MITSUBISHI ELECTRIC

Small Type Display Unit for Energy Measuring Unit

MODEL

EMU4-D65

User's Manual (Details)

- Before operating the instrument, you should first read thoroughly this operation manual for safe operation and optimized performance of the product.
  Deliver this user's manual to the end user.

Safety precautions

Thank you for purchasing the Energy Measuring Unit.

- This manual describes setup and usage for Energy Measuring Unit. Before using the product, please read this manual carefully to ensure correct use. Especially, in the case of where unit is to be installed, please read “1. Precautions for Use” to ensure correct use.
- Make sure that the end users read this manual and then keep the manual in a safe place for future reference.
- Make sure to deliver this manual to the end-user.
- If you are considering using this unit for special purpose such as nuclear power plants, aerospace, medical care, or passenger vehicles please refer to our sales representative. (For details, please see at the end of this manual.)

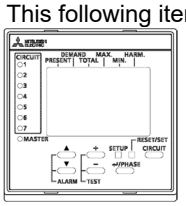
■Notations in this manual

Use the following marks in this manual.

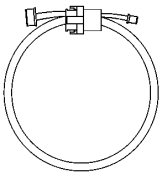
Mark	Meaning of the icons
⚠Caution	Indicates that incorrect handling may result in injury or property damage, ignoring this marking.
✓ Supplement	Indicates that precautions to avoid a malfunction and to work the unit properly.
☞	Indicates that the pages described that related matters.

■Checking package contents

This following items for this device and included in package. Check that no items are missing.



Display unit ×1



Connection cable ×1

User’s Manual (Digest)×1

Switching board installation screw x2

This unit cannot be used for deal and proof of electric energy measurement stipulated in the measurement law.
Please use the certified watt-hour meter to be used for deal and proof of electric energy measurement stipulated.

Features

- The monitoring of measured data at Mitsubishi Energy Measuring Unit is possible.
- Easily viewable by backlight and dot matrix LCD display.
- Multiple circuit monitoring is possible using only one unit.
- It is possible to switch the display language (Japanese / English) in the setting.

Table of Content

1. Precautions concerning working environment and conditions

1.1 Working environment and working conditions

This equipment, based on the assumption that it is used in the pollution degree 2 (Note 1) environment. If it is used in other degree of contamination, please do the protection on the device side to be incorporated. Measurement categories for measuring circuit for this equipment is CATⅢ (Note 1). The overvoltage category of the auxiliary power supply circuit (MA, MB) is CATⅢ (Note 1).Do not use the unit in any of the following places. Doing so may cause malfunction or reduction in service life.

- Place where the ambient temperature exceeds the working temperature range (–5°C to +55°C)
- Place where the humidity exceeds the humidity range (30% to 85%RH) or condensation occurs
- Place with much dust, corrosive gas, salt, or oily smoke
- Place where the unit may be exposed to rain or drops of water
- Place where metallic particles or inductive substances are dispersed
- Place where the daily mean temperature exceeds +35°C
- Place with much vibration or impact
- Place exposed to direct sunlight
- Place with strong electromagnetic field or much foreign noise
- Place where the altitude is over 2000m

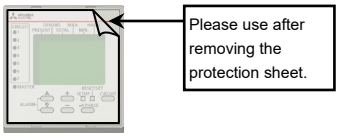
< For prevention of electric shock >

- This unit is designed to be housed within another device for prevention of electric shock. House this unit within the device such as the grounded control panel before use.
- To prevent persons with little knowledge about electric equipment from electric shock, panel must be taken either following measure.
  - ・Lock the panel so that only those who get an education about electric equipment and have sufficient knowledge can unlock, or shut off power supply automatically by opening the panel.
  - ・Cover the dangerous part of this unit. (Required protection code is higher than IP2X.)

Note 1：For the definition of the pollution degree and the over voltage category, refer to EN61010-1/2010.

1.2 Preparation before using

- An installation place should keep the working environment and working conditions.
- The protection sheet for the crack prevention is put on the display part. Before use this product, remove the protection sheet. It is not unusual, although an LCD display part may light up by generating of static electricity in case it removes. After a while, it disappears by natural electric discharge.



- Following setup is need before using EMU4-D65.
  The one always in one system is the Master set, other display unit of, please to Slave configuration. (The wrong setting and it does not work)

1.3 Installation and connection

Before installing and connecting the unit, read the instruction manual without fail.

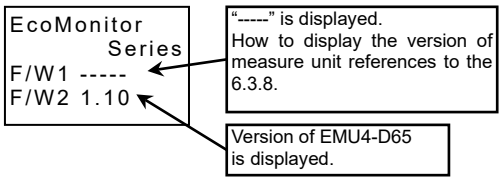
⚠Caution

- For safety, the unit shall be installed and connected by experts in electrical work.
- When threading and wiring, take utmost care that cuttings and wire pieces do not enter the unit.
- Connect the wires carefully checking the wiring diagram. Improper wiring can cause unit failure, fire, and electric shock.
- Perform wiring work in a dead state. Do not wire the unit in a live state. Doing so can cause electric shock, ground fault, unit failure and fire.

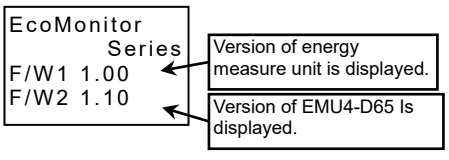
1.4 Precautions for Use

F/W version is displayed after the power turned on.

【In the case of the model to connect the EMU4-**】



【In the case of the model to connect the EMU2-** or MDU2-**】



- <u>This unit cannot be used for deal and proof of electric energy measurement stipulated in Measurement Act.</u>
- Model: EMU4-PX4 and Model: EMU4-AX4 is supported with later version 2.00. For information about how to determine the version. If you wish to upgrade, please contact us.
- In the event of a power outage during the setting, the unit is not set correctly. Please set again after power recovery.
- When using by connecting to EMU4-CNT-MB, a fixed value is displayed on the operation screen and the setting menu of EMU4-HM1-MB is displayed on the setting screen, so the operation status of the control unit and the control unit can be displayed. It cannot be set. For details on the operation, refer to "6.2 Operation Mode".

⚠ Caution

- Do not disassemble or modify this unit. It may cause failure, malfunction, injury, or fire.
- Use this unit within the ratings specified in this manual. If it is used outside the ratings, it may cause not only malfunction or failure but also fire burnout.
- Do not touch the live part. It may cause electric shock, electric burn injury or damage of the device. If any bare wire exists, stop the operation immediately, and take an appropriate action such as isolation protection.

1.5 Maintenance Precautions

- Use a soft dry cloth to clean off dirt of the unit surface. Do not let a chemical cloth remain on the surface for an extended period of time nor wipe the surface with thinner or benzene.
- Check for the following items to use this unit properly for long time.

（1） Daily maintenance

① No damage on this unit
② No abnormality with LCD indicators
③ No abnormal noise, smell, or heat

（2） Periodical maintenance (Once every 6 months to 1 year)

・No looseness with installation and wire connection.

⚠**Caution**	Do periodical maintenance under the electric outage condition. Failure to do so may cause electric shock, failure of the unit or a fire. Tighten the terminal regularly to prevent a fire.

1.6 Storage Precautions

- To store this unit, turn off the power and remove wires, and put it in a plastic bag.
- For long-time storage, avoid the following places. Failure to follow the instruction may cause a failure and reduced life of the unit.
  - Places the Ambient temperature exceeds the range -10 to +60°C.
  - Places the Relative humidity exceeds the range 30 to 85% or places with dewfall.
  - Dust, corrosive gas, saline, and oil smoke exist.
  - Places the average daily temperature exceeds +35°C.
  - Vibration and impact exceed the specifications.
  - Places exposed to rain, water drop or direct sunlight.
  - Places metal fragments or conductive substance are flying.

1.7 Disposal Precautions

When disposing of this unit, treat it as industrial waste.

1.8 About packaging materials and this manual

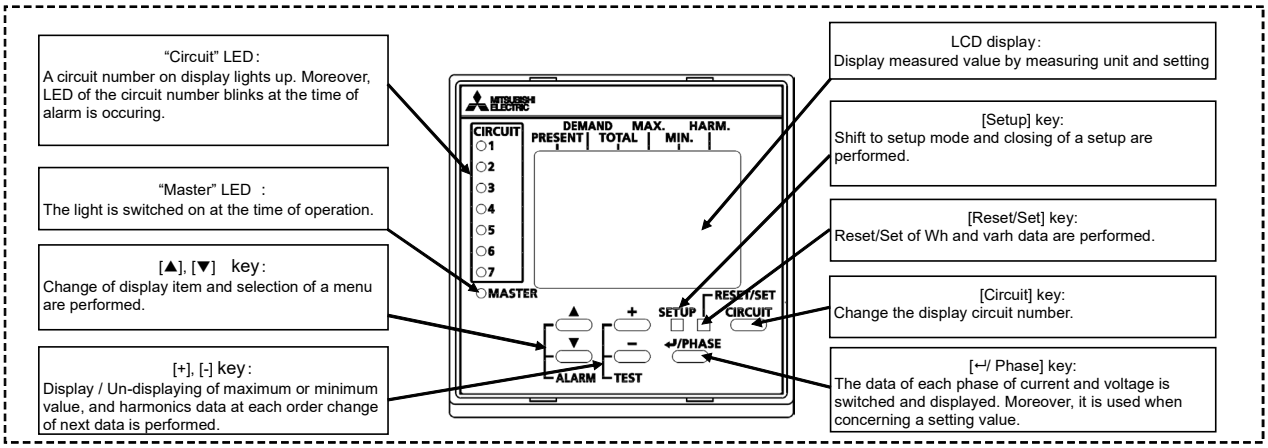
For reduction of environment load, packaging materials are produced with cardboard, and this manual is printed on recycled paper.

2. Disclaimer

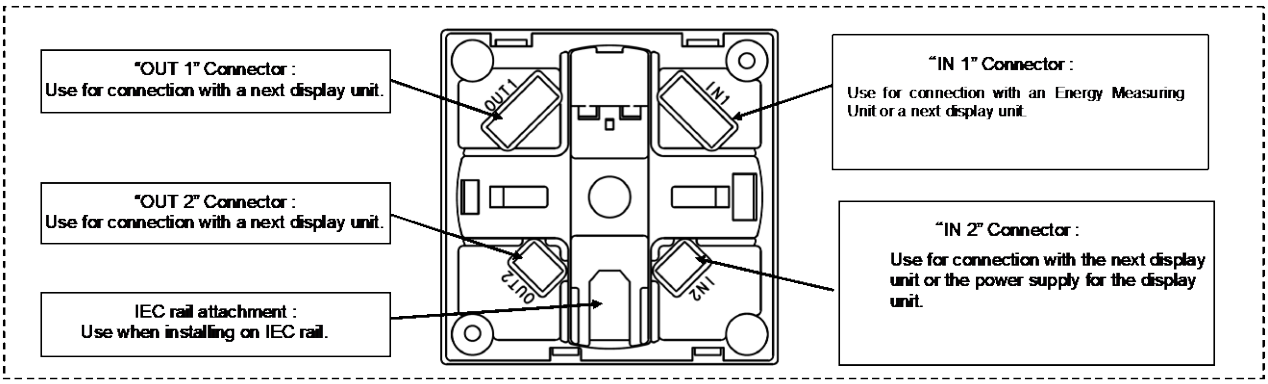
- It is prohibited to reprint or copy all contents of this document in any form without our permission.
- The contents of this document will be updated to follow revisions to software and hardware, however under unavoidable circumstances it may not be synchronized.

3. Name and function of each part

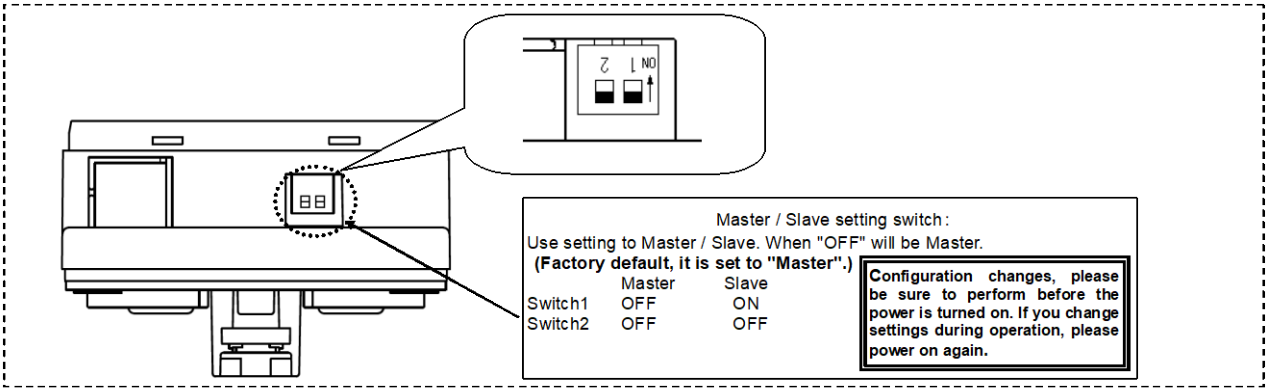
■Front



■Back



■Bottom

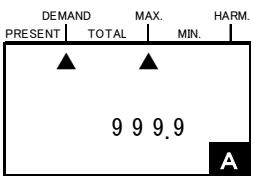


■Upper display in LCD

▲ is displayed in the upper items coincide measured value.
Each meaning is in follw

PRESENT : Present value
DEMAND : Demand value
TOTAL : Total value
MAX. : Maximum value
MIN. : Minimum value
HARM. : Harmonics

Example : Maximum demand current



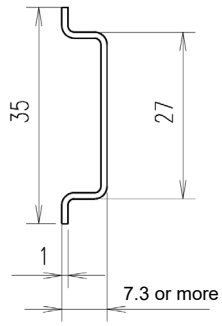
4. Installation

⚠Caution
• Before installing and connecting the unit, read the instruction manual without fail. For safety, the unit shall be installed and connected by experts in electrical work.

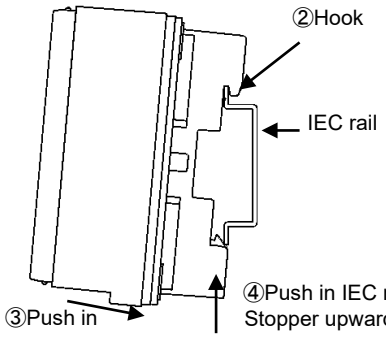
4.1 IEC rail installation

Fix the display unit to IEC rail using IEC rail attachment on the back. Changing the direction of IEC rail attachment, it can attach in both direction of vertical and horizontal.

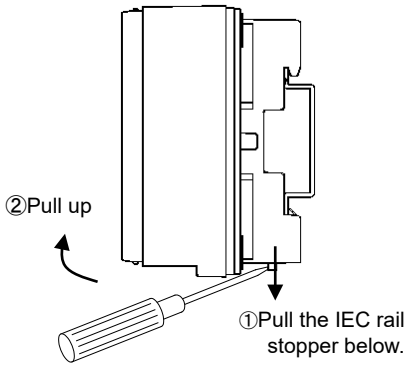
•Applicable IEC rail (35mm)



•Installation



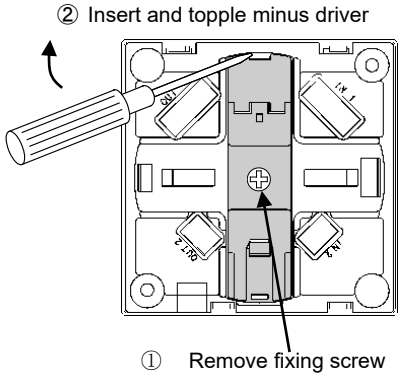
•Removal



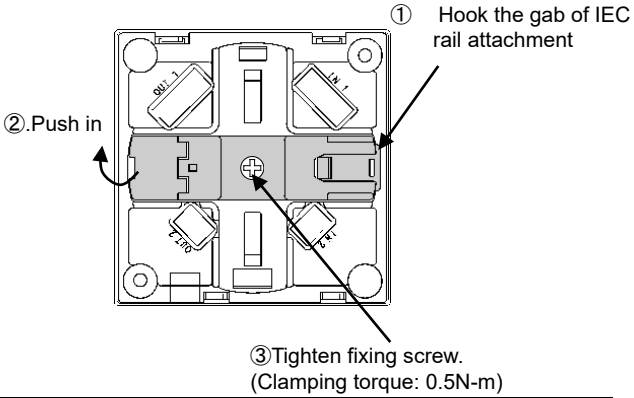
- Fit the IEC rail with M4 or M5 screws at distances of 25 to 100 mm.
- When installing the unit after once it was removed from the IEC rail, install it while pushing the IEC rail fitting upward.

●A method for changing the direction of IEC rail

•Removal of the IEC rail attachment

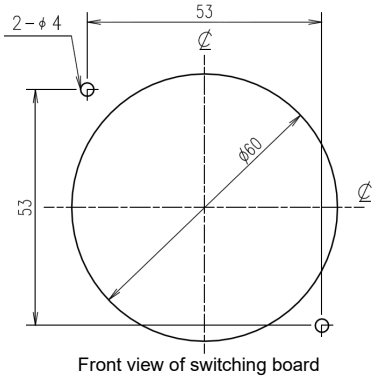


•Fitting of the IEC rail attachment



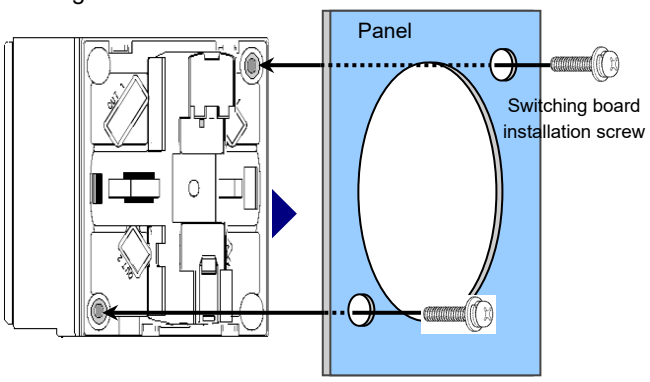
4.2 Panel mounting

●Cutout dimension



Front view of switching board

●Mounting

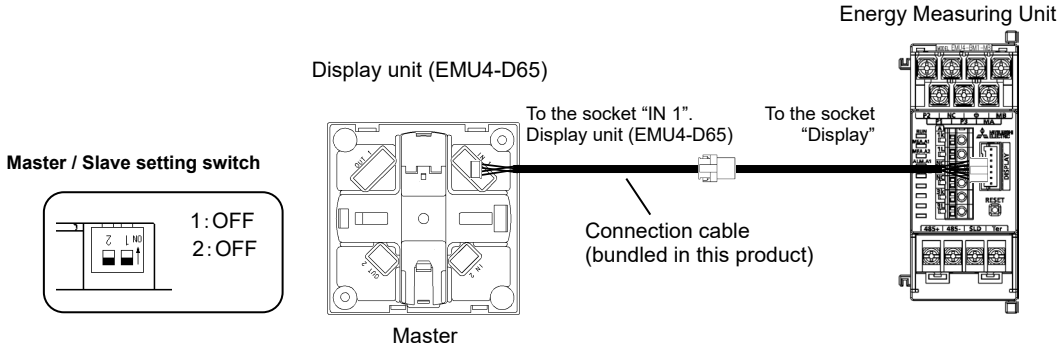


Attach the display unit from front side of panel, and tighten the screw from the backside.

(Clamping torque: 0.5N-m)

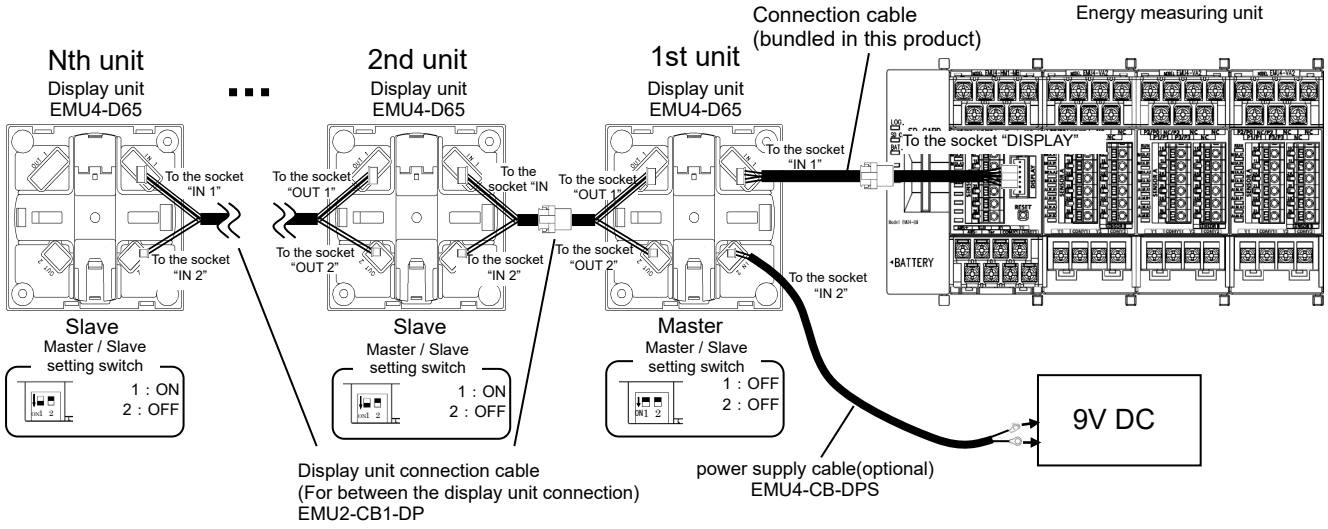
5. Connection method

5.1 1-to-1 Connection example



●The one always in one system is the Master set, other display unit of, please to Slave configuration. (**The wrong setting and it does not work**)

5.2 1-to-N(N≦7)Connection example

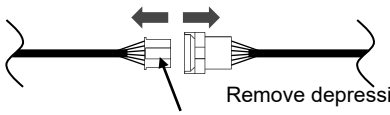


●If the connection is two or more, you must have a power supply from commercial DC power supply (Model: PBA15F-9 equivalent, made in COSEL CO., LTD.). Also, the power supply cable (optional: EMU4-CB-DPS) on its connection is required.
●Maximum connectable devices of display unit is 7.
●Please display when connect other measuring units in condition that display unit power is turned off.
●The one always in one system is the Master set, other display unit of, please to Slave configuration.
(**The wrong setting and it does not work**)

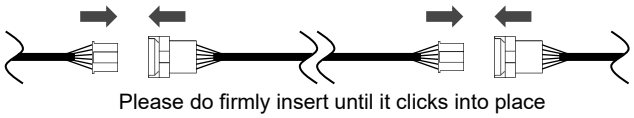
5.3 How to extend the connected cable

Connected cable in upper connected figure are extendable up to 10m.

(1) Remove the trunking connector



(2) Insert the extension cable, and connect the connector



●Please use EMU2-CB-T1M, EMU-CB-T5M, EMU2-CB-T10M as a current sensor extension cable.
●Extension cable (EMU2-CB-T * M), the sum of the length is less than 10m.

6. How to use (In the case of the model to connect the EMU4-**)

In this section, the use when connected the EMU4-** models is described. (☛7. How to use (In the case of the model to connect the EMU2-** and MDU2-**)

6.1 Display of circuits and CH

6.1.1 Two circuits measurement mode in 1P2W setting

If you set 1P2W and measure 2 circuits, you can measure 2 circuits by 1 terminal base when connect to EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2 or EMU4-VA2.

Current can be measured when current sensor connected to 1K1L and 3K3L of measure unit as shown in Fig. 6.1 and 6.2. **If rated voltage isn't same value, you can't measure the current.**

∗Please reference to the operating instructions each measuring units.

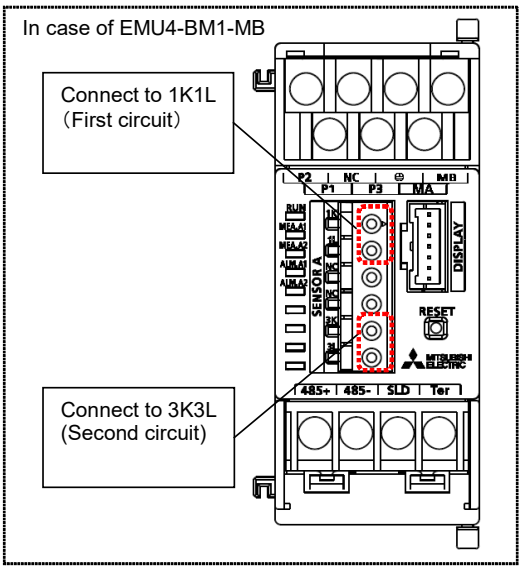


Fig. 6.1 Connecting point

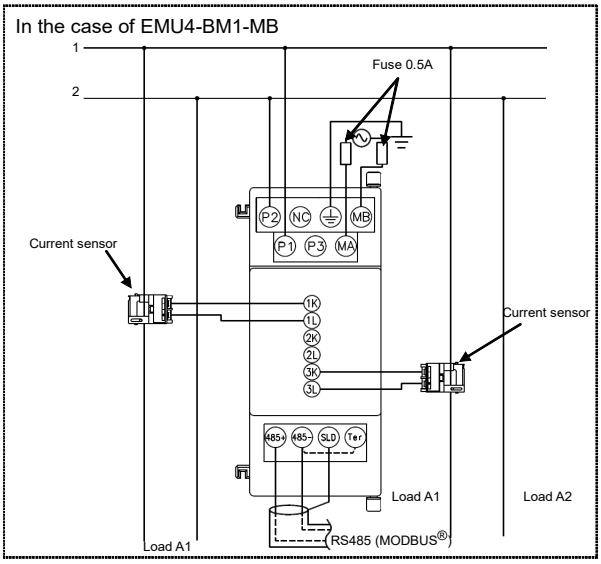


Fig.6.2 Connect example

[1] is displayed when measuring 1 side of circuits and [2] is displayed when measuring 3 side of the circuit in LCD display of this products. (In fig.6.3 and Fig. 6.4)

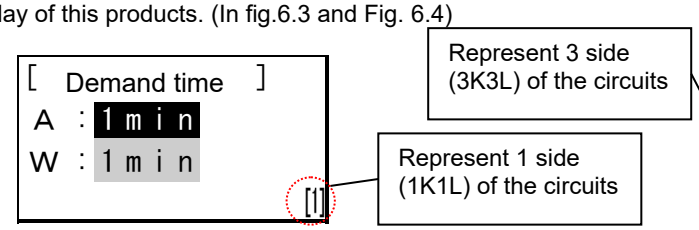


Fig.6.3 Display example
(Demand time setting display when 2 circuits measure setting)

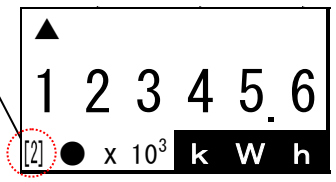


Fig.6.4 Display example
(Electric energy operating display in the setting 1P2W)

6.1.2 EMU4-PX4 or EMU4-AX4 connecting

[*] is displayed when represent the CH*. (* = 1 to 4) (In fig.6.5 and Fig. 6.6)

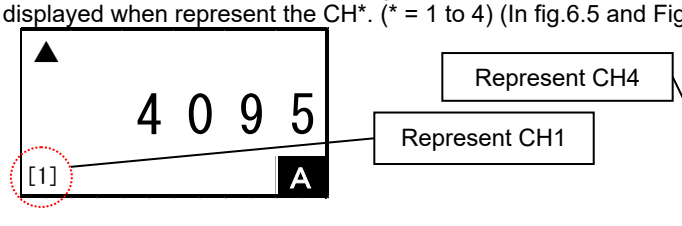


Fig.6.5 Display example
(Scaling value operating display in EMU4-AX4)

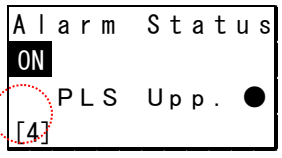
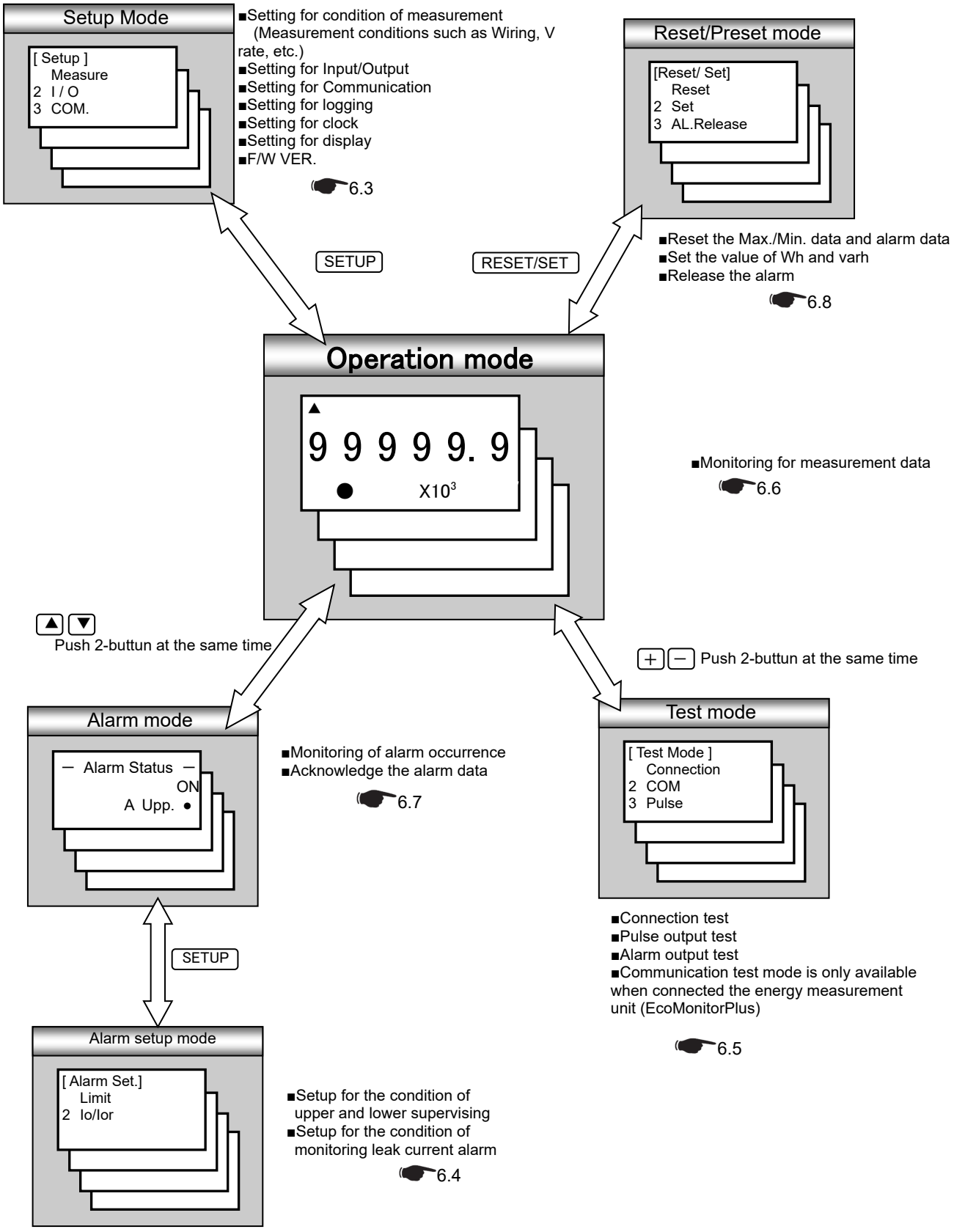


Fig.6.6 Display example
(Pulse conversion upper limit alarm value alarm state display in EMU4-PX4)

6.2 Operation mode

There are following modes of operation. This device is used to switch the operation mode depending on the application. Immediately after the power is turned on, it will be the display of the operation mode.



6.2.1 When used in combination with EMU4-CNT-MB

The behavior when connected to EMU4-CNT-MB is shown below.

Mode	Behavior	
	EMU4-CNT-MB (Circuit number =1)	Expansion unit (Circuit number=2 to 7)
Setup mode	× You cannot set. The same screen is displayed when EMU4-HM1-MB is connected.	○ You can settings and confirm settings of the expansion unit.
Alarm setup mode	× You cannot alarm set. The same screen is displayed when EMU4-HM1-MB is connected.	○ Alarm of expansion unit can be setup.
Test mode	× You cannot use Test mode. Each test mode does the following: ・Connection test The fixed value is displayed. ・Communication test The fixed value is displayed when EMU4-HM1-MB connected. ・Pulse output test, Alarm output test The fixed value is displayed when EMU4-HM1-MB connected. There is no output from the control unit itself.	○ You can use various test mode functions of the expansion unit. * It is necessary to change the control status to STOP.
Operation mode	× You cannot monitor contact output and analog output of EMU4-CNT-MB. A fixed value :999999kWh is displayed.	○ Measured value of expansion unit can be displayed.
Alarm mode	× You cannot monitor alarm status. A fixed value is displayed, Alarm status:OFF, Contact input : Non	○ Alarm status of expansion unit can be displayed.
Reset/Preset mode	× You cannot use reset/ preset funstion. The same screen is displayed when EMU4-HM1-MB is connected.	○ Integrated value of expansion unit can be reset / preset.

○ Function can be used

× Function can not be used

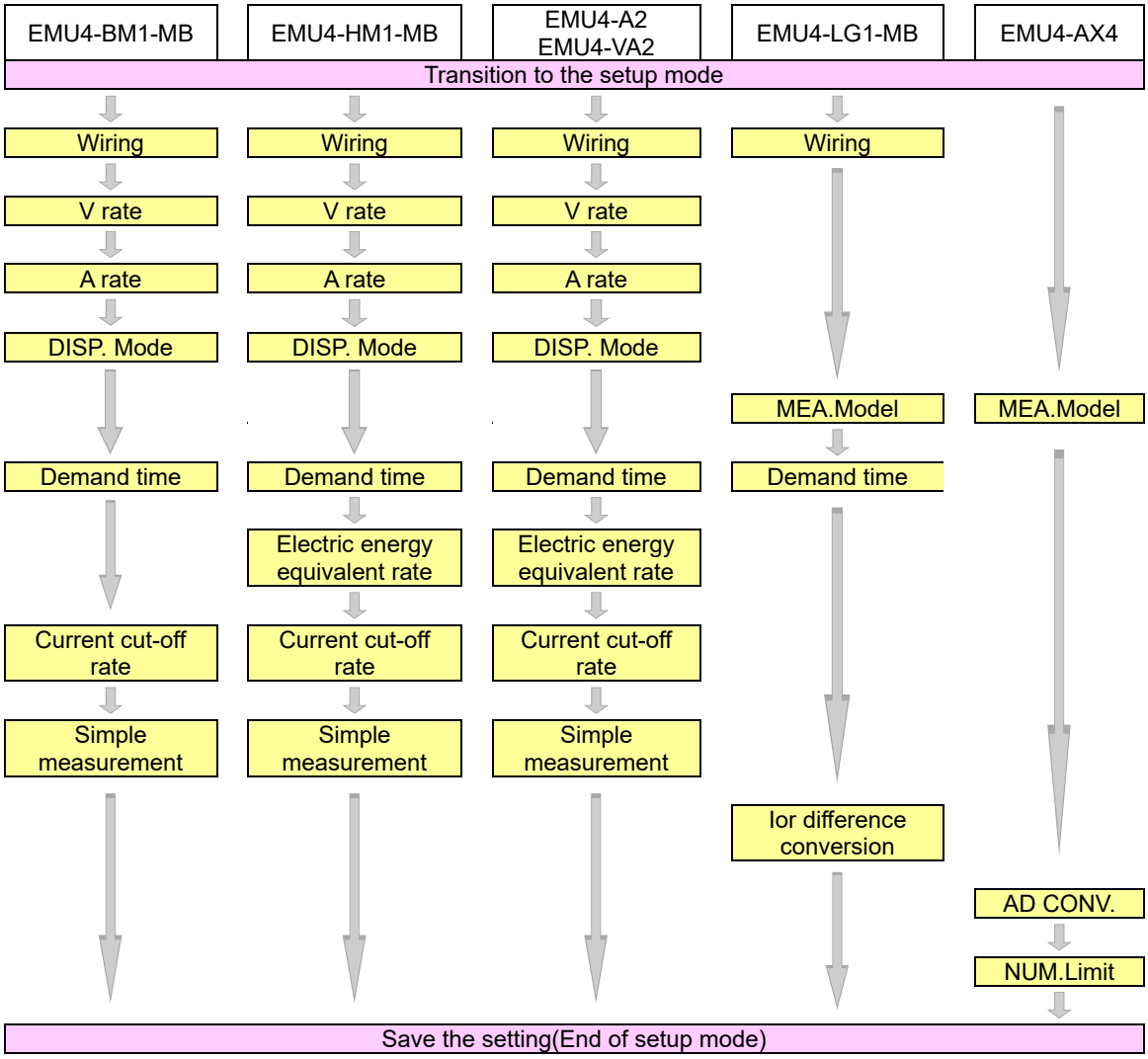
6.3 Setup mode

6.3.1 Flow of the setup

Setup “(1)Measure”, “(2)Input/Output”, “(3)Communication”,“(4)Logging”,“(5)Clock”,“(6)Display” when connected with EMU4-**, setup in setup mode.
You can confirm the F/W version of connected measure unit in “(7)F/W version”.

(1) Measure

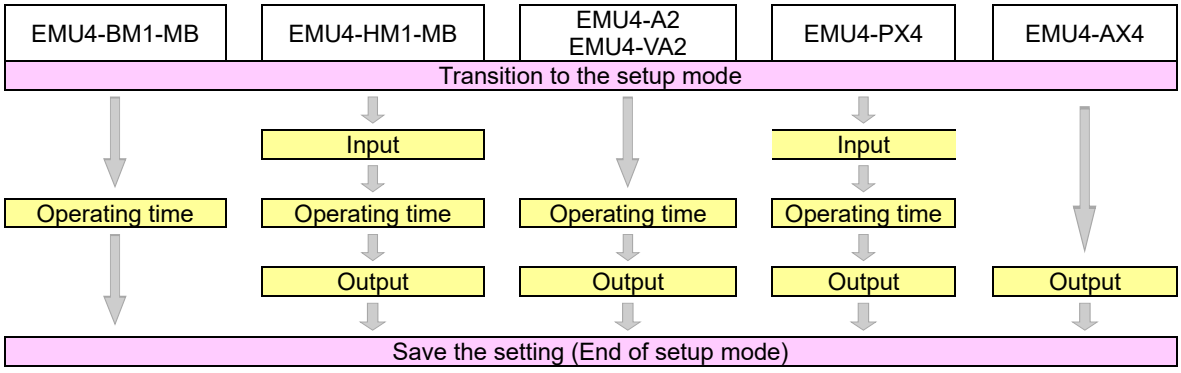
Setting the measurement conditions connected energy measuring unit. ☛6.3.2 Measure setting



(2) Input/Output setup

Set for the external Input/Output. Only EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2, EMU4-PX4, EMU4-AX4 is set.

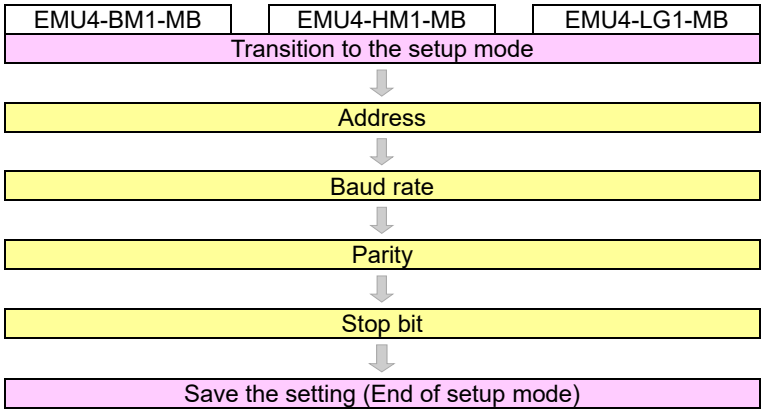
☛Setting Input / Output(EMU4)



(3) Communication setup

Set for the MODBUS communication. Only MU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB is set.

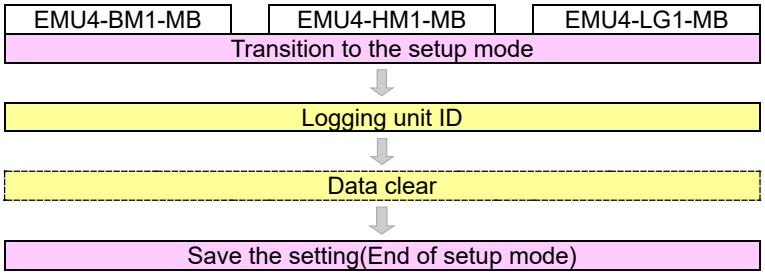
☛6.3.4 Setup the communication



(4) Logging setup

Set for the logging ID. (Set only EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB connected the EMU4-LM)

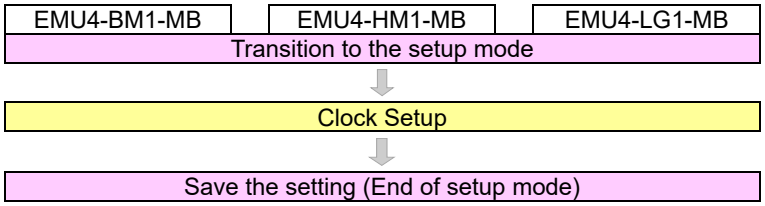
☛6.3.5 Setup the logging unit ID.



(5) Clock setup

Set for the clock. (Set only EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB connected the EMU4-LM.)

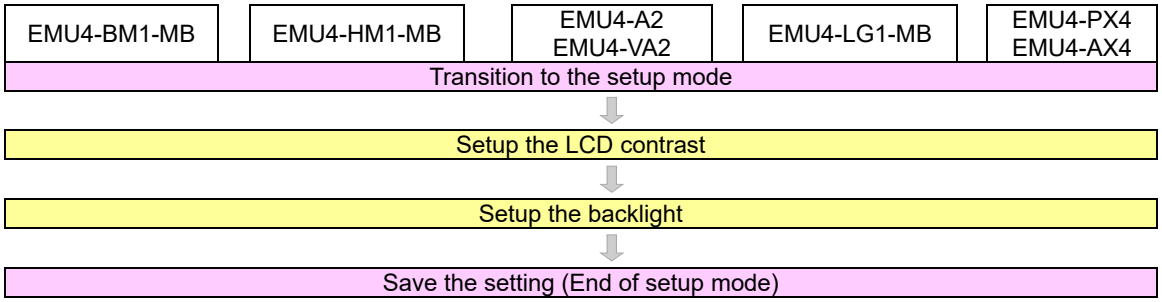
☛6.3.6 Setup the cleck



(6) Display setup

Set for the display such as LCD contrast or backlight lighting pattern.

☛6.3.7 Setup the display



(7) F/W version

The model name of measure unit connected and F/W version are displayed.☛6.3.8 Display the F/W version

6.3.2 Measuring setup

(1) Please set the display language when the Display unit start-up for the first time

1 Transition to the setup mode		
Screen	Operation	Note
1-1. 日本語 English	(1) Push the ▲ or ▼ key, and move the cursor to the language. (2) Push the ↵/PHASE key. (3) Version screen is displayed after a while, and transition to the operating mode.	

(2) Setup the measuring condition of the energy measurement unit that is connected. EMU4-PX4 is not set.

1 Transition to the setup mode		
Screen	Operation	Note
1-1. [Setup] 1 Measure 2 I/O 3 COM ▼	(1) Push the SETUP key in operation mode. (2) 1-1. will be displayed.	
	(1) Confirm that the cursor focused the “1 Measure”, push the ↵/PHASE key. (2) 2-1. will be displayed	

2 Setup the phase wire system (All models except for EMU4-LG1-MB, EMU4-PX4 and EMU4-AX4)		
Screen	Operation	Note
2-1. [Measure] 1 Wiring 2 V rate 3 A rate ▼	(1) In 2-1, Push ▲ or ▼ key, and move the cursor to the “1 Wiring”. (2) Push the ↵/PHASE key. (3) 2-2 will be displayed.	
2-2. [Wiring] 3P3W	(1) Push the + or − key, and change the set value. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting wiring type. 1P2W → To 2-3. In the case of 1P3W, 3P3W, 3P4W → To 2-1.	[Wiring]: 1P2W⇔1P3W⇔**3P3W**⇔3P4W⇔ *If the basic unit is EMU4-BM1-MB, [Wiring] will be 1P2W, 1P3W, 3P3W only. *The setting value is set in same voltage system after confirmed setting value.
2-3. [2 circuits MEA.] Off	(1) Push the + or − key, change the set value. (2) Push the ↵/PHASE key, confirm the setting value. (3) 2-1 will displayed.	[2 circuits Measuring existence]: **No**⇔Yes⇔ *The setting value is set in same voltage system after confirmed setting value.

3 Setup the primary voltage (All models except for EMU4-LG1-MB, EMU4-PX4, and EMU4-AX4)		
Screen	Operation	Note
3-1. [Measure] 1 Wiring 2 V rate 3 A rate ▲▼	(1) In 3-1, Push the ▲ or ▼ key, and move the cursor to the “2 V rate”. (2) Push the ↵/PHASE key. (3) 3-2 will be displayed.	*The setting value is set in same voltage system after confirmed setting value. [VT] : **No**⇔Yes⇔ *1P3W is “No” fixed. 1P2W, 3P3W ---------- When [VT] : “No” setting [Direct V] : 110V⇔**220V**⇔440V*⇔ *If the basic unit is EMU4-BM1-MB, [Direct V] will be 110V,220V only. When [VT] : “Yes” setting [Primary V] : **440V**⇔690V⇔1100V⇔2200V⇔3300V⇔6600V⇔11000V⇔13200V⇔13800V⇔15000V⇔16500V⇔22000V⇔24000V⇔33000V⇔66000V⇔77000V⇔110000V⇔SP⇔ When [Primary V] setting and SP setting [SP.PRI.V] : 1 to 110000V(**440V**) (1 to 99V: Can be set in the 1V step.) (100 to 110000V: Can be set in the 1V step.) [SP.2nd.V] : 1 to 220V(**110V**) (Can be set in the 1V step.) 1P3W ---------- “No” fixed [Direct V] : **110V** ⇔220V* ⇔ (110V/220V) (220V/440V) *If the basic unit is EMU4-BM1-MB, [Direct V] will be 110V 3P4W ---------- *For 3P4W, set the phase voltage. When [VT] : “Yes” setting [Direct V] : 63.5V⇔100V⇔105V⇔110V⇔ 115V⇔120V⇔127V⇔200V⇔**220V**⇔230V⇔240V⇔242V⇔250V⇔254V⇔265V⇔277V⇔ When [VT] : “Yes” setting [SP.PRI.V] : 1 to 63500V(**440V**) (1 to 99V: Can be set in the 1V step.) (100 to 110000V: Can be set in the 1V step.) [SP.2nd.V] : 1 to 220V(**64V**) (Can be set in the 1V step.)
3-2. [VT] No	(1) Push the + or − key, change the set value. (2) Push the ↵/PHASE key, confirm the setting value. (3) Transition to the following screen by the selection of VT use or non-use. [No] setting→To 3-3 [YES] setting→To 3-4(If Wiring is 3P4W, transition to 3-5)	
3-3. [Direct V] 220V	(1) Push the + or − key, change the set value. (2) Push the ↵/PHASE key, confirm the setting value. (3) 3-1 will be displayed.	
3-4. [Primary V] 440V	(1) Push the + or − key, change the set value. (2) Push the ↵/PHASE key, confirm the setting value. (3) Transition to the following screen by the setting value of the primary voltage. [SP] setting → To 3-5 Non-[SP] setting → To 3-1	
3-5. [SP.PRI.V] 00440V	(1) Push the ▲, ▼, + or − key, change the set value. (2) Push the ↵/PHASE key, confirm the setting value. (3) 3-6 will be displayed.	
3-6. [SP.2nd.V] 220V	(1) Push the ▲, ▼, + or − key, change the set value. (2) Push the ↵/PHASE key, confirm the setting value. (3) 3-1 will be displayed.	

4 Setup the primary current (All models except for EMU4-LG1-MB, EMU4-PX4 and EMU4-AX4)

Screen	Operation	Note
4-1. [Measure] 1 Wiring 2 V rate 3 A rate ▲▼	(1) In 4-1, Push the ▲ or ▼ key, and move the cursor to the "3A rate". (2) Push the ↵/PHASE key. (3) 4-2 will be displayed.	[Sensor]:**Direct**⇔5A⇔ Direct setting [A rate]:50A⇔**100A**⇔250A⇔400A⇔600A⇔
4-2. [Sensor] Direct [PRI. A] 100A	(1) Push the ▲ or ▼ key, and move the cursor to the "Sensor" (2) Push the + or − key, and select sensor type. (3) Push the ▲ or ▼ key, and move the cursor to the "A rate". (4) Push the + or − key, and change the primary current value. (5) Push the ↵/PHASE key, and confirm the setting value. (6) Transition to the following screen by the setting wiring type and primary current value. [SP] setting → To 4-3. Non-[SP] setting → To 4-1.	5Asetting [A rate]:5A⇔6A⇔7.5A⇔8A⇔10A⇔12A⇔15A⇔ 20A⇔25A⇔30A⇔40A⇔50A⇔60A⇔75A⇔ 80A⇔**100A**⇔120A⇔150A⇔200A⇔250A⇔ 300A⇔400A⇔500A⇔600A⇔750A⇔800A⇔ 1000A⇔1200A⇔1250A⇔1500A⇔1600A⇔ 2000A⇔2500A⇔3000A⇔4000A⇔5000A⇔ 6000A⇔7500A⇔8000A⇔10000A⇔12000A⇔ 20000A⇔25000A⇔30000A⇔SP⇔
4-3. [SP.PRI.A] 001000A	(1) Push the ▲, ▼, + or − key, change the set value. (2) Push the ↵/PHASE key, confirm the setting value. (3) 4-1 will be displayed.	[SP.PRI.A] : 5.0 to 30000A(**100A**) 10A less than, the upper two digits. 10A or more is possible to set the upper three digits.

5 Setup the display mode (All models except for EMU4-LG1-MB, EMU4-PX4 and EMU4-AX4)

Screen	Operation	Note
5-1. [Measure] 2 V rate 3 A rate 4 DISP.Mode ▲▼	(1) In 5-1, Push the ▲ or ▼ key, and move the cursor to the "4 DISP.Mode". (2) Push the ↵/PHASE key. (3) 5-2 will be displayed.	Set the measurement elements to be displayed in the display unit.
5-2. [DISP.Mode] Wh+A+4 Harmonics	(1) Push the ▲ or ▼ key, and select the display mode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the selection of measurement mode. [Wh+A+4] setting → To 5-3 [Harmonics] setting → To 5-4	[DISP.Mode]:**Wh+A+4**⇔Harmonics⇔ *In case of the model EMU4-BM1-MB, the "Harmonics" is not displayed. Wh+A+4…In addition to the active energy and current, up to 4 items can be displayed by selection. (The harmonics data is only about total.) Harmonics…It can display about harmonic data at each order.
5-3. [Elements] ☐V ☐W ☐var ☐VA ☐PF ☐Hz ☐CONV.Wh ☐PRD.Wh ☐OP.Time ☐REG.Wh ☐varh ☐PLS. ☐UNB.A ☐UNB.V ☐HA ☐HV ▲▼	(1) Push the ▲ or ▼ key, and move the cursor to target element. (In the actual display, it will be scrolling display of each three elements in one screen.) (2) Push the + or − key, and choose the selected or deselected. (3) When selecting the other measurement item, repeat the operation from (1) to (2). (4) Push the ↵/PHASE key, and determine the setting. (5) 5-1 will be displayed. *Elements is showed follow. V:Voltage W:Electric power var:reactive power VA:apparent power PF:Power factor Hz:frequency Wh converted value:Electric energy (converted) Periodic Wh:Electric energy (regeneration) Regenerated Wh:Periodic electric energy varh:Reactive energy (consumption lag) PULSE:Pulse count value and pulse converted value UNB.A:Current unbalance rate UNB.V:Voltage unbalance rate HA:Harmonics current HV:Harmonics voltage	[Element]:V, W, var, VA, PF, Hz, CONV.Wh, PRD.Wh, OP.Time, REG.Wh, varh, CONV.PLS, UNB.V, HA, HV ☐(Deselected), ☑(Selected) *The selectable number of elements is up to 4. So, change the selection at the state that already 4 items are selected, deselect the items before changing. *Elements can't select in follow table.
5-4. [HA,HV] r.m.s.	(1) Push the ▲ or ▼ key, and change the "HA, HV" value. (2) Push the ↵/PHASE key. (3) 5-1 will be displayed.	[HA,HV]:**r.m.s.**⇔% *In case of the model EMU4-BM1, "HA, HV" cannot be set. r.m.s.…To display the RMS value of harmonics current or harmonics voltage %…To display the distortion rate and content rate of harmonics current or harmonics voltage. (The "r.m.s" not be displayed)

Element	In the case cannot select
UNB.A UNB.V	Setting simplicity measuring mode
Periodic Wh	In the case of EMU4-BM1-MB, EMU4-A2, EMU4-VA2. External input is not pulse input.
Pulse converted value	In the case EMU4-BM1-MB, EMU4-A2, EMU4-VA2. Pulse input is not contact input.
HA HV	In the case EMU4-BM1-MB.
VA	In the case EMU4-BM1-MB, or Wiring type is 1P2W,1P3W,3P3W
Wh converted value	In the case EMU4-BM1-MB

6(1) Setup the measurement mode (EMU4-LG1-MB only)		
Screen	Operation	Note
6(1)-1. [Measure] 3 A rate 4 DISP.Mode 5 MEA.Mode ▲▼	(1) In 6(1)-1, push the ▲ or ▼ key, and move the cursor to the "5 MEA.Mode" (2) Push the ↵/PHASE key. (3) 6(1)-2 will be displayed.	Setup the measurement mode of "lo"or "lor".
6(1)-2. [MEA.Mode] High SENS. Low SENS.	(1) Push the ▲ or ▼ key, and select the measurement mode. (2) Push the ↵/PHASE key. (3) 6(1)-1 will be displayed.	[MEA.Mode]: **High SENS.**⇔Low SENS.⇔ High SENS….0.00 to 100mA 0.01mA step Low SENS….0 to 1000mA 1mA step

6(2) Setup the measurement mode (EMU4-AX4 only)		
Screen	Operation	Note
6(2)-1. [Measure] 3 A rate 4 DISP.Mode 5 MEA.Mode ▲▼	(1) In 6(2)-1, push the ▲ or ▼ key, and move the cursor to the "5 MEA.Mode" (2) Push the ↵/PHASE key. (3) 6(2)-2 will be displayed.	Setup the measurement mode of AD converted.
6(2)-2. [MEA.Mode] 50ms SAMP. 1ms SAMP.	(1) Push the ▲ or ▼ key, and select the measurement mode. (2) Push the ↵/PHASE key. (3) 6(2)-1 will be displayed.	[MEA.Mode]: **50ms SAMP.**⇔1ms SAMP.⇔ 50ms SAMP. …AD converted in a cycle of 50ms. 1ms SAMP. …AD converted in a cycle of 1ms.

7(1) Setup the demand time (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
7(1)-1. [Measure] 4 DISP.Mode 5 MEA.Mode 6 Demand ▲▼	(1) In 7(1)-1, push the ▲ or ▼ key, and move the cursor to the "6 Demand". (2) Push the ↵/PHASE key. (3) 7(1)-2 will be displayed.	[Demand]: 0sec⇔10sec⇔20sec⇔30sec⇔40sec⇔ 50sec⇔1min⇔**2min**⇔3min⇔4min⇔ 5min⇔6min⇔7min⇔8min⇔9min⇔ 10min⇔11min⇔12min⇔13min⇔ 14min⇔15min⇔20min⇔25min⇔ 30min⇔
7(1)-2. [Demand] A : 2min W : 2min	(1) Push the ▲ or ▼ key, and move the cursor to the A(Current). (2) Push the + or − key, and charge the demand time value. (3) Push the ▲ or ▼ key, and move the cursor to the W(Electric power). (4) Push the + or − key, and change the demand time value. (5) Push the ↵/PHASE key, and confirm the setting value. (6) 7(1)-1 will be displayed.	

7(2) Setup the demand time (EMU4-LG1-MB only)		
Screen	Operation	Note
7(2)-1. [Measure] 4 DISP.Mode 5 MEA.Mode 6 Demand ▲▼	(1) In 7(2)-1, push the ▲ or ▼ key, and move the cursor to the "6 Demand". (2) Push the ↵/PHASE key. (3) 7(2)-2 will be displayed.	[Demand time]: 0sec⇔**5min**⇔6min⇔7min⇔ 8min⇔9min⇔10min⇔11min⇔ 12min⇔13min⇔14min⇔15min⇔ 20min⇔25min⇔30min⇔
7(2)-2. [Demand] Io/Ior: 5min	(1) Push the + or − key, and change the Io/Ior demand time value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 7(2)-1 will be displayed.	

8 Setup the electric energy equivalent rate (EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
8-1. [Measure] 5 MEA.Mode 6 Demand 7 CONV.Wh ▲▼	(1) In 8-1, push the ▲ or ▼ key, and move the cursor to the "7 CONV.Wh". (2) Push the ↵/PHASE key. (3) 8-2 will be displayed.	
8-2. [CONV.Rate] 1.000 [Unit] Non [1] ↑ 2 circuits measuring only	(1) Push the ▲ ▼ + − key, and change the "CONV.Rate" value and unit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the setting wiring type. 2 circuits measurement → To 8-3. Non-2 circuits measurement → To 8-1.	[CONV.Rate]: 0.001 to 10000(**1.000**) [Unit]: **Non**⇔Wh⇔kWh⇔MWh⇔J⇔m^2⇔m^3⇔L⇔ kL⇔sec⇔min⇔hour⇔piece⇔set⇔g⇔ kg⇔t⇔ ¥ ⇔ $ ⇔
8-3. [CONV.Rate] 1.000 [Unit] Non [2] ↑ 2 circuits measuring only	(1) In a similar way as 8-2, change the "CONV.Rate" value and unit of the second circuit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 8-1 will be displayed.	

9 Setup the current cut-off rate (All models except for EMU4-LG1-MB, EMU4-PX4 and EMU4-AX4)		
Screen	Operation	Note
9-1. [Measure] 6 Demand 7 CONV.Wh 8 A cut-off	(1) In 9-1, push the ▲ or ▼ key, and move the cursor to the “8 A cut-off”. (2) Push the ↵/PHASE key. (3) 9-2 will be displayed.	
9-2. [A cut-off] 00.5% [1] 2 circuits measuring only	(1) Push the + or − key, and change the set value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the setting wiring type. 2 circuits measurement → To 9-3. Non-2 circuits measurement → To 9-1.	[A cut-off]:0.1 to 50.0% (**0.5**) A cut-off rate…represent as the ratio of cut-off current to rated current. *Measured value is 0A if it is less than the cut-off current.
9-3. [A cut-off] 00.5% [2] 2 circuits measuring only	(1) In a similar way as 9-2, change the “A cut-off” value of the second circuit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 9-1 will be displayed.	

10 Setup the Simple measurement (All models except for EMU4-LG1-MB, EMU4-PX4 and EMU4-AX4)		
Screen	Operation	Note
10-1. [Measure] 7 CONV.Wh 8 A Cut-off 9 Simple MEA	(1) In 10-1, push the ▲ or ▼ key, and move the cursor to the “9 Simple MEA”. (2) Push the ↵/PHASE key. (3) 10-2 will be displayed	
10-2. [Simple MEA.] Off	(1) Push the + or − key, and select SimpleMEA ([On]/[Off]). (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the setting SimpleMEA ([On]/[Off]). [On] setting → To 10-3. [Off] setting → To 10-1.	[SimpleMEA]:**Off**⇔On⇔ SimpleMEA…The value set in the electric power and the power factor the fixed value. By measuring the current only, and calculating the values of the measurement elements. *After confirm the setting value, it is reflected to same voltage system.
10-3. [FP Set] 1.000 [1] 2 circuits measuring only	(1) Push the ▲ ▼ + − key, and change the power factor value in the SimpleMEA. (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the setting wiring type. 2 circuit measurement → To 10-4. Non-2 circuits measurement → To 10-1.	[FP Set]:-0.001 to **1.000** to 0.000
10-4. [FP Set] 1.000 [2] 2 circuits measuring only	(1) In a similar way as 10-3 , changet the power factor value of the second circuit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 10-1 will be displayed.	

11 Setup the Ior difference conversion (EMU4-LG1-MB only)		
Screen	Operation	Note
11-1. [Measure] 8 A cut-off 9 SimpleMEA 10DIF.CONV	(1) Push the ▲ or ▼ key, and move the cursor to the “10 DIF.CONV”. (2) Push ↵/PHASE key. (3) 11-2 will be displayed.	DIF.CONV]:**Off**⇔On⇔ DIF.CONV…To calculate the amount of change from the Ior difference converted value.
11-2. [DIF.CONV. of Ior] Off	(1) Push the + or − key, and select the Ior difference converted value ([On]/[Off]). (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the setting DIF.CNV([On]/[Off]). [On] setting → To 11-3. [Off] setting → To 11-1.	
11-3. [DIF.Ior Reference] 0.00 mA	(1) Push the ▲ ▼ + − key, and change the Ior difference converted reference value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 11-1 will be displayed.	High SENS mode [DIF.Ior]:**0.00** to 100.00mA Low SENS mode [DIF.Ior]:**0** to 1000mA

12 Setup the AD Converted (EMU4-AX4 only) *Please refer to manual of EMU4-AX4 for more details.		
Screen	Operation	Note
12-1. [Measure] 9 SimpleMEA 10DIF.CONV 11AD.CONV.	(1) In 12-1, push the ▲ or ▼ key, and move the cursor to the "11 AD.CONV.". (2) Push the ↵/PHASE key. (3) 12-2 will be displayed	
12-2. [AD.CONV.] On [1]	(1) Push the + or − key, and select the AD converted([On]/[Off]). (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the setting AD.CONV.([On]/[Off]). [On] setting → To 12-3 [Off] setting → To 12-6	[AD.CONV.]:Off⇔**On**⇔ AD.CONV. …The setting value is set in AD convert per CH
12-3. [Range] Current [1]	(1) Push the + or − key, and select the input range. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-4 will be displayed.	[Range]:**Current**⇔Voltage⇔
12-4. [Moving average] 001 times [1]	(1) Push the ▲ ▼ + − key, and change the number of moving average. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-5 will be displayed.	[Moving average]:001 to 100 (**001**)
12-5. [Scaling] Upp.:04095 Low.: 00000 Unit:Non [1]	(1) Push the ▲ ▼ + − key, and change the upper limit, lower limit, and unit of scaling. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-6 will be displayed.	[Upp]:-32767 to 32767 (**4095**) [Low]:-32767 to 32767 (**0**) [Unit]:**Non**⇔A⇔mA⇔kA⇔V⇔kV⇔W⇔kW⇔MW⇔Hz⇔N⇔kN⇔Pa⇔kPa⇔MPa⇔C⇔deg⇔%⇔
12-6. [AD.CONV.] On [2]	(1) Push the + or − key, and select the AD converted([On]/[Off]). (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the setting AD.CONV.([On]/[Off]). [On] setting → To 12-7 [Off] setting → To 12-10	[AD.CONV.]:Off⇔**On**⇔ AD.CONV. …The setting value is set in AD convert per CH
12-7. [Range] Current [2]	(1) Push the + or − key, and select the input range. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-8 will be displayed.	[Range]:**Current**⇔Voltage⇔
12-8. [Moving average] 001 times [2]	(1) Push the ▲ ▼ + − key, and change the number of moving average. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-9 will be displayed.	[Moving average]:001 to 100 (**001**)
12-9. [Scaling] Upp.:04095 Low.: 00000 Unit:Non [2]	(1) Push the ▲ ▼ + − key, and change the upper limit, lower limit, and unit of scaling. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-10 will be displayed.	[Upp]:-32767 to 32767 (**4095**) [Low]:-32767 to 32767 (**0**) [Unit]:**Non**⇔A⇔mA⇔kA⇔V⇔kV⇔W⇔kW⇔MW⇔Hz⇔N⇔kN⇔Pa⇔kPa⇔MPa⇔C⇔deg⇔%⇔
12-10. [AD.CONV.] On [3]	(1) Push the + or − key, and select the AD converted([On]/[Off]). (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the setting AD.CONV.([On]/[Off]). [On] setting → To 12-11 [Off] setting → To 12-14	[AD.CONV.]:Off⇔**On**⇔ AD.CONV. …The setting value is set in AD convert per CH
12-11. [Range] Current [3]	(1) Push the + or − key, and select the input range. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-12 will be displayed.	[Range]:**Current**⇔Voltage⇔
12-12. [Moving average] 001 times [3]	(1) Push the ▲ ▼ + − key, and change the number of moving average. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-13 will be displayed.	[Moving average]:001 to 100 (**001**)
12-13. [Scaling] Upp.:04095 Low.: 00000 Unit:Non [3]	(1) Push the ▲ ▼ + − key, and change the upper limit, lower limit, and unit of scaling. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-14 will be displayed.	[Upp]:-32767 to 32767 (**4095**) [Low]:-32767 to 32767 (**0**) [Unit]:**Non**⇔A⇔mA⇔kA⇔V⇔kV⇔W⇔kW⇔MW⇔Hz⇔N⇔kN⇔Pa⇔kPa⇔MPa⇔C⇔deg⇔%⇔
12-14. [AD.CONV.] On [4]	(1) Push the + or − key, and select the AD converted([On]/[Off]). (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the setting AD.CONV.([On]/[Off]). [On] setting → To 12-15 [Off] setting → To 12-1	[AD.CONV.]:Off⇔**On**⇔ AD.CONV. …The setting value is set in AD convert per CH
12-15. [Range] Current [4]	(1) Push the + or − key, and select the input range. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-16 will be displayed.	[Range]:**Current**⇔Voltage⇔
12-16. [Moving average] 001 times [4]	(1) Push the ▲ ▼ + − key, and change the number of moving average. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-17 will be displayed.	[Moving average]:001 to 100 (**001**)
12-17. [Scaling] Upp.:04095 Low.: 00000 Unit:Non [4]	(1) Push the ▲ ▼ + − key, and change the upper limit, lower limit, and unit of scaling. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-1 will be displayed.	[Upp]:-32767 to 32767 (**4095**) [Low]:-32767 to 32767 (**0**) [Unit]:**Non**⇔A⇔mA⇔kA⇔V⇔kV⇔W⇔kW⇔MW⇔Hz⇔N⇔kN⇔Pa⇔kPa⇔MPa⇔C⇔deg⇔%⇔

13 Setup the Number Limit (EMU4-AX4 only)		
Screen	Operation	Note
13-1. [Measure] 10DIF.CONV 11AD.CONV. 12Num.Limit ▲▼	(1) In 13-1, push the ▲ or ▼ key, and move the cursor to the “12 Num.Limit”. (2) Push the ↵/PHASE key. (3) 13.1-1 will be displayed	Num.Limit …Set any limit. *If the scaling value over the limit, Number limit countup.

13.1 Setup the Limit A, Limit B, Limit C, and Limit D (EMU4-AX4 only)		
Screen	Operation	Note
13.1-1. [Num.Limit] 1 Limit A 2 Limit B 3 Limit C ▼	(1) In 13.1-1, push the ▲ or ▼ key, and move the cursor to the “1 Limit A”. (2) Push the ↵/PHASE key. (3) 13.1-2 will be displayed	Limit B, Limit C, and Limit D is done in the same way as the setting of Limit A.
13.1-2. [Limit A] 32767 [1]	(1) Push the ▲ ▼ + − key, and change the set value. (2) Push the ↵/PHASE key. (3) 13.1-3 will be displayed.	Limit …Set any scaling value. You can configure the four different limits for limit A, limit B, limit C, and limit D. [Limit A]:**Scaling Low** to Scaling Upp *If scaling setting value is set “Scaling Low > Scaling Upp”, default setting is Scaling Upp.
13.1-3. [Limit A] 32767 [2]	(1) Push the ▲ ▼ + − key, and change the set value. (2) Push the ↵/PHASE key. (3) 13.1-4 will be displayed.	
13.1-4. [Limit A] 32767 [3]	(1) Push the ▲ ▼ + − key, and change the set value. (2) Push the ↵/PHASE key. (3) 13.1-5 will be displayed.	
13.1-5. [Limit A] 32767 [4]	(1) Push the ▲ ▼ + − key, and change the set value. (2) Push the ↵/PHASE key. (3) 13.1-1 will be displayed.	

13.2 Setup the multiplying factor (EMU4-AX4 only)		
Screen	Operation	Note
13.2-1. [Num.Limit] 3 Limit C 4 Limit D 5 Factor ▲	(1) In 13.2-1, push the ▲ or ▼ key, and move the cursor to the “5 Factor”. (2) Push the ↵/PHASE key. (3) 13.2-2 will be displayed	Factor …Set up the multiplying factor displayed of Number Limit.
13.2-2. [Factor] x1 [1]	(1) Push the + or − key, and select the multiplying factor displayed. (2) Push the ↵/PHASE key. (3) 13.2-3 will be displayed.	[Factor]:**x1**⇔x10⇔x100⇔x1000⇔
13.2-3. [Factor] x1 [2]	(1) Push the + or − key, and select the multiplying factor displayed. (2) Push the ↵/PHASE key. (3) 13.2-4 will be displayed.	
13.2-4. [Factor] x1 [3]	(1) Push the + or − key, and select the multiplying factor displayed. (2) Push the ↵/PHASE key. (3) 13.2-5 will be displayed.	
13.2-5. [Factor] x1 [4]	(1) Push the + or − key, and select the multiplying factor displayed. (2) Push the ↵/PHASE key. (3) 13.2-1 will be displayed.	

14 Save the settings		
Screen	Operation	Note
14-1. Quit Setup 1 Save 2 Not Save 3 Cansel 14-2. Completed OK	(1) After setting all of the items, push the SETUP key. (2) 14-1 will be displayed. (3) When save the setting, push the ▲ or ▼ key, move the cursor to the “1 Save”, and Push the ↵/PHASE key. (4) After completing the setting saving, “Completed” message will be displayed. Push the ↵/PHASE key. (5) Return to the operation mode.	1 Save →Save setting and return to the operation mode. 2 Not Save →Discard the changes and return to the operation mode. 3 Cancel →Continue the setup.

*Setting for condition of the measurement mode can only configure in the display unit is set to master. (Setting for condition of the measurement mode cannot configure in the display unit is set to slave.)

*If you change a setting, please push the ↵/PHASE key and be sure to determine changes If without determine, the changes will be discarded.

*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.

*If you want to set the other circuit, push the CIRCUIT key on the “setup” screen (1-1), select the circuit, make the setting.

*In the case change or expand measuring unit, please reflect the setup value of wire phase system, rated voltage, and simple measuring to reference unit in same voltage system before setting.

*Same voltage system is same setting in wire system, primary voltage, 2 circuits Measuring existence, Simple measurement.

6.3.3 Input/Output setup－the settings for the external Input/Output. EMU4-LG1-MB is not set.

1 Transit to the Setup mode		
Screen	Operation	Note
1-1. [Setup] 1 Measure 2 I/O 3 COM.	(1) Push the SETUP key in operation mode. (2) 1-1 will be displayed.	
	(1) Push the ▲ or ▼ key, and move the cursor to the “2 I/O”. Push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Setup input (EMU4-HM1-MB, EMU4-PX4)		
Screen	Operation	Note
2-1. [I/O] 1 Input 2 OP.Time 3 Output	(1) In 2-1, push the ▲ or ▼ key, and move the cursor to the “1 input”. (2) Push the ↵/PHASE key. (3) 2-2 will be displayed.	
2-2. [Input] Non [1] EMU4-PX4 only	(1) Push the + or − key, and select the input method. (Non/Contact/Pulse) (2) Push the ↵/PHASE key. (3) Transition to the following screen by the model and setting input method. [Non] setting Model:EMU4-HM1-MB → To 2-1 Model:EMU4-PX4 → To 2-5 [Pulse] setting → To 2-3. [Contact] setting → To 2-4.	<EMU4-HM1-MB> [Input]:**Non**⇔Contact⇔Pulse⇔ <EMU4-PX4> [Input]:**Pulse**⇔Contact⇔Non⇔
2-3. [CONV.Rate] 1.000 [Unit] Non [1] EMU4-PX4 only	(1) Push the ▲ ▼ + − key, and change the “CONV./Rate” value and unit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the model. Model:EMU4-HM1-MB → To 2-1 Model:EMU4-PX4 → To 2-5	[CONV./Rate]:0.001 to 10000(**1.000**) [Unit]:**Non**⇔Wh⇔kWh⇔MWh⇔J⇔m^2⇔ m^3⇔L⇔kL⇔sec⇔min⇔hour⇔ piece⇔set⇔g⇔kg⇔t⇔￥⇔$⇔
2-4. ResetMode] Auto [1] EMU4-PX4 only	(1) Push the + or − key, and select the reset mode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the model. Model:EMU4-HM1-MB → To 2-1 Model:EMU4-PX4 → To 2-5	[ResetMode]:**Auto**⇔Hold⇔ Auto …Contact input state is reset automatically when contact input is less. Hold …Contact input state is hold until contact input released even thought contact input is less. (For information about how to release of the contact input, ☛6.8.3)
2-5. [Input] Non [2]	(1) Push the + or − key, and select the input method. (Non/Contact/Pulse) (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting input method. [Non] setting → To 2-8 [Pulse] setting → To 2-6. [Contact] setting → To 2-7.	<EMU4-PX4> [Input]:**Pulse**⇔Contact⇔Non⇔
2-6. [CONV.Rate] 1.000 [Unit] Non [2]	(1) Push the ▲ ▼ + − key, and change the “CONV./Rate” value and unit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-8 will be displayed.	[CONV./Rate]:0.001 to 10000(**1.000**) [Unit]:**Non**⇔Wh⇔kWh⇔MWh⇔J⇔m^2⇔ m^3⇔L⇔kL⇔sec⇔min⇔hour⇔ piece⇔set⇔g⇔kg⇔t⇔￥⇔$⇔
2-7. ResetMode] Auto [2]	(1) Push the + or − key, and select the Reset mode. (2) Push the ↵/PHASE key. (3) 2-8 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto …Contact input state is reset automatically when contact input is less. Hold …Contact input state is hold until contact input released even thought contact input is less. (For information about how to release of the contact input, ☛6.8.3)
2-8. [Input] Non [3]	(1) Push the + or − key, and select the input method. (Non/Contact/Pulse) (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting input method. [Non] setting → To 2-11 [Pulse] setting → To 2-9. [Contact] setting → To 2-10.	<EMU4-PX4> [Input]:**Pulse**⇔Contact⇔Non⇔
2-9. [CONV.Rate] 1.000 [Unit] Non [3]	(1) Push the ▲ ▼ + − key, and change the “CONV./Rate” value and unit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-11 will be displayed.	[CONV./Rate]:0.001 to 10000(**1.000**) [Unit]:**Non**⇔Wh⇔kWh⇔MWh⇔J⇔m^2⇔ m^3⇔L⇔kL⇔sec⇔min⇔hour⇔ piece⇔set⇔g⇔kg⇔t⇔￥⇔$⇔
2-10. ResetMode] Auto [3]	(1) Push the + or − key, and select the Reset mode. (2) Push the ↵/PHASE key. (3) 2-11 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto …Contact input state is reset automatically when contact input is less. Hold …Contact input state is hold until contact input released even thought contact input is less. (For information about how to release of the contact input, ☛6.8.3)

Screen	Operation	Note
2-11. [Input] Non [4]	(1) Push the + or − key, and select the input method. (Non/Contact/Pulse) (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting input method. [Non] setting → To 2-1 [Pulse] setting → To 2-12. [Contact] setting → To 2-13.	<EMU4-PX4> [Input]:**Pulse**⇔Contact⇔Non⇔
2-12. [CONV.Rate] 1.000 [Unit] Non [4]	(1) Push the ▲ ▼ + − key, and change the "CONV./Rate" value and unit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-1 will be displayed.	[CONV./Rate]:0.001 to 10000(**1.000**) [Unit]:**Non**⇔Wh⇔kWh⇔MWh⇔J⇔m^2⇔ m^3⇔L⇔kL⇔sec⇔min⇔hour⇔ piece⇔set⇔g⇔kg⇔t⇔¥⇔$⇔
2-13. ResetMode] Auto [4]	(1) Push the + or − key, and select the Reset mode. (2) Push the ↵/PHASE key. (3) 2-1 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto …Contact input state is reset automatically when contact input is less. Hold …Contact input state is hold until contact input released even thought contact input is less. (For information about how to release of the contact input, ☛6.8.3)

3 Setup the operating time measurement (All models except for EMU4-LG1-MB and EMU4-AX4)

Screen	Operation	Note
3-1. [I/O] 1 Input 2 OP.time 3 Output ▼	(1) In 3-1, Push the ▲ or ▼ key, and move the cursor to the "2 OP.Time". (2) Push the ↵/PHASE key. (3) 3-2 will be displayed.	[OP.Time]:**Off**⇔On⇔ EMU4-HM1-MB [OP.Time]:**A**⇔x⇔ EMU4-BM1-MB, EMU4-A2, EMU4-VA2 [OP.Time]:**A** EMU4-PX4 If input setting value is set to anything other than contact, this CH is not displayed. Operating time is integrated time while the current measured value is higher than the rated current×Current cut-off rate when select Current. Operating time is integration time while Contact input is ON when Contact input.
3-2. [OP.Time] Off [1] Model:EMU4-PX4 or 2 circuits measuring only	(1) Push the + or − key, and select the operating time measurement. (On/Off) (2) Push the ↵/PHASE key. (3) Transition to the following screen by the model, setting wiring type and existence of the operating time measurement. Model:EMU4-PX4 → To 3-4 Model:Other than EMU4-PX4 2 circuit measurement and [Off] setting →To 3-4 Non-2 circuit measurement and [Off] setting → To 3-1. [On] setting →To 3-3	
3-3. [OP.Time Mode] A [1] 2 circuit measuring only	(1) Push the + or − key, and select the operating time measurement mode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting wiring type. 2 circuit measurement → To 3-4 Non-2 circuit measurement → To 3-1	
3-4. [OP.Time] Off [2]	(1) Push the + or − key, and select the operating time measurement. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the model, and setting existence of the operating time measurement. Model:EMU4-PX4 → To 3-6 Model:Other than EMU4-PX4 [Off] setting → To 3-1 [On] setting→ To 3-5	
3-5. [OP.Time Mode] A [2]	(1) Push the + or − key, and select the operating time measurement mode. (2) Push the ↵/PHASE key. (3) 3-1 will be displayed.	
3-6. [OP.Time] Off [3]	(1) Push the + or − key, and select the operating time measurement. (2) Push the ↵/PHASE key. (3) 3-7 will be displayed.	
3-7. [OP.Time] Off [4]	(1) Push the + or − key, and select the operating time measurement. (2) Push the ↵/PHASE key. (3) 3-1 will be displayed.	

4 Setup Output (EMU4-HM1-MB, EMU4-A2, EMU4-VA2, EMU4-PX4, EMU4-AX4)

Screen	Operation	Note
4-1. [I/O] 1 Input 2 OP.Tilme 3 Output ▲▼	(1) In 4-1, push the ▲ or ▼ key, and move the cursor to the “3 Output”. (2) Push the ↵/PHASE key. (3) 4-2 will be displayed.	EMU4-HM1-MB, EMU4-A2, EMU4-VA2 [Output]:**Non**⇔Pulse⇔Alarm⇔ EMU4-PX4, EMU4-AX4 [Output]:**Non**⇔Alarm⇔Contact⇔ The pulse output unit changes by the full load power. [Pulse]:
4-2. [Output] Non	(1) Push the + or − key, and select the output signal type. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the model, setting wiring type and the output signal type. Model:EMU4-PX4 or EMU4-AX4 → To 4-1 Model:EMU4-HM1-MB, EMU4-A2 or EMU4-VA2 [Non] setting → To 4-1 2 circuits measurement and [Pulse] setting → To 4-3 Non-2 circuit measurement and [Pulse] setting → To 4-4 2 circuits measurement and [Alarm] setting → To 4-3 Non-2 circuit measurement and [Alarm] setting → To 4-1	
4-3. [Output] 1	(1) Push the + or − key, and select the output target. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting output signal type. [Pulse] setting → To 4-4 [Alarm] setting→ To 4-1	[Output] : **1**⇔2⇔ *It is set which circuit it does external output, because it inputs 2 circuits per a terminal block for 1P2W. If the target of external output is 1K, 1L connection side circuit, Set “1”. If the target of external output is 3K, 3L connection side circuit, Set “2”.
4-4. [Pulse] 0.01 kWh/Pulse	(1) Push the ▲ ▼ + − key, and change the pulse output unit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 4-1 will be displayed.	

Full load power (kW)	Setting range
Wfull<12kW	**0.001**⇔0.01⇔0.1⇔1⇔
12kW ≤ Wfull < 120kW	**0.01**⇔0.1⇔1⇔10⇔
120kW ≤ Wfull < 1200kW	**0.1**⇔1⇔10⇔100⇔
1200kW ≤ Wfull < 12000kW	**1**⇔10⇔100⇔1000⇔
12000kW ≤ Wfull < 120000kW	**10**⇔100⇔1000⇔ 10000⇔
120000kW ≤ Wfull	**100**⇔1000⇔10000⇔ 100000⇔

5 Save the setting

Screen	Operation	Note
5-1. Quit Setup 1 Save 2 Not Save 3 Cancel	(1) After setting all of the items, push the SETUP key. (2) 5-1 will be displayed. (3) When save the setting, push the ▲ or ▼ key, move the cursor to the ”1 Save”, and Push the ↵/PHASE key. (4) After completing the setting saving, “Completed” message will be displayed. Push the ↵/PHASE key. (5) Return to the operation mode, and it will be displayed electric energy screen.	1 Save → Save settings and return to the operation mode. 2 Not Save → Discard the changes and return to the operation mode. 3 Cancel →Continue the setup.

*Full load is calculated by following formula. (Full load)=(Primary voltage) x (Primary current) x (Coefficient) / 1000[kW]
*1: In case 3P4W, apply the not phase voltage but line voltage as primary voltage.
*2: Coefficient is varies according to the phase wire system. 1P2W →1, 1P3W→2, 3P3W→1.732, 3P4W →3

*If you change a setting, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.
* If you want to set the other circuit, push the CIRCUIT key on the "Setup" screen (1-1), select the circuit, make the setting.

6.3.4 Communication setup－the settings for the MODBUS communication (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB only)

1 Transition to the setup mode

Screen	Operation	Note
1-1. [Setup] 1 Measure 2 I/O **3** COM ▲▼	(1) Push the SETUP key in operation mode. (2) 1-1 will be displayed. (1) Confirm that the cursor focuses the “3 COM.”, push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Setup MODBUS address (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB)

Screen	Operation	Note
2-1. [COM] **1** Address 2 Baut rate 3 Parity ▼	(1) In 2-1, push the ▲ or ▼ key, and move the cursor to the ”1 Address”. (2) Push the ↵/PHASE key. (3) 2-2 will be displayed.	[Address]:**001** to 255
2-2. [Address] **0**01	(1) Push the ▲ ▼ + − key, and change the address. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-1 will be displayed.	

3 Setup the baud rate (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB)

Screen	Operation	Note
3-1. [COM] 1 Address **2** Baut rate 3 Parity ▲▼	(1) In 3-1, push the ▲ or ▼ key, and move the cursor to the ”2 Baut rate”. (2) Push the ↵/PHASE key. (3) 3-2 will be displayed.	[Baut rate]:2400⇔4800⇔9600⇔**19200**⇔38400⇔
3-2. [Baut rate] **19200**bps	(1) Push the + or − key, and select the baut rate. (2) Push the ↵/PHASE key. (3) 3-1 will be displayed.	

4 Setup the parity (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB)

Screen	Operation	Note
4-1. [COM] 1 Address 2 Baut rate **3** Parity ▲▼	(1) In 4-1, push the ▲ or ▼ key, and move the cursor to the ”3 Parity”. (2) Push the ↵/PHASE key. (3) 4-2 will be displayed.	[Parity]:Non⇔**Even**⇔Odd⇔
4-2. [Parity] **Even**	(1) Push the + or − key, and select the parity. (2) Push the ↵/PHASE key. (3) 4-1 will be displayed.	

5 Setup the stop bit (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB)

Screen	Operation	Note
5-1. [COM] 2 Baut rate 3 Parity **4** Stop bit ▲▼	(1) In 5-1, push the ▲ or ▼ key, and move the cursor to the ”4 Stop bit”. (2) Push the ↵/PHASE key. (3) 5-2 will be displayed.	[Stop bit]:**1**⇔2⇔
5-2. [Stop bit] **1**	(1) Push the + or − key, and select the stop bit. (2) Push the ↵/PHASE key. (3) 5-1 will be displayed.	

6 Save the settings

Screen	Operation	Note
6-1. Quit setup **1** Save 2 Note Save 3 Cancel	(1) After setting all of the items, push the SETUP key. (2) 6-1 will be displayed. (3) When save the settings, push the ▲ or ▼ key, move the cursor to the “1 Save”, and push the ↵/PHASE key. (4) After completing the settings saving, “Completed” message will be displayed. Push the ↵/PHASE key. (5) Return to the operation mode, and it will be displayed electric energy screen.	1 Save → Save settings and return to the operation mode. 2 Not Save → Discard the changes and return to the operation mode. 3 Cancel → Continue the setup.

*If you change a setting, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.

6.3.5 Logging setup－the settings for the logging ID (Set only EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB connected the EMU4-LM.)

1 Transition to the setup mode		
Screen	Operation	Note
1-1. [Setup] 2 I/O 3 COM 4 Logging ▲▼	(1) Push the SETUP key in operation mode. (2) 1-1 will be displayed. (1) Confirm that the cursor focuses the “4 Logging”, and push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Setup the logging unit ID (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB)		
Screen	Operation	Note
2-1. [Logging] 1 ID 2 Data clear 0 Back ▼	(1) In 2-1, push the ▲ or ▼ key, and move the cursor to the ”1 ID”. (2) Push the ↵/PHASE key. (3) 2-2 will be displayed.	[ID]：**001** to 255
2-2. [ID] 001	(1) Push the ▲ ▼ ＋ － key, and change the logging unit ID. (2) Push the ↵/PHASE key. Confirm the setting value. (3) 2-1 will be displayed.	

3 Save the settings		
Screen	Operation	Note
3-1. Quit Setup 1 Save 2 Not Save 3 Cancel	(1) After setting all of the items, push the SETUP key. (2) 3-1 will be displayed. (3) When save the settings, push the ▲ or ▼ key, move the cursor to the “1 Save”, and push the ↵/PHASE key. (4) After completing the settings saving, “Completed” message will be displayed. Push the ↵/PHASE key. (5) Return to the operation mode, and it will be displayed electric energy screen.	1 Save → Save settings and return to the operation mode. 2 Not Save → Discard the changes and return to the operation mode. 3 Cancel → Continue the setup.

*If you change a setting, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.

6.3.6 Clock setup－the settings for the clock. (Set only EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB connected the EMU4-LM)

1 Transition to the setup mode		
Screen	Operation	Note
1-1. [Setup] 3 COM 4 Logging ▲ 5 Clock ▼	(1) Push the SETUP key in operation mode. (2) 1-1 will be displayed. (1) Confirm that the cursor focuses the “5 Clock”, push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Clock Setup (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-LG1-MB)		
Screen	Operation	Note
2-1. [Clock] 2013/01/01 00:00 OK Cancel 2-2. Logging data will be cleared. OK Cancel	(1) In 2-1, Push the ▲ or ▼ key, and move the cursor to the “Year”. (2) Push the ＋ or － key. Change the set value. (3) Push the ▼ key, and move the cursor to the “Month”. (4) Push the ＋ or － key. Change the set value. (5) In a similar way, change the “Day”,“Hour”,“Minute”.Note 1 (6) After setting all of the items, push the ▲ or ▼ key, and move the cursor to the ”OK”. (7) Push the ↵/PHASE key, and clock setting changed.Note2 (8) 2-2 will be displayed. (9) When to exit the clock setup, push the ＋ or － key, and move the cursor to the ”OK”, and push the ↵/PHASE key.(If select the ”Cancel”, return to 1-1) (10) After completing the settings saving, and 1-1 will be displayed.	[Year]：00⇔01⇔02⇔…⇔**13**⇔…⇔99⇔ [Month]：**01**⇔02⇔03⇔04⇔…⇔12⇔ [Day]：**01**⇔02⇔…⇔29⇔30⇔31⇔ [Hour]：**00**⇔01⇔…⇔12⇔13⇔…23⇔ [Minute]：**00**⇔01⇔…⇔59⇔ Note 1：The setting range of the day changes with setting in the year and the month. Note 2：It becomes “00” second when the timing of pushing the ↵/PHASE key at the clock setup screen. Note 3：The logging data stored in EMU4-LM is deleted if clock setting is changed. Measured data stored in SD card is not deleted.

*If you change a setting, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.
*Setup value is stored in Logging unit (EMU4-LM).

6.3.7 Display setup－Setup about display such as LCD contrast or backlight lighting pattern.

1 Transition to the setup mode

Screen	Operation	Note
1-1. [Setup] 4 Logging 5 Cloock 6 Display ▲▼	(1) Push the SETUP key in operation mode. (2) 1-1 will be displayed.	
	(1) Confirm that the cursor focuses the “6 Display, push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Setup the LCD contrast

Screen	Operation	Note
2-1. [Display] 1 Contrast 2 Backlight 0 Back	(1) In 2-1, push the ▲ or ▼ key, and move the cursor to the “1 Contrast”. (2) Push the ↵/PHASE key. (3)2-2 will be displayed.	[Contrast]: ■□□□□□□□⇔ ■■□□□□□□⇔ ■■■□□□□□⇔ ■■■■□□□□⇔ ■■■■■□□□⇔ ■■■■■■□□⇔ ■■■■■■■□⇔ ■■■■■■■■ Pale ⇕ Dark
2-2. [Contrast] －■■■■□□□□＋	(1) Push the ＋ or － key, and change the LCD contrast value. (2) Push the ↵/PHASE key. (3) 2-1 will be displayed.	

3 Setup the backlight

Screen	Operation	Note
3-1. [Display] 1 LCD 2 Backlight 0 Back	(1) In 3-1, push the ▲ or ▼ key, and move the cursor to the “2 Backlight”. (2) Push the ↵/PHASE key. (3) 3-2 will be displayed.	Auto OFF…If 5 minutes have passed since the last key operation, backlight will be OFF automatically. There are any key operation, backlight will be lighted again. Always ON…Backlight is always lighted.
3-2. [Backlight] Auto OFF Always On	(1) Push the ▲ or ▼ key, and select the backlight condition. (Auto OFF/ Always ON) (2) Push the ↵/PHASE key. (3) 3-1 will be displayed.	

4 Save the settings

Screen	Operation	Note
4-1. Quit Setup 1 Save 2 Not Save 3 Cancel	(1) After setting all of the items, push the SETUP key. (2) 4-1 will be displayed. (3) When save the settings, push the ▲ or ▼ key, move the cursor to the “1 Save”, and Push the ↵/PHASE key. (4) After completing the settings saving, “Completed” message will be displayed. Push the ↵/PHASE key. (5) Return to the operation mode, and it will be displayed electric energy screen.	1 Save → Save settings and return to the operation mode. 2 Not Save → Discard the changes and return to the operation mode. 3 Cancel →Continue the setup.

*If you change a setting, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.
* Setup value is stored in Display unit (EMU4-D65).
*If you want to set the other circuit, push the CIRCUIT key on the “Setup” screen (1-1), select the circuit, make the setting.

6.3.8 F/W VER. setup－Display the F/W Version of Energy Measuring Unit.

1 Transition to the setup mode

Screen	Operation	Note
1-1. [Setup] 5 Cloock 6 Display 7 F/W VER. ▲▼	(1) Push the SETUP key in operation mode. (2) 1-1 will be displayed.	
	(1) Confirm that the cursor focuses the “7 F/W VER.”, push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Display the F/W version

Screen	Operation	Note
2-1. [F/W VER.] 1.00 MODEL: EMU4-BM1-MB	(1) Transition to the following screen by push the specific key push. Push the ↵/PHASE key → To 1-1 Push the CIRCUIT key → To 2-1(defferent circuit) Push the ▲ or ▼ key → To 2-2	Display the model and F/W Version of energy measurement unit that is connected. *In ver.1.05：2-2 is not displayed, when push ▲ or ▼ keys.
2-2. [F/W VER.] 2.00 MODEL: EMU4-D65	(1) Transition to the following screen by push the specific key push. Push the ↵/PHASE key → To 1-1 Push the CIRCUIT key → To 2-1	Display the model and F/W Version of display unit. *In ver.1.05：2-2 is not displayed.

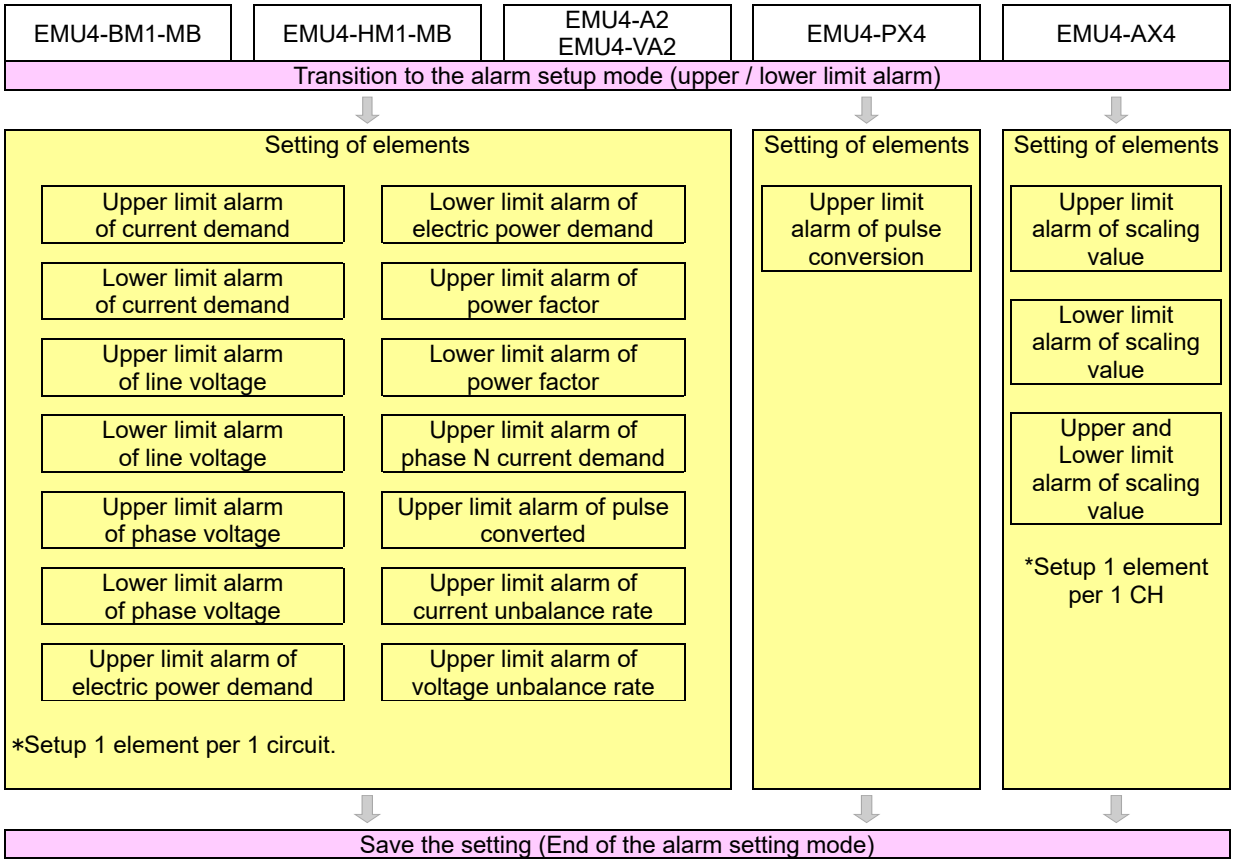
6.4 Alarm setup mode

6.4.1 Flow of alarm setting

"(1)Upper/Lower limit alarm", "(2)Leak current alarm" is setup when connected to EMU4-** in alarm setting.

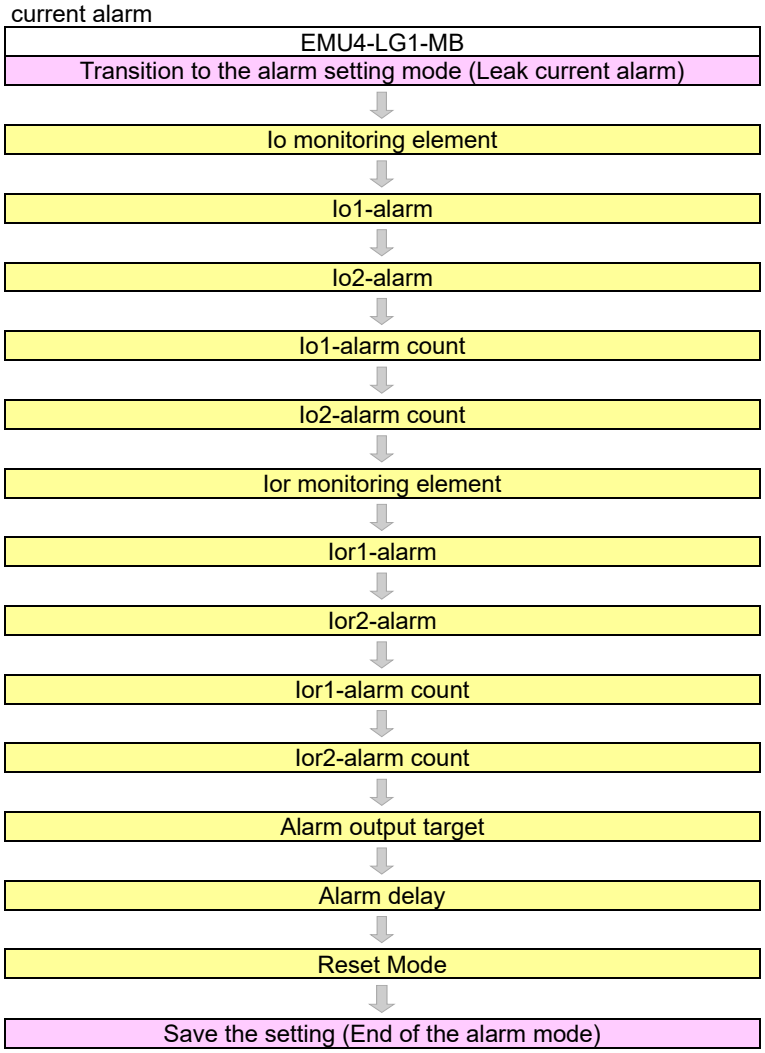
(1) Upper/Lower limit alarm

Setting for the Upper/Lower alarm of current, voltage, electric power and power factor in MU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2, EMU4-PX4 and EMU4-AX4.(☛6.4.2 Setup the upper/lower limit alarm.



(2) Leak current alarm

The settings for the limit alarm of the Leak current Io, Ior EMU4-LG1-MB only.☛6.4.3 Setup the monitoring leak current alarm



6.4.2 Setup the upper/lower limit alarm condition

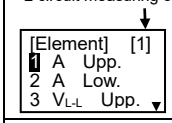
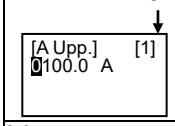
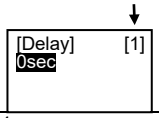
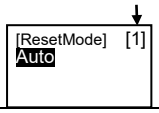
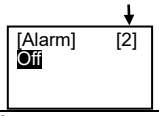
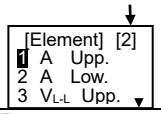
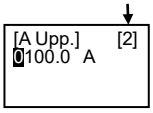
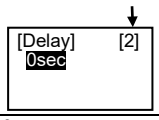
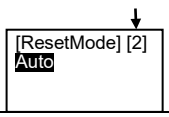
Setup the upper/lower limit alarm condition. Setup in EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2, EMU4-PX4 and EMU4-AX4.

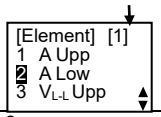
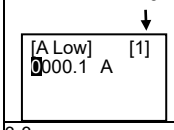
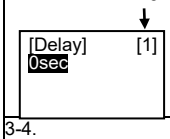
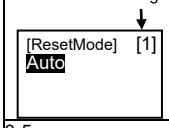
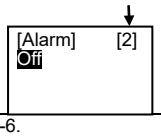
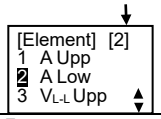
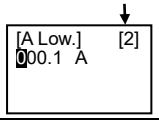
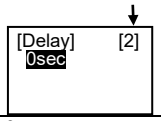
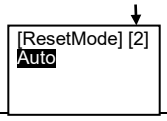
1(1) Transition to the Alarm setup mode (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)

Screen	Operation	Note
1(1)-1. [Alarm Set.] **1** Limit 2 Io/Ior	(1) Push the SETUP key in alarm mode. (2) 1(1)-1 will be displayed. (1) Push the confirm the cursor on the "1 Limit" ↵/PHASE key. (2) 1(1)-2 will be displayed.	Push simultaneous ▲ ▼ key, and transition from in operation mode to alarm mode.
1(1)-2. 2 circuit measuring only ↓ [Alarm] [1] **Off**	(1) Push the + or − key, and select alarm existence. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Off] setting → To 1(1)-1 Note 1 [On] setting → To 1(1)-3	[Demand]**Off**⇔On⇔ Note 1 : For 1P2W (with 2 circuit measurement), the screen for selecting whether or not to monitor the alarm for the 2nd circuit is displayed.
1(1)-3. 2 circuit measuring only ↓ [Elements] [1] **1** A upp. 2 A low. 3 V_{L-L} Upp. 4 V_{L-L} Low. 5 V_{L-N} Upp. 6 V_{L-N} Low. 7 W Upp. 8 W Low. 9 PF Upp. 10PF Low. 11A_N Upp. 12 PLS.Upp. 13UNB.A Upp. 14UNB.V Low. 0 Back	A upper alarm → To 2 A lower alarm→ To 3 V_{L-L} upper alarm→ To 4 V_{L-L} lower alarm→ To 5 V_{L-N} upper alarm→ To 6 V_{L-N} lower alarm→ To 7 W upper alarm→ To 8 W lower alarm→ To 9 PF upper alarm→ To 10 PF lower alarm→ To 11 A_N upper alarm→ To 12 PULSE upper alarm→ To 13 UNB.A upper alarm→ To 14 UNB.V upper alarm→ To 15	*When monitoring the upper and lower limit alarm of the voltage with the phase wire system 1P3W, set with "VL-L upper alarm" and "VL-L lower alarm".

1(2) Transition to the Alarm setup mode (EMU4-PX4, EMU4-AX4)

Screen	Operation	Note
1(2)-1. [Alarm Set.] **1** Limit 2 Io/Ior	(1) Push the SETUP key in alarm mode. (2) 1(2)-1 will be displayed. (1) Push the confirm the cursor on the "1 Limit" ↵/PHASE key. (2) Transition to the following screen by the model. Model : EMU4-PX4 → To 13 Model : EMU4-AX4 → To 16	Push simultaneous ▲ ▼ key, and transition from in operation mode to alarm mode.

2 Setup the upper limit alarm (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operate	Note
2-1. 2 circuit measuring only 	(1) In 2-1, Push the ▲ or ▼ key, and move the cursor to the "1 A Upp.". (2) Push the ↵/PHASE key. (3) 2-2 will be displayed.	
2-2. 2 circuit measuring only 	(1) Push the ▲ ▼ + − key, and change the current upper limit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-3 will be displayed.	[A Upp.] : 0 to 120% of primary current (**100%**) *The minimum step of settable value is varies by primary current. Less than 40A Step: 0.01A 40A or more and less than 400A Step: 0.1A 400A or more and less than 4000A Step: 1A 4000A or more Step: 10A
2-3. 2 circuit measuring only 	(1) Push the + or − key, and select the alarm delay time. (2) Push the ↵/PHASE key. (3) 2-4 will be displayed.	[Delay]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
2-4. 2 circuit measuring only 	(1) Push the + or − key, and select the reset mode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting wiring type. 2 circuit measurement → To 2-5 Non-2 circuit measurement → To 1(1)-1	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)
2-5. 2 circuit measuring only 	(1) Push the + or − key, and select the alarm existence of second circuit. (2) Push the ↵/PHASE key. (3) Transition to the following screen by setting the alarm existence. [Off] setting → To 1(1)-1 [On] setting → To 2-6	[Alarm]:**Off**⇔On⇔
2-6. 2 circuit measuring only 	(1) In 2-6, Push the ▲ or ▼ key, and move the cursor to the "1 A Upp.". (2) Push the ↵/PHASE key. (3) 2-7 will be displayed.	
2-7. 2 circuit measuring only 	(1) Push the ▲ ▼ + − key, and change the current upper limit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-8 will be displayed.	[A Upp.] : 0 to 120% of primary current (**100%**) *The minimum step of settable value is varies by primary current. Less than 40A Step: 0.01A 40A or more and less than 400A Step: 0.1A 400A or more and less than 4000A Step: 1A 4000A or more Step:10A
2-8. 2 circuit measuring only 	(1) Push the + or − key, and select the alarm delay time of second circuit. (2) Push the ↵/PHASE key. (3) 2-9 will be displayed.	[Delay]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
2-9. 2 circuit measuring only 	(1) Push the + or − key, and select the reset mode of second circuit. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

3 Setup the lower limit alarm (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operate	Note
3-1 2 circuit measuring only 	(1) In 3-1, push the ▲ or ▼ key and move the cursor to the "2 A Low.". (2) Push the ↵/PHASE key. (3) 3-2 will be displayed.	
3-2. 2 circuit measuring only 	(1) Push the ▲ ▼ + − key, and change the current lower limit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 3-3 will be displayed.	[ALow]: 0 to 120% of primary current (**0%**) *The minimum step of settable value is varies by primary current. Less than 40A Step: 0.01A 40A or more and less than 400A Step: 0.1A 400A or more and less than 4000A Step: 1A 4000A or more Step: 10A
3-3. 2 circuit measuring only 	(1) Push the + or − key, and select the alarm delay time. (2) Push the ↵/PHASE key. (3) 3-4 will be displayed.	[Delay]: **0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
3-4. 2 circuit measuring only 	(1) Push the + or − key, and select the reset mode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting wiring type. 2 circuit measurement → To 3-5 Non-2 circuit measurement → To 1(1)-1	[ResetMode]: **Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)
3-5. 2 circuit measuring only 	(1) Push the + or − key, and select the alarm existence of second circuit. (2) Push the ↵/PHASE key. (3) Transition to the following screen by setting the alarm existence. [Off] setting → To 1(1)-1 [On] setting → To 3-6	[Alarm]: **Off**⇔On⇔
3-6. 2 circuit measuring only 	(1) In 3-6, Push the ▲ or ▼ key, and move the cursor to the "2 A Low.". (2) Push the ↵/PHASE key. (3) 3-7 will be displayed.	
3-7. 2 circuit measuring only 	(1) Push the ▲ ▼ + − key, and change the current lower limit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 3-8 will be displayed.	[ALow]: 0 to 120% of primary current (**0%**) *The minimum step of settable value is varies by primary current. Less than 40A Step: 0.01A 40A or more and less than 400A Step: 0.1A 400A or more and less than 4000A Step: 1A 4000A or more Step:10A
3-8. 2 circuit measuring only 	(1) Push the + or − key, and select the alarm delay time of second circuit. (2) Push the ↵/PHASE key. (3) 3-9 will be displayed.	[Delay]: **0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
3-9. 2 circuit measuring only 	(1) Push the + or − key, and select the reset mode of second circuit. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]: **Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

4 Setup the upper /lower limit alarm line voltage (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
4-1. 2 circuit measuring only ↓ [Element] [1] 1 A Upp. 2 A Low. 3 V_{L-L} Upp. ▲▼	(1) In 4-1, Push the ▲ or ▼ key, and move the cursor to the" 3 VL-Upp.". (2) Push the ↵/PHASE key. (3) 4-2 will be displayed.	
4-2. 2 circuit measuring only ↓ [V_{L-L}Upp.] [1] 000242 V	(1) Push the ▲ ▼ + - key, and change the upper limit value of line voltage. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 4-3 will be displayed.	[V_{L-L} Upp.]:0 ≦primary voltage≦100%×15/11 (**110% of primary voltage**) The minimum step of settable value is varied by primary voltage. Less than 300V Step: 0.1V 300V or more and less than 3000V Step: 1V 3000V or more Step: 10V *For phase wire system 1P3W, set the voltage value to a voltage of 1-2 or 2-3.
4-3. 2 circuit measuring only ↓ [Delay] [1] 0sec	(1) Push the + or - key, and select the delay. (2) Push the ↵/PHASE key. (3) 4-4 will be displayed.	[Delay]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
4-4. 2 circuit measuring only ↓ [Reset Mode] [1] Auto	(1) Push the + or - key, and select the Reset Mode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the selection of wiring type. 2 circuit measurement → To 4-5 Non-2 circuit measurement → To 1-1	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)
4-5. 2 circuit measuring only ↓ [Alarm] [2] Off	(1) Push the + or - key, select the alarm existence of second circuit. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting the alarm existence. [Off] setting → To 1(1)-1 [On] setting → To 4-6	[Alarm]:**Off**⇔On⇔
4-6. 2 circuit measuring only ↓ [Element] [2] 1 A Upp. 2 A Low. 3 V_{L-L} Upp. ▲▼	(1) In 4-6, push the ▲ or ▼ key, and move the cursor to the "3 V_{L-L} Upp.". (2) Push the ↵/PHASE key. (3) 4-7 will be displayed.	
4-7. 2 circuit measuring only ↓ [V_{L-L} Upp.] [2] 000242 V	(1) Push the ▲ ▼ + - key, and change the Upper limit value of line Voltage. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 4-8 will be displayed.	[V_{L-L} Upp.]:0≦Primary voltage≦100%×15/11 (**110% of primary voltage**) The minimum step of settable value is varied by primary voltage. Less than 300V Step: 0.1V 300V or more and less than 3000V Step: 1V 3000V or more Step: 10V
4-8. 2 circuit measuring only ↓ [Delay] [2] 0sec	(1) Push the + or - key, and the alarm delay time. (2) Push the ↵/PHASE key. (3) 4-9 will be displayed.	[Delay]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
4-9. 2 circuit measuring only ↓ [Reset Mode] [2] Auto	(1) Push the + or - key, and select the Reset Mode. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

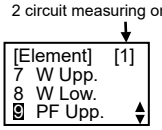
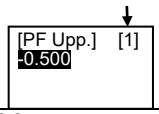
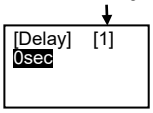
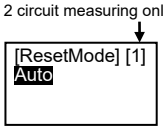
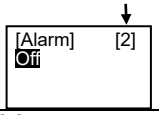
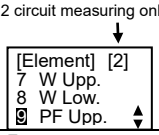
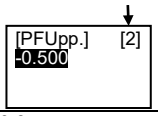
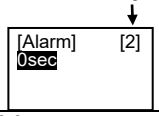
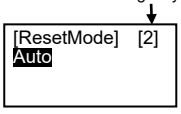
5 Setup the lower limit alarm line voltage (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
5-1. 2 circuit measuring only ↓ [Element] [1] 2 A Low. 3 V_{L-L} Upp. 4 V_{L-L} Low. ▲▼	(1) In 5-1, Push the ▲ or ▼ key, and move the cursor to the" 4 V_{L-L} Low.". (2) Push the ↵/PHASE key. (3) 5-2 will be displayed.	
5-2. 2 circuit measuring only ↓ [V_{L-L} Upp.] [1] 000085 V	(1) Push the ▲ ▼ + − key, and change the upper limit value of line voltage. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 5-3 will be displayed.	[V_{L-L} Low.]:0 ≦primary voltage≦100%×15/11 (**0% of primary voltage**) The minimum step of settable value is varied by primary voltage. Less than 300V Step: 0.1V 300V or more and less than 3000V Step: 1V 3000V or more Step: 10V *For phase wire system 1P3W, set the voltage value to a voltage of 1-2 or 2-3.
5-3. 2 circuit measuring only ↓ [Delay] [1] 0sec	(1) Push the + or − key, and select the delay. (2) Push the ↵/PHASE key. (3) 5-4 will be displayed.	[Delay]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
5-4. 2 circuit measuring only ↓ [Reset Mode] [1] Auto	(1) Push the + or − key, and select the Reset Mode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the selection of wiring type. 2 circuits measurement → To 5-5 Non-2 circuits measurement → To 1(1)-1	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)
5-5. 2 circuit measuring only ↓ [Alarm] [2] Off	(1) Push the + or − key, select the alarm existence of second circuit. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting the alarm existence. [Off] setting → To 1(1)-1 [On] setting → To 5-6	[Alarm]:**Off**⇔On⇔
5-6. 2 circuit measuring only ↓ [Element] [2] 2 A Low. 3 V_{L-L} Upp. 4 V_{L-L} Low. ▲▼	(1) In 5-6, push the ▲ or ▼ key, and move the cursor to the "4 V_{L-L} Low.". (2) Push the ↵/PHASE key. (3) 5-7 will be displayed.	
5-7. 2 circuit measuring only ↓ [V_{L-L} Low.] [2] 000085 V	(1) Push the ▲ ▼ + − key, and change the lower limit value of line Voltage. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 5-8 will be displayed.	[V_{L-L} Low.]:0≦Primary voltage≦100%×15/11 (**0% of primary voltage**) The minimum step of settable value is varied by primary voltage. Less than 300V Step: 0.1V 300V or more and less than 3000V Step: 1V 3000V or more Step: 10V
5-8. 2 circuit measuring only ↓ [Delay] [2] 0sec	(1) Push the + or − key, and the alarm delay time. (2) Push the ↵/PHASE key. (3) 5-9 will be displayed.	[Delay]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
5-9. 2 circuit measuring only ↓ [Reset Mode] [2] Auto	(1) Push the + or − key, and select the Reset Mode. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

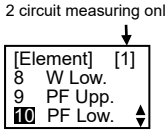
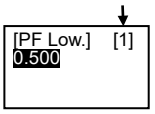
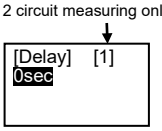
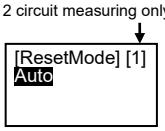
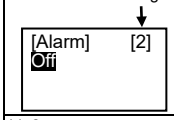
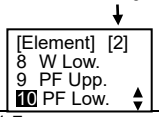
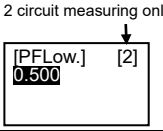
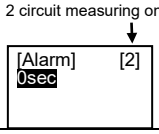
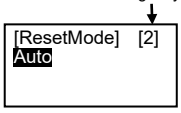
6 Setup the upper limit phase voltage (EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
6-1. [Element] 3 V_{L-L}Upp. 4 V_{L-L}Low. 5 V_{L-N}Upp. ▲▼	(1) In 6-1 push ▲ or ▼ key, and move the cursor to the "5 V_{L-N}Upp.". (2) Push the ↵/PHASE key. (3) 6-2 will be displayed.	
6-2. [V_{L-N}Upp.] 000242 V	(1) Push the ▲ ▼ + − key, and change the V_{L-N}Upp. Value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 6-3 will be displayed.	[V_{L-N} Upp]: 0≦Primary voltage≦100%×15/11 (**110% of primary voltage**) The minimum unit of settable value is varied by primary voltage. Less than 300V Step: 0.1V 300V or more and less than 3000V Step: 1V 3000V or more Step: 10V
6-3. [Delay] 0sec	(1) Push the + or − key, and select the delay time. (2) Push the ↵/PHASE key. (3) 6-4 will be displayed.	[Delay]: **0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
6-4. [ResetMode] Auto	(1) Push the + or − key, and select the Resetmode. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]: **Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

7 Setup the lower limit phase voltage (EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
7-1. [Element] 4 V_{L-L} Low. 5 V_{L-N} Upp. 6 V_{L-N} Low. ▲▼	(1) In 7-1, push the ▲ or ▼ key, and move the cursor to the "6 V_{L-N} Low.". (2) Push the ↵/PHASE key. (3) 7-2 will be displayed.	
7-2. [V_{L-N} Upp.] 000085 V	(1) Push the ▲ ▼ + − key, and change the V_{L-N} Low.. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 7-3 will be displayed.	[V_{L-N} Low]: 0≦Primary voltage≦100%×15/11 (**0% of primary voltage**) The minimum step of settable value is varied by primary voltage. Less than 300V Step: 0.1V 300V or more and less than 3000V Step: 1V 3000V or more Step: 10V
7-3. [Delay] 0sec	(1) Push the + or − key, and select the delay. (2) Push the ↵/PHASE key. (3) 7-4 Will be displayed.	[Delay]: **0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
7-4. [ResetMode] Auto	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]: **Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

8 Setup the Upper demand electric energy (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
8-1. 2 circuit measuring only ↓ [Element] [1] 5 V_{L-N} Upp. 6 V_{L-N} Low. 7 W Upp. ▲▼	(1) In 8-1, push the ▲ or ▼ key, and move the cursor to the "7 W Upp.". (2) Push the ↵/PHASE key. (3) 8-2 will be displayed.	
8-2. 2 circuit measuring only ↓ [W Upp.] [1] 001000 kW	(1) Push the ▲ ▼ + − key, and change the W Upp.. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 8-3 will be displayed.	[W Upp]: -120≦Full load≦120% (**100% of full load**) The minimum unit of settable value is varies by full load (Wfull). Wfull < 12kW Step: 0.001kW 12kW ≤ Wfull < 120kW Step: 0.01kW 120kW ≤ Wfull < 1200kW Step: 0.1kW 1200kW ≤ Wfull < 12000kW Step: 1kW 12000kW ≤ Wfull < 120000kW Step: 10kW 120000kW ≤ Wfull Step: 100kW
8-3. 2 circuit measuring only ↓ [Delay] [1] 0sec	(1) Push the + or − key, and select the Delay (2) Push the ↵/PHASE key. (3) 8-4 will be displayed.	[Delay]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
8-4. 2 circuit measuring only ↓ [Resetmode] [1] Auto	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting wiring type. 2 circuit measurement → To 8-5 Non-2 circuit measurement → To 1(1)-1	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)
8-5. 2 circuit measuring only ↓ [Alarm] [2] Off	(1) Push the + or − key, and select alarm existence of second circuit. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Off] setting → To 1(1)-1 [On] setting → To 8-1	[Alarm]:**Off**⇔On⇔
8-6. 2 circuit measuring only ↓ [Element] [2] 5 V_{L-N} Upp. 6 V_{L-N} Low. 7 W Upp. ▲▼	(1) In 8-6, push the ▲ or ▼ key, and move the cursor to the "7 W .Upp.". (2) Push the ↵/PHASE key. (3) 8-7 will be displayed.	
8-7. 2 circuit measuring only ↓ [W Low.] [2] 001000 kW	(1) Push the ▲ ▼ + − key, and change the W Low. value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 8-8 will be displayed.	[W Upp]: -120≦Full load≦120% (**100% of full load**) The minimum unit of settable value is varies by full load (Wfull). Wfull < 12kW Step: 0.001kW 12kW ≤ Wfull < 120kW Step: 0.01kW 120kW ≤ Wfull < 1200kW Step: 0.1kW 1200kW ≤ Wfull < 12000kW Step: 1kW 12000kW ≤ Wfull < 120000kW Step: 10kW 120000kW ≤ Wfull Step: 100kW
8-8. 2 circuit measuring only ↓ [Alarm] [2] 0sec	(1) Push the + or − key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 8-9 will be displayed.	[Alarm]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
8-9. 2 circuit measuring only ↓ [ResetMode] [2] Auto	(1) Push the + or − key, and select the ResetMode (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

9 Setup the Lower demand electric energy (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
9-1 2 circuit measuring only ↓ [Element] [2] 6 V_{L-N} Low. 7 W Upp. 8 W Low. ▲▼	(1) In 9-1, push the ▲ or ▼ key, and move the cursor to the "8 W Low.". (2) Push the ↵/PHASE key. (3) 9-2 will be displayed.	
9-2 2 circuit measuring only ↓ [W Low.] [1] 000010 kW	(1) Push the ▲ ▼ + − key, and change the W Low.. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 9-3 will be displayed.	[W Low]: -120≦Full load≦120% (**0% of full load**) The minimum unit of settable value is varies by full load (Wfull). Wfull < 12kW Step: 0.001kW 12kW ≤ Wfull < 120kW Step: 0.01kW 120kW ≤ Wfull < 1200kW Step: 0.1kW 1200kW ≤ Wfull < 12000kW Step: 1kW 12000kW ≤ Wfull < 120000kW Step: 10kW 120000kW ≤ Wfull Step: 100kW
9-3 2 circuit measuring only ↓ [Delay] [1] 0sec	(1) Push the + or − key, and select the Delay (2) Push the ↵/PHASE key. (3) 9-4 will be displayed.	[Delay]: **0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
9-4 2 circuit measuring only ↓ [Resetmode] [1] Auto	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting wiring type. 2 circuit measurement → To 9-5 Non-2 circuit measurement → To 1(1)-1	[ResetMode]: **Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)
9-5 2 circuit measuring only ↓ [Alarm] [2] Off	(1) Push the + or − key, and select alarm existence of second circuit. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Off] setting → To 1(1)-1 [On] setting → To 9-6	[Alarm]: **Off**⇔On⇔
9-6 2 circuit measuring only ↓ [Element] [2] 6 V_{L-N} Low. 7 W Upp. 8 W Low. ▲▼	(1) In 9-6, push the ▲ or ▼ key, and move the cursor to the "8 W Low". (2) Push the ↵/PHASE key. (3) 9-7 will be displayed.	
9-7 2 circuit measuring only ↓ [W Low.] [2] 000010 kW	(1) Push the ▲ ▼ + − key, and change the W Low. value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 9-8 will be displayed.	[W Low]: -120≦Full load≦120% (**0% of full load**) The minimum unit of settable value is varies by full load (Wfull). Wfull < 12kW Step: 0.001kW 12kW ≤ Wfull < 120kW Step: 0.01kW 120kW ≤ Wfull < 1200kW Step: 0.1kW 1200kW ≤ Wfull < 12000kW Step: 1kW 12000kW ≤ Wfull < 120000kW Step: 10kW 120000kW ≤ Wfull Step: 100kW
9-8 2 circuit measuring only ↓ [Alarm] [2] 0sec	(1) Push the + or − key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 9-9 will be displayed.	[Alarm]: **0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
9-9 2 circuit measuring only ↓ [ResetMode] [2] Auto	(1) Push the + or − key, and select the ResetMode (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]: **Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

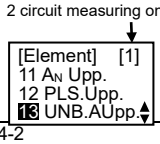
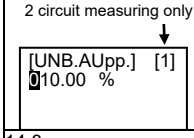
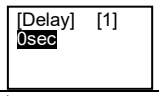
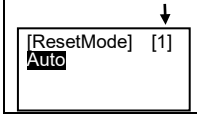
10 Setup the upper limit power factor (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
10-1 2 circuit measuring only 	(1) In 10-1, push the ▲ or ▼ key, and move the cursor to the "9 PFUpp.". (2) Push the ↵/PHASE key. (3) 10-2 will be displayed.	
10-2 2 circuit measuring only 	(1) Push the ▲ ▼ + − key, and change the PF upper limit. (2) Push the ↵/PHASE key, and confirm the setting value and, confirm the setting value. (3) 10-3 will be displayed.	[PF Upp.]:-0.050⇔-0.100⇔…⇔-0.950⇔1.000⇔ 0.950⇔…⇔0.100⇔0.050⇔ (**-0.500**)
10-3 2 circuit measuring only 	(1) Push the + or − key, and select the delay time (2) Push the ↵/PHASE key. (3) 10-4 will be displayed.	[Alarm]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
10-4 2 circuit measuring only 	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting wiring type. 2 circuit measurement → To 10-5 Non-2 circuit measurement → To 1(1)-1	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)
10-5 2 circuit measuring only 	(1) Push the + or − key, and select alarm existence of second circuit. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Off] setting → To 1(1)-1 [On] setting → To 10-6	[Alarm]:**Off**⇔hold⇔
10-6 2 circuit measuring only 	(1) In 10-6, push the ▲ or ▼ key, and move the cursor "9 PFUpp.". (2) Push the ↵/PHASE key. (3) 10-7 will be displayed.	
10-7 2 circuit measuring only 	(1) Push the ▲ ▼ + − key, and change the PF Upp. (2) Push the ↵/PHASE key, and, confirm the setting value. (3) 10-8 will be displayed.	[PFUpp.]:-0.050⇔-0.100⇔…⇔-0.950⇔1.000⇔ 0.950⇔…⇔0.100⇔0.050⇔ (**-0.500**)
10-8 2 circuit measuring only 	(1) Push the + or − key, and select the alarm time. (2) Push the↵/PHASE key. (3) 10-9 will be displayed.	[Alarm]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
10-9 2 circuit measuring only 	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3)

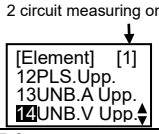
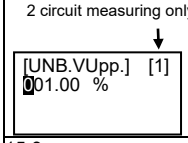
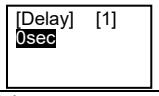
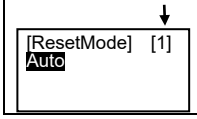
11 Setup the upper limit power factor (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
11-1 2 circuit measuring only 	(1) In 11-1, push the ▲ or ▼ key, and move the cursor to the “10 PFLow.”. (2) Push the ↵/PHASE key. (3) 11-2 will be displayed.	
11-2 2 circuit measuring only 	(1) Push the ▲ ▼ + − key, and change the PF lower limit. (2) Push the ↵/PHASE key, and confirm the setting value and, confirm the setting value. (3) 11-3 will be displayed.	[PF Low.]:-0.050⇔-0.100⇔…⇔-0.950⇔1.000⇔ 0.950⇔…⇔0.100⇔0.050⇔ (**0.500**)
11-3 2 circuit measuring only 	(1) Push the + or − key, and select the delay time (2) Push the ↵/PHASE key. (3) 11-4 will be displayed.	[Alarm]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
11-4 2 circuit measuring only 	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting wiring type. 2 circuit measurement → To 11-5 Non-2 circuit measurement → To 1(1)-1	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)
11-5 2 circuit measuring only 	(1) Push the + or − key, and select alarm existence of second circuit. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Off] setting → To 1(1)-1 [On] setting → To 11-6	[Alarm]:**Off**⇔hold⇔
11-6 2 circuit measuring only 	(1) In 10-6, push the ▲ or ▼ key, and move the cursor “10 PFLow.”. (2) Push the ↵/PHASE key. (3) 11-7 will be displayed.	
11-7 2 circuit measuring only 	(1) Push the ▲ ▼ + − key, and change the PF Low. (2) Push the ↵/PHASE key, and, confirm the setting value. (3) 11-8 will be displayed.	[PFLow.]:-0.050⇔-0.100⇔…⇔-0.950⇔1.000⇔ 0.950⇔…⇔0.100⇔0.050⇔ (**0.500**)
11-8 2 circuit measuring only 	(1) Push the + or − key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 11-9 will be displayed.	[Alarm]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
11-9 2 circuit measuring only 	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

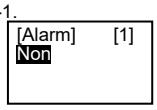
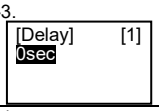
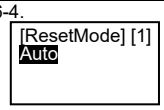
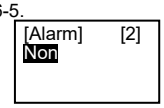
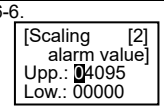
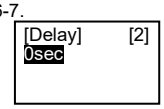
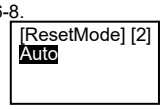
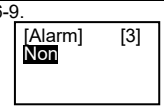
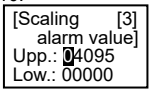
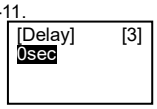
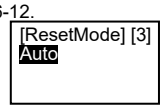
12 Setup the upper limit alarm N phase demand current (EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
12-1. [Element] 9 PF Upp. 10 PFLow. 11 A_N Upp.	(1) In 12-1, push the ▲ or ▼ key, and move the cursor to the "11 A_N Upp.". (2) Push the ↵/PHASE key. (3) 12-2.will be displayed.	∗Only setup in 3P4W
12-2. [A_N Upp.] 00100 A	(1) Push the ▲ ▼ + − key, and change the N-phase current upper limit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 12-3 will be displayed.	[A_N Upp.]: 0≦Primary current≦120% (**100% of primary current**)
12-3. [Alarm] 0sec	(1) Push the + or − key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 12-4 will be displayed.	[Alarm]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
12-4. [ResetMode] Auto	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3)

13(1) Setup the upper limit alarm pulse converted value (EMU4-HM1-MB)		
Screen	Operation	Note
13(1)-1 2 circuit measuring only ↓ [Element] [1] 10 PF Low. 11 A_N Upp. 12 PLS. Upp.	(1) In 13(1)-1, push the ▲ or ▼ key, and move the cursor to the "12 PLS. Upp.". (2) Push the ↵/PHASE key. (3) 13(1)-2 will be displayed.	
13(1)-2 2 circuit measuring only ↓ [PLS.Upp.] [1] 100.000	(1) Push the ▲ ▼ + − key, and change the Pulse upper limit. (2) Push the ↵/PHASE key, and, confirm the setting value. (3) 13(1)-3 will be displayed.	[PLS.Upp.]: 1 to 999.999(**100.000**)
Tubo-fukuyama@09	(1) Push the + or − key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 13(1)-4 will be displayed.	[Alarm]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
13(1)-4 2 circuit measuring only ↓ [ResetMode] [1] Auto	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting wiring type. 2 circuit measurement → 13(1)-5 Non-2 circuit measurement → 1(1)-1	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)
13(1)-5 2 circuit measuring only ↓ [Alarm] [2] Off	(1) Push the + or − key, and select the alarm existence of second circuit. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Off] setting → 1(1)-1 [On] setting → 13(1)-6	[Alarm]:**Off**⇔On⇔
13(1)-6 2 circuit measuring only ↓ [Element] [1] 10 PF Low. 11 A_N Upp. 12 PLS.Upp.	(1) In 9-6, push the ▲ or ▼ key, and move the cursor to the "12 PLS.Upp." (2) Push the ↵/PHASE key. (3) 13(1)-7 will be displayed.	
13(1)-7 2 circuit measuring only ↓ [PLS.Upp.] [2] 100.000	(1) Push the ▲ ▼ + − key, and change the pulse upper limit. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 13(1)-8 will be displayed.	[PLS.Upp]:1～999999(**100000**)
13(1)-8 2 circuit measuring only ↓ [Delay] [2] 0sec	(1) Push the + or − key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 13(1)-9 will be displayed.	[Alarm]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
13(1)-9 2 circuit measuring only ↓ [ResetMode] [2] Auto	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[RsetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. ((Release alarm ☛6.8.3 Release alarm)

13(2) Setup the upper limit alarm pulse converted value (EMU4-PX4 only)		
Screen	Operation	Note
13(2)-1 [Alarm] [1] Off	(1) Push the ⊞ or ⊟ key, and select the alarm existence. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Off] setting → To 13(2)-3 [On] setting → To 13(2)-2	[Alarm]:**Off**⇔On⇔ *If input setting value is set to anything other than pulse, this CH is not displayed.
13(2)-2 [PLS.Upp.] [1] 10000.0 x10	(1) Push the ▲ ▼ ⊞ ⊟ key, and change the Pulse upper limit. (2) Push the ↵/PHASE key, and, confirm the setting value. (3) 13(2)-3 will be displayed.	[PLS.Upp.]:0.1 to 99999.9(**10000.0**)
13(2)-3 [Alarm] [2] Off	(1) Push the ⊞ or ⊟ key, and select the alarm existence. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Off] setting → To 13(2)-5 [On] setting → To 13(2)-4	[Alarm]:**Off**⇔On⇔ *If input setting value is set to anything other than pulse, this CH is not displayed.
13(2)-4 [PLS.Upp.] [2] 10000.0 x10	(1) Push the ▲ ▼ ⊞ ⊟ key, and change the Pulse upper limit. (2) Push the ↵/PHASE key, and, confirm the setting value. (3) 13(2)-5 will be displayed.	[PLS.Upp.]:0.1 to 99999.9(**10000.0**)
13(2)-5 [Alarm] [3] Off	(1) Push the ⊞ or ⊟ key, and select the alarm existence. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Off] setting → To 13(2)-7 [On] setting → To 13(2)-6	[Alarm]:**Off**⇔On⇔ *If input setting value is set to anything other than pulse, this CH is not displayed.
13(2)-6 [PLS.Upp.] [3] 10000.0 x10	(1) Push the ▲ ▼ ⊞ ⊟ key, and change the Pulse upper limit. (2) Push the ↵/PHASE key, and, confirm the setting value. (3) 13(2)-7 will be displayed.	[PLS.Upp.]:0.1 to 99999.9(**10000.0**)
13(2)-7 [Alarm] [4] Off	(1) Push the ⊞ or ⊟ key, and select the alarm existence. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Off] setting → To 13(2)-9 [On] setting → To 13(2)-8	[Alarm]:**Off**⇔On⇔ *If input setting value is set to anything other than pulse, this CH is not displayed.
13(2)-8 [PLS.Upp.] [4] 10000.0 x10	(1) Push the ▲ ▼ ⊞ ⊟ key, and change the Pulse upper limit. (2) Push the ↵/PHASE key, and, confirm the setting value. (3) 13(2)-9 will be displayed.	[PLS.Upp.]:0.1 to 99999.9(**10000.0**)
13(2)-9 [Alarm target CH] Non	(1) Push the ⊞ or ⊟ key, and select the CH to output the alarm state from contact output terminals. (2) Push the ↵/PHASE key, and, confirm the setting value. (3) 1(2)-1 will be displayed.	[Alarm target CH]: **Non**⇔[1]⇔[2]⇔[3]⇔[4]⇔ *If alarm existence setting is set to off, this CH is not displayed.

14 Setup the upper limit alarm current unbalance rate (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
14-1 2 circuit measuring only 	(1) In 14-1, push the ▲ or ▼ key, and move the cursor to the “13 UNB.AUpp.”. (2) Push the ↵/PHASE key. (3) 14-2 will be displayed.	This can be set when the phase wire system is set to something other than 1P2W.
14-2 2 circuit measuring only 	(1) Push the ▲ ▼ + − key, and change the current unbalance rate. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 14-3 will be displayed.	[UNB.AUpp.]: 0.01 to 999.99%(**<u>30.00</u>**)
14-3 2 circuit measuring only 	(1) Push the + or − key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 14-4 will be displayed.	[Delay]: **<u>0sec</u>**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
14-4 2 circuit measuring only 	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]: **<u>Auto</u>**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3)

15 Setup the upper limit alarm voltage unbalance rate (EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2)		
Screen	Operation	Note
15-1 2 circuit measuring only 	(1) In 15-1, push the ▲ or ▼ key, and move the cursor to the “14 UNB.V Upp.”. (2) Push the ↵/PHASE key. (3) 15-2 will be displayed.	This can be set when the phase wire system is set to something other than 1P2W.
15-2 2 circuit measuring only 	(1) Push the ▲ ▼ + − key, and change the current unbalance rate. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 15-3 will be displayed.	[UNB.V upper]: 0.01 to 999.99%(**<u>3.00</u>**)
15-3 2 circuit measuring only 	(1) Push the + or − key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 15-4 will be displayed.	[Delay]: **<u>0sec</u>**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
15-4 2 circuit measuring only 	(1) Push the + or − key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 1(1)-1 will be displayed.	[ResetMode]: **<u>Auto</u>**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

16 Setup the limit alarm scaling value (EMU4-AX4 only)		
Screen	Operation	Note
16-1. 	(1) Push the ⊞ or ⊟ key, and select the alarm existence. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Non] setting → To 16-5 Other setting → To 16-2	[Alarm]: **Non**⇔Upp.⇔Low.⇔Upp.&Low.⇔
16-2. 	(1) Push the ▲ ▼ ⊞ ⊟ key, and change the scaling alarm value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 16-3 will be displayed.	[Scaling alarm value Upp.]: Scaling Low. to **Scaling Upp.** *If you set Scaling Upp.<Scaling Low., the default is Scaling Low. [Scaling alarm value Low.]: **Scaling Low.** to Scaling Upp. *If you set Scaling Upp.<Scaling Low., the default is Scaling Upp.
16-3. 	(1) Push the ⊞ or ⊟ key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 16-4 will be displayed.	[Delay]: **0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
16-4. 	(1) Push the ⊞ or ⊟ key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 16-5 will be displayed.	[ResetMode]: **Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3)
16-5. 	(1) Push the ⊞ or ⊟ key, and select the alarm existence. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Non] setting → To 16-9 Other setting → To 16-6	[Alarm]: **Non**⇔Upp.⇔Low.⇔Upp.&Low.⇔
16-6. 	(1) Push the ▲ ▼ ⊞ ⊟ key, and change the scaling alarm value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 16-7 will be displayed.	[Scaling alarm value Upp.]: Scaling Low. to **Scaling Upp.** *If you set Scaling Upp.<Scaling Low., the default is Scaling Low. [Scaling alarm value Low.]: **Scaling Low.** to Scaling Upp. *If you set Scaling Upp.<Scaling Low., the default is Scaling Upp.
16-7. 	(1) Push the ⊞ or ⊟ key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 16-8 will be displayed.	[Delay]: **0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
16-8. 	(1) Push the ⊞ or ⊟ key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 16-9 will be displayed.	[ResetMode]: **Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3)
16-9. 	(1) Push the ⊞ or ⊟ key, and select the alarm existence. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Non] setting → To 16-13 Other setting → To 16-10	[Alarm]: **Non**⇔Upp.⇔Low.⇔Upp.&Low.⇔
16-10. 	(1) Push the ▲ ▼ ⊞ ⊟ key, and change the scaling alarm value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 16-11 will be displayed.	[Scaling alarm value Upp.]: Scaling Low. to **Scaling Upp.** *If you set Scaling Upp.<Scaling Low., the default is Scaling Low. [Scaling alarm value Low.]: **Scaling Low.** to Scaling Upp. *If you set Scaling Upp.<Scaling Low., the default is Scaling Upp.
16-11. 	(1) Push the ⊞ or ⊟ key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 16-12 will be displayed.	[Delay]: **0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
16-12. 	(1) Push the ⊞ or ⊟ key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 16-13 will be displayed.	[ResetMode]: **Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3)

Screen	Operation	Note
16-13. [Alarm] [4] Non	(1) Push the ⊕ or ⊖ key, and select the alarm existence. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the setting alarm existence. [Non] setting → To 16-17 Other setting → To 16-14	[Alarm]:**Non**⇔Upp.⇔Low.⇔Upp.&Low.⇔
16-14. [Scaling alarm value] Upp.: 04095 Low.: 00000	(1) Push the ▲ ▼ ⊕ ⊖ key, and change the scaling alarm value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 16-15 will be displayed.	[Scaling alarm value Upp.]:Scaling Low. to **Scaling Upp.** *If you set Scaling Upp.<Scaling Low., the default is Scaling Low. [Scaling alarm value Low.]:**Scaling Low.** to Scaling Upp. *If you set Scaling Upp.<Scaling Low., the default is Scaling Upp.
16-15. [Delay] [4] 0sec	(1) Push the ⊕ or ⊖ key, and select the alarm time. (2) Push the ↵/PHASE key. (3) 16-16 will be displayed.	[Delay]:**0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔40sec⇔50sec⇔1min⇔2min⇔3min⇔4min⇔5min⇔
16-16. [ResetMode] [4] Auto	(1) Push the ⊕ or ⊖ key, and select the ResetMode. (2) Push the ↵/PHASE key. (3) 16-17 will be displayed.	[ResetMode]:**Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3)
16-17. [Alarm target CH] Non	(1) Push the ⊕ or ⊖ key, and select the CH to output the alarm state from contact output terminals. (2) Push the ↵/PHASE key, and, confirm the setting value. (3) Transition to the following screen by setting Alarm target CH and alarm existence. Alarm target CH : [Non] setting → To 1(2)-1 Alarm target CH : Other setting Alarm existence : [Upp.&Low.] setting → To 16-18 Alarm existence : Other setting → To 1(2)-1	[Alarm target CH]: **Non**⇔[1]⇔[2]⇔[3]⇔[4]⇔ *If alarm existence setting is set to non, this CH is not displayed.
16-18. [Output] Upp.Alarm	(1) Push the ⊕ or ⊖ key, and select the output alarm state. (2) Push the ↵/PHASE key. (3) 1(2)-1 will be displayed.	Output…Setting the output alarm state from external output terminal. [Output]: Upp.Alarm⇔Low.Alarm⇔Upp.&Low.Alarm⇔

17 Save the settings		
Screen	Operation	Note
17-1 Quit Setup 1 Save 2 Not Save 3 Cancel	(1) After setting all of the items, push the SETUP key. (2) 17-1 will be displayed. (3) When save the settings, push the ▲ or ▼ key, move the cursor to the "1 Save", and Push the ↵/PHASE key. (4) After completing the settings saving, "Completed" message will be displayed. Push the ↵/PHASE key. Return to the alarm mode, and it will be displayed alarm list screen.	1 Save → Save settings and return to the alarm mode. 2 Not Save → Discard the changes and return to the alarm mode. 3 Cancel →Continue the setup (1(1)-1 or 1(2)-1).

*Setting for the measurement mode can only be in the display unit is set to master.(Setting for the measurement mode cannot be in the display unit is set to slave.)
*If you change a settings, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.
*If you want to set the other circuit, push the CIRCUIT key on the "Setup" screen (1(1)-1 or 1(2)-1), select the circuit, make the setting.

6.4.3 Leak current condition setup－The settings for the limit alarm of the Leak current Io, Ior. EMU4-LG1-MB only.

1 Transition to the alarm setup mode		
Screen	Operation	Note
1-1. [Alarm Set] 1 Limit 2 Io/Ior	(1) Push the SETUP key in alarm mode. (2) 1-1 will be displayed.	Push simultaneous ▲ ▼ key, and transition from in operation mode to alarm mode.
	(1) Push the ▲ or ▼ key, and move the cursor to the "2 Io/Ior". Push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Setup the leak current alarm		
Screen	Operation	Note
2-1. [Io-Alarm] Current VAL.	(1) In 2-1, Push the ▲ or ▼ key, and select the Io-Alarm. (2) Push the ↵/PHASE key. (3) 2-2 will be displayed.	[Io-Alarm] : **Current VAL.**⇔Demand.VAL.⇔
2-2. [Io1-Alarm] 1000 mA	(1) Push the ▲ ▼ + − key, and change the Io2-Alarm. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-3 will be displayed.	Low SENS mode [Io1-Alarm] : **0** to 1000mA High SENS mode [Io1-Alarm] : **0.00** to 100.00mA * If value is set 0, alarm monitoring is not conducted.
2-3. [Io2-Alarm] 1000 mA	(1) Push the ▲ ▼ + − key, and change the Io2-Alarm. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-4 will be displayed.	Low SENS mode [Io2-Alarm] : **0** to 1000mA High SENS mode [Io2-Alarm] : **0.00** to 100.00mA * If value is set 0, alarm monitoring is not conducted.
2-4. [Io1-Alarm count] 000100	(1) Push the ▲ ▼ + − key, and change the Io1-Alarm count. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-5 will be displayed.	[Io1-Alarm count] : **0** to 999999 * If value is set 0, alarm monitoring is not conducted.
2-5. [Io2-Alarm count] 000100	(1) Push the ▲ ▼ + − key, and change the Io2-Alarm count. (2) Push the ↵/PHASE key, and confirm the setting value. (3) Transition to the following screen by the setting wiring type. 1P2W,1P3W,3P3W → To 2-6 3P4W → To 2-11	[Io2-Alarm count] : **0** to 999999 * If value is set 0, alarm monitoring is not conducted.
2-6. [Ior-Alarm] Current VAL.	(1) Push the ▲ or ▼ key, and change the Ior-Alarm. (2) Push the ↵/PHASE key. (3) 2-7 will be displayed.	[Ior-Alarm] : **Current VAL.**⇔Demand.VAL.⇔ DIF.VAL.⇔ Alarm about Ior can't be setup in 3P4W.
2-7. [Ior1-Alarm] 1000 mA	(1) Push the ▲ ▼ + − key, and change the Ior1-Alarm. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-8 will be displayed.	Low SENS mode [Ior1-Alarm] : **0** to 1000mA High SENS mode [Ior1-Alarm] : **0.00** to 100.00mA * If value is set 0, alarm monitoring is not conducted.
2-8. [Ior2-Alarm] 1000 mA	(1) Push the ▲ ▼ + − key, and change the Ior2-Alarm. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-9 will be displayed.	Low SENS mode [Ior2-Alarm] : **0** to 1000mA High SENS mode [Ior2-Alarm] : **0.00** to 100.00mA * If value is set 0, alarm monitoring is not conducted.
2-9. [Ior1-Alarm count] 000100	(1) Push the ▲ ▼ + − key, and change the Ior1-Alarm count. (2) Push the ↵/PHASE key, confirm the setting value. (3) 2-10 will be displayed.	[Ior1-Alarm count] : **0** to 999999 * If value is set 0, alarm monitoring is not conducted.
2-10. [Ior2-Alarm count] 000100	(1) Push the ▲ ▼ + − key, and change the Ior2-Alarm count. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-11 will be displayed.	[Ior2-Alarm count] : **0** to 999999 * If value is set 0, alarm monitoring is not conducted.
2-11. [Output] Io1-Alarm	(1) Push the ▲ or ▼ key, and change the Output (2) Push the ↵/PHASE key. (3) 2-12 will be displayed.	[Output] : Io1-Alarm⇔Off⇔Io2-Alarm⇔ Ior1-Alarm⇔**Ior2-Alarm**⇔ Io1-Alarm count⇔Io2-Alarm count⇔ Ior1-Alarm count⇔Ior2-Alarm count⇔ Select alarm that output from external output terminal.
2-12. [Delay] 0sec	(1) Push the + or − key, and change the alarm delay time. (2) Push the ↵/PHASE key. (3) 2-13 will be displayed.	[Delay] : **0sec**⇔5sec⇔10sec⇔20sec⇔30sec⇔ 40sec⇔50sec⇔1min⇔2min⇔3min⇔ 4min⇔5min⇔
2-13. [ResetMode] Auto	(1) Push the + or − key, and select the reset mode. (2) Push the ↵/PHASE key. (3) 1-1 will be displayed.	[ResetMode] : **Auto**⇔Hold⇔ Auto…Alarm is reset automatically when measured value is less then setting value. Hold…Alarm is hold until alarm released even thought measured value is less than setting value. (Release alarm ☛6.8.3 Release alarm)

3 Save the settings		
Screen	Operation	Note
3-1. Quit Setup 1 Save 2 Not Save 3 Cancel	(1) After setting all of the items, push the SETUP key. (2) 3-1 will be displayed. (3) When save the settings, push the ▲ or ▼ key, move the cursor to the "1 Save", and push the ↵/PHASE key. (4) After completing the settings saving, "Completed" message will be displayed. Push the ↵/PHASE key. (5) Return to the alarm mode, and it will be displayed alarm list screen.	1 Save → Save settings and return to the alarm mode. 2 Not Save → Discard the changes and return to the alarm mode. 3 Cancel → Continue the setup (1-1).

6.5 How to use test mode

6.5.1 About test mode

Test mode has the functions which you can utilize in such as the launch of equipment.
The functions in test mode are as follows:

Test menu	Details
1.Discrimination support function for improper connection	For EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2, indicate phase angle of current and voltage, electric power, voltage and current of each phase. You can discriminate easily whether the input connection for measurement (voltage and current) is proper or not by checking each indicated values.
2.Communication test	For the device with communication function, it can send back the fixed numerical data without the input of measurement (voltage and current). Use for such as the opposing test to host system.
3.Pulse output test	For EMU4-HM1-MB, EMU4-A2, EMU4-VA2, you can check the pulse output without the input of measurement (voltage and current). Use for such as the check of the connection to the receiving device.
4.Alarm output test	You can check the alarm output without the input of measurement (voltage and current). Use for such as the check of the connection to the receiving device.

*In the case of master of display unit MASTER LED is light while in test mode.
"In test mode" is displayed in LCD display of slave unit.

	EMU4-BM1-MB	EMU4-HM1-MB	EMU4-A2 EMU4-VA2	EMU4-LG1-MB	EMU4-PX4 EMU4-AX4
Discrimination support function for improper connection	○*1	○*1	○*1	–	–
Communication test	○	○	○	○	○
Pulse output test	–	○	○	–	–
Alarm output test	–	○	○	○	○

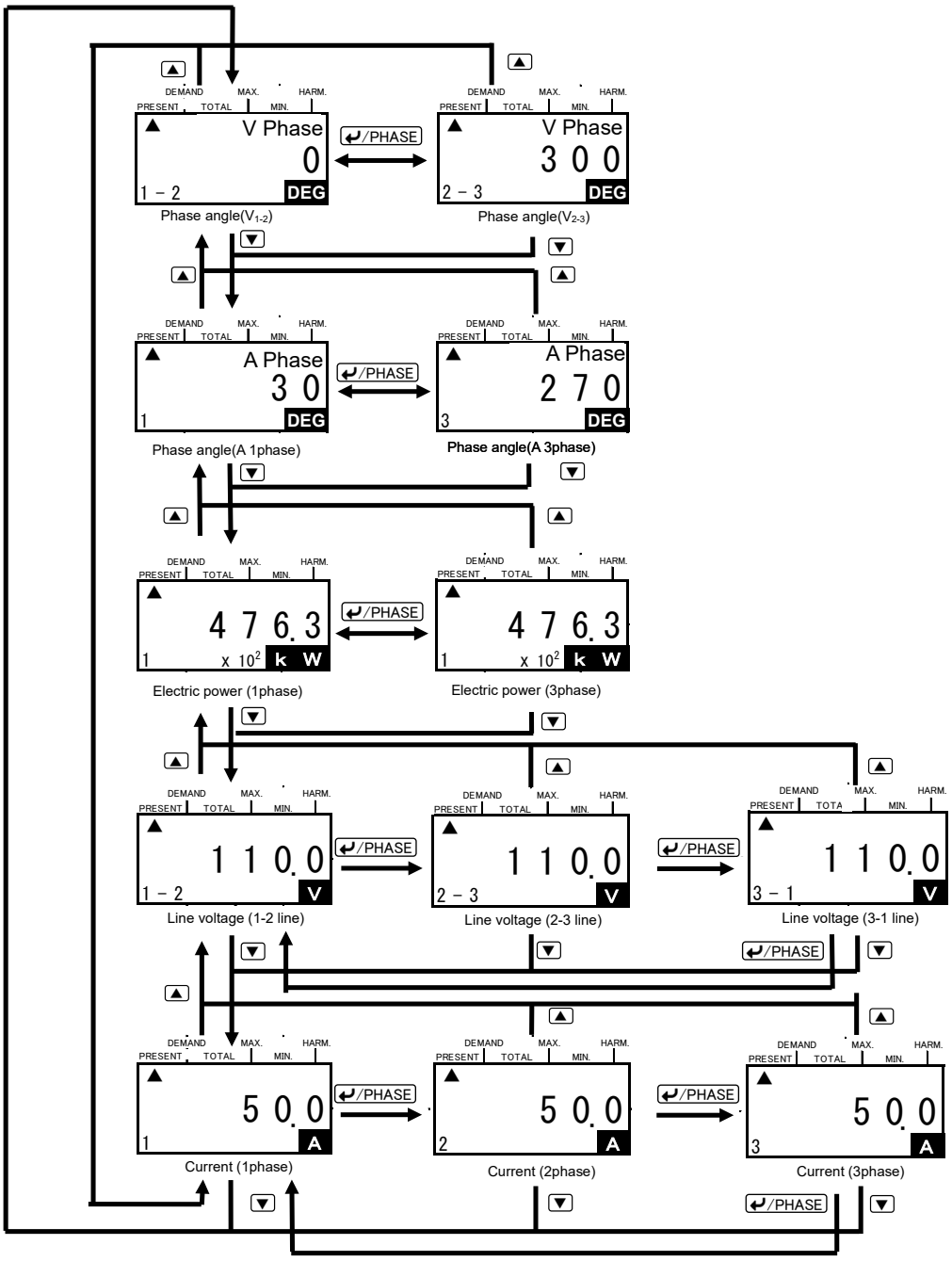
*1 If setting 1P2W in wiring type, you cannot use this function.

6.5.2 Support of incorrect wiring discrimination

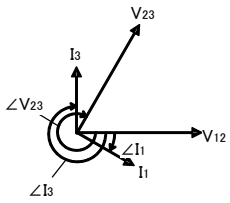
1 Transition to the alarm setup mode	
Screen	Operation
1-1. Do you run test mode? OK Cancel	(1) Push the [+] and [−] key in time in Operation mode. (2) 1-1 will be displayed.
1-2. [Test mode] 1 Connection 2 COM. 3 Pulse ▼	(1) Push the [▲] key, and move the cursor to the "OK" and push the [↵/PHASE] key. (2) 1-2 will be displayed after a whille displayed transition screen to test mode. (3) Push the [▲] or [▼] key, and move the cursor to the "1 incorrect wiring discrimination " and push the [↵/PHASE] key.

1 Discrimination support function for improper connection

Indicate the phase angle, electric power, voltage and current. <Example for three-phase 3-wire>



■ About phase angle
The phase angle is indicated in a clockwise direction from V12, as baseline (0 degree).

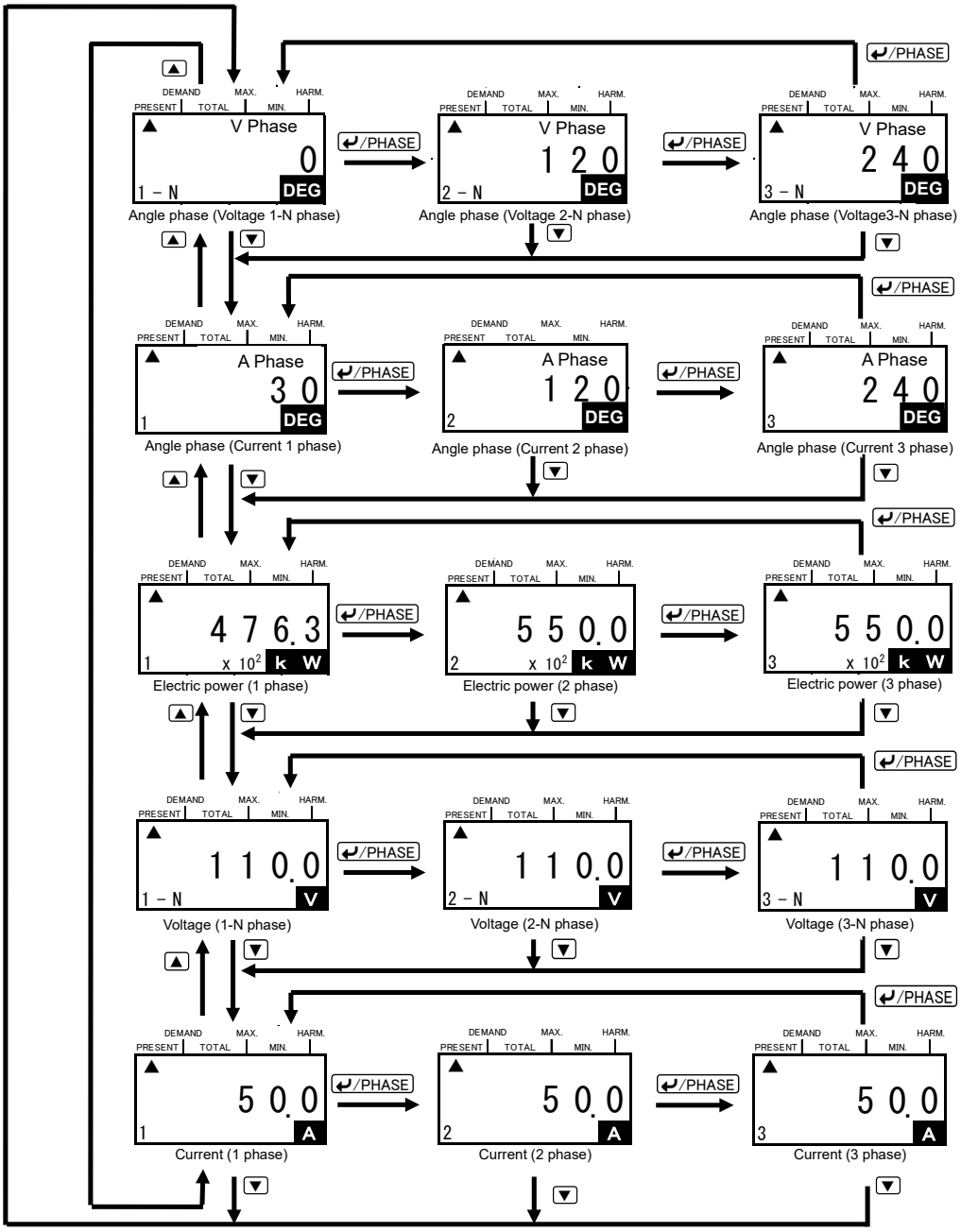


∠V_{23} : Phase angle between V_{23} and V_{12}
∠I_1 : Phase angle between I_1 and V_{12}
∠I_3 : Phase angle between I_3 and V_{12}

2 Discrimination support function for improper connection

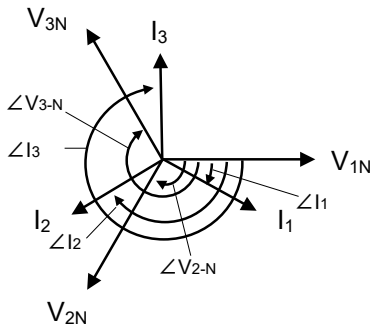
Indicate the phase angle, electric power, voltage and current.

＜Example for three-phase 4-wire＞



■ About phase angle

The phase angle is indicated in a clockwise direction from V1N, as baseline (0 degree).



∠V1-N(Reference)

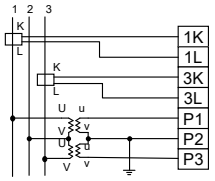
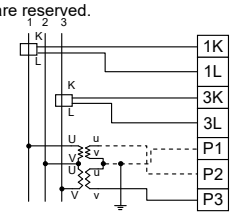
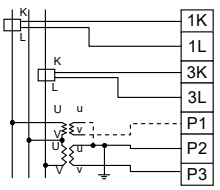
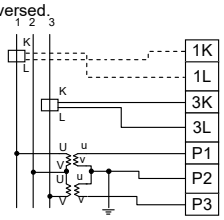
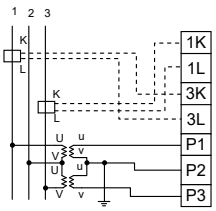
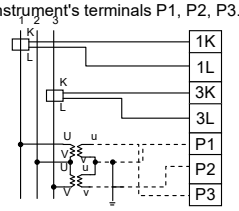
∠V1-N : Reference angle (=0)
∠V2-N : Phase angle between V1N and V2N
∠V3-N : Phase angle between V1N and V3N
∠I1 : Phase angle between I1 and V1N
∠I2 : Phase angle between I2 and V1N
∠I3 : Phase angle between I3 and V1N

Display example of discrimination support function for improper connection

For display examples for each connection pattern, pp. 47 – 56.

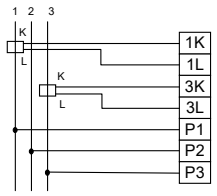
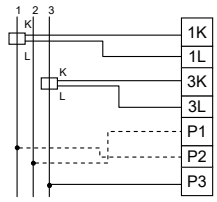
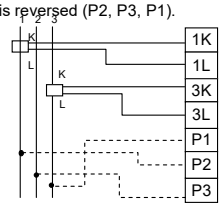
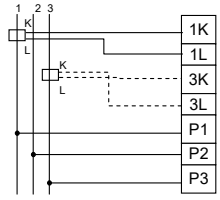
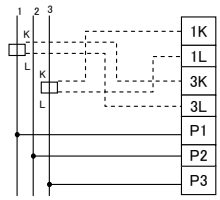
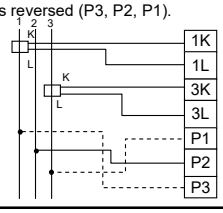
■Display example of discrimination support function for improper connection

Display example (Connection example for three-phase 3-wire) -------- Indicates improper connection

No.	Power factor (Input)	At the average current (V12=V23、I1=I3)												Wiring
		Phase angle display				Electric power display		Voltage display			Current display			
		∠V12	∠V23	∠I1	∠I3	W1	W3	V12	V23	V31	I1	I2	I3	
Normal status	Forward 0.707	0	300	345	225	W1>W3		V12=V23=V31			I1=I2=I3			
	Forward 0.866			0	240									
	1			30	270	W1=W3								
	Delayed 0.866			60	300	W1<W3								
	Delayed 0.707			75	315									
1	Forward 0.707	0	60	165	45	W1=Negative value W3=Positive value		V12=V23=V31			I1=I2=I3			Connection between P1 and P2 are reserved. 
	Forward 0.866			180	60									
	1			210	90									
	Delayed 0.866			240	120									
	Delayed 0.707			255	135									
2	Forward 0.707	0	120	165	45	W1=Negative value W3=Positive value		V12=V23<V31			I1=I2=I3			Connection of VT side "1"is reversed. 
	Forward 0.866			180	60									
	1			210	90									
	Delayed 0.866			240	120									
	Delayed 0.707			255	135									
3	Forward 0.707	0	300	165	225	W1=Negative value W3=Positive value		V12=V23=V31			I1=I3<I2			Connection of CT on side "1" is reversed. 
	Forward 0.866			180	240									
	1			210	270									
	Delayed 0.866			240	300									
	Delayed 0.707			255	315									
4	Forward 0.707	0	300	225	345	W1=Negative value W3=Positive value		V12=V23=V31			I1=I2=I3			CT side "1" and "3" are swapped. 
	Forward 0.866			240	0									
	1			270	30	W1=W3=0								
	Delayed 0.866			300	60	W1=Positive value W3=Negative value								
	Delayed 0.707			315	75									
5	Forward 0.707	0	300	225	105	W1=Negative value W3=Negative value		V12=V23=V31			I1=I2=I3			Connection of VT's terminals in order of P2, P3, P1 to measuring instrument's terminals P1, P2, P3. 
	Forward 0.866			240	120									
	1			270	150	W1=0 W3=Negative								
	Delayed 0.866			300	180	W1=Positive value W3=Negative value								
	Delayed 0.707			315	195									

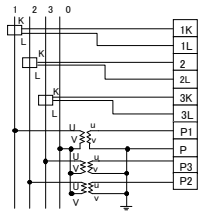
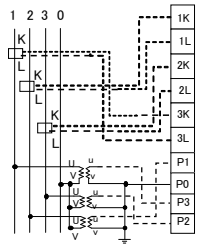
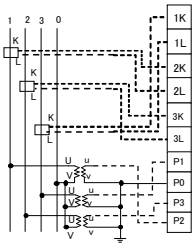
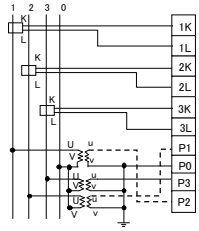
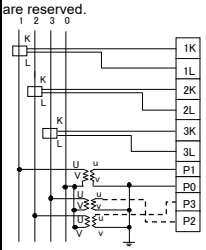
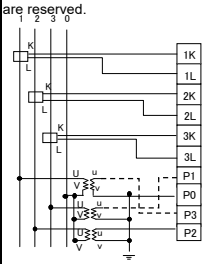
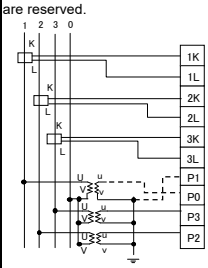
Display example (Connection example for single-phase 3-wire)

-------- Indicates improper connection

No.	Power factor (Input)	At the average current ($V_{12}=V_{23}$、$I_1=I_3$)												Connection					
		Phase angle display				Electric power display		Voltage display			Current display			Voltage			Current		Connecting diagram
		$\angle V_{12}$	$\angle V_{23}$	$\angle I_1$	$\angle I_3$	W_1	W_3	V_{12}	V_{23}	V_{31}	I_1	I_2	I_3	1	2	3	CT(side "1")	CT(side "3")	
Normal status	Forward 0.707	0	180	315	135	$W_1=W_3$		$V_{12}=V_{23}<V_{31}$			$I_1=I_3$ $I_2=0$			P1	P2	P3	1K 1L Forward	3K 3L Forward	
	Forward 0.866			330	150														
	1			0	180														
	Delayed 0.866			30	210														
	Delayed 0.707			45	225														
1	Forward 0.707	0	0	135	315	W1= Negative value W3= Positive value		$V_{12}=V_{23}<V_{31}$			$I_1=I_3$ $I_2=0$			P2	P1	P3	1K 1L Forward	3K 3L Forward	Connection between P1 and P2 are reserved. 
	Forward 0.866			150	330														
	1			180	0														
	Delayed 0.866			210	30														
	Delayed 0.707			225	45														
2	Forward 0.707	0	0	135	315	W1= Negative value W3= Positive value		$V_{12}>V_{23}=V_{31}$			$I_1=I_3$ $I_2=0$			P2	P3	P1	1K 1L Forward	3K 3L Forward	Connection of P1, P2, P3 terminals of measuring instrument is reversed (P2, P3, P1). 
	Forward 0.866			150	330														
	1			180	0														
	Delayed 0.866			210	30														
	Delayed 0.707			225	45														
3	Forward 0.707	0	180	315	315	W1= Positive value W3= Negative value		$V_{12}=V_{23}<V_{31}$			$I_1=I_3<I_2$			P1	P2	P3	3K 3L Forward	3K 3L Reverse	Connection of CT side "3" is reversed. 
	Forward 0.866			330	330														
	1			0	0														
	Delayed 0.866			30	30														
	Delayed 0.707			45	45														
4	Forward 0.707	0	180	135	315	W1= Negative value W3= Negative value		$V_{12}=V_{23}<V_{31}$			$I_1=I_3$ $I_2=0$			P1	P2	P3	3K 3L Forward	1K 1L Forward	CT side "1" and "3" are swapped. 
	Forward 0.866			150	330														
	1			180	0														
	Delayed 0.866			210	30														
	Delayed 0.707			225	45														
5	Forward 0.707	0	180	135	315	W1= Negative value W3= Negative value		$V_{12}=V_{23}<V_{31}$			$I_1=I_3$ $I_2=0$			P3	P2	P1	1K 1L Forward	3K 3L Forward	Connection of P1, P2, P3 terminals of measuring instrument is reversed (P3, P2, P1). 
	Forward 0.866			150	330														
	1			180	0														
	Delayed 0.866			210	30														
	Delayed 0.707			225	45														

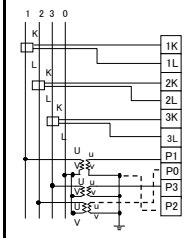
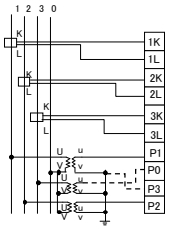
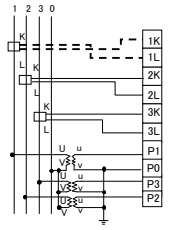
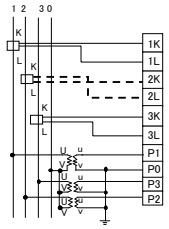
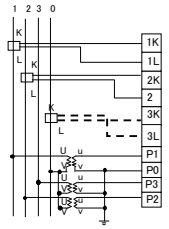
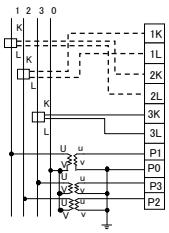
Display example (connection example for three-phase 4-wire)

------- Indicates improper connection

No.	Power factor (input)	Phase angle display						At the average current (V1N=V2N=V3N, I1=I2=I3)									Wiring
								Electric power display			Voltage display			Current display			
		∠V1N	∠V2N	∠V3N	∠I1	∠I2	∠I3	W1	W2	W3	V1N	V2N	V3N	I1	I2	I3	
Normal status	Forward 0.707	0	120	240	315	75	195	W1=W2=W3			V1N=V2N=V3N			I1=I2=I3			
	Forward 0.866				330	90	210										
	1				0	120	240										
	Delayed 0.866				30	150	270										
	Delayed 0.707				45	165	285										
1	Forward 0.707	0	120	240	315	75	195	W1=W2=W3			V1N=V2N=V3N			I1=I2=I3			Negative phase sequence1  Negative phase sequence 2 
	Forward 0.866				330	90	210										
	1				0	120	240										
	Delayed 0.866				30	150	270										
	Delayed 0.707				45	165	285										
2	Forward 0.707	0	240	120	190	315	75	W1=Negative value W2=Positive value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			Connection between P1 and P2 are reserved. 
	Forward 0.866				210	330	90	W1=Negative value W2=0 W3=Positive value									
	1				240	0	120	W1=Negative value W2=Negative value W3=Positive value									
	Delayed 0.866				270	30	150	W1=0 W2=Negative value W3=Positive value									
	Delayed 0.707				285	45	165	W1=Positive value W2=Negative value W3=Positive value									
3	Forward 0.707	0	240	120	315	75	195	W1=Positive value W2=Negative value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			Connection between P2 and P3 are reserved. 
	Forward 0.866				330	90	210	W1=Positive value W2=Negative value W3=0									
	1				0	120	240	W1=Positive value W2=Negative value W3=Negative value									
	Delayed 0.866				30	150	270	W1=Positive value W2=0 W3=Negative value									
	Delayed 0.707				45	165	285	W1=Positive value W2=Positive value W3=Negative value									
4	Forward 0.707	0	240	120	75	195	315	W1=Positive value W2=Positive value W3=Negative value			V1N=V2N=V3N			I1=I2=I3			Connection between P1 and P3 are reserved. 
	Forward 0.866				90	210	330	W1=0 W2=Positive value W3=Negative value									
	1				120	240	0	W1=Negative value W2=Positive value W3=Negative value									
	Delayed 0.866				150	270	30	W1=Negative value W2=Positive value W3=0									
	Delayed 0.707				165	285	45	W1=Negative value W2=Positive value W3=Positive value									
5	Forward 0.707	0	330	30	135	255	15	W1=Negative value W2=Positive value W3=Positive value			V1N<V2N=V3N			I1=I2=I3			Connection between P1 and P0 are reserved. 
	Forward 0.866				150	270	30										
	1				180	300	60										
	Delayed 0.866				210	330	90										
	Delayed 0.707				225	345	105										

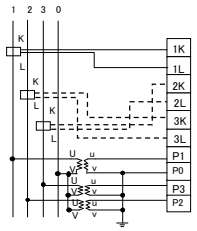
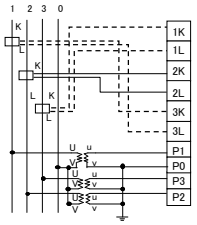
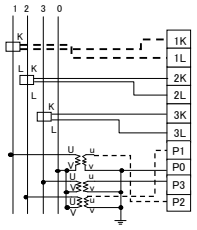
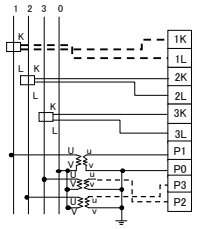
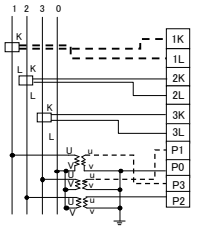
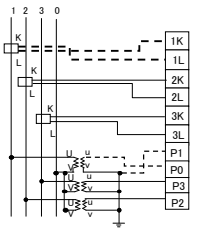
Display example (connection example for three-phase 4-wire)

------- Indicates improper connection

No.	Power factor (input)	Phase angle display						At the average current (V1N=V2N=V3N, I1=I2=I3)									Wiring
								Electric power display			Voltage display			Current display			
		∠V1N	∠V2N	∠V3N	∠I1	∠I2	∠I3	W1	W2	W3	V1N	V2N	V3N	I1	I2	I3	
6	Forward 0.707	0	330	300	345	105	225	W1=Positive value W2=Negative value W3=Positive value			V1N=V3N>V2N			I1=I2=I3			Connection between P2 and P0 are reserved. 
	Forward 0.866				0	120	240										
	1				30	150	270										
	Delayed 0.866				60	180	300										
	Delayed 0.707				75	195	315										
7	Forward 0.707	0	60	30	285	45	165	W1=Positive value W2=Positive value W3=Negative value			V1N=V2N>V3N			I1=I2=I3			Connection between P3 and P0 are reserved. 
	Forward 0.866				300	60	180										
	1				330	90	210										
	Delayed 0.866				0	120	240										
	Delayed 0.707				15	135	255										
8	Forward 0.707	0	120	240	135	75	195	W1=Negative value W2=Positive value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			Connection of CT on side "1" is reserved. 
	Forward 0.866				150	90	210										
	1				180	120	240										
	Delayed 0.866				210	150	270										
	Delayed 0.707				225	165	285										
9	Forward 0.707	0	120	240	315	255	195	W1=Positive value W2=Negative value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			Connection of CT on side "2" is reserved. 
	Forward 0.866				330	270	210										
	1				0	300	240										
	Delayed 0.866				30	330	270										
	Delayed 0.707				45	345	285										
10	Forward 0.707	0	120	240	315	75	15	W1=Positive value W2=Positive value W3=Negative value			V1N=V2N=V3N			I1=I2=I3			Connection of CT on side "3" is reserved. 
	Forward 0.866				330	90	30										
	1				0	120	60										
	Delayed 0.866				30	150	90										
	Delayed 0.707				45	165	105										
11	Forward 0.707	0	120	240	75	315	195	W1=Positive value W2=Negative value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			CT side "1" and "2" are swapped. 
	Forward 0.866				90	330	210	W1=0 W2=Negative value W3=Positive value									
	1				120	0	240	W1=Negative value W2=Negative value W3=Positive value									
	Delayed 0.866				150	30	270	W1=Negative value W2=0 W3=Positive value									
	Delayed 0.707				165	45	285	W1=Negative value W2=Positive value W3=Positive value									

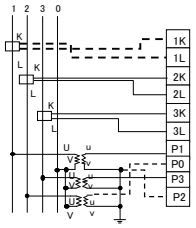
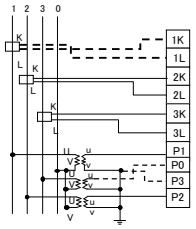
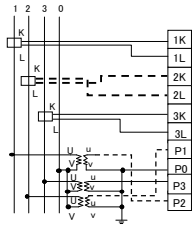
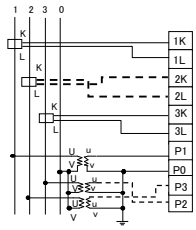
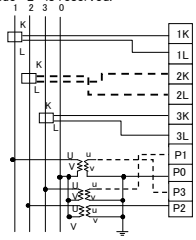
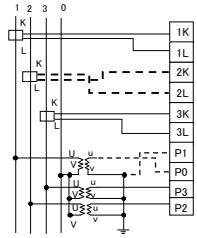
Display example (connection example for three-phase 4-wire)

------- Indicates improper connection

No.	Power factor (input)	Phase angle display						At the average current (V1N=V2N=V3N, I1=I2=I3)									Wiring
								Electric power display			Voltage display			Current display			
		∠V1N	∠V2N	∠V3N	∠I1	∠I2	∠I3	W1	W2	W3	V1N	V2N	V3N	I1	I2	I3	
12	Forward 0.707	0	120	240	315	195	75	W1=Positive value W2=Positive value W3=Negative value			V1N=V2N=V3N			I1=I2=I3			CT side "2" and "3" are swapped. 
	Forward 0.866				330	210	90	W1=Positive value W2=0 W3=Negative value									
	1				0	240	120	W1=Positive value W2=Negative value W3=Negative value									
	Delayed 0.866				30	270	150	W1=Positive value W2=Negative value W3=0									
	Delayed 0.707				45	285	165	W1=Positive value W2=Negative value W3=Positive value									
13	Forward 0.707	0	120	240	195	75	315	W1=Negative value W2=Positive value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			CT side "1" and "3" are swapped. 
	Forward 0.866				210	90	330	W1=Negative value W2=Positive value W3=0									
	1				240	120	0	W1=Negative value W2=Positive value W3=Negative value									
	Delayed 0.866				270	150	30	W1=0 W2=Positive value W3=Negative value									
	Delayed 0.707				285	165	45	W1=Positive value W2=Positive value W3=Negative value									
14	Forward 0.707	0	240	120	15	315	75	W1=Positive value W2=Positive value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			Connection between P1 and P2 are reserved. And connection of CT on side "1" is reserved. 
	Forward 0.866				30	330	90	W1=Positive value W2=0 W3=Positive value									
	1				60	0	120	W1=Positive value W2=Negative value W3=Positive value									
	Delayed 0.866				90	30	150	W1=0 W2=Negative value W3=Positive value									
	Delayed 0.707				105	45	165	W1=Negative value W2=Negative value W3=Positive value									
15	Forward 0.707	0	240	120	135	75	195	W1=Negative value W2=Negative value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			Connection between P2 and P3 are reserved. And connection of CT on side "1" is reserved. 
	Forward 0.866				150	90	210	W1=Negative value W2=Negative value W3=0									
	1				180	120	240	W1=Negative value W2=Negative value W3=Negative value									
	Delayed 0.866				210	150	270	W1=Negative value W2=0 W3=Negative value									
	Delayed 0.707				225	165	285	W1=Negative value W2=Positive value W3=Negative value									
16	Forward 0.707	0	240	120	255	195	315	W1=Negative value W2=Positive value W3=Negative value			V1N=V2N=V3N			I1=I2=I3			Connection between P1 and P3 are reserved. And connection of CT on side "1" is reserved. 
	Forward 0.866				270	210	330	W1=0 W2=Positive value W3=Negative value									
	1				300	240	0	W1=Positive value W2=Positive value W3=Negative value									
	Delayed 0.866				330	270	30	W1=Positive value W2=Positive value W3=0									
	Delayed 0.707				345	285	45	W1=Positive value W2=Positive value W3=Positive value									
17	Forward 0.707	0	330	30	315	255	15	W1=Positive value W2=Positive value W3=Positive value			V1N＜V2N=V3N			I1=I2=I3			Connection between P1 and P0 are reserved. And connection of CT on side "1" is reserved. 
	Forward 0.866				330	270	30										
	1				0	300	60										
	Delayed 0.866				30	330	90										
	Delayed 0.707				45	345	105										

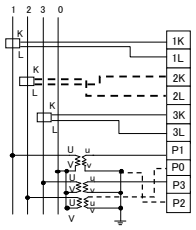
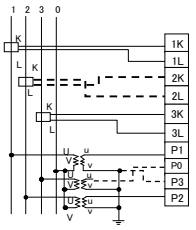
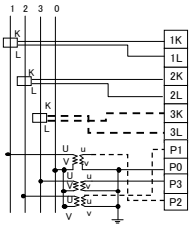
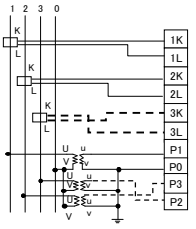
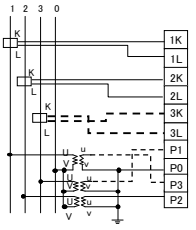
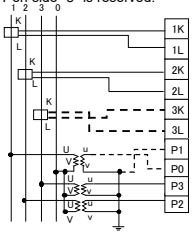
Display example (connection example for three-phase 4-wire)

------- Indicates improper connection

No.	Power factor (input)	Phase angle display						At the average current (V1N=V2N=V3N, I1=I2=I3)									Wiring
								Electric power display			Voltage display			Current display			
		∠V1N	∠V2N	∠V3N	∠I1	∠I2	∠I3	W1	W2	W3	V1N	V2N	V3N	I1	I2	I3	
18	Forward 0.707	0	330	300	165	105	225	W1=Negative value W2=Negative value W3=Positive value			V1N=V3N>V2N			I1=I2=I3			Connection between P2 and P0 are reserved. And connection of CT on side "1" is reserved. 
	Forward 0.866				180	120	240										
	1				210	150	270										
	Delayed 0.866				240	180	300										
	Delayed 0.707				255	195	315										
19	Forward 0.707	0	60	30	105	45	165	W1=Negative value W2=Positive value W3=Negative value			V1N=V2N>V3N			I1=I2=I3			Connection between P3 and P0 are reserved. And connection of CT on side "1" is reserved. 
	Forward 0.866				120	60	180										
	1				150	90	210										
	Delayed 0.866				180	120	240										
	Delayed 0.707				195	135	255										
20	Forward 0.707	0	240	120	195	135	75	W1=Negative value W2=Negative value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			Connection between P1 and P2 are reserved. And connection of CT on side "2" is reserved. 
	Forward 0.866				210	150	90	W1=Negative value W2=0 W3=Positive value									
	1				240	180	120	W1=Negative value W2=Positive value W3=Positive value									
	Delayed 0.866				270	210	150	W1=0 W2=Positive value W3=Positive value									
	Delayed 0.707				285	225	165	W1=Positive value W2=Positive value W3=Positive value									
21	Forward 0.707	0	240	120	315	255	195	W1=Positive value W2=Positive value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			Connection between P2 and P3 are reserved. And connection of CT on side "2" is reserved. 
	Forward 0.866				330	270	210	W1=Positive value W2=Positive value W3=0									
	1				0	300	240	W1=Positive value W2=Positive value W3=Negative value									
	Delayed 0.866				30	330	270	W1=Positive value W2=0 W3=Negative value									
	Delayed 0.707				45	345	285	W1=Positive value W2=Negative value W3=Negative value									
22	Forward 0.707	0	240	120	75	15	315	W1=Positive value W2=Negative value W3=Negative value			V1N=V2N=V3N			I1=I2=I3			Connection between P1 and P3 are reserved. And connection of CT on side "2" is reserved. 
	Forward 0.866				90	30	330	W1=0 W2=Negative value W3=Negative value									
	1				120	60	0	W1=Negative value W2=Negative value W3=Negative value									
	Delayed 0.866				150	90	30	W1=Negative value W2=Negative value W3=0									
	Delayed 0.707				165	105	45	W1=Negative value W2=Negative value W3=Positive value									
23	Forward 0.707	0	330	30	135	75	15	W1=Negative value W2=Negative value W3=Positive value			V1N<V2N=V3N			I1=I2=I3			Connection between P1 and P0 are reserved. And connection of CT on side "2" is reserved. 
	Forward 0.866				150	90	30										
	1				180	120	60										
	Delayed 0.866				210	150	90										
	Delayed 0.707				225	165	105										

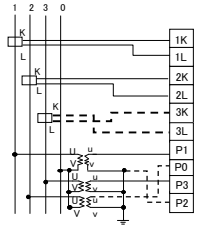
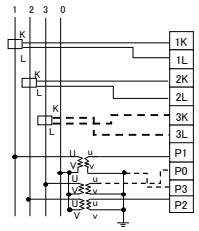
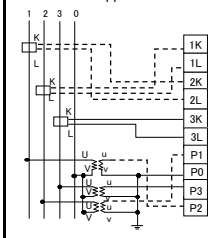
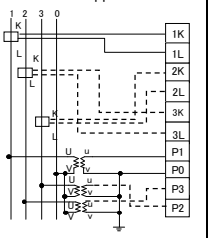
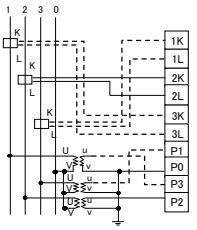
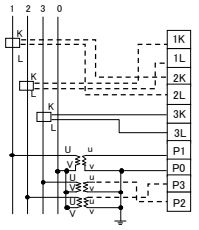
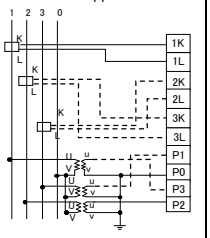
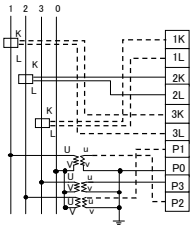
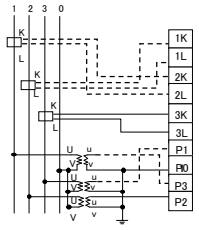
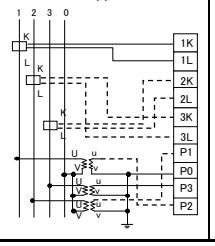
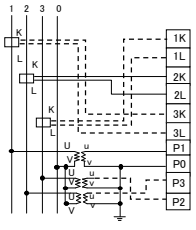
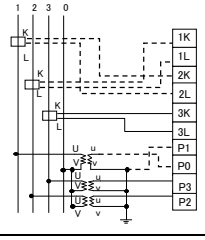
Display example (connection example for three-phase 4-wire)

------- Indicates improper connection

No.	Power factor (input)	Phase angle display						At the average current (V1N=V2N=V3N, I1=I2=I3)									Wiring
								Electric power display			Voltage display			Current display			
		∠V1N	∠V2N	∠V3N	∠I1	∠I2	∠I3	W1	W2	W3	V1N	V2N	V3N	I1	I2	I3	
24	Forward 0.707	0	330	300	345	285	225	W1=Positive value W2=Positive value W3=Positive value			V1N=V3N>V2N			I1=I2=I3			Connection between P2 and P0 are reserved. And connection of CT on side "2" is reserved. 
	Forward 0.866				0	300	240										
	1				30	330	270										
	Delayed 0.866				60	0	300										
	Delayed 0.707				75	15	315										
25	Forward 0.707	0	60	30	285	225	165	W1=Positive value W2=Negative value W3=Negative value			V1N=V2N>V3N			I1=I2=I3			Connection between P3 and P0 are reserved. And connection of CT on side "2" is reserved. 
	Forward 0.866				300	240	180										
	1				330	270	210										
	Delayed 0.866				0	300	240										
	Delayed 0.707				15	315	255										
26	Forward 0.707	0	240	120	195	315	255	W1=Negative value W2=Positive value W3=Negative value			V1N=V2N=V3N			I1=I2=I3			Connection between P1 and P2 are reserved. And connection of CT on side "3" is reserved. 
	Forward 0.866				210	330	270	W1=Negative value W2=0 W3=Negative value									
	1				240	0	300	W1=Negative value W2=Negative value W3=Negative value									
	Delayed 0.866				270	30	330	W1=0 W2=Negative value W3=Negative value									
	Delayed 0.707				285	45	345	W1=Positive value W2=Negative value W3=Negative value									
27	Forward 0.707	0	240	120	315	75	15	W1=Positive value W2=Negative value W3=Negative value			V1N=V2N=V3N			I1=I2=I3			Connection between P2 and P3 are reserved. And connection of CT on side "3" is reserved. 
	Forward 0.866				330	90	30	W1=Positive value W2=Negative value W3=0									
	1				0	120	60	W1=Positive value W2=Negative value W3=Positive value									
	Delayed 0.866				30	150	90	W1=Positive value W2=0 W3=Positive value									
	Delayed 0.707				45	165	105	W1=Positive value W2=Positive value W3=Positive value									
28	Forward 0.707	0	240	120	75	195	135	W1=Positive value W2=Positive value W3=Positive value			V1N=V2N=V3N			I1=I2=I3			Connection between P1 and P3 are reserved. And connection of CT on side "3" is reserved. 
	Forward 0.866				90	210	150	W1=0 W2=Positive value W3=Positive value									
	1				120	240	180	W1=Negative value W2=Positive value W3=Positive value									
	Delayed 0.866				150	270	210	W1=Negative value W2=Positive value W3=0									
	Delayed 0.707				165	285	225	W1=Negative value W2=Positive value W3=Negative value									
29	Forward 0.707	0	330	30	135	255	195	W1=Negative value W2=Positive value W3=Negative value			V1N<V2N=V3N			I1=I2=I3			Connection between P1 and P0 are reserved. And connection of CT on side "3" is reserved. 
	Forward 0.866				150	270	210										
	1				180	300	240										
	Delayed 0.866				210	330	270										
	Delayed 0.707				225	345	285										

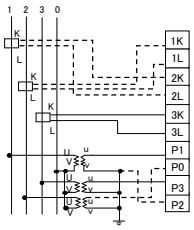
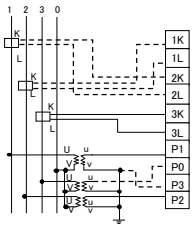
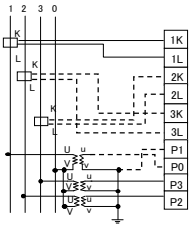
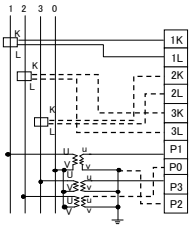
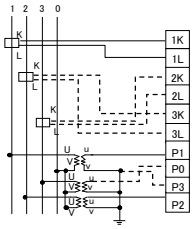
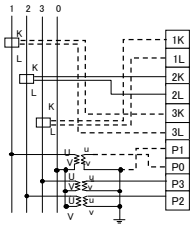
Display example (connection example for three-phase 4-wire)

------- Indicates improper connection

No.	Power factor (input)	Phase angle display						At the average current (V1N=V2N=V3N, I1=I2=I3)									Wiring
								Electric power display			Voltage display			Current display			
		∠V1N	∠V2N	∠V3N	∠I1	∠I2	∠I3	W1	W2	W3	V1N	V2N	V3N	I1	I2	I3	
30	Forward 0.707	0	330	300	345	105	45	W1=Positive value W2=Negative value W3=Negative value			V1N=V3N>V2N			I1=I2=I3			Connection between P2 and P0 are reserved. And connection of CT on side "3" is reserved. 
	Forward 0.866				0	120	60										
	1				30	150	90										
	Delayed 0.866				60	180	120										
	Delayed 0.707				75	195	135										
31	Forward 0.707	0	60	30	285	45	345	W1=Positive value W2=Positive value W3=Positive value			V1N=V2N>V3N			I1=I2=I3			Connection between P3 and P0 are reserved. And connection of CT on side "3" is reserved. 
	Forward 0.866				300	60	0										
	1				330	90	30										
	Delayed 0.866				0	120	60										
	Delayed 0.707				15	135	75										
32	Forward 0.707	0	240	120	315	195	75	W1=W2=W3			V1N=V2N=V3N			I1=I2=I3			Connection between P1 and P2 are reserved. And CT side "1" and "2" are swapped. 
	Forward 0.866				330	210	90										Connection between P2 and P3 are reserved. And CT side "2" and "3" are swapped. 
	1				0	240	120										Connection between P1 and P3 are reserved. And CT side "1" and "3" are swapped. 
	Delayed 0.866				30	270	150										
	Delayed 0.707				45	285	165										
33	Forward 0.707	0	240	120	75	315	195	W1=W2=W3			V1N=V2N=V3N			I1=I2=I3			Connection between P2 and P3 are reserved. And CT side "1" and "2" are swapped. 
	Forward 0.866				90	330	210										Connection between P1 and P3 are reserved. And CT side "2" and "3" are swapped. 
	1				120	0	240										Connection between P1 and P2 are reserved. And CT side "1" and "3" are swapped. 
	Delayed 0.866				150	30	270										
	Delayed 0.707				165	45	285										
34	Forward 0.707	0	240	120	195	75	315	W1=W2=W3			V1N=V2N=V3N			I1=I2=I3			Connection between P1 and P3 are reserved. And CT side "1" and "2" are swapped. 
	Forward 0.866				210	90	330										Connection between P1 and P2 are reserved. And CT side "2" and "3" are swapped. 
	1				240	120	0										Connection between P2 and P3 are reserved. And CT side "1" and "3" are swapped. 
	Delayed 0.866				270	150	30										
	Delayed 0.707				285	165	45										
35	Forward 0.707	0	330	30	255	135	15	W1=Negative value W2=Negative value W3=Positive value			V1N<V2N=V3N			I1=I2=I3			Connection between P1 and P0 are reserved. And CT side "1" and "2" are swapped. 
	Forward 0.866				270	150	30	W1=0 W2=Negative value W3=Positive value									
	1				300	180	60										
	Delayed 0.866				330	210	90	W1=Positive value W2=Negative value W3=Positive value									
	Delayed 0.707				345	225	105										

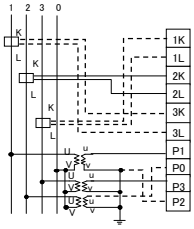
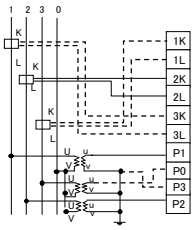
Display example (connection example for three-phase 4-wire)

------- Indicates improper connection

No.	Power factor (input)	Phase angle display						At the average current (V1N=V2N=V3N, I1=I2=I3)									Wiring
								Electric power display			Voltage display			Current display			
		∠V1N	∠V2N	∠V3N	∠I1	∠I2	∠I3	W1	W2	W3	V1N	V2N	V3N	I1	I2	I3	
36	Forward 0.707	0	330	300	105	345	225	W1=Negative value W2=Positive value W3=Positive value			V1N=V3N>V2N			I1=I2=I3			Connection between P2 and P0 are reserved. And CT side "1" and "2" are swapped. 
	Forward 0.866				120	0	240										
	1				150	30	270										
	Delayed 0.866				180	60	300	W1=Negative value W2=0 W3=Positive value									
	Delayed 0.707				195	75	315	W1=Negative value W2=Negative value W3=Positive value									
37	Forward 0.707	0	60	30	45	285	165	W1=Positive value W2=Negative value W3=Negative value			V1N=V2N>V3N			I1=I2=I3			Connection between P3 and P0 are reserved. And CT side "1" and "2" are swapped. 
	Forward 0.866				60	300	180										
	1				90	330	210	W1=0 W2=0 W3=Negative value									
	Delayed 0.866				120	0	240	W1=Negative value W2=Positive value W3=Negative value									
	Delayed 0.707				135	15	255										
38	Forward 0.707	0	330	30	135	15	255	W1=Negative value W2=Positive value W3=Negative value			V1N<V2N=V3N			I1=I2=I3			Connection between P1 and P0 are reserved. And CT side "2" and "3" are swapped. 
	Forward 0.866				150	30	270										
	1				180	60	300	W1=Negative value W2=0 W3=0									
	Delayed 0.866				210	90	330	W1=Negative value W2=Negative value W3=Positive value									
	Delayed 0.707				225	105	345										
39	Forward 0.707	0	330	300	345	225	105	W1=Positive value W2=Negative value W3=Negative value			V1N=V3N>V2N			I1=I2=I3			Connection between P2 and P0 are reserved. And CT side "2" and "3" are swapped. 
	Forward 0.866				0	240	120	W1=Positive value W2=0 W3=Negative value									
	1				30	270	150										
	Delayed 0.866				60	300	180	W1=Positive value W2=Positive value W3=Negative value									
	Delayed 0.707				75	315	195										
40	Forward 0.707	0	60	30	285	165	45	W1=Positive value W2=Negative value W3=Positive value			V1N=V2N>V3N			I1=I2=I3			Connection between P3 and P0 are reserved. And CT side "2" and "3" are swapped. 
	Forward 0.866				300	180	60										
	1				330	210	90										
	Delayed 0.866				0	240	120	W1=Positive value W2=Negative value W3=0									
	Delayed 0.707				15	255	135	W1=Positive value W2=Negative value W3=Negative value									
41	Forward 0.707	0	330	30	15	255	135	W1=Positive value W2=Positive value W3=Negative value			V1N<V2N=V3N			I1=I2=I3			Connection between P1 and P0 are reserved. And CT side "1" and "3" are swapped. 
	Forward 0.866				30	270	150										
	1				60	300	180										
	Delayed 0.866				90	330	210	W1=0 W2=Positive value W3=Negative value									
	Delayed 0.707				105	345	225	W1=Negative value W2=Positive value W3=Negative value									

Display example (connection example for three-phase 4-wire)

------- Indicates improper connection

No.	Power factor (input)	Phase angle display						At the average current (V1N=V2N=V3N, I1=I2=I3)							Wiring
								Electric power display			Voltage display			Current display	
		∠V1N	∠V2N	∠V3N	∠I1	∠I2	∠I3	W1	W2	W3	V1N	V2N	V3N	I1	I2	I3	
42	Forward 0.707	0	330	300	225	105	345	W1=Negative value W2=Negative value W3=Positive value			V1N=V3N>V2N			I1=I2=I3			Connection between P2 and P0 are reserved. And CT side "1" and "3" are swapped. 
	Forward 0.866				240	120	0								
	1				270	150	30	W1=0 W2=Negative value W3=0							
	Delayed 0.866				300	180	60	W1=Positive value W2=Negative value W3=Negative value							
	Delayed 0.707				315	195	75								
42	Forward 0.707	0	60	30	165	45	285	W1=Negative value W2=Positive value W3=Negative value			V1N=V2N>V3N			I1=I2=I3			Connection between P3 and P0 are reserved. And CT side "1" and "3" are swapped. 
	Forward 0.866				180	60	300	W1=Negative value W2=Positive value W3=0							
	1				210	90	330								
	Delayed 0.866				240	120	0	W1=Negative value W2=Positive value W3=Positive value							
	Delayed 0.707				255	135	15								

3 End of test mode	
Screen	Operation
3-1. Do you exit connection test? OK Cancel	(1) Push the SETUP key in display of incorrect wiring discrimination. (2) 3-1 will be displayed.
3-2. [Test mode] 1 Connection 2 COM 3 Pulse ▼	(1) Push the ▲ key, and move the cursor to the"OK", push the ↵/PHASE key. (2) 3-2 will be displayed.
3-3. Do you exit test mode? OK Cancel	(1) Push the ▼ key, and move the cursor to the “5 Finish” and push the ↵/PHASE key. (2) 3-3 will be displayed. (3) Push the ▲ key, and move the cursor to the “OK” and push the ↵/PHASE key. (4) Operating mode is displayed after exit test mode.

6.5.3 Communication test

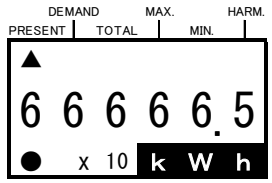
You can monitor non-zero values without voltage or current input.
Monitoring the fixed value determined by the set value (phase wire system, primary voltage, primary current) is possible.

1 Transition to the test mode (communication test)

Screen	Operation
1-1. Do you run test mode? OK Cancel	(1) Push the [+] and [−] key in Operation Mode. (2) 1-1 will be displayed.
1-2. [Test mode] 1 Connection 2 COM. 3 Pulse	(1) Push the [▲] key, and move the cursor to the “OK” and push the [↵/PHASE] key. (2) 1-2 will be displayed after in transition display. (3) Push the [▲] or [▼] key, and move the cursor to the “2 COM” and push the [↵/PHASE] key.

2 Communication test

■ Display example(Wh)



Confirm by key operation

Operation	Function
Push the [▲] [▼]	Change the elements
Push the [↵/PHASE]	Change the phases

3 End of test mode (communication test)

Screen	Operation
3-1. Do you exit COM. test? OK Cancel	(1) Push the [SETUP] key in communication test screen. (2) 3-1 will be displayed.
3-2. [Test mode] 1 Connection 2 COM. 3 Pulse	(1) Push the [▲] key, and move the cursor to the”OK” and push the [↵/PHASE] key. (2) 3-2. will be displayed after displayed in ending screen.
3-3. Do you exit test mode? OK Cancel	(1) Push the [▼] key, an d move the cursor to the "5 End” and push the [↵/PHASE] key. (2) 3-3 will be displayed. (3) Push the [▲] key, and move the cursor to the “OK” and push the [↵/PHASE] key. (4) Operating mode is displayed after exit test mode.

6.5.4 Pulse output test

1 Transition to the test mode (pulse output test)	
Screen	Operation
1-1. Do you run test mode? OK Cancel	(1) Push the [+] [−] key in operation display (2) 1-1 will be displayed.
1-2. [Test mode] 1 Connection 2 COM. 3 Pulse ▲▼	(1) Push the [▲] key, and move the cursor to the “OK” and push the [↵/PHASE] key. (2) 1-2 will be displayed after displayed in transition screen. (3) Push the [▲] or [▼] key, and move the cursor to the “3 Pulse output” and push the [↵/PHASE] key. (4) 2-1 will be displayed.

2 Pulse output test		
Screen	Operation	Note
2-1. [Pulse output] 1 Set number 2 Continous	(1) Push the [▲] or [▼] key, and the select the how to pulse output. (2) Push the [↵/PHASE] key, and confirm the setting value. (3) Transition to the following screen by how to pulse output. Specific number output → To 2-2 Continuous output → To 2-3	[Pulse output test] : Specific number⇔ Continuous⇔
2-2. [Pulse Test] 001 Pulse OK Cancel	(1) Push the [▲] [▼] [+] [−] key, and change the setting value. (2) Push the [▲] [▼] key, and move the cursor to the ”OK” and push the [↵/PHASE] key. (3) Return 2-2 after output specific number output. (4) Push the [▲] [▼] key, and move the cursor to the “Cancel” and push the [↵/PHASE] key. (5) 2-1 will be displayed.	[Specific number output] : **001** to 255
2-3. During Output pulse Stop	(1) Push the [↵/PHASE] key after confirm the pulse output. (2) 2-1 will be displayed.	

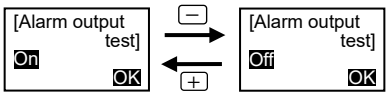
3 End of test mode (Pulse output test)	
Screen	Operation
3-1. Do you exit pulse test? OK Cancel	(1) Push the [SETUP] key in pulse output test. (2) 3-1 will be displayed.
3-2. [Test mode] 1 Connection 2 COM. 3 Pulse ▲▼	(1) Push the [▲] key, and move the cursor to the ”OK” and push the [↵/PHASE] key. (2) 3-2 will be displayed after displayed ending the pulse output test.
3-3. Do you exit test mode? OK Cancel	(1) Push the [▼] key, and move the cursor to the “5 END” and push the [↵/PHASE] key. (2) 3-3 will be displayed. (3) Push the [▲] key, and move the cursor to the “OK” and push the [↵/PHASE] key. (4) Operating mode is displayed after exit test mode.

6.5.5 Alarm output test

1 Transition to the test mode (alarm output test)

Screen	Operation
1-1. Do you run test mode? OK Cancel	(1) Push the ⊞ ⊟ key simultaneous in the operation mode. (2) 1-1 will be displayed.
1-2. [Test mode] 2 COM. 3 Pulse 4 Alarm ▲▼	(1) Push the ▲ key, and move the cursor to the "OK" and push the ↵/PHASE key. (2) 1-2 will be displayed after displayed in transition screen. (3) Push the ▲ or ▼ key, and move the cursor to the "4 Alarm output" and push the ↵/PHASE key. (4) 2-1 will be displayed.

2 Alarm output test



Push the ⊞ ⊟ key, and change On ⇔ Off.

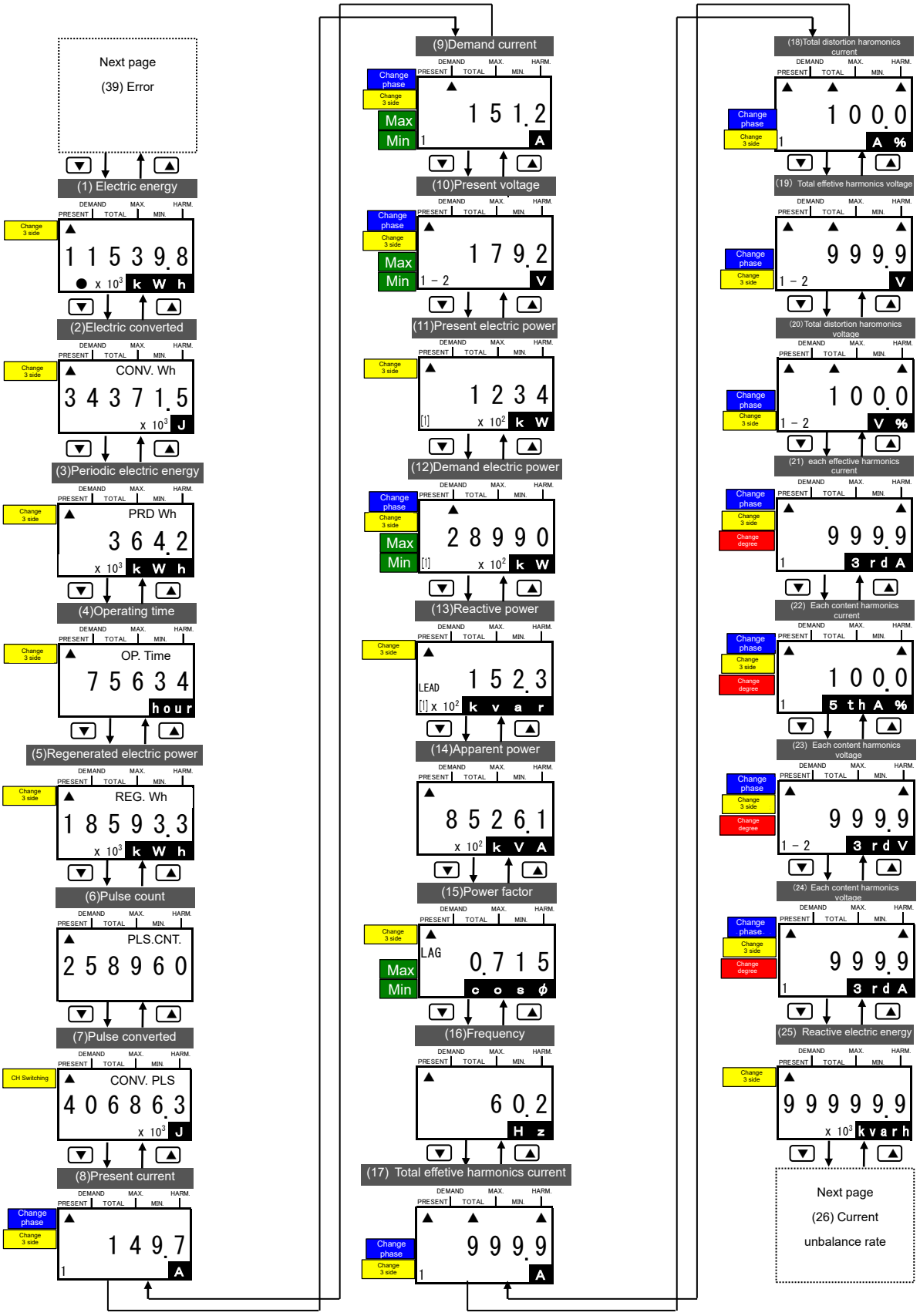
3 End of test mode (alarm output test)

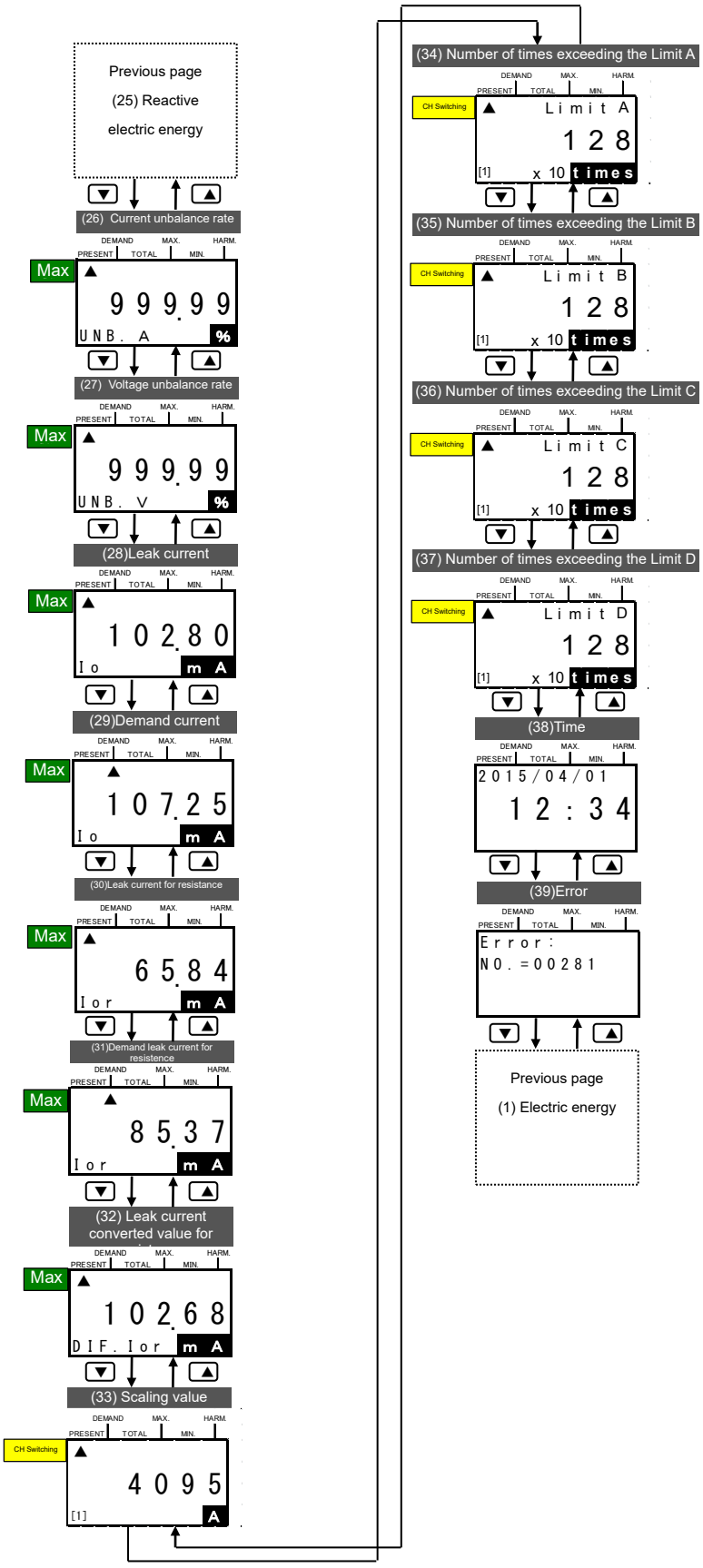
Screen	Operation
3-1. Do you exit alarm test? OK Cancel	(1) Push the SETUP key in alarm output test. (2) 3-1 will be displayed.
3-2. [Test mode] 2 Com. 3 Pulse 4 Alarm ▲▼	(1) Push the ▲ key, and move the cursor to the "OK" and push the ↵/PHASE key. (2) 3-2 will be displayed after displayed ending the alarm output test.
3-3. Do you exit test mode? OK Cancel	(1) Push the ▼ key, and move the cursor to the "5 END" and push the ↵/PHASE key. (2) 3-3 will be displayed. (3) Push the ▲ key, and move the cursor to the "OK" and push the ↵/PHASE key. (4) Operating mode is displayed after reset display unit.

6.6 Operation mode

6.6.1 Transition of display

Transition in operation mode is showed follow.





Change phase … Phase of current and voltage can be changed by pushing ↵/PHASE key.

Max Min … Push the ⊞ or ⊟ key, maximum and minimum value is displayed.

Change degree … Push the ⊞ or ⊟ key, harmonics current and voltage is displayed changing degree of them.

Change 3 side … In 1P2W setting, push the ↵/PHASE key, and display 3 side circuits.

CH Switching … When model is EMU4-PX4 or EMU4-AX4, display other CH by push the ↵/PHASE key.

*Screen what display or not appear is different based on the models connected measure unit. (☛6.6.3 Detail of display)

6.6.2 Correspondence of connected models and display.

Screen what display or not appear is different based on the models connected measure unit.

●…Displayed elements ○…element displayed only setting －…Not displayed elements

		EMU4-BM1-MB		EMU4-HM1-MB				EMU4-A2/ EMU4-VA2				EMU4-LG1-MB		EMU4-AX4	EMU4-PX4
		Wh+A+4 elements		Wh+A+4 elements		Detail of harmonics		Wh+A+4 elements		Detail of harmonics		Low / High Sensitivity		—	—
		1P2W	1P3W /3P3W	1P2W	1P3W /3P3W /3P4W	1P2W	1P3W /3P3W /3P4W	1P2W	1P3W /3P3W /3P4W	1P2W	1P3W /3P3W /3P4W	1P2W /1P3W /3P3W	3P4W	—	—
(1)Electric energy	Present value	●	●	●	●	●	●	●	●	●	●	—	—	—	—
(2) Electric energy converted	Present value	—	—	○	○	●	●	○	○	●	●	—	—	—	—
(3) Period electric energy	Present value	—	—	○	○	●	●	—	—	—	—	—	—	—	—
(4)Operating time	Present value	○	○	○	○	●	●	○	○	●	●	—	—	—	●
(5)Regeneration electric energy	Present value	○	○	○	○	●	●	○	○	●	●	—	—	—	—
(6)Pulse count value	Present value	—	—	○	○	●	●	—	—	—	—	—	—	—	●
(7)Pulse converted value	Present value														
(8)Current	1,2,3,N, Total※1	●	●	●	●	●	●	●	●	●	●	—	—	—	—
(9)Demand current	1,2,3,N※1														
	Max. and Min.														
(10)Voltage	1-2,2-3,3-1,1-N, 2-N,3-N,Total※2	○	○	○	○	●	●	○	○	●	●	—	—	—	—
	Max. , Min. value														
(11)Electric power	Present value	○	○	○	○	●	●	○	○	●	●	—	—	—	—
(12)Demand electric power	Present value														
	Max. , Min. value														
(13) Reactive power	Present value	○	○	○	○	●	●	○	○	●	●	—	—	—	—
(14) Apparent power	Present value	—	—	—	○※7	—	—	—	○※7	—	○※7	—	—	—	—
(15) Power factor	Present value	○	○	○	○	●	●	○	○	●	●	—	—	—	—
	Max. , Min. value														
(16) Frequency	Present value	○	○	○	○	●	●	○	○	●	●	—	—	—	—
(17)(18) Harmonics current total effective / distortion	1,2,3,N※3	—	—	○	○	○※5	○※5	○	○	○※5	○※5	—	—	—	—
(19) (20) Harmonics voltage total effective / distortion	1-2,2-3,3-1, 1-N,2-N,3-N※4	—	—	○	○	○※5	○※5	○	○	○※5	○※5	—	—	—	—
(21)(22)1-13N harmonics current effective / distortion	1,2,3,N※3	—	—	—	—	○※5	○※5	—	—	○※5	○※5	—	—	—	—
(23) (24) 1-13N harmonics voltage effective / distortion	1-2,2-3, 1-N,2-N,3-N※4	—	—	—	—	○※5	○※5	—	—	○※5	○※5	—	—	—	—
(25) Leak current	Present value	○	○	○	○	—	—	○	○	—	—	—	—	—	—
(26) Current unbalance rate	Present value	○※6	○	○※6	○	—	○	○※6	○	—	○	—	—	—	—
	Max. value														
(27) Voltage unbalance rate	Present value	○※6	○	○※6	○	—	○	○※6	○	—	○	—	—	—	—
	Max. value														
(28)Leak current	Present value	—	—	—	—	—	—	—	—	—	—	●	●	—	—
(29)Demand leak current	Present value	—	—	—	—	—	—	—	—	—	—	●	●	—	—
	Max. value														
(30)Leak current of resistance	Present value	—	—	—	—	—	—	—	—	—	—	●	—	—	—
(31) Demand leak current of resistance	Present value	—	—	—	—	—	—	—	—	—	—	●	—	—	—
	Max. value														
(32)Differential conversion Value demand leak current of resistance	Present value	—	—	—	—	—	—	—	—	—	—	●※8	—	—	—
	Max. value														
(33) Scaling value	Present value	—	—	—	—	—	—	—	—	—	—	—	—	●	—
	Max. , Min. value														
(34) Number of times exceeding the Limit A	Present value	—	—	—	—	—	—	—	—	—	—	—	—	●	—
(35) Number of times exceeding the Limit B	Present value														
(36) Number of times exceeding the Limit C	Present value														
(37) Number of times exceeding the Limit D	Present value														
(38)Time	Present value	●※9	●※9	●※9	●※9	●※9	●※9	—	—	—	—	●※9	●※9	—	—
(39)Error	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●

∗1 2 and 3 phases is not displayed in wiring setting 1P2W. N phase is only displayed in 3P4W setting.

∗2 Between 2 and 3 , 3 and 1 is not displayed in setting 1P2W1-N . Between 2 and N, 3 and N is displayed in 3P4W setting.

∗3 If wiring setting is 1P2W, 3 phase is not displayed. 2 phase is only displayed in setting 3P4W.

∗4 If wiring setting is 1P2W, between 2 and 3 is not displayed. Between 1 and N, 2 and N, 3 and N is only displayed.

∗5 Either effective value and content rate ,distortion by the setting elements of HA and HV.

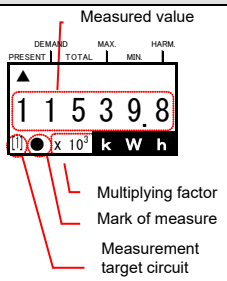
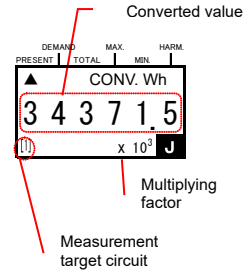
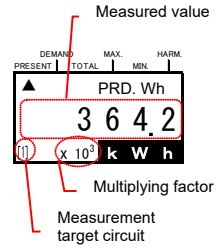
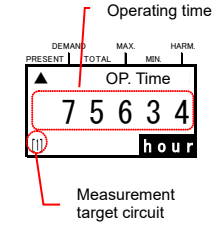
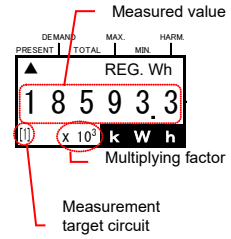
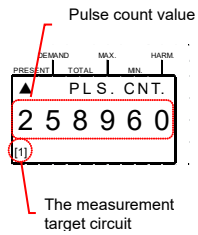
∗6 Current unbalance rate, voltage unbalance rate is displayed 0% in 1P2W setting.

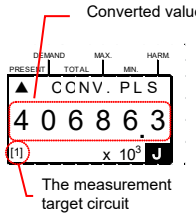
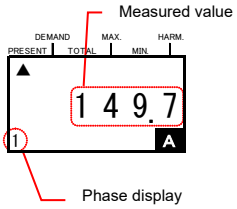
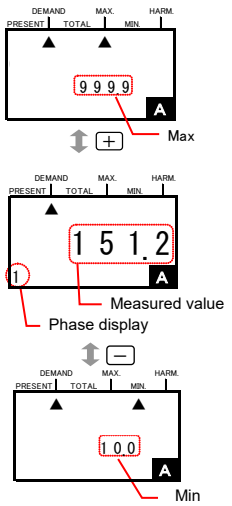
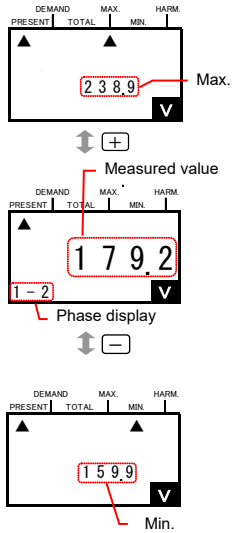
∗7 Apparent power is only measured in 3P4W setting

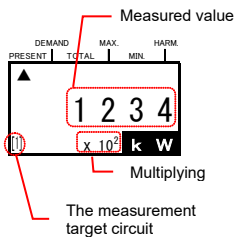
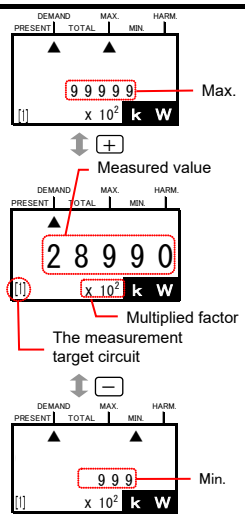
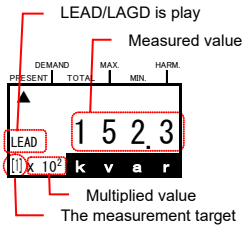
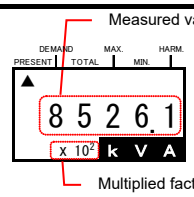
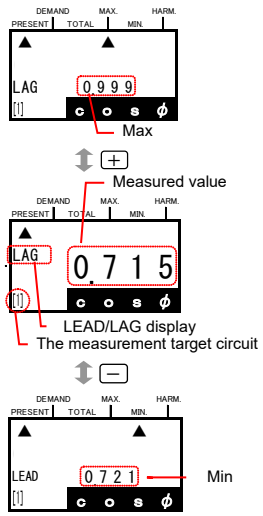
∗8 Measured value is displayed differential conversion setting is ON.

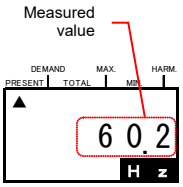
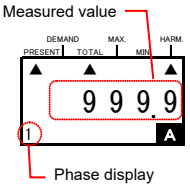
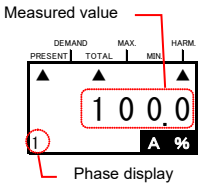
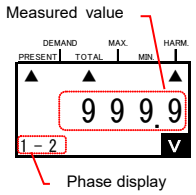
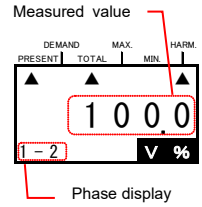
∗9 Present time is only displayed when connected EMU4-LM.

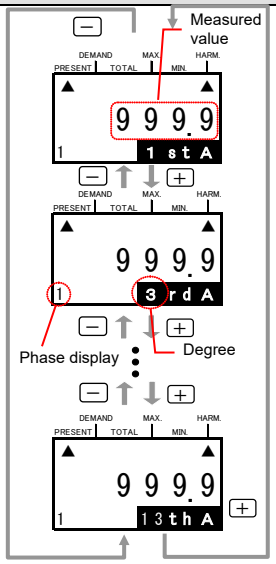
6.6.3 Detail of display

Screen name	Screen	Key operation		Note
		Key	Operation	
(1) Electric energy		▲	Measured value in previous is displayed	Integral power consumption is displayed. "●" mark is displayed while measuring ・[1] and [2] is displayed as a measurement target circuit in the bottom left of the screen in 1P2W. The phase type is displayed when other wiring. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Change 3 side circuit in the 1P2W setting	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	
(2) Electric energy converted value		▲	Measured value in previous is displayed	The value multiplied electric energy and setting electric energy converted value is displayed. ・[1] and [2] is displayed as a measurement target circuit in the bottom left of the screen in 1P2W. The phase type is displayed when other wiring. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Change 3 side circuit in the 1P2W setting	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	
(3) Periodic electric energy		▲	Measured value in previous is displayed	Integral electric energy is displayed while contact input is ON. ・[1] and [2] is displayed as a measurement target circuit in the bottom left of the screen in 1P2W. The phase type is displayed when other wiring. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed.
		▼	Measured value in next is displayed.	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Change 3 side circuit in the 1P2W setting	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	
(4) Operating time		▲	Measured value in previous is displayed.	Operating time is displayed. ・[1] and [2] is displayed as a measurement target circuit in the bottom left of the screen in 1P2W. The phase type is displayed when other wiring.
		▼	Measured value in next is displayed.	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Change 3 side circuit in the 1P2W setting	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	
(5) Regeneration electric energy		▲	Measured value in previous is displayed	Integral power consumption in regenerated side is displayed. ・[1] and [2] is displayed as a measurement target circuit in the bottom left of the screen in 1P2W. The phase type is displayed when other wiring. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed.
		▼	Measured value in next is displayed.	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Change 3 side circuit in the 1P2W setting	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	
(6) Pulse count value		▲	Measured value in previous is displayed	Input pulse count value is displayed. ・[1], [2], [3], [4] is displayed as a measurement target circuit (Represent the CH) in the bottom left of the screen if models is EMU4-PX4.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display the other CH if models is EMU4-PX4	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	

Screen name	Screen	Key operation		Note
		Key	Operation	
(7) Pulse converted value		▲	Measured value in previous is displayed	The value multiplied pulse count value and setting pulse. Converted rate is displayed. ・[1], [2], [3], [4] is displayed as a measurement target circuit (Represent the CH) in the bottom left of the screen if models is EMU4-PX4.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display the other CH if models is EMU4-PX4	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−−	Transition confirmation screen is displayed	
(8) Current		▲	Measured value in previous is displayed	Present current is displayed ・Push the ↵/PHASE key, and change follow. *1P2W setting* [1](1side*)→[2](3side*) →[1](1side total)→[2](3side total) *1P3W, 3P3W setting* 1phase→2phase→3phase→total *3P4W setting* 1phase→2phase→3phase →Nphaase→Total * Measured value connected to 1 side is displayed. * Measured value connected to 3 side is displayed.
		▼	Measured value in next is displayed.	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−−	Transition confirmation screen is displayed	
(9) Demand current value		▲	Measured value in previous is displayed	Demand current value is displayed. ・Push the ↵/PHASE key, and change follow. *1P2W setting* [1](1 side*)→[2](3 side*) *1P3W, 3P3W setting* 1phase→2 phase→3 phase *3P4W setting* 1 phase→2 phase→3 phase→N phase * Measured value connected to 1 side is displayed. * Measured value connected to 3 side is displayed. ・If you push the + or − key, Max/Min value displayed. Return the standard display if push same key again. Max/min value of 1 side circuit is displayed after push + or − key in 1 side in1P2W setting. Max/min value of 3 side circuit is displayed after push + or − the key in 3 side.
		▼	Measured value in next is displayed.	
		+	Maximum demand current value is displayed	
		−	Minimum demand current value is displayed	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−−	Transition confirmation screen is displayed	
(10) Voltage		▲	Measured value in previous is displayed	Present voltage is displayed. ・Push the ↵/PHASE key, and change follow. *1P2W setting* [1](1side*)→[2](3side*)→ [1](1side total)→[2](3side total) *1P3W, 3P3W setting* 1-2→2-3→3-1→total *3P4W setting* 1-2→2-3→3-1→1-N→2-N→3-N→total * Measured value connected to 1 side is displayed. * Measured value connected to 3 side is displayed. ・If you push the + or − key, Max/Min value displayed. Return the standard display if push same key again. Max/min value of 1 side circuit is displayed after push + or − key in 1 side in1P2W setting. Max/min value of 3 side circuit is displayed after push + or − the key in 3 side.
		▼	Measured value in next is displayed.	
		+	Maximum voltage value is displayed	
		−	Minimum voltage value is displayed	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−−	Transition confirmation screen is displayed	

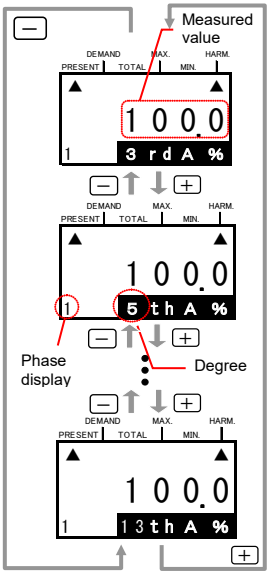
Screen name	Screen	Key operation		Note
		Key	Operation	
(11) Electric energy		▲	Measured value in previous is displayed	Present electric power is displayed. ・[1] and [2] is displayed as a measurement target circuit in the bottom left of the screen in 1P2W. The phase type is displayed when other wiring. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Change 3 side circuit in the 1P2W setting	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	
(12) Demand electric power		▲	Measured value in previous is displayed	Present electric power is displayed. ・[1] and [2] is displayed as a measurement target circuit in the bottom left of the screen in 1P2W. The phase type is displayed when other wiring. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed. ・If you push the + or − key, Max/Min value displayed. Return the standard display if push same key again. Max/min value of 1 side circuit is displayed after push + or − key in 1 side in1P2W setting. Max/min value of 3 side circuit is displayed after push + or − the key in 3 side.
		▼	Measured value in next is displayed	
		+	Maximum demand electric power value is displayed	
		−	Minimum demand electric power value is displayed	
		↵/PHASE	Change 3 side circuit in the 1P2W setting	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	
(13) Reactive electric power		▲	Measured value in previous is displayed	Present reactive electric power value is displayed. ・[1] and [2] is displayed as a measurement target circuit in the bottom left of the screen in 1P2W. The phase type is displayed when other wiring. ・“Lead” is display when data is -, “LAG” is displayed when data is + in LEAD/LAG display
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Change 3 side circuit in the1P2W setting	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	
(14) Apparent power		▲	Measured value in previous is displayed	Present apparent power is displayed. ・Apparent power is only measured in 3P4W setting.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	
(15) Power factor		▲	Measured value in previous is displayed	Present power factor is displayed. ・[1] and [2] is displayed as a measurement target circuit in the bottom left of the screen in 1P2W. The phase type is displayed when other wiring. ・If you push the + or − key, Max/Min value displayed. Return the standard display if push same key again. Max/min value of 1 side circuit is displayed after push + or − key in 1 side in1P2W setting. Max/min value of 3 side circuit is displayed after push + or − the key in 3 side.
		▼	Measured value in next is displayed	
		+	Maximum power factor value is displayed	
		−	Minimum power factor value is displayed	
		↵/PHASE	Change 3 side circuit in the 1P2W setting	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+−	Transition confirmation screen is displayed	

Screen name	Screen	Key operation		Note
		Key	Operation	
(16) Frequency		▲	Measured value in previous is displayed	Present frequency is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(17) Harmonics current total effective value		▲	Measured value in previous is displayed	Harmonics current effective value is displayed. ・Push the ↵/PHASE key, and change follow. *1P2W setting* [1](1side*)→[2](3side*) *1P3W, 3P3W setting* 1phase→3phase *3P4W setting* 1phase→2phase→3phase→Nphase * Measured value connected to 1 side is displayed. * Measured value connected to 3 side is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(18) Harmonics current total distortion		▲	Measured value in previous is displayed	Harmonics current total distortion is displayed. ・Push the ↵/PHASE key, and change follow. *1P2W setting* [1](1side*)→[2](3side*) *1P3W, 3P3W setting* 1phase→3 phase *3P4W setting* 1 phase→2 phase→3 phase→N phase * Measured value connected to 1 side is displayed. * Measured value connected to 3 side is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mod	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(19) Harmonics voltage total effective value		▲	Measured value in previous is displayed	Harmonics voltage total effective value is displayed. ・Push the ↵/PHASE key, and change follow. *1P2W setting* [1](1side*)→[2](3side*) *1P3W, 3P3W setting* 1-2→2-3 *3P4W setting* 1-N→2-N→3-N * Measured value connected to 1 side is displayed. * Measured value connected to 3 side is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(20) Harmonics voltage total distortion rate		▲	Measured value in previous is displayed	Harmonics voltage total distortion is displayed. ・Push the ↵/PHASE key, and change follow. *1P2W setting* [1](1side*)→[2](3side*) *1P3W, 3P3W setting* 1-2→2-3 *3P4W setting* 1-N→2-N→3-N * Measured value connected to 1 side is displayed. * Measured value connected to 3 side is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	

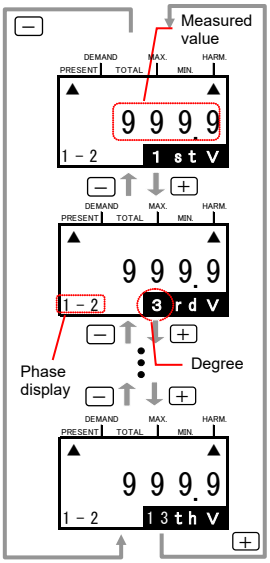
<table>
<tr><th>Screen name</th><th>Screen</th><th colspan="2">Key operation</th><th>Note</th></tr>
<tr><td></td><td></td><td>Key</td><td>Operation</td><td></td></tr>
<tr>
<td>(21)
Harmonics current
1st to 13th
effective value</td>
<td> 
</td>
<td>▲
▼
+
−
↵/PHASE
CIRCUIT
SETUP
RESET/SET
▲+▼
+−</td>
<td>Measured value in previous is displayed
Measured value in next is displayed
The order in next is displayed
The order in previous is displayed
Display by changed phase
Change measured circuit
Transition to the Setup mode
Transition to the Reset/Preset mode
Transition to the Alarm mode
Transition confirmation screen is displayed</td>
<td>Effective value of each harmonics current degree. Is displayed.

・Push the ↵/PHASE key, and change follow.
1P2W setting
[1](1side*)→[2](3side*)
1P3W, 3P3W setting
1side→3side
3P4W setting
1phase→2 phase→3 phase→N phase
* Measured value connected to 1 side is displayed.
* Measured value connected to 3 side is displayed.

・Push the + key, and change follow.
1st→3rd→5th→7th→9th→11th→13 th

・Push the − key, and change follow.
1st→13th→11th→9th→7th→5th→3rd</td>
</tr>
<tr>
<td>(22)
Harmonics current
1st to 13th
contained rate</td>
<td> 
</td>
<td>▲
▼
+
−
↵/PHASE
CIRCUIT
SETUP
RESET/SET
▲+▼
+−</td>
<td>Measured value in previous is displayed
Measured value in next is displayed
The order in next is displayed
The order in previous is displayed
Display by changed phase
Change measured circuit
Transition to the Setup mode
Transition to the Reset/Preset mode
Transition to the Alarm mode
Transition confirmation screen is displayed</td>
<td>Contained rate of each harmonics current degree is displayed.

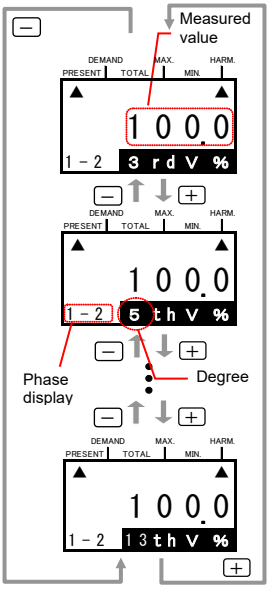
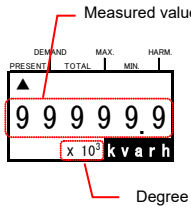
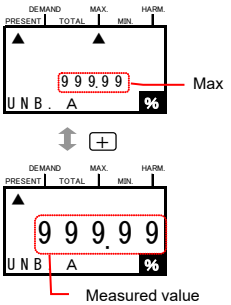
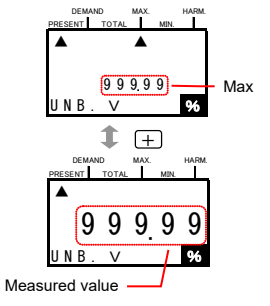
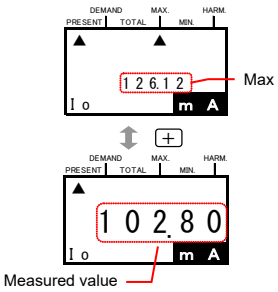
・Push the ↵/PHASE key, and change follow.
1P2W setting
[1](1side*)→[2](3side*)
1P3W, 3P3W setting
1phase→3 phase
3P4W setting
1phase→2 phase→3 phase
* Measured value connected to 1 side is displayed.
* Measured value connected to 3 side is displayed.
・Push the + key, and change follow.
3rd→5th→7th→9th→11th→13 th

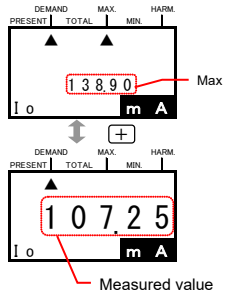
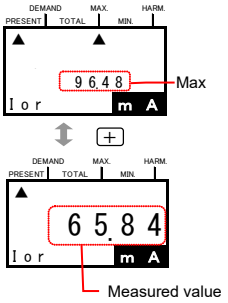
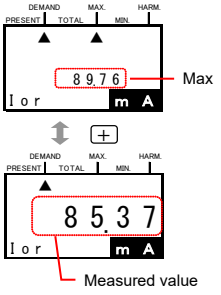
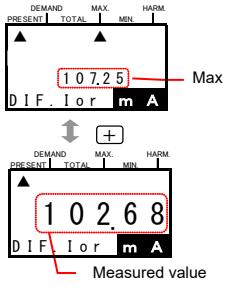
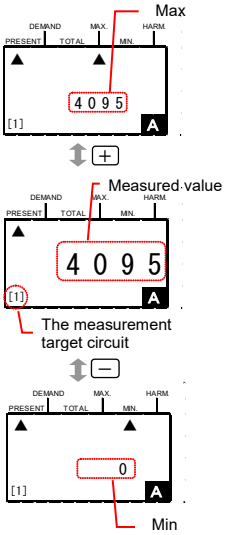
・Push the − key, and change follow.
3rd→13th→11th→9th→7th→5th</td>
</tr>
<tr>
<td>(23)
Harmonics voltage
1st to 13th
effective value</td>
<td> 
</td>
<td>▲
▼
+
−
↵/PHASE
CIRCUIT
SETUP
RESET/SET
▲+▼
+−</td>
<td>Measured value in previous is displayed
Measured value in next is displayed
The order in next is displayed
The order in previous is displayed
Display by changed phase
Change measured circuit
Transition to the Setup mode
Transition to the Reset/Preset mode
Transition to the Alarm mode
Transition confirmation screen is displayed</td>
<td>Effective value of each harmonics voltage is displayed.

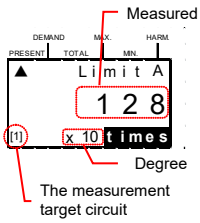
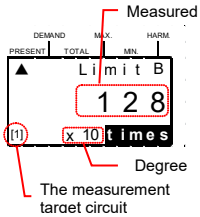
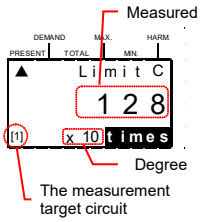
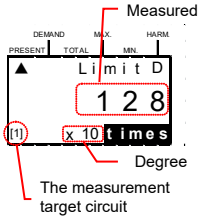
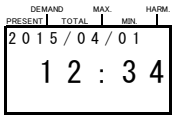
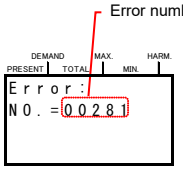
・Push the ↵/PHASE key, and change follow.
1P2W setting
[1](1side*)→[2](3side*)
1P3W, 3P3W setting
1-2→2-3
3P4W setting
1-N→2-N→3-N
* Measured value connected to 1 side is displayed.
* Measured value connected to 3 side is displayed.

・Push the + key, and change follow.
1st→3rd→5th→7th→9th→11th→13 th

・Push the − key, and change follow.
1st→13th→11th→9th→7th→5th→3rd</td>
</tr>
</table>

<table>
<tr><th rowspan="2">Screen name</th><th rowspan="2">Screen</th><th colspan="2">Key operation</th><th rowspan="2">Note</th></tr>
<tr><th>Key</th><th>Operation</th></tr>
<tr><td>(24)
Harmonics voltage 1st to 13th contained rate</td><td> 
</td><td>▲
▼
+
−
↵/PHASE
CIRCUIT
SETUP
RESET/SET
▲+▼
+ +−</td><td>Measured value in previous is displayed
Measured value in next is displayed
The order in next is displayed
The order in previous is displayed
Display by changed phase
Change measured circuit
Transition to the Setup mode
Transition to the Reset/Preset mode
Transition to the Alarm mode
Transition confirmation screen is displayed</td><td>Harmonics voltage of contained rate each degree.
・Push the ↵/PHASE key, and change follow.
1P2W setting
→[1](1side*)→[2](3side*)→
1P3W, 3P3W setting
→1-2→2-3→
3P4W setting
→1-N→2-N→3-N→
* Measured value connected to 1 side is displayed.
* Measured value connected to 3 side is displayed.
・Push the + key, and change follow.
→3rd→5th→7th→9th→11th→13 th→
・Push the − key, and change follow.
→3rd→13th→11th→9th→7th→5th→</td></tr>
<tr><td>(25)
Reactive electric energy</td><td> 
</td><td>▲
▼
+
−
↵/PHASE
CIRCUIT
SETUP
RESET/SET
▲+▼
+ +−</td><td>Measured value in previous is displayed
Measured value in next is displayed
Key operation is invalid
Key operation is invalid
Change 3 side circuit in the 1P2W setting
Change measured circuit
Transition to the Setup mode
Transition to the Reset/Preset mode
Transition to the Alarm mode
Transition confirmation screen is displayed</td><td>Present reactive energy is displayed.
・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed.</td></tr>
<tr><td>(26)
Current unbalance rate</td><td> 
</td><td>▲
▼
+
−
↵/PHASE
CIRCUIT
SETUP
RESET/SET
▲+▼
+ +−</td><td>Measured value in previous is displayed
Measured value in next is displayed
Current Unbalance Rate is displayed
Key operation is invalid
Key operation is invalid
Change measured circuit
Transition to the Setup mode
Transition to the Reset/Preset mode
Transition to the Alarm mode
Transition confirmation screen is displayed</td><td>Max. and Min. current unbalance rate is displayed.
・Push the + key, and display the maximum value, and push again return standard display.</td></tr>
<tr><td>(27)
Voltage unbalance rate</td><td> 
</td><td>▲
▼
+
−
↵/PHASE
CIRCUIT
SETUP
RESET/SET
▲+▼
+ +−</td><td>Measured value in previous is displayed
Measured value in next is displayed
Maximum voltage value is displayed
Key operation is invalid
Key operation is invalid
Change measured circuit
Transition to the Setup mode
Transition to the Reset/Preset mode
Transition to the Alarm mode
Transition confirmation screen is displayed</td><td>Max. and Min. voltage unbalance rate is displayed.
・Push the + key, and display the maximum value, and push again return standard display.</td></tr>
<tr><td>(28)
Leak current</td><td> 
</td><td>▲
▼
+
−
↵/PHASE
CIRCUIT
SETUP
RESET/SET
▲+▼
+ +−</td><td>Measured value in previous is displayed
Measured value in next is displayed.
Maximum leak current value is displayed
Key operation is invalid
Key operation is invalid
Key operation is invalid
Transition to the Setup mode
Transition to the Reset/Preset mode
Transition to the Alarm mode
Transition confirmation screen is displayed</td><td>Max. and Min. leak current is displayed.</td></tr>
</table>

Screen name	Screen	Key		Note
		Key	Operation	
(29) Demand leak current		▲	Measured value in previous is displayed	Demand leak current is displayed. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed ・Push the + key, and display the maximum value, and push again return standard display.
		▼	Measured value in next is displayed	
		+	Maximum leak current demand value is displayed	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(30) Leak Current for resistance		▲	Measured value in previous is displayed	Present and maximum value of leak current for resistance is displayed.
		▼	Measured value in next is displayed	
		+	Maximum leak current value is displayed	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(31) Demand current of resistance		▲	Measured value in previous is displayed	Demand and maximum demand value of leak current for resistance is displayed. ・Push the + key, and display the maximum value, and push again return standard display.
		▼	Measured value in next is displayed	
		+	Maximum demand value of leak current for resistance is displayed	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(32) Leak current converted value for resistance		▲	Measured value in previous is displayed	Present and maximum value of differential converted leak current is displayed. ・Push the + key, and display the maximum value, and push again return standard display.
		▼	Measured value in next is displayed	
		+	Maximum value of differential converted leak current is displayed	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(33) Scaling value		▲	Measured value in previous is displayed	Present, maximum, and minimum value of scaling value is displayed. ・[1], [2], [3], [4] is displayed as a measurement target circuit (Represent the CH) in the bottom left of the screen. ・If you push the + or − key, Max/Min value displayed. Return the standard display if push same key again.
		▼	Measured value in next is displayed	
		+	Maximum value of Scaling value is displayed	
		−	Minimum value of Scaling value is displayed	
		↵/PHASE	Display the other CH	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	

Screen name	Screen	Key	Operation	Note
(34) Number of times exceeding the Limit A		▲	Measured value in previous is displayed	Present value of number of times exceeding the Limit A is displayed. ・[1], [2], [3], [4] is displayed as a measurement target circuit (Represent the CH) in the bottom left of the screen.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display the other CH	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(35) Number of times exceeding the Limit B		▲	Measured value in previous is displayed	Present value of number of times exceeding the Limit B is displayed. ・[1], [2], [3], [4] is displayed as a measurement target circuit (Represent the CH) in the bottom left of the screen.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display the other CH	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(36) Number of times exceeding the Limit C		▲	Measured value in previous is displayed	Present value of number of times exceeding the Limit C is displayed. ・[1], [2], [3], [4] is displayed as a measurement target circuit (Represent the CH) in the bottom left of the screen.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display the other CH	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(37) Number of times exceeding the Limit D		▲	Measured value in previous is displayed	Present value of number of times exceeding the Limit D is displayed. ・[1], [2], [3], [4] is displayed as a measurement target circuit (Represent the CH) in the bottom left of the screen.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display the other CH	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(38) Present time		▲	Measured value in previous is displayed	Present time is displayed. ・Display format is showed follow. Year/Month/Day Hour:Minute *Only displayed when connected to EMU4-LM.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	
(39) Error		▲	Measured value in previous is displayed	Error number is displayed when there are error. If there are no error, "-----" is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
		+−+	Transition confirmation screen is displayed	

6.6.4 Display significant digits

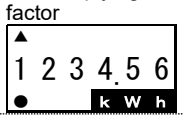
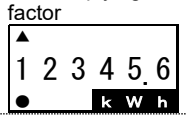
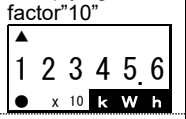
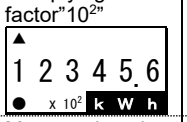
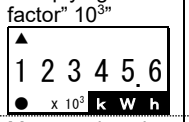
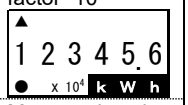
In this section, significant digits by measured method can be displayed. Resolution of measured data references to energy measure unit's manual.

■Electric energy(kWh), Periodic electric energy(kWh), Regeneration electric energy(kWh), Reactive electric energy(kvarh).
Full load is calculated is below equation.

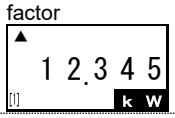
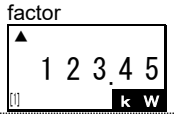
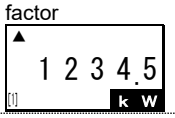
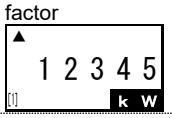
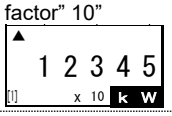
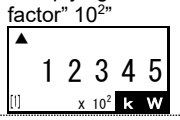
$$\text{Full load [kW]} = \frac{\text{Wiring coefficient} \times (\text{VT}) \times (\text{CT Primary current})}{1000}$$

Wiring coefficient :		
1		Single-phase 2-wire
2		Single-phase 3-wire
1.732		3-phase 3-wire
3		3-phase 4-wire

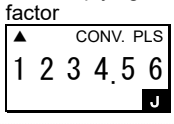
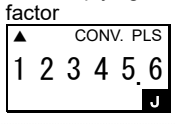
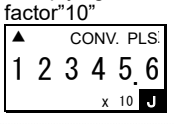
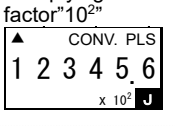
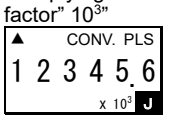
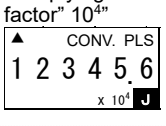
*1. Using direct connection, replace VT primary voltage with direct voltage in calculation above.
*2. In case 3P4W, apply the not phase voltage but line voltage as primary voltage.

Full load	Less than 12kW	12kW≦ Full Load ≦120kW	120kW≦ Full Load ≦1200kW	1200kW≦ Full Load ≦12000kW	120000W≦ Full Load ≦120000k	More than 120000kW
Display significant digits	****.**	*****.*	*****.* x10	*****.* x10^2	*****.* x10^3	*****.* x10^4
unit	kWh kvarh	kWh kvarh	kWh kvarh	kWh kvarh	kWh kvarh	kWh kvarh
Screen example	No multiplying factor  Measured value is =1234.56kWh	No multiplying factor  Measured value is =12345.6kWh	Multiplying factor"10"  Measured value is 12345.6x10 =123456kWh	Multiplying factor"10^2"  Measured value is 12345.6x100 =1234560kWh	Multiplying factor" 10^3"  Measured value is 12345.6x1000 =12345600kWh	Multiplying factor" 10^4"  Measured value is 345.6x10000 =123456000kWh

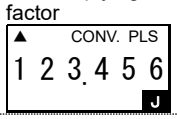
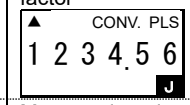
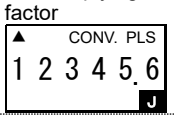
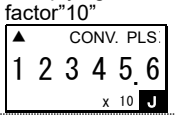
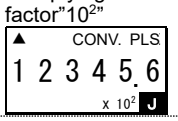
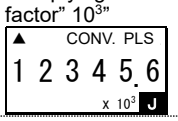
■Present electric power(kW), Demand electric power (kW), Reactive electric power (kvar), apparent power(kVA)
Full load is present follow.

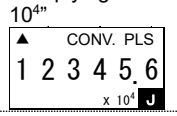
Full load	Less than 12kW	12kW≦ Full Load ≦120kW	120kW≦ Full Load ≦1200kW	1200kW≦ Full Load ≦12000kW	120000W≦ Full Load ≦120000kW	More than 120000kW
Display significant digits	**.***	***.**	****.*	*****	***** x10	***** x10^2
Unit	kW kvar kVA	kW kvar kVA	kW kvar kVA	kW kvar kVA	kW kvar kVA	kW kvar kVA
Screen example	No multiplying factor  Measured value is =12.345kW	No multiplying factor  Measured value is =123.45kW	No multiplying factor  Measured value is =1234.5kW	No multiplying factor  Measured value is =12345kW	Multiplying factor" 10"  Measured value is 12345x10 =123450kW	Multiplying factor" 10^2"  Measured value is 12345x100 =1234500kW

■Converted value of electric energy
Calculated by full load in follow. Unit is determined by setting for value of electric energy converted.
(☛6.3.2 Measuring setup)

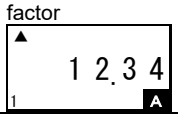
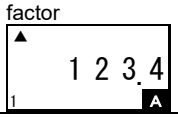
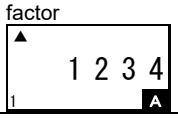
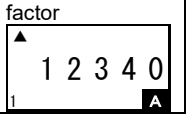
Full load	Less than 12kW	12kW≦ Full Load ≦120kW	120kW≦ Full Load ≦1200kW	1200kW≦ Full Load ≦12000kW	120000W≦ Full Load ≦120000k	More than 120000kW
Display Significant digits	****.**	*****.*	*****.* x10	*****.* x10^2	*****.* x10^3	*****.* x10^4
Screen example	No multiplying factor  Measured value is =1234.56J	No multiplying factor  Measured value is =12345.6 J	Multiplying factor"10"  Measured value is 12345.6x10 =123456 J	Multiplying factor"10^2"  Measured value is 12345.6x100 =1234560 J	Multiplying factor" 10^3"  Measured value is 12345.6x1000 =12345600 J	Multiplying factor" 10^4"  Measured value is 12345.6x10000 =123456000 J

■Converted value of pulse
Calculated by converted value of pulse in follow. Unit is determined by setting for value of pulse converted.
(☛**6.3.3 Input/Output setup**)

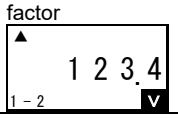
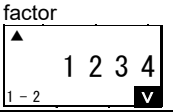
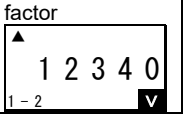
Value of pulse converted	0.001 to 0.009	0.01 to 0.099	0.1 to 0.999	1 to 9.999	10 to 99.99	100 to 999.9
Display significant digits	***.***	****.**	*****.*	*****.* x10	*****.* x10^2	*****.* x10^3
Screen example	No multiplying factor 	No multiplying factor 	No multiplying factor 	Multiplying factor"10" 	Multiplying factor"10^2" 	Multiplying factor" 10^3" 
	Measured value is =123.456 J	Measured value is =1234.56 J	Measured value is 12345.6 J	Measured value is 12345.6x10 =123456 J	Measured value is 12345.6x100 =1234560 J	Measured value is 12345.6x1000 =12345600 J

Value of pulse converted	1000 to 10000
Display significant digits	*****.* x10^4
Screen example	Multiplying factor" 10^4" 
	Measured value is 12345.6x10000 =123456000 J

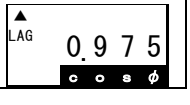
■Present current, Demand current, Harmonics current effective value
Calculated by setup the primary voltage value.

Primary current	Less than 40A	40A≦primary current≦400A	400A≦primary current≦4000A	More than 4000A
Display significant digits	**.**	***.*	****	****0
Unit	A	A	A	A
Screen example	No multiplying factor 	No multiplying factor 	No multiplying factor 	No multiplying factor 

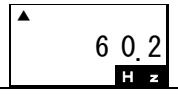
■Present voltage, Harmonics voltage effective value
Calculated by setup the primary voltage value.

Primary voltage	Less than 300V	300V≦primary voltage≦3000V	More than 3000V
Display significant digits	***.*	****	****0
unit	V	V	V
Screen example	No multiplying factor 	No multiplying factor 	No multiplying factor 

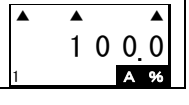
■Power factor

Display significant digits	*.***
unit	—
Screen example	No multiplying factor 

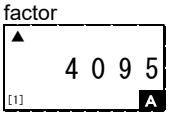
■Frequency

Display significant digits	**.*
unit	Hz
Screen example	No multiplying factor 

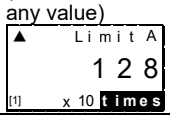
■Harmonics current and voltage, Distortion, contained rate

Display significant digits	***.*
unit	%
Screen example	No multiplying factor 

■Present scaling value

Display significant digits	*****
Unit	Any unit
Screen example	No multiplying factor 

■Number of times exceeding the limit

Display significant digits	***** x10*
Unit	Any unit
Screen example	Multiplying factor"10*" (It can be set to any value) 

6.7 Alarm mode

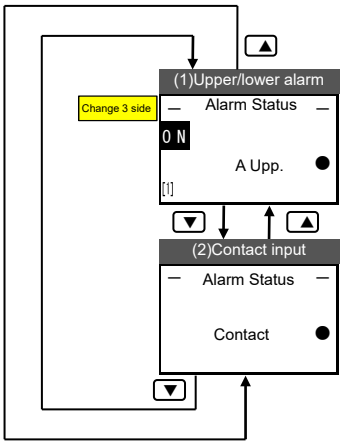
6.7.1 Transition of display

In this section, transition of display is showed.

（1）Upper/lower limit alarm is available (Only can monitoring when connected to EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2, EMU4-PX4, EMU4-AX4)

- In the case of EMU4-BM1-MB, EMU4-HM1-MB, EMU4-A2, EMU4-VA2

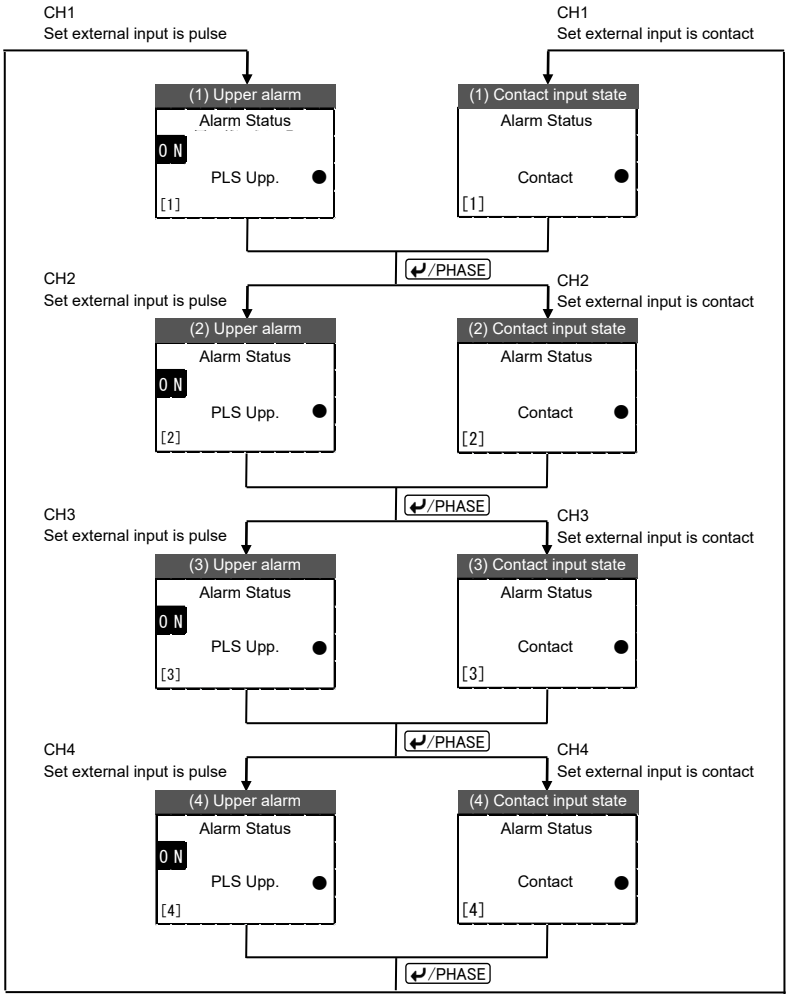
  Push ▲ or ▼ key, Screen is transit in below figure.



Change 3 side …Push the ↵/PHASE key, and change display 2nd circuit In 1P2W (2 circuits measuring)

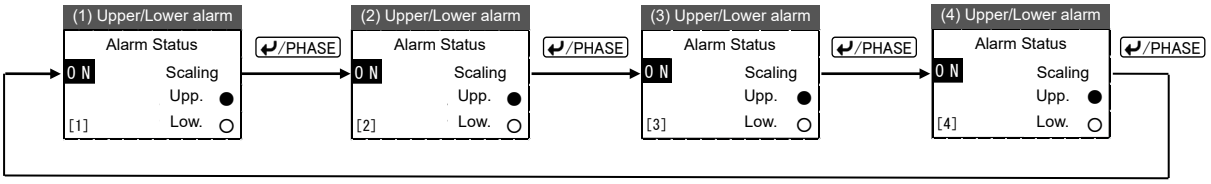
- In the case of EMU4-PX4

  Push ↵/PHASE key, Screen is transit in below figure. (If set external input is non, next display is showed.)



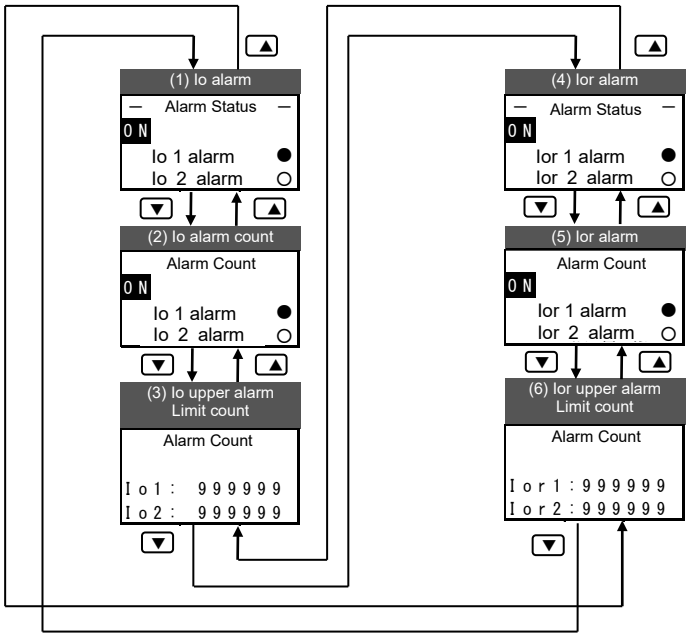
● In the case of EMU4-AX4

Push ↵/PHASE key, Screen is transit in below figure. (If set external input is non, next display is showed.)



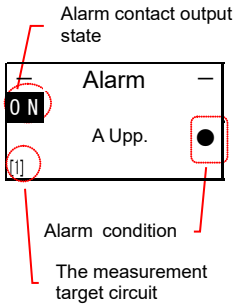
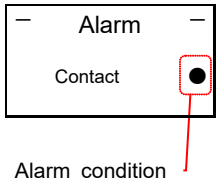
（2）Leakage alarm (Only can monitoring when connected to EMU4-LG1-MB)

Push ▲ or ▼ key, Screen is transit in below figure.



6.7.2 Screen detail

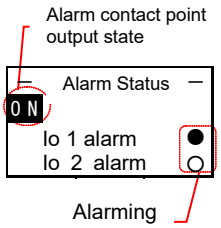
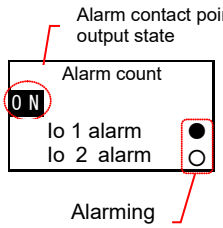
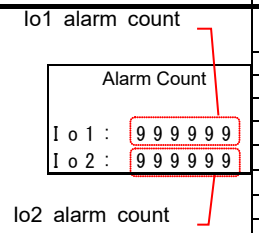
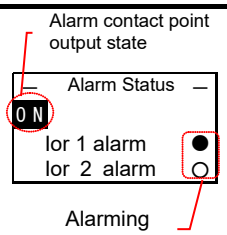
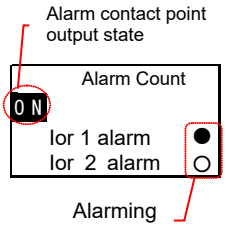
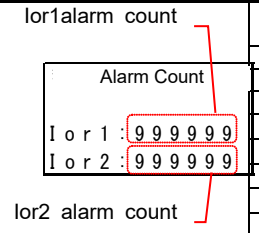
(1) Upper/lower limit alarm

Screen name	Screen	Key operation		Note
		Key	Operation	
(1) Upper/ lower alarm state*1		▲	Alarm display in the previous is displayed	Alarm state of elements is displayed Signs mean below. "—"…Not alarm monitoring(impossible) "○"…Alarm non-occurrence "●"…Alarming or during latch
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Change 3 side circuit in the 1P2W setting	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode. (displayed electric energy)	
		+−+−	Key operation is invalid	
(2) Contact point input state		▲	Alarm display in the previous is displayed	State that contact input is displayed.
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode.	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
		+−+−	Key operation is invalid	

*1 Elements in below table can be alarm monitoring.
Please reference to below table about the existence of measurement target circuit.

Alarm element	Display	The existence of measurement target circuit in 1P2W (2 circuits measuring)
Upper limit Current	A upper	Yes
Lowe limit Current	A lower	Yes
Line voltage upper	V_{L-L} upper	Yes
Line voltage lower	V_{L-L} lower	Yes
Phase voltage upper	V_{L-N} upper	No
Phase voltage lower	V_{L-N} lower	No
Upper electric power	W upper	Yes
Lower electric power	W lower	Yes
Upper power factor	PF upper	Yes
Lower power factor	PF lower	Yes
N phase current upper	A_N upper	No
Upper limit pulse	Pulse upper	Yes
Upper Current unbalance rate upper	UNB.A upper	No
Upper Voltage unbalance rate upper	UNB.V upper	No
Upper limit alarm of Scaling value	Scaling upper	-
Lower limit alarm of Scaling value	Scaling lower	-

(2) Leak current alarm

Screen name	Screen	Key operation		Note
		Key	Operation	
(1) Io alarm state		▲	Alarm display in the previous is displayed	Io(leak current) alarm state is displayed. Sign means below. "○"…Alarm non-occurrence "●"…Alarming
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
		+−+	Key operation is invalid	
(2) Io upper limit of alarm count state		▲	Alarm display in the previous is displayed	Count of Io upper current alarm is displayed. Sign means below. "○"…Lo alarm count is not more than set number of alarm count. "●"…Lo alarm count is more than set number of alarm count.
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
		+−+	Key operation is invalid	
(3) Io alarm count		▲	Alarm display in the previous is displayed	Io1-Alarm and Io2-Alarm count is displayed.
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
		+−+	Key operation is invalid	
(4) Ior alarm status		▲	Alarm display in the previous is displayed	Ior(leak current) alarm state is displayed. Sign means below. "○"…Alarm non-occurrence "●"…Alarming
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
		+−+	Key operation is invalid	
(5) Ior upper alarm count		▲	Alarm display in the previous is displayed	Upper limit of Ior alarm count is display. Sign means below. "○"…Lo alarm count is not more than set number of alarm count. "●"…Lo alarm count is more than set number of alarm count.
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the alarm setting mod	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
		+−+	Key operation is invalid	
(6) Ior alarm count		▲	Alarm display in the previous is displayed	Lor1-Alarm and Ior2-Alarm count is displayed.
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
		+−+	Key operation is invalid	

6.8 Reset/Preset mode

You can reset each max/min value and integral value, reset alarm value, and preset integral value.
You can release the alarm and latch of contact input.

6.8.1 Data reset

(1) Data can be reset

Data can be reset is differed in below table what models connect.

Reset target	Models	Reset data		
		1P2W		1P3W, 3P3W, 3P4W
		1side([1])	3side([2])	
Maximum (all data) －only selected circuit	EMU4-BM1-MB EMU4-HM1-MB EMU4-A2 EMU4-VA2	Current demand Voltage Electric power demand Power factor	Current demand Voltage Electric power demand Power factor	Current demand Voltage Electric power demand Power factor Current unbalance rate Voltage unbalance rate
	EMU4-LG1-MB	Present leak current Leak current demand Present leak current for resistance Current demand leak current for resistance Differential conversion of leak current for resistance		
	EMU4-AX4	Scaling value		
	EMU4-PX4	―		
Minimum (all data) －only selected circuit	EMU4-BM1-MB EMU4-HM1-MB EMU4-A2 EMU4-VA2	Current demand Voltage Electric power demand Power factor	Current demand Voltage Electric power demand Power factor	Current demand Voltage Electric power demand Power factor
	EMU4-LG1-MB	―		
	EMU4-AX4	Scaling value		
	EMU4-PX4	―		
Integral value (Wh, varh) －only selected circuit	EMU4-BM1-MB	Electric energy Reactive electric energy[*1] Operating time Regeneration[*1] electric energy	Electric energy Operating time Regeneration electric energy	Electric energy Reactive electric energy Operating time Regeneration electric energy
	EMU4-HM1-MB	Electric energy Reactive electric energy[*1] Converted electric energy Period electric energy[*2] Operating time Regeneration electric energy Pulse count value[*3] Pulse conversion[*3]	Electric energy Converted electric energy Period electric energy[*2] Operating time Regeneration electric energy	Electric energy Reactive electric energy Converted electric energy Period electric energy[*2] Operating time Regeneration electric energy Pulse count value[*3] Pulse conversion[*3]
	EMU4-A2 EMU4-VA2	Electric energy Reactive electric energy[*1] Converted electric energy Operating time Regeneration electric energy	Electric energy Converted electric energy Operating time Regeneration electric energy	Electric energy Reactive electric energy Converted electric energy Operating time Regeneration electric energy
	EMU4-LG1-MB	―		
	EMU4-AX4	Number of times exceeding the Limit		
	EMU4-PX4	Pulse count value Pulse conversion Operating time		
Alarm value - only selected circuit	EMU4-BM1-MB	―		
	EMU4-HM1-MB	―		
	EMU4-A2	―		
	EMU4-VA2	―		
	EMU4-LG1-MB	Leak current, leak current for resistance, Io1 and Io2 alarm count		
	EMU4-AX4	―		
	EMU4-PX4	―		
Release alarm	All models	Alarm state		
Release contact input	EMU4-HM1-MB EMU4-PX4	Contact input state		

*1 It becomes reset target only when it doesn't set 2 circuits measuring.
*2 External input when it is contact input become only reset target.
*3 External input when it is pulse input become only reset target.

(2) Reset data

1 Transition to the Reset/Preset mode		
Screen	Operation	Note
1-1. [Reset/Set] **1** Reset 2 Set 3 AL.Release	(1) Push the RESET/SET key in operation mode. (2) 1-1 will be displayed.	
	(1) Push the ▲ or ▼ key, and move the cursor to the "1 Data Reset". (2) Push the ↵/PHASE key. (3) 2-1 will be displayed.	

2 Select the items want to reset		
Screen	Operation	Note
2-1. [Reset] ☑MAX.MIN ☑Integrate ☐Alarm	(1) Push the CIRCUIT key, and select the measurement target circuit. (LED of the selected circuit is light.) (2) Push the ▲ or ▼ key, and move the cursor to the item you want to reset. (3) Push the + or − key, and check the check box. (If you push the + or − key again, Non-checked item turned to checked.) (4) Repeat (1) to (3) operation and check the all check box you want to reset. (5) Push the ↵/PHASE key after select all data. (6) Display transit to follow by the Checked/Non-checked in the models and setting of 2 circuits measuring existence. All items is non-checked → Return to operation display. Models is EMU4-PX4 or EMU4-AX4, or Checked either items in 1P2W(2 circuits measuring) → To 2-2 Other models and checked either items in Non-1P2W(2 circuits measuring) → To 2-3	☐(Non-checked), ☑(Checked)
2-2. [Target] **[1]**	(1) Push the + or − key, and select the measure target circuit. (2) ↵/PHASE key. (3) 2-3 will be displayed.	[measure target circuit] EMU4-PX4 or EMU4-AX4 : **[1]**⇔[2]⇔[3]⇔[4]⇔ 1P2W(2 circuits measuring : **[1]**⇔[2]⇔
2-3. Do you really execute? OK **Cancel**	(1) Push the ▲ ▼ key, and move the cursor to the "OK" and push the ↵/PHASE key. (Return to the 2-1, if you push cancel key.) (2) 2-4 will be displayed after rest data.	
2-4. Completed **OK**	(1) Push the ↵/PHASE key.	

6.8.2 Data preset

(1) Data can be preset

Data can be preset is differs as below table by connected models.

	EMU4-BM1-MB	EMU4-HM1-MB	EMU4-A2 EMU4-VA2	EMU4-LG1-MB	EMU4-PX4	EMU4-AX4
Electric energy	○	○	○	–	–	–
Reactive electric energy	○*1	○*1	○*1	–	–	–
Conversion electric energy	–	○	○	–	–	–
Period electric energy	–	○*2	–	–	–	–
Operating time	○	○	○	–	○*2	–
Regeneration electric energy	○	○	○	–	–	–
Pulse count value	–	○*3	–	–	○*3	–
Pulse conversion	–	○*3	–	–	○*3	–

*1 Can't preset when wiring type is 1P2W (2 circuits measuring).

*2 Can preset only when input is contact input.

*3 Can preset only when input is pulse input.

(2) Preset data

1 Transition to the Reset/Preset mode

Screen	Operation	Note
1-1. [Reset/Set] 1 Reset **2** Set 3 AL.Release	(1) Push the RESET/SET key in operation mode. (2) 1-1 will be displayed.	
	(1) Push the ▲ or ▼ key, and move the cursor to the "2 Data Preset" and push ↵/PHASE key. (2) 2-1 will be displayed.	

2 Preset data(Example:Electric energy

Screen	Operation	Note
2-1. [Set] **1** Wh 2 varh 3 CONV.Wh	(1) In 2-1, push the ▲ or ▼ key, and move the cursor to the "1 Consumed Wh" and push the ↵/PHASE key. (2) 2-2 will be displayed.	
2-2. [Wh] **1**2345.6 kWh [1]	(1) Push the ▲ ▼ + − key, and set the electric energy. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the 2 circuits measure existence. 1P2W (2 circuits measuring) → To 2-3 Non-1P2W (2 circuits measuring) To → 2-4	
2-3. [Wh] **1**2345.6 kWh [2]	(1) Set the electric energy of 2nd circuit. (2) Push the ↵/PHASE key. (3) 2-4 will be displayed.	
2-3(1) [OP.Time] **0**00000 hour [1]	If models is EMU4-PX4 or EMU4-AX4, transition the 2-3(1) to (4). (exanple: Operating time) That CH is not displayed if measurement elements is different.	
2-3(2) [OP.Time] **0**00000 hour [2]		
2-3(3) [OP.Time] **0**00000 hour [3]		
2-3(4) [OP.Time] **0**00000 hour [4]		

Screen	Operation	Note
2-4. Do you really execute? OK Cancel	(1) Push the ▲ ▼ key, and move the cursor to the “OK”, and push the ↵/PHASE key. (If you select cancel, return to operation mode. (2) After data reset is completed 2-5. will be displayed.	
2-5. Completed OK	(1) Push the ↵/PHASE key, and end preset.	

6.8.3 Release alarm

(1) Release alarm

1 Transition to the reset/preset mode		
Screen	Operation	Note
1-1. [Rese/Set] 1 Reset 2 Set 3 AL.Release	(1) Push the RESET/SET key in the operation mode. (2) 1-1 will be displayed.	
	(1) Push the ▲ or ▼ key, and move the cursor to the “3 Release alarm” and push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Release alarm		
Screen	Operation	Note
2-1. [Releasealarm] ☑Alarm ☐Contact	(1) In 2-1, push the ▲ or ▼ key, and move the cursor to the item to release alarm. (2) Push the + or − key, and check the check box. (If you push the + or − key again, Non-checked item turned to checked.) (3) Repeat (1) to (3) operation and check the all check box you want to reset. (4) Push the ↵/PHASE key. (5) Transition to the following screen by whether checked/non-checked items. All items are non-checked → Return to operation display. Either items ate checked → To 2-2.	☐(Non-checked), ☑(checked)
2-2. Do you really execute? OK Cancel	(1) Push the ▲ ▼ key, and move the cursor to the “OK” and push the ↵/PHASE key. (If you select cancel, return to 2-1) (2) After released alarm 2-3 will be displayed.	
2-3. Completed OK	(1) Push the ↵/PHASE key, and end.	

6.9 Change the setup circuit of same voltage system

6.9.1 Automatic reflect of setup value in same voltage system.

Below caution is required about Wring type, 2 circuits measuring, Rating voltage and Simple measuring in using extension unit.

- Setup value of same voltage system unit is automatically changed when Wring type, 2 circuits measuring, Rating voltage and Simple measuring are changed in using EMU4-D65.
- Please be careful about the initialization of setup value even if setup value is changed in automatically. (Please reference to each manuals of measuring unit for check initialized items)
- Items you need to change and automatically changed are below table.

		Changing setting value			
		Wiring	Voltage rating	2 circuit measurement	Simple measurement
Reflect setting value	Wiring	○	○	○	×
	Voltage rating	○	○	○	×
	2 circuit measurement	○	○	○	×
	Simple measurement	×	×	×	○

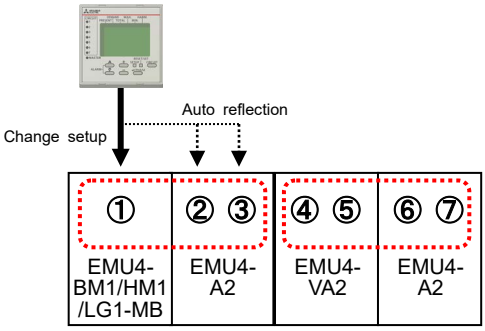
*Wiring type is only reflected in EMU4-LG1-MB.

*Setup value of EMU4-PX4 and EMU4-AX4 is not changed because setup item is different.

Example of reflection of setup value is displayed in below.

(1) In the case of change the measuring unit (EMU4-BM1-MB/ EMU4-HM1-MB/ EMU4-LG1-MB)

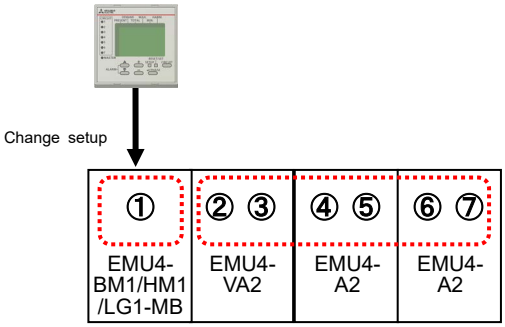
a. In the case of the unit of the right side is same voltage system expansion unit (EMU4-A2).



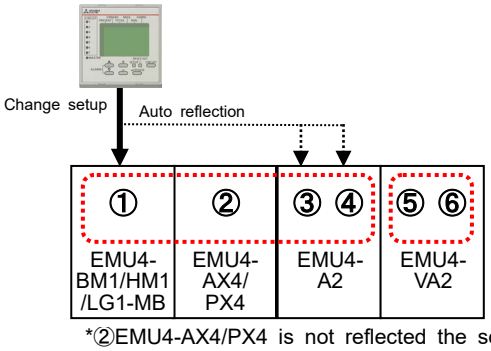
① to ⑦ in the figure indicate the circuit number.
Circuit numbers are assigned in order from the side closest to the basic unit.
The number of input circuits for each unit is as follows.

Unit		Number of input circuits
Basic Unit	EMU4-BM1-MB,EMU4-HM1-MB, EMU4-LG1-MB,EMU4-CNT-MB	1
Extension Unit	EMU4-A2,EMU4-VA2	2
	EMU4-AX4,EMU4-PX4	1

b. In the case of the unit of the right side is different voltage system expansion unit (EMU4-VA2).



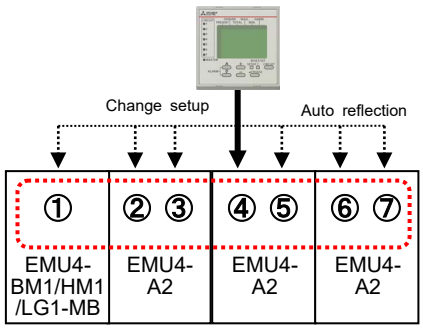
c. In the case of the unit of the right side is pulse input unit(EMU4-PX4) or analog input unit (EMU4-AX4).



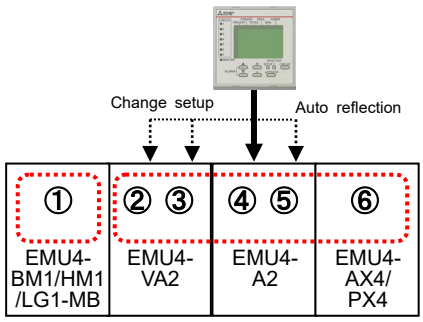
*②EMU4-AX4/PX4 is not reflected the setup value.

(2) In the case of change the same voltage expansion system (EMU4-A2).

a. In the case of the unit of the left side is same voltage system expansion unit (EMU4-A2).

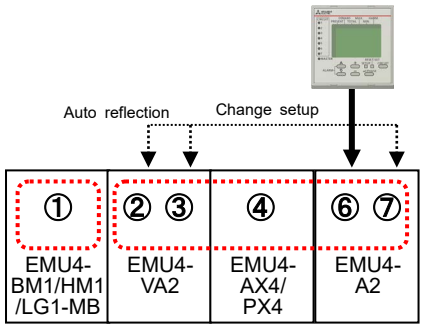


b. In the case of the unit of left side is different voltage system expansion unit (EMU4-VA2).



*⑥EMU4-AX4/PX4 is not reflected the setup value.

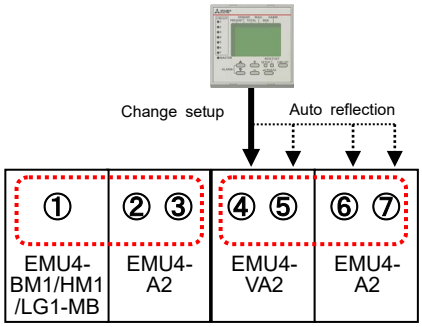
c. In the case of the unit of left side is pulse input unit(EMU4-PX4) or analog input unit(EMU4-AX4).



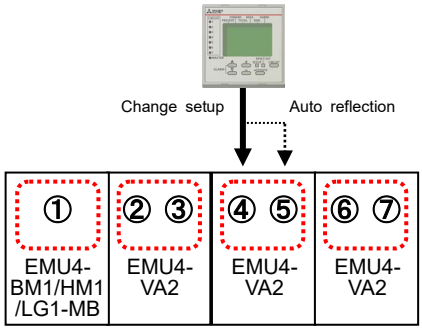
*④EMU4-AX4/PX4 is not reflected the setup value.

(3) In the case of change the different voltage expansion system (EMU4-VA2).

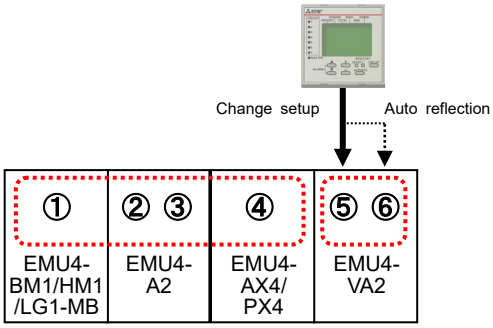
a. In the case of the unit of the left side is same voltage system expansion unit(EMU4-A2).



b. In the case of the unit of left side is different voltage system expansion unit (EMU4-VA2).



c. In the case of the unit of left side is pulse input unit(EMU4-PX4) or analog input unit(EMU4-AX4).

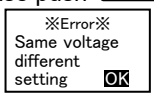


*④EMU4-AX4/PX4 is not reflected the setup value.

6.9.2 Operation in the case of the setup value is different in same voltage system

Below error is displayed when the setup value of same voltage system is different in the exchange and expansion of units.

Please push ↵/PHASE key to transition setup mode.



Please operate below in basis unit of same voltage system for reflect setting value.

(1) Please setup any one of ”Wiring, voltage, 2 circuit measurements” for reflect setting value.to same voltage system.

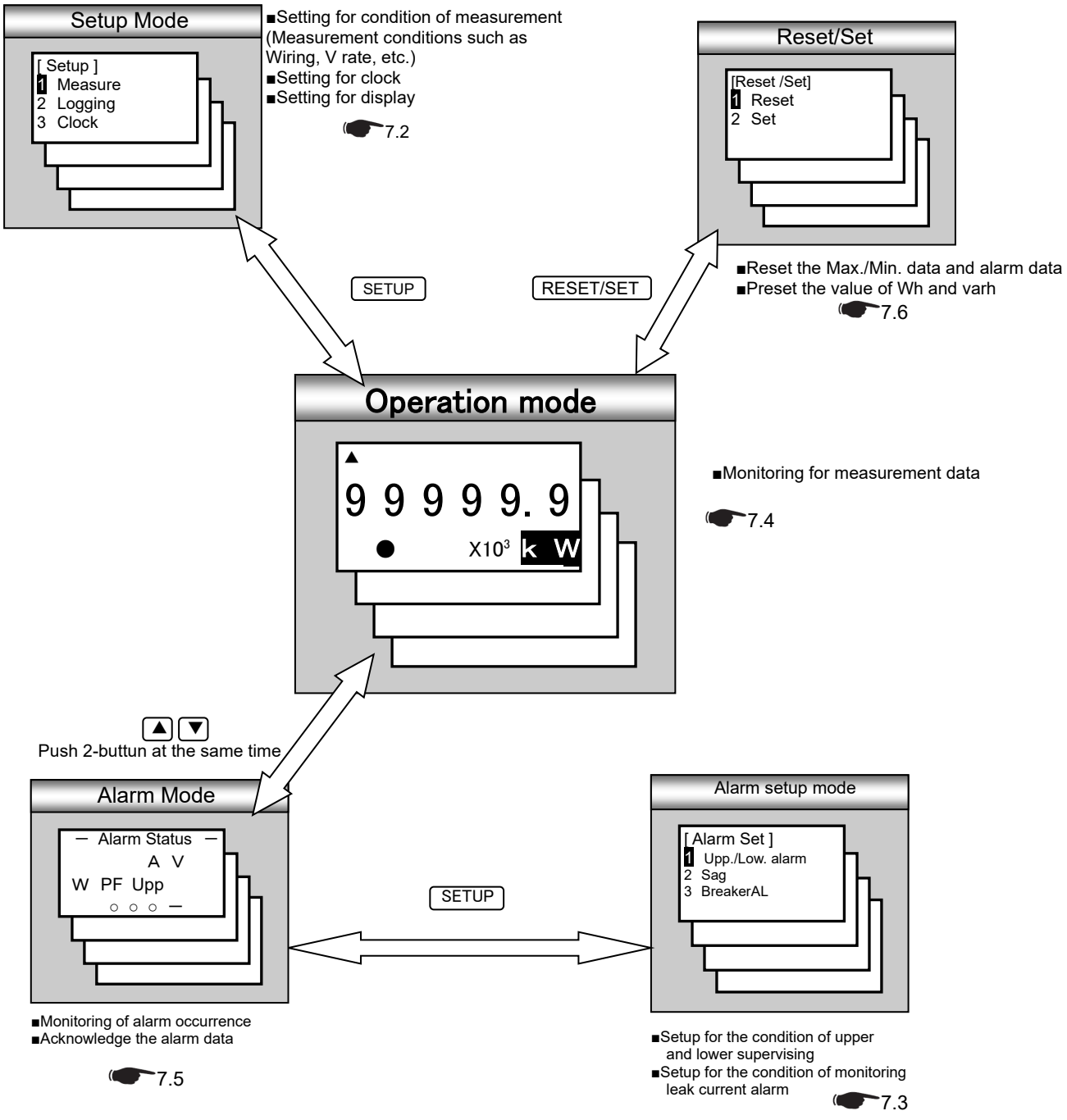
(2) Please setup “simple measurement” for reflect setting value.to same voltage system.

7. Operation method (when connected to EMU2-** to MDU2-**)

In this section operation method is showed when connected EMU2-** and MDU2-**.

Reference to ☛6. Operation method (connected to EMU4-**) when connected to EMU4 -**.

7.1 Operation mode

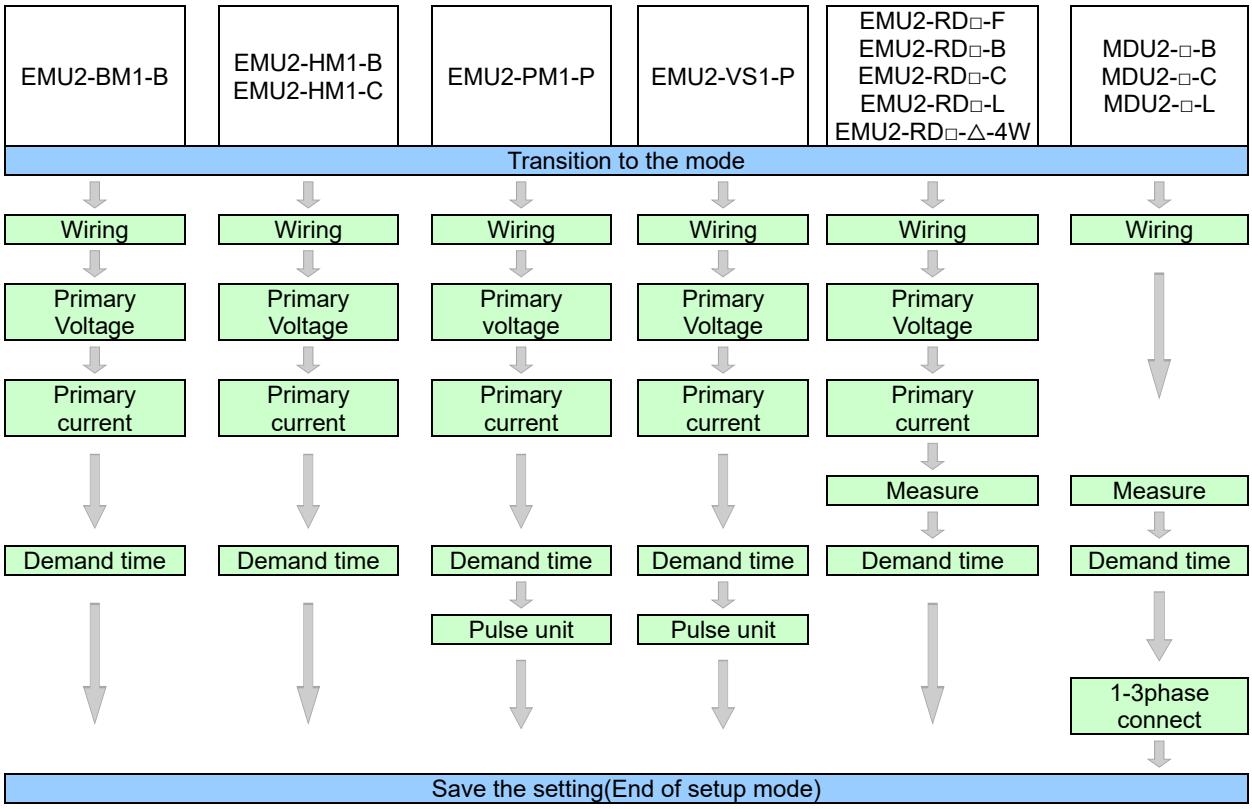


7.2 Setup mode

7.2.1 Follow of setup

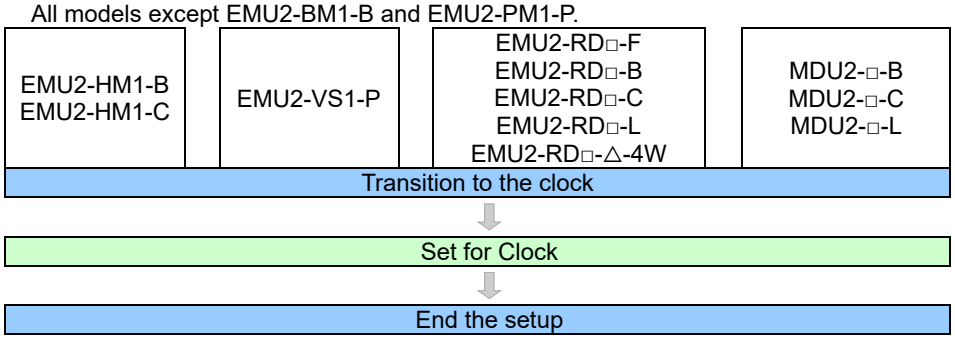
Setup the “(1)Measure setting”, “(2)Clock setting”, “(3)Display setting” in setup mode when connected EMU2-** and MDU2-**.

(1) Measure setting･･･Setup the measure conditions of connected measure unit. ☛7.2.2 Measure setup

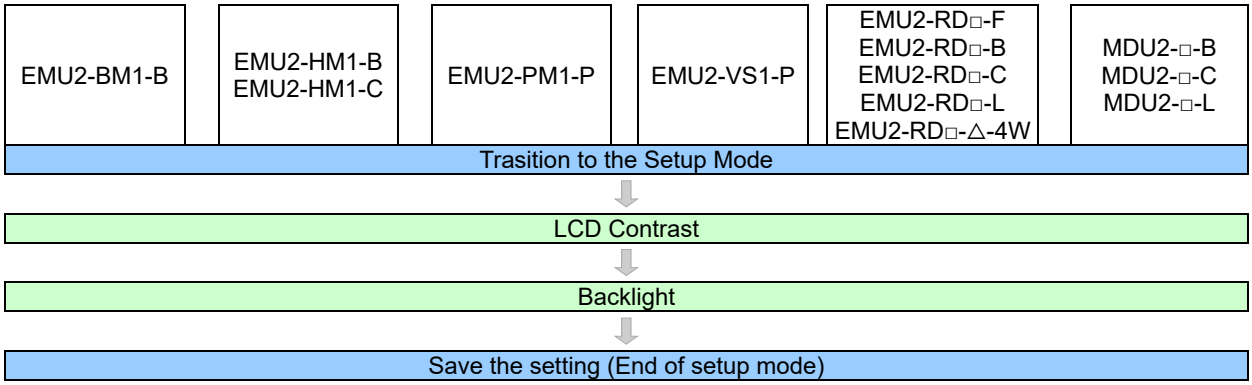


(2) Clock setting･･･Setup the clock of connected measure unit. ☛7.2.3 Setup clock

All models except EMU2-BM1-B and EMU2-PM1-P.



(3) Display setting･･･Setup about display such as LCD contrast or backlight lighting pattern. ☛7.2.4 Setup display



7.2.2 Measure setup

1 Transition to the Setup		
Screen	Operation	Note
1-1. [Setup] 1 Measure 2 Clock 3 Display ▼	(1) Push the SETUP key in Operation Mode. (2) 1-1 will be displayed.	
	(1) Confirm that the cursor focuses the “1 Measure”, push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Setup the phase wire system(All models)		
Screen	Operation	Note
2-1. [Measure] 1 Wiring 2 V rate 3 A rate ▼	(1) In 2-1, push the ▲ or ▼ key, and move the cursor to the “1 Wiring”. (2) Push the ↵/PHASE key. (3) 2-2 will be displayed.	[Wiring]：1P2W⇔1P3W⇔3P3W⇔3P4W⇔ *“3P4W” setting is EMU2-RD□-△-4W only. (3P4W fixed) * □=2,4, △=B, C, L
2-2. [Wring] 3P3W	(1) Push the + or − key, and change the setting value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-1 will be displayed.	*In the case of the model MDU2-□-△, displays all 1P2W to 3P4W, but cannot be set for 3P4W in the case of connection breaker 3 pole products.

3 Setup the primary voltage(EMU2-BM1-B, EMU2-HM1-△, EMU2-PM1-P, EMU2-VS1-P, EMU2-RD□-△)		
Screen	Operation	Note
3-1. [Measure] 1 Wiring 2 V rate 3 A rate ▲▼	(1) In 3-1, push the ▲ or ▼ key, and move the cursor to the ”2 V rate”. (2) Push the ↵/PHASE key. (3) 3-2 will be displayed.	1P2W, 3P3W---------- [V rate]：110V Direct⇔**220V Direct**⇔440V⇔690V⇔ 1100V⇔2200V⇔3300V⇔6600V⇔11000V⇔ 13200V⇔13800V⇔15000V⇔16500V⇔ 22000V⇔24000V⇔33000V⇔66000V⇔ 77000V⇔110000V⇔ 1P3W---------- [V rate]：110V Direct only 3P4W(display the phase voltage / line voltage.)------ [V rate]：63.5V/110V⇔110V/190V⇔120V/208V⇔ **220V/380V**⇔240V/415V⇔254V/440V⇔
3-2. [V rate] 220V Direct	(1) Push the + or − key, and change the setting value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 3-1 will be displayed.	
	*1：In case of the model EMU2-BM1-B,EMU2-HM1-B,EMU2-VS1-P, set only value of 110V Direct, 220V Direct, 440V. *2：In case of the model EMU2-RD□-△-4W settings about voltage surveillance is common for circuit1 and circuit2, or circuit3 and circuit4. For example, if you change the primary voltage of the circuit 1, circuit 2 will also be changed at the same time.	

4 Setup the primary current (EMU2-BM1-B, EMU2-HM1-△, EMU2-PM1-P, EMU2-VS1-P, EMU2-RD□-△)		
Screen	Operation	Note
4-1. [Measure] 1 wiring 2 V rate 3 A rate ▲▼	(1) In 4-1, push the ▲ or ▼ key, and move the cursor to the “3 A rate”. (2) Push the ↵/PHASE key. (3) 4-2 will be displayed.	[Sensor]：**Direct**⇔5A⇔ Direct setting [A rate]：50A⇔**100A**⇔250A⇔400A⇔600A⇔ 5A setting [A rate]：5A⇔6A⇔7.5A⇔8A⇔10A⇔12A⇔15A⇔ 20A⇔25A⇔30A⇔40A⇔50A⇔60A⇔75A⇔80A⇔ **100A**⇔120A⇔150A⇔200A⇔250A⇔300A⇔ 400A⇔500A⇔600A⇔750A⇔800A⇔1000A⇔ 1200A⇔1500A⇔1600A⇔2000A⇔2500A⇔3000A⇔ 4000A⇔5000A⇔6000A⇔7500A⇔8000A⇔ 10000A⇔12000A⇔20000A⇔25000A⇔30000A⇔
4-2. [Sensor] 5A [A rate] 100A	(1) Push the ▲ or ▼ key, and move the cursor to the “Sensor”. (2) Push the + or − key, and select sensor type. (3) Push the ▲ or ▼ key, and move the cursor to the “A rate”. (4) Push the + or − key, and change the primary current value. (5) Push the ↵/PHASE key, and confirm the setting value. (6) 4-1 will be displayed.	

5 Setup the measurement mode(EMU2-RD□-Δ, MDU2-□-Δ)

Screen	Operation	Note
5-1. [Measure] 2 V rate 3 A rate 4 Mode ▲▼	(1) In 5-1, Push the ▲ or ▼ key, and move the cursor to the “4 Measure”. (2) Push the ↵/PHASE key. (3) 5-2 will be displayed.	
5-2. [Mode] Wh+A+4 Harmonics	(1) Push the ▲ or ▼ key, and select the “Mode”. (2) Push the ↵/PHASE key. (3) Transition to the following screen by the selection of measurement mode. [Wh+A+4] setting → To 5-3 [Harmonics] setting → To 5-4	[Mode]:**Wh+A+4**⇔Harmonics⇔ Wh+A+4…In addition to the active energy and current, up to 4 items can be displayed by selection. (The harmonics data is only about total.) Harmonics…It can display about harmonic data at each order. (Maximum and minimum values, demand, reactive power cannot be displayed.)
5-3. [Element] ☑V ☑W □var	(1) Push the ▲ or ▼ key, and move the cursor to target element. (In the actual display, it will be scrolling display of each three elements in one screen.) (2) Push the + or − key, and choose the selected or deselected. (3) When selecting the other measurement item, repeat the operation from (1) to (2). (4) Push the ↵/PHASE key, and determine the setting. (5) Transition to the following screen by the selection of measurement mode. Not check “HA” and “HV” → To 5-1 Check “HA” or “HV” → To 5-4	[Element]:V, W, var, PF, Hz, varh, Demand, HA, HV, Ie, HIe □(Deselected), ☑ (Selected) *The selectable number of elements is up to4. So, change the selection at the state that already 4 items are selected, deselect the items before changing.
5-4. [HA, HV] r.m.s.	(1) Push the + or − key, and change the “HA, HV” value. (2) Push the ↵/PHASE key. (3) 5-1 will be displayed	[HA, HV]:**r.ms.**⇔%⇔ r.m.s.…Display the RMS value of harmonic current or harmonic voltage. (Not display harmonic current and harmonic voltage.) %… Display the distortion rate and content rate of harmonic current or harmonic voltage. (Not display the r.m.s.)

6 Setup the demand time (All models *However, EMU2-BM1-B, EMU2-PM1-P is only Current demand.)

Screen	Operation	Note
6-1. [Measure] 3 A rate 4 Mode 5 Demand ▲▼	(1) In 6-1, Push the ▲ or ▼ key, and move the cursor to the “5 Demand”. (2) Push the ↵/PHASE key. (3) 6-2 will be displayed.	Demand]:0sec⇔10sec⇔20sec⇔30sec⇔40sec⇔ 50sec⇔1min⇔**2min**⇔3min⇔4min⇔5min⇔ 6min⇔7min⇔8min⇔9min⇔10min⇔ 11min⇔12min⇔13min⇔14min⇔15min⇔ 20min⇔25min⇔30min⇔
6-2. [Demand] A : 2min W : 2min	(1) Push the ▲ or ▼ key, and move the cursor to the A(Current). (2) Push the + or − key, and change the demand time value. (3) Push the ▲ or ▼ key, and move the cursor to the W(Electric power). (4) Push the + or − key, and change the demand time value. (5) Push the ↵/PHASE key, and confirm the setting value. (6) 6-1 will be displayed.	

7 Setup the pulse unit (EMU2-PM1-P, EMU2-VS1-P)

Screen	Operation	Note
7-1. [Measure] 4 Mode 5 Demand 6 Pulse ▲▼	(1) In 7-1, push the ▲ or ▼ key, and move the cursor to the ”6 Pulse”. (2) Push the ↵/PHASE key. (3) 7-2 will be displayed.	The pulse output unit changes by the full load power. [Pulse]:
7-2. [Pulse] 10 kWh/pulse	(1) Push the + or − key, and change the set value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 7-1 will be displayed.	

Full load power (kW)	Setting range
Wfull<12kW	⇔**0.001**⇔0.01⇔0.1⇔1⇔
12kW ≤ Wfull < 120kW	⇔**0.01**⇔0.1⇔1⇔10⇔
120kW ≤ Wfull < 1200kW	⇔**0.1**⇔1⇔10⇔100⇔
1200kW ≤ Wfull < 12000kW	⇔**1**⇔10⇔100⇔1000⇔
12000kW ≤ Wfull < 120000kW	⇔**10**⇔100⇔1000⇔ 10000⇔
120000kW ≤ Wfull	⇔**100**⇔1000⇔10000⇔ 100000⇔

8 Setup 1-3Change(MDU2-□-Δ)		
Screen	Operation	Note
8-1. [Measure] 5 Demand 6 Pulse 7 1-3Change	(1) In 8-1, Push the ▲ or ▼ key, and move the cursor to the “7 1-3Change”. (2) Push the ↵/PHASE key. (3) 8-2 will be displayed.	[1-3Change]:**Standard**⇔Change⇔ Standard…From breaker of the left pole, turn to 1,2,3 (R, S, T) assigned in phase. Change…From breaker of the right pole, turn to 3,2,1 (T, S, R) assigned in phase.
8-2. [1-3Change] Standard	(1) Push the + or − key, and change the set value. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 8-1 will be displayed.	

9 Save the settings		
Screen	Operation	Note
9-1. Quit Setup 1 Save 2 Not Save 3 Cancel 9-2. Completed OK	(1) After setting all of the items, push the Setup key. (2) 9-1 will be displayed. (3) When save the settings, push the ▲ or ▼ key, move the cursor to the “1 Save”, and Push the ↵/PHASE key. (4) After completing the settings saving, 9-2 will be displayed. Push the ↵/PHASE key. (5) Return to the operation mode, and it will be displayed electric energy screen.	1 Save → Save settings and return to the operation mode. 2 Not Save → Discard the changes and return to the operation mode. 3 Cancel →Continue the setup.

*Setting for the measurement mode can only be in the display unit is set to master. (Setting for the measurement mode cannot be in the display unit is set to slave.)
*Full load is calculated by following formula. (Full load)=(Primary voltage) x (Primary current) x (Coefficient) / 1000[kW]
*1: In case 3P4W, apply the not phase voltage but line voltage as primary voltage.
*2: Coefficient is varies according to the phase wire system. 1P2W →1, 3P3W/3P4W →1.73
*Primary voltage setting value × primary current setting value cannot be set in excess of 88665kW. For example, if the primary current is set to 30,000 A when the primary voltage setting is 110,000 V, the primary voltage setting is automatically initialized to 220 V. If the primary voltage is set to 110,000 V when the primary current setting is 30,000 A, the primary current setting is automatically initialized to 100 A.
*If you change settings, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.
*If you want to set the other circuit, push the CIRCUIT key on the "Setup" screen (1-1), select the circuit, make the setting.

7.2.3 Clock setup－the settings for the clock.

Setup the clock connected measure unit.

1 Transition to the setup mode		
Screen	Operation	Note
	(1) Push the [SETUP] key in operation mode. (2) 2-1 will be displayed.	

2 Clock setup(EMU2-HM1-⊿, EMU2-VS1-P, EMU2-RD□-⊿, MDU2-□-⊿)		
Screen	Operation	Note
2-1. [Setup] 1 Measure 2 Clock 3 Display	(1) In 2-1, push the [▲] or [▼] key, and move the cursor to the “Clock”. (2) Push the [↵/PHASE] key. (3) 2-2 will be displayed.	[Year]：00⇔01⇔02⇔**03**⇔04⇔…⇔99⇔ [Month]：**01**⇔02⇔03⇔04⇔…⇔12⇔ [Day]：**01**⇔02⇔…⇔29⇔30⇔31⇔ [Hour]：**00**⇔01⇔…⇔12⇔13⇔…23⇔ [Minute]：**00**⇔01⇔…⇔59⇔ Note 1：Setting range of day will change depending on the setting of the year and month. Note 2：It becomes “00” second when the timing of pushing the [↵/PHASE] key at the clock setup screen.
2-2. [Clock] 2015/01/01 00:00 OK Cancel	(1) Push the [▲] or [▼] key, and move the cursor to the “Year”. (2) Push the [+] or [−] key, and change the set value. (3) Push the [▲] key, and move the cursor to the “Month”. (4) Push the [+] or [−] key, and change the set value. (5) In a similar way, change the “Day”, “Hour”,“Minute”.note 1 (6) After setting all of the items, push the [▲] or [▼] key, and move the cursor to the ”OK”. (7) Push the [↵/PHASE] key, and clock setting changed.Note 2	

3 To exit the the setup mode		
Screen	Operation	Note
3-1. Quit Setup 1 Save 2 Not Save 3 Cancel	(1) In 2-1, Push the [SETUP] key. (2) Push the [▲] or [▼] key, and move the cursor to the “2 Not Save”Note1 Push the [↵/PHASE] key. (3) Return to the operation mode, and it will be displayed electric energy screen.	Note 1：If change the measurement settings and the display settings, select the ”1 Save”.

*In case of the model EMU2-BM1-B, EMU2-PM1-P, you cannot clock set because it does not have a clock function.

*Setting for clock can only be in the display unit is set to master. (Setting for clock cannot be in the display unit is set to slave.)

*If you change a setting, please push the [↵/PHASE] key and be sure to determine changes. If without determine, the changes will be discarded.

*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.

7.2.4 Setup the display

Setup about display such as LCD contrast or backlight lighting pattern.

1 Transition to the setup mode		
Screen	Operation	Note
1-1. [Setup] 1 Measure 2 Clock 3 Display	(1) Push the SETUP key in operation mode. (2) 1-1 will be displayed.	
	(1) In 1-1, push the ▲ or ▼ key, and move the cursor to the “Display”. (2) Push the ↵/PHASE key. (3) 2-1 will be displayed.	

2 Setup the LCD contrast		
Screen	Operation	Note
2-1. [Display] 1 Contrast 2 Backlight 0 Back	(1) Push the ▲ or ▼ key, and move the cursor to the ”1 Contrast”. (2) Push the ↵/PHASE key. (3) 2-2 will be displayed.	[Contrast]: ■□□□□□□□⇔ ■■□□□□□□⇔ ■■■□□□□□⇔ ■■■■□□□□⇔ ■■■■■□□□⇔ ■■■■■■□□⇔ ■■■■■■■□⇔ ■■■■■■■■ Pale Dark
2-2. [Contrast] −■■■■□□□□+	(1) Push the + or − key, and change the LCD contrast value. (2) Push the ↵/PHASE key. (3) 2-1 will be displayed.	

3 Setup the backlight		
Screen	Operation	Note
3-1. [Display] 1 Contrast 2 Backlight 0 Back	(1) Push the ▲ or ▼ key, and move the cursor to the “2 Backlight”. (2) Push the ↵/PHASE key. (3) 3-2 will be displayed.	[Backlight]: Auto OFF⇔**Always ON** Auto OFF: If 5 minutes has passed since the last key operation, backlight will be OFF automatically. There are any key operation, backlight will be lighted again. Always ON: Backlight is always lighted.
3-2. [Backlight] Auto OFF Always ON	(1) Push the ▲ or ▼ key, and select the backlight condition. (2) Push the ↵/PHASE key. (3) 3-1 will be displayed.	

4 Save the settings		
Screen	Operation	Note
4-1. Quit Setup 1 Save 2 Not Save 3 Cancel	(1) After setting all of the items, push the SETUP key. (2) 4-1 will be displayed. (3) When save the settings, push the ▲ or ▼ key, move the cursor to the “1 Save”, and Push the ↵/PHASE key. (4) After completing the settings saving, “Completed” message will be displayed. Push the ↵/PHASE key. (5) Return to the operation mode, and it will be displayed electric energy screen.	1 Save → Save settings and return to the operation mode. 2 Not Save → Discard the changes and return to the operation mode. 3 Cancel → Continue the setup.

*If you change settings, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.
*If you want to set the other circuit, push the CIRCUIT key on the "Setup" screen (1-1), select the circuit, make the setting.

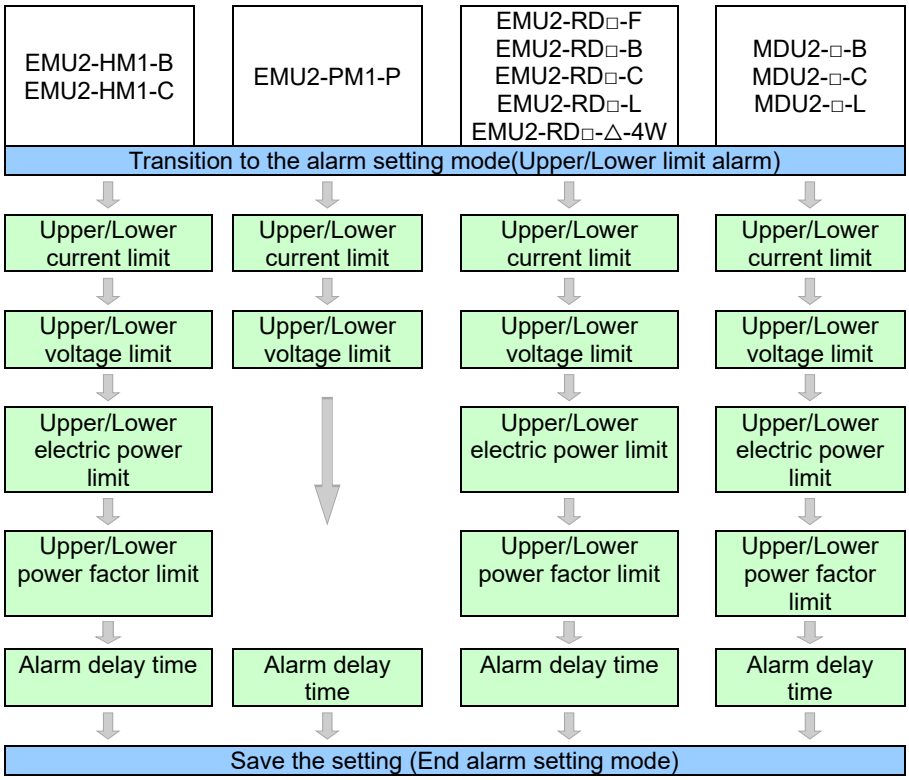
7.3 Alarm setup mode

7.3.1 Follow of alarm setting

Setup“(1)Upper/lower limit alarm”, “(2)Voltage sag alarm”, “(3)BreakerAL” when connected to EMU2-** and MDU2-**.

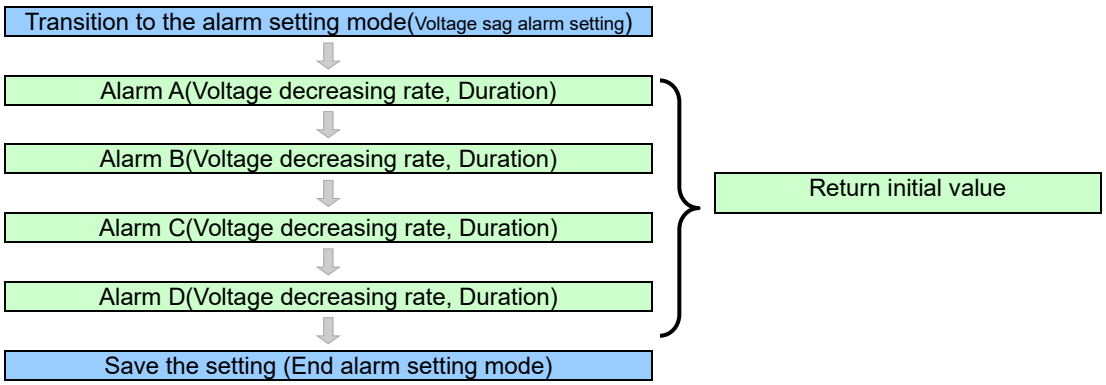
(1) Upper/lower limit alarm

Setup upper/lower limit alarm for current, voltage, electric power, and power factor. (You can’t setup upper/lower limit alarm when EMU2-BM1-P, EMU2-VS1-P)



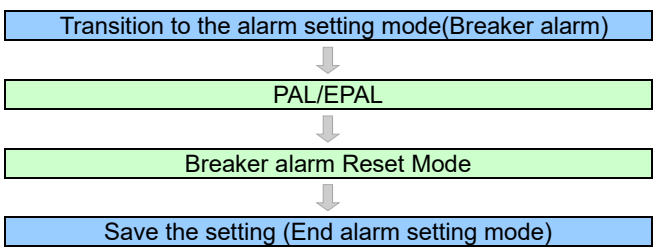
(2) Voltage sag alarm setting

Setup the condition of Voltage sag alarm setting up to 4. (Only EMU2-VS1-P)



(3) Breaker alarm

Setup condition of breaker alarm monitoring. (Only setup MDU2-□-△.)



7.3.2 Upper / lower limit alarm condition setup

The settings for the upper / lower limit alarm of current, voltage, electric power, power factor.

1 Transition to the alarm setup mode		
Screen	Operation	Note
1-1. [Alarm Set] 1 Limit 2 Vsag	(1) Push the SETUP key in alarm mode. (2) 1-1 will be displayed. (1) Confirm that the cursor focuses the "1 Limit", push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Setup the current upper/lower limit alarm(EMU2-PM1-P, EMU2-HM1-Δ, EMU2-RD□-Δ, MDU2-□-Δ)		
Screen	Operation	Note
2-1. [Limit] 1 A Limit 2 V Limit 3 W Limit ▼	(1) Push the ▲ or ▼ key, and move the cursor to the check box of A Upper. (2) Push the ↵/PHASE key. (3) 2-2 will be displayed.	[A Upper]:0A to **(Primary current)A** [A Lower]:**0A** to (Primary current)A *The minimum step of settable value is varied by primary current. 5A to 30A Step:0.01A 40A to 300A Step:0.1A 400A to 3000A Step:1A 4000A to 30000A Step:10A
2-2. ■ A Upper 30000A □ ALower 00300A	(1) Push the ▲ or ▼ key, and move the cursor to the check box of A Upper. (2) Push the + or − key, and setting A Upper limit alarm existence. (3) If it is set to alarm, push the ▲ or ▼ key, and move the cursor, and change the limit value. (4) In a similar way, setting the A Lower limit alarm. (5) Push the ↵/PHASE key, and confirm the setting value. (6) 2-1 will be displayed.	

3 Setup the Voltage upper/lower limit alarm(EMU2-PM1-P, EMU2-HM1-Δ, EMU2-RD□-Δ, MDU2-□-Δ)		
Screen	Operation	Note
3-1. [Limit] 1 A Limit 2 V Limit 3 W Limit ▲▼	(1) Push the ▲ or ▼ key, and move the cursor to the "2 V Limit". (2) Push the ↵/PHASE key. (3) 3-2 will be displayed.	[V Upper]:0V to **(Primary voltage×15/11)V** [V Lower]:**0V** to (Primary voltage×15/11)V *The minimum step of settable value is varied by primary voltage. Less than 440V Step:0.1V 440V to 2200V Step:1V 3300V to 110000V Step:10V
3-2. ■ V Upper 2200V ☑ V Lower 2200V	(1) In a similar way as 2-2, change the setting of the voltage limit alarm.	

Note 1: In case of the model EMU2-RD□-△-4W,Upper and lower limits of the voltage for the circuit 1 and circuit 2 set in the circuit 1.If you set the upper limit lower limit value of the voltage in the circuit 1, the same value is also set in the circuit 2. Similarly, Upper and lower limits of the voltage for the circuit 3 and circuit 4 set in the circuit 3. If you set the upper limit lower limit value of the voltage in the circuit 3, the same value is also set in the circuit 4. The circuit of even number is not used for setting upper and lower limits value of the voltage. (Setting is invalid.)

Note 2: Upper and lower limits of the voltage is monitored at the **line voltage**. It is not possible to monitor the phase voltage.

4 Setup the electric power upper/lower limit alarm(EMU2-HM1-Δ, EMU2-RD□-Δ, MDU2-□-Δ)		
Screen	Operation	Note
4-1. [Limit] 1 A Limit 2 V Limit 3 W Limit ▲▼	(1) Push the ▲ or ▼ key, and move the cursor to the "3 W Limit". (2) Push the ↵/PHASE key. (3) 4-2 will be displayed.	[W Upper]:0W to **(Full load)W** [W Lower]:**0W** to (Full load)W *The minimum step of settable value is varies by full load(Wfull). Wfull<12kW Step: 0.001kW 12kW ≤ Wfull < 120kW Step: 0.01kW 120kW ≤ Wfull < 1200kW Step: 0.1kW 1200kW ≤ Wfull < 12000kW Step: 1kW 12000kW ≤ Wfull < 120000kW Step: 10kW 120000kW ≤ Wfull Step: 100kW
4-2. ☑ W Upper 11410 10^2kW ☑ W Lower 00114 10^2kW	(1) In a similar way as 2-2, change the setting of the electric power limit alarm.	

5 Setup the Power factor upper/lower limit alarm(EMU2-HM1-Δ, EMU2-RD□-Δ, MDU2-□-Δ)		
Screen	Operation	Note
5-1. [Limit] 2 V Limit 3 W Limit 4 PF Limit ▲▼	(1) Push the ▲ or ▼ key, and move the cursor to the "4 PF Limit". (2) Push the ↵/PHASE key. (3) 5-2 will be displayed.	[PF Upper]:**-0.500**⇔-0.550⇔…⇔-0.950⇔ 1.000⇔0.950⇔…⇔0.500⇔ [PF Lower]:-0.500⇔-0.550⇔…⇔-0.950⇔ 1.000⇔0.950⇔…⇔**0.500**⇔
5-2. ☑ PF Upper 0.500 ☑ PF Lower -0.500	(1) In a similar way as 2-2, change the setting of the power factor limit alarm.	

6 Setup for alarm delay time(EMU2-PM1-P, EMU2-HM1-△, EMU2-RD□-△, MDU2-□-△)		
Screen	Operation	Note
6-1. [Limit] 3 W Limit 4 PF Limit 5 Delay ▲▼	(1) Push the ▲ or ▼ key, and move the cursor to the “5 Delay”. (2) Push the ↵/PHASE key. (3) 6-2 will be displayed.	[Delay]：0sec⇔5sec⇔**10sec**⇔20sec⇔30sec⇔40sec⇔50sec⇔1min⇔2min⇔3min⇔4min⇔5min⇔
6-2. [Delay] 1min	(1) Push the ▲ or ▼ key, and change the alarm delay time. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 6-1 will be displayed.	
	In case of the model EMU2-RD□-△-4W, alarm delay time that affects the upper and lower limits of voltage for the circuit 2 use the alarm delay time setting value of circuit 1. Similarly, alarm delay time that affects the upper and lower limits of voltage for the circuit 4 use the alarm delay time setting value of circuit 3. Alarm delay time of the circuit of even number does not affect the monitoring of upper and lower limits of the voltage.	

7 Save the settings		
Screen	Operation	Note
7-1. Quit Setup 1 Save 2 Not Save 3 Cancel	(1) After setting all of the items, push the SETUP key. (2) 7-1 will be displayed. (3) When save the settings, push the ▲ or ▼ key, move the cursor to the “1 Save”, and Push the ↵/PHASE key. (4) After completing the settings saving, “Completed” message will be displayed. Push the ↵/PHASE key. (5) Return to the alarm mode, and it will be displayed alarm list screen.	1 Save → Save settings and return to the operation mode. 2 Not Save → Discard the changes and return to the operation mode. 3 Cancel →Continue the setup.

*In case of the model EMU2-BM1-B, the alarm setup mode cannot be used.
*Setting for alarm mode can only be in the display unit is set to master. (Setting for alarm mode cannot be in the display unit is set to slave.)
*If you change a setting, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.
*The underline means the default of setting. After you have been set, even if a power failure occurs does not disappear setting.
*If you want to set the other circuit, push the CIRCUIT key on the "Setup" screen (1-1), select the circuit, make the setting.

7.3.3 Setup the Voltage sag alarm

Setup the Voltage decreasing rate and duration of Voltage sag alarm. (Only EMU2-VS1-P)

1 Transition to the alarm setup mode		
Screen	Operation	Note
1-1. [Alarm Set] 1 Limit **2** Vsag 3 Breaker	(1) Push the SETUP key in alarm mode. (2) 1-1 will be displayed. (1) Confirm that the cursor focuses the “2 Voltage sag alarm”, push the ↵/PHASE key. (2) 2-1 will be displayed.	

2 Setup the monitoring condition of Voltage sag alarm. (EMU2-VS1-P)		
Screen	Operation	Note
2-1. [Vsag] **1** Alarm A 2 Alarm B 3 Alarm C ▼	(1) Push the ▲ or ▼ key, and move the cursor to the “1 _Alarm A”. (2) Push the ↵/PHASE key. (3) 2-2 will be displayed.	<V decreasing rate> 0% to 100% (1% step) <Duration> 20ms to 10000ms (10ms step) *Alarm is not monitored when voltage decreasing rate is set 0%.
2-2. Sag Rate: **20**% Duration: 01000ms Sag Rate: 20% Duration: **0**1000ms	(1) Push the ▲ or ▼ key, and move the cursor to the item decreasing rate of V. (2) Push the + or − key, and setup decreasing rate of voltage sag. (3) Push the ▲ or ▼key, and move cursor to the voltage sag time. (Cursor is moved by 1 digit.) (4) Push the + or − key, and setup the voltage sag time. (5) Repeat (3) to (4) operation and setup all digits (6) Push the ↵/PHASE key, and confirm the setting value. (7) Return to 2-1.	
	(1) In a similar way, setup alarm B, C, D.	

3 Return to default setting of voltage sag alarm(EMU2-VS1-P)		
Screen	Operation	Note
3-1. [Vsag] 3 Alarm C 4 Alarm D **5** Default ▲▼	(1) Push the ▲ or ▼ key, and move the cursor to the “5 Return default” (2) Push the ↵/PHASE key.	Default value is in below. V decreasing rate Duration Alarm A 20% 1000ms Alarm B 30% 500ms Alarm C 50% 200ms Alarm D 100% 20ms
3-2. A 20% 1000ms B 30% 500ms C 50% 200ms D 100% 20ms	(1) Push the ↵/PHASE key, after confirming the default setting value. (Voltage decreasing rate and duration return to the default value.) (2) 3-1 will be displayed.	

4 Save the settings		
Screen	Operation	Note
4-1. Quit Setup **1** Save 2 Not Save 3 Cancel	(1) After setting all of the items, push the SETUP key. (2) 4-1 will be displayed. (3) When save the settings, push the ▲ or ▼ key, move the cursor to the “1 Save”, and Push the ↵/PHASE key. (4) After completing the settings saving, “Completed” message will be displayed. Push the ↵/PHASE key. (5) Return to the operation mode.	1 Save → Save settings and return to the operation mode. 2 Not Save → Discard the changes and return to the operation mode. 3 Cancel →Continue the setup.

*If you change settings, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.

7.3.4 Setup breaker alarm

Setup for breaker alarm monitoring (Only MDU2-□-△ models)

1 Transition to the alarm setup mode		
Screen	Operation	Note
1-1. [Alarm Set] 1 Limit 2 Vsag 3 Breaker	(1) Push the SETUP key in alarm mode. (2) 1-1 will be displayed.	
	(1) Confirm that the cursor focuses the "3 Breaker" and ↵/PHASE key. (2) 2-1 will be displayed.	

2 Setup PAL/EPAL (Only MDU2-□-△models)		
Screen	Operation	Note
2-1. [Breaker] 1 PAL/EPAL 2 Reset 3 Return	(1) Push the ▲ or ▼ key, and move the cursor to the "1 PAL/EPAL". (2) ↵/PHASE key. (3) 2-2 will be displayed.	<PAL> 70% to 100% (1% step) <EPAL> 0mA to rated leak current for measure×1/2 (1mA step) *Alarm monitoring is not work when EPA is set 0mA. *The items are different by the connected models. ・PAL：setup only when less than 250A frames. "---" is displayed when connected models can't setup (more than 400A frames) ・EPAL：leakage breaker, Leak current alarm can be setup. You can operate the change the value but setup value is not. (Fixed 0A)
2-2. [PAL] 100% [EPAL] 0000mA [PAL] 100% [EPAL] 0000mA	(1) Push the ▲ or ▼ key, and move the cursor to the "PAL". (2) Push the + or − key, and change the PAL setting value. (3) Push the ▲ or ▼ key, and move the cursor to the "EPAL". (Cursor is moved by 1 digit.) (4) Push the + or − key, and change the EPAL setting value. (5) Repeat (3) to (4) operation and setup all digits. (6) Push the ↵/PHASE key, and confirm the setting value. (7) 2-1 will be displayed.	
	(1) When you setup other circuits, push the CIRCUIT key, and select the circuit and repeat above operation.	

3 Setup Reset Mode of Breaker alarm(MDU2-□-△)		
Screen	Operation	Note
3-1. [Breaker] 1 PAL/EPAL 2 ResetMode 3 Rerturn	(1) Push the ▲ or ▼ key, and move the cursor to the "2 ResetMode". (2) Push the ↵/PHASE key. (3) 3-2 will be displayed.	**Auto Reset**, ・・・Auto Reset is automatically worked if removed the cause of each alarm PAL, EPAL, ECA. Hold ・・・Alarm is hold if removed the cause of each alarm PAL, EPAL, ECA .(Reset is worked at breaker AL reset☛7.6.1 Reset measured data)
3-2. [Reset mode] Auto reset	(1) Push the + or − key, and change the Reset mode. (2) Push the ↵/PHASE key, and confirm the setting value. (3) 2-1 will be displayed.	
	(1) When you setup other circuits, push the CIRCUIT key, and select the circuit and repeat above operation.	

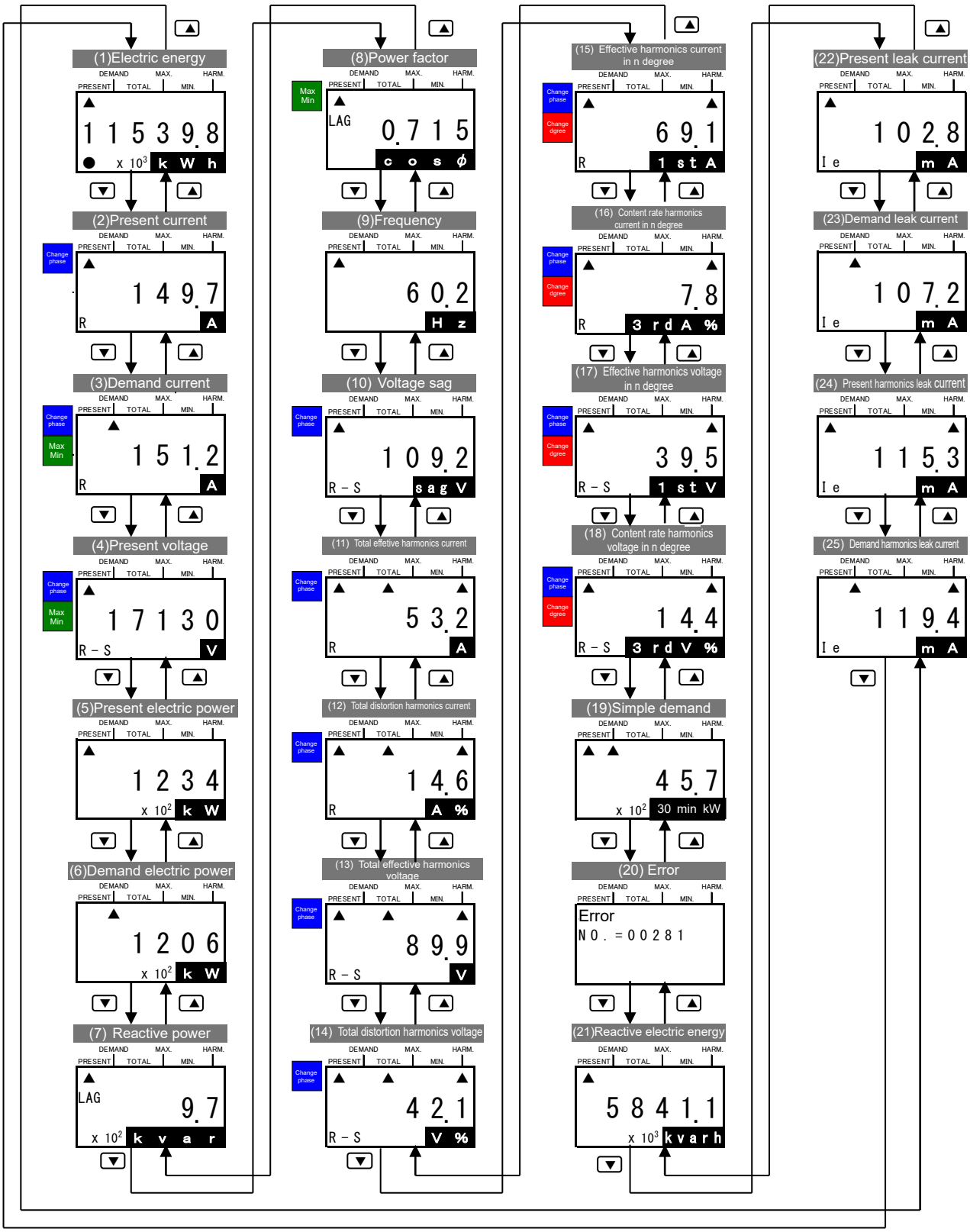
4 Save the settings		
Screen	Operation	Note
4-1. Quit Setup 1 Save 2 Not Save 3 Cancel	(1) After setting all of the items, push the SETUP key. (2) 4-1 will be displayed. (3) When save the settings, push the ▲ or ▼ key, move the cursor to the "1 Save", and Push the ↵/PHASE key. (4) After completing the settings saving, "Completed" message will be displayed. Push the ↵/PHASE key. (5) Return to the alarm mode	1 Save → Save settings and return to the alarm mode. 2 Not Save →Discard the changes and return to the alarm mode. 3 Cancel →Continue the setup(1-1).

*If you change a setting, please push the ↵/PHASE key and be sure to determine changes. If without determine, the changes will be discarded.

7.4 Operation mode

7.4.1 Transition of display

Transition of display in operation mode is showed below.



Change phase … Push the ↵/PHASE key, and display switched phase of current or voltage.

Max Min … Push the + or − key, and showed the Max and Min value.

Change dgree … Push the + or − key, and display switched degree of harmonics current or voltage.

*Displayed screen is different by the connected models and setup.(☛7.4.2 Connected model and Correspondence of connected models and display screen)

*Record measured target in operation mode at 10 minutes period. When turned on after power outage, screen before power outage will be displayed.

*Measured circuit by more than 2 circuits measure unit is switched and displayed in any screen except (20) error by push the CIRCUIT key.

7.4.2 Correspondence of connected models and display screen

Screen what display or not appear is different based on the models connected measure unit.

●…Displayed elements ○…element displayed only setting －…Not displayed elements

Data		Displayed data in each models							
		EMU2-BM1-B	EMU2-HM1-B,C	EMU2-PM1-P	EMU2-VS1-P	EMU2-RD□-△*6 EMU2-RD□-△-4W *6		MDU2-□-△*6	
		-	-	-	-	Wh+A +4elements	Detail of harmonics	Wh+A +4 elements	Detail of harmonics
(1)Electric energy		●	●	●	●	●	●	●	●
(2)Present current	R, S, T, N, total *1	●	●	●	●	●	●	●	●
(3)Demand current	R, S, T, N *1	●	●	●	●	●	●	●	●
	Max., Min. value	●	●	－	－	●	－	●	－
	When measured max and min value	－	●	－	－	●	－	●	－
(4)Demand voltage	R-S, S-T, T-R, total *2 R-N, S-N, T-N	－	●	●	●	○	●	○	●
	Max., Min. value	－	●	－	－		－		－
	When measured max and min value	－	●	－	－		－		－
(5)Present electric power		－	●	－	●	○	●	○	●
(6)Demand electric power	Present	－	●	－	●		●		●
	Max., Min. value	－	●	－	－		－		－
	When measured max and min value	－	●	－	－		－		－
(7)Reactive electric power		－	－		－	○	●	○	●
(8)Power factor	Present	－	●	－	●	○	●	○	●
	Max., Min. value	－	●	－	－		－		－
	When measured max and min value	－	●	－	－		－		－
(9)Frequency		－	－	－	－	○	●	○	●
(10) Voltage sag	R-S, S-T, T-R *2	－	－	－	●	－	－	－	－
(11),(12)Total effective value and distortion of harmonics current *5	R, S, T *3	－	－	－	－	○	●	○	●
(13),(14) Total effective value and distortion of harmonics voltage *5	R-S, S-T *4 R-N, S-N, T-N	－	－	－	－	○	●	－	－
(15),(16)1st to 13th Effective value/ content rate of harmonics current *5	R, S, T *3	－	－	－	－	－	●	－	●
(17),(18) 1st to 13th Effective value/ content rate of harmonics voltage *5	R-S, S-T *4 R-N, S-N, T-N	－	－	－	－	－	●	－	－
(19) Simple demand		－	●	－	－	○	－	－	－
(20) Error		●	●	●	●	●	●	●	●
(21) Reactive power		－	－	－	－	○	－	○	－
(22) Present leak current value		－	－	－	－	－	－		●
(23)Demand leak current value	Present	－	－	－	－	－	－		●
	Max./Min.	－	－	－	－	－	－	○	－
	When measured max and min value	－	－	－	－	－	－		－
(24) Present value of harmonics including leak current		－	－	－	－	－	－		●
(25)Demand value of leak current including harmonics	Present	－	－	－	－	－	－		●
	Max./Min.	－	－	－	－	－	－	○	－
	When measured max and min value	－	－	－	－	－	－		－

*1 S and T phase are not displayed when the wiring set 1P2W. N phase is displayed only setup 3P4W. All phases that in breakers are displayed in MDU2 regardless of wiring.

*2 S-T and T-R are not displayed when the wiring set 1P2W. R-N, S-N, T-N is displayed only setup 3P4W. All values of between the lines of breaker are displayed in MDU2 regardless of wiring.

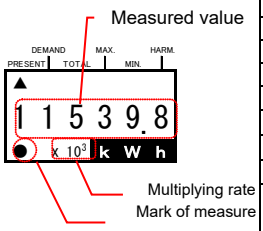
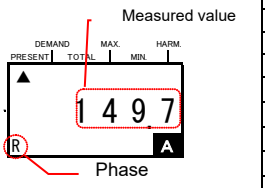
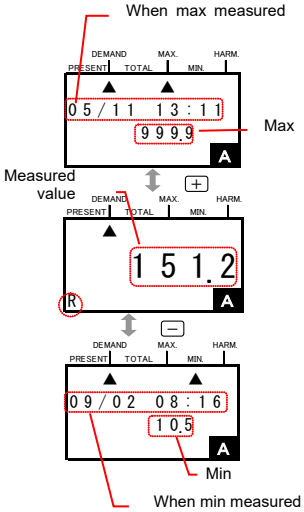
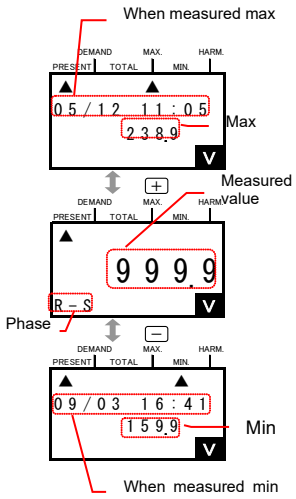
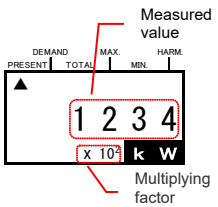
*3 T phase is not displayed when the wiring set 1P2W. S phase is displayed only setup 3P4W. All values are displayed in MDU2 regardless of wiring.

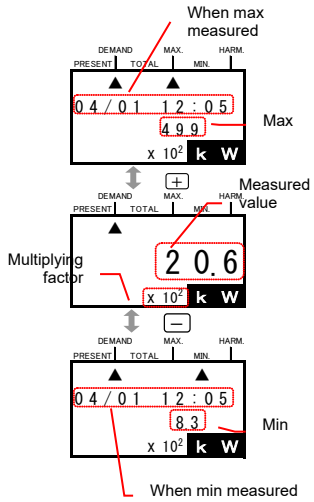
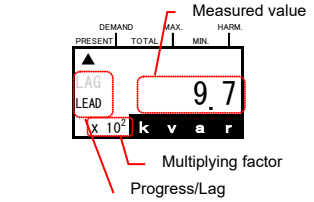
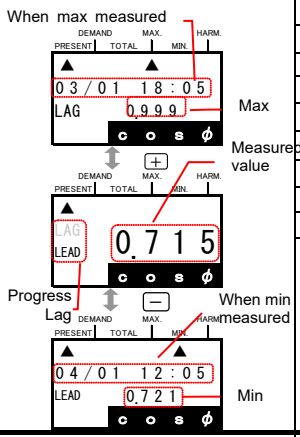
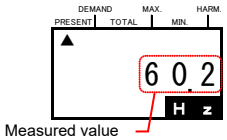
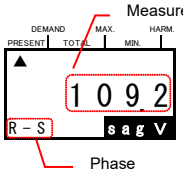
*4 S-T is not displayed when the wiring set 1P2W. R-N, S-N, T-N are only displayed in 3P4W. Harmonics voltage is measured as phase voltage in 3P4W. It is displayed in between the lines. Please read replace R-S⇒R-N, S-T⇒S-N, T-R⇒T-N.

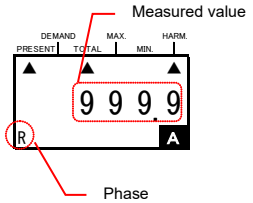
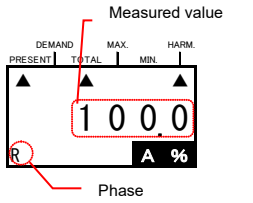
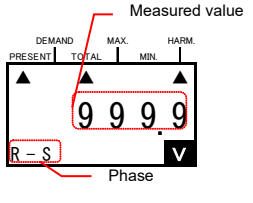
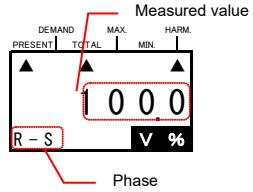
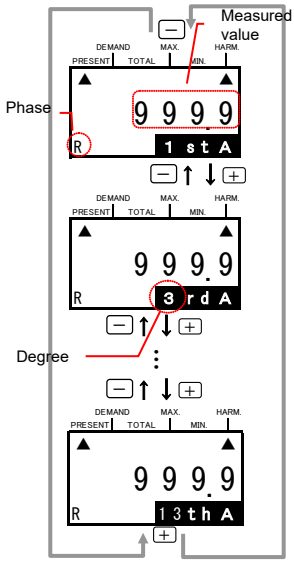
*5 Either effective value/ content rate or distortion is displayed by the setup of HA,HV.

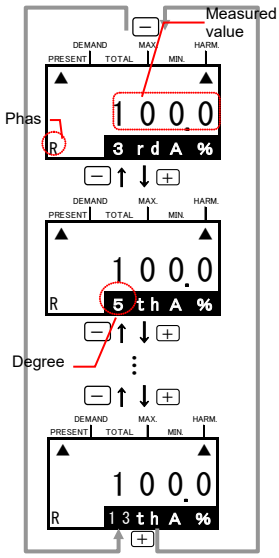
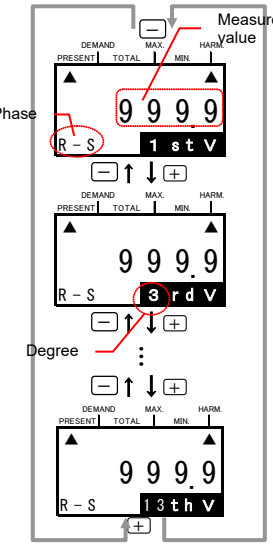
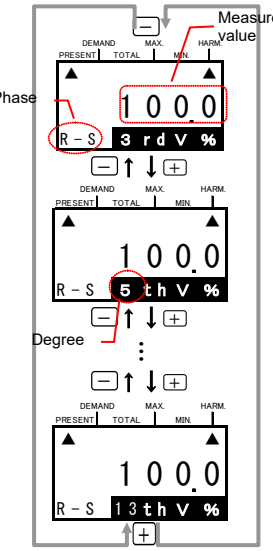
*6 □…number of measure circuit 1 to 7, △…Communication specification B(B/NET), C(CC-Link), L(LONWORKS).

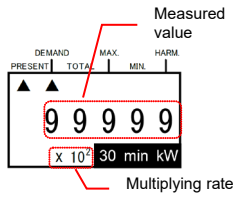
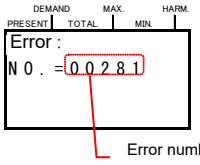
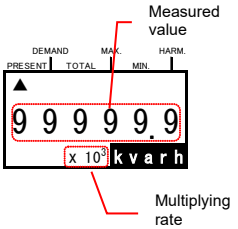
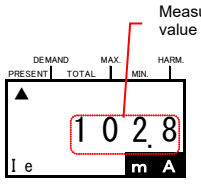
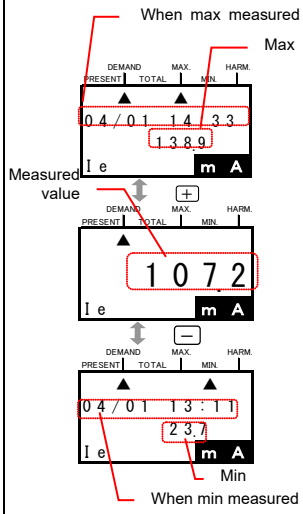
7.4.3 Detail of display

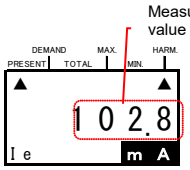
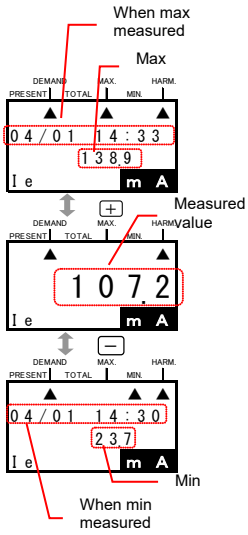
Screen name	Screen	Key operation		Note
		Key	operation	
(1) Electric energy		▲	Measured value in previous is displayed	Integral electric power is displayed. "●" is displayed while measuring in left in display. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(2) Present current		▲	Measured value in previous is displayed	Present current is displayed. ・Push the ↵/PHASE key, display change below. R phase→S phase→T phase→Total Only 《R phase》⇔《Total》 transition in 1P2W. N phase is displayed in 3P4W.(《R phase》→《S phase》→《T phase》→《N phase》→《Total》)
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(3) Demand current		▲	Measured value in previous is displayed	Demand current is displayed. ・Push the ↵/PHASE key, switch below. *1P2W setting* Only display R phase *1P3W, 3P3W setting* R phase→S phase→T phase *3P4W setting* R phase→S phase→T phase→N phase ・Push the + key, and display the maximum value, and push again return standard display. ・Time when measured max and min is displayed MM/DD hh:mm. * "--/-- --:--" is displayed in EMU2-BM1 because of not measuring time.
		▼	Measured value in next is displayed	
		+	Maximum demand current value is displayed	
		−	Minimum demand current value is displayed	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(4) Present voltage value		▲	Measured value in previous is displayed	Present voltage value is displayed. ・Push the ↵/PHASE key, and switch below. *1P2W setting* R-S→Total *1P3W, 3P3W setting* R-S→S-T→T-R→Total *3P4W setting* R-S→S-T→T-R→R-N→S-N→T-N→Total ・Push the + key, and display the maximum value, and push again return standard display. ・Time when measured max and min is displayed MM/DD hh:mm.
		▼	Measured value in next is displayed	
		+	Maximum voltage value is displayed	
		−	Minimum voltage value is displayed	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(5) Present electric power		▲	Measured value in previous is displayed	Present electric power is displayed. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	

Screen name	Screen	Key operation		Note
		Key	Operation	
(6) Demand electric power		▲	Measured value in previous is displayed	Demand electric power is displayed. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed. ・Push the + key, and display the maximum value, and push again return standard display. ・Time when measured max and min is displayed MM/DD hh:mm.
		▼	Measured value in next is displayed	
		+	Maximum demand electric power value is displayed	
		−	Minimum demand electric power value is displayed	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(7) Reactive electric power		▲	Measured value in previous is displayed	Reactive electric power is displayed. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed. ・LEAD and LAG is displayed in left side of measured value.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(8) Power factor		▲	Measured value in previous is displayed	Power factor is displayed. ・Push the + key, and display the maximum value, and push again return standard display. ・Time when measured max and min is displayed MM/DD hh:mm. ・LEAD and LAG is displayed in left side of measured value.
		▼	Measured value in next is displayed	
		+	Maximum power factor value is displayed	
		−	Minimum power factor value is displayed	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(9) Frequency		▲	Measured value in previous is displayed	Present frequency is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(10) Voltage sag		▲	Measured value in previous is displayed	Present voltage sag is displayed. ・Push the ↵/PHASE key, switch below. *1P2W setting* R-S *1P3W, 3P3W setting* R-S→S-T→T-R
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	

Screen name	Screen	Key operation		Note
		Key	Operation	
(11) Total effective value of harmonics current		▲ ▼ + − ↵/PHASE CIRCUIT SETUP RESET/SET ▲+▼	Measured value in previous is displayed Measured value in next is displayed Key operation is invalid Key operation is invalid Display by changed phase Change measured circuit Transition to the Setup mod Transition to the Reset/Preset mode Transition to the Alarm mode	Total effective value of harmonics current is displayed. ・Push the ↵/PHASE key, and switch below. *1P2W setting* R phase *1P3W, 3P3W setting* R phase→T phase *3P4W setting* R phase→S phase→T phase
(12) Total distortion of harmonics current		▲ ▼ + − ↵/PHASE CIRCUIT SETUP RESET/SET ▲+▼	Measured value in previous is displayed Measured value in next is displayed Key operation is invalid Key operation is invalid Display by changed phase Change measured circuit Transition to the Setup mode Transition to the Reset/Preset mode Transition to the Alarm mode	Total distortion of harmonics current is displayed. ・Push the ↵/PHASE key, switch below. *1P2W setting* R phase *1P3W, 3P3W setting* R phase→T phase *3P4W setting* R phase→S phase→T phase
(13) Total effective value of harmonics voltage		▲ ▼ + − ↵/PHASE CIRCUIT SETUP RESET/SET ▲+▼	Measured value in previous is displayed Measured value in next is displayed Key operation is invalid Key operation is invalid Display by changed phase Change measured circuit Transition to the Setup mode Transition to the Reset/Preset mode Transition to the Alarm mode	Total effective value of harmonics voltage. ・Push the ↵/PHASE key, and switch below. *1P2W setting* R-S *1P3W, 3P3W setting* R-S→S-T *3P4W setting* R-S→S-T→T-R Please read replace R-S⇒R-N, S-T⇒S-N, T-R⇒T-N.
(14) Total distortion of harmonics voltage		▲ ▼ + − ↵/PHASE CIRCUIT SETUP RESET/SET ▲+▼	Measured value in previous is displayed Measured value in next is displayed Key operation is invalid Key operation is invalid Display by changed phase Change measured circuit Transition to the Setup mode Transition to the Reset/Preset mode Transition to the Alarm mode	Total distortion of harmonics voltage is displayed. ・Push the ↵/PHASE key, and switch below. *1P2W setting* R-S *1P3W, 3P3W setting* R-S→S-T *3P4W setting* R-S→S-T→T-R Please read replace R-S⇒R-N, S-T⇒S-N, T-R⇒T-N.
(15) 1st to13th degree effective value of harmonics current		▲ ▼ + − ↵/PHASE CIRCUIT SETUP RESET/SET ▲+▼	Measured value in previous is displayed Measured value in next is displayed The order in next is displayed The order in previous is displayed Display by changed phase Change measured circuit Transition to the Setup mode Transition to the Reset/Preset mode Transition to the Alarm mode	The nth effective value of harmonics current Is displayed. ・Push the ↵/PHASE key, and switch below. *1P2W setting* R phase *1P3W, 3P3W setting* R phase→T phase *3P4W setting* R phase→S phase→T phase ・ Push the + key, and switch below. 1st→3rd→5th→7th→9th→11th→13 th Push the − key, and switch below. 1st→13th→11th→9th→7th→5th→3rd

Screen name	Screen	Key operation		Note
		Key	Operation	
(16) 1st to 13th content rate of harmonics current		▲ ▼ + − ↵/PHASE CIRCUIT SETUP RESET/SET ▲+▼	Measured value in previous is displayed Measured value in next is displayed The order in next is displayed The order in previous is displayed Display by changed phase Change measured circuit Transition to the Setup mode Transition to the Reset/Preset mode Transition to the Alarm mode	Nth content rate of harmonics current is displayed. ・Push the ↵/PHASE key, and switch below. *1P2W setting* R phase *1P3W, 3P3W setting* R phase→T phase *3P4W setting* R phase→S phase→T phase ・Push the + key, and switch below. 3rd→5th→7th→9th→11th→13th Push the − key, and switch below. 3rd→13th→11th→9th→7th→5th
(17) 1st to 13th effective vale of harmonics voltage		▲ ▼ + − ↵/PHASE CIRCUIT SETUP RESET/SET ▲+▼	Measured value in previous is displayed Measured value in next is displayed The order in next is displayed The order in previous is displayed Display by changed phase Change measured circuit Transition to the Setup mode Transition to the Reset/Preset mode Transition to the Alarm mode	Nth effective value of harmonics voltage is displayed. ・Push the ↵/PHASE key, and switch below. *1P2W setting* R-S *1P3W, 3P3W setting* R-S→S-T *3P4W setting* R-S→S-T→T-R Please read replace R-S⇒R-N, S-T⇒S-N, T-R⇒T-N. ・Push the + key, and switch below. 1st→3rd→5th→7th→9th→11th→13th Push the − key, and switch below. 1st→13th→11th→9th→7th→5th→3rd
(18) 1st to 13th content rate of harmonics voltage		▲ ▼ + − ↵/PHASE CIRCUIT SETUP RESET/SET ▲+▼	Measured value in previous is displayed Measured value in next is displayed The order in next is displayed The order in previous is displayed Display by changed phase Change measured circuit Transition to the Setup mode Transition to the Reset/Preset mode Transition to the Alarm mode	Nth content rate if harmonics voltage. ・Push the ↵/PHASE key, and switch below. *1P2W setting* R-S *1P3W, 3P3W setting* R-S→S-T *3P4W setting* R-S→S-T→T-R Please read replace R-S⇒R-N, S-T⇒S-N, T-R⇒T-N. ・Push the + key, and switch below. 3rd→5th→7th→9th→11th→13th Push the − key, and switch below. 3rd→13th→11th→9th→7th→5th

Screen name	Screen	Key operation		Note
		Key	Operation	
(19) Simple demand		▲	Measured value in previous is displayed	Present value of simple 30 minutes demand displayed. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(20) Error		▲	Measured value in previous is displayed	Error information of energy measure unit is Displayed. "NO.=-----" or "04518" is displayed while working right. Confirm ☛9.1 when you think failure when error number is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(21) Reactive electric energy		▲	Measured value in previous is displayed	Integral reactive electric energy is displayed. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(22) Present leak current		▲	Measured value in previous is displayed	Present leak current value is displayed.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(23) Demand leak current		▲	Measured value in previous is displayed	Demand leak current is displayed. Push the + or − key, and display the maximum or minimum value, and push again return standard display. ・Time when measured max and min is displayed MM/DD hh:mm.
		▼	Measured value in next is displayed.	
		+	Demand Maximum leak current value is displayed	
		−	Demand min leak current is displayed	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	

Screen name	Screen	Key operation		Note
		Key	Operation	
(25) Present leak current harmonics		▲	Measured value in previous is displayed	Present leak current contend harmonics.
		▼	Measured value in next is displayed.	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit.	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	
(26) Demand leak current content harmonics		▲	Measured value in previous is displayed	Demand leak current contend harmonics. ・Push the + or − key, and display the maximum or minimum value, and push again return standard display. ・Time when measured max and min is displayed MM/DD hh:mm.
		▼	Measured value in next is displayed	
		+	Maximum leak current value content harmonics is displayed	
		−	Minimum leak current value content harmonics is displayed	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the Setup mode	
		RESET/SET	Transition to the Reset/Preset mode	
		▲+▼	Transition to the Alarm mode	

7.4.4 Display significant digits

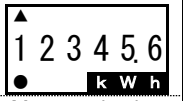
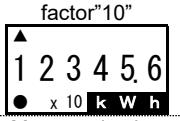
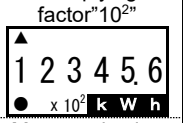
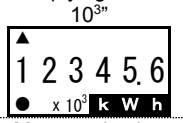
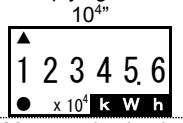
In this section, significant digits by measured method can be displayed. Resolution of measured data references to energy measure unit's manual.

■The indication format of electric energy, reactive energy and periodic energy is as follows depending on the full load power:

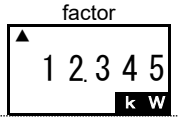
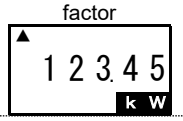
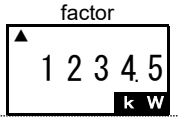
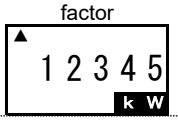
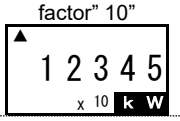
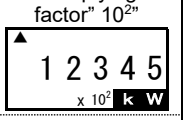
$$\text{Full load power[kW]} = \frac{\alpha \times (\text{VT primary voltage}) \times (\text{CT primary current})}{1000}$$

α: 1 Single-phase, 2-wire
2 Single-phase, 3-wire
1.73 Three-phase, 3-wire
3 Three-phase, 4-wire

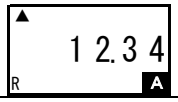
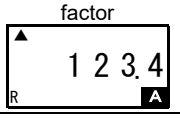
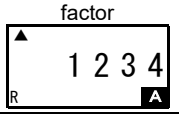
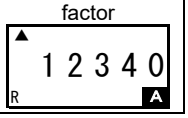
*1: Using direct connection, replace VT primary voltage with direct voltage in calculation above.
*2: In three-phase 4-wire system, replace VT primary voltage or direct voltage with phase voltage in calculation above.

Full load	Less than 12kW	12kW≦ Full Load ≦120kW	120kW≦ Full Load ≦1200kW	1200kW≦ Full Load ≦12000kW	120000W≦ Full Load ≦120000kW	More than 120000kW
Display significant digits	****.** (kWh)	*****.* (kWh)	*****.* x10(kWh)	*****.* x10^2 (kWh)	*****.* x10^3 (kWh)	*****.* x10^4 (kWh)
Screen example	No multiplying factor 	No multiplying factor 	Multiplying factor"10" 	Multiplying factor"10^2" 	Multiplying factor" 10^3" 	Multiplying factor" 10^4" 
	Measured value is 1234.56kWh	Measured value is 12345.6kWh	Measured value is 12345.6kWh	Measured value is 12345.6x100 =1234560kWh	Measured value is12345.6x1000 =12345600kWh	Measured value is 12345.6x10000 =123456000kWh

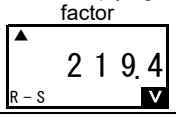
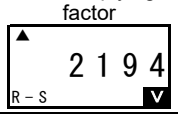
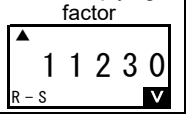
■Present electric power (kW), Demand electric power (kW), Reactive electric power(kvar).
Full load is present follow.

Full load	Less than 12kW	12kW≦ Full Load ≦120kW	120kW≦ Full Load ≦1200kW	1200kW≦ Full Load ≦12000kW	120000W≦ Full Load ≦120000kW	More than 120000kW
Display significant digits	**.*** (kW)	***.** (kW)	****.* (kW)	***** (kW)	*****x10 (kW)	*****x10^2 (kW)
Screen example	No multiplying factor 	No multiplying factor 	No multiplying factor 	No multiplying factor 	Multiplying factor" 10" 	Multiplying factor" 10^2" 
	Measured value is 12.345kW	Measured value is 123.45kW	Measured value is 1234.5kW	Measured value is 12345kW	Measured value is 12345x10 =1234500kW	Measured value is 12345x100 =12345000kW

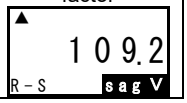
■Present current, Demand current, Effective value of harmonics current
Showed in below table by the primary current setting.

Primary current	5A to 30A	40A to 300A	400A to 3000A	4000A to 30000A
Display significant digits	**.** (A)	***.* (A)	**** (A)	****0 (A)
Screen example	No multiplying factor 	No multiplying factor 	No multiplying factor 	No multiplying factor 

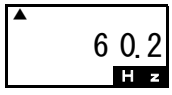
■Present voltage, effective value of harmonics voltage
Showed in below table by the setting of primary voltage

Primary voltage	110V to 220V	440V to 2200V	3300V to 110000V
Display significant digits	***.* (V)	**** (V)	****0 (V)
Screen example	No multiplying factor 	No multiplying factor 	No multiplying factor 

■Voltage sag
Displayed fixed decimal point one digit regardless of the setting of primary voltage

Primary voltage	—
Display significant digits	***.* (V)
Screen example	No multiplying factor 

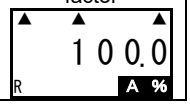
■Frequency

Display significant digits	**.* (Hz)
Screen example	No multiplying factor 

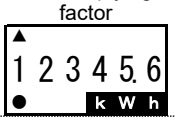
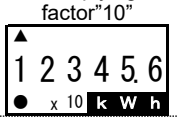
■Power factor

Display significant digits	*.***
Screen example	No multiplying factor 

■Harmonics current and voltage distortion／content rate

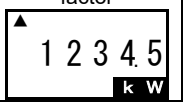
Display significant digits	***.* (%)
Screen example	No multiplying factor 

■Electric energy, Reactive energy
Calculated by the frame connected MDU breaker.

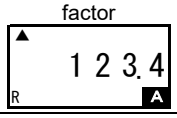
MDU Breaker A frame	Less than 250A frame	More than 400A frame
Display significant digits	*****.* (kWh)	*****.*x10(kWh)
Screen example	No multiplying factor  Measured value is 12345.6kWh	Multiplying factor"10"  Measured value is 12345.6x10 =123456kWh

Decimal point position is fixed in below items.

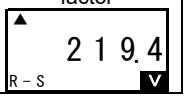
■Present electric power, Demand electric power, Reactive power

Display significant digits	****.* (kW)
Screen example	No multiplying factor 

■Present current, Demand current, Effective value of harmonics current

Display significant digits	****.* (A)
Screen example	No multiplying factor 

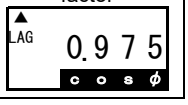
■Present voltage value

Display significant digits	***.* (V)
Screen example	No multiplying factor 

■Frequency

Display significant digits	**.* (Hz)
Screen example	No multiplying factor 

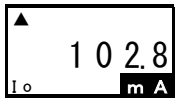
■Power factor

Display significant digits	*.***
Screen example	No multiplying factor 

■Distortion／content rate of harmonics current

Display significant digits	***.* (%)
Screen example	No multiplying factor 

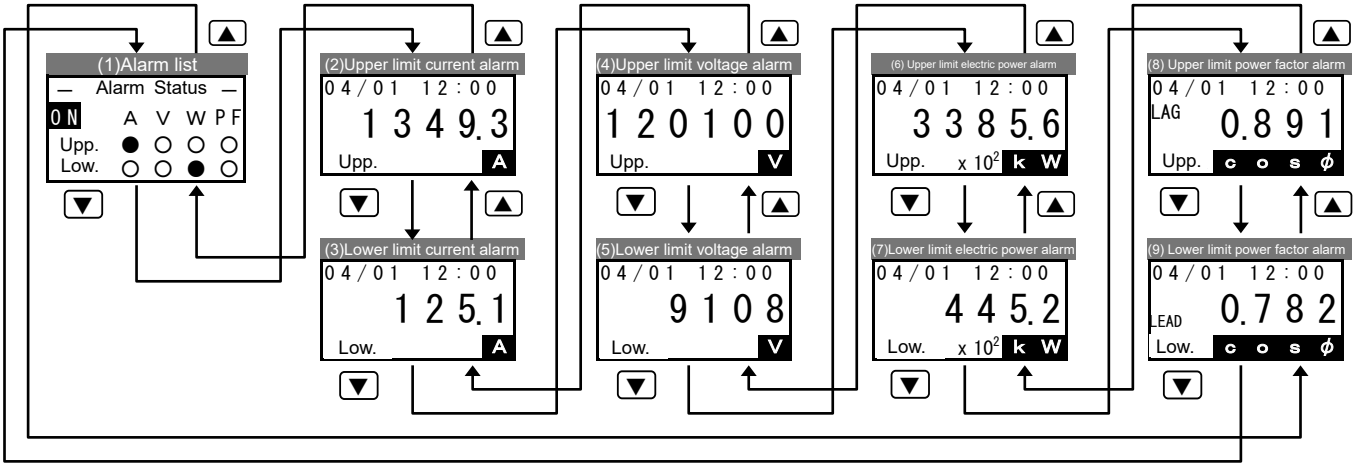
■Present leak current, Demand leak current, Present leak current contend harmonics, Demand leak current contend harmonics

Display significant digits	****.* (A)
Screen example	No multiplying factor 

7.5 Alarm mode

7.5.1 Transition of display

Transition to display in alarm mode.

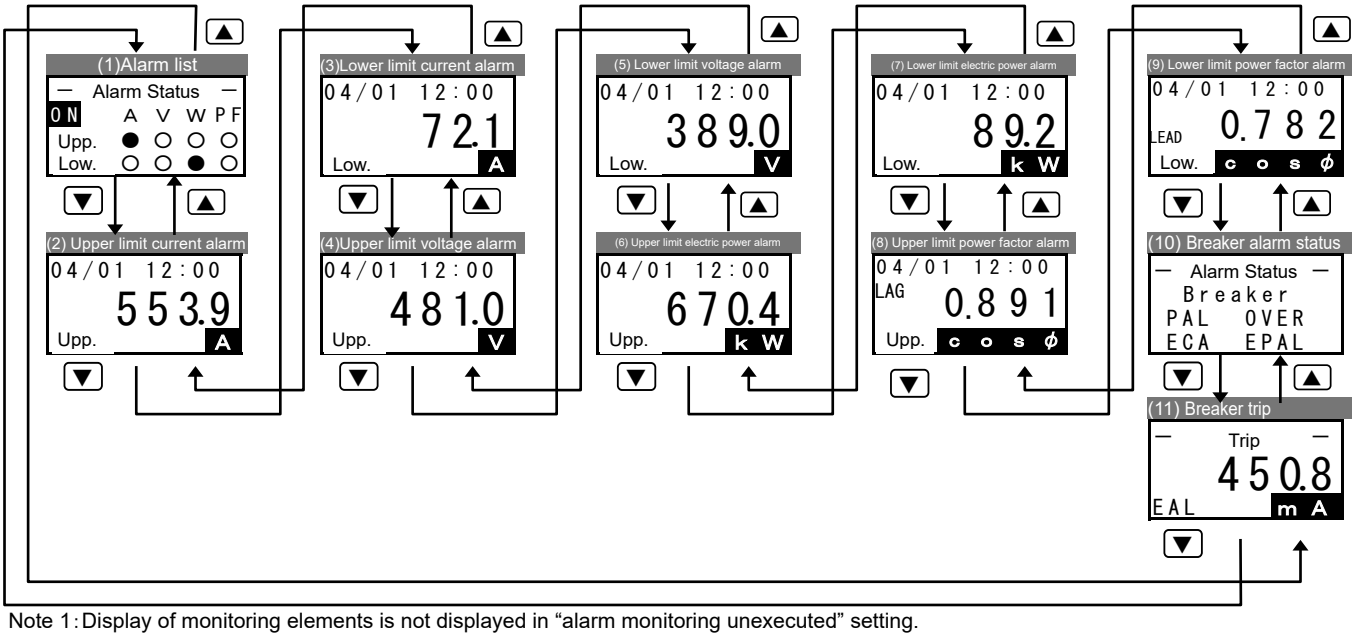


Note 1: EMU2-BM1-B can't use alarm mode.

Note 2: EMU2-PM1-P model can monitoring upper/lower limit of voltage and current alarm. Display of upper /lower alarm of electric energy and power factor Is not displayed.

Note 3: Display of monitoring elements is not displayed in "alarm monitoring unexecuted" setting.

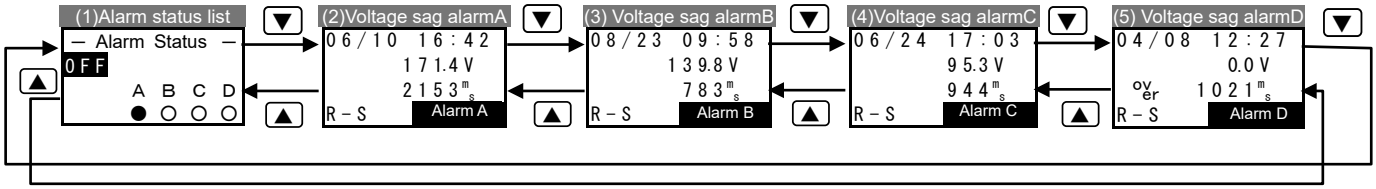
Note 4: Push the CIRCUIT key, and switch measure circuit and display when using more than 2 energy measure units in any display



Note 1: Display of monitoring elements is not displayed in "alarm monitoring unexecuted" setting.

Note 2: Screen of upper/lower limit alarm is not displayed when operation mode is harmonics detail mode.

Note 3: Push the CIRCUIT key, and switch measure circuit and display when using more than 2 energy measure units in any display.

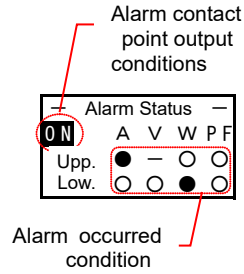
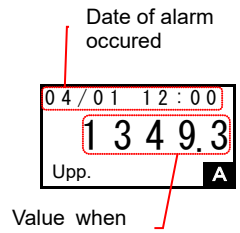
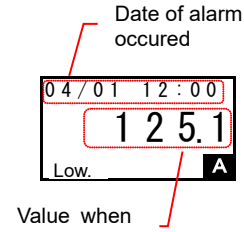
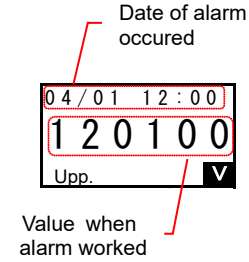
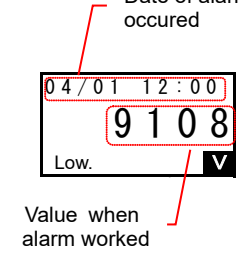


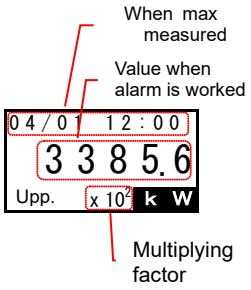
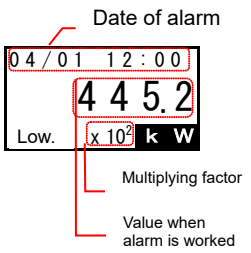
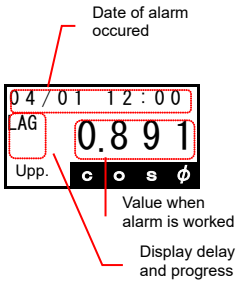
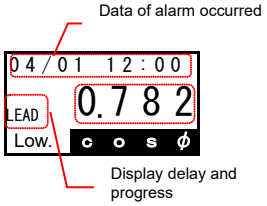
Note 1: Voltage sag alarm is only worked in the EMU2-VS1-P models.

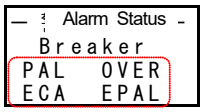
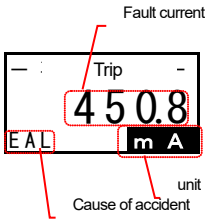
Note 2: Alarm monitoring is not worked if voltage decrease rate is 0%. Items setup that voltage decrease rate is 0% In voltage sag alarm screen (upper figures (2)-(5)) is not displayed.

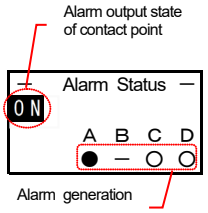
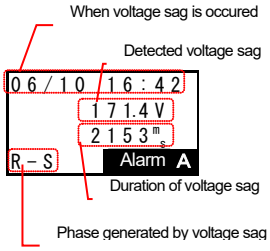
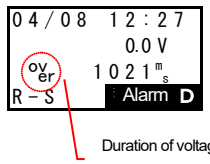
Note 3: In voltage sag alarm screen A to D, phase can be switched and displayed like ↱R-S⇒S-T⇒T-R┐ in 1P3W, 3P3W.

7.5.2 Detail screen

Screen Name	Screen	Key operation		Note
		Key	Operation	
(1) List of alarm conditions		▲	Alarm display in the previous is displayed	All upper/lower limit alarm conditions are confirmed in this screen. Condition of output of alarm is displayed at upper left in EMU2-PM1-P models. Signs mean below. "—"…Not alarm monitoring(impossible) "○"…Alarm non-occurrence "●"…Alarming or during latch
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Output of alarm contact point is turned to "OFF" when alarm is occurred (connected to EMU2-PM1-P)	
		▲+▼	Transition to the operate mode (displayed electric energy)	
(2) Upper limit of current alarm		▲	Measured value in previous is displayed	Latest date and value when upper limit current alarm occurred of displayed. *Value is displayed in below when alarm does not work once. <Date> --/-- --:-- <Value> 0A Date is displayed --/-- --:--, because EMU2-PM1-P does not have clock function.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Output of alarm contact point is turned to "OFF" when alarm is occurred (connected to EMU2-PM1-P)	
		▲+▼	Transition to the operate mode (displayed electric energy)	
(3) Lower limit of current alarm		▲	Measured value in previous is displayed	Latest date and value when lower limit current alarm occurred of displayed. *Value is displayed in below when alarm does not work once. <Date> --/-- --:-- <Value> 0A Date is displayed --/-- --:--, because EMU2-PM1-P does not have clock function.
		▼	Measured value in next is displayed.	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Output of alarm contact point is turned to "OFF" when alarm is occurred (connected to EMU2-PM1-P)	
		▲+▼	Transition to the operate mode (displayed electric energy)	
(4) Upper limit of voltage alarm		▲	Measured value in previous is displayed	Latest date and value when upper limit voltage alarm occurred of displayed. *Value is displayed in below when alarm does not work once. <Date> --/-- --:-- <Value> 0V Date is displayed --/-- --:--, because EMU2-PM1-P does not have clock function.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Output of alarm contact point is turned to "OFF" when alarm is occurred (connected to EMU2-PM1-P)	
		▲+▼	Transition to the operate mode (displayed electric energy)	
(5) Lower limit of voltage alarm		▲	Measured value in previous is displayed	Latest date and value when lower limit voltage alarm occurred of displayed. *Value is displayed in below when alarm does not work once. <Date> --/-- --:-- <Value> 0V Date is displayed --/-- --:--, because EMU2-PM1-P does not have clock function.
		▼	Measured value in next is displayed.	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Output of alarm contact point is turned to "OFF" when alarm is occurred (connected to EMU2-PM1-P)	
		▲+▼	Transition to the operate mode (displayed electric energy)	

Screen name	Screen	Key operation		Note
		Key	Operation	
(6) Upper limit alarm of electric power		▲	Measured value in previous is displayed	Latest date and value when upper limit Electric power alarm occurred of displayed. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed. *Value is displayed in below when alarm does not work once. <Date> --/-- --:-- <Value> 0kW
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
(7) Lower limit alarm of electric power		▲	Measured value in previous is displayed	Latest date and value when lower limit Electric power alarm occurred of displayed. ・Measured value is multiplied by the displayed value and multiplying factor if multiplying factor is displayed. ・Value is displayed in below when alarm does not work once. <Date> --/-- --:-- <Value> 0kW
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
(8) Upper limit alarm of power factor		▲	Measured value in previous is displayed	Latest date and value when upper limit power factor alarm occurred of displayed. ・Time when measured max and min is displayed MM/DD hh:mm. ・Value is displayed in below when alarm does not work once. <Date> --/-- --:-- <Value> 1.000
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
(9) Lower limit alarm of power factor		▲	Measured value in previous is displayed	Latest date and value when lower limit power factor alarm occurred of displayed. ・Time when measured max and min is displayed MM/DD hh:mm. ・LEAD and LAG is displayed in left side of measured value. *Value is displayed in below when alarm does not work once. <Date> --/-- --:-- <Value> 1.000
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	

Screen name	Screen	Key operation		Note
		Key	Operation	
(10) Breaker alarm status		▲	Alarm display in the previous is displayed	All breakers alarm conditions are confirmed in this screen. ・Alarm name is displayed when alarm occurred. ・Nothing is displayed when not occurring.
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	
(11) Accident information of breaker		▲	Measured value in previous is displayed	Latest breaker accident is displayed. Meaning of cause of accident is below. "LTD"…Overload "S/I"…Short circuit "AL"…Overload or short circuit "EAL"…Leakage Below is displayed when accident is not occurred. Cause of accident:not displayed Accident current:0A
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Change measured circuit	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Key operation is invalid	
		▲+▼	Transition to the operate mode (displayed electric energy)	

Screen name	Screen	Key operation		Note
		Key	Operation	
(1) List of alarm state		▲	Alarm display in the previous is displayed	All upper/lower limit alarm conditions are confirmed in this screen. Condition of output of alarm is displayed at upper left. Signs mean below. "−"…Not alarm monitoring(impossible) "○"…Alarm non-occurrence "●"…Alarming or during latch
		▼	Alarm display in the next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Key operation is invalid	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Output of alarm contact point is turned to "OFF" when alarm is occurred	
		▲+▼	Transition to the operate mode (displayed electric energy)	
(2) Voltage sag alarm A to D	 	▲	Measured value in previous is displayed	Latest date of voltage sag, detected voltage sag and duration of voltage sag is displayed. ・Push the ↵/PHASE key, switch like below. *1P2WSetting* Only R-S is displayed *1P3W, 3P3W setting* R-S→S-T→T-R *Value is displayed in below when alarm does not work once. <Date> --/-- --:-- <Value> 0.0V *When sag state is continue more than setup time of duration of voltage sag +1000ms, duration of voltage sag is calculated by setup value + 1001ms and displayed "Over" in the upper left in the display.
		▼	Measured value in next is displayed	
		+	Key operation is invalid	
		−	Key operation is invalid	
		↵/PHASE	Display by changed phase	
		CIRCUIT	Key operation is invalid	
		SETUP	Transition to the alarm setting mode	
		RESET/SET	Output of alarm contact point is turned to "OFF" when alarm is occurred	
		▲+▼	Transition to the operate mode (displayed electric energy)	

7.6 Reset/Preset mode

7.6.1 Reset the measured data.

1 Transition to the Reset/Preset mode		
Screen	Operation	Note
[Reset/Set] 1 Reset 2 Set	(1) Push the RESET/SET key in the Operation Mode. (2) Rest / Preset menu will be displayed. (1) In Reset / Preset menu screen, push the ▲ or ▼ key, and move the cursor to the "1 Data Reset". (2) Push the ↵/PHASE key. (3) Data Reset will be displayed.	*If you want to cancel reset / preset, push the RESET/SET key, return to operation mode. (screen of electric energy)

2 Select the items you want to reset		
Screen	Operation	Note
[Data Reset] □Max・Min □AL (Limit) □AL (Vsag) □Wh, varh □Logging □Braker AL □Trip	(1) Push the CIRCUIT key, and select the target circuit to reset. (LED of selected circuit is lighted.) (2) Push the ▲ or ▼ key, and move the cursor to the target item to reset. (3 items are only displayed.) (3) Push the + or − key, and move the cursor to the checkbox. (If you push the + or − key again, Non-checked item turned to checked) (4) Repeat (2) and (3) operation and check in all check box want to reset. (5) Repeat (1)-(4) operation when reset other circuits.	*If you want to cancel reset / preset, push the RESET/SET key, return to operation mode (screen of electric energy) *Logging is conduct only EMU2-D65-Mmodel.

3 Conduct reset		
Screen	Operation	Note
Do you really execute? OK Cancel Completed OK	(1) Push the ↵/PHASE key after select all items you want to reset. (2) Confirmation reset screen will be displayed. (3) Push the ▲ key, and move the cursor to the"OK" push ↵/PHASE key.(Return to Data reset screen after push "Cancel" key.) (4) Reset is conducted after push the confirmation key. (5) Confirmation screen will be displayed. Push the ↵/PHASE key. (6) Return to the operation mode. (Screen of electric energy).	*If you want to cancel reset / preset, push the RESET/SET key, return to operation mode (screen of electric energy)

7.6.2 Preset the electric energy and reactive energy.

1 Transition to the Reset/Preset mode.		
Screen	Operation	Note
[Reset/Set] 1 Reset 2 Set	(1) Push the RESET/SET key in operation mode. (2) Reset /Preset menu will be displayed. (1) In Reset/Preset setting menu screen, push the ▲ or ▼ key, and move the cursor to the "2 DataPreset". (2) Push the ↵/PHASE key. (3) Data preset menu will be displayed.	*If you want to cancel reset / preset, push the RESET/SET key, return to operation mode. (screen of electric energy)

2 Preset the electric energy value		
Screen	Operation	Note
[Set] 1 Wh 2 varh	(1) In Data preset menu, push the CIRCUIT key, select the target circuit to reset. (LED of selected circuit is lighted.) (2) In data preset screen, push the ▲ or ▼ key, and select the"1 Integral Wh value". (3) Push the ↵/PHASE key. (4) Setup screen of integral Wh value will be displayed. (Present integral electric energy is displayed)	*If you want to cancel reset / preset, push the RESET/SET key, return to operation mode. (screen of electric energy)
[Wh] 13541.8 × 10^3kWh	(1) Push the ▲ or ▼ key, and move the cursor to change the value of digit. (2) Push the + or − key, and change the value. (3) In similar way, setup all digits. (4) After change the value, push the ↵/PHASE key. (5) Confirmation of preset will be displayed.	*If you want to cancel reset / preset, push the RESET/SET key, return to operation mode. (screen of electric energy)
Do you really execute? OK Cancel	(1) Push the ▲ key, and move the cursor to the "OK" and push the ↵/PHASE key.(Return to operation mode (electric energy screen) , after select "Cancel".) (2) Push the ↵/PHASE key, preset is conducted. (3) Confirmation screen will be displayed. Push the ↵/PHASE key. (4) Return to the operation mode.	

3 Preset the reactive energy value.		
Screen	Operation	Note
[Set] 1 Wh 2 varh	(1) Push the CIRCUIT key, and select the target circuit to reset. (LED of selected circuit is lighted.) (2) In data preset screen, push the ▲ or ▼ key, and select the "2 integral varh value". (3) Push the ↵/PHASE key. (4) Setup screen integral varh will be displayed.(Present value of integral reactive electric power is displayed.	*If you want to cancel reset / preset, push the RESET/SET key, return to operation mode (screen of electric energy)
[varh] 52371.9 × 10^3kvarh	(1) Push the ▲ or ▼ key, and move the cursor to the digit want to change. (2) Push the + or − key, and change the value. (3) In similar way, setup all digits. (4) After change the value, push the ↵/PHASE key. (5) Confirmation for reset be displayed.	*If you want to cancel reset / preset, push the RESET/SET key, return to operation mode (screen of electric energy)
Do you really execute? OK Cancel	(1) Push the ▲ key, and move the cursor to the "OK" and push the ↵/PHASE key. (Return to operation mode (electric energy screen) , after select "Cancel".) (2) Push the ↵/PHASE, and preset is conducted. (3) Confirmation screen will be displayed. Push the ↵/PHASE key. (4) Return to the operation mode.	

8. Common items

In this section common item is showed regardless the connected models.

8.1 How to switch the language

1 Setting language		
Screen	Operation	Note
1-1. 日本語 English	(1)Push the CIRCUIT key, and turn on in the key pushing, (2) 1-1 will be displayed.	
	(1) Push the ▲ or ▼ key, and move the cursor to the language. (2) Push the ↵/PHASE key. (3) Version screen is displayed after a while, and transition to the operating mode.	

9. Reference

9.1 In case you think the unit is in failure

If an abnormal sound, bad-smelling smoke, fever break out from this unit, switch it off promptly and don't use it. If you think the unit is in failure, check the following before sending for repair.

Symptom	Check point	Connected models	
		EMU4-**	EMU2-** MDU2-**
Nothing is displayed.	・Connector to energy measure unit is connected right? ・Power supply of energy measure unit is turned on? ・Power supply of display unit is turned on when display unit is connected more than 2? ・Connection is right?	○	○
"－－－－－－" is displayed as a measured value.	・Master / Slave setting is wright? ・Connected cable is disconnection? ・Connection is right? ・Power supply of energy measure unit is turned off?	○	○
The screen is displayed when turn on. Error : Check connection	・Connector of energy measure unit right connected. ・Connection is right? ・Connected cable is disconnection?	○	○
The screen is displayed when turn on. Unsupported terminal	・Not corresponding to display unit machine is connected. ・Confirm the version of display unit and machine that corresponding.	○	○
Below error is displayed when transit to setup, alarm setup mode and reset/preset mode. * Error * Error No:01 OK	・Energy measure unit is in Busy. Push the ↵/PHASE key, and escape the error display. Same operation is conduct after push the ↵/PHASE key and escape the error display.	○	○
Error number "00261" is displayed in operation mode.	Communication instrument is short circuit or not connected right. Confirm the signal mark and check the communication connector, tightening screw and terminal screw is loose.	○	○
Error number "00262" is displayed in operation mode.	Communication is crowded. Return from abnormal automatically after a while. Please contact to sales outlet when many times.	○	○
Error number "00263" is displayed in operation mode.	There is malfunction in energy measure unit. Please contact MITSUBISHI electric service or sales outlet. (Tell the error number when contact)	○	○
Error number "00264" or "00265" is displayed in operation mode.	＜B/NET transmission＞ Confirm below 3 points. ① Power supply of B/NET transmission is turned OFF? ② B/NET transmission line is disconnection? ③ Transmission line is connected right? (Confirm signal mark D, N, S and B/NET transmission connector and screw is loose.) ＜CC-Link communication＞ Confirm below 2 points ① CC-Link communication line is disconnection ② Transmission line is connected right? (Confirm signal mark DA, DB, DG, SLD and CC-Link Communication connector and tightening screw and terminal screw are loose.)	○	○
Error number "00266" or "00912" is displayed in operation mode.	Communication between Energy measuring unit and Option unit is failed. Please reset Energy measuring unit.	○	—
Error number "00281" is displayed in operation mode.	Address duplicate with other devices. Confirm all address of energy measure unit and connected device.	○	○
Error number "00901" is displayed in operation mode.	Light protect switch of SD memory card in logging unit is ON. Turn the light protect switch to OFF.	○	—
Error number "00902" is displayed in operation mode.	Logging element that energy measure unit can't measure is set. Setup logging conditions again.	○	—
Error number "00903" or "00904" is displayed in operation mode.	Turn on the auxiliary power again.	○	—
Error number "00905" is displayed in operation mode.	Setup the present time again.	○	—
Error number "00907" is displayed in operation mode.	There is a possibility that setup data file for logging is wrong or out of range of the data. Confirm the contents of setup data file again.	○	—
Turn off f the back light.	If back light is setup automatic turning-off, light is automatically turned off in 5 minutes.	○	○

9.2 After-sales service

If you have any questions or the product is broken down, contact our sales representative near you. (For details, refer to the end of this manual.)

- Gratis warranty is effective until the earlier of 1 year after the date of your purchase or 18 months after manufacturing.
- The gratis warranty shall apply if the product fails even though it is being used properly in the conditions, with the methods and under the environments in accordance with the terms and precautions described in the catalogs, the instruction manual, caution label on the product, etc.
- Repair shall be charged for the following cases even during the gratis warranty period.
  - Failures occurring due to your improper storage or handling, carelessness or fault.
  - Failures due to faulty workmanship
  - Failures due to faults in use and undue modification
  - Failures due to accidental force such as a fire, abnormal voltage, etc. and force majeure such as an earthquake, wind, flood, etc.
  - Failures due to matters unpredictable based on the level of science technology at the time of product.
- Our company shall not be liable to compensate for any loss arising from events not attributable to our company, opportunity loss and lost earning of the customer due to failure of the product, and loss, secondary loss, accident compensation, damage to other products besides our products and other operations caused by a special reason regardless of our company's predictability

10. Requirement for the compliance with EMC Directives

EMC Directives prescribe both "Emission (electromagnetic interference): Do not radiate strong electromagnetic waves outside" and "Immunity (electromagnetic susceptibility): Do not be influenced by electromagnetic waves from outside".

This section compiles the precautions for the compliance of the system incorporating the energy measuring unit (target model: EMU4-D65) with the EMC Directives. The manufacturer of the system finally needs to evaluate the way of the compliance with EMC Directives and whether the system complies with them or not.

(1)Harmonized standard for EMC Directives: EN61326-1:2013

(a)Compatibility condition for harmonized standard

The energy measuring unit is the open type device (i.e. the device incorporated in other device), and needs to be installed in the conductive control panel. The unit is tested with installed in the control panel for the emission and the immunity out of the test items for the standard.

(2)Recommended condition for installation in the control panel

(a)Control panel

- Control panel needs to have conducting property.
- When bolting the top panel, bottom panel etc. of the control panel, mask the grounding part of the panel so as not to be painted.
- In inner panel, keep the conductivity in as large area as possible by masking the bolting part to the main panel to keep the electric contact to main panel.
- Ground the main panel by the thick wire so as to keep high impedance even for high-frequency wave.

(b)Installation of power line and ground line

- Set up the ground point to the control panel near the energy measuring unit, and ground the frame GND terminal of the unit to the ground terminal of the control panel (PE) by as thick and short wires as possible. (wire length is 300mm or shorter)

(3)Cable

(a)Auxiliary power, Input voltage, CC-Link cable, MODBUS cable, Small display unit cable

When it is necessary to comply with the EMC Directive (EN-61326-1), attach ferrite cores to each cable. Ferrite cores used in our testing is below.

- Auxiliary power
  KITAGAWA INDUSTRIES CO.,LTD., RFC series
  KITAGAWA INDUSTRIES CO.,LTD., TRM series
- Input voltage
  KITAGAWA INDUSTRIES CO., LTD., RFC series
- CC-Link cable, MODBUS cable
  KITAGAWA INDUSTRIES CO., LTD., RFC series
- Small display unit cable
  KITAGAWA INDUSTRIES CO.,LTD., RFC series

(b)External input signal line, External output signal line

Wiring of each connection wire should satisfy the following conditions.

- For wiring inside buildings, the wiring length should not exceed 30 m.
- Do not route wiring from the inside of the building to the outside of the building.

11. Specifications

11.1 Specifications

Item		Specification
Product name		Display unit
Model name		EMU4-D65
Display part		Dot matrix Liquid Crystal Display (with backlight)
Rating		9V DC
Math		0.1kg
Display update cycle		500ms
Compensation for power failure	(1)Position of display (Operation mode) (2)Setup for display (LCD contrast, back light)	(1) Record in nonvolatile memory. (Memory cycle is every 10 minutes (EcoMonitorPro, MDU2), every screen transition (EcoMonitorPlus)) (2) Record in nonvolatile memory. (It is memorized when the setting is changed.) *Data in left table and setup value is not deleted in power outage. *If power outage is occurred while saving setting, display setup value may return to initial when power is recovered. (LCD contrast is “4”, Back light is ”continuous lighting”)
Applicable model		Energy Measuring Unit (EcoMonitorPlus) Energy Measuring Unit (EcoMonitorPro) Mitsubishi Measuring Units for MDU Breakers (MDU2)
Connecting method		Connecting by dedicated cable (Bundled in this product. Length: 1m)
Number of connected		For a single Energy Measuring Unit until seven* *If the connection is two or more, you must have a power supply from commercial DC power supply (Model: PBA15F-9-N1, made in COSEL CO., LTD.), the power supply cable (optional: EMU4-CB-DPS) and display unit connection cable (for between the display unit connection) Model: EMU2-CB1-DP.
Maximum extension distance		10m (However, the sum of the length of the extension cable that was connected to a single unit)
Usage environment	Operating temperature	-5℃ to +55℃ (Daily average temperature is +35°C or lower)
	Operating humidity	30% to 85%Rh (No condensation)
	Storage temperature	-10℃ to +60℃
How to installation		IEC rail installation (You can install 2 directions) Plate mounting

12. Option devices

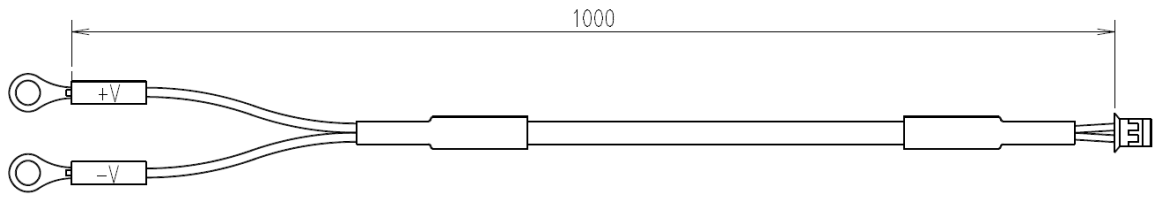
12.1 Option devices

Following devices can be available for this product.

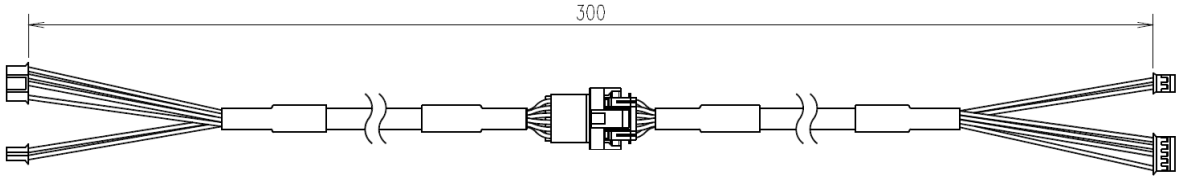
Product name	Model		Note
Supply cable	EMU4-CB-DPS		It is required to connect DC power supply on the market and small display unit.
Cable of small display between the units (Connecting for between display units)	EMU2-CB1-DP	0.3m	It is required to connect the energy measure unit to more than 2 small display units.
Extension cable	EMU2-CB-T1M	1m	10m (However, the sum of the length of the extension cable that was connected to a single unit)
	EMU2-CB-T5M	5m	
	EMU2-CB-T10M	10m	

12.2 External dimensions of option devices

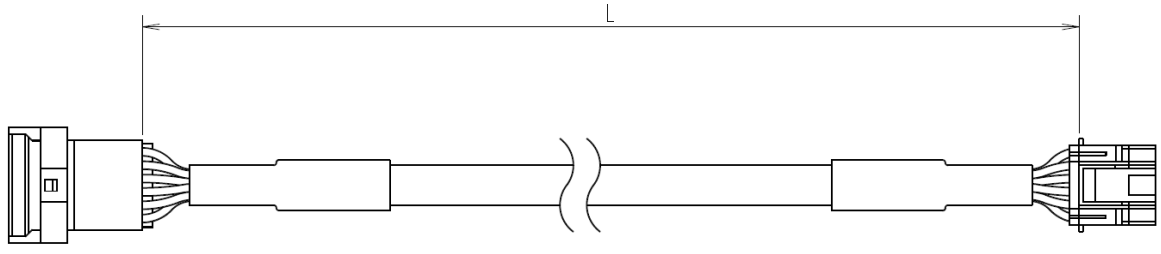
■Supply cable(EMU4-CB-DPS) Unit mm



■Cable between display units(EMU2-CB1-DP) Unit mm



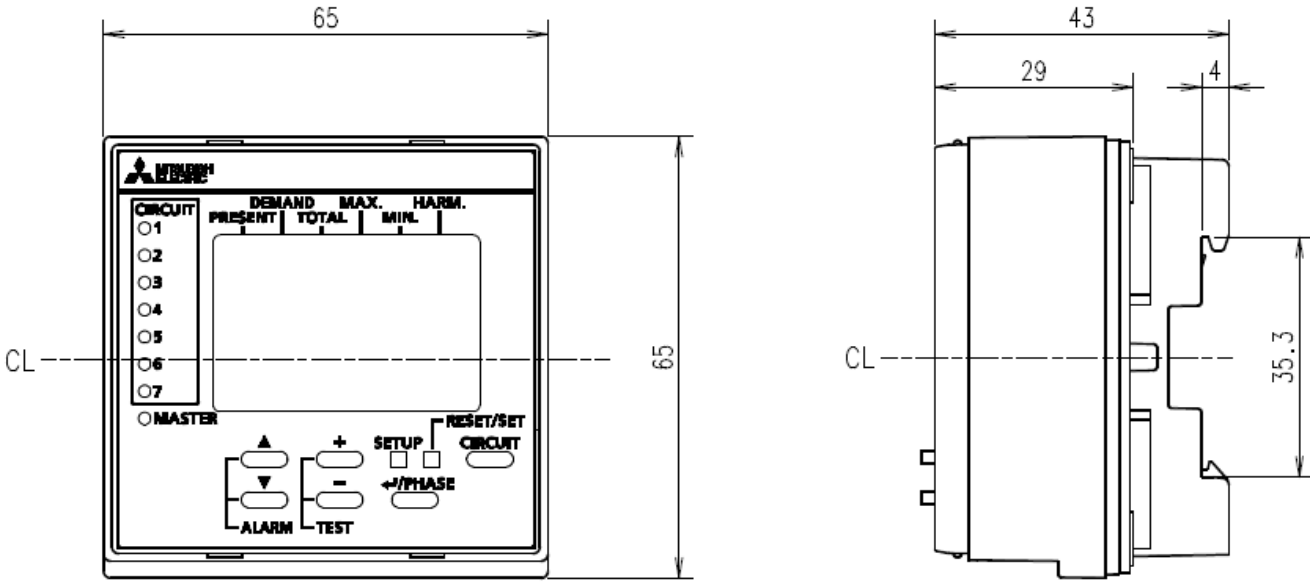
■Extension cable(EMU2-CB-T**M) Unit mm



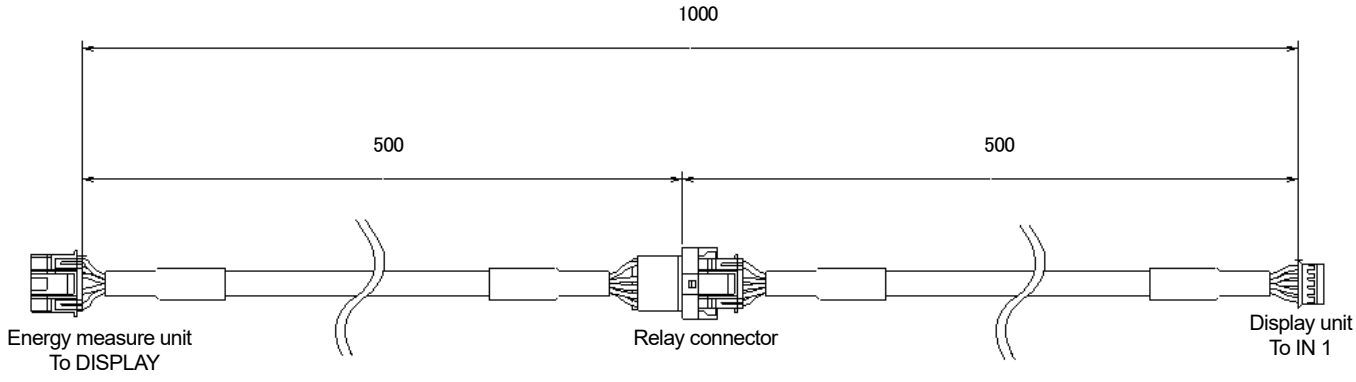
Model	EMU2-CB-T1M	EMU2-CB-T5M	EMU2-CB-T10M
L size	1m	5m	10m

13. External dimensions

■ Display unit of EMU4-D65 Unit:mm



■Connected cable to display unit Unit:mm



14. Index

Small type Display Unit for Energy Measuring Unit

Please refer to our website for service network.
Our website address: https://www.mitsubishielectric.com/fa/

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