



Susol
Super Solution

Air Circuit Breakers
Digital Trip Relay(P, S Type)
Manual

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Susol ACB

UL type digital trip relay P, S-Type manual instruction

A. P/ S type relay setting

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Safety precaution



WARNING

1. Please do not operate, inspect, and install by yourself.
2. Please do not wiring operation during power-on or under operation; it may result in electric shock.
3. Please do not wiring operation with the live bus bar; it may result in electric shock or a fire and property damage by charging voltage of current transformer.
4. Please do not attempt to disassemble even when the power not applied; it may result in electric shock by charging current remained in the product.
5. Please do not wire or operate with wet hands; it may result in electric shock.
6. Please do not use any damaged cable; it may result in electric shock.
7. Please work after wearing safety gear.
8. Please work after setting up the safety caution sign.
9. Please disconnect all Input/output wires when measuring HI POT or meger.



CAUTION

- Safety caution for installation & terminal wiring
 1. Apply the rated voltage to the power supply terminal; it may result in property damage or fire.
 2. Please keep away product from screws, metals, water, or oil; it may result in fire.
 3. Please keep the rated load and polarity of input & output contacts; it may result in property damage or fire.
 4. Specialist help shall be sought for the installation and maintenance of product; it may result in malfunction or accident.
- Inspection item before power supply being applied
 1. Check the voltage or polarity of control power supply.
 2. Check the wiring condition of input/output terminal.
- Caution for storage and handling
 1. Please store at dry and clean place.
 2. Please do not throw or put force on it during transport.
It may result in malfunction or faulty operation.
- Caution for disposal
 1. Please dispose of it in accordance with industrial waste regulation.

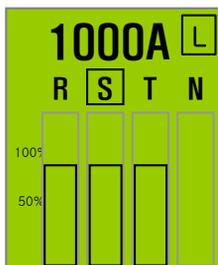
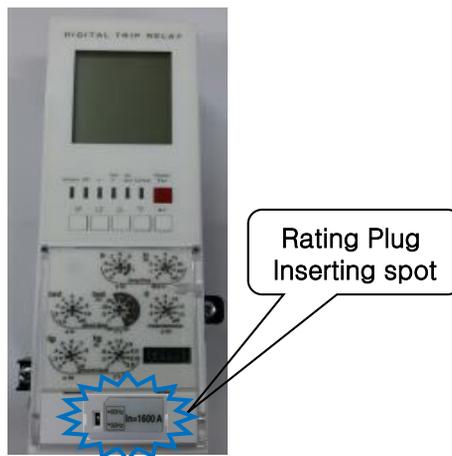
A. P type, S type relay setting

1. Setting the rated current

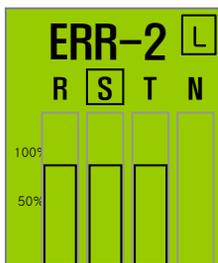
Cautions

- UL type OCR can set various rated current by inserting the Rating Plug.
- Only the Rating Plug within the range 45~100% of ACB Ampere Frame can be used.
- When not inserting the Rating Plug or inserting it which is out of the range, Error-1/2 will occur and LED will flicker.

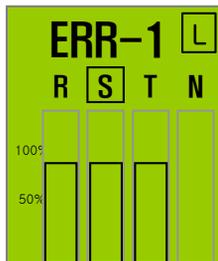
Rating plug setting example



- 1) When Ampere Frame of ACB is 800A, and Rating Plug is 400A,
- 2) Rating Plug rated $I_n = 400A$ and is 45% of 800A, will operate normally.



- 1) When Ampere Frame of ACB is 800A, and Rating Plug is 1600A,
- 2) Rating Plug rated $I_n = 1600A$ and is out of the proper range, Error-2 will show up.
- 3) Disconnect the Rating Plug and insert proper Rating Plug to operate it normally.



- 1) When not inserting the Rating Plug regardless of Ampere Frame of ACB,
- 2) Error-1 will show up on the screen.
- 3) If inserting proper Rating Plug, it will operate normally.

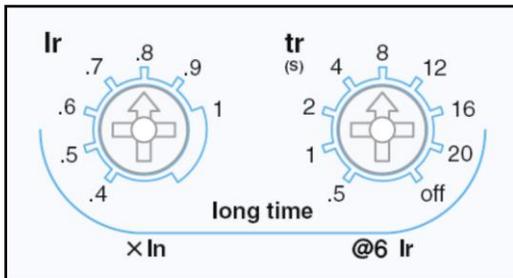
A. P/S type relay setting

2. Fine adjustment of relay setting current - OCR

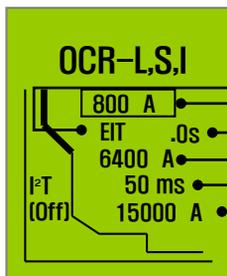
! Cautions

- Current setting of OCR and OCGR is basically done by using Knob.
- Minute current value which can not be set with Knob, ▲ ▼ button can be used to fine control.
- Fine adjustment is able within the range between current Knob and the next Knob setting, and if Knob is moved, all fine controlled data will be initialized.
- OCR and OCGR is separated, so if the Knob(long, short, instantaneous timing) related to OCR is changed, fine control of OCGR is not changed.

Example of using fine adjustment



- 1) Setting Knob when long timing, is now located on the 0.8.
- 2) When I_n is 1000A,
Fine control range is $0.8 \times I_n \sim 0.9 \times I_n - 1$.
I.e, fine control can be done from 800A~899A.
- 3) If it needs to fine control with 910A, move the I_r Knob to 0.9 and fine control again.



- **Fine control the current when long timing.**
- **Select the characteristic curve of IDMYL**
Select one among (None, DT, SIT, VIT, EIT)
- **Fine control the current when short timing.**
- **Fine control the current when instantaneous.**
- **Operation time**

| Display | Button | Contents |
|------------------------|--------------|---|
| <p>Fine Adjustment</p> | | <ol style="list-style-type: none"> 1) Use ▲ ▼ button to move to control position. 2) Control part will flicker if pressing the Enter(<↵>) button. 3) Fine control with ▲ ▼ button then press Enter (<↵>), and will switch to above menu after saving the data. 4) Press Reset/Esc button and will return to the above menu without saving the data. |
| | | |

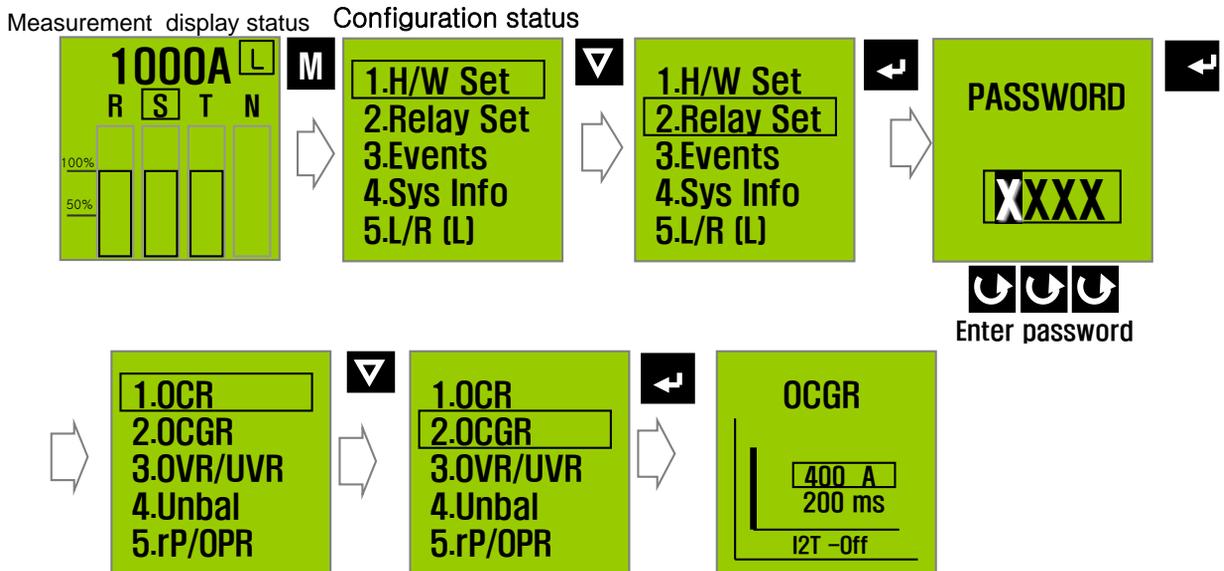
A. P/S type relay setting

3. Fine adjustment of relay setting current - OCGR

Cautions

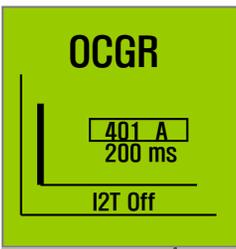
- Relay setting of OCR and OCGR is basically performed with setting value of Knob.
- Control unit of Knob is gradation.
- When using the current value which can not be controlled accurately with gradation of Knob, use fine controlling function.

OCGR detail setting



Cautions

- When initial Password is not entered, press the Enter key after moving the cursor to far right (press  key 3 times) to pass the Password screen.
- If the Password is already entered, you can't pass with above steps.

| Display | Button | Contents |
|--|---|---|
| <p>Fine Adjustment</p>  <p>SETTING CHANGE ?</p> <p>Enter-YES Esc-NO</p> |     | <ol style="list-style-type: none"> 1) Use ▲ ▼ button to move to control position. 2) Control part will flicker if you press Enter(<↵) button. 3) Fine control with ▲ ▼ button then press Enter (<↵), and will switch to above menu after saving the data 4) Press Reset/Esc button and will return to the above menu without saving the data. |

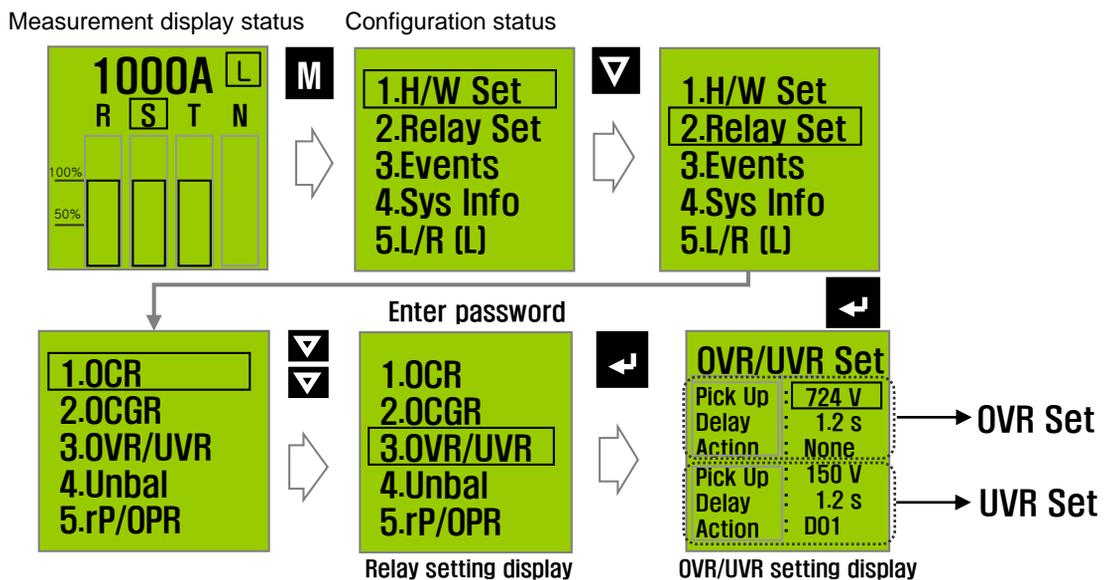
A. P/S type relay setting

4. Over voltage / Under voltage relay (OVR / UVR)

⚠ Cautions

- If overvoltage, low voltage occur on any phase among the 3 phases voltage, only TRIP/None/DO1/DO2/DO3/Fault is available.
- Low voltage relay operates when the Max voltage of 3 phase voltage is over 60V. When all 3 phase voltage is under 60V, low voltage relay is Disable.
- Overvoltage/low voltage relay is applied individually on each phase. When 3phase voltage is low at the same time, all 3 of Fault Event will be recorded.

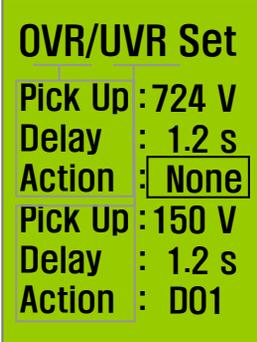
OVR, UVR Setting



| Display | Button | Contents |
|--|--------------------------------------|--|
| <p>OVR/UVR Set</p> <p>Pick Up : 725 V Delay : 1.2 s Action : None</p> <p>Pick Up : 150 V Delay : 1.2 s Action : D01</p> <p>SETTING CHANGE ?</p> <p>Enter-YES Esc-NO</p> | <p>▲ ▼</p> <p>↵</p> <p>Reset ESC</p> | <p>1) Use ▲ ▼ button to move to control position.</p> <p>2) Control part will flicker if pressing the Enter(<↵>)button.</p> <p>3) Fine control with ▲ ▼ button then press Enter (<↵>), and will switch to above menu after saving the data</p> <p>4) Press Reset/Esc button and will return to the above menu without saving the data.</p> <p>* OVR Setting range:151V ~ 900V</p> <p>* UVR Setting range: 80V ~ 899V</p> |

A. P/S type relay setting

4. Over voltage / Under voltage relay (OVR / UVR)

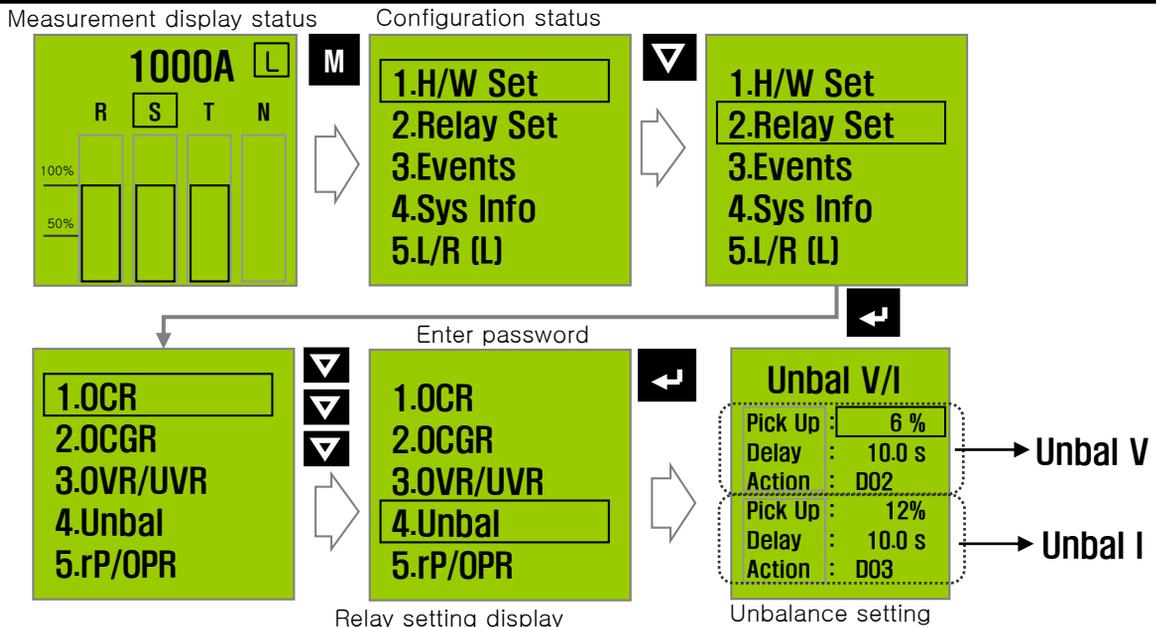
| Display | Contents |
|---|---|
|  <p>OVR/UVR Set Pick Up : 724 V Delay : 1.2 s Action : None Pick Up : 150 V Delay : 1.2 s Action : D01</p> | <ol style="list-style-type: none">1. Pick Up<ul style="list-style-type: none">- OVR Pick-up : UVR Pickup Setting value ~ 900V- UVR Pick-up : 80V ~ OVR Pickup Setting value -1V2. Delay : 1.2s ~ 40s3. Action<ol style="list-style-type: none">1) None : Not using relay function.2) Fault : When OVR, UVR operating condition, only Fault Event is recorded.3) DO1 : When OVR, UVR operating condition, only Fault Event is recorded and D01 Relay is Closed.4) DO2 : When OVR, UVR operating condition, only Fault Event is recorded and D02 Relay is Closed.5) DO3 : When OVR, UVR operating condition, only Fault Event is recorded and D03 Relay is Closed.6) TRIP : When OVR, UVR operating condition, records the Fault Event and trips ACB.4. The upper part of screen composition is OVR Setting, and the bottom part is UVR setting. |

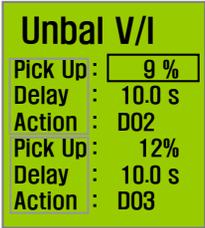
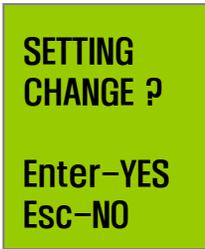
A. P/S type relay setting

5. Voltage / Current unbalance type relay (Vunbal / Iunbal)

⚠ Cautions

- When imbalance occurs on the 3 phase voltage(current) over setting value, TRIP/None/DO1/DO2/DO3/Fault is available.
 - Voltage(Current) imbalance rate = (negative sequence voltage(current) value)/(positive sequence voltage(current) value)*100%
- Relay voltage range: Over 80V ~ under 900V (At least 1 phase on the 3 phase)
 Relay current range: Over 30% ~ under 120% of In(rated current)
 Delay : 1.2s ~ 40s



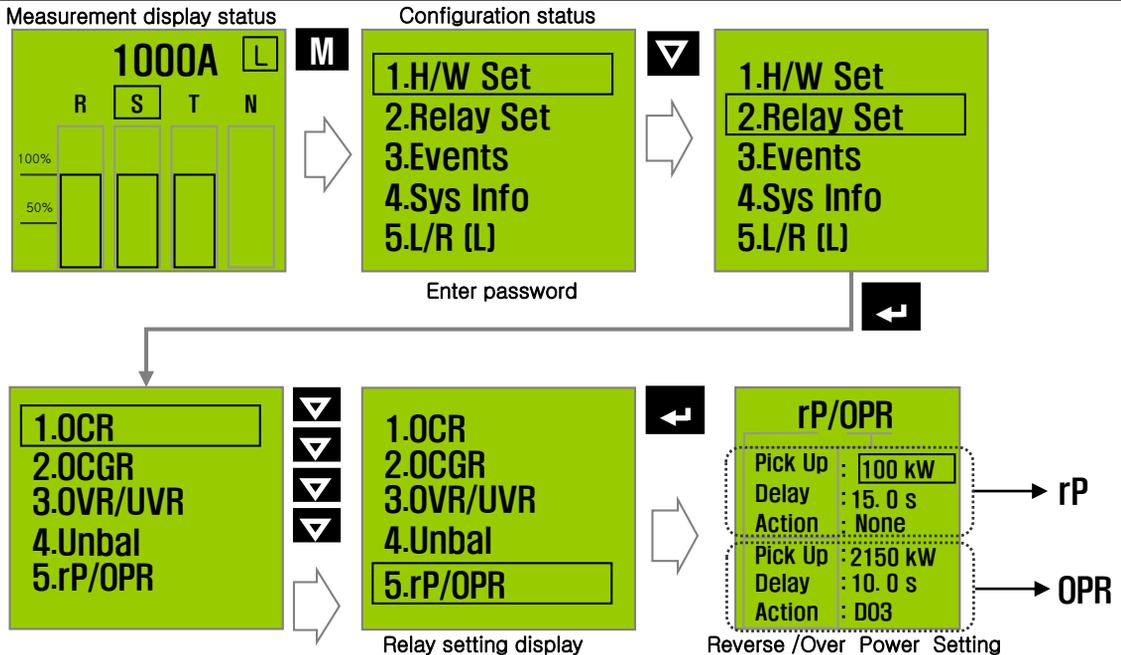
| Display | Button | Contents |
|--|--|--|
| Fine Adjustment   Enter-YES Esc-NO |     | 1) Use ▲ ▼ button to move to control position. 2) Control part will flicker if pressing the Enter(<↵>) button. 3) Fine control with ▲ ▼ button then press Enter (<↵>), and will switch to above menu after saving the data 4) Press Reset/Esc button and will return to the above menu without saving the data. |
| | Action 1) None : Not using relay function. 2) Fault : When Vunbal, Iunbal operating condition, only Fault Event is recorded. 3) DO1 : When Vunbal, Iunbal operating condition, only Fault Event is recorded and D01 Relay is Closed. 4) DO2 : When Vunbal, Iunbal operating condition, only Fault Event is recorded and D02 Relay is Closed. 5) DO3 : When Vunbal, Iunbal operating condition, only Fault Event is recorded and D03 Relay is Closed. 6) TRIP : When Vunbal, Iunbal operating condition, records the Fault Event and trips ACB. * The upper part of screen composition is V Unbal Setting, and the bottom part is I Unbal setting. | |

A. P/S type relay setting

6. Reverse/Over power relay (rP / OPR)

⚠ Cautions

- Occurs when total 3phase watt is reverse/over setting. TRIP/None/DO1/DO2/DO3/Fault is available.
- Reverse power pickup setting: 10 ~ 500kW (Step: 1kW)
- Overpower pickup setting: 500 ~ 5000kW (Step: 1kW)
- Delay range: 1.2s ~ 40s
- Relay is effective within the range of absolute power angle curve (voltage-current phase difference) 0 ~ 60.



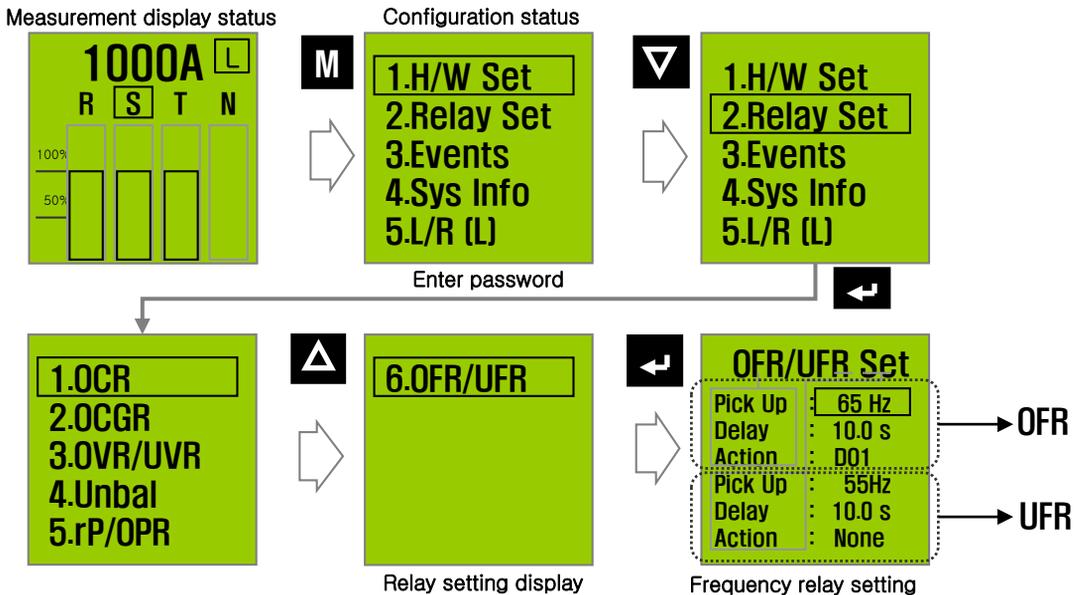
| | Display | Button | Contents |
|-----------------|--|--|---|
| Fine Adjustment | <p>rP/OPR</p> <p>Pick Up : 200 kW Delay : 15.0 s Action : None Pick Up : 2150 kW Delay : 10.0 s Action : D03</p> | <p>▲ ▼</p> <p>↵</p> <p>Reset ESC</p> | <ol style="list-style-type: none"> 1) Use ▲ ▼ button to move to control position. 2) Control part will flicker if pressing the Enter(↵) button. 3) Fine control with ▲ ▼ button then press Enter (↵), and will switch to above menu after saving the data 4) Press Reset/Esc button and will return to the above menu without saving the data. |
| | <p>SETTING CHANGE ?</p> <p>Enter-YES Esc-NO</p> | | <p>Action</p> <ol style="list-style-type: none"> 1) None : Not using relay function. 2) Fault : When rP, OPR operating condition, only Fault Event is recorded. 3) DO1 : When rP, OPR operating condition, only Fault Event is recorded and D01 Relay is Closed. 4) DO2 : When rP, OPR operating condition, only Fault Event is recorded and D02 Relay is Closed. 5) DO3 : When rP, OPR operating condition, only Fault Event is recorded and D03 Relay is Closed. 6) TRIP : When rP, OPR operating condition, records the Fault Event and trips ACB. <p>* The upper side of screen composition is rP Setting composition, and the bottom is OPR setting.</p> |

A. P/S type relay setting

7. Over / Under frequency relay (OFR, UFR)

⚠ Cautions

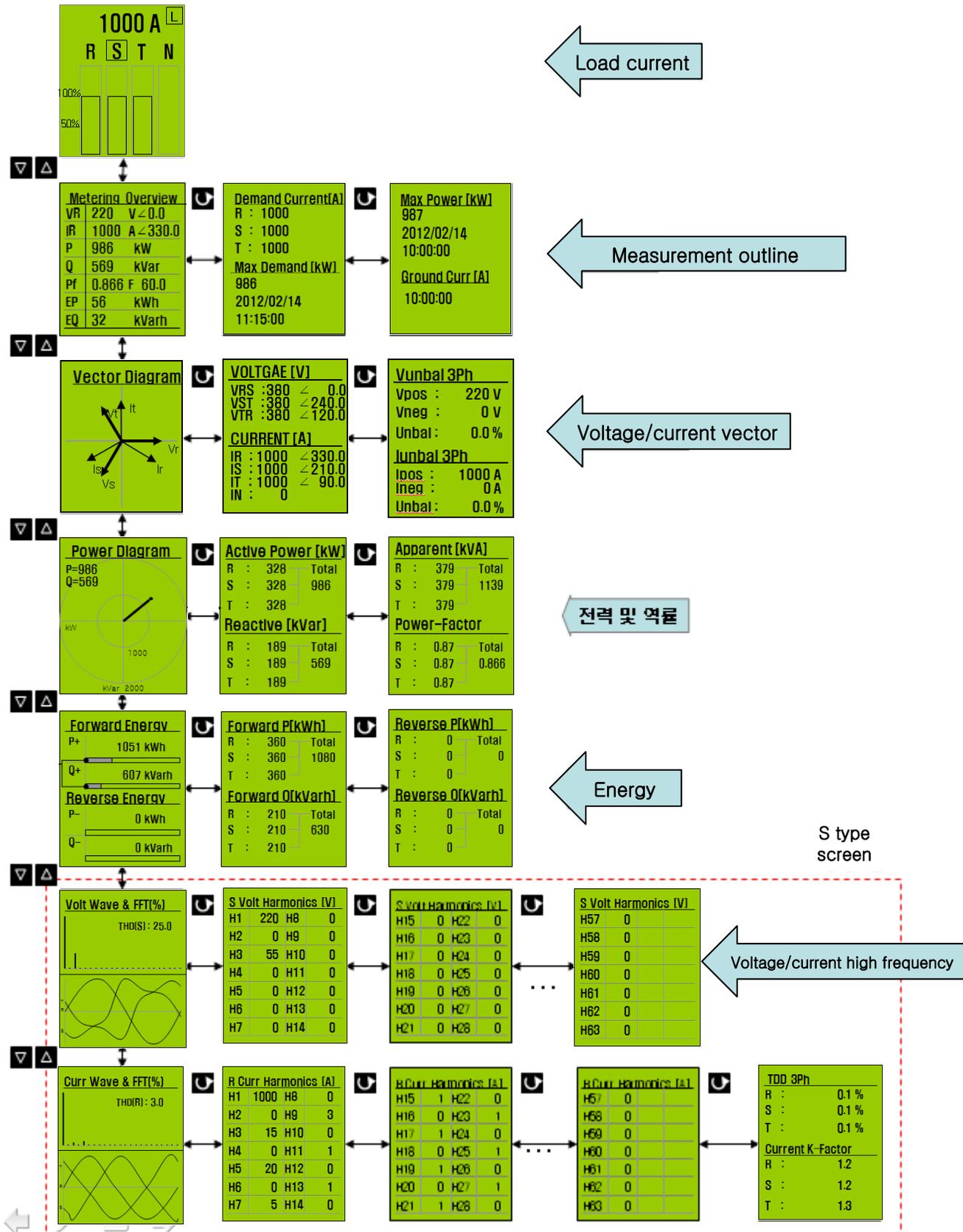
- Occurs when the frequency of R phase voltage is over setting value. TRIP/None/DO1/DO2/DO3/Fault is available.
- Pickup Setting:
 - Over frequency(60Hz): Low frequency Pickup value ~ 65Hz (Step: 1Hz)
 - (50Hz) : Low frequency Pickup value ~ 55Hz
 - Low frequency(60Hz) : 55Hz ~ over frequency Pickup value -1Hz
 - (50Hz) : 45Hz ~ over voltage Pickup value -1Hz
- Delay : 1.2s ~ 40s
- Relay voltage range: R phase voltage over 80V ~ below 900V



| Display | Button | Contents |
|---|--------------------------------------|--|
| <p>OFR/UFR Set</p> <p>Pick Up : 64 Hz Delay : 10.0 s Action : D01</p> <p>Pick Up : 55Hz Delay : 10.0 s Action : None</p> <p>SETTING CHANGE ?</p> <p>Enter-YES Esc-NO</p> | <p>▲ ▼</p> <p>↵</p> <p>Reset ESC</p> | <p>1) Use ▲ ▼ button to move to control position.</p> <p>2) Control part will flicker if pressing the Enter(↵) button.</p> <p>3) Fine control with ▲ ▼ button then press Enter (↵), and will switch to above menu after saving the data</p> <p>4) Press Reset/Esc button and will return to the above menu without saving the data.</p> |
| Fine Adjustment | Action | <p>1) None : Not using relay function.</p> <p>2) Fault : When OFR, UFR operating condition, only Fault Event is recorded.</p> <p>3) DO1 : When OFR, UFR operating condition, only Fault Event is recorded and D01 Relay is Closed.</p> <p>4) DO2 : When OFR, UFR operating condition, only Fault Event is recorded and D02 Relay is Closed.</p> <p>5) DO3 : When OFR, UFR operating condition, only Fault Event is recorded and D03 Relay is Closed.</p> <p>6) TRIP : When OFR, UFR operating condition, records the Fault Event and trips ACB.</p> <p>* The upper side of screen/composition is OFR Setting composition, and the bottom is UFR setting.</p> |

B. P/S type measurement display

1. Measurement display arrangement

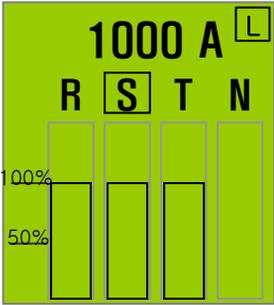
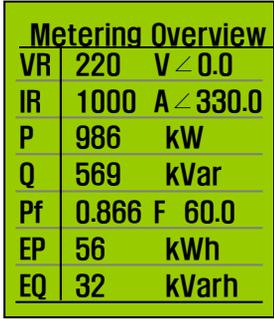


B. P/S type measurement display

2. Initial display and measurement outline

Cautions

- If there isn't any operation and key input over a minute on the setting screen or other measurement screen, (not initial screen) it automatically moves to initial screen. (Backlight will turn off after 40 seconds.)

| | Display | Button | Content |
|-----------------|---|---|--|
| Initial display |  |  | Indicates the % load based on the current of I _r . Ex) If setting 0.4 of the I _r knob on the 2000AF, 100% I _r means 800A(0.4*2000). |
| |  |  | <ol style="list-style-type: none"> 1. P : 3 phase active power 2. Q : 3 phase reactive power 3. Pf : Synthetic power factor 4. EP : Indicates forward energy 5. EQ : Indicates power consumption energy |
| |  |  | <ol style="list-style-type: none"> 1. Demand Current[A] 2. Max Demand size and occurrence time information |
| Display setting |  | | <ol style="list-style-type: none"> 1. Maximum power size and occurrence time information 2. Occurrence time information of earth current |

B. P/S type measurement display

3. Vector diagram display



Cautions

- Indicates 3 phase voltage current vector and analysis value of symmetrical component.
- All values are updated once in every second.
- Vector diagram should be drawn in phase voltage when 3phase 4 wire mode, and line voltage when 3 phase 3 wire mode.
- When 3 phase 4 wire mode, the value of vector should be indicated in phase voltage and line voltage on shifts in every 3 seconds.

| | Display | Button | Contents |
|-----------------|---------|--------|---|
| Display setting | | | <ol style="list-style-type: none"> When 3 phase 4 wire mode, the phase voltage should be indicated in vector. When 3 phase 3 wire mode, the line voltage should be indicated in vector. |
| | | | <ol style="list-style-type: none"> When 3 phase 4 wire mode, phase voltage and line voltage should be indicated on shifts in every 3 seconds. When 3 phase 3 wire mode, only the line voltage is indicated. |
| | | | |
| | | | |

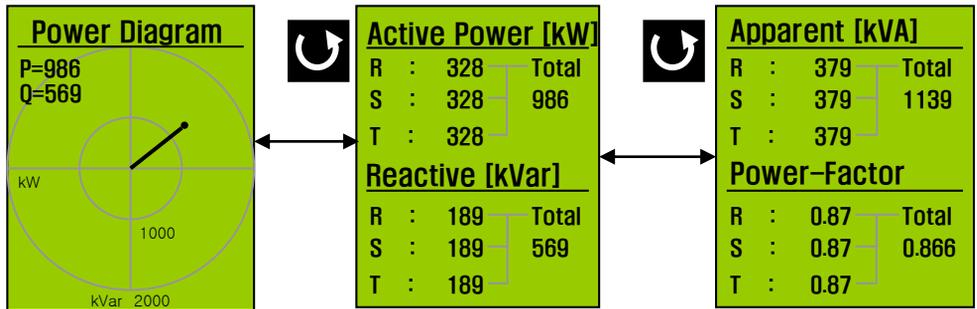
B. P/S type measurement display

4. Power diagram display

⚠ Cautions

- Indicates 3 phase voltage current vector and symmetrical component analysis value.
- All values are updated once every second.
- Decimal place is not indicated so there may be a slight difference when adding all 3 phase values.
- The scale of the screen is automatically regulated.

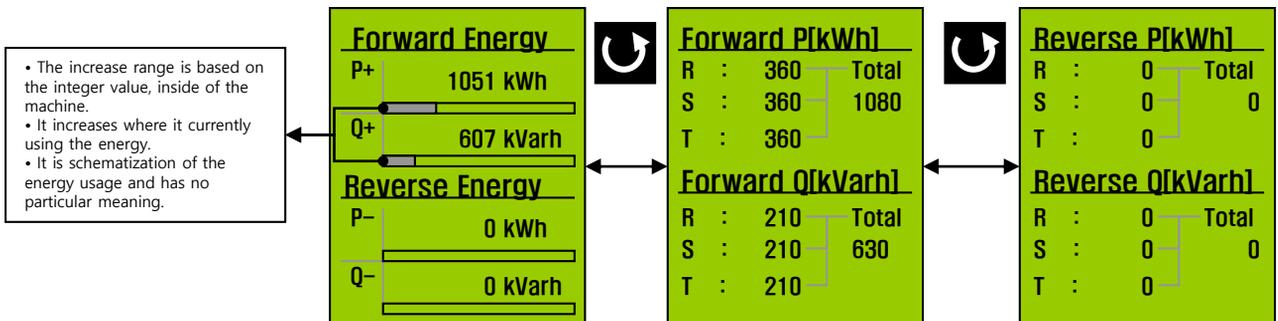
Energy measurement display



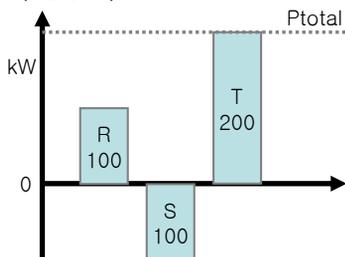
5. Energy measurement display

⚠ Cautions

- Indicates the energy measurement on each phase of 3 phases or compound energy(normal direction valid, invalid, reverse direction valid, invalid).
- All values are updated once every second.
- There may be difference between energy addition of each phase and compound energy addition, (refer to 1)



(Refer 1)



Sometimes when phase current appears like picture on the left, the combined power is 200.

R phase accumulates 100 on forward energy, as for S phase, it accumulates 100 on the reverse energy and T phase accumulates 200 on the forward energy.

Combined power is 200 so the compound energy is accumulated by 200 on the forward energy.

After an hour in this circumstance,

1.Forward efficient energy : Total : 200 (R:100, S: 0, T:200)

2.Reverse efficient energy: Total : 0 (R: 0, S:100, T: 0)

Therefore, there may be difference,

B. P/S type measurement display

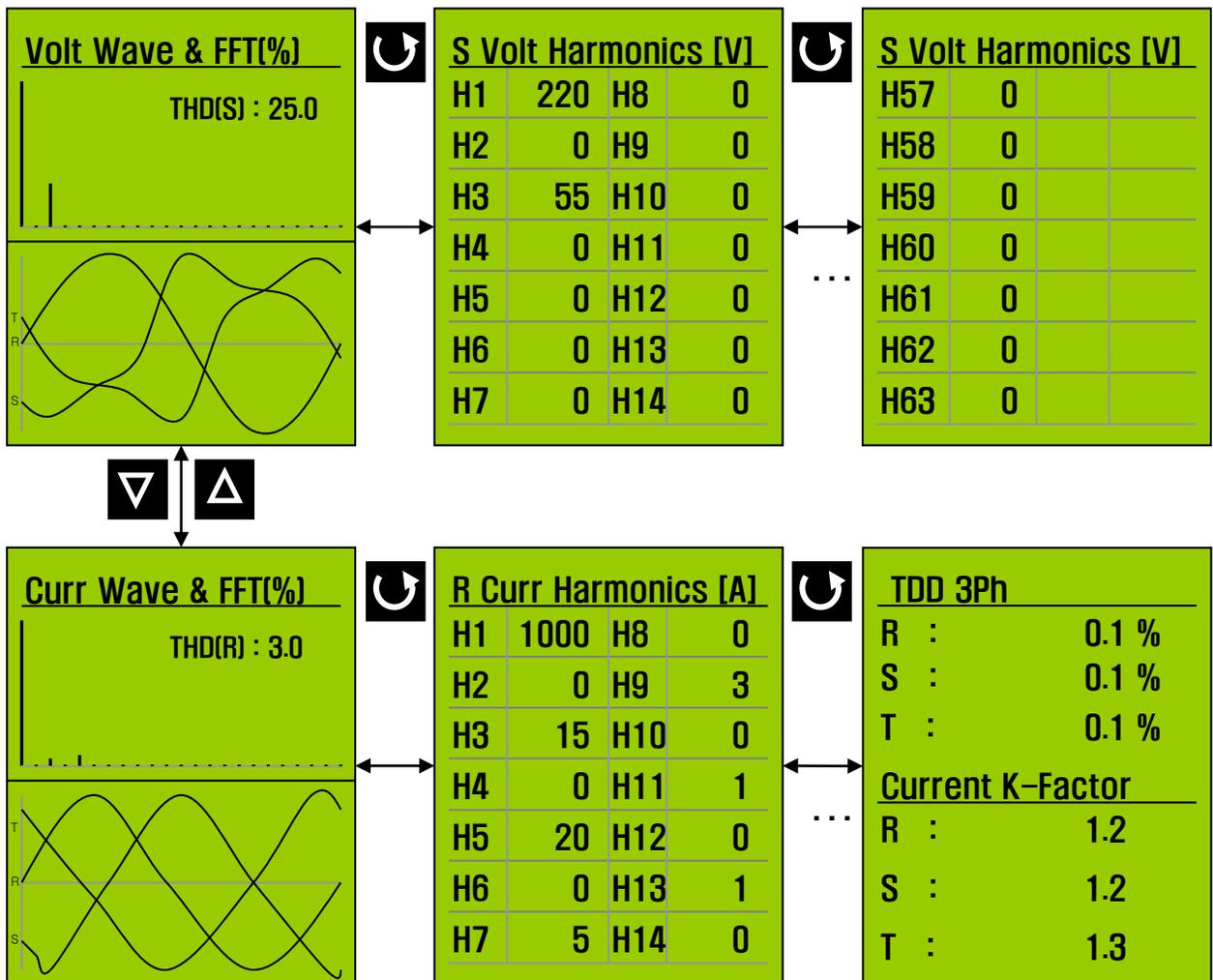
6. Waveform and harmonics analysis display



Cautions

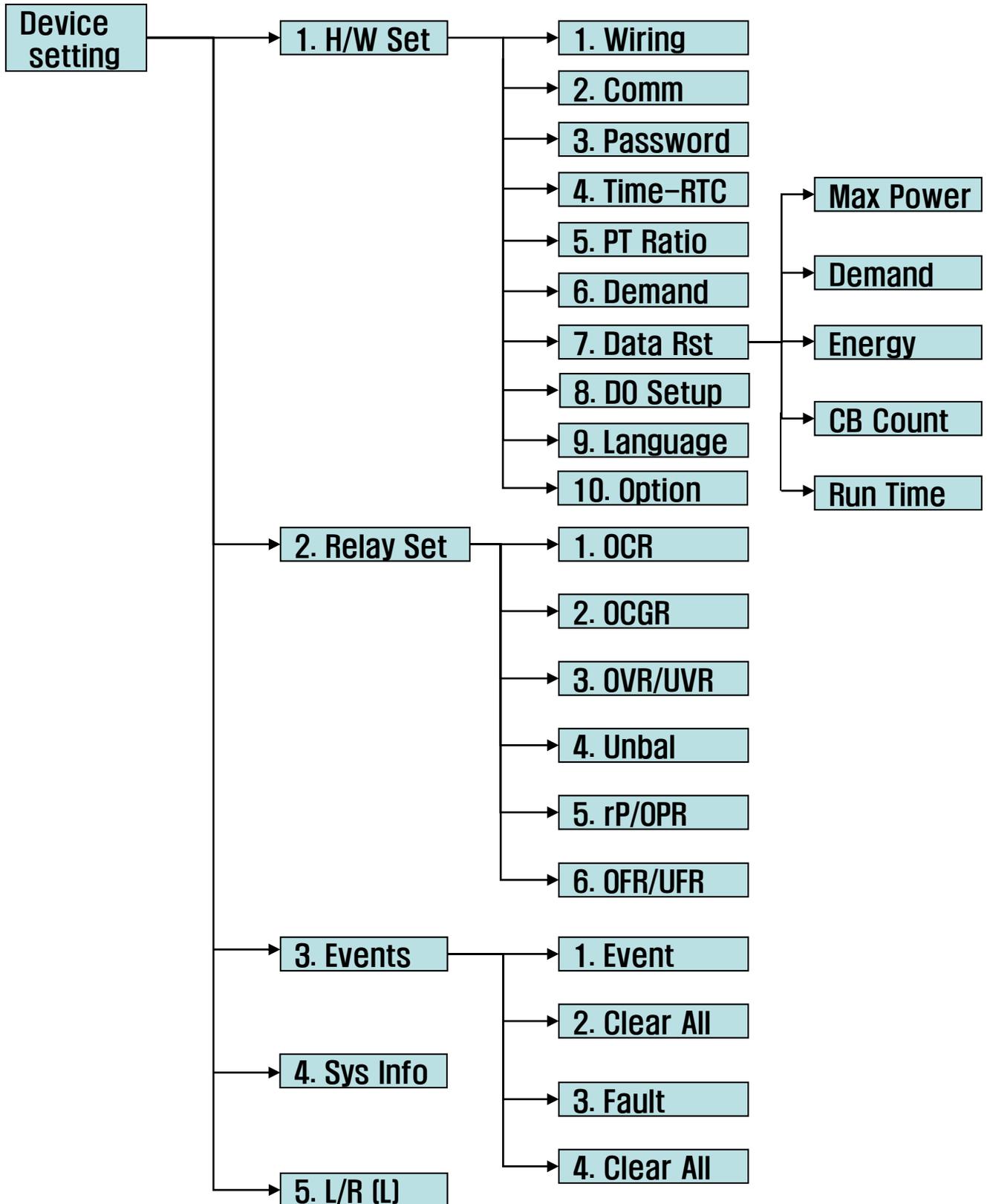
- Harmonic wave is analyzed after achieving the wave form of 3phase voltage/current with 128 sample/cycle.
- It is a function only for S type.
- TDD and K-Factor value is indicated on the analysis of Current harmonic wave.
- It is performed once every 30 seconds.
- Harmonic wave is measured up to 63rd.

Waveform and harmonics analysis



C. P/S type device setting

1. Menu arrangement



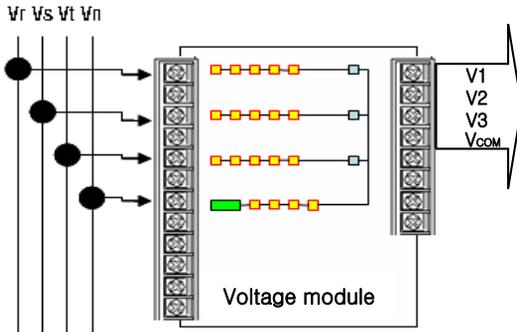
C. P/S type device setting

2. Device H/W setting - wiring setting

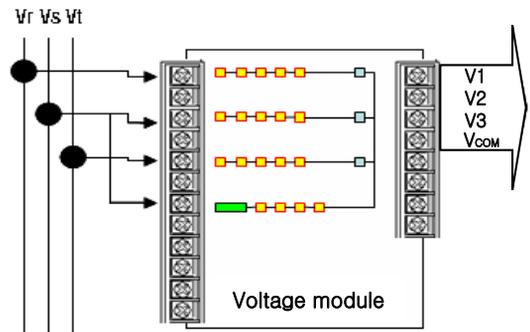
Cautions

- P type and S type supports 3phase 4 wire type and 3phase 3 wire type.
- Connection of voltage module should be conducted according to wiring type.
- H/W setting – Connecting type should be set properly on the wiring setting.

Wiring setting

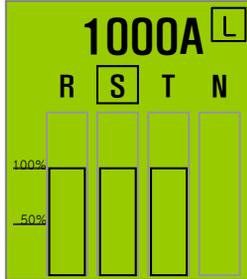


3 phase 4 wire type voltage

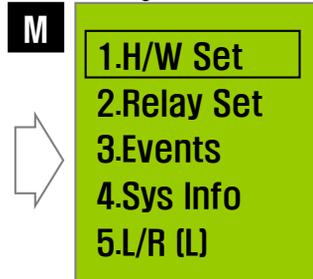


3 phase 3 wire type voltage

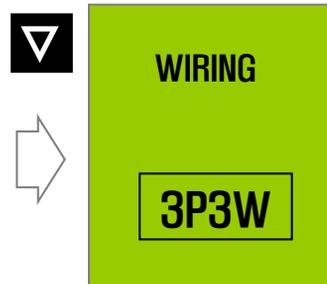
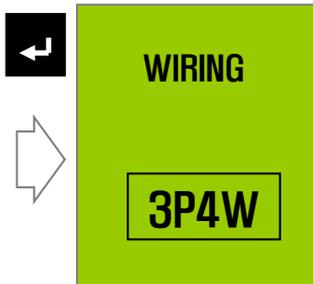
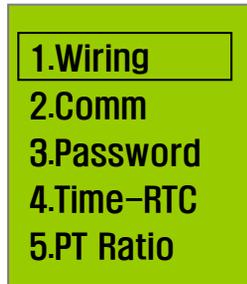
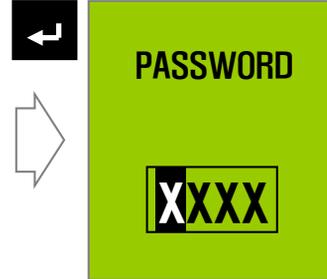
Measurement screen status



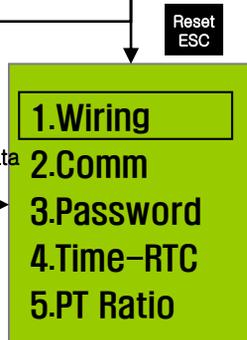
Configuration status



Enter Password



-  Move to above menu after saving the data
-  Move to above menu without saving the data



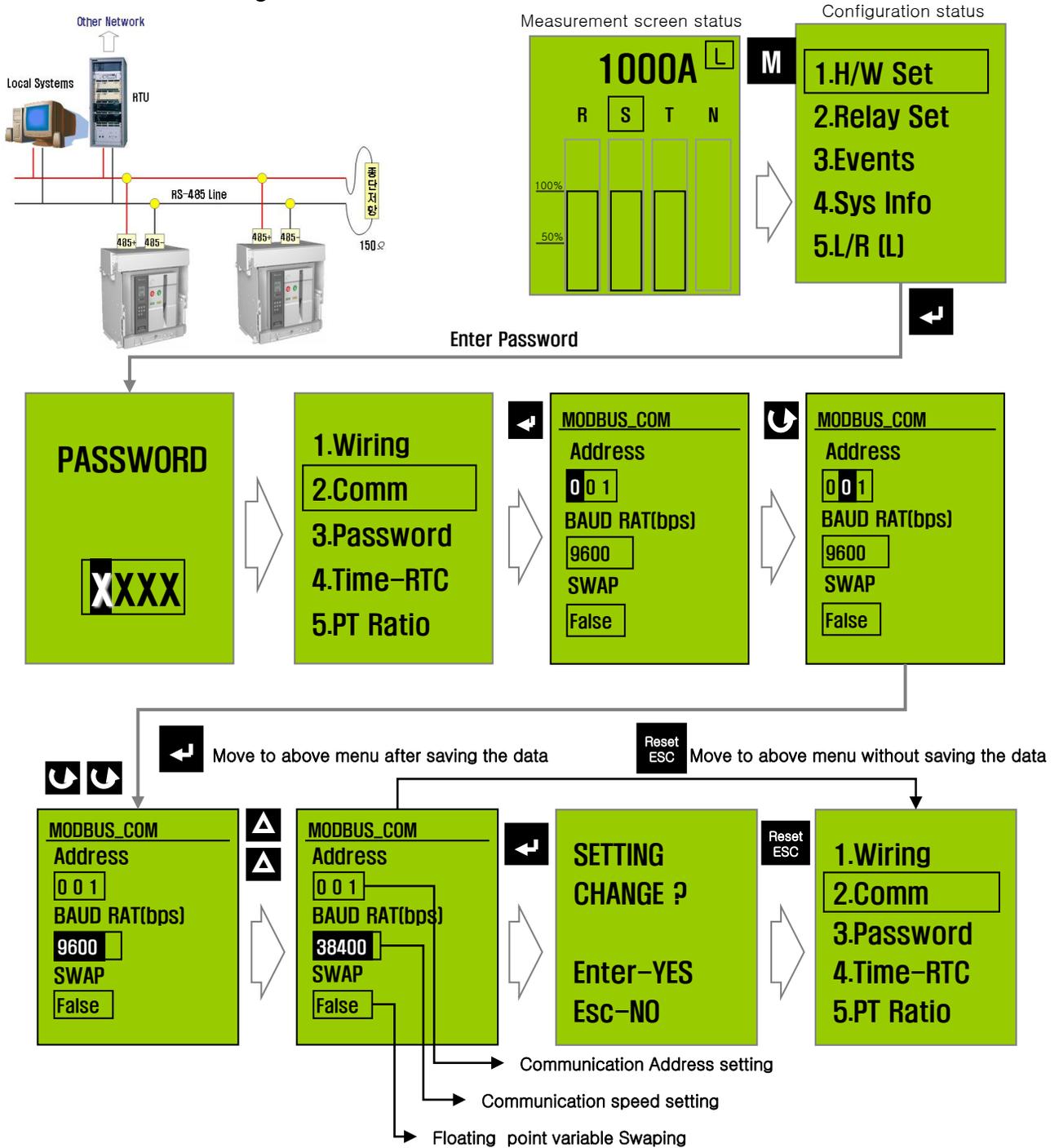
C. P/S type device setting

3. Device H/W setting - communication setting

Cautions

- P type and S type supports MODBUS RS-485 communication.
- It is composed of Multi-Drop type on the RS-485 line.
- Terminal deals 150 ohm.

Communication setting



C. P/S type device setting

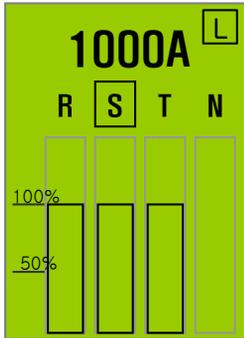
4. Device H/W setting - password setting

Cautions

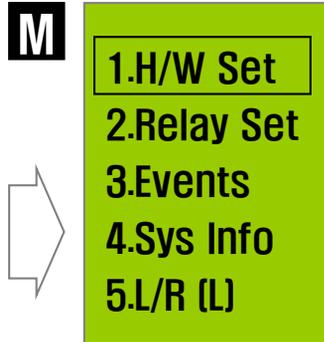
- P type and S type provides password function to protect the device.
The initial password is [0000]. It may be changed through setting new password.

Password setting

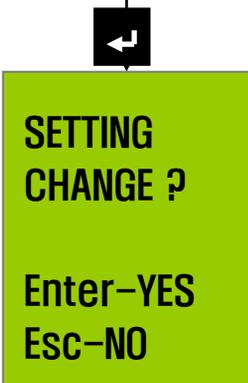
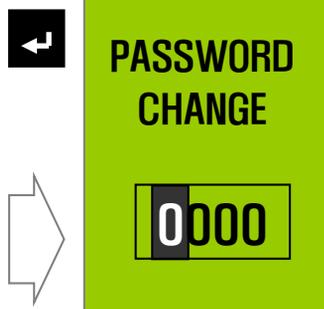
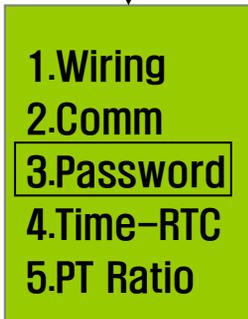
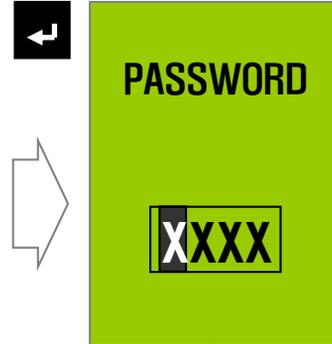
Measurement screen status



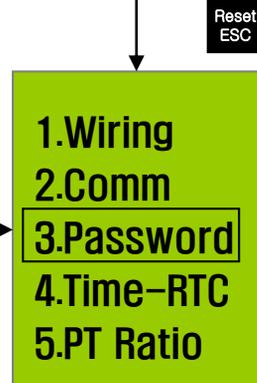
Configuration status



Enter Password



← Move to above menu after saving the data
Reset ESC Move to above menu without saving the data



C. P/S type device setting

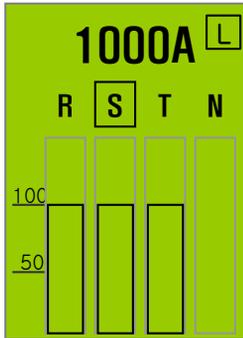
5. Device H/W setting - time setting



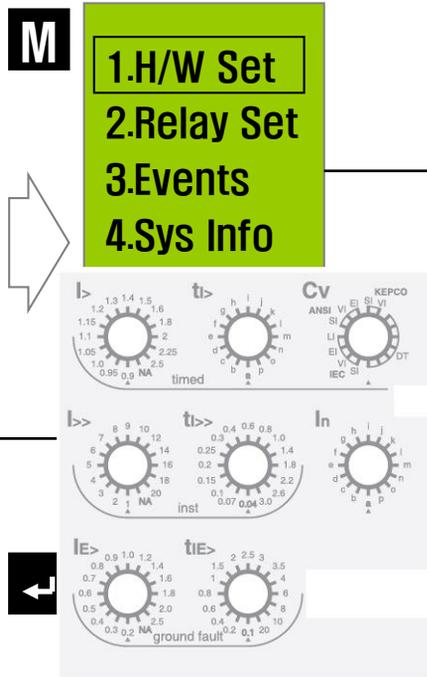
Cautions

- P type and S type include precise clock inside of them.
Time may be changed by remote controlling or on the device.

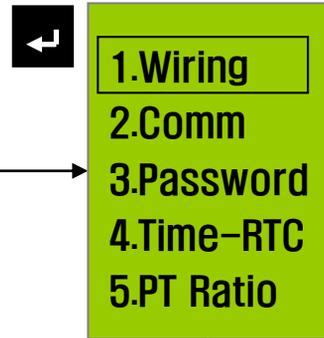
Measurement display status



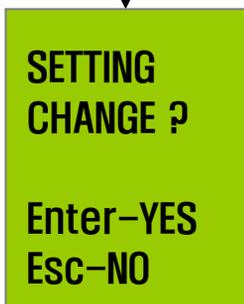
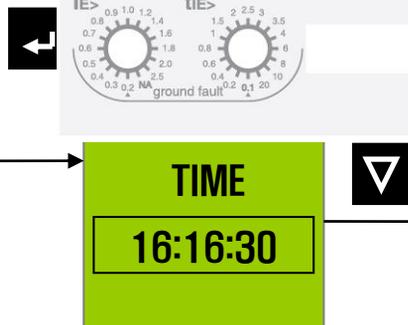
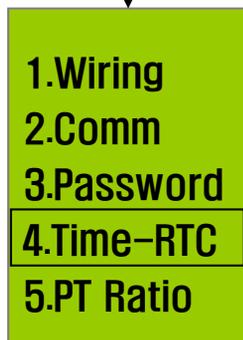
Configuration status



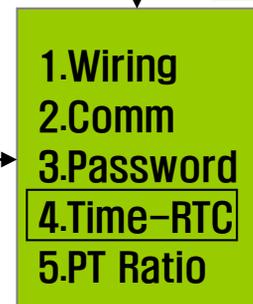
Enter password



▼ X 3 times



Move to above menu after saving the data
 Move to above menu without saving the data



C. P/S type device setting

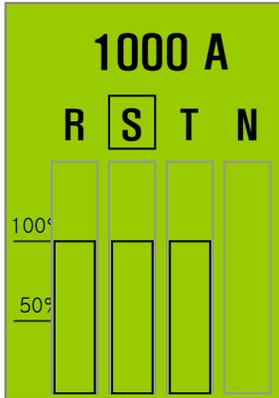
6. Device H/W setting – PT ratio setting



Cautions

- P type and S type provide PT proportion setting function.
It make it as a rule to connect directly in VDM and set proportion when conducting VDM after using PT.

Measurement display status



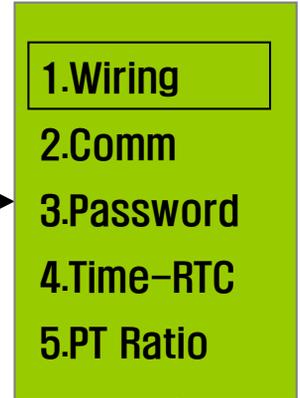
M

Configuration status

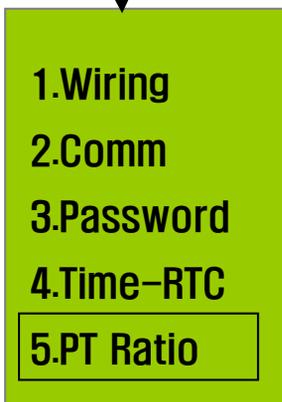


Enter password

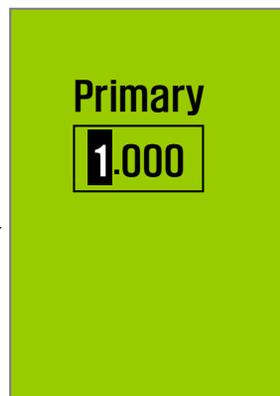
←



▽ X 4 times

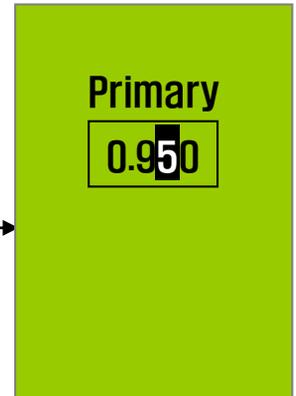


←

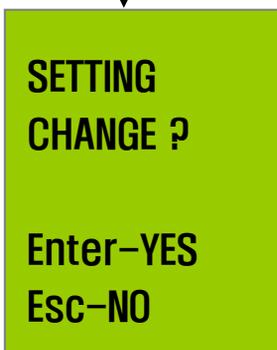


▽
↺
▽

↻
▽ X 5회



←

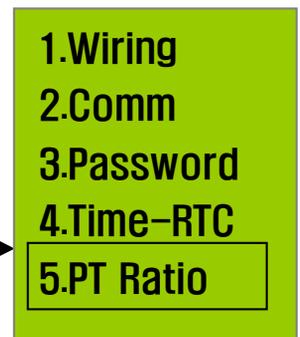


←

Move to above menu after saving the data

Reset ESC

Move to above menu without saving the data

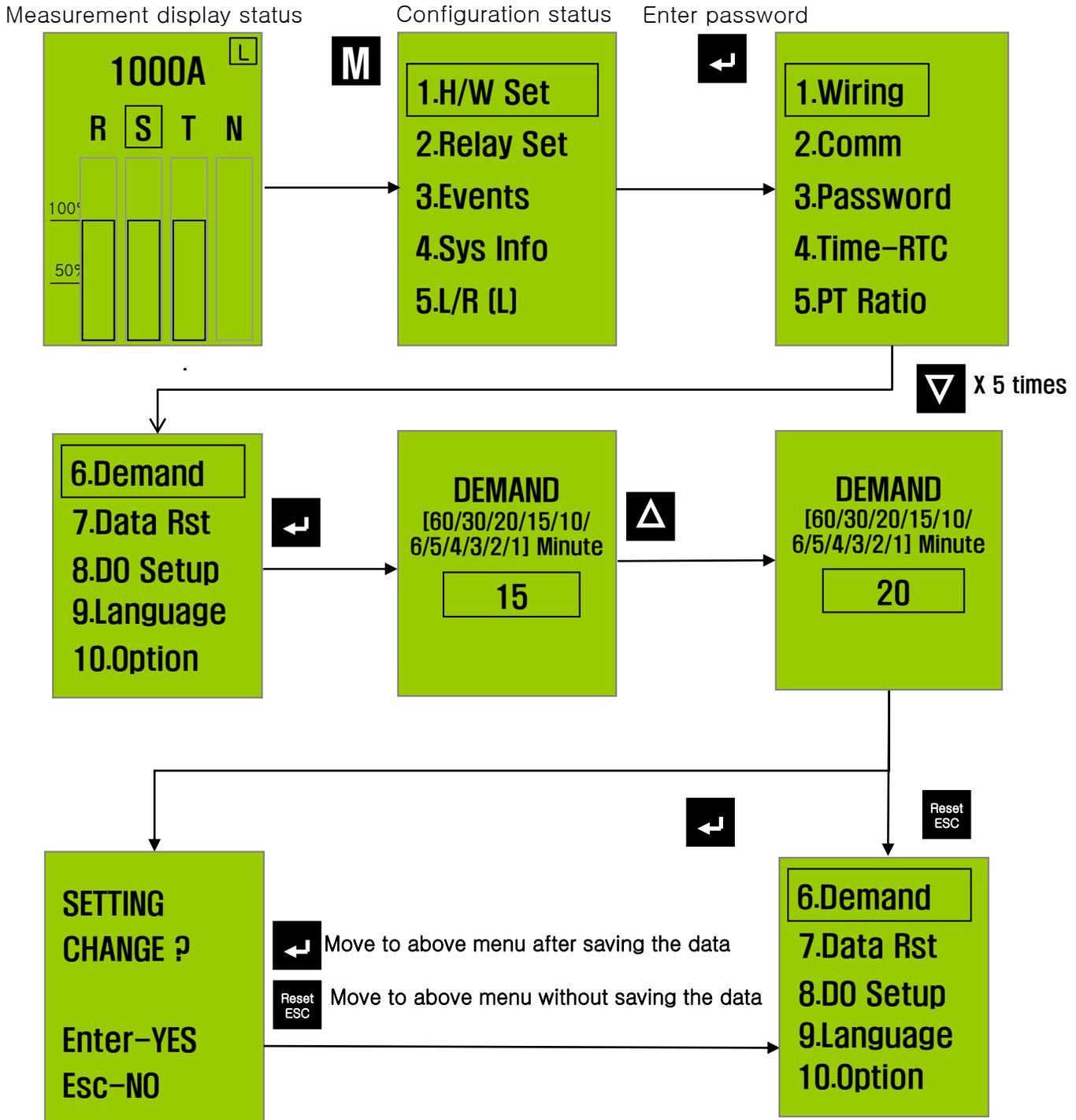


C. P/S type device setting

7. Device H/W setting- demand setting

Cautions

- P type and S type provide demand measuring function,
Demand cycle can be set in minutes, dividing 60 minutes without decimal point.



C. P/S type device setting

8. Device H/W setting - data reset



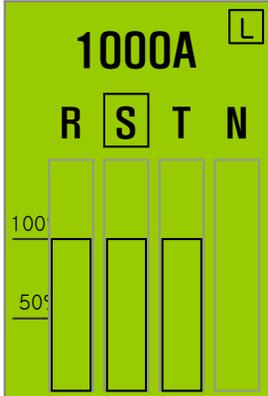
Cautions

- P type and S type constantly records the maximum power, maximum demand, energy, number of operation cycle of circuit breaker, operating time of circuit breaker. User may initialize the data and restart.

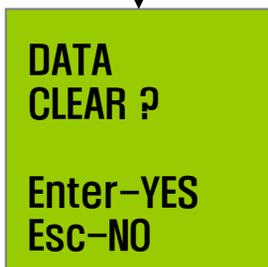
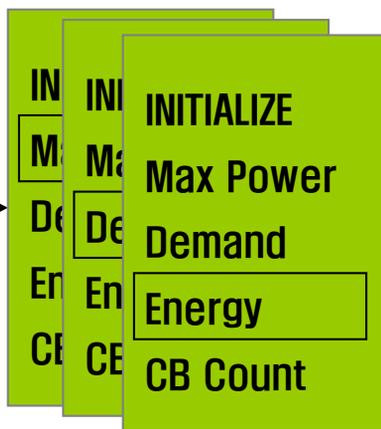
Measurement display status

Configuration status

Enter password



X 4 times



Move to above menu after initializing the data



Move to above menu without initializing the data

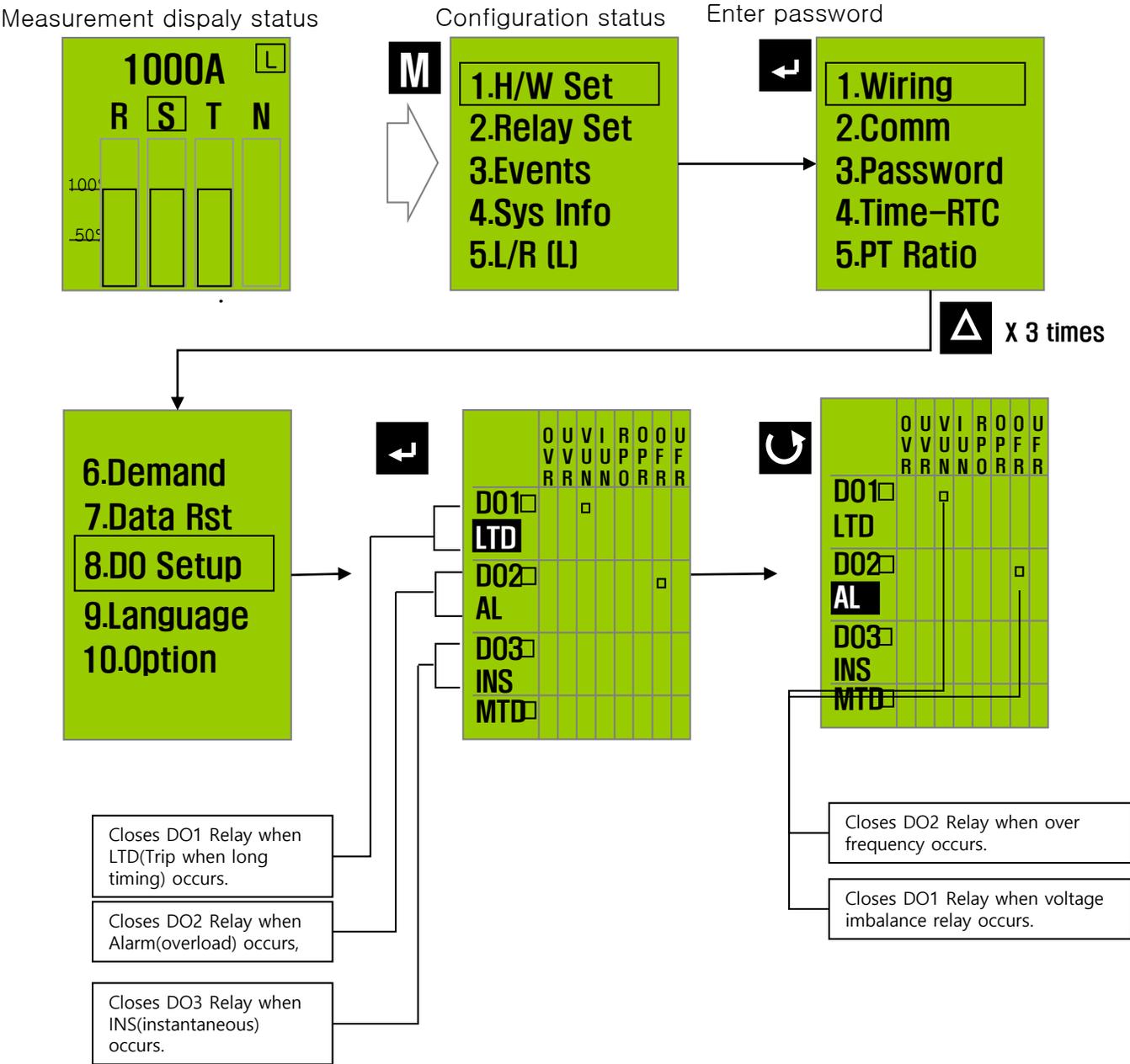


C. P/S type device setting

9. Device H/W setting - DO setting

Cautions

- There are 3 Relay Output on P type and S type. You may set to fit in the purpose. Setting can be used in relay operation, OCR/OCGR operation alarm, overload alarm.



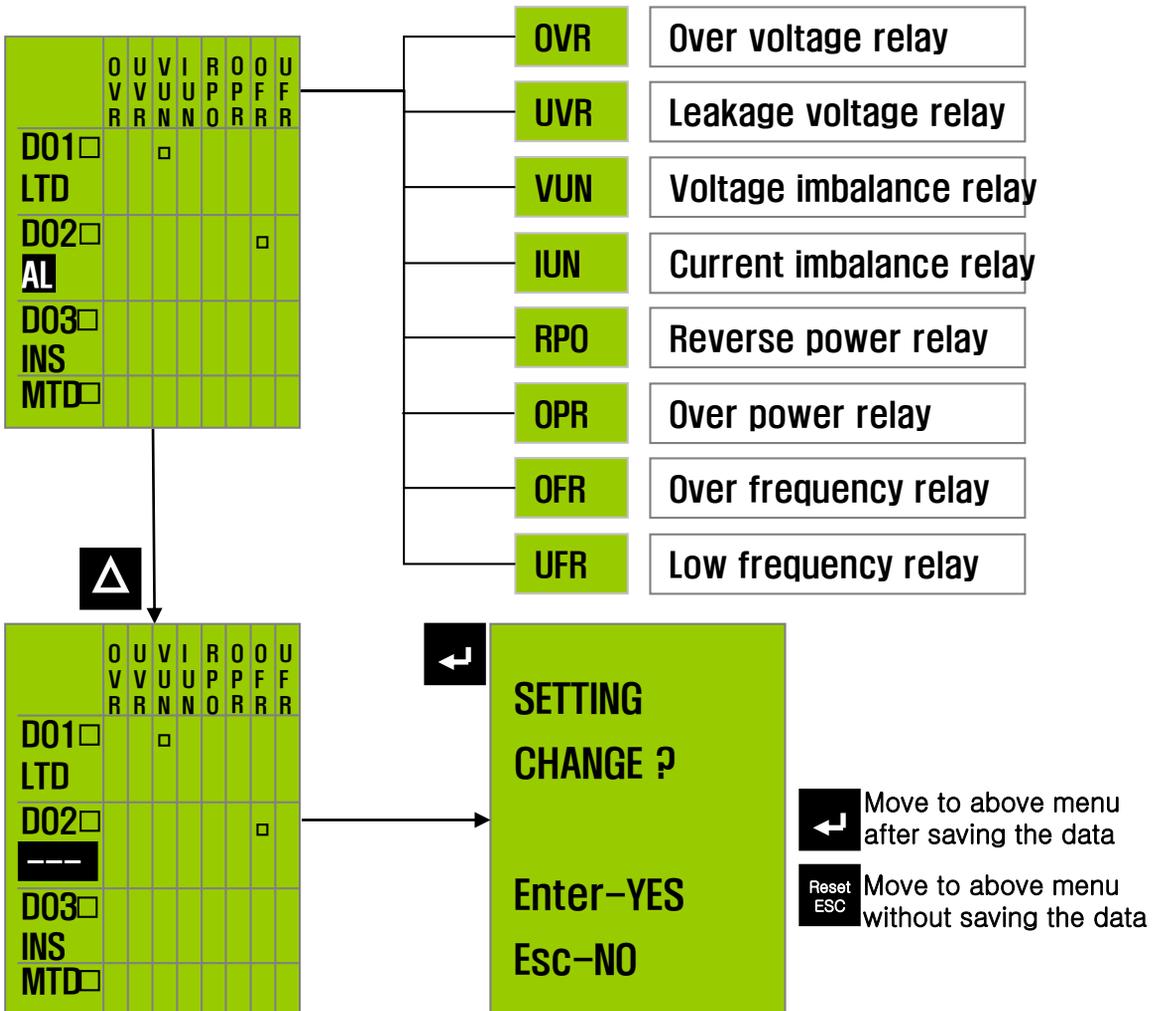
Cautions

- Operation setting of DO is as following order.
--- → LTD → S,I → GND → PTA → AL

C. P/S type device setting

9. Device H/W setting – DO setting

| | |
|-----|---|
| --- | DO does not operate in any event. |
| LTD | Closes the related DO [Relay] when long timing trip occurs. |
| S,I | Closes the related DO [Relay] when short timing, instantaneous trip occurs. |
| GND | Closes the related DO [Relay] when ground trip occurs. |
| PTA | Closes the related DO [Relay] when Pre-Trip Alarm occurs. |
| AL | Closes the related DO [Relay] when overload [over 95% of rated current] occurs. |

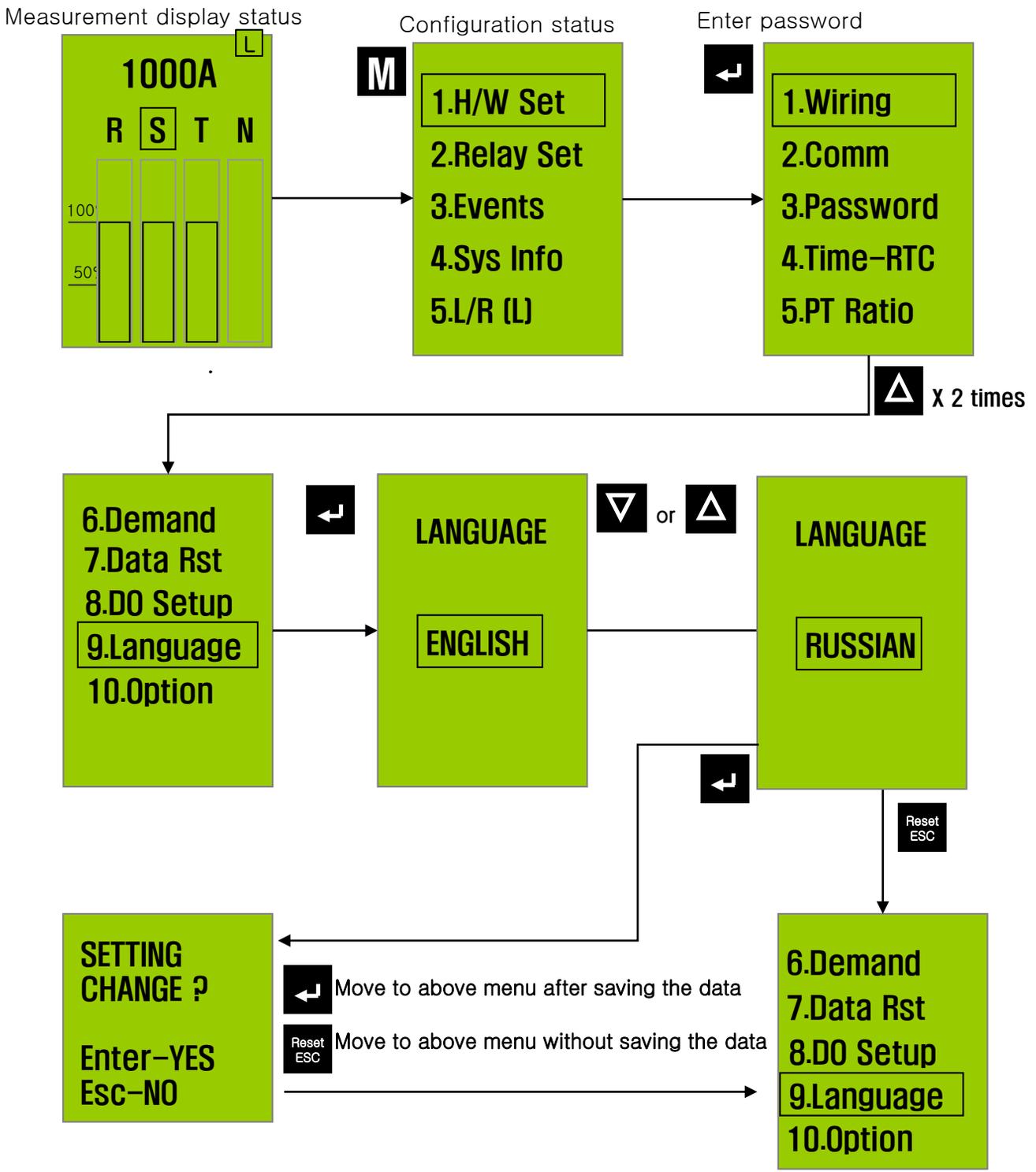


C. P/S type device setting

10. Device H/W setting – language setting

⚠ Cautions

- P type and S type can set language, There are English and Russian, choose either one.



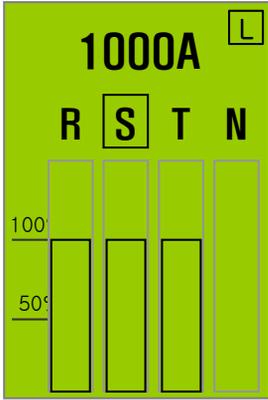
C. P/S type device setting

10. Device H/W setting – option setting

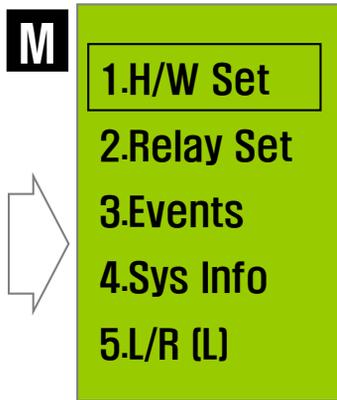
Cautions

- P type and S type provide option function.
- May set ground Blocking time, Action, HOT start, ZSI in option.

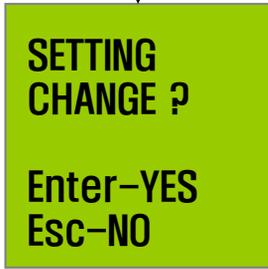
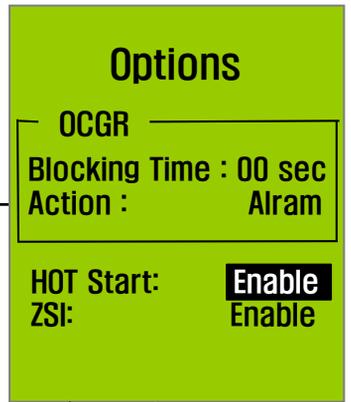
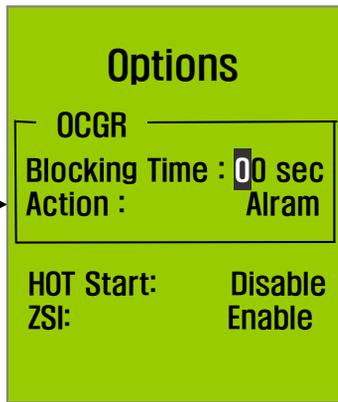
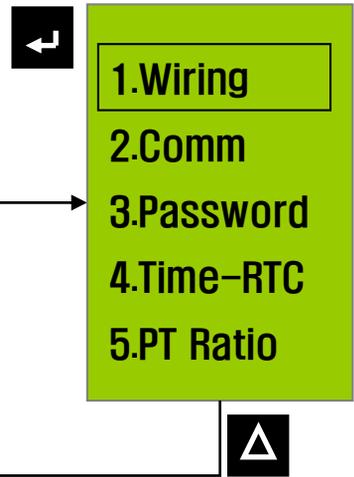
Measurement display status



Configuration status



Enter password



↩ Move to above menu after initializing the data

Reset ESC Move to above menu without initializing the data



C. P/S type device setting

12. Event information display



Cautions

- P type and S type record the events which occur in the device.
- Records the information of occurred event up to 256 hourly.
- When the event occurs more than 256, it deletes the earliest data and records the newest data.

Event information

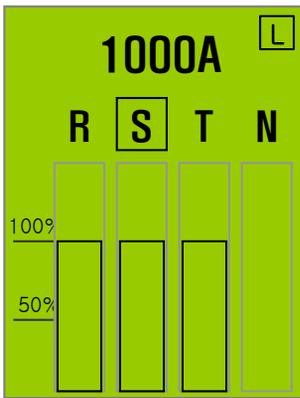
| | | |
|-------------------------------|--|---|
| Device setting Alternation | Change wiring | Records the Event when the user wants to change the wiring type. |
| | Change communication condition | Records communication environment modification (Speed, Address, Swap) |
| | Change password | Records the information when changing the password |
| | Change time | Records when changing the time information of inside |
| | Change demand setting | Records when changing the demand setting (demand cycle) |
| | Change DO setting | Records when changing the setting of DO1~DO3 |
| | OCR fine control | Records when fine controlling long, short, instantaneous relay current of OCR |
| | OCGR fine control | Records when fine controlling the relay current of OCGR |
| | Change OVR/UVR | Records when changing the setting of OVR/UVR relay |
| | Change imbalance relay setting | Records when changing the setting of voltage/current imbalanced relay. |
| | Change reverse power relay setting | Records when changing the setting of reverse power relay. |
| | Change over power relay setting | Records when changing the over power relay setting. |
| | Change option | Records when changing the option |
| | Change language | Records when changing the language |
| | Change PT proportion | Records when changing the PT proportion of OCR |
| | Change frequency relay setting | Records when changing the setting of low/high frequency relay |
| | Change OCR knob | Records when changing the long/short/instantaneous knob of overall device |
| Change OCGR knob | Records when changing the knob which is related with ground of overall device. | |
| Device faulty occurrence | Interior communication faulty | Records when communication between the inner CPU is bad. |
| | MTD wire is fall out/disconnected | Records when MTD (Magnetic Trip Device) wire connection is bad. |
| | Memory faulty | Records when the record memory of the inside is bad |
| | Not inserting Rating Plug | Records when Rating Plug is not inserted. |
| | Rating Plug misinsertion | Records when Rating Plug is misinserted. |
| Device status Alternation | Change Local / Remote | Records when changing the device mode into Local↔Remote |
| | Power on | Records after initial Booting of P type/S type. |
| | Fault Reset | Records if Reset when fault has occurred. |
| | DO1 control (Close/Open) | Records when changing the output of DO1 OFF→ON, ON→OFF |
| | DO2 control (Close/Open) | Records when changing the output of DO2 OFF→ON, ON→OFF |
| | DO3 control (Close/Open) | Records when changing the output of DO3 OFF→ON, ON→OFF |

C. P/S type device setting

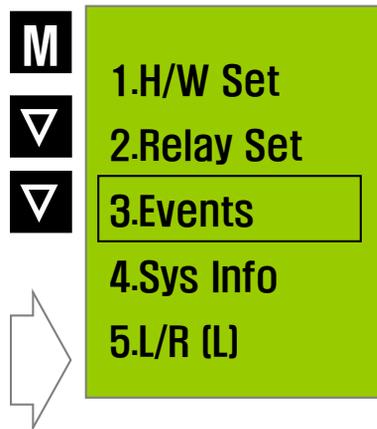
12. Event information display

| | | |
|---------------------------|------------------------------|--|
| Change device information | Initialize maximum power | Records when initializing the maximum power |
| | Initialize maximum demand | Records when initializing the maximum power |
| | Initialize energy | Records when initializing the energy(wattage) |
| | Initialize event information | Records when initializing all of the event information |
| | Initialize Fault information | Records when initializing all of the fault information |

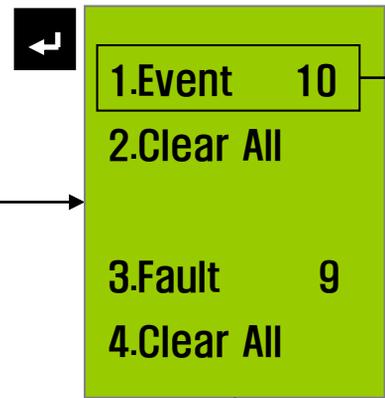
Measurement display status



Configuration status



Enter password



10 events are recorded in this device now.



Changing the information is conducted in Local
The latest Event was booted at 2012/03/14 20:29:41 as the power got into P type/S type

C. P/S type device setting

12. Event information display

| Display indication | | |
|--|--|--------------------------------------|
| Change device setting → "Cfg Change" | Change wiring type | "Wiring" |
| | Change communication condition | "Comm Setup" |
| | Change password | "Password" |
| | Change time | "Time Change" |
| | Change demand setting | "Demand" |
| | Change DO setting | "OCR DO Config" |
| | OCR fine control | "OCR Fine Set" |
| | OCGR fine control | "OCGR Fine Set" |
| | Change OVR/UVR | "OVR/UVR" |
| | Change unbalance relay setting | "Unbal RY" |
| | Change reverse/overpower relay setting | "rP/OPR RY" |
| | Change frequency relay setting | "OFR/UFR" |
| | Change option | "OCR Options" |
| | Change language | "Language" |
| | Change PT proportion | "PT Ratio" |
| | Change OCR knob | "OCR Knob" |
| Change OCGR knob | "OCGR Knob" | |
| Device faulty → "Error" | Inner communication faulty | "Inter Comm" |
| | MTD wire is fall out/disconnected | "MTD Wire" |
| | Memory faulty | "Memory" |
| | Rating Plug not inserted | "Miss-Rate Plug" |
| | Rating Plug misinserted | "Mismatch Plug" |
| Change device status → "Sta Change" | Change Local / Remote | "Local 2 Remote" "Remote 2 Local" |
| | Power on | "Power On" |
| | Fault Reset | "Trip Reset" |
| | DO1 control (Close/Open) | "DO#1 CTRL" |
| | DO2 control (Close/Open) | "DO#2 CTRL" |
| | DO3 control (Close/Open) | "DO#3 CTRL" |
| Change Device information → "Rst Data" | Initialize maximum power | "Reset Max P" |
| | Initialize maximum demand | "Reset Max Demand" |
| | Initialize energy | "Reset Energy" |
| | Initialize event information | "Clear Sys Event" |
| | Initialize Fault information | "Clear Trip Event" |

C. P/S type device setting

13. Fault information display

Cautions

- P type and S type record the fault (Trip & selective relay operation) up to 256 in order to notify the operation information and cause when trip or relay have operated
- When the event occurs more than 256, it deletes the earliest data and records the newest data.

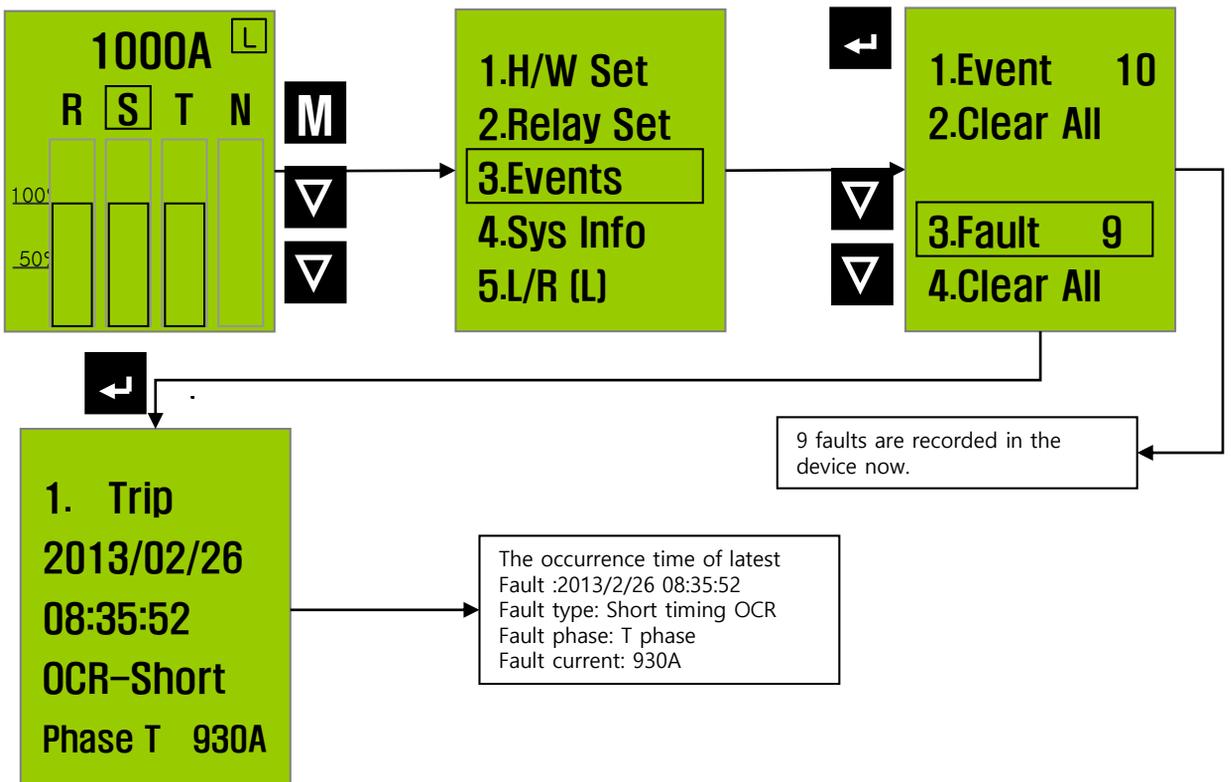
Fault information

| | | |
|-----------------|----------------------|---|
| OCR OCGR | Long timing | Records when over current relay operates |
| | Short timing | Records when short timing fault relay operates |
| | Instantaneous | Records when instantaneous fault relay operates |
| | Ground | Records when trip occurs due to earth current |
| | Ground-ZCT | Records when trip occurs due to earth[outer CT] current |
| | Leakage | Records when trip occurs due to leakage current |
| Selective relay | PTA (Pre Trip Alarm) | Records when Pre Trip Alarm relay operates |
| | OVR | Records when OVR relay operates |
| | UVR | Records when UVR relay operates |
| | Voltage Unbalance | Records when Voltage unbalance relay operates |
| | Current Unbalance | Records when current unbalance relay operates |
| | Reverse Power | Records when Reverse power relay operates |
| | Over Power | Records when Overpower relay operates |
| | OFR | Records when Over frequency relay operates |
| | UFR | Records when Under frequency relay operates |

Measurement display status

Configuration status

Enter password



C. P/S type device setting

13. Fault information display

Display indication–Fault information

| | | |
|-----------------|----------------------|-------------|
| OCR OCGR | Long timing | “OCR–Long” |
| | Short timing | “OCR–Short” |
| | Instantaneous | “OCR–Ins” |
| | Ground | “OCGR” |
| | Ground–CT (outer CT) | “OCGR–ZCT” |
| | Leakage | “Leakage” |
| Selective relay | PTA (Pre Trip Alarm) | “PTA” |
| | OVR | “OVR” |
| | UVR | “UVR” |
| | Voltage Unbalance | “Vunbal” |
| | Current Unbalance | “Iunbal” |
| | Reverse Power | “rP/OPR” |
| | Over Power | “rP/OPR” |
| | OFR | “OFR” |
| UFR | “UFR” | |

Display indication–Indication of fault phase and trip value

| | | |
|-----------------|----------------------|------------------------------------|
| OCR OCGR | Long timing | “Phase–R xxx A” |
| | Short timing | “Phase–S xxx A” |
| | Instantaneous | “Phase–T xxx A” |
| | IDMTL | “Phase–N xxx A” |
| | Ground | “xxx A” |
| | Leakage | “xxx A” |
| Selective relay | PTA (Pre Trip Alarm) | “xxx A” |
| | OVR | “Phase–R xxx V” |
| | UVR | “Phase–S xxx V” “Phase–T xxx V” |
| | Voltage Unbalance | “xx %” |
| | Current Unbalance | “xx %” |
| | Reverse Power | “xxx kW” |
| | Over Power | “xxx kW” |
| | OFR | “xx Hz” |
| | UFR | “xx Hz” |

C. P/S type device setting

14. Event information / fault information deletion



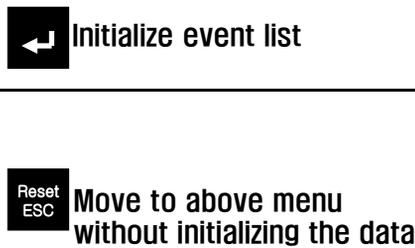
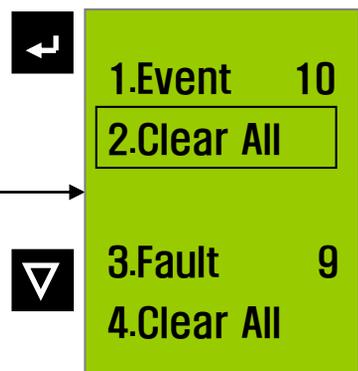
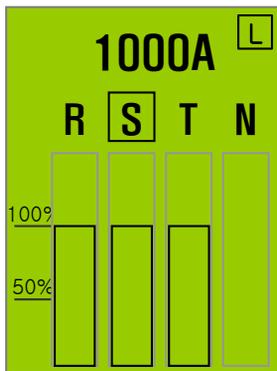
Cautions

- P type and S type can record event information and fault information up to 256 of each.
- The user may delete the event and Fault list as one wishes.
- Deleted information remains in the event information.

Measurement display status

Configuration status

Enter password



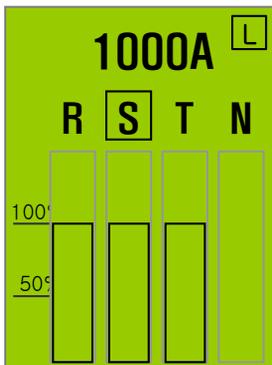
C. P/S type device setting

15. System information display

CAUTION

- P and S type can indicate its own information including the information of the ACB
- 1) Present time
 - 2) ACB current ratings
 - 3) EX - Functions
 - 4) Frequency information (60Hz, 50Hz)
 - 5) Breaking / Closing numbers of a circuit breaker (nr. of operating times)
 - 6) OCR operating time
 - 7) Conducting time of a circuit breaker
 - 8) F/W version info

Measurement display status



Configuration status

1.H/W Set
2.Relay Set
3.Events
4.Sys Info
5.L/R (L)

Enter Password



System Info.

| | |
|-----------|---------------------|
| Date Time | 2012/03/15 21:23:30 |
| Rating | 1000 A |
| Ex-Func | 4POCGR |
| Freq | 60 Hz |
| CB ON# | 23 |
| Ver-Arm | 1.73 |



System Info.

| | |
|-----------|---------------------|
| Date Time | 2012/03/15 21:23:30 |
| Rating | 1000 A |
| Ex-Func | 4POCGR |
| T-OPER | 220 h |
| T-CB ON | 180 h |
| Ver-Msp | 4.01UL |

| | |
|---------|---|
| Rating | Rated current of ACB |
| EX-Func | Extended functions of ACB |
| Freq | Rated frequency |
| CB ON# | Breaking/Closing numbers of a circuit breaker |
| T-OPER | OCR(P/S type) operating time |
| T-CB ON | Operating time of ACB under closed condition |
| Version | Firmware version |

C. P/S type device setting

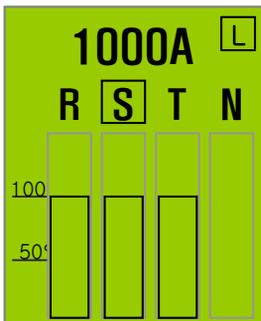
16. Local / Remote setting



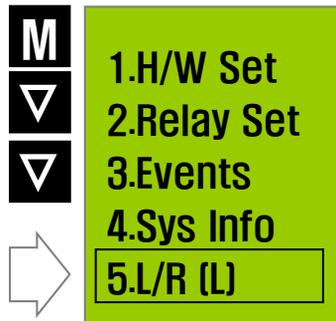
CAUTION

- For P and S type, one can set whether to control locally or remotely. .
- When device is set to local, every operation is available through the Key of OCR..
- When device is set to Remote, it is locked not to be controlled from the local site.

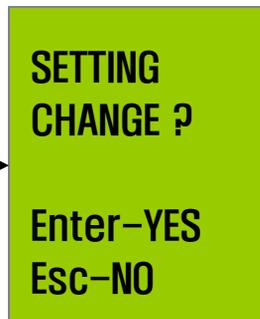
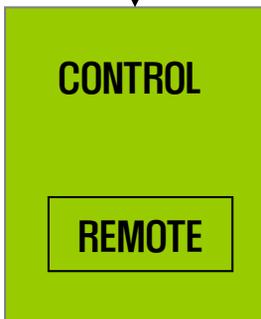
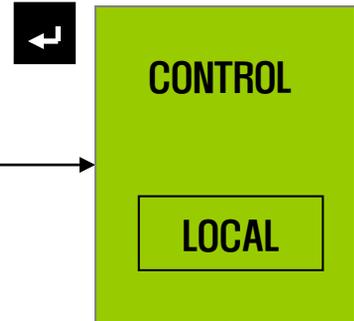
Measurement display status



Configuration status



Enter password



Move to above menu
After saving the data



Move to above menu
without saving the data