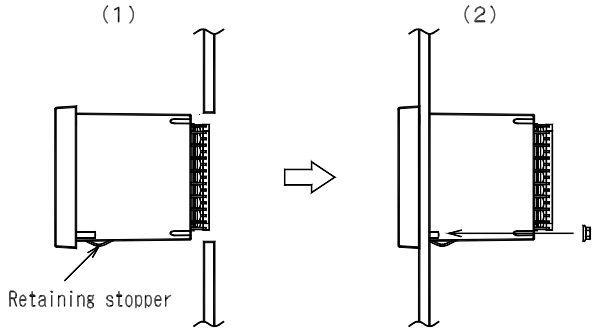


(Side view) (Top view)

● Installation

(1) A product is put in a cut hole of a panel from a front. A body is inserted until it exceeds retaining stopper of the lower base.

(2) Please fix a product certainly with attached M5 flange nut for installation. Please give a tightening torque as 2.0 to 2.5N·m.

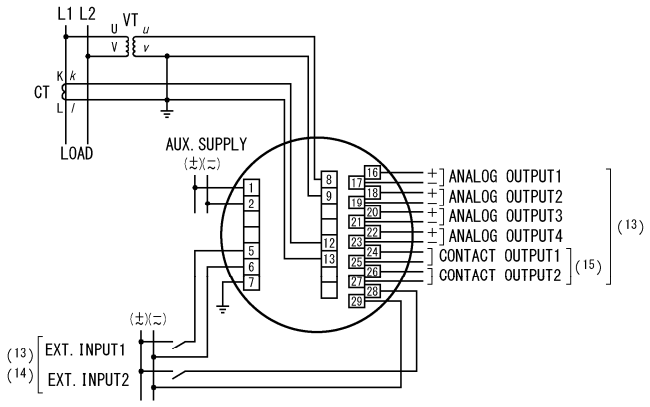


3.2 Connections

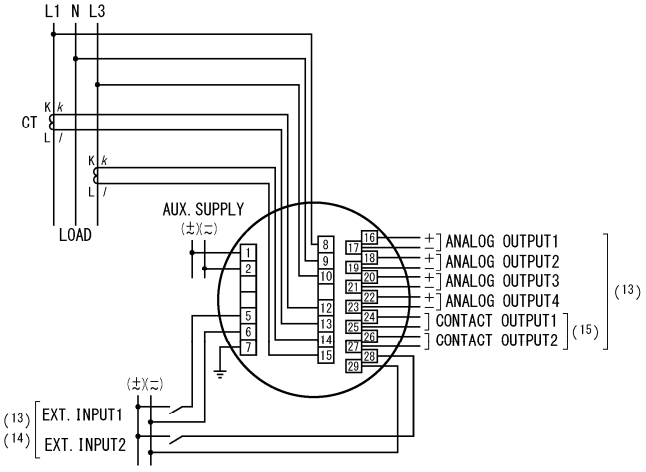
Please perform connection after referring to the following wiring diagram.

● Connection drawing (16)

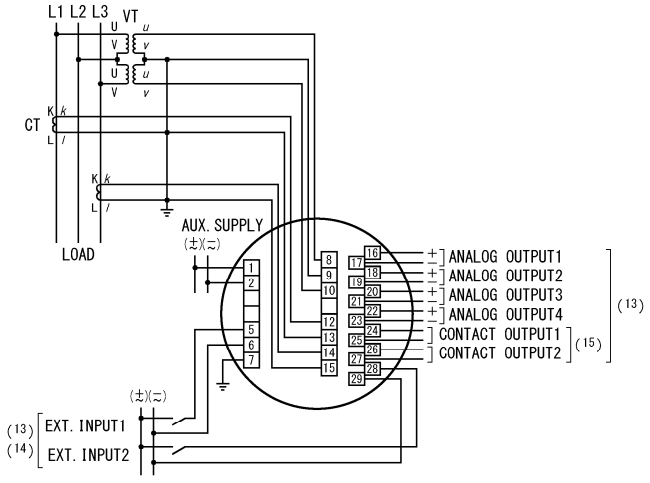
(1) 1φ2W



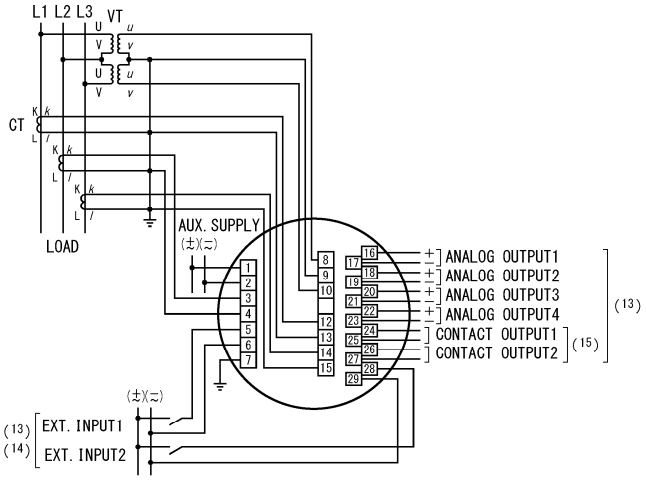
(2) 1φ3W



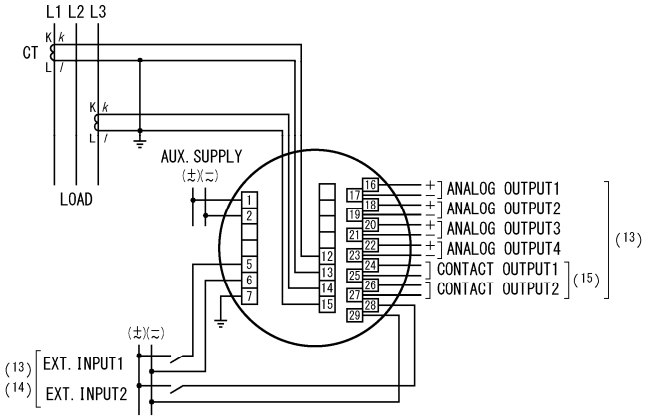
(3) 3φ3W (2VT, 2CT)



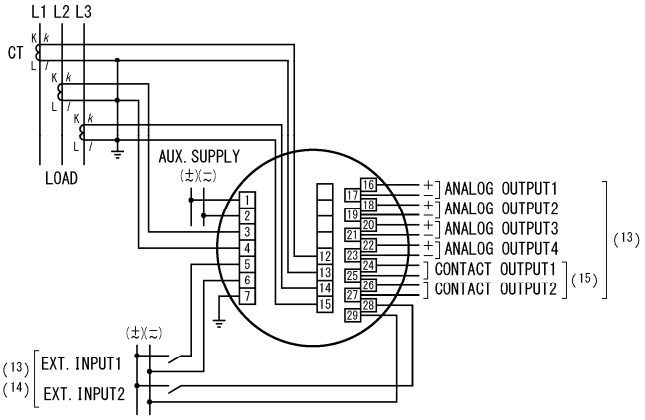
(4) 3φ3W (2VT, 3CT)



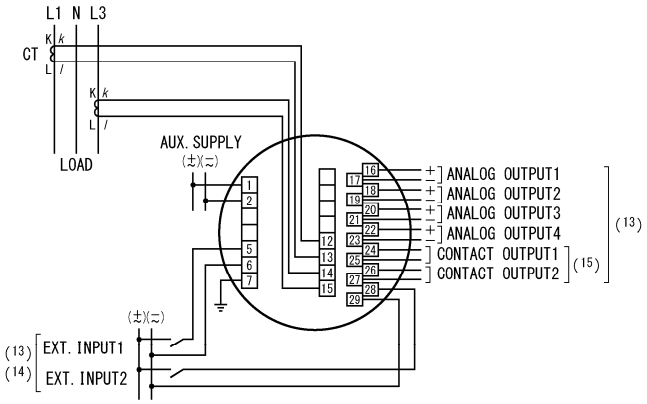
(5) Current input 3φ3W (2CT)



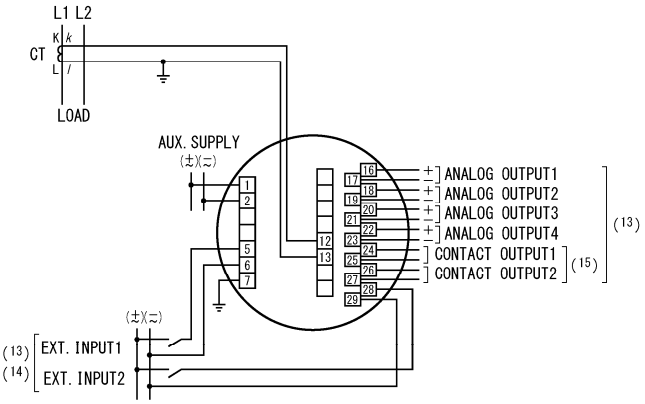
(6) Current input 3φ3W (3CT)



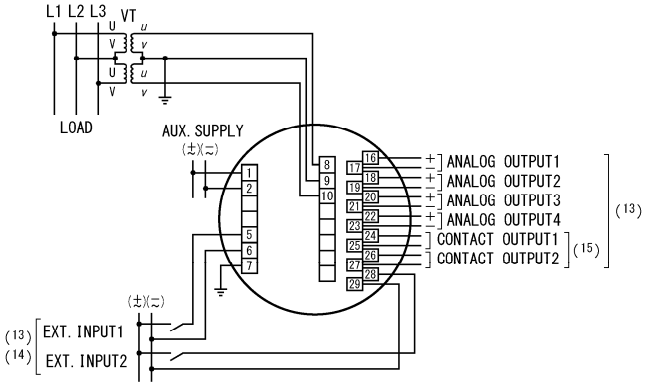
(7) Current input 1φ3W



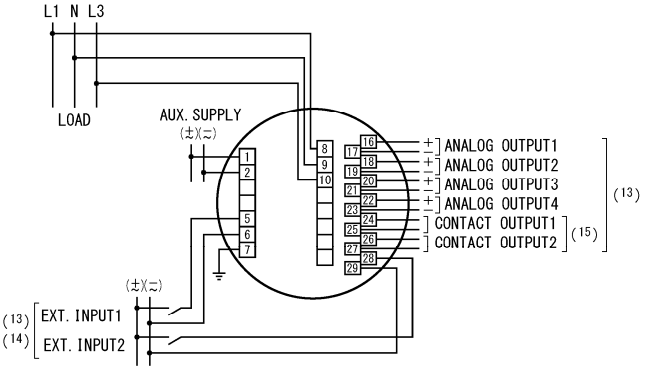
(8) Current input 1φ2W



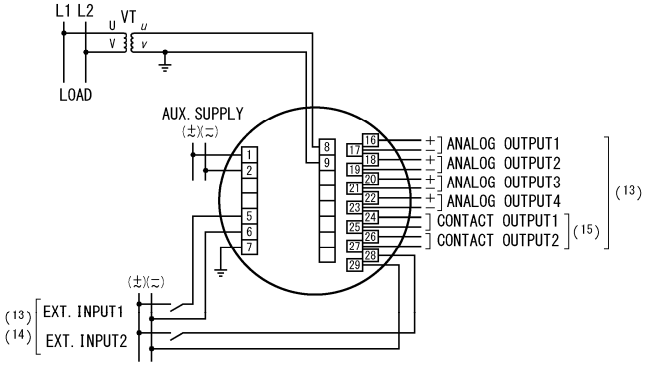
(9) Voltage input 3φ3W



(10) Voltage input 1φ3W



(11) Voltage input 1φ2W



Note(13) Analog output, contact output, external operation input is an option.

Note(14) Can change to external reset function or external display change function by setting.

Note(15) Can choose the contact output among the pulse output, the alarm output, the CPU error output. (Designation)

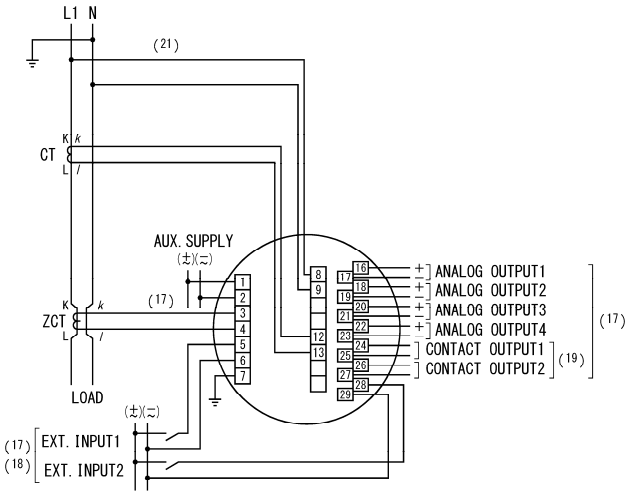
・Combination of contact output

	Contact output 1	Contact output 2
Pulse+Alarm	Pulse output	Alarm output
Alarm×2	Alarm output 1	Alarm output 2
Pulse×2	Pulse output 1	Pulse output 2
Pulse+CPU error	Pulse output	CPU error output
Alarm+CPU error	Alarm output	CPU error output

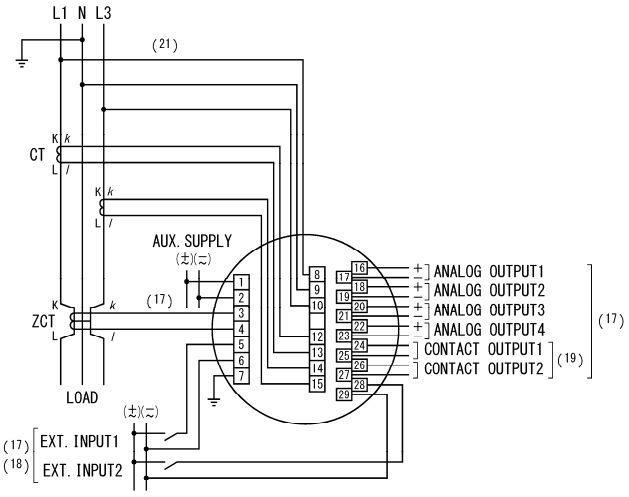
Note(16) In case of low-voltage circuit, secondary side grounding of VT and CT is unnecessary. And, VT is unnecessary in case it used direct 110V, 220V or 440V.

● Schematics in the leakage monitor of low-voltage circuit (20)(22)

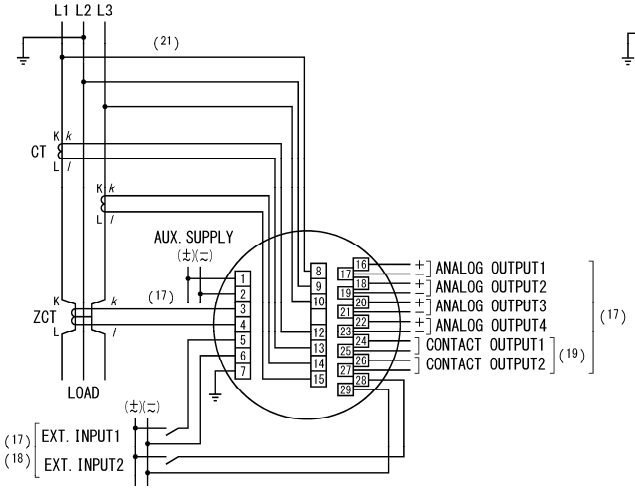
(1) 1φ2W (N-phase grounding)



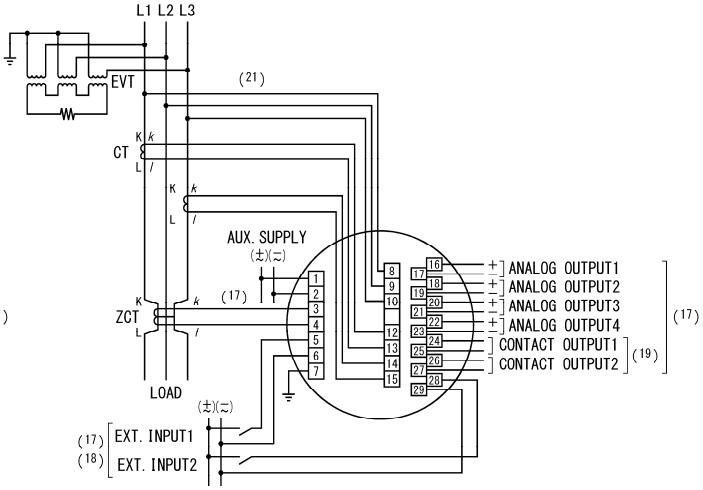
(2) 1φ3W (N-phase grounding)



(3) 3φ3W (L2-phase grounding)



(4) 3φ3W (No grounding)



Note(17) Analog output, contact output, external operation input is an option. Zero-phase current input product will be only with current leakage measurement.

Note(18) Can change to external reset function or external display change function by setting.

Note(19) Can choose the contact output among the pulse output, the alarm output, the CPU error output. (Designation)

・Combination of contact output

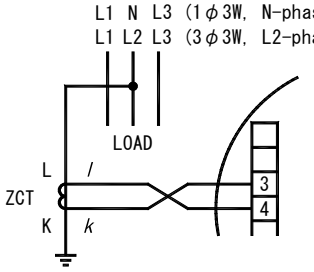
	Contact output 1	Contact output 2
Pulse＋Alarm	Pulse output	Alarm output
Alarm×2	Alarm output 1	Alarm output 2
Pulse×2	Pulse output 1	Pulse output 2
Pulse＋CPU error	Pulse output	CPU error output
Alarm＋CPU error	Alarm output	CPU error output

Note(20) In case of low-voltage circuit, secondary side grounding of VT and CT is unnecessary. And, VT is unnecessary in case it used direct 110V, 220V or 440V.

Note(21) Voltage input is needed at the time of Ior measurement in a short circuit electric current.

Note(22) A voltage input and a leakage input are not insulated. Please use it combining ZCT.

● In case of installing ZCT to ground wire by leakage monitor.



<Caution> When doing Ior measurement by a leakage monitor, please be careful about polarity of ZCT.

● Caution on connection

(1) Mount the terminal cover without fail for safety after the end of connections.

(2) Separate the input wiring and output wiring from each other without fail, and take a preventive measure against malfunction due to external noises.

(3) Connect the grounding terminal E (No. 7 terminal) to the ground without fail for enhancing the shield effect. Keep the grounding resistance between the grounding terminal and the ground to be lower than 100Ω.

(4) Keep a distance of more than 30cm between this unit and the circuit breaker as well as between this unit and the relay contact signal line.

(5) No protection is necessary for this unit even if the transmission line may be affected by an induced lightning surge or the like when transmitting an analog output to the receiver. Mount an about 500V arrester or the like between the line surge protector and the ground as well as between the transmission line and the ground on the receiver side for the purpose of protecting the devices on the receiver side.

(6) It is recommended to mount a surge killer outside when connecting an inductive load to the pulse output and alarm output. If no surge killer is mounted, the contact life may shorten.

(7) Please do not grounding the output terminal of ZCT.

(8) Please shorten wiring for this product from secondary of ZCT as much as possible. And, in case secondary wiring becomes close to other large current circuits, please use shielding wire.

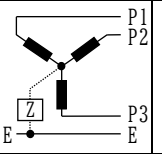
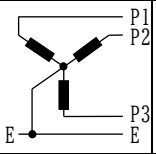
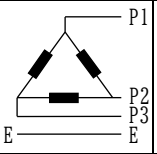
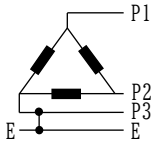
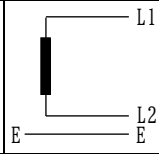
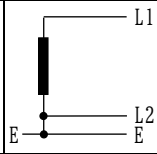
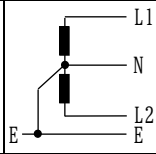
(9) In case it measures a current leakage Ior, it is necessary to measure correctly the phase angle of a voltage input and a zero-phase current input. Wiring of ZCT (primary, secondary) and wiring for this product should check schematics.

(10) This product takes in frequency from voltage input terminals 8-9 and current input terminals 12-13 and performs various measurements.
When using with no input to this terminal (less than 20% of voltage full scale, less than 10% of current full scale), set the frequency range (No. 218) according to the input frequency.
If the settings do not match, the measurement value may fluctuate or the error may become large.
Please refer to page 62 for setting instructions.

● Maximum rated voltage and VT installation

Line to neutral voltage : 150＜U≦300V (withstand voltage 2210V) maximum rated voltage

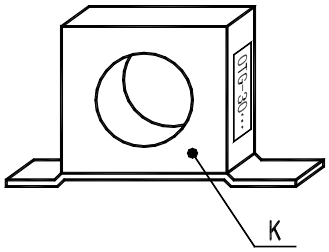
Z : High impedance ground (Normally 1500Ω)

		3φ4W (Ungrounded)	3φ4W (Grounded)	3φ3W (Ungrounded)	3φ3W (Grounded)	1φ2W (Ungrounded)	1φ2W (Grounded)	1φ3W
Wiring type								
Maximum rated voltage		277V (L-N) 480V (L-L)	277V (L-N) 480V (L-L)	480V (L-L)	220V (L-L)	480V (L-L)	220V (L-L)	220V (L-N) 440V (L-L)
VT	110/220V input	○ (Except during 200V)	○ (Except during 200V)	○ (Except during 200V)	×	○ (Except during 200V)	×	×
	440V input	×	×	×	Not applicable	×	Not applicable	Not applicable

● The distinction method of the primary side polarity of ZCT

(1) Product of OMRON Corporation

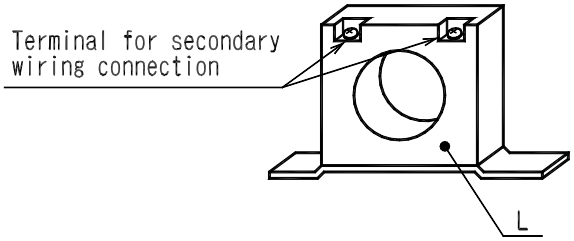
The direction (near side) which the character of the name plate can be read correctly on ZCT is "K".



(2) Product of TAIWA ELECTRIC INDUSTRIES CO.,LTD.

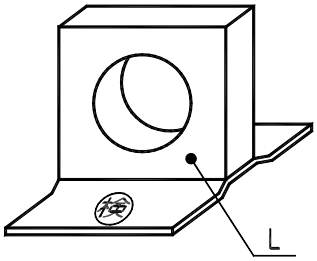
① ZB-30M, ZB-58M

A side with " **k** " and " **l** " of the terminal for secondary wiring connection is "L".



② ZB-70M

The "(検)" mark side of ZCT is "L".



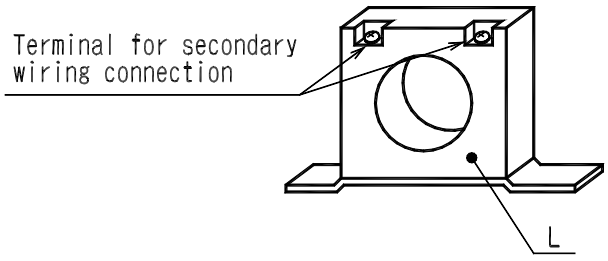
③ ZB-90M

It is printed on ZCT.

(3) Product of Hitachi, Ltd.

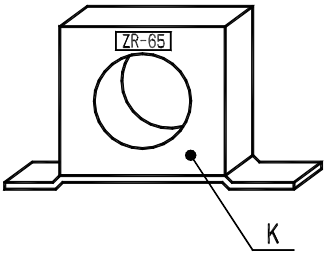
① ZR-30B, ZR-58B

A side with " **k** " and " **l** " of the terminal for secondary wiring connection is "L".



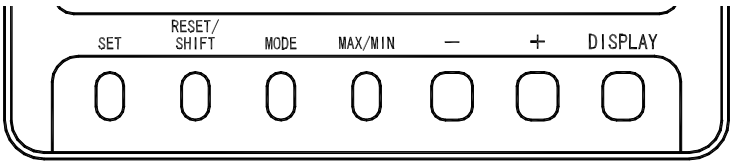
② ZR-65, ZR-80

The name plate side of ZCT is "K".



4. Operation

● The function of switch



Switch	Function
SET	The integrated value of electric energy is changed to the usual display and an enlarged display. If it continues pushing 3 seconds or more, it will change to setting mode. In setting mode, it is used for the determination of a setting value.
RESET/SHIFT	Various kinds of alarms are reset. The maximum value and the minimum value are reset in the maximum minimum measurement display. In setting mode, it is used for movement of a setting item.
MODE	The usual general measurement display and harmonic measurement (voltage, current) display are changed. In setting mode, it is used for the change of a setting item.
MAX/MIN	The usual measurement display and maximum value or minimum value display are changed.
+, −	The measurement display element of the main monitor is changed. In setting mode, it is used for change of a setting value.
DISPLAY	A phase (between lines) display of current (voltage) is changed. It is used in case it terminates setting mode. And, it is used in case it returns the display combination of a measurement element.

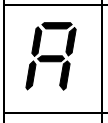
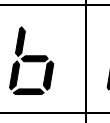
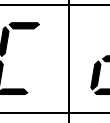
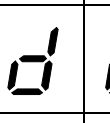
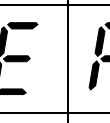
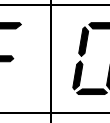
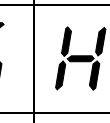
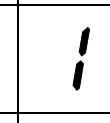
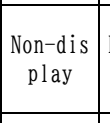
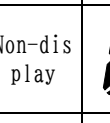
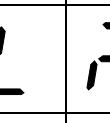
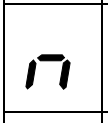
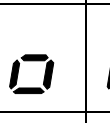
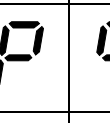
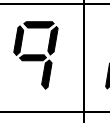
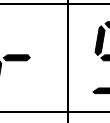
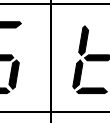
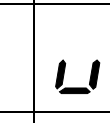
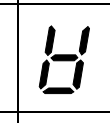
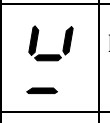
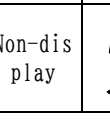
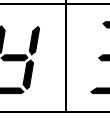
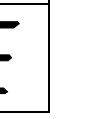
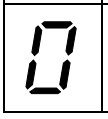
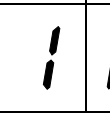
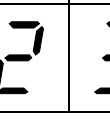
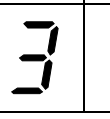
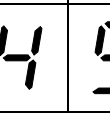
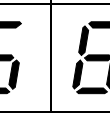
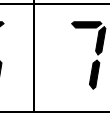
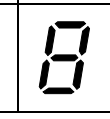
● Convenient functions

(1) In case a measurement change or a phase change is performed and the original screen composition is not clear anymore, DISPLAY is pushed for more than 3 seconds or it's no-operation for 10 minutes and returns to original screen structure.

(2) Even if it stops operation with setting mode, it returns to the display mode in 10 minutes.

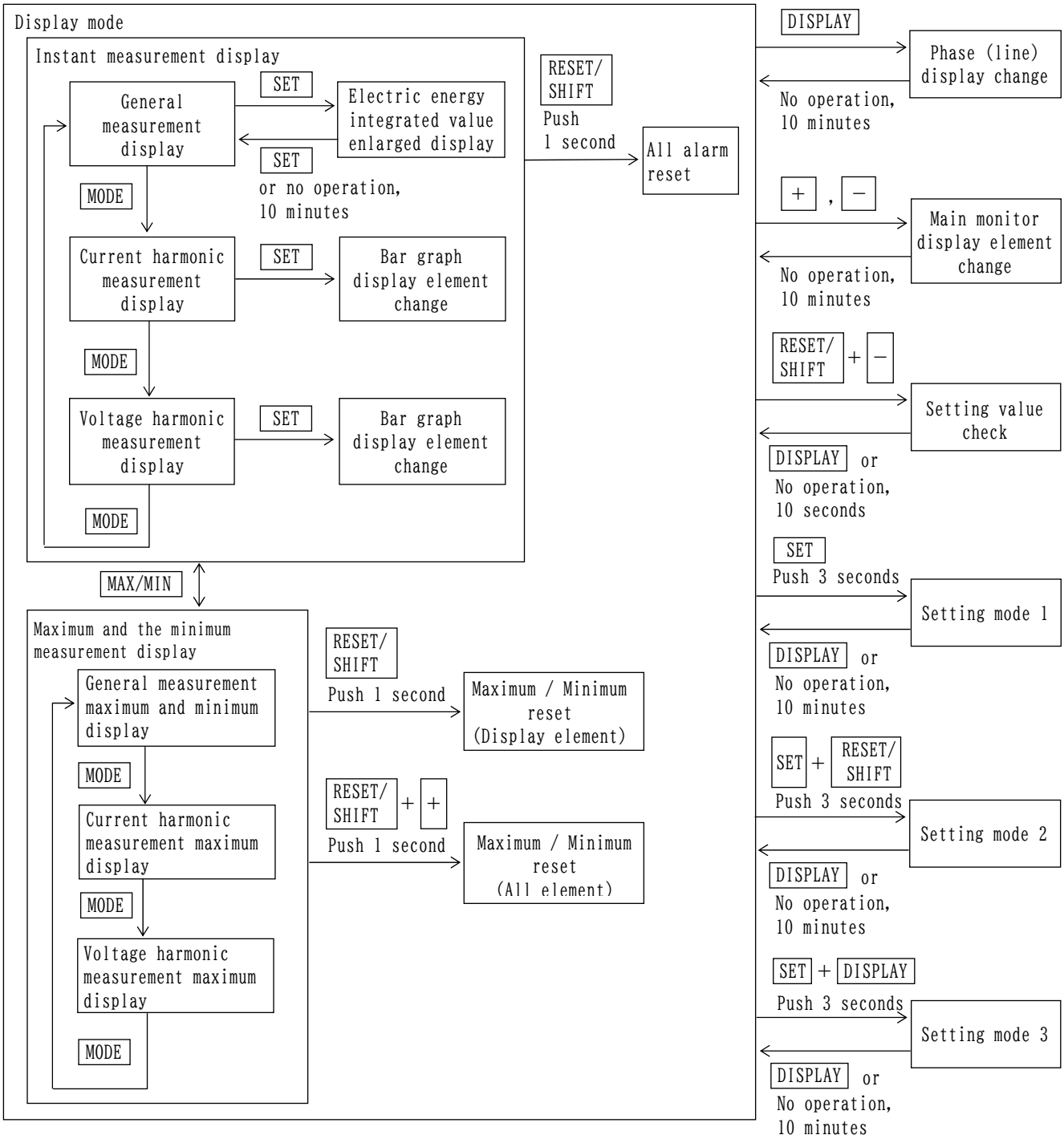
● 7 segment displays

This product shows the guidance in various setting using 7 segment displays besides a display of a measurement value. A digital readout and 7 segment displays corresponding to each alphabet are shown in the following.

A	*B(b)*	*C*	*D(d)*	*E*	*F*	*G*	*H*	*I*	*J*	*K*	*L*	*M*
									Non-display	Non-display		
N(n)	*O(o)*	*P*	*Q(q)*	*R(r)*	*S*	*T(t)*	*U(u)*	*V*	*W*	*X*	*Y(y)*	*Z*
										Non-display		
0	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*			
												

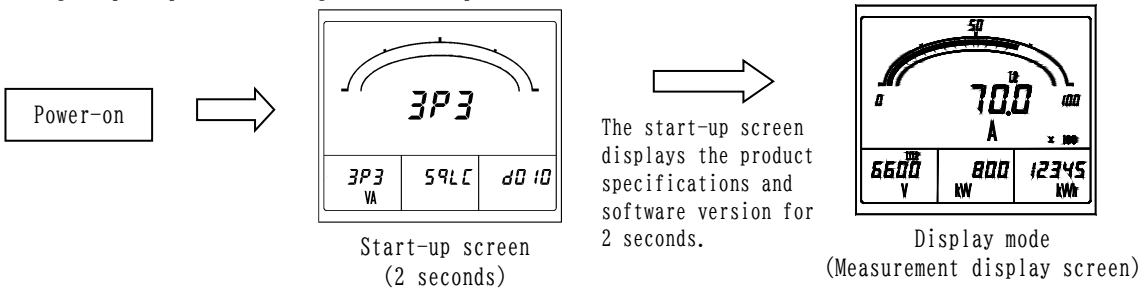
4.1 The screen change and function by switch operation

This product changes various screens by switch operation. Here, the change step of the screen by switch operation is explained.



● Operation at power-on

The start-up screen (display of product specifications and software version) is displayed for 2 seconds after the power on. After that, the display mode (measurement display screen) is automatically entered.
The maximum and minimum values for each measurement are not updated on the start-up screen.
The analog output operates during the start-up screen.

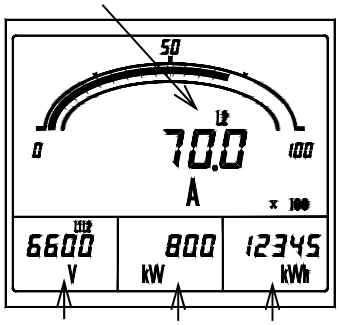


4.2 The kind of display

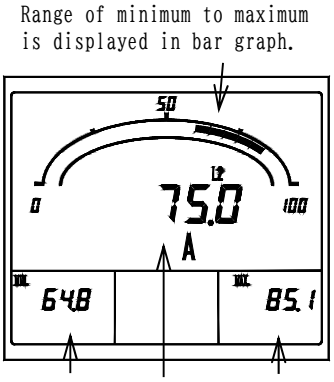
4.2.1 Measurement display

A measurement value display has the three following types of displays.
The change of the measurement display element of the main monitor by switch operation and the change of the phase / line display of current / voltage is possible (temporarily).
In a general measurement display, if switch operation is not performed for 10 minutes after changing a display element, it returns to the original measurement display element automatically.

① General measurement display
Measurement elements, such as current, voltage, and active power, are displayed.
The measurement value of four elements is displayed at the maximum.
Setting which always displays a measurement element is possible. And, it is possible to change to a display of the maximum value and the minimum value, about the measurement element which performs holding of the maximum value and the minimum value by switch operation.
These maximum values and the minimum value are reset by switch operation (it updates to the instantaneous value at the time).
In addition, as for the maximum value and the minimum value, power-supply reset is not cleared either. And, this display is held by even after 10 minutes of switch non-operation.

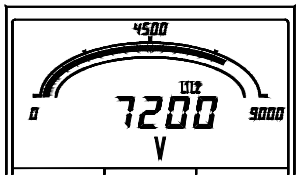
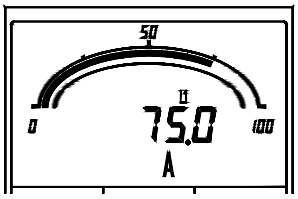
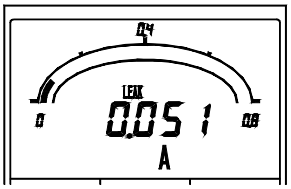
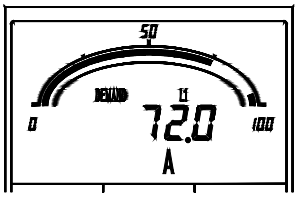
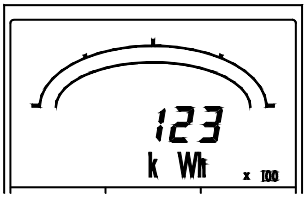
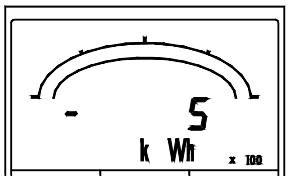
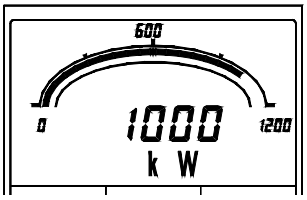
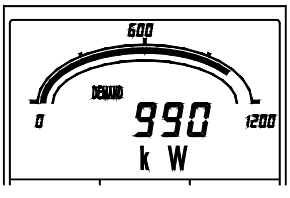


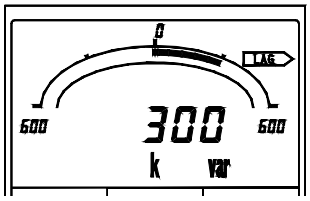
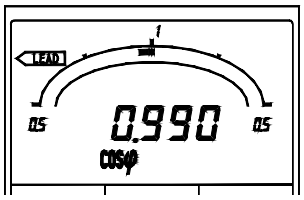
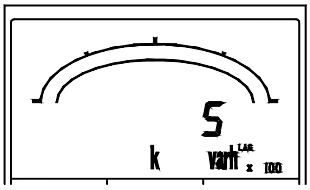
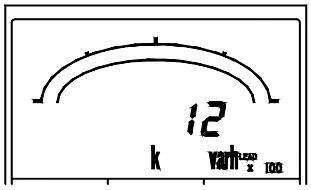
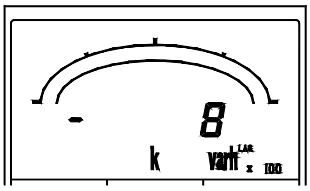
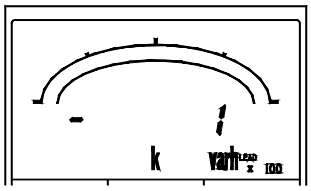
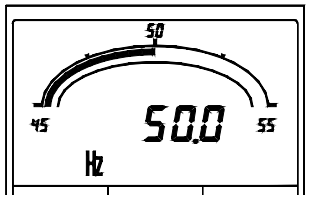
General measurement display



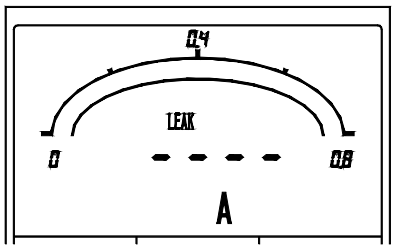
General measurement maximum and minimum display

・The example of a measurement display of each measurement element (Main monitor) ・・・ Harmonic measurement is excluded.

Measurement element	Example of display	Note	Measurement element	Example of display	Note
Voltage			Current		
Current leakage		“LEAK” display	Demand current		“DEMAND” display
Watt-hour (Power receiving)			Watt-hour (Power transmission)		“－” display
Active power			Demand active power		“DEMAND” display

Measurement element	Example of display	Note	Measurement element	Example of display	Note
Reactive power		LAG or LEAD display	Power factor		LAG or LEAD display
var-hour (Power receiving, LAG)		"LAG" display	var-hour (Power receiving, LEAD)		"LEAD" display
var-hour (Power transmission, LAG)		"LAG" and "—" display	var-hour (Power transmission, LEAD)		"LEAD" and "—" display
Frequency					

・ About a current leakage measurement display
The current leakage of this product can select a element from the next two types.
The system by which Io where an electric current for the capacity by a ground capacitance (Ic) and an electric current for the resistance by insulation degradation (Ior) are synthesis is measured.
The method which measures only the resistance part current (Ior) by insulation degradation etc.
By the Ior method, a current leakage is calculated from a voltage input and a zero-phase-current input. In case of 3-phase 3-wire (1 phase grounding), in the range whose phase angle (leading-phase angle of the zero-phase current by reference voltage) of these inputs is 150 to 350° ,
it will become the outside of a measuring range and a measurement display of a zero-phase current will be "----".



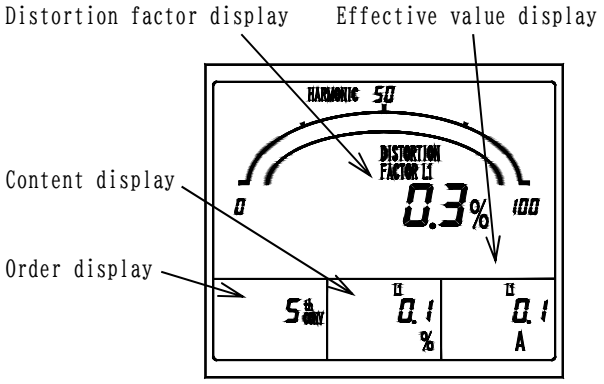
The measurement display besides an Ior measuring range

② Current harmonic measurement display
It is a measurement element display of the distortion factor of current, relative harmonic content, harmonic effective value, etc. The measurement value of three elements is displayed at the maximum.
About sub-monitor (center) and sub-monitor (right), it is possible to change to the element that always indicates by measurement. And, it is possible to change to a display of the maximum value by switch operation.
These maximum values can be reset by switch operation (it updates to the instantaneous value at the time).
In addition, as for the maximum value, even power-supply reset is not cleared. And, a display is held, even after elapsing for 10 minutes without operating a switch.

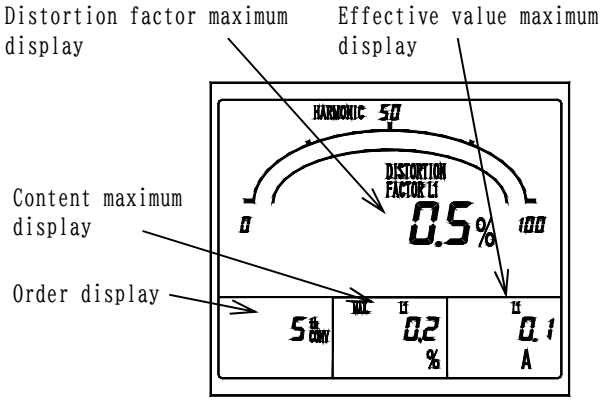
Measurement display element)
Main monitor : Distortion factor
Sub-monitor (Left) : 5th conversion or harmonic order (n)
Sub-monitor (Center) : Harmonic 5th conversion content or harmonic nth content (n=3,4,5,7,9,11,13,15)
Sub-monitor (Right) : Fundamental-wave effective value , 5th harmonic conversion effective value or harmonic nth effective value (n=3,4,5,7,9,11,13,15)

③ Voltage harmonic measurement display

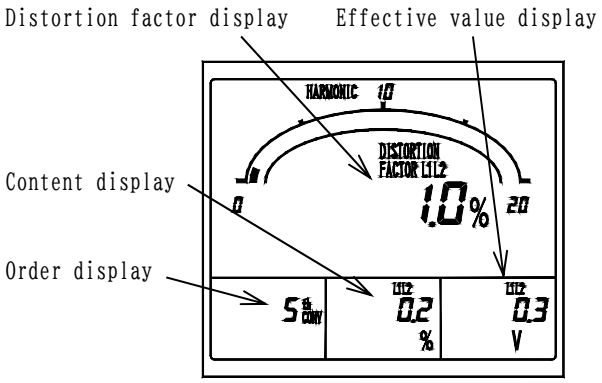
Measurement element display of the distortion factor of voltage, relative harmonic content, harmonic effective value, etc.. About a function, it is the same as a current harmonic measurement display.



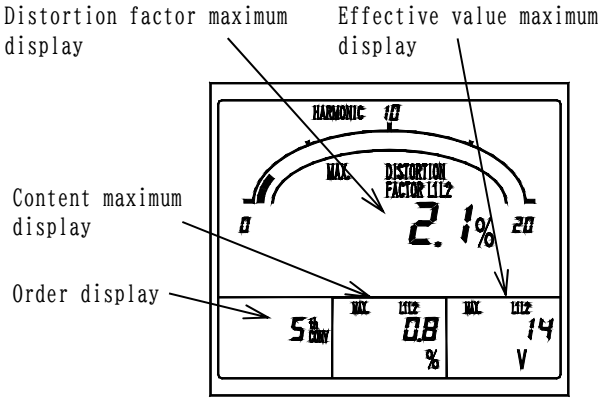
Current harmonic measurement display.



Current harmonic measurement maximum display.



Voltage harmonic measurement display.

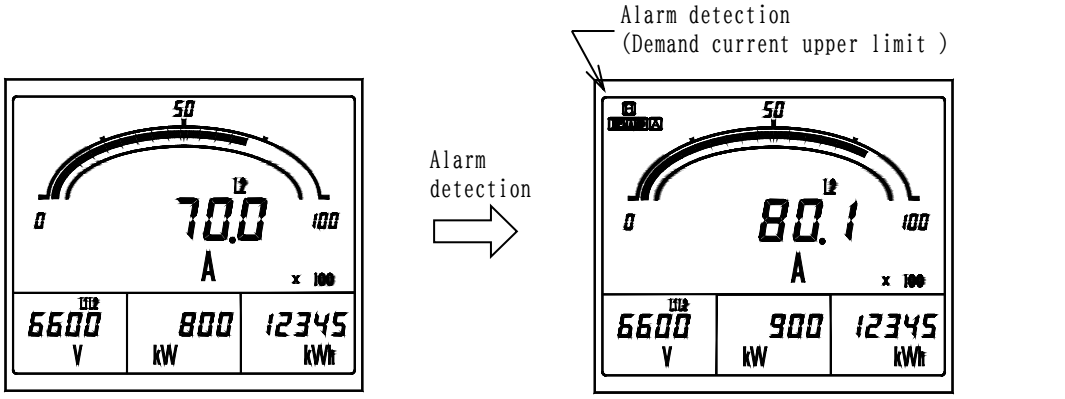


Voltage harmonic measurement maximum display.

4.2.2 Alarm detection display

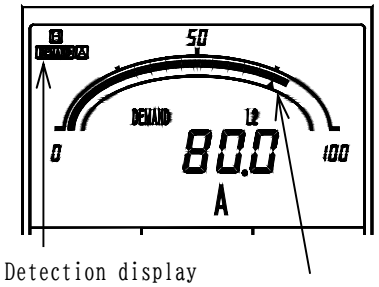
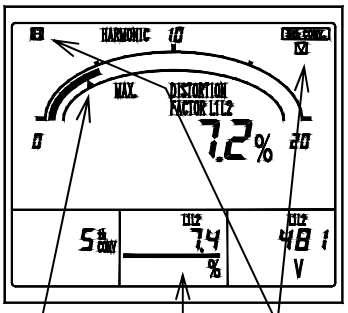
The alarm value setting is a possible measurement element (demand current and harmonic, etc.), it displays in case an input exceeds a setting value.
Besides the usual measurement display, the detected element is displayed on a screen upper case.
In addition, in case setting OFF (not use) as measurement element, it does not detect.
And in the case of with an alarm output option, it is possible to do an alarm output (relay make contact) to the outside simultaneously with a screen display.

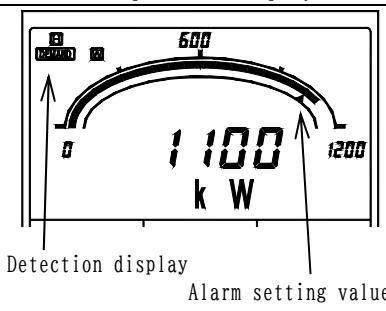
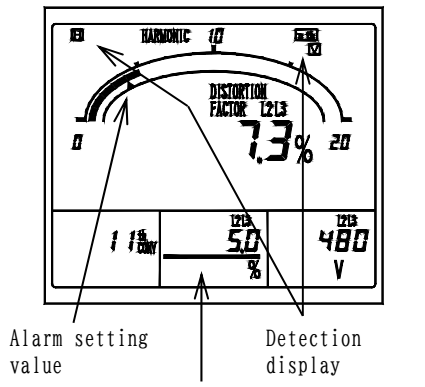
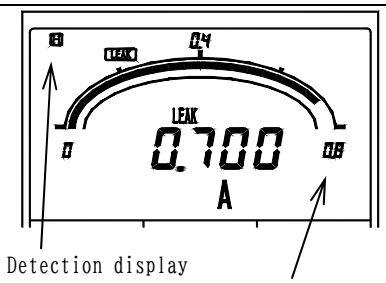
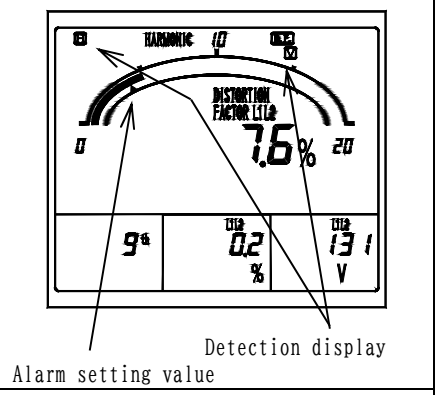
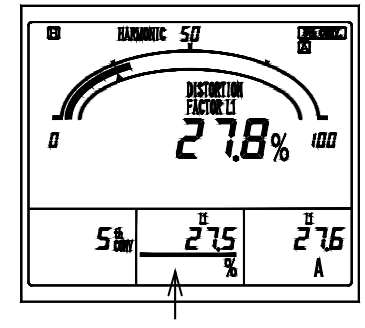
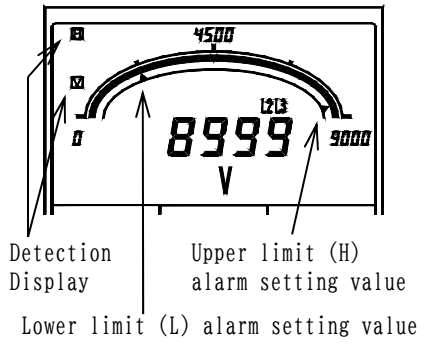
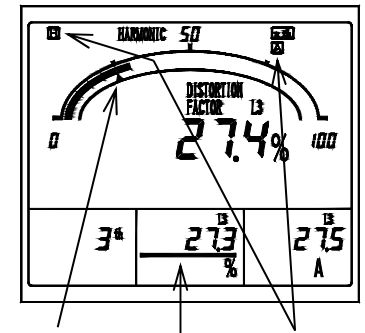
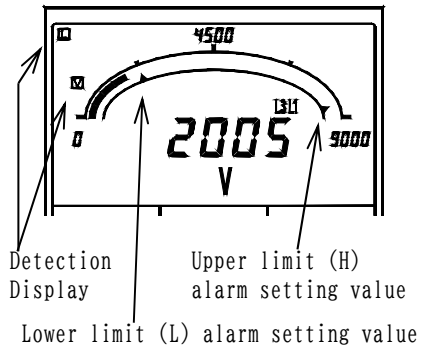
Alarm display possible factor) Demand current, Demand active power, Harmonic distortion factor (current, voltage),
Harmonic 5th conversion content (current, voltage),
Harmonic nth content (current, voltage n=3, 4, 5, 7, 9, 11, 13, 15),
Voltage, Current leakage

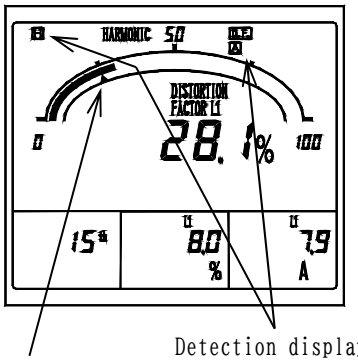


General measurement display. General measurement display (Alarm detection)

・The example of a display at the case of the detection in each alarm element.
In case the alarm element is indicating by measurement at the main monitor or the sub-monitor, a measurement value constitutes a blinking display.
The displays after an alarm return.
In case a return method is automatic reset setting : It returns to the usual measurement display.
In case a return method is manual reset setting
: A detection display and an alarm output hold (in case setting as an alarm output of applicable element).
The return in this case needs alarm reset operation. Please refer to "4.3.7 Reset" about alarm reset.

Alarm element		Example of a display	Alarm element		Example of a display
Demand current	Upper limit (H)	 Detection display Alarm setting value	Voltage harmonic 5th conversion content	Upper limit (H)	 Alarm setting Value Detection display Setting as 5th conversion content of bar graph (It distinguishes in an underbar)

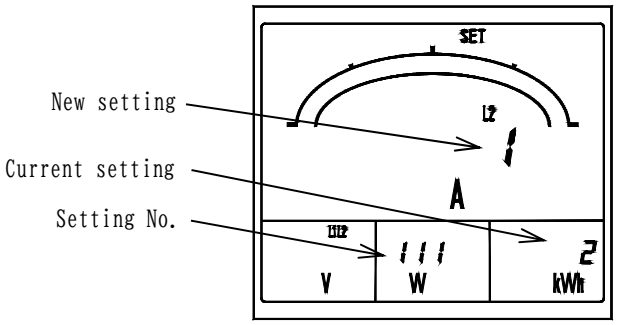
<table>
<tr><th colspan="2">Alarm element</th><th>Example of a display</th><th colspan="2">Alarm element</th><th>Example of a display</th></tr>
<tr>
<td>Demand active power</td>
<td>Upper limit (H)</td>
<td> 
</td>
<td>Voltage harmonic nth content</td>
<td>Upper limit (H)</td>
<td> 
</td>
</tr>
<tr>
<td>Current leakage</td>
<td>Upper limit (H)</td>
<td> 
</td>
<td>Voltage distortion factor</td>
<td>Upper limit (H)</td>
<td> 
</td>
</tr>
<tr>
<td>Current harmonic 5th conversion content</td>
<td>Upper limit (H)</td>
<td> 
</td>
<td>Voltage</td>
<td>Upper limit (H)</td>
<td> 
</td>
</tr>
<tr>
<td>Current harmonic nth content</td>
<td>Upper limit (H)</td>
<td> 
</td>
<td>Voltage</td>
<td>Lower limit (L)</td>
<td> 
</td>
</tr>
</table>

Alarm element		Example of a display
Current distortion factor	Upper limit (H)	

4.2.3 Setting display

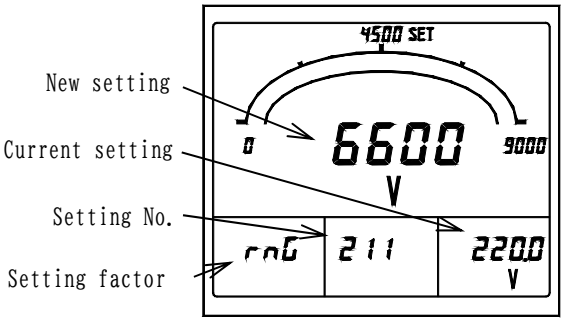
The display of various setting. There are three types of setting modes according to the contents of a setting. Refer to "5. Setting" for the operation in setting mode, and the detailed contents of a setting.

① Setting mode 1
Setting of a measurement display element, an alarm output, and an alarm value is mainly performed.
And, an alarm output can be tested in this setting mode.



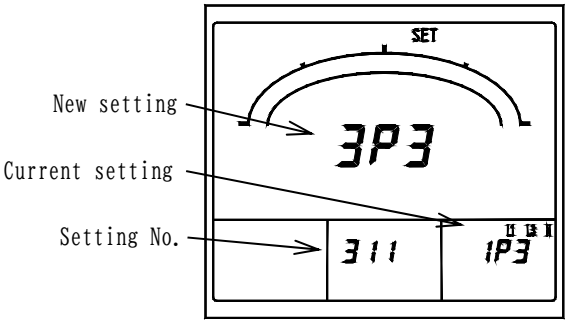
Setting mode 1 (No.111 Display pattern)

② Setting mode 2
Setting of measurement range, analog output, pulse output, and measurement display ON/OFF is mainly performed.
And, initialization of a setting value and reset of watt-hour integrated value can be performed in this setting mode.



Setting mode 2 (No.211 Voltage range)

③ Setting mode 3
Setting of an input circuit and tidal current measurement is mainly performed.
And, analog output can be adjusted in this setting mode.

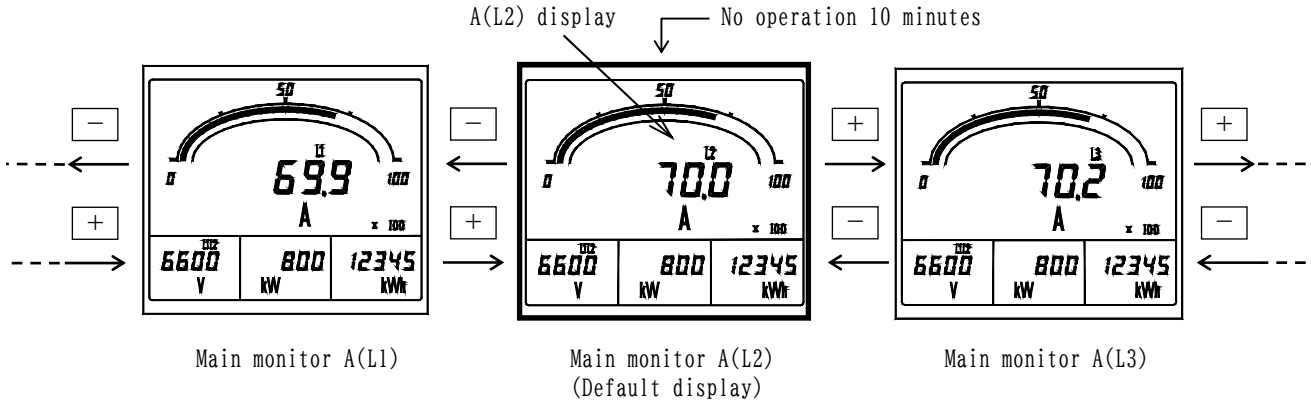


Setting mode 3
(No.311 Input circuit phase line change)

4.3 Operation

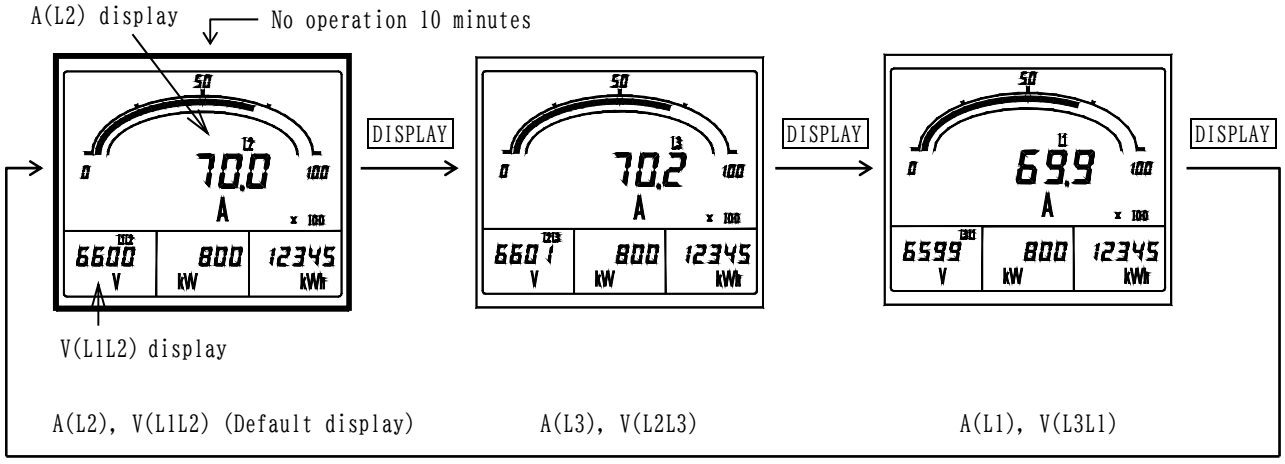
4.3.1 The main monitor display element change

The measurement display element of the main monitor is changed. A change is performed by [+] [−].
In addition to general measurement display, this operation can be performed also (harmonic measurement display, maximum display and minimum display). However, in a harmonic measurement display, a sub-monitor changes with a harmonic order. (The main monitor is distortion-factor fixation.)
After changing a measurement display element, if a switch is not operated for 10 minutes, it will return to the original measurement display element automatically.
In a harmonic measurement display and maximum display and minimum display, even if a switch is not operated for 10 minutes, it does not return to the original display.
Setting can perform same operation in external operation input. Please refer to "5.3.2 Setting mode 2, (4) external operation input setting" about the setting method. Please refer to "6.3 Option specification" about external operation input.



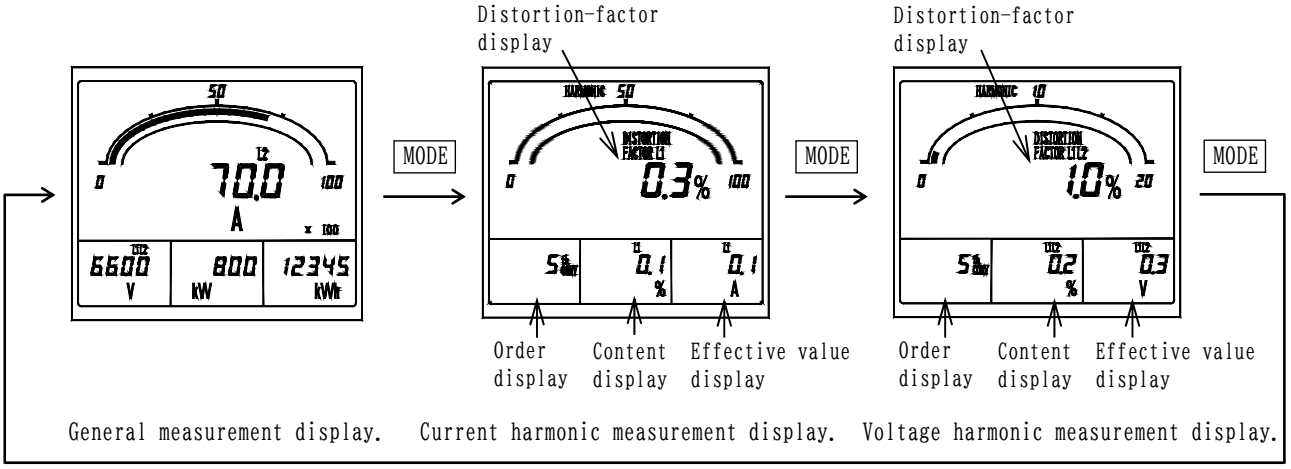
4.3.2 Phase (line) display change

A phase (line) display of current or voltage is changed. (Everything which is being indicated)
A change is performed by [DISPLAY]. This operation can be performed also except a general measurement display (harmonic measurement display, maximum display and minimum display).
In addition, after changing a phase (line) display, if a switch is not operated for 10 minutes, it will return to the original phase (line) display automatically.
In a harmonic measurement display and maximum display and minimum display, even if a switch is not operated for 10 minutes, it does not return to the original display.
Setting can perform same operation in external operation input. Please refer to "5.3.2 Setting mode 2, (4) external operation input setting" about the setting method. Please refer to "6.3 Option specification" about external operation input.



4.3.3 Harmonic measurement display change

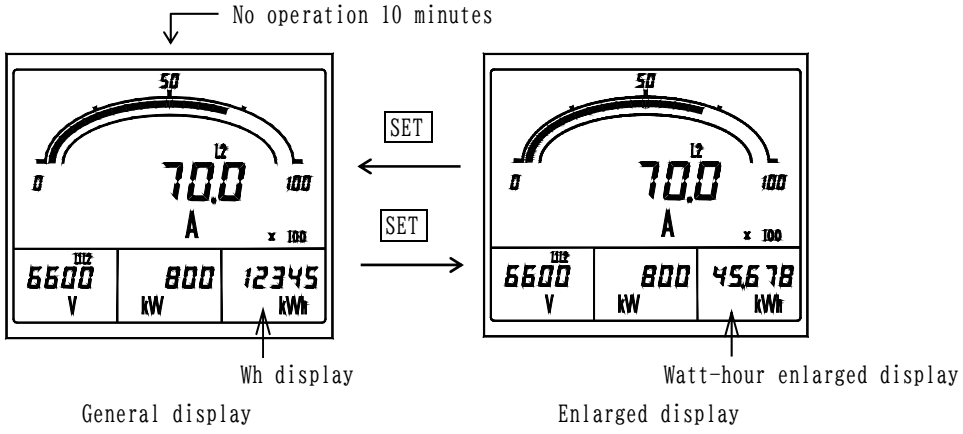
A general measurement display and a harmonic measurement display are changed. A change is performed by MODE.
Whenever it pushes a switch, it changes (General measurement display → Current harmonic measurement display → Voltage harmonic measurement display → General measurement display).
This operation can also perform the maximum display and minimum display.
In that case, it changes in order of general measurement maximum and the minimum display → Current harmonic measurement maximum display → Voltage harmonic measurement maximum display → General measurement maximum and the minimum display.
In addition, about this operation, even if it does not do switch operation for 10 minutes, it does not return to the original display.



4.3.4 Watt-hour enlarged display

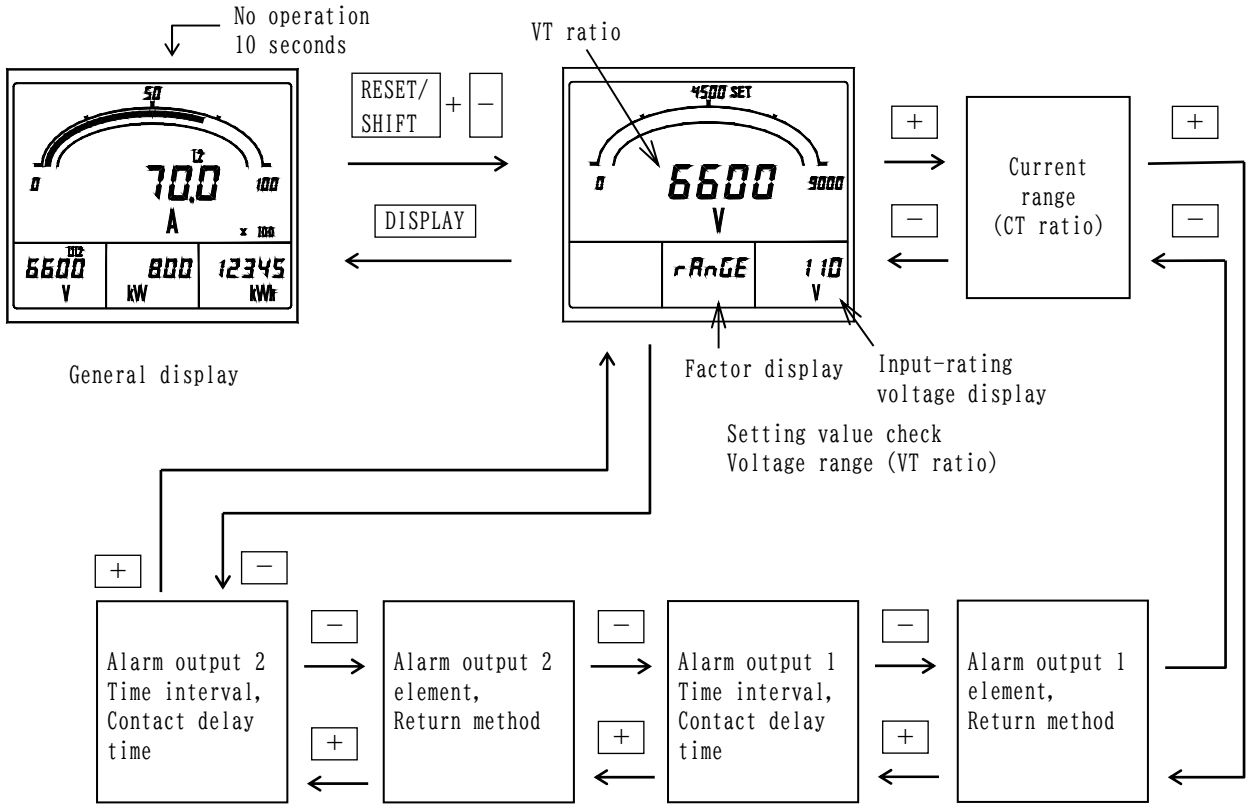
In case electric energy is being displayed by the general measurement display, an electric-energy display is usually changed to a display (5 digits of integers), and an enlarged display (2 digits integer + 3 decimal places).
A change is performed by SET.
After an enlarged display, if a switch is not operated for 10 minutes, it returns to the usual display automatically.

<Caution > If it continues pushing SET 3 seconds or more, it will become the setting mode 1. (An electric-energy display does not change)



4.3.5 Setting value check

A voltage range (VT ratio), a current range (CT ratio), and an alarm output setting value are checked.
Check by [RESET/SHIFT] and [−] pushed simultaneously.
The change of a setting value is carries out by [+] and [−].
In addition to general measurement display, this operation can be performed also (harmonic measurement display, maximum display and minimum display). [DISPLAY] is pushed to return to the original measurement display.
And, if a switch is not operated for 10 seconds after a setting value check, it will return to the original measurement display automatically.

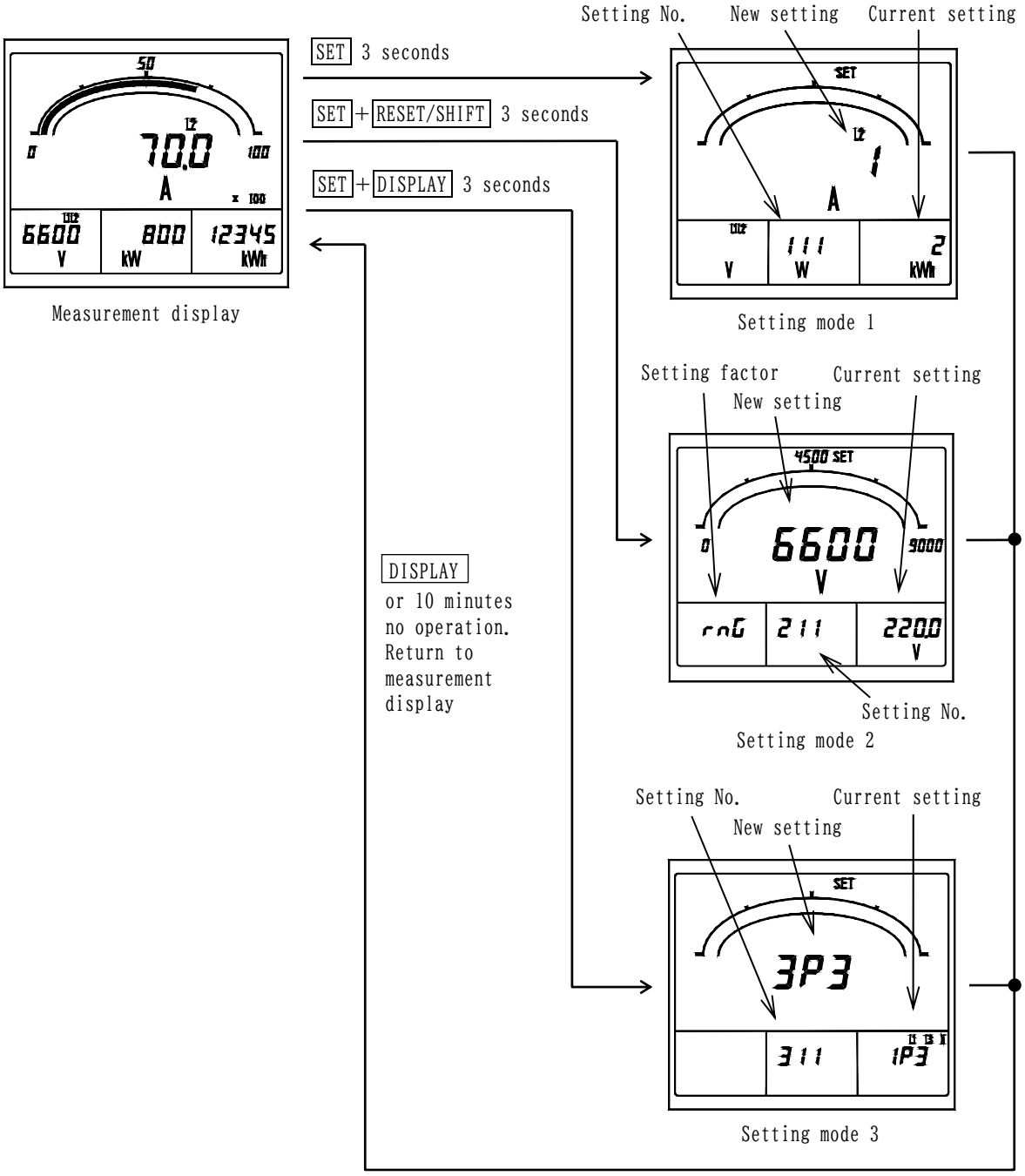


4.3.6 Setting mode

Various kinds of setting are performed. Setting mode is three types, and operations are different.
DISPLAY is pushed to return to the original measurement display. And, if a switch is not operated for 10 minutes after a setting value check, it will return to the original measurement display automatically.
Operation and the contents of setting (detail) in setting mode, please refer to "5 Setting".

- Setting mode 1 : Press SET for longer than 3 seconds.
- Setting mode 2 : Press SET and RESET/SHIFT together for longer than 3 seconds.
- Setting mode 3 : Press SET and DISPLAY together for longer than 3 seconds.

<Reference> In addition to general measurement display, this operation can be performed also (harmonic measurement display, maximum display and minimum display).



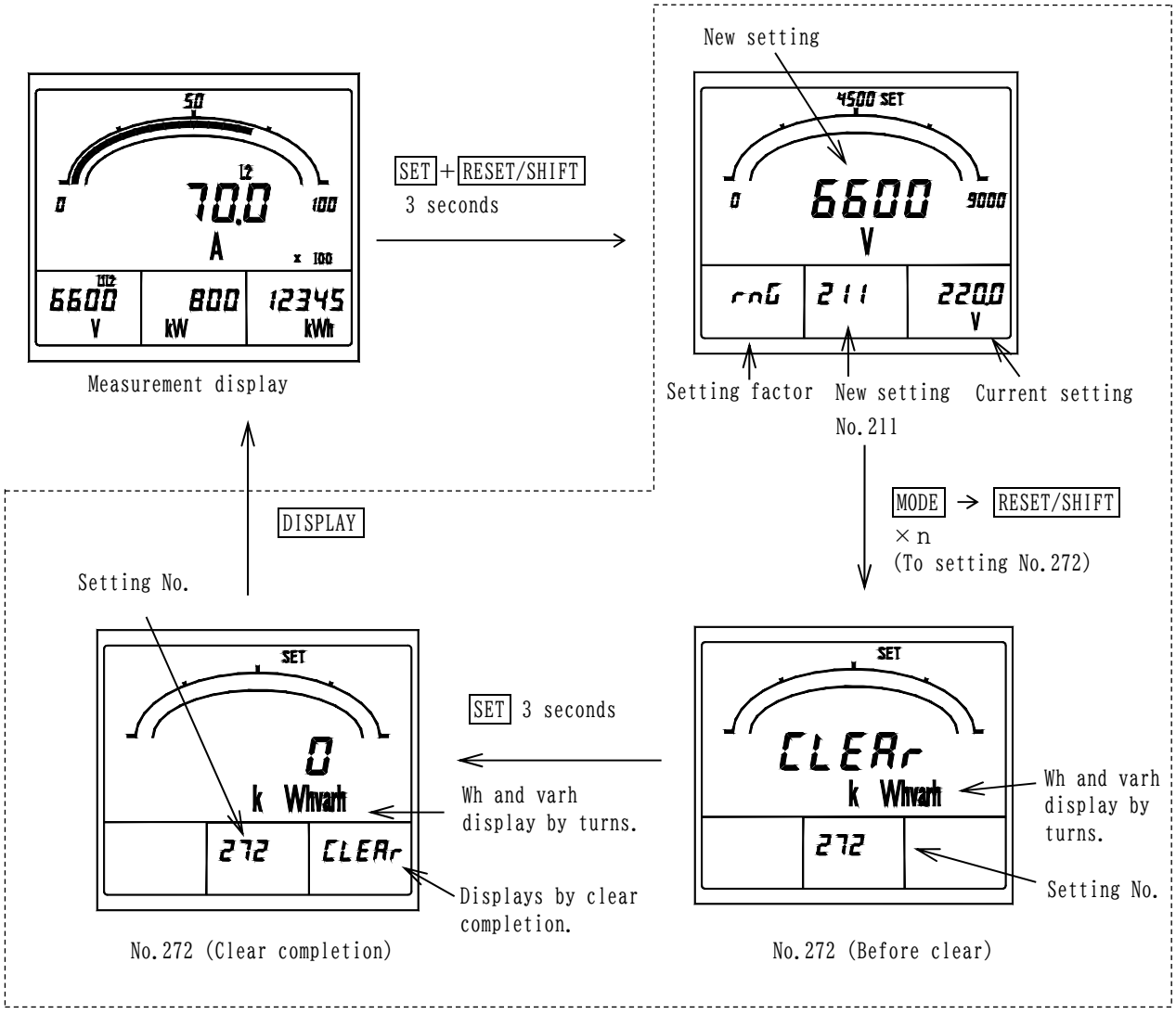
4.3.7 Reset

Various kinds of reset are performed. The kind of reset is as follows and operations are different, respectively.
Reset of watt-hour integrated value (zero clear),
Reset of maximum value and minimum value (it updates to the instantaneous value at the time),
Alarm output reset (OFF of an alarm output (at the case of manual reset setting)).
And, the operation from each measurement display constitutes conditions at each reset.

(1) Watt-hour integrated value reset

The integrated value of various watt-hour resets simultaneously. Watt-hour reset is performed in the setting mode 2. In detail explanation in the setting mode 2, please refer to "5.3.2 Setting mode 2".

① Press [SET] and [RESET/SHIFT] together for longer than 3 seconds. Migrate to the setting mode 2.
② [MODE] is pushed until setting is set to No.271. Further [RESET/SHIFT] is pushed once and it is made a watt-hour-reset display.
③ Press [SET] for longer than 3 seconds.
④ [DISPLAY] is pushed and it returns to a measurement display.

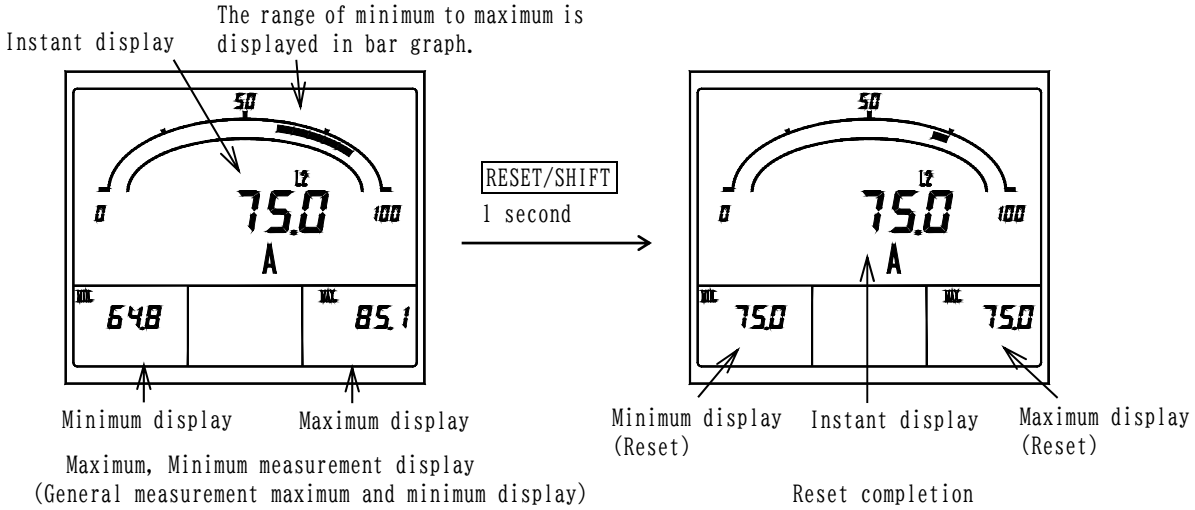


Setting mode 2

(2) Reset of maximum value and minimum value
Reset of the various measurement values of maximum value and minimum value is performed.
This reset has two types of methods. (How to perform according to a measurement element individual.
How to reset all maximum values and minimum values simultaneously.)

a) Individual reset
Reset of only a certain differential maximum value or the minimum value is performed.
Other maximum values and minimum values are not reset by this operation.
① A measurement element to reset is displayed. (General measurement maximum value, minimum value, or Current, voltage harmonic measurement maximum display)
② Press [RESET/SHIFT] for longer than 1 second.

<Caution> An alarm output will be reset if this operation is performed by instant measurement display. Please be sure to perform this operation after displaying the maximum value and a minimum value measurement element to make it reset.

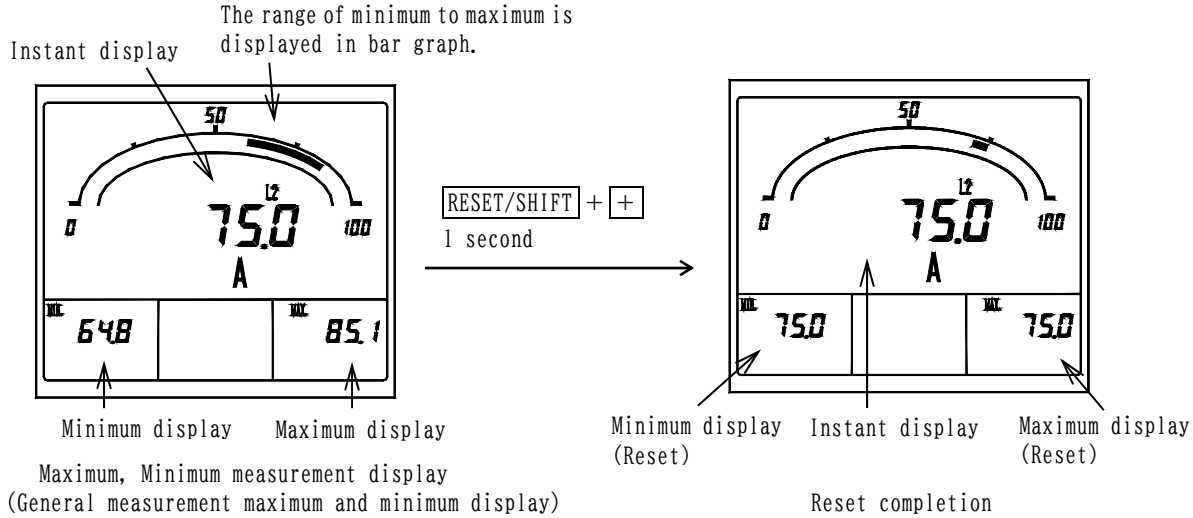


Maximum, Minimum measurement display
(General measurement maximum and minimum display)

Reset completion

b) Simultaneously reset
Reset of all the maximum values and minimum value is performed.
In addition, setting can perform same operation in external operation input.
Please refer to "5.3.2 Setting mode 2 (4) external operation input setting" for the setting method,
Please refer to "6.3 Option" for the external operation input,

① Press [RESET/SHIFT] and [+] together for longer than 1 second. By the maximum and the minimum measurement display (The general measurement maximum and minimum display or current, voltage harmonic measurement maximum display).



Maximum, Minimum measurement display
(General measurement maximum and minimum display)

Reset completion

<Caution> In the general measurement maximum and minimum value reset, all the elements of general measurement are reset by simultaneously. (The harmonic measurement maximum value is not reset.)
By harmonic measurement maximum value reset, a current element and a voltage element are reset by simultaneously. (The general measurement maximum value and the minimum value are not reset.)

(3) Alarm reset

In case an alarm return method is set to “HOLD (manual return)”, an alarm output is reset (output OFF). (With an alarm output option)

However, an output is not turned off by this operation, in case an alarm continues and it has caused.

And, this operation is unnecessary in case setting as ”AUTO (automatic return)” in alarm return method. (By which an output is also OFF according to an alarm return.)

In case the number of alarm outputs is two, both outputs are reset (output OFF) by this operation. (Return operation separately cannot be performed.)

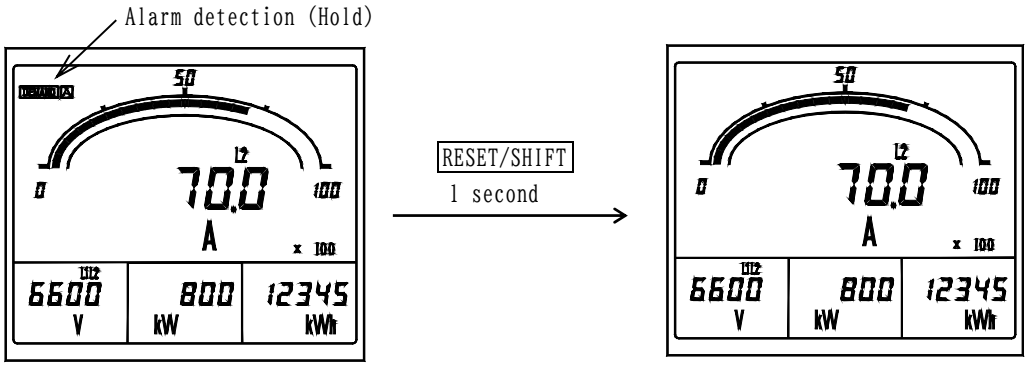
In addition, setting can perform same operation in external operation input.

Please refer to ”5.3.2 Setting mode 2 (4) external operation input setting” for the setting method,

Please refer to ”6.3 Option” for the external operation input,

① By instant measurement display (a general measurement display or current, voltage harmonic measurement display), RESET/SHIFT is pushed 1 second or more.

<Caution> If this operation is performed by the maximum and the minimum measurement display, the maximum value and minimum value of the measurement element currently displayed will be reset.
Please be sure to perform this operation in the state of an instant measurement display.



Instant measurement display
(General measurement display)

Reset completion

5. Setting

< Caution >

When changing the input circuit setting, please be sure to perform a setup from an input circuit setting in the setting mode 3. After changing the other setting, when the input circuit setting is changed the set value returns to default value (default value of a changed input circuit).

5.1 Function table

This product has each function setting with a front switch.

<Caution> In case the input circuit is not designated at the case of an order, it is shipping in the default value of 3-phase 3-wire.

Setting mode 1. Function table (1)

Setting No.	Function	Functional description	Current input	Voltage input	Default setting	Important setting	Page
111	Display pattern	Set the display combination pattern of the digital 4 displays and bar graph display.	○	○	Pattern 1	○	46 to 50
112	Main monitor	Set the display element of digital main monitor.	○	○	3φ3W A(L2) 1φ3W A(L1) 1φ2W A	○	46 to 50
113	Sub-monitor (Left)	Set the display element of digital sub-monitor (left).	○	○	3φ3W V(L1L2) 1φ3W V(L1N) 1φ2W V	○	46 to 50
114	Sub-monitor (Center)	Set the display element of digital sub-monitor (center).	○	○	W	○	46 to 50
115	Sub-monitor (Right)	Set the display element of digital sub-monitor (right).	○	○	Wh	○	46 to 50
116	Bar graph	Set the display element of bar graph.	○	○	3φ3W A(L2) 1φ3W A(L1) 1φ2W A	○	46 to 50
121AL (23)	Alarm 1 element	Set the output element of alarm 1.	○	○	DA	○	51
122AL (23)	Alarm 1 return method	Set the output action at the case of reset of alarm 1.	○	○	Automatic reset		51
123AL (23)	Alarm 1 mask time (Contact delay time)	Set the contact delay time of alarm 1.	○	○	0 second		51
124AL (23)	Alarm 1 test	Output test of alarm 1 is performed.	○	○	−		51
125AL (23)	Alarm 2 element	Set the output element of alarm 2.	○	○	DA	○	51
126AL (23)	Alarm 2 return method	Set the output action at the case of reset of alarm 2.	○	○	Automatic reset		51
127AL (23)	Alarm 2 mask time (Contact delay time)	Set the contact delay time of alarm 2.	○	○	0 second		51
128AL (23)	Alarm 2 test	Output test of alarm 2 is performed.	○	○	−		51
131H	Demand current upper limit	Sets the high alarm value of demand current.	○		80% (Full scale =100%)		52,53
132	Demand current time interval	Set time interval of demand current.	○		0 second	○	52,53
133H	Demand active power upper limit	Set the high alarm value of demand active power.			OFF (No operation)		52,53

Note(23) A setting item is not displayed in case there is no corresponding option.

Setting mode 1. Function table (2)

Setting No.	Function	Functional description	Current input	Voltage input	Default setting	Important setting	Page
134	Demand active power time interval	Set the time interval of demand active power.			0 second	○	52,53
135	Demand active power operating method	Set the operating method of demand active power.			Operating system according with bimetallic type.	○	52,53
136	Power factor operating method	Set the operating method of power factor measurement.			Instant measurement		52,53
141H	Current distortion factor upper limit	Set the high alarm value of current distortion factor.	○		OFF (No operation)		53,54
142H	Current 5th conversion content upper limit	Set the high alarm value of current 5th conversion content.	○		OFF (No operation)		53,54
143	Current n-th content factor	Set the order of n-th current content.	○		5th		53,54
144H	Current n-th content upper limit	Set the high alarm value of current n-th content.	○		OFF (No operation)		53,54
145H	Voltage distortion factor upper limit	Set this high alarm value of voltage distortion factor.		○	OFF (No operation)		53,54
146H	Voltage 5th conversion content upper limit	Set the high alarm value of voltage 5th conversion content.		○	OFF (No operation)		53,54
147	Voltage n-th content factor	Set the order of n-th voltage content.		○	5th		53,54
148H	Voltage n-th content upper limit	Set the high alarm value of voltage n-th content.		○	OFF (No operation)		53,54
149	5th conversion detection characteristics	Set the detection characteristic of 5th conversion content.	○	○	Inverse-time-delay mode		53,54
14A	Average value time interval	Set the average value detection time interval of harmonic.	○	○	0 minute		53,54
151H	Instant measurement voltage upper limit	Set the high alarm value of instant voltage.		○	OFF (No operation)		54
152L	Instant measurement voltage lower limit	Set the low alarm value of instant voltage.		○	OFF (No operation)		54
161 (24)	Leakage detection rated sensitivity current value	Set the rated sensitivity current value of current leakage.	○	○	0.1A		55
162 (24)(25)	Leakage detection element change	Set the element of the current leakage that performs leakage detection.	○	○	Io		55
163 (24)	Leakage detect circuitry change	Set the circuit configuration at the time that 3-phase 3-wire performs leakage detection.	○	○	1 phase grounding		55
164 (24)	Selection of ZCT used	Sets the ZCT used by current-leakage measurement.	○	○	TYPE 0		55
171	Backlight action	Set the ON/OFF of backlight.	○	○	AUTO OFF		56
172	Backlight brightness	Set the brightness of backlight.	○	○	3 (Middle)		56

Note(24) A setting item is not displayed in case there is no corresponding option.
Note(25) Current input product are only Io detection. Ior detection cannot be performed.

Setting mode 2. Function table (1)

Setting No.	Function	Functional description	Current input	Voltage input	Default setting		Important setting	Page
211	Voltage range	Set the voltage measurement range (VT ratio).		○	3φ3W	6600V (27)	○	58 to 62
					1φ3W	110.0V		
					1φ2W	3300V (27)		
212	Current range	Set the current measurement range (CT ratio).	○		3φ3W	100.0A	○	58 to 62
					1φ3W	500A		
					1φ2W	50.0A		
213	Current display intrinsic sensitivity	Set the full scale of current meter.	○		3φ3W	100.0A		58 to 62
					1φ3W	500A		
					1φ2W	50.0A		
214	Active power polarity	Set the swing display of active power meter.			One-side swing			58 to 62
215	Active power display intrinsic sensitivity	Set the full scale of active power meter.			3φ3W	1200kW (28)		58 to 62
					1φ3W	100.0kW		
					1φ2W	150.0kW (28)		
216	Reactive power display intrinsic sensitivity	Set the full scale of reactive power meter.			3φ3W	600kvar (28)		58 to 62
					1φ3W	50.0kvar		
					1φ2W	75.0kvar (28)		
217	Power factor range	Set the full scale of power factor meter. And, set this output range of analog output.			0.500 to 1.000 to 0.500			58 to 62
218	Frequency range	Set the full scale of frequency meter. And, set this output range of analog output.		○	45.0 to 65.0Hz			58 to 62
221A (26)	AO1 output element	Set the output element of AO1 (analog output 1).	○	○	3φ3W	A(L2)	○	63,64
					1φ3W	A(L1)		
					1φ2W	A		
222A (26)	AO2 output element	Set the output element of AO2 (analog output 2).	○	○	3φ3W	V(L1L2)	○	63,64
					1φ3W	V(L1N)		
					1φ2W	V		
223A (26)	AO3 output element	Set the output element of AO3 (analog output 3).	○	○	W		○	63,64
224A (26)	AO4 output element	Set the output element of AO4 (analog output 4).	○	○	cosφ		○	63,64
225A (26)	Current output intrinsic sensitivity	Set the analog output sensitivity (% of output for input) of current.	○		100.0%			63,64
226A (26)	Active power output intrinsic sensitivity	Set the analog output sensitivity (% of output for input) of active power.			100.0%			63,64
227A (26)	Reactive power output intrinsic sensitivity	Set the analog output sensitivity (% of output for input) of reactive power.			50.0%			63,64
228A (26)	Low input cut	Set the function which makes a lower limit the output at the case of a minute input (adequate to 0.5% or less) in analog output.	○	○	OFF (No operation)			63,64

Note(26) A setting item is not displayed in case there is no corresponding option.
Note(27) In 220V input, it becomes "220V". In 440V input, it becomes "440V".
Note(28) In 220V input, it becomes "40.0kW" and "20.00kvar" (3φ3W).
In 220V input, it becomes "10.00kW" and "5.00kvar" (1φ2W).
In 440V input, it becomes "80.0kW" and "40.0kvar" (3φ3W).
In 440V input, it becomes "20.00kW" and "10.00kvar" (1φ2W).

Setting mode 2. Function table (2)

Setting No.	Function	Functional description	Current input	Voltage input	Default setting	Important setting	Page
241P (29)	PO1 element	Set the output element of PO1 (pulse output 1).			Wh	○	64
242P (29)(30)	PO1 pulse unit	Set the output pulse unit of PO1 (pulse output 1).			3φ3W 10kWh/p 1φ3W 1φ2W 1kWh/p		64
243P (29)	PO2 element	Set the output element of PO2 (pulse output 2).			Wh	○	64
244P (29)(30)	PO2 pulse unit	Set the output pulse unit of PO2 (pulse output 2).			3φ3W 10kWh/p 1φ3W 1φ2W 1kWh/p		64
251 (29)	External operation input 1 function	Set the function of the external operation input 1.	○	○	Alarm reset	○	65
252 (29)	External operation input 2 function	Set the function of the external operation input 2.	○	○	Maximum / Minimum reset	○	65
261	Voltage ON/OFF	Set the ON/OFF of voltage measurement display.		○	ON		66
262	Current ON/OFF	Set the ON/OFF of current measurement display.	○		ON		66
263	Active power ON/OFF	Set the ON/OFF of active power measurement display.			ON		66
264	Reactive power ON/OFF	Set the ON/OFF of reactive power measurement display.			ON		66
265	Power factor ON/OFF	Set the ON/OFF of power factor measurement display.			ON		66
266	Frequency ON/OFF	Set the ON/OFF of frequency measurement display.		○	ON		66
267	Power receiving watt-hour ON/OFF	Set the ON/OFF of power receiving watt-hour measurement display.			ON		66
268	Power transmission watt-hour ON/OFF	Set the ON/OFF of power transmission watt-hour measurement display.			ON		66
269	Power receiving var-hour (LAG,LEAD) ON/OFF	Set the ON/OFF of power receiving var-hour (LAG,LEAD) measurement display.			ON		66
26A	Power transmission var-hour (LAG,LEAD) ON/OFF	Set the ON/OFF of power transmission var-hour (LAG,LEAD) measurement display.			ON		66
26B	Harmonic current ON/OFF	Set the ON/OFF of harmonic current measurement display.	○		ON		66
26C	Harmonic voltage ON/OFF	Set the ON/OFF of harmonic voltage measurement display.		○	ON		66
26D (29)	Current leakage ON/OFF	Set the ON/OFF of current-leakage measurement display.	○	○	ON		66
271	Set value initialization	All set values are initialized. (Return to default setting)	○	○	−		66
272	Watt-hour reset	Integrated value is cleared by simultaneously about each electric energy.			−		66

Note(29) A setting item is not displayed in case there is no corresponding option.
Note(30) In 220V and 440V input, it becomes "0.1kWh/p". (3φ3W、1φ2W)

Setting mode 3. Function table

Setting No.	Function	Functional description	Current input	Voltage input	Default setting		Important setting	Page
311	Input circuit phase line change	Set the input circuit or phase line.	○	○	3φ3W	3φ3W	○	68
					1φ3W	1φ3W (L1-N-L3)		
					1φ2W	1φ2W		
312	Input voltage	Set the input voltage or phase-voltage full scale. In 440V input, setting item is not displayed.		○	3φ3W	110V	○	68
					1φ3W	300V		
					1φ2W	110V		
321	Measurement dead band	Set the dead band of measurement display.	○	○	0.0%			69,70
322	Tidal current measurement	Set the general measurement or tidal current measurement which was conscious of power transmission / power receiving, in measurement of reactive power and power factor.			General measurement			69,70
331 (31)(32)	Analog output specification	Set the analog output specification.	○	○	DC1 to 5V or DC0 to 5V (Designation)			71
341 (31)	A01 BIAS adjustment	Set the BIAS value of A01 (Analog output 1).	○	○	0.0%			71
342 (31)	A01 SPAN adjustment	Set the SPAN value of A01 (Analog output 1).	○	○	100.0%			71
343 (31)	A02 BIAS adjustment	Set the BIAS value of A02 (Analog output 2).	○	○	0.0%			71
344 (31)	A02 SPAN adjustment	Set the SPAN value of A02 (Analog output 2).	○	○	100.0%			71
345 (31)	A03 BIAS adjustment	Set the BIAS value of A03 (Analog output 3).	○	○	0.0%			71
346 (31)	A03 SPAN adjustment	Set the SPAN value of A03 (Analog output 3).	○	○	100.0%			71
347 (31)	A04 BIAS adjustment	Set the BIAS value of A04 (Analog output 4).	○	○	0.0%			71
348 (31)	A04 SPAN adjustment	Set the SPAN value of A04 (Analog output 4).	○	○	100.0%			71

Note(31) A setting item is not displayed in case there is no corresponding option.
Note(32) A setting item is not displayed if analog output is not DC0 to 5V (or DC1 to 5V) specification, And analog output insulation product does not display a setting item.

5.2 Setting table

A setting item changes by the specification of a product, or the existence of an option.

(1) Important setting

Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the measurement range of voltmer (211)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → (211) Select a measurement range by [+] and [−] → Press [SET] → Selected measurement range is entered → Press [DISPLAY] → Returns to display mode.	58 to 62
Set the measurement range of ammeter (212)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [RESET/SHIFT] → (211) (212) Select a measuring range by [+] and [−] → Press [SET] → Selected measuring range is entered → Press [DISPLAY] → Returns to display mode.	58 to 62
Set the display combination (111)	Press [SET] for longer than 3 seconds → Select the display combination by [+] and [−] → (111) Press [SET] → Selected display combination is entered → Press [DISPLAY] → Returns to display mode.	46 to 50
Set the output element of analog output 1 (A01). (221A)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Select an output element by [+] and [−] → Press [SET] → Selected output element is entered → Press [DISPLAY] → Returns to display mode.	63,64
Set the output element of analog output 2 (A02). (222A)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [RESET/SHIFT] → Select an output element by [+] and [−] → Press [SET] → (222A) Selected output element is entered → Press [DISPLAY] → Returns to display mode.	63,64
Set the output element of analog output 3 (A03). (223A)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Select an output element by [+] and [−] → (222A) (223A) Press [SET] → Selected output element is entered → Press [DISPLAY] → Returns to display mode.	63,64
Set the output element of analog output 4 (A04). (224A)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (222A) (223A) (224A) Select an output element by [+] and [−] → Press [SET] → Selected output element is entered → Press [DISPLAY] → Returns to display mode.	63,64
Set the output element of pulse output 1 (P01). (241P)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [MODE] → Select an output element by [+] and [−] → Press [SET] → (241P) Selected output element is entered → Press [DISPLAY] → Returns to display mode.	64
Set the output element of pulse output 2 (P02). (243P)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [MODE] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (241P) (242P) (243P) Select an output element by [+] and [−] → Press [SET] → Selected output element is entered → Press [DISPLAY] → Returns to display mode.	64

Items	Setting and operation procedures	Page
Set the element of alarm output 1. (121AL)	Press [SET] for longer than 3 seconds → Press [MODE] → (111) (121AL) Select an output element by [+] and [−] → Press [SET] → Selected element is entered → Press [DISPLAY] → Returns to display mode.	51
Set the element of alarm output 2. (125AL)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [RESET/SHIFT] → (111) (121AL) (122AL) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (123AL) (124AL) (125AL) Select an element by [+] and [−] → Press [SET] → Selected element is entered → Press [DISPLAY] → Returns to display mode.	51
Set the external operation input 1 function. (251)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [MODE] → Press [MODE] → Select an function by [+] and [−] → Press [SET] → (241P) (251) Selected function is entered → Press [DISPLAY] → Returns to display mode.	65
Set the external operation input 2 function. (252)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [MODE] → Press [MODE] → Press [RESET/SHIFT] → Select an function by [+] and [−] → (241P) (251) (252) Press [SET] → Selected function is entered → Press [DISPLAY] → Returns to display mode.	65
Set the time interval of demand current. (132)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → (111) (121AL) (131H) Press [RESET/SHIFT] → Select an time interval by [+] and [−] → Press [SET] → (132) Selected time interval is entered → Press [DISPLAY] → Returns to display mode.	52,53
Set the time interval of demand active power. (134)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → (111) (121AL) (131H) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (132) (133H) (134) Select an time interval by [+] and [−] → Press [SET] → Selected time interval is entered → Press [DISPLAY] → Returns to display mode.	52,53
Set the operation method of demand active power. (135)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → (111) (121AL) (131H) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (132) (133H) (134) (135) Select an operation method by [+] and [−] → Press [SET] → Selected operation method is entered → Press [DISPLAY] → Returns to display mode.	52,53
Set the phase wire of input circuit. (311)	Press [SET] and [DISPLAY] together for longer than 3 seconds → (311) Select an phase wire by [+] and [−] → Press [SET] → Selected phase wire is entered → Press [DISPLAY] → Returns to display mode.	68
Set the input voltage (phase-voltage full scale). (312)	Press [SET] and [DISPLAY] together for longer than 3 seconds → Press [RESET/SHIFT] → (311) (312) Select the input voltage (phase voltage full scale for 1φ3W) with [+] and [−] → Press [SET] → Selected input voltage is entered → Press [DISPLAY] → Returns to display mode.	68

(2) A combination except a display pattern.
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the display element of main monitor. (112)	Press [SET] for longer than 3 seconds → Press [RESET/SHIFT] → (111) (112) Select an display element by [+] and [−] → Press [SET] → Selected display element is entered → Press [DISPLAY] → Returns to display mode.	46 to 50
Set the display element of sub-monitor (left). (113)	Press [SET] for longer than 3 seconds → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (111) (112) (113) Select an display element by [+] and [−] → Press [SET] → Selected display element is entered → Press [DISPLAY] → Returns to display mode.	46 to 50
Set the display element of sub-monitor (center). (114)	Press [SET] for longer than 3 seconds → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (111) (112) (113) Press [RESET/SHIFT] → Select an display element by [+] and [−] → Press [SET] → (114) Selected display element is entered → Press [DISPLAY] → Returns to display mode.	46 to 50
Set the display element of sub-monitor (right). (115)	Press [SET] for longer than 3 seconds → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (111) (112) (113) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Select an display element by [+] and [−] → (114) (115) Press [SET] → Selected display element is entered → Press [DISPLAY] → Returns to display mode.	46 to 50
Set the display element of bar graph. (116)	Press [SET] for longer than 3 seconds → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (111) (112) (113) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (114) (115) (116) Select an display element by [+] and [−](If a sub-monitor is selected, an underbar will be displayed on the bottom of a digital display.) → Press [SET] → Selected display element is entered → Press [DISPLAY] → Returns to display mode.	46 to 50

(3) Setting of active power polarity and measurement range.
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Setting of measurement range of active power. (214), (215)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [RESET/SHIFT] → (211) (212) Press [RESET/SHIFT] → Press [RESET/SHIFT] → (213) (214) Select an one-side(P)/both-side(-) deflection by [+] and [−] → Press [SET] → Selected deflection is entered → Press [RESET/SHIFT] → (215) Select a measuring range by [+] and [−] → Press [SET] → Selected measuring range is entered → Press [DISPLAY] → Returns to display mode.	58 to 62

(4) Setting of reactive power measurement range.
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Setting of measurement range of reactive power. (216)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [RESET/SHIFT] → (211) (212) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (213) (214) (215) (216) Select a measuring range by [+] and [−] → Press [SET] → Selected measuring range is entered → Press [DISPLAY] → Returns to display mode.	58 to 62

(5) Setting of Wh (varh) output pulse unit.
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the pulse unit of pulse output 1 (Po1). (242P)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [MODE] → Press [RESET/SHIFT] → Select a output pulse unit by [+] and [−] → (241P) (242P) Press [SET] → Selected output pulse unit is entered → Press [DISPLAY] → Returns to display mode.	64
Set the pulse unit of pulse output 2 (Po2). (244P)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [MODE] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (241P) (242P) (243P) (244P) Select a output pulse unit by [+] and [−] → Press [SET] → Selected output pulse unit is entered → Press [DISPLAY] → Returns to display mode.	64

(6) Setting of power factor and frequency measurement range
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the measurement range of power factor. (217)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [RESET/SHIFT] → (211) (212) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (213) (214) (215) (216) Press [RESET/SHIFT] → Select a measuring range by [+] and [−] → Press [SET] → (217) Selected measuring range is entered → Press [DISPLAY] → Returns to display mode.	58 to 62
Set the measurement range of frequency. (218)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [RESET/SHIFT] → (211) (212) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (213) (214) (215) (216) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Select a measuring range by [+] and [−] → (217) (218) Press [SET] → Selected measuring range is entered → Press [DISPLAY] → Returns to display mode.	58 to 62

(7) Setting of current display intrinsic sensitivity.
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the display sensitivity (% of a display to an input) of current. (213)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [RESET/SHIFT] → (211) (212) Press [RESET/SHIFT] → Select a display sensitivity by [+] and [−] → Press [SET] → (213) Selected display sensitivity is entered → Press [DISPLAY] → Returns to display mode.	58 to 62

(8) Setting of analog output.
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the analog output sensitivity (% of an output to an input) of current. (225A)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (222A) (223A) (224A) (225A) Select a output sensitivity by [+] and [−] → Press [SET] → Selected output sensitivity is entered → Press [DISPLAY] → Returns to display mode.	63, 64
Set the analog output sensitivity (% of an output to an input) of active power. (226A)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (222A) (223A) (224A) (225A) Press [RESET/SHIFT] → Select a output sensitivity by [+] and [−] → Press [SET] → (226A) Selected output sensitivity is entered → Press [DISPLAY] → Returns to display mode.	63, 64
Set the analog output sensitivity (% of an output to an input) of reactive power. (227A)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (222A) (223A) (224A) (225A) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Select a output sensitivity by [+] and [−] → (226A) (227A) Press [SET] → Selected output sensitivity is entered → Press [DISPLAY] → Returns to display mode.	63, 64
Set the output cut function at the case in minute input (0.5% or less). (At the case of analog output) (228A)	Press [SET] and [RESET/SHIFT] together for longer than 3 seconds → Press [MODE] → (211) (221A) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (222A) (223A) (224A) (225A) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (226A) (227A) (228A) Select a low Input cut ON/OFF by [+] and [−] → Press [SET] → Selected action is entered → Press [DISPLAY] → Returns to display mode.	63, 64

(9) Setting of alarm output.
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the return method of alarm output 1. (122AL)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [RESET/SHIFT] → (111) (121AL) (122AL) Select a return method by [+] and [−] → Press [SET] → Sselected return method is entered → Press [DISPLAY] → Returns to display mode.	51
Set the contact delay time of alarm output 1. (123AL)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [RESET/SHIFT] → (111) (121AL) (122AL) Press [RESET/SHIFT] → Select an contact delay time by [+] and [−] → Press [SET] → (123AL) Selected contact delay time is entered → Press [DISPLAY] → Returns to display mode.	51
Set the return method of alarm output 2. (126AL)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [RESET/SHIFT] → (111) (121AL) (122AL) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (123AL) (124AL) (125AL) (126AL) Select a return method by [+] and [−] → Press [SET] → Selected return method is entered → Press [DISPLAY] → Returns to display mode.	51
Set the contact delay time of alarm output 2. (127AL)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [RESET/SHIFT] → (111) (121AL) (122AL) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (123AL) (124AL) (125AL) (126AL) Press [RESET/SHIFT] → Select an contact delay time by [+] and [−] → Press [SET] → (127AL) Selected contact delay time is entered → Press [DISPLAY] → Returns to display mode.	51

(10) Demand measurement (current, active power) setting.
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the high alarm value of demand current. (131H)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → (111) (121AL) (131H) Select a high alarm value by [+] and [−] → Press [SET] → Selected high alarm value is entered → Press [DISPLAY] → Returns to display mode.	52,53
Set the high alarm value of demand active power. (133H)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → (111) (121AL) (131H) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Select a high alarm value by [+] and [−] → (132) (133H) Press [SET] → Selected high alarm value is entered → Press [DISPLAY] → Returns to display mode.	52,53
Set the operation method of power factor measurement. (136)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → (111) (121AL) (131H) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (132) (133H) (134) (135) Press [RESET/SHIFT] → Select a operation method by [+] and [−] → Press [SET] → (136) Selected operation method is entered → Press [DISPLAY] → Returns to display mode.	52,53

(11) Harmonic measurement setting

Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the high alarm value of current distortion factor. (141H)	Press [SET] for longer than 3 seconds → Press [MODE] (111) → Press [MODE] (121AL) → Press [MODE] (131H) → (141H) Select a high alarm value by [+] and [−] → Press [SET] → Selected high alarm value is entered → Press [DISPLAY] → Returns to display mode.	53,54
Set the high alarm value of 5th current conversion content. (142H)	Press [SET] for longer than 3 seconds → Press [MODE] (111) → Press [MODE] (121AL) → Press [MODE] (131H) → (141H) Press [RESET/SHIFT] (142H) → Select a high alarm value by [+] and [−] → Press [SET] → Selected high alarm value is entered → Press [DISPLAY] → Returns to display mode.	53,54
Set the order of n-th current content. (143)	Press [SET] for longer than 3 seconds → Press [MODE] (111) → Press [MODE] (121AL) → Press [MODE] (131H) → (141H) Press [RESET/SHIFT] (142H) → Press [RESET/SHIFT] (143) → Select a order by [+] and [−] → Press [SET] → Selected order is entered → Press [DISPLAY] → Returns to display mode.	53,54
Set the high alarm value of n-th current content. (144H)	Press [SET] for longer than 3 seconds → Press [MODE] (111) → Press [MODE] (121AL) → Press [MODE] (131H) → (141H) Press [RESET/SHIFT] (142H) → Press [RESET/SHIFT] (143) → Press [RESET/SHIFT] (144H) → Select a high alarm value by [+] and [−] → Press [SET] → Selected high alarm value is entered → Press [DISPLAY] → Returns to display mode.	53,54
Set the high alarm value of voltage distortion factor. (145H)	Press [SET] for longer than 3 seconds → Press [MODE] (111) → Press [MODE] (121AL) → Press [MODE] (131H) → (141H) Press [RESET/SHIFT] (142H) → Press [RESET/SHIFT] (143) → Press [RESET/SHIFT] (144H) → Press [RESET/SHIFT] (145H) → Select a high alarm value by [+] and [−] → Press [SET] → Selected high alarm value is entered → Press [DISPLAY] → Returns to display mode.	53,54
Set the high alarm value of voltage 5th conversion content. (146H)	Press [SET] for longer than 3 seconds → Press [MODE] (111) → Press [MODE] (121AL) → Press [MODE] (131H) → (141H) Press [RESET/SHIFT] (142H) → Press [RESET/SHIFT] (143) → Press [RESET/SHIFT] (144H) → Press [RESET/SHIFT] (145H) → Press [RESET/SHIFT] (146H) → Select a high alarm value by [+] and [−] → Press [SET] → Selected high alarm value is entered → Press [DISPLAY] → Returns to display mode.	53,54
Set the order of n-th voltage content. (147)	Press [SET] for longer than 3 seconds → Press [MODE] (111) → Press [MODE] (121AL) → Press [MODE] (131H) → (141H) Press [RESET/SHIFT] (142H) → Press [RESET/SHIFT] (143) → Press [RESET/SHIFT] (144H) → Press [RESET/SHIFT] (145H) → Press [RESET/SHIFT] (146H) → Press [RESET/SHIFT] (147) → Select a order by [+] and [−] → Press [SET] → Selected order is entered → Press [DISPLAY] → Returns to display mode.	53,54
Set the high alarm value of n-th voltage content. (148H)	Press [SET] for longer than 3 seconds → Press [MODE] (111) → Press [MODE] (121AL) → Press [MODE] (131H) → (141H) Press [RESET/SHIFT] (142H) → Press [RESET/SHIFT] (143) → Press [RESET/SHIFT] (144H) → Press [RESET/SHIFT] (145H) → Press [RESET/SHIFT] (146H) → Press [RESET/SHIFT] (147) → Press [RESET/SHIFT] (148H) → Select a element by [+] and [−] → Press [SET] → Selected element is entered → Press [DISPLAY] → Returns to display mode.	53,54

Items	Setting and operation procedures	Page
Set the detected characteristics of 5th conversion content. (149)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → Press [MODE] → (111) (121AL) (131H) (141H) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (142H) (143) (144H) (145H) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (146H) (147) (148H) (149) Select a detected characteristics by [+] and [−] → Press [SET] → Selected detected characteristics is entered → Press [DISPLAY] → Returns to display mode.	53,54
Set the average time interval. (14A)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → Press [MODE] → (111) (121AL) (131H) (141H) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (142H) (143) (144H) (145H) Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (146H) (147) (148H) (149) Press [RESET/SHIFT] → Select a time interval by [+] and [−] → Press [SET] → (14A) Selected time interval is entered → Press [DISPLAY] → Returns to display mode.	53,54

(12) Instant measurement setting

Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the high alarm value of instant voltage. (151H)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → Press [MODE] → (111) (121AL) (131H) (141H) Press [MODE] → Select a high alarm value by [+] and [−] → Press [SET] → (151H) Selected high alarm value is entered → Press [DISPLAY] → Returns to display mode.	54
Set the low alarm value of instant voltage. (152L)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → Press [MODE] → (111) (121AL) (131H) (141H) Press [MODE] → Press [RESET/SHIFT] → Select a low alarm value by [+] and [−] → (151H) (152L) Press [SET] → Selected low alarm value is entered → Press [DISPLAY] → Returns to display mode.	54

(13) Current-leakage measurement setting

Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the rated sensitivity current value of current leakage. (161)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → Press [MODE] → (111) (121AL) (131H) (141H) Press [MODE] → Press [MODE] → Select a rated sensitivity current by [+] and [−] → (151H) (161) Press [SET] → Selected rated sensitivity current is entered → Press [DISPLAY] → Returns to display mode.	55
Set the detected element of current leakage. (162)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → Press [MODE] → (111) (121AL) (131H) (141H) Press [MODE] → Press [MODE] → Press [RESET/SHIFT] → (151H) (161) (162) Select a detected element by [+] and [−] → Press [SET] → Selected detected element is entered → Press [DISPLAY] → Returns to display mode.	55

Items	Setting and operation procedures	Page
Set the leakage detected circuit configuration. (by 3-phase 3-wire) (163)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → Press [MODE] → (111) (121AL) (131H) (141H) Press [MODE] → Press [MODE] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (151H) (161) (162) (163) Select a circuit by [+] and [−] → Press [SET] → Selected circuit is entered → Press [DISPLAY] → Returns to display mode.	55
Set the ZCT used by current-leakage measurement. (164)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → Press [MODE] → (111) (121AL) (131H) (141H) Press [MODE] → Press [MODE] → Press [RESET/SHIFT] → Press [RESET/SHIFT] → (151H) (161) (162) (163) Press [RESET/SHIFT] → Select a ZCT type by [+] and [−] → Press [SET] → (164) Selected ZCT type is entered → Press [DISPLAY] → Returns to display mode.	55

(14) Backlight setting
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

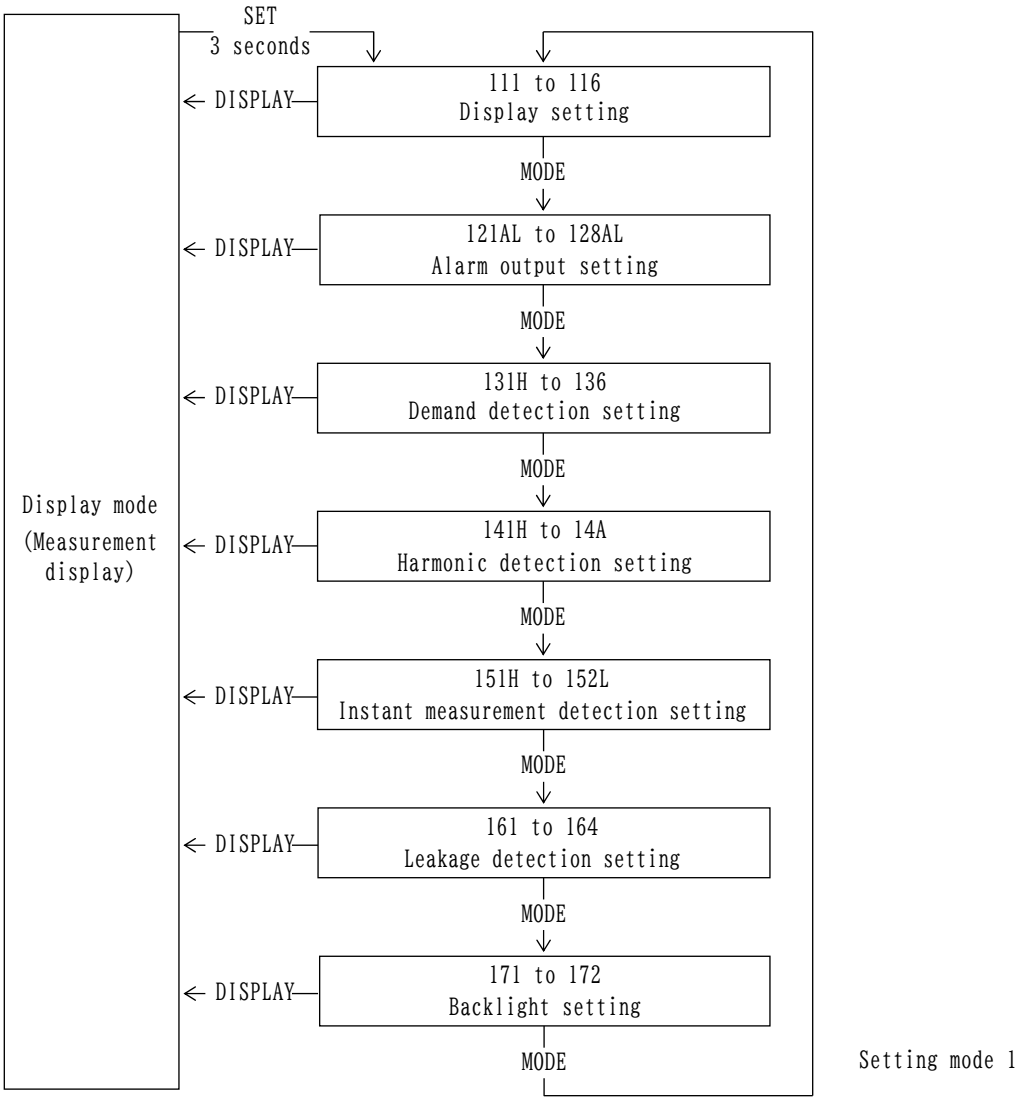
Items	Setting and operation procedures	Page
Set the action of backlight. (171)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → Press [MODE] → (111) (121AL) (131H) (141H) Press [MODE] → Press [MODE] → Press [MODE] → Select a backlight action by [+] and [−] → (151H) (161) (171) Press [SET] → Selected backlight action is entered → Press [DISPLAY] → Returns to display mode.	56
Set the brightness of backlight. (172)	Press [SET] for longer than 3 seconds → Press [MODE] → Press [MODE] → Press [MODE] → (111) (121AL) (131H) (141H) Press [MODE] → Press [MODE] → Press [MODE] → Press [RESET/SHIFT] → (151H) (161) (171) (172) Select a brightness by [+] and [−] → Press [SET] → Selected backlight brightness is entered → Press [DISPLAY] → Returns to display mode.	56

(15) Other, measurement setting
Each parenthesized number shows a setting number and this number is displayed on the setting screen.

Items	Setting and operation procedures	Page
Set the dead band of measurement display. (321)	Press [SET] and [DISPLAY] together for longer than 3 seconds → Press [MODE] → (311) (321) Select of dead band value in measurement display by [+] and [−] → Press [SET] → Value of dead band in display is entered → Press [DISPLAY] → Returns to display mode.	69,70
Set the tidal current measurement of reactive power and power factor. (322)	Press [SET] and [DISPLAY] together for longer than 3 seconds → Press [MODE] → (311) (321) Press [RESET/SHIFT] → Select a tidal current measurement ON/OFF by [+] and [−] → (322) Press [SET] → Selected action is entered → Press [DISPLAY] → Returns to display mode.	69,70

5.3 Setting in detail explanation

5.3.1 Setting mode 1



Setting mode 1 is selected by pressing SET switch for longer than 3 seconds.
Pushing MODE switch performs movement of setting item.
The present mode can be returned to the display mode by pressing DISPLAY switch.

< Caution >
If setting change should have been mistaken, an alarm output is not obtained correctly.
Therefore, users must not set. The setting item without the corresponding option is not displayed.

(1) 111 to 116 Display combination setting

● 3-phase 3-wire (Voltage, current input) (33)(34)

No.	Pattern No.	Main monitor	Sub-monitor (Left)	Sub-monitor (Center)	Sub-monitor (Right)	Bar graph
1	Pattern 1	A(L2)	V(L1L2)	W	Wh	A(L2)
2	Pattern 2	A(L2)	V(L1L2)	W	cosϕ	A(L2)
3	Pattern 3	A(L2)	V(L1L2)	W	Hz	A(L2)
4	Pattern 4	DA(L2)	A(L2)	V(L1L2)	W	DA(L2)
5	Pattern 5	DA(L2)	A(L2)	V(L1L2)	Wh	DA(L2)
6	Pattern 6	DA(L2)	V(L1L2)	W	cosϕ	DA(L2)
7	Pattern 7	W	V(L1L2)	A(L2)	Wh	W
8	Pattern 8	W	V(L1L2)	A(L2)	cosϕ	W
9	Pattern 9	W	V(L1L2)	A(L2)	Hz	W
10	Pattern 10	DW	V(L1L2)	W	Wh	DW
11	Pattern 11	DW	V(L1L2)	A(L2)	cosϕ	DW
12	Pattern 12	A(L2)	cosϕ	W	Wh	A(L2)
13	Pattern 13	A(L2)	var	W	Wh	A(L2)
14	Pattern 14	W	cosϕ	var	Wh	W
15	Pattern 15	A(L2)	A(L1)	A(L3)	Wh	A(L2)
16	Pattern 16	V(L1L2)	V(L2L3)	V(L3L1)	Hz	V(L1L2)
17	Pattern 17	A(L1)	Io/Ior (35)	V(L1L2)	W	A(L1)
18	Pattern 18	A(L1)	Io/Ior (35)	V(L1L2)	Wh	A(L1)

Note(33) Voltage input is pattern 16 only.
Note(34) Current input is pattern 15 only. (However, sub-monitor (right) is displayed blank.)
Note(35) Io/Ior is only with leakage measurement.

● Displays set element (3-phase 3-wire)

Main monitor	V(L1L2), V(L2L3), V(L3L1), A(L1), A(L2), A(L3), DA(L1), DA(L2), DA(L3), W, DW, var, cosϕ, Hz, Io/Ior, Wh, -Wh, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD), Distortion factor(A,V)
Sub-monitor (Left)	V(L1L2), V(L2L3), V(L3L1), A(L1), A(L2), A(L3), W, var, cosϕ, Io/Ior
Sub-monitor (Center)	V(L1L2), V(L2L3), V(L3L1), A(L1), A(L2), A(L3), DA(L1), DA(L2), DA(L3), W, DW, var, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD), Harmonic 5th conversion content(A,V), Harmonic nth content(A,V)
Sub-monitor (Right)	V(L1L2), V(L2L3), V(L3L1), A(L1), A(L2), A(L3), DA(L1), DA(L2), DA(L3), W, DW, cosϕ, Hz, Wh, -Wh, Fundamental-wave effective value(A,V), Harmonic 5th conversion effective value(A,V), Harmonic nth effective value(A,V)
Bar graph	V(L1L2), V(L2L3), V(L3L1), A(L1), A(L2), A(L3), DA(L1), DA(L2), DA(L3), W, DW, var, cosϕ, Hz, Io/Ior, Distortion factor(A,V), Harmonic 5th conversion content(A,V), Harmonic nth content(A,V), Fundamental-wave effective value(A,V), Harmonic 5th conversion effective value(A,V), Harmonic nth effective value(A,V)

● Phase (line) change (3-phase 3-wire) (36)

→ V(L1L2) → V(L2L3) → V(L3L1) →

→ A(L2) → A(L3) → A(L1) →

Note(36) Press [DISPLAY], Voltage and current are replaced at the same time.

● Measurement element change (3-phase 3-wire, Measurement display mode)

→ V(L1L2) → V(L2L3) → V(L3L1) → A(L1) → A(L2) → A(L3) → DA(L1) →

→ DA(L2) → DA(L3) → W → DW → var → cosϕ → Hz →

→ Io/Ior → Wh → -Wh → varh(LAG) → varh(LEAD) →

→ -varh(LAG) → -varh(LEAD) → Nothing →

● Measurement element change (3-phase 3-wire, Harmonic measurement display mode)

Main monitor : Distortion factor (Fixation)
Sub-monitor (Left) : Harmonic order n → 5th conversion → 1 → 3 → 4 → 5 → 7 → 9 → 11 → 13 → 15 →
Sub-monitor (Center) : Harmonic nth content (Fixation)
Sub-monitor (Right) : Harmonic nth effective value (Fixation)

● Single-phase 3-wire (Voltage, current input) (37)(38)

No.	Pattern No.	Main monitor	Sub-monitor (Left)	Sub-monitor (Center)	Sub-monitor (Right)	Bar graph
1	Pattern 1	A(L1)	V(L1N)	W	Wh	A(L1)
2	Pattern 2	A(L1)	V(L1N)	W	cosϕ	A(L1)
3	Pattern 3	A(L1)	V(L1N)	W	Hz	A(L1)
4	Pattern 4	DA(L1)	A(L1)	V(L1N)	W	DA(L1)
5	Pattern 5	DA(L1)	A(L1)	V(L1N)	Wh	DA(L1)
6	Pattern 6	DA(L1)	V(L1N)	W	cosϕ	DA(L1)
7	Pattern 7	W	V(L1N)	A(L1)	Wh	W
8	Pattern 8	W	V(L1N)	A(L1)	cosϕ	W
9	Pattern 9	W	V(L1N)	A(L1)	Hz	W
10	Pattern 10	DW	V(L1N)	W	Wh	DW
11	Pattern 11	DW	V(L1N)	A(L1)	cosϕ	DW
12	Pattern 12	A(L1)	cosϕ	W	Wh	A(L1)
13	Pattern 13	A(L1)	var	W	Wh	A(L1)
14	Pattern 14	W	cosϕ	var	Wh	W
15	Pattern 15	A(L1)	A(L3)	A(N)	Wh	A(L1)
16	Pattern 16	V(L1N)	V(L3N)	V(L1L3)	Hz	V(L1N)
17	Pattern 17	A(L1)	Io/Ior (39)	V(L1N)	W	A(L1)
18	Pattern 18	A(L1)	Io/Ior (39)	V(L1N)	Wh	A(L1)

Note(37) Voltage input is pattern 16 only.
Note(38) Current input is pattern 15 only. (However, sub-monitor (right) is displayed blank.)
Note(39) Io/Ior is only with leakage measurement.

● Displays set element (Single-phase 3-wire)

Main monitor	V(L1N), V(L3N), V(L1L3), A(L1), A(L3), A(N), DA(L1), DA(L3), DA(N), W, DW, var, cosϕ, Hz, Io/Ior, Wh, -Wh, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD), Distortion factor(A,V)
Sub-monitor (Left)	V(L1N), V(L3N), V(L1L3), A(L1), A(L3), A(N), W, var, cosϕ, Io/Ior
Sub-monitor (Center)	V(L1N), V(L3N), V(L1L3), A(L1), A(L3), A(N), DA(L1), DA(L3), DA(N), W, DW, var, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD), Harmonic 5th conversion content(A,V), Harmonic nth content(A,V)
Sub-monitor (Right)	V(L1N), V(L3N), V(L1L3), A(L1), A(L3), A(N), DA(L1), DA(L3), DA(N), W, DW, cosϕ, Hz, Wh, -Wh, Fundamental-wave effective value(A,V), Harmonic 5th conversion effective value(A,V), Harmonic nth effective value(A,V)
Bar graph	V(L1N), V(L3N), V(L1L3), A(L1), A(L3), A(N), DA(L1), DA(L3), DA(N), W, DW, var, cosϕ, Hz, Io/Ior, Distortion factor(A,V), Harmonic 5th conversion content(A,V), Harmonic nth content(A,V), Fundamental-wave effective value(A,V), Harmonic 5th conversion effective value(A,V), Harmonic nth effective value(A,V)

● Phase (line) change (40)
(Single-phase 3-wire)

→ V(L1N) → V(L3N) → V(L1L3) ┐
└→ A(L1) → A(L3) → A(N) ┘

Note(41) Press DISPLAY, Voltage and current are replaced at the same time.

● Measurement element change (3-phase 3-wire, Measurement display mode)

→ V(L1N) → V(L3N) → V(L1L3) → A(L1) → A(L3) → A(N) → DA(L1) ┐
└→ DA(L3) → DA(N) → W → DW → var → cosϕ → Hz ┐
└→ Io/Ior → Wh → -Wh → varh(LAG) → varh(LEAD) ┐
└→ -varh(LAG) → -varh(LEAD) → Nothing ┘

● Measurement element change (Single-phase 3-wire, Harmonic measurement display mode)
Main monitor : Distortion factor (Fixation)
Sub-monitor (Left) : Harmonic order n → 5th conversion → 1 → 3 → 4 → 5 → 7 → 9 → 11 → 13 → 15 ┐ ┘
Sub-monitor (Center) : Harmonic nth content (Fixation)
Sub-monitor (Right) : Harmonic nth effective value (Fixation)

● Single-phase 2-wire (Voltage, current input) (41)(42)

No.	Pattern No.	Main monitor	Sub-monitor (Left)	Sub-monitor (Center)	Sub-monitor (Right)	Bar graph
1	Pattern 1	A	V	W	Wh	A
2	Pattern 2	A	V	W	cosϕ	A
3	Pattern 3	A	V	W	Hz	A
4	Pattern 4	DA	A	V	W	DA
5	Pattern 5	DA	A	V	Wh	DA
6	Pattern 6	DA	V	W	cosϕ	DA
7	Pattern 7	W	V	A	Wh	W
8	Pattern 8	W	V	A	cosϕ	W
9	Pattern 9	W	V	A	Hz	W
10	Pattern 10	DW	V	W	Wh	DW
11	Pattern 11	DW	V	A	cosϕ	DW
12	Pattern 12	A	cosϕ	W	Wh	A
13	Pattern 13	A	var	W	Wh	A
14	Pattern 14	W	cosϕ	var	Wh	W
15	Pattern 15	A	—	—	Wh	A
16	Pattern 16	V	—	—	Hz	V
17	Pattern 17	A	Io/Ior (43)	V	W	A
18	Pattern 18	A	Io/Ior (43)	V	Wh	A

Note(41) Voltage input is pattern 16 only.
Note(42) Current input is pattern 15 only. (However, sub-monitor (right) is displayed blank.)
Note(43) Io/Ior is only with leakage measurement.

● Displays set element (Single-phase 2-wire)

Main monitor	V, A, DA, W, DW, var, cosϕ, Hz, Io/Ior, Wh, -Wh, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD), Distortion factor(A,V)
Sub-monitor (Left)	V, A, W, var, cosϕ, Io/Ior
Sub-monitor (Center)	V, A, DA, W, DW, var, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD), Harmonic 5th conversion content(A,V), Harmonic nth content(A,V)
Sub-monitor (Right)	V, A, DA, W, DW, cosϕ, Hz, Wh, -Wh, Fundamental-wave effective value(A,V), Harmonic 5th conversion effective value(A,V), Harmonic nth effective value(A,V)
Bar graph	V, A, DA, W, DW, var, cosϕ, Hz, Io/Ior, Distortion factor(A,V), Harmonic 5th conversion content(A,V), Harmonic nth content(A,V), Fundamental-wave effective value(A,V), Harmonic 5th conversion effective value(A,V), Harmonic nth effective value(A,V)

● Measurement element change (Single-phase 2-wire, Measurement display mode)

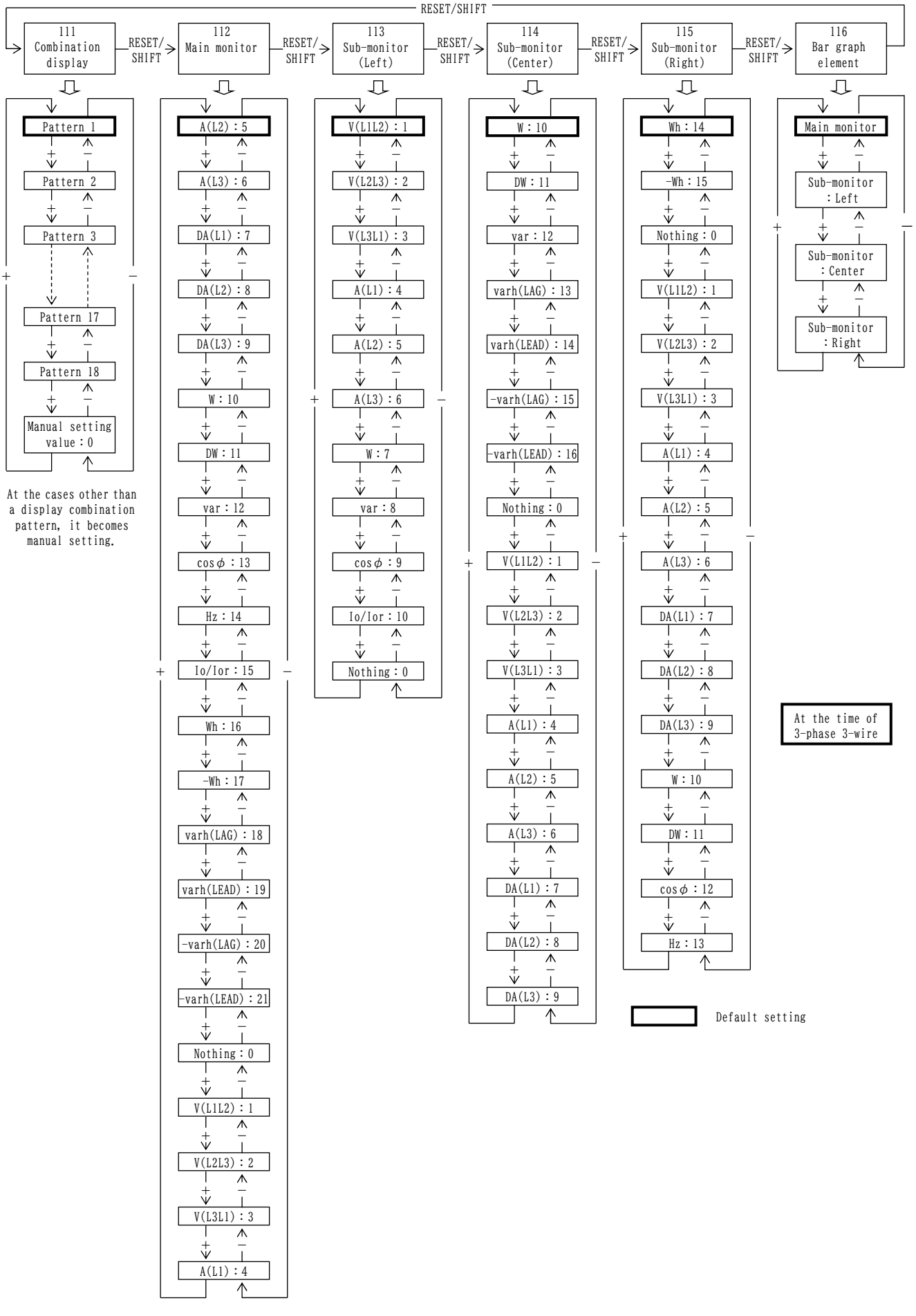
→ V → A → DA → W → DW → var → cosϕ → Hz → Io/Ior → Wh → -Wh →
→ varh(LAG) → varh(LEAD) → -varh(LAG) → -varh(LEAD) → Nothing →

● Measurement element change (Single-phase 2-wire, Harmonic measurement display mode)

Main monitor : Distortion factor (Fixation)
Sub-monitor (Left) : Harmonic order n → 5th conversion → 1 → 3 → 4 → 5 → 7 → 9 → 11 → 13 → 15 →

Sub-monitor (Center) : Harmonic nth content (Fixation)
Sub-monitor (Right) : Harmonic nth effective value (Fixation)

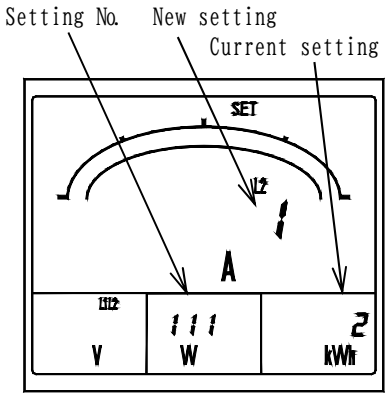
Display combination setting

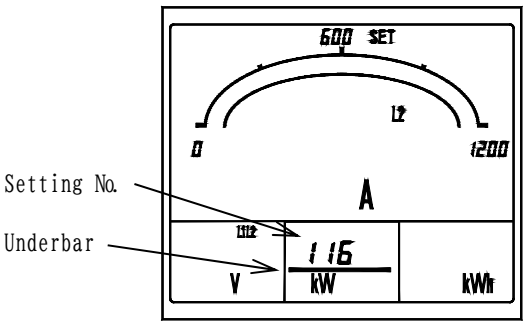


◆ 111 Combination display
Select the elements to be measured and monitored by 4 digital displays out of combination patterns.
Set values are updated by SET.

◆ 112 to 115 Main monitor, Sub-monitor (left), Sub-monitor (center), Sub-monitor (right)
Set these items for a display configuration other than combined patterns. Set values are updated by SET.

◆ 116 Bar graph element
A element being monitored in the main monitor is basically displayed by a bar graph.
Set this item for displaying a element being monitored on a sub-monitor by bar graph.
An underbar is attached to the digital display of the setting sub-monitor.
Set values are updated by SET.

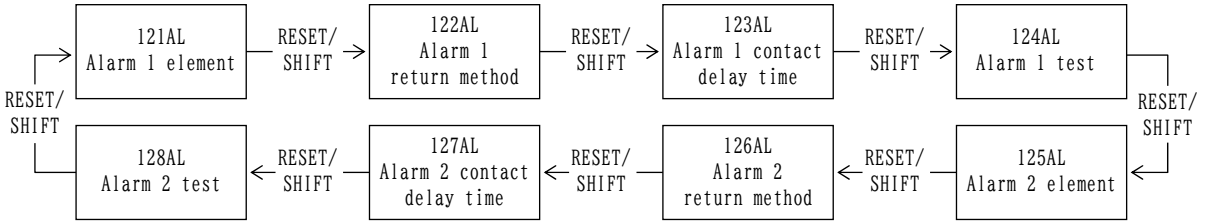




(2) 121AL to 128AL Alarm output setting 【With an alarm output option】

Various settings and an output test are performed about alarm output.

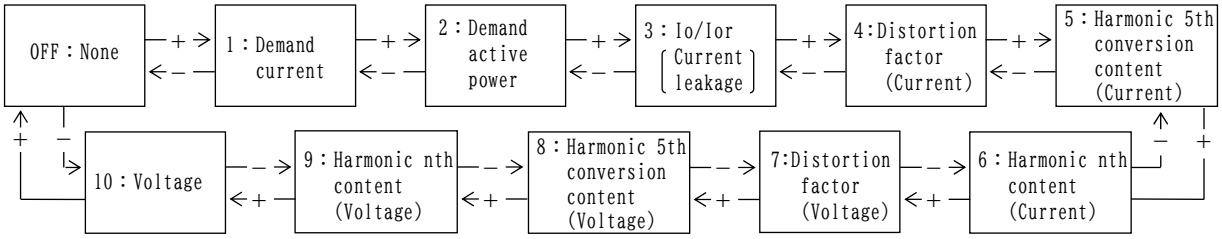
In case contact outputs 1 and 2 are alarm output specifications, the corresponding alarm output is setting.



◆ 121AL Alarm 1 element setting, 125AL Alarm 2 element setting.

Set the output element of alarms 1 and 2. Selection by [+] and [−], set value is updated by [SET].

Default value : 1(DA : Demand current)

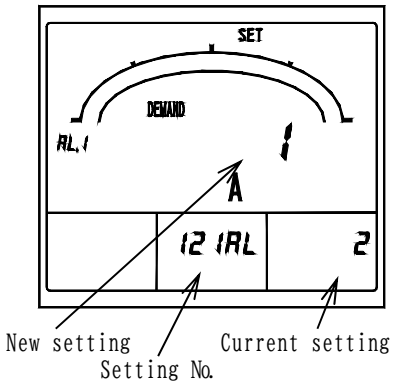


◆ 122AL Alarm 1 reset method setting,
126AL Alarm 2 reset method setting

Output action at the case of a reset of alarms 1 and 2 can be selected from AUTO (automatic reset) and HOLD (manual reset).
In "AUTO (automatic reset)", an alarm output also constitutes OFF according to a reset of an alarm. In "HOLD (manual reset)", even after an alarm reset, an output holds ON. The reset in this case (output OFF) is performed in [RESET/SHIFT].

Selection by [+] and [−], set value is updated by [SET].

Default setting : AUTO (automatic reset)



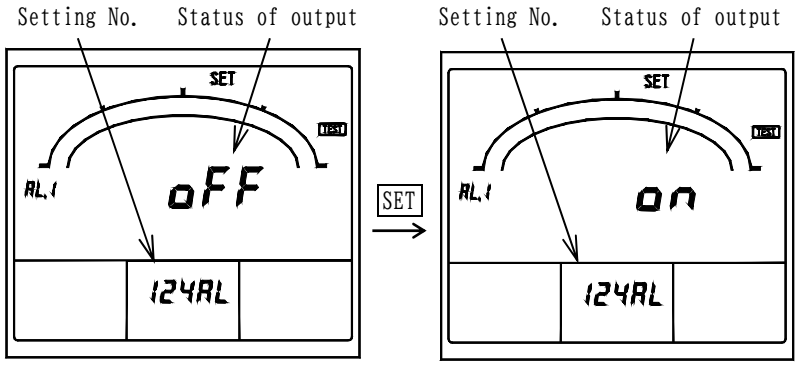
◆ 123AL Alarm 1 contact delay time, 127AL Alarm 2 contact delay time

Set the contact delay time of alarms 1 and 2. The setting range is 0 to 300 seconds (1-second step).
Selection by [+] and [−], set value is updated by [SET].

Default setting : 0 second (With no contact delay)

◆ 124AL Alarm 1 test, 128AL Alarm 2 test

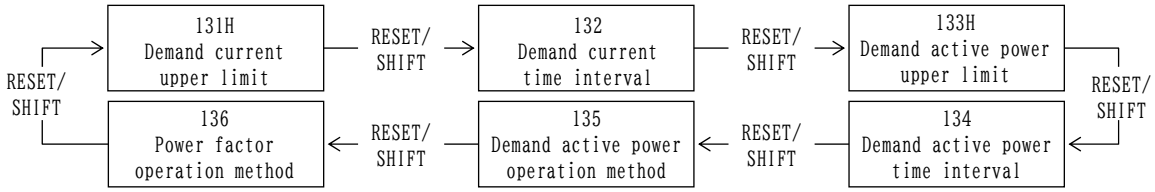
The output of alarms 1 and 2 is tested. While pushing [SET], an output is ON, and if it detaches, an output switches OFF. In addition, while pushing [SET], the test input exceeding rated sensitivity current value is applied to the zero-phase current input circuit inside a product, and if the time which is pushing [SET] exceeds the operating time (time-delay type, 0.1 seconds < 2 seconds) of a current leakage, an alarm will occur.
(In case an alarm output element is a current leakage (Io/Ior))
And, test input will become OFF if [SET] is detached. Please apply rated voltage to a voltage-input terminal (between P1-P2) at this time.
In addition, about a reset of an alarm, it becomes action united with reset method setting (automatic reset / manual reset) of each alarm output.



(Output OFF) (Output ON)

Alarm 1 test

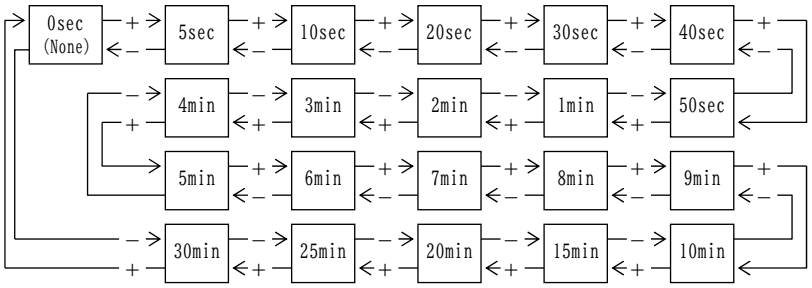
(3) 131H to 136 Demand detection setting 【Except voltage input】
Set the high alarm value and time interval of demand current and demand active power, and the operation method of demand active power and power-factor.

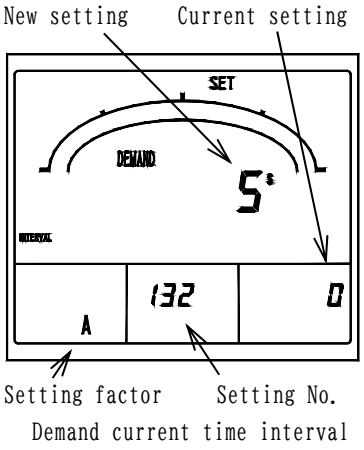


◆ 131H Demand current upper limit. 133H Demand active power upper limit.
Set the high alarm value of demand current(DA) and demand active power(DW).
The setting range is 5 to 100% (1% step). Selection by [+] and [−], set value is updated by [SET].
Default setting : 80% (Demand current),
OFF [Non use] (Demand active power)

◆ 132 Demand current time interval. 134 Demand active power time interval.
Set the time interval (95% time interval) of demand current(DA) and demand active power(DW). Selection by [+] and [−], set value is updated by [SET].

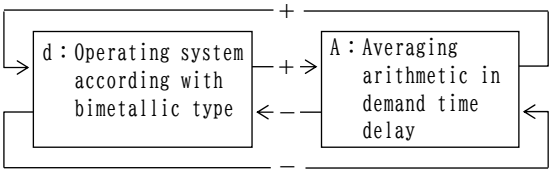
Default setting : 0 second (demand current, demand active power)



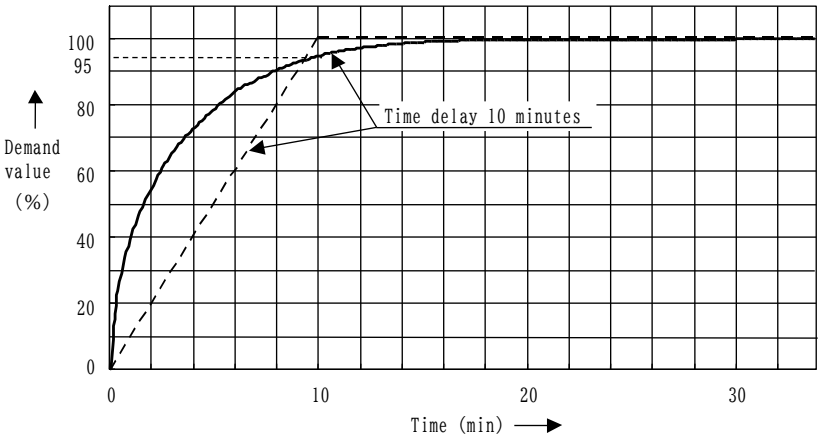


Demand current time interval

◆ 135 Demand active power operation method
The operating system of demand (DW) can be selected from d (operating system according with bimetallic type : demand) and A (Averaging arithmetic in demand time delay : average).
Selection by [+] and [−], set value is updated by [SET].
Default setting : d (Operating system according with bimetallic type)



● Demand time delay characteristic (Demand current, Demand active power)



——— Arithmetic method according with bimetallic type. (Indication time to 95% of a final constant value)

– – – Averaging arithmetic in demand time delay. (Averaging time in demand time delay.)

Arithmetic method
Demand current measurement : Arithmetic method according with bimetallic type.
Demand active power measurement : Arithmetic method according with bimetallic type (Default value).
Or the averaging arithmetic in a demand time interval.
One is selected by setting.

100% indication time is about 3 times the time delay at the case of the arithmetic method according with bimetallic type. (In case of 10 minutes/95% of time-interval, time to reach to 100% is about 30 minutes.)
Demand measurement is measured to the 2 times of the rated current, and the 2 times of the rated active power.

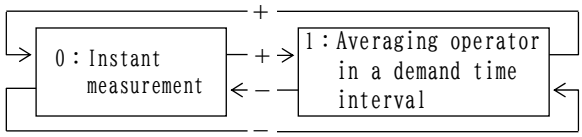
◆ 136 Power factor operation method

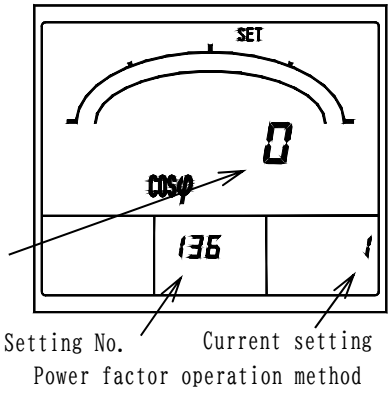
The operation method of power factor measurement can be selected from 0 (instant measurement) and 1 (averaging operator in a demand time interval).

In case it is set as "1 (averaging operator in a demand time interval)", power factor measurement is calculated from the operation method of a power demand time interval and a demand active power meter.

Selection by [+] and [−], set value is updated by [SET].

Default setting : 0 (Instant measurement)

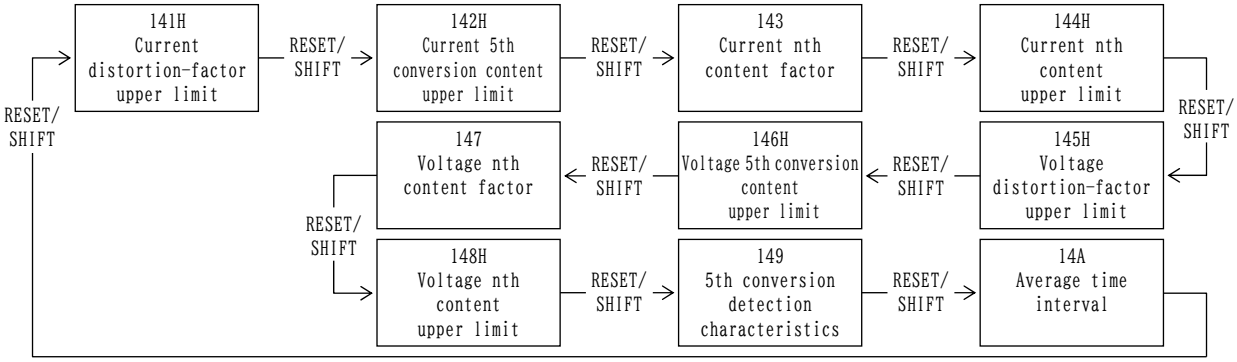




Power factor operation method

(4) 141H to 14A Harmonic detection setting

Set the high alarm value of each harmonic (current, voltage) measurement element, 5th conversion detection characteristics, and average time interval is performed.



◆ 141H Current distortion-factor upper limit,
145H Voltage distortion-factor upper limit

Set the high alarm value of distortion factor (current, voltage).

Setting range. Current : 5 to 100% (1% step) or OFF
Voltage : 1.0 to 20.0% (0.1% step) or OFF

Selection by [+] and [−], set value is updated by [SET].

Default setting : OFF [Non-use] (Current, Voltage)

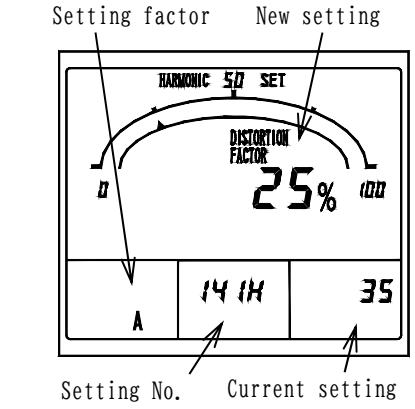
◆ 142H Current 5th conversion content upper limit,
146H Voltage 5th conversion content upper limit.

Set the high alarm value of 5th conversion content (current, voltage).

Setting range. Current : 5 to 100% (1% step) or oFF
Voltage : 1.0 to 20.0% (0.1% step) or OFF

Selection by [+] and [−], set value is updated by [SET].

Default setting : OFF [Non-use] (Current, Voltage)



Current distortion-factor upper limit

◆ 143 Current nth content factor, 147 Voltage nth content factor.

Set the element (order) of nth content (current, voltage).

An order can be selected from n= 3, 4, 5, 7, 9, 11, 13, 15.

Selection by [+] and [−], set value is updated by [SET].

Default setting : 5th(Current, Voltage)

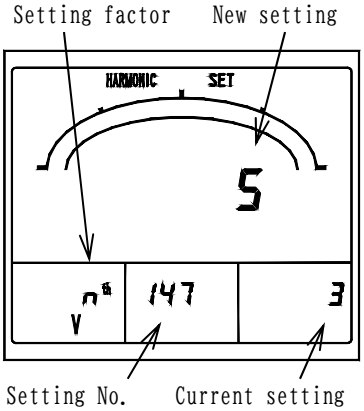
◆ 144H Current nth content upper limit,
148H Voltage nth content upper limit.

Set the high alarm value of nth content (current, voltage).

Setting range. Current : 5 to 100% (1% step) or OFF
Voltage : 1.0 to 20.0% (0.1% step) or OFF

Selection by [+] and [−], set value is updated by [SET].

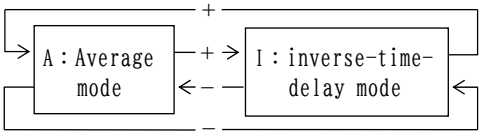
Default setting : OFF [Non-use] (Current, Voltage)

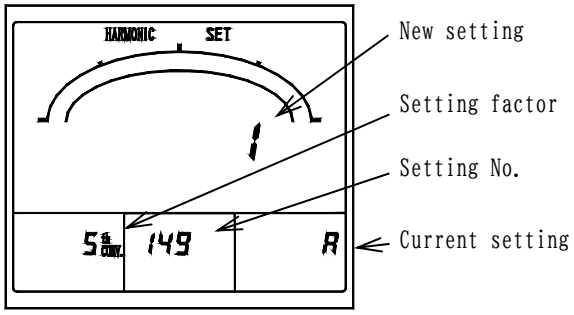


Voltage nth content factor

◆ 149 5th conversion detection characteristics.

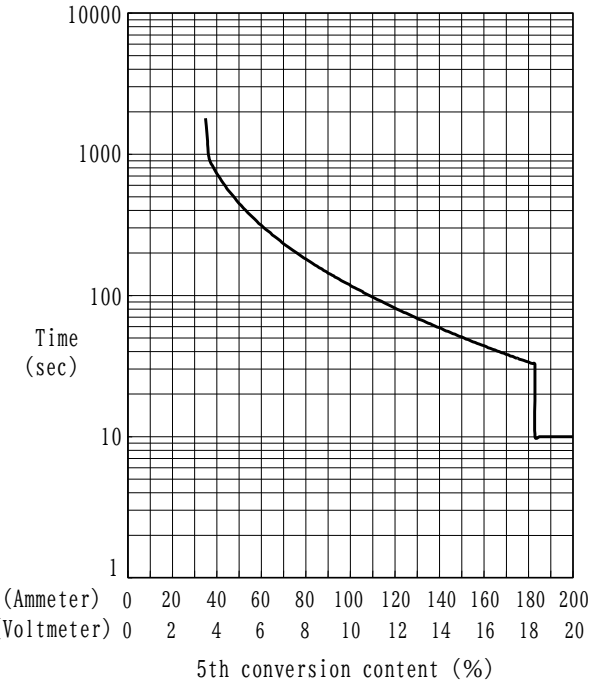
The detection characteristics of 5th conversion content can be selected from A (average mode) and I (inverse-time-delay mode).
In case of "A (average mode)", when average measured value (the average of instantaneous value in average time interval) exceeded the high alarm value, it detects.
And in case of "I (inverse-time-delay mode)", when exceeding the upper limit warning value by anti-time limit characteristic of instantaneous value, it detects.
Selection by [+] and [−], set value is updated by [SET].
Default setting : I (inverse-time-delay mode)





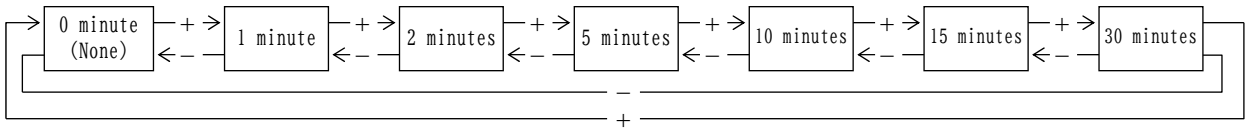
5th conversion detection

Alarm output, Inverse-time-delay characteristics
In case of high-limit-setting value 35%
(voltmeter 3.5%)

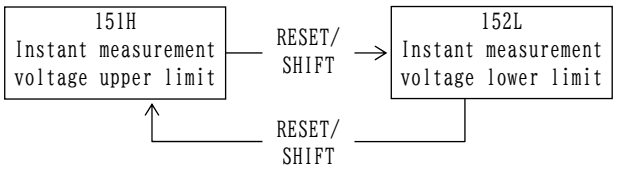


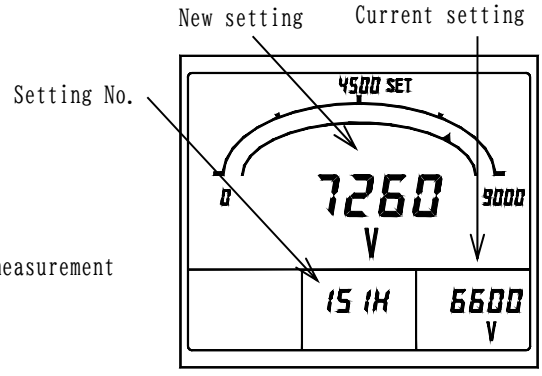
◆ 14A Average time interval

Set the average time interval of each harmonic measurement.
Selection by [+] and [−], set value is updated by [SET].
In addition, in case the detection characteristics of 5th conversion content are set as inverse-time-delay mode, in order that 5th conversion content may operate in inverse-time-delay characteristics, this time interval is disregarded. Default setting : 0 minute (With no average)



(5) 151H to 152L Instant measurement detection setting 【Current input is excluded.】
An upper limit low alarm value is set by instant measurement (voltage element).



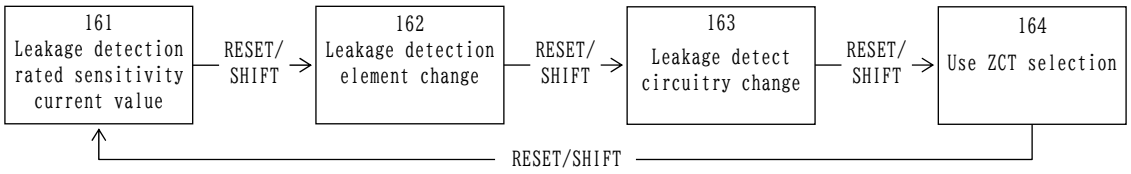


Instant measurement voltage upper limit

◆ 151H Instant measurement voltage upper limit,
152L Instant measurement voltage lower limit.

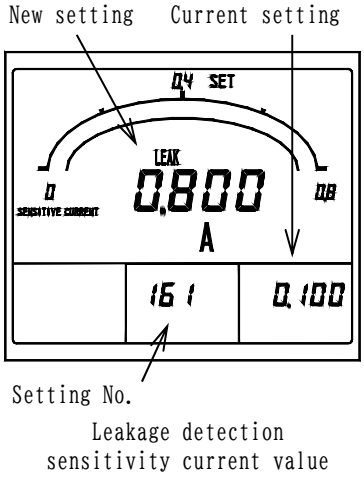
Set the high alarm value and low alarm value of instant measurement (voltage).
Setting range is 30 to 150%(1% step).
Selection by [+] and [−], set value is updated by [SET].
Default setting : OFF 〔Non-use〕 (Upper limit, lower limit)

(6) 161 to 164 Leakage detection setting 【With leakage measurement】
The rated sensitivity current value of leakage measurement, a detection element, the circuit configuration at the case of 3-phase 3-wire, and setting of ZCT to be used are performed.



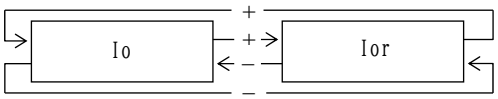
◆ 161 Leakage detection rated sensitivity current value

Set the rated sensitivity current value of current leakage.
Setting value can be selected from 0.03A, 0.05A, 0.1A, 0.2A, 0.4A, 0.8A.
Selection by [+] and [−], set value is updated by [SET].
Default setting : 0.1A



◆ 162 Leakage detection element change

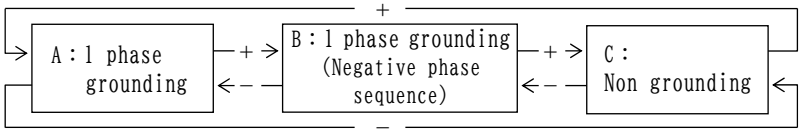
Measurement of current leakage and detection element can be selected from Io and Ior.
Selection by [+] and [−], set value is updated by [SET].
However, a current input product constitutes Io fixation and cannot carry out Ior detection.
Default setting : Io
<Caution> Please apply a voltage input, in case you measure and detect Ior. In case the voltage input is not applied, measurement or detection of Ior cannot be performed correctly.



◆ 163 Leakage detect circuitry change

The circuit configuration of the current-leakage detection in 3-phase 3-wire can be selected from 1 phase grounding, 1 phase grounding (negative phase sequence), and non-grounding.
Selection by [+] and [−], set value is updated by [SET]. Default setting : A (1 phase grounding)

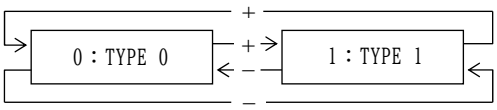
<Caution> If actual connection is different from this setting, a current leakage Ior cannot measure or detect correctly. Setting of "1 phase grounding (negative phase sequence)" is setting for making Ior measure and detect correctly, in case a circuit is a negative phase sequence. In the case of the right usual phase sequence, it is not necessary to make it this setting.



◆ 164 Use ZCT selection

ZCT used by current-leakage measurement can be selected.
Selection by [+] and [−], set value is updated by [SET].
Default setting : 0(TYPE 0)

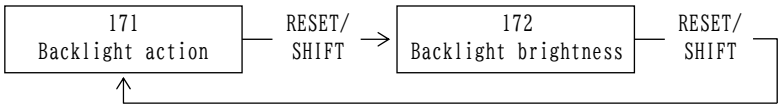
<Caution> If ZCT which you actually use is different from this setting, the error of current leakages Io and Ior will become large. In case you use ZCT(s) other than our company recommendation goods, please consult in advance.

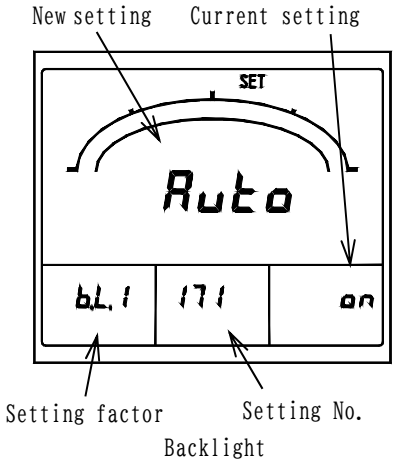


TYPE 0 : Our company recommendation product (Standard).
TYPE 1 : Other than our company recommendation product.

(7) 171 to 172 Backlight setting

Set the action and brightness of backlight.





◆ 171 Backlight action

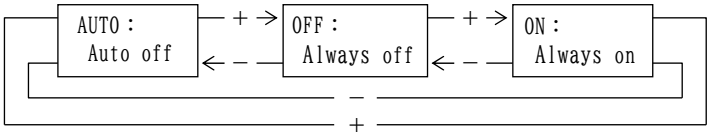
The backlight operation can be selected from ON (always on), AUTO (auto off), and OFF (always off).

If 5 minutes elapses without operating a switch in case it is set as "AUTO (auto off)", backlight will go out automatically.

After that, backlight will be turned on if either of switches is operated.

Selection by [+] and [−], set value is updated by [SET].

Default setting : AUTO (Auto off)



◆ 172 Backlight brightness

The backlight brightness can be selected from five steps of 1 to 5.

Backlight becomes the darkest if it is set as "1".

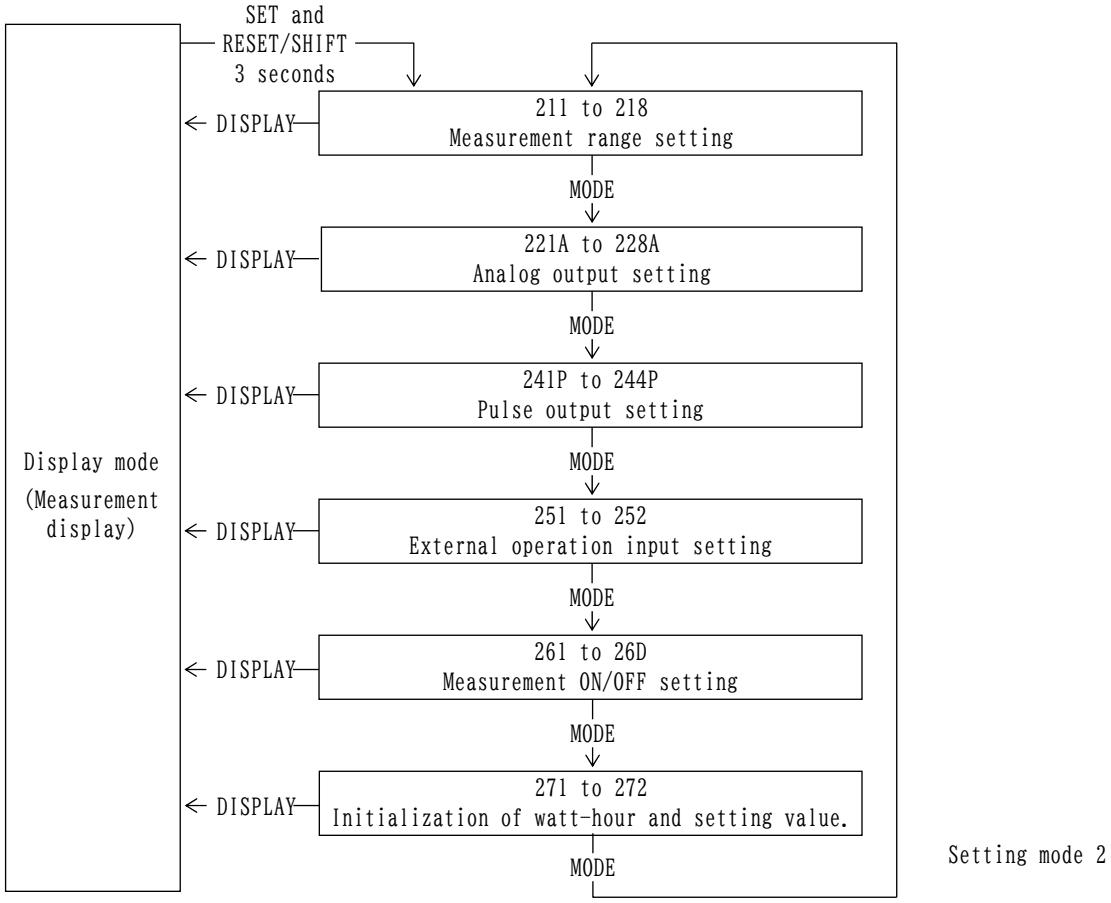
Backlight becomes the brightest if it is set as "5".

Selection by [+] and [−], set value is updated by [SET].

Default setting : 3 (Middle)

Setting	Brightness
5	Bright
4	↕
3	
2	
1	Dark

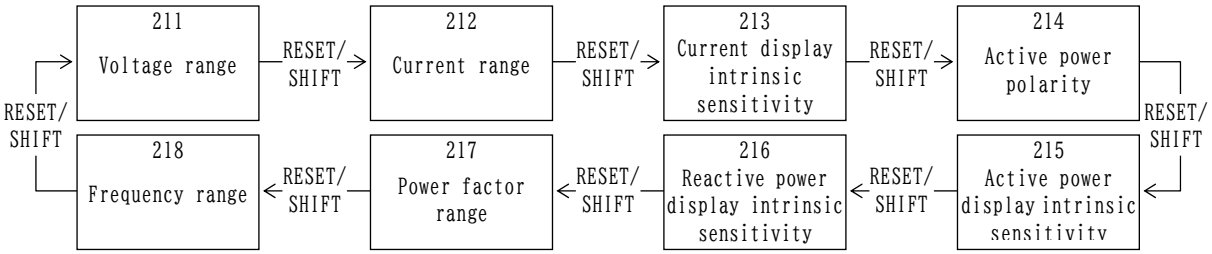
5.3.2 Setting mode 2



Setting mode 2 is selected by pressing SET and RESET/SHIFT switches continuously for longer than 3 seconds.
Pushing MODE switch performs movement of setting item.
The present mode can be returned to the display mode by pressing DISPLAY switch.

< Caution >
If setting change should have been mistaken, a display and output of measurement are not obtained correctly.
Therefore, users must not set. The setting item without the corresponding option is not displayed.

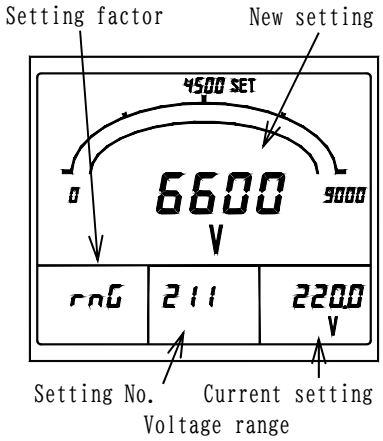
(1) 211 to 218 Measurement-range setting
Setting of measurement range in each measurement elements.



◆ 211 Voltage range
Set the voltage range (VT ratio). Change of this setting also sets the measurement range of active power and reactive power automatically simultaneously.
Selection by [+] and [−], set value is updated by [SET].
Default setting : 6600V(3φ3W), 110.0V(1φ3W), 3300V(1φ2W) (110/220V input)
: 440V(3φ3W, 1φ2W) (440V input)

Voltage measurement range (34 range)

150.0V(110V)	4500V (3300V)	150.0kV (110kV)
150V (110V)	4.50kV (3300V)	180.0kV (132kV)
300.0V(220V)	9000V (6600V)	210.0kV (154kV)
300V (220V)	9.00kV (6600V)	270.0kV (187kV)
500V (380V)	15.00kV (11kV)	300.0kV (220kV)
600V (440V)	18.00kV (13.2kV)	400.0kV (275kV)
600V (460V)	18.00kV (13.8kV)	500.0kV (380kV)
600V (480V)	24.00kV (16.5kV)	750.0kV (550kV)
1200V (880V)	25.00kV (18.4kV)	
1500V (1100V)	30.0 kV (22kV)	
2400V (1650V)	45.0 kV (33kV)	
3000V (2200V)	90.0 kV (66kV)	
3.00kV (2200V)	120.0 kV (77kV)	



◆ 212 Current range
Set the current range (CT ratio). Change of this setting also sets the measurement range of active power and reactive power automatically simultaneously.
Selection by [+] and [−], set value is updated by [SET].
Default setting : 100.0A(3φ3W), 500A(1φ3W), 50.0A(1φ2W)

Current measurement range (76 range)

5.00A	20.00A	80.0A	250A	1.00kA	2.00kA	6.00kA	15.00kA
6.00A	20.0A	100.0A	300.0A	1200A	2500A	7500A	15.0kA
7.50A	25.00A	100A	300A	1.20kA	2.50kA	7.50kA	20.00kA
8.00A	25.0A	120.0A	400A	1500A	3000A	8000A	20.0kA
10.00A	30.00A	120A	500A	1.50kA	3.00kA	8.00kA	30.00kA
10.0A	30.0A	150.0A	600A	1600A	4000A	9.00kA	30.0kA
12.00A	40.0A	150A	750A	1.60kA	4.00kA	10.00kA	
12.0A	50.0A	200.0A	800A	1800A	5000A	10.0kA	
15.00A	60.0A	200A	900A	1.80kA	5.00kA	12.00kA	
15.0A	75.0A	250.0A	1000A	2000A	6000A	12.0kA	

◆ 213 Current display intrinsic sensitivity

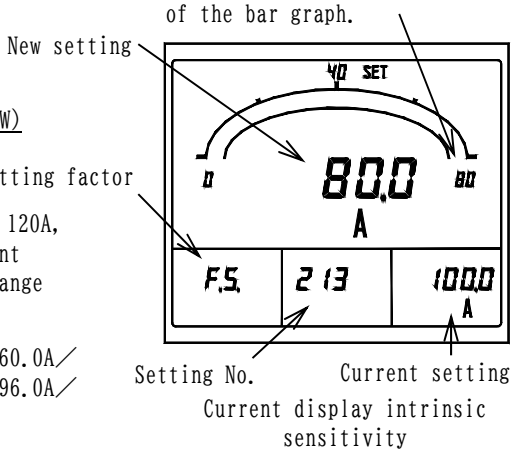
Set the full scale of current meter.
The setting range is from 40 to 120% of the current range and can be selected from the [Current display intrinsic sensitivity (full scale) list].
Selection by [+] and [−], set value is updated by [SET].

Default setting : 100.0A (3φ3W), 500A (1φ3W), 50.0A (1φ2W)

<Example>
When the current range is 100A.
From 40% of current range = 40A and 120% of current range = 120A, display intrinsic sensitivity can be selected from [Current display intrinsic sensitivity (full scale) list] in the range of 40A to 120A.

Setting range : 40.0A／42.0A／45.0A／48.0A／50.0A／56.0A／60.0A／64.0A／72.0A／75.0A／80.0A／84.0A／90.0A／96.0A／100.0A／100A／120.0A／120A

Full scale
Changing the display specific sensitivity changes the full scale of the bar graph.



<Note> Changing this setting does not change the analog output sensitivity.
When changing the sensitivity of analog output, set "225A current output intrinsic sensitivity

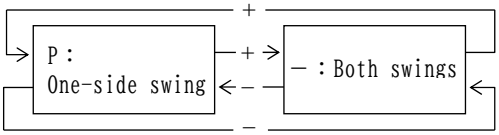
【 Current display intrinsic sensitivity (full scale) list 】

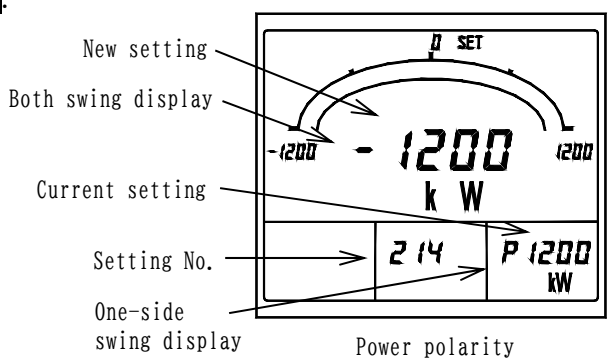
Full scale		Full scale		Full scale		Full scale	
3 digits	4 digits	3 digits	4 digits	3 digits	4 digits	3 digits	4 digits
		40.0A		400A		4.00kA	4000A
		42.0A		420A		4.20kA	4200A
		45.0A		450A		4.50kA	4500A
		48.0A		480A		4.80kA	4800A
5.00A		50.0A		500A		5.00kA	5000A
5.60A		56.0A		560A		5.60kA	5600A
6.00A		60.0A		600A		6.00kA	6000A
6.40A		64.0A		640A		6.40kA	6400A
7.20A		72.0A		720A		7.20kA	7200A
7.50A		75.0A		750A		7.50kA	7500A
8.00A		80.0A		800A		8.00kA	8000A
8.40A		84.0A		840A		8.40kA	
9.00A		90.0A		900A		9.00kA	
9.60A		96.0A		960A		9.60kA	
10.0A	10.00A	100A	100.0A	1.00kA	1000A	10.0kA	10.00kA
12.0A	12.00A	120A	120.0A	1.20kA	1200A	12.0kA	12.00kA
14.0A	14.00A	140A	140.0A	1.40kA	1400A	14.0kA	14.00kA
15.0A	15.00A	150A	150.0A	1.50kA	1500A	15.0kA	15.00kA
16.0A	16.00A	160A	160.0A	1.60kA	1600A	16.0kA	16.00kA
18.0A	18.00A	180A	180.0A	1.80kA	1800A	18.0kA	18.00kA
20.0A	20.00A	200A	200.0A	2.00kA	2000A	20.0kA	20.00kA
24.0A	24.00A	240A	240.0A	2.40kA	2400A	24.0kA	24.00kA
25.0A	25.00A	250A	250.0A	2.50kA	2500A	25.0kA	25.00kA
28.0A	28.00A	280A	280.0A	2.80kA	2800A	28.0kA	28.00kA
30.0A	30.00A	300A	300.0A	3.00kA	3000A	30.0kA	30.00kA
32.0A	32.00A	320A	320.0A	3.20kA	3200A	32.0kA	32.00kA
36.0A	36.00A	360A	360.0A	3.60kA	3600A	36.0kA	36.00kA

◆ 214 Active power polarity

A swing display of active power meter can be selected from P (one side swing) and − (both swings).
Selection by [+] and [−], set value is updated by [SET].

Default setting : P (One-side swing)





Power polarity

<Caution> If active power polarity is changed,
analog output scale also changes.

<Example>
In case of primary power value = 1200kW,
analog output = DC4 to 20mA
・One-side swing 0 to 1200kW/DC4 to 20mA
・Both swings -1200kW to 0 to 1200kW/DC4 to 12 to 20mA

◆ 215 Active power display intrinsic sensitivity

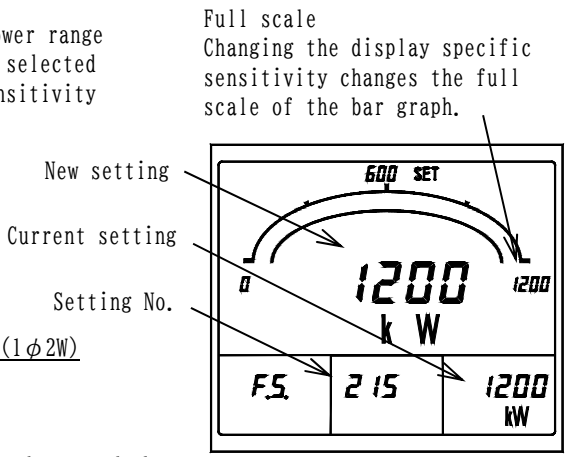
Set the full scale of active power meter.
The range that can be set is 40 to 115% of the active power range (VT ratio × CT ratio in the attached table), and can be selected from [Active power / Reactive power display intrinsic sensitivity (full scale) list].
Selection by [+] and [−], set value is updated by [SET].

<Caution> VT ratio : In case of 220V direct input.
Calculates by VT ratio=2.
CT ratio : In case of 1A input.
Calculates by CT ratio÷5.

Default setting : 1200kW (3φ3W), 100.0kW (1φ3W), 150.0kW (1φ2W)

<Example>
For 6600V / 110V, 100 / 5A with 3-phase 3-wire.
Active power range is 1200kW (from VT ratio × CT ratio in the attached table)
From 40% of the active power range = 480kW and 115% of the power range = 1380kW, the display intrinsic sensitivity can be selected from the [Active power / Reactive power display intrinsic sensitivity (full scale) list] within the range of 480kW to 1380kW.

Setting range : 480kW／500kW／560kW／600kW／640kW／720kW／750kW／
800kW／840kW／900kW／960kW／1000kW／1200kW



Active power display
intrinsic sensitivity

<Note> Changing this setting does not change the analog output sensitivity.
When changing the sensitivity of analog output, set "226A Active power output intrinsic sensitivity.

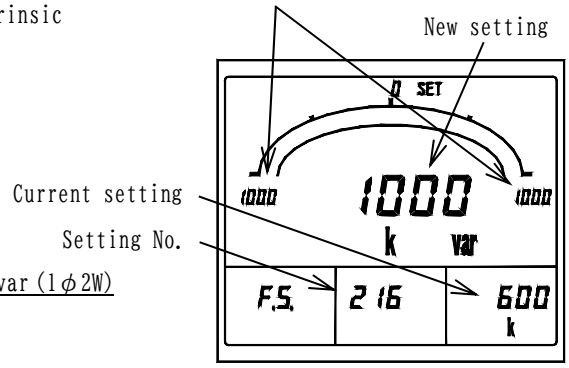
◆ 216 Reactive power display intrinsic sensitivity

Set the full scale of reactive power meter.
The range that can be set is 30 to 115% of the reactive power range (VT ratio × CT ratio in the attached table), and can be selected from [Active power / Reactive power display intrinsic sensitivity (full scale) list].
Selection by [+] and [−], set value is updated by [SET].

<Caution> VT ratio : In case of 220V direct input.
Calculates by VT ratio=2.
CT ratio : In case of 1A input.
Calculates by CT ratio÷5.

Default setting : 600kvar (3φ3W), 50.0kvar (1φ3W), 75.0kvar (1φ2W)

Full scale
Changing the display intrinsic sensitivity changes the full scale of the bar graph.



Reactive power display intrinsic sensitivity

<Note> The reactive power display is LEAD on the left and LAG on the right.
There is no power polarity display.
(2 quadrant display)
Also, changing this setting does not change the sensitivity of the analog output. When changing the sensitivity of analog output, set "227A Reactive power output intrinsic sensitivity".

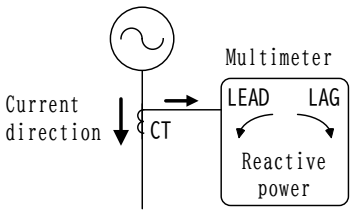


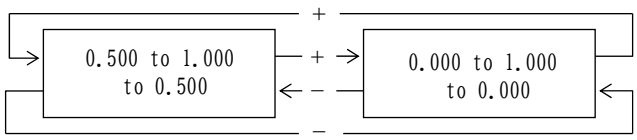
Image of reactive power display

【Active power and Reactive power display intrinsic sensitivity (Full scale) list】 Unit : [W] or [var]

Full scale	Full scale	Full scale	Full scale	Full scale	Full scale	Full scale
400	4.00k	40.0k	400k	4.00M	40.0M	400M
420	4.20k	42.0k	420k	4.20M	42.0M	420M
450	4.50k	45.0k	450k	4.50M	45.0M	450M
480	4.80k	48.0k	480k	4.80M	48.0M	480M
500	5.00k	50.0k	500k	5.00M	50.0M	500M
560	5.60k	56.0k	560k	5.60M	56.0M	560M
600	6.00k	60.0k	600k	6.00M	60.0M	600M
640	6.40k	64.0k	640k	6.40M	64.0M	640M
720	7.20k	72.0k	720k	7.20M	72.0M	720M
750	7.50k	75.0k	750k	7.50M	75.0M	750M
800	8.00k	80.0k	800k	8.00M	80.0M	800M
840	8.40k	84.0k	840k	8.40M	84.0M	840M
900	9.00k	90.0k	900k	9.00M	90.0M	900M
960	9.60k	96.0k	960k	9.60M	96.0M	960M
1000	10.00k	100.0k	1000k	10.00M	100.0M	1000M
1200	12.00k	120.0k	1200k	12.00M	120.0M	
1400	14.00k	140.0k	1400k	14.00M	140.0M	
1500	15.00k	150.0k	1500k	15.00M	150.0M	
1600	16.00k	160.0k	1600k	16.00M	160.0M	
1800	18.00k	180.0k	1800k	18.00M	180.0M	
2000	20.00k	200.0k	2000k	20.00M	200.0M	
2400	24.00k	240.0k	2400k	24.00M	240.0M	
2500	25.00k	250.0k	2500k	25.00M	250.0M	
2800	28.00k	280.0k	2800k	28.00M	280.0M	
3000	30.00k	300.0k	3000k	30.00M	300.0M	
3200	32.00k	320.0k	3200k	32.00M	320.0M	
3600	36.00k	360.0k	3600k	36.00M	360.0M	

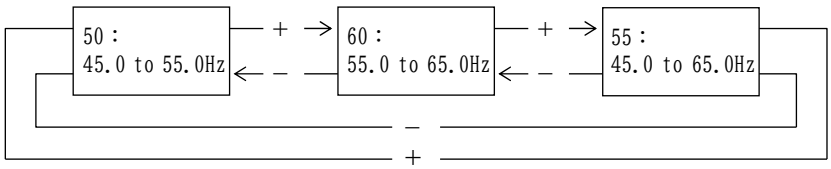
◆ 217 Power factor range

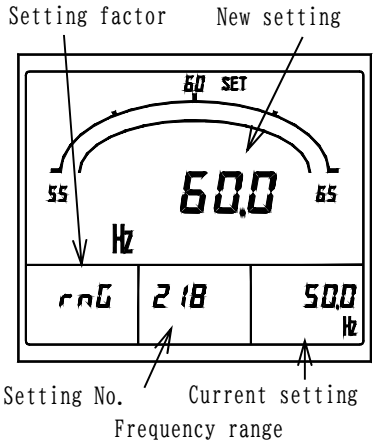
A power factor measurement range can be selected from 0.500 to 1.000 to 0.500/0.000 to 1.000 to 0.000.
Change of this setting also sets the analog output range of a power factor automatically simultaneously.
Selection by [+] and [−], set value is updated by [SET].
Default setting : 0.500 to 1.000 to 0.500



◆ 218 Frequency range

A frequency measurement range can be selected from 45.0 to 55.0Hz / 55.0 to 65.0Hz / 45.0 to 65.0Hz. Change of this setting also sets the analog output range of a frequency automatically simultaneously.
Selection by [+] and [−], set value is updated by [SET].
Default setting : 45.0 to 65.0Hz

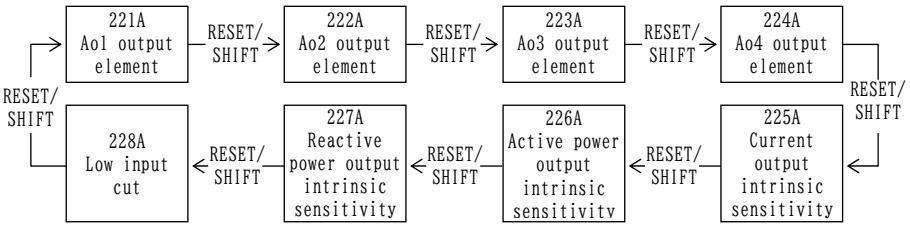


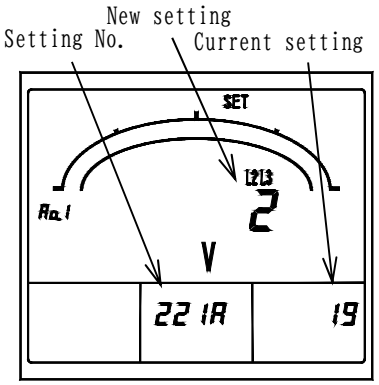


<Note>

This product takes in frequency from voltage input terminals 8-9 and current input terminals 12-13.
When using with no input to this terminal (less than 20% of voltage full scale, less than 10% of current full scale), set the frequency range according to the input frequency.
If the settings do not match, the measurement value may fluctuate or the error may become large.
50Hz input: 45.0 to 55.0Hz or 45.0 to 65.0Hz setting
60Hz input: 55.0 to 65.0Hz setting

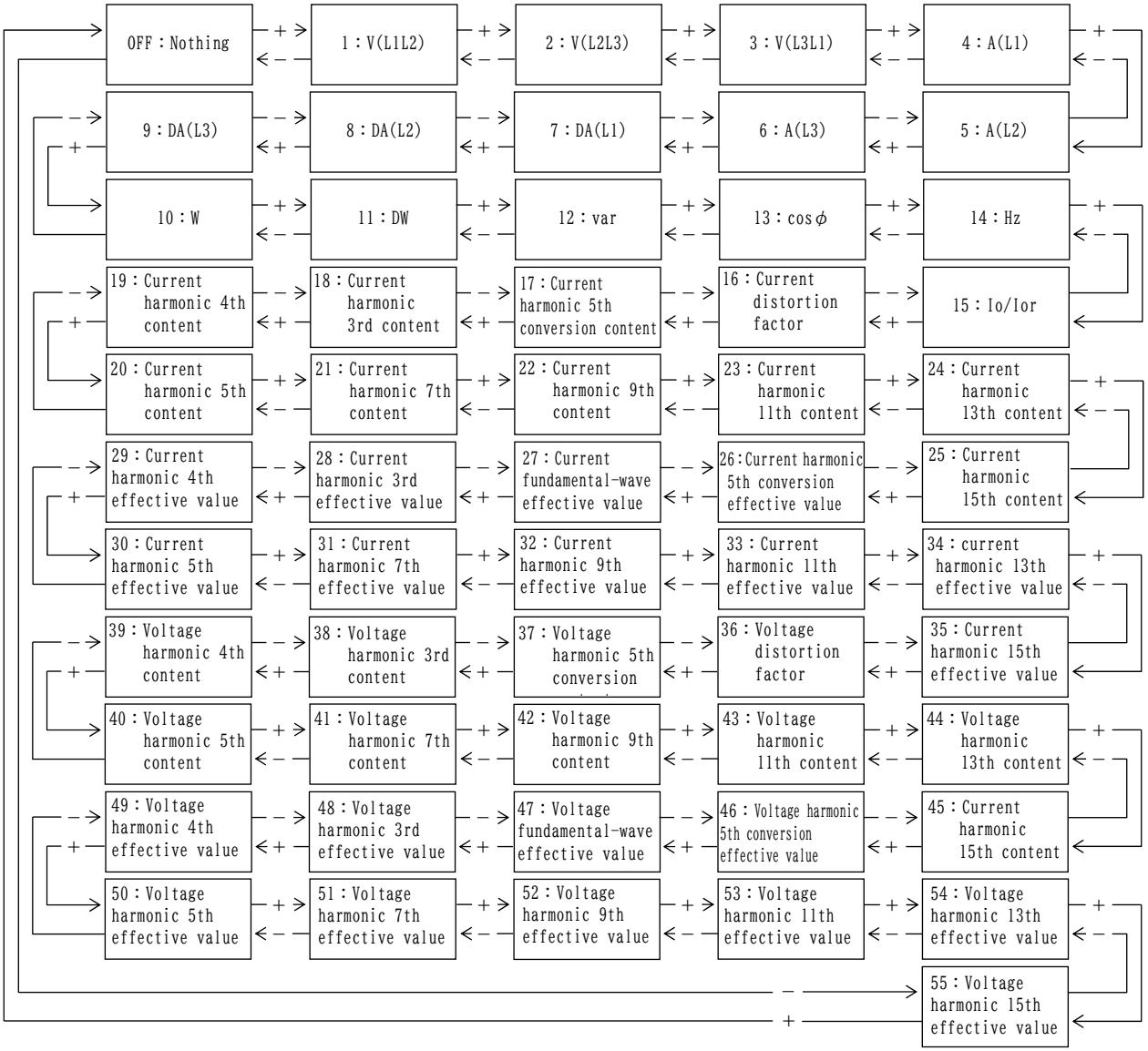
(2) 221A to 228A Analog output setting 【With an analog output option】
Various setting of analog output is performed.





Ao1 output element

◆ 221A to 224A AO(analog output)1 to 4 output element.
Set the output element of each analog outputs.
Selection by [+] and [−], set value is updated by [SET].
Default setting：AO1 A(L2) (3φ3W)、A(L1) (1φ3W)、A (1φ2W)
AO2 V(L1L2) (3φ3W)、V(L1N) (1φ3W)、V (1φ2W)
AO3 W (3φ3W/1φ3W/1φ2W)
AO4 cosφ (3φ3W/1φ3W/1φ2W)

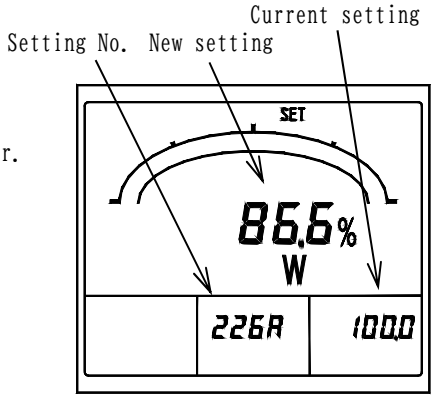


◆ 225A Current output intrinsic sensitivity,
226A Active power output intrinsic sensitivity,
227A Reactive power output intrinsic sensitivity.

Output intrinsic sensitivity (% of an output to an input) is set about each analog output of current, active power, and reactive power.
The setting range can be selected from the following.

Current : 40.0 to 120.0% (0.1% step)
Active power : 40.0 to 115.0% (0.1% step)
Reactive power : 30.0 to 115.0% (0.1% step)

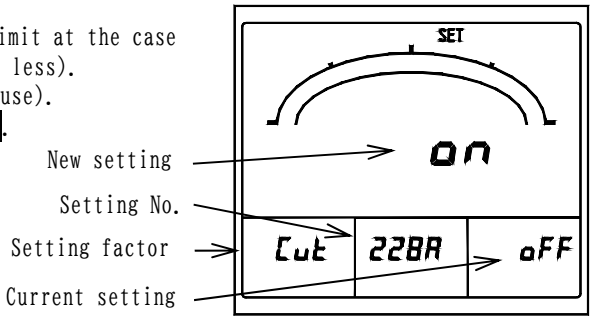
Selection by [+] and [−], set value is updated by [SET].
Default setting : 100.0%(Current, Active power),
50.0%(Reactive power)



Active power output intrinsic sensitivity,

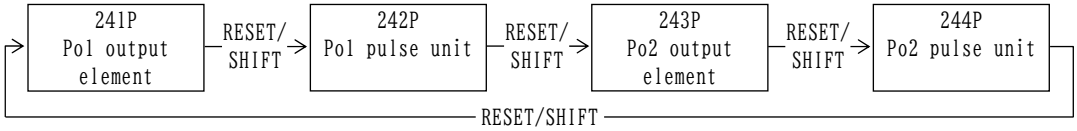
Example) 3φ3W, 9000V, 100.0A, 1200kW range, Analog output DC4 to 20mA
·Set 100.0%. Analog output is DC20mA in 1200kW of primary inputs.
·Set 80.0%. Analog output is DC20mA in 1200kW×0.8=960kW of primary input.

◆ 228A Low input cut
It is the function which makes analog output a lower limit at the case of a minute input (input which corresponds to 0.5% or less).
A function can be selected from ON (Use) and OFF (Non-use).
Selection by [+] and [−], set value is updated by [SET].
Default setting : OFF (Non-use)



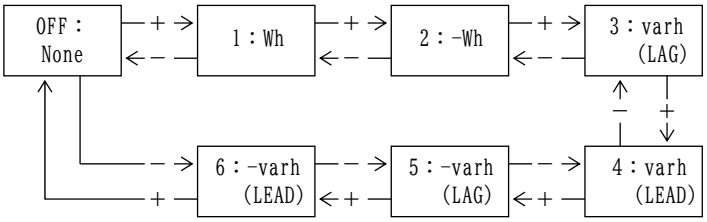
Low input cut

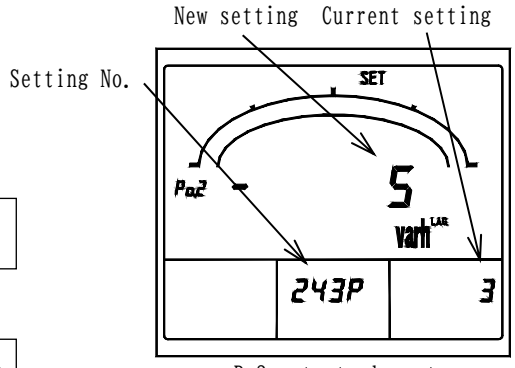
(3) 241P to 244P Pulse output setting 【With a pulse output option】
Various setting of a pulse output is performed.



◆ 241P PO(pulse output) 1 output element,
243P PO(pulse output) 2 output element

Set the output element of each pulse output.
Selection by [+] and [−], set value is updated by [SET].
Default setting : Wh (PO1, PO2)

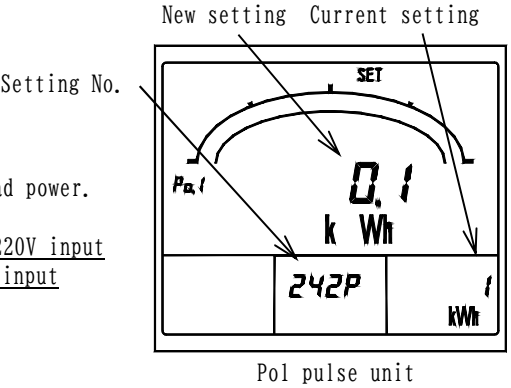




Po2 output element

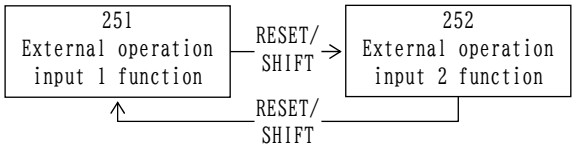
◆ 242P PO(pulse output) 1 pulse unit,
244P PO(pulse output) 2 pulse unit

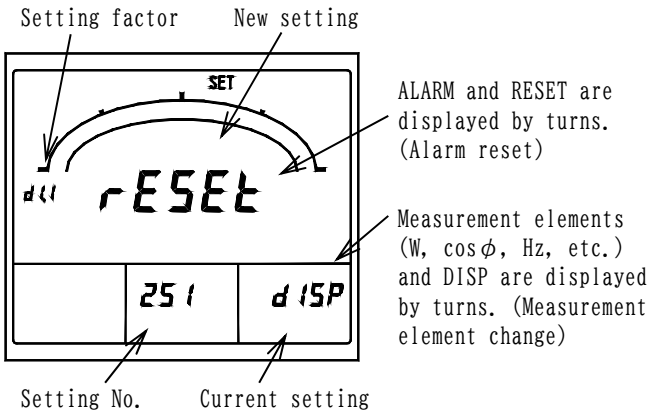
Set the pulse unit of each pulse output.
A pulse unit can be selected from four types.
The pulse unit that can be selected is decided with full-load power.
Default setting : 10kWh/p [3φ3W] (PO1, PO2),
1kWh/p [1φ3W/1φ2W] (PO1, PO2) For 110/220V input
: 0.1kWh/p[3φ3W/1φ2W] (PO1, PO2) For 440V input



Po1 pulse unit

(4) 251 to 252 External operation input setting 【With an external operation input option】
Various setting of external operation input is performed.



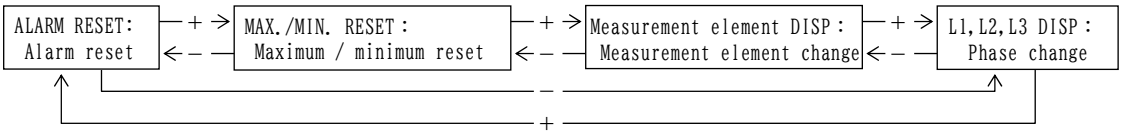


◆ 251 External operation input 1 function,
252 External operation input 2 function

The function of each external operation input (alarm reset, maximum / minimum reset, measurement element change, phase change) can be selected.
Selection by [+] and [−], set value is updated by [SET].

Default setting (With an alarm output option)
Alarm reset (External operation input 1)
Maximum / minimum reset (External operation input 2)

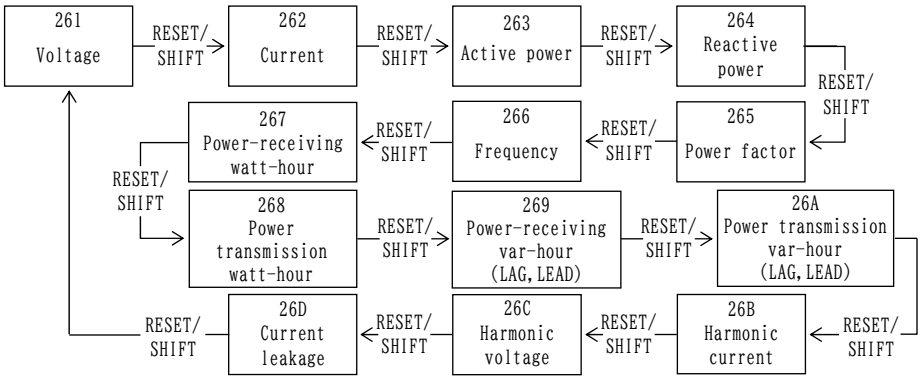
Default setting (With no alarm output option)
Maximum / minimum reset (External operation input 1)
Measurement element change (External operation input 2)

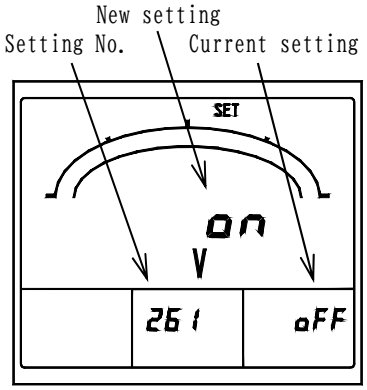


・About the setting display in an external operation input function

Function	The contents of a display at the case of function setting	"Current setting" display point	"New setting" display point
Alarm reset	"ALARM" and "RESET" are displayed by turns by 7 segment displays of the main monitor.	Sub-monitor (right)	Main monitor
Maximum / minimum reset	"RESET" is displayed by 7 segment displays of the main monitor. And, "MAX" and "MIN" display by turns.		
Measurement element change	"DISP" is displayed by 7 segment displays of the main monitor. And, each measurement element (units of A, V, W, etc.) displays by turns.		
Phase change	"DISP" is displayed by 7 segment displays of the main monitor. And, each phase (L1, L2, L3, N) displays by turns.		

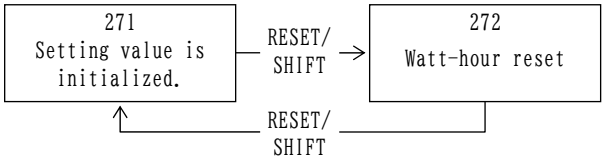
(5) 261 to 26D Measurement ON/OFF setting 【However, a current leakage is with leakage measurement】
Measurement display ON/OFF setting of each measurement element is performed.
Selection by [+] and [−], set value is updated by [SET].
Default setting : ON (All measurement elements)



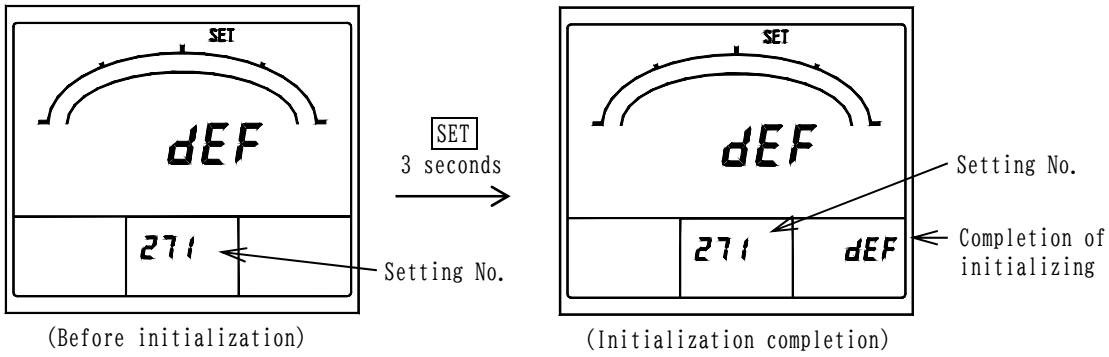


Voltage ON/OFF

(6) 271 to 272 Initialization of watt-hour and setting value.
Package reset of watt-hour is performed. And, each set value is initialized (returns to default setting).



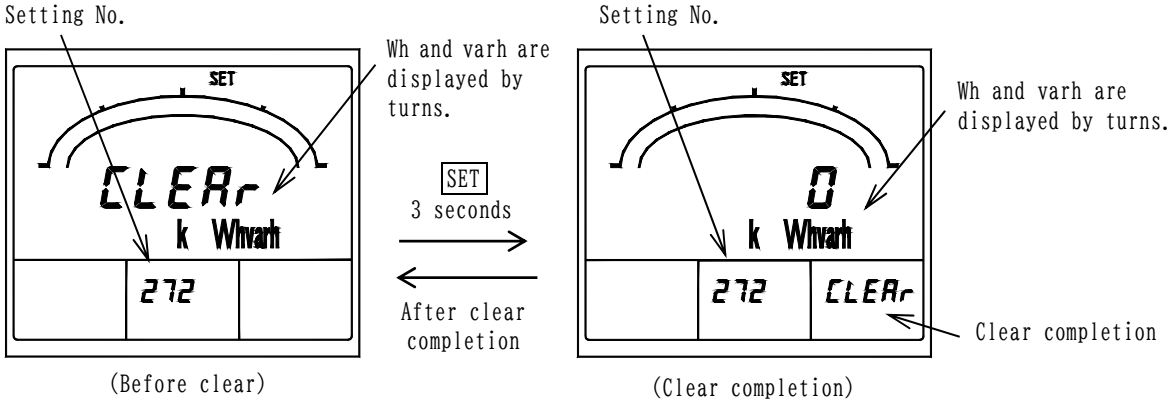
◆ 271 Initialization of setting value
Each set value is initialized (returns to default setting).
Pushing [SET] for 3 seconds initializes all set values.



(Before initialization) (Initialization completion)

Initialization of setting value

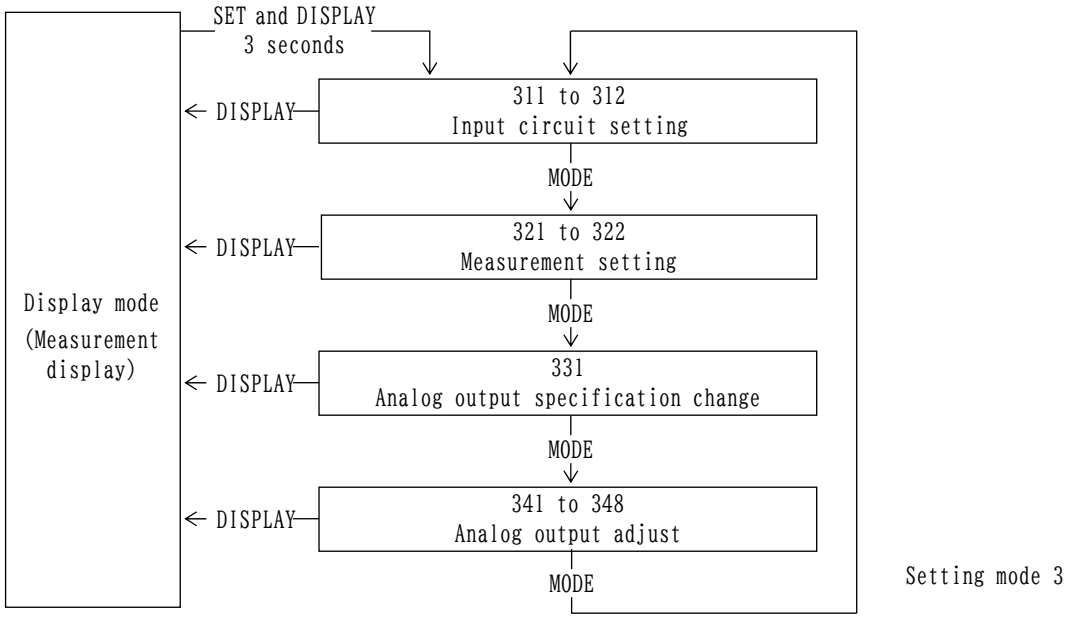
◆ 272 Watt-hour reset
Integrated value of each electric-energy display is cleared (=0). By pushing [SET] for 3 seconds, all integrated value (Wh, -Wh, varh(LAG), -varh(LAG), varh(LEAD), -varh(LEAD)) is cleared by simultaneously.



(Before clear) (Clear completion)

Watt-hour reset

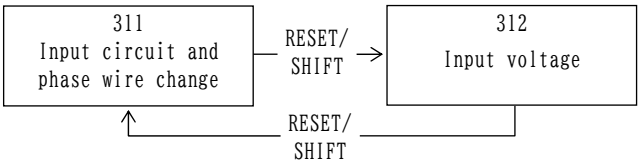
5.3.3 Setting mode 3



Setting mode 3 is selected by pressing SET and DISPLAY switches continuously for longer than 3 seconds.
Pushing MODE switch performs movement of setting item.
The present mode can be returned to the display mode by pressing DISPLAY switch.

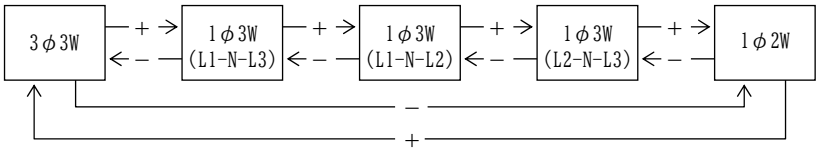
< Caution >
If setting change should have been mistaken, a display and output of measurement are not obtained correctly.
Therefore, users must not set. The setting item without the corresponding option is not displayed.

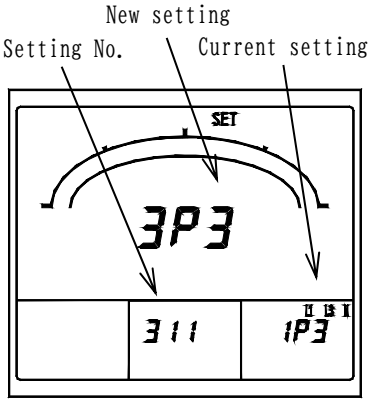
(1) 311 to 312 Input circuit setting
Set the input circuit and phase wire and input voltage / phase-voltage full scale.



◆ 311 Input circuit and phase wire change
Set the input circuit and phase wire (1φ3W).
Selection by [+] and [−], set value will be updated if [SET] is pushed for 3 seconds.
Default setting : 3φ3W (3φ3W, No designation),
1φ3W [L1-N-L3] (1φ3W), 1φ2W (1φ2W)

<Caution>
・When this setting is changed, it will become the default setting of the input circuit after all set values changing.
・The right measurement cannot be performed if setting of actual connection and phase wire are different.

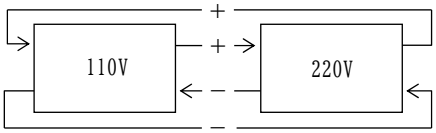




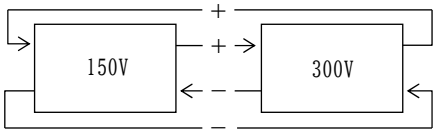
Input circuit and phase wire change

◆ 312 Input voltage
Set the input voltage (3φ3W, 1φ2W) or phase-voltage full scale (1φ3W).
In 3φ3W/1φ2W and 1φ3W, the contents of a setting are different.
Selection by [+] and [−], set value is updated by [SET].
Default setting : 300V (1φ3W)
Default setting : 110V (3φ3W, 1φ2W or no designation)

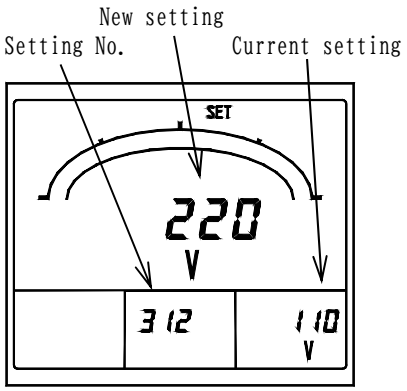
・3φ3W, 1φ2W



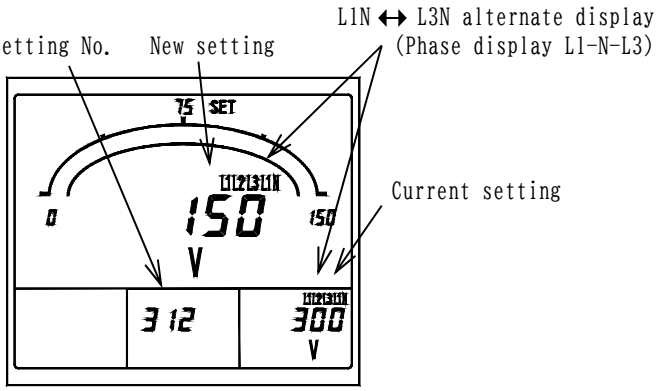
・1φ3W



Setting of 300V, Output is AC0 to 150V/DC4 to 12mA.
Setting of 150V, Output is AC0 to 150V/DC4 to 20mA.



Input voltage rating (3φ3W)

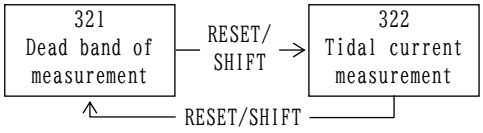


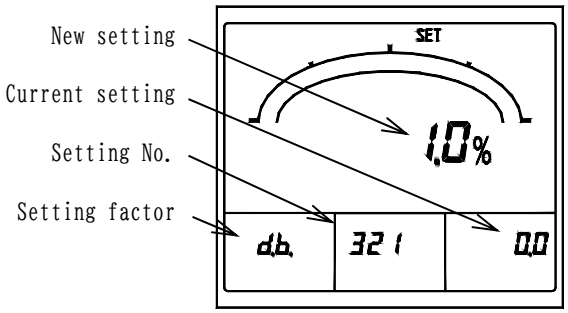
Phase-voltage full scale (1φ3W)

<Cantion> For 440V input, setting item is not displayed.

(2) 321 to 322 Measurement setting

Set the dead band of measurement display, and with or without of tidal current measurement.





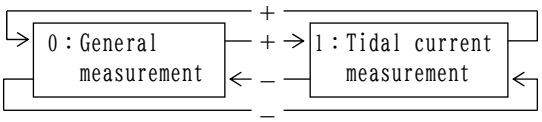
Dead band of measurement

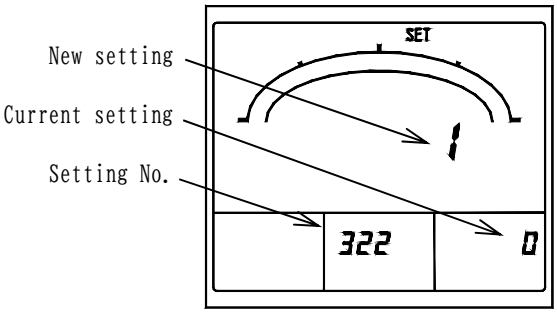
◆ 321 Measurement dead band

Set the dead band of measurement display.
By this setting, variation of value less than this set value is disregarded by voltage, current, active power, and reactive power measurement display.
Setting range : 0.0 to 2.0% (0.1% step)
Selection by [+] and [−], set value is updated by [SET].
Default setting : 0.0% (Nothing)

◆ 322 Tidal current measurement

By measurement of reactive power and a power factor, 0 (general measurement) or 1 (tidal current measurement which was conscious of power transmission/power receiving) can be selected.
Selection by [+] and [−], set value is updated by [SET].
Default setting : 0 (General measurement)

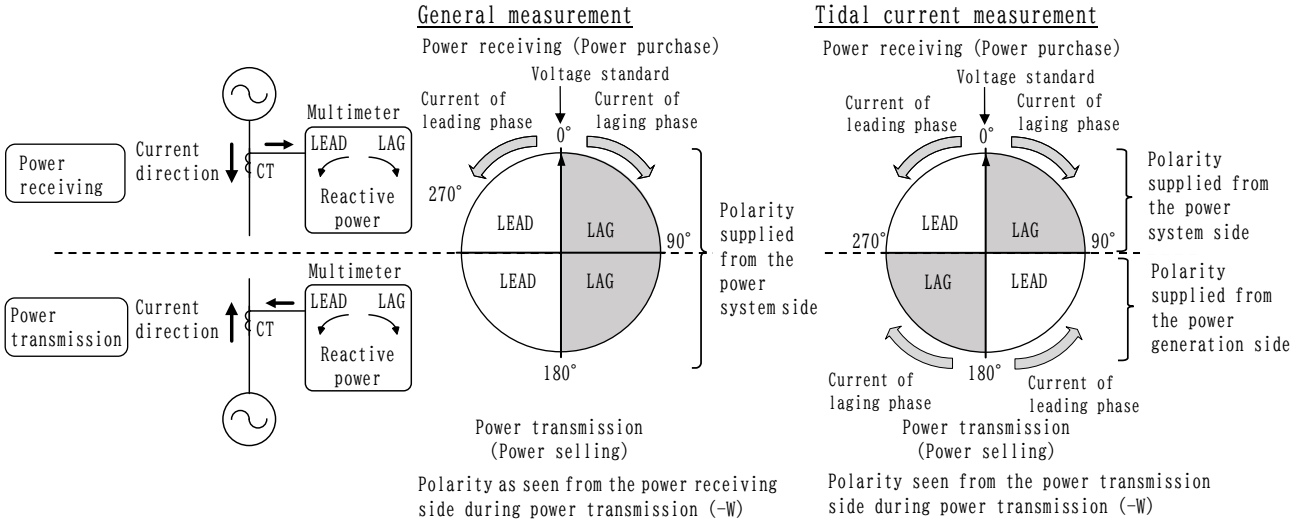




Tidal current measurement

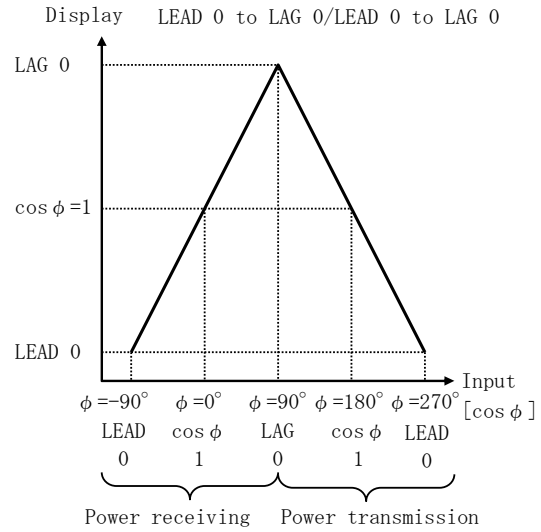
General measurement : Displays the polarity (LAG / LEAD) supplied from the power system side.
(Both power receiving and power transmission)
Tidal current measurement : Displays the polarity (LAG / LEAD) supplied from the power system side.
(At power receiving)
Displays the polarity (LAG / LEAD) supplied from the power generation side.
(At power transmission)

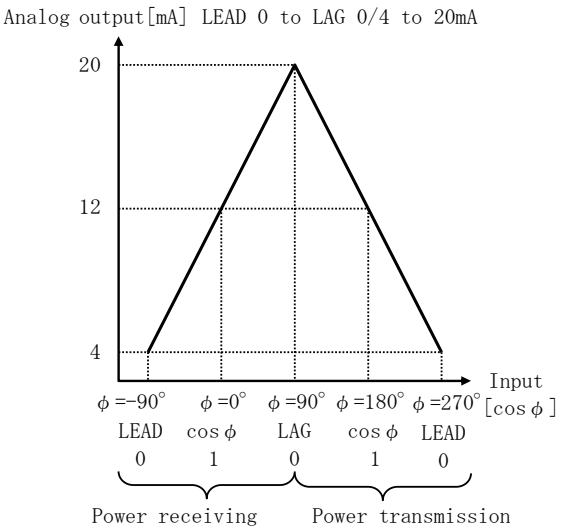
Image of reactive power and power factor display



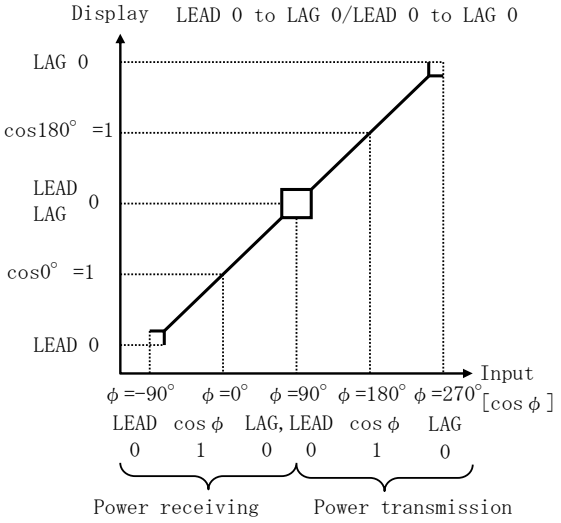
<Note> When used in a place where power transmission operation is performed (supply from the power generation side to the power system side), the polarity (LEAD / LAG) of reactive power and power factor measurement during power transmission changes depending on the power flow measurement setting.
However, the meter display is LEAD on the left and LAG on the right.

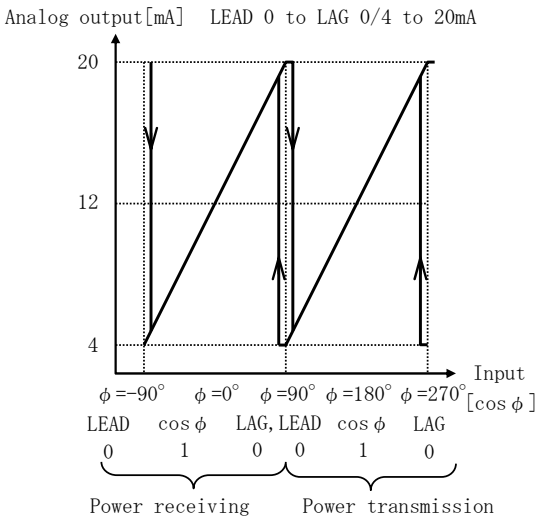
(General measurement)



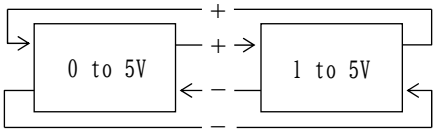


(Tidal current measurement)

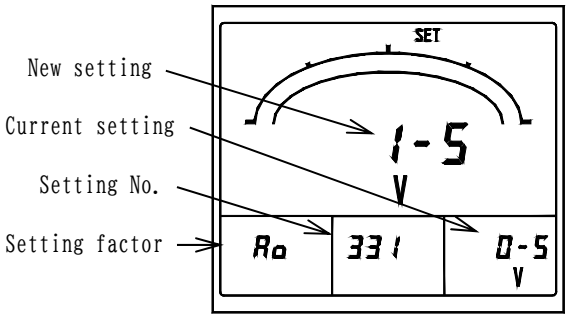




(3) 331 Analog output specification setting 【With analog output (DC0 to 5V or DC1 to 5V)】
Set the specification of analog output (DC0 to 5V／DC1 to 5V).
Selection by [+] and [−], set value is updated by [SET].
Default setting : DC1 to 5V or DC0 to 5V (Designation)

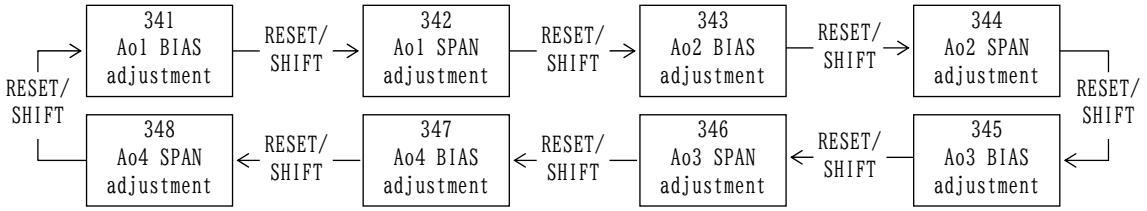


<Note> This setting does not exist at the time of an analog output insulation product.



Analog output specification

(4) 341 to 348 Analog output adjustment 【With analog output】
The bias and span of each analog output are adjusted.

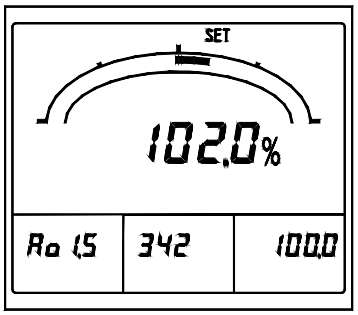


◆ 341 AO(Analog output)1 bias adjustment,
343 AO(Analog output)2 bias adjustment,
345 AO(Analog output)3 bias adjustment,
347 AO(Analog output)4 bias adjustment.

The bias of each analog output is adjusted.
Setting range : ±10.0% (0.1% step)
Selection by [+] and [−], set value is updated by [SET].

◆ 342 AO(Analog output)1 span adjustment,
344 AO(Analog output)2 span adjustment,
346 AO(Analog output)3 span adjustment,
348 AO(Analog output)4 span adjustment.

The span of each analog output is adjusted.
Setting range : ±10.0% (0.1% step)
Selection by [+] and [−], set value is updated by [SET].



Ao1 span adjustment

6. Specification

6.1 Specification and intrinsic error

Input circuit	Input	
3-phase 3-wire Single-phase 2-wire	AC110V, 220V common use. AC 5 A or AC 1 A 50/60Hz Designation	
	AC440V (44) AC 5 A or AC 1 A 50/60Hz Designation	
Single-phase 3-wire	AC100-200V (45) AC 5 A or AC 1 A 50/60Hz Designation	
Current leakage	Rated sensitivity current value. 0.03A / 0.05A / 0.1A / 0.2A / 0.4A / 0.8A	Only with leakage measurement

Measurement item	Measurement range / Display specification		Current input	Voltage input	Intrinsic error (46) Digital display	Intrinsic error (46) Analog output Pulse output (47)	Maximum measur-ement	Minimum measur-ement	Note
Voltage	AC150V to 750.0kV (34 range)			○	±1.0%	±0.5%	○	○	L1L2-L2L3-L3L1 line change (48)
Current	Maximum demand (56), Demand, Instant AC5.00A to 30.0kA (76 range)		○		±1.0%	±0.5%	○	○	L1-L2-L3 phase change (49) Possible to set a range of indication and output apart from the CT ratio.
Active power	Maximum demand (56), Demand, Instant 200.0W to 1000MW (Range select) Based on voltage and current range. One-side swing or both side swings can be set.				±1.0%	±0.5%	○	○	Range of an analog output can be set as indication independently. (50)(51)
Reactive power	LEAD,LAG 150.0var to 1000Mvar (Range select) Based on voltage and current range.				±1.0%	±0.5%	○	○	Range of an analog output can be set as indication independently. (51)
Power factor	LEAD 0.500 to 1.000 to LAG 0.500 or LEAD 0.000 to 1.000 to LAG 0.000 Range select				±2.0%	±2.0%	○	○	In case input is below 20% of voltage range or below 2% of current range : $\cos\phi$=1. (Output is $\cos\phi$=1 equivalence)
Frequency	45.0 to 55.0Hz or 55.0 to 65.0Hz or 45.0 to 65.0Hz Range select			○	±0.5%	±0.5%	○	○	0.0Hz in case input is below 20% of voltage range. Output is a lower limit value. (Lower limit value -1% : % for output span)
Current leakage (52) Io method, Ior method	Current leakage AC0.03A to 0.8A (6 range)		○	○	±2.5% (53)	±2.5% (53)	○		% for rated sensitivity current value. An input (ZCT primary) 3mA or less becomes zero display.
Distortion factor	Voltage	0.0 to 20.0% (Second to 15th harmonic) L1L2-L2L3 (54)		○	±1.0%	±2.5%	○		Digital display is % to 100% of distortion factors.
	Current	0.0 to 100.0% (Second to 15th harmonic) L1-L3 (55)	○		±2.5%	±2.5%	○		
Harmonic nth effective value Fundamental-wave effective value	Voltage	AC150V to 750.0kV (34 range) n=3,4,5,7,9,11,13,15, and fundamental wave. L1L2-L2L3 (54)		○	±1.5%	±1.5%	○		Digital display is % to a voltage range.
	Current	AC5.00A to 30.0kA (76 range) n=3,4,5,7,9,11,13,15, and fundamental wave. L1-L3 (55)	○		±1.5%	±1.5%	○		Digital display is % to a current range.

Measurement item	Measurement range / Display specification		Current input	Voltage input	Intrinsic error (46) Digital display	Intrinsic error (46) Analog output Pulse output (47)	Maximum measur-ement	Minimum measur-ement	Note
Harmonic nth content	Voltage	0.0 to 20.0% n=3,4,5,7,9,11,13,15 L1L2-L2L3 (54)		○	±1.0%	±2.5%	○		Digital display is % to 100% of content.
	Current	0.0 to 100.0% n=3,4,5,7,9,11,13,15 L1-L3 (55)	○		±2.5%	±2.5%	○		
Harmonic 5th conversion effective value	Voltage	AC150V to 750.0kV (34 range) L1L2-L2L3 (54)		○	±1.5%	±1.5%	○		Digital display is % to a voltage range.
	Current	AC5.00A to 30.0kA (76 range) L1-L3 (55)	○		±1.5%	±1.5%	○		Digital display is % to a current range.
Harmonic 5th conversion content	Voltage	0.0 to 20.0% L1L2-L2L3 (54)		○	±1.0%	±2.5%	○		Digital display is % to 100% of content.
	Current	0.0 to 100.0% L1-L3 (55)	○		±2.5%	±2.5%	○		
Watt-hour	Display : Integer, 5 digit. Multiplier : Integral number times of 10. Possible to indicate it to 3 decimal place. Electric power is integrated. (Power receiving, Power transmission)				Power factor 1 : ±2.0% Power factor 0.5 : ±2.5%	Power factor 1 : ±2.0% Power factor 0.5 : ±2.5%			Conformity with normal watt-hour meter. Setting range of pulse output unit (kWh/pulse) is referred to option-specification.
var-hour	Display : Integer, 5 digit. Multiplier : Integral number times of 10. Possible to indicate it to 3 decimal place. Integrating reactive power of power receiving. (LAG·LEAD) Integrating reactive power of power transmission. (LAG·LEAD)				Power factor 0 : ±2.5% Power factor 0.87 : ±2.5%	Power factor 0 : ±2.5% Power factor 0.87 : ±2.5%			Setting range of pulse output unit (kvarh/pulse) is referred to option-specification.

Note (44) Usage condition : Measurement category Ⅲ, pollution degree 2, line to neutral voltage 300V or less.
Note (45) The rated voltage of each phase and L3 phase is 100V. However, the full scale of a bar graph is 300V.
Note (46) If this unit directly measures an inverter output of cycle control, SCR phase angle control or PWM, an error may increase due to its operation principle.
As for harmonic 5th conversion effective value and nth harmonic effective value, a display will be zero by 0.2% or less of the measurement range. And, analog output constitutes lower limit output. At this time, a distortion factor, harmonic 5th conversion content rate, and nth harmonic content also become 0% (analog output is lower limit output). As for a distortion factor, harmonic 5th conversion effective value / content, and nth harmonic effective value / content, fundamental-wave effective value constitutes zero by 3% or less of the measurement range.
Note (47) Analog output and pulse output are options.
Analog output of harmonic distortion factor and harmonic content : It becomes an upper limit output from a lower limit output, for current 0 to 100% and voltage 0 to 20%.
The analog output of current leakage constitutes an upper limit output to leakage sensitivity current value. (Only with leakage measurement)
Note (48) Single-phase 3-wire : L1N-L3N-LIL3, Single-phase 2-wire : With no phase display.
Note (49) Single-phase 3-wire : L1-N-L3, Single-phase 2-wire : With no phase display.
Note (50) At the case of one side swing setting of bar graph. Digital meter measures reverse power to -15% full scale. (Instantaneous power)
Note (51) Active power, reactive power display digit.
A full scale display is below 4000 : 4 digits display. A full scale display is 4000 or more : 3 digits display.
Example) 4800kW → 4.80MW
40kvar → 40.0kvar
20kW → 20.00kW Please refer to an appendix table 1 to 3 for details.
Note (52) Only with leakage measurement. However, current input product constitute only Io method.
Note (53) The error of ZCT is not included. However, leakage detection sensitivity current below 0.1A constitutes ±0.0025A (ZCT primary).
Note (54) Single-phase 3-wire : L1N-L3N, single-phase 2-wire : With no phase display, line display.
Note (55) Single-phase 3-wire : L1-L3, single-phase 2-wire : With no phase display
Note (56) The maximum value (maximum demand current, others) minimum value can be checked in the maximum and the minimum measurement mode.

Item	Specification	
Bar graph display	Bar graph display for the main-monitor element. (Watt-hour and var-hour exclude) A display of a sub-monitor element can also be set.	
Operating method	Current, Voltage : Effective value computing type. Demand ammeter : Arithmetic method according with bimetallic type. Demand active power meter : Arithmetic method according with bimetallic type, or average value within the demand time limit. (One is selected by setting.) Active power, Reactive power, Watt-hour, var-hour : Time-division multiplication method. Power factor : Average value within instant measurement or the demand time limit. (One is selected by setting.) Calculates for active power and reactive power. Frequency : Zero cross cycle computing type. Current leakage : Fundamental-wave effective value arithmetic method. Harmonic : FFT computing type.	
Interval setting	Demand current	0 second / 5 seconds / 10 seconds / 20 seconds / 30 seconds / 40 seconds / 50 seconds / 1 minute / 2 minutes / 3 minutes / 4 minutes / 5 minutes / 6 minutes / 7 minutes / 8 minutes / 9 minutes / 10 minutes / 15 minutes / 20 minutes / 25 minutes / 30 minutes (95% time limit)
	Demand active power	
	Harmonic measurement	Average time limit. 0 minute / 1 minute / 2 minutes / 5 minutes / 10 minutes / 15 minutes / 30 minutes Average measurement.
The element in which display setting is possible	Main monitor	Voltage(L1L2-L2L3-L3L1), Current(L1-L2-L3), Demand current(L1-L2-L3), Active power, Demand active power, Reactive power, Power factor, Frequency, Current leakage, Watt-hour(Power receiving, Power transmission), var-hour(Power receiving LAG/LEAD, Power transmission LAG/LEAD), Distortion factor(A, V)
	Sub-monitor (Left)	Voltage(L1L2-L2L3-L3L1), Current(L1-L2-L3), Active power, Reactive power, Power factor, Current leakage
	Sub-monitor (Center)	Voltage(L1L2-L2L3-L3L1), Current(L1-L2-L3), Demand current(L1-L2-L3), Active power, Demand active power, Reactive power, var-hour(Power receiving LAG/LEAD, Power transmission LAG/LEAD), Harmonic 5th conversion content(A, V), Harmonic nth content(A, V)
	Sub-monitor (Right)	Voltage(L1L2-L2L3-L3L1), Current(L1-L2-L3), Demand current(L1-L2-L3), Active power, Demand active power, Power factor, Frequency, Watt-hour(Power receiving, Power transmission), Fundamental-wave effective value(A, V), Harmonic 5th conversion content(A, V), Harmonic nth effective value(A, V)
	Bar graph	Voltage(L1L2-L2L3-L3L1), Current(L1-L2-L3), Demand current(L1-L2-L3), Active power, Demand active power, Reactive power, Power factor, Frequency, Current leakage, Distortion factor(A, V), Harmonic 5th conversion content(A, V), Harmonic nth content(A, V), Fundamental-wave effective value(A, V), Harmonic 5th conversion effective value(A, V), Harmonic nth effective value(A, V)
Option	Analog output (4 sets) Contact output (2 sets. Select of pulse output or alarm output or CPU error output.) External operation change input (2 sets)	

● About power and reactive power full scale range selection
The power range and reactive power range is automatically decided in a current range and voltage range.
The full scale range of a bar graph can be selected out of the following values within a 40 to 115% (range of active power) and 30 to 115% (range of reactive power), assuming that the rated power (VT ratio × CT ratio)([57]) is 100%.
1.0 / 1.2 / 1.4 / 1.5 / 1.6 / 1.8 / 2.0 / 2.4 / 2.5 / 2.8 / 3.0 / 3.2 / 3.6 / 4.0 / 4.2 / 4.5 / 4.8 / 5.0 / 5.6 / 6.0 / 6.4 / 7.2 / 7.5 / 8.0 / 8.4 / 9.0 / 9.6 $\times 10^n$

Example) In case of VT ratio × CT ratio = 1200kW
A full scale range can be selected from the following.
480 / 500 / 560 / 600 / 640 / 720 / 750 / 800 / 840 / 900 / 960 / 1000 / 1200

Note ([57]) Assume VT ratio is “2” for calculation in case of 220V and “4” for calculation in case of 440V input specifications and also assume CT ratio is
CT ratio ÷ 5 in case of 1A input specifications.

● Measurement possible range.

Measurement element			Input (58)	Measurement possible range			
				Display		Analog output	
				Limiter	Low input cut	Limiter	Low input cut
Voltage			AC0 to 150V [AC0 to 300V] <AC0 to 600V>	101% of meter full scale.	0.5% of meter full scale.	101% of output span.	0.5% of output span.
Current, Demand current			AC0 to 5A [AC0 to 1A]	120% of current range.	0.5% of current range.	120% of output span.	0.5% of output span.
Active power, Demand active power			0 to 1kW (0 to 200W) [0 to 2kW (0 to 400W)] <0 to 4kW (0 to 800W)> -1kW to 0 to 1kW (-200W to 0 to 200W) [-2kW to 0 to 2kW (-400W to 0 to 400W)] <-4kW to 0 to 4kW (-800W to 0 to 800W)>	120% of active power display intrinsic sensitivity	0.5% of active power range	-1%, 120% of output span.	0.5% of output span.
Reactive power			LEAD 1 to 0 to LAG 1kvar (LEAD 200 to 0 to LAG 200var) [LEAD 2 to 0 to LAG 2kvar (LEAD 400 to 0 to LAG 400var)] <LEAD 4 to 0 to LAG 4kvar (LEAD 800 to 0 to LAG 800var)>	120% of reactive power display intrinsic sensitivity	0.5% of reactive power range	-1%, 120% of output span.	0.5% of output span.
Power factor			LEAD 0 to 1 to LAG 0	LEAD 0.000 to 1 to LAG 0.000	Less than 20% of voltage full scale or less than 2% of current range	0%, 100% of output span.	Less than 20% of voltage full scale or less than 2% of current range
			LEAD 0.5 to 1 to LAG 0.5	LEAD 0.490 to 1 to LAG 0.490		-1%, 101% of output span.	
Frequency			45 to 55Hz	44.9 to 55.1Hz	Less than 20% of voltage full scale	-1%, 101% of output span.	Less than 20% of voltage full scale
			55 to 65Hz	54.9 to 65.1Hz			
			45 to 65Hz	44.8 to 65.2Hz			
Current leakage			AC0 to Rated sensitivity current value	120% of 0.8A	Less than 0.003A	120% of output span.	Less than 0.003A
Harmonic	Effective value	Current	AC0 to 5A [AC0 to 1A]	—	0.25% of full scale	120% of output span.	0.25% of output span.
		Voltage	AC0 to 150V [AC0 to 300V] <AC0 to 600V>	—	0.25% of voltage range	101% of output span.	0.25% of output span.
	Rate of content	Current	0 to 100%	200%	By harmonic effective value current	120% of output span.	By harmonic effective value current
		Voltage	0 to 20%	100%	By harmonic effective value voltage	120% of output span.	By harmonic effective value voltage

Note (58) [ ] is the 220V input case, < > is the 440V input case. ( ) is the 1A input case.

6.2 Specification, Performance.

Item	Specification			
Intrinsic error	Reference to measure specification and intrinsic error			
Intrinsic error of bar graph	±10% (% of span)			
Influence by temperature	23±10℃ within intrinsic error.			
Compliance standards	JIS C 1102-1, -2, -3, -4, -5, -7：1997 , JIS C 1111：1989 , JIS C 1216：1995 , JIS C 1263：1995 , JIS C 8374：1991			
Display updating time	About 1 second (Bar graph：0.25 seconds) (Current leakage measurement：Digital and bar graph is 2 seconds or less. Harmonic measurement：Digital and bar graph is 10 seconds or less.)			
Display device Display composition	LCD	Main monitor	5 digit, character height 11mm	
		Sub-monitor (Left)	4 digit, character height 6mm	
		Sub-monitor (Center),(Right)	5 digit, character height 6mm	
		Bar graph	20 dots	
LCD view angle	For upper installation (For lower view)	Upper view angle 10° , Lower view angle 60° , Right and left view angle 60°		
	Wide viewing angle	Upper view angle and lower view angle 75° , Right and left view angle 75°		
Backlight	LED backlight：White Always-on, Auto off (after 5 minutes without operating), Always-off. Setting is possible. Backlight can select brightness from five steps of 1 to 5.			
Auxiliary supply	(1) AC85 to 264V 50/60Hz 10VA (Rated voltage, AC100/110V, 200/220V) DC80 to 143V 6W (Rated voltage, DC100/110V) for both AC and DC uses			
	(2) DC20 to 56V 6W (Rated voltage, DC24/48V)			
Rush current (Time constant)	Rated voltage AC110V 2.2A or less (About 3.6ms)			
	Rated voltage AC220V 4.4A or less (About 3.6ms)			
	Rated voltage DC110V 1.6A or less (About 3.6ms)			
	Rated voltage DC24V 5.0A or less (About 2.0ms)			
	Rated voltage DC48V 9.9A or less (About 2.0ms)			
Input consumption VA	Voltage circuit	0.1VA or less (110V) , 0.2VA or less (220V)		
	Current circuit	0.1VA or less (5A,1A)		
Overload capacity	Voltage circuit	2 times 10 seconds, 1.2 times continuation of rated voltage.		
	Current circuit	40 times 1 second, 20 times 4 seconds, 10 times 16 seconds, 1.2 times continuation of rated current.		
	Auxiliary supply	1.5 times 10 seconds, 1.2 times continuation of rated voltage. In case of DC110V, 1.5 times 10 seconds, 1.3 times continuation of rated voltage.		
Insulation resistance JIS C 1102-1 (59) JIS C 1111	Between electric circuits and case (ground).	Above 50MΩ at DC500V		
	Between input and output and auxiliary supply.			
	Between analog output and pulse output and alarm output.			
	Between pulse outputs.			
	Between alarm outputs.			
	Between analog outputs.	Non-insulation (minus common) Above 50MΩ at DC500V megger	Designation	
Withstand voltage (59) JIS C 1102-1 JIS C 1111	Between electric circuits and case (ground).	AC2000V (50/60Hz) 1 minute		
	Between input and output and auxiliary supply.			
	Between analog output and pulse output and alarm output.	AC1500V (50/60Hz) 1 minute		
	Between pulse outputs.			
	Between alarm outputs.			
	Between analog outputs.	Non-insulation (minus common) AC500V (50/60Hz) 1 minute	Designation	
Impulse withstand voltage JIS C 1111	Between auxiliary supply and case (ground). (Only with leakage measurement)	7kV 1.2/50μs Both positive and negative polarities, for 3 times each.		
	Between electric circuits and case (ground). (An analog output is excluded)	6kV 1.2/50μs Both positive and negative polarities, for 3 times each.		
	Between analog output and case (ground).	5kV 1.2/50μs Both positive and negative polarities, for 3 times each.		

Note (59) A voltage input and a leakage input are not insulated. Please use it combining ZCT.

Item	Specification
Noise-capacity JEA B-402	(1) Oscillatory surge voltage When a damping vibration waveform (peak voltage 2.5kV, frequency 1MHz±10%) is repeatedly applied, the measurement error should be within 10% and no malfunction should occur. Voltage input circuit (Normal / Common) Current input circuit (Common. Current leakage input circuit is excluded) Auxiliary supply circuit (Normal / Common) (2) Square wave impulse noise If a noise (1μs, 100ns width) is repeated and added, a measurement error should be within 10% and no malfunction should occur. Auxiliary supply circuit (Normal / Common) Over 1500V Voltage input circuit (Normal / Common) Over 1500V Current input circuit (Common) Over 1500V (Current leakage input circuit is excluded) Pulse output (Common) Over 1000V Alarm output (Common) Over 1000V Operation input (Common) Over 1000V Analog output circuit (Induction) Over 1000V (3) Electric wave noise If intermittence irradiation of the electric wave of a 150MHz,400MHz band is done by (5W, 1m), a measurement error should be within 10% and no malfunction should occur. (4) Electrostatic noise Measurement error shall be within 10% at contact discharge 8kV and air discharge 15kV, and no malfunction shall occur.
Vibration, Shock JIS C 1102-1	Vibration：Single amplitude 0.15mm, 10 to 55Hz, Each minute octave in 5 times sweep Shock：490m/s^2 It is each 3 times to the X,Y,Z direction.
Construction	Dimension：110mm(Width)×110mm(Height)×103.5mm(Depth) Body diameter：99mmφ With terminal cover
Material	Case, Cover：ABS(V-0) , Terminal block：PBT , Terminal cover：Polycarbonate
Color	Black (Munsell N1.5)
Mass	Approx. 600g
Blackout guarantee	Maximum value, Minimum value, Integrates value and each setting value. Data hold by nonvolatile memory.
Operating temperature and humidity limits	-10 to +55℃, 30 to 85% RH, Non condensing.
Storage temperature limits	-25 to +70℃

6.3 Option

<table>
<tr><th>Item</th><th colspan="8">Specification</th></tr>
<tr><td rowspan="5">Analog output</td><td>Number of output</td><td colspan="7">4 circuits</td></tr>
<tr><td rowspan="2">Output specification</td><td colspan="4">Analog output non-insulation type</td><td colspan="3">Analog output insulation type</td></tr>
<tr><td colspan="4">DC4 to 20mA (Below 550Ω)
DC0 to 1mA (Below 10kΩ)
DC0 to 5V/1 to 5V (Over 600Ω)
DC0 to 10V (Over 2kΩ)
One of them is designated by identical ratings.</td><td colspan="3">DC4 to 20mA (Below 550Ω)
DC1 to 5V (Over 600Ω)
One of them is designated by identical ratings.</td></tr>
<tr><td>Output element</td><td colspan="7">Voltage(L1L2-L2L3-L3L1), Current(L1-L2-L3), Demand current(L1-L2-L3), Active power, Demand active power, Reactive power, Power factor, Frequency,
Current leakage (Only with leakage measurement), Distortion factor(A, V),
Fundamental-wave effective value (Maximum value of each A/V phase),
Harmonic 5th conversion content (Maximum value of each A/V phase),
Harmonic 5th conversion effective value (Maximum value of each A/V phase),
Harmonic nth content (Maximum value of each A/V phase),
nth harmonic effective value (Maximum value of each A/V phase)</td></tr>
<tr><td>Response time</td><td colspan="7">1 second or less (Time within ±1% of final constant value.)
Leakage measurement is 2 seconds or less. Harmonic measurement is 10 seconds or less.</td></tr>
<tr><td>Output ripple</td><td colspan="7">Within the double precision of accuracy (% for output span)</td></tr>
<tr><td rowspan="10">Pulse output (61)</td><td colspan="8">Possible output ：Watt-hour or var-hour.
Output form ：Optical MOS-FET relay. Normally open contact (1a contact)
Contact capacity：AC, DC125V, 70mA (Resistance load, inductive load)
Pulse width ：250±10ms (When the output pulse period of rated active power constitutes speed more than 2 pulse/second by setting of an voltage measurement range, a current measurement range, and an output pulse unit, output pulse width is set to 100 to 130ms.)
Setting of output pulse unit is possible by the next range.
■ 3-phase 3-wire ：Full load power (kW,kvar)＝$\sqrt{3}$×Rated voltage(V)×Rated current(A)×10^{-3}
■ Single-phase 3-wire：Full load power (kW,kvar)＝2×Rated voltage(V)×Rated current(A)×10^{-3}
■ Single-phase 2-wire：Full load power (kW,kvar)＝Rated voltage(V)×Rated current(A)×10^{-3}</td></tr>
<tr><td colspan="2">Full load power (kW,kvar)</td><td colspan="4">Output pulse unit. kWh(kvarh)/pulse</td><td>Multiplying factor</td></tr>
<tr><td colspan="2">Below 1</td><td>0.1</td><td>0.01</td><td>0.001</td><td>0.0001</td><td>0.01 (60)</td></tr>
<tr><td>Over 1</td><td>Below 10</td><td>1</td><td>0.1</td><td>0.01</td><td>0.001</td><td>0.1</td></tr>
<tr><td>Over 10</td><td>Below 100</td><td>10</td><td>1</td><td>0.1</td><td>0.01</td><td>1</td></tr>
<tr><td>Over 100</td><td>Below 1,000</td><td>100</td><td>10</td><td>1</td><td>0.1</td><td>10</td></tr>
<tr><td>Over 1,000</td><td>Below 10,000</td><td>1,000</td><td>100</td><td>10</td><td>1</td><td>100</td></tr>
<tr><td>Over 10,000</td><td>Below 100,000</td><td>10,000</td><td>1,000</td><td>100</td><td>10</td><td>1,000</td></tr>
<tr><td>Over 100,000</td><td>Below 1,000,000</td><td>100,000</td><td>10,000</td><td>1,000</td><td>100</td><td>10,000</td></tr>
</table>

Note(60) Although multiplying factor is 0.01, a multiplying factor display will be 0.1.
(The place by the integer is 4 digits display. An enlarged display is with 4 decimal places.)

Note(61) 2 outputs combination is possible, for pulse output and alarm output and CPU error output.
(CPU error output is 1 point only)

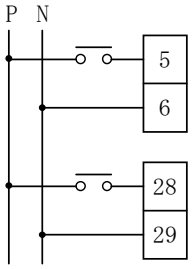
<table>
<tr><th>Item</th><th colspan="4">Specification</th></tr>
<tr><td rowspan="15">Alarm output
(62)</td><td colspan="4">Alarm element : Demand current, Demand active power, Current leakage, harmonic 5th conversion content, Harmonic nth content, Distortion factor, Voltage, Alarm OFF.
Possible to setting one of them.
Reset form : Automatic reset or Manual reset (Setting)
Output contact : No-voltage normally open contact (1a contact) (OR of each phase detection)
Contact capacity : AC250V 8A, DC125V 0.3A (Resistance load) AC250V 2A, DC125V 0.1A (Inductive load)</td></tr>
<tr><td>Alarm element</td><td>Item</td><td colspan="2">Specification</td></tr>
<tr><td rowspan="3">Demand current,
Demand active power</td><td>Function</td><td colspan="2">Demand measurement value ≧ Upper limit setting value,
Alarm display, Alarm output.</td></tr>
<tr><td>Setting accuracy</td><td colspan="2">±1.0% (% for full scale)</td></tr>
<tr><td>Setting range</td><td colspan="2">5 to 100% to the maximum scale. (1% step)</td></tr>
<tr><td rowspan="4">Current leakage
(Only with leakage measurement)</td><td>Sensitivity current</td><td colspan="2">50 to 100% (% for rated sensitivity current value)</td></tr>
<tr><td>Rated sensitivity current value</td><td colspan="2">0.03A / 0.05A / 0.1A / 0.2A / 0.4A / 0.8A</td></tr>
<tr><td>Operating time</td><td colspan="2">Time-delay type (It exceeds 0.1 seconds and is 2 or less seconds.)</td></tr>
<tr><td>Test function</td><td colspan="2">The functional test of the current-leakage detection by the test mode is possible.</td></tr>
<tr><td rowspan="4">Harmonic 5th conversion content

Harmonic nth content

Distortion factor</td><td>Function</td><td colspan="2">Measurement value ≧ Upper limit setting value,
Alarm display, Alarm output. (Detects by the maximum phase)</td></tr>
<tr><td>Setting accuracy</td><td colspan="2">Current : ±2.5%, Voltage : ±1.0%, % to 100% of content rate.</td></tr>
<tr><td>Setting range</td><td>Current</td><td>Harmonic 5th conversion content, Harmonic nth content (n=3,4,5,7,9,11,13,15), Distortion factor.
5 to 100% (1% step)</td></tr>
<tr><td>Detection characteristics</td><td>Voltage</td><td>Harmonic 5th conversion content, Harmonic nth content (n=3,4,5,7,9,11,13,15), Distortion factor.
1.0 to 20.0% (0.1% step)</td></tr>
<tr><td>Voltage</td><td>Function</td><td colspan="2">Average value mode : It will detect, if a par measurement value becomes beyond the above setting.
Inverse-time-delay mode : It detects in the inverse-time-delay characteristics of instantaneous value (only a harmonic 5th conversion content is possible).</td></tr>
<tr><td rowspan="3"></td><td colspan="3">Measurement value ≧ Upper limit setting value,
Alarm display, Alarm output. (Detects by the maximum phase)
Measurement value ≦ Lower limit setting value,
Alarm display, Alarm output. (Detects by the minimum phase)</td></tr>
<tr><td>Setting accuracy</td><td colspan="2">±1.0% (% for full scale)</td></tr>
<tr><td>Setting range</td><td colspan="2">Using a full scale as 150%. 30 to 150% (1% step)</td></tr>
<tr><td>CPU error output
(62)</td><td colspan="2">Detection item (Self-diagnostics item)</td><td>Contact composition</td><td>Contact capacity</td></tr>
<tr><td colspan="2">(1) Watchdog timer
(2) RAM check error
(3) A/D-conversion error
At the case of error detection and not applying for auxiliary supply, an output is ON.
It becomes OR output of a detection item.</td><td>Normally close contact
(b contact)</td><td>AC250V 5A, DC125V 0.2A
(Resistance load)
AC250V 1.5A, DC125V 0.1A
(Inductive load)</td></tr>
<tr><td rowspan="7">External operation input</td><td colspan="2">Number of circuits</td><td colspan="2">2 circuits, A function (four types) is changed by setting.</td></tr>
<tr><td colspan="2">Function</td><td colspan="2">Four types of following functions can be operated by adding a voltage signal from the outside in addition to switch operation.</td></tr>
<tr><td>Alarm reset</td><td colspan="2">Alarm output is reset (output OFF).</td></tr>
<tr><td>Maximum / Minimum value reset</td><td colspan="2">The maximum/minimum value is reset (it updates to the instantaneous value at the time).</td></tr>
<tr><td>Measurement element change</td><td colspan="2">The measurement display element of the main monitoring is changed.</td></tr>
<tr><td>Phase change</td><td colspan="2">A phase/lines display of all the current/voltage currently displayed is changed.</td></tr>
<tr><td colspan="2">Minimum operation pulse width</td><td colspan="2">300ms , Continuation applying is possible.</td></tr>
<tr><td colspan="2">Rated input</td><td colspan="2">Input rating becomes the same as that of auxiliary supply.
(1) AC100/110V 0.4VA, AC200/220V 1.4VA, DC100/110V 0.4W AC DC two ways.
Contact capacity : About 3mA (AC,DC100/110V) , About 6mA (AC200/220V)
(2) DC24V 0.3W, DC48V 1.2W
Contact capacity : About 10mA (DC24V) , About 20mA (DC48V)</td></tr>
</table>

Note (62) 2 outputs combination is possible, for pulse output and alarm output and CPU error output.
(CPU error output is 1 point only)

● Caution on the use of external display selection input (option)
External power consumption is 0.4VA at AC110V or 1.4VA at AC220V or 0.4W at DC110V.
In case a relay or a switch is used for power-supply, please use the thing with about 1mA of minimum application loads.



7. Maintenance and check

7.1 Trouble shooting

Symptoms	Possible causes	Remedial measures
Indication does not display.	The power supply is not supplied. (Not connected. or voltage is low)	Check the auxiliary supply. Again, a power supply is supplied.
	Measurement display ON/OFF setting is set to OFF.	Setting check.
	Trouble of device.	Replace the device.
Measuring value error is noticeable	Range is not set correctly.	Please set again.
	Out of range in rated frequency (45 to 65Hz).	Cannot be used.
	Cycle control, SCR phase angle control, PWM, or other inverter output is measured.	Cannot be used.
	The frequency range setting is incorrect when there is no input to voltage input terminals 8-9 and current input terminals 12-13 (less than 20% of voltage full scale, less than 10% of current full scale).	Change the frequency range (No. 218) according to the input frequency Please refer to page 62 for setting method.
Measurement display of current leakage Ior is "----".	The direction of the connection to ZCT or this product is reverse.	Please do connection correctly.
	The cable run constitutes a negative phase sequence.	Please change setting (No.163) into "1 : 1-phase grounding (negative phase sequence)".
Analog output is not outputted.	Analog output is set to OFF or measurement element is set to OFF.	Please check setting
Pulse output is not outputted.	Pulse output is set to OFF or measurement element is set to OFF.	Please check setting
Alarm output does not return.	The return method is a "manual reset".	Please check setting

7.2 Test

In case this product is tested, a special setting or operation is not needed fundamentally.
However, the following test should operate it along with each process.

(1) Alarm output test

Even if this product does not have input, it can perform ON/OFF test of an alarm output (relay-contact output).
Operation is performed by alarm 1 test and alarm 2 test in the setting mode 1.
Please refer to "5.3.1 Setting mode 1 (2) alarm output setup" about the details of operation.

In case an alarm output element is a current leakage (Io/Ior).

While pushing [SET], the test input exceeding rated sensitivity current value is applied to the current leakage input circuit inside a product. If the time that is pushing [SET] exceeds the operating time (it exceeds time-delay form 0.1 seconds, and is 2 or less seconds) of a current leakage, an alarm will occur.
And, test input will become off if [SET] is detached. Please be sure to apply rated voltage to voltage input terminal (between P1-P2) at this time.

In addition, an alarm return constitutes action corresponding to a return method setting (automatic reset / manual reset) of each alarm output.

< Operating process >

・Alarm 1 test (Setting No. 124)

(111) (121) (124)
Press [SET] for 3 seconds → Press [MODE] → Press [RESET/SHIFT] for 3 times → While pushing [SET], the alarm 1 output is ON.

・Alarm 2 test (Setting No. 128)

(111) (121) (128)
Press [SET] for 3 seconds → Press [MODE] → Press [RESET/SHIFT] for 7 times → While pushing [SET], the alarm 2 output is ON.

・In case an alarm output element is current leakage (Io/Ior) ··· Example) ALARM 2

(111) (121) (128)
Press [SET] for 3 seconds → Press [MODE] → Press [RESET/SHIFT] for 7 times

↳ If it continues pushing [SET] for a long time from the current-leakage operating time, alarm 2 output is ON.

(2) Harmonic time-interval test

Please test by the following operation about the time interval of a harmonic. An error becomes large, in case it tests without performing the following operation.
Operation is performed with the average time interval in the setting mode 1.
Please refer to "5.3.1 setting mode 1 (4) harmonic detection setting" for operation details.

< Operating process > (Setting No. 14A)

(111) (141) (14A)
Press [SET] for 3 seconds → Press [MODE] for 3 times → Press [RESET/SHIFT] for 9 times

↳ Please press [SET] simultaneously with a test start.

Please press [DISPLAY] and return to a measurement screen.

Appendix table 1-1

Active power range, watt-hour multiplier rate table (3-phase 3-wire)

Multiplier rate	V range / A range	750.0kV (VT550000/110V) [W]	500.0kV (VT380000/110V) [W]	375.0kV (VT275000/110V) [W]	300.0kV (VT220000/110V) [W]	255.0kV (VT187000/110V) [W]	210.0kV (VT154000/110V) [W]	180.0kV (VT132000/110V) [W]	150.0kV (VT110000/110V) [W]	105.0kV (VT77000/110V) [W]	90.0kV (VT66000/110V) [W]	45.0kV (VT33000/110V) [W]	30.0kV (VT22000/110V) [W]	Multiplier rate
	5A	5.00 M	3600 k (3455)	2500 k	2000 k	1800 k (1700)	1400 k	1200 k	1000 k	720 k (700)	600 k	300.0 k	200.0 k	
	6A	6.00 M	4.20 M (4.15)	3000 k	2400 k	2000 k (2040)	1800 k (1680)	1500 k (1440)	1200 k	840 k (840)	720 k	360.0 k	240.0 k	
	7.5A	7.50 M	5.60 M (5.18)	4.00 M (3.75)	3000 k	2800 k (2550)	2400 k (2100)	1800 k	1500 k	1200 k (1050)	900 k	450 k	300.0 k	
	8A	8.00 M	5.60 M (5.53)	4.00 M	3200 k	2800 k (2720)	2400 k (2240)	2000 k (1920)	1600 k	1200 k (1120)	960 k	480 k	320.0 k	
×100	10A	10.00 M	7.20 M (6.91)	5.00 M	4.00 M	3600 k (3400)	2800 k	2400 k	2000 k	1400 k	1200 k	600 k	400 k	
	12A	12.00 M	8.40 M (8.29)	6.00 M	4.80 M	4.20 M (4.08)	3600 k (3360)	3000 k (2880)	2400 k	1800 k (1680)	1500 k (1440)	720 k	480 k	
	15A	15.00 M	10.00 M (10.36)	7.50 M	6.00 M	5.60 M (5.10)	4.20 M	3600 k	3000 k	2400 k (2100)	1800 k	900 k	600 k	
	20A	20.00 M	14.00 M (13.82)	10.00 M	8.00 M	7.20 M (6.80)	5.60 M	4.80 M	4.00 M	2800 k	2400 k	1200 k	800 k	
	25A	25.00 M	18.00 M (17.27)	14.00 M (12.50)	10.00 M	9.00 M (8.50)	7.20 M (7.00)	6.00 M	5.00 M	3600 k (3500)	3000 k	1500 k	1000 k	×10
	30A	30.00 M	20.00 M (20.73)	15.00 M	12.00 M	10.00 M (10.20)	8.40 M	7.20 M	6.00 M	4.20 M	3600 k	1800 k	1200 k	
	40A	40.0 M	28.00 M (27.64)	20.00 M	16.00 M	14.00 M (13.60)	12.00 M (11.20)	9.60 M	8.00 M	5.60 M	4.80 M	2400 k	1600 k	
	50A	50.0 M	36.00 M (34.55)	25.00 M	20.00 M	18.00 M (17.00)	14.00 M	12.00 M	10.00 M	7.20 M (7.00)	6.00 M	3000 k	2000 k	
	60A	60.0 M	42.0 M (41.5)	30.00 M	24.00 M	20.00 M (20.40)	18.00 M (16.80)	15.00 M (14.40)	12.00 M	8.40 M	7.20 M	3600 k	2400 k	
	75A	75.0 M	56.0 M (51.8)	40.0 M (37.5)	30.00 M	28.00 M (25.50)	24.00 M (21.00)	18.00 M	15.00 M	12.00 M (10.50)	9.00 M	4.50 M	3000 k	
	80A	80.0 M	56.0 M (55.3)	40.0 M	32.00 M	28.00 M (27.20)	24.00 M (22.40)	20.00 M (19.20)	16.00 M	12.00 M (11.20)	9.60 M	4.80 M	3200 k	
×1000	100A	100.0 M	72.0 M (69.1)	50.0 M	40.0 M	36.00 M (34.00)	28.00 M	24.00 M	20.00 M	14.00 M	12.00 M	6.00 M	4.00 M	
	120A	120.0 M	84.0 M (82.9)	60.0 M	48.0 M	42.0 M (40.8)	36.00 M (33.60)	30.00 M (28.80)	24.00 M	18.00 M (16.80)	15.00 M (14.40)	7.20 M	4.80 M	
	150A	150.0 M	100.0 M (103.6)	75.0 M	60.0 M	56.0 M (51.0)	42.0 M	36.00 M	30.00 M	24.00 M (21.00)	18.00 M	9.00 M	6.00 M	
	200A	200.0 M	140.0 M (138.2)	100.0 M	80.0 M	72.0 M (68.0)	56.0 M	48.0 M	40.0 M	28.00 M	24.00 M	12.00 M	8.00 M	
	250A	250.0 M	180.0 M (172.7)	140.0 M (125.0)	100.0 M	90.0 M (85.0)	72.0 M (70.0)	60.0 M	50.0 M	36.00 M (35.00)	30.00 M	15.00 M	10.00 M	×100
	300A	300.0 M	200.0 M (207.3)	150.0 M	120.0 M	100.0 M (102.0)	84.0 M	72.0 M	60.0 M	42.0 M	36.00 M	18.00 M	12.00 M	
	400A	400 M	280.0 M (276.4)	200.0 M	160.0 M	140.0 M (136.0)	120.0 M (112.0)	96.0 M	80.0 M	56.0 M	48.0 M	24.00 M	16.00 M	
	500A	500 M	360.0 M (345.5)	250.0 M	200.0 M	180.0 M (170.0)	140.0 M	120.0 M	100.0 M	72.0 M (70.0)	60.0 M	30.00 M	20.00 M	
	600A	600 M	420 M (415)	300.0 M	240.0 M	200.0 M (204.0)	180.0 M (168.0)	150.0 M (144.0)	120.0 M	84.0 M	72.0 M	36.00 M	24.00 M	
	750A	750 M	560 M (518)	400 M (375)	300.0 M	280.0 M (255.0)	240.0 M (210.0)	180.0 M	150.0 M	120.0 M (105.0)	90.0 M	45.0 M	30.00 M	
	800A	800 M	560 M (553)	400 M	320.0 M	280.0 M (272.0)	240.0 M (224.0)	200.0 M (192.0)	160.0 M	120.0 M (112.0)	96.0 M	48.0 M	32.00 M	
	900A	900 M	640 M (622)	450 M	360.0 M	320.0 M (306.0)	280.0 M (252.0)	240.0 M (216.0)	180.0 M	140.0 M (126.0)	120.0 M (108.0)	56.0 M (54.0)	36.00 M	
×10000	1000A	1000 M	720 M (691)	500 M	400 M	360.0 M (340.0)	280.0 M	240.0 M	200.0 M	140.0 M	120.0 M	60.0 M	40.0 M	
	1200A		840 M (829)	600 M	480 M	420 M (408)	360.0 M (336.0)	300.0 M (288.0)	240.0 M	180.0 M (168.0)	150.0 M (144.0)	72.0 M	48.0 M	
	1500A			750 M	600 M	560 M (510)	420 M	360.0 M	300.0 M	240.0 M (210.0)	180.0 M	90.0 M	60.0 M	
	1600A			800 M	640 M	560 M (544)	450 M (448)	400 M (384)	320.0 M	240.0 M (224.0)	200.0 M (192.0)	96.0 M	64.0 M	
	1800A			900 M	720 M	640 M (612)	560 M (504)	450 M (432)	360.0 M	280.0 M (252.0)	240.0 M (216.0)	120.0 M (108.0)	72.0 M	
	2000A			1000 M	800 M	720 M (680)	560 M	480 M	400 M	280.0 M	240.0 M	120.0 M	80.0 M	
	2500A				1000 M	900 M (850)	720 M (700)	600 M	500 M	360.0 M (350.0)	300.0 M	150.0 M	100.0 M	×1000
	3000A						840 M	720 M	600 M	420 M	360.0 M	180.0 M	120.0 M	
	4000A							960 M	800 M	560 M	480 M	240.0 M	160.0 M	
	5000A								1000 M	720 M (700)	600 M	300.0 M	200.0 M	
	6000A									840 M	720 M	360.0 M	240.0 M	
	7500A										900 M	450 M	300.0 M	
	8000A										960 M	480 M	320.0 M	
	9000A											560 M (540)	360.0 M	
	10000A											600 M	400 M	
	12000A											720 M	480 M	
	15000A											900 M	600 M	
	20000A												800 M	×10000
	30000A													

<Note 1>

Parenthesis is primary active power (reactive power) value in /1kW(1kvar).
In the blank, setting is impossible.
About active power and reactive power range.
Full scale display, less than 4000：4 digit. More than 4000：3 digit.
An example) 4800kW → 4.80MW
40kvar → 40.0kvar
20kW → 20.00kW

<Note 2>

In case the voltage range and the current range were set as ▭ of an upper table and an output pulse unit (a four-step setup is possible) is set as the fastest.
The output pulse width of a pulse output is set to 100 to 130ms. (Usually 240 to 260ms)

Appendix table 1-2

Active power range, watt-hour multiplier rate table (3-phase 3-wire)

Multiplier rate	V range / A range	25.00kV (VT18400/110V) [W]	24.00kV (VT16500/110V) [W]	18.00kV (VT13800/110V) [W]	18.00kV (VT13200/110V) [W]	15.00kV (VT11000/110V) [W]	9000V (VT6600/110V) [W]	4500V (VT3300/110V) [W]	3000V (VT2200/110V) [W]	2400V (VT1650/110V) [W]	1500V (VT1100/110V) [W]	1200V (VT880/110V) [W]	600V (VT480/110V) [W]	Multiplier rate
	5A	180.0 k (167.3)	150.0 k	140.0 k (125.5)	120.0 k	100.0 k	60.0 k	30.00 k	20.00 k	15.00 k	10.00 k	8.00 k	4.50 k (4.36)	
	6A	200.0 k (200.7)	180.0 k	160.0 k (150.5)	150.0 k (144.0)	120.0 k	72.0 k	36.00 k	24.00 k	18.00 k	12.00 k	9.60 k	5.60 k (5.24)	
	7.5A	280.0 k (250.9)	240.0 k (225.0)	200.0 k (188.2)	180.0 k	150.0 k	90.0 k	45.0 k	30.00 k	24.00 k (22.50)	15.00 k	12.00 k	7.20 k (6.55)	
	8A	280.0 k (267.6)	240.0 k	200.0 k (200.7)	200.0 k (192.0)	160.0 k	96.0 k	48.0 k	32.00 k	24.00 k	16.00 k	14.00 k (12.80)	7.20 k (6.98)	
	10A	360.0 k (334.5)	300.0 k	280.0 k (250.9)	240.0 k	200.0 k	120.0 k	60.0 k	40.0 k	30.00 k	20.00 k	16.00 k	9.00 k (8.73)	
	12A	420 k (401)	360.0 k	320.0 k (301.1)	300.0 k (288.0)	240.0 k	150.0 k (144.0)	72.0 k	48.0 k	36.00 k	24.00 k	20.00 k (19.20)	12.00 k (10.47)	×0.1
	15A	560 k (502)	450 k	400 k (376)	360.0 k	300.0 k	180.0 k	90.0 k	60.0 k	45.0 k	30.00 k	24.00 k	14.00 k (13.09)	
	20A	720 k (669)	600 k	560 k (502)	480 k	400 k	240.0 k	120.0 k	80.0 k	60.0 k	40.0 k	32.00 k	18.00 k (17.45)	
×10	25A	840 k (836)	750 k	640 k (627)	600 k	500 k	300.0 k	150.0 k	100.0 k	75.0 k	50.0 k	40.0 k	24.00 k (21.82)	
	30A	1000 k (1004)	900 k	800 k (753)	720 k	600 k	360.0 k	180.0 k	120.0 k	90.0 k	60.0 k	48.0 k	28.00 k (26.18)	
	40A	1400 k (1338)	1200 k	1000 k (1004)	960 k	800 k	480 k	240.0 k	160.0 k	120.0 k	80.0 k	64.0 k	36.00 k (34.91)	
	50A	1800 k (1673)	1500 k	1400 k (1255)	1200 k	1000 k	600 k	300.0 k	200.0 k	150.0 k	100.0 k	80.0 k	45.0 k (43.6)	
	60A	2000 k (2007)	1800 k	1600 k (1505)	1500 k (1440)	1200 k	720 k	360.0 k	240.0 k	180.0 k	120.0 k	96.0 k	56.0 k (52.4)	
	75A	2800 k (2509)	2400 k (2250)	2000 k (1882)	1800 k	1500 k	900 k	450 k	300.0 k	240.0 k (225.0)	150.0 k	120.0 k	72.0 k (65.5)	
	80A	2800 k (2676)	2400 k	2000 k (2007)	2000 k (1920)	1600 k	960 k	480 k	320.0 k	240.0 k	160.0 k	140.0 k (128.0)	72.0 k (69.8)	
	100A	3600 k (3345)	3000 k	2800 k (2509)	2400 k	2000 k	1200 k	600 k	400 k	300.0 k	200.0 k	160.0 k	90.0 k (87.3)	
	120A	4.20 M (4.01)	3600 k	3200 k (3011)	3000 k (2880)	2400 k	1500 k (1440)	720 k	480 k	360.0 k	240.0 k	200.0 k (192.0)	120.0 k (104.7)	×1
	150A	5.60 M (5.02)	4.50 M	4.00 M (3.76)	3600 k	3000 k	1800 k	900 k	600 k	450 k	300.0 k	240.0 k	140.0 k (130.9)	
	200A	7.20 M (6.69)	6.00 M	5.60 M (5.02)	4.80 M	4.00 M	2400 k	1200 k	800 k	600 k	400 k	320.0 k	180.0 k (174.5)	
×100	250A	8.40 M (8.36)	7.50 M	6.40 M (6.27)	6.00 M	5.00 M	3000 k	1500 k	1000 k	750 k	500 k	400 k	240.0 k (218.2)	
	300A	10.00 M (10.04)	9.00 M	8.00 M (7.53)	7.20 M	6.00 M	3600 k	1800 k	1200 k	900 k	600 k	480 k	280.0 k (261.8)	
	400A	14.00 M (13.38)	12.00 M	10.00 M (10.04)	9.60 M	8.00 M	4.80 M	2400 k	1600 k	1200 k	800 k	640 k	360.0 k (349.1)	
	500A	18.00 M (16.73)	15.00 M	14.00 M (12.55)	12.00 M	10.00 M	6.00 M	3000 k	2000 k	1500 k	1000 k	800 k	450 k (436)	
	600A	20.00 M (20.07)	18.00 M	16.00 M (15.05)	15.00 M (14.40)	12.00 M	7.20 M	3600 k	2400 k	1800 k	1200 k	960 k	560 k (524)	
	750A	28.00 M (25.09)	24.00 M (22.50)	20.00 M (18.82)	18.00 M	15.00 M	9.00 M	4.50 M	3000 k	2400 k (2250)	1500 k	1200 k	720 k (655)	
	800A	28.00 M (26.76)	24.00 M	20.00 M (20.07)	20.00 M (19.20)	16.00 M	9.60 M	4.80 M	3200 k	2400 k	1600 k	1400 k (1280)	720 k (698)	
	900A	32.00 M (30.11)	28.00 M (27.00)	24.00 M (22.58)	24.00 M (21.60)	18.00 M	12.00 M (10.80)	5.60 M (5.40)	3600 k	2800 k (2700)	1800 k	1500 k (1440)	800 k (785)	
	1000A	36.00 M (33.45)	30.00 M	28.00 M (25.09)	24.00 M	20.00 M	12.00 M	6.00 M	4.00 M	3000 k	2000 k	1600 k	900 k (873)	
	1200A	42.0 M (40.1)	36.00 M	32.00 M (30.11)	30.00 M (28.80)	24.00 M	15.00 M (14.40)	7.20 M	4.80 M	3600 k	2400 k	2000 k (1920)	1200 k (1047)	×10
	1500A	56.0 M (50.2)	45.0 M	40.0 M (37.6)	36.00 M	30.00 M	18.00 M	9.00 M	6.00 M	4.50 M	3000 k	2400 k	1400 k (1309)	
	1600A	56.0 M (53.5)	48.0 M	42.0 M (40.1)	40.0 M (38.4)	32.00 M	20.00 M (19.20)	9.60 M	6.40 M	4.80 M	3200 k	2800 k (2560)	1400 k (1396)	
	1800A	64.0 M (60.2)	56.0 M (54.0)	48.0 M (45.2)	45.0 M (43.2)	36.00 M	24.00 M (21.60)	12.00 M (10.80)	7.20 M	5.60 M (5.40)	3600 k	3000 k (2880)	1600 k (1571)	
	2000A	72.0 M (66.9)	60.0 M	56.0 M (50.2)	48.0 M	40.0 M	24.00 M	12.00 M	8.00 M	6.00 M	4.00 M	3200 k	1800 k (1745)	
×1000	2500A	84.0 M (83.6)	75.0 M	64.0 M (62.7)	60.0 M	50.0 M	30.00 M	15.00 M	10.00 M	7.50 M	5.00 M	4.00 M	2400 k (2182)	
	3000A	100.0 M (100.4)	90.0 M	80.0 M (75.3)	72.0 M	60.0 M	36.00 M	18.00 M	12.00 M	9.00 M	6.00 M	4.80 M	2800 k (2618)	
	4000A	140.0 M (133.8)	120.0 M	100.0 M (100.4)	96.0 M	80.0 M	48.0 M	24.00 M	16.00 M	12.00 M	8.00 M	6.40 M	3600 k (3491)	
	5000A	180.0 M (167.3)	150.0 M	140.0 M (125.5)	120.0 M	100.0 M	60.0 M	30.00 M	20.00 M	15.00 M	10.00 M	8.00 M	4.50 M (4.36)	
	6000A	200.0 M (200.7)	180.0 M	160.0 M (150.5)	150.0 M (144.0)	120.0 M	72.0 M	36.00 M	24.00 M	18.00 M	12.00 M	9.60 M	5.60 M (5.24)	
	7500A	280.0 M (250.9)	240.0 M (225.0)	200.0 M (188.2)	180.0 M	150.0 M	90.0 M	45.0 M	30.00 M	24.00 M (22.50)	15.00 M	12.00 M	7.20 M (6.55)	
	8000A	280.0 M (267.6)	240.0 M	200.0 M (200.7)	200.0 M (192.0)	160.0 M	96.0 M	48.0 M	32.00 M	24.00 M	16.00 M	14.00 M (12.80)	7.20 M (6.98)	
	9000A	320.0 M (301.1)	280.0 M (270.0)	240.0 M (225.8)	240.0 M (216.0)	180.0 M	120.0 M (108.0)	56.0 M (54.0)	36.00 M	28.00 M (27.00)	18.00 M	15.00 M (14.40)	8.00 M (7.85)	
	10000A	360.0 M (334.5)	300.0 M	280.0 M (250.9)	240.0 M	200.0 M	120.0 M	60.0 M	40.0 M	30.00 M	20.00 M	16.00 M	9.00 M (8.73)	
	12000A	420 M (401)	360.0 M	320.0 M (301.1)	300.0 M (288.0)	240.0 M	150.0 M (144.0)	72.0 M	48.0 M	36.00 M	24.00 M	20.00 M (19.20)	12.00 M (10.47)	×100
	15000A	560 M (502)	450 M	400 M (376)	360.0 M	300.0 M	180.0 M	90.0 M	60.0 M	45.0 M	30.00 M	24.00 M	14.00 M (13.09)	
×10000	20000A	720 M (669)	600 M	560 M (502)	480 M	400 M	240.0 M	120.0 M	80.0 M	60.0 M	40.0 M	32.00 M	18.00 M (17.45)	
	30000A		900 M	800 M (753)	720 M	600 M	360.0 M	180.0 M	120.0 M	90.0 M	60.0 M	48.0 M	28.00 M (26.18)	×1000

<Note 1>

Parenthesis is primary active power (reactive power) value in /1kW(1kvar).
In the blank, setting is impossible.
About active power and reactive power range.
Full scale display, less than 4000：4 digit. More than 4000：3 digit.
An example) 4800kW → 4.80MW
40kvar → 40.0kvar
20kW → 20.00kW

<Note 2>

In case the voltage range and the current range were set as ▭ of an upper table and an output pulse unit (a four-step setup is possible) is set as the fastest.
The output pulse width of a pulse output is set to 100 to 130ms. (Usually 240 to 260ms)

Appendix table 1-3

Active power range, watt-hour multiplier rate table (3-phase 3-wire)

Multiplier rate	V range / A range	600V (VT460/110V) [W]	600V (VT440/110V) [W]	500V (VT380/110V) [W]	300V (VT220/110V) [W]	150V (110V) [W]	Multiplier rate
	5A	4.20 k (4.18)	4.00 k	3600 k (3455)	2000	1000	×0.01
	6A	5.60 k (5.02)	4.80 k	4.20 k (4.15)	2400	1200	
	7.5A	6.40 k (6.27)	6.00 k	5.60 k (5.18)	3000	1500	
	8A	7.20 k (6.69)	6.40 k	5.60 k (5.53)	3200	1600	
	10A	8.40 k (8.36)	8.00 k	7.20 k (6.91)	4.00 k	2000	
×0.1	12A	10.00 k (10.04)	9.60 k	8.40 k (8.29)	4.80 k	2400	
	15A	14.00 k (12.55)	12.00 k	10.00 k (10.36)	6.00 k	3000	
	20A	18.00 k (16.73)	16.00 k	14.00 k (13.82)	8.00 k	4.00 k	
	25A	24.00 k (20.91)	20.00 k	18.00 k (17.27)	10.00 k	5.00 k	
	30A	28.00 k (25.09)	24.00 k	20.00 k (20.73)	12.00 k	6.00 k	
	40A	36.00 k (33.45)	32.00 k	28.00 k (27.64)	16.00 k	8.00 k	
	50A	42.0 k (41.8)	40.0 k	36.00 k (34.55)	20.00 k	10.00 k	×0.1
	60A	56.0 k (50.2)	48.0 k	42.0 k (41.5)	24.00 k	12.00 k	
	75A	64.0 k (62.7)	60.0 k	56.0 k (51.8)	30.00 k	15.00 k	
	80A	72.0 k (66.9)	64.0 k	56.0 k (55.3)	32.00 k	16.00 k	
	100A	84.0 k (83.6)	80.0 k	72.0 k (69.1)	40.0 k	20.00 k	
×1	120A	100.0 k (100.4)	96.0 k	84.0 k (82.9)	48.0 k	24.00 k	
	150A	140.0 k (125.5)	120.0 k	100.0 k (103.6)	60.0 k	30.00 k	
	200A	180.0 k (167.3)	160.0 k	140.0 k (138.2)	80.0 k	40.0 k	
	250A	240.0 k (209.1)	200.0 k	180.0 k (172.7)	100.0 k	50.0 k	
	300A	280.0 k (250.9)	240.0 k	200.0 k (207.3)	120.0 k	60.0 k	
	400A	360.0 k (334.5)	320.0 k	280.0 k (276.4)	160.0 k	80.0 k	
	500A	420 k (418)	400 k	360.0 k (345.5)	200.0 k	100.0 k	×1
	600A	560 k (502)	480 k	420 k (415)	240.0 k	120.0 k	
	750A	640 k (627)	600 k	560 k (518)	300.0 k	150.0 k	
	800A	720 k (669)	640 k	560 k (553)	320.0 k	160.0 k	
	900A	800 k (753)	720 k	640 k (622)	360.0 k	180.0 k	
	1000A	840 k (836)	800 k	720 k (691)	400 k	200.0 k	
×10	1200A	1000 k (1004)	960 k	840 k (829)	480 k	240.0 k	
	1500A	1400 k (1255)	1200 k	1000 k (1036)	600 k	300.0 k	
	1600A	1400 k (1338)	1400 k (1280)	1200 k (1105)	640 k	320.0 k	
	1800A	1600 k (1505)	1500 k (1440)	1400 k (1244)	720 k	360.0 k	
	2000A	1800 k (1673)	1600 k	1400 k (1382)	800 k	400 k	
	2500A	2400 k (2091)	2000 k	1800 k (1727)	1000 k	500 k	
	3000A	2800 k (2509)	2400 k	2000 k (2073)	1200 k	600 k	
	4000A	3600 k (3345)	3200 k	2800 k (2764)	1600 k	800 k	
	5000A	4.20 M (4.18)	4.00 M	3600 k (3455)	2000 k	1000 k	×10
	6000A	5.60 M (5.02)	4.80 M	4.20 M (4.15)	2400 k	1200 k	
	7500A	6.40 M (6.27)	6.00 M	5.60 M (5.18)	3000 k	1500 k	
	8000A	7.20 M (6.69)	6.40 M	5.60 M (5.53)	3200 k	1600 k	
	9000A	8.00 M (7.53)	7.20 M	6.40 M (6.22)	3600 k	1800 k	
	10000A	8.40 M (8.36)	8.00 M	7.20 M (6.91)	4.00 M	2000 k	
×100	12000A	10.00 M (10.04)	9.60 M	8.40 M (8.29)	4.80 M	2400 k	
	15000A	14.00 M (12.55)	12.00 M	10.00 M (10.36)	6.00 M	3000 k	
	20000A	18.00 M (16.73)	16.00 M	14.00 M (13.82)	8.00 M	4.00 M	
×1000	30000A	28.00 M (25.09)	24.00 M	20.00 M (20.73)	12.00 M	6.00 M	×100

<Note 1>

Parenthesis is primary active power (reactive power) value in /1kW(1kvar).
In the blank, setting is impossible.
About active power and reactive power range.
Full scale display, less than 4000 : 4 digit. More than 4000 : 3 digit.
An example) 4800kW → 4.80MW
40kvar → 40.0kvar
20kW → 20.00kW

<Note 2>

In case the voltage range and the current range were set as ▭ of an upper table and an output pulse unit (a four-step setup is possible) is set as the fastest.
The output pulse width of a pulse output is set to 100 to 130ms. (Usually 240 to 260ms)

Appendix table 2

Active power range, watt-hour multiplier rate table (Single-phase 3-wire)

V range / A range	150V (110V) [W]	Multiplier rate
5A	1000	
6A	1200	
7.5A	1500	
8A	1600	
10A	2000	
12A	2400	
15A	3000	
20A	4.00 k	
25A	5.00 k	
30A	6.00 k	
40A	8.00 k	×0.1
50A	10.00 k	
60A	12.00 k	
75A	15.00 k	
80A	16.00 k	
100A	20.00 k	
120A	24.00 k	
150A	30.00 k	
200A	40.0 k	
250A	50.0 k	
300A	60.0 k	
400A	80.0 k	×1
500A	100.0 k	
600A	120.0 k	
750A	150.0 k	
800A	160.0 k	
900A	180.0 k	
1000A	200.0 k	
1200A	240.0 k	
1500A	300.0 k	
1600A	320.0 k	
1800A	360.0 k	
2000A	400 k	
2500A	500 k	
3000A	600 k	
4000A	800 k	×10
5000A	1000 k	
6000A	1200 k	
7500A	1500 k	
8000A	1600 k	
9000A	1800 k	
10000A	2000 k	
12000A	2400 k	
15000A	3000 k	
20000A	4.00 M	
30000A	6.00 M	×100

<Note 1>

Parenthesis is primary active power (reactive power) value in /1kW(1kvar).
In the blank, setting is impossible.
About active power and reactive power range.
Full scale display, less than 4000：4 digit. More than 4000：3 digit.
An example) 4800kW → 4.80MW
40kvar → 40.0kvar
20kW → 20.00kW

<Note 2>

In case the voltage range and the current range were set as ▭ of an upper table and an output pulse unit (a four-step setup is possible) is set as the fastest.
The output pulse width of a pulse output is set to 100 to 130ms. (Usually 240 to 260ms)

Appendix table 3-1

Active power range, watt-hour multiplier rate table (Single-phase 2-wire)

Multiplier rate	V range / A range	750.0kV (VT550000/110V) [W]	500.0kV (VT380000/110V) [W]	375.0kV (VT275000/110V) [W]	300.0kV (VT220000/110V) [W]	255.0kV (VT187000/110V) [W]	210.0kV (VT154000/110V) [W]	180.0kV (VT132000/110V) [W]	150.0kV (VT110000/110V) [W]	105.0kV (VT77000/110V) [W]	90.0kV (VT66000/110V) [W]	45.0kV (VT33000/110V) [W]	30.0kV (VT22000/110V) [W]	Multiplier rate
	5A	2500 k	1800 k (1727)	1400 k (1250)	1000 k	900 k (850)	720 k (700)	600 k	500 k	360.0 k (350.0)	300.0 k	150.0 k	100.0 k	
	6A	3000 k	2000 k (2073)	1500 k	1200 k	1000 k (1020)	840 k	720 k	600 k	420 k	360.0 k	180.0 k	120.0 k	
	7.5A	4.00 M (3.75)	2800 k (2591)	2000 k (1875)	1500 k	1400 k (1275)	1200 k (1050)	900 k	750 k	560 k (525)	450 k	240.0 k (225.0)	150.0 k	
	8A	4.00 M	2800 k (2764)	2000 k	1600 k	1400 k (1360)	1200 k (1120)	960 k	800 k	560 k	480 k	240.0 k	160.0 k	
	10A	5.00 M	3600 k (3455)	2500 k	2000 k	1800 k (1700)	1400 k	1200 k	1000 k	720 k (700)	600 k	300.0 k	200.0 k	
	12A	6.00 M	4.20 M (4.15)	3000 k	2400 k	2000 k (2040)	1800 k (1680)	1500 k (1440)	1200 k	840 k	720 k	360.0 k	240.0 k	
×100	15A	7.50 M	5.60 M (5.18)	4.00 M (3.75)	3000 k	2800 k (2550)	2400 k (2100)	1800 k	1500 k	1200 k (1050)	900 k	450 k	300.0 k	
	20A	10.00 M	7.20 M (6.91)	5.00 M	4.00 M	3600 k (3400)	2800 k	2400 k	2000 k	1400 k	1200 k	600 k	400 k	
	25A	14.00 M (12.50)	9.00 M (8.64)	6.40 M (6.25)	5.00 M	4.50 M (4.25)	3600 k (3500)	3000 k	2500 k	1800 k (1750)	1500 k	750 k	500 k	
	30A	15.00 M	10.00 M (10.36)	7.50 M	6.00 M	5.60 M (5.10)	4.20 M	3600 k	3000 k	2400 k (2100)	1800 k	900 k	600 k	
	40A	20.00 M	14.00 M (13.82)	10.00 M	8.00 M	7.20 M (6.80)	5.60 M	4.80 M	4.00 M	2800 k	2400 k	1200 k	800 k	×10
	50A	25.00 M	18.00 M (17.27)	14.00 M (12.50)	10.00 M	9.00 M (8.50)	7.20 M (7.00)	6.00 M	5.00 M	3600 k (3500)	3000 k	1500 k	1000 k	
	60A	30.00 M	20.00 M (20.73)	15.00 M	12.00 M	10.00 M (10.20)	8.40 M	7.20 M	6.00 M	4.20 M	3600 k	1800 k	1200 k	
	75A	40.0 M (37.5)	28.00 M (25.91)	20.00 M (18.75)	15.00 M	14.00 M (12.75)	12.00 M (10.50)	9.00 M	7.50 M	5.60 M (5.25)	4.50 M	2400 k (2250)	1500 k	
	80A	40.0 M	28.00 M (27.64)	20.00 M	16.00 M	14.00 M (13.60)	12.00 M (11.20)	9.60 M	8.00 M	5.60 M	4.80 M	2400 k	1600 k	
	100A	50.0 M	36.00 M (34.55)	25.00 M	20.00 M	18.00 M (17.00)	14.00 M	12.00 M	10.00 M	7.20 M (7.00)	6.00 M	3000 k	2000 k	
	120A	60.0 M	42.0 M (41.5)	30.00 M	24.00 M	20.00 M (20.40)	18.00 M (16.80)	15.00 M (14.40)	12.00 M	8.40 M	7.20 M	3600 k	2400 k	
×1000	150A	75.0 M	56.0 M (51.8)	40.0 M (37.5)	30.00 M	28.00 M (25.50)	24.00 M (21.00)	18.00 M	15.00 M	12.00 M (10.50)	9.00 M	4.50 M	3000 k	
	200A	100.0 M	72.0 M (69.1)	50.0 M	40.0 M	36.00 M (34.00)	28.00 M	24.00 M	20.00 M	14.00 M	12.00 M	6.00 M	4.00 M	
	250A	140.0 M (125.0)	90.0 M (86.4)	64.0 M (62.5)	50.0 M	45.0 M (42.5)	36.00 M (35.00)	30.00 M	25.00 M	18.00 M (17.50)	15.00 M	7.50 M	5.00 M	
	300A	150.0 M	100.0 M (103.6)	75.0 M	60.0 M	56.0 M (51.0)	42.0 M	36.00 M	30.00 M	24.00 M (21.00)	18.00 M	9.00 M	6.00 M	
	400A	200.0 M	140.0 M (138.2)	100.0 M	80.0 M	72.0 M (68.0)	56.0 M	48.0 M	40.0 M	28.00 M	24.00 M	12.00 M	8.00 M	×100
	500A	250.0 M	180.0 M (172.7)	140.0 M (125.0)	100.0 M	90.0 M (85.0)	72.0 M (70.0)	60.0 M	50.0 M	36.00 M (35.00)	30.00 M	15.00 M	10.00 M	
	600A	300.0 M	200.0 M (207.3)	150.0 M	120.0 M	100.0 M (102.0)	84.0 M	72.0 M	60.0 M	42.0 M	36.00 M	18.00 M	12.00 M	
	750A	400 M (375)	280.0 M (259.1)	200.0 M (187.5)	150.0 M	140.0 M (127.5)	120.0 M (105.0)	90.0 M	75.0 M	56.0 M (52.5)	45.0 M	24.00 M (22.50)	15.00 M	
	800A	400 M	280.0 M (276.4)	200.0 M	160.0 M	140.0 M (136.0)	120.0 M (112.0)	96.0 M	80.0 M	56.0 M	48.0 M	24.00 M	16.00 M	
	900A	450 M	320.0 M (310.9)	240.0 M (225.0)	180.0 M	160.0 M (153.0)	140.0 M (126.0)	120.0 M (108.0)	90.0 M	64.0 M (63.0)	56.0 M (54.0)	28.00 M (27.00)	18.00 M	
	1000A	500 M	360.0 M (345.5)	250.0 M	200.0 M	180.0 M (170.0)	140.0 M	120.0 M	100.0 M	72.0 M (70.0)	60.0 M	30.00 M	20.00 M	
	1200A	600 M	420 M (415)	300.0 M	240.0 M	200.0 M (204.0)	180.0 M (168.0)	150.0 M (144.0)	120.0 M	84.0 M	72.0 M	36.00 M	24.00 M	
	1500A	750 M	560 M (518)	400 M (375)	300.0 M	280.0 M (255.0)	240.0 M (210.0)	180.0 M	150.0 M	120.0 M (105.0)	90.0 M	45.0 M	30.00 M	
	1600A	800 M	560 M (553)	400 M	320.0 M	280.0 M (272.0)	240.0 M (224.0)	200.0 M (192.0)	160.0 M	120.0 M (112.0)	96.0 M	48.0 M	32.00 M	
×10000	1800A	900 M	640 M (622)	450 M	360.0 M	320.0 M (306.0)	280.0 M (252.0)	240.0 M (216.0)	180.0 M	140.0 M (126.0)	120.0 M (108.0)	56.0 M (54.0)	36.00 M	
	2000A		720 M (691)	500 M	400 M	360.0 M (340.0)	280.0 M	240.0 M	200.0 M	140.0 M	120.0 M	60.0 M	40.0 M	
	2500A		900 M (864)	640 M (625)	500 M	450 M (425)	360.0 M (350.0)	300.0 M	250.0 M	180.0 M (175.0)	150.0 M	75.0 M	50.0 M	
	3000A			750 M	600 M	560 M (510)	420 M	360.0 M	300.0 M	240.0 M (210.0)	180.0 M	90.0 M	60.0 M	
	4000A				800 M	720 M (680)	560 M	480 M	400 M	280.0 M	240.0 M	120.0 M	80.0 M	×1000
	5000A					900 M (850)	720 M (700)	600 M	500 M	360.0 M (350.0)	300.0 M	150.0 M	100.0 M	
	6000A						840 M	720 M	600 M	420 M	360.0 M	180.0 M	120.0 M	
	7500A							900 M	750 M	560 M (525)	450 M	240.0 M (225.0)	150.0 M	
	8000A								800 M	560 M	480 M	240.0 M	160.0 M	
	9000A								900 M	640 M (630)	560 M (540)	280.0 M (270.0)	180.0 M	
	10000A									720 M (700)	600 M	300.0 M	200.0 M	
	12000A									840 M	720 M	360.0 M	240.0 M	
	15000A										900 M	450 M	300.0 M	
	20000A											600 M	400 M	
	30000A											900 M	600 M	×10000

<Note 1>

Parenthesis is primary active power (reactive power) value in /500W(500var).
In the blank, setting is impossible.
About active power and reactive power range.
Full scale display, less than 4000：4 digit. More than 4000：3 digit.
An example) 4800kW → 4.80MW
40kvar → 40.0kvar
20kW → 20.00kW

<Note 2>

In case the voltage range and the current range were set as ▭ of an upper table and an output pulse unit (a four-step setup is possible) is set as the fastest.
The output pulse width of a pulse output is set to 100 to 130ms. (Usually 240 to 260ms)

Appendix table 3-2

Active power range, watt-hour multiplier rate table (Single-phase 2-wire)

Multiplier rate	V range / A range	25.00kV (VT18400/110V) [W]	24.00kV (VT16500/110V) [W]	18.00kV (VT13800/110V) [W]	18.00kV (VT13200/110V) [W]	15.00kV (VT11000/110V) [W]	9000V (VT6600/110V) [W]	4500V (VT3300/110V) [W]	3000V (VT2200/110V) [W]	2400V (VT1650/110V) [W]	1500V (VT1100/110V) [W]	1200V (VT880/110V) [W]	600V (VT480/110V) [W]	Multiplier rate
×1	5A	84.0 k (83.6)	75.0 k	64.0 k (62.7)	60.0 k	50.0 k	30.00 k	15.00 k	10.00 k	7.50 k	5.00 k	4.00 k	2400 (2182)	
	6A	100.0 k (100.4)	90.0 k	80.0 k (75.3)	72.0 k	60.0 k	36.00 k	18.00 k	12.00 k	9.00 k	6.00 k	4.80 k	2800 (2618)	
	7.5A	140.0 k (125.5)	120.0 k (112.5)	96.0 k (94.1)	90.0 k	75.0 k	45.0 k	24.00 k (22.50)	15.00 k	12.00 k (11.25)	7.50 k	6.00 k	3600 (3273)	
	8A	140.0 k (133.8)	120.0 k	100.0 k (100.4)	96.0 k	80.0 k	48.0 k	24.00 k	16.00 k	12.00 k	8.00 k	6.40 k	3600 (3491)	
	10A	180.0 k (167.3)	150.0 k	140.0 k (125.5)	120.0 k	100.0 k	60.0 k	30.00 k	20.00 k	15.00 k	10.00 k	8.00 k	4.50 k (4.36)	
	12A	200.0 k (200.7)	180.0 k	160.0 k (150.5)	150.0 k (144.0) k	120.0 k	72.0 k	36.00 k	24.00 k	18.00 k	12.00 k	9.60 k	5.60 k (5.24)	
	15A	280.0 k (250.9)	240.0 k (225.0)	200.0 k (188.2)	180.0 k	150.0 k	90.0 k	45.0 k	30.00 k	24.00 k (22.50)	15.00 k	12.00 k	7.20 k (6.55)	
	20A	360.0 k (334.5)	300.0 k	280.0 k (250.9)	240.0 k	200.0 k	120.0 k	60.0 k	40.0 k	30.00 k	20.00 k	16.00 k	9.00 k (8.73)	×0.1
	25A	420 k (418)	400 k (375.0)	320.0 k (313.6)	300.0 k	250.0 k	150.0 k	75.0 k	50.0 k	40.0 k (37.5)	25.00 k	20.00 k	12.00 k (10.91)	
	30A	560 k (502)	450 k	400 k (376.4)	360.0 k	300.0 k	180.0 k	90.0 k	60.0 k	45.0 k	30.00 k	24.00 k	14.00 k (13.09)	
×10	40A	720 k (669)	600 k	560 k (502)	480 k	400 k	240.0 k	120.0 k	80.0 k	60.0 k	40.0 k	32.00 k	18.00 k (17.45)	
	50A	840 k (836)	750 k	640 k (627)	600 k	500 k	300.0 k	150.0 k	100.0 k	75.0 k	50.0 k	40.0 k	24.00 k (21.82)	
	60A	1000 k (1004)	900 k	800 k (753)	720 k	600 k	360.0 k	180.0 k	120.0 k	90.0 k	60.0 k	48.0 k	28.00 k (26.18)	
	75A	1400 k (1255)	1200 k (1125)	960 k (941)	900 k	750 k	450 k	240.0 k (225.0)	150.0 k	120.0 k (112.5)	75.0 k	60.0 k	36.00 k (32.73)	
	80A	1400 k (1338)	1200 k	1000 k (1004)	960 k	800 k	480 k	240.0 k	160.0 k	120.0 k	80.0 k	64.0 k	36.00 k (34.91)	
	100A	1800 k (1673)	1500 k	1400 k (1255)	1200 k	1000 k	600 k	300.0 k	200.0 k	150.0 k	100.0 k	80.0 k	45.0 k (43.6)	
	120A	2000 k (2007)	1800 k	1600 k (1505)	1500 k (1440)	1200 k	720 k	360.0 k	240.0 k	180.0 k	120.0 k	96.0 k	56.0 k (52.4)	
	150A	2800 k (2509)	2400 k (2250)	2000 k (1882)	1800 k	1500 k	900 k	450 k	300.0 k	240.0 k (225.0)	150.0 k	120.0 k	72.0 k (65.5)	
	200A	3600 k (3345)	3000 k	2800 k (2509)	2400 k	2000 k	1200 k	600 k	400 k	300.0 k	200.0 k	160.0 k	9.00 k (87.3)	×1
	250A	4.20 M (4.18)	4.00 M (3.75)	3200 k (3136)	3000 k	2500 k	1500 k	750 k	500 k	400 k (375)	250.0 k	200.0 k	120.0 k (109.1)	
	300A	5.60 M (5.02)	4.50 M	4.00 M (3.76)	3600 k	3000 k	1800 k	900 k	600 k	450 k	300.0 k	240.0 k	140.0 k (130.9)	
×100	400A	7.20 M (6.69)	6.00 M	5.60 M (5.02)	4.80 M	4.00 M	2400 k	1200 k	800 k	600 k	400 k	320.0 k	180.0 k (174.5)	
	500A	8.40 M (8.36)	7.50 M	6.40 M (6.27)	6.00 M	5.00 M	3000 k	1500 k	1000 k	750 k	500 k	400 k	240.0 k (218.2)	
	600A	10.00 M (10.04)	9.00 M	8.00 M (7.53)	7.20 M	6.00 M	3600 k	1800 k	1200 k	900 k	600 k	480 k	280.0 k (261.8)	
	750A	14.00 M (12.55)	12.00 M (11.25)	9.60 M (9.41)	9.00 M	7.50 M	4.50 M	2400 k (2250)	1500 k	1200 k (1125)	750 k	600 k	360.0 k (327.3)	
	800A	14.00 M (13.38)	12.00 M	10.00 M (10.04)	9.60 M	8.00 M	4.80 M	2400 k	1600 k	1200 k	800 k	640 k	360.0 k (349.1)	
	900A	16.00 M (15.05)	14.00 M (13.50)	12.00 M (11.29)	12.00 M (10.80)	9.00 M	5.60 M (5.40)	2800 k (2700)	1800 k	1400 k (1350)	900 k	720 k	400 k (393)	
	1000A	18.00 M (16.73)	15.00 M	14.00 M (12.55)	12.00 M	10.00 M	6.00 M	3000 k	2000 k	1500 k	1000 k	800 k	450 k (436)	
	1200A	20.00 M (20.07)	18.00 M	16.00 M (15.05)	15.00 M (14.40)	12.00 M	7.20 M	3600 k	2400 k	1800 k	1200 k	960 k	560 k (524)	
	1500A	28.00 M (25.09)	24.00 M (22.50)	20.00 M (18.82)	18.00 M	15.00 M	9.00 M	4.50 M	3000 k	2400 k (2250)	1500 k	1200 k	720 k (655)	
	1600A	28.00 M (26.76)	24.00 M	24.00 M (20.07)	20.00 M (19.20)	16.00 M	9.60 M	4.80 M	3200 k	2400 k	1600 k	1400 k (1280)	720 k (698)	
	1800A	32.00 M (30.11)	28.00 M (27.00)	24.00 M (22.58)	24.00 M (21.60)	18.00 M	12.00 M (10.80)	5.60 M (5.40)	3600 k	2800 k (2700)	1800 k	1500 k (1440)	800 k (785)	
	2000A	36.00 M (33.45)	30.00 M	28.00 M (25.09)	24.00 M	20.00 M	12.00 M	6.00 M	4.00 M	3000 k	2000 k	1600 k	900 k (873)	×10
	2500A	42.0 M (41.8)	40.0 M (37.5)	32.00 M (31.36)	30.00 M	25.00 M	15.00 M	7.50 M	5.00 M	4.00 M (3.75)	2500 k	2000 k	1200 k (1091)	
	3000A	56.0 M (50.2)	45.0 M	40.0 M (37.6)	36.00 M	30.00 M	18.00 M	9.00 M	6.00 M	4.50 M	3000 k	2400 k	1400 k (1309)	
×1000	4000A	72.0 M (66.9)	60.0 M	56.0 M (50.2)	48.0 M	40.0 M	24.00 M	12.00 M	8.00 M	6.00 M	4.00 M	3200 k	1800 k (1745)	
	5000A	84.0 M (83.6)	75.0 M	64.0 M (62.7)	60.0 M	50.0 M	30.00 M	15.00 M	10.00 M	7.50 M	5.00 M	4.00 M	2400 k (2182)	
	6000A	100.0 M (100.4)	90.0 M	80.0 M (75.3)	72.0 M	60.0 M	36.00 M	18.00 M	12.00 M	9.00 M	6.00 M	4.80 M	2800 k (2618)	
	7500A	140.0 M (125.5)	120.0 M (112.5)	96.0 M (94.1)	90.0 M	75.0 M	45.0 M	24.00 M (22.50)	15.00 M	12.00 M (11.25)	7.50 M	6.00 M	3600 k (3273)	
	8000A	140.0 M (133.8)	120.0 M	100.0 M (100.4)	96.0 M	80.0 M	48.0 M	24.00 M	16.00 M	12.00 M	8.00 M	6.40 M	3600 k (3491)	
	9000A	160.0 M (150.5)	140.0 M (135.0)	120.0 M (112.9)	120.0 M (108.0)	90.0 M	56.0 M (54.0)	28.00 M (27.00)	18.00 M	14.00 M (13.50)	9.00 M	7.20 M	4.00 M (3.93)	
	10000A	180.0 M (167.3)	150.0 M	140.0 M (125.5)	120.0 M	100.0 M	60.0 M	30.00 M	20.00 M	15.00 M	10.00 M	8.00 M	4.50 M (4.36)	
	12000A	200.0 M (200.7)	180.0 M	160.0 M (150.5)	150.0 M (144.0)	120.0 M	72.0 M	36.00 M	24.00 M	18.00 M	12.00 M	9.60 M	5.60 M (5.24)	
	15000A	280.0 M (250.9)	240.0 M (225.0)	200.0 M (188.2)	180.0 M	150.0 M	90.0 M	45.0 M	30.00 M	24.00 M (22.50)	15.00 M	12.00 M	7.20 M (6.55)	
	20000A	360.0 M (334.5)	300.0 M	280.0 M (250.9)	240.0 M	200.0 M	120.0 M	60.0 M	40.0 M	30.00 M	20.00 M	16.00 M	9.00 M (8.73)	×100
×10000	30000A	560 M (502)	450 M	400 M (376)	360.0 M	300.0 M	180.0 M	90.0 M	60.0 M	45.0 M	30.00 M	24.00 M	14.00 M (13.09)	×1000

<Note 1>

Parenthesis is primary active power (reactive power) value in /500W(500var).
In the blank, setting is impossible.
About active power and reactive power range.
Full scale display, less than 4000：4 digit. More than 4000：3 digit.
An example) 4800kW → 4.80MW
40kvar → 40.0kvar
20kW → 20.00kW

<Note 2>

In case the voltage range and the current range were set as ▭ of an upper table and an output pulse unit (a four-step setup is possible) is set as the fastest.
The output pulse width of a pulse output is set to 100 to 130ms. (Usually 240 to 260ms)

Appendix table 3-3

Active power range, watt-hour multiplier rate table (Single-phase 2-wire)

Multiplier rate	V range / A range	600V (VT460/110V) [W]	600V (VT440/110V) [W]	500V (VT380/110V) [W]	300V (VT220/110V) [W]	150V (110V) [W]	Multiplier rate
	5A	2400 (2091)	2000	1800 (1727)	1000	500	
	6A	2800 (2509)	2400	2000 (2073)	1200	600	
	7.5A	3200 (3136)	3000	2800 (2591)	1500	750	
	8A	3600 (3345)	3200	2800 (2764)	1600	800	×0.01
	10A	4.20 k (4.18)	4.00 k	3600 (3455)	2000	1000	
	12A	5.60 k (5.02)	4.80 k	4.20 k (4.15)	2400	1200	
	15A	6.40 k (6.27)	6.00 k	5.60 k (5.18)	3000	1500	
×0.1	20A	8.40 k (8.36)	8.00 k	7.20 k (6.91)	4.00 k	2000	
	25A	12.00 k (10.45)	10.00 k	9.00 k (8.64)	5.00 k	2500	
	30A	14.00 k (12.55)	12.00 k	10.00 k (10.36)	6.00 k	3000	
	40A	18.00 k (16.73)	16.00 k	14.00 k (13.82)	8.00 k	4.00 k	
	50A	24.00 k (20.91)	20.00 k	18.00 k (17.27)	10.00 k	5.00 k	
	60A	28.00 k (25.09)	24.00 k	20.00 k (20.73)	12.00 k	6.00 k	
	75A	32.00 k (31.36)	30.00 k	28.00 k (25.91)	15.00 k	7.50 k	
	80A	36.00 k (33.45)	32.00 k	28.00 k (27.64)	16.00 k	8.00 k	×0.1
	100A	42.0 k (41.8)	40.0 k	36.00 k (34.55)	20.00 k	10.00 k	
	120A	56.0 k (50.2)	48.0 k	42.0 k (41.5)	24.00 k	12.00 k	
	150A	64.0 k (62.7)	60.0 k	56.0 k (51.8)	30.00 k	15.00 k	
×1	200A	84.0 k (83.6)	80.0 k	72.0 k (69.1)	40.0 k	20.00 k	
	250A	120.0 k (104.5)	100.0 k	90.0 k (86.4)	50.0 k	25.00 k	
	300A	140.0 k (125.5)	120.0 k	100.0 k (103.6)	60.0 k	30.00 k	
	400A	180.0 k (167.3)	160.0 k	140.0 k (138.2)	80.0 k	40.0 k	
	500A	240.0 k (209.1)	200.0 k	180.0 k (172.7)	100.0 k	50.0 k	
	600A	280.0 k (250.9)	240.0 k	200.0 k (207.3)	120.0 k	60.0 k	
	750A	320.0 k (313.6)	300.0 k	280.0 k (259.1)	150.0 k	75.0 k	
	800A	360.0 k (334.5)	320.0 k	280.0 k (276.4)	160.0 k	80.0 k	
	900A	400 k (376)	360.0 k	320.0 k (310.9)	180.0 k	90.0 k	×1
	1000A	420 k (418)	400 k	360.0 k (345.5)	200.0 k	100.0 k	
	1200A	560 k (502)	480 k	420 k (415)	240.0 k	120.0 k	
	1500A	640 k (627)	600 k	560 k (518)	300.0 k	150.0 k	
	1600A	720 k (669)	640 k	560 k (553)	320.0 k	160.0 k	
	1800A	800 k (753)	720 k	640 k (622)	360.0 k	180.0 k	
×10	2000A	840 k (836)	800 k	720 k (691)	400 k	200.0 k	
	2500A	1200 k (1045)	1000 k	900 k (864)	500 k	250.0 k	
	3000A	1400 k (1255)	1200 k	1000 k (1036)	600 k	300.0 k	
	4000A	1800 k (1673)	1600 k	1400 k (1382)	800 k	400 k	
	5000A	2400 k (2091)	2000 k	1800 k (1727)	1000 k	500 k	
	6000A	2800 k (2509)	2400 k	2000 k (2073)	1200 k	600 k	
	7500A	3200 k (3136)	3000 k	2800 k (2591)	1500 k	750 k	
	8000A	3600 k (3345)	3200 k	2800 k (2764)	1600 k	800 k	
	9000A	4.00 M (3.76)	3600 k	3200 k (3109)	1800 k	900 k	×10
	10000A	4.20 M (4.18)	4.00 M	3600 k (3455)	2000 k	1000 k	
	12000A	5.60 M (5.02)	4.80 M	4.20 M (4.15)	2400 k	1200 k	
	15000A	6.40 M (6.27)	6.00 M	5.60 M (5.18)	3000 k	1500 k	
×100	20000A	8.40 M (8.36)	8.00 M	7.20 M (6.91)	4.00 M	2000 k	
×1000	30000A	14.00 M (12.55)	12.00 M	10.00 M (10.36)	6.00 M	3000 k	×100

<Note 1>

Parenthesis is primary active power (reactive power) value in /500W(500var).
In the blank, setting is impossible.
About active power and reactive power range.
Full scale display, less than 4000：4 digit. More than 4000：3 digit.
An example) 4800kW → 4.80MW
40kvar → 40.0kvar
20kW → 20.00kW

<Note 2>

In case the voltage range and the current range were set as ▭ of an upper table and an output pulse unit (a four-step setup is possible) is set as the fastest.
The output pulse width of a pulse output is set to 100 to 130ms. (Usually 240 to 260ms)

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