

Shaping the power of the future

Installation Guide

Pixii Home Outdoor Cabinet

Grid tied energy storage system



Public

System safety and environmental precautions

Product warranty becomes invalid if following precautions are not followed during handling, storage, installation, commissioning and operation of Pixii energy storage systems.

General precautions



Although this system incorporates protective circuits and other security features, it may still be destroyed, damaged, work poorly or shorten its lifetime if exposed to improper handling during transportation, installation or operation. Always handle the system with care, use proper lifting techniques, do not roll, climb or drill holes in the cabinet or enclosure.



Opening the equipment may cause serious injury even when the AC power is disconnected. Dangerous voltage may be present inside, as system can be still running from batteries or capacitors may still be charged.

Environmental precautions



Some devices can reach high temperatures during normal operation. It is very important to ensure that airflow through equipment is not blocked, filters are in good condition and fans can rotate freely. If other equipment is installed in close proximity, secure that inlets and outlets are not blocked.



Electronic devices installed in the energy storage system are designed for indoor environment with pollution degree 2. When installed in an outdoor enclosure (open or closed loop heat management system), it is important to ensure, that the enclosure is closed and sealed during normal operation, to avoid external air with increased level of humidity and dust from entering. In addition, in open loop systems, filters maintenance must be properly planned. In case of indoor systems, operating environment must be of pollution degree 2, without increased level of dust and humidity.



Installer is responsible to protect system against current surges, over-voltages, etc. caused by lightning, electrostatic discharges, etc. To avoid system damage, it is recommended to always install proper SPDs. Always follow the local regulations and laws.

Installation precautions



Read carefully user documentation before installation and using this equipment. Follow all commands, always use recommended tools and torque values as described. Commissioning and configuration of equipment should be done only by Pixii personnel or by other authorized and qualified persons.



For safety reason, before you start installation, ensure all external power sources are disconnected, as well as internal battery and load fuses/breakers. To avoid injuries caused by high leakage/touch current you must always start installation by connecting earthing wire (PE), before you connect other AC input wires (phases, neutral).

If system contains batteries, they represent major energy hazard. To avoid short circuit on batteries, do not operate with full metallic tools close to battery poles. Be careful also about other objects (rings, watches, necklaces, etc.).



All Pixii devices are certified according to international safety, environmental and EMC standards. If any other devices will be installed inside this product, it might influence parameters and violate original approvals. Installer is responsible that during installation environmental properties of this device are not impaired and installation is according to local regulations.

Battery safety and environmental precautions

For safety reasons, installers are responsible for familiarizing themselves with the contents of battery installation manual and all warnings before performing installation. Failure to observe the precautions described in this section can cause serious injury to persons or damage to property.

General precautions

The voltage of this battery module is strong enough to cause electric shock.

- Do not disassemble the battery module.
- Do not touch the battery module with wet hands.
- Do not expose the battery module to moisture or liquids.
- Keep the battery module away from children and animals.



The battery module may explode.

- Do not subject the battery module to strong impacts.
- Do not crush or puncture the battery module.
- Do not dispose of the battery module in a fire.



Keep the battery module away from open flame or ignition sources.

- Do not expose the battery module to temperatures in excess of 60°C.
- Do not place the battery module near a heat source, such as a fireplace.
- Do not expose the battery module to direct sunlight.
- Do not allow the battery connectors to touch conductive objects such as wires.



Risks of damage to the battery module.

- Do not allow the battery module to get in contact with liquids.
- Do not subject the battery module to high pressures.
- Do not place any objects on top of the battery module.



Environmental precautions

The battery module may leak corrosive electrolyte. Avoid contact with the leaking liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns.



The battery module should not be disposed of with household waste at the end of its working life.



The battery module should be disposed of at a proper facility for environmentally safe recycling



Installation precautions

Read the battery installation manual before installing and operating the battery module.

- Disconnect the charging source prior to connecting or disconnecting battery terminals.
- Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance.



Wear appropriate personal protective equipment when dealing with the battery module.

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.



The battery module is heavy enough to cause severe injury.



Response to emergency situations

While the battery module comprises multiple battery cells that are designed to prevent hazards resulting from failures, Pixii can not guarantee their absolute safety.

In the event that hazardous quantities of electrolyte are released, or in case of smoke, or fire, leave the battery room and contact the fire brigade.

Leaking batteries

If the battery module leaks electrolyte, avoid contact with the leaking liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If one is exposed to the leaked substance, do these actions:

Inhalation:

Evacuate the contaminated area, and seek medical attention immediately.

Eye contact:

Rinse eyes with flowing water for 15 minutes, and seek medical attention immediately.

Skin contact:

Wash the affected area thoroughly with soap and water, and seek medical attention immediately.

Ingestion:

Induce vomiting, and seek medical attention immediately

Rinse mouth and wash around the mouth with water.

Burns:

If burns are caused, treat them accordingly. Likewise, immediate medical attention shall be obtained.

Fire

In case of a fire, make sure that an ABC or carbon dioxide extinguisher is nearby. If a fire breaks out where the battery module is installed, do these actions:

1. Extinguish the fire before the battery module catches fire.
2. If the battery module has caught fire, do not try to extinguish the fire. Evacuate people immediately.



!!! Warning !!!

The battery module may catch fire when heated above 150°C.

If the battery catches fire, it will produce noxious and poisonous gases. Do not approach.

Wet batteries

If the battery module is wet or submerged in water, do not try to access it. Contact Pixii or your distributor for technical assistance.

Damaged batteries

Damaged batteries are dangerous and must be handled with extreme caution. They are not fit for use and may pose a danger to people or property. If the battery module seems to be damaged, pack it in its original container, and then return it to Pixii or your distributor.



!!! Caution !!!

Damaged batteries may leak electrolyte or produce flammable gas. If you suspect such damage, immediately contact Pixii for advice and information.

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Revision	Date	Comment
1.0	18.03.2024	Initial
1.1	29.07.2024	Correct module positions in chapter “4.9 Power modules” on page 37
1.2	04.11.2024	Update after first installations

Table of Contents

1 Introduction	8
1.1 Recommended tools and torque	8
1.2 Thermal management system (TMS)	9
1.3 Installation block diagram	10
1.3.1 Behind the meter	10
1.4 System ratings	11
1.4.1 Electrical specifications	11
1.4.2 Environmental specifications	12
1.4.3 Mechanical specifications	13
1.4.4 Fuse list	14
1.5 Anti-islanding	14
2 Preparing installation site	15
2.1 Pre-installation steps	15
2.2 Packaging	16
2.3 Recommended upstream breaker and input cable	16
2.4 Mains input metering	16
2.4.1 AMS energy meter (Applicable Only for Norway)	17
2.4.2 Industrial grade energy meter	17
3 Mechanical installation	18
3.1 Preparing site for installation	18
3.2 Fixing the cabinet	19
3.3 Opening the door	19
4 Electrical installation	20
4.1 Cable glands	20
4.2 Protective bonding	21
4.3 AC Mains Connection	22
4.3.1 AC ONLY (12511)	23
4.3.2 HYBRID (12524)	24
4.3.3 PV/Genset input connection (Optional)	26
4.4 Output customer terminals	29
4.5 External communication	30
4.5.1 Wi-Fi Access Point	30
4.5.2 Ethernet connection	31
4.6 AC meter connection	32
4.6.1 AMS energy meter (Optional)	32
4.6.2 Industrial grade energy meter	32
4.7 Installing batteries	33
4.8 Battery Com converter	36
4.9 Power modules	37
4.9.1 Installing module	37
4.9.2 Removing module	38
4.10 System label	38
4.10.1 AC Only	38
4.10.2 Hybrid	39
4.11 Finalization	40
4.11.1 Door cover	40
4.11.2 Heater breaker	40
5 Maintenance	41
5.1 System	41

5.2 Firmware upgrade	41
5.3 Alarm and Diagnostics	41
5.4 Commissioning	41
6 De-Installation procedure.	42

1 Introduction

This document describe step by step installation, commissioning and start-up of energy storage system. Read it carefully and follow all recommendations to be sure system is running in correct environment under good conditions and installation reached all safety requirements.

NOTE:

The Pixii Home system must be installed by a certified installer. Failure to do so will result in no support from Pixii and invalid warranties.

1.1 Recommended tools and torque

	Tool
W	Wrench
PZ2	Pozidriv screwdriver
Flat	Flat screwdriver
T-W	Torque wrench
T-PZ2	Torque Pozidriv screwdriver
TX	Torque Torx screwdriver

	Type & Size	Torque
T1	Terminal block (WDU2.5, WPE2.5, WSI4)	0,4Nm
T2	AC Mains input terminals (10-16mm ²)	3,0Nm
T3	Shoto batteries (DC cables)	6Nm
T4	M5 self tapping screw	5,7Nm
T5	M6 self tapping screw	9,8Nm

Table 1. Recommended tools and torques

1.2 Thermal management system (TMS)

Cabinet thermal management system provides appropriate thermal conditions inside the cabinet. Solution is integrated on the cabinet door with controlled air flow inside the cabinet.

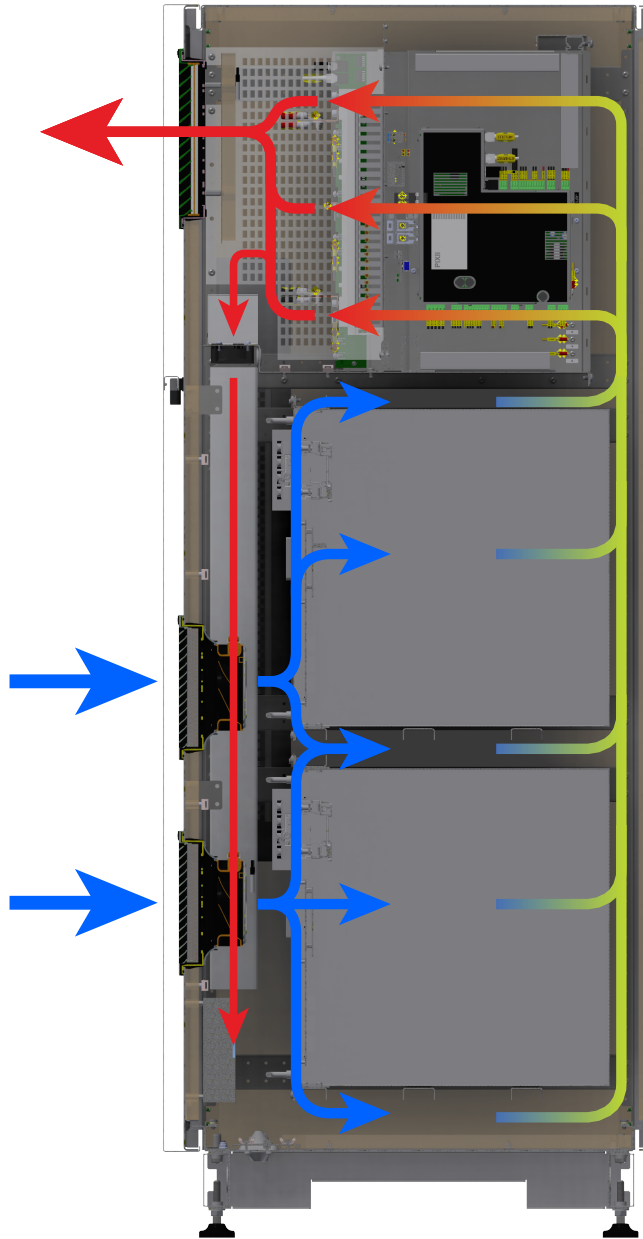


Figure 1.1 Airflow diagram in the cabinet

1.3 Installation block diagram

1.3.1 Behind the meter

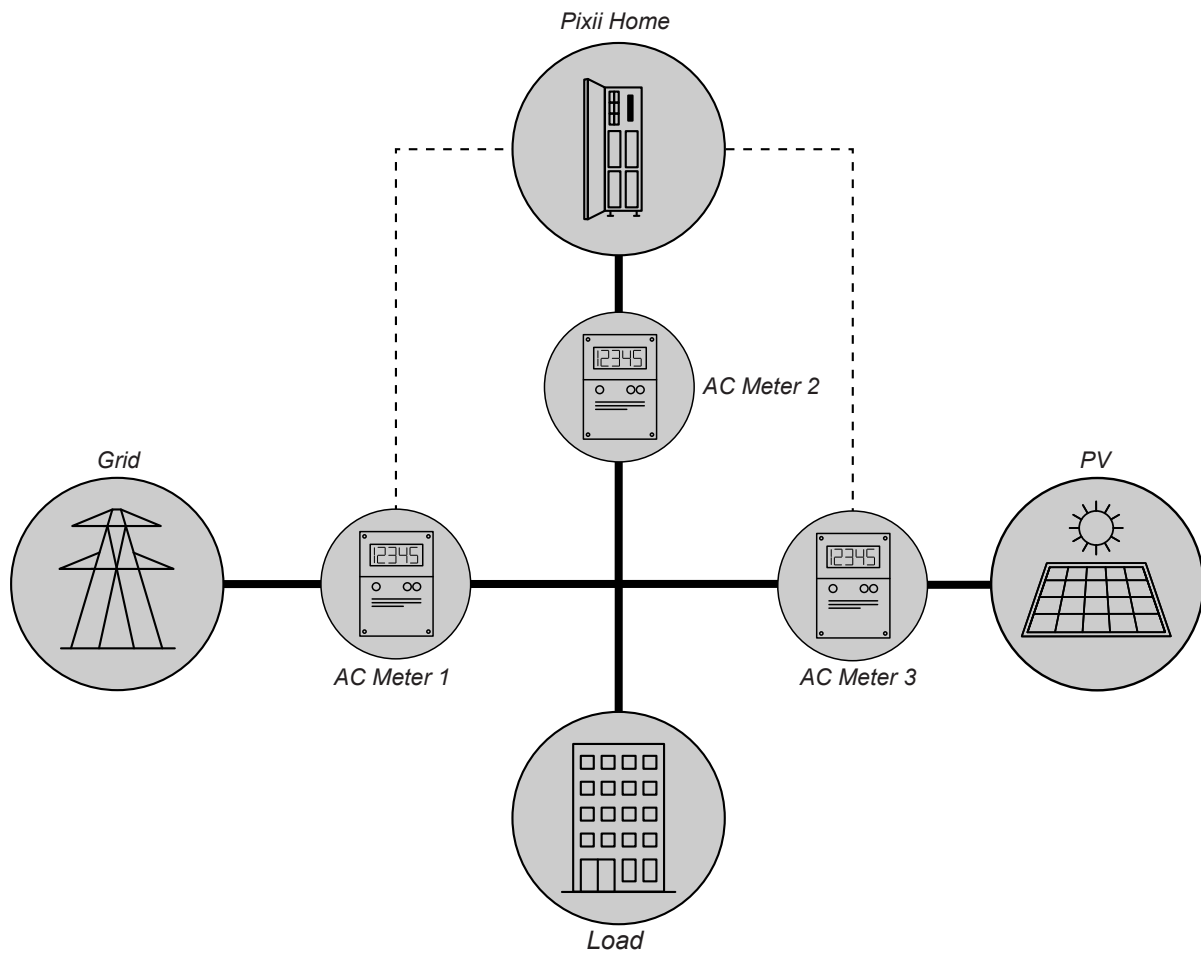


Figure 1.2 Single line installation block diagram - behind the meter

AC Meter 1 - Peak shaving

AC Meter 2 - Frequency meter (Optional for aggregators)

AC Meter 3 - Visualization of PV self sufficiency (Optional)

1.4 System ratings

1.4.1 Electrical specifications

The Pixii Home consist of modular converters, each of them providing transformers with Reinforced insulation between AC side and the DC side.

	AC ONLY (12511)	HYBRID (12524)			
AC Mains Type	TN	TN	TN 1ph	IT	IT 1ph
Max. Active Power (charge and discharge)	± 20kW	±10kW			
Max. Apparent Power (charge and discharge)	20kVA	10kVA			
AC voltage	400/230V	400/230V	230V	230V	230V
Configuration	3Ph+N+PE	3Ph+N+PE	1Ph+N+PE	3Ph+PE	2Ph+PE
Max. AC current	32Arms	16Arms	50Arms	29Arms	50Arms
Nominal AC current	29Arms	14.5Arms	44Arms	25Arms	44Arms
Frequency range	45Hz to 66Hz				
Cos φ range	0.5 inductively to 0.5 capacitively				
Protective class	Class I				
Overvoltage category	OVC II				
Max. short circuit current	10kA				
Prospective short-circuit current (min. required)	630A				
Max. Energy	20kWh				
Max. Battery DC voltage	58V				
Max. Battery DC current	400A				

Table 2. Electrical specifications

Type of the battery	Shoto SDA10-48100
Nominal capacity	100Ah
Nominal energy	5.12kWh
Operating voltage	40V-57.7V
Max. charge/discharge current	100A

Table 3. Battery specifications

Voltage fluctuations and flicker:

	P_{st}	P_{lt}	Z
Measured using Z_{test}	0,645	0,603	0,013Ω+j0,002Ω
Maximum permissible network impedance, Z_{max}	-	-	0,093Ω+j0,093Ω

Table 4. Voltage fluctuations and flicker

PV input specifications:

Max PV strings wit MPPT	3
PV V_{max}	420Vdc
PV Isc pr. string	15A
MPPT range	100-400Vdc
Max PV output power pr. string	3.3kW
Max Solar array size pr. string	4.5kW

Table 5. PV input specifications

Genset input specifications

V_{rms}	230Vac
I_{ac}	16A
AC frequency	50hz \pm 10%

Table 6. Genset input specifications

1.4.2 Environmental specifications

Operating temperatures	-20°C to +45°C
Humidity	5% to 95% RH (non-condensing)
Storage and transportation temperatures	-30°C to +60°C*
Storage and transportation humidity	5% to 95% RH (non-condensing)
Storage (less than 12 months)	State of Charge (SoC): 25%
Acoustic noise (maximum)	<60dBA at 1m distance
Maximum altitude	2000m
Ingress protection rating	IP55
Pollution degree	3
Wet locations	Yes
Current (inrush)	25Apeak
Maximum output fault current	200Apeak/1ms
Inverter topology	Isolated
Env. cat. (IEC 62040-1:2017)	Outdoor
Env. cat. (IEC 62109-1)	Outdoor
Env. cat. (IEC 62477-1)	Outdoor

Table 7. Environmental specifications

* Without batteries installed.

1.4.3 Mechanical specifications

Height	1717 mm
Width	684 mm
Depth	387 mm
Weight (without modules and batteries)	62 kg
Door Cover	3,5 kg
PixiiBox	2 kg
3U battery	~ 42 kg

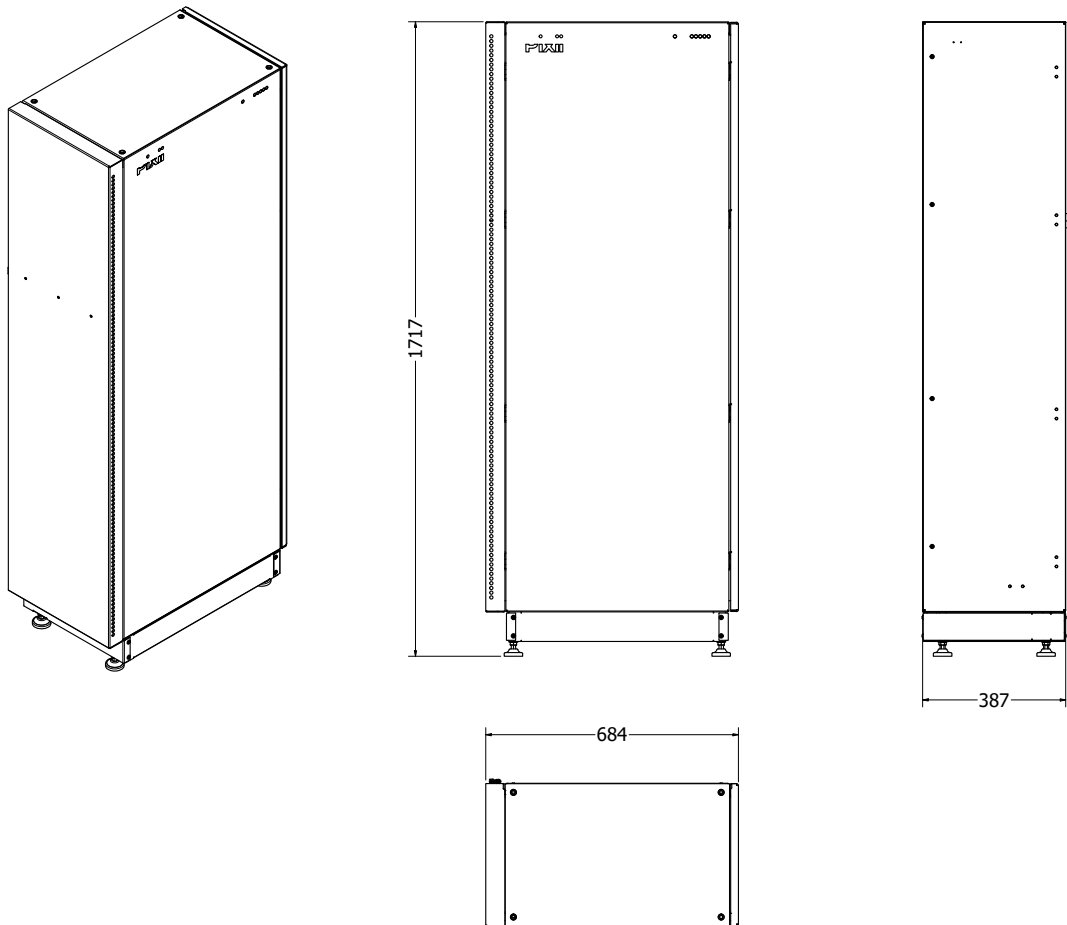


Figure 1.3 Mechanical specifications

1.4.4 Fuse list

	Type	Manufacturer	Manufacturer part number
-FC4	10A 2-pole MCB B-curve	Nader	30065338
-FC13	10A 6.3x32mm fast 10kA	Eaton	BK-AHC-10-R
-FC14	10A 6.3x32mm fast 10kA	Eaton	BK-AHC-10-R
-FC20	10A 6,4x32mm fast 10kA	Bussmann	ABC-10-R
-FC21	10A 6,4x32mm fast 10kA	Bussmann	ABC-10-R

Table 8. Spare part list

NOTE:

Please consult replacement of any fuse or circuit breaker with Pixii first.

1.5 Anti-islanding

The Pixii Home incorporates both passive and active anti-islanding functionality. The passive methods included are under/over voltage, under/over frequency and rate of change of frequency detection. The active anti-islanding functionality uses the frequency shift method based on feedback from frequency variation in combination with a small reactive power perturbation. The active anti-islanding function may be disabled for grid codes not accepting such means of islanding detection.

2 Preparing installation site

2.1 Pre-installation steps

1. Organize installation site

- Mounting base strong enough to carry weight of fully equipped system (approx. 252kg)
- Clearances for cabinet access

	Minimum distance	Suggested distance
Front	60cm	80cm
Rear	3cm	5cm
Top	15cm	30cm
Sides	45cm	60cm

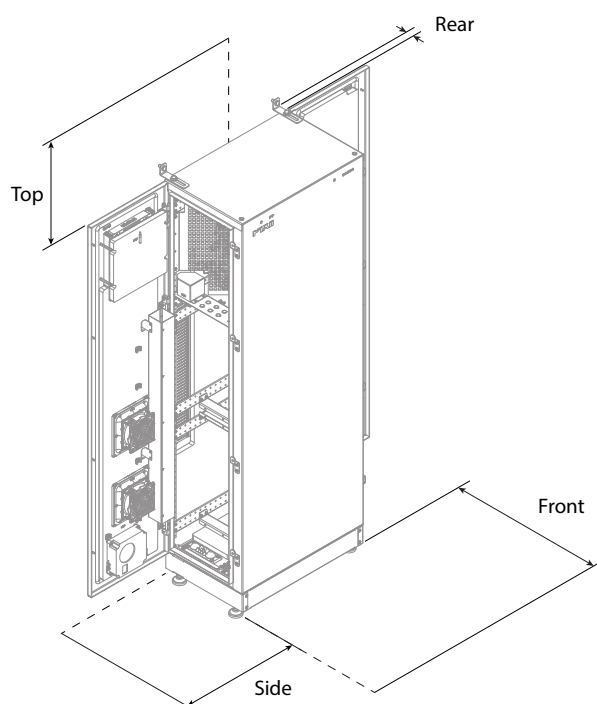


Table 9. Distances and clearances

NOTE:

It is strictly required to follow local regulations if separation distances larger than the table above are required.

NOTE:

If the energy storage system is installed indoor, automatic sprinkler system is highly recommended and sometimes required. Local regulations must be adhered to.

2. Prepare installation tools

- Use insulated tools suitable for electrical installations
- Recommended tools list is in chapter “Tool” on page 8

3. Prepare AC Mains supply

- Correct type of AC Mains supply
- Correct rating of AC input cables and external fuses
- AC Mains supply meter

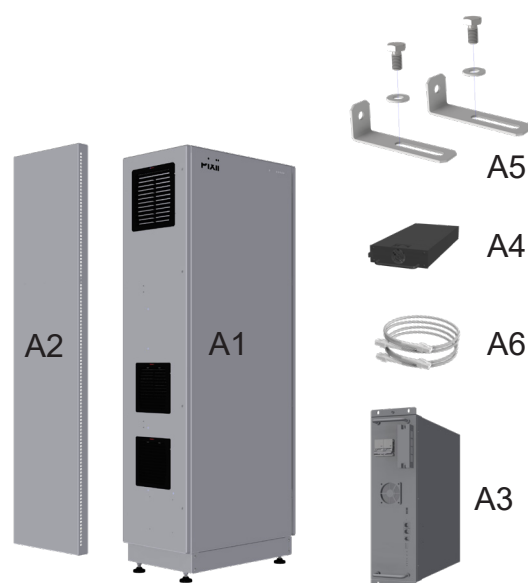
2.2 Packaging

Standard:

- Cabinet 1x(A1)
- Door cover 1x(A2)
- Batteries 2x(A3)
- PixiiBoxes 3x(A4)
- Wall mounting kit 1x(A5)
- Cable kit 1x(A6)

Extension kit (Optional):

- Batteries 2x(A3)
- PixiiBoxes 3x(A4)



2.3 Recommended upstream breaker and input cable

To reach stable system operation, it is very important to use proper input cable and upstream breaker. Recommended values for different types of networks can be found in table below.

AC Mains Type	Number of Power Shelves	Maximum current	Upstream breaker	Input cable
230/400Vac 3-phase, TN-S network 5-wire system	2	32A	63A C-curve	10mm ² - 16mm ² (CU or AL)

Table 10. Recommended upstream breaker and input cable

!!! WARNING !!!

System is designed to operate on 1-phase or 3-phase networks. It is strictly forbidden to connect multiple single-phases to the system.

NOTE:

If different number of power shelves or breaker with lower rating needs to be used from any reason, discuss possibilities with Pixii.

NOTE:

Cable type, upstream breaker and RCD depends on local conditions and regulations.

2.4 Mains input metering

To secure correct operation, system must have actual readings from mains input AC meter. Therefore compatible meter must be installed on site. Measured values are important to perform autonomous operation functionality such as peak shaving and others. Pixii system has support for communicating with 2 different types of meters.

NOTE:

Measured data are used at the customer's own risk. The distribution company or Pixii is not responsible for any losses resulting from its use, including losses due to errors or omissions in the data.

2.4.1 AMS energy meter (Applicable Only for Norway)

AMS meter allows for monitoring consumption and production down to a few second intervals through the HAN-port (M-Bus) according to Norwegian HAN-port specification. The HAN-port is closed by default. Contact your local network company to open it. Before opening the HAN-port, the network company will first ask some questions related to securing the gate for privacy reasons. For connecting to the HAN-port a standard Ethernet cable with RJ45 connectors is required. Maximum practical distance at highest speed is 350 meters.

Supported AC Meters

- Aidon
- Kamstrup
- Nuri

2.4.2 Industrial grade energy meter

The Pixii system has support for an energy meters from different manufacturers. Depending on type of the meter, external measuring transformers may be required. Currently, communication via Modbus/RTU (RS485) is supported. This means that a cable (2-wire at least) needs to be connected from the meter to the controller in the system. Maximum practical distance is 300 meters.

Supported AC Meters

Manufacturer	Supported	Supported with PixiiHome app
Phoenix Contact	EEM-EM357 series	EEM-EM355 series EEM-MA370-R series EEM-MA371-R series
Schneider	iEM 3155 series	iEM 32xx series iEM 33xx series
Acuvim	Acuvim II series Accuenergy (Modbus/TCP available)	
Janitza	-	B23 312-10J B24 312-10J UMG series

Table 11. Supported AC Meters

3 Mechanical installation

3.1 Preparing site for installation

To secure correct system operation, cabinet must stand on solid horizontal leveled surface.

Because of small space behind and underneath and an easier installation, it is recommended to prepare all cables before putting the cabinet in the position.

Position the cabinet with 3-5 cm distance to the wall on the ground and use the screw-in feet to level it out in horizontal and vertical plane.

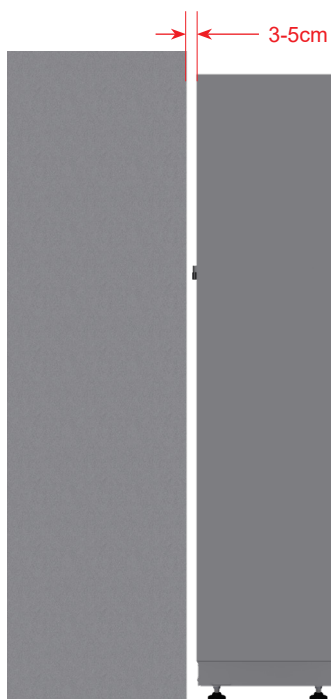


Figure 3.1 Positioning the cabinet

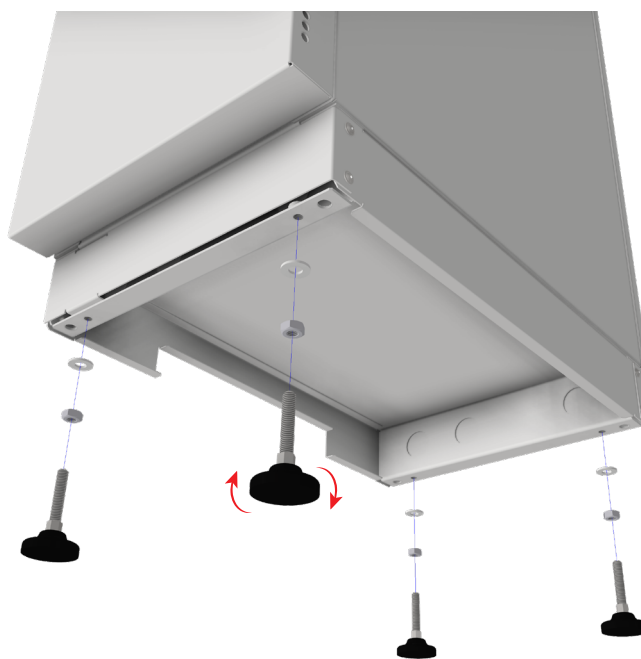


Figure 3.2 Adjusting the feet

!!! WARNING !!!

Never lift cabinet with opened door.

Do NOT lift cabinet with installed modules and batteries.

3.2 Fixing the cabinet

To fasten the PixiiHome system on the wall as a tilt protection, use the supplied angles (*Figure 3.3*).

NOTE:

The anchor bolts and screws for the wall are not supplied and need to be chosen accordingly to the material and composition of the wall.

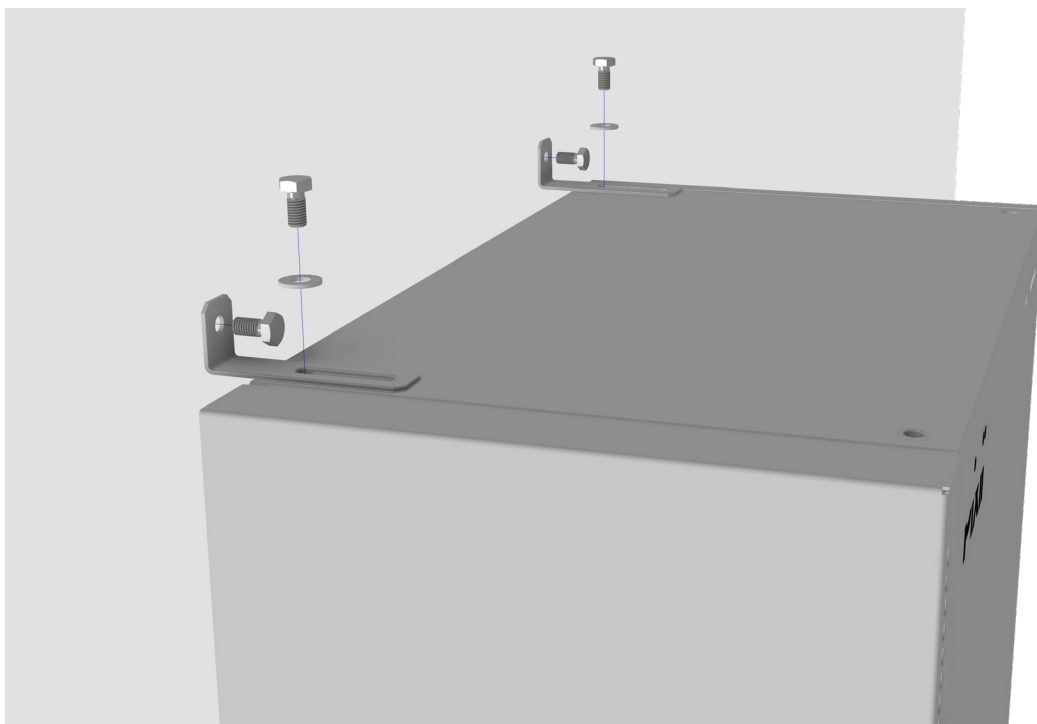


Figure 3.3 Fixing the cabinet

3.3 Opening the door

Before opening the door, sun cover must be removed.

1. Loose the latch.
2. Slide cover to side.
3. Then release 4x M5x12 torx screws and open the door.

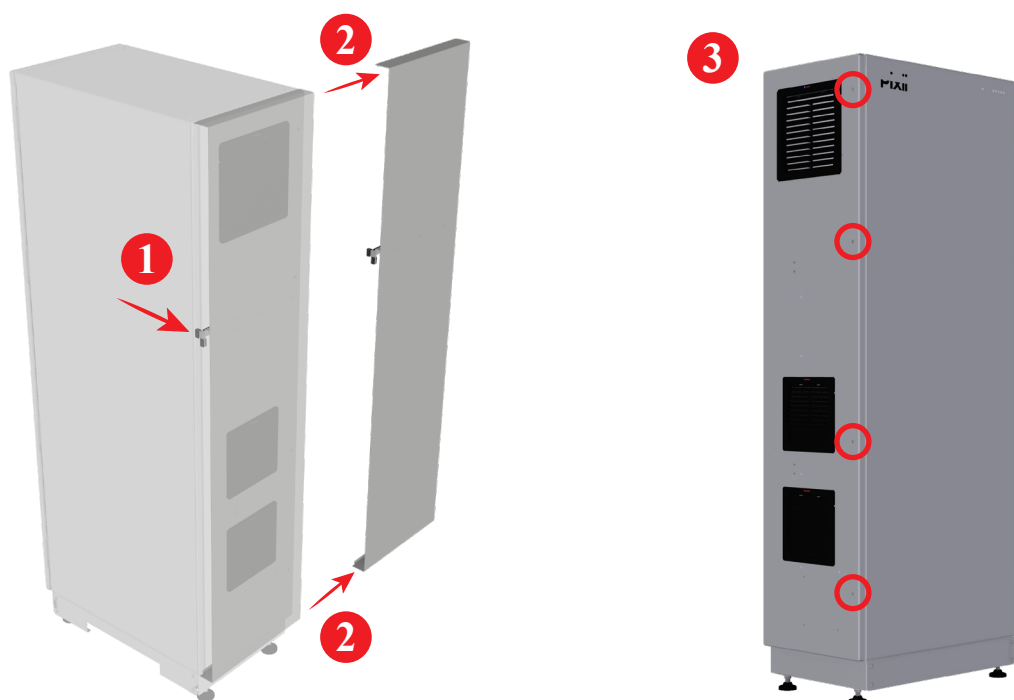


Figure 3.4 Opening the door

4 Electrical installation

For safety reason, before you start installation, ensure all external power sources are disconnected, as well as internal battery and load fuses/breakers are in OFF position. To avoid injuries caused by high leakage/touch current we recommend always start installation by connecting earthing wire (PE), before you connect other AC input wires (phases, neutral).

4.1 Cable glands

Prepare the cable glands (*Figure 4.1*) accordingly to the amount of cables you need.

For example:

- AC Main
- Grounding
- Ethernet (Optional)
- AC-Meter(s)

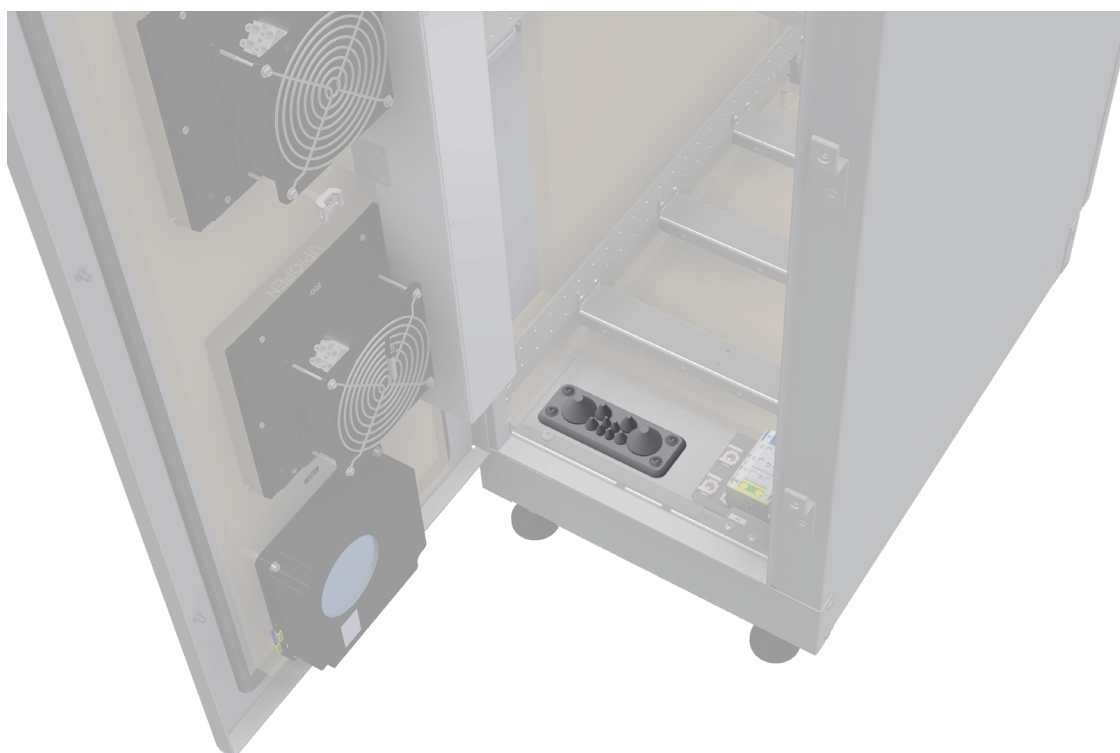


Figure 4.1 Cable glands in cabinet

1. Make a small hole into the membrane using a screwdriver or cut the top of the cone using side cutter (*Figure 4.2*).
2. Push the cable through the guide hole (*Figure 4.3*).

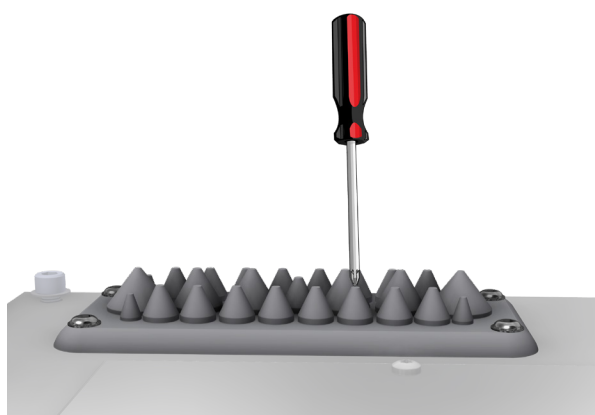


Figure 4.2 Cable glands preparation

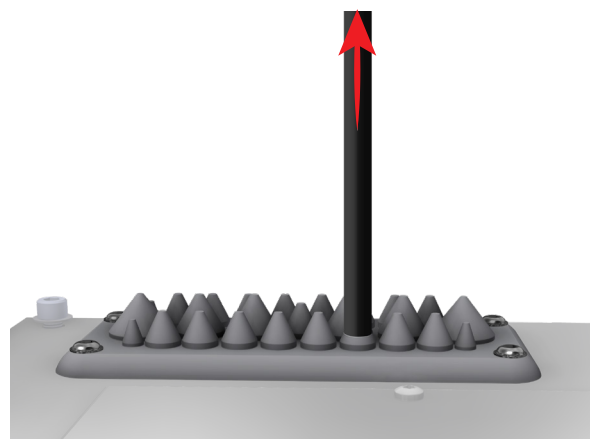


Figure 4.3 Cable glands with cable

4.2 Protective bonding

It is recommended to interconnect cabinet chassis with main earthing point, to ensure equal potential throughout the installation thus preventing a hazardous potential difference occurring between such parts in the event of a fault.

NOTE:

Protective bonding is mandatory for OFF GRID installations! Always follow local regulations and laws.

Connect bonding cable from main earthing point to the bonding point on the bottom of the cabinet with M6 lug.

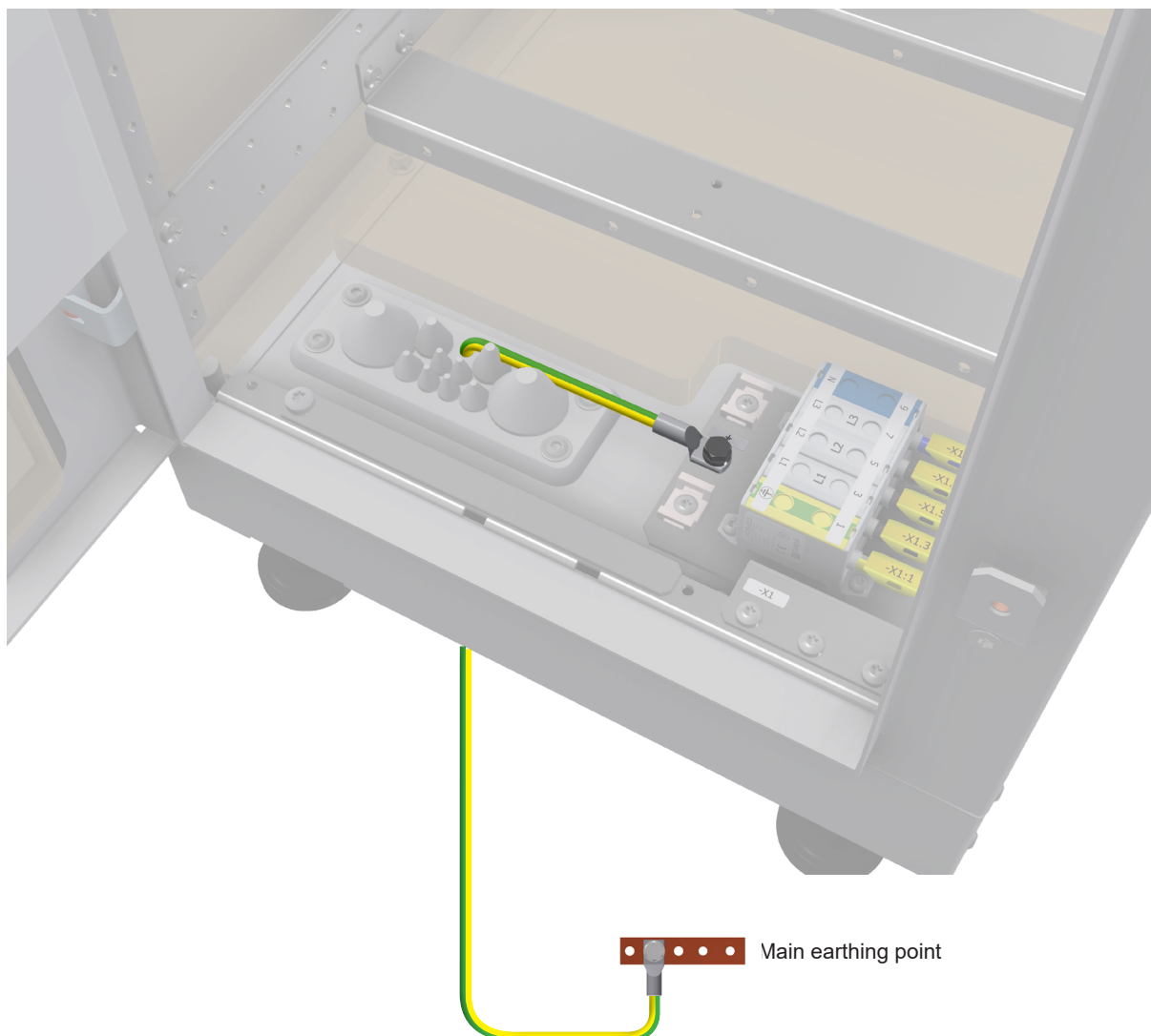


Figure 4.4 Protective bonding

NOTE:

Do NOT interconnect bonding busbars in multiple cabinets in multicabinet installation. Connect separate bonding cable to each cabinet in multicabinet installation.

4.3 AC Mains Connection

AC mains connection can be configured for different grid types.

Connection to the AC mains is at terminal -X1.



Figure 4.5 AC mains connection terminals -X1

In addition, configure the terminal block links at terminal -X2 according to description according to your grid type.

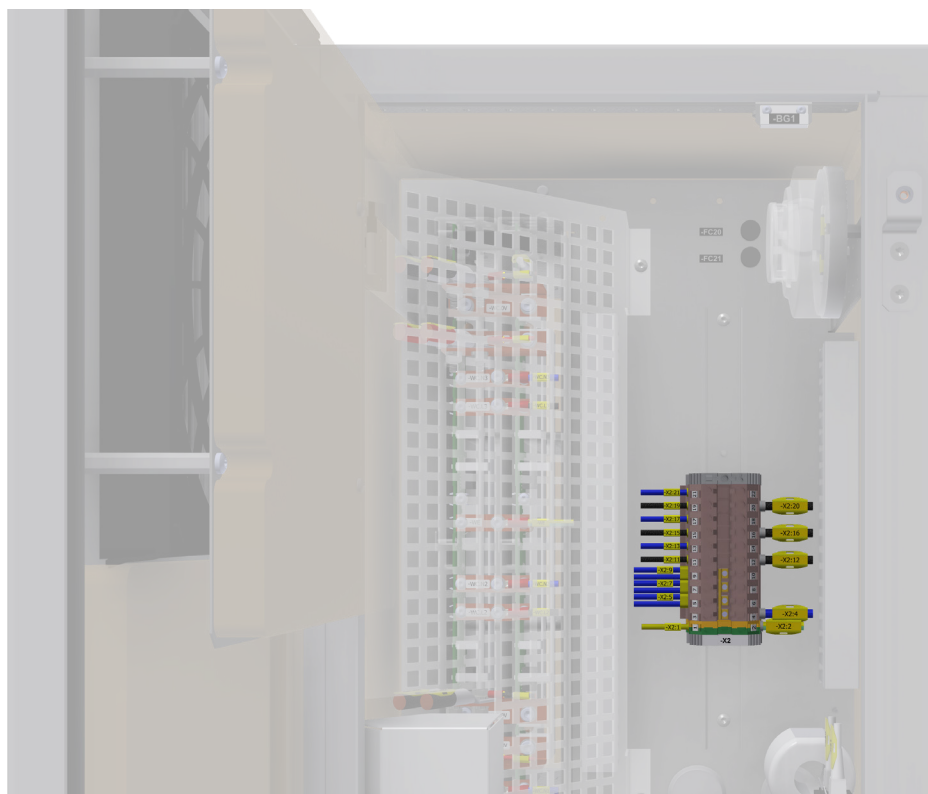


Figure 4.6 Configurable internal terminals -X2

4.3.1 AC ONLY (12511)

TN-S / TT (230/400Vac) network 3 phase (Standard)

- Connect PE wire to terminal -X1:2 (PE). Use torque T2.
 - Conductor (CU, AL) 10mm² - 16mm².
- Connect phase wires (L1, L2, L3) and neutral wire (N) to terminals -X1:6(L1), -X1:8(L2), -X1:10 (L3) and -X1:4(N) respectively. Use torque T2.
 - Conductor (CU, AL) 10mm² - 16mm².

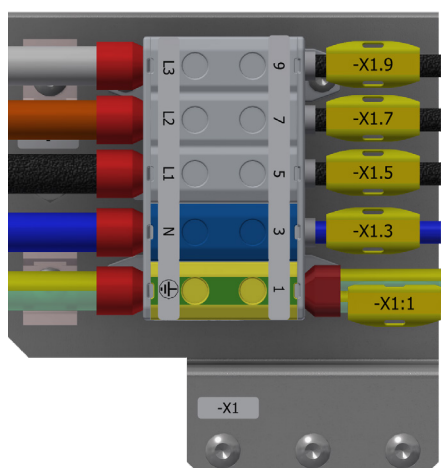


Figure 4.7 TN-S / TT (230/400Vac) network 3 phase

4.3.2 HYBRID (12524)

IT (230Vac) network 1 phase (Optional)

- Connect PE wire to terminal -X1:2 (PE). Use torque T2.
 - Conductor (CU, AL) 10mm² - 16mm².
- Connect phase wires (L1, L1, L1) and (L2) to terminals -X1:6(L1), -X1:8(L2), -X1:10 (L3) and -X1:4(N) respectively. Use torque T2.
 - Conductor (CU, AL) 10mm² - 16mm².
- Neutral terminals -X2:3 - -X2:10 should be connected with interlink.

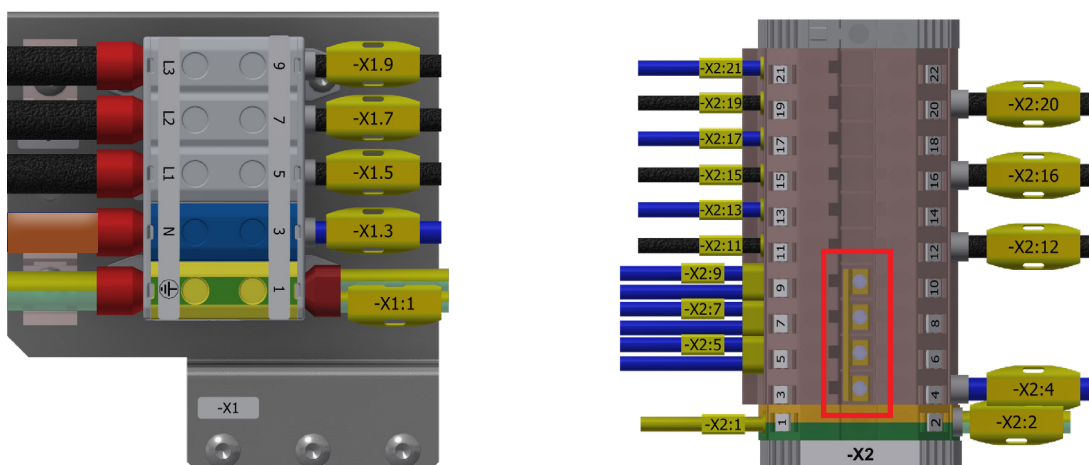


Figure 4.8 IT (230Vac) network 1 phase

IT (230Vac) network 3 phase (Optional)

- Connect PE wire to terminal -X1:2 (PE). Use torque T2.
 - Conductor (CU, AL) 10mm² - 16mm².
- Connect phase wires (L1, L2, L3) to terminals -X1:6(L1), -X1:8(L2) and -X1:10 (L3) respectively. Use torque T2.
 - Conductor (CU, AL) 10mm² - 16mm².
- Terminals -X2:11 - -X2:14 should be connected with interlink.
- Terminals -X2:15 - -X2:18 should be connected with interlink.
- Terminals -X2:19 - -X2:22 should be connected with interlink.

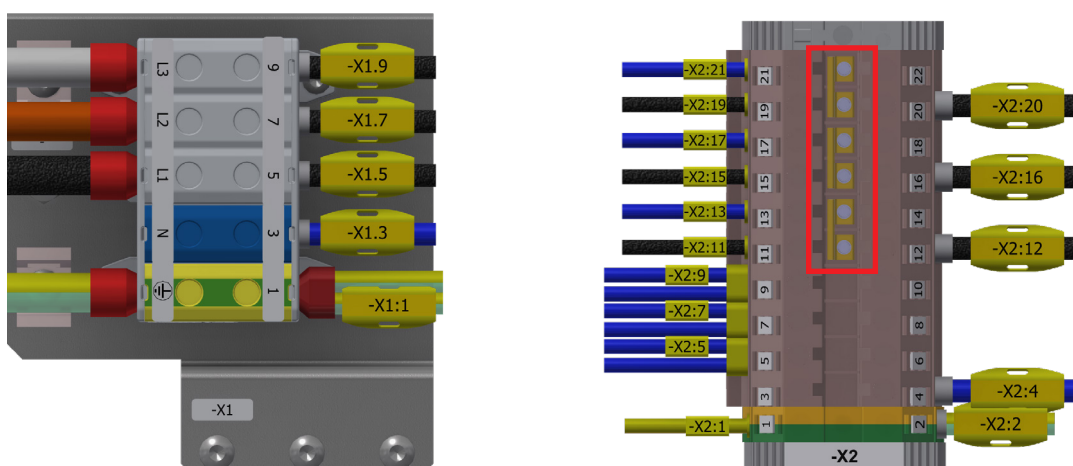


Figure 4.9 IT (230Vac) network 3 phase

TN-S / TT (230/400Vac) network 1 phase

- Connect PE wire to terminal -X1:2 (PE). Use torque T2.
 - Conductor (CU, AL) 10mm² - 16mm².
- Connect phase wires (L1, L1, L1) and neutral wire (N) to terminals -X1:6(L1), -X1:8(L2), -X1:10 (L3) and -X1:4(N) respectively. Use torque T2.
 - Conductor (CU, AL) 10mm² - 16mm².
- Neutral terminals -X2:3 - -X2:10 should be connected with interlink.

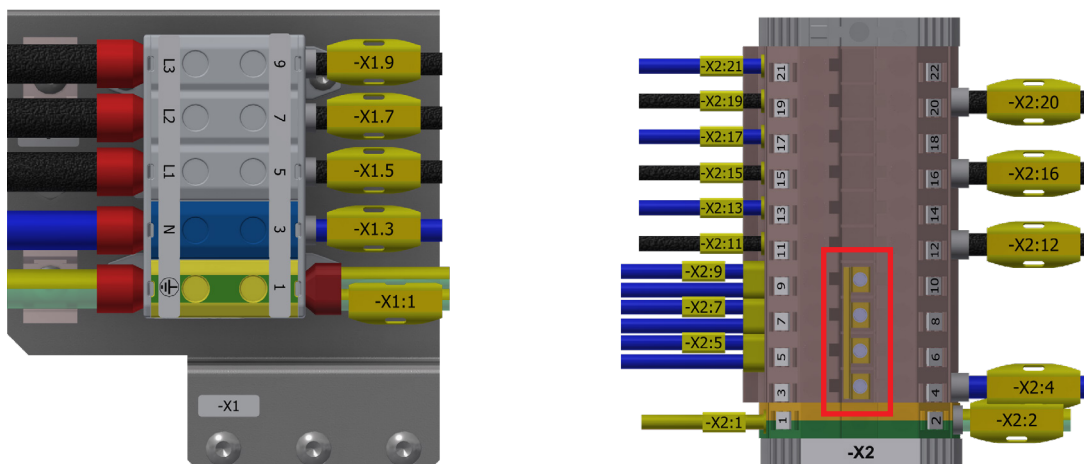


Figure 4.10 TN-S / TT (230/400Vac) network 1 phase

TN-S / TT (230/400Vac) network 3 phase

- Connect PE wire to terminal -X1:2 (PE). Use torque T2.
 - Conductor (CU, AL) 10mm² - 16mm².
- Connect phase wires (L1, L2, L3) and neutral wire (N) to terminals -X1:6(L1), -X1:8(L2), -X1:10 (L3) and -X1:4(N) respectively. Use torque T2.
 - Conductor (CU, AL) 10mm² - 16mm².
- Neutral terminals -X2:3 - -X2:10 should be connected with interlink.

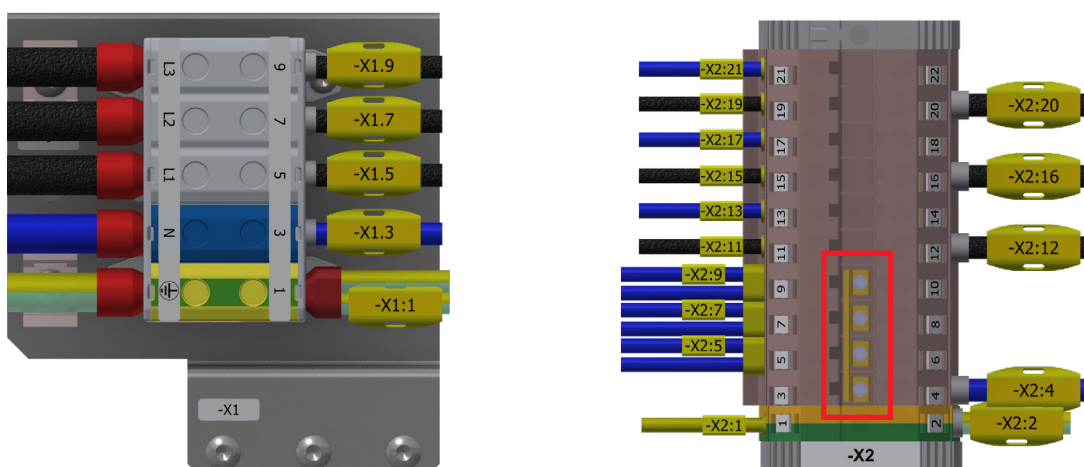


Figure 4.11 TN-S / TT (230/400Vac) network 3 phase

4.3.3 PV/Genset input connection (Optional)

Pixii Home could use solar panels or generator as a source of the power.

PV input

Connect PV input cables to the terminals X3, on the left side of the cabinet.

NOTE:

For correct operation, install an external DC switch between the input terminals and PV panels.

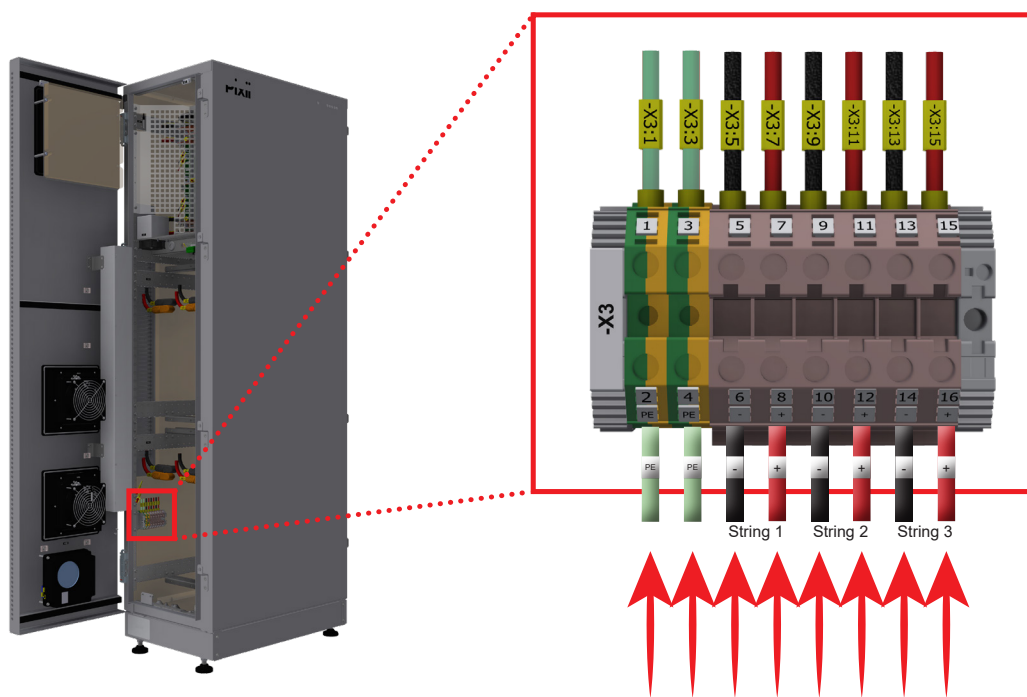


Figure 4.12 PV input connection

Genset input (Optional)

1. Connect Genset input cables to the terminals -X3.

- Connect PE cable to the terminal -X3:1
- Connect neutral cable to the terminal -X3:14
- Connect phase cable to the terminal -X3:16

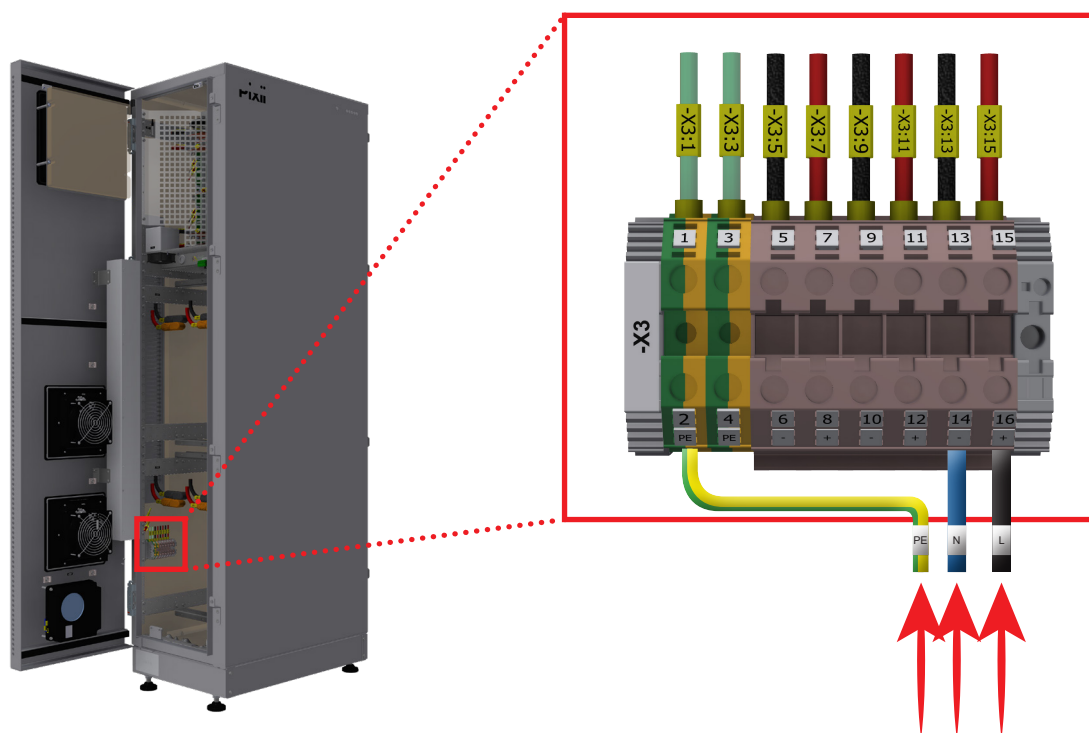


Figure 4.13 Genset input connection

2. Remove cartridges (marked in yellow) from SPD -FA3.

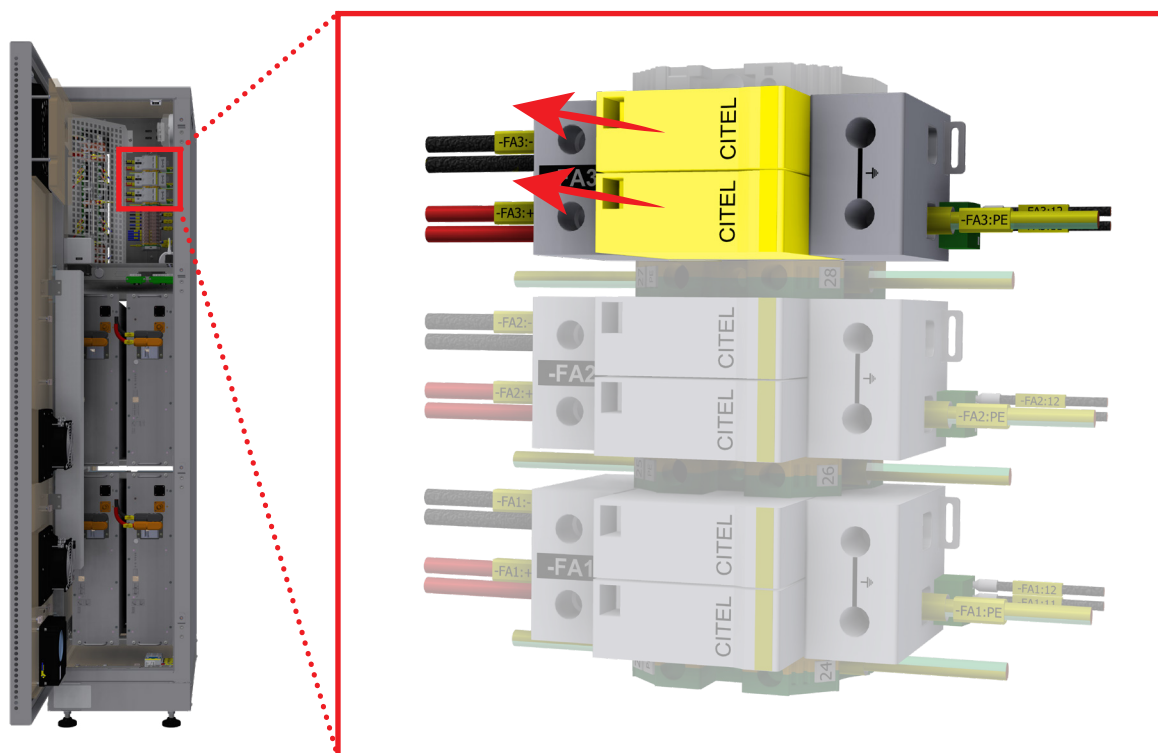


Figure 4.14 Removing the cartridges from -FA3

3. Change power rack (-UF2) DIP switch coding according to the picture bellow.

NOTE:

Genset is connected to the position 6. For more info, see chapter "4.9 Power modules".

Function	DIP1	DIP2	DIP3	DIP4	DIP5	DIP6
RECTIFIER/GENSET	0	0	0	1	0	0

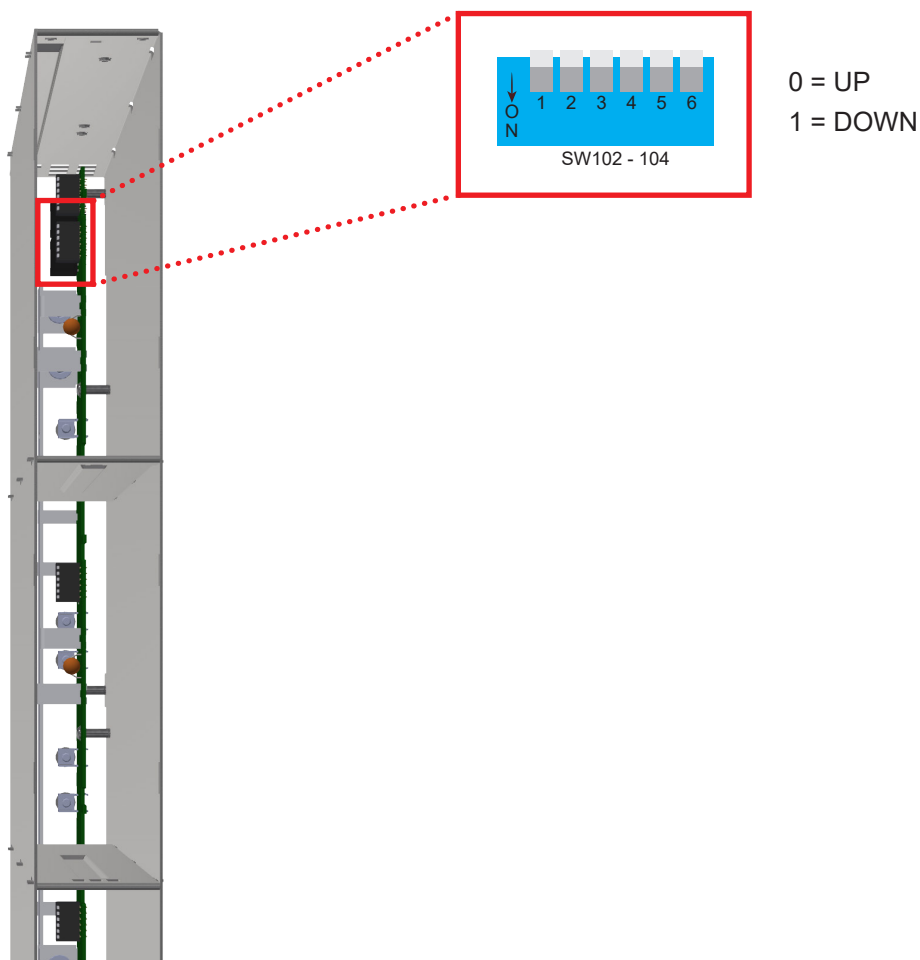


Figure 4.15 Changing the power rack function by DIP switch coding

4. Refer to the manufacturer manual to set the optimal power of the genset.

Generator Settings

Generator priority ☐

Max generator AC power W

Max generator DC current A

Save Set default

Figure 4.16 Optimal genset settings

4.4 Output customer terminals

Pixii Home system has output terminals for customers X9 (external meter) and X10. They will be usable with future software updates.

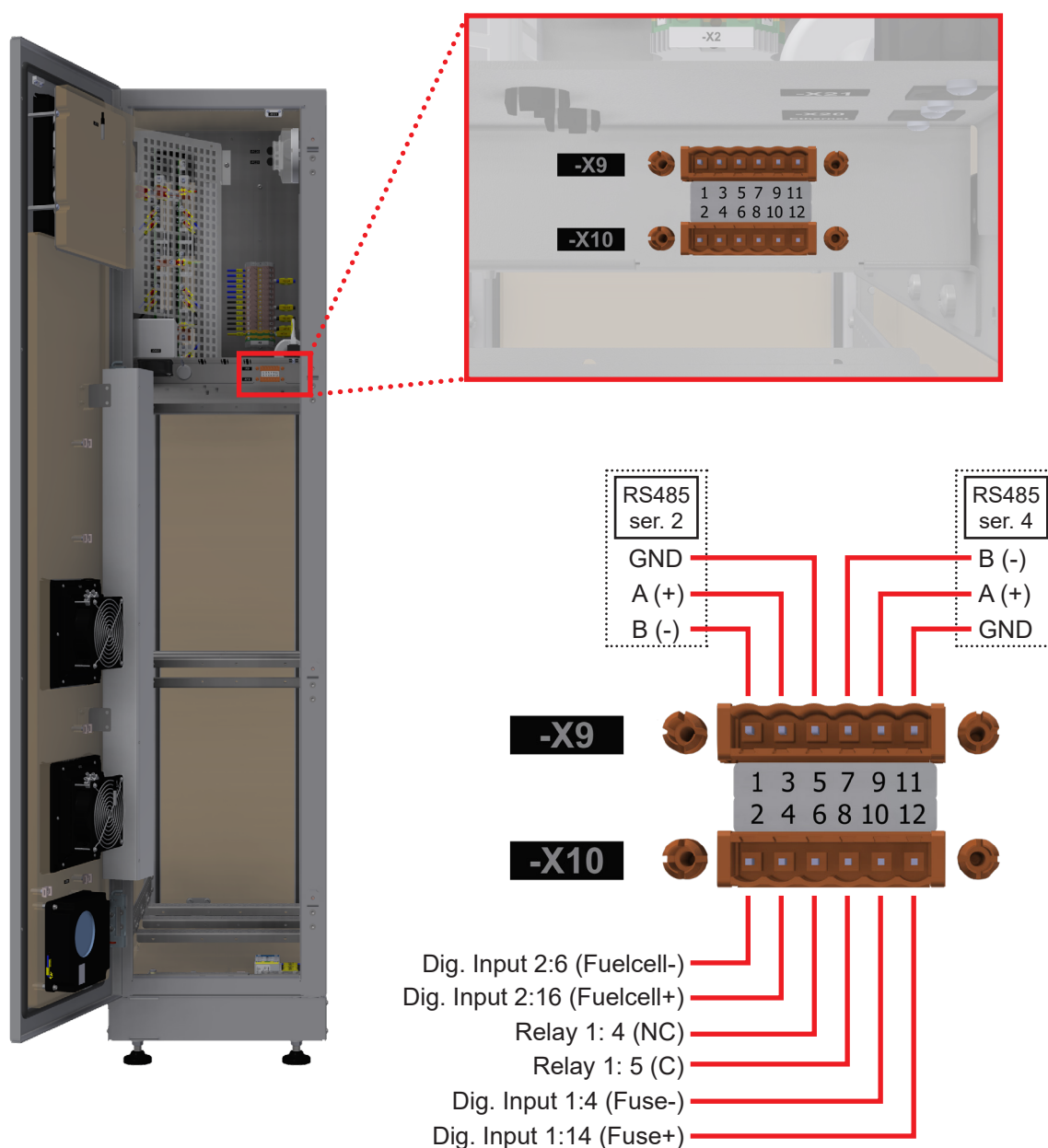


Figure 4.17 Output customer terminals

NOTE:

Pin 10 and 12 should be shortened, if no Offgrid kit is installed.

4.5 External communication

Pixii system is fully configurable through web interface. Therefore a network connection to controller is required. This can be done in different ways, depending on what type of network is present on site. The system has a Wi-Fi Access Point that can be activated to access the web interface for configuration and monitoring when at the site. Test report enclosed in system contains the installer login information.

NOTE:

The WiFi access point is intended solely for commissioning purposes. An Ethernet cable is required for connecting to the internet.

4.5.1 Wi-Fi Access Point

The Wi-Fi Access Point is disabled by default. It may be enabled or disabled by pressing the button found at the upper right hand side (*Figure 4.18*).

Enable

- Press the button for a duration of between 50ms and maximum of 2 seconds.
- The green led will then blink 2 seconds ON and 0.5 seconds OFF.

Disable

- Press the button for a duration of between 50ms and maximum of 2 seconds.
- The green led will then be lit steady.

The SSID and password are printed on the right side of the controller.

The web page is accessible at <https://10.42.0.1>.

For commissioning see *16012_Commissioning guide_Pixii Home Outdoor Cabinet*

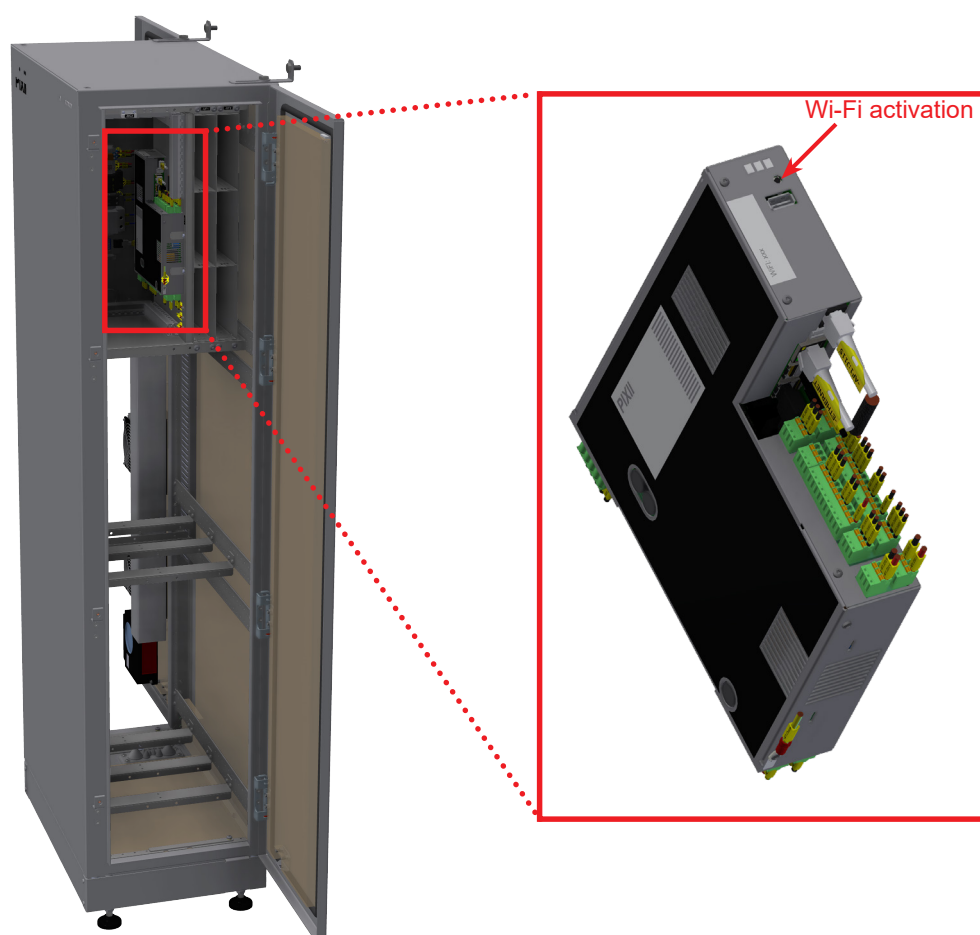


Figure 4.18 Wi-Fi Access Point

4.5.2 Ethernet connection

- Route RJ45 network cable from customer switch.
- Use bottom cable entry to enter the cabinet.
- Connect ethernet cable to the connector -X20.

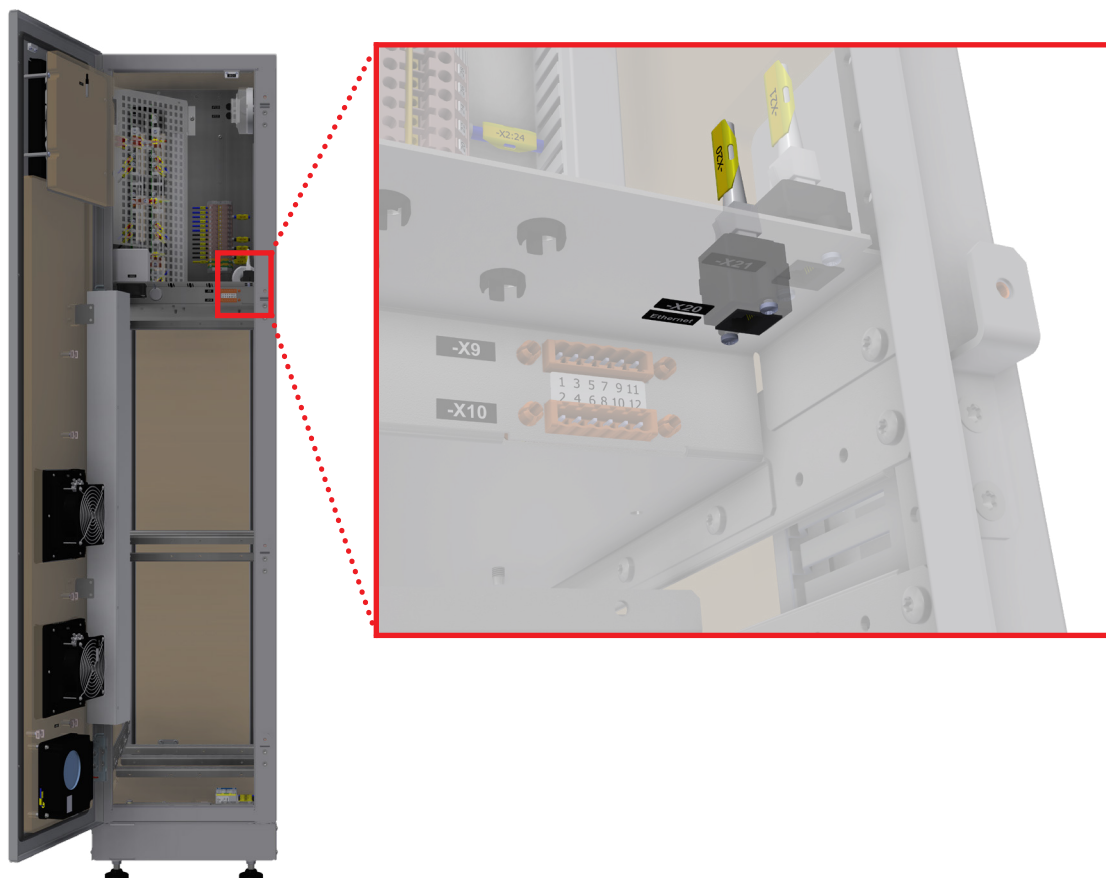


Figure 4.19 Network cable connection

4.6 AC meter connection

AC meters from various manufacturers can be used during installation. In next chapters will be described most common ways how to connect it to Pixii system.

4.6.1 AMS energy meter (Optional)

Pixii controller is not equipped with M-Bus port, therefore USB to M-Bus converter (optional kit) needs to be used. Connect it to free USB port on Pixii controller and connect Ethernet cable to RJ45 connector on converter. On meter side are 2 possible options for connecting communication cable. If only Pixii controller will be connected to AC meter, connect Ethernet cable directly to RJ45 connector on meter. Otherwise connect short cable with RJ45 splitter to AC meter and then to splitter connect Ethernet cable from Pixii controller. For more information, see installation guide DN 14754 (14754_Installation guide - HAN to USB converter).

4.6.2 Industrial grade energy meter

Modbus/RTU

All supported AC meters are equipped with RS485 port for communication. Therefore 3-wire bus must be wired between meter and Pixii controller. Use the customer spare terminals -X9/-X10 extension function. Connect AC meter to the terminals -X9. For more information, see chapter “4.5 Customer spare terminals” on page 24.

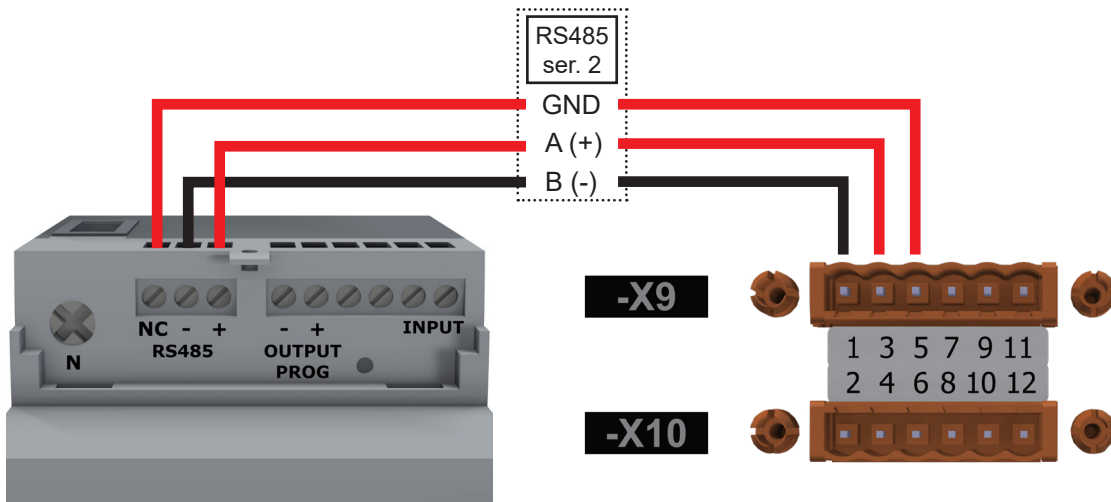


Figure 4.20 Industrial AC meter connection

Figure 4.21 Customer spare terminals

Modbus/TCP

All supported AC meters are equipped with RJ45 port for communication. Therefore ethernet cable must be connected between the meter and the switch. Pixii controller must be connected with ethernet cable to the same switch as the meter to ensure the correct communication.

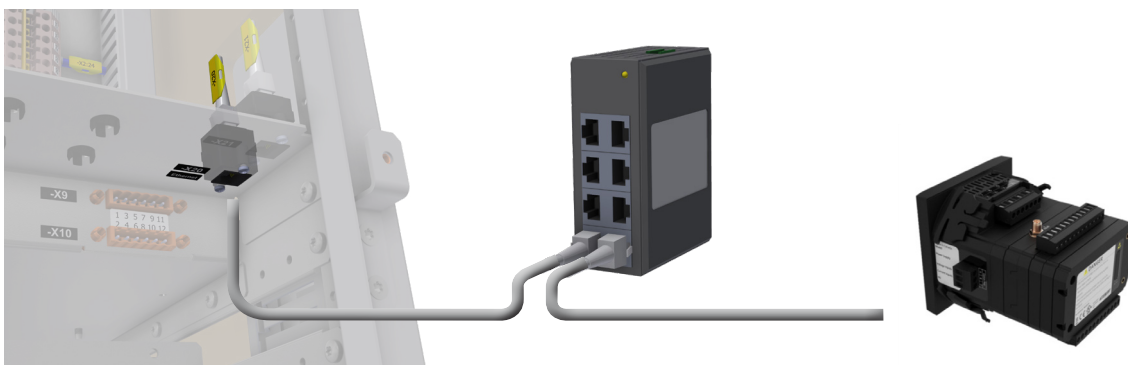


Figure 4.22 Modbus/TCP connection

NOTE:

Pictures above are showing only examples of AC meters.

4.7 Installing batteries

Cabinets are default prepared for 3U batteries (4pcs) from factory. Using different models of battery modules together is not permitted. Be very careful during installation, because of the high weight of the battery. It's strictly recommended, that batteries are installed by 2 persons. Batteries must be installed in order from bottom to top (see *Figure 4.23*). Place each battery back side at the rails and slowly slide them in correct position. Fix each battery with at least 2x M6 (depending on the accessible holes on the mounting brackets) self tapping screws (see *Figure 4.24*), using torque T5.

NOTE:

Self tapping screws are used also for grounding the batteries.



Figure 4.23 Battery positions



Figure 4.24 Battery installation

NOTE:

Use attached self tapping screws (**from cabinet enclosure items**) for fixing batteries to the battery shelves.

Battery connection

Each battery module contains an internal Battery Management System (BMS) and a breaker to secure safe operation. Before connecting the batteries, check once again that all batteries are the same type.

If the check was successful, start connecting the batteries.

1. Connect each battery module to those adjacent to it using an intra-rack RJ45 communication cable. For connection use Modbus ports on batteries (see *Figure 4.25*).
2. Interconnect connector -X21 with the bottom battery Modbus port using attached RJ45 communication cable (see *Figure 4.25*).
3. Fix cables to avoid contact with fans, heaters and other equipment mounted on door if needed.
4. Connect the positive cable (red, marked -GB1:+) to the bottom left battery positive terminal.
5. Connect the negative cable (black, marked -GB1:-) to the bottom left battery negative terminal.
6. Repeat step 4 and 5 to connect all other batteries installed in the system (see *Figure 4.26*).

NOTE:

Do NOT power ON batteries at this stage of installation.



Figure 4.25 Battery communication cables

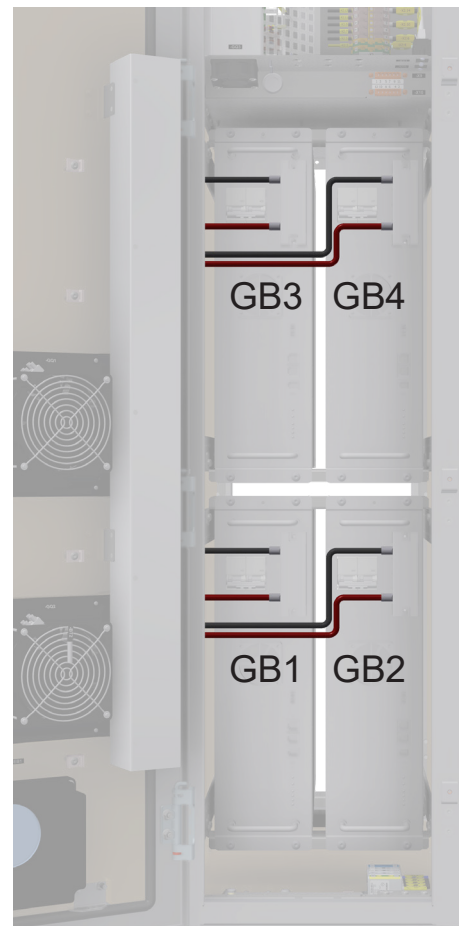


Figure 4.26 Battery cables

NOTE:

For connection of DC battery cables use appropriate torque T4 from chapter “1.1 Recommended tools and torque” on page 8, or follow manufacturer installation documentation.

NOTE:

Use outside battery terminals to connect battery cables, the bottom for positive red cables and the top for negative black cables.

NOTE:

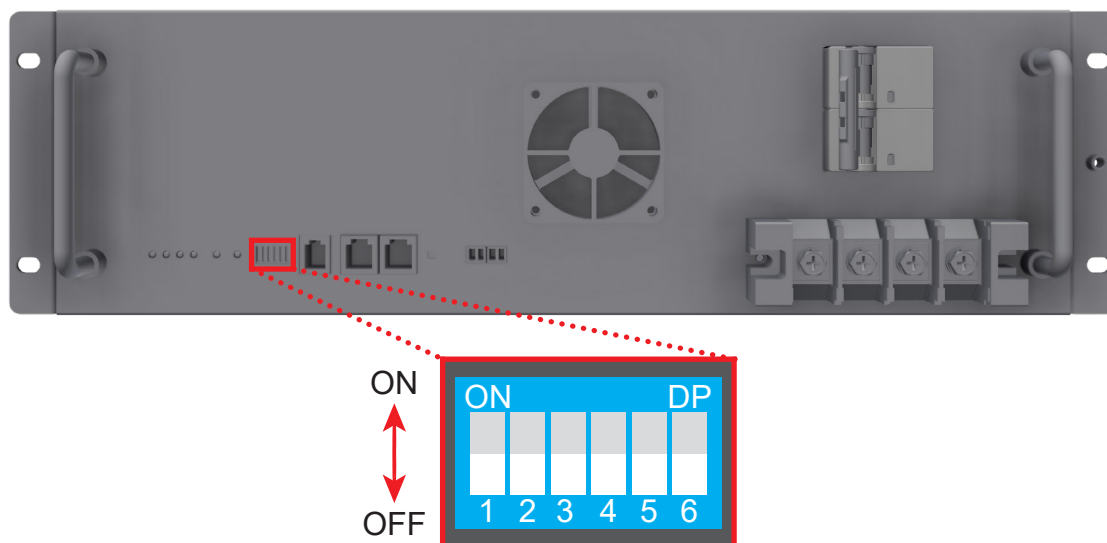
Ensure, that battery cables are NOT colliding with battery breakers above the battery terminals.

NOTE:

Ensure, that battery cables are NOT in/NOT colliding with air gap between the batteries. It could cause overheating problems.

Configuration

For the correct function of Shoto batteries, set the dial switch on the front panel of each battery. There are 4 numerals (1-4) to set the code which can be used to address the battery. The code is assigned as follows:



Address NO	Code switch 1	Code switch 2	Code switch 3	Code switch 4	Code switch 5	Code switch 6
1	ON	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF

Table 12. Code switch address

NOTE:

Start addressing the batteries from first battery #1 at the bottom and continue to the top.

NOTE:

Do NOT power ON batteries at this stage of installation.

4.8 Battery Com converter

Proper configuration of converter (-TF2) is necessary to secure the correct communication with various type of batteries. Follow the tables below to set the DIP switches in the right positions.

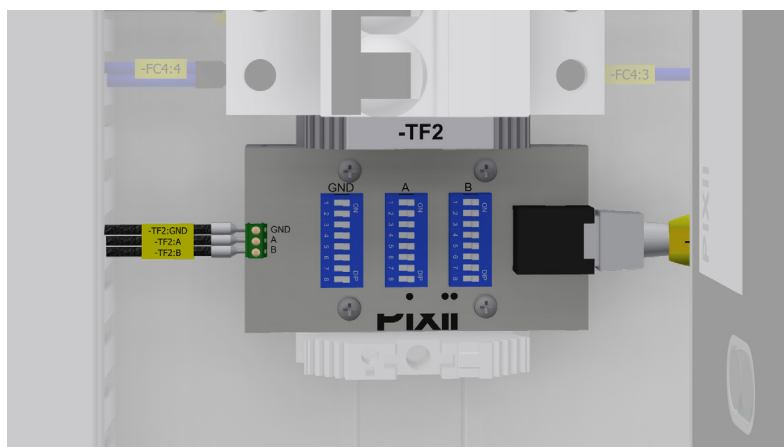


Figure 4.27 Battery Com converter (-TF2)

	GND	A	B
1	OFF	OFF	ON
2	OFF	ON	OFF
3	OFF	OFF	OFF
4	OFF	OFF	OFF
5	OFF	OFF	OFF
6	OFF	OFF	OFF
7	OFF	ON	OFF
8	ON	OFF	OFF

Table 13. Shoto batteries configuration table

4.9 Power modules

The last step in the system installation is to install PixiiBox modules. Each power shelf contains 3 positions for modules. Each position is wired to different phase, starting with L1 from the bottom. To secure correct 3-phase operation, all 3 modules must be installed in every used shelf. The controller will identify the position of each inserted module, therefore it is not critical in which order the modules are inserted or removed. There is a label located next to the power shelves describing the module positions. It is recommended to start inserting modules from shelf -UF1 position 1.

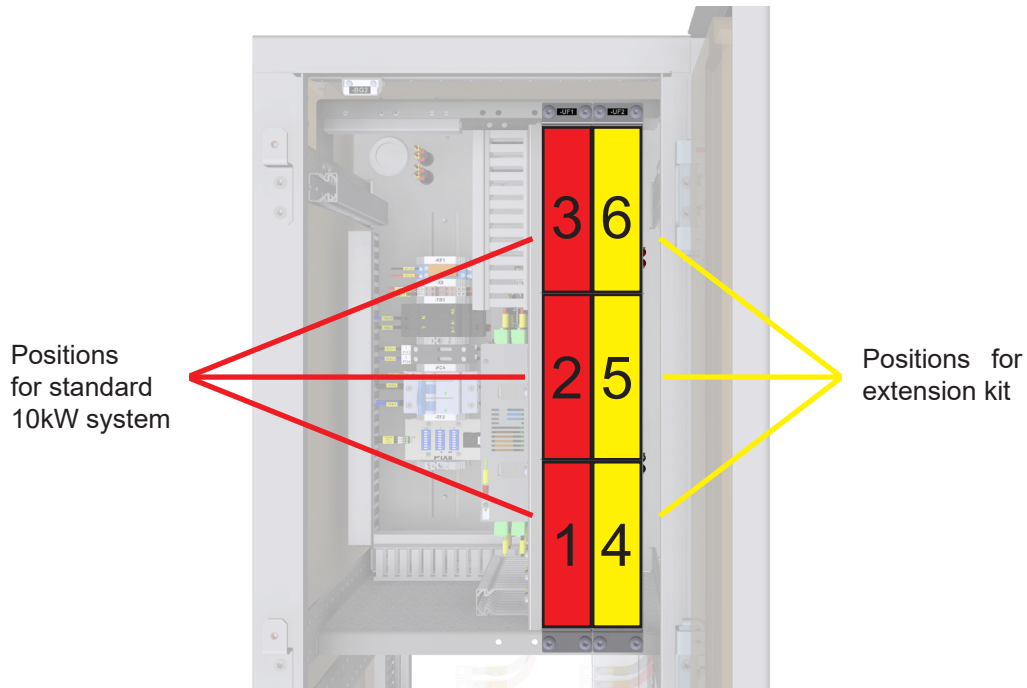


Figure 4.28 The sequence of inserting modules

4.9.1 Installing module

1. Place the module in the shelf and slide in.
2. Using the module handle, push firmly until the unit is properly connected and the ratchet on the left side lock the module in position.



Figure 4.29 Slide the module in

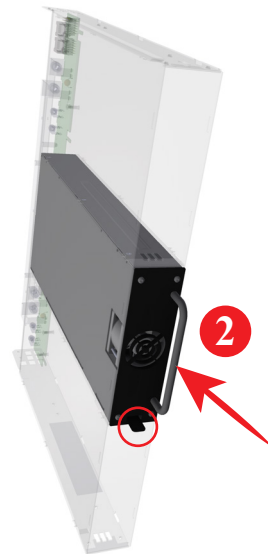


Figure 4.30 Push firmly until the ratchet lock the module

NOTE:

If the module does not fit easily, do not use that power shelf and contact supplier for repair.

4.9.2 Removing module

1. Push the ratchet on the left side to unlock the module.
2. Pull out the module using the handle while holding the ratchet.
3. Replace with a new module or blind panel.



Figure 4.31 Unlock the ratchet

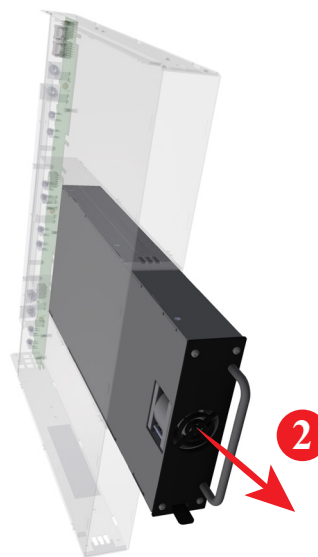


Figure 4.32 Pull the module out

WARNING:

Do NOT touch connectors on the module rear side, there is risk of electric shock because of accumulated energy inside.

NOTE:

Empty positions must be covered with blank panels to obtain correct airflow.

4.10 System label

4.10.1 AC Only

PixiiHome system is marked with 2 system labels. One label is located on the inside of the cabinet (on the cabinet door) and one label is a separate sticker with the documentation.








		WARNING! Dual Supply 	
PART NAME:	Pixii home OD	Revision: 1.3	     Isolated inverter
PART NO:	12511		
BATCH NO:			
AC VOLTAGE:	<input type="checkbox"/> 400/230Vac (3W+N+PE)		
AC CURRENT:	<input type="checkbox"/> 3x32A (3W+N+PE)		
ACTIVE POWER:	±20kW (3W+N)/±10kW (L+N)		
APPARENT POWER:	±20kVA (3W+N)/±10kVA (L+N)		
FREQUENCY:	45-66Hz		
PWR FACTOR:	Default 1, 0.5cap...0.5ind		
AC: OVC II Class I ICC:10kA			
IP55 -20°C to 45°C			
Designed by Pixii		Made in Poland	
PIXII AS, Andøyfaret 33, 4623 Kristiansand, Norway			

Figure 4.33 System label - AC Only

4.10.2 Hybrid

Pixii

PART NAME: Pixii Home OD HYBRID
PART NO: 12524 **HW Rev:** 1.2
BATCH: 1111
FREQUENCY Hz 45-66Hz
ACTIVE PWR ~ +/-10kW (3/1W+N+PE)/(3/2W+PE)
APP. PWR ~ +/-10kVA (3/1W+N+PE)/(3/2W+PE)
PWR FACTOR Default 1, 0,5cap....0,5ind
PV Vmax = 420V
PV Isc = 3x15A
MPPT RANGE = 100 - 400V

TN 3 PHASE ☐
AC VOLTAGE ~ 400/230VAC (3W+N+PE)
AC CURRENT ~ 3x16A (3W+N+PE)


TN 1 PHASE ☐
AC VOLTAGE ~ 230VAC (1W+N+PE)
AC CURRENT ~ 1x50A (1W+N+PE)


IT 3 PHASE ☐
AC VOLTAGE ~ 230VAC (3W+PE)
AC CURRENT ~ 3x29A (3W+PE)



IT 1 PHASE ☐
AC VOLTAGE ~ 230VAC (2W+PE)
AC CURRENT ~ 1x50A (2W+PE)

AC: OVC II Class I
IP55 -20°C to 55°C


Pixii AS, Andøyfaret 15, 4623 Kristiansand S, Norway

WARNING 
Dual Supply

 Isolated inverter

CE



SN: 123456789012

Figure 4.34 System label - Hybrid

4.11 Finalization

4.11.1 Door cover

After successful installation, mount door cover back following steps in Chapter “3.3 Opening the door”.

4.11.2 Heater breaker

Pixii Home is equipped with a single heater mounted at the bottom of the left side cabinet door. The purpose of the heater is to keep the batteries within an operational temperature range in cold environments.

The heaters are enabled by engaging the heater breaker located on the right of the cabinet interior. The breaker is mounted to a DIN rail behind the Gateway control unit.

Please check, if the heater breaker is switched ON after the installation is done.

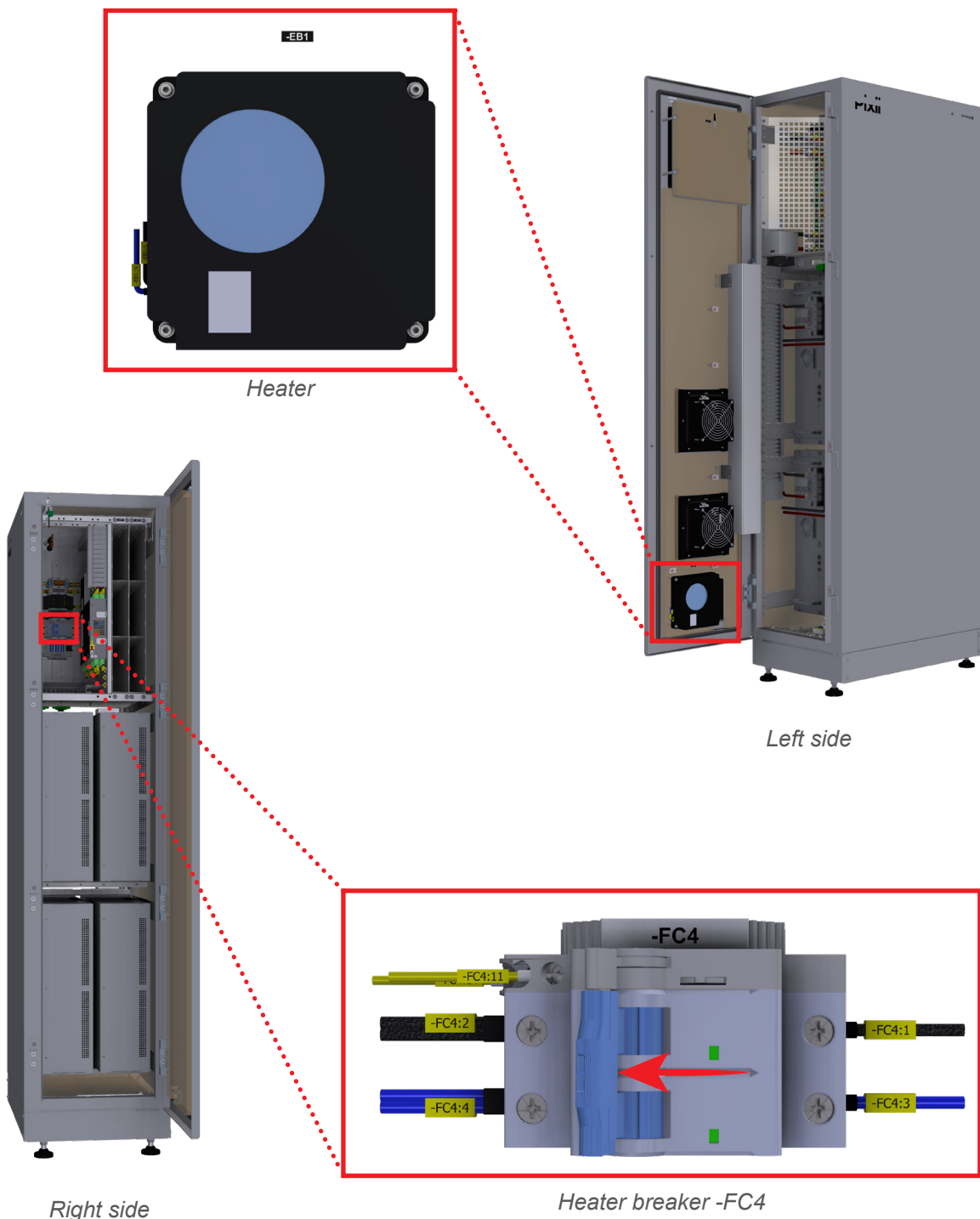


Figure 4.35 Heater breaker

5 Maintenance

To ensure that the system lifetime will be reached, regular inspections of the system are required. To be within warranty terms of the product the owner must follow the complete maintenance procedure. This procedure can be adapted based on local conditions and regulations. Pixii recommends a complete system maintenance at least once every two years, except for filters that may need more frequent inspection based on local environmental conditions.

Only authorized and qualified persons are allowed to perform system maintenance. These persons must be familiar with the system and must follow all precautions described in this manual. Below is a non-exhaustive list of points for general consideration. Do not limit the evaluation to only those points.

NOTE:

For repair and replacement use only original Pixii parts and in accordance with technical specification provided by Pixii. Use of non-original parts may void the warranty provided by Pixii.

5.1 System

- Remove all objects around cabinet that can block air flow.
- Check for physical damage on the cabinet body. Repair scratches with RAL 9006 paint. If the cabinet body has severe damage, like deformation or holes, the system should immediately be taken out of operation and replaced with a new cabinet.
- Check the door hinges and apply oil or grease if needed.
- Check that the door gasket has no visible damage.
- Check that all cabinet entry points are correctly sealed and there is no possibility of water and dust entering the cabinet.
- Check the batteries, look for possible leakage and mechanical damage.
- Check that all accessible cables are not mechanically damaged.
- Check that all screws are at the right torque and the batteries are tightly fixed to the racks (Torque table is in chapter “1.1 Recommended tools and torque” on page 8).
- The filters needs to be replaced at least every two years, depending on the environmental conditions.
- Check that the mains input cable well tightened (Torque table is in chapter “1.1 Recommended tools and torque” on page 8).

5.2 Firmware upgrade

Please refer to Configuration Guide *13298_Pixii PowerShaper Firmware upgrade instructions*.
The setup for the PixiiHome system is identical.

5.3 Alarm and Diagnostics

Please refer to Configuration Guide *13911_Pixii PowerShaper Alarms and Diagnostics*.
The setup for the PixiiHome system is identical.

5.4 Commissioning

See document *16012_Commissioning guide_Pixii Home Outdoor Cabinet*.

6 De-Installation procedure

Switch OFF internal breakers (-FC4).

Switch OFF external upstream breaker.

Check if the system is completely voltage free.

Disconnect input cable.

Remove all modules.

Disconnect battery cables and then the batteries.

Lose the cabinet from the wall by removing the wall mounting kit.

• •
PIXII

