
User's Manual

Model PR720

Power and Energy Meter User's Manual

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Introduction

Thank you for your purchase of our product.

Read this instruction manual carefully before installation, wiring, and using this product.

Keep this instruction manual handy for reference at any time.

Have a contact with us or sales agent in case that this instruction manual is lost or damaged.

<Caution>

Have a contact with us when you have any questions or are aware of missing article.

Safety precaution

Important contents are mentioned in this instruction manual to prevent any damage / use this product appropriately.

Keep the following safety precaution in mind after understanding each sign.



DANGER

Improper use may lead to death or severe injury.



WARNING

Improper use may possibly lead to death or severe injury.



ATTENTION

Improper use may lead to medium injury.

- We are not responsible for the damage caused by following condition (earthquake / fire which is not caused by us, action by third party, other accident, damage caused by our customer, misuse, product usage under abnormal condition).
- We are not responsible for secondary damage caused by product use / product malfunction(loss of profit, halt of business operation). We are also not responsible for damage caused by false operation in combination with connecting equipment which is beyond our control.



DANGER

- Do not disassemble, remodel and repair this product.
Have a contact with us or sales agent when product failure happens to prevent fire / electric shock / injury.
- Do not get this product wet to prevent heat generation / ignition / product failure. When this product gets wet, stop using it.
- Do not connect metal excepting wiring to terminal in order to prevent heat generation/ignition.
- Do not get this product near the inflammables / combustible chemicals / gas to prevent fire.



WARNING

- Connect specified power supply.
Connecting power supply beyond specification causes fire / product failure.
- When dust is on the terminal, wipe it off after power is OFF to prevent fire.
- Follow the below-mentioned procedure when abnormality (fuming / bad odor) happens.
(1) Stop a power supply and input, and stop using.
(2) Contact our company or a distributing agent.



ATTENTION

- Do not use this product in a environment of high temperature / high humidity to prevent any damage.
- Do not touch the terminal during operation to prevent electric shock.
- Do not pull/bend connecting cable with force. Cable damage causes heat generation / burn and contact failure leads to equipment damage.
- Do not connect/inspect with wet hands to prevent electric shock.

Other precaution

- Don't mount or store this unit in the following environment.
 - Places where corrosive gas (SO₂ / H₂S / etc.)⁽¹⁾ is generated.
 - Places where dust is generated.
 - Places with much vibration and shock.
 - Places with influence of external magnetic field ⁽²⁾.
- Note ⁽¹⁾ Corrosive gas = Sulfur dioxide SO₂ / Hydrogen sulfide H₂S / etc.
- Note ⁽²⁾ Large current bus / saturable reactor / etc.
- Wipe off dirt on the surface with dry cloth softly. Keep in mind that strong rubbing of nameplate leads to character disappearance. Organic solvent and chemicals and cleaner is not appropriate for cleaning.
- Mercury component, Nickel-cadmium battery are not used in this product.
- Please dispose of this product as industrial waste (noncombustible).
- The precautions at the case of using by outdoor board.
 - This product is not dust-proof structure and not waterproof structure. In using by the outdoor panel, please avoid the place, which dust causes. And, please install in the place that requires neither rain nor waterdrop.
 - Please do not install in the place of sunlight. A display of this product may become hard to see. And, deformation of a case may take place by the surface temperature rise.

The warranty period and warranty scope.

- Warranty period.
 - The warranty period of this product is for one year after supplying the appointed place.
- Warranty scope.
 - In the state of the normal use of product-specification within the range according to this instruction manual, the trouble within the warranty period performs exchange or repair gratuitously.
 - However, the shipping expenses and the packing cost in the case of shipping obtain as payment on a customer.
 - And, if it corresponds to the next, it does not warrant.
 - (1) If it breaks down when converted or repaired except our company.
 - (2) If it breaks down by use out of specification range.
 - (3) If the cause of trouble is based on cause other than this product.
 - (4) Transportation, movement, damage by falling, and trouble.
 - (5) A natural disaster, disaster, etc., if it is the trouble which is irresponsible for a payment side (our company or distributing agent).

This warranty is a warranty of a product simplex. It cannot warrant the damage induced by trouble of this product.

Change of instruction manual written contents.

This instruction manual changes written contents without a notice by product improvement etc.

The precaution for use

1. Environment of usage and storage.

Don't mount or store this product in the following environments. If the unit becomes defective due to the use in an environment other than specified, it may be repaired for pay even during its warranty period (one year after the date of delivery).

- Don't mount or store the unit at a place where the ambient temperature is other than a range of -10 to +55°C or the relative humidity is higher than 85% RH.
- Don't mount or store the unit at a place where a corrosive gas such as SO₂, H₂S, etc. is generated.
Corrosive gas = Sulfur dioxide SO₂ / Hydrogen sulfide H₂S / etc.
Large current bus / saturable reactor / etc.
- Don't mount or store the unit at a dusty place.
- Don't mount or store the unit at a place subjected to noticeable vibrations or shocks.
- Don't mount or store the unit at a place subjected to noticeable external noises.
- 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.

2. Cautions on use in an outdoor panel

Be careful with the following items when using this unit in an outdoor panel.

- Don't mount the unit at a place where it is directly exposed to rain or water drops, otherwise this unit may become defective because of no water-proof or drip-proof structure.
- Don't mount the unit at a dusty place.
- Don't mount the unit at a place exposed to direct sunlight. Avoid exposing the unit to direct sunlight even through a glass window.
If the meter is directly exposed to sunlight, the surface temperature of the meter rises and the case may be deformed if the temperature exceeds 80°C.
- If the average temperature around the meter exceeds 40°C, the life of the unit may shorten.

3. 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 improves by doing the power distribution of the auxiliary power and leaving it for about 2 hours.

4. Mounting and wiring

Mount and connect the unit by a technician while referring to the instruction manual and observing the following cautions.



- Connect the unit after confirming the connection diagram. An improper connection may cause troubles such as the generation of a high voltage on the secondary side of its current transformer or burning of the unit or the occurrence of a fire.
- Don't perform any connection in a hot line without turning off the power supply in advance, otherwise an electric shock accident, troubles or burning of the unit, a fire, gas explosion, or other very dangerous accidents may occur.
- The terminal cover is mounted for preventing an electric shock accident. Mount the terminal cover without fail after the end of work.

5. 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 settings 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 (110V).

The unit will be delivered with your specified setting values, if so specified.

No	Setting item		3-phase 3-wire		Single-phase 3-wire (U-W-N)	Single-phase		
			110V input	220V input		110V input	220V input	
1	Display combination	Pattern	Pattern 1		Pattern 1	Pattern 1		
		Main monitor	A(V)		A(U)	A		
		Sub monitor (Left)	V(UV)		V(UN)	V		
		Sub monitor (Center)	W		W	W		
		Sub monitor (Right)	Wh		Wh	Wh		
		Bar graph	A(V)		A(U)	A		
2	Alarm output	Factor	DA		DA	DA		
		Reset form	AUTO		AUTO	AUTO		
		Contact delay time	0 second		0 second	0 second		
3	Demand detection	Demand current	Upper limit <H>	80.0A	400.0A	40.00A		
			Interval	0 second		0 second	0 second	
		Demand power	Upper limit <H>	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.	
4	Instant measurement detection	Voltage upper limit	OFF		OFF	OFF		
		Voltage lower limit	OFF		OFF	OFF		
5	Backlight	Action	AUTO		AUTO	AUTO		
		Brightness	3 (Middle)		3 (Middle)	3 (Middle)		
6	Measurement range	Voltage range	6600V	220.0V	110.0V	3300V	220.0V	
		Digit number of voltage range	4 digits	4 digits	4 digits	4 digits	4 digits	
		Current range	100.0A		500.0A	50.00A		
		Current display intrinsic sensitivity	100.0A		500.0A	50.00A		
		Digit number of current range	4 digits		4 digits	4 digits		
		Active power polarity	One-way deflection		One-way deflection	One-way deflection		
		Active power range	1200kW (/1kW)	40.00kW (/2kW)	100.0kW (/1kW)	150.0kW (/500W)	10.00kW (/1kW)	
		Digit number of active power range	4 digits	4 digits	4 digits	4 digits	4 digits	
		Reactive power range	600.0kvar (/500var)	20.00kvar (/1kvar)	50.00kvar (/500var)	75.00kvar (/250var)	5000var (/500var)	
		Digit number of reactive power range	4 digits	4 digits	4 digits	4 digits	4 digits	
		Power-factor range	LEAD0.5 to 1 to LAG0.5		LEAD0.5 to 1 to LAG0.5	LEAD0.5 to 1 to LAG0.5		
		Frequency range	45.0 to 65.0Hz		45.0 to 65.0Hz	45.0 to 65.0Hz		
Digit number of frequency range	3 digits		3 digits	3 digits				

№	Setting item		3-phase 3-wire		Single-phase 3-wire (U-W-N)	Single-phase	
			110V input	220V input		110V input	220V input
7	Communication output	Address	1		1	1	
		Transmission rate	9600bps		9600bps	9600bps	
		Parity	Even number		Even number	Even number	
		Stop bit	1 bit		1 bit	1 bit	
8	Pulse output	Factor	Wh		Wh	Wh	
		Pulse unit	10kWh/pulse	0.1kWh/pulse	1kWh/pulse	1kWh/pulse	0.1kWh/pulse
9	External operation input		Alarm reset		Alarm reset	Alarm reset	
10	Measurement display ON/OFF	Voltage	ON		ON	ON	
		Current	ON		ON	ON	
		Demand current	ON		ON	ON	
		Active power	ON		ON	ON	
		Demand 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			
11	Input circuit	Phase line change ⁽³⁾	3φ3W		1φ3W(U-W-N)	1φ2W	
		Input voltage ⁽⁴⁾	110V	220V	300V	110V	220V
12	Measurement	Tidal current measurement	General measurement		General measurement	General measurement	

Note⁽³⁾ If input circuit phase wire change setting is changed, it will return to the default setting of the phase wire which the value (No. 1 to 10 of a table) of setting 1 and setting 2 changed.

Note⁽⁴⁾ 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, 220.0V at the case of 220V setting.)

6. 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 with a measurement factor in this product. A blackout is guaranteed and this value isn't also 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 make the past minimum value hold by powering on, please apply input within 1 second after switching on a power supply.
- The maximum value, a minimum value measurement factor

Measurement factor	Maximum value measurement	Minimum value measurement
Voltage, Current, Demand current, Active power, Demand power, Reactive power, Power factor, Frequency	✓	✓

 CAUTION	<ul style="list-style-type: none"> ● 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.
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7. Maintenance and check

- Wipe off the surface of the unit with a dry soft cloth. The liquid crystal display (LCD) may light during cleaning on the LCD face. However, this phenomenon is caused by the static electricity that may be produced in the filter, and it does not show any trouble. Leave the unit as it is for a while, and the display goes out due to natural discharge. Please keep in mind that it will break if a LCD is pushed strongly. And, if a filter is pushed, a LCD face will touch a filter. Therefore, the pattern of the shape of a circle or an ellipse may occur. Please do not push a filter strongly.
- Check the following items.
 - ◎ Check the unit for damage in appearance.
 - ◎ Check if indications conform to the inputs.
 - ◎ Check if the unit is mounted normally without any loose connections of the terminal board after turning off the power supply.

If a question has arisen or if the unit seems to be defective, please contact us.

■ Phase and wire system

The phase and wire system described in this manual are as follows.

- 1φ2W: Single-phase two-wire systems
- 1φ3W: Single-phase three-wire systems
- 3φ3W: Three-phase three-wire systems

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1. Product outline

1.1 Usage of product

This single unit can measure and monitor voltage ×3, current ×3, demand-current ×3, active-power, demand active power, reactive-power, power-factor, frequency, watt-hour, var-hour.

The measurement monitor of an initial power receiving circuit, an energy conservation power monitor, a demand current measurement monitor, etc. are adapted for various usages from a low tension circuit to a high tension circuit. The intensive monitor doubled with the system (analog output, alarm output, pulse output, external operation input) addendum is possible.

1.2 Features of product

- It is common type product of 3-phase 3-wire, single-phase 2-wire, single-phase 3-wire. It's possible to share stock.
- Bar graph 1 measurement and digital 4 measurement are displayed simultaneously.
- Modbus (RTU mode) output and a pulse output and a contact-output can be taken out. And, about an output factor, it can select by setting.
- External operation inputs are possible of reset. Choice of an alarm output, the maximum/minimum value, and an alarm output, and the maximum/minimum value is possible at setting.
- Power supply is AC 85 to 264V, DC 80 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 3rd digit below the decimal point.
- A tidal current measurement (output 2 quadrant) change is possible for var and cosφ.
- A backlight function is equipped. Selection of backlight-on, backlight-off, and auto backlight-off and setting of brightness (only white backlight) are possible. Automatic turning off the lights at the time of non-operation can be established.

1.3 Model and suffix codes

Model	Suffix Codes							Descriptions
PR720								Power and Energy Meter (with terminal cover)
Suffix Codes	-3							Universal three-phase three-wire system (single-phase two-wire, single-phase three-wire, and three-phase three-wire systems)
		2						Universal voltage input (150V/300V)/5A
			2					1 digital input, 1 pulse output
				0				RS-485 communication
					3			Demand measurement
						-6		100-240V AC±10% (50/60Hz), 80-143V DC
							U	U, V and W indications
							-0	Always 0

2. The name and function of each part

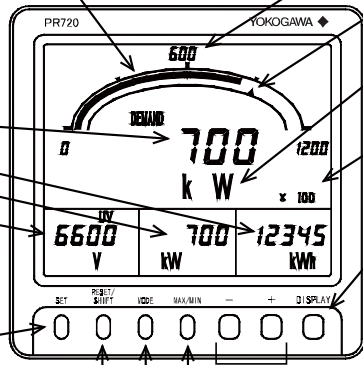
Bar graph display

The measurement value of the main monitor is indicated by the analog. (Setting which does 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

It sets automatically by measurement-range setting.

Upper limit (or lower limit) setting index

An upper limit (or lower limit) set point is displayed.

Unit display

It sets automatically by measurement-range setting.

Multiplying factor display

It displays on the lower right of the main monitor at the time of watt-hour and var-hour display.

DISPLAY



It is the switch that changes a 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 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 + below decimal point, 3 digits) 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 set point.



If this switch is pushed 1 second or more continuously, it will reset an alarm, the maximum value, and the minimum value (factor which it is displaying on the main monitor). In setting mode, it uses it as a switch to which it moves a setting item (move up).



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 factor. In set mode, it is used as a switch that changes a setting value.



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

In setting mode, it uses it as a switch to which it moves a setting item (move down).



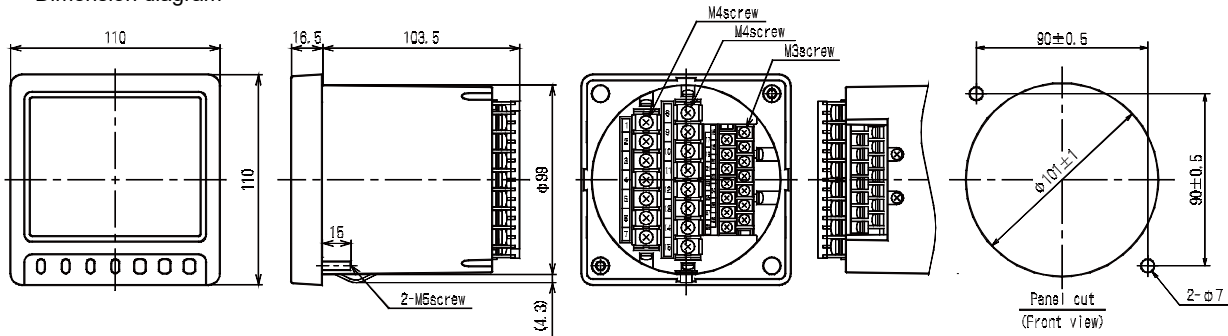
In setting mode, it is used as a switch that changes a setting item.

3. Preparation

3.1 Installation

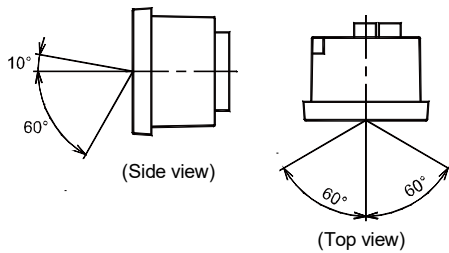
Mount the unit by the attached M5 nuts to a panel of thinner than 10mm, referring to the following external dimensions drawing and panel cutout. Fasten these nuts with tightening torque 2.0 to 2.5N·m.

• Dimension diagram



• Caution on handling

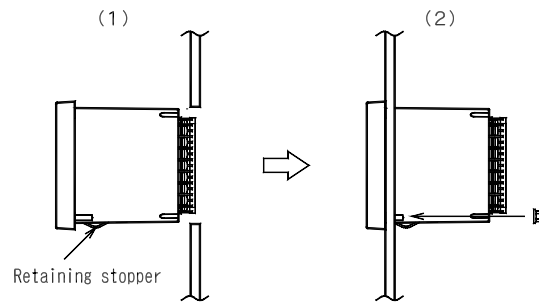
Mount the LCD to obtain an optimum angle, since the contrast changes according to the monitoring angle.



Display viewing angle

• 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 2.5 N·m.

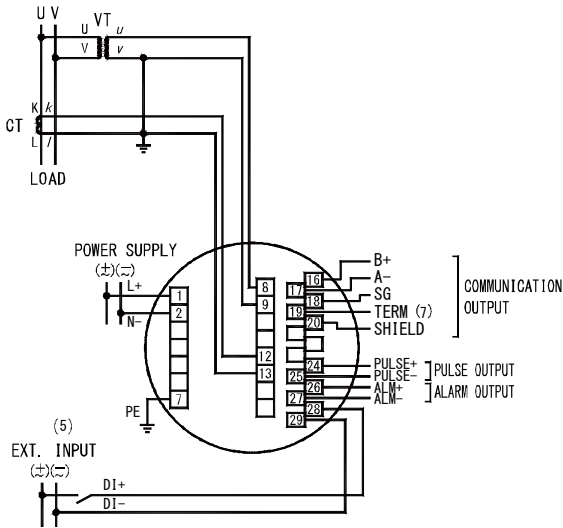


3.2 Connections

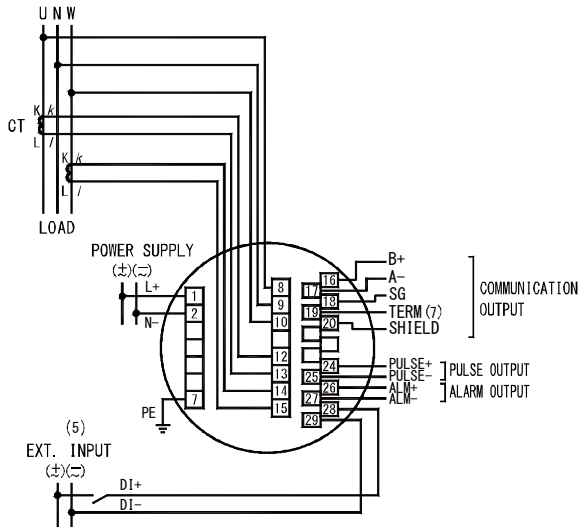
Please perform connection after referring to the following wiring diagram.

- Connection drawing ⁽⁶⁾

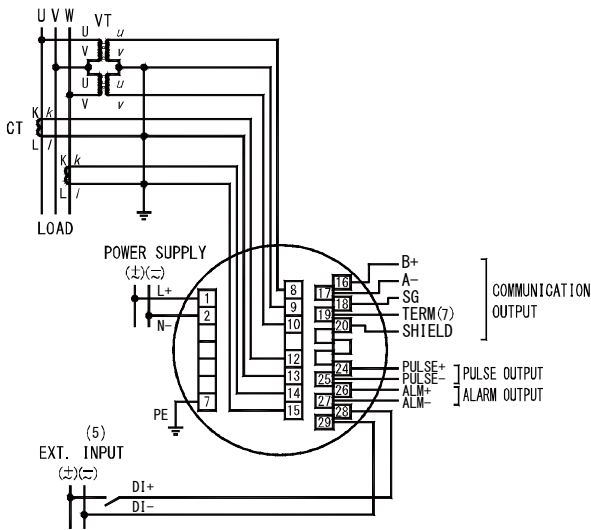
(1) 1 φ 2W



(2) 1 φ 3W



(3) 3 φ 3W



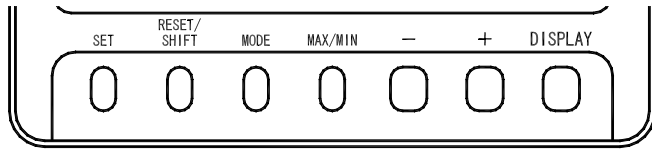
- Note⁽⁵⁾ By setting, it can switch an external operation input.
Alarm reset. Maximum, minimum value reset.
Alarm and maximum, minimum value all reset.
- Note⁽⁶⁾ In case of low-voltage circuit, secondary side earthing of VT and CT is unnecessary.
And, VT is unnecessary in case it used 110V or direct 220V.
- Note⁽⁷⁾ A terminating resistor is connected to inside in short-circuiting No.17 (-) and No.19 (Ter.).
(Please use only the product used as a termination on a topology.)

- 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 PE (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) Please use a transmission line into a twisted-pair cable with a shield. And, please use as the same thing including the inside of a board. And, in case there are many induction noises, please earth in the most effective place (one point).
- (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.

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 set point.
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 uses it as a switch to which it moves (move up) a setting item.
MODE	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. In setting mode, it uses it as a switch to which it moves (move down) a setting item.
+, -	The measurement display element of the main monitor is changed. In setting mode, it is used for change of a set point.
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 factor.

- 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) If a measurement change is performed and the original main monitor display is not clear anymore. It continues pushing a + or - more than 3 seconds, or returns to the original measurement display factor by no operation for 10 minutes.
- (3) Even if it stops operation with setting mode, it returns to the display mode in 10 minutes.

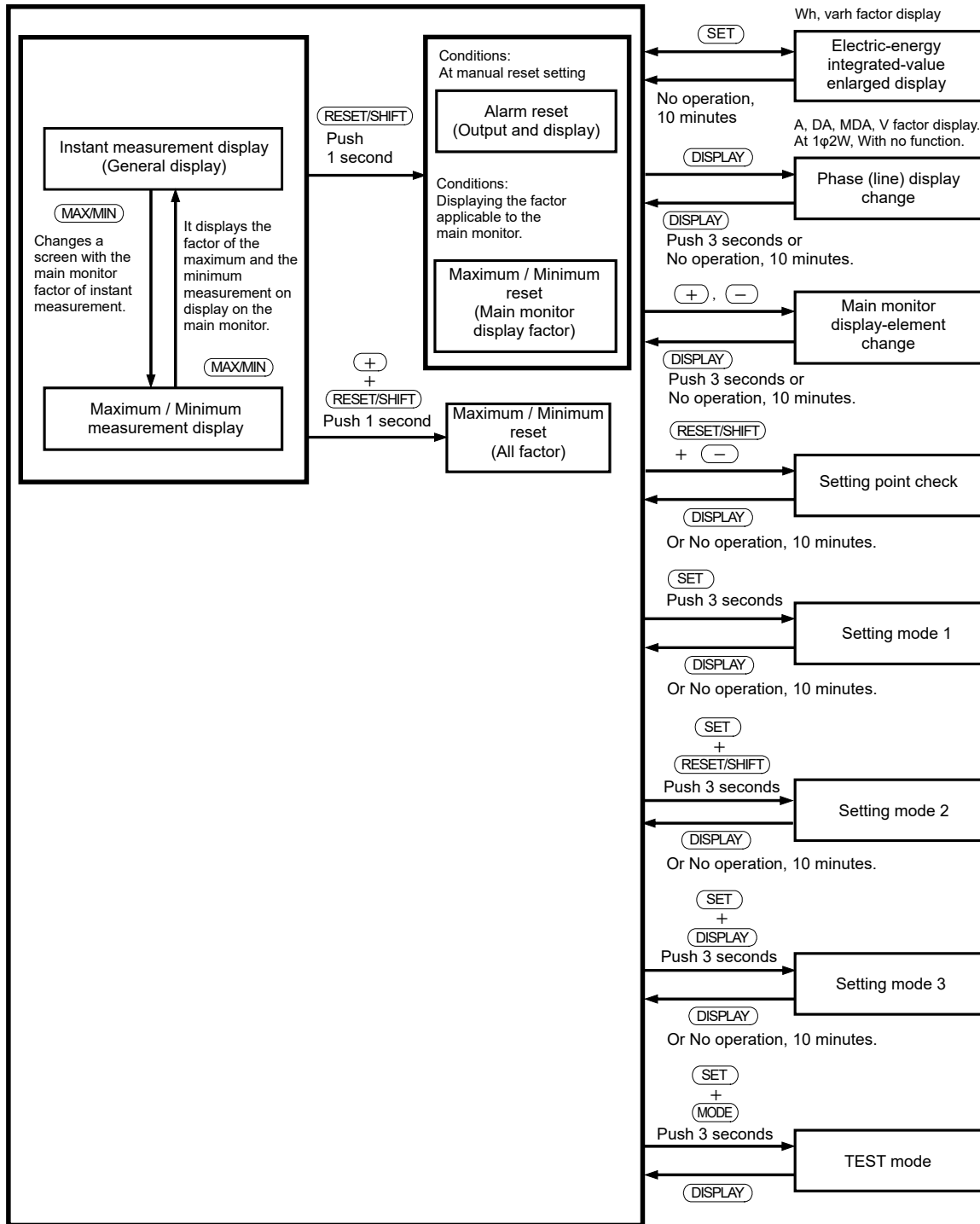
- 7 segment displays

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
A	b	C	d	E	F	G	H	I	Non-dis play	Non-dis play	L	M
N(n)	O(o)	P	Q(q)	R(r)	S	T(t)	U(u)	V	W	X	Y(y)	Z
n	o	P	q	r	S	t	u	v	w	Non-dis play	y	z
0	1	2	3	4	5	6	7	8	9			
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.

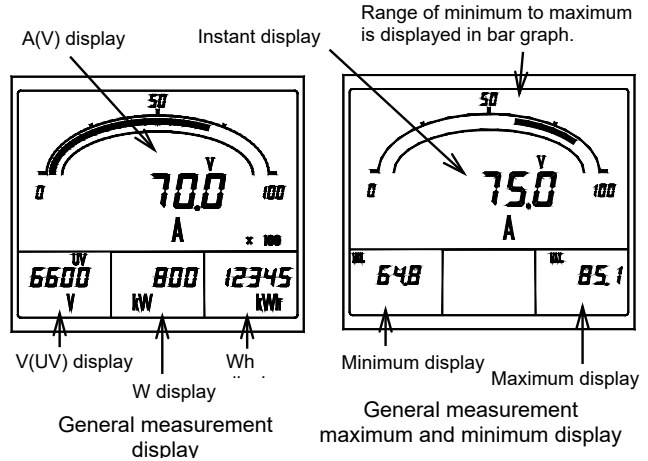


4.2 The kind of display

4.2.1 Measurement display

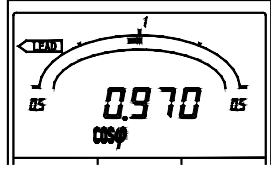
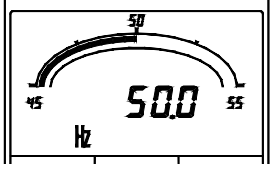
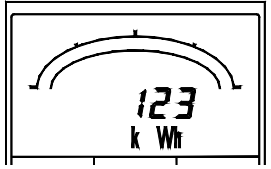
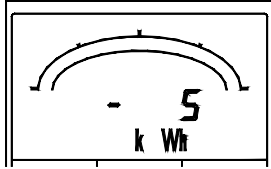
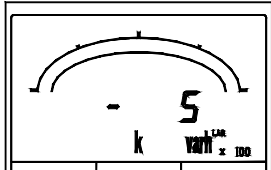
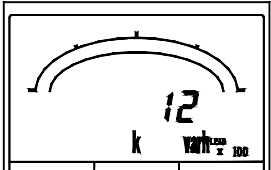
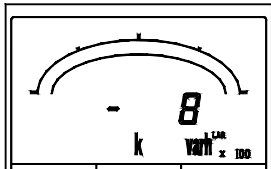
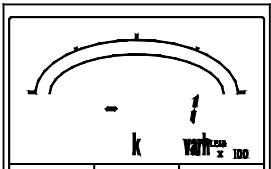
The change of the measurement display element of the main monitor by switch operation and the change of the phase / line display of current / voltage is possible (temporarily). In a general measurement display, if switch operation is not performed for 10 minutes after changing a display element, it returns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

Measurement factors, such as current, voltage, and active power, are displayed. The measurement value of four factors is displayed. Setting which always displays a measurement factor is possible. And, it is possible to change to a display of the maximum value and the minimum value, about the measurement factor 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.



• The example of a measurement display of each measurement factor (Main monitor)

Measurement factor	Example of display	Note	Measurement factor	Example of display	Note
Voltage V			Current A		
Demand current DA		"DEMAND" display	Maximum demand current MDA		"MAX DEMAND" display
Active power W			Demand power DW		"DEMAND" display
Maximum demand power MDW		"MAX DEMAND" display	Reactive power var		LAG or LEAD display

Measurement factor	Example of display	Note	Measurement factor	Example of display	Note
Power factor cosφ		LAG or LEAD display	Frequency Hz		
Watt-hour (Power receiving) Wh			Watt-hour (Power transmission) -Wh		"-" (minus)" display
var-hour (Power receiving, LAG) varh(LAG)		"LAG" display	var-hour (Power receiving, LEAD) varh(LEAD)		"LEAD" display
var-hour (Power transmission, LAG) -varh(LAG)		"LAG" and "- (minus)" display	var-hour (Power transmission, LEAD) -varh(LEAD)		"LEAD" and "- (minus)" display

4.2.2 Alarm detection display

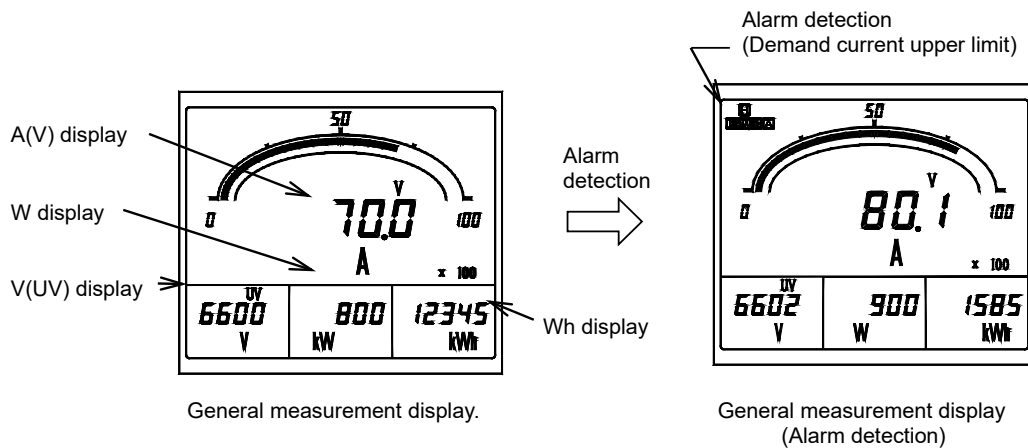
The alarm value setting is a possible measurement factor (demand current and demand power, etc.), it displays in case an input exceeds a set point.

Besides the usual measurement display, the detected factor is displayed on a screen upper case.

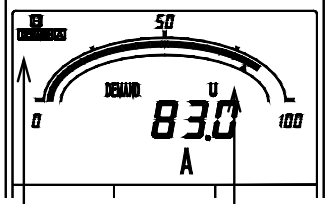
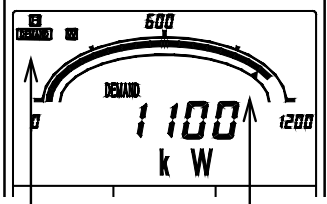
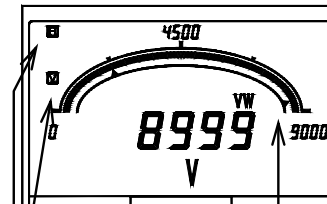
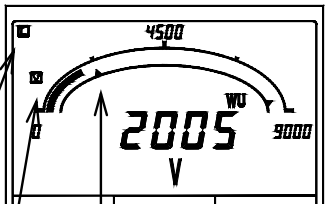
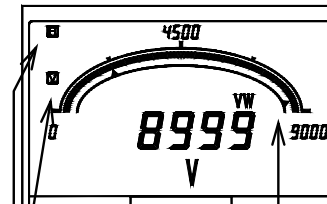
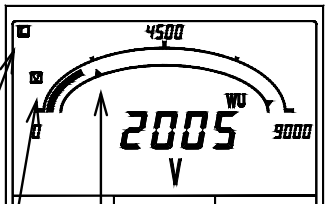
In addition, in case setting OFF (not use) as measurement factor, it does not detect.

And in the case of with an alarm-output, 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 power, Voltage



- The example of a display at the case of the detection in each alarm factor.
 In case the alarm factor 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 factor).
 The return in this case needs alarm reset operation. Please refer to "4.3.7 Reset" about alarm reset.

Alarm factor		Example of a display	Alarm factor		Example of a display
Demand current	Upper limit (H)	 <p>Alarm setting value Detection display (At alarm factor setting)</p>	Demand power	Upper limit (H)	 <p>Alarm setting value Detection display (At alarm factor setting)</p>
		 <p>High-alarm setting value Detection display (At alarm factor setting)</p>			 <p>Low-alarm setting value Detection display (At alarm factor setting)</p>
Voltage	Upper limit (H)	 <p>High-alarm setting value Detection display (At alarm factor setting)</p>	Voltage	Lower limit (L)	 <p>Low-alarm setting value Detection display (At alarm factor setting)</p>

4.2.3 Setting display

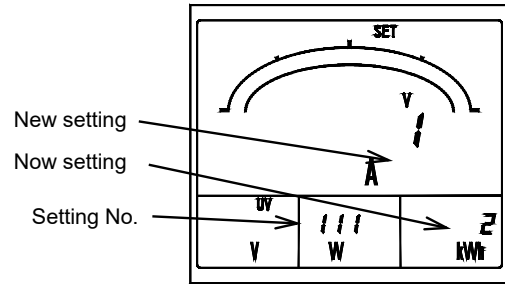
It is the display at the case of various setting. There are three types of setting modes according to the contents of a setting.

Operation and the contents of setting (detail) in setting mode, please refer to "5 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.

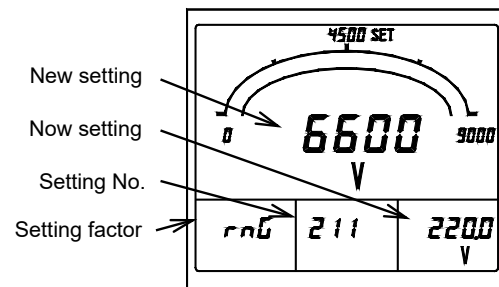


Setting mode 1
(No.111 Display pattern)

(2) Setting mode 2

Setting of measurement range, communication output, pulse output, and measurement display ON/OFF is mainly performed.

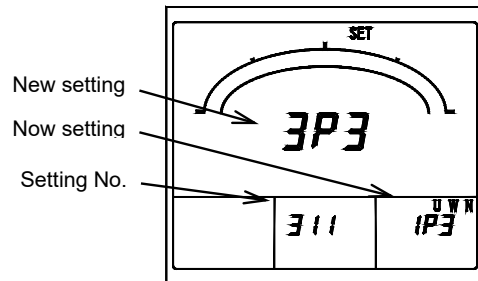
And, initialization of a setting value and reset of watt-hour integrated value can be performed in this setting mode.



Setting mode 2
(No.211 Voltage range)

(3) Setting mode 3

Setting of an input circuit and tidal current measurement is mainly performed.



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

4.3 Operation

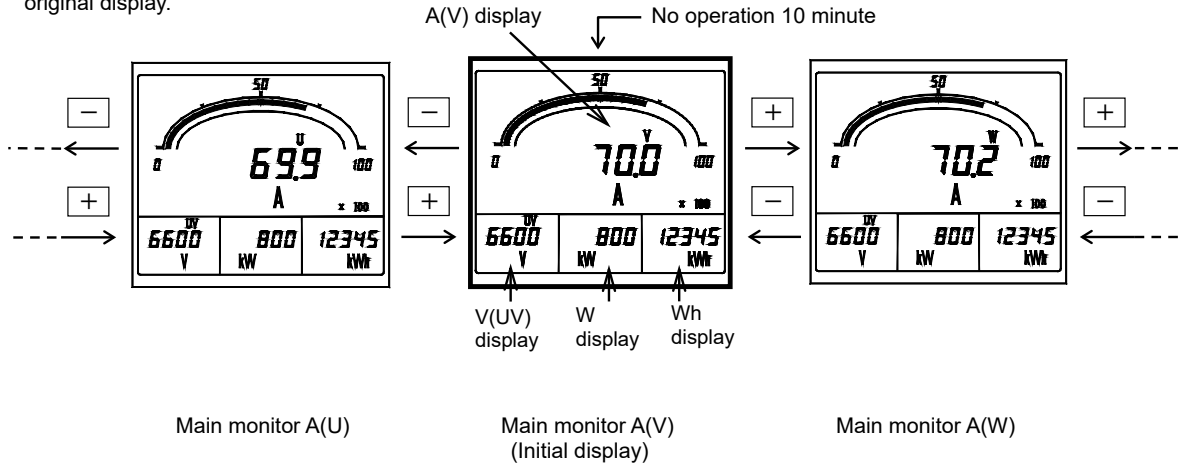
4.3.1 The main monitor display-element change

The measurement display element of the main monitor is changed. A change is performed by $\boxed{+}$ $\boxed{-}$.

A measurement display and maximum display, minimum display can also perform this operation.

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 maximum display and minimum display, even if a switch is not operated for 10 minutes, it does not return to the original display.



4.3.2 Phase (line) display change (Three-phase three-wire, Single-phase three-wire)

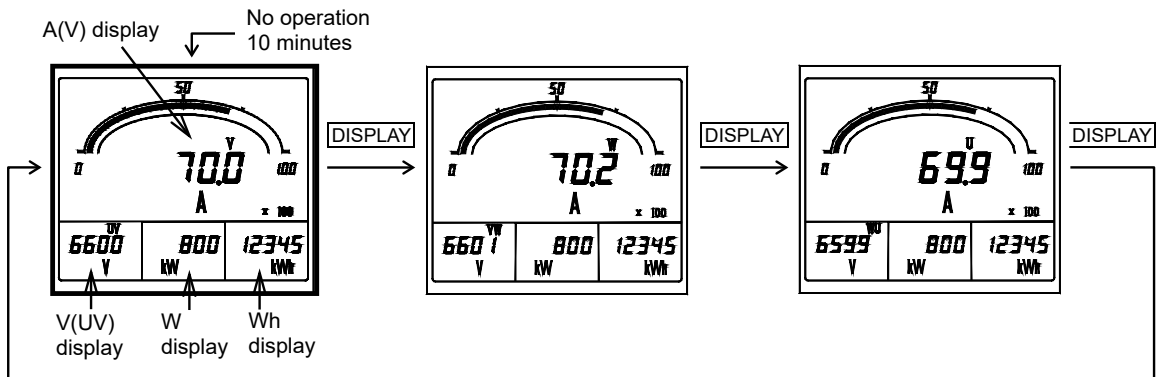
A phase (line) display of current or voltage is changed. (Everything which is being indicated.)

A change is performed by $\boxed{\text{DISPLAY}}$.

A measurement display and maximum display, minimum display can also perform this operation.

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.

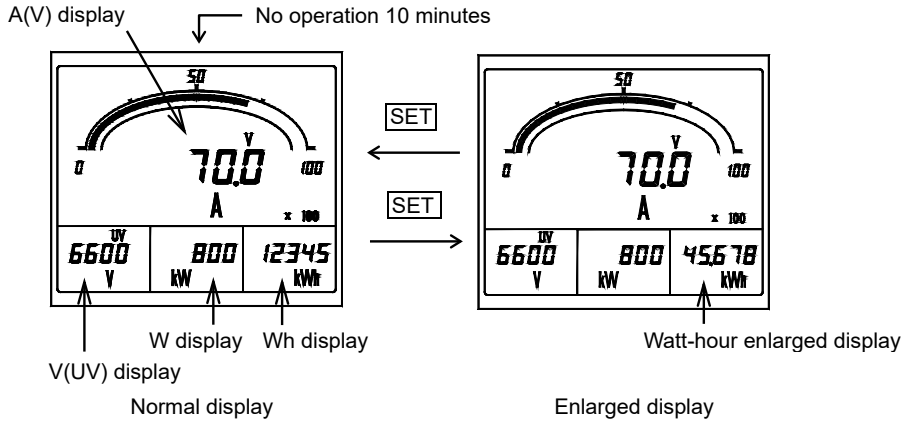
In a maximum display and minimum display, even if a switch is not operated for 10 minutes, it does not return to the original display.



4.3.3 Enlarged display of integral power consumption

In case electric energy is being displayed by the general measurement display, an electric-energy display is changed to a normal display (5 digits of integers), and an enlarged display (2 digits integer + below decimal point, 3 digits). 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.

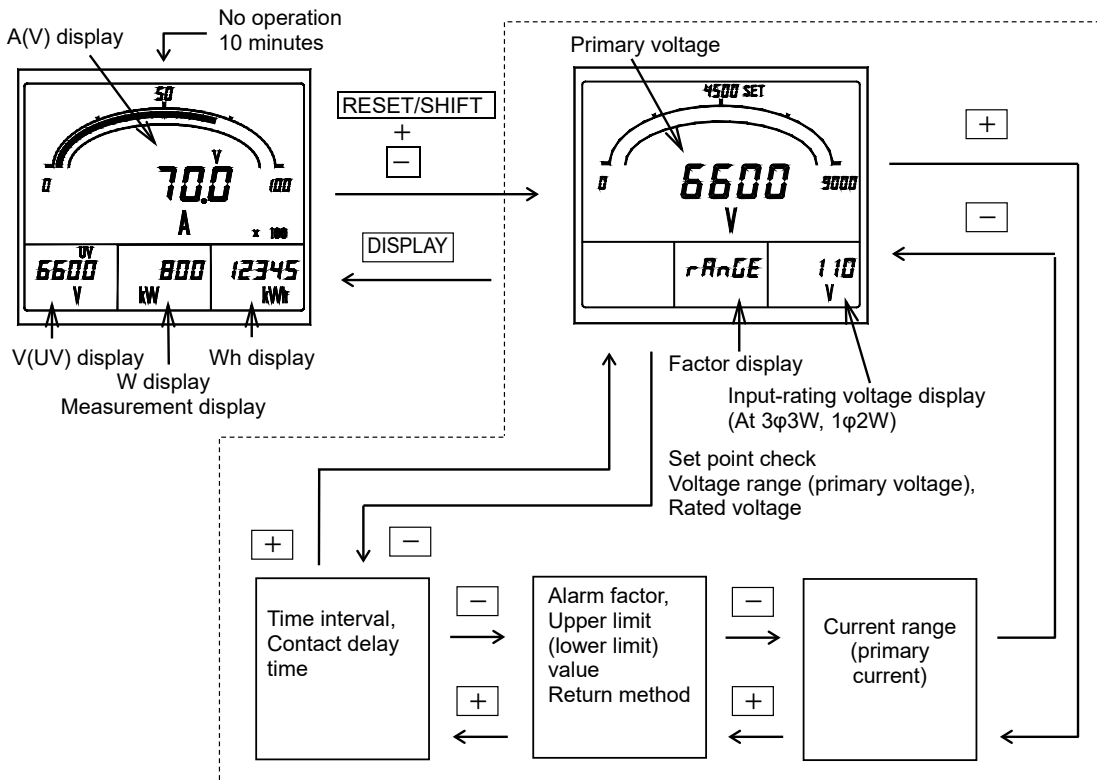
<Caution > If it continues pushing **SET** 3 seconds or more, it will become the setting mode 1.



4.3.4 Setting value check

A voltage range (primary voltage), a current range (primary current), and an alarm-output set point are checked. Check is **RESET/SHIFT** and **-** are pushed simultaneously and performed.

The change of a set point is carries out by **+** and **-**. **DISPLAY** is pushed in case it returns to the original measurement display. And, if a switch is not operated for 10 seconds after a set point check, it will return to the original measurement display automatically.

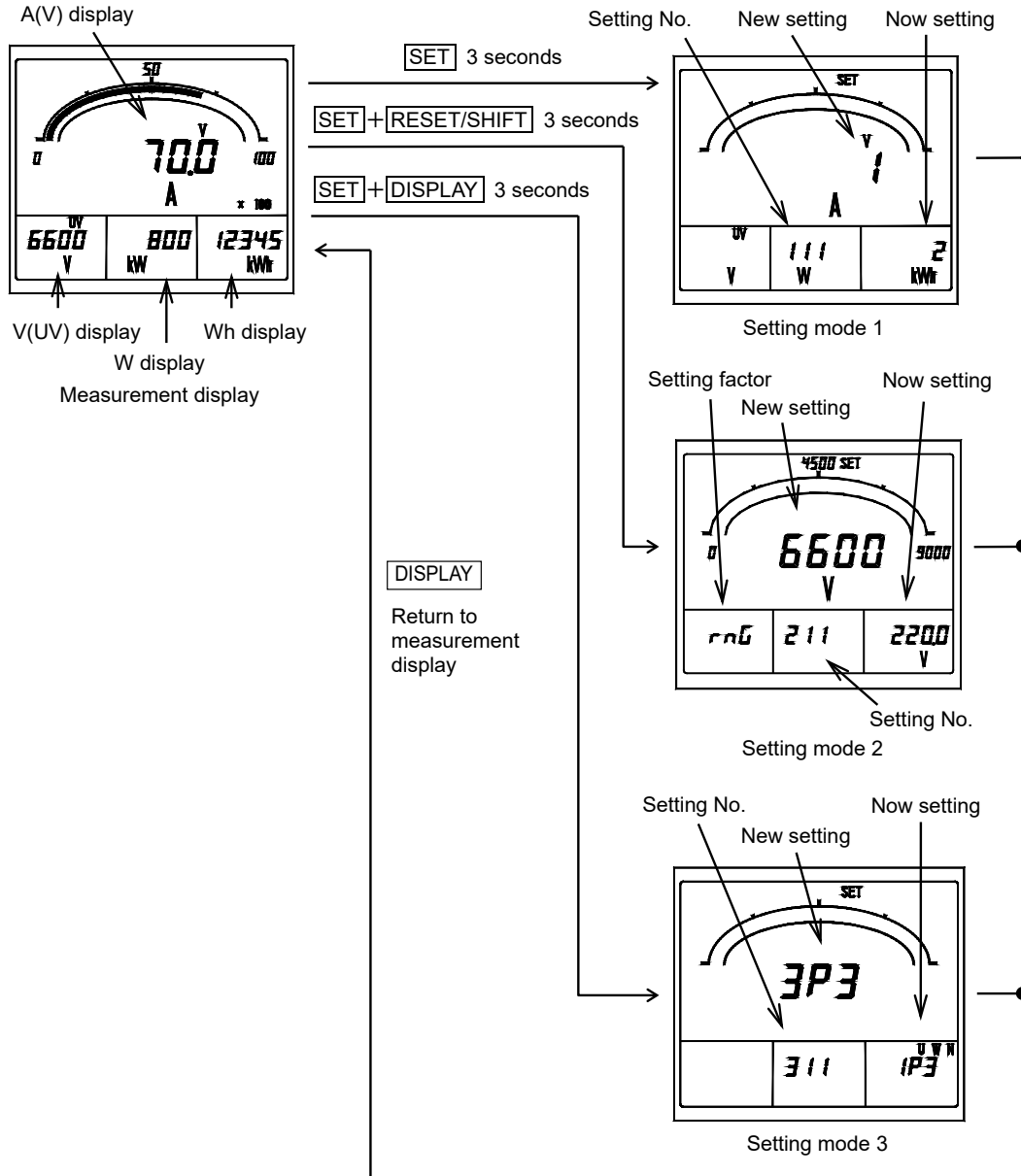


4.3.5 Setting mode

Various kinds of setting are performed. Setting mode is three types, and operations are different. **DISPLAY** is pushed in case it returns to the original measurement display. And, if a switch is not operated for 10 minutes after a set point 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> A measurement display and maximum display, minimum display can also perform this operation.



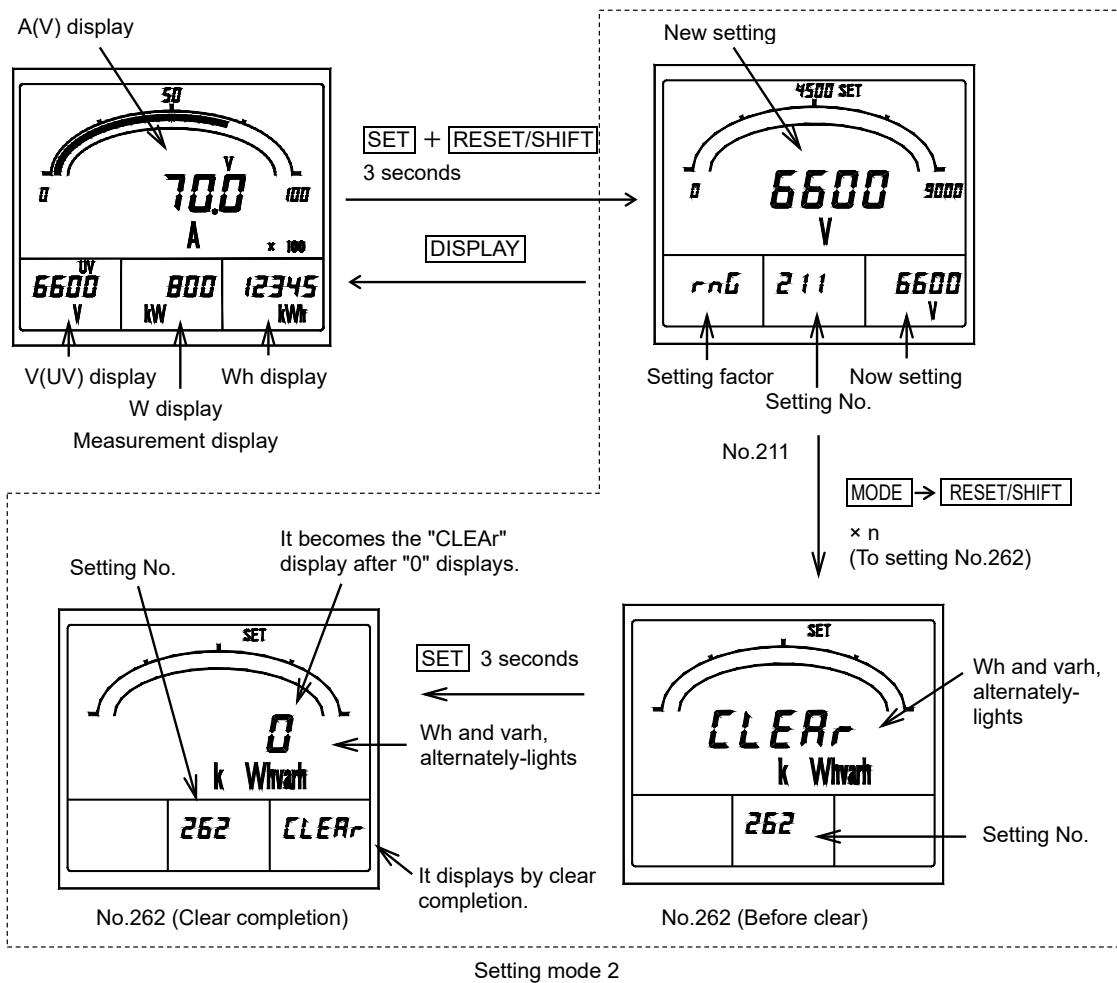
4.3.6 Reset

Various kinds of reset are performed. The kind of reset is as follows and operations are different, respectively. Reset of integral power consumption (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) Integral power consumption reset

It resets by package about the integrated value of various watt-hour. 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. It goes into the setting mode 2.
- ② **MODE** is pushed until setting is set to No.261. Further **RESET/SHIFT** is pushed once and it is made a watt-hour-reset display by No.262.
- ③ Press **SET** for longer than 3 seconds.
- ④ **DISPLAY** is pushed and it returns to a measurement display.



(2) 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)

However, an output is not turned off by this operation, in case an alarm continues and it has caused.
And, this operation is unnecessary if an alarm return method is set as "AUTO (automatic return)".
(An output is also OFF to an alarm return.)

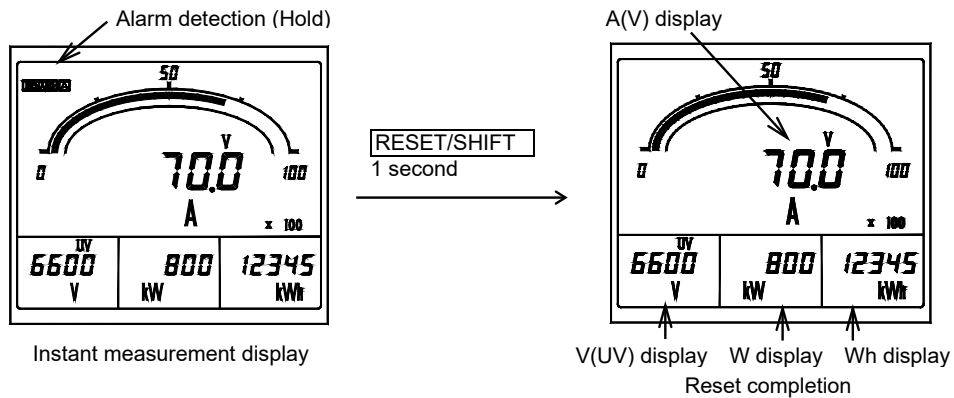
In addition, setting can perform same operation in external operation input.

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

Please refer to "6.3 Input/output functions" for the external operation input.

- 1) It continues pushing **[RESET/SHIFT]** 1 second or more by a measurement display, the maximum measurement display, and the minimum measurement display.

<Caution> If a **[RESET/SHIFT]** switch performs alarm reset, the maximum value of the measurement factor currently displayed on the main monitor and the minimum value are also reset.



(3) Maximum value and minimum value reset.

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 factor individual.

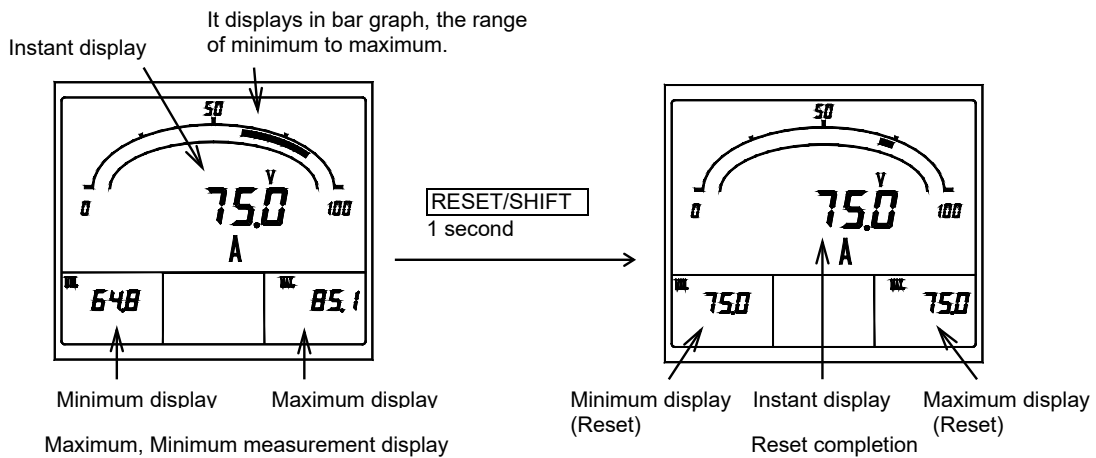
How to reset all maximum values and minimum values by package.)

a) Individual reset

It resets the differential maximum value and minimum value. Other maximum values and minimum values are not reset by this operation.

- 1) It displays a measurement factor to reset on the main monitor. (By measurement display and the maximum and the minimum measurement display.)
- 2) Press **[RESET/SHIFT]** for longer than 1 second.

<Caution> Please be sure to perform this operation after displaying the maximum value and a minimum value measurement factor to reset. And, if the maximum value and minimum value reset are performed, the alarm output of detection will also be reset.



b) All reset of maximum value and minimum value.

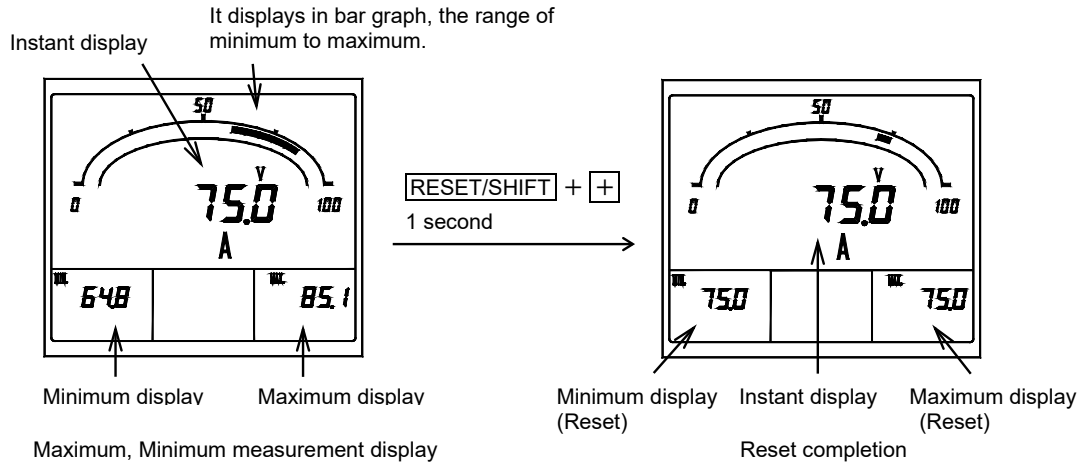
It resets all the maximum values and minimum values.

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 Input/output functions" for the external operation input.

1) By measurement display and the maximum and minimum measurement display, it continues pushing **RESET/SHIFT** and **+** 1 second or more simultaneously.



(4) Alarm reset, and all reset of maximum value and minimum value.

It resets an alarm in an external operation input. And, it resets all the maximum values and minimum values.

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

Please refer to "6.3 Input/output functions" for the external operation input.

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> Shipped in the default value of 3-phase 3-wire 110V input.

Setting mode 1. Function table

Setting No.	Function	Functional description	Default setting	Important setting	Page
111	Display pattern	Sets the display combination pattern of the digital 4 displays and bar graph display.	Pattern 1	✓	35 to 39
112	Main monitor	Sets the display factor of digital main monitor.	3φ3W A(V)	✓	35 to 39
			1φ3W A(U)		
			1φ2W A		
113	sub monitor (left)	Sets the display factor of digital sub monitor (left).	3φ3W V(UV)	✓	35 to 39
			1φ3W V(UN)		
			1φ2W V		
114	sub monitor (center)	Sets the display factor of digital sub monitor (center).	W	✓	35 to 39
115	sub monitor (right)	Sets the display factor of digital sub monitor (right).	Wh	✓	35 to 39
116	Bar graph	Sets the display factor of bar graph.	3φ3W A(V)	✓	35 to 39
			1φ3W A(U)		
			1φ2W A		
121A L	Alarm factor	Sets the output factor of alarm.	DA	✓	39
122A L	Alarm return method	Sets the output action at the case of an alarm return.	Automatic reset		39
123A L	Alarm contact delay time	Sets the contact delay time of alarm.	0 second		39
131H	Demand current upper limit	Sets the high-alarm value of demand current.	80% (Full scale=100%)		40
132	Demand current time interval	Sets time interval of demand current.	0 second	✓	40
133H	Demand power upper limit	Sets the high-alarm value of demand power.	OFF (No operation)		40
134	Demand power time interval	Sets the time interval of demand power.	0 second	✓	40
135	Demand power operating method	Sets the operating method of demand active power.	Operating method according with bimetal type.	✓	40
141H	Instant measurement voltage upper limit	Sets the high-alarm value of instant voltage.	OFF (No operation)		41
142L	Instant measurement voltage lower limit	Sets the low-alarm value of instant voltage.	OFF (No operation)		41
151	Backlight action	Sets the ON/OFF of backlight.	AUTO OFF		41
152	Backlight brightness	Sets the brightness of backlight.	3 (Middle)		41

Setting mode 2. Function table (1)

Setting No.	Function	Functional description	Default setting		Important setting	Page
211	Voltage range	Sets the voltage-measurement range (primary voltage).	3φ3W	6600V ⁽⁸⁾	✓	43 to 46
			1φ3W	110.0V		
			1φ2W	3300V ⁽⁸⁾		
212	Digit number of voltage range	Sets the digit number of voltage range.	3φ3W	4 digits		43 to 46
			1φ3W	4 digits		
			1φ2W	4 digits		
213	Current range	Sets the current-measurement range (primary current).	3φ3W	100.0A	✓	43 to 46
			1φ3W	500.0A		
			1φ2W	50.00A		
214	Current display intrinsic sensitivity	Sets the full scale of current meter.	3φ3W	100.0A		43 to 46
			1φ3W	500.0A		
			1φ2W	50.0A		
215	Digit number of current range	Sets the digit number of current range.	3φ3W	4 digits		43 to 46
			1φ3W	4 digits		
			1φ2W	4 digits		
216	Active power polarity	Sets the deflection display of active power meter.	One-way deflection			43 to 46
217	Active power range	Sets the full scale of active power meter.	3φ3W	1200kW ⁽⁹⁾		43 to 46
			1φ3W	100.0kW		
			1φ2W	150.0kW ⁽¹⁰⁾		
218	Digit number of active power range	Sets the digit number of active power range.	3φ3W	4 digits		43 to 46
			1φ3W	4 digits		
			1φ2W	4 digits		
219	Reactive power range	Sets the full scale of reactive power meter.	3φ3W	600.0kvar ⁽⁹⁾		43 to 46
			1φ3W	50.00kvar		
			1φ2W	75.00kvar ⁽¹⁰⁾		
21A	Digit number of reactive power range	Sets the digit number of reactive power range.	3φ3W	4 digits		43 to 46
			1φ3W	4 digits		
			1φ2W	4 digits		
21B	Power-factor range	Sets the full scale of power-factor meter.	0.5 to 1 to 0.5			43 to 46
21C	Frequency range	Sets the full scale of frequency meter.	45.0 to 65.0Hz			43 to 46
21D	Digit number of frequency range	Sets the digit number of frequency range.	3 digits			43 to 46
221C	Address	Set the address of device in communication output.	1		✓	47
222C	Transmission rate	Set the transmission rate of communication output.	9600bps		✓	47
223C	Parity	Set the parity bit added to communication data.	Even number		✓	47
224C	Stop bit	Set the stop bit added to communication data.	1 bit		✓	47
231P	Pulse output factor	Sets the factor of pulse output.	Wh		✓	48
232P ⁽¹¹⁾	Pulse unit	Sets the pulse unit of pulse output.	3φ3W	10kWh/pulse		48
			1φ3W	1kWh/pulse		
			1φ2W	1kWh/pulse		

Note⁽⁸⁾ It is set to "220.0V (4-digits)" in 220V input.

Note⁽⁹⁾ It is set to "40.00kW (4-digits)" and "20.00kvar (4-digits)" in 220V input.

Note⁽¹⁰⁾ It is set to "10.00kW (4-digits)" and "5.000kvar (4-digits)" in 220V input.

Note⁽¹¹⁾ It is set to "0.1kWh/pulse" in 220V input. (3φ3W, 1φ2W)

Setting mode 2. Function table (2)

Setting No.	Function	Functional description	Default setting	Important setting	Page
241	External operation input function	Sets the function of the external operation input.	Alarm reset	✓	48
251	Voltage ON/OFF	Sets the ON/OFF of voltage measurement display.	ON		49
252	Current ON/OFF	Sets the ON/OFF of current measurement display.	ON		49
253	Demand current ON/OFF	Sets the ON/OFF of demand current measurement display.	ON		49
254	Active power ON/OFF	Sets the ON/OFF of active power measurement display.	ON		49
255	Demand power ON/OFF	Sets the ON/OFF of demand power measurement display.	ON		49
256	Reactive power ON/OFF	Sets the ON/OFF of reactive power measurement display.	ON		49
257	Power factor ON/OFF	Sets the ON/OFF of power-factor measurement display.	ON		49
258	Frequency ON/OFF	Sets the ON/OFF of frequency measurement display.	ON		49
259	Power receiving watt-hour ON/OFF	Sets the ON/OFF of power-receiving watt-hour measurement display.	ON		49
25A	Power transmission var-hour ON/OFF	Sets the ON/OFF of power transmission var-hour measurement display.	ON		49
25B	Power receiving var-hour (LAG, LEAD) ON/OFF	Sets the ON/OFF of power-receiving var-hour (LAG, LEAD) measurement display.	ON		49
25C	Power transmission var-hour (LAG, LEAD) ON/OFF	Sets the ON/OFF of power transmission var-hour (LAG, LEAD) measurement display.	ON		49
261	set value initialization	Initializes the settings in the setting mode 1 and the setting mode 2. (Return to default setting.)	—		49
262	Watt-hour reset	Integrated value is cleared by package about each electric energy.	—		49

Setting mode 3. Function table

Setting No.	Function	Functional description	Default setting		Important setting	Page
311	Input circuit phase line change	Sets the input circuit or phase line.	3φ3W	3φ3W	✓	50
			1φ3W	1φ3W(U-W-N)		
			1φ2W	1φ2W		
312	Input voltage	Sets the input voltage or phase voltage full scale.	3φ3W	110V	✓	51
			1φ3W	300V		
			1φ2W	110V		
321	Tidal current measurement	Sets 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			51

5.2 Setting table

A setting item changes by the specification of a product.

(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
Sets 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 for longer than 3 seconds ➡ Selected phase wire is entered ➡ Press DISPLAY ➡ Returns to display mode.	50
Sets the input voltage (phase-voltage full scale). (312)	Press SET and DISPLAY together for longer than 3 seconds ➡ Press RESET/SHIFT ➡ (311) (312) Select an input voltage (In case of 1φ3W, it is phase-voltage full scale) by + and - ➡ Press SET ➡ Selected input voltage is entered ➡ Press DISPLAY ➡ Returns to display mode.	51
Sets the measurement range of voltmeter (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.	43 to 46
Sets the measurement range of ammeter (213)	Press SET and RESET/SHIFT together for longer than 3 seconds ➡ (211) Press RESET/SHIFT ➡ Press RESET/SHIFT ➡ Select a measuring range by + and - (212) (213) ➡ Press SET ➡ Selected measuring range is entered ➡ Press DISPLAY ➡ Returns to display mode.	43 to 46
Sets 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.	35 to 39
Set the address of device in communication output. (221C)	Press SET and RESET/SHIFT together for longer than 3 seconds ➡ Press MODE ➡ (211) (221C) Select an address by + and - ➡ Press SET ➡ Selected address is entered ➡ Press DISPLAY ➡ Returns to display mode.	47
Set the transmission rate of communication output. (222C)	Press SET and RESET/SHIFT together for longer than 3 seconds ➡ Press MODE ➡ (211) (221C) Press RESET/SHIFT ➡ Select an transmission rate by + and - ➡ Press SET ➡ (222C) Selected transmission rate is entered ➡ Press DISPLAY ➡ Returns to display mode.	47
Set the parity bit added to communication data. (223C)	Press SET and RESET/SHIFT together for longer than 3 seconds ➡ Press MODE ➡ (211) (221C) Press RESET/SHIFT ➡ Press RESET/SHIFT ➡ Select an parity by + and - ➡ (222C) (223C) Press SET ➡ Selected parity is entered ➡ Press DISPLAY ➡ Returns to display mode.	47

Items	Setting and operation procedures	Page
Sets the stop bit added to communication data. (224C)	Press SET and RESET/SHIFT together for longer than 3 seconds → Press MODE → <small>(211) (221C)</small> Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → <small>(222C) (223C) (224C)</small> Select an stop bit by + and - → Press SET → Selected stop bit is entered → Press DISPLAY → Returns to display mode.	47
Sets the output factor of pulse output. (231P)	Press SET and RESET/SHIFT together for longer than 3 seconds → Press MODE → <small>(211) (221A)</small> Press MODE → Select an output factor by + and - → Press SET → <small>(231P)</small> Selected output factor is entered → Press DISPLAY → Returns to display mode.	48
Sets the factor of alarm output. (121AL)	Press SET for longer than 3 seconds → Press MODE → <small>(111) (121AL)</small> Select an factor by + and - → Press SET → Selected factor is entered → Press DISPLAY → Returns to display mode.	39
Sets the function of external operation input. (241)	Press SET and RESET/SHIFT together for longer than 3 seconds → Press MODE → <small>(211) (221A)</small> Press MODE → Press MODE → Select an function by + and - → Press SET → <small>(231P) (241)</small> Selected function is entered → Press DISPLAY → Returns to display mode.	48
Sets the time interval of demand current. (132)	Press SET for longer than 3 seconds → Press MODE → Press MODE → <small>(111) (121AL) (131H)</small> Press RESET/SHIFT → Select an time interval by + and - → Press SET → <small>(132)</small> Selected time interval is entered → Press DISPLAY → Returns to display mode.	40
Sets the time interval of demand power. (134)	Press SET for longer than 3 seconds → Press MODE → Press MODE → <small>(111) (121AL) (131H)</small> Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → <small>(132) (133H) (134)</small> Select an time interval by + and - → Press SET → Selected time interval is entered → Press DISPLAY → Returns to display mode.	40
Sets the operation method of demand power. (135)	Press SET for longer than 3 seconds → Press MODE → Press MODE → <small>(111) (121AL) (131H)</small> Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → <small>(132) (133H) (134)</small> Press RESET/SHIFT → Select an operation method by + and - → Press SET → <small>(135)</small> Selected operation method is entered → Press DISPLAY → Returns to display mode.	40

(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
Sets the display factor of main monitor. (112)	Press SET for longer than 3 seconds → Press RESET/SHIFT → (111) (112) Select an display factor by + and - → Press SET → Selected display factor is entered → Press DISPLAY → Returns to display mode.	35 to 39
Sets the display factor of sub monitor (left). (113)	Press SET for longer than 3 seconds → Press RESET/SHIFT → Press RESET/SHIFT (111) (112) → Select an display factor by + and - → Press SET → (113) Selected display factor is entered → Press DISPLAY → Returns to display mode.	35 to 39
Sets the display factor of sub monitor (center). (114)	Press SET for longer than 3 seconds → Press RESET/SHIFT → Press RESET/SHIFT (111) (112) → Press RESET/SHIFT → Select an display factor by + and - → Press SET → (113) (114) Selected display factor is entered → Press DISPLAY → Returns to display mode.	35 to 39
Sets the display factor of sub monitor (right). (115)	Press SET for longer than 3 seconds → Press RESET/SHIFT → Press RESET/SHIFT (111) (112) → Press RESET/SHIFT → Press RESET/SHIFT → (113) (114) (115) Select an display factor by + and - → Press SET → Selected display factor is entered → Press DISPLAY → Returns to display mode.	35 to 39
Sets the display factor of bar graph. (116)	Press SET for longer than 3 seconds → Press RESET/SHIFT → Press RESET/SHIFT (111) (112) → Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (113) (114) (115) (116) Select an display factor by + and - (If a sub monitor is selected, an underbar will be displayed on the bottom of a digital display.) → Press SET → Selected display factor is entered → Press DISPLAY → Returns to display mode.	35 to 39

(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
Sets the polarity and measurement range of active power. (216) (217)	Press SET and RESET/SHIFT together for longer than 3 seconds → (211) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (212) (213) (214) Press RESET/SHIFT → Press RESET/SHIFT → (215) (216) Select an one-way deflection (P) / both deflection (-) by + and - → Press SET → Selected deflection is entered → Press RESET/SHIFT → (217) Select a measuring range by + and - → Press SET → Selected measuring range is entered → Press DISPLAY → Returns to display mode.	43 to 46

(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
Sets the measurement range of reactive power. (219)	<p>Press SET and RESET/SHIFT together for longer than 3 seconds → (211)</p> <p>Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (212) (213) (214)</p> <p>Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (215) (216) (217)</p> <p>Press RESET/SHIFT → Press RESET/SHIFT → Select a measuring range by + and - (218) (219)</p> <p>→ Press SET → Selected measuring range is entered → Press DISPLAY →</p> <p>Returns to display mode.</p>	43 to 46

(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
Sets the pulse unit of pulse output. (232P)	<p>Press SET and RESET/SHIFT together for longer than 3 seconds → Press MODE → (211) (221A)</p> <p>Press MODE → Press RESET/SHIFT → Select a output pulse unit by + and - → (231P) (232P)</p> <p>Press SET → Selected output pulse unit is entered → Press DISPLAY →</p> <p>Returns to display mode.</p>	48

(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
Sets the measurement range of power-factor. (21B)	<p>Press SET and RESET/SHIFT together for longer than 3 seconds → (211)</p> <p>Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (212) (213) (214)</p> <p>Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (215) (216) (217)</p> <p>Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (218) (219) (21A)</p> <p>Press RESET/SHIFT → Select a measuring range by + and - → Press SET → (21B)</p> <p>Selected measuring range is entered → Press DISPLAY → Returns to display mode.</p>	43 to 46
Sets the measurement range of frequency. (21C)	<p>Press SET and RESET/SHIFT together for longer than 3 seconds → (211)</p> <p>Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (212) (213) (214)</p> <p>Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (215) (216) (217)</p> <p>Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (218) (219) (21A)</p> <p>Press RESET/SHIFT → Press RESET/SHIFT → Select a measuring range by + and - (21B) (21C)</p> <p>→ Press SET → Selected measuring range is entered → Press DISPLAY →</p> <p>Returns to display mode.</p>	43 to 46

(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
Sets the display sensitivity (% of a display to an input) of current. (214)	Press SET and RESET/SHIFT together for longer than 3 seconds → (211) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (212) (213) (214) Select a display sensitivity by + and - → Press SET → Selected display sensitivity is entered → Press DISPLAY → Returns to display mode.	43 to 46

(8) Setting of range digit number.

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

Items	Setting and operation procedures	Page
Sets the digit number of voltage range. (212)	Press SET and RESET/SHIFT together for longer than 3 seconds → (211) Press RESET/SHIFT → Select a digit number by + and - → Press SET → (212) Selected digit number is entered → Press DISPLAY → Returns to display mode.	43 to 46
Sets the digit number of current range. (215)	Press SET and RESET/SHIFT together for longer than 3 seconds → (211) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (212) (213) (214) Press RESET/SHIFT → Select a digit number by + and - → Press SET → (215) Selected digit number is entered → Press DISPLAY → Returns to display mode.	43 to 46
Sets the digit number of active power range. (218)	Press SET and RESET/SHIFT together for longer than 3 seconds → (211) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (212) (213) (214) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (215) (216) (217) Press RESET/SHIFT → Select a digit number by + and - → Press SET → (218) Selected digit number is entered → Press DISPLAY → Returns to display mode.	43 to 46
Sets the digit number of reactive power range. (21A)	Press SET and RESET/SHIFT together for longer than 3 seconds → (211) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (212) (213) (214) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (215) (216) (217) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (218) (219) (21A) Select a digit number by + and - → Press SET → Selected digit number is entered → Press DISPLAY → Returns to display mode.	43 to 46

Items	Setting and operation procedures	Page
Sets the digit number of frequency range. (21D)	Press SET and RESET/SHIFT together for longer than 3 seconds → (211) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (212) (213) (214) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (215) (216) (217) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (218) (219) (21A) Press RESET/SHIFT → Press RESET/SHIFT → Press RESET/SHIFT → (21B) (21C) (21D) Select a digit number by + and - → Press SET → Selected digit number is entered → Press DISPLAY → Returns to display mode.	43 to 46

(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
Sets the return method of alarm output. (122AL)	Press SET for longer than 3 seconds → Press MODE → Press RESET/SHIFT → (111) (121AL) (122AL) Select a return method by + and - → Press SET → The selected return method is entered → Press DISPLAY → Returns to display mode.	39
Sets the contact delay time of alarm output. (123AL)	Press SET for longer than 3 seconds → Press MODE → Press RESET/SHIFT → (111) (121AL) (122AL) Press RESET/SHIFT → Select a contact delay time by + and - → Press SET → (123AL) The selected contact delay time is entered → Press DISPLAY → Returns to display mode.	39

(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
Sets 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.	40
Sets the high-alarm value of demand 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.	40

(11) 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
Sets the high-alarm value of instant voltage. (141H)	Press SET for longer than 3 seconds → Press MODE → Press MODE → (111) (121AL) (131H) Press MODE → Select a high-alarm value by + and - → Press SET → (141H) Selected high-alarm value is entered → Press DISPLAY → Returns to display mode.	41
Sets the low-alarm value of instant voltage. (142L)	Press SET for longer than 3 seconds → Press MODE → Press MODE → (111) (121AL) (131H) Press MODE → Press RESET/SHIFT → Select a low-alarm value by + and - → (141H) (142L) Press SET → Selected low-alarm value is entered → Press DISPLAY → Returns to display mode.	41

(12) Backlight setting

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

Items	Setting and operation procedures	Page
Sets the action of backlight. (151)	Press SET for longer than 3 seconds → Press MODE → Press MODE → Press MODE → (111) (121AL) (131H) → Press MODE → Select a backlight action by + and - → Press SET → (141H) (151) Selected backlight action is entered → Press DISPLAY → Returns to display mode.	41
Sets the brightness of backlight. (152)	Press SET for longer than 3 seconds → Press MODE → Press MODE → Press MODE → (111) (121AL) (131H) → Press MODE → Press RESET/SHIFT → Select a brightness by + and - → (141H) (151) (152) Press SET → Selected backlight brightness is entered → Press DISPLAY → Returns to display mode.	41

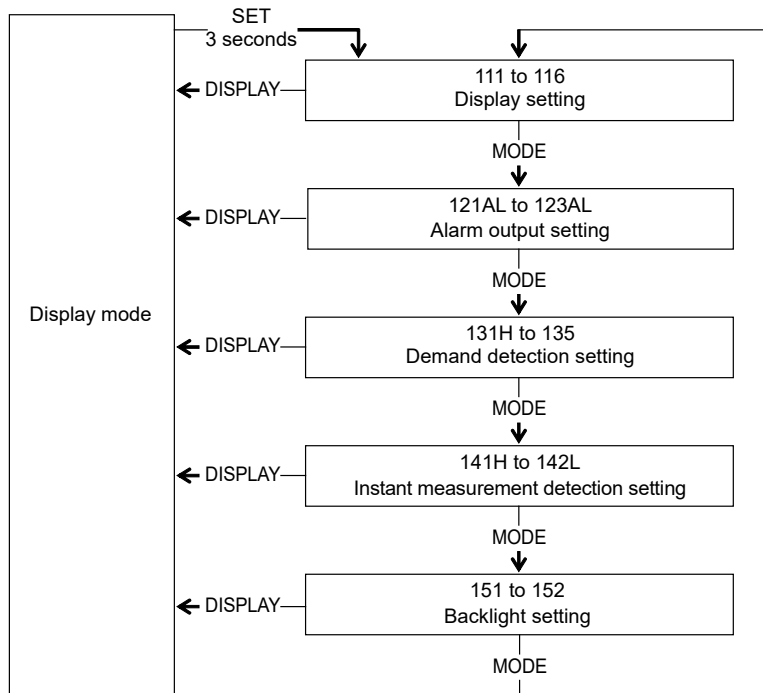
(13) Other, measurement setting

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

Items	Setting and operation procedures	Page
Sets the tidal current measurement of reactive power and power-factor. (321)	Press SET and DISPLAY together for longer than 3 seconds → Press MODE → (311) (321) Select a tidal current measurement ON/OFF by + and - → Press SET → Selected action is entered → Press DISPLAY → Returns to display mode.	51

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.

(1) 111 to 116 Display combination setting

• 3-phase 3-wire

No	Pattern No	Main monitor	Sub monitor (Left)	Sub monitor (Center)	Sub monitor (Right)	Bar graph
1	Pattern 1	A(V)	V(UV)	W	Wh	A(V)
2	Pattern 2	A(V)	V(UV)	W	cosφ	A(V)
3	Pattern 3	A(V)	V(UV)	W	Hz	A(V)
4	Pattern 4	DA(V)	V(UV)	MDA(V)	Wh	MDA+DA(V)
5	Pattern 5	MDA(V)	A(V)	V(UV)	Wh	MDA+DA(V)
6	Pattern 6	W	V(UV)	A(V)	Wh	W
7	Pattern 7	W	V(UV)	A(V)	cosφ	W
8	Pattern 8	W	V(UV)	A(V)	Hz	W
9	Pattern 9	DW	V(UV)	MDW	Wh	MDW+DW
10	Pattern 10	MDW	W	V(UV)	Wh	MDW+DW
11	Pattern 11	A(V)	cosφ	W	Wh	A(V)
12	Pattern 12	A(V)	var	W	Wh	A(V)
13	Pattern 13	W	cosφ	var	Wh	W
14	Pattern 14	A(V)	A(U)	A(W)	Wh	A(V)
15	Pattern 15	V(UV)	V(VW)	V(WU)	Hz	V(UV)

• Displays set factor (3-phase 3-wire)

Main monitor	V(UV), V(VW), V(WU), A(U), A(V), A(W), DA(U), DA(V), DA(W), MDA(U), MDA(V), MDA(W), W, DW, MDW, var, cosφ, Hz, Wh, -Wh, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD)
Sub monitor (Left)	V(UV), V(VW), V(WU), A(U), A(V), A(W), W, var, cosφ
Sub monitor (Center)	V(UV), V(VW), V(WU), A(U), A(V), A(W), DA(U), DA(V), DA(W), MDA(U), MDA(V), MDA(W), W, DW, MDW, var, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD)
Sub monitor (Right)	V(UV), V(VW), V(WU), A(U), A(V), A(W), DA(U), DA(V), DA(W), MDA(U), MDA(V), MDA(W), W, DW, MDW, cosφ, Hz, Wh, -Wh
Bar graph	V(UV), V(VW), V(WU), A(U), A(V), A(W), DA(U), DA(V), DA(W), MDA(U), MDA(V), MDA(W), W, DW, MDW, var, cosφ, Hz

• Phase (line) change (3-phase 3-wire) ⁽¹²⁾

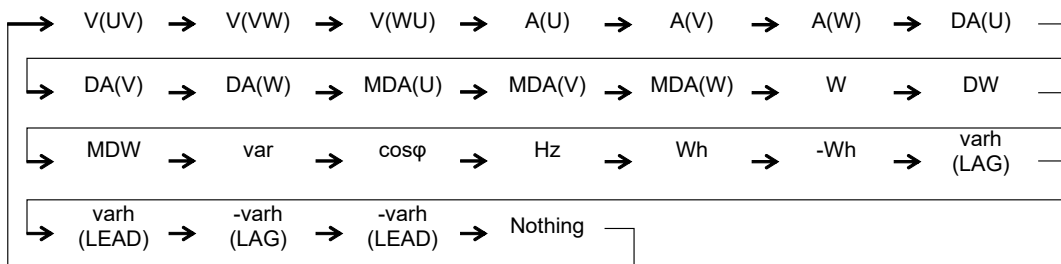
→ V(UV) → V(VW) → V(WU) →

→ A(V) → A(W) → A(U) → ⁽¹³⁾

Note⁽¹²⁾ Press **DISPLAY**, Voltage and current are replaced at the same time.

Note⁽¹³⁾ DA and MDA also change.

• Measurement factor change (3-phase 3-wire, Measurement display mode)



• Single-phase 3-wire ⁽¹⁶⁾

№	Pattern №	Main monitor	Sub monitor (Left)	Sub monitor (Center)	Sub monitor (Right)	Bar graph
1	Pattern 1	A(U)	V(UN)	W	Wh	A(U)
2	Pattern 2	A(U)	V(UN)	W	cosφ	A(U)
3	Pattern 3	A(U)	V(UN)	W	Hz	A(U)
4	Pattern 4	DA(U)	V(UN)	MDA(U)	Wh	MDA+DA(U)
5	Pattern 5	MDA(U)	A(U)	V(UN)	Wh	MDA+DA(U)
6	Pattern 6	W	V(UN)	A(U)	Wh	W
7	Pattern 7	W	V(UN)	A(U)	cosφ	W
8	Pattern 8	W	V(UN)	A(U)	Hz	W
9	Pattern 9	DW	V(UN)	MDW	Wh	MDW+DW
10	Pattern 10	MDW	W	V(UN)	Wh	MDW+DW
11	Pattern 11	A(U)	cosφ	W	Wh	A(U)
12	Pattern 12	A(U)	var	W	Wh	A(U)
13	Pattern 13	W	cosφ	var	Wh	W
14	Pattern 14	A(U)	A(W)	A(N)	Wh	A(U)
15	Pattern 15	V(UN)	V(WN)	V(UW)	Hz	V(UN)

• Displays set factor (Single-phase 3-wire) ⁽¹⁶⁾

Main monitor	V(UN), V(WN), V(UW), A(U), A(W), A(N), DA(U), DA(W), DA(N), MDA(U), MDA(W), MDA(N), W, DW, MDW, var, cosφ, Hz, Wh, -Wh, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD)
Sub monitor (Left)	V(UN), V(WN), V(UW), A(U), A(W), A(N), W, var, cosφ
Sub monitor (Center)	V(UN), V(WN), V(UW), A(U), A(W), A(N), DA(U), DA(W), DA(N), MDA(U), MDA(W), MDA(N), W, DW, MDW, var, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD)
Sub monitor (Right)	V(UN), V(WN), V(UW), A(U), A(W), A(N), DA(U), DA(W), DA(N), MDA(U), MDA(W), MDA(N), W, DW, MDW, cosφ, Hz, Wh, -Wh
Bar graph	V(UN), V(WN), V(UW), A(U), A(W), A(N), DA(U), DA(W), DA(N), MDA(U), MDA(W), MDA(N), W, DW, MDW, var, cosφ, Hz

• Phase (line) change (Single-phase 3-wire) ⁽¹⁴⁾

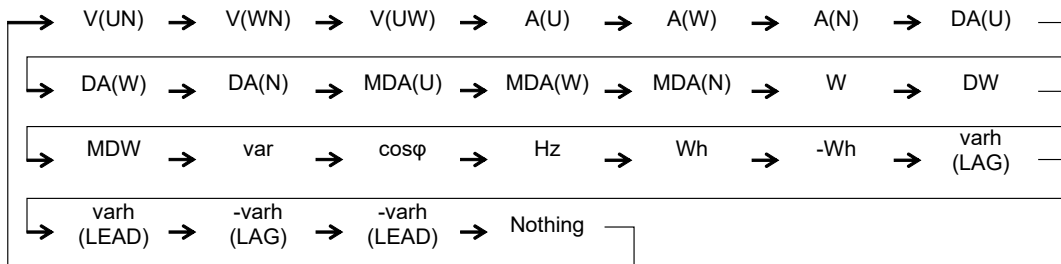
→ V(UN) → V(WN) → V(UW) →

Note⁽¹⁴⁾ Press **DISPLAY**, Voltage and current are replaced at the same time.

→ A(U) → A(W) → A(N) → ⁽¹⁵⁾

Note⁽¹⁵⁾ DA and MDA also change.

• Measurement factor change (Measurement display mode) ⁽¹⁶⁾



Note⁽¹⁶⁾ It is the case of single phase 3-wire (U-W-N).

The case of single phase 3-wire (U-V-N), voltage (UN-VN-UV) and current (U-V-N).

The case of single phase 3-wire (V-W-N), voltage (VN-WN-VW) and current (V-W-N).

• Single-phase 2-wire

№	Pattern №	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	V	MDA	Wh	MDA+DA
5	Pattern 5	MDA	A	V	Wh	MDA+DA
6	Pattern 6	W	V	A	Wh	W
7	Pattern 7	W	V	A	cosφ	W
8	Pattern 8	W	V	A	Hz	W
9	Pattern 9	DW	V	MDW	Wh	MDW+DW
10	Pattern 10	MDW	W	V	Wh	MDW+DW
11	Pattern 11	A	cosφ	W	Wh	A
12	Pattern 12	A	var	W	Wh	A
13	Pattern 13	W	cosφ	var	Wh	W
14	Pattern 14	A	—	—	Wh	A
15	Pattern 15	V	—	—	Hz	V

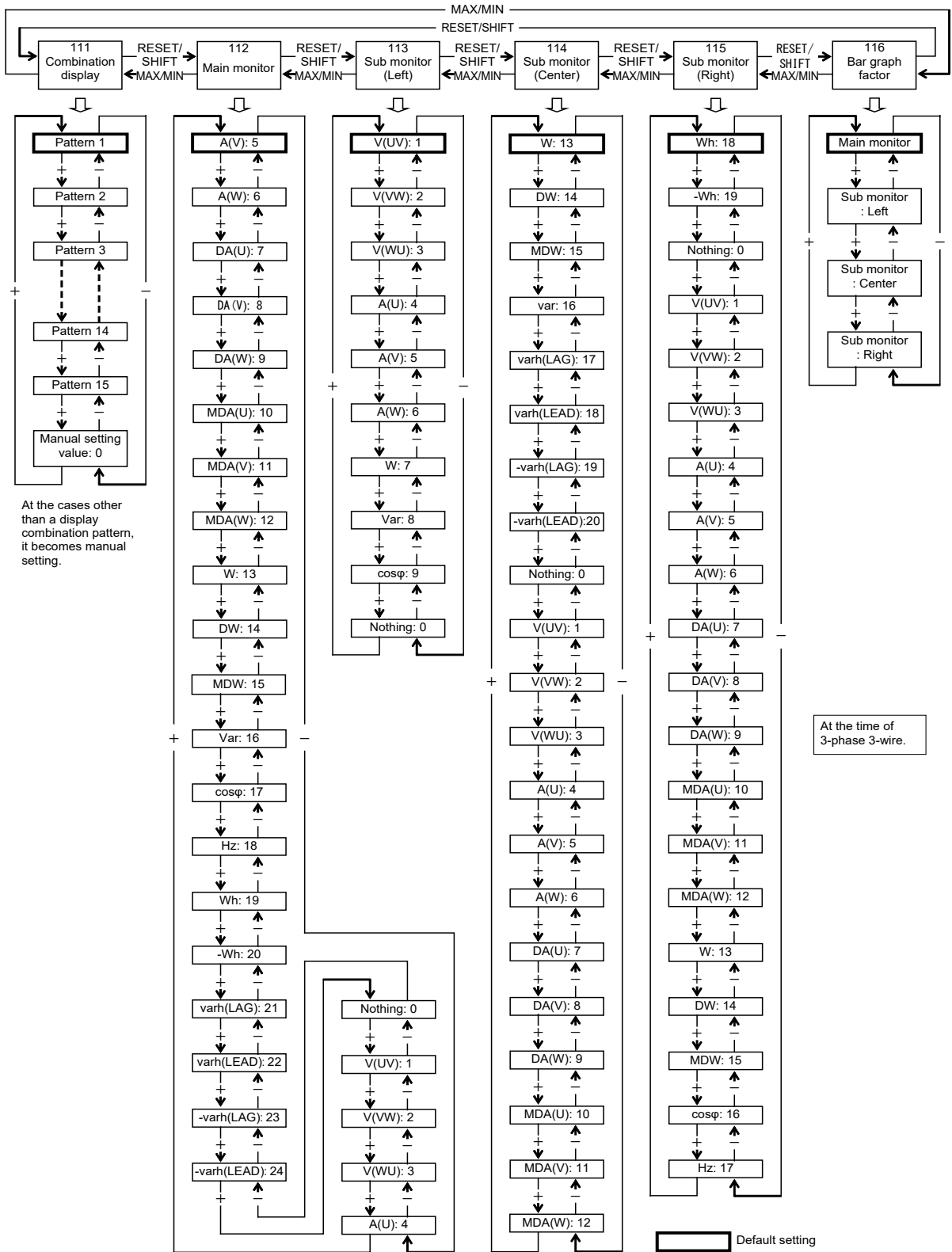
• Displays set factor (Single-phase 2-wire)

Main monitor	V, A, DA, MDA, W, DW, MDW, var, cosφ, Hz, Wh, -Wh, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD)
Sub monitor (Left)	V, A, W, var, cosφ
Sub monitor (Center)	V, A, DA, MDA, W, DW, MDW, var, varh(LAG), varh(LEAD), -varh(LAG), -varh(LEAD)
Sub monitor (Right)	V, A, DA, MDA, W, DW, MDW, cosφ, Hz, Wh, -Wh
Bar graph	V, A, DA, MDA, W, DW, MDW, var, cosφ, Hz

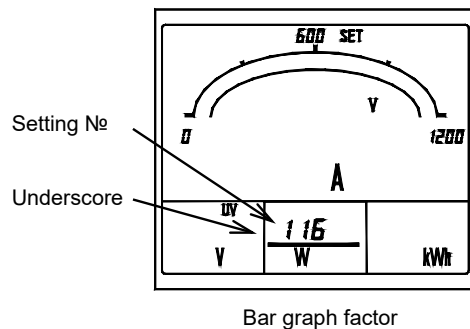
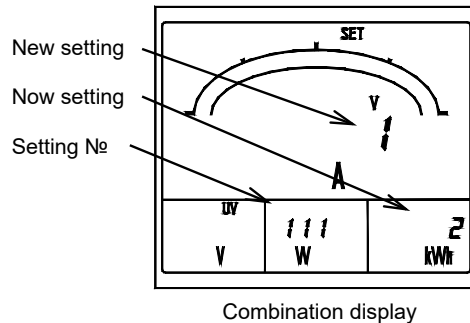
• Measurement factor change (Measurement display mode)



Display combination setting

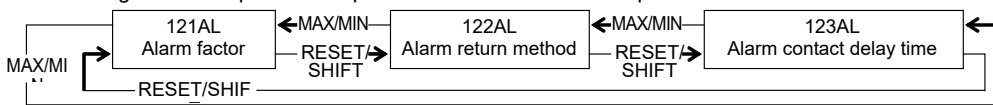


- ◆ 111 Combination display
Select the factors to be measured and monitored by 4 digital displays out of combination patterns.
Set values are updated by **[SET]**.
- ◆ 112 to 115 Main monitor, Sub monitor (left), Sub monitor (center), Sub monitor (right)
Sets these items for a display configuration other than combination patterns.
Set values are updated by **[SET]**.
- ◆ 116 Bar graph factor
A factor being monitored in the main monitor is basically displayed by a bar graph.
Set this item for displaying a factor being monitored on a sub monitor by bar graph.
An underscore is attached to the digital display of the setting sub monitor.
Set values are updated by **[SET]**.

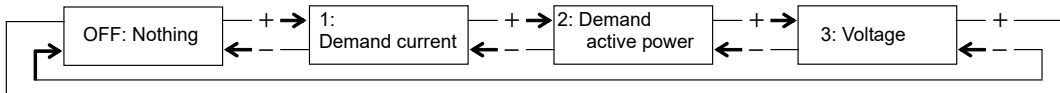


(2) 121AL to 123AL Alarm output setting

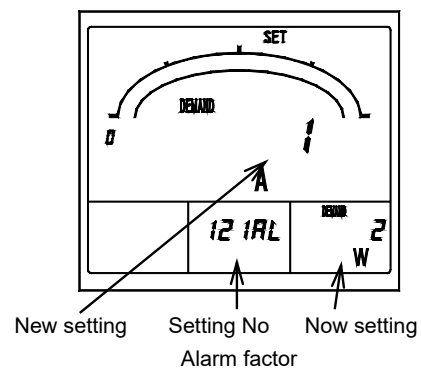
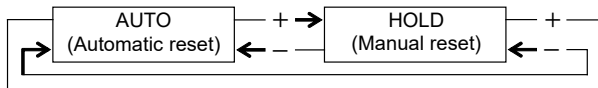
Various setting and an output test are performed about an alarm output.



- ◆ 121AL Alarm output factor setting
Sets the factor of alarms outputs. Selection by **[+]** and **[-]**, set value is updated by **[SET]**.
Default setting: 1 (DA: Demand current)



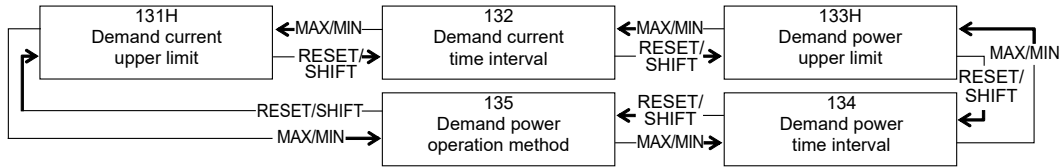
- ◆ 122AL Alarm reset method setting.
Action at the case of a reset of alarm output can be selected from AUTO (automatic reset) and HOLD (manual reset).
In "AUTO (automatic reset)", an alarm output is OFF according to a reset of an alarm. In "HOLD (manual reset)", even after an alarm reset, an output holds ON.
It performs a return (output OFF) in **[RESET/SHIFT]**.
Selection by **[+]** and **[-]**, set value is updated by **[SET]**.
Default setting: AUTO (automatic reset)



- ◆ 123AL Alarm contact delay time
Sets the contact delay time of alarm. 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)

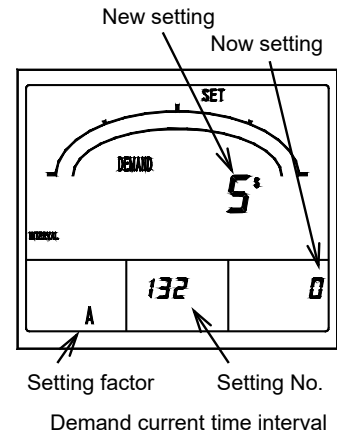
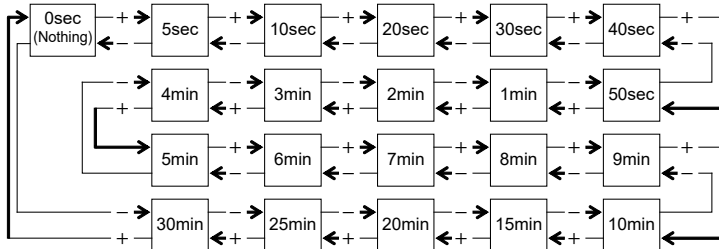
(3) 131H to 135 Demand detection setting

The next operation method is setting. Demand current, Demand power, High-alarm value, Time-interval, Power-factor, Demand power operation method.

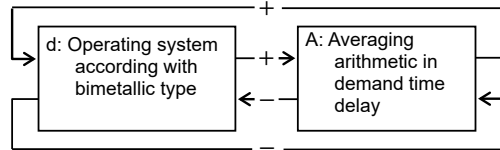


- ◆ 131H Demand current upper limit. 133H Demand power upper limit. Sets the high-alarm value of demand current (DA) and demand power (DW). The setting range is 5 to 100% (1% step) and OFF. (To full scale = 100%) Selection by **[+]** and **[-]**, set value is updated by **[SET]**.
Default setting: 80% (demand current), OFF (demand power)

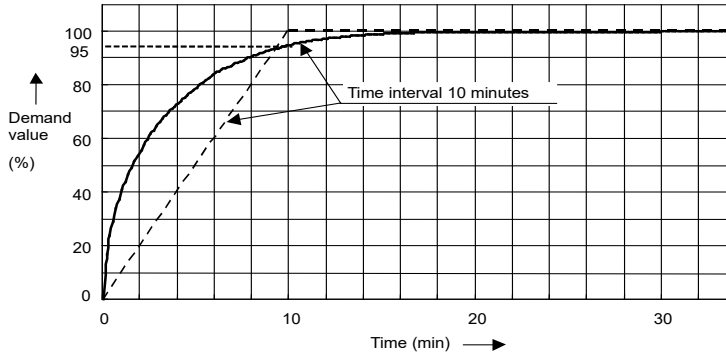
- ◆ 132 Demand current time interval. 134 Demand power time interval. Sets the time interval (95% time interval) of demand current(DA) and demand power(DW). Selection by **[+]** and **[-]**, set value is updated by **[SET]**.
Default setting: 0 second (Demand current, Demand power)



- ◆ 135 Demand 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 (operation method according with bimetallic type)



• Demand time delay characteristic (Demand current, Demand 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.)

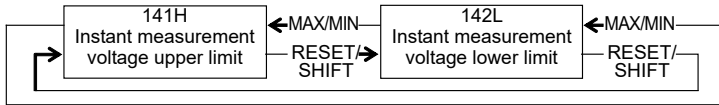
Arithmetic method

Demand current measurement: Arithmetic method according with bimetallic type.
 Demand 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 time of a rated active power.

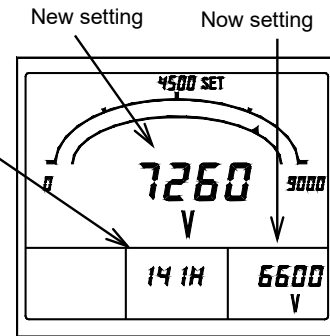
(4) 141H to 142L Instant measurement detection setting

An upper limit low-alarm value is set by instant measurement (voltage factor).



- ◆ 141H Instant measurement voltage upper limit, 142L Instant measurement voltage lower limit. Sets the high-alarm value and low-alarm value of instant measurement (voltage full scale =150%). Setting range is 30 to 150% (1% step). Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} . Default setting: OFF [Non-use] (Upper limit, lower limit)

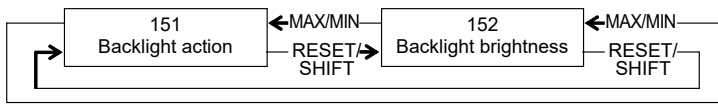
Setting No.



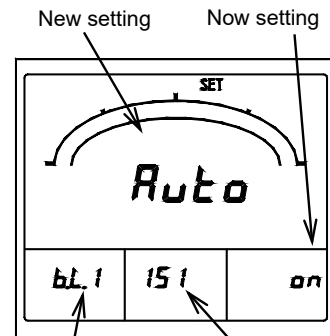
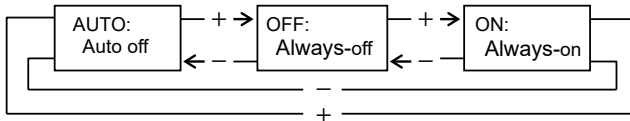
Instant measurement voltage upper limit

(5) 151 to 152 Backlight setting

Sets the action and brightness of backlight.



- ◆ 151 Backlight action It can select from ON (always-on), AUTO (auto off), and OFF (always-off) about action of backlight. 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 $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} . Default setting: AUTO (Auto off)

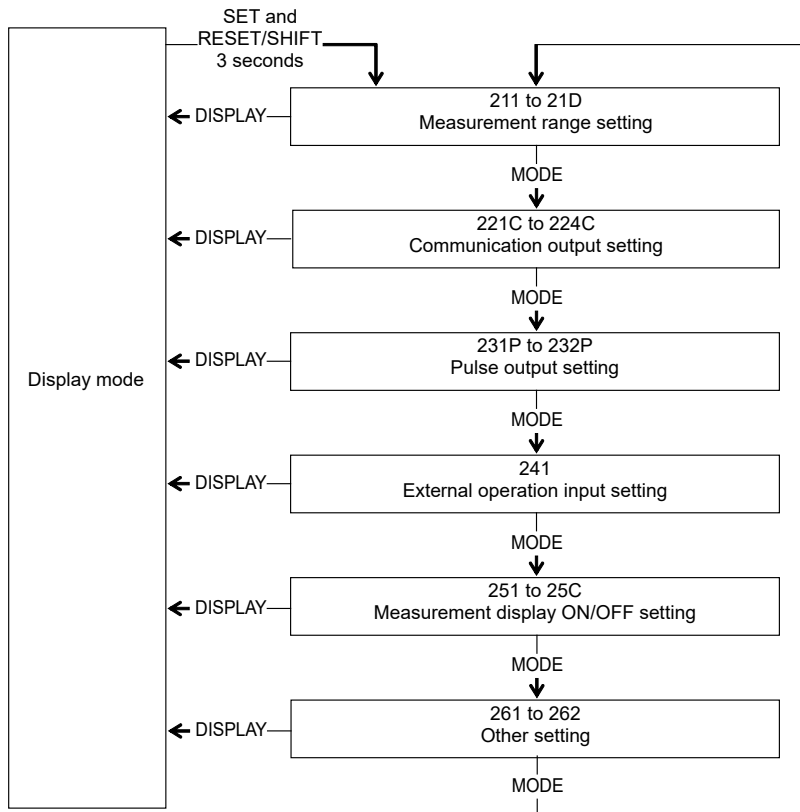


Setting factor Backlight

- ◆ 152 Backlight brightness It can select the brightness of backlight as 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 $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} . Default setting: 3 (Middle)

Setting	Brightness
5	Bright
4	↕
3	
2	
1	Dark

5.3.2 Setting mode 2



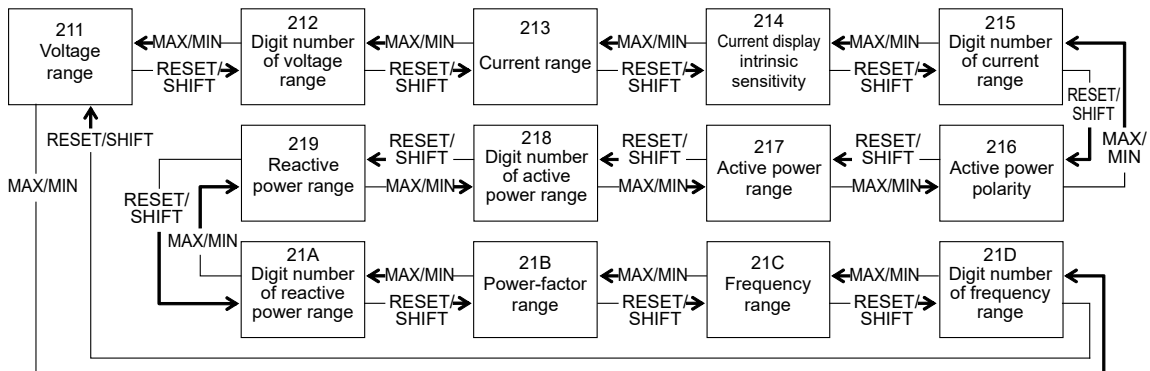
Setting mode 2 is selected by pressing **SET** and **RESET/SHIFT** switches continuously for longer than 3 seconds. Pushing **MODE** switch performs movement of setting item. The present mode can be returned to the display mode by pressing **DISPLAY** switch.

< Caution >

If setting change should have been mistaken, a display and output of measurement are not obtained correctly. Therefore, other than the administrator must not set.

(1) 211 to 21D Measurement range setting

Sets the measurement range of each measurement factor.



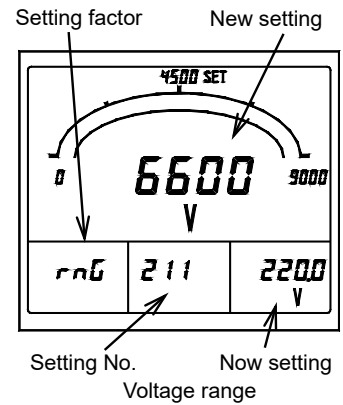
◆ 211 Voltage range

Sets the voltage range (primary voltage). Change of this setting also sets the measurement range of active power and reactive power automatically simultaneously.

Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .

Default setting: 6600V (3 ϕ 3W, 110V input), 110.0V (1 ϕ 3W), 3300V (1 ϕ 2W, 110V input),
220.0V (3 ϕ 3W/1 ϕ 2W, 220V input)

150V (110V)	24kV (16.5kV/110V)
300V (220V, 220V/110V)	25kV (18.4kV/110V)
500V (380V/110V)	30kV (22kV/110V)
600V (440V/110V)	45kV (33kV/110V)
600V (460V/110V)	90kV (66kV/110V)
600V (480V/110V)	120kV (77kV/110V)
1200V (880V/110V)	150kV (110kV/110V)
1500V (1100V/110V)	180kV (132kV/110V)
2400V (1650V/110V)	210kV (154kV/110V)
3000V (2200V/110V)	270kV (187kV/110V)
4500V (3300V/110V)	300kV (220kV/110V)
9000V (6600V/110V)	400kV (275kV/110V)
15kV (11kV/110V)	500kV (380kV/110V)
18kV (13.2kV/110V)	750kV (550kV/110V)
18kV (13.8kV/110V)	



◆ 212 Digit number of voltage range

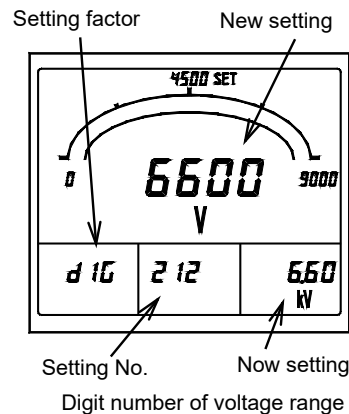
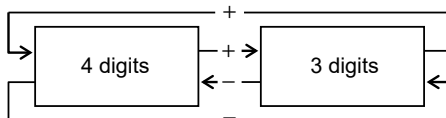
Sets the digit number of voltage range.

Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .

Default setting: 4 digits

The unit may be changed if the number of digits is changed.

Example) 6600V \leftrightarrow 6.60kV



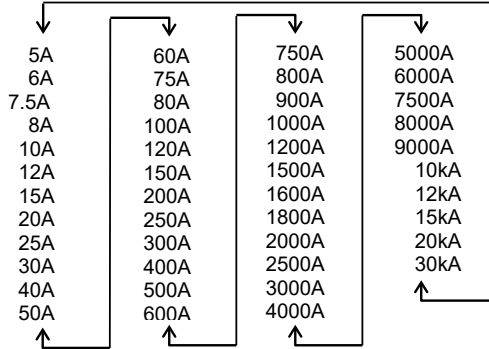
◆ 213 Current range

Sets the current range (primary current). 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), 500.0A (1φ3W), 50.00A (1φ2W)

Current-measurement range



◆ 214 Current display intrinsic sensitivity

Sets the full scale of current meter.

The setting range is 40 to 120% of CT ratio. And, it can select from the following values.

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

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

The measurement range (current, active power, reactive power) which can be set. (×10 ⁿ)	
1. <input type="checkbox"/>	1.0 / 1.2 / 1.4 / 1.5 / 1.6 / 1.8
2. <input type="checkbox"/>	2.0 / 2.4 / 2.5 / 2.8
3. <input type="checkbox"/>	3.0 / 3.2 / 3.6
4. <input type="checkbox"/>	4.0 / 4.2 / 4.5 / 4.8
5. <input type="checkbox"/>	5.0 / 5.6
6. <input type="checkbox"/>	6.0 / 6.4
7. <input type="checkbox"/>	7.2 / 7.5
8. <input type="checkbox"/>	8.0 / 8.4
9. <input type="checkbox"/>	9.0 / 9.6

Example)

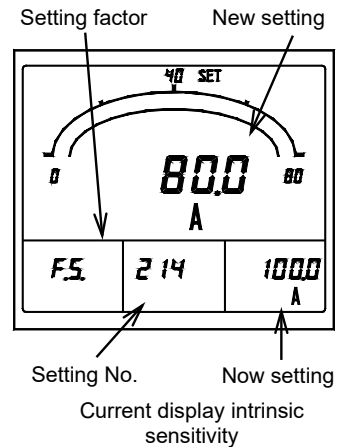
In case of CT ratio=100.0A.

·40% of 100A is 40A.

·120% of 100A is 120A.

A measurement range can be selected within the limits of 40 to 120A.

Therefore, a left table A measurement range can be selected from 40/42/45/48/50/56/60/64/72/75/80/84/90/96/100/120A.



◆ 215 Digit number of current range

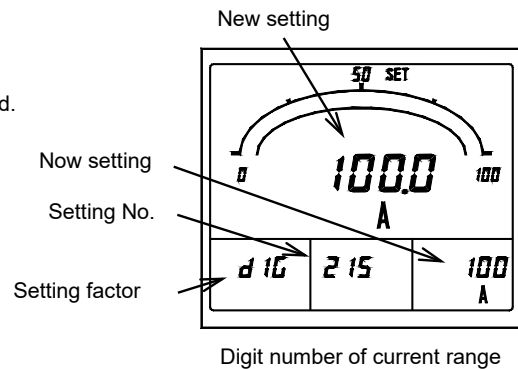
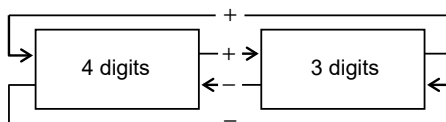
Sets the digit number of current range.

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

Default setting: 4 digits

The unit may be changed if the number of digits is changed.

Example) 1000A ↔ 1.00kA

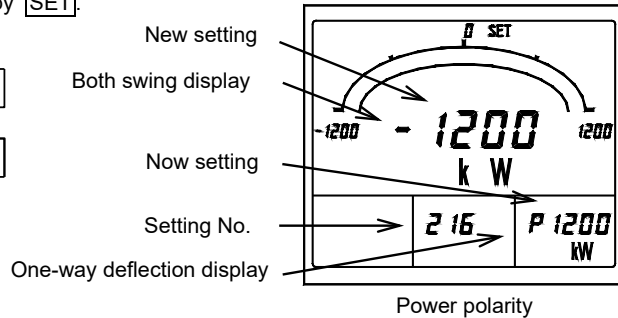
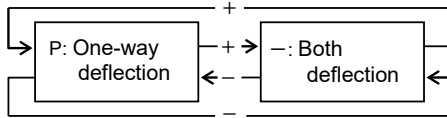


◆ 216 Active power polarity

A swing display of active power meter can be selected from P (one-way deflection) and - (both deflection).

Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .

Default setting: P (one-way deflection)



◆ 217 Active power range

Set the full scale of active power meter. The setting range is 30 to 120% of rated power.

And it can select from "214 current display intrinsic sensitivity" tables.

Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .

(1000MW or more becomes 4 digits display fixation.)

<Caution> In case of 220V direct input. Calculates by VT ratio=2.

Default setting: 3 ϕ 3W, 110V input: 1200kW, 3 ϕ 3W, 220V input: 40.00kW, 1 ϕ 3W: 100.0kW
 1 ϕ 2W, 110V input: 150.0kW, 1 ϕ 2W, 220V input: 10.00kW

◆ 218 Digit number of active power range

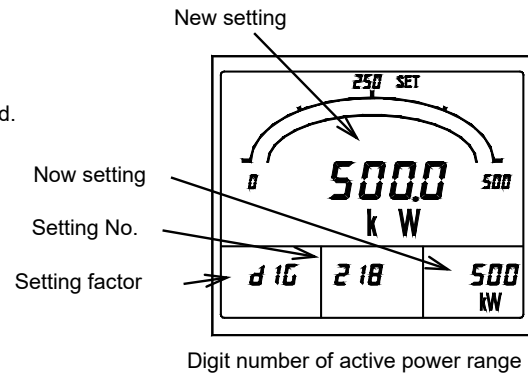
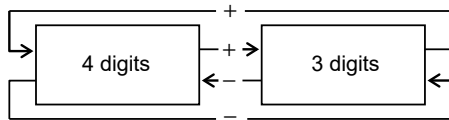
Sets the digit number of active power range.

Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .

Default setting: 4 digits

The unit may be changed if the number of digits is changed.

Example) 1200kW \leftrightarrow 1.20MW



◆ 219 Reactive power range

Sets the full scale of reactive power meter.

The setting range is 30 to 120% of rated reactive power.

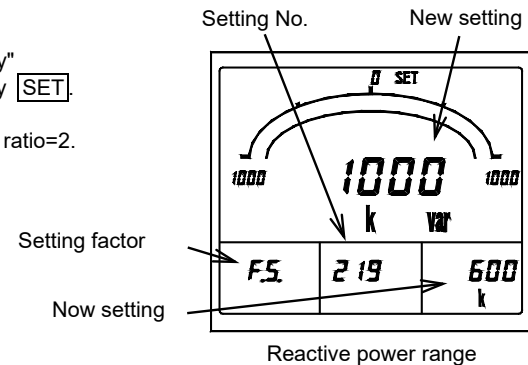
And it can select from "214 current display intrinsic sensitivity" tables.

Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .

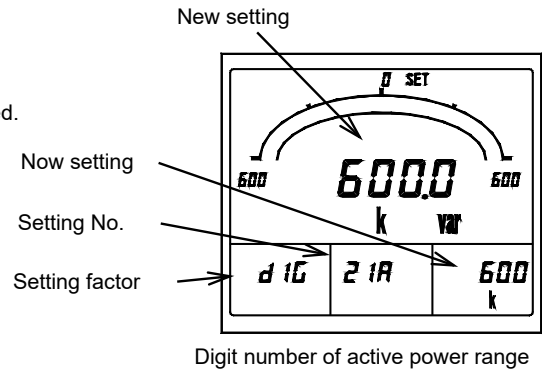
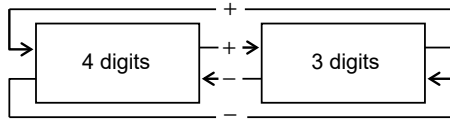
(1000Mvar or more becomes 4 digits display fixation.)

<Caution> In case of 220V direct input. Calculates by VT ratio=2.

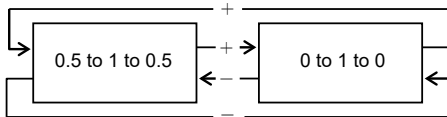
Default setting: 3 ϕ 3W, 110V input: 600.0kvar
 3 ϕ 3W, 220V input: 20.00kvar
 1 ϕ 3W: 50.00kvar
 1 ϕ 2W, 110V input: 75.00kvar
 1 ϕ 2W, 220V input: 5000var



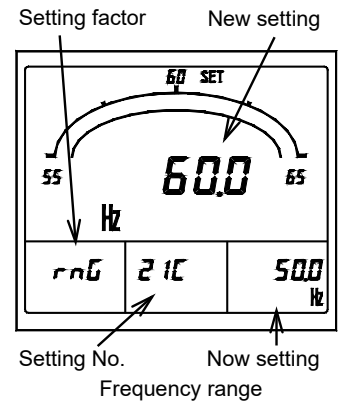
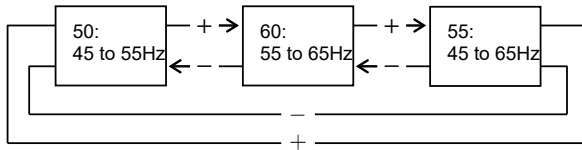
- ◆ 21A Digit number of reactive power range
Sets the digit number of reactive power range.
Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .
Default setting: 4 digits
The unit may be changed if the number of digits is changed.
Example) 1000kvar \leftrightarrow 1.00Mvar



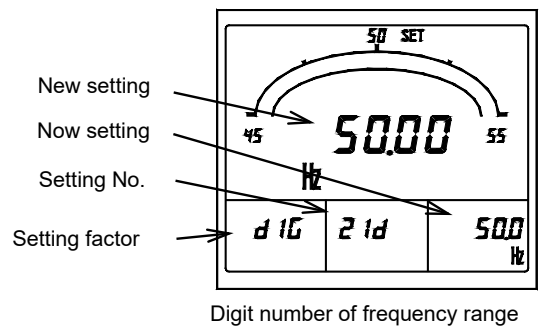
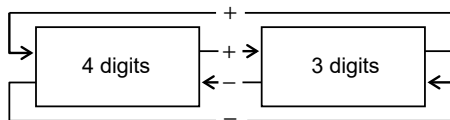
- ◆ 21B Power-factor range
A power-factor measurement range can be selected from 0.5 to 1 to 0.5 to 1 to 0.
Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .
Default setting: 0.5 to 1 to 0.5



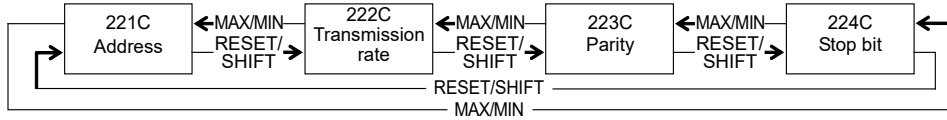
- ◆ 21C Frequency range
A frequency measurement range can be selected from 45 to 55Hz/55 to 65Hz/45 to 65Hz.
Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .
Default setting: 45 to 65Hz



- ◆ 21D Digit number of frequency range
Sets the digit number of frequency range.
Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .
Default setting: 3 digits

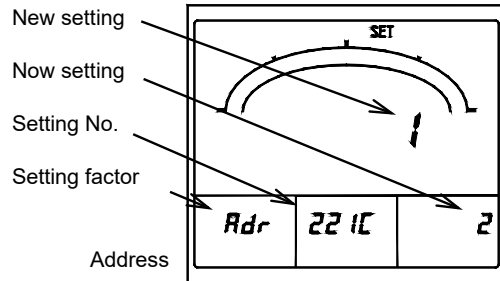


(2) 221C to 224C Communication output setting



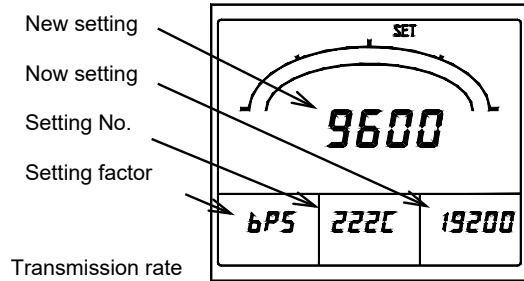
◆ 221C Address

Sets the address of device in communication output. The address can be selected from 1 to 247. Selection by **[+]** and **[-]**, set value is updated by **[SET]**.
Default setting: 1



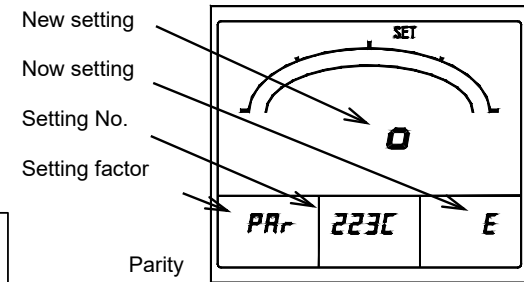
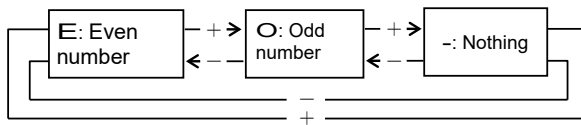
◆ 222C Transmission rate

Sets the transmission rate of communication output. The transmission rate can be selected from 4800bps, 9600bps, 19200bps, 38400bps. Selection by **[+]** and **[-]**, set value is updated by **[SET]**.
Default setting: 9600bps



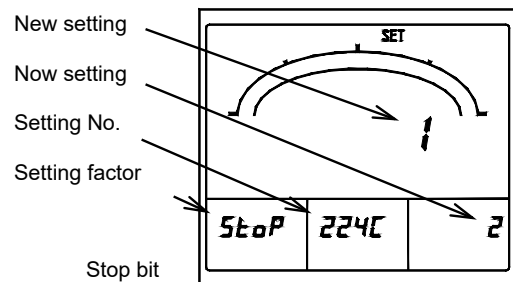
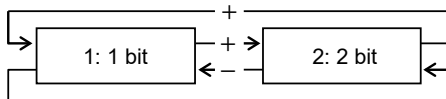
◆ 223C Parity

Sets the parity bit added to communication data. Parity can be selected from nothing (-), even number (EVEN), odd number (oDD). In case parity is set as "nothing (-)", parity is not added to communication data. Selection by **[+]** and **[-]**, set value is updated by **[SET]**. Default setting: Even number (EVEN)

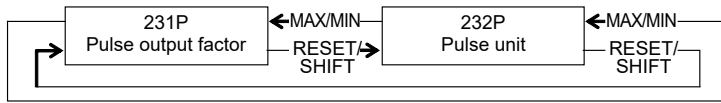


◆ 224C Stop bit

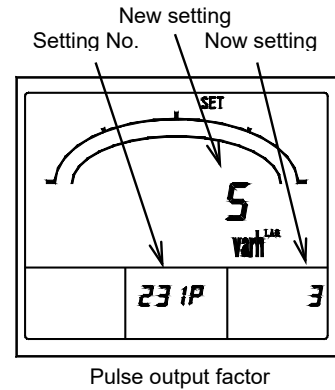
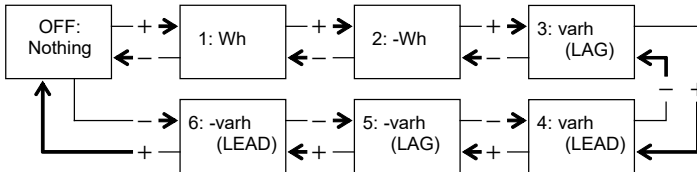
Sets the stop bit added to communication data. The stop bit can be selected from 1 bit or 2 bit. Selection by **[+]** and **[-]**, set value is updated by **[SET]**. Default setting: 1 bit



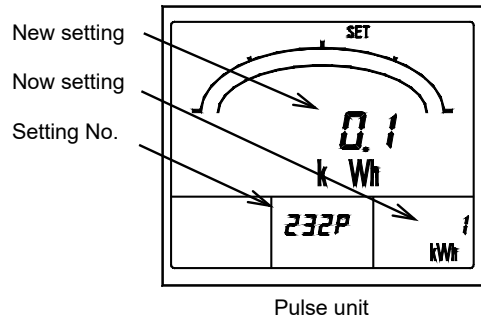
(3) 231P to 232P Pulse output setting
Various setting of a pulse output is performed.



- ◆ 231P Pulse output factor,
Sets the output factor of pulse output.
Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .
Default setting: Wh

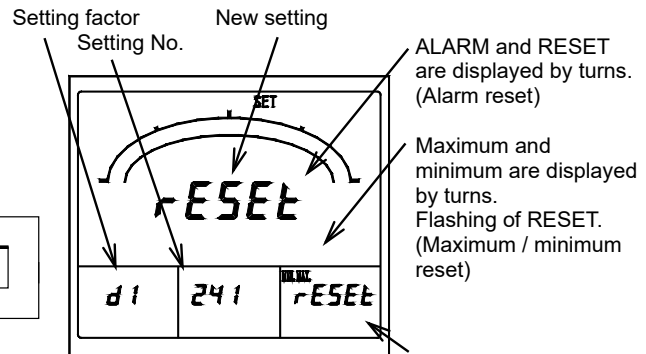
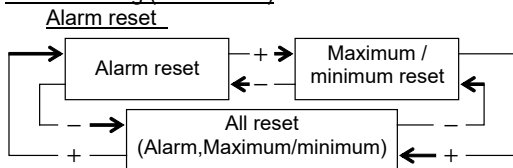


- ◆ 232P Unit of pulse output
Sets the pulse unit of pulse output.
A pulse unit can be selected from four types.
The pulse unit that can be selected is decided with full-load power.
Default setting: 10kWh/pulse [3 ϕ 3W, 110V input]
1kWh/pulse [1 ϕ 3W/1 ϕ 2W, 110V input]
0.1kWh/pulse [3 ϕ 3W/1 ϕ 2W, 220V input]



(4) 241 External operation input setting
Various setting of external operation input is performed.

- ◆ 241 External operation input function
The function of each external operation input (alarm reset, maximum / minimum reset, all reset) can be selected.
Selection by $\boxed{+}$ and $\boxed{-}$, set value is updated by \boxed{SET} .
Default setting (Alarm reset)



• About the setting display in an external operation input function

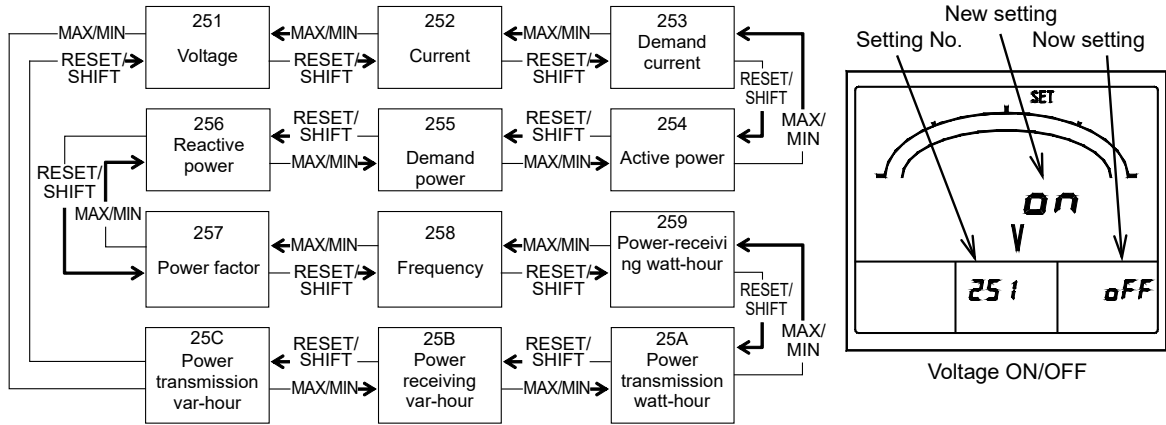
Function	The contents of a display at the function setting	"Now setting" display point	"New setting" display point
Alarm reset	"ALARM" and "RESET" are displayed by turns by 7 segment display.	Sub monitor (right)	Main monitor
Maximum / minimum reset	Flashing of RESET, by 7 segment display. And, maximum and minimum of guidance displayed by turns.		
All reset	"ALL" and "RESET" are displayed by turns by 7 segment display.		

(5) 251 to 25C Measurement ON/OFF setting

Measurement display ON/OFF setting of each measurement factor is performed.

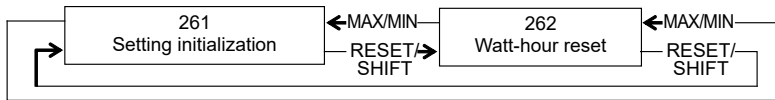
Selection by **[+]** and **[-]**, set value is updated by **[SET]**.

Default setting: ON (All measurement factors)



(6) 261 to 262 Initialization of watt-hour and setting value.

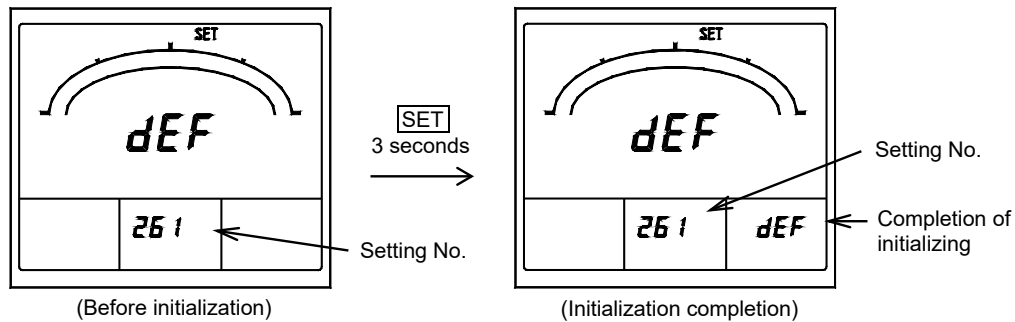
All reset of watt-hour, and initializes the each settings (it returns to a default setting).



◆ 261 Initialization of setting value

Each set value is initialized (returns to default setting).

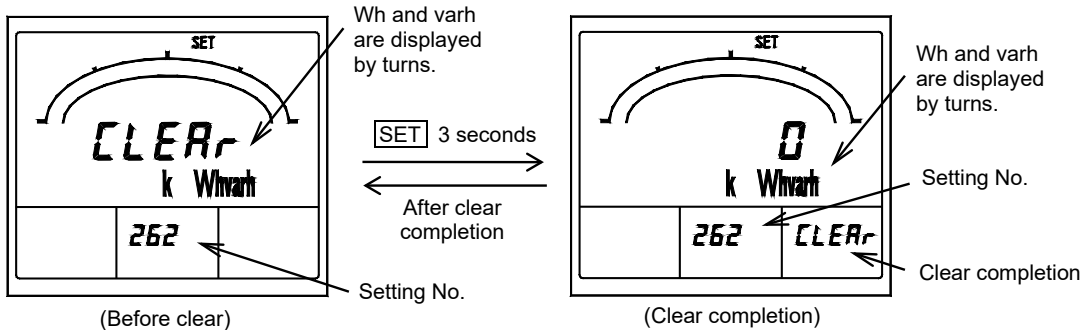
Pushing **[SET]** for 3 seconds initializes all set values.



Initialization of setting value

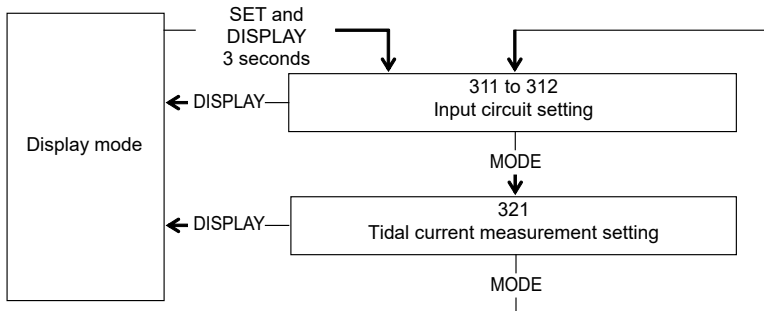
◆ 262 Watt-hour reset

Integrated value of each electric-energy display is cleared (=0). By pushing **[SET]** for 3 seconds, all integrated value (Wh, -Wh, var(LAG), -var(LAG), var(LEAD), -var(LEAD)) is all cleared.



Watt-hour reset

5.3.3 Setting mode 3



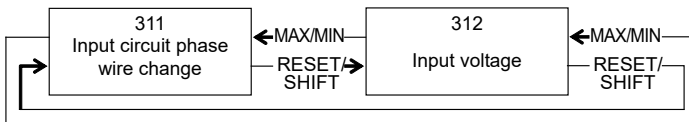
Setting mode 3 is selected by pressing **SET** and **DISPLAY** switches continuously for longer than 3 seconds. Pushing **MODE** switch performs movement of setting item. The present mode can be returned to the display mode by pressing **DISPLAY** switch.

< Caution >

If setting change should have been mistaken, a display and output of measurement are not obtained correctly. Therefore, other than the administrator must not set.

(1) 311 to 312 Input circuit setting

Sets the input circuit and phase wire and input voltage / phase-voltage full scale.



◆ 311 Input circuit phase wire change

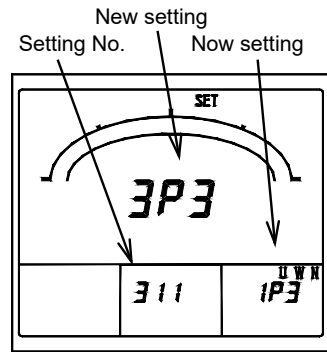
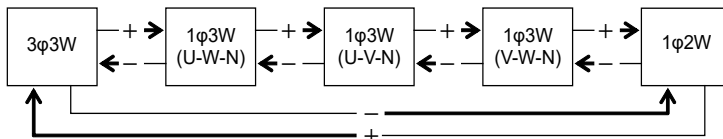
Sets the input circuit and phase wire (1φ3W).

Selection by **+** and **-**, set value is updated by pushing **SET** 3 seconds or more.

Default setting: 3φ3W (No designation)

<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).

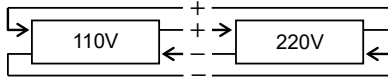
In 3φ3W/1φ2W and 1φ3W, the contents of a setting are different.

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

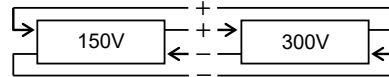
Default setting: 300V (1φ3W)

Default setting: 110V (3φ3W, 1φ2W or no designation)

• 3φ3W, 1φ2W

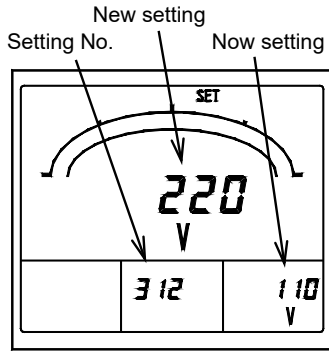


• 1φ3W

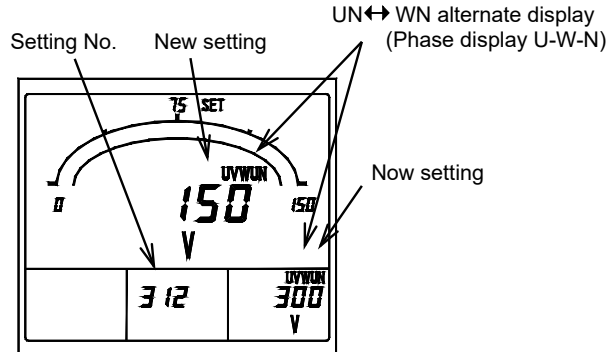


Setting of 300V, Output is AC0 to 150V/0 to 5000.

Setting of 150V, Output is AC0 to 150V/0 to 10000.



Input-voltage rating (3φ3W)



Phase-voltage full scale (1φ3W)

(2) 321 Tidal current measurement setting

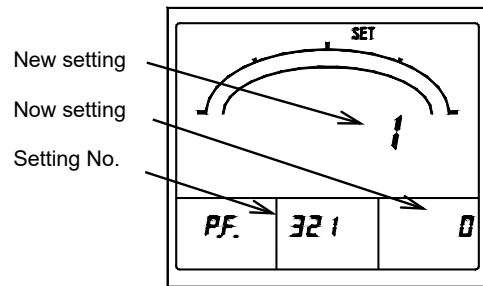
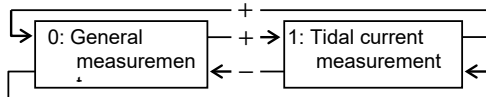
Sets the with or without of tidal current measurement.

◆ 321 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.

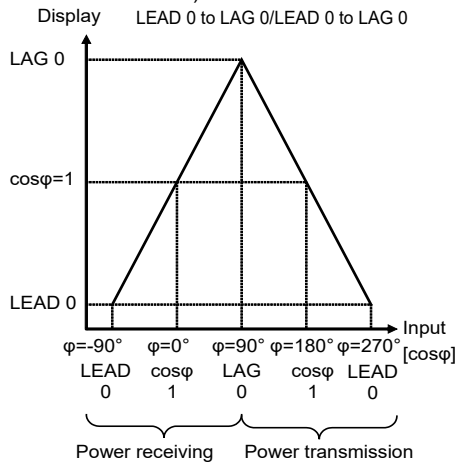
Selection by **[+]** and **[-]**, set value is updated by **[SET]**.

Default setting: 0 (General measurement)

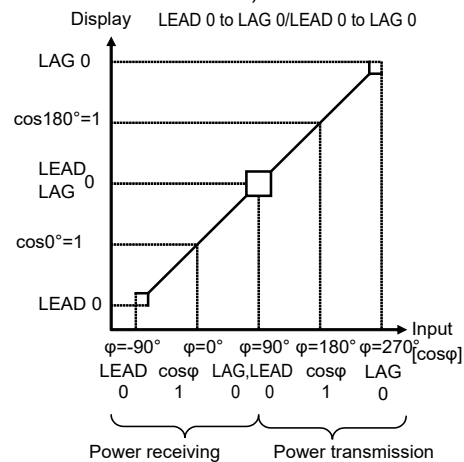


Tidal current measurement

(General measurement)



(Tidal current measurement)



6. Specification

6.1 Specification and intrinsic error

Input circuit	Input
3-phase 3-wire Single-phase 2-wire	AC110V, 220V common use. AC5A 50/60Hz
Single-phase 3-wire	AC100-200V ⁽¹⁷⁾ , AC5A 50/60Hz

Note ⁽¹⁷⁾ The rated voltage of each phase and W phase is 100V. However, the full scale of a bar graph is 300V.

Measurement item	Measurement range / Display specification	Intrinsic error ⁽¹⁸⁾		Maximum measurement	Minimum measurement	Notes
		Digital display	Communication output			
Voltage	AC150V to 750kV	±0.5%	±0.5%	✓	✓	UV-VW-WU line change ⁽¹⁹⁾
Current	Maximum demand, Demand, Instant AC5A to 30kA	±0.5%	±0.5%	✓	✓	U-V-W phase change ⁽²⁰⁾ Apart from a measurement range, range setting of a display and an output is possible.
Active power	Maximum demand, Demand, Instant 150W to 1200MW (Range select) In voltage and current range. One-way deflection or both deflection can be setting.	±0.5%	±0.5%	✓	✓	
Reactive power	LEAD, LAG 150var to 1200Mvar (Range select) In voltage and current range.	±0.5%	±0.5%	✓	✓	
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 to 55Hz or 55 to 65Hz or 45 to 65Hz 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)

Measurement item	Measurement range / Display specification	Intrinsic error ⁽¹⁸⁾		Maximum measurement	Minimum measurement	Notes
		Digital display	Pulse output			
Watt-hour	Display: Integer, 5 digit. Multiplier: Integral number time of 10. Expansion display is possible to the 3rd place below a decimal point. 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 "6.3 Input/output functions".
var-hour	Display: Integer, 5 digit. Multiplier: Integral number time of 10. Expansion display is possible to the 3rd place below a decimal point. 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 "6.3 Input/output functions".

Note ⁽¹⁸⁾ 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.

Note ⁽¹⁹⁾ Single-phase 3-wire (U-W-N): UN-WN-UW, Single-phase 3-wire (U-V-N): UN-VN-UV, Single-phase 3-wire (V-W-N) : VN-WN-VW, Single-phase 2-wire: With no phase display.

Note ⁽²⁰⁾ Single-phase 3-wire (U-W-N): U-W-N, Single-phase 3-wire (U-V-N): U-V-N, Single-phase 3-wire (V-W-N): V-W-N, Single-phase 2-wire: With no phase display.

Note ⁽²¹⁾ It can usually check the maximum value and the minimum value by MAX/MIN switch operation from a display.

Item	Specification	
Bar graph display	Bar graph display of the main-monitor factor is done. (Watt-hour and var-hour exclude) A display of a sub monitor factor can also be set.	
Operating method	Current, Voltage : Effective value computing type. Demand ammeter : Arithmetic method according with bimetallic type. Demand power meter: Arithmetic method according with bimetallic type, or average value within the demand time limit. (One side is selected by setting.) Active power, Reactive power, Watt-hour, var-hour: Time-division multiplication method. Power factor : Calculates for active power and reactive power. Frequency : Zero cross cycle 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 /
	Demand power	6 minutes / 7 minutes / 8 minutes / 9 minutes / 10 minutes / 15 minutes / 20 minutes / 25 minutes / 30 minutes (95% time limit)
The factor in which display setting is possible	Main monitor	Voltage (Each phase and line), Current (Each phase), Demand current (Each phase), Maximum demand current (Each phase), Active power, Demand power, Maximum demand power, Reactive power, Power factor, Frequency, Watt-hour (Power receiving, Power transmission), var-hour (Power receiving LAG/LEAD, Power transmission LAG/LEAD)
	Sub monitor (Left)	Voltage (Each phase and line), Current (Each phase), Active power, Reactive power, Power factor
	Sub monitor (Center)	Voltage (Each phase and line), Current (Each phase), Demand current (Each phase), Maximum demand current (Each phase), Active power, Demand power, Maximum demand power, Reactive power, var-hour (Power receiving LAG/LEAD, Power transmission LAG/LEAD)
	Sub monitor (Right)	Voltage (Each phase and line), Current (Each phase), Demand current (Each phase), Maximum demand current (Each phase), Active power, Demand power, Maximum demand power, Power factor, Frequency, Watt-hour (Power receiving, Power transmission)
Bar graph	Voltage (Each phase and line), Current (Each phase), Demand current (Each phase), Maximum demand current (Each phase), Active power, Demand power, Maximum demand power, Reactive power, Power factor, Frequency	
Input / output functions	Communication output (Modbus RTU mode). Pulse output. Alarm output. External operation change input.	

- 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 range within a 30 to 120%, assuming that the rated power (VT ratio × CT ratio)⁽²²⁾ 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 × 10ⁿ

Example) (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 ⁽²²⁾ Assume VT ratio is "2" for calculation in case of 220V input specifications.

- Measurement is possible range.

Measurement factor	Input ⁽²³⁾	Measurement is possible range	
		Display	Communication output
Voltage	AC0 to 150V [AC0 to 300V]	101% of meter full scale.	101% of output span.
Current	AC0 to 5A	120% of meter full scale. ⁽²⁴⁾	120% of output span.
Demand current		200% of meter full scale. ⁽²⁴⁾	120% of output span.
Active power		120% of meter full scale. ⁽²⁴⁾	-1% and 120% of output span.
Demand power		200% of meter full scale. ⁽²⁴⁾	-1% and 120% of output span.
Reactive power	LEAD 1 to 0 to LAG 1kvar [LEAD 2 to 0 to LAG 2kvar]	120% of meter full scale. ⁽²⁴⁾	-1% and 120% of output span.
Power factor	LEAD 0 to 1 to LAG 0	LEAD 0.000 to 1 to LAG 0.000	0% and 100% of output span.
	LEAD 0.5 to 1 to LAG 0.5	LEAD 0.490 to 1 to LAG 0.490	-1% and 101% of output span.
Frequency	45 to 55Hz	44.9 to 55.1Hz	-1% and 101% of output span.
	55 to 65Hz	54.9 to 65.1Hz	
	45 to 65Hz	44.8 to 65.2Hz	

Note ⁽²³⁾ [] is the 300V input case.

Note ⁽²⁴⁾ If the number of display digits is exceeded in spite of the measurable range, it becomes to 9999 (four-digit display) or 999 (triple digit display).

* Please reference to the Model PR720 Power and Energy Meter Modbus RTU Mode Protocol User's Manual (IM 77C01E31-10EN) for the details of communication output data.

6.2 Performance

Item	Specification		
Accuracy	Reference to measure specification and accuracy		
Accuracy of bar graph	±10% (% for span)		
Influence by temperature	Within accuracy by 23±10°C.		
Compliance standard	JIS C 1102-1: 2007, JIS C 1102-2, -3, -4, -5, -7: 1997, JIS C 1111: 2006, JIS C 1216-1: 2009, JIS C 1263-1: 2009, TIA/EIA RS-485: 1983		
Safety	JIS C 1010-1: 2005 CAT III (The category to the measurement performed with fabric equipment) Maximum circuit voltage 300V Pollution degree 2 (Usually, environment which only contamination of non-conductivity generates. However, temporary conductivity which originates in dew condensation depending on the case occurs.)		
Display updating time	About 1 second (Bar graph: 0.25 seconds)		
Display device Display composition	LCD (Number, Character, Segment color: Black)	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	Standard	For upper installation (For lower view)	Upper view angle 10°, Lower view angle 60°, Right and left view angle 60°
Backlight	LED backlight: Green or White Always-on, Auto off (after 5 minutes without operating), Always-off. Setting is possible. White backlight can select brightness from five steps of 1 to 5. ⁽²⁵⁾		
Auxiliary supply	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		
Rush current (Time constant)	Rated voltage AC110V		2.2A or less (About 2.5ms)
	Rated voltage AC220V		4.4A or less (About 2.5ms)
	Rated voltage DC110V		1.6A or less (About 2.5ms)
Input consumption VA	Voltage circuit	0.25VA or less (110V), 0.5VA or less (220V)	
	Current circuit	0.1VA or less (5A)	
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	Between electric circuits and case (Earth).		Above 50MΩ at DC500V megger
	Between input and output and auxiliary supply.		
	Between communication output and pulse output and alarm output.		
Voltage test (Commercial frequency withstand voltage) JIS C 1102-1 JIS C 1111 JIS C 1216-1 JIS C 1263-1	Between electric circuits and case (Earth).		AC2210V (50/60Hz) 5 seconds
	Between input and output and auxiliary supply.		
	Between electric circuits and case (Earth).		AC2000V (50/60Hz) 1 minute
	Between input and output and auxiliary supply.		
Impulse voltage test (Lightning impulse withstand voltage) JIS C 1111 JIS C 1216-1 JIS C 1263-1	Between electric circuits and case (Earth). (An communication output is excluded)		6kV 1.2/50μs Positive and negative polarities, for each 3 time.
	Between input and auxiliary supply. (Grounds an output.)		5kV 1.2/50μs Positive and negative polarities, for each 3 time.

Note⁽²⁵⁾ About white backlight.

The white backlight of this product is using white LED which combined the special phosphor and blue LED. In the characteristics of this LED, color tone may be different for each product.

Item	Specification
Noise-capacity JEA B-402	<p>(1) Oscillatory surge voltage If a vibration damping waveform (1 to 1.5MHz, Peak voltage: 2.5 to 3kV) is repeated and adds for 30 seconds, a measurement error should be within $\pm 10\%$. And, there needs to be no malfunction. And there are not a communication error and a communication stop. Voltage input circuit (Normal / Common), Current input circuit (Common), Auxiliary supply circuit (Normal / Common)</p> <p>(2) Square wave impulse noise If a noise (1μs, 100ns width) is repeated and adds for 5 minutes, a measurement error should be within $\pm 10\%$. And, there needs to be no malfunction. And there are not a communication error and a communication stop. Auxiliary supply circuit (Normal / Common) Over 1500V Voltage input circuit (Normal / Common) Over 1500V Current input circuit (Common) Over 1500V Pulse output (Common) Over 1000V Alarm output (Common) Over 1000V Operation input (Common) Over 1000V Communication output circuit (Induction) Over 1000V</p> <p>(3) Electric wave noise If intermittence irradiation of the electric wave of a 150, 400, 900MHz band is done by (5W, 1m), and if the intermittence irradiation of the electric wave of a cellular phone is done by 1m, a measurement error should be within $\pm 10\%$. And, there needs to be no malfunction. And there are not a communication error and a communication stop.</p> <p>(4) Electrostatic noise It is within $\pm 10\%$ of errors in 8kV electrostatic noise at the case of an energization. And there are not a communication error and a communication stop. There needs to be no 10kV damage at the case of a non-energization. Condenser charge form.</p> <p>* Communication error Even if it does a retry three consecutive times, it says the time of transmission and reception not being performed correctly.</p>
Vibration JIS C 1102-1	Sweep vibration frequency range: 10 to 55 to 10Hz, Displacement amplitude: 0.15mm, Number of sweep: 5, Sweep velocity: 1 octave /minute
Shock JIS C 1102-1	Peak acceleration: 490m/s ² , Waveform of pulse: Sine half wave, duration of pulse: 11ms Number of shock: It is each 3 times about a forward reverse to 3 shaft orientations (right-angled to mutual). (Total 18 times)
Construction	Dimension : 110mm(Width) \times 110mm(Height) \times 104mm(Depth) Body diameter : 99mm ϕ Case materials: ABS(V-0) Outward color : Black (Munsell N1.5) Mass : Approx. 600g With terminal cover, Protection code IP40
Blackout guarantee	Maximum value, Minimum value, Integrates value, Each setting value. Data hold by nonvolatile memory.
Operating temperature and humidity limits	-10 to +55°C, 30to85% RH, Non condensing.
Storage temperature limits	-25to+70°C
Installation altitude	The altitude of 2000m or less.

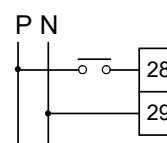
6.3 Input/output functions

Item	Specification						
Communication output	Standard	EIA RS-485					
	Protocol	Modbus protocol RTU mode				RTU: Remote Terminal Unit (Monitor operating unit) PI-MBUS-300 Rev.J Modbus Application Protocol specification V1.1b	
		Use function code	03H, 04H, 06H, 08H				
	Transmission system	Half duplex two-wire system					
	Synchronous system	asynchronous communication method					
	Transmission rate	4800bps / 9600bps / 19200bps / 38400bps					
	Line code	NRZ					
	Start bit	1 bit					
	Data length	8 bit					
	Parity bit	NONE (Nothing) / ODD (Odd number) / EVEN (Even number)					
	Stop bit	1 bit / 2 bit					
	Transmission code	Binary					
	Cable length	1000m					
	Address	1 to 247				The number of connection Max. 31 sets	
	Error detection	CRC-16				$X^{16}+X^{15}+X^2+1$	
Topology	Multidrop						
Please reference to the Model PR720 Power and Energy Meter Modbus RTU Mode Protocol User's Manual (IM 77C01E31-10EN) for the details of communication output data.							
Pulse output	Possible output : Watt-hour or var-hour. Output form : Optical MOS-FET relay. 1a contact Contact capacity: AC, DC125V, 70mA (Resistance load, inductive load) Pulse width : 250±10ms (Output pulse width 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 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						
	Full load power (kW, kvar)		Output pulse unit. kWh(kvarh)/pulse			Multiplying factor	
	Below 1	0.1	0.01	0.001	0.0001	0.01 ⁽²⁶⁾	
	Over 1	Below 10	1	0.1	0.01	0.01	
	Over 10	Below 100	10	1	0.1	0.01	
	Over 100	Below 1,000	100	10	1	0.1	
	Over 1,000	Below 10,000	1,000	100	10	1	
	Over 10,000	Below 100,000	10,000	1,000	100	10	
	Over 100,000	Below 1,000,000	100,000	10,000	1,000	100	
	Alarm output	Alarm factor: Demand current, Demand power, Voltage, Alarm OFF. Possible to setting one of them. Reset method: Automatic reset or Manual reset (Setting) Output contact : No-voltage a contact (OR of each phase detection) Contact capacity: AC250V 5A, DC125V 0.3A (Resistance load) AC250V 2A, DC125V 0.1A (Inductive load)					
Alarm factor		Item	Specification				
Demand current, Demand power		Function	Demand measurement value \geq Upper limit setting value, Alarm display, Alarm output.				
		Setting accuracy	$\pm 0.5\%$ (% for full scale)				
		Setting range	5 to 100% to the maximum scale. (1% step)				
Voltage		Function	Measurement value \geq Upper limit setting value, Alarm display, Alarm output. Measurement value \leq Lower limit setting value, Alarm display, Alarm output.				
	Setting accuracy	$\pm 0.5\%$ (% for full scale)					
	Setting range	Using a full scale as 150%. 30 to 150% (1% step)					

Note⁽²⁶⁾ 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 4 digits below decimal point.)

Item	Specification	
External operation input	Function	About three types of following functions (it changes by setting), it can carry out by applying a voltage signal from the outside.
	Alarm reset	Alarm output is reset (output OFF). Please refer to "4.3.6 Reset" about operation by the switch.
	Maximum / Minimum value reset	The maximum/minimum value is reset (it updates to the instantaneous value at the time). Please refer to "4.3.6 Reset" about operation by the switch.
	All reset	Resets all of the alarm output and maximum/minimum value. Please refer to "4.3.6 Reset" about operation by the switch.
	Minimum operation pulse width	300ms, Continuation applying is possible.
Rated input	Input rating becomes the same as that of auxiliary supply. 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)	

- Caution on the use of external display selection input
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 supply, please use the thing of about 1mA of the minimum application loads.



7. Maintenance and check

7.1 Trouble shooting

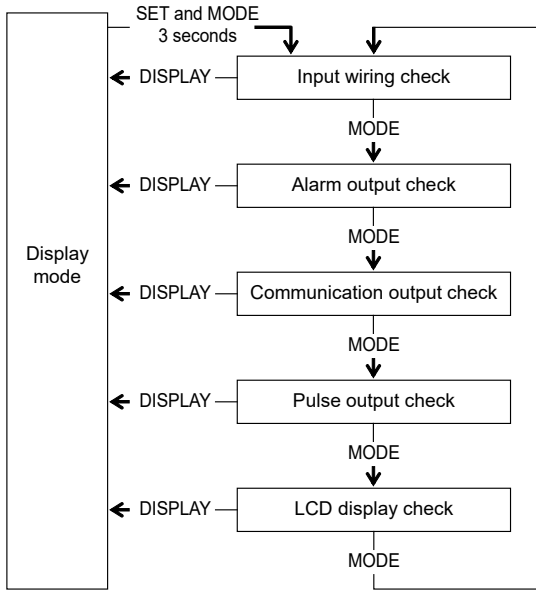
Symptoms	Possible causes	Remedial measures
Indicator does not display.	The power supply is not supplied. (Not connected. or voltage is low)	Check the auxiliary supply. Again, a power supply is supplied.
	Measurement display ON/OFF setting is set to OFF.	Check the setting.
	Trouble of device.	Replace the device.
Backlight does not lights.	It is set as auto off or always-off.	Check the setting.
Have a margin of measurement error.	Setting of a range is not right.	Please set again.
	Setting of a input voltage is not right.	Check the setting.
	Wiring is not right.	Check the wiring.
	Outside the rated frequency (45 to 65Hz).	It cannot be used.
Communication error occurs.	Cycle control, SCR phase angle control, PWM control, or other inverter output is measured.	It cannot be used.
	Communication cable is disconnection. Or communication cable isn't connected justly. (Polarity, etc.)	Check the communication cable.
Pulse output is not outputted.	Setting of communication isn't good. (Address, Transmission rate, Parity, Stop bit)	Check the setting.
Alarm output does not return.	Pulse output is set to OFF or measurement factor is set to OFF.	Check the setting.
Settings changed.	The return method is a "manual reset".	Check the setting.
	It changed an input circuit or input voltage setting.	Please set again.

7.2 Check

Be careful with the following items periodically.

- (1) Check if the measuring values, scale digits, units, etc. are displayed correctly.
- (2) Check if LCD is free of a color change, breakage of case, or other defects.
- (3) Check the unit for loose wiring and loose mounting screws.
- (4) Please remove, if dust has adhered to the product.

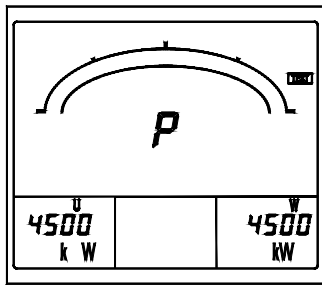
7.3 Test



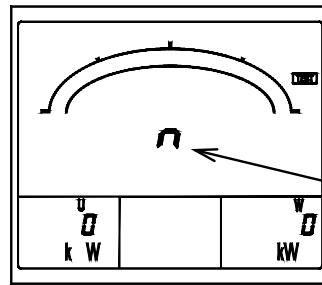
Test mode is selected by pressing **SET** and **MODE** switches continuously for longer than 3 seconds. Pushing **MODE** switch performs movement of setting item. The present mode can be returned to the display mode by pressing **DISPLAY** switch.

(1) Input wiring check

It becomes a wiring check screen and can check the connection status of a voltage input and a current input.



Positive phase sequence display.



Negative phase sequence display.

The example of a display (3φ3W)

Main monitor ⁽²⁷⁾: Positive phase sequence, "P"(Positive),
 Negative phase sequence, "n"(Negative),
 With no input, "-----"

Sub monitor (Left) ⁽²⁸⁾: Power of U phase.
 Sub monitor (Right) ⁽²⁸⁾: Power of W phase.

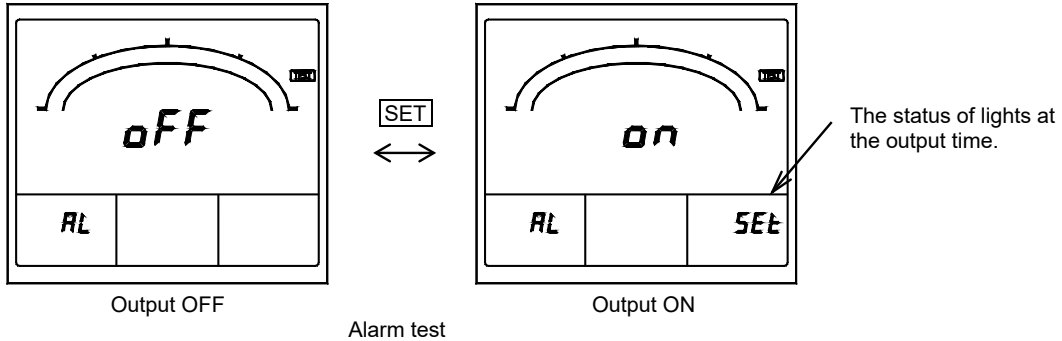
Note⁽²⁷⁾ It is set to "-----" if it is used in 1φ3W and 1φ2W circuit.

Note⁽²⁸⁾ The phases displayed by setting of an input circuit phase wire change are different at 1φ3W. There is no phase display at 1φ2W.

(2) Alarm output check

Even if this product does not have input, it can perform ON/OFF test of an alarm output (relay-contact output). Whenever it pushes **[SET]**, ON and OFF change.

Default: OFF



(3) Communication output check

It can check the measurement data of a communication output, without applying an input.

It selects 0% (measurement data 0), 50% (measurement data 5000), and 100% (measurement data 10000) with **+** or **-** switch.

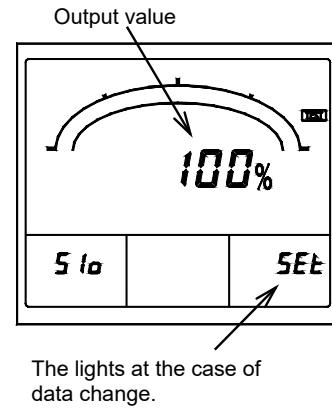
A push on **[SET]** changes the measurement data of all measurement factors (except for each electric energy factor).

If a request is performed from a high order in this condition, it will return selected measurement data.

Default: 0% (Measurement data 0)

However, in the following cases, measurement data is different from the above.

- The measurement data of frequency is based on frequency range setting.
At the case of 45 to 55Hz, 0%(4500), 50%(5000), 100%(5500)
At the case of 55 to 65Hz, 0%(5500), 50%(6000), 100%(6500)
At the case of 45 to 65Hz, 0%(4500), 50%(5500), 100%(6500)
- Phase voltage data of single phase 3 wire, if a phase voltage full scale is 300V setting, it becomes 0%(0), 50%(2500), and 100%(5000).
- The power and reactive power data at the case of single phase become 0%(0), 50%(2500), and 100%(5000).

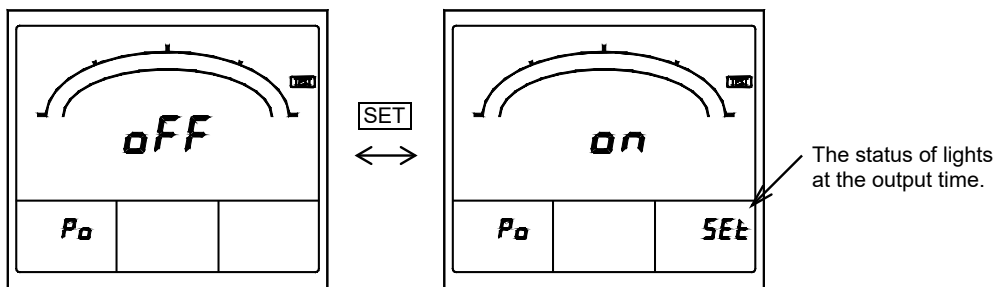


(4) Pulse output check

Even if this product does not have input, it can test pulse output.

A push on **[SET]** outputs the pulse of a rated power. Pulse unit are the settings of "232P Pulse unit".

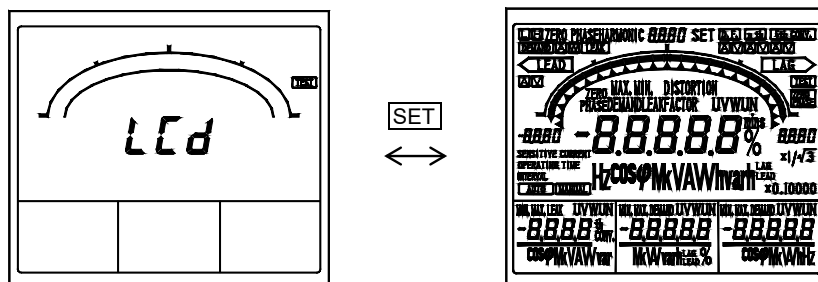
Default: OFF



(5) LCD display check

It can check a liquid crystal display. Whenever it pushes **SET**, a display changes.

Default: Main monitor "LCD" display



7.4 Maintenance

- (1) Please do not make a wiring change of the input and auxiliary supply in an energization.
- (2) In case you check an output in an energization, please warn to be unable to touch output wiring and a human body to an input and an auxiliary supply terminal. (Please do not short-circuit a voltage output.)
- (3) Please check a connection diagram, in case you check the voltage of input, output, and auxiliary supply.
- (4) If a name-plate is wiped with solvents (an alcoholic nature), a display item may disappear. Please wipe off with the dry cloth.

7.5 Storage

- (1) Please avoid storage in the next space. Low temperature, high temperature, high humidity, and sunny place.
- (2) The aluminum electrolytic capacitor is used for a product. Please do the energization of the power supply within one year after shipment.

7.6 Countermeasures against troubles

As our principle, we recall product in question and repair it. If judged as product failure, have a contact with us or sales agent for repairing work (Also have a contact with us or sales agent for specification change). Product failure which we are not responsible for (When responsibility in manufacturing process is not recognized, when product is disassembled/remodeled, in case of false operation by customer, etc.) is beyond our warranty.

Appendix table 1-1
Active power range, watt-hour multiplier rate table (Three-phase three-wire)

Multiplier factor	V range A range	750kV	500kV	400kV	300kV	270kV	210kV	180kV	150kV	120kV	90kV	45kV	30kV	Multiplier factor
		(VT550kV/110V) [W]	(VT380kV/110V) [W]	(VT275kV/110V) [W]	(VT220kV/110V) [W]	(VT187kV/110V) [W]	(VT154kV/110V) [W]	(VT132kV/110V) [W]	(VT110kV/110V) [W]	(VT77kV/110V) [W]	(VT66kV/110V) [W]	(VT33kV/110V) [W]	(VT22kV/110V) [W]	
x 100	5A	5000 k	3600 k (3455)	2500 k	2000 k	1800 k (1700)	1400 k	1200 k	1000 k	720.0 k (700.0)	600.0 k	300.0 k	200.0 k	x 10
	6A	6000 k	4200 k (4145)	3000 k	2400 k	2400 k (2040)	1800 k (1680)	1500 k (1440)	1200 k	840 k	720.0 k	360.0 k	240.0 k	
	7.5A	7500 k	5600 M (5182)	4000 k (3750)	3000 k	2800 k (2550)	2400 k (2100)	1800 k	1500 k	1200 k (1050)	900.0 k	450.0 k	300.0 k	
	8A	8000 k	5600 k (5527)	4000 k	3200 k	2800 k (2720)	2400 k (2240)	2000 k (1920)	1600 k	1200 k (1120)	960.0 k	480.0 k	320.0 k	
	10A	10.00 M	7200 k (6909)	5000 k	4000 k	3600 k (3400)	2800 k	2400 k	2000 k	1400 k	1200 k	600.0 k	400.0 k	
	12A	12.00 M	8400 k (8291)	6000 k	4800 k	4200 k (4080)	3600 k (3360)	3000 k (2880)	2400 k	1800 k (1680)	1500 k (1440)	720.0 k	480.0 k	
	15A	15.00 M	12.00 M (10.36)	7500 k	6000 k	5600 k (5100)	4200 k	3600 k	3000 k	2400 k (2100)	1800 k	900.0 k	600.0 k	
	20A	20.00 M	14.00 M (13.82)	10.00 M	8000 k	7200 k (6800)	5600 k	4800 k	4000 k	2800 k	2400 k	1200 k	800.0 k	
	25A	25.00 M	18.00 M (17.27)	14.00 M (12.50)	10.00 M	9000 k (8500)	7200 k (7000)	6000 k	5000 k	3600 k (3500)	3000 k	1500 k	1000 k	
	30A	30.00 M	24.00 M (20.73)	15.00 M (12.00)	12.00 M	12.00 M (10.20)	8400 k	7200 k	6000 k	4200 k	3600 k	1800 k	1200 k	
40A	40.00 M	28.00 M (27.64)	20.00 M	16.00 M	14.00 M (13.60)	12.00 M (11.20)	9600 k	8000 k	5600 k	4800 M	2400 k	1600 k		
50A	50.00 M	38.00 M (34.55)	25.00 M	20.00 M	18.00 M (17.00)	14.00 M	12.00 M	10.00 M	7200 k (7000)	6000 M	3000 k	2000 k		
60A	60.00 M	42.00 M (41.45)	30.00 M	24.00 M	24.00 M (20.40)	18.00 M (16.80)	15.00 M (14.40)	12.00 M	8400 k	7200 k	3600 k	2400 k		
75A	75.00 M	56.00 M (51.82)	40.00 M (37.50)	30.00 M	28.00 M (25.50)	24.00 M (21.00)	18.00 M	15.00 M	12.00 M (10.50)	9000 k	4500 k	3000 k		
80A	80.00 M	56.00 M (55.27)	40.00 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)	9600 k	4800 k	3200 k		
100A	100.0 M	72.00 M (69.09)	50.00 M	40.00 M	36.00 M (34.00)	28.00 M	24.00 M	20.00 M	14.00 M	12.00 M	6000 k	4000 k		
120A	120.0 M	84.00 M (82.91)	60.00 M	48.00 M	42.00 M (40.80)	36.00 M (33.60)	30.00 M (28.80)	24.00 M	18.00 M (16.80)	15.00 M (14.40)	7200 k	4800 k		
150A	150.0 M	120.0 M (103.6)	75.00 M	60.00 M	56.00 M (51.00)	42.00 M	36.00 M	30.00 M	24.00 M (21.00)	18.00 M	9000 k	6000 k		
200A	200.0 M	140.0 M (138.2)	100.0 M	80.00 M	72.00 M (68.00)	56.00 M	48.00 M	40.00 M	28.00 M	24.00 M	12.00 M	8000 k	x 1000	
250A	250.0 M	180.0 M (172.7)	140.0 M (125.0)	100.0 M	90.00 M (85.00)	72.00 M (70.00)	60.00 M	50.00 M	36.00 M (35.00)	30.00 M	15.00 M	10.00 M		
300A	300.0 M	240.0 M (207.3)	150.0 M	120.0 M	12.00 M (102.0)	84.00 M	72.00 M	60.00 M	42.00 M	36.00 M	18.00 M	12.00 M		
400A	400.0 M	280.0 M (276.4)	200.0 M	160.0 M	140.0 M (136.0)	120.0 M (112.0)	96.00 M	80.00 M	56.00 M	48.00 M	24.00 M	16.00 M		
500A	500.0 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	72.00 M (70.00)	60.00 M	30.00 M	20.00 M		
600A	600.0 M	420.0 M (414.5)	300.0 M	240.0 M	240.0 M (204.0)	180.0 M (168.0)	150.0 M (144.0)	120.0 M	84.00 M	72.00 M	36.00 M	24.00 M		
750A	750.0 M	560.0 M (518.2)	400.0 M (375.0)	300.0 M	280.0 M (255.0)	240.0 M (210.0)	180.0 M	150.0 M	120.0 M (105.0)	90.00 M	45.00 M	30.00 M		
800A	800.0 M	560.0 M (552.7)	400.0 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)	96.00 M	48.00 M	32.00 M		
900A	900.0 M	840.0 M (821.8)	450.0 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)	56.00 M (54.00)	36.00 M		
1000A	1000 M	720.0 M (690.9)	500.0 M	400.0 M	360.0 M (340.0)	280.0 M	240.0 M	200.0 M	140.0 M	120.0 M	60.00 M	40.00 M		
x 10000	1200A		840.0 M (829.1)	600.0 M	480.0 M	420.0 M (408.0)	360.0 M (336.0)	300.0 M (288.0)	240.0 M	180.0 M (168.0)	150.0 M (144.0)	72.00 M	48.00 M	x 10000
	1500A			750.0 M	600.0 M	560.0 M (510.0)	420.0 M	360.0 M	300.0 M	240.0 M (210.0)	180.0 M	90.00 M	60.00 M	
	1600A			800.0 M	640.0 M	560.0 M (544.0)	450.0 M (448.0)	400.0 M (384.0)	320.0 M	240.0 M (224.0)	200.0 M (192.0)	96.00 M	64.00 M	
	1800A			900.0 M	720.0 M	640.0 M (612.0)	560.0 M (504.0)	450.0 M (432.0)	360.0 M	280.0 M (252.0)	240.0 M (216.0)	120.0 M (108.0)	72.00 M	
	2000A			1000 M	800.0 M	720.0 M (680.0)	560.0 M	480.0 M	400.0 M	280.0 M	240.0 M	120.0 M	80.00 M	
	2500A				1000 M	900.0 M (850.0)	720.0 M (700.0)	600.0 M	500.0 M	360.0 M (350.0)	300.0 M	150.0 M	100.0 M	
	3000A						840.0 M	720.0 M	600.0 M	420.0 M	360.0 M	180.0 M	120.0 M	
	4000A							960.0 M	800.0 M	560.0 M	480.0 M	240.0 M	160.0 M	
	5000A								1000 M	720.0 M (700.0)	600.0 M	300.0 M	200.0 M	
	6000A									840.0 M	720.0 M	360.0 M	240.0 M	
	7500A										900.0 M	450.0 M	300.0 M	
	8000A										960.0 M	480.0 M	320.0 M	
	9000A											560.0 M (540.0)	360.0 M	
	10kA											600.0 M	400.0 M	
	12kA											720.0 M	480.0 M	
	15kA											900.0 M	600.0 M	
	20kA												800.0 M	
	30kA													

<Note 1>
Parenthesis is primary active power (reactive power) value in /1kW(1kvar).
In the blank, setting is impossible. A display of a default is 4 digits.
The unit may be changed if the number of digits is changed.
An example) 4 digits 3 digits
4800W → 4.80kW
4000kvar → 4.00Mvar
2000kW → 2.00MW

<Note 2>
In case the voltage range and the current range were set as [] of an upper table and an output pulse unit (a 4-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 (Three-phase three-wire)

Multiplier factor	V range A range	25kV	24kV	18kV	18kV	15kV	9000V	4500V	3000V	2400V	1500V	1200V	600V	Multiplier factor	
		(VT18.4kV/110V) [W]	(VT16.5kV/110V) [W]	(VT13.8kV/110V) [W]	(VT13.2kV/110V) [W]	(VT11kV/110V) [W]	(VT6600/110V) [W]	(VT3300/110V) [W]	(VT2200/110V) [W]	(VT1650/110V) [W]	(VT1100/110V) [W]	(VT880/110V) [W]	(VT480/110V) [W]		
x 10	5A	180.0 k (167.3)	150.0 k	140.0 k (125.5)	120.0 k	100.0 k	60.0 k	30.0 k	20.0 k	15.0 k	10.0 k	8000	4500 (4364)	x 0.1	
	6A	240.0 k (200.7)	180.0 k	160.0 k (150.5)	150.0 k (144.0)	120.0 k	72.0 k	36.0 k	24.0 k	18.0 k	12.0 k	9600	5600 (5236)		
	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	30.0 k	24.0 k (22.50)	15.0 k	12.0 k	7200 (6545)		
	8A	280.0 k (267.6)	240.0 k	240.0 k (200.7)	200.0 k (192.0)	160.0 k	96.0 k	48.0 k	32.0 k	24.0 k	16.0 k	14.0 k (12.80)	7200 (6982)		
	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	30.0 k	20.0 k	16.0 k	9000 (8727)		
	12A	420.0 k (401.5)	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	36.0 k	24.0 k	20.0 k (19.20)	12.00 k (10.47)		x 1
	15A	560.0 k (501.8)	450.0 k	400.0 k (376.4)	360.0 k	300.0 k	180.0 k	90.0 k	60.0 k	45.0 k	30.0 k	24.0 k	14.00 k (13.09)		
	20A	720.0 k (669.1)	600.0 k	560.0 k (501.8)	480.0 k	400.0 k	240.0 k	120.0 k	80.0 k	60.0 k	40.0 k	32.0 k	18.00 k (17.45)		
	25A	840.0 k (836.4)	750.0 k	640.0 k (627.3)	600.0 k	500.0 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	1200 k (1004)	900.0 k	800.0 k (752.7)	720.0 k	600.0 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	1200 k (1004)	960.0 k	800.0 k	480.0 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	600.0 k	300.0 k	200.0 k	150.0 k	100.0 k	80.0 k	45.00 k (43.64)			
60A	2400 k (2007)	1800 k	1600 k (1505)	1500 k (1440)	1200 k	720.0 k	360.0 k	240.0 k	180.0 k	120.0 k	96.0 k	56.00 k (52.36)			
75A	2800 k (2509)	2400 k (2250)	2000 k (1882)	1800 k	1500 k	900.0 k	450.0 k	300.0 k	240.0 k (225.0)	150.0 k	120.0 k	72.00 k (65.45)			
80A	2800 k (2676)	2400 k	2400 k (2007)	2000 k (1920)	1600 k	960.0 k	480.0 k	320.0 k	240.0 k	160.0 k	140.0 k (128.0)	72.00 k (69.82)			
100A	3600 k (3345)	3000 k	2800 k (2509)	2400 k	2000 k	1200 k	600.0 k	400.0 k	300.0 k	200.0 k	160.0 k	90.00 k (87.27)			
120A	4200 k (4015)	3600 k	3200 k (3011)	3000 k (2880)	2400 k	1500 k (1440)	720.0 k	480.0 k	360.0 k	240.0 k	200.0 k (192.0)	120.0 k (104.7)	x 10		
150A	5600 k (5018)	4500 k	4000 k (3764)	3600 k	3000 k	1800 k	900.0 k	600.0 k	450.0 k	300.0 k	240.0 k	140.0 k (130.9)			
200A	7200 k (6691)	6000 k	5600 k (5018)	4800 k	4000 k	2400 k	1200 k	800.0 k	600.0 k	400.0 k	320.0 k	180.0 k (174.5)			
250A	8400 k (8364)	7500 k	6400 k (6273)	6000 k	5000 k	3000 k	1500 k	1000 k	750.0 k	500.0 k	400.0 k	240.0 k (218.2)			
300A	12.00 M (10.04)	9000 k	8000 k (7527)	7200 k	6000 k	3600 k	1800 k	1200 k	900.0 k	600.0 k	480.0 k	280.0 k (261.8)			
400A	14.00 M (13.38)	12.00 M	12.00 M (10.04)	9600 k	8000 k	4800 k	2400 k	1600 k	1200 k	800.0 k	640.0 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	6000 k	3000 k	2000 k	1500 k	1000 k	800.0 k	450.0 k (436.4)			
600A	24.00 M (20.07)	18.00 M	16.00 M (15.05)	15.00 M (14.40)	12.00 M	7200 k	3600 k	2400 k	1800 k	1200 k	960.0 k	560.0 k (523.6)			
750A	28.00 M (25.09)	24.00 M (22.50)	20.00 M (18.82)	18.00 M	15.00 M	9000 k	4500 k	3000 k	2400 k (2250)	1500 k	1200 k	720.0 k (654.5)			
800A	28.00 M (26.76)	24.00 M	24.00 M (20.07)	20.00 M (19.20)	16.00 M	9600 k	4800 k	3200 k	2400 k	1600 k	1400 k (1280)	720.0 k (698.2)			
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)	5600 k (5400)	3600 k	2800 k (2700)	1800 k	1500 k (1440)	800.0 k (785.5)			
1000A	36.00 M (33.45)	30.00 M	28.00 M (25.09)	24.00 M	20.00 M	12.00 M	6000 k	4000 k	3000 k	2000 k	1600 k	900.0 k (872.7)			
1200A	42.00 M (40.15)	36.00 M	32.00 M (30.11)	30.00 M (28.80)	24.00 M	15.00 M (14.40)	7200 k	4800 k	3600 k	2400 k	2000 k (1920)	1200 k (1047)	x 10		
1500A	56.00 M (50.18)	45.00 M	40.00 M (37.64)	36.00 M	30.00 M	18.00 M	9000 k	6000 k	4500 k	3000 k	2400 k	1400 k (1309)			
1600A	56.00 M (53.53)	48.00 M	42.00 M (40.15)	40.00 M (38.40)	32.00 M	20.00 M (19.20)	9600 k	6400 k	4800 k	3200 k	2800 k (2560)	1400 k (1396)			
1800A	64.00 M (60.22)	56.00 M (54.00)	48.00 M (45.16)	45.00 M (43.20)	36.00 M	24.00 M (21.60)	12.00 M (10.80)	7200 k	5600 k (5400)	3600 k	3000 k (2880)	1600 k (1571)			
2000A	72.00 M (66.91)	60.00 M	56.00 M (50.18)	48.00 M	40.00 M	24.00 M	12.00 M	8000 k	6000 k	4000 k	3200 k	1800 k (1745)			
2500A	84.00 M (83.64)	75.00 M	64.00 M (62.73)	60.00 M	50.00 M	30.00 M	15.00 M	10.00 M	7500 k	5000 k	4000 k	2400 k (2182)			
3000A	120.0 M (100.4)	90.00 M	80.00 M (75.27)	72.00 M	60.00 M	36.00 M	18.00 M	12.00 M	9000 k	6000 k	4800 k	2800 k (2618)			
4000A	140.0 M (133.8)	120.0 M	120.0 M (100.4)	96.00 M	80.00 M	48.00 M	24.00 M	16.00 M	12.00 M	8000 k	6400 k	3600 k (3491)			
5000A	180.0 M (167.3)	150.0 M	140.0 M (125.5)	120.0 M	100.0 M	60.00 M	30.00 M	20.00 M	15.00 M	10.00 M	8000 k	4500 k (4364)			
6000A	240.0 M (200.7)	180.0 M	160.0 M (150.5)	150.0 M (144.0)	120.0 M	72.00 M	36.00 M	24.00 M	18.00 M	12.00 M	9600 k	5600 k (5236)			
7500A	280.0 M (250.9)	240.0 M (225.0)	200.0 M (188.2)	180.0 M	150.0 M	90.00 M	45.00 M	30.00 M	24.00 M (22.50)	15.00 M	12.00 M	7200 k (6545)			
8000A	280.0 M (267.6)	240.0 M	240.0 M (200.7)	200.0 M (192.0)	160.0 M	96.00 M	48.00 M	32.00 M	24.00 M	16.00 M	14.00 M (12.80)	7200 k (6982)			
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)	56.00 M (54.00)	36.00 M	28.00 M (27.00)	18.00 M	15.00 M (14.40)	8000 k (7855)			
10kA	360.0 M (334.5)	300.0 M	280.0 M (250.9)	240.0 M	200.0 M	120.0 M	60.00 M	40.00 M	30.00 M	20.00 M	16.00 M	9000 k (8727)			
12kA	420.0 M (401.5)	360.0 M	320.0 M (301.1)	300.0 M (288.0)	240.0 M	150.0 M (144.0)	72.00 M	48.00 M	36.00 M	24.00 M	20.00 M (19.20)	12.00 M (10.47)	x 100		
15kA	560.0 M (501.8)	450.0 M	400.0 M (376.4)	360.0 M	300.0 M	180.0 M	90.00 M	60.00 M	45.00 M	30.00 M	24.00 M	14.00 M (13.09)			
20kA	720.0 M (669.1)	600.0 M	560.0 M (501.8)	480.0 M	400.0 M	240.0 M	120.0 M	80.00 M	60.00 M	40.00 M	32.00 M	18.00 M (17.45)			
30kA	900.0 M	750.0 M	800.0 M (752.7)	720.0 M	600.0 M	360.0 M	180.0 M	120.0 M	90.00 M	60.00 M	48.00 M	28.00 M (26.18)			

<Note 1>
Parenthesis is primary active power (reactive power) value in /1kW(1kvar).
In the blank, setting is impossible. A display of a default is 4 digits.
The unit may be changed if the number of digits is changed.
An example) 4 digits 3 digits
4800W → 4.80kW
4000kvar → 4.00Mvar
2000kW → 2.00MW

<Note 2>
In case the voltage range and the current range were set as [] of an upper table and an output pulse unit (a 4-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 (Three-phase three-wire)

Multipl ying factor	V range A range	600V	600V	500V	300V	150V	Multipl ying factor
		(VT460/110V) [W]	(VT440/110V) [W]	(VT380/110V) [W]	(VT220/110V) [W]	(110V) [W]	
× 0.01	5A	4200 (4182)	4000	3600 (3455)	2000	1000	× 0.01
	6A	5600 (5018)	4800	4200 (4145)	2400	1200	
	7.5A	6400 (6273)	6000	5600 (5182)	3000	1500	
	8A	7200 (6691)	6400	5600 (5527)	3200	1600	
	10A	8400 (8364)	8000	7200 (6909)	4000	2000	
	12A	12.00 k (10.04)	9600	8400 (8291)	4800	2400	
× 0.1	15A	14.00 k (12.55)	12.00 k	12.00 k (10.36)	6000	3000	× 0.1
	20A	18.00 k (16.73)	16.00 k	14.00 k (13.82)	8000	4000	
	25A	24.00 k (20.91)	20.00 k	18.00 k (17.27)	10.00 k	5000	
	30A	28.00 k (25.09)	24.00 k	24.00 k (20.73)	12.00 k	6000	
	40A	36.00 k (33.45)	32.00 k	28.00 k (27.64)	16.00 k	8000	
	50A	42.00 k (41.82)	40.00 k	36.00 k (34.55)	20.00 k	10.00 k	
	60A	56.00 k (59.18)	48.00 k	42.00 k (41.45)	24.00 k	12.00 k	
	75A	64.00 k (62.73)	60.00 k	56.00 k (51.82)	30.00 k	15.00 k	
	80A	72.00 k (66.91)	64.00 k	56.00 k (55.27)	32.00 k	16.00 k	
	100A	84.00 k (83.64)	80.00 k	72.00 k (69.09)	40.00 k	20.00 k	
× 1	120A	120.0 k (100.4)	96.00 k	84.00 k (82.91)	48.00 k	24.00 k	× 1
	150A	140.0 k (125.5)	120.0 k	120.0 k (103.6)	60.00 k	30.00 k	
	200A	180.0 k (167.3)	160.0 k	140.0 k (138.2)	80.00 k	40.00 k	
	250A	240.0 k (209.1)	200.0 k	180.0 k (172.7)	100.0 k	50.00 k	
	300A	280.0 k (250.9)	240.0 k	240.0 k (207.3)	120.0 k	60.00 k	
	400A	360.0 k (334.5)	320.0 k	280.0 k (276.4)	160.0 k	80.00 k	
	500A	420.0 k (418.2)	400.0 k	360.0 k (345.5)	200.0 k	100.0 k	
	600A	560.0 k (501.8)	480.0 k	420.0 k (414.5)	240.0 k	120.0 k	
	750A	640.0 k (627.3)	600.0 k	560.0 k (518.2)	300.0 k	150.0 k	
	800A	720.0 k (669.1)	640.0 k	560.0 k (552.7)	320.0 k	160.0 k	
× 10	900A	800.0 k (752.7)	720.0 k	640.0 k (621.8)	360.0 k	180.0 k	× 10
	1000A	840.0 k (836.4)	800.0 k	720.0 k (690.9)	400.0 k	200.0 k	
	1200A	1200 k (1004)	960.0 k	840.0 k (829.1)	480.0 k	240.0 k	
	1500A	1400 k (1255)	1200 k	1200 k (1036)	600.0 k	300.0 k	
	1600A	1400 k (1338)	1400 k (1280)	1200 k (1105)	640.0 k	320.0 k	
	1800A	1600 k (1505)	1500 k (1440)	1400 k (1244)	720.0 k	360.0 k	
	2000A	1800 k (1673)	1600 k	1400 k (1382)	800.0 k	400.0 k	
	2500A	2400 k (2091)	2000 k	1800 k (1727)	1000 k	500.0 k	
	3000A	2800 k (2509)	2400 k	2400 k (2073)	1200 k	600.0 k	
	4000A	3600 k (3345)	3200 k	2800 k (2764)	1600 k	800.0 k	
× 100	5000A	4200 k (4182)	4000 k	3600 k (3455)	2000 k	1000 k	× 100
	6000A	5600 k (5018)	4800 k	4200 k (4145)	2400 k	1200 k	
	7500A	6400 k (6273)	6000 k	5600 k (5182)	3000 k	1500 k	
	8000A	7200 k (6691)	6400 k	5600 k (5527)	3200 k	1600 k	
	9000A	8000 k (7527)	7200 k	6400 k (6218)	3600 k	1800 k	
	10kA	8400 k (8364)	8000 k	7200 k (6909)	4000 k	2000 k	
	12kA	12.00 M (10.04)	9600 k	8400 k (8291)	4800 k	2400 k	
	15kA	14.00 M (12.55)	12.00 M	12.00 M (10.36)	6000 k	3000 k	
	20kA	18.00 M (16.73)	16.00 M	14.00 M (13.82)	8000 k	4000 k	
	30kA	28.00 M (25.09)	24.00 M	24.00 M (20.73)	12.00 M	6000 k	

<Note 1>
Parentesis is primary active power (reactive power) value in /1kW(1kvar).
In the blank, setting is impossible. A display of an default is 4 digits.
The unit may be changed if the number of digits is changed.
An example) 4 digits 3 digits
4800W → 4.80kW
4000kvar → 4.00Mvar
2000kW → 2.00MW

<Note 2>
In case the voltage range and the current range were set as [] of an upper table and an output pulse unit (a 4-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]	Multipl ying factor
5A	1000	
6A	1200	
7.5A	1500	
8A	1600	
10A	2000	
12A	2400	
15A	3000	
20A	4000	
25A	5000	
30A	6000	
40A	8000	
<hr/>		
50A	10.00 k	× 0.1
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	40.00 k	
250A	50.00 k	
300A	60.00 k	
400A	80.00 k	
<hr/>		
500A	100.0 k	× 1
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	400.0 k	
2500A	500.0 k	
3000A	600.0 k	
4000A	800.0 k	
<hr/>		
5000A	1000 k	× 10
6000A	1200 k	
7500A	1500 k	
8000A	1600 k	
9000A	1800 k	
10000A	2000 k	
12000A	2400 k	
15000A	3000 k	
20000A	4000 k	
30000A	6000 k	
<hr/>		
		× 100

<Note 1>
Parenthesis is primary active power (reactive power) value in /1kW(1kvar).
In the blank, setting is impossible. A display of an default is 4 digits.
The unit may be changed if the number of digits is changed.
An example) 4 digits 3 digits
4800W → 4.80kW
4000kvar → 4.00Mvar
2000kW → 2.00MW

<Note 2>
In case the voltage range and the current range were set as [] of an upper table and an output pulse unit (a 4-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 two-wire)

Multiplier factor	V range A range	750kV	500kV	400kV	300kV	270kV	210kV	180kV	150kV	120kV	90kV	45kV	30kV	Multiplier factor													
		(VT550kV/110V) [W]	(VT380kV/110V) [W]	(VT275kV/110V) [W]	(VT220kV/110V) [W]	(VT187kV/110V) [W]	(VT154kV/110V) [W]	(VT132kV/110V) [W]	(VT108kV/110V) [W]	(VT77kV/110V) [W]	(VT66kV/110V) [W]	(VT33kV/110V) [W]	(VT22kV/110V) [W]														
× 100	5A	2500 k	1800 k (1727)	1400 k (1250)	1000 k	900.0 k (850.0)	720.0 k (700.0)	600.0 k	500.0 k	360.0 k (350.0)	300.0 k	150.0 k	100.0 k	× 10													
	6A	3000 k	2400 k (2073)	1500 k	1200 k	1200 k (1020)	840.0 k	720.0 k	600.0 k	420.0 k	360.0 k	180.0 k	120.0 k		× 10												
	7.5A	4000 k (3750)	2800 k (2591)	2000 k (1875)	1500 k	1400 k (1275)	1200 k (1050)	900.0 k	750.0 k	560.0 k (525.0)	450.0 k	240.0 k (225.0)	150.0 k			× 10											
	8A	4000 k	2800 k (2764)	2000 k	1600 k	1400 k (1360)	1200 k (1120)	960.0 k	800.0 k	560.0 k	480.0 k	240.0 k	160.0 k				× 10										
	10A	5000 k	3600 k (3455)	2500 k	2000 k	1800 k (1700)	1400 k	1200 k	1000 k	720.0 k (700.0)	600.0 k	300.0 k	200.0 k					× 10									
	12A	6000 k	4200 k (4145)	3000 k	2400 k	2400 k (2040)	1800 k (1680)	1500 k (1440)	1200 k	840.0 k	720.0 k	360.0 k	240.0 k						× 10								
	15A	7500 k	5600 k (5182)	4000 k (3750)	3000 k	2800 k (2550)	2400 k (2100)	1800 k	1500 k	1200 k (1050)	900.0 k	450.0 k	300.0 k							× 10							
	20A	10.00 M	7200 k (6909)	5000 k	4000 k	3600 k (3400)	2800 k	2400 k	2000 k	1400 k	1200 k	600.0 k	400.0 k								× 10						
	25A	14.00 M (12.50) M	9000 k (8636)	6400 k	5000 k	4500 k (4250)	3600 k (3500)	3000 k	2500 k	1800 k (1750)	1500 k	750.0 k	500.0 k									× 10					
	30A	15.00 M	12.00 M (10.36)	7500 M	6000 k	5600 k (5100)	4200 k	3600 k	3000 k	2400 k (2100)	1800 k	900.0 k	600.0 k										× 10				
	40A	20.00 M	14.00 M (13.82)	10.00 M	8000 k	7200 k (6800)	5600 M	4800 k	4000 k	2800 k	2400 k	1200 k	800.0 k											× 10			
	50A	25.00 M	18.00 M (17.27)	14.00 M (12.50)	10.00 M	9000 k (8500)	7200 M	6000 k	5000 k	3600 k (3500)	3000 k	1500 k	1000 k												× 10		
	60A	30.00 M	24.00 M (20.73)	15.00 M	12.00 M	12.00 M (10.20)	8400 M	7200 k	6000 k	4200 k	3600 k	1800 k	1200 k													× 10	
	75A	40.00 M (37.50)	28.00 M (25.91)	20.00 M (18.75)	15.00 M	14.00 M (12.75)	12.00 M (10.50)	9000 k	7500 k	5600 k (5250)	4500 k	2400 k (2250)	1500 k														× 10
	80A	40.00 M	28.00 M (27.64)	20.00 M	16.00 M	14.00 M (13.60)	12.00 M (11.20)	9600 k	8000 k	5600 k	4800 k	2400 k	1600 k														
100A	50.00 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	7200 k (7000)	6000 k	3000 k	2000 k	× 10														
120A	60.00 M	42.00 M (41.45)	30.00 M	24.00 M	24.00 M (20.40)	18.00 M (16.80)	15.00 M (14.40)	12.00 M	8400 k	7200 k	3600 k	2400 k		× 10													
150A	75.00 M	56.00 M (51.82)	40.00 M (37.50)	30.00 M	28.00 M (25.50)	24.00 M (21.00)	18.00 M	15.00 M	12.00 M (10.50)	9000 M	4500 k	3000 k			× 10												
200A	100.00 M	72.00 M (69.09)	50.00 M	40.00 M	36.00 M (34.00)	28.00 M	24.00 M	20.00 M	14.00 M	12.00 M	6000 k	4000 k				× 10											
250A	140.00 M (125.0) M	90.00 M (86.36)	64.00 M (62.50)	50.00 M	45.00 M (42.50)	36.00 M (35.00)	30.00 M	25.00 M	18.00 M (17.50)	15.00 M	7500 k	5000 k					× 10										
300A	150.00 M	120.00 M (103.6)	75.00 M	60.00 M	56.00 M (51.00)	42.00 M	36.00 M	30.00 M	24.00 M (21.00)	18.00 M	9000 k	6000 k						× 10									
400A	200.00 M	140.00 M (138.2)	100.00 M	80.00 M	72.00 M (68.00)	56.00 M	48.00 M	40.00 M	28.00 M	24.00 M	12.00 M	8000 k							× 10								
500A	250.00 M	180.00 M (172.7)	140.00 M (125.0)	100.00 M	90.00 M (85.00)	72.00 M (70.00)	60.00 M	50.00 M	36.00 M (35.00)	30.00 M	15.00 M	10.00 M								× 10							
600A	300.00 M	240.00 M (207.3)	150.00 M	120.00 M	120.00 M (102.0)	84.00 M	72.00 M	60.00 M	42.00 M	36.00 M	18.00 M	12.00 M									× 10						
750A	400.00 M (375.0) M	280.00 M (259.1)	200.00 M (187.5)	150.00 M	140.00 M (127.5)	120.00 M (105.0)	90.00 M	75.00 M	56.00 M (52.50)	45.00 M	24.00 M (22.50)	15.00 M										× 10					
800A	400.00 M	280.00 M (276.4)	200.00 M	160.00 M	140.00 M (136.0)	120.00 M (112.0)	96.00 M	80.00 M	56.00 M	48.00 M	24.00 M	16.00 M											× 10				
900A	450.00 M	320.00 M (310.9)	240.00 M (225.0)	180.00 M	160.00 M (153.0)	140.00 M (126.0)	120.00 M (108.0)	90.00 M	64.00 M (63.00)	56.00 M (54.00) M	28.00 M (27.00)	18.00 M												× 10			
1000A	500.00 M	360.00 M (345.5)	250.00 M	200.00 M	180.00 M (170.0)	140.00 M	120.00 M	100.00 M	72.00 M (70.00)	60.00 M	30.00 M	20.00 M													× 10		
1200A	600.00 M	420.00 M (414.5)	300.00 M	240.00 M	240.00 M (204.0)	180.00 M (168.0)	150.00 M (144.0)	120.00 M	84.00 M	72.00 M	36.00 M	24.00 M														× 10	
1500A	750.00 M	560.00 M (518.2)	400.00 M (375.0)	300.00 M	280.00 M (255.0)	240.00 M (210.0)	180.00 M	150.00 M	120.00 M (105.0)	90.00 M	45.00 M	30.00 M															× 10
1600A	800.00 M	560.00 M (552.7)	400.00 M	320.00 M	280.00 M (272.0)	240.00 M (224.0)	200.00 M (192.0)	160.00 M	120.00 M (112.0)	96.00 M	48.00 M	32.00 M	× 10														
1800A	900.00 M	640.00 M (621.8)	450.00 M	360.00 M	320.00 M (306.0)	280.00 M (252.0)	240.00 M (216.0)	180.00 M	140.00 M (126.0)	120.00 M (108.0)	56.00 M (54.00)	36.00 M		× 10													
2000A		720.00 M (690.9)	500.00 M	400.00 M	360.00 M (340.0)	280.00 M	240.00 M	200.00 M	140.00 M	120.00 M	60.00 M	40.00 M			× 10000												
2500A		900.00 M (863.6)	640.00 M (625.0)	500.00 M	450.00 M (425.0)	360.00 M (350.0)	300.00 M	250.00 M	180.00 M (175.0)	150.00 M	75.00 M	50.00 M				× 10000											
3000A			750.00 M	600.00 M	560.00 M (510.0)	420.00 M	360.00 M	300.00 M	240.00 M (210.0)	180.00 M	90.00 M	60.00 M					× 10000										
4000A				800.00 M	720.00 M (680.0)	560.00 M	480.00 M	400.00 M	280.00 M	240.00 M	120.00 M	80.00 M						× 10000									
5000A					900.00 M (850.0)	720.00 M (700.0)	600.00 M	500.00 M	360.00 M (350.0)	300.00 M	150.00 M	100.00 M							× 10000								
6000A						840.00 M	720.00 M	600.00 M	420.00 M	360.00 M	180.00 M	120.00 M								× 10000							
7500A							900.00 M	750.00 M	560.00 M (525.0)	450.00 M	240.00 M (225.0)	150.00 M									× 10000						
8000A								800.00 M	560.00 M	480.00 M	240.00 M	160.00 M										× 10000					
9000A								900.00 M	640.00 M (630.0)	560.00 M (540.0) M	280.00 M (270.0) M	180.00 M											× 10000				
10kA									720.00 M (700.0)	600.00 M	300.00 M	200.00 M												× 10000			
12kA									840.00 M	720.00 M	360.00 M	240.00 M													× 10000		
15kA										900.00 M	450.00 M	300.00 M														× 10000	
20kA											600.00 M	400.00 M															× 10000
30kA											900.00 M	600.00 M	× 10000														

<Note 1>
Parenthesis is primary active power (reactive power) value in /500W(500var).
In the blank, setting is impossible. A display of an default is 4 digits.
The unit may be changed if the number of digits is changed.
An example) 4 digits 3 digits
4800W → 4.80kW
4000kvar → 4.00Mvar
2000kW → 2.00MW

<Note 2>
In case the voltage range and the current range were set as [] of an upper table and an output pulse unit (a 4-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 two-wire)

Multiplier factor	V range A range	25kV	24kV	18kV	18kV	15kV	9000V	4500V	3000V	2400V	1500V	1200V	600V	Multiplier factor
		(VT18.4kV/110V) [W]	(VT16.5kV/110V) [W]	(VT13.8kV/110V) [W]	(VT13.2kV/110V) [W]	(VT11kV/110V) [W]	(VT6600/110V) [W]	(VT3300/110V) [W]	(VT2200/110V) [W]	(VT1650/110V) [W]	(VT1100/110V) [W]	(VT880/110V) [W]	(VT480/110V) [W]	
x 1	5A	84.00 k (83.64)	75.00 k	64.00 k (62.73)	60.00 k	50.00 k	30.00 k	15.00 k	10.00 k	7500	5000	4000	2400 (2182)	x 0.1
	6A	120.0 k (100.4)	90.00 k	80.00 k (75.27)	72.00 k	60.00 k	36.00 k	18.00 k	12.00 k	9000	6000	4800	2800 (2618)	
	7.5A	140.0 k (125.5)	120.0 k (112.5)	96.00 k (94.09)	90.00 k	75.00 k	45.00 k	24.00 k (22.50) k	15.00 k	12.00 k (11.25)	7500	6000	3600 (3273)	
	8A	140.0 k (133.8)	120.0 k	120.0 k (100.4)	96.00 k	80.00 k	48.00 k	24.00 k	16.00 k	12.00 k	8000	6400	3600 (3491)	
	10A	180.0 k (167.3)	150.0 k	140.0 k (125.5)	120.0 k	100.0 k	60.00 k	30.00 k	20.00 k	15.00 k	10.00 k	8000	4500 (4364)	
	12A	240.0 k (200.7)	180.0 k	160.0 k (150.5)	150.0 k (144.0)	120.0 k	72.00 k	36.00 k	24.00 k	18.00 k	12.00 k	9600	5600 (5236)	
	15A	280.0 k (250.9)	240.0 k (225.0)	200.0 k (188.2)	180.0 k	150.0 k	90.00 k	45.00 k	30.00 k	24.00 k (22.50)	15.00 k	12.00 k	7200 (6545)	
	20A	360.0 k (334.5)	300.0 k	280.0 k (250.9)	240.0 k	200.0 k	120.0 k	60.00 k	40.00 k	30.00 k	20.00 k	16.00 k	9000 (8727)	
	25A	420.0 k (418.2)	400.0 k (375.0)	320.0 k (313.6)	300.0 k	250.0 k	150.0 k	75.00 k	50.00 k	40.00 k (37.50)	25.00 k	20.00 k	12.00 k (10.91)	
	30A	560.0 k (501.8)	450.0 k	400.0 k (376.4)	360.0 k	300.0 k	180.0 k	90.00 k	60.00 k	45.00 k	30.00 k	24.00 k	14.00 k (13.09)	
x 10	40A	720.0 k (669.1)	600.0 k	560.0 k (501.8)	480.0 k	400.0 k	240.0 k	120.0 k	80.00 k	60.00 k	40.00 k	32.00 k	18.00 k (17.45)	x 1
	50A	840.0 k (836.4)	750.0 k	640.0 k (627.3)	600.0 k	500.0 k	300.0 k	150.0 k	100.0 k	75.00 k	50.00 k	40.00 k	24.00 k (21.82)	
	60A	1200 k (1004)	900.0 k	800.0 k (752.7)	720.0 k	600.0 k	360.0 k	180.0 k	120.0 k	90.00 k	60.00 k	48.00 k	28.00 k (26.18)	
	75A	1400 k (1255)	1200 k (1125)	960.0 k (940.9)	900.0 k	750.0 k	450.0 k	240.0 k (225.0)	150.0 k	120.0 k (112.5)	75.00 k	60.00 k	36.00 k (32.73)	
	80A	1400 k (1338)	1200 k	1200 k (1004)	960.0 k	800.0 k	480.0 k	240.0 k	160.0 k	120.0 k	80.00 k	64.00 k	36.00 k (34.91)	
	100A	1800 k (1673)	1500 k	1400 k (1255)	1200 k	1000 k	600.0 k	300.0 k	200.0 k	150.0 k	100.0 k	80.00 k	45.00 k (43.64)	
	120A	2400 k (2007)	1800 k	1600 k (1505)	1500 k (1440)	1200 k	720.0 k	360.0 k	240.0 k	180.0 k	120.0 k	96.00 k	56.00 k (52.36)	
	150A	2800 k (2509)	2400 k (2250)	2000 k (1882)	1800 k	1500 k	900.0 k	450.0 k	300.0 k	240.0 k (225.0)	150.0 k	120.0 k	72.00 k (65.45)	
	200A	3600 k (3345)	3000 k	2800 k (2509)	2400 k	2000 k	1200 k	600.0 k	400.0 k	300.0 k	200.0 k	160.0 k	90.00 k (87.27)	
	250A	4200 k (4182)	4000 k (3750)	3200 k (3136)	3000 k	2500 k	1500 k	750.0 k	500.0 k	400.0 k (375.0)	250.0 k	200.0 k	120.0 k (109.1)	
x 100	300A	5600 k (5018)	4500 k	4000 k (3764)	3600 k	3000 k	1800 k	900.0 k	600.0 k	450.0 k	300.0 k	240.0 k	140.0 k (130.9)	x 10
	400A	7200 k (6691)	6000 k	5600 k (5018)	4800 k	4000 k	2400 k	1200 k	800.0 k	600.0 k	400.0 k	320.0 k	180.0 k (174.5)	
	500A	8400 k (8364)	7500 k	6400 k (6273)	6000 k	5000 k	3000 k	1500 k	1000 k	750.0 k	500.0 k	400.0 k	240.0 k (218.2)	
	600A	12.00 M (10.04)	9000 k	8000 k (7527)	7200 k	6000 k	3600 k	1800 k	1200 k	900.0 k	600.0 k	480.0 k	280.0 k (261.8)	
	750A	14.00 M (12.55)	12.00 M (11.25)	9600 k (9409)	9000 k	7500 k	4500 k	2400 k (2250)	1500 k	1200 k (1125)	750.0 k	600.0 k	360.0 k (327.3)	
	800A	14.00 M (13.38)	12.00 M	12.00 M (10.04)	9600 k	8000 k	4800 k	2400 k	1600 k	1200 k	800.0 k	640.0 k	360.0 k (349.1)	
	900A	18.00 M (15.05)	14.00 M (13.50)	12.00 M (11.29)	12.00 M (10.80)	9000 k	5600 k (5400)	2800 k (2700) k	1800 k	1400 k (1350)	900.0 k	720.0 k	400.0 k (392.7)	
	1000A	18.00 M (16.73)	15.00 M	14.00 M (12.55)	12.00 M	10.00 M	6000 k	3000 k	2000 k	1500 k	1000 k	800.0 k	450.0 k (436.4)	
	1200A	24.00 M (20.07)	18.00 M	16.00 M (15.05)	15.00 M (14.40)	12.00 M	7200 k	3600 k	2400 k	1800 k	1200 k	960.0 k	560.0 k (523.6)	
	1500A	28.00 M (25.09)	24.00 M (22.50)	20.00 M (18.82)	18.00 M	15.00 M	9000 k	4500 k	3000 k	2400 k (2250)	1500 k	1200 k	720.0 k (654.5)	
x 1000	1600A	28.00 M (26.76)	24.00 M	24.00 M (20.07)	20.00 M (19.20)	16.00 M	9600 k	4800 k	3200 k	2400 k	1600 k	1400 k (1280)	720.0 k (698.2)	x 10
	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)	5600 k (5400)	3600 k	2800 k (2700)	1800 k	1500 k (1440)	800.0 k (785.5)	
	2000A	36.00 M (33.45)	30.00 M	28.00 M (25.09)	24.00 M	20.00 M	12.00 M	6000 k	4000 k	3000 k	2000 k	1600 k	900.0 k (872.7)	
	2500A	42.00 M (41.82)	40.00 M (37.50)	32.00 M (31.36)	30.00 M	25.00 M	15.00 M	7500 k	5000 k	4000 k (3750)	2500 k	2000 k	1200 k (1091)	
	3000A	56.00 M (50.18)	45.00 M	40.00 M (37.64)	36.00 M	30.00 M	18.00 M	9000 k	6000 k	4500 k	3000 k	2400 k	1400 k (1309)	
	4000A	72.00 M (66.91)	60.00 M	56.00 M (50.18)	48.00 M	40.00 M	24.00 M	12.00 M	8000 k	6000 k	4000 k	3200 k	1800 k (1745)	
	5000A	84.00 M (83.64)	75.00 M	64.00 M (62.73)	60.00 M	50.00 M	30.00 M	15.00 M	10.00 M	7500 k	5000 k	4000 k	2400 k (2182)	
	6000A	120.0 M (100.4)	90.00 M	80.00 M (75.27)	72.00 M	60.00 M	36.00 M	18.00 M	12.00 M	9000 k	6000 k	4800 k	2800 k (2618)	
	7500A	140.0 M (125.5)	120.0 M (112.5)	96.00 M (94.09)	90.00 M	75.00 M	45.00 M	24.00 M (22.50)	15.00 M	12.00 M (11.25)	7500 k	6000 k	3600 k (3273)	
	8000A	140.0 M (133.8)	120.0 M	120.0 M (100.4)	96.00 M	80.00 M	48.00 M	24.00 M	16.00 M	12.00 M	8000 k	6400 k	3600 k (3491)	
x 10000	9000A	160.0 M (150.5)	140.0 M (135.0)	120.0 M (112.9)	120.0 M (108.0)	90.00 M	56.00 M (54.00)	28.00 M (27.00)	18.00 M	14.00 M (13.50)	9000 k	7200 k	4000 k (3927)	x 100
	10kA	180.0 M (167.3)	150.0 M	140.0 M (125.5)	120.0 M	100.0 M	60.00 M	30.00 M	20.00 M	15.00 M	10.00 M	8000 k	4500 k (4364)	
	12kA	240.0 M (200.7)	180.0 M	160.0 M (150.5)	150.0 M (144.0)	120.0 M	72.00 M	36.00 M	24.00 M	18.00 M	12.00 M	9600 k	5600 k (5236)	
	15kA	280.0 M (250.9)	240.0 M (225.0)	200.0 M (188.2)	180.0 M	150.0 M	90.00 M	45.00 M	30.00 M	24.00 M (22.50)	15.00 M	12.00 M	7200 k (6545)	
	20kA	360.0 M (334.5)	300.0 M	280.0 M (250.9)	240.0 M	200.0 M	120.0 M	60.00 M	40.00 M	30.00 M	20.00 M	16.00 M	9000 k (8727)	
	30kA	560.0 M (501.8)	450.0 M	400.0 M (376.4)	360.0 M	300.0 M	180.0 M	90.00 M	60.00 M	45.00 M	30.00 M	24.00 M	14.00 M (13.09)	

<Note 1>
Parenthesis is primary active power (reactive power) value in /500W(500var).
In the blank, setting is impossible. A display of a default is 4 digits.
The unit may be changed if the number of digits is changed.
An example) 4 digits 3 digits
4800W → 4.80kW
4000kvar → 4.00Mvar
2000kW → 2.00MW

<Note 2>
In case the voltage range and the current range were set as [] of an upper table and an output pulse unit (a 4-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 two-wire)

Multipl ying factor	V range A range	600V	600V	500V	300V	150V	Multipl ying factor		
		(VT460/110V) [W]	(VT440/110V) [W]	(VT380/110V) [W]	(VT220/110V) [W]	(110V) [W]			
× 0.1	5A	2400 (2091)	2000	1800 (1727)	1000	500.0	× 0.01		
	6A	2800 (2509)	2400	2400 (2073)	1200	600.0			
	7.5A	3200 (3136)	3000	2800 (2591)	1500	750.0			
	8A	3600 (3345)	3200	2800 (2764)	1600	800.0			
	10A	4200 (4182)	4000	3600 (3455)	2000	1000			
	12A	5600 (5018)	4800	4200 (4145)	2400	1200			
	15A	6400 (6273)	6000	5600 (5182)	3000	1500			
	20A	8400 (8364)	8000	7200 (6909)	4000	2000			
	× 0.1	25A	12.00 k (10.45)	10.00 k	9000 (8636)	5000		2500	× 0.1
		30A	14.00 k (12.55)	12.00 k	12.00 k (10.36)	6000		3000	
40A		18.00 k (16.73)	16.00 k	14.00 k (13.82)	8000	4000			
50A		24.00 k (20.91)	20.00 k	18.00 k (17.27)	10.00 k	5000			
60A		28.00 k (25.09)	24.00 k	24.00 k (20.73)	12.00 k	6000			
75A		32.00 k (31.36)	30.00 k	28.00 k (25.91)	15.00 k	7500			
80A		36.00 k (33.45)	32.00 k	28.00 k (27.64)	16.00 k	8000			
100A		42.00 k (41.82)	40.00 k	36.00 k (34.55)	20.00 k	10.00 k			
120A		56.00 k (50.18)	48.00 k	42.00 k (41.45)	24.00 k	12.00 k			
150A		64.00 k (62.73)	60.00 k	56.00 k (51.82)	30.00 k	15.00 k			
× 1	200A	84.00 k (83.64)	80.00 k	72.00 k (69.09)	40.00 k	20.00 k	× 1		
	250A	120.0 k (104.5)	100.0 k	90.00 k (86.36)	50.00 k	25.00 k			
	300A	140.0 k (125.5)	120.0 k	120.0 k (103.6)	60.00 k	30.00 k			
	400A	180.0 k (167.3)	160.0 k	140.0 k (138.2)	80.00 k	40.00 k			
	500A	240.0 k (209.1)	200.0 k	180.0 k (172.7)	100.0 k	50.00 k			
	600A	280.0 k (250.9)	240.0 k	240.0 k (207.3)	120.0 k	60.00 k			
	750A	320.0 k (313.6)	300.0 k	280.0 k (259.1)	150.0 k	75.00 k			
	800A	360.0 k (334.5)	320.0 k	280.0 k (276.4)	160.0 k	80.00 k			
	900A	400.0 k (376.4)	360.0 k	320.0 k (310.9)	180.0 k	90.00 k			
	1000A	420.0 k (418.2)	400.0 k	360.0 k (345.5)	200.0 k	100.0 k			
× 10	1200A	560.0 k (501.8)	480.0 k	420.0 k (414.5)	240.0 k	120.0 k	× 10		
	1500A	640.0 k (627.3)	600.0 k	560.0 k (518.2)	300.0 k	150.0 k			
	1600A	720.0 k (669.1)	640.0 k	560.0 k (552.7)	320.0 k	160.0 k			
	1800A	800.0 k (752.7)	720.0 k	640.0 k (621.8)	360.0 k	180.0 k			
	2000A	840.0 k (836.4)	800.0 k	720.0 k (690.9)	400.0 k	200.0 k			
	2500A	1200 k (1045)	1000 k	900.0 k (863.6)	500.0 k	250.0 k			
	3000A	1400 k (1255)	1200 k	1200 k (1036)	600.0 k	300.0 k			
	4000A	1800 k (1673)	1600 k	1400 k (1382)	800.0 k	400.0 k			
	5000A	2400 k (2091)	2000 k	1800 k (1727)	1000 k	500.0 k			
	6000A	2800 k (2509)	2400 k	2400 k (2073)	1200 k	600.0 k			
× 100	7500A	3200 k (3136)	3000 k	2800 k (2591)	1500 k	750.0 k	× 100		
	8000A	3600 k (3345)	3200 k	2800 k (2764)	1600 k	800.0 k			
	9000A	4000 k (3764)	3600 k	3200 k (3109)	1800 k	900.0 k			
	10kA	4200 k (4182)	4000 k	3600 k (3455)	2000 k	1000 k			
	12kA	5600 k (5018)	4800 k	4200 k (4145)	2400 k	1200 k			
	15kA	6400 k (6273)	6000 k	5600 k (5182)	3000 k	1500 k			
	20kA	8400 k (8364)	8000 k	7200 k (6909)	4000 k	2000 k			
	30kA	14.00 M (12.55)	12.00 M	12.00 M (10.36)	6000 k	3000 k			

<Note 1>
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<Note 2>
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