Power Management Module-c (PMM-c)

60–160 kVA

Installation, Operation and Maintenance

11/2013

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Legal Information

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Important Safety Information

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

WARNING indicates an imminently hazardous situation which, if not avoided, **can result in** death or serious injury.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ CAUTION

CAUTION indicates an imminently hazardous situation which, if not avoided, **can result in** minor or moderate injury.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Specifications

Weights and Dimensions

Power Management Module without Isolation Transformer

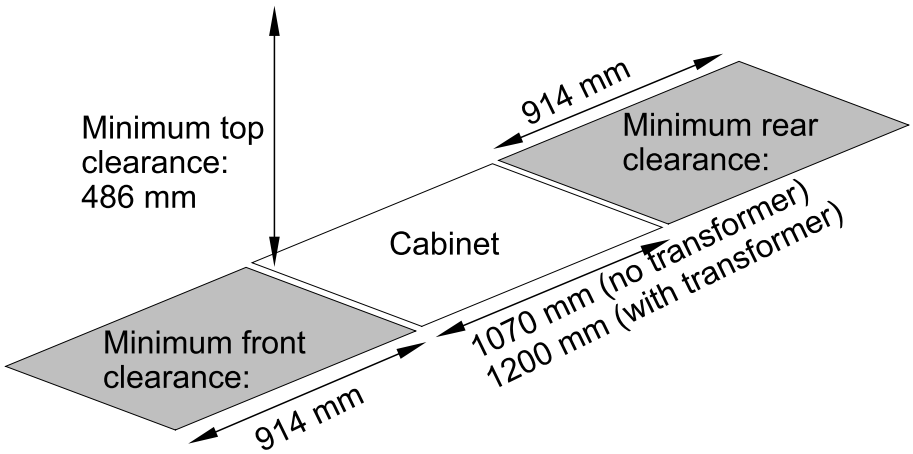
kVA rating	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
60–100	1991	600	1070	255
120–160	1991	800	1070	270

Power Management Module with Isolation Transformer

kVA rating	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
60	1991	600	1200	450
80	1991	600	1200	595
100	1991	600	1200	660
120	1991	800	1200	770
160	1991	800	1200	955

Space Considerations

NOTE: Clearance dimensions are published for airflow and service access only. Consult with the local safety codes and standards for additional requirements in your local area.



Power Management Module Parameters

AC Input

kVA rating	60/80/100/120/160
Voltage rating (V)	380/400/415

AC Input

Rated insulation voltage (V)	690
Number of conductors	Power management module with isolation transformer: 3P+ PE Power management module without isolation transformer: 3P+ N + PE
Frequency (Hz)	50/60

Environmental

	Operation	**Storage**
Temperature	-5°C to 40°C	-30°C to 70°C
Relative humidity	10% to 90% non-condensing	
Elevation	0 to 2000 m	0 to 5000 m
Audible noise	65 dB	
Color	Black	
Protection level	IP20	
Service conditions	Indoor use only	

Component Parameters

Isolation Transformer

K factor	K13
Max inrush current	6 time
Winding	DYn11
Efficiency	95%-98%
Audible noise	65 dB
Cooling	Forced air cooling 2+1 fans

Recommended Upstream and Downstream Protection

	Upstream	**Downstream**
Rated current (A)	100/125/160/250/400 depending on the main input breaker capacity	160/250/400
Number of conductors	3P+PE+N	
Tripping curve	<400A: TM 400 A: MIC	
Rated short-circuit capacity (kA)	36	
Auxiliary contacts	Auxiliary contacts: (ON/OFF)	Auxiliary contacts: (ON/OFF) Fault contacts (Trip/Not trip)

Output Circuit Breaker

kVA rating	60–160
Rated current (A)	10/16/20/25/32/63
Phase number	1P/3P
Tripping curve	C-curve
Number of branches	63 branch/ 84 branch/ 126 branch
Auxiliary contacts	Auxiliary contacts: (ON/OFF)
Installation type	Hot plug
Phase regulator	Support

Other Parameters

	Standard	**Option**
External communication protocol	Modbus RTU	FTP, HTTP, SNMP, TCP/IP
External communication interface	2–wire	RJ45
Emergency power off (EPO)	Support	Support
Neutral conductor size for neutral line	2 x phase line	2 x phase line

NOTICE

Electrical connection type for functional unit: **F**

- F: Fixed connection
- D: Disconnectable connection
- W: Withdrawable connection

Failure to follow these instructions can result in equipment damage.

Installation

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.
- The system must be installed in a room with restricted access (qualified personnel only).
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Read and understand this manual before installing or operating the power management module. Installation, adjustment, repair and maintenance must only be performed by qualified personnel.

- The power management module must be grounded in compliance with all international and national electrical standards in force concerning protective grounding of all equipment.
- Many parts in this equipment operate at line voltage. DO NOT TOUCH. Use only electrically insulated tools.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- DO NOT short across terminals INPUT and OUTPUT.
- Install and close all the covers before applying power or starting and stopping the drive.
- Check for hazardous voltage between all terminals including the protective earth before working on the system.
- Disconnect the power supply before working on the equipment. Wait for discharging to finish before starting to work.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Before servicing the power management module:

- **Disconnect all power.**
- **Place a “DO NOT TURN ON” label on the disconnect at the head of the installation.**
- **Lock the disconnect in the open position.**

Failure to follow these instructions will result in death or serious injury.

Level the Power Management Module Cabinets

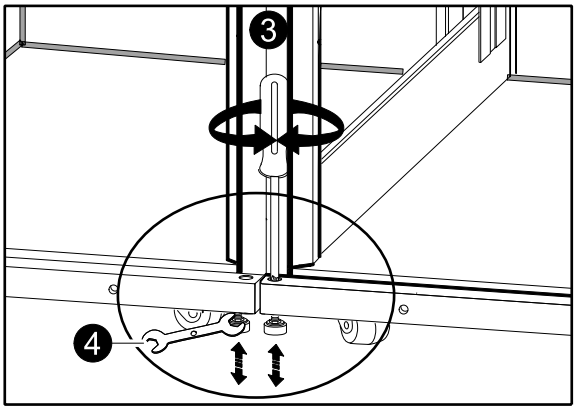
⚠ WARNING

HAZARD OF TILTING

The system must be installed on a level floor. The leveling feet will stabilize the cabinet, but will not compensate for a badly sloped floor.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

1. Align the cabinet(s).
2. If more cabinets are present: Connect exterior joining brackets to secure and bond the cabinets.
3. On the leveling foot, fit the provided 14 mm open-ended wrench onto the hex head and turn the wrench to the right until the leveling foot makes firm contact with the floor.



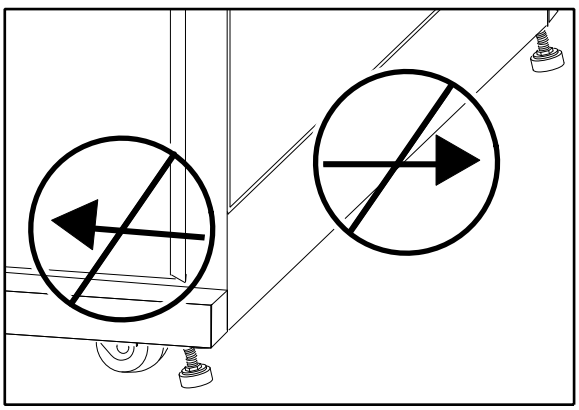
4. Level the other three leveling feet.
5. Use a bubble level to determine which feet need further adjustments to level the cabinet, and adjust as necessary.

⚠ WARNING

HAZARD OF TILTING

Do not push the cabinet to move it after the feet have been lowered as they might get damaged. Use a forklift or similar lifting equipment to move the power management module cabinet, but no equipment that uses hoisting as this can damage the structure and function of the cabinet.

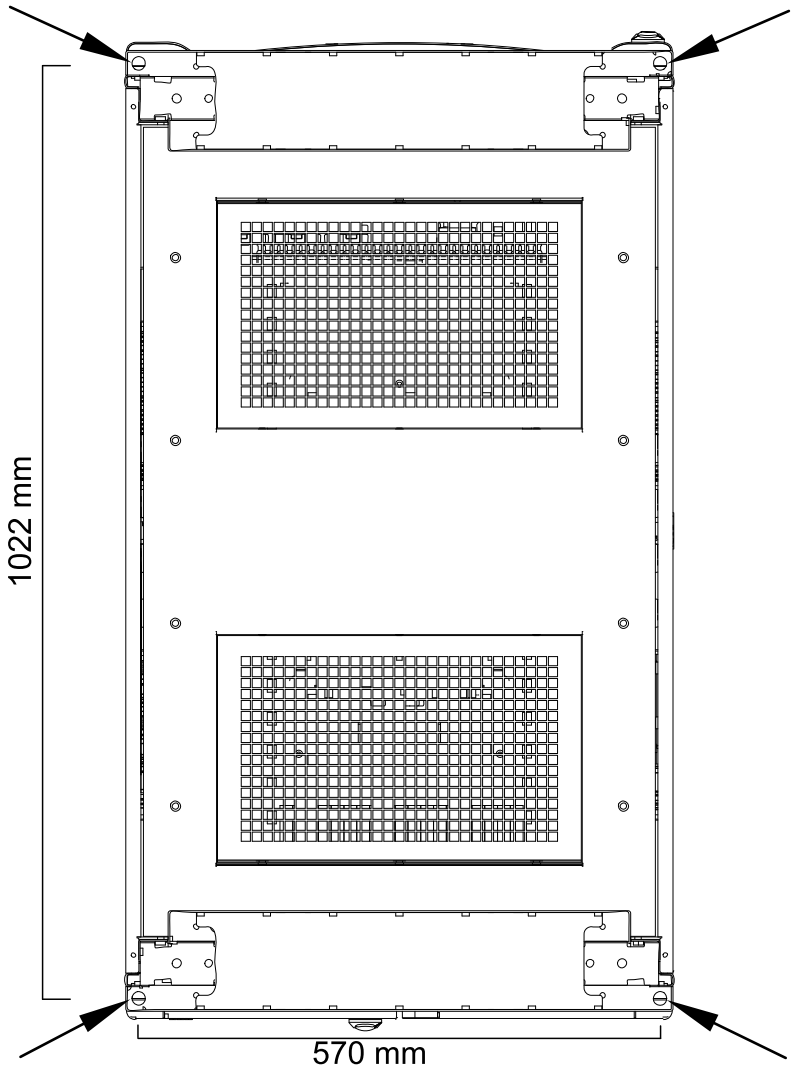
Failure to follow these instructions can result in death, serious injury, or equipment damage.



Anchor the Power Management Module Cabinet (Optional)

The power management module cabinet can be anchored to either a concrete floor/block or to mounting brackets. There are four predrilled anchoring holes in the bottom of the power management module cabinet. Anchoring to a concrete surface is described here, but using anchoring brackets (not supplied by Schneider Electric) is a similar process.

Bottom view of the power management module cabinet



1. At the installation site, drill four holes (Φ13) in the concrete floor/block to fit the footprint shown above (1022 mm x 570 mm).
2. Move the power management module cabinet to the installation site and aim the predrilled holes in the cabinet to the holes in the floor.
3. Use the four M10 expansion screws (supplied with the power management module cabinet) to fix the cabinet to the concrete floor/block.

Prepare for Cables

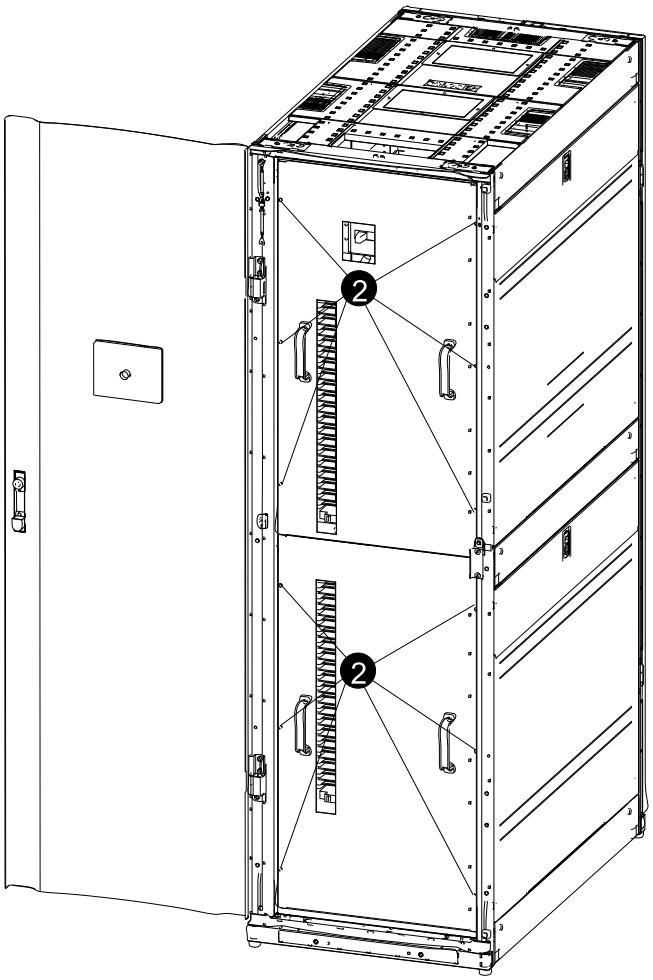
⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

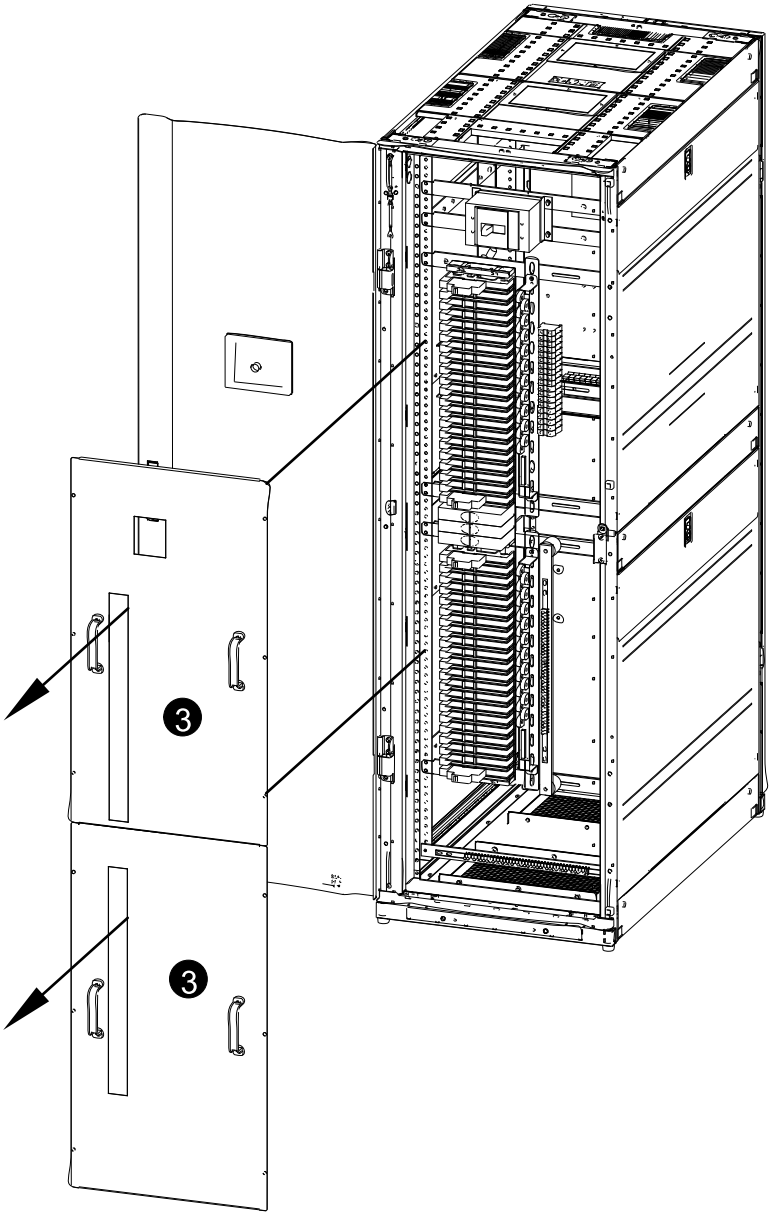
Turn off and disconnect all power sources feeding the power management module before performing this procedure.

Failure to follow these instructions will result in death or serious injury.

1. Open the front door of the power management module.
2. Remove the 12 screws holding the upper and lower deadfront panels.



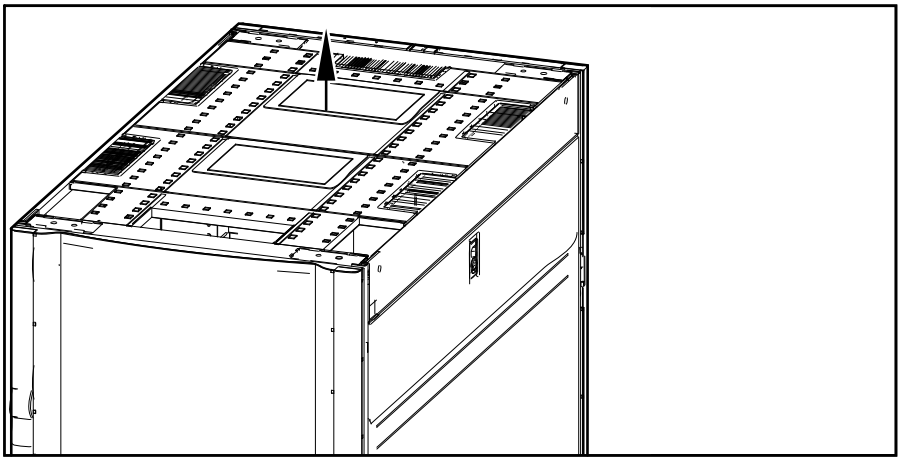
3. Remove the deadfront panels.



4. Cables can be routed both through the top of the power management module cabinet for overhead cable routing and through the bottom of the power management module cabinet for cable routing through a raised floor.

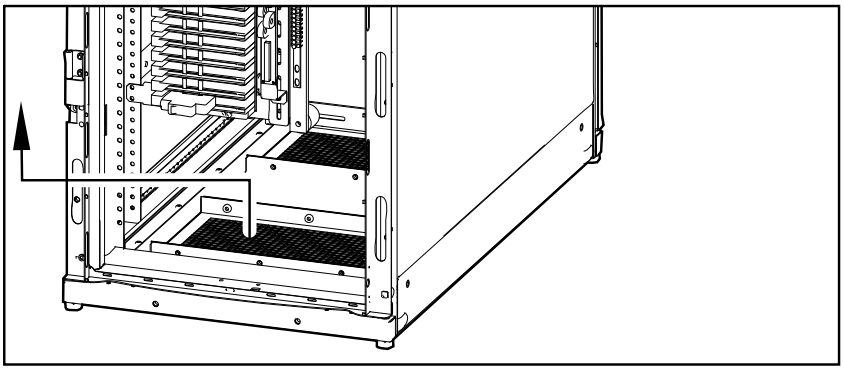
   a. Top cable entry: Push out the filler plate in the top of the cabinet

Cable entry through the top of the cabinet



   b. Bottom cable entry: Push out the filler plate in the bottom of the cabinet.

Cable entry through the bottom of the cabinet



Connect Input Cables to the Power Management Module

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

PE cables must be connected first.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

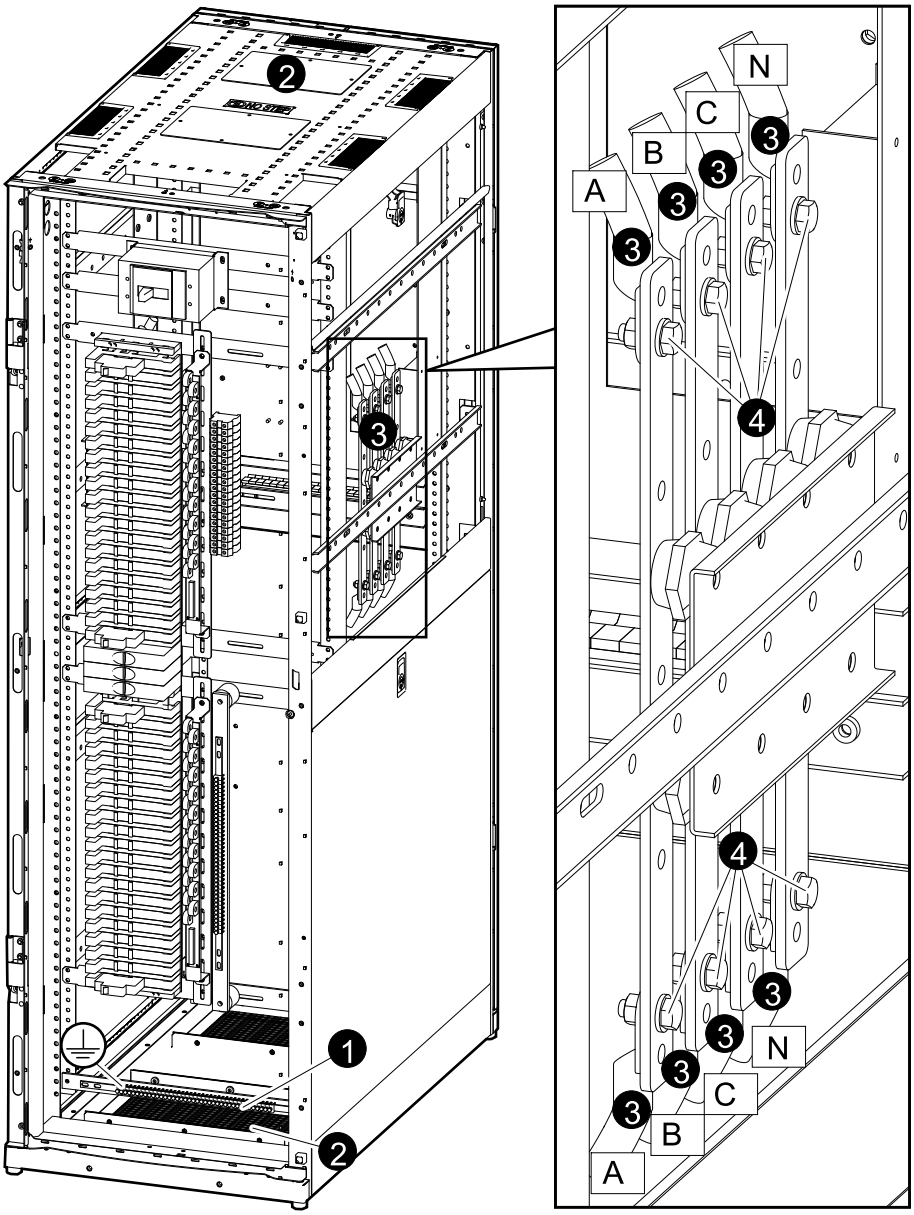
Turn off the AC input source and measure that there is no power on the terminals or on the AC input source connection upstream from the power management module before connecting the cables.

Failure to follow these instructions will result in death or serious injury.

1. Connect the PE cable to the PE busbar. Torque the M6 bolt for the PE cable to 6-8 Nm.
2. Route the input cables through the bottom or top and use the line beam to fix the cable.
3. Connect the input cables (A, B, C, N) to the input busbar (A, B, C, N).

4. After connecting the cables, secure them tightly with M8 bolts to the correct position. Torque the M8 bolts to 8.8-10.8 Nm.

Front view



Install the Output Circuit Breakers

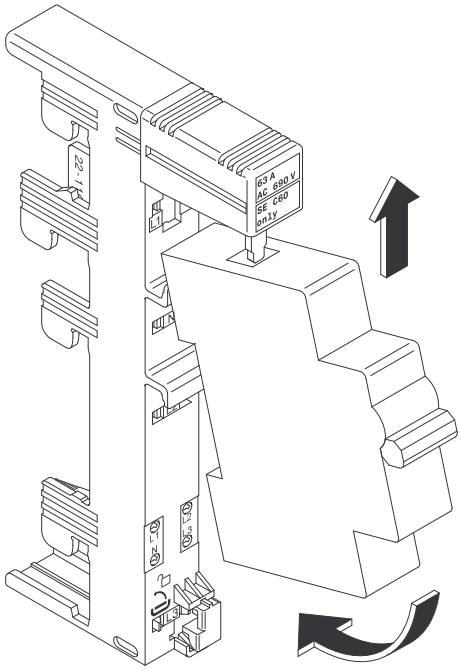
⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

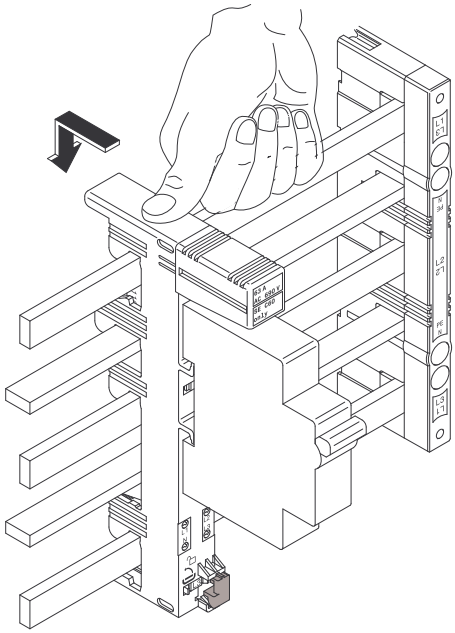
Turn off the AC input power source and the load before installing the output circuit breakers.

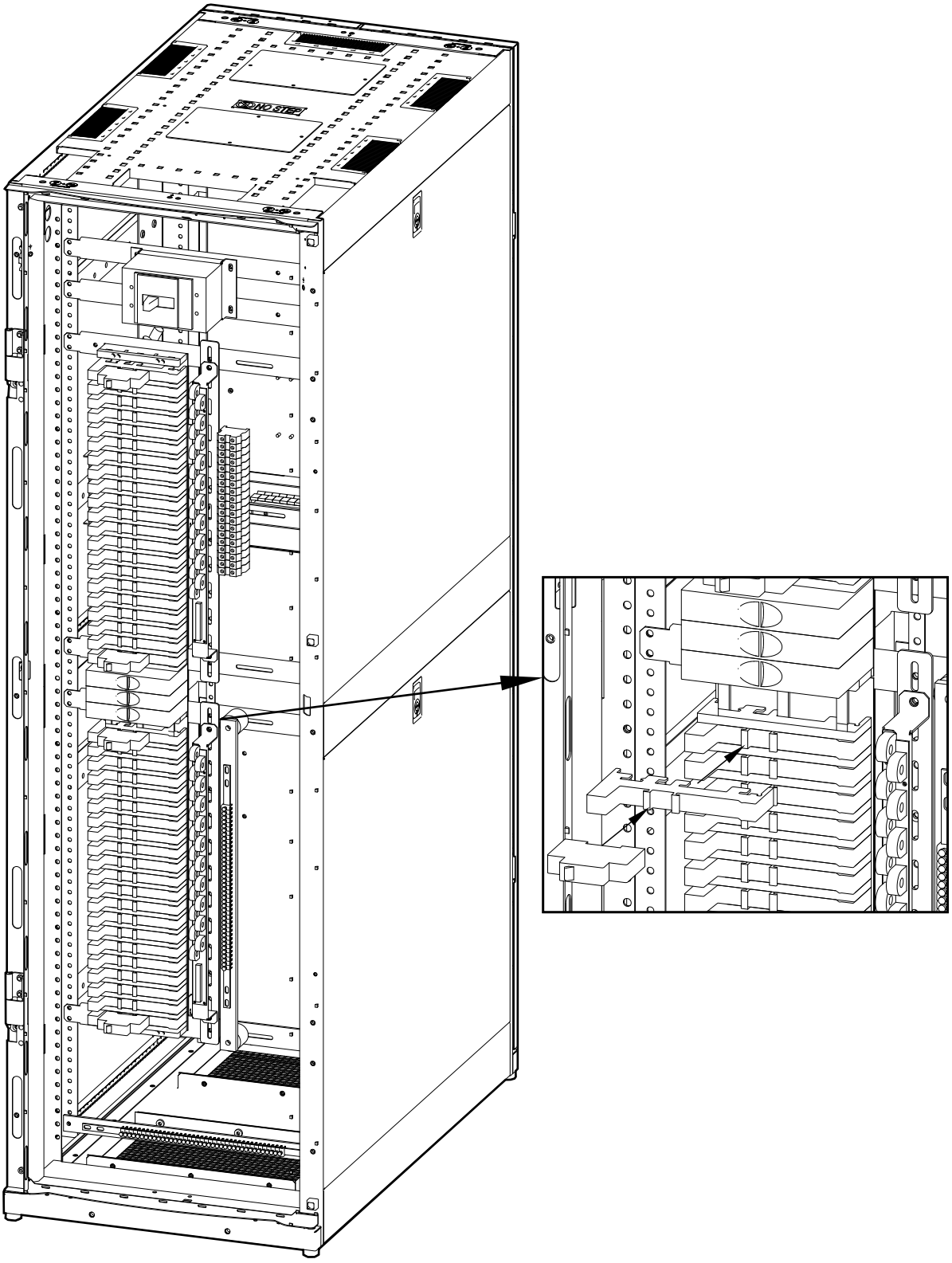
Failure to follow these instructions will result in death or serious injury.

1. Insert the copper contactor of the adapter in the output breaker's connection port and fit the output circuit breaker onto the adapter.

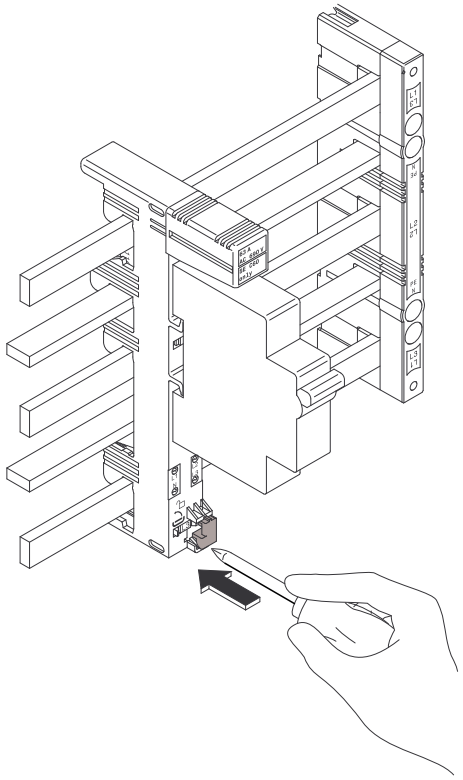


2. Fit the adapter onto the busbar of the power management module cabinet as shown in the illustration.





3. Use a screwdriver to lock the adapter onto the busbar by turning the screw 90° towards the right.



Adjust Phases to Balance the Load

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Turn off the AC input power source and the load before adjusting the phases.

Failure to follow these instructions will result in death or serious injury.

⚠ CAUTION

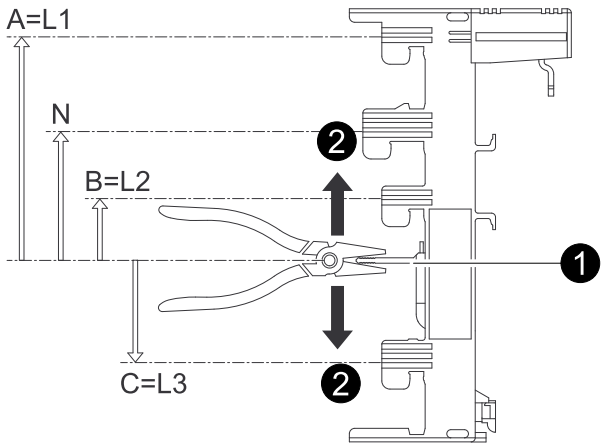
HAZARD OF COMPONENT DAMAGE

After finishing the mechanical phase adjustment, phase assignment settings must be carried out via the display. See Step 15 in *Set Up Parameters for the Power Management Module via the SETUP Menu, page 27*.

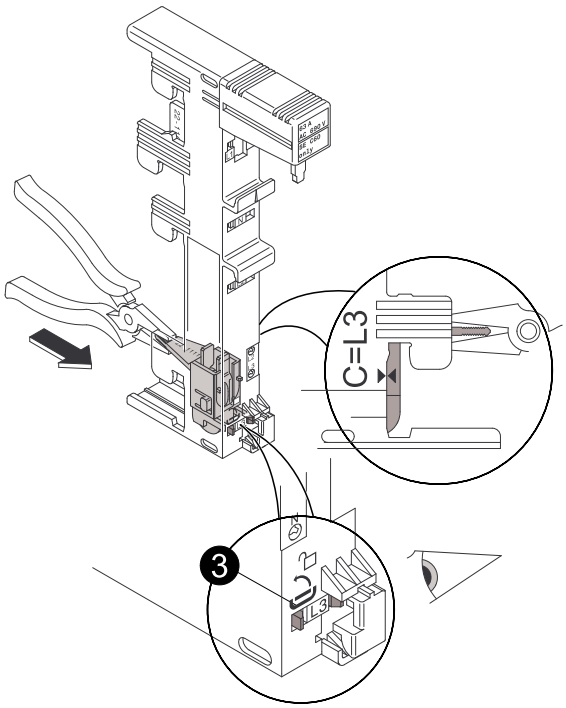
Failure to follow these instructions can result in injury or equipment damage.

NOTE: On the output circuit breaker adapter, the phases are listed as L1, L2 and L3 on the labels. These correspond to phase A, B, and C.

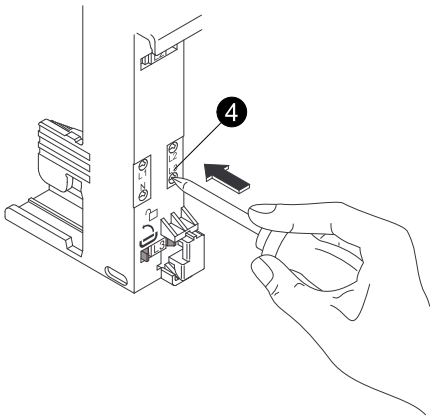
1. Grip the phase control pin on the back of the adapter with a pair of pliers as shown in the illustration. If an output circuit breaker is on the adapter — remove this first.
2. Lift the phase control pin up or down to the correct phase position (in this example phase C (L3 on the label)) until it makes a CLICK sound.



3. Check on the front of the adapter that the feet of the phase control pin are out.



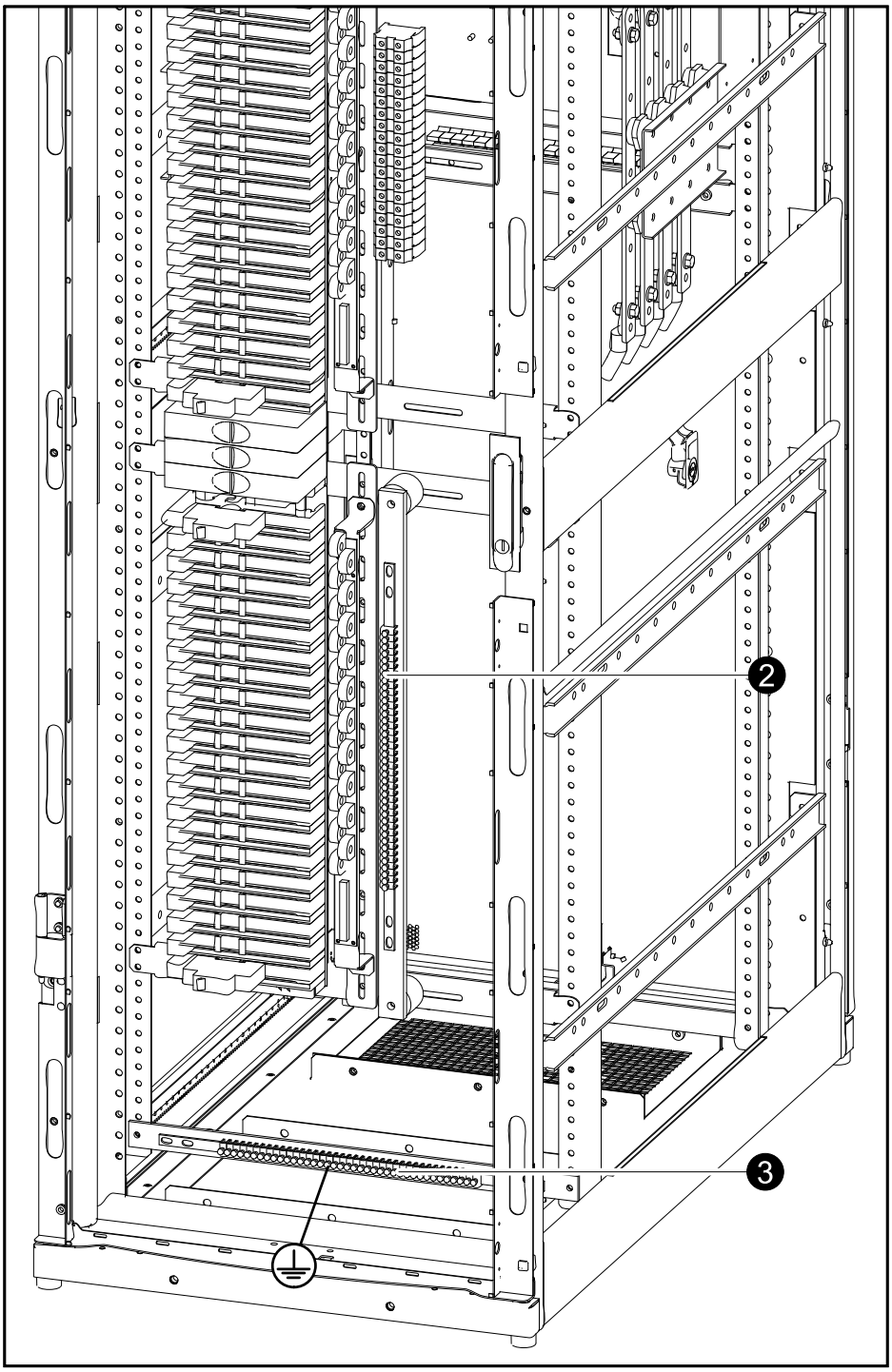
4. Lock the phase with a screwdriver as shown.



5. Insert or reinsert the output circuit breaker and install the adapter on the busbar as shown in Install the Output Circuit Breakers*, page 14*.

Connect the Power Management Module to the Load

1. Route the load cable through the top or bottom of the power management module cabinet. Fix the cable to the line beam.
2. Connect the N line of the cable to the Neutral busbar.
3. Connect the PE line of the cable to the PE busbar.



4. Fix the power cable to the output circuit breaker with a screwdriver.
5. Connect the load cable to the load.

Power Management Module Remote Control Communication

⚠ CAUTION

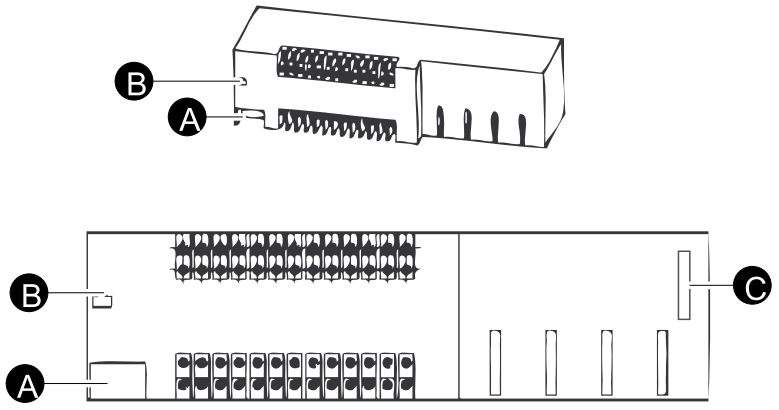
HAZARD OF COMPONENT DAMAGE

Never connect or disconnect the communication cable in serial port 2 (SL2) while the PLC is powered on. This will result in PLC damage.

Failure to follow these instructions can result in injury or equipment damage.

The PLC controller is in the top left corner of the power management module cabinet, and provides remote control functions. The power management module provides a communication interface to communicate with daemon software. It is possible to communicate with the power management module via MODBUS or via Ethernet (option).

Top and front view of the PLC controller

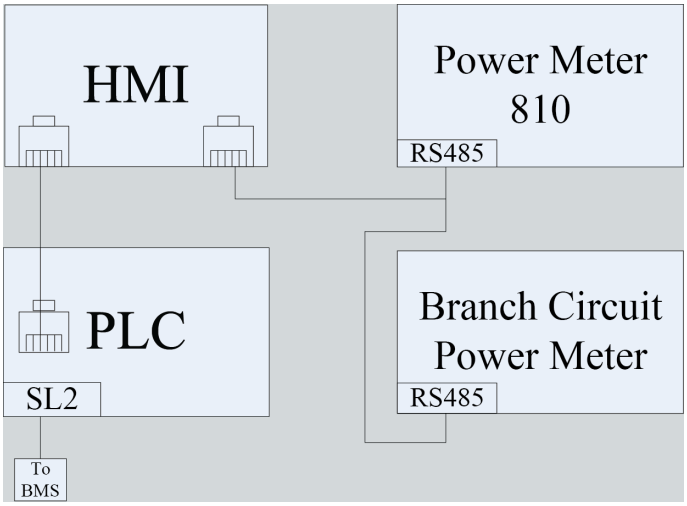


A. 2 RS485 serial ports (SL1 and SL2), MODBUS/ASCII treaty
(Serial port 1 is not used)
(Serial port 2 (SL2) is an external communication port for the building management system)

B. Line interface

C. Digital extended interface

Interconnections in the power management module system



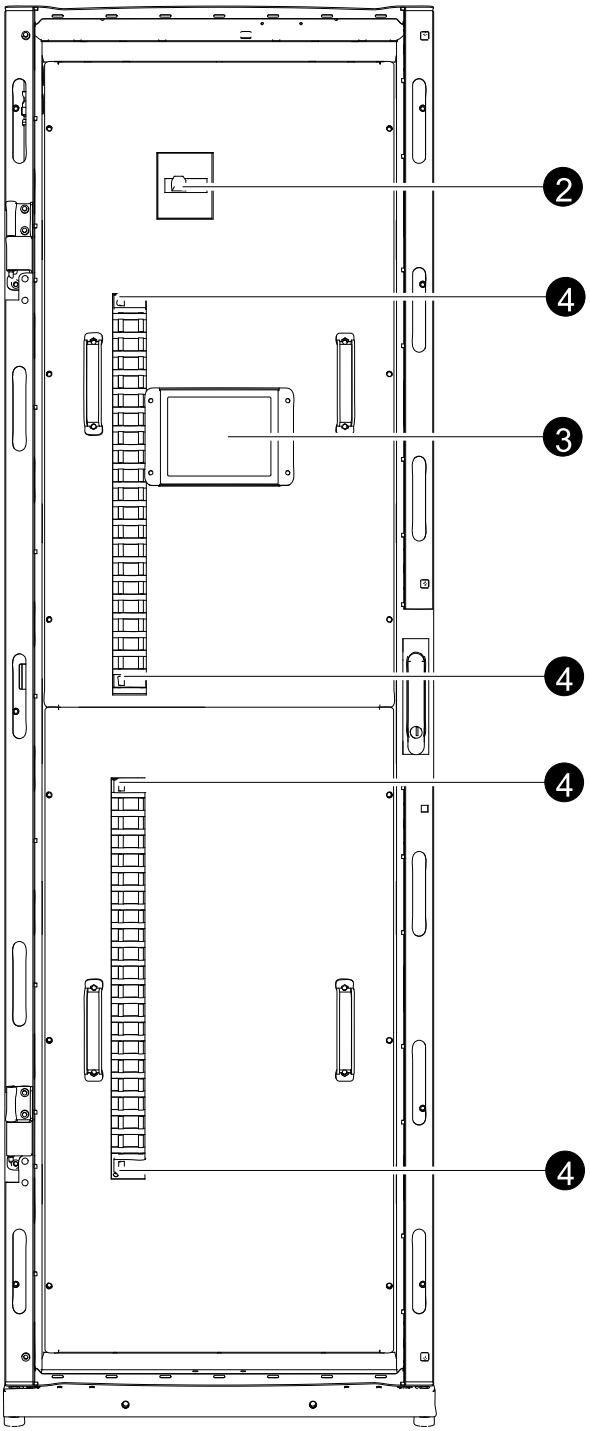
Operation

Check This List Before Starting up the Power Management Module

1. Turn the power management module main input power OFF.
2. Check that the input and output power cables are installed correctly and that they are the correct type.
3. Open the front door.
4. Remove the six screws in the upper deadfront panel and remove the panel.
5. Remove the cover on the upper switch, and pull out the entire fuse from the switch. This disconnects the secondary circuit from the main circuit.
6. Measure the insulation resistance – the value must not be lower than 2MΩ.
7. Reinstall the fuse.
8. Reinstall the switch cover.
9. Reinstall the deadfront panels.
10. Close the front door.

Start up the Power Management Module

1. Open the front door of the power management module cabinet.
2. Close the input breaker. The display will light up and become operational.
3. Use the display to set up the power management module. See *Settings via the display, page 24*.
4. After doing the system settings of the power management module, close the output switches on the front of the power management module cabinet to connect the load.



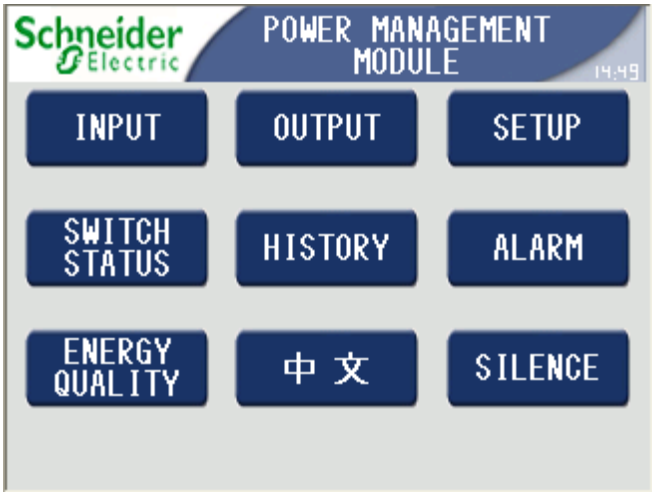
5. Close the front door of the power management module.

Settings via the display

Main Menu Screen

When the power management module has powered on, the **Main menu** screen appears.

Main Menu Screen — English language selected



Main Menu Screen — Chinese language selected

Screen Symbols

The right arrow scrolls to the right

The left arrow scrolls to the left

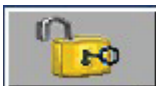
The up arrow returns you to the previous screen

and

The home buttons return you to the main screen of the display interface

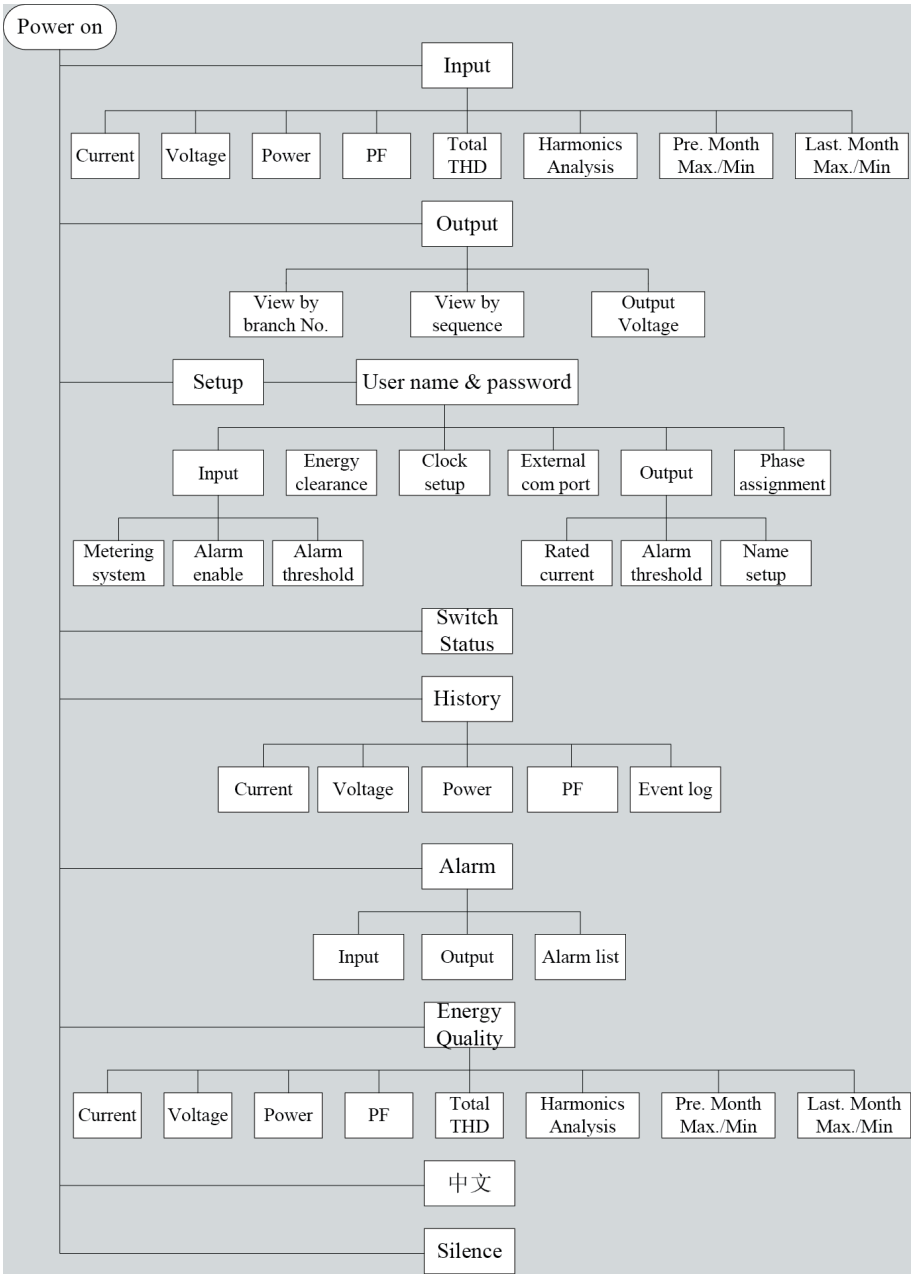
The access button takes you to the SETUP menu

The menu hierarchy button returns you to the menu level above the current menu level



The unlock button unlocks and logs you on to the setup screen

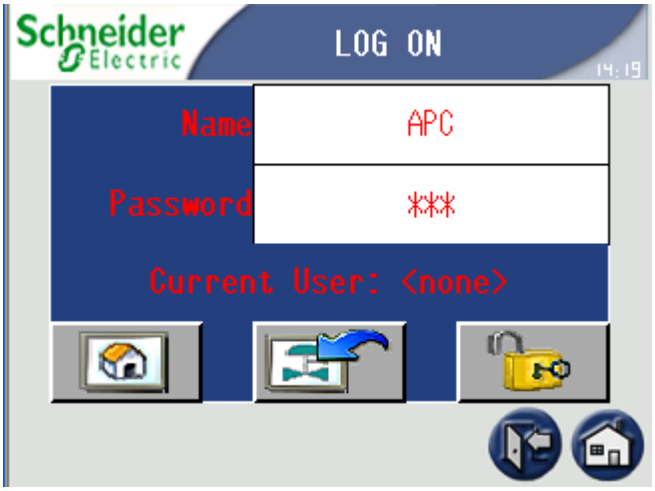
Display Menu Tree



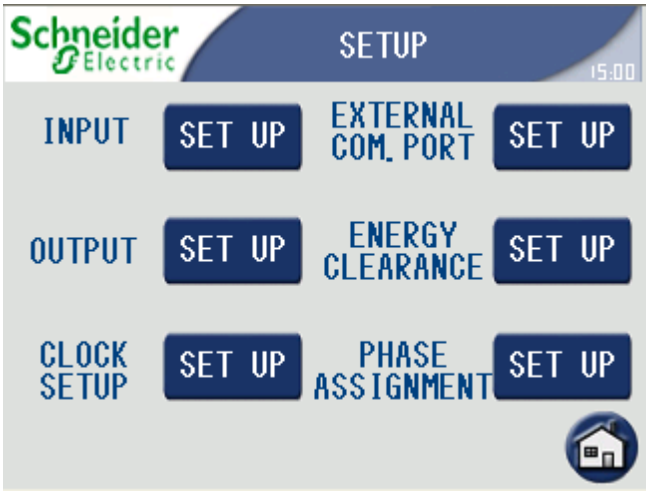
Set Up Parameters for the Power Management Module via the SETUP Menu

NOTE: The display provides access to more screens than described in this manual. Those SETUP screens should not be accessed without a password in order to avoid unwanted impacts. Wrong setup will result in wrong display functionality, so follow the setup instructions and contact Schneider Electric for support if needed.

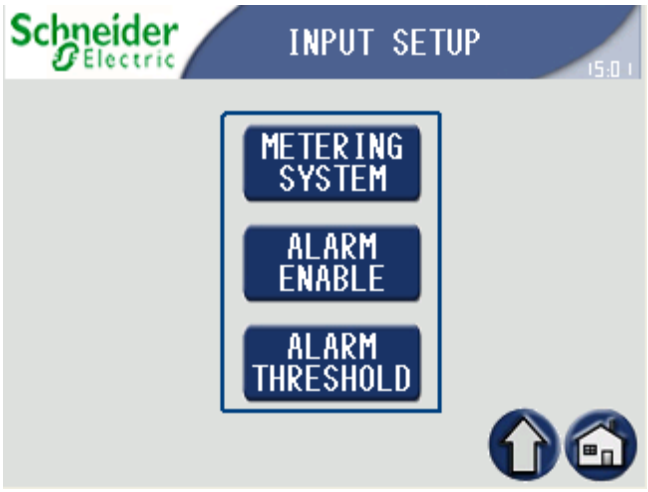
1. Press SETUP on the main screen.
2. Enter your user name and password.
3. Press on the **Unlock** button.
4. Press on the **Access** button below the Unlock button.

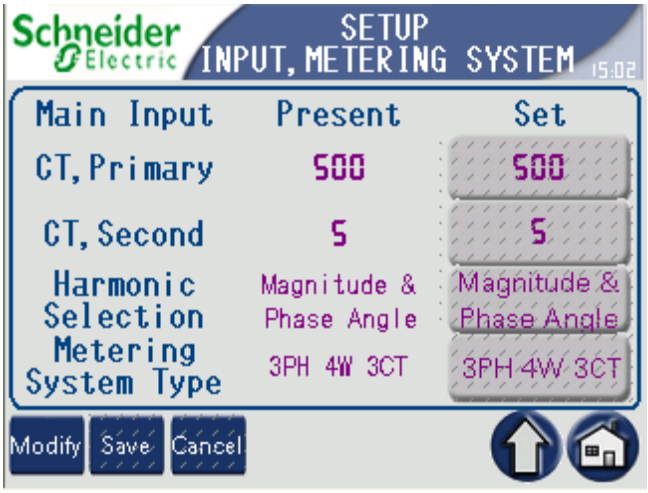


On the settings screen that appears next you can set the different parameters needed.

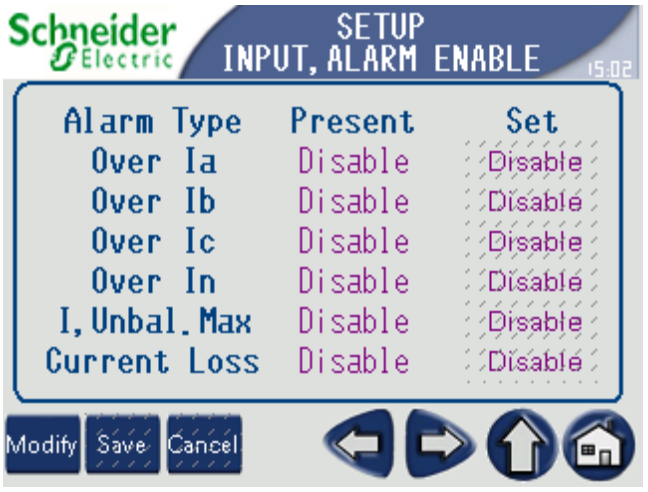


5. In the settings menu **Input Setup> Metering system**, you can set the CT size of the main input, harmonic quantity selection, and metering system type.

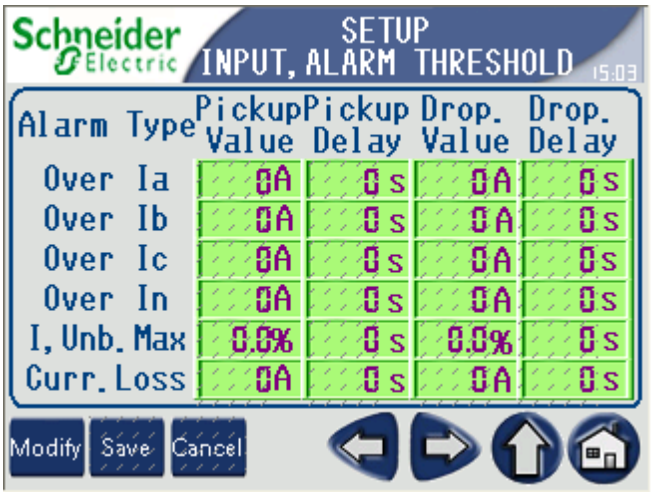




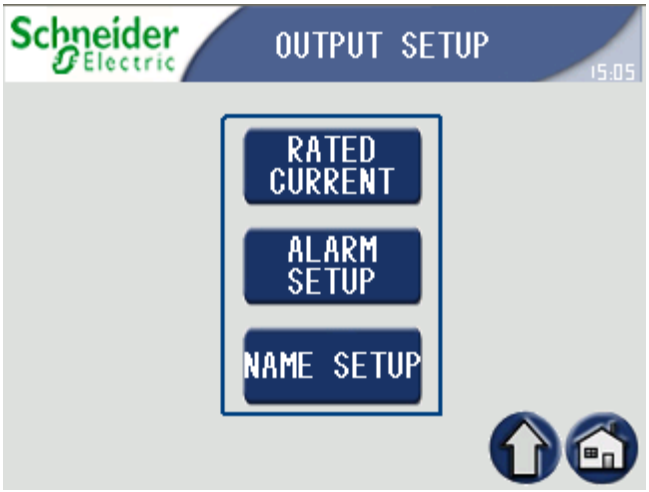
6. In the settings menu **Input > Alarm Enable**, you can enable or disable up to 23 alarms for the main input circuit.

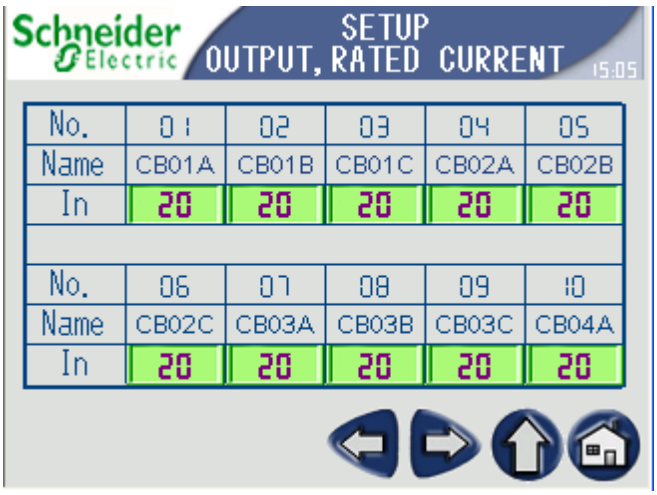


7. In the settings menu **Input > Alarm Threshold**, you can set or modify pickup values and delays, dropout values and delays for the main input alarms.

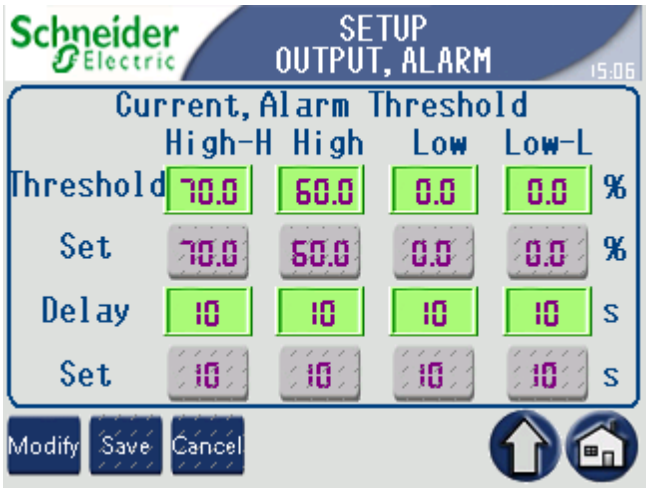


8. In the settings menu **Output > Rated Current**, you can set the rated current of each branch.

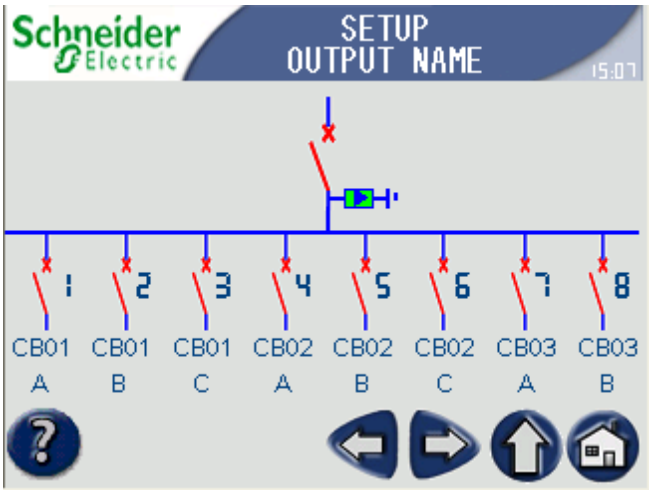




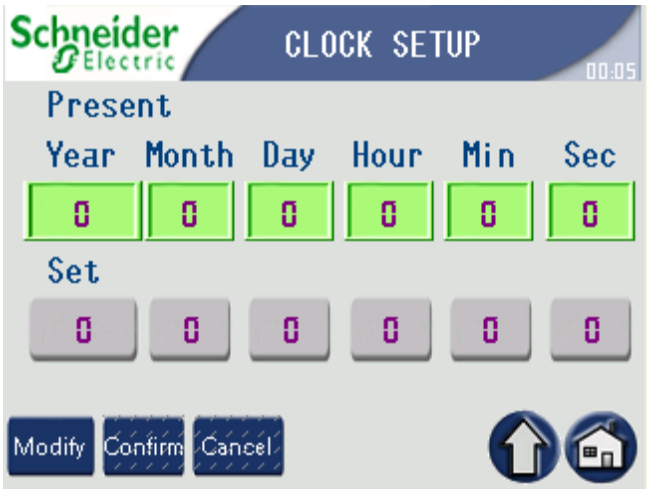
9. In the settings menu **Output >Alarm Setup**, you can set the thresholds of current alarms which cover all branch circuits.



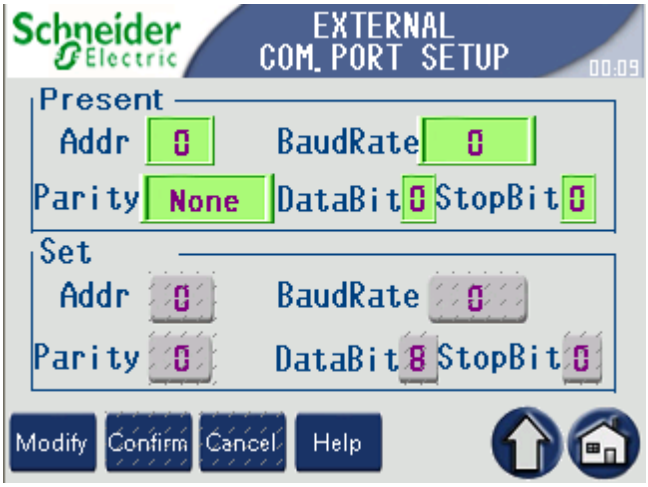
10. In the settings menu **Output > Name Setup**, you can set a name for each branch by pressing on the display on the default name for the branch (e.g.: CB1) and type your chosen branch name.

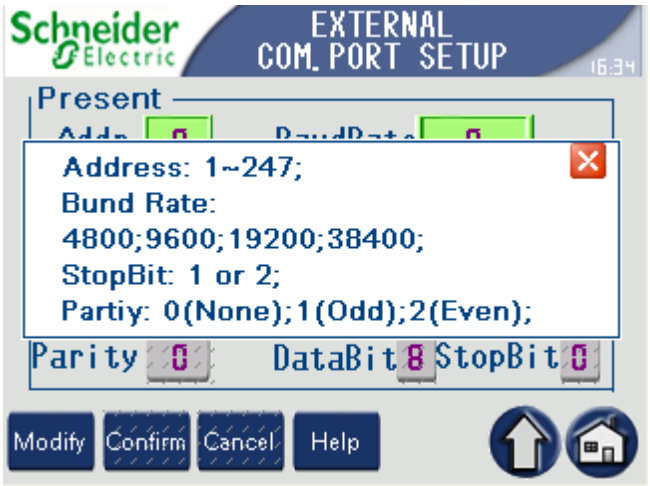


11. In the settings menu **Clock Setup**, you can set the clock of the PLC and synchronize with the display interface clock and Power meter PM810. Press **Modify** to change or set the time and date.



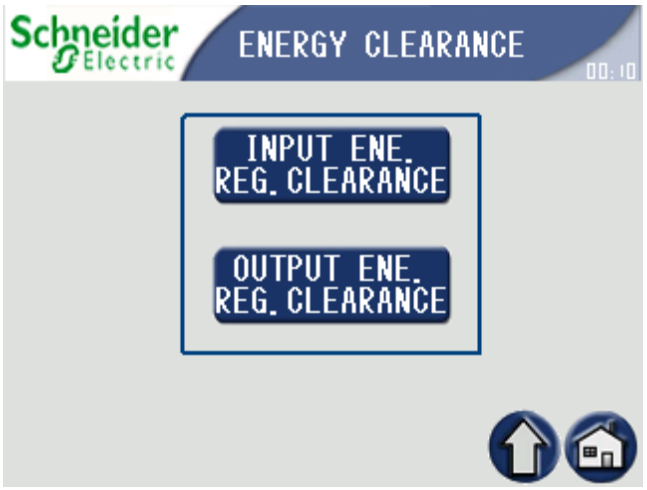
12. In the settings menu **External Communication Port**, you can set the PLC's SL2 port: Address, baud rate, parity bit, data bits, stop bits (Modbus RTU). Press **Modify** and then press the parts that you need to modify, enter the new value and press the **Confirm** button. You can press the menu **Help** for explanations.

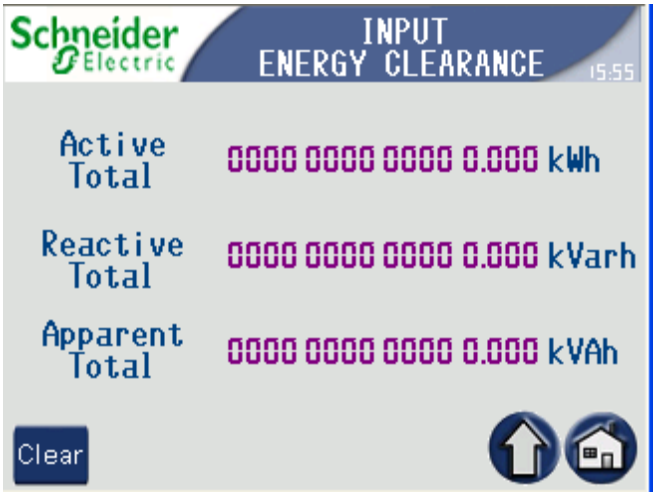


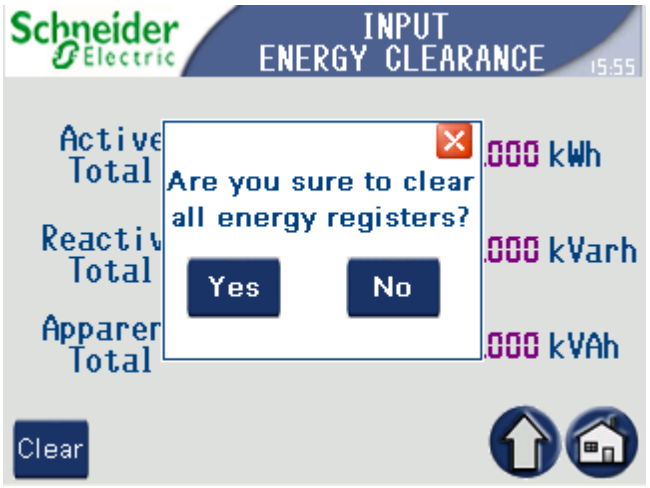


Parameter name	Default value	Available settings
Communication protocol	MODBUS RTU	Default values can not be changed
Communication address		1–247
Baud rate	9600 bps	4800 / 9600 / 19200 bps
Parity	None (0)	None (0) / Odd parity (1) / Even parity (2)
Data bits		8 (not set by default)
Stop bits	1	1 / 2

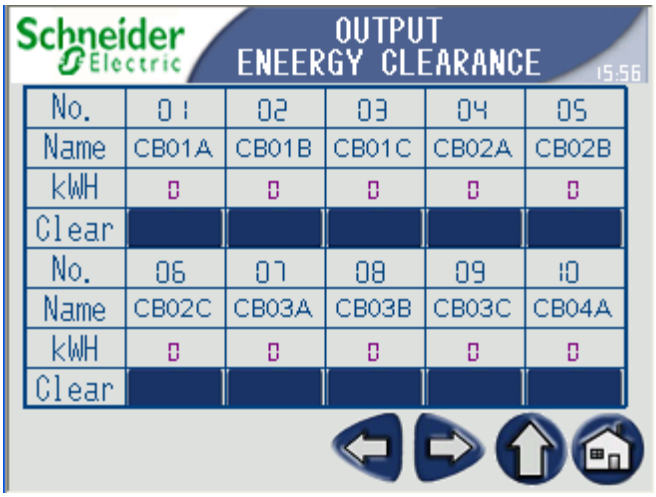
13. In the settings menu **Energy Clearance> Input Energy Register Clearance**, you can clear all energy registers of main input.

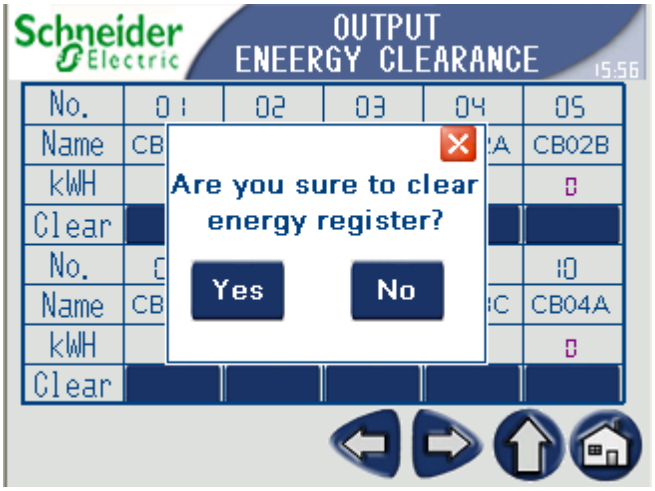






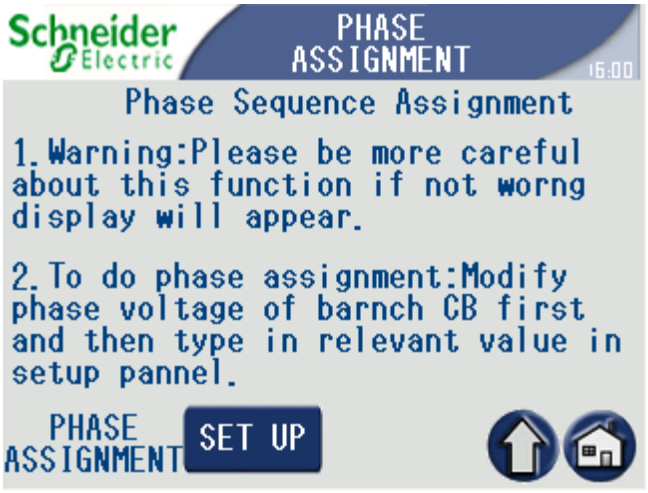
14. In the settings menu **Energy Clearance>Output Energy Register Clearance**, you can clear energy register for each branch circuit by pressing on the blue **Clear** cells.

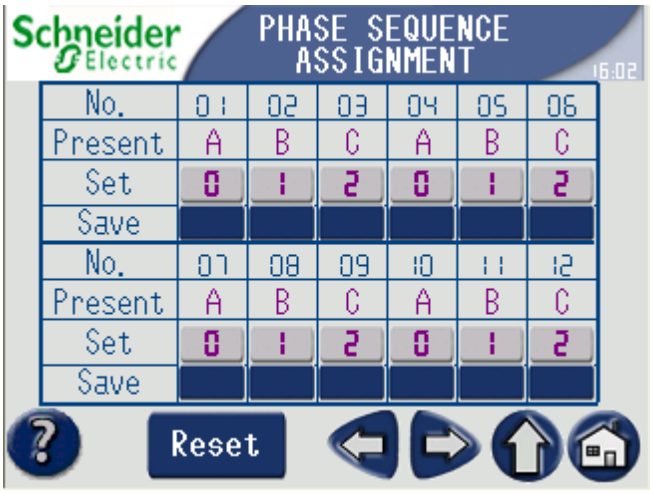




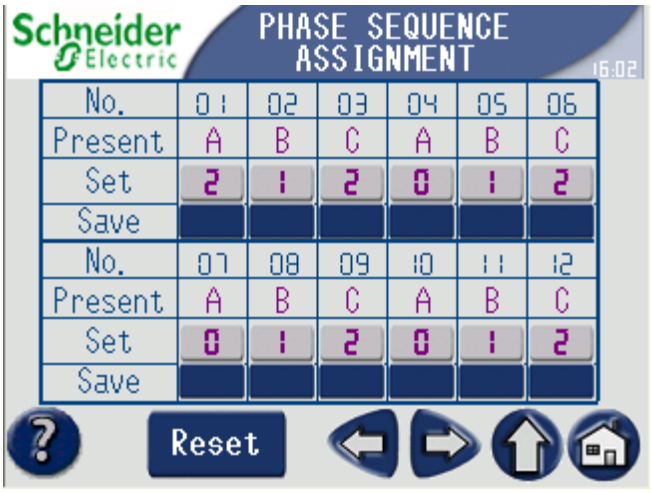
15. In the settings menu **Phase assignment**, you can adjust the phase for each branch circuit after performing the procedure *Adjust Phases to Balance the Load, page 17*. Default phase sequence for each branch is A-B-C-A-B-C. Example: Branch number 1 is connected on phase A (by default), and you want to connect branch number 1 to phase C instead of phase A. First perform the mechanical phase adjustment (see *Adjust Phases to Balance the Load, page 17*) and then change the phase settings via the display. Type in ' 2 ' in the set area and press the save button to double check and enable.

NOTE: Schneider Electric strongly recommends to use the default phase assignment. Factory default settings can be restored by pressing the **Reset** button.

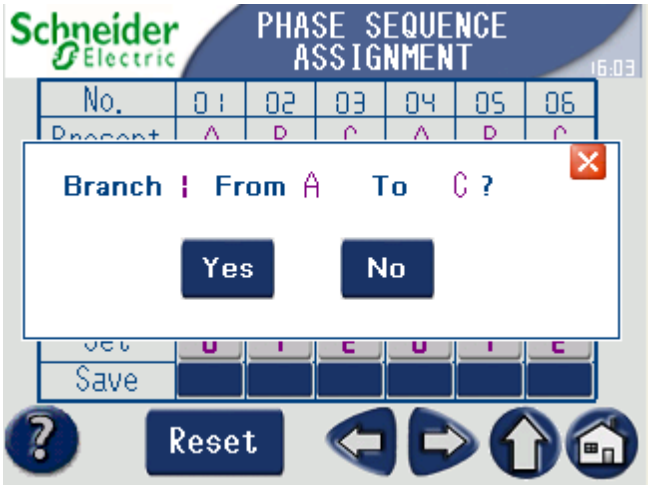




Press on the **Set** cells to type in the new phase settings.

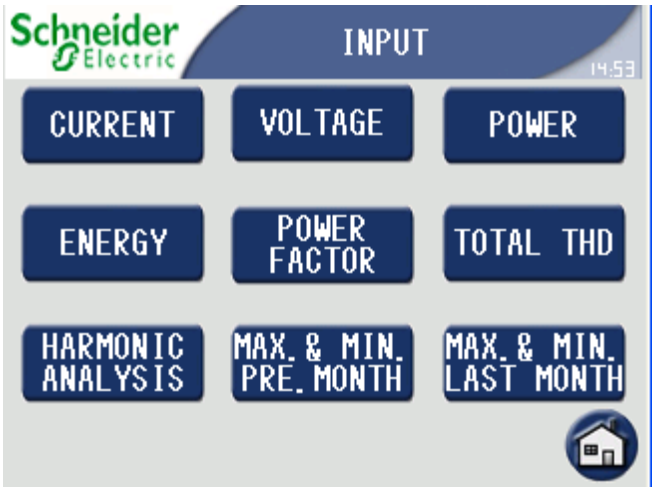


Press on the blue **Save** cell to save.



Overview of the Input Menu

Press **Input** on the **Main menu** screen. On the **Input** menu, press the parameter, you want to check and the detailed data will be shown on the display.



1. **Current**

- The current of the phases (A, B , and C) and N, and the load portion that each phase supports
- Average current
- the unbalanced current of the phases (A, B, and C), N, and the max unbalanced current

2. **Voltage**

- Phase voltage, average phase voltage
- Line voltage, average line voltage
- Unbalanced line voltage, max unbalanced line voltage
- Unbalanced phase voltage, max unbalanced phase voltage

3. **Power**

- Active power, reactive power, and apparent power of the phases (A, B, and C) and N
- Total active power, reactive power, and apparent power

4. **Energy**

- Total real in/out energy
- Total reactive in/out energy
- Apparent power

5. **Frequency**
6. **Power Factor**

- True power factor of the phases (A, B, and C), total true power factor

7. **Harmonic Distortion (THD)**

- Current harmonic distortion of the phases (A, B, and C) and N
- Phase voltage harmonic distortion of the phases (A, B, and C) and N, line voltage harmonic distortion

8. **Harmonic Analysis**

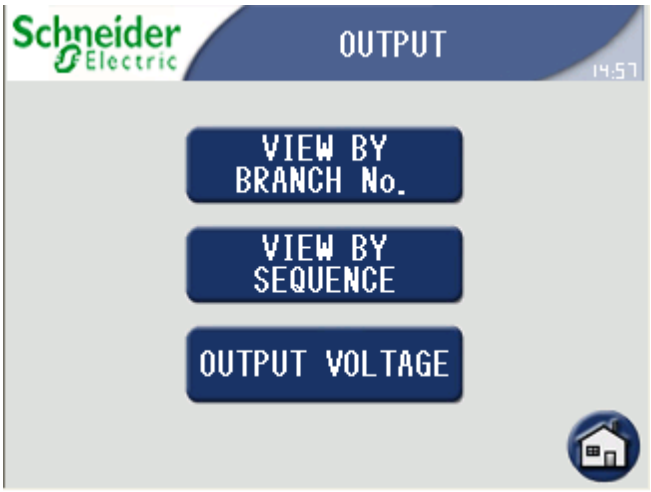
- Every phase voltage harmonic analysis
- Line voltage harmonic analysis
- Phase current harmonic analysis
- Neutral current harmonic analysis

9. **Max /Min (last & present month)**

- Active power, reactive power, apparent power
- Frequency
- THDU L-L, THDU L-N, THDI
- Unbalanced L-L, L-N
- L-L(V), L-N(V), current

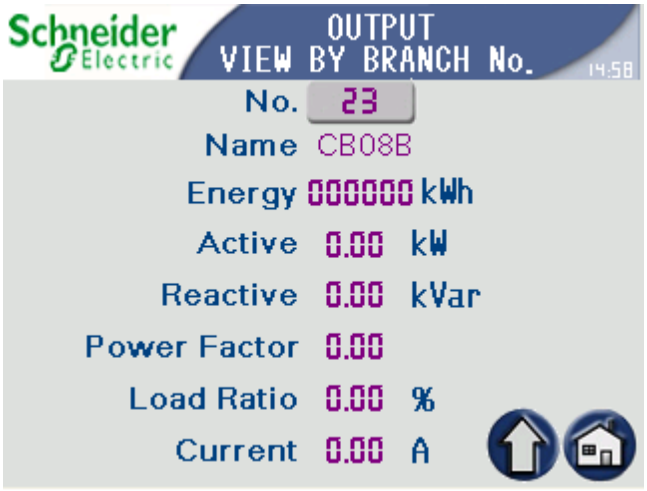
Overview of the Output Menu

Press **Output** on the **Main menu** screen. In the **Output** menu, press the parameters you want to check and the detailed data will be shown on the display.

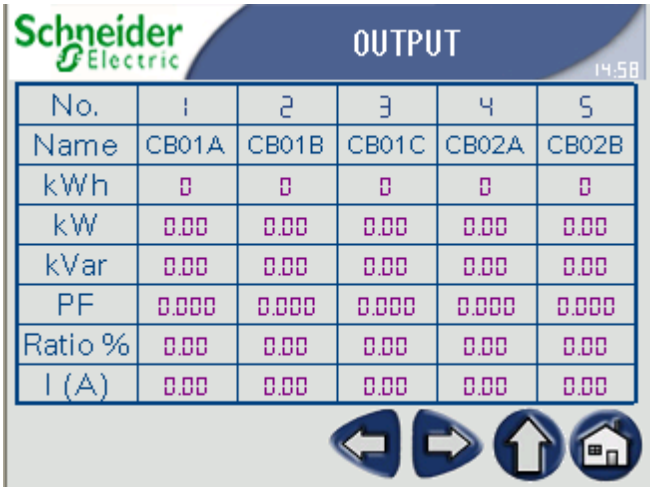


1. Press **View by branch No.** to check all the output parameters of the chosen branch:

- Branch name
- Energy
- Active power
- Reactive power
- Power Factor
- Load ratio
- Current

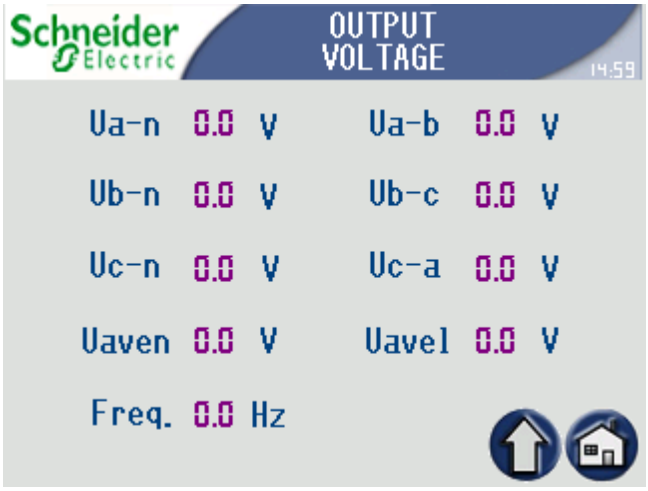


2. Press **View by sequence** to see all output parameters for five branches on one screen.



3. Press **Output Voltage** to see all the output parameters, that you have just accessed:

- Line voltage
- Phase voltage
- Average phase voltage
- Average line voltage
- Frequency



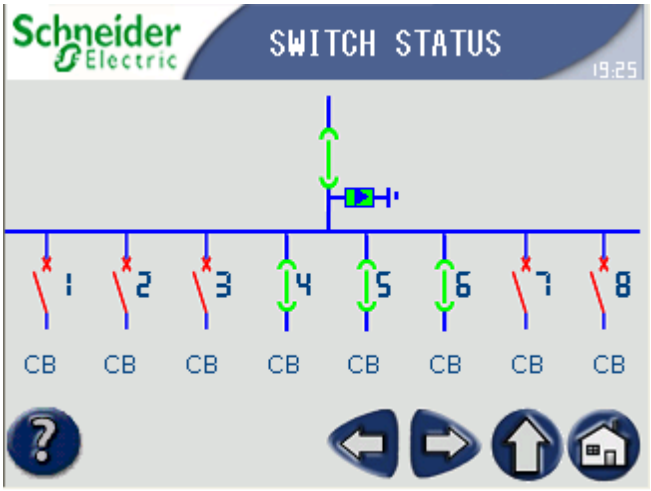
Overview of the Switch Status Menu

Press **Switch status** on the **Main menu** screen. On the **Switch status** menu, press the breaker set you want to see.

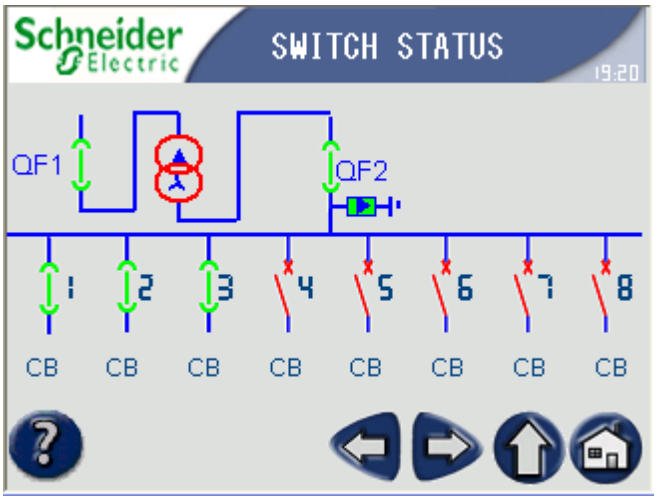
The color shows the status of each branch.

- If the switch is red, it is in the open position
- If the switch is green, it is in the closed position

Status screen for power management module without transformer

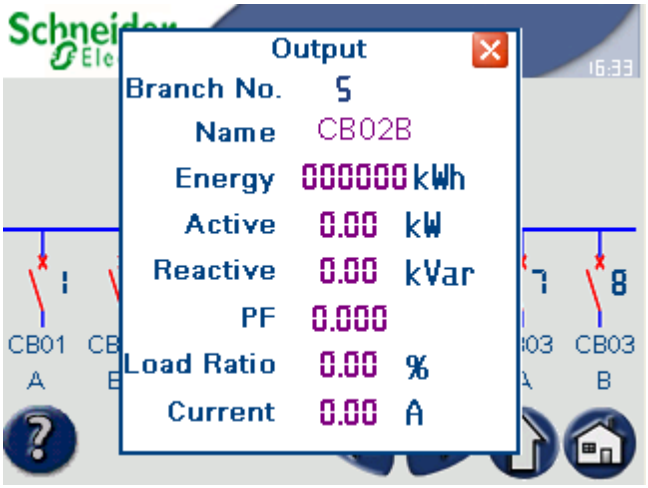


Status screen for power management module with transformer



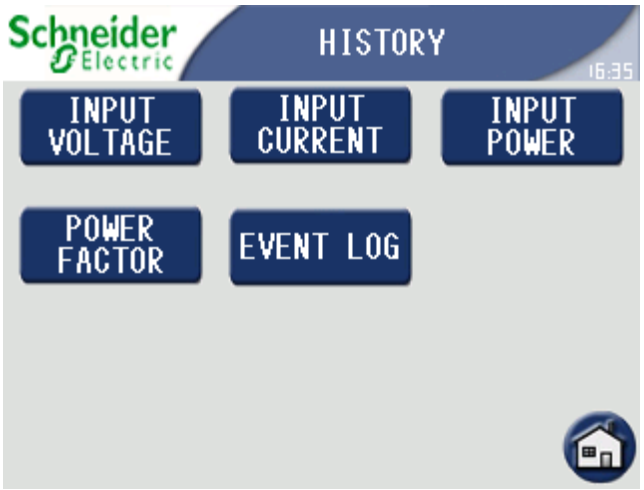
Press on one of the switch symbols to see the parameters for that switch.

E.g. press branch No. 5, and the following pop-up screen will appear.

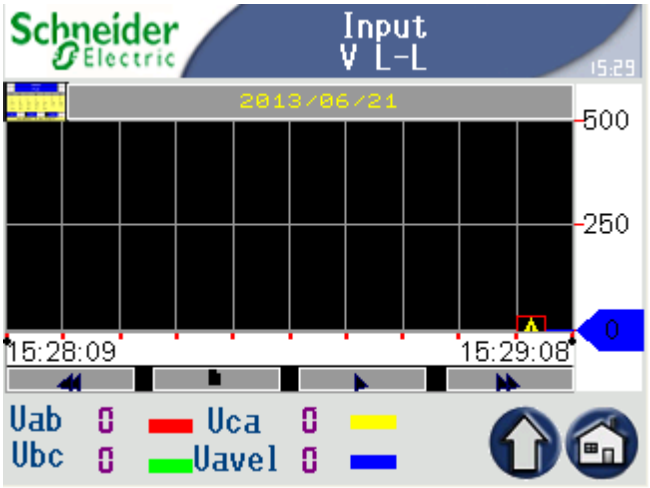


Overview of the History Menu

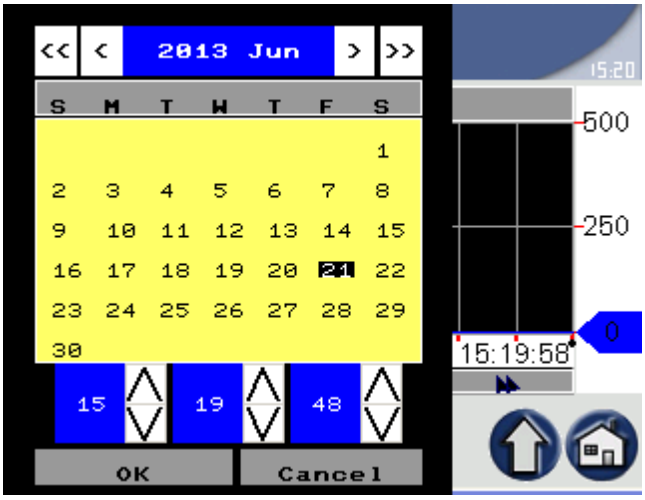
Press **History** on the **Main menu** screen. In the **History** menu, press the parameter you want to see the history data for.



The **Event log** shows the operation and alarm record including input and output circuits. The other parameters on this screen only cover input circuits.

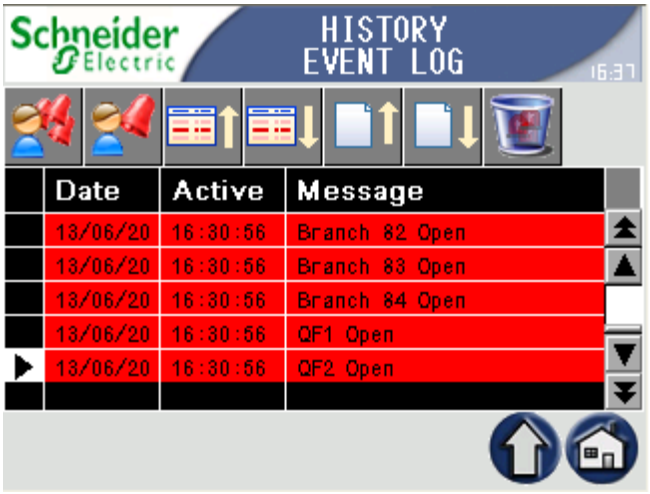


Press the small calendar thumbnail under the Schneider Electric logo in the top left corner to select a date



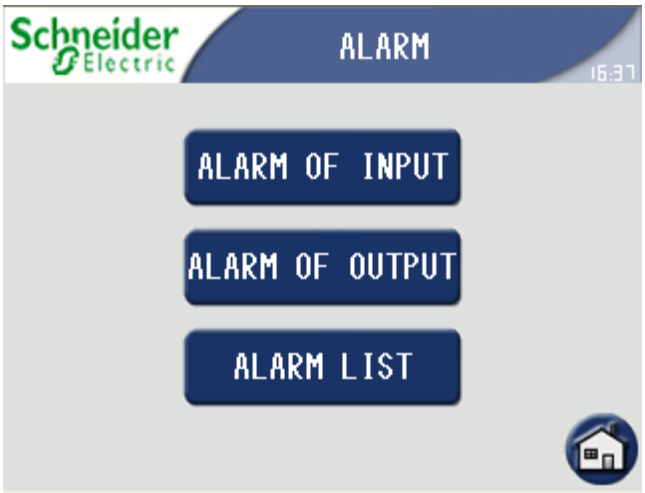
The history data is shown in one minute intervals – Use the left or right arrow button to change the time by 1 second.

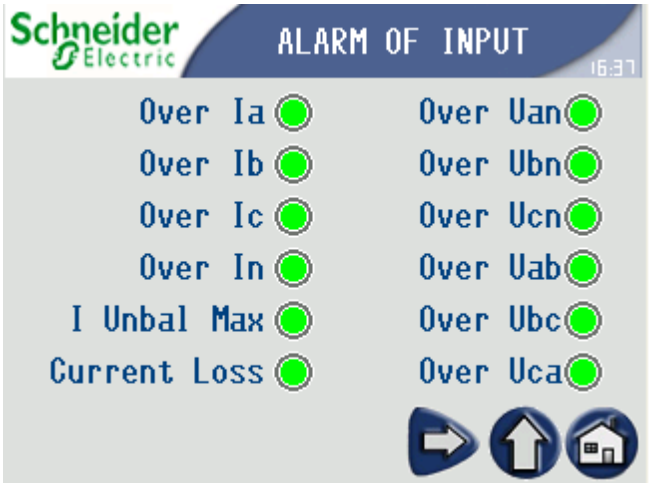
In the menu **History>Event log**, you can see all operation and alarm history.

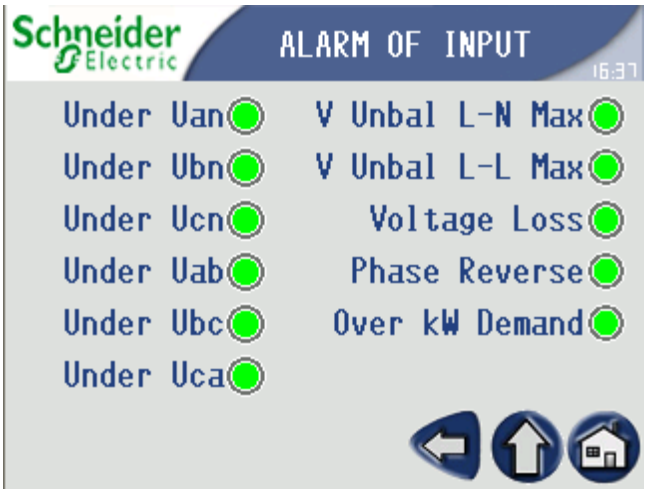


Overview of the Alarm Menu

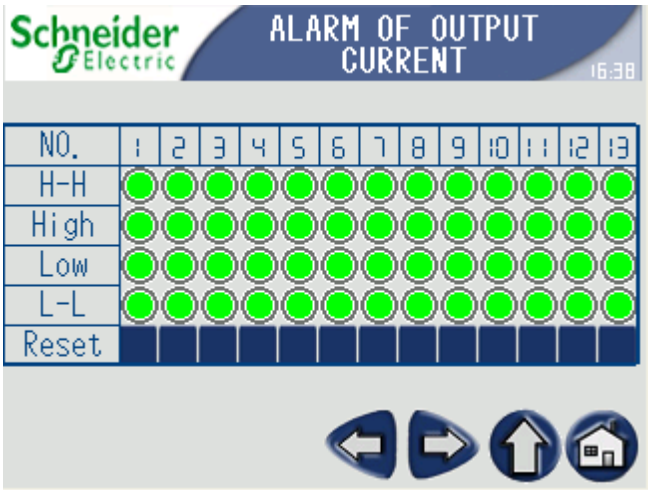
Press **Alarm** on the **Main menu** screen. On the **Alarm** screen press the parameter, you want to check and the detailed data will be shown on the display. Press **Alarm>Alarm of Input** to see the 23 latest alarms for the main input circuit.



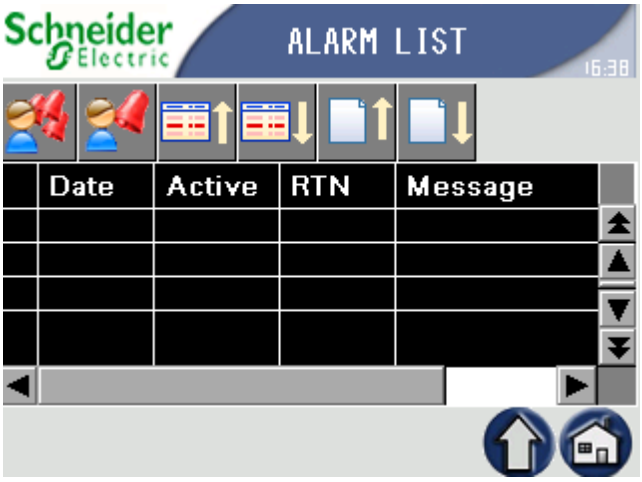




Press **Alarm> Alarm of Output** to see alarms for each branch circuit.

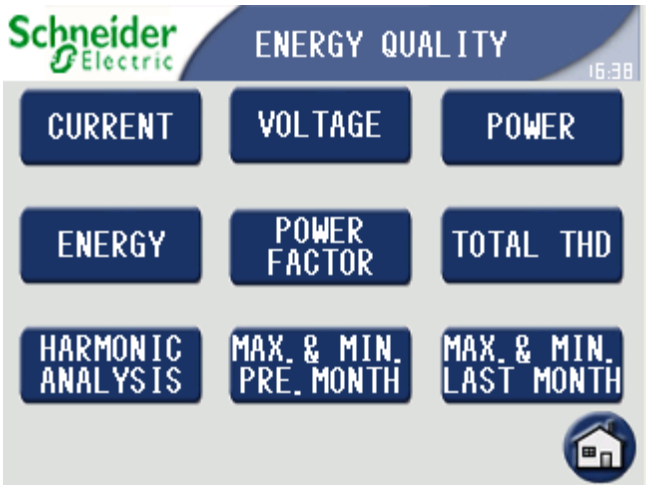


Press **Alarm> Alarm list** to see all alarm information.



Overview of the Energy Quality Menu

Press **Energy Quality** on the **Main menu** screen. On the **Energy Quality** screen, press the parameter, you want to check and the detailed data will be shown on the display.



1. **Current**

- The current of the phases (A, B, and C) and N, load ration of each phase
- Average current
- Unbalanced current of the phases (A, B, and C) and N, max unbalanced current
- Present current demand, average current demand, peak of current demand
- 3PH average current demand, 3PH average current demand peak

2. **Voltage**

- Phase voltage, average phase voltage
- Line voltage, average line voltage
- Unbalanced line voltage, max unbalanced line voltage
- Unbalanced phase voltage, max unbalanced phase voltage

3. **Power**

- Active power, reactive power, apparent power of the phases (A, B, and C) and N
- Total active power, reactive power, apparent power

4. **Energy**

- Real in /out energy, total real in/out energy
- Reactive in/out energy, total reactive in/out energy
- Apparent power

5. **Power Factor**
- True power factor of the phases (A, B, and C)
- Total power factor, displacement power
- Displacement power factor of the phases (A, B, and C)

6. **Total THD**
- Current harmonic distortion of the phases (A, B, and C) and N
- Phase voltage harmonic distortion of the phases (A, B, and C) and N
- Line voltage harmonic distortion
- Current fundamental wave RMS magnitude coincident angle.
- Voltage fundamental wave RMS magnitude coincident angle.

7. **Harmonic Analysis**
- Every phase voltage harmonic analysis
- Line voltage harmonic analysis
- Phase current harmonic analysis
- Neutral current harmonic analysis

8. **Max and Min present month**
- Active power, reactive power, apparent power
- Frequency
- THDU L-L, THDU L-N, THDI
- Unbalanced L-L, L-N
- L-L(V).L-N(V),Current

9. **Max and Min last month**
- Active power, reactive power, apparent power
- Frequency
- THDU L-L, THDU L-N, THDI
- Unbalanced L-L, L-N
- L-L(V).L-N(V),Current

Troubleshooting

> **⚠ CAUTION**
>
> **HAZARD OF INJURY AND SERIOUS DAMAGE TO EQUIPMENT OR LOAD**
>
> Never ignore any event alarms generated by the monitoring system. All event alarms in this chapter can result in serious damage to the load or to other equipment.
>
> **Failure to follow these instructions can result in injury or equipment damage.**

Alarm Indicators

- **The yellow indicator LED** will light up if the power management module detects an event. When the event has been resolved, the yellow indicator LED will turn off.
- **The buzzer** will sound if the power management module detects a critical event. The buzzer sound will stop when the critical event has been resolved or if you press the mute button on the display.

Alarm information for the main input circuit is generated by Power meter (PM810) and will be shown on the power management module display and on the Power meter's display. Alarm information of branch output is generated by BCPM board (branch circuit power meter) and will be shown on the power management module display only.

Alarm Types for Input Circuit

Alarm number	Event description	Abbreviated display name	Alarm type ①
Standard Speed Alarms (1 second)			
01	Over Current Phase A	Over Ia	010
02	Over Current Phase B	Over Ib	010
03	Over Current Phase C	Over Ic	010
04	Over Current Neutral	Over In	010
05	Current Unbalance, Max	I Unbal Max	010
06	Current Loss	Current Loss	053
07	Over Voltage Phase A–N	Over Van	010
08	Over Voltage Phase B–N	Over Vbn	010
09	Over Voltage Phase C–N	Over Vcn	010
10	Over Voltage Phase A–B	Over Vab	010
11	Over Voltage Phase B–C	Over Vbc	010

Alarm number	Event description	Abbreviated display name	Alarm type ①
12	Over Voltage Phase C–A	Over Vca	010
13	Under Voltage Phase A	Under Van	020
14	Under Voltage Phase B	Under Vbn	020
15	Under Voltage Phase C	Under Vcn	020
16	Under Voltage Phase A–B	Under Vab	020
17	Under Voltage Phase B–C	Under Vbc	020
18	Under Voltage Phase C–A	Under Vca	020
19	Voltage Unbalance L–N, Max	V Unbal L-N Max	010
20	Voltage Unbalance L–L, Max	V Unbal L-L Max	010
21	Voltage Loss (loss of A,B, or C, but not all)	Voltage Loss	052
22	Phase Reversal	Phase Rev	051
23	Over kW Demand	Over kW Dmd	011

Alarm Types for Input Circuit

Alarm type	Event description	Operation
010	Over Value Alarm	The alarm will activate when the test register value exceeds the alarm threshold for a preset number of seconds. To deactivate the alarm again, the test register value must drop and stay below the alarm threshold for a preset number of seconds.
011	Over Power Alarm	The alarm will activate when the test register value exceeds the alarm threshold for a preset number of seconds. To deactivate the alarm again, the test register value must drop and stay below the alarm threshold for a preset number of seconds.
012	Over Reverse Power Alarm	The alarm will activate when the test register value exceeds the alarm threshold for a preset number of seconds. To deactivate the alarm again, the test register value must drop and stay below the alarm threshold for a preset number of

Alarm type	Event description	Operation
		seconds. This alarm will only appear for reverse power conditions. Positive power values will not cause the alarm to occur.
020	Under Value Alarm	The alarm will activate when the test register value falls below the alarm threshold for a preset number of seconds. To deactivate the alarm again, the test register value must rise and stay above the alarm threshold for a preset number of seconds.
021	Under Power Alarm	The alarm will activate when the test register value falls below the alarm threshold for a preset number of seconds. To deactivate the alarm again, the test register value must rise and stay above the alarm threshold for a preset number of seconds.
051	Phase Reversal	The phase reversal alarm will occur whenever the phase voltage waveform rotation differs from the default phase rotation. The ABC phase rotation is assumed to be standard. If a CBA phase rotation is standard, the user should reprogram the power meter phase rotation from ABC to CBA phase rotation.
052	Phase Loss, Voltage	The phase loss voltage alarm will occur when one or two phase voltages (but not all three) fall to or below the alarm threshold for a preset number of seconds. To deactivate the alarm again, the concerned phase voltages must rise to or above the alarm threshold for a preset number of seconds. If all three phase voltages fall to or below the alarm threshold, this will also deactivate the alarm as there are now equal voltages across all three phases.
053	Phase Loss, Current	The phase loss current alarm will occur when one or two phase currents (but not all three) fall to or below the alarm threshold for a preset number of seconds. To deactivate the alarm again, the concerned phase currents must rise to or above the alarm threshold for a preset number of seconds. If all three phase currents fall to or below the alarm threshold, this will also deactivate the alarm as there are now equal currents across all three phases.

Alarm Types for Branch Output Circuit

All values are expressed as % rated current.

All branches use these global values.

Alarm	**Threshold % rated current** Default 0: disable Non-0: enable	**Timer (seconds)** Default
High-High alarm	70	10
High alarm	60	10
Low alarm	0 (disable)	10
Low-Low alarm	0 (disable)	10

Other Alarm Types

Alarm	**Event description**
QF1 SD	QF1 Trip
QF2 SD (option)	QF2 Trip
TVSS	Transient Voltage Surge Suppressor
TFO 160℃	High temperature alarm of transformer
TFO 180℃	High-high temperature alarm of transformer

Maintenance

Replace an Output Circuit Breaker

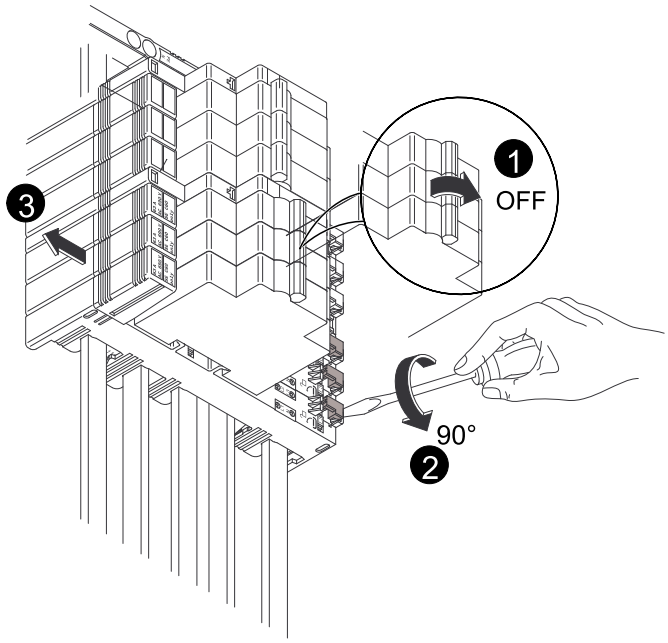
⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

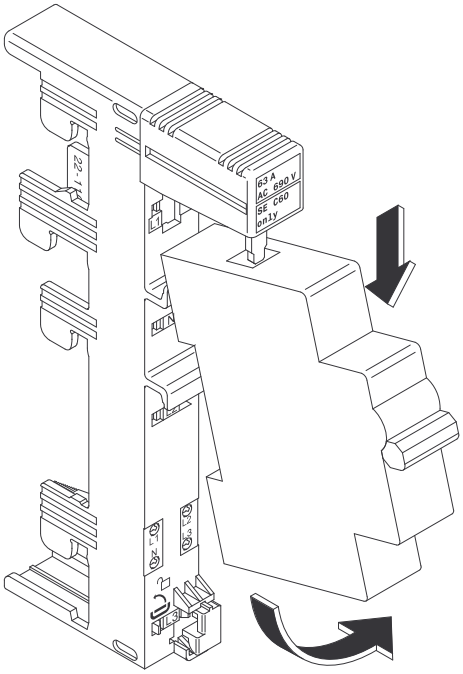
- Turn off all power supplying this equipment before working on the equipment. Perform appropriate lockout/tagout procedures.
- Only certified and qualified electricians are allowed to perform this installation.
- Wear appropriate personal protective equipment (PPE) and follow safe electrical work practices.

Failure to follow these instructions will result in death or serious injury.

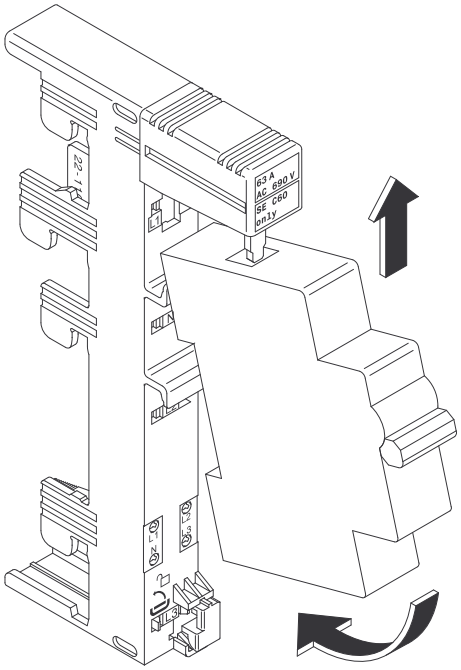
1. Turn the switch downwards to the OFF position.
2. Unlock the adapter from the busbars by turning the screw 90° to the left.
3. Remove the adapter from the busbars by lifting it upwards.



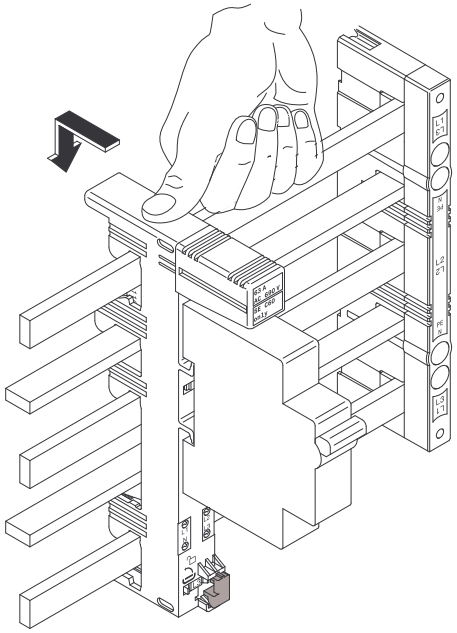
4. Remove the output circuit breaker from the adapter by tilting it outwards and then down to disconnect the copper contactor on the adapter.

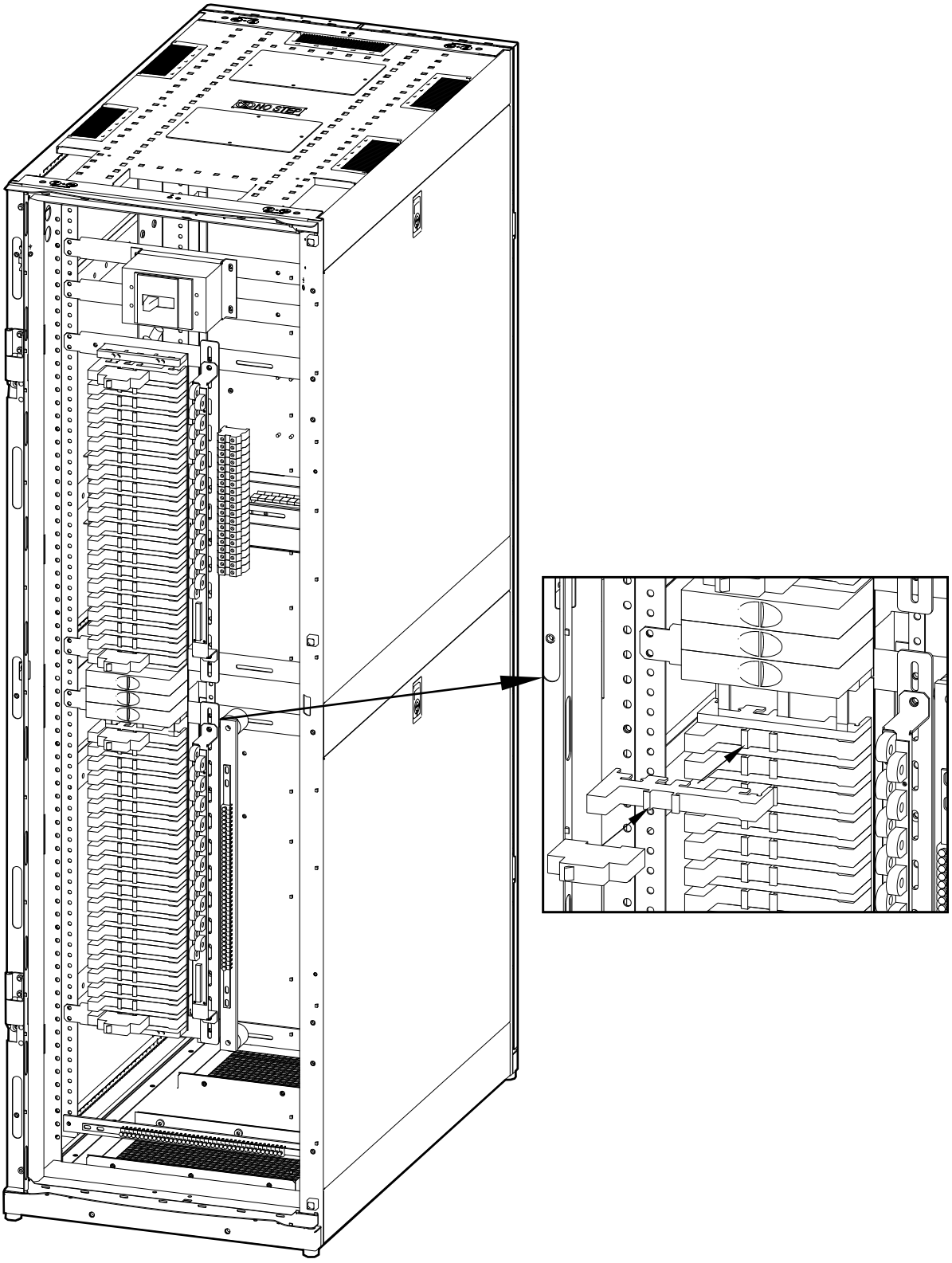


5. Prepare the new output circuit breaker for installation
6. Insert the copper contactor of the adapter in the output breaker's connection port and fit the output circuit breaker onto the adapter.

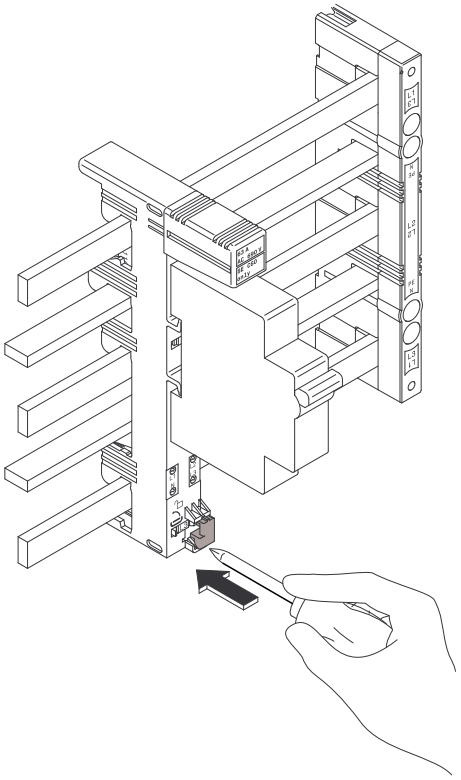


7. Fit the adapter onto the busbar of the power management module cabinet as shown in the illustration.

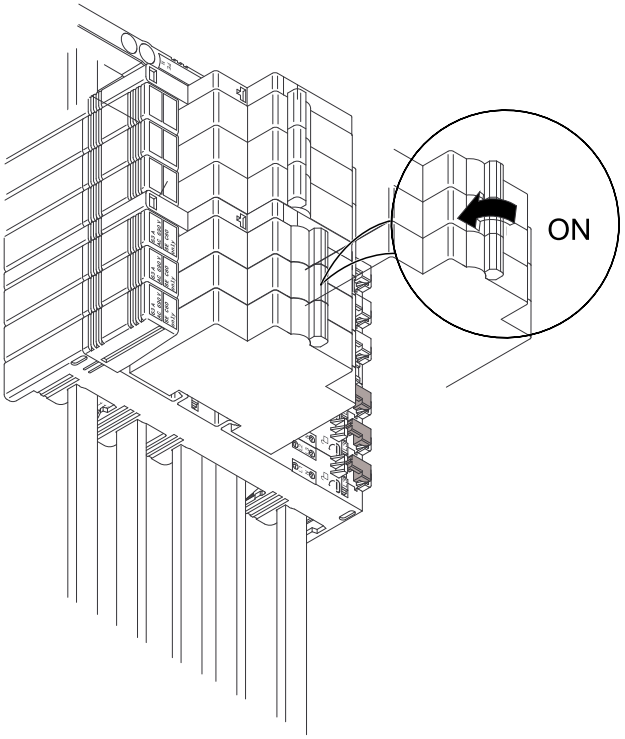




8. Use a screwdriver to lock the adapter onto the busbar by turning the screw 90° towards the right.



9. Turn the output circuit breaker ON by moving the switch to the ON position.



Printed in.
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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

990–4905-001