CEGASA

Energy you can trust

E/Xpand HV

Installation Manual

Original manual
October 2025

Control of revisions

DATE	DESCRIPTION
October 2025	Content update

Table of Contents

1 INTRODUCTION

Read this manual carefully to ensure the energy storage Battery System is properly installed. All these operations must be performed by a qualified and authorised technician.

1.1 PURPOSE OF THE MANUAL

This is the complete manual for the installation of the energy storage system made up of the following products.

Table 1-1. Glossary.

TERM	DEFINITION
Module	HV EXpand Module.
BMU	EXpand BMU control unit.
EXpand Master	EXpand Master MCS unit.
PDC	PDC distribution and protection cabinets.
Inverter	Hybrid inverter.
Frame	Metal cabinet for housing Modules and BMUs
Rack	Group of modules assembled on a frame.
String	Group of modules connected in series, assembled on one or more racks and controlled by an HV EXpand BMU control unit.
Battery System	Energy storage battery system.
CEGASA web app	Battery system monitoring platform.
CEGASA Cloud	Cloud platform.

1.2 CONFIDENTIALITY

All the information provided by CEGASA ENERGIA SLU by virtue of this manual and any data or aspects that may become known as a result thereof will be absolutely confidential, and may not be provided to third parties or used for any purpose other than that intended, without the prior and express written authorisation of CEGASA ENERGIA SLU, (hereinafter CEGASA).

1.3 SAFETY DURING ASSEMBLY

The Battery System has been designed and tested in accordance with international safety standards. However, to avoid personal injury and property damage and ensure long-term operation of the Battery System, please read this section carefully and follow all recommended safety measures.

1.3.1 General

- The area around the Battery System must be kept clear and free of combustible materials, petrol and/or other flammable vapours and liquids.
- Any air inlet or outlet in the room must be clear and free of obstacles.
- There must be no signs of deterioration in any component of the Battery System. Contact CEGASA with any questions.
- Do not manipulate any internal components or access the interior of the BMU, the EXpand Master, or the Modules.
- Do not use or manipulate the Battery System components if your feet or hands are wet.
- Ensure that the output and input connection cables are not short circuited.
- Ensure that there is no short-circuit between positive and negative terminals at any point.
- Follow the specifications proposed by CEGASA for the power and communications cables of the installation.
- Do not use, manipulate, install or store any of the components of the Battery System in locations with high humidity levels or subject to adverse weather conditions.

1.3.2 Mechanical

- The floor must be capable of holding the weight of the entire system, made up of one or multiple racks. The floor must be in optimal condition.
- Due to the weight of the Modules (120 kg approx.), they must be installed by two people with the aid of machinery (pallet jack or forklift).
- Fix the rack to the wall at a height according to the instructions.

1.3.3 Fire prevention measures

- Ensure there is a carbon dioxide extinguisher nearby.
- Do not use water to extinguish the fire.
- Full protective clothing and self-contained breathing apparatus are required for firefighters to extinguish the fire.

1.3.4 Anti-electrolyte measures

If the Battery System loses electrolyte due to a system malfunction, avoid contact with the leaking liquid or gas.

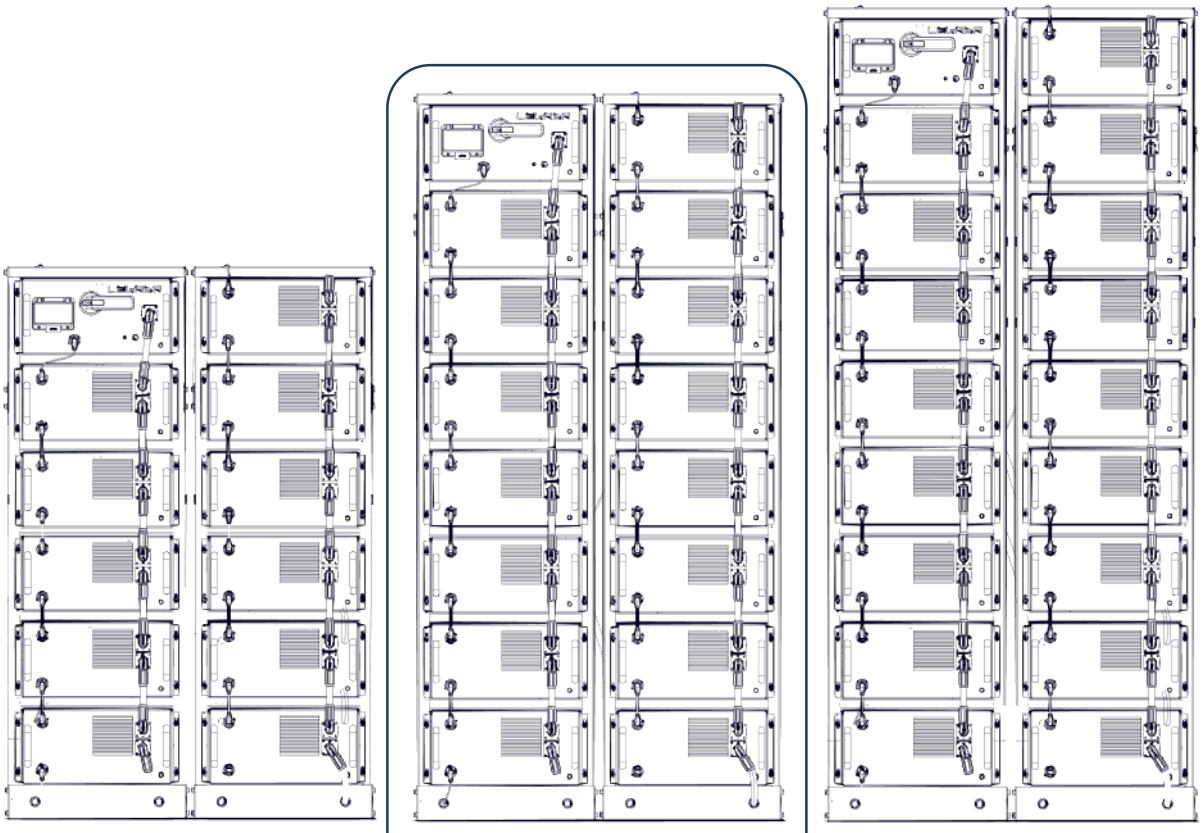
Electrolyte is corrosive and contact can cause skin irritation and chemical burns. In case of exposure to this substance, proceed as follows:

- Inhalation: Evacuate the contaminated area.
- Contact with eyes: Rinse eyes with cold water for 15 minutes.
- Contact with skin: Carefully wash the affected area with cold water and soap.
- Ingestion: Induce vomiting.

In any of the above cases, seek immediate medical assistance.

1.4 CONSIDERATIONS TO KEEP IN MIND

This installation manual is based on an **8-level rack**. However, the design and instructions provided here are also applicable to the 6- and 9-level versions of the same model.



6 levels

8 levels

9 levels

2 COMPONENTS

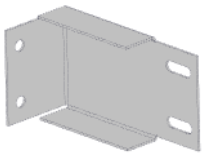
2.1 FRAME

- 6 modules: **110207**
- 8 modules: **110209**
- 9 modules: **110212**

CS1

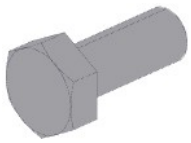
Frame X1

CS2



Wall bracket X2

CS3



M8x20 Screw X4

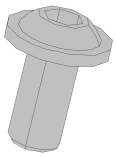
CS4

DIN125 M8 Washer X4

CS5

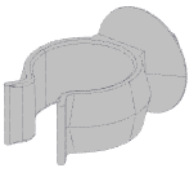
Levelling plate X2

CS6



DIN7380 FL M6x16 Screw X36

CS7



Clamp X5

2.2 SIDE CLOSURE PANEL

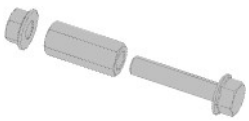
- 6 modules: **110208**
- 8 modules: **110211**
- 9 modules: **110213**

CT1

Closure panel X1

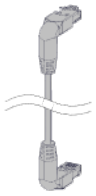
2.3 RACK KIT

CR1



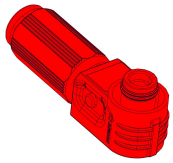
Bushing - Screw - Nut X4

CR2



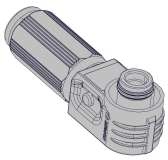
5 m COMMS cable X1

CR3



Positive aerial connector X1

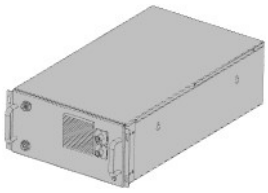
CR4



Negative aerial connector X1

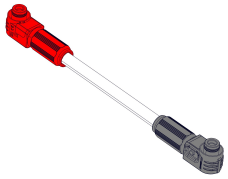
2.4 HV EXPAND MODULE (110162)

CM1



HV EXpand Module X1

CM2



Module POT Cable X1

CM3

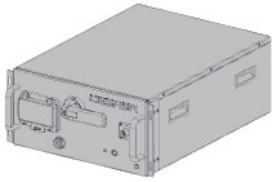
Module COMMS Cable X1

CM4

Earthing cable X1

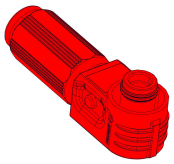
2.5 EXPAND BMU CONTROL UNIT (110201)

CB1



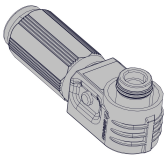
BMU X1

CB2



Positive aerial connector X3

CB3



Negative aerial connector X1

CB4

Hook X4

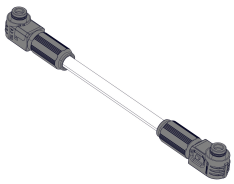
CB5

BMU COMMS cable X1

CB6

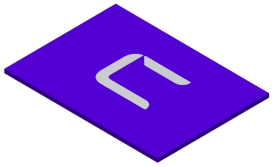
Earthing cable X1

CB7



BMU POT cable X1

CB8



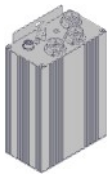
BMU QR Card X1

CB9

M6 nut, washer, and grower washer set X1

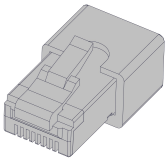
2.6 EXPAND MASTER MCS

CE1



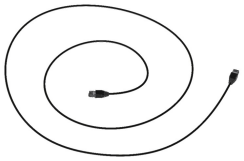
EXpand Master MCS Unit 110202 X1

CE2



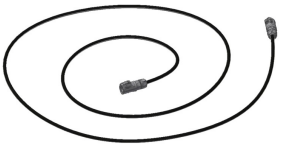
Termination resistor X1

CE3



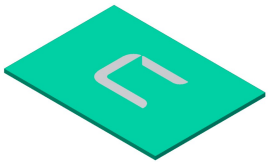
EXpand Master-BMU COMMS cable X1

CE4



EXpand Master external power cable X1

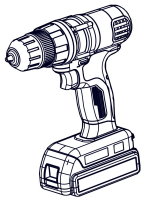
CE5



MCS QR Card X1

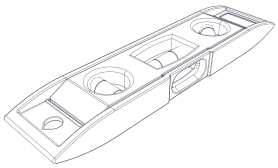
3 NECESSARY TOOLS

T1



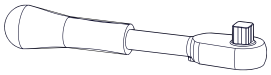
Drill

T2



Spirit level

T3

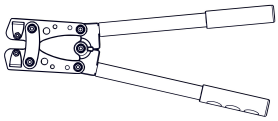


Ratchet

T4

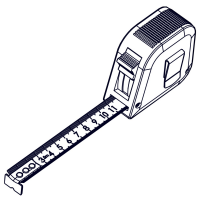
5 Allen key

T5



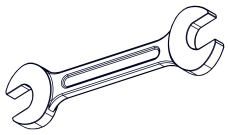
Crimper

T6



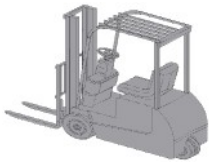
Tape measure

T7



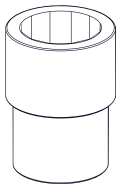
Spanner

T8



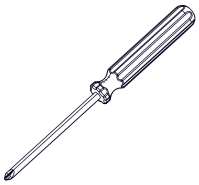
Pallet jack

T9



13 socket

T10

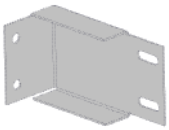
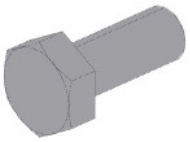


Phillips screwdriver

4 INSTALLATION

4.1 A SINGLE RACK

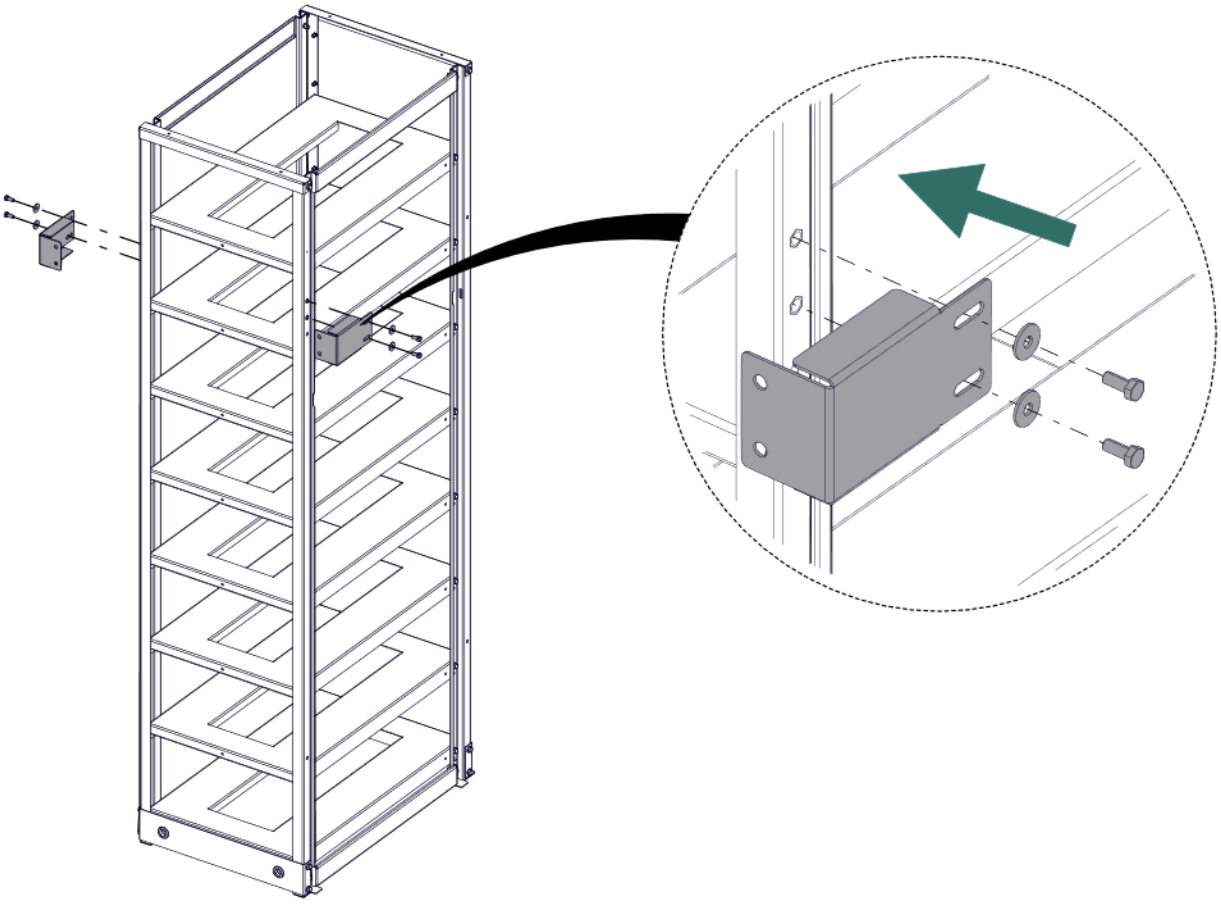
1

CS1	CS2	CS3
		
Frame X1	Wall bracket X2	M8x20 Screw X4

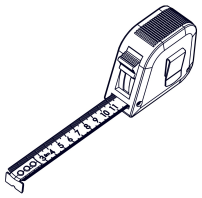
CS4

DIN125 M8 Washer X4

Tighten by hand so that they can be adjusted later



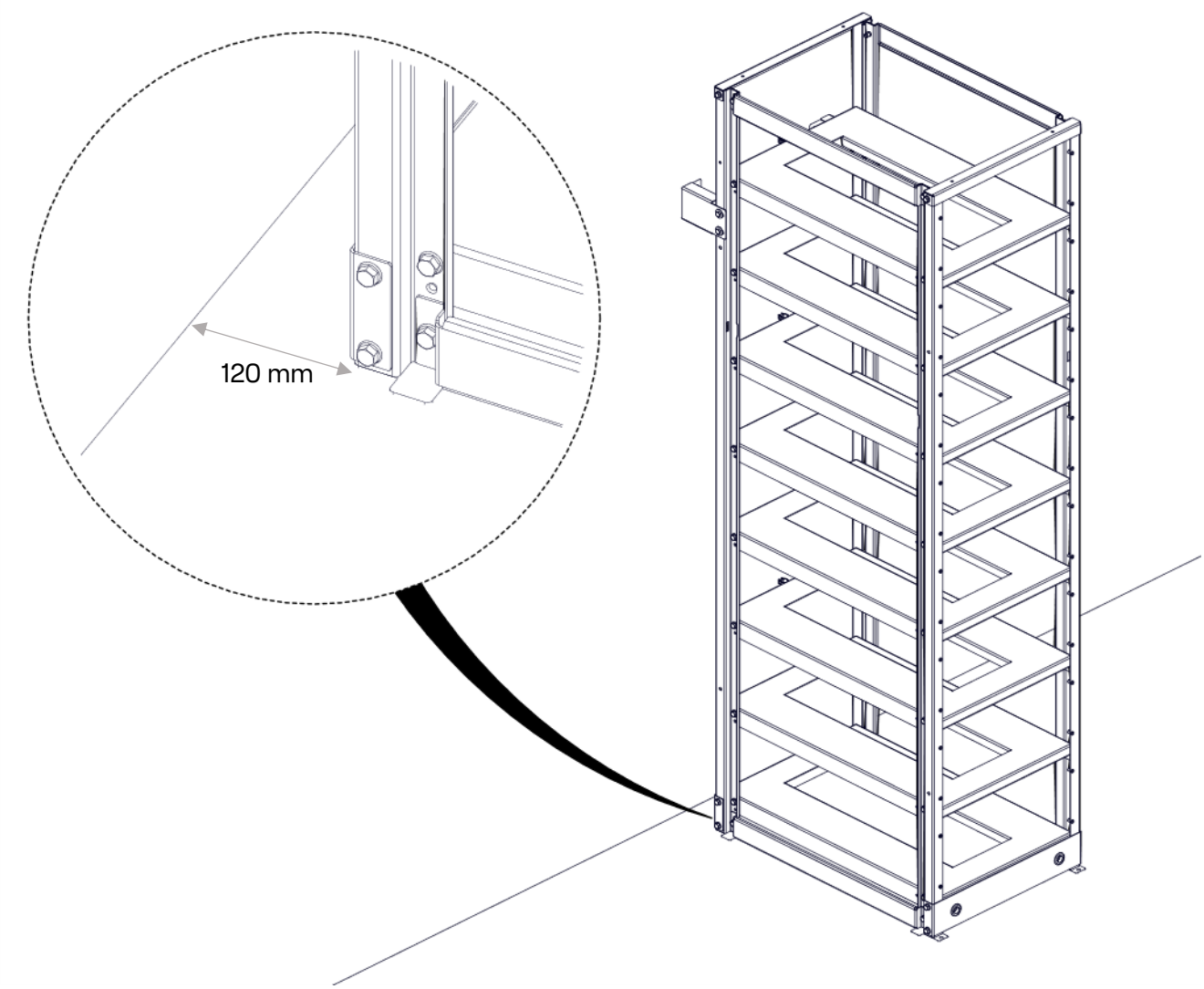
2



T6

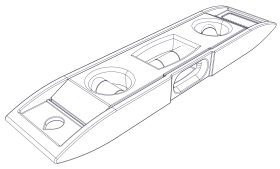
Tape measure

Ensure that there is a distance of 120 mm between the rear of the frame and the wall



3

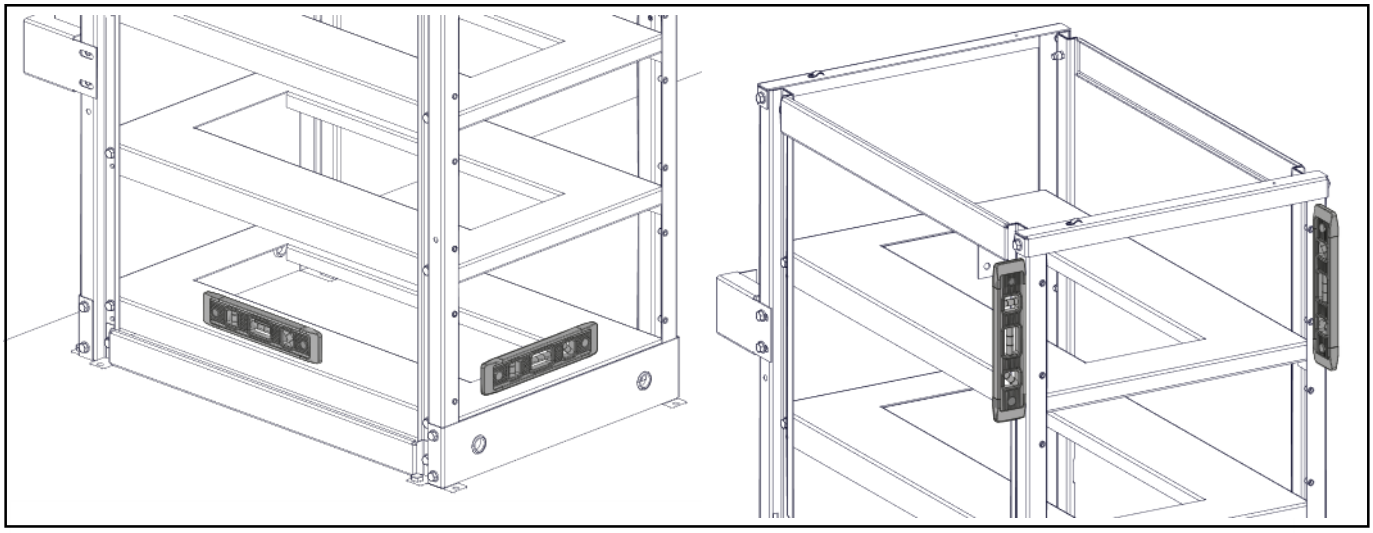
T2

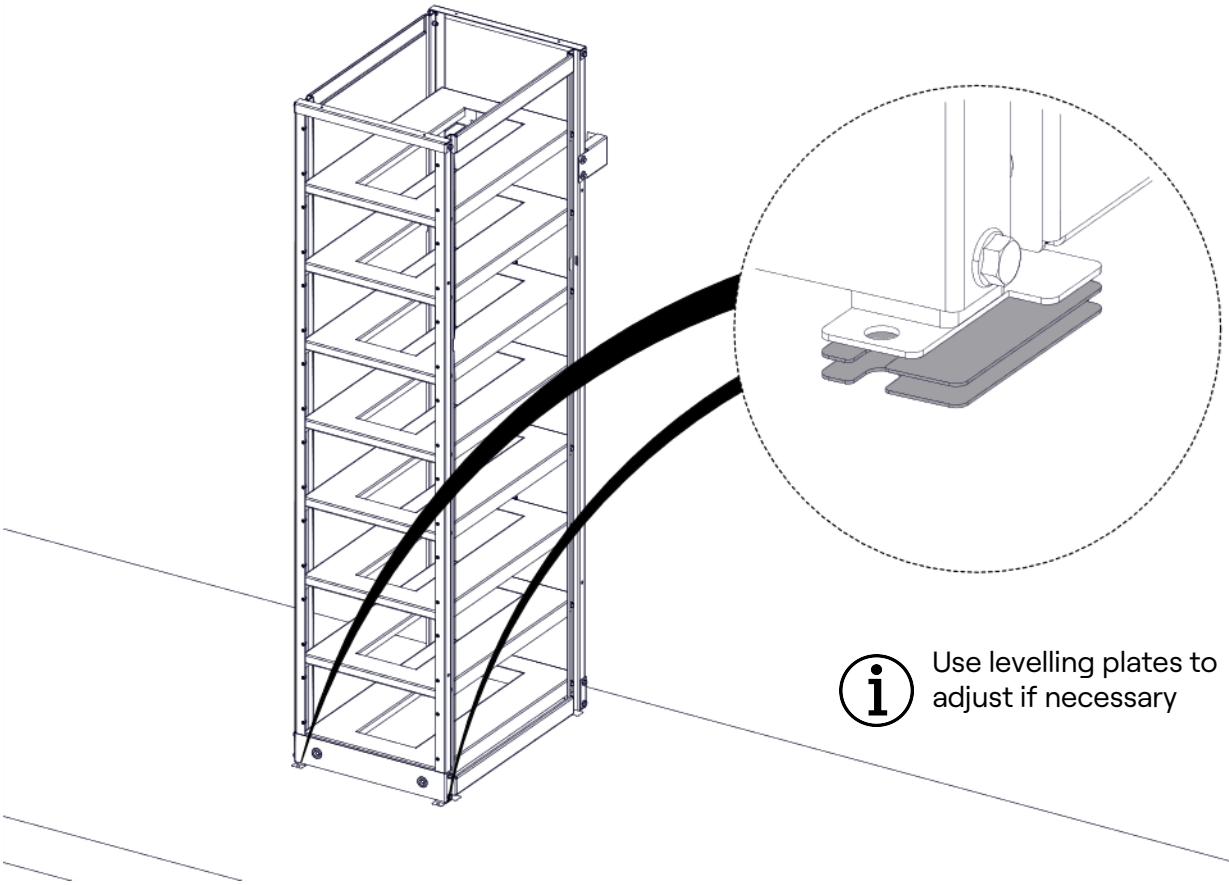


Spirit level

CS5

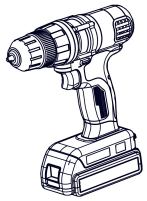
Levelling plate





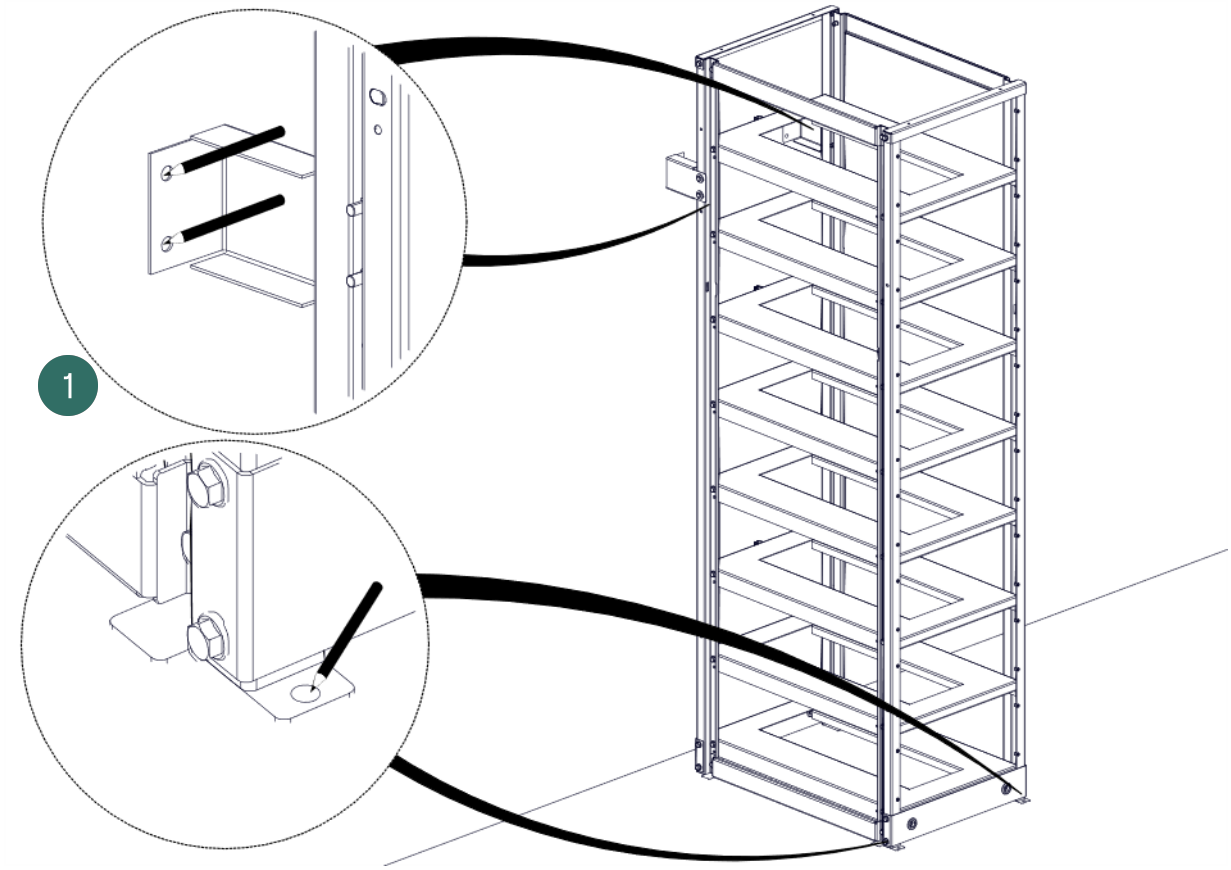
Use levelling plates to adjust if necessary

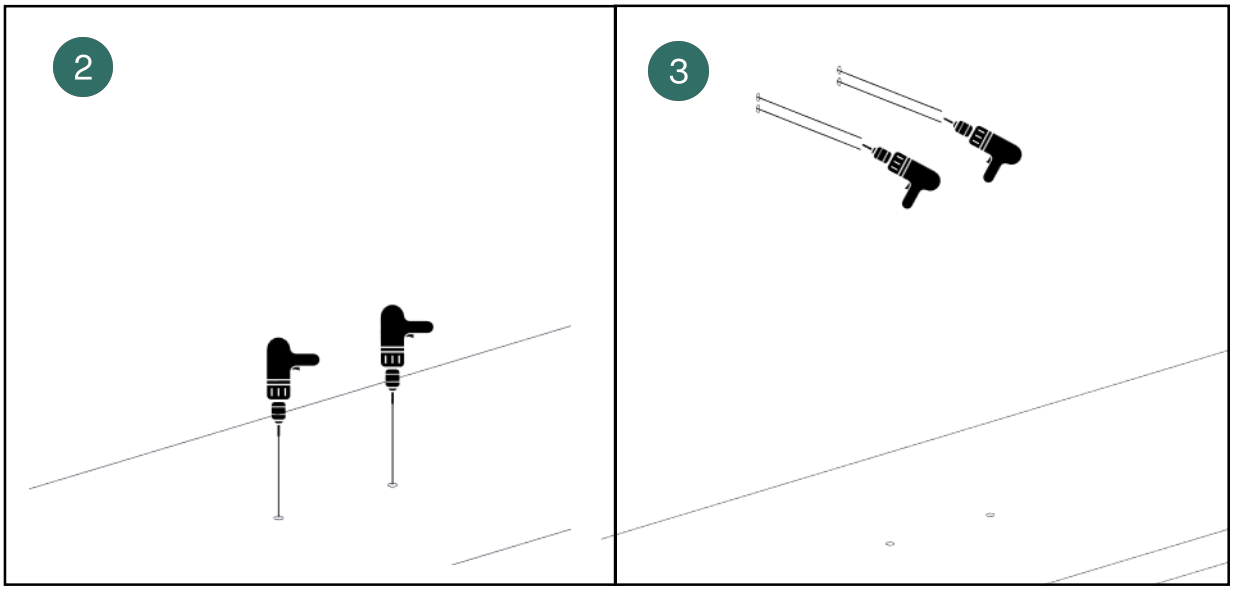
4



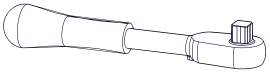
T1

Drill X1



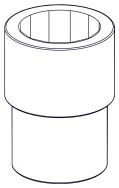


5



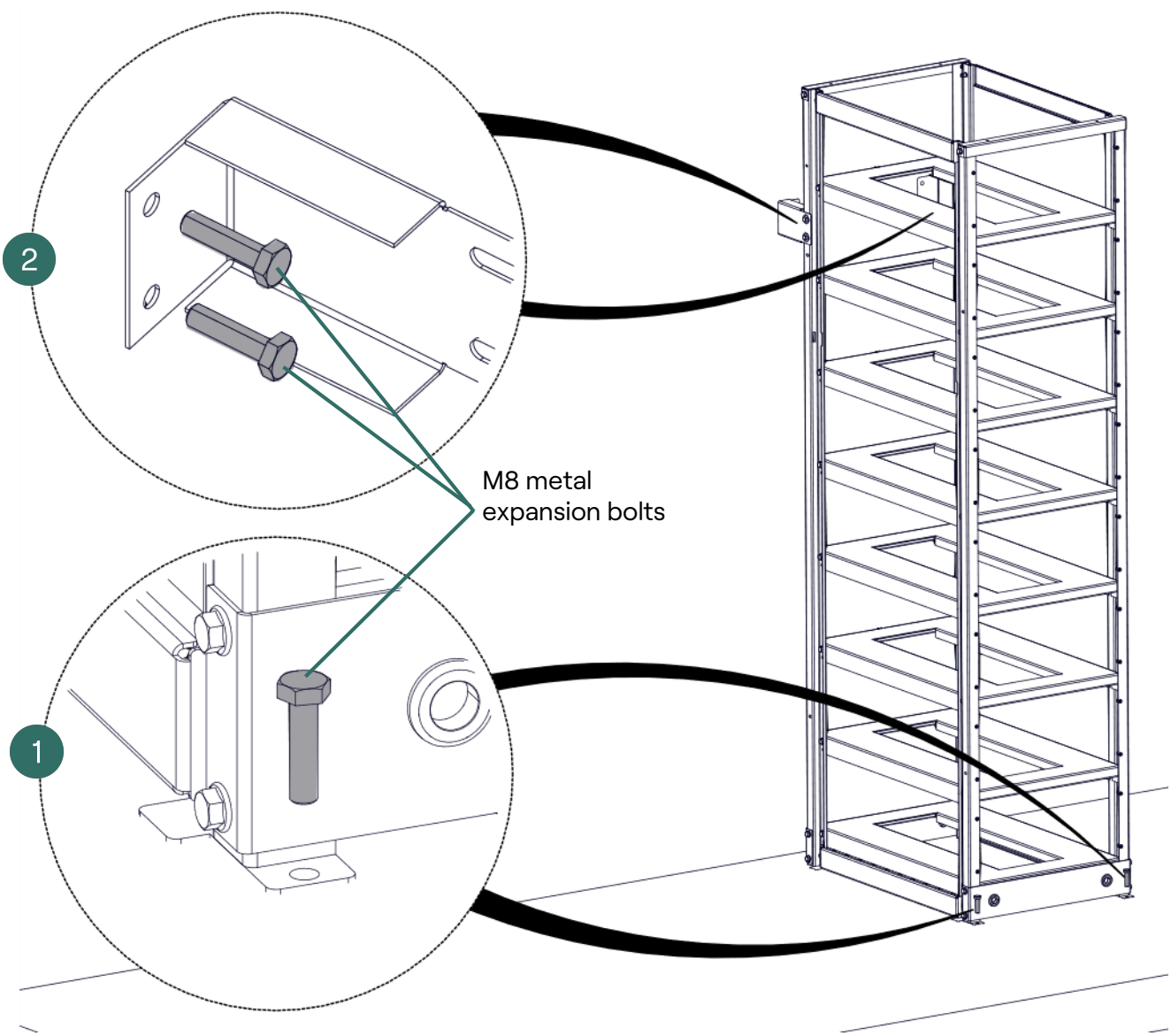
T3

Ratchet



T9

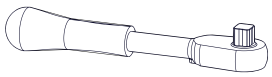
13 socket



Use of M8 metal expansion bolts is recommended.
Not provided by CEGASA.

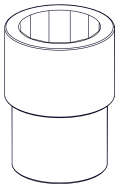
6

T3



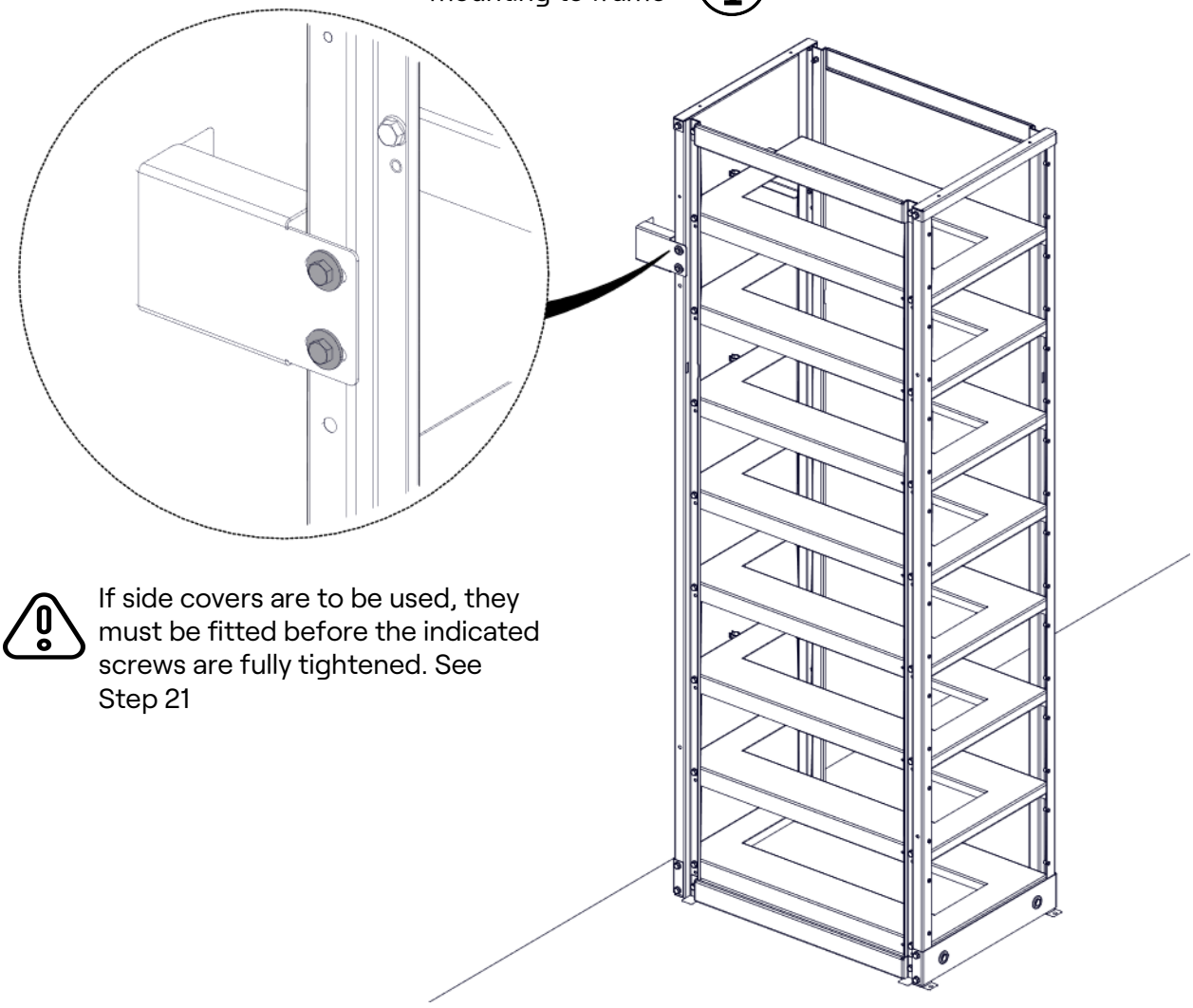
Ratchet

T9



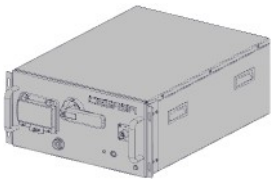
13 socket

Tighten wall mounting to frame



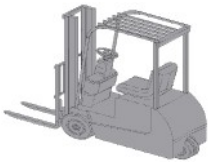
If side covers are to be used, they must be fitted before the indicated screws are fully tightened. See Step 21

7



CB1

BMU X1

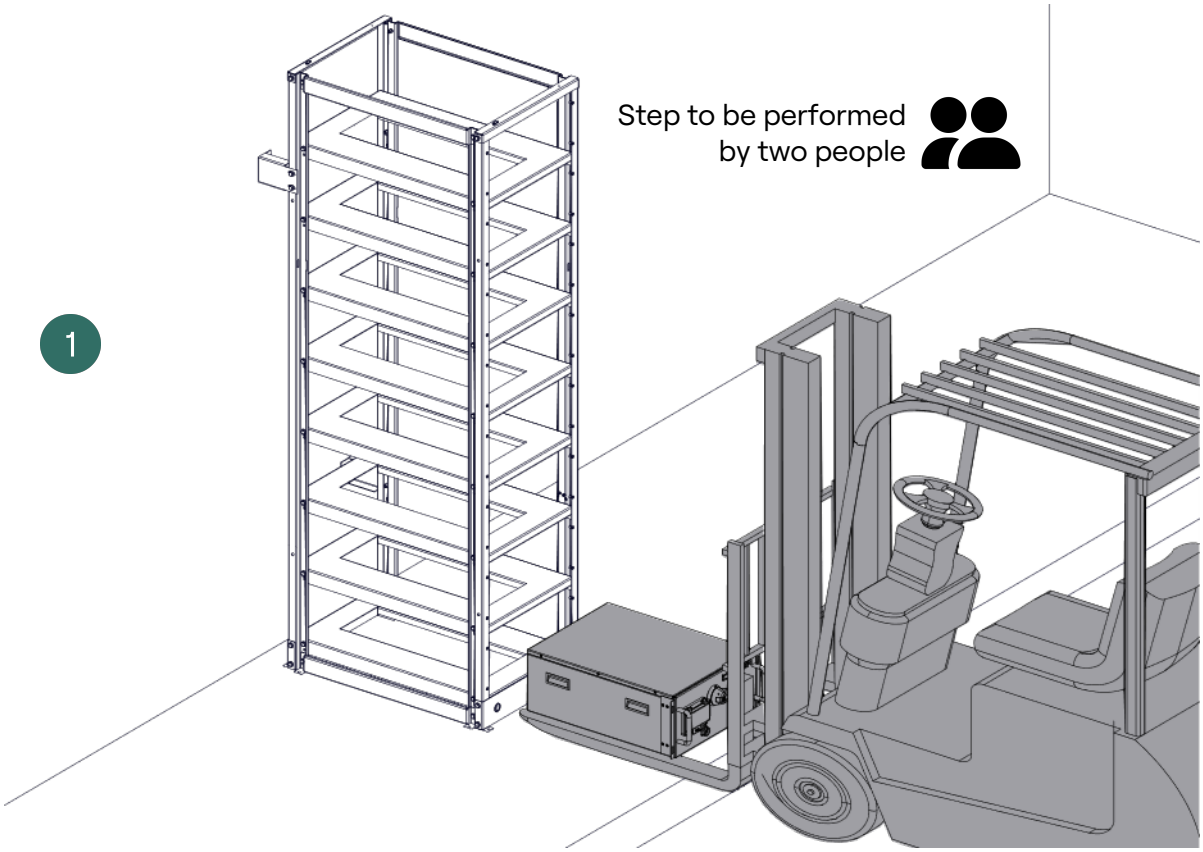


T8

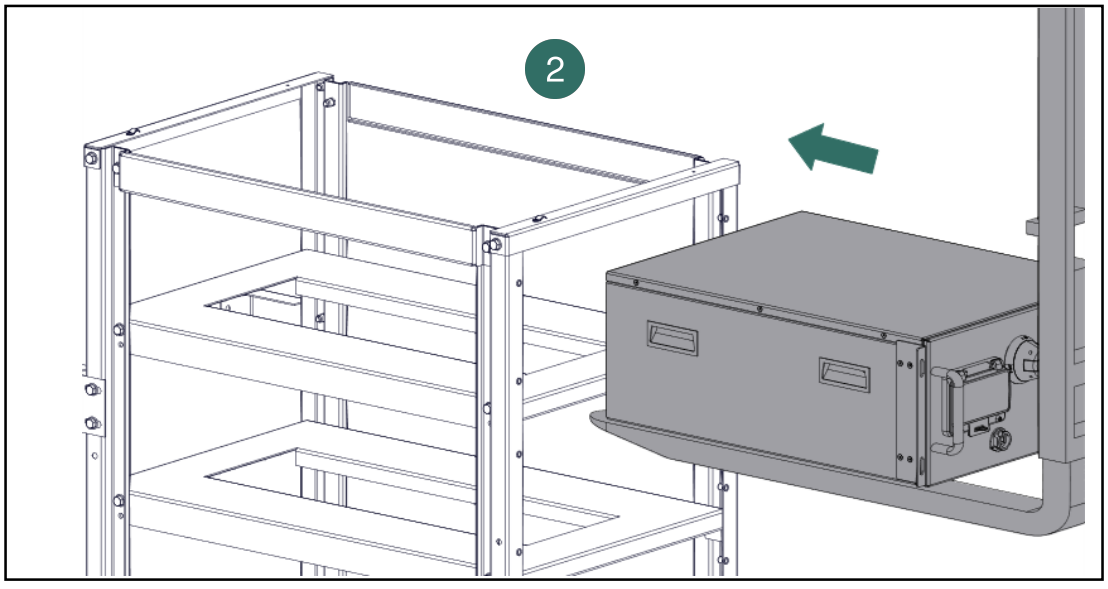
Pallet jack

Step to be performed by two people

1



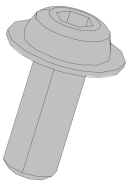
2



8

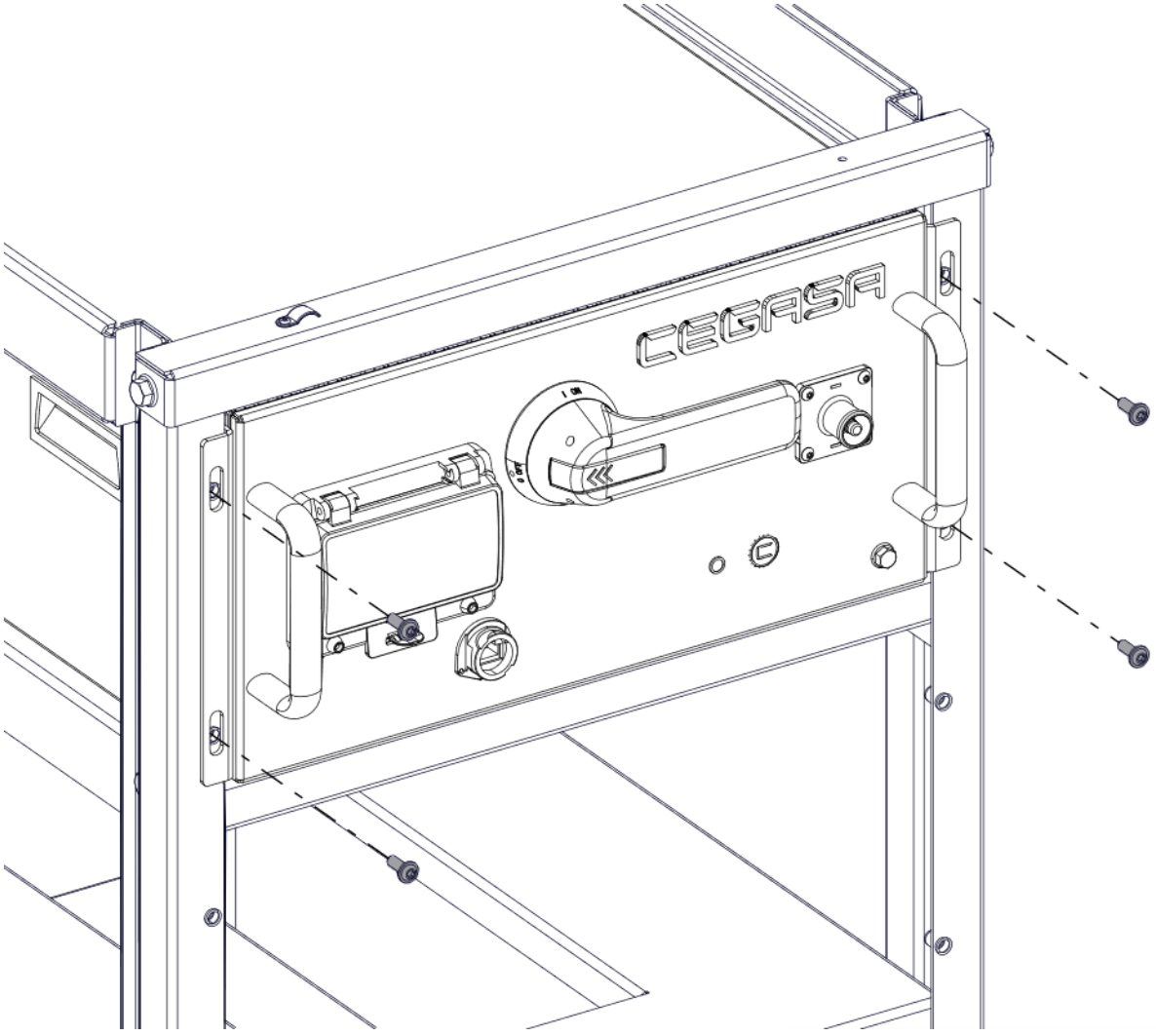
T4

5 Allen key

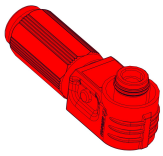


CS6

M6 Screw X4



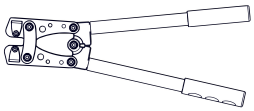
9



CB2

Positive aerial connector

X1

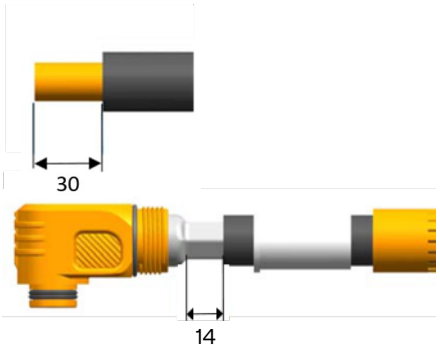


T5

Crimper

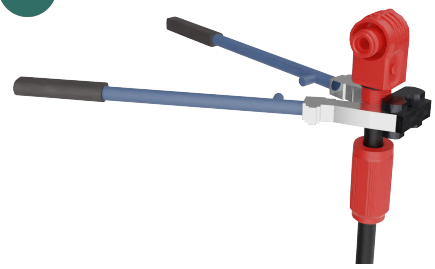
Cable not provided by CEGASA. Use a **1000 VDC 70 MM2 cable.**

1



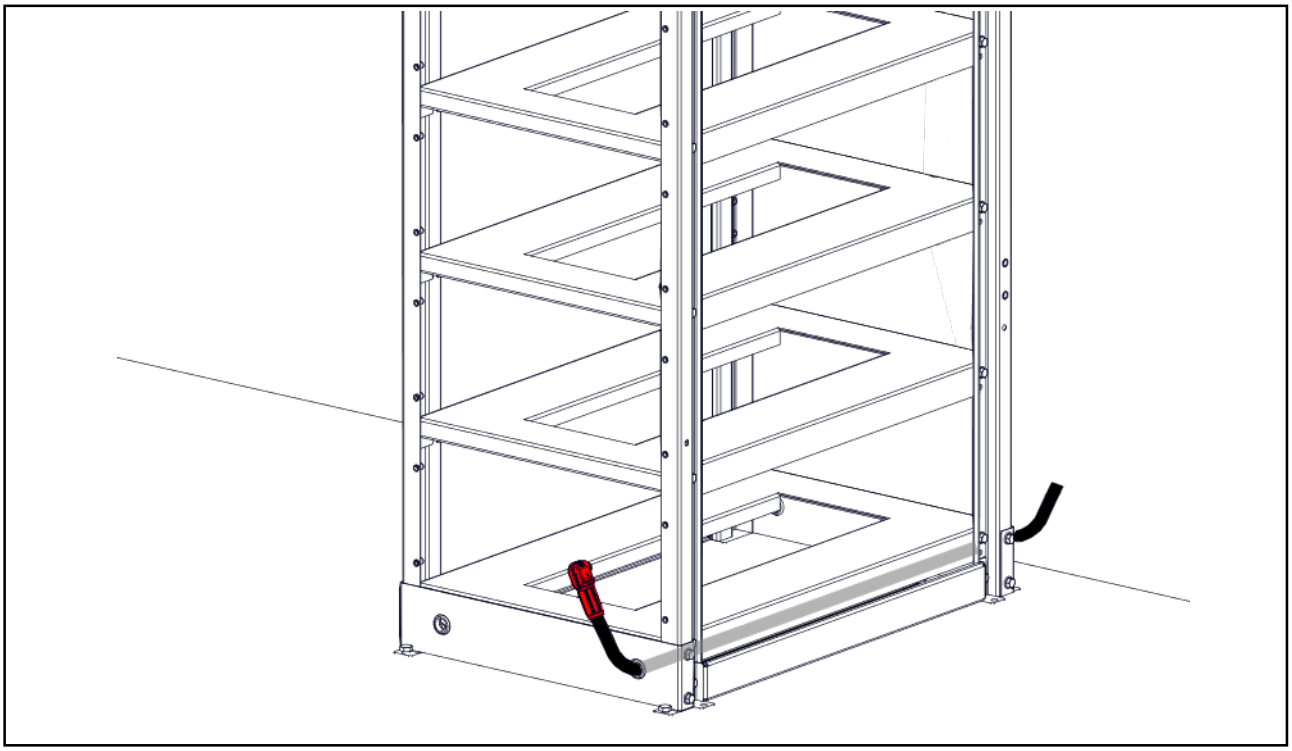
Crimp the positive and negative aerial connector

2

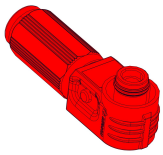


3

Check that the cable is well crimped. If in doubt, contact CEGASA.

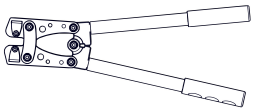


10



CB2

Positive aerial connector X1

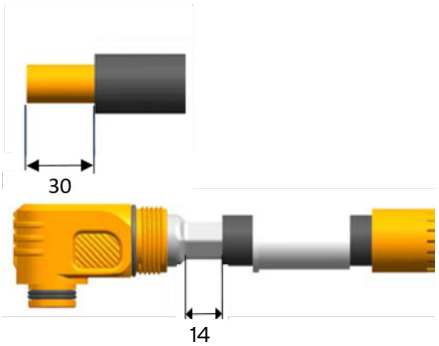


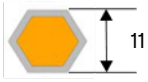
T5

Crimper

Cable not provided by CEGASA. Use a **1000 VDC 70 MM2 cable.**

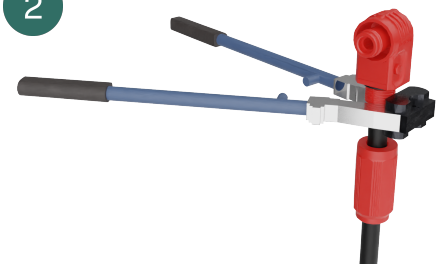
1





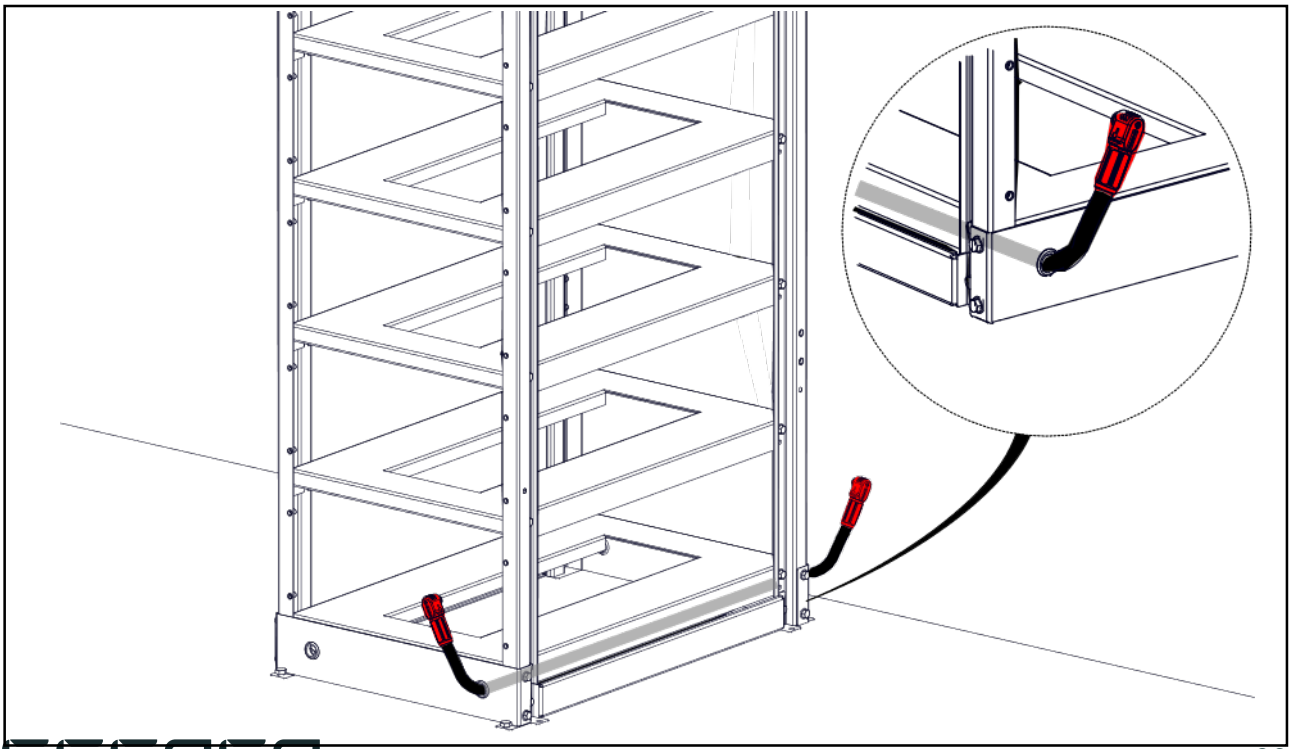
Crimp the positive and negative aerial connector

2

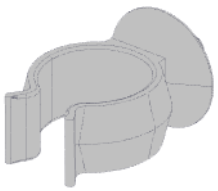


3

Check that the cable is well crimped. If in doubt, contact CEGASA.

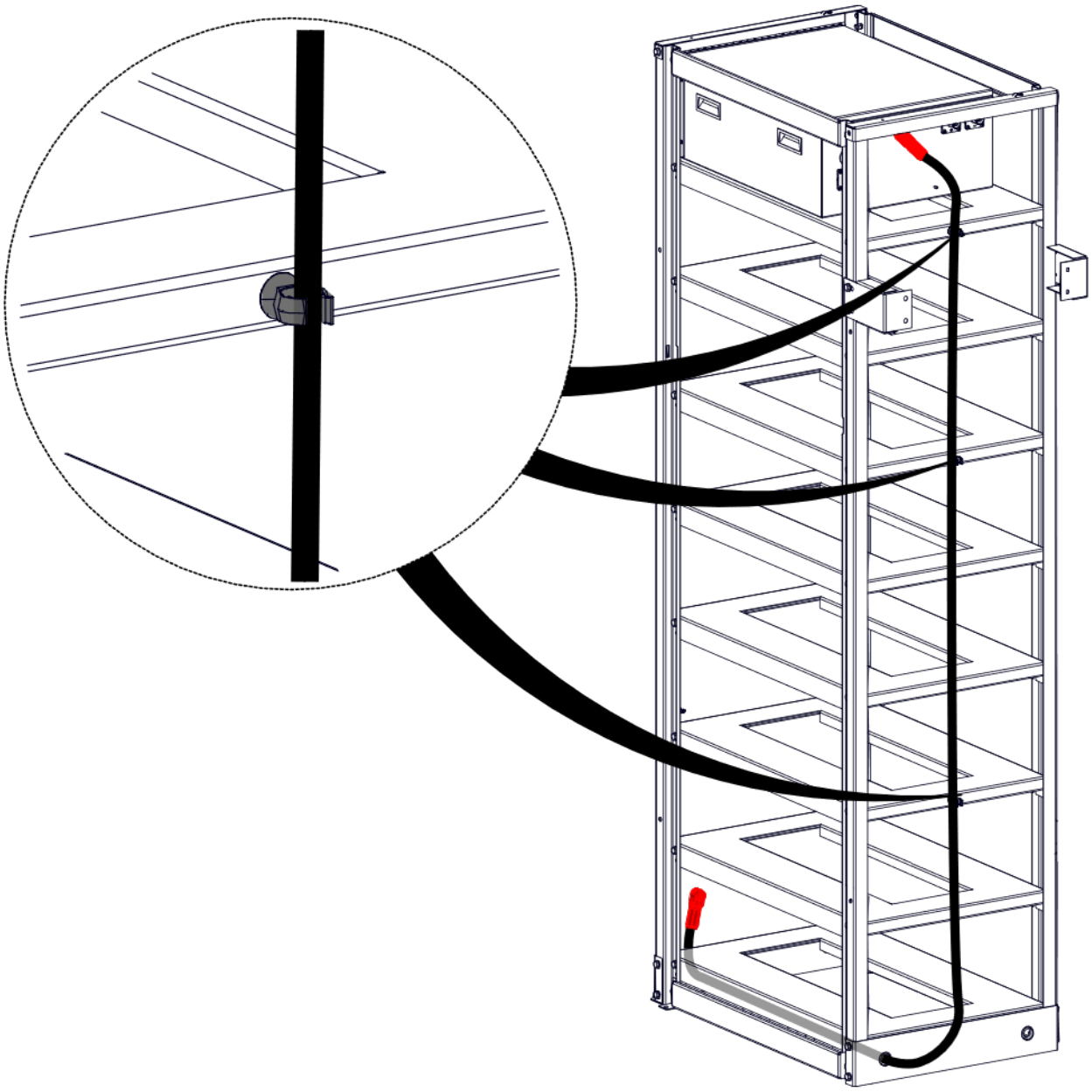


11

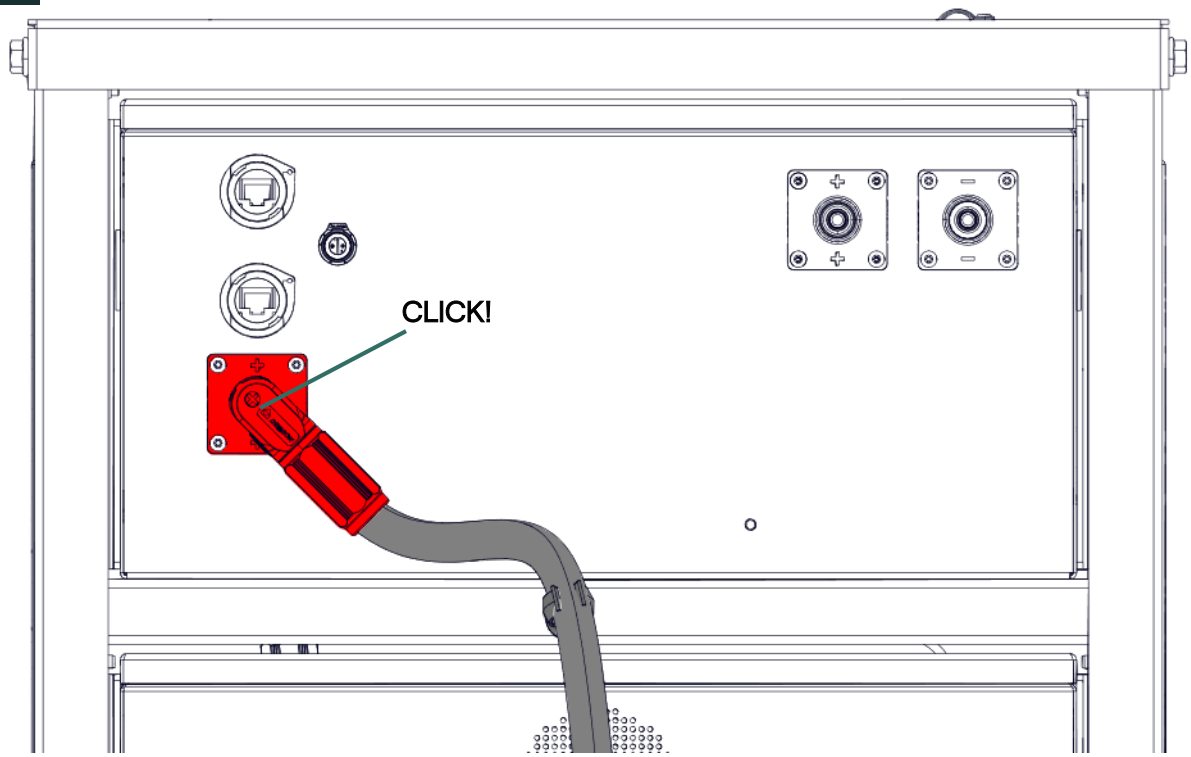


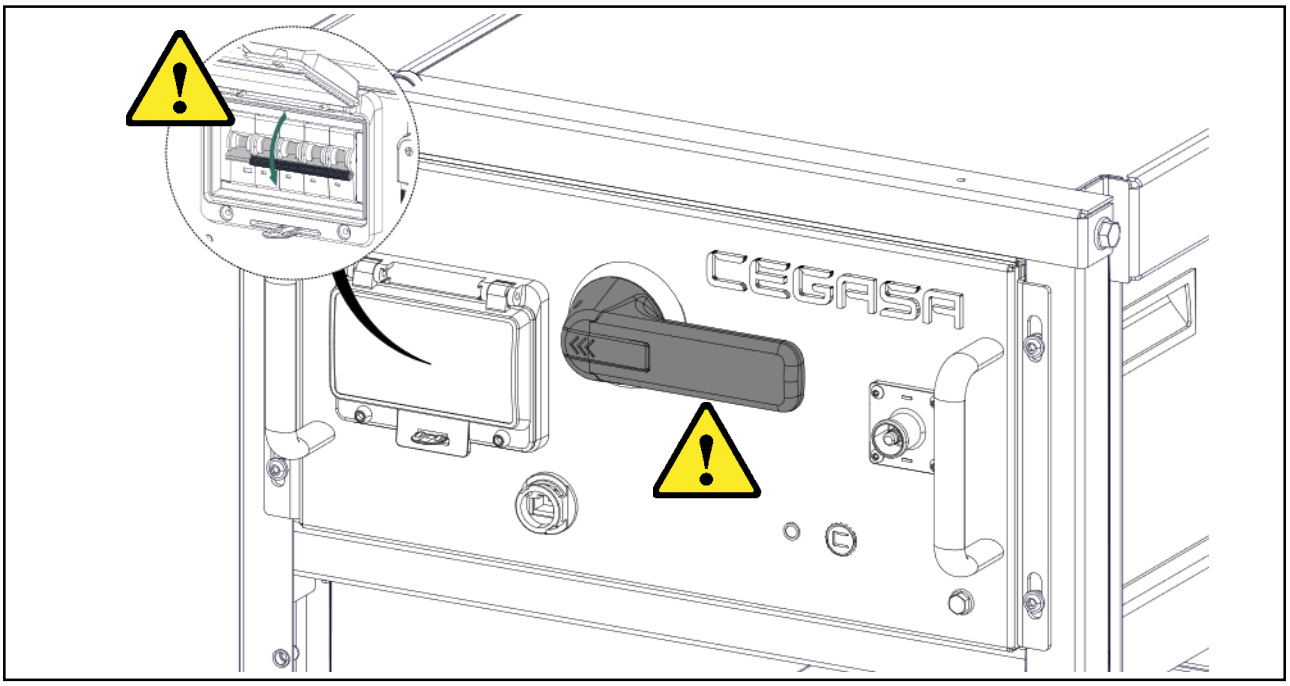
CS4

Cable grommet X3



12





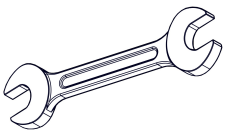
13

CB6

Earthing cable X1

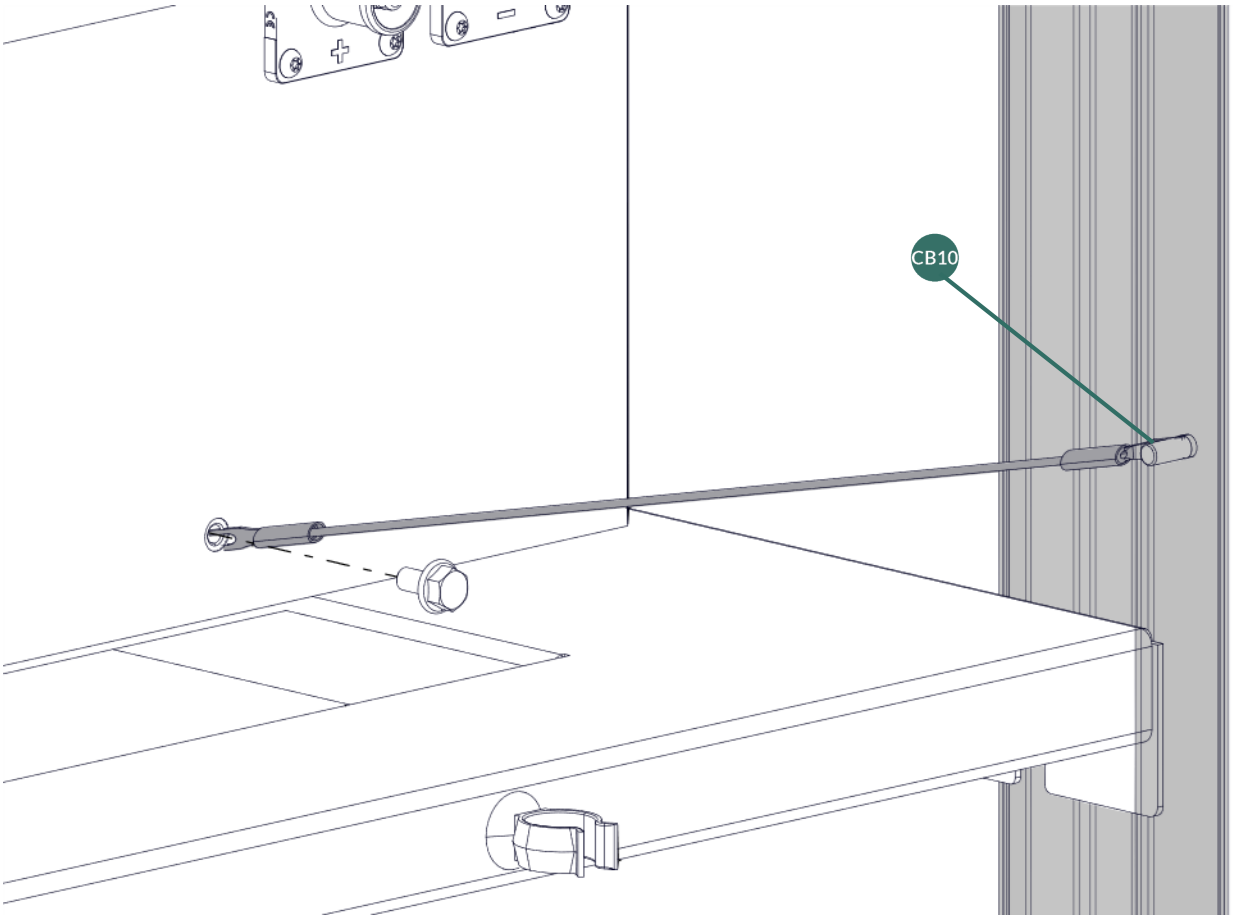
CB10

M6 nut, washer, and grower washer set X1

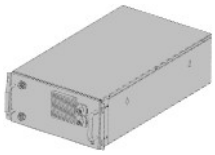


T7

Spanner

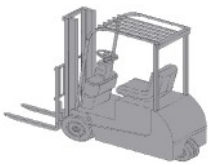


14 A



CM1

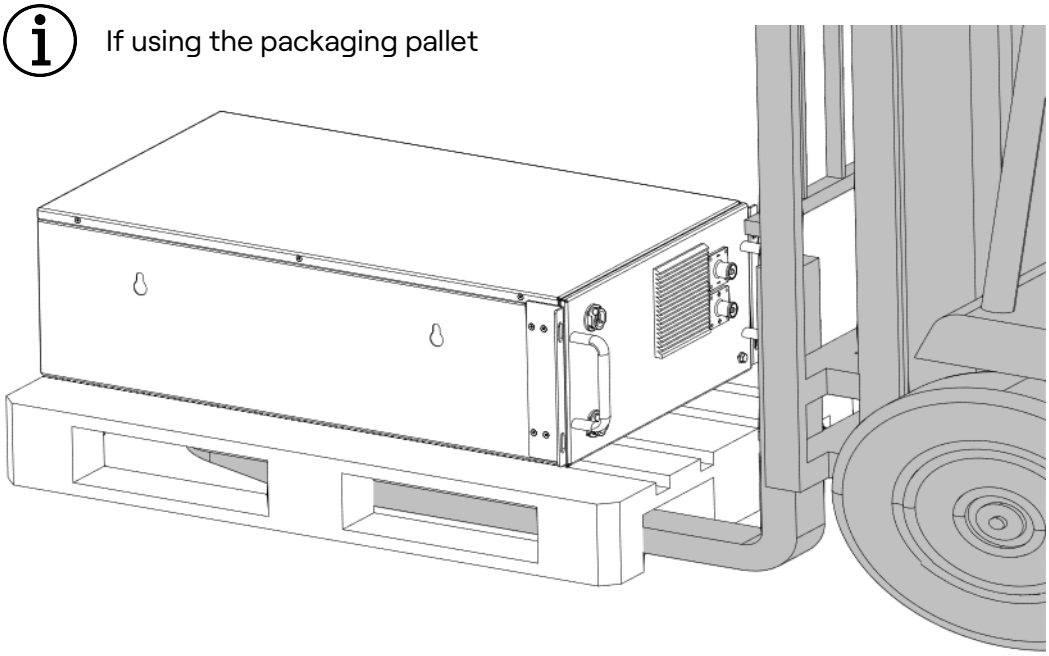
HV EXpand Module

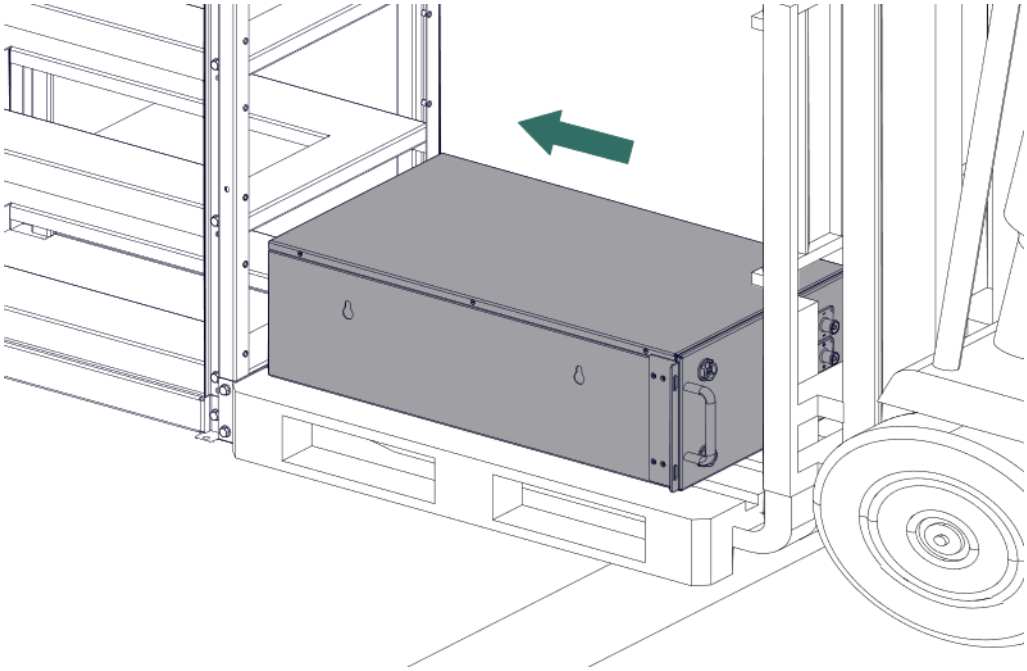


T8

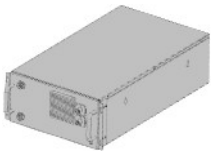
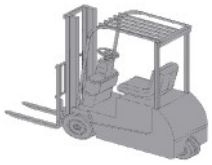
Pallet jack

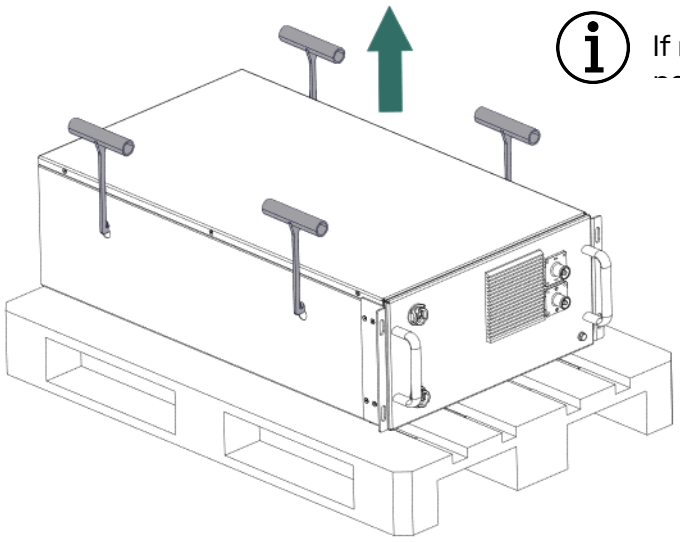
If using the packaging pallet





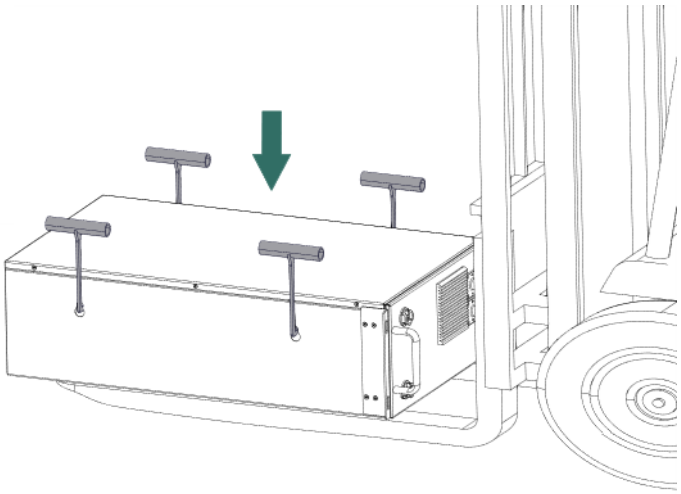
14 B

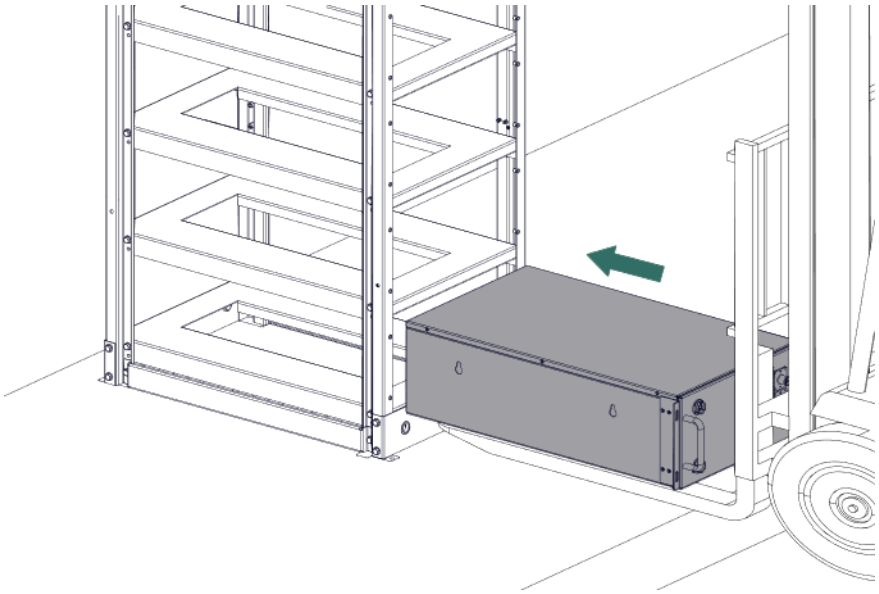
CM1	CB4	T8
		
HV EXpand Module	Hook	Pallet jack



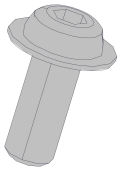
If removing the module from the packaging pallet

Step to be performed by several people





15

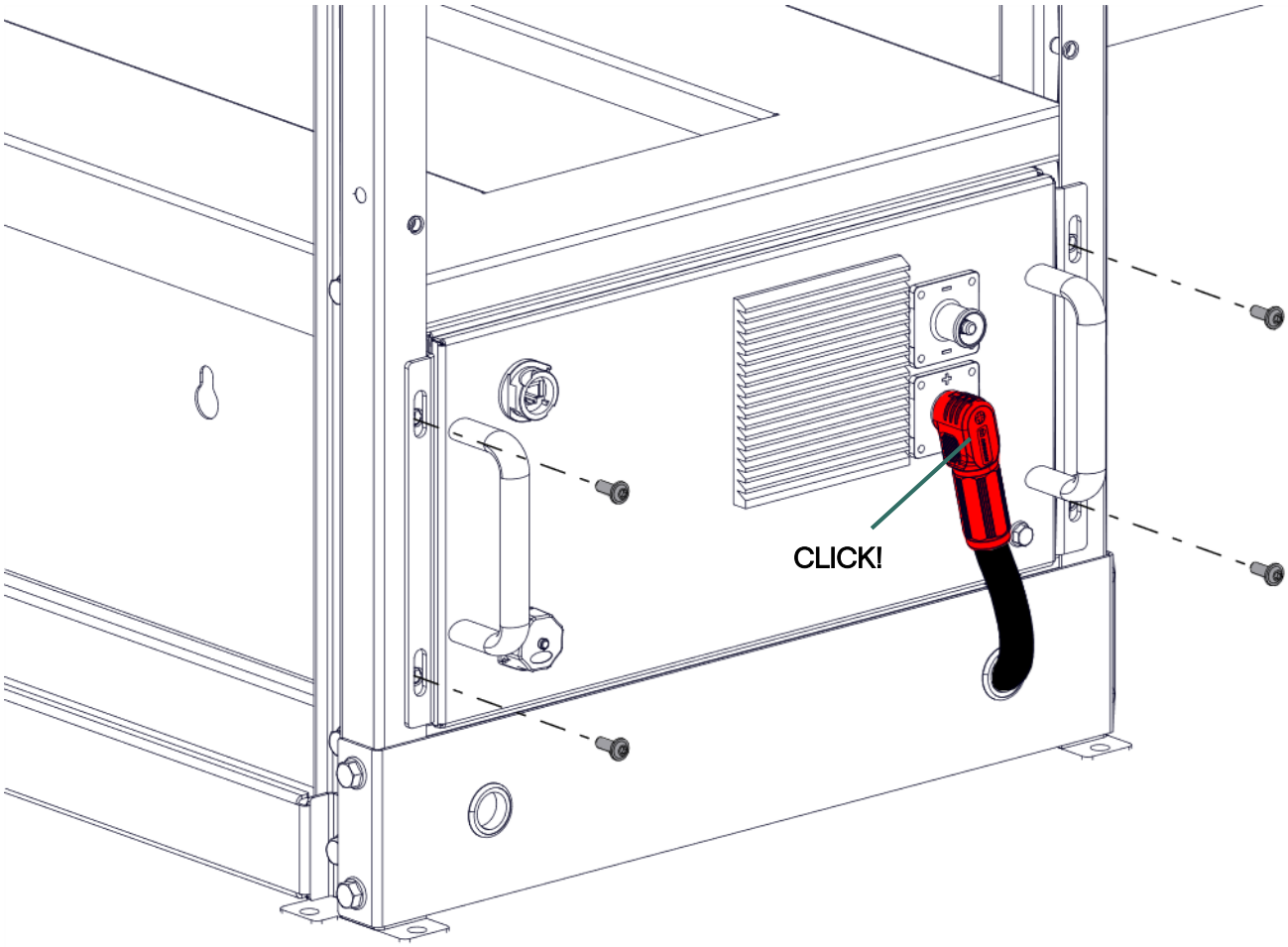


CS6

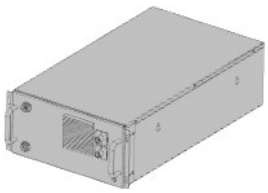
DIN7380 FL M6x16 Screw X4

T4

5 Allen key

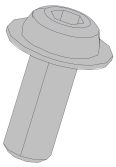


16



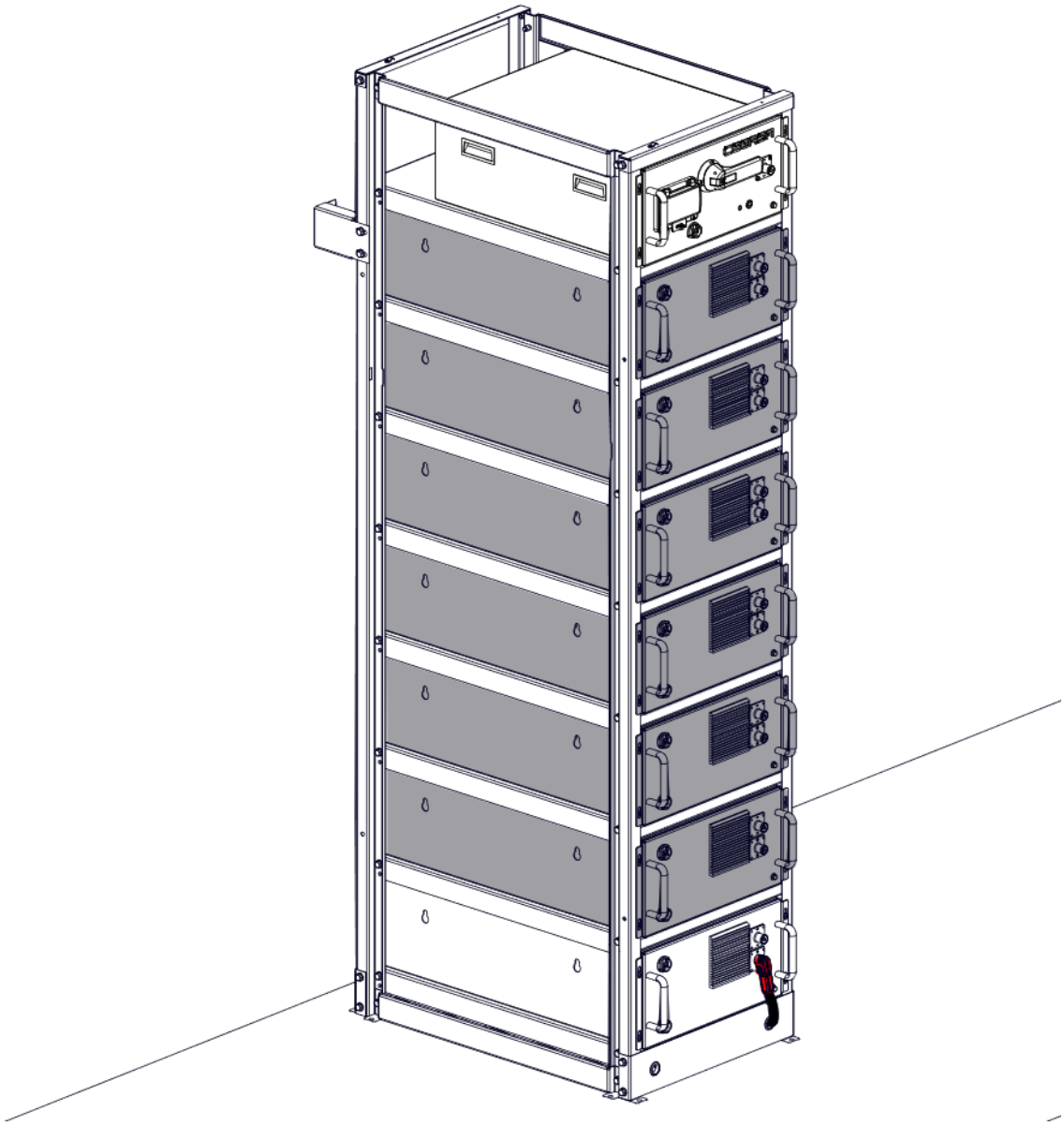
CM1

HV EXpand Module X6



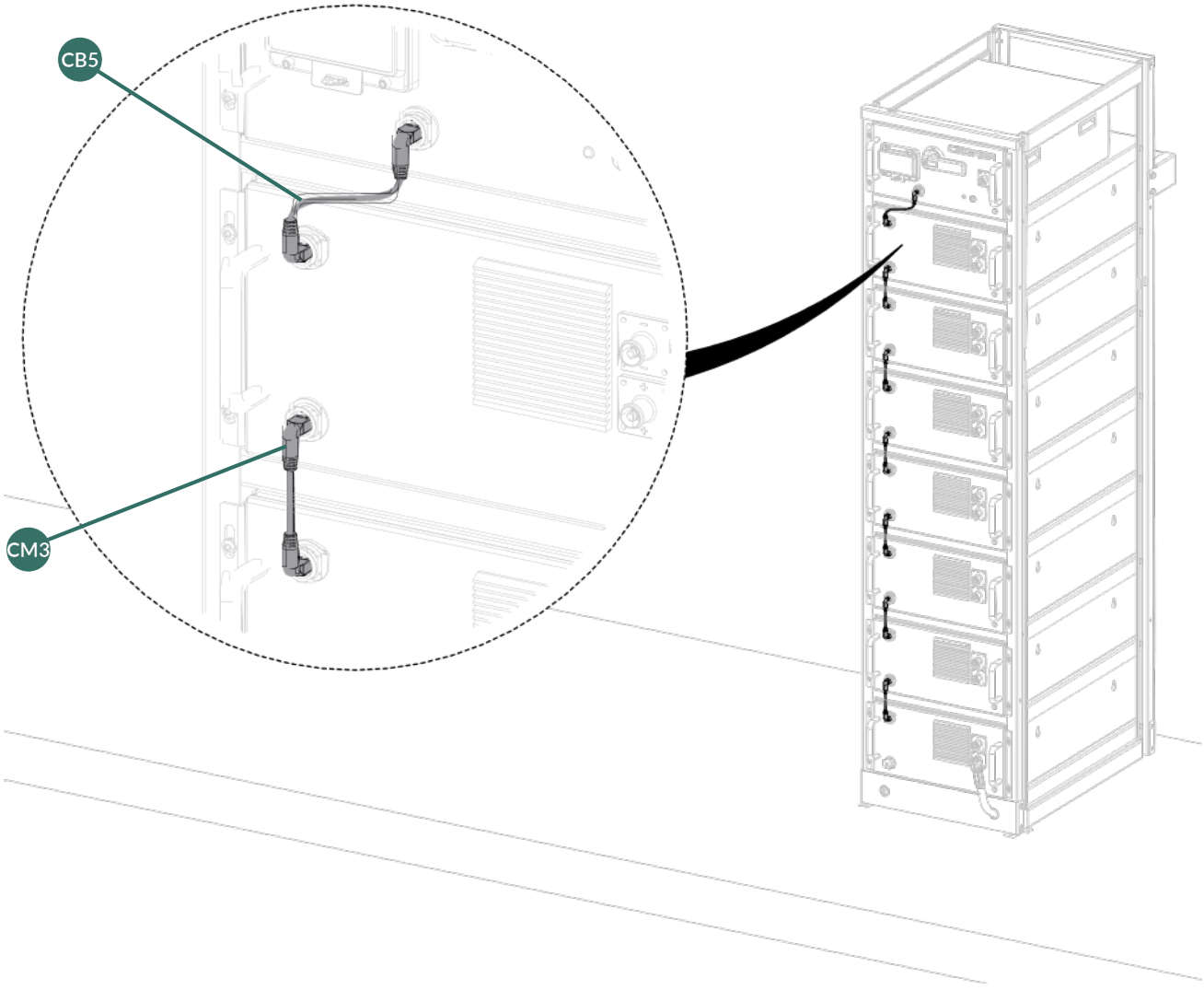
CS6

DIN7380 FL M6x16 Screw X24

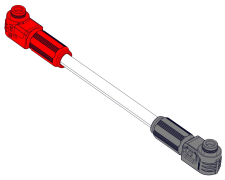


17

CB5		CM3	
			
BMU COMMS cable	X1	Module COMMS Cable	X6

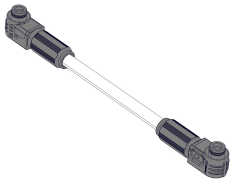


18



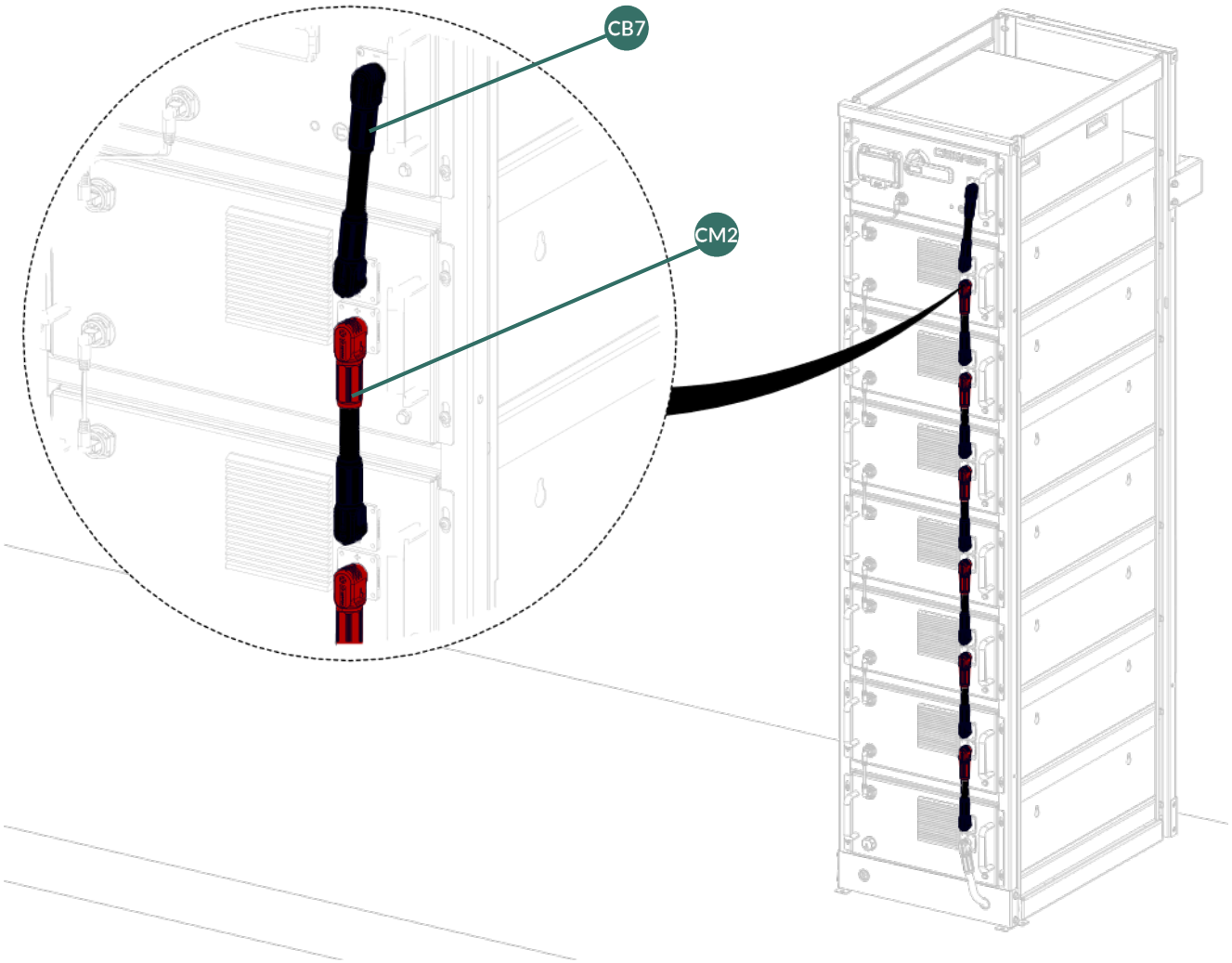
CM2

Module POT Cable X6



CB7

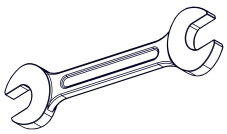
BMU POT cable X1



19

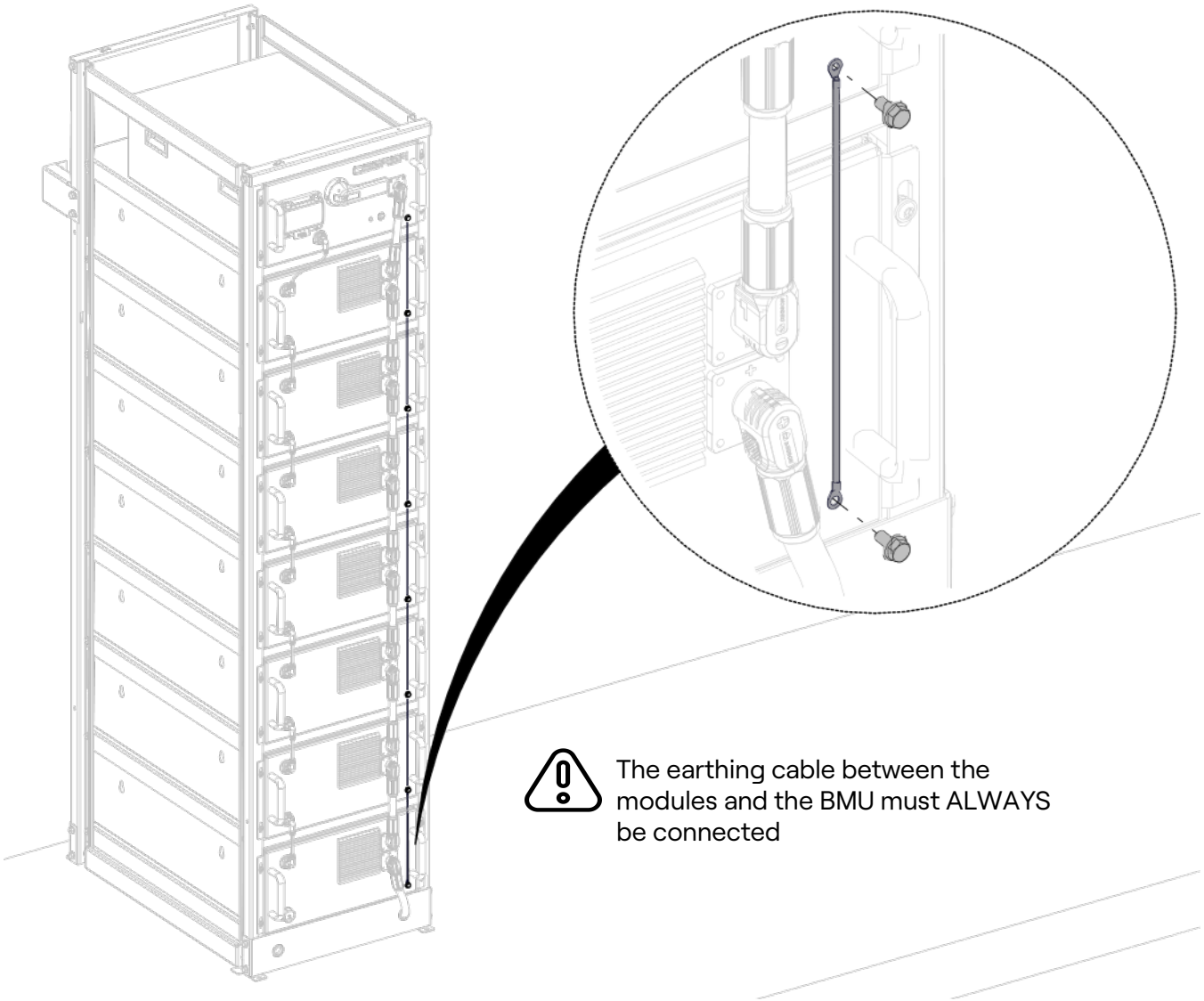
CM4

Earthing cable X7



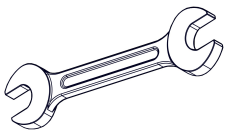
T7

Spanner



The earthing cable between the modules and the BMU must ALWAYS be connected

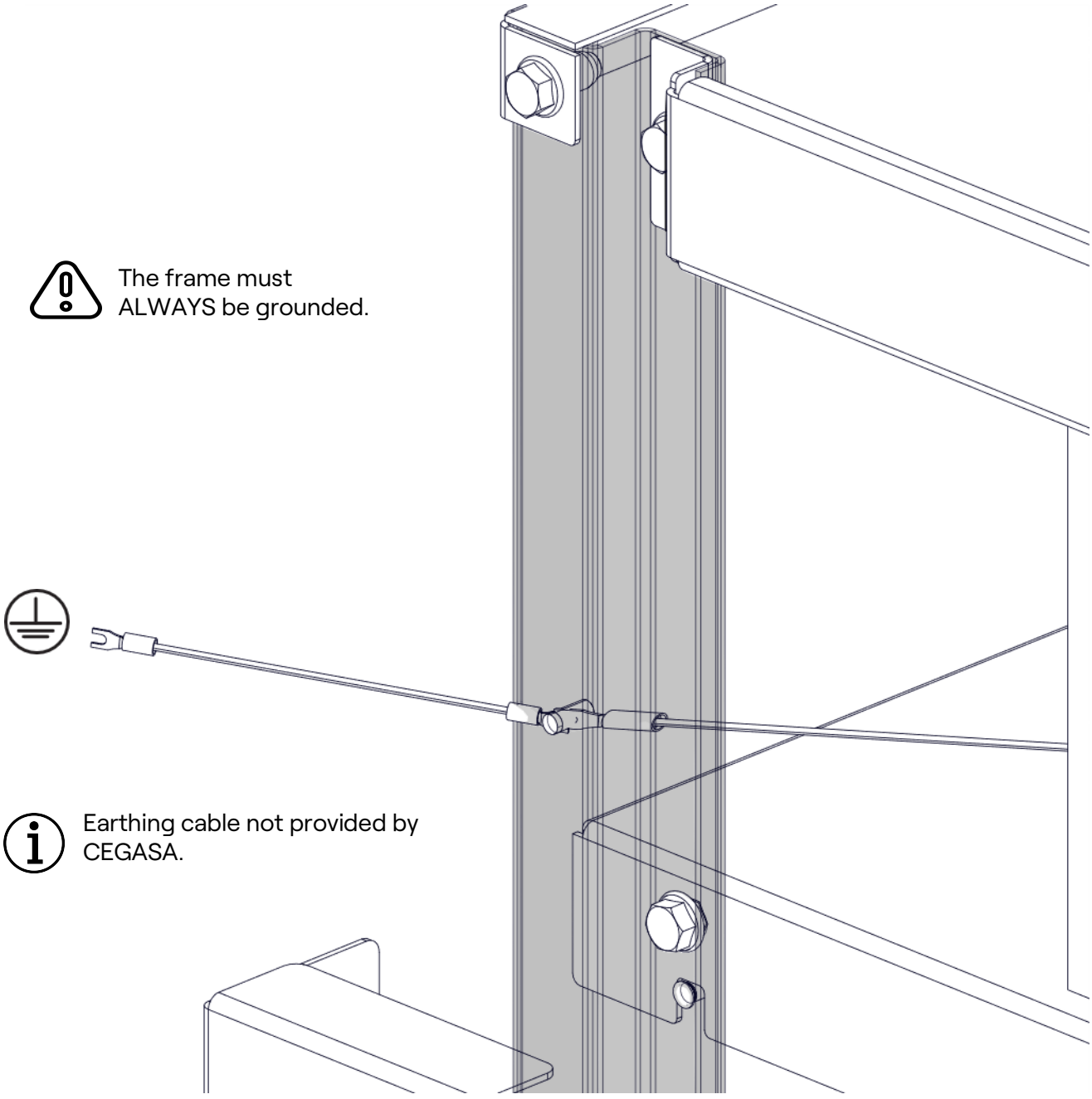
20



T7

Spanner

The frame must ALWAYS be grounded.

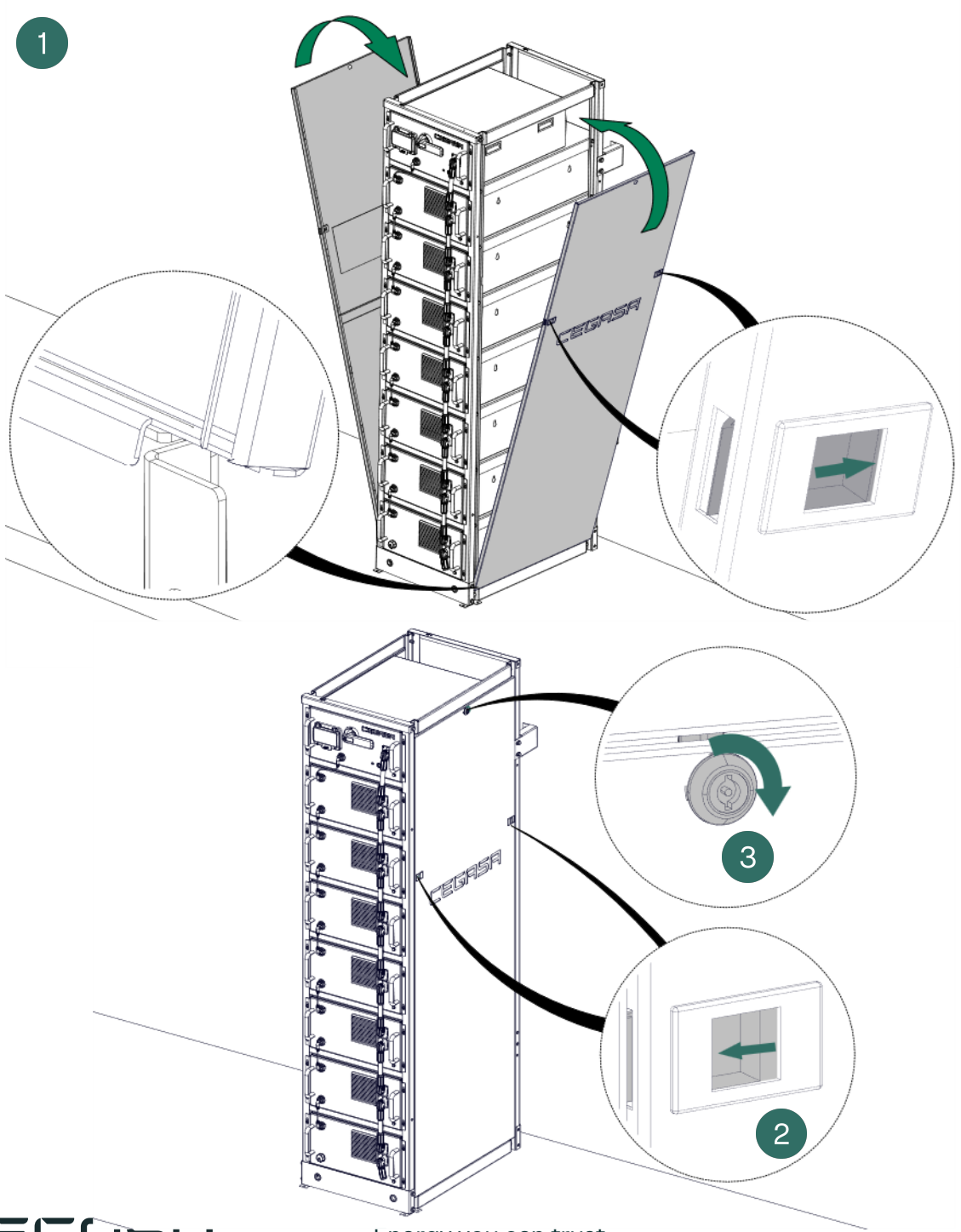


Earthing cable not provided by CEGASA.

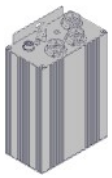
21

CT1

Closure panel X2



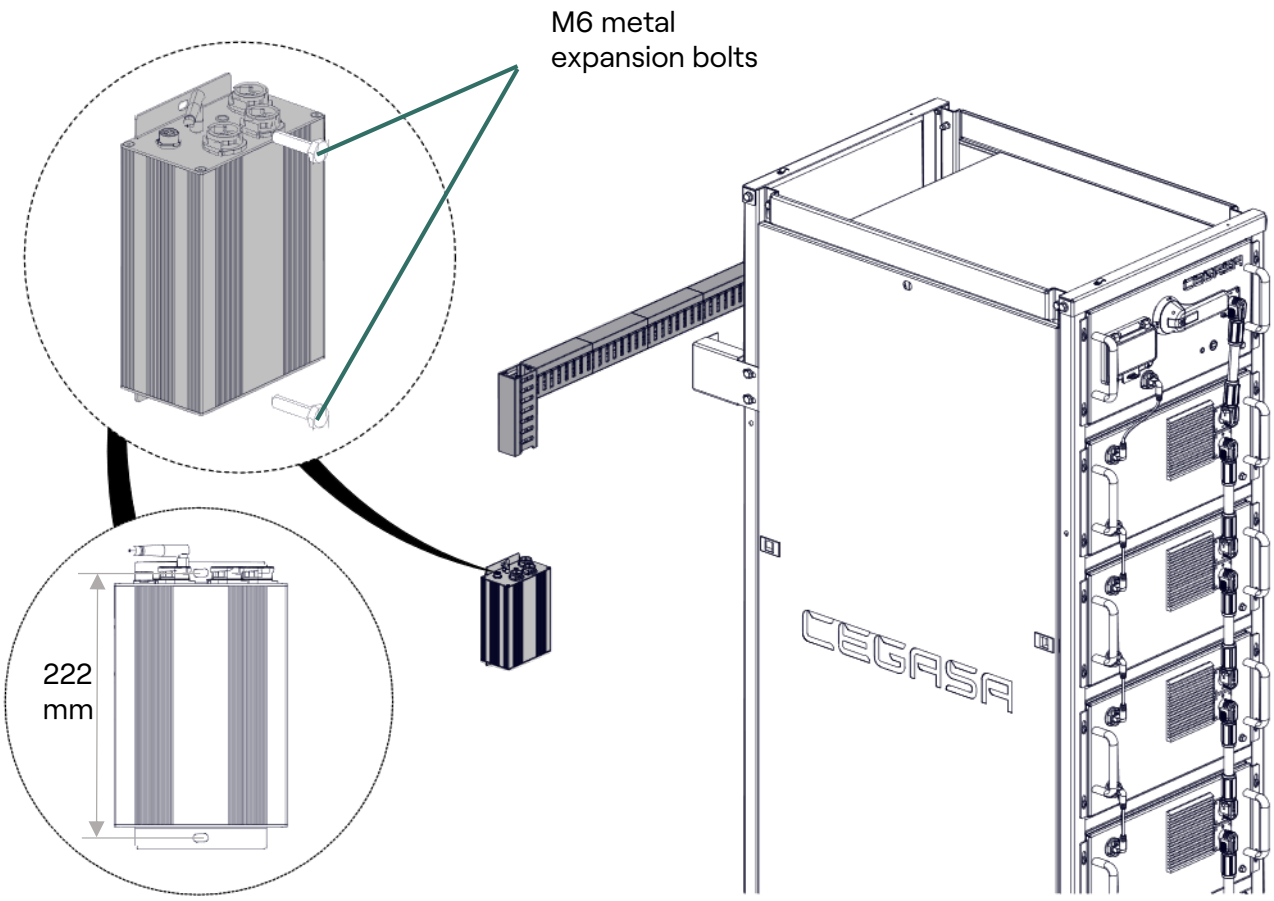
22



CE1

EXpand Master MCS Unit
110202

X1



Use of M6 metal expansion bolts is recommended.
Not provided by CEGASA.

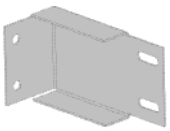
4.2 TWO RACKS

1

CS1

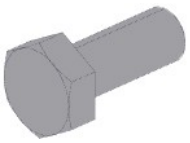
Frame X1

CS2



Wall bracket X2

CS3

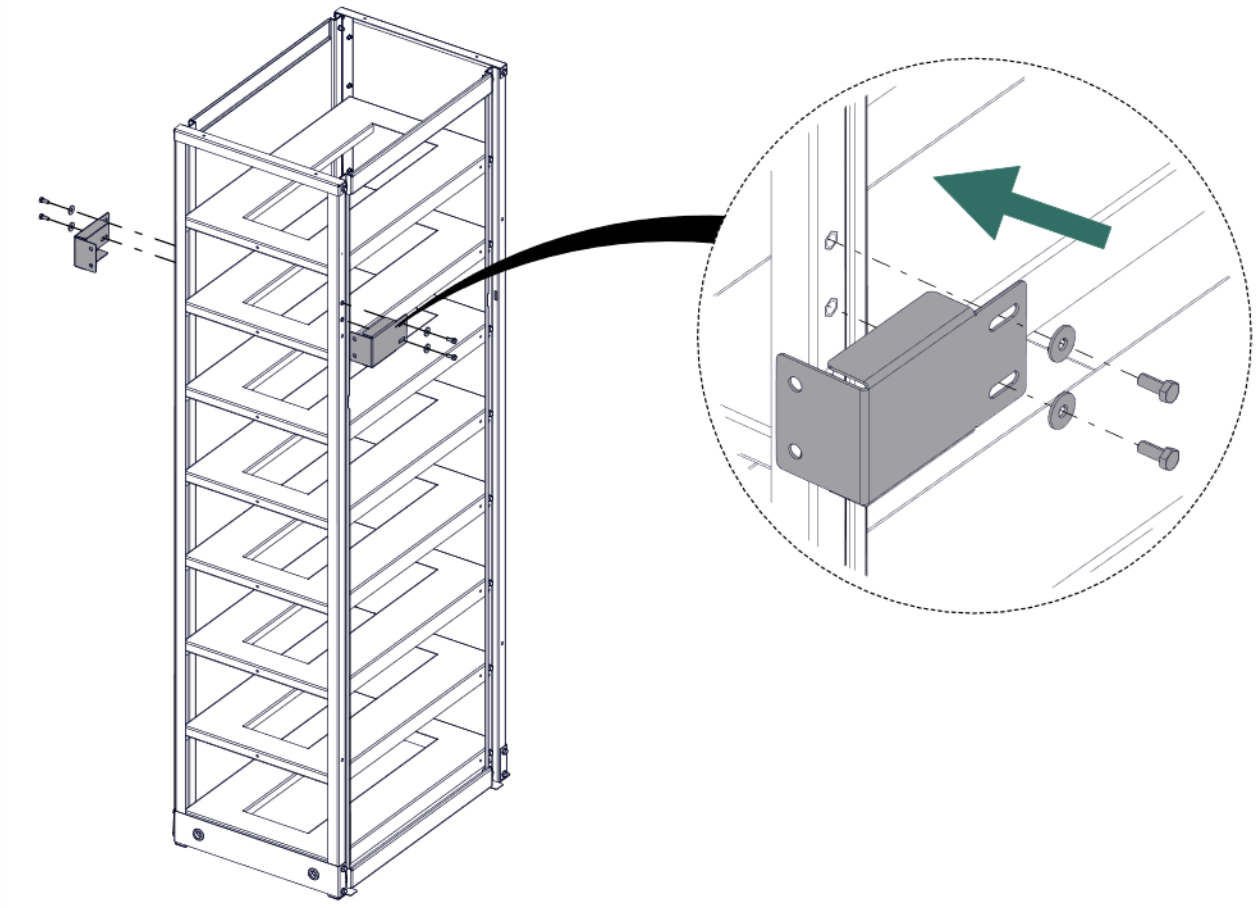


M8x20 Screw X4

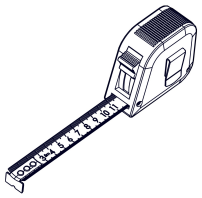
CS4

DIN125 M8 Washer X4

Tighten by hand so that they can be adjusted later



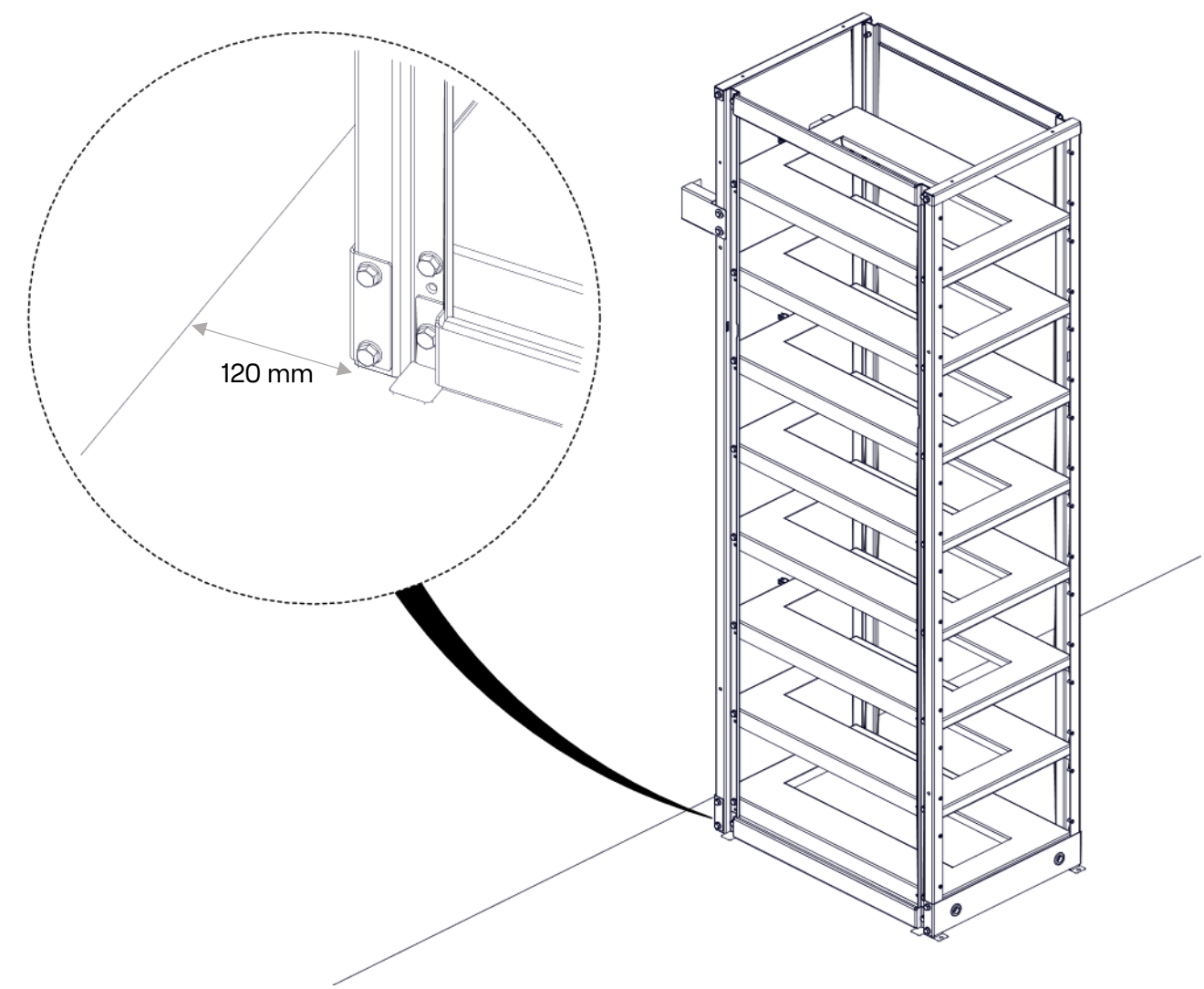
2



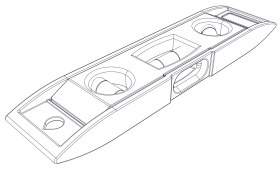
T6

Tape measure

Ensure that there is a distance of 120 mm between the rear of the frame and the wall



3

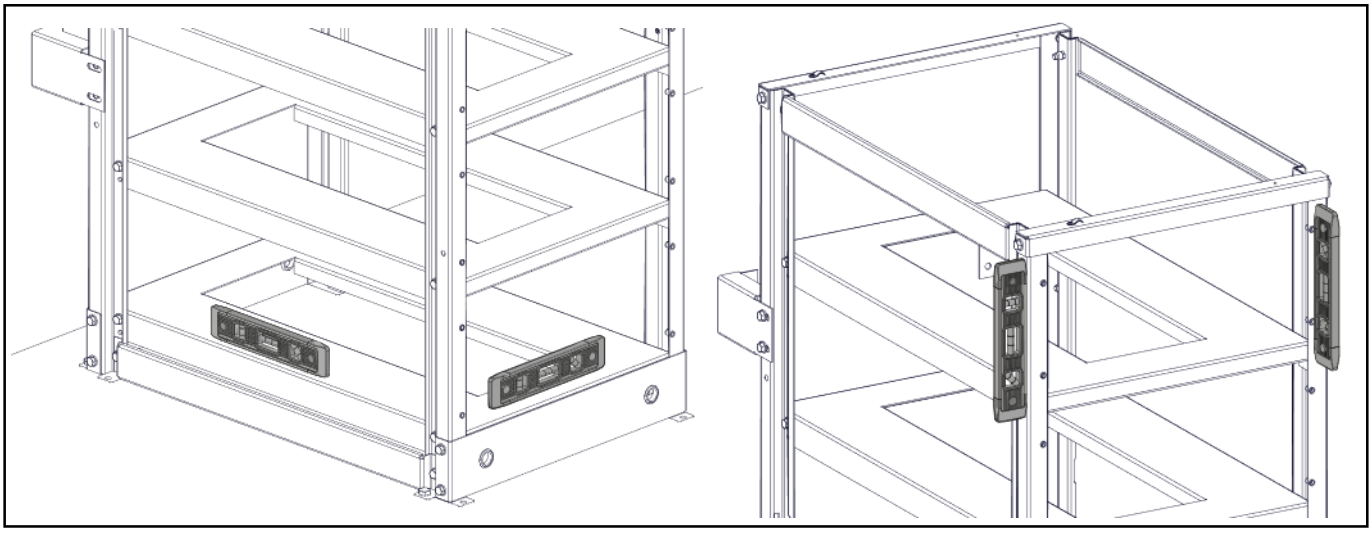


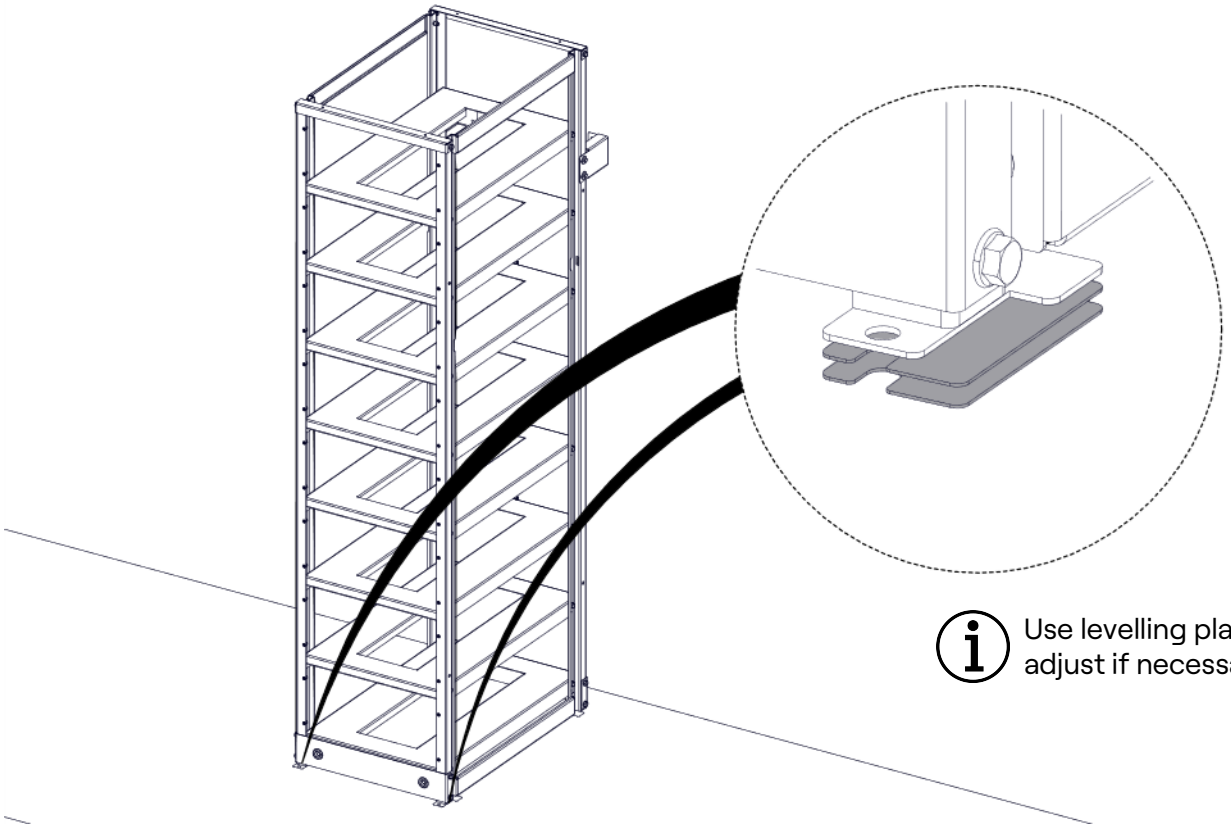
T2

Spirit level

CS5

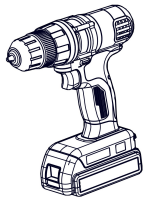
Levelling plate





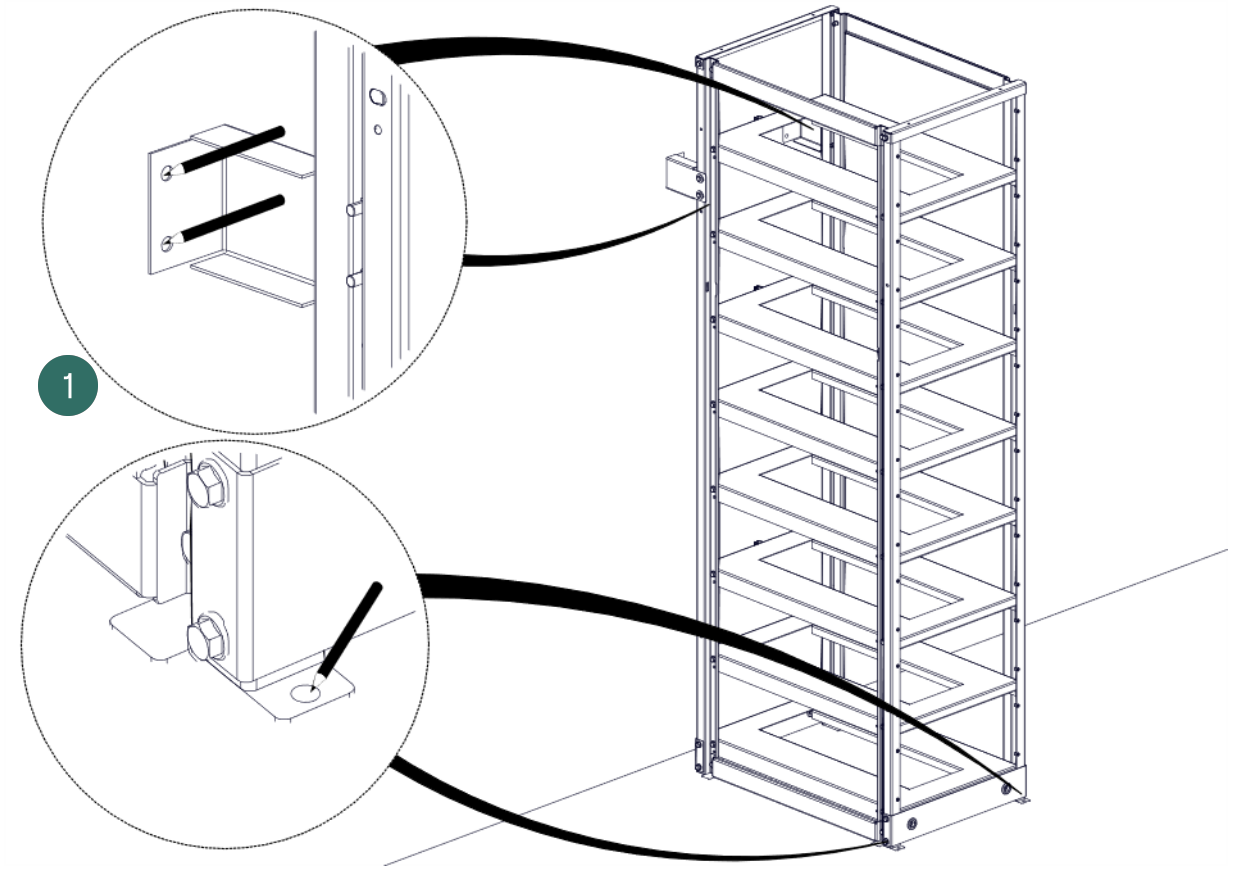
Use levelling plates to adjust if necessary

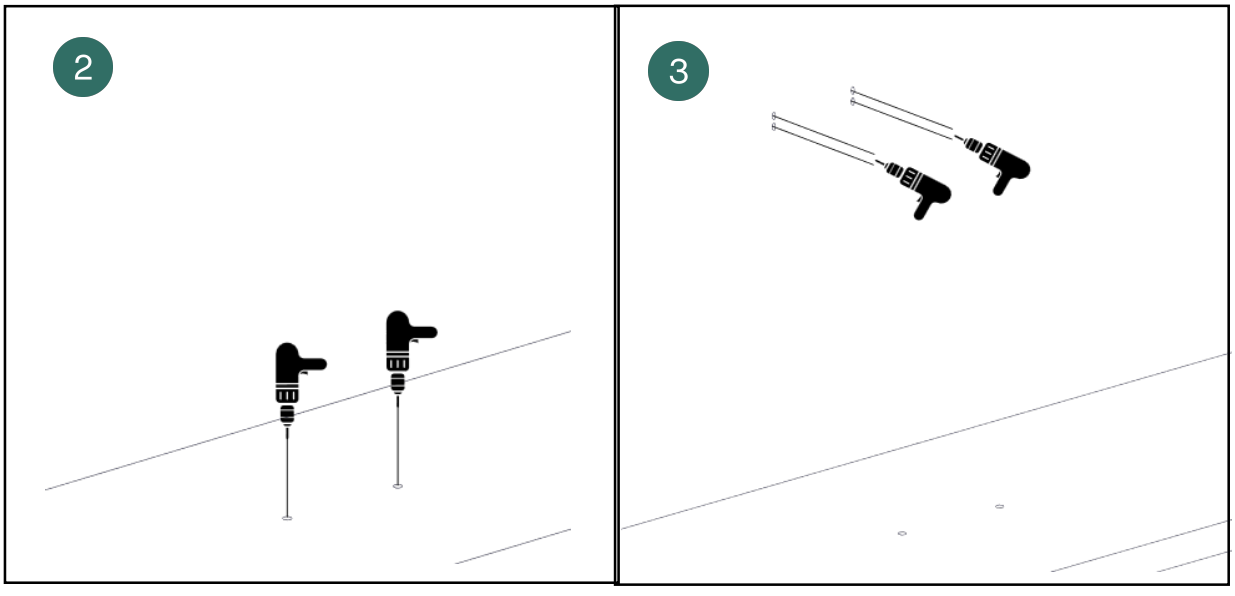
4



T1

Drill X1

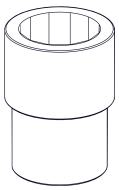




5

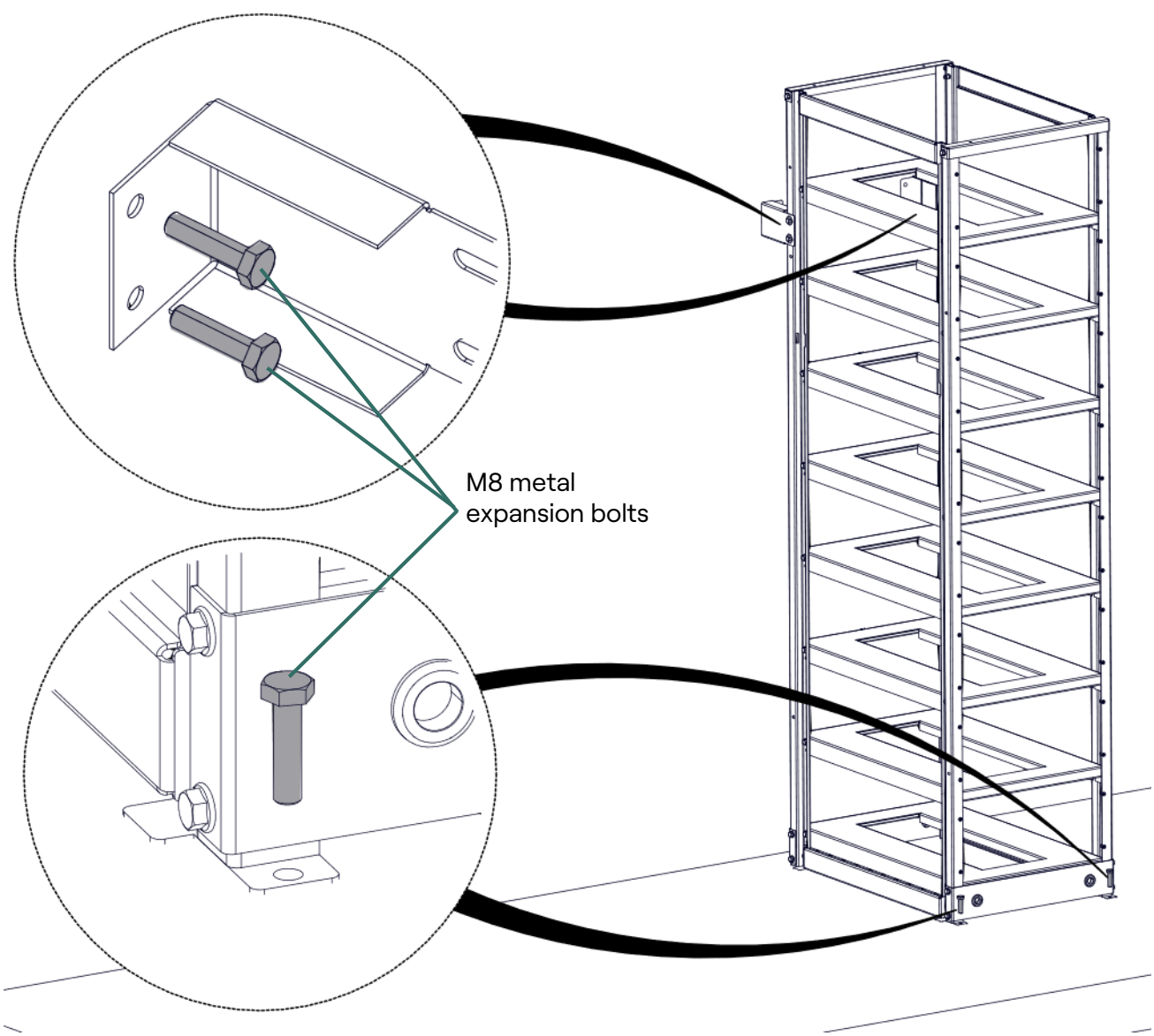
T3

Ratchet



T9

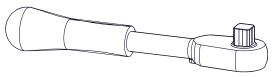
13 socket



Use of M8 metal expansion bolts is recommended.
Not provided by CEGASA

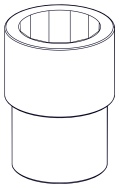
6

T3



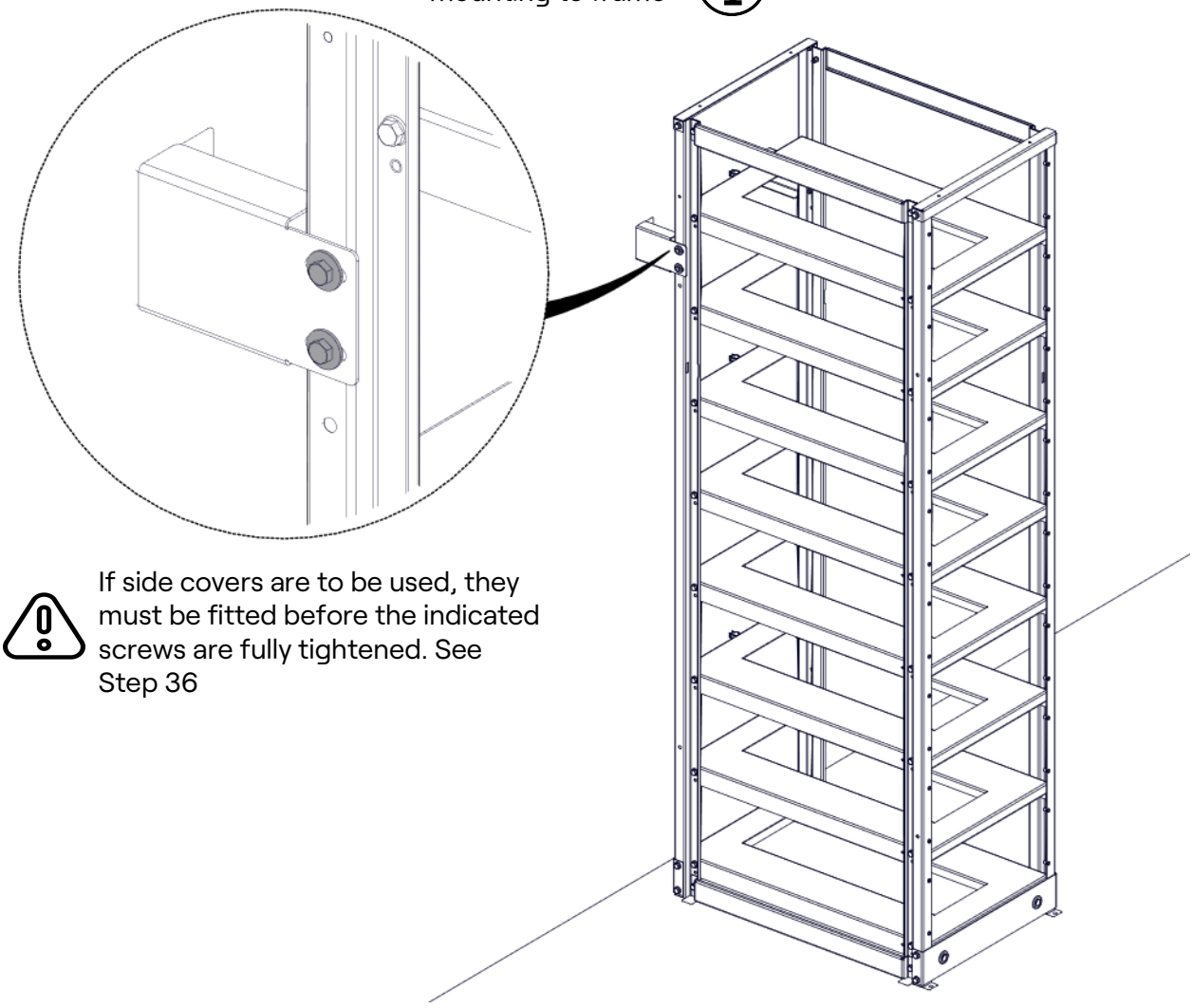
Ratchet

T9



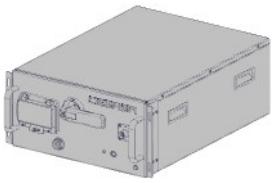
13 socket

Tighten wall mounting to frame



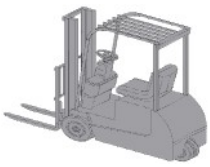
If side covers are to be used, they must be fitted before the indicated screws are fully tightened. See Step 36

7



CB1

BMU X1

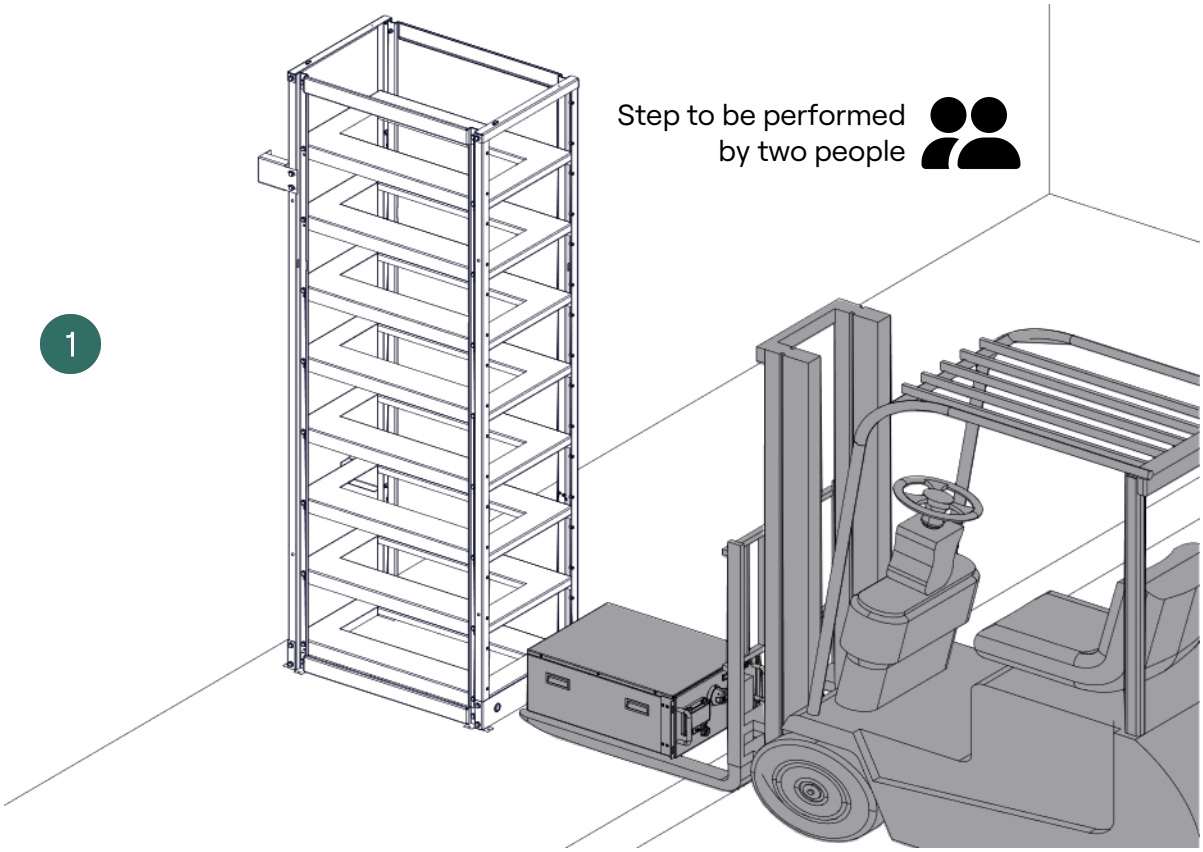


T8

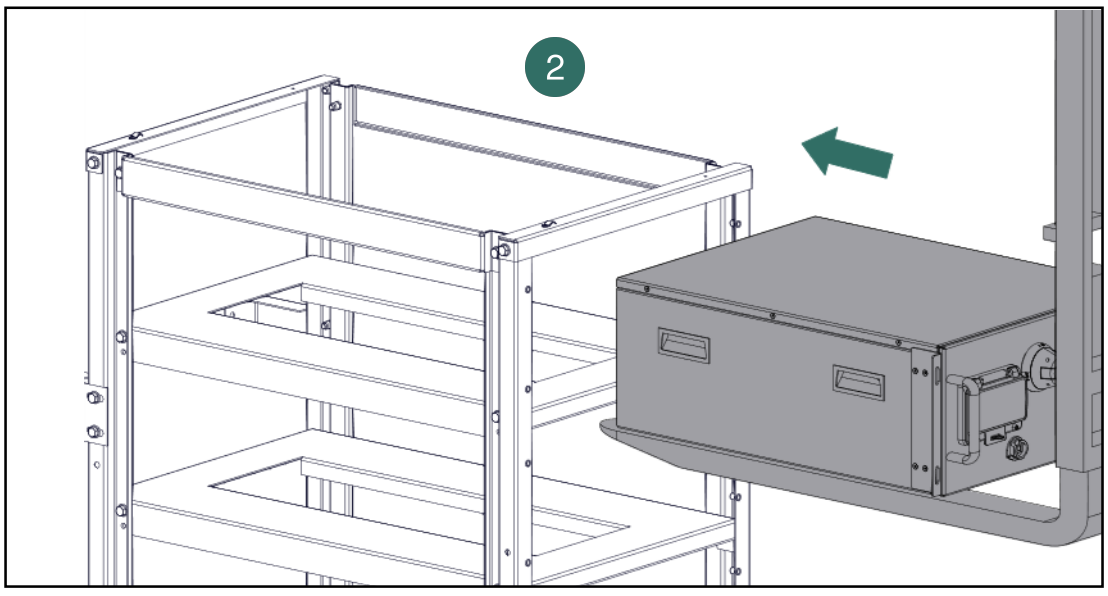
Pallet jack

Step to be performed by two people

1



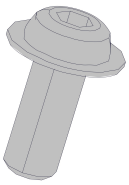
2



8

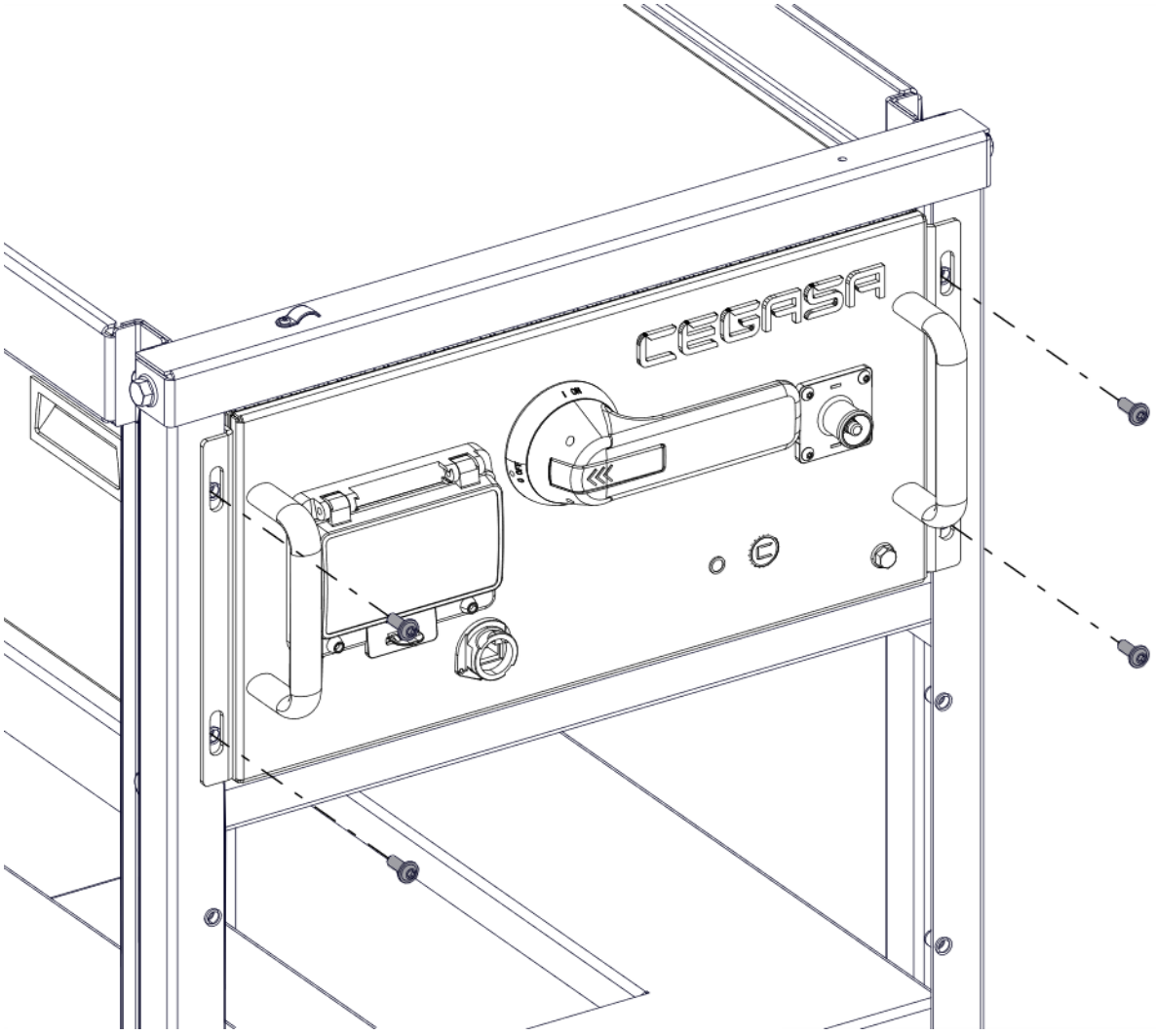
T4

5 Allen key



CS6

M6 Screw X4

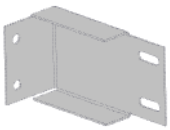


9

CS1

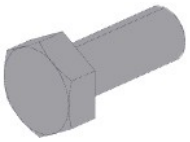
Frame X1

CS2



Wall bracket X2

CS3

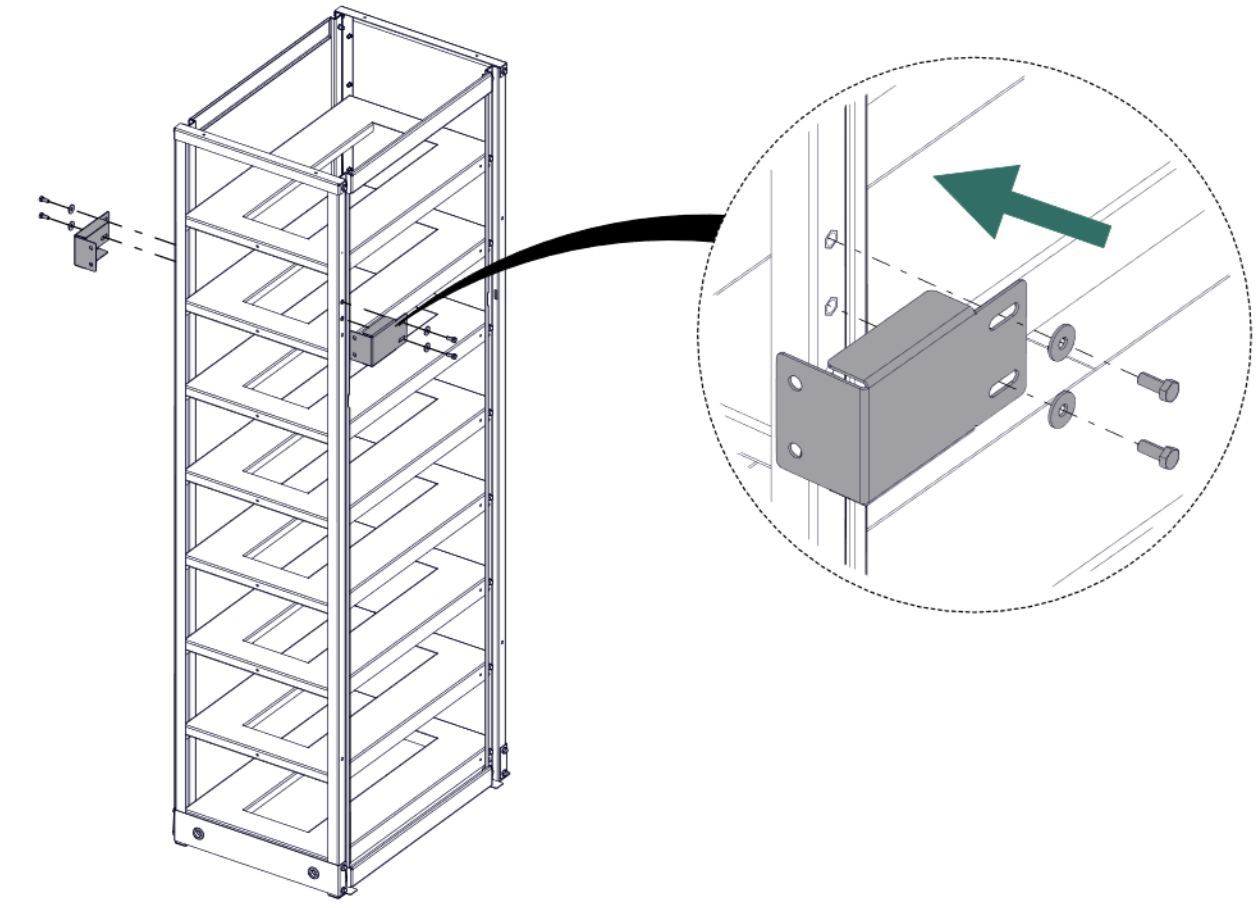


M8x20 Screw X4

CS4

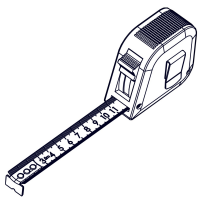
DIN125 M8 Washer X4

Tighten by hand so that they can be adjusted later

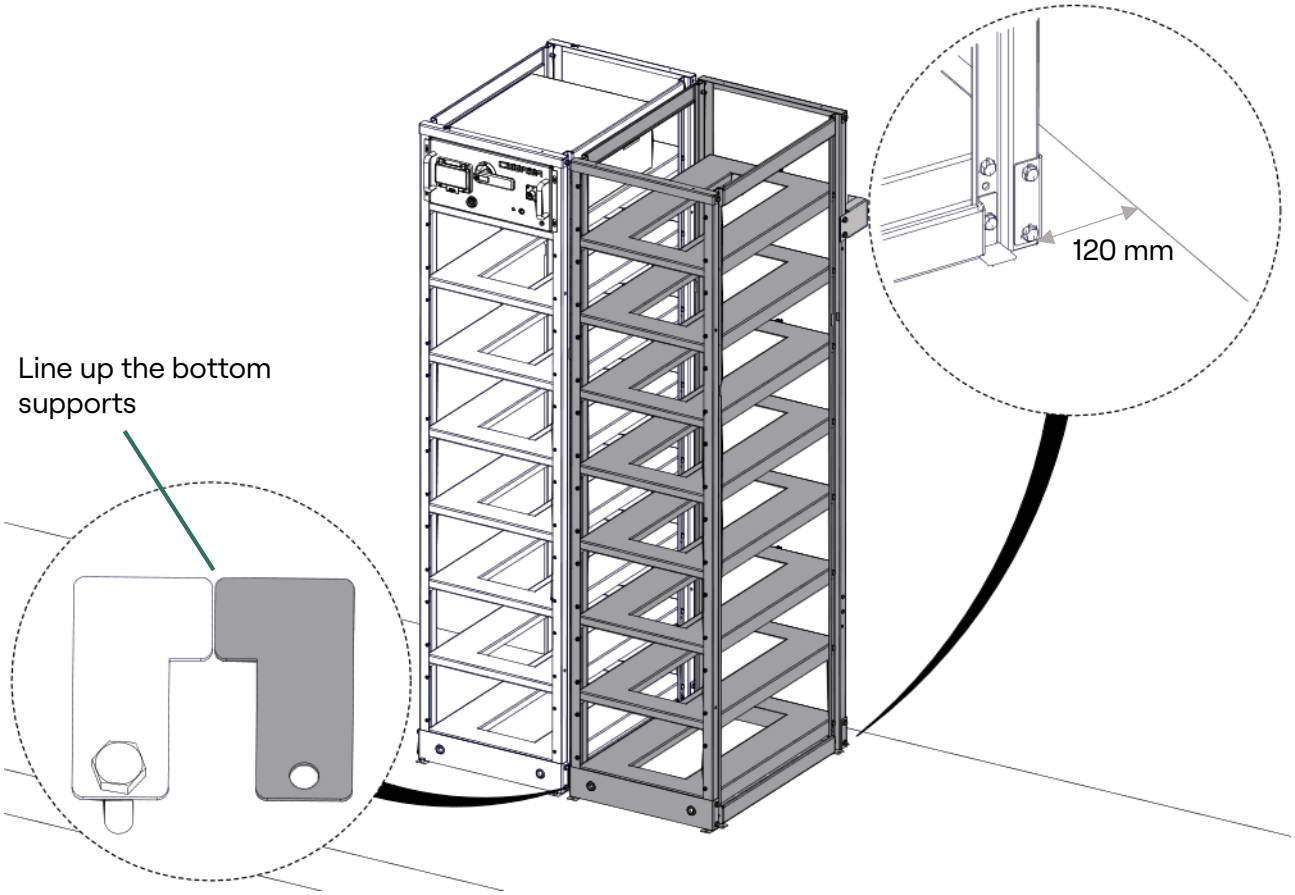


10

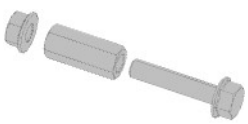
T6



Tape measure

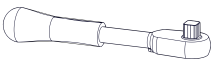


11



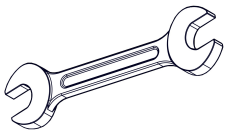
CR1

Bushing - Screw - Nut X4



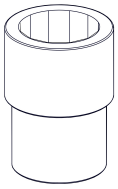
T3

Ratchet



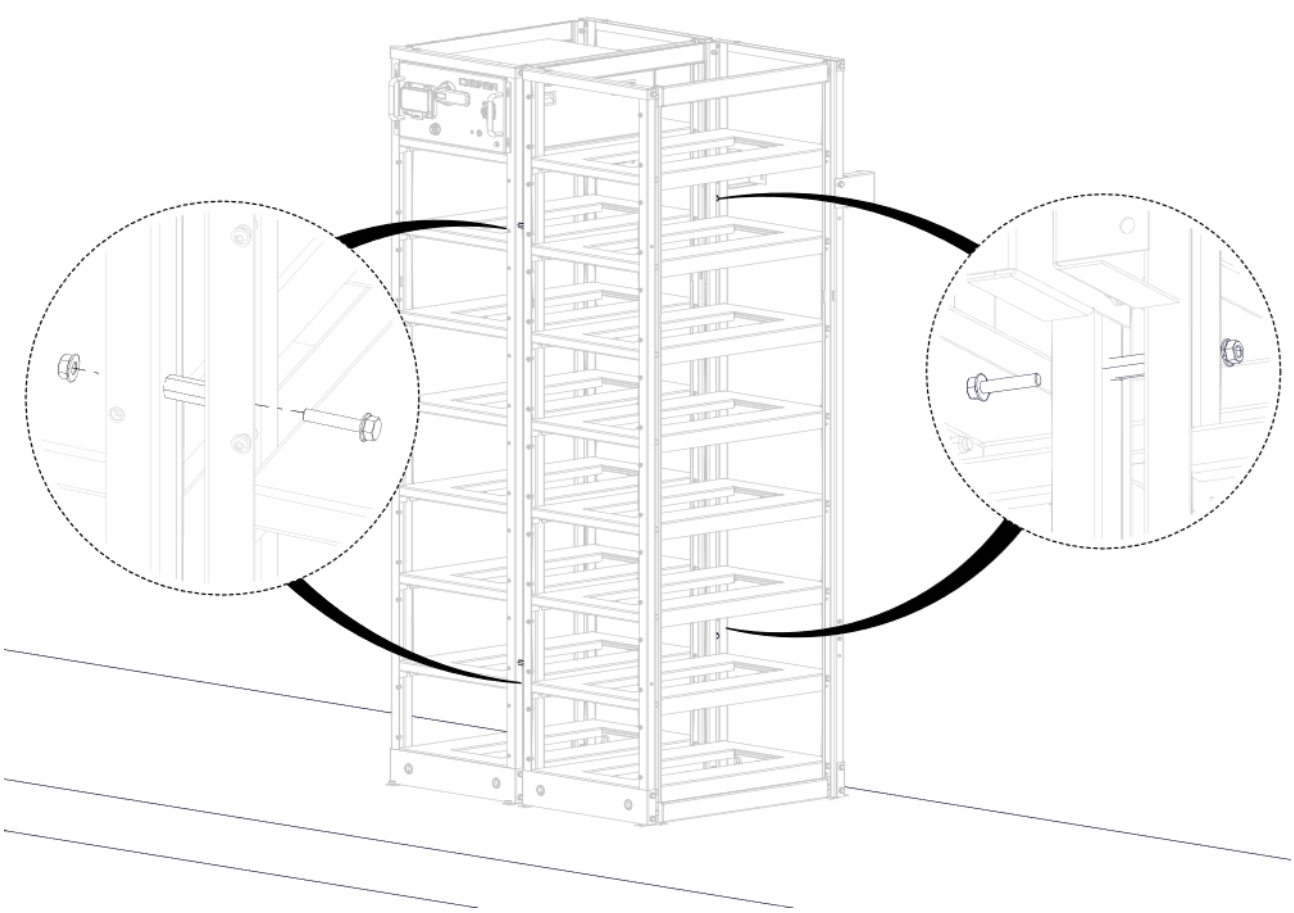
T7

Spanner

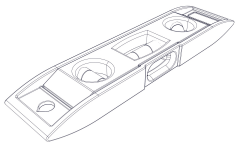


T9

13 socket



12

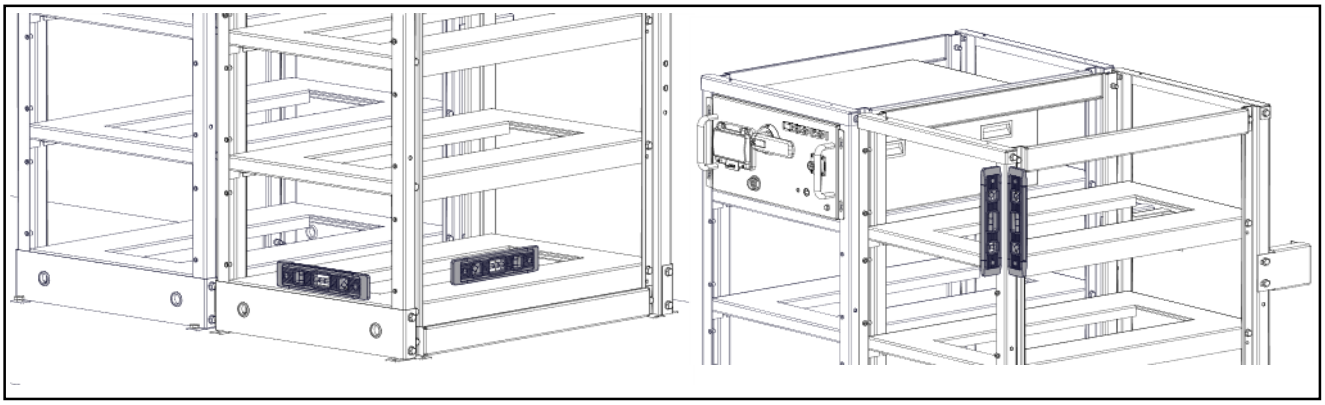


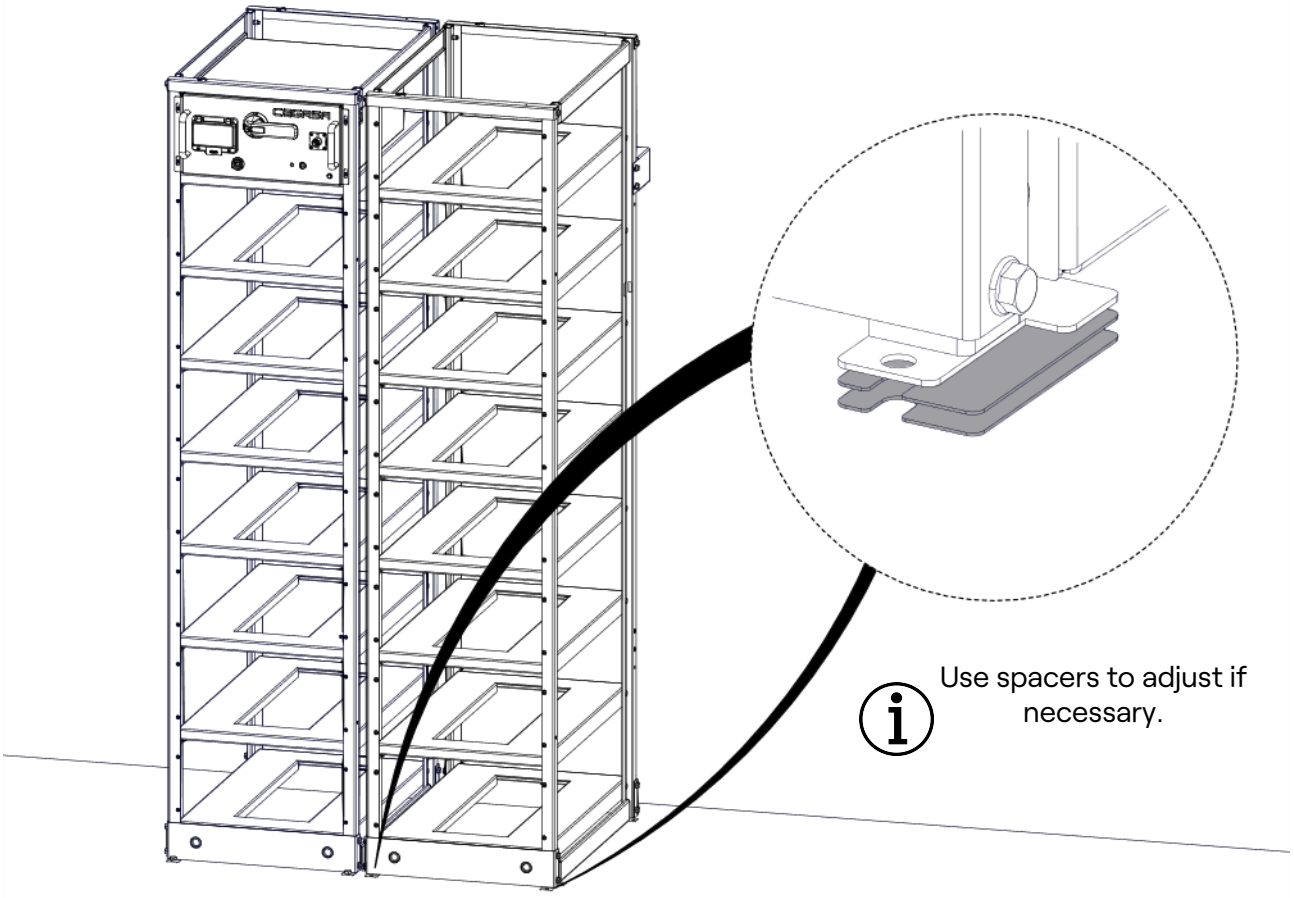
T2

Spirit level

CS5

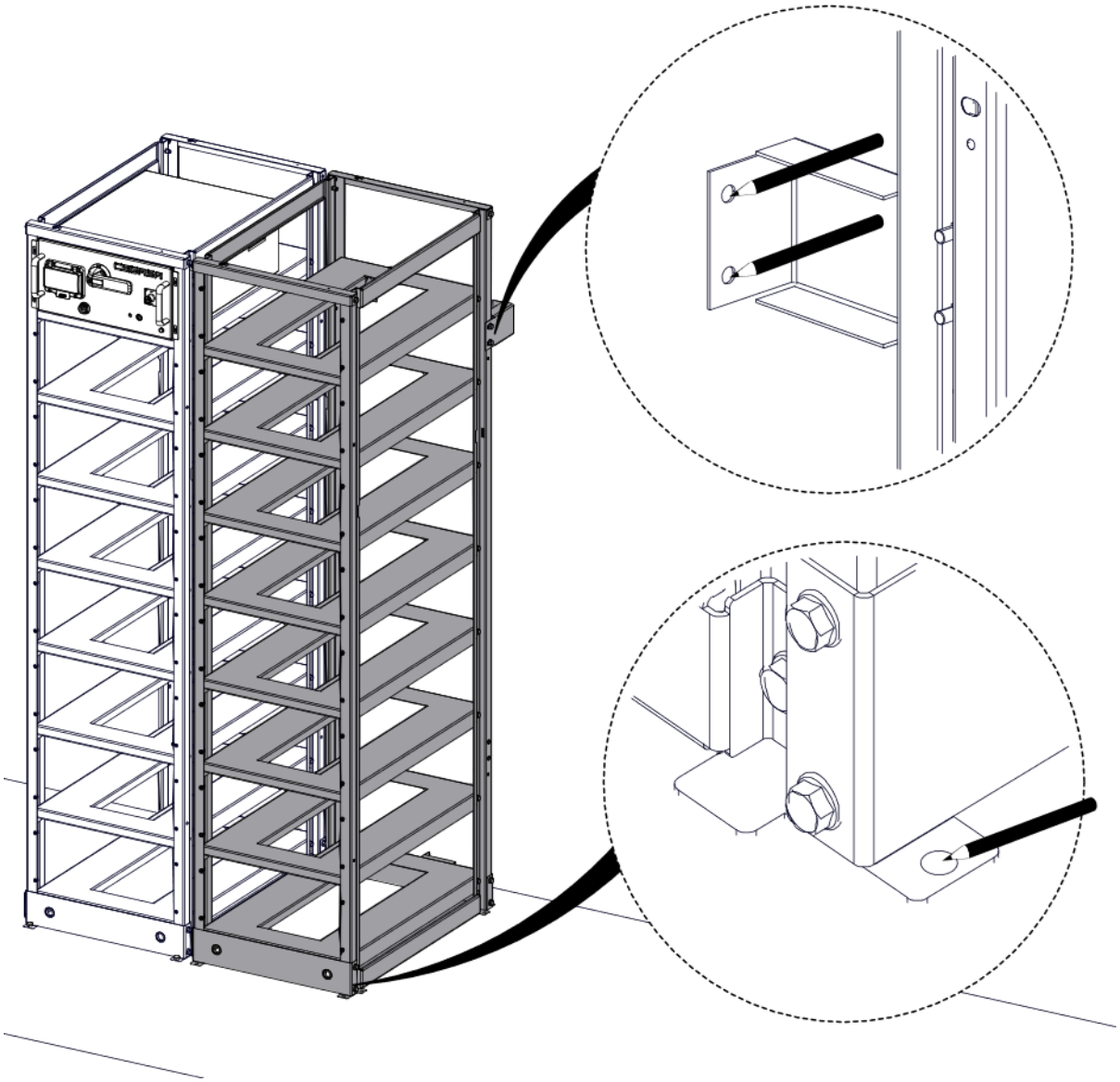
Levelling plate



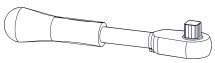


Use spacers to adjust if necessary.

13

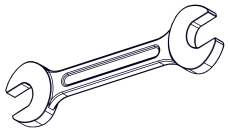


14



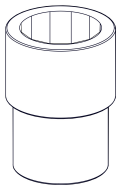
T3

Ratchet



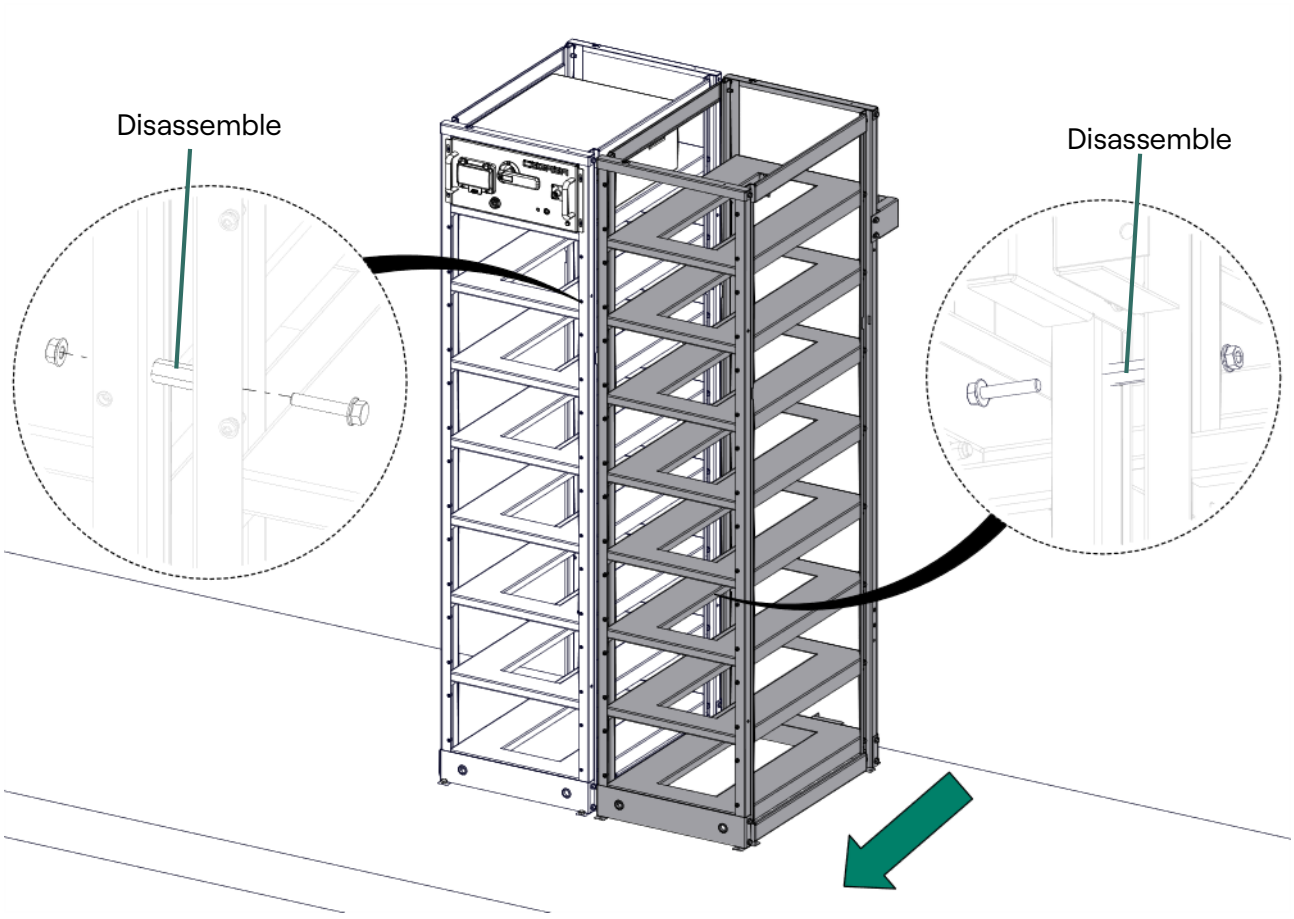
T7

Spanner

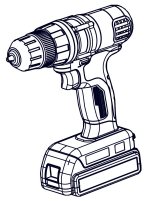


T9

13 socket

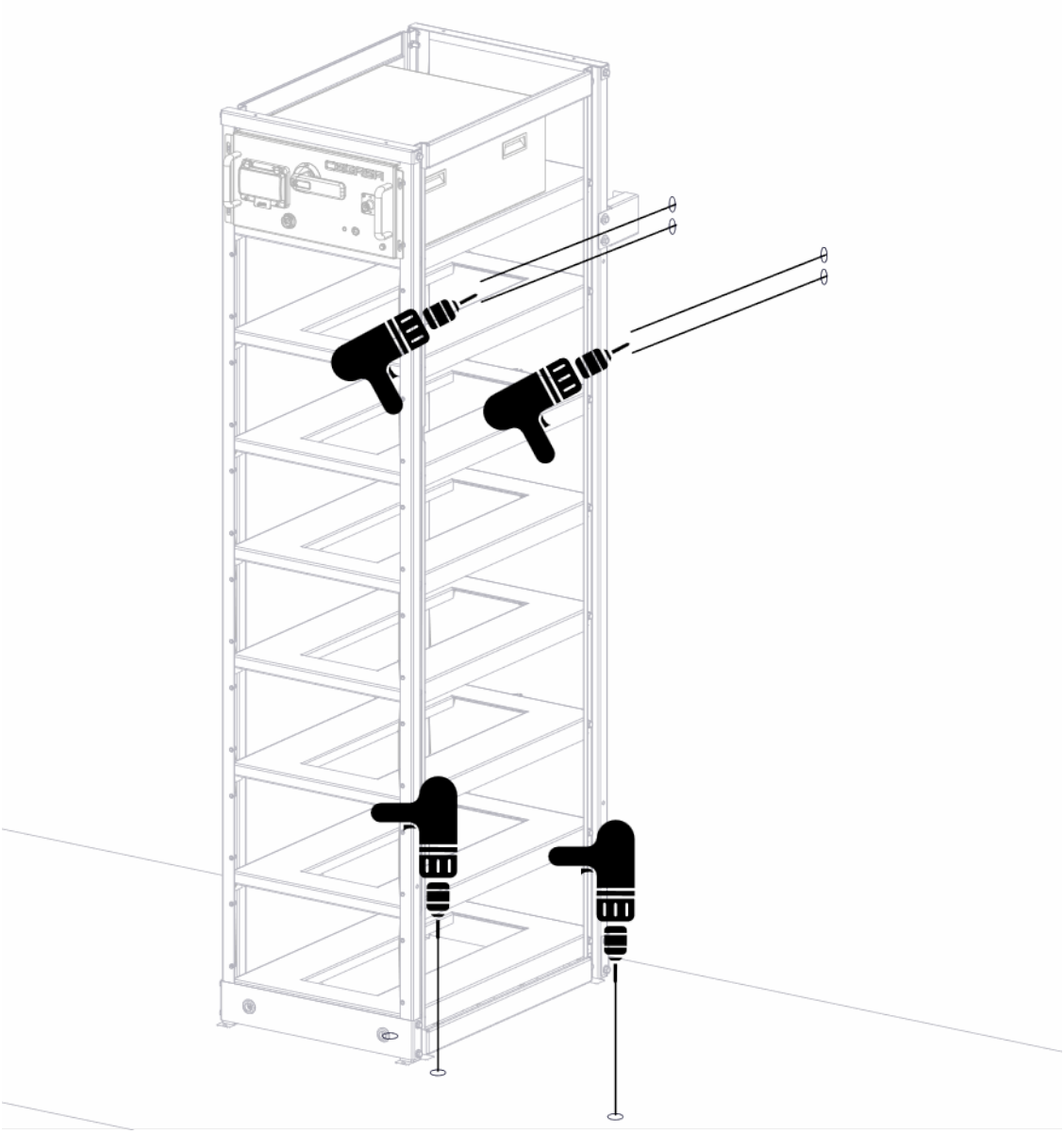


15



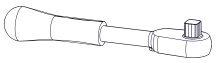
T1

Drill



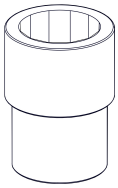
16

T3



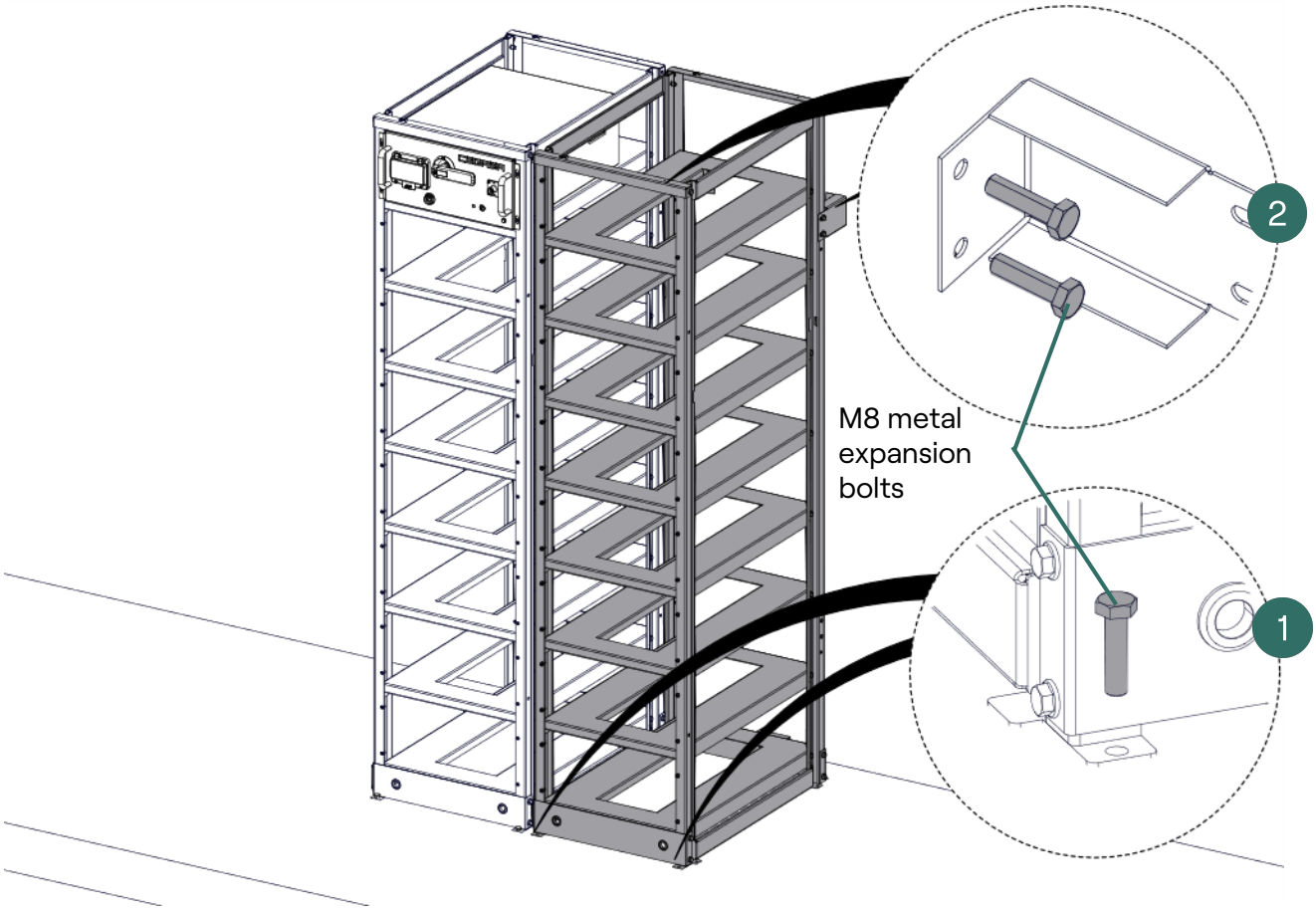
Ratchet

T9



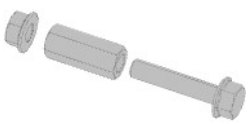
13 socket

Use of M8 metal expansion bolts is recommended. Not provided by CEGASA.



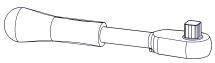
Do not fully tighten the

17



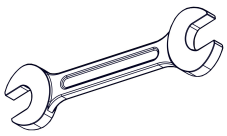
CR1

Bushing - Screw - Nut X4



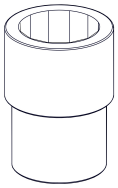
T3

Ratchet



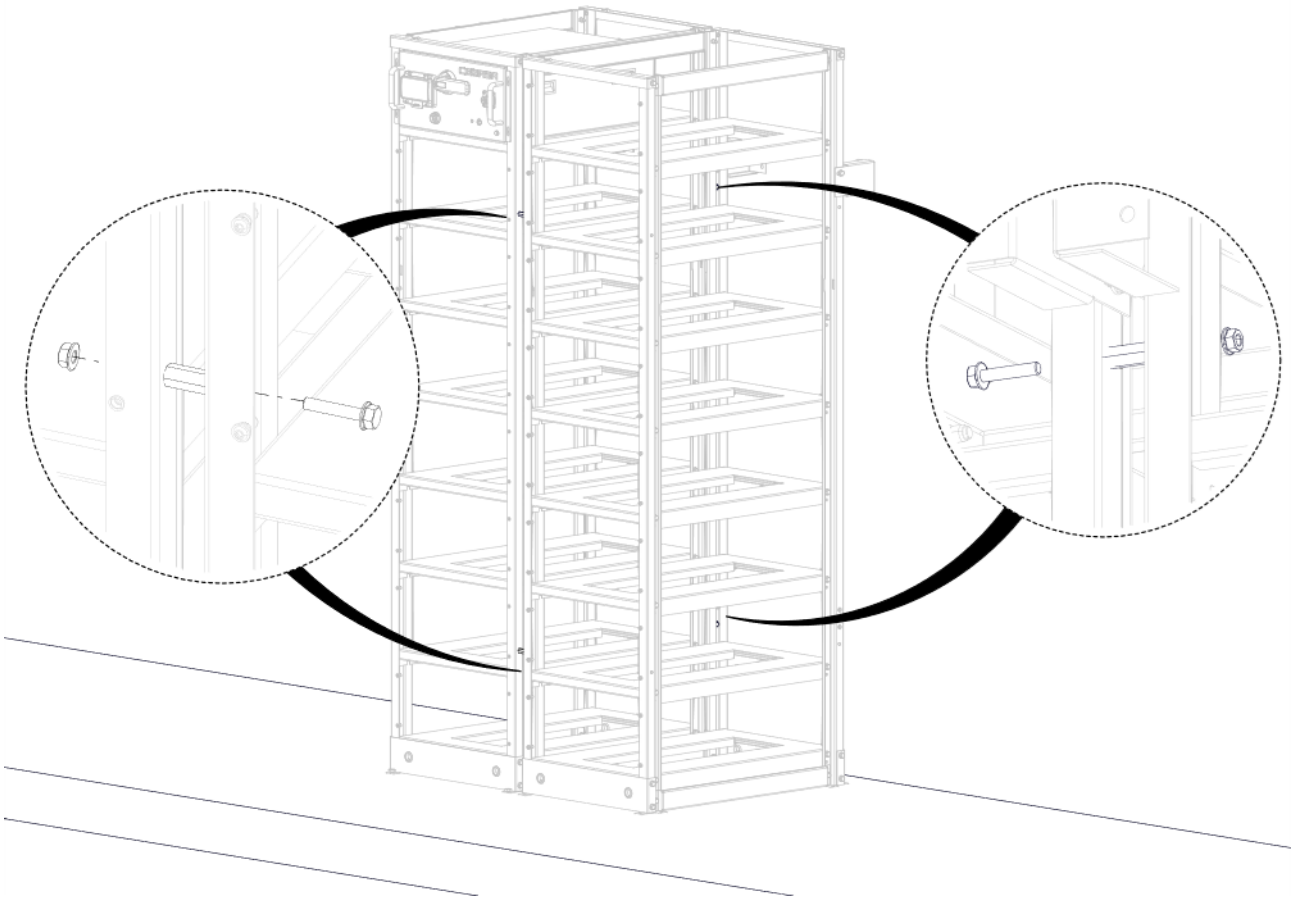
T7

Spanner



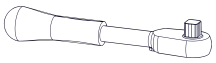
T9

13 socket



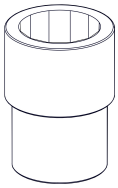
18

T3

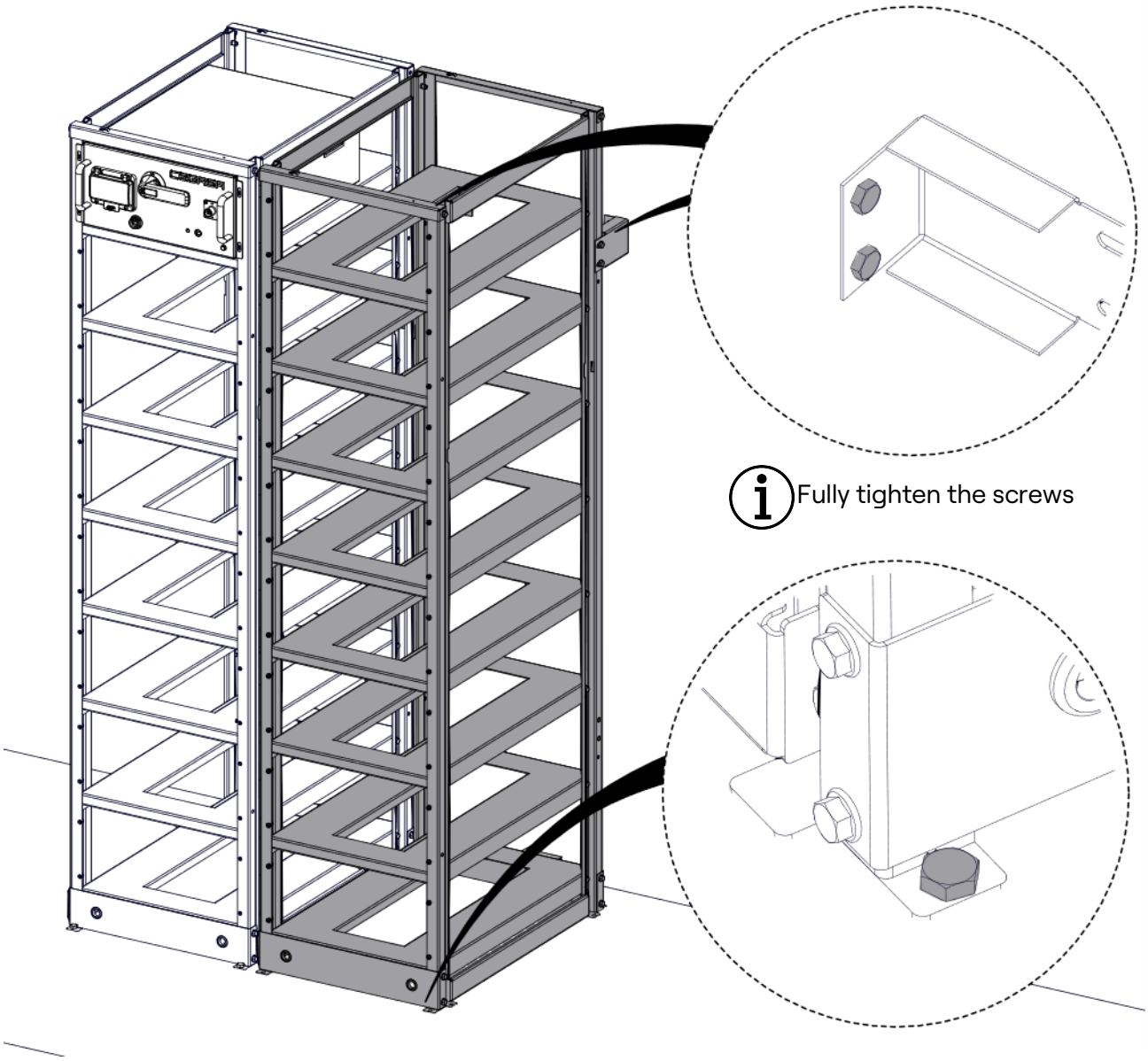


Ratchet

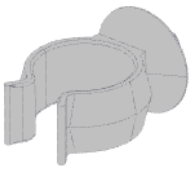
T9



13 socket

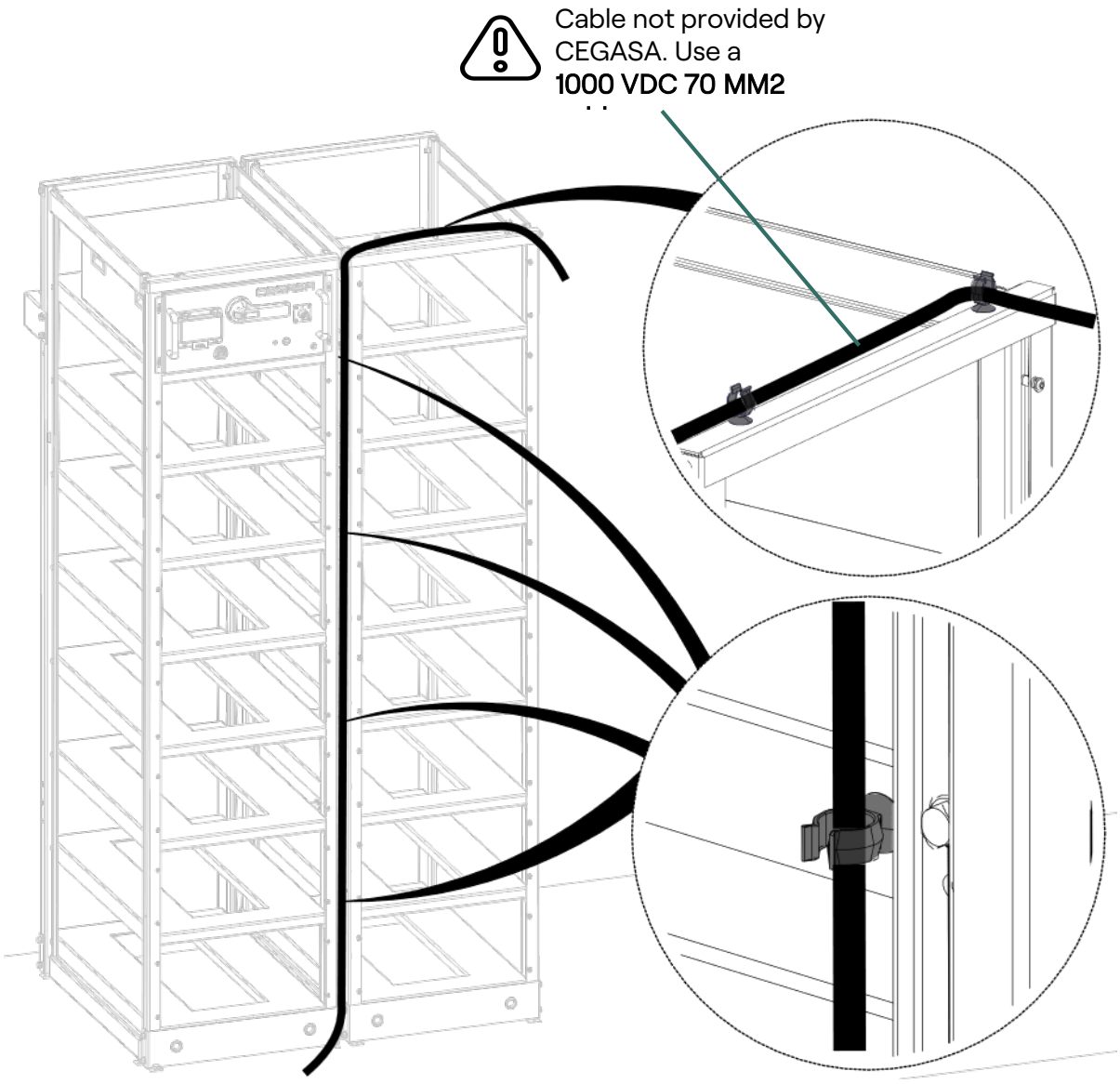


19

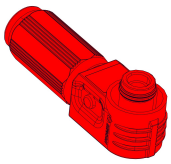


CS4

Clamp X5

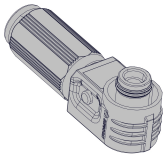


20



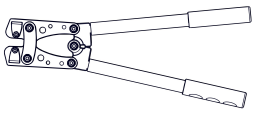
CR3

Positive aerial connector X1



CR4

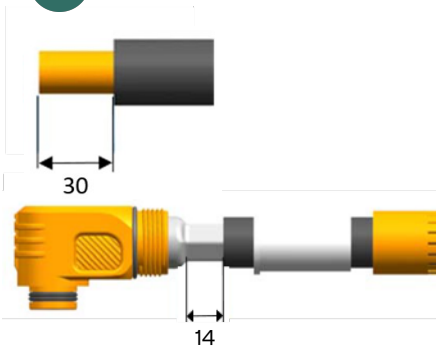
Negative aerial connector X1



T5

Crimper

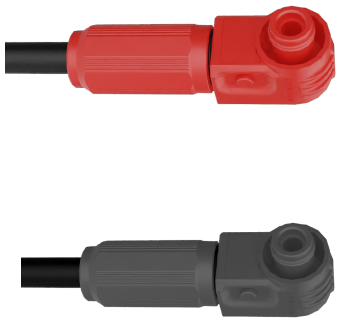
1



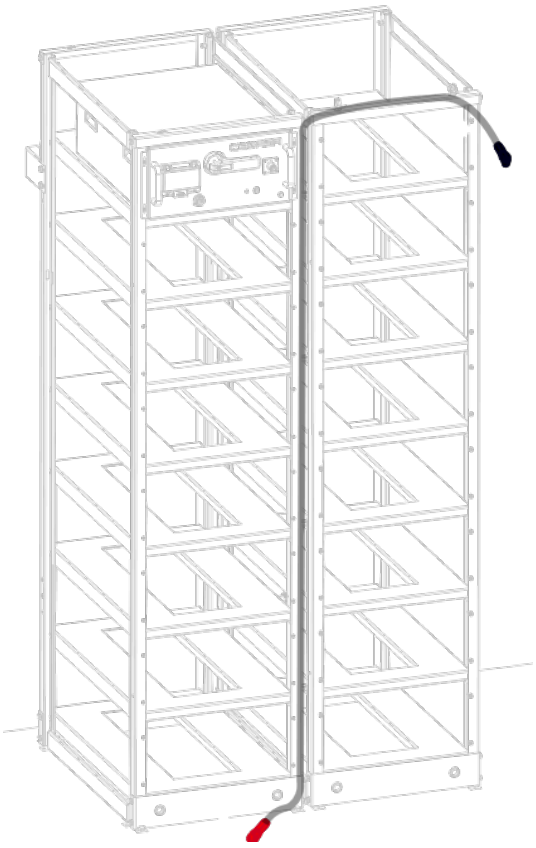
Crimp the positive and negative aerial connector

2

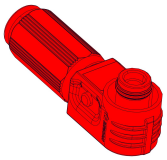
3



Check that the cable is well crimped. If in doubt, contact CEGASA.



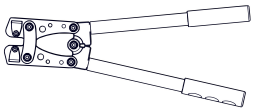
21



CB2

Positive aerial connector

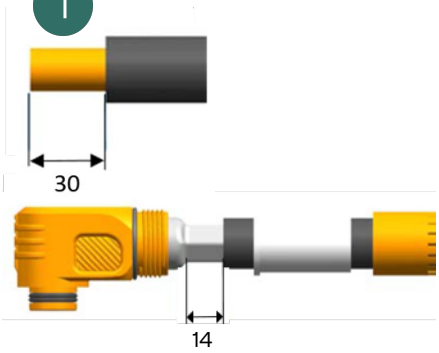
X1



T5

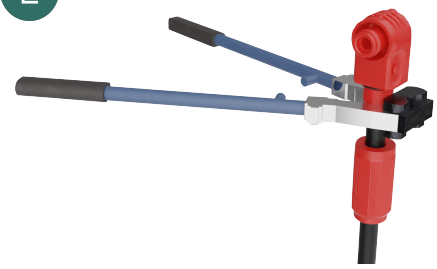
Crimper

1



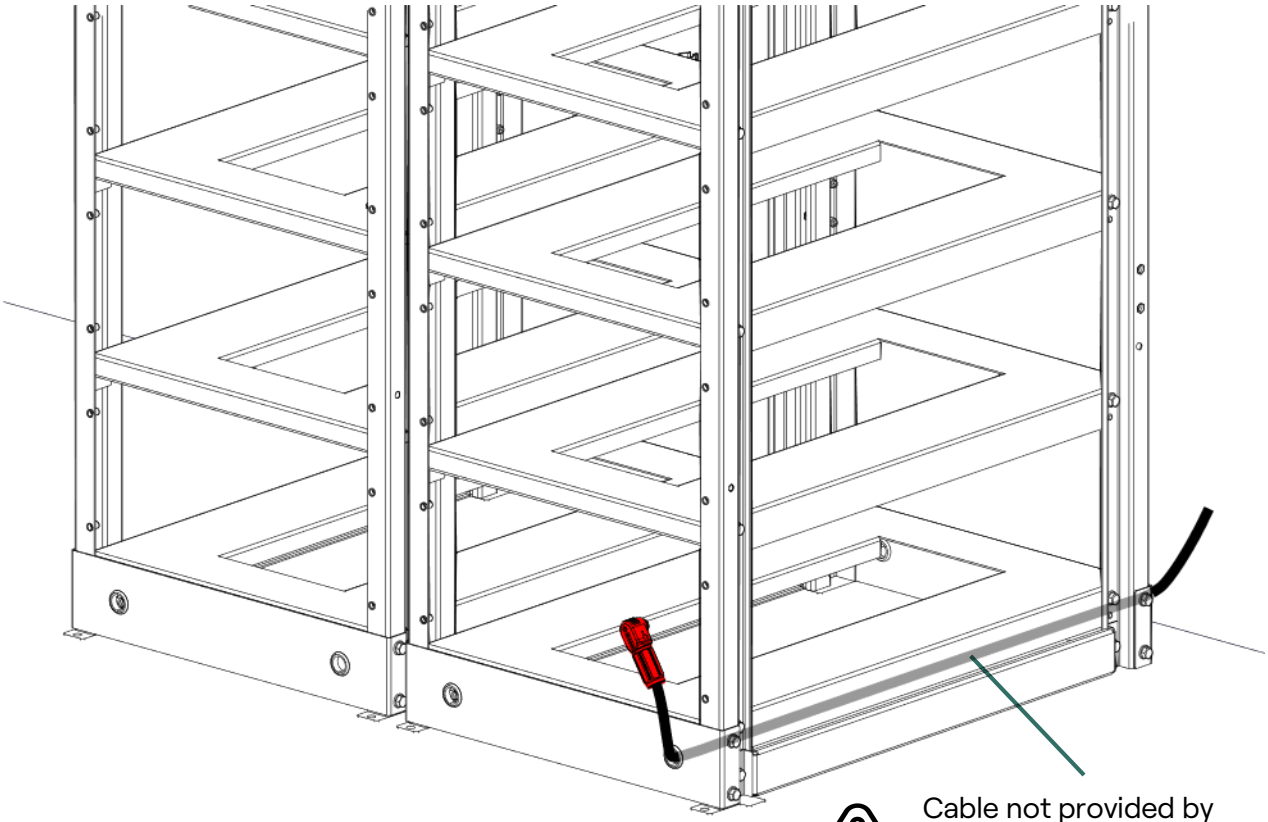
Crimp the positive aerial connector

2



3

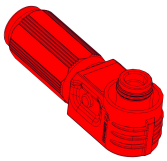
Check that the cable is well crimped. If in doubt, contact CEGASA.



Cable not provided by CEGASA. Use a **1000 VDC 70 MM2**

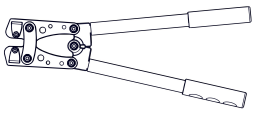
22

CB2



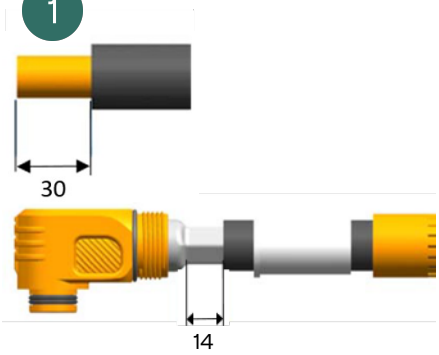
Positive aerial connector X1

T5



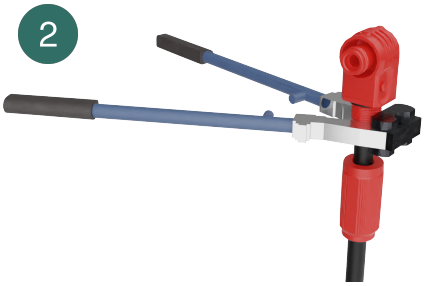
Crimper

1

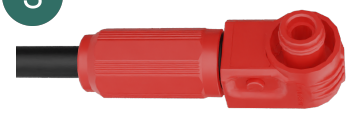


Crimp the positive aerial connector

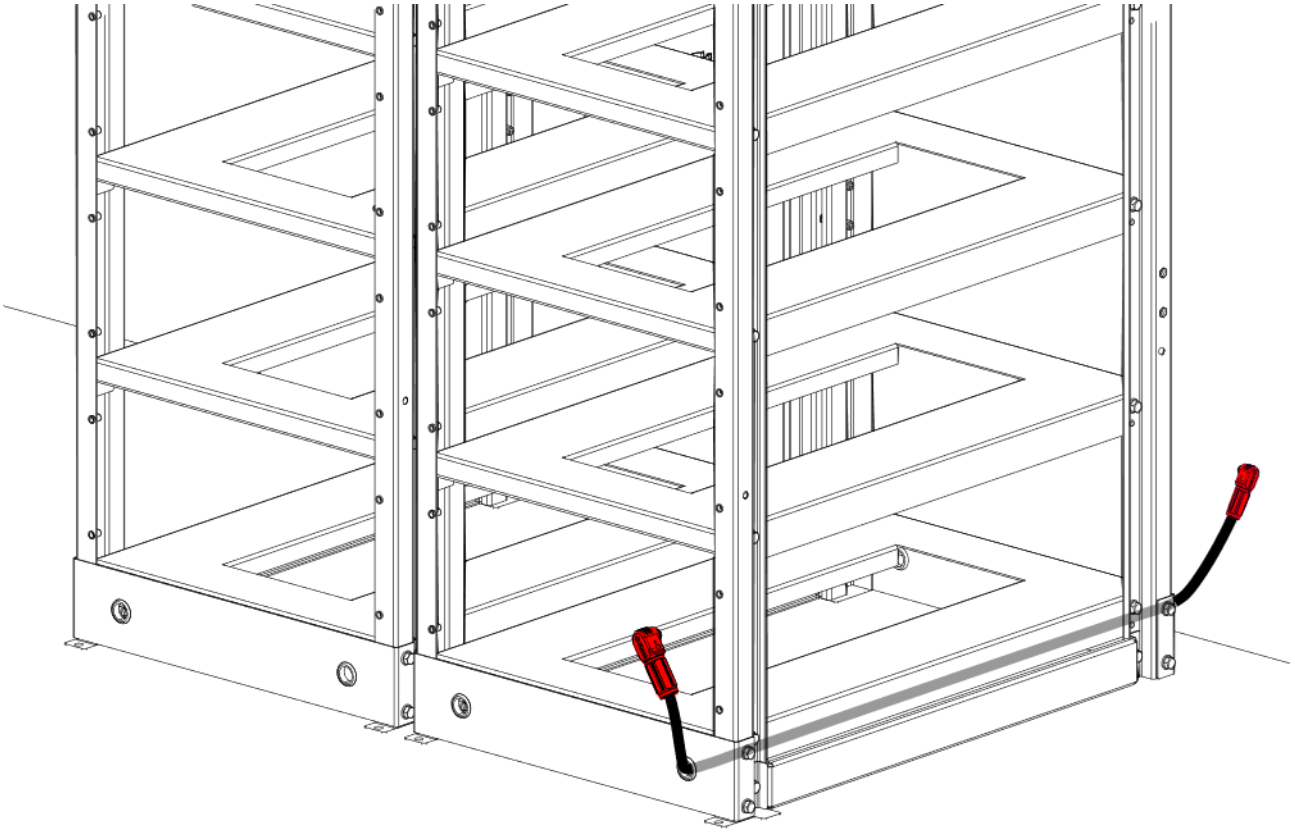
2



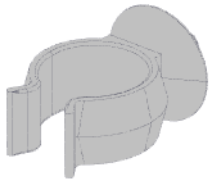
3



Check that the cable is well crimped. If in doubt, contact CEGASA.

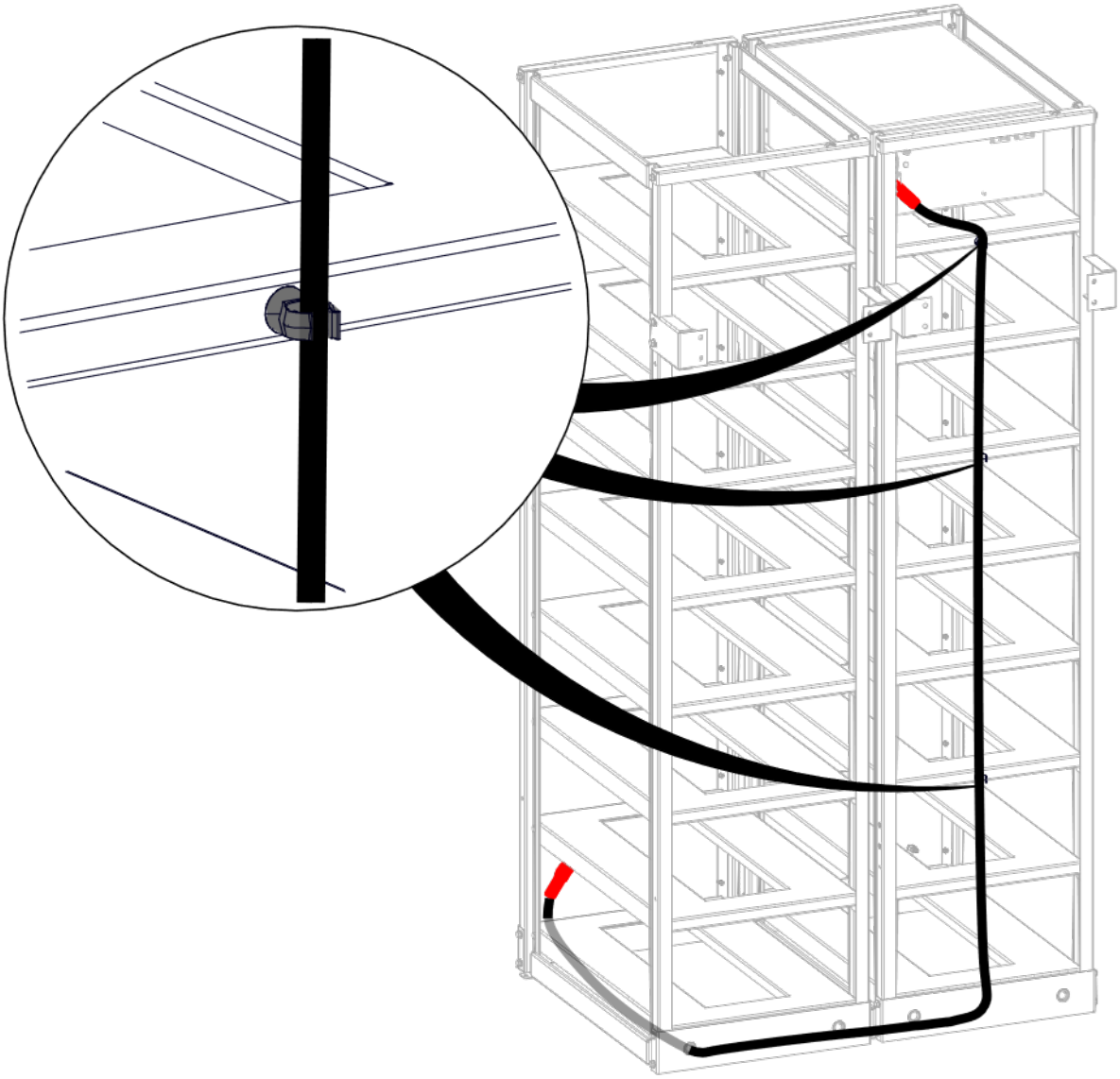


23

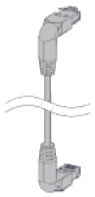


CS4

Clamp X3

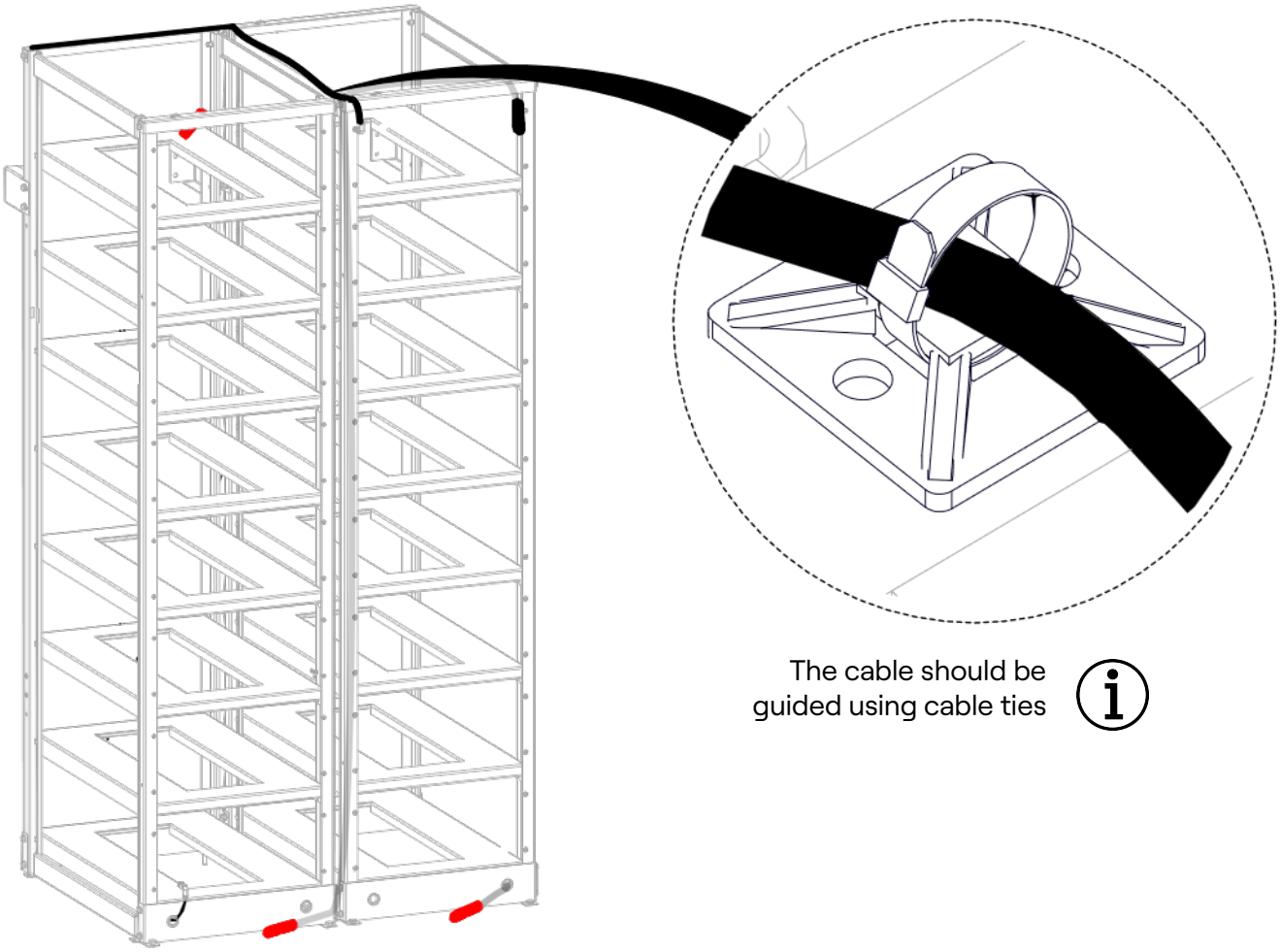


24



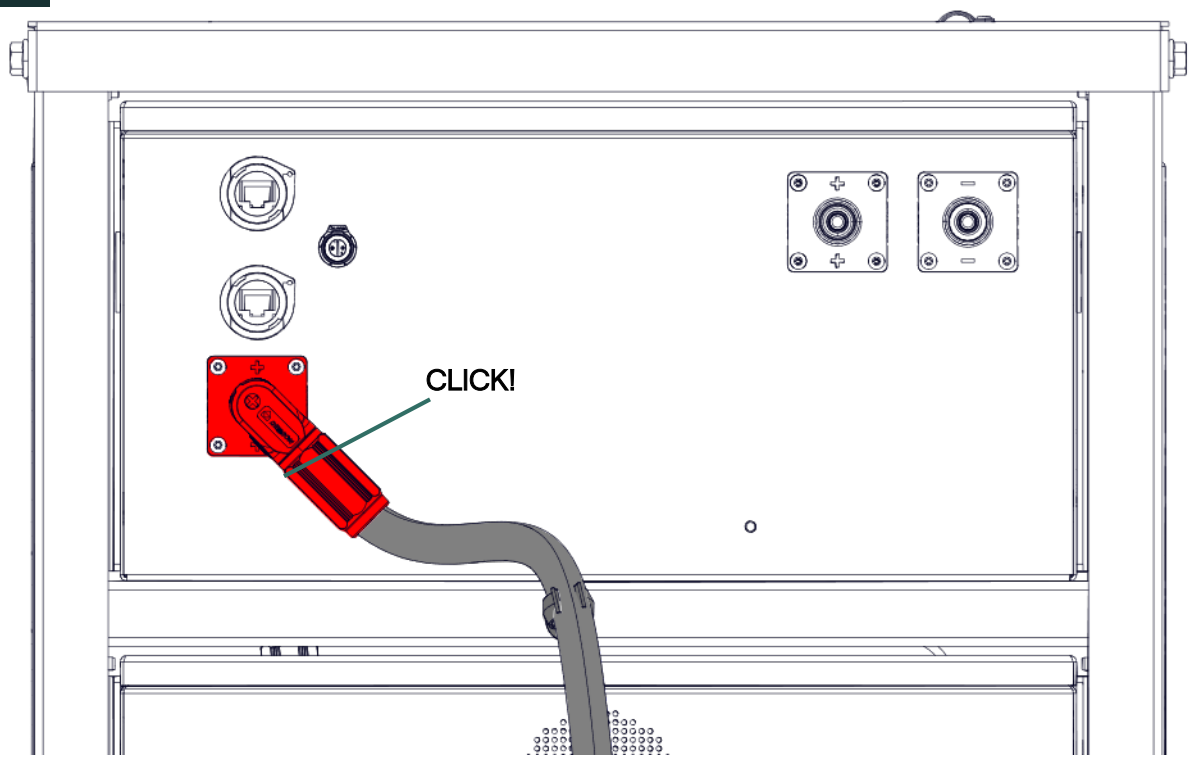
CR2

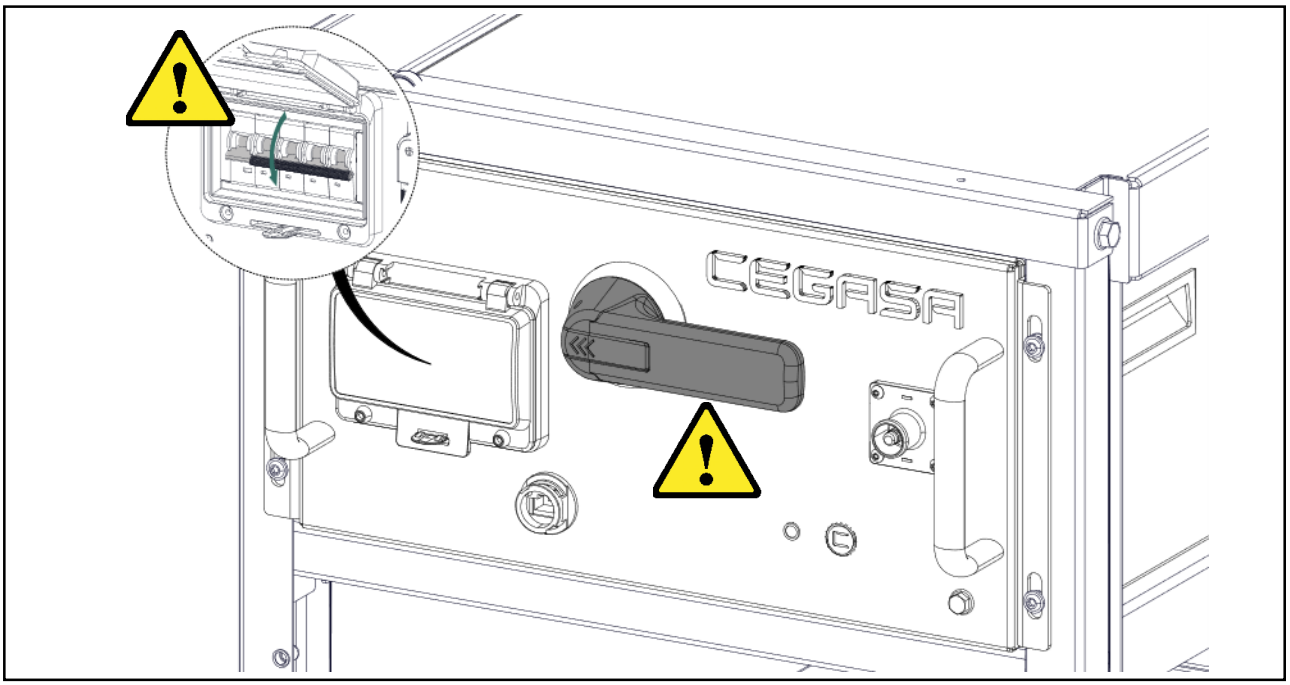
5 m COMMS cable X1



The cable should be guided using cable ties

25





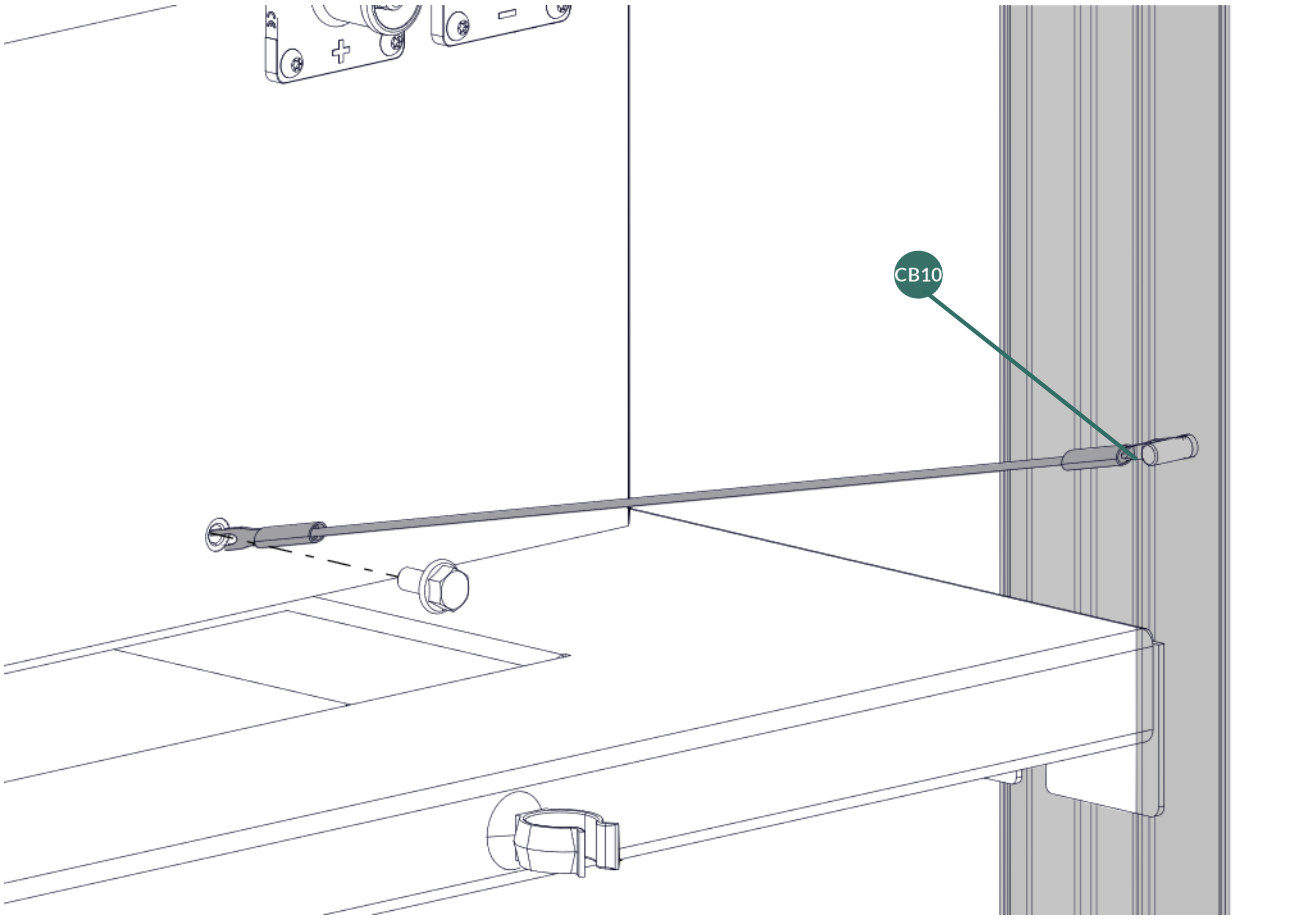
26

CB6

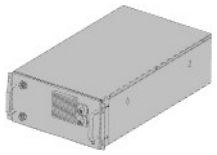
Earthing cable X1

CB10

M6 nut, washer, and grower washer set X1

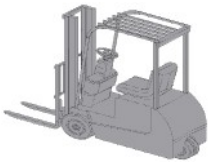


27 A



CM1

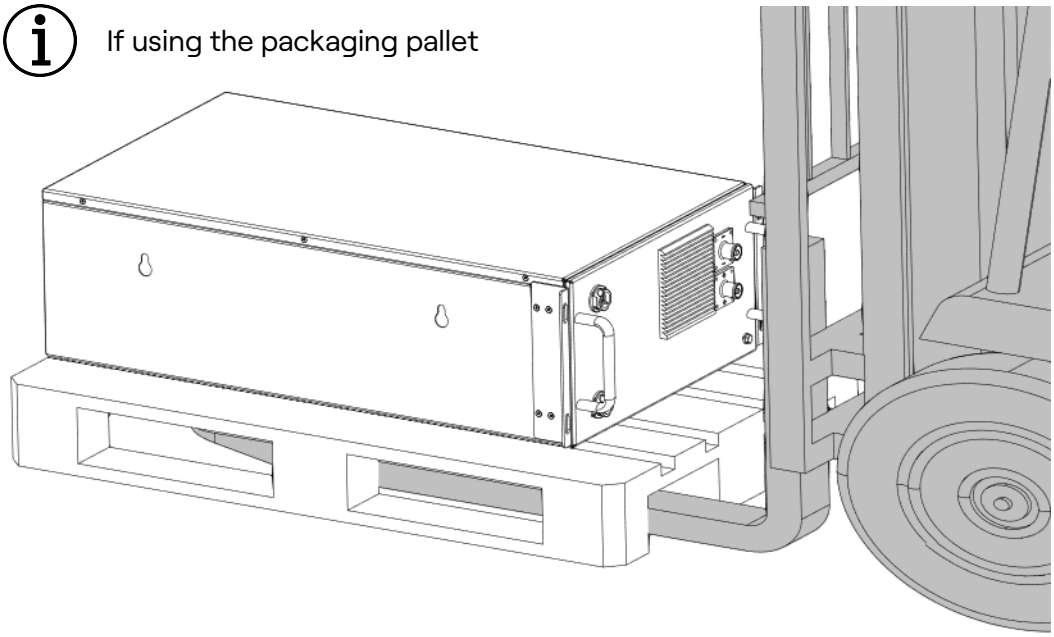
HV EXpand Module X1

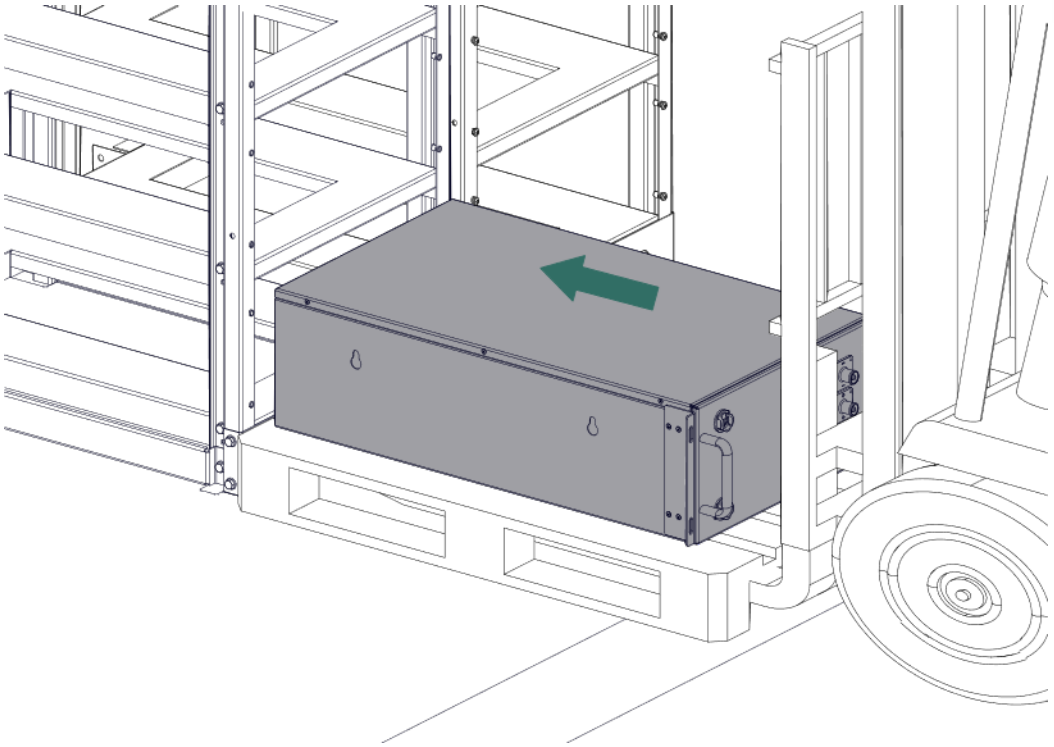


T8

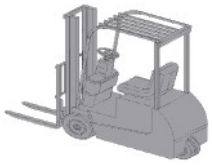
Pallet jack

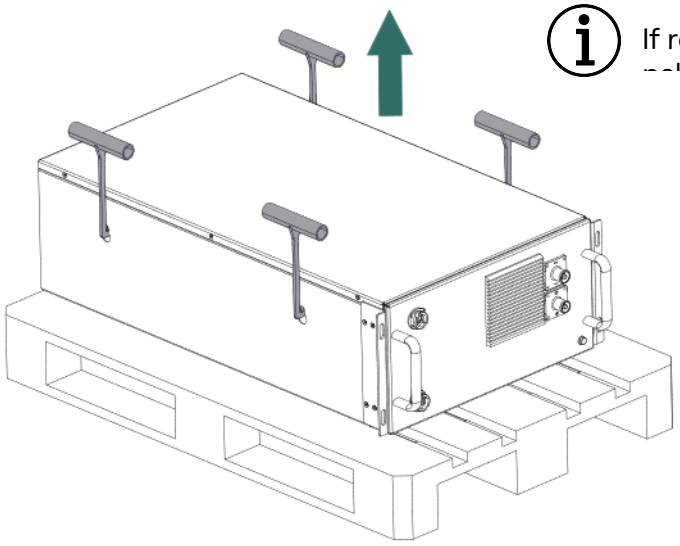
If using the packaging pallet





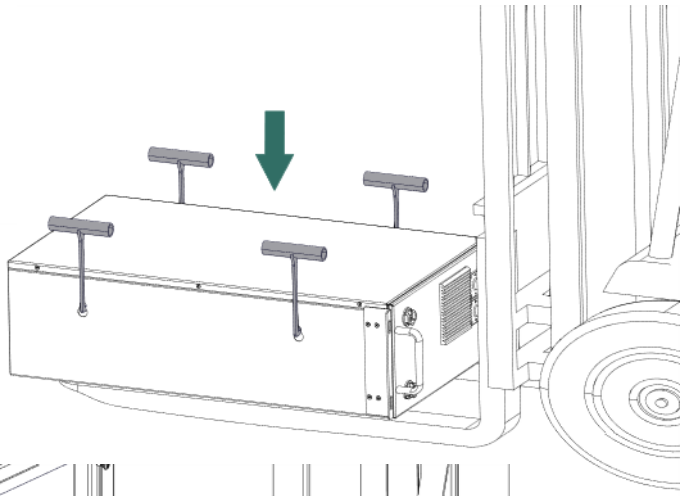
27 B

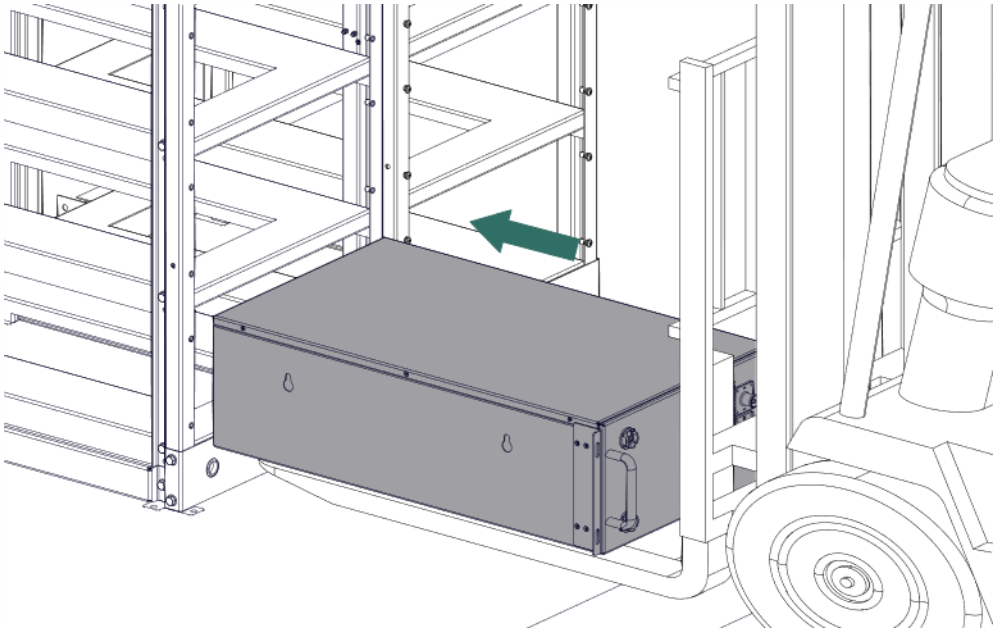
CM1	CB4	T8
		
HV EXpand Module	Hook	Pallet jack



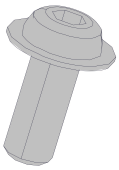
If removing the module from the packaging pallet

Step to be performed by several people





28



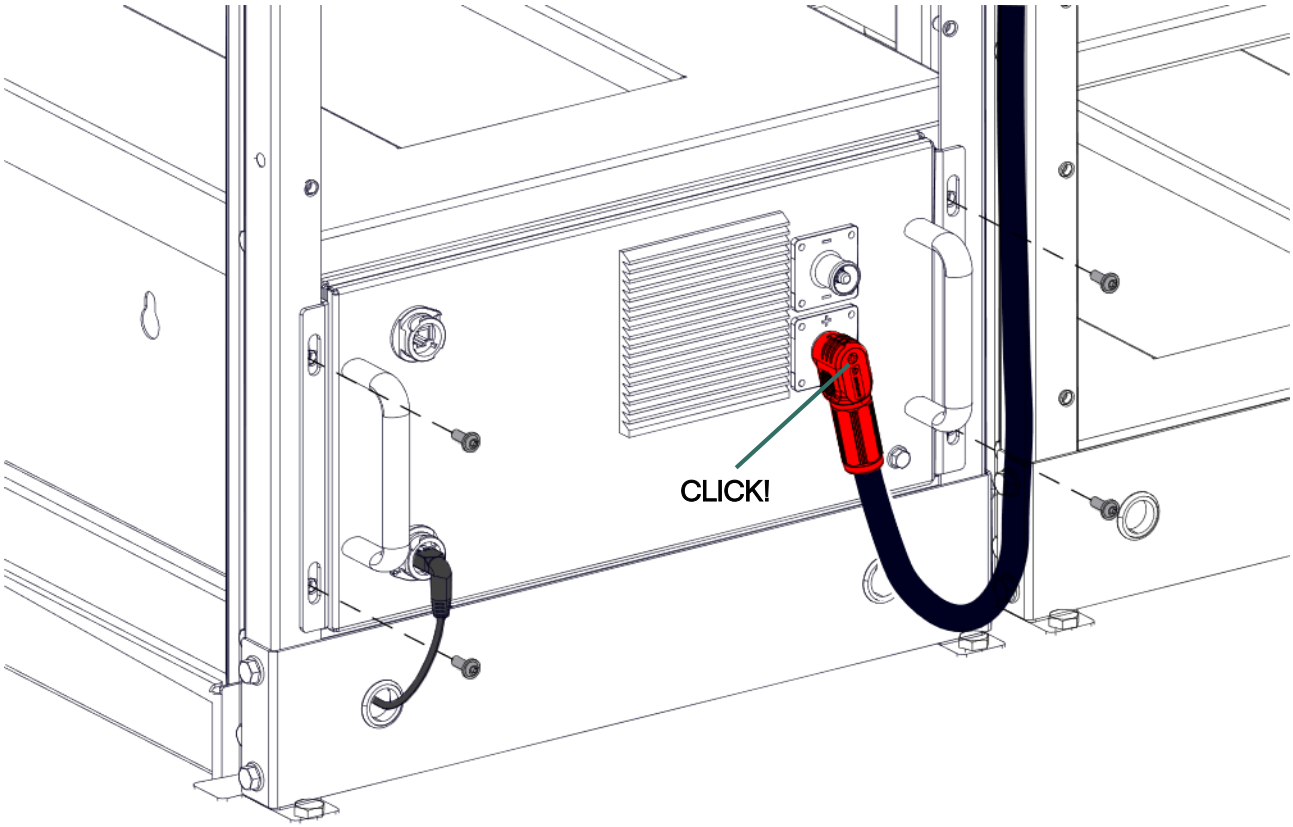
CS6

DIN7380 FL M6x16 Screw

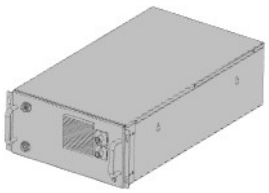
X4

T4

5 Allen key

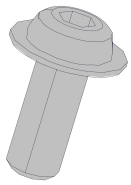


29



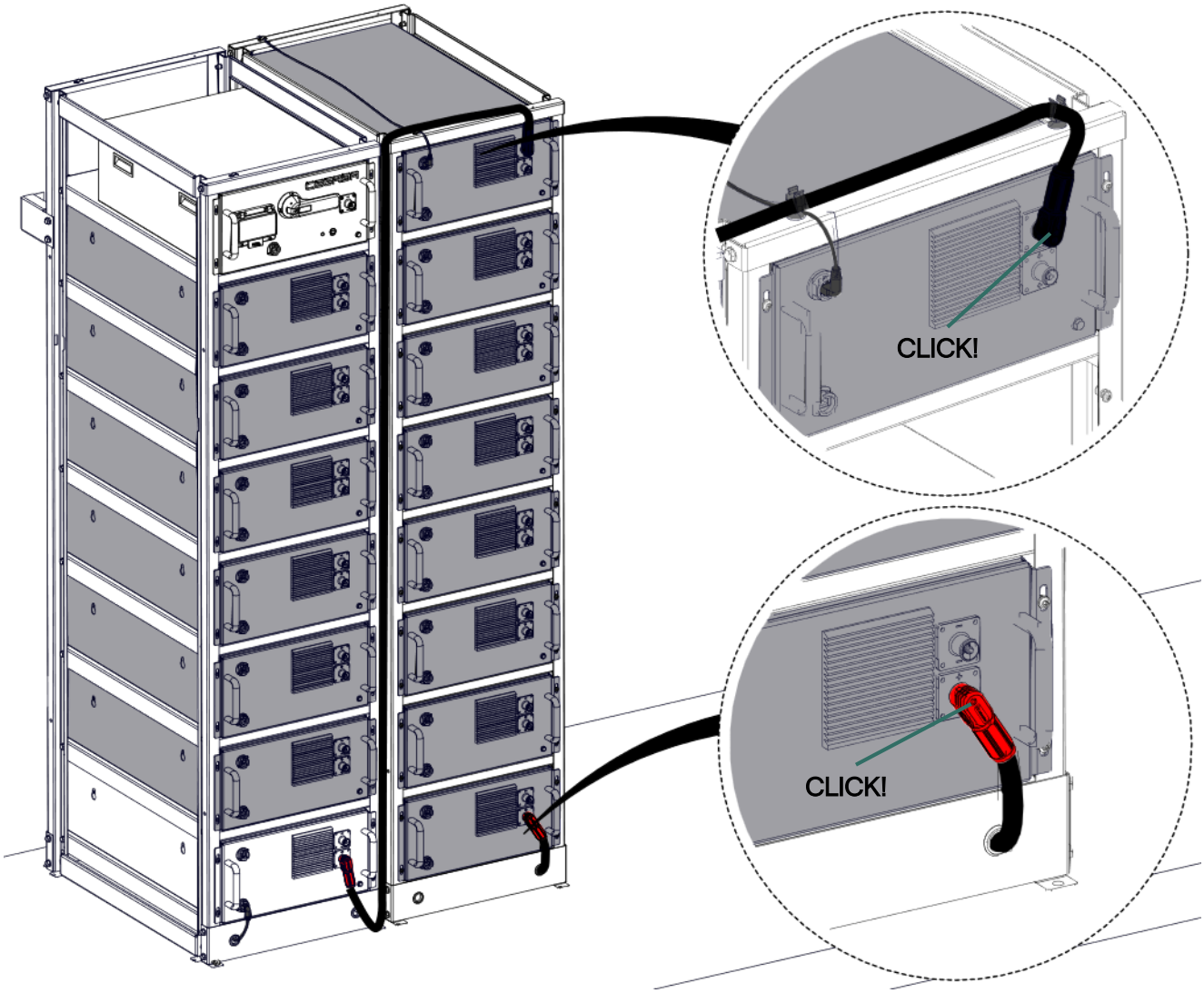
CM1

HV EXpand Module X14



CS6

M6 Screw X56



First assemble the left rack followed by the right rack, from bottom to top.

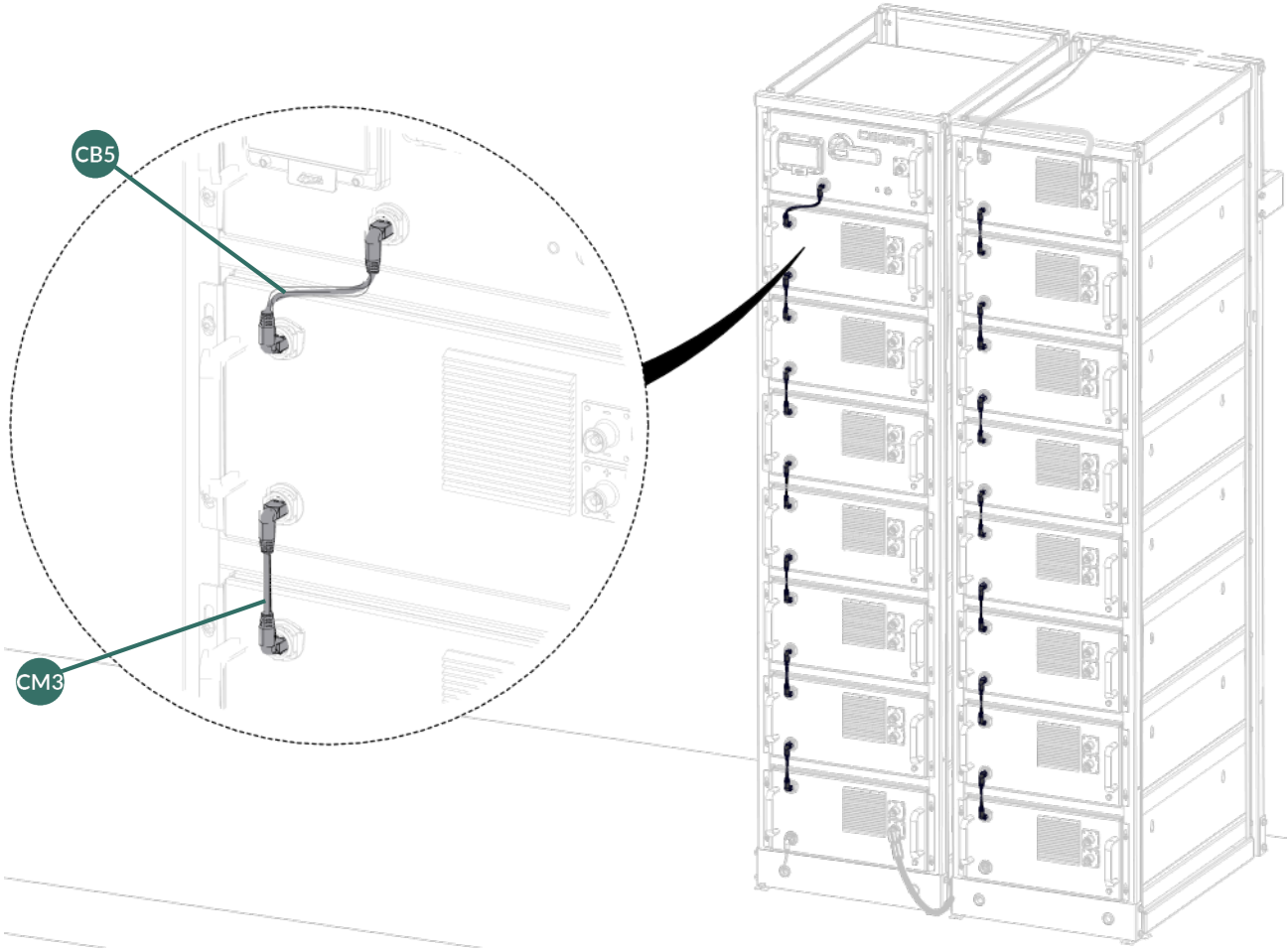
30

CB5

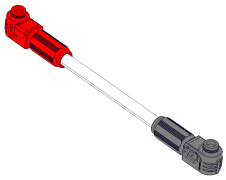
BMU COMMS cable X1

CM3

Module COMMS Cable X13

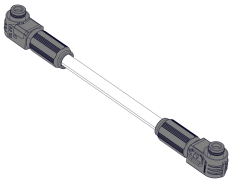


31



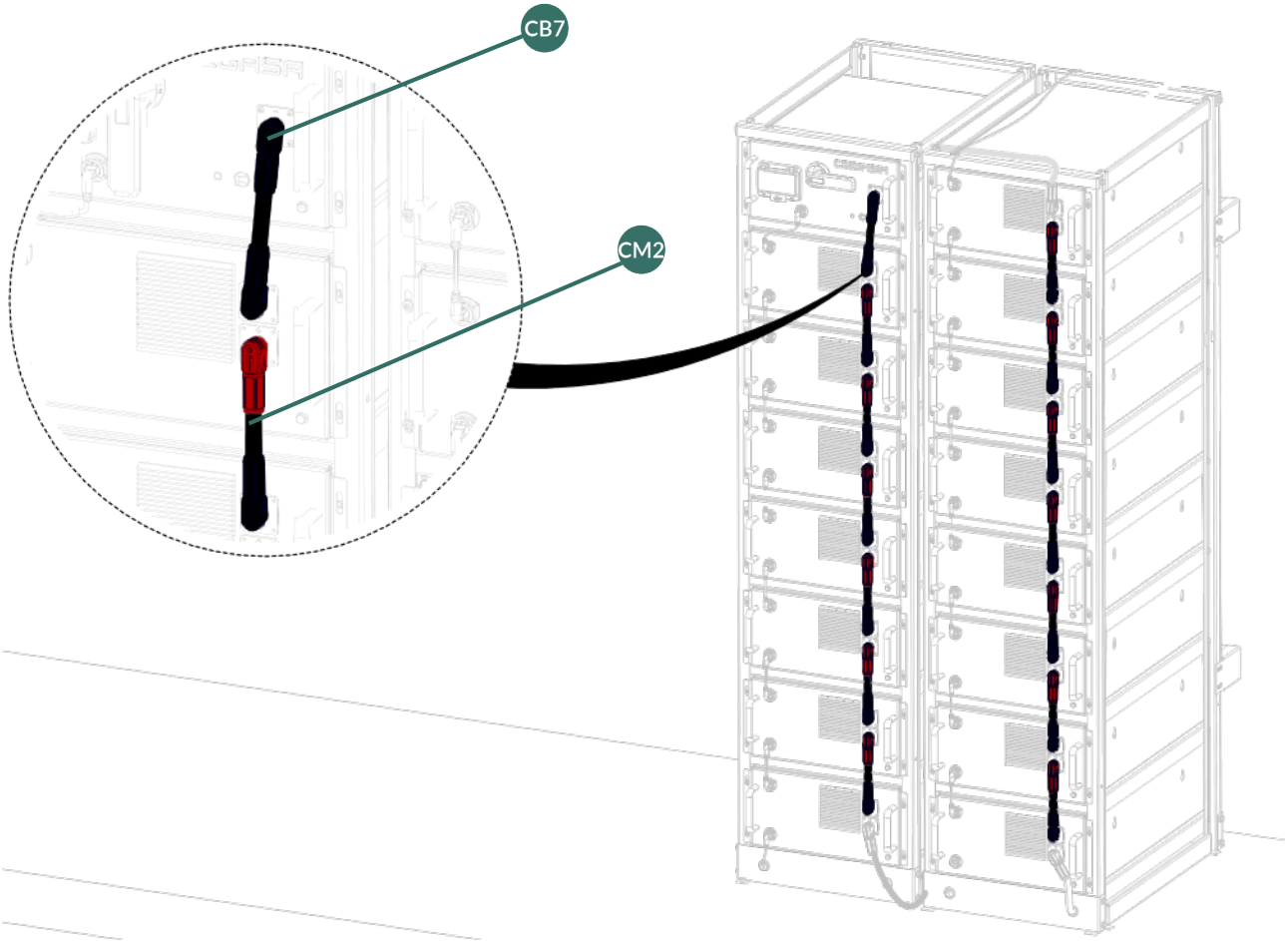
CM2

Module POT Cable X13



CB7

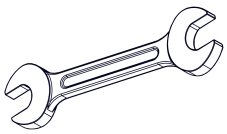
BMU POT cable X1



32

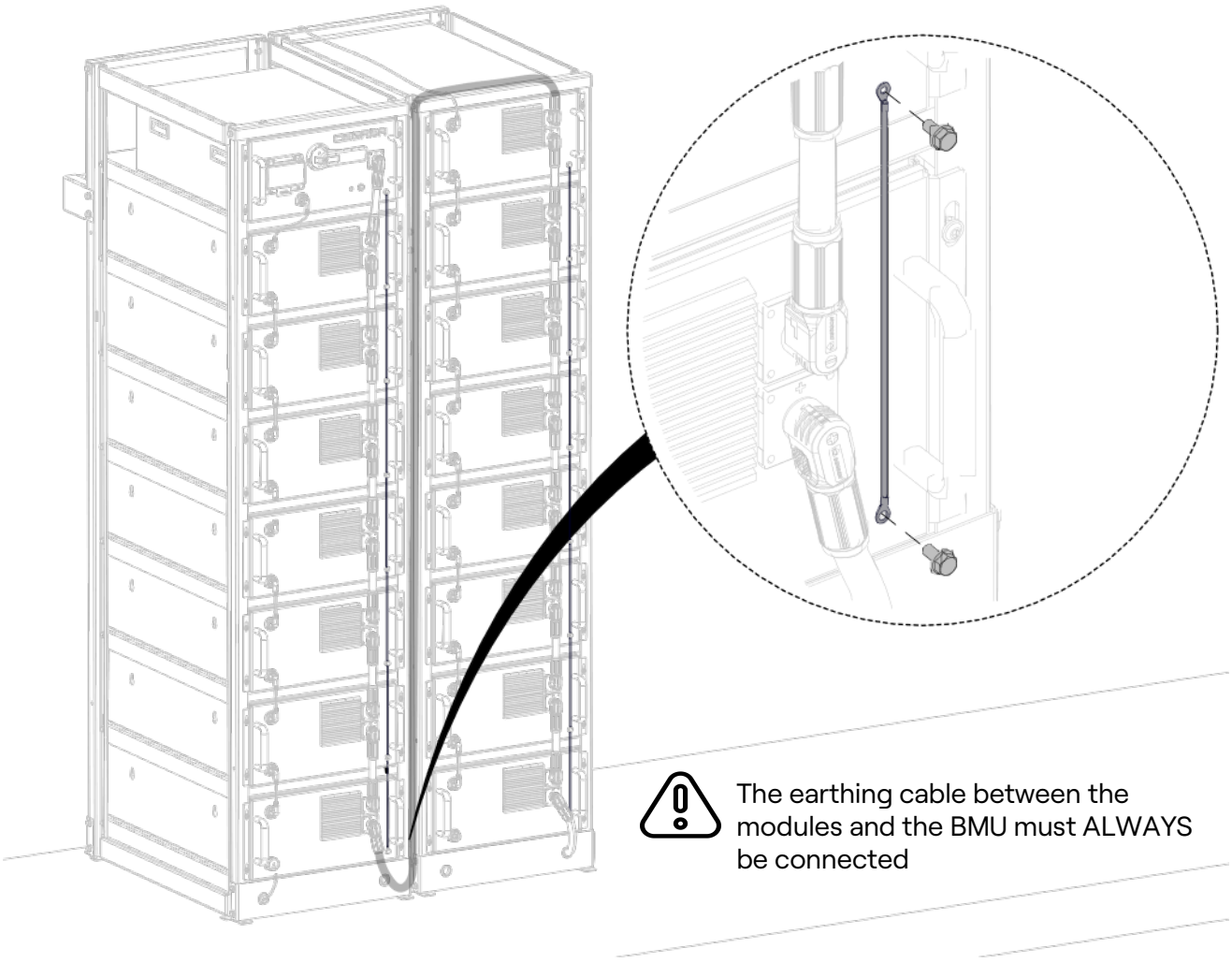
CM4

Earthing cable X14



T7

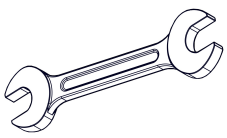
Spanner



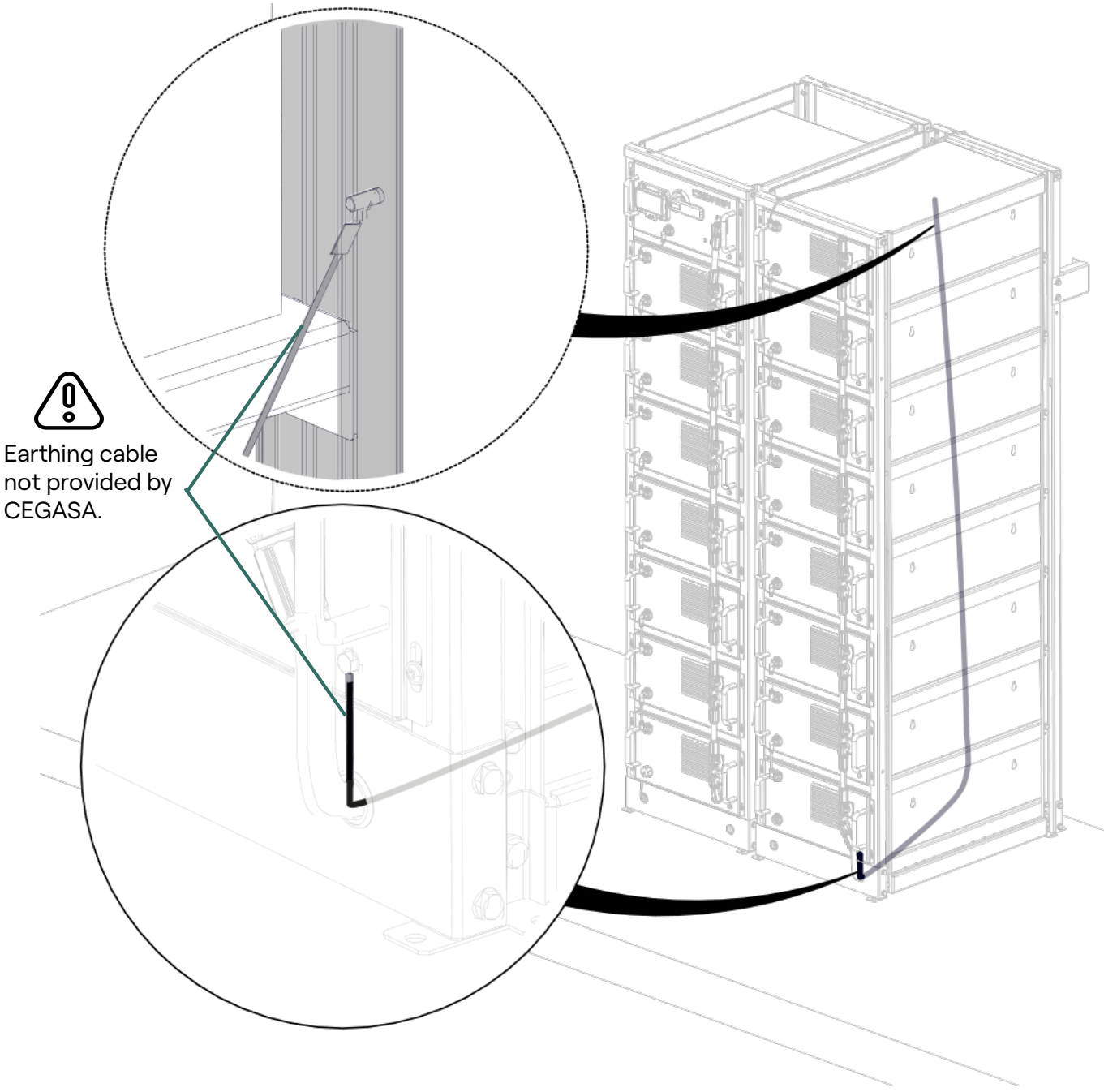
The earthing cable between the modules and the BMU must ALWAYS be connected

33

T7

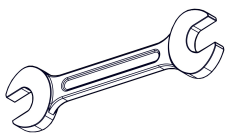


Spanner



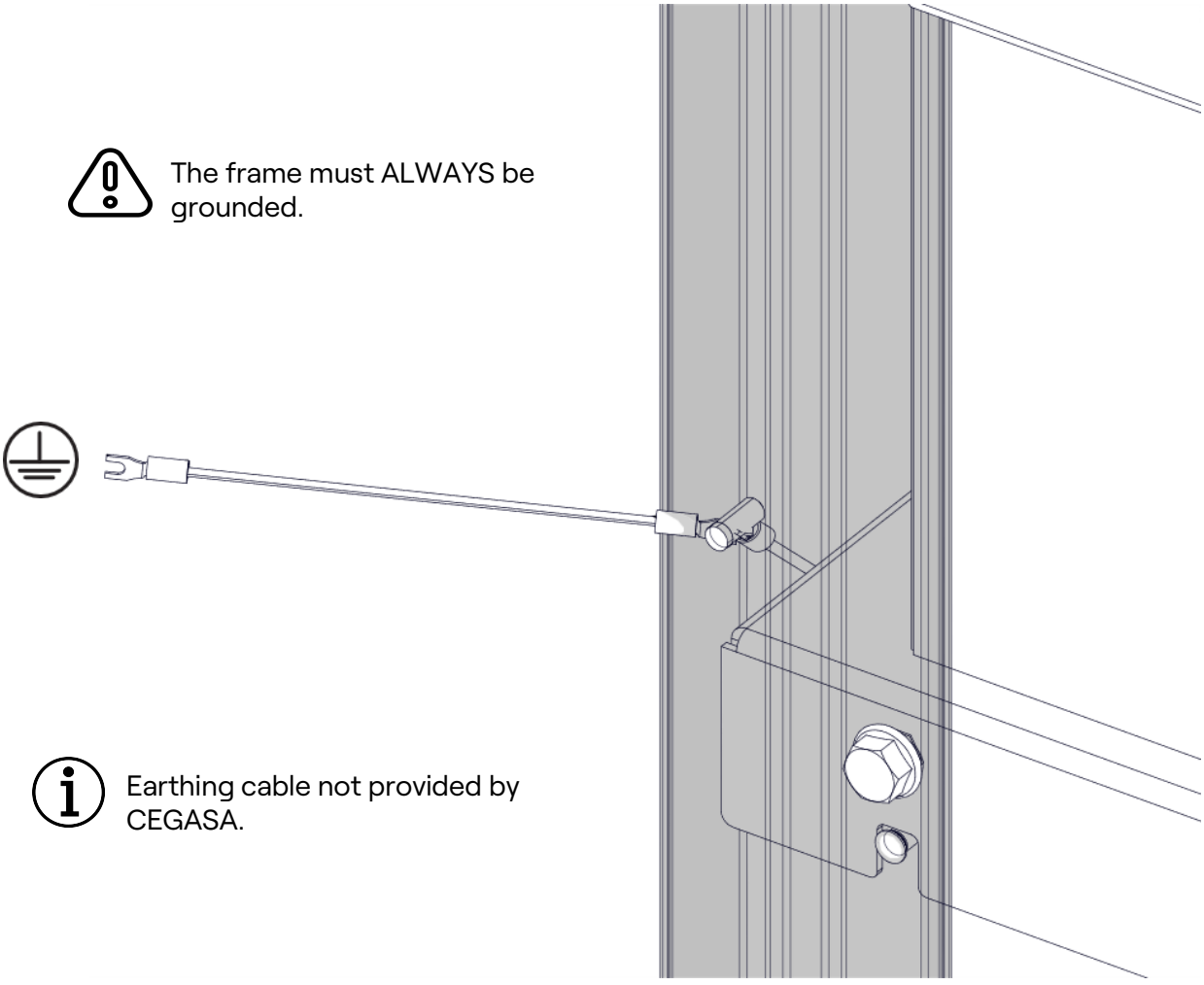
34

T7



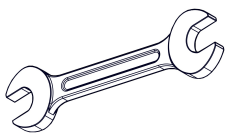
Spanner

The frame must ALWAYS be grounded.



Earthing cable not provided by CEGASA.

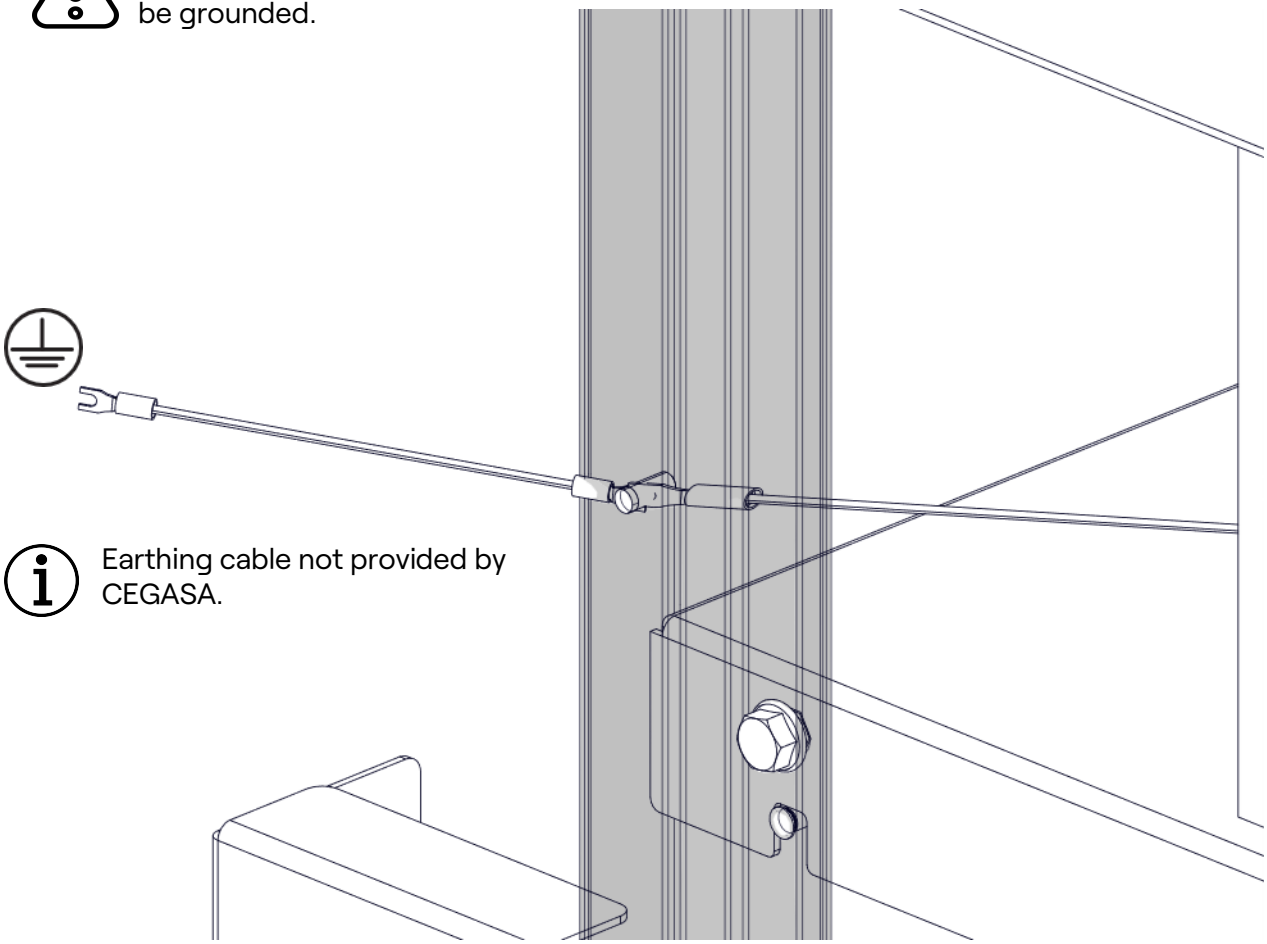
35



T7

Spanner

The frame must ALWAYS be grounded.

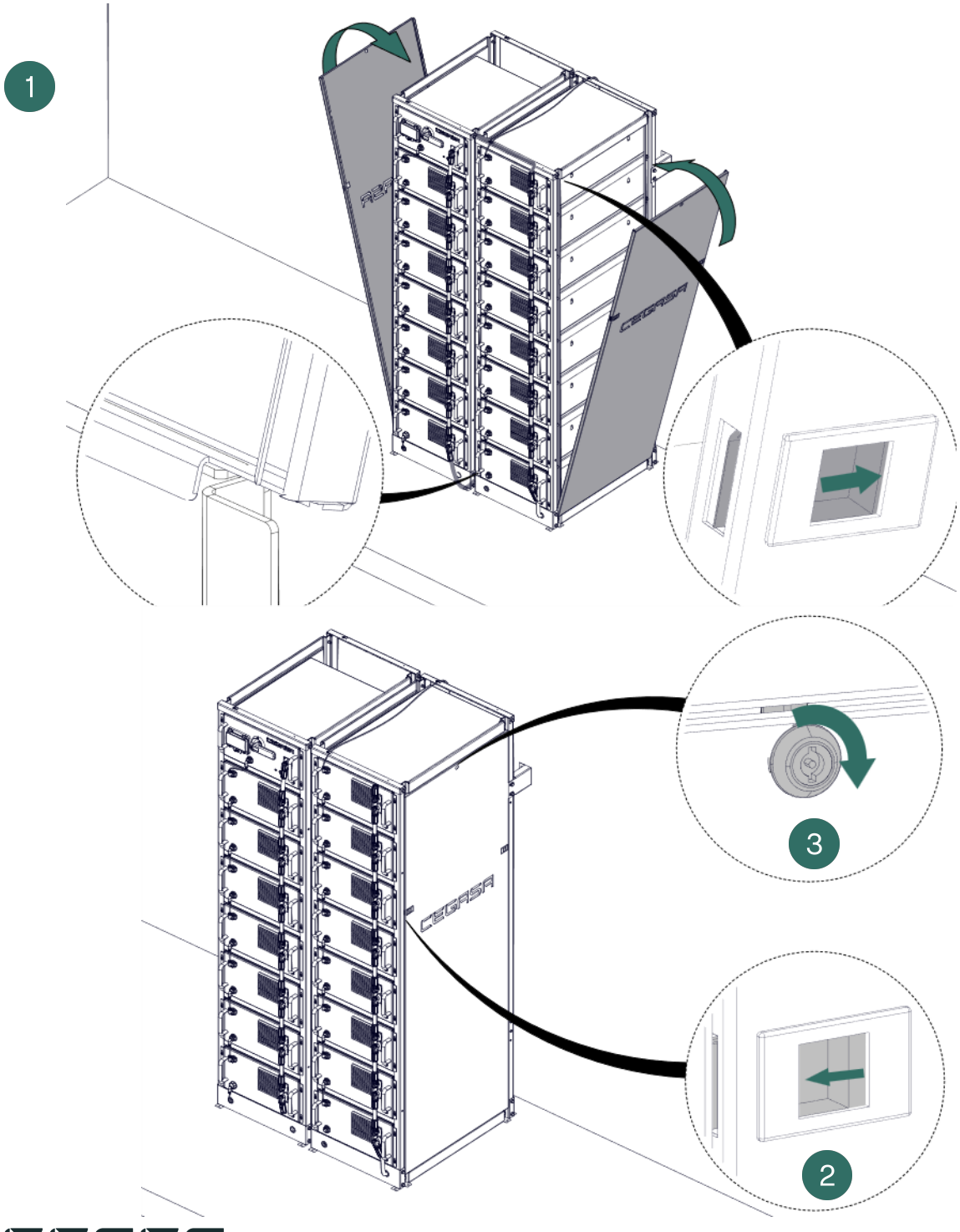


Earthing cable not provided by CEGASA.

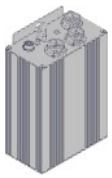
36

CT1

Closure panel X2



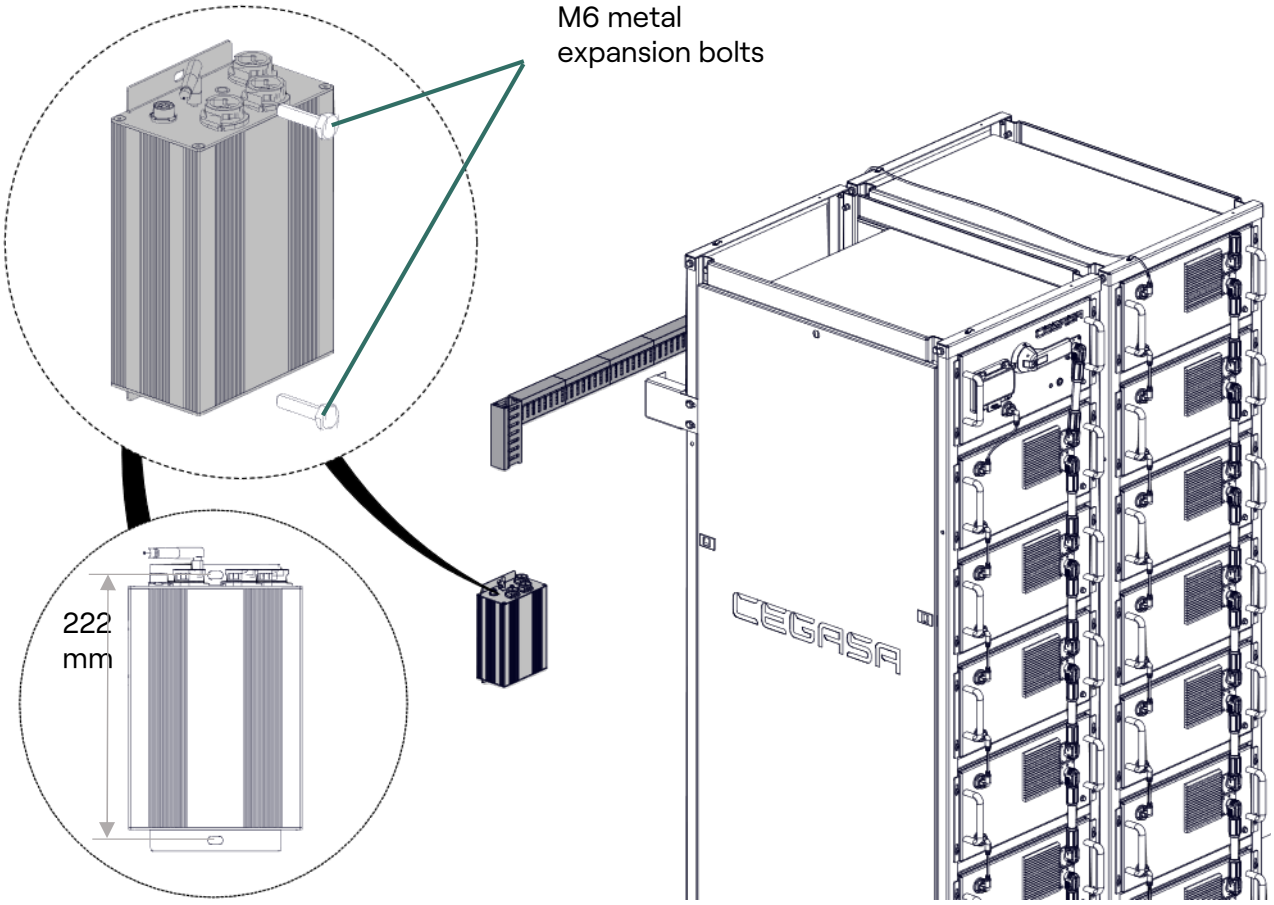
37



CE1

EXpand Master MCS Unit
110202

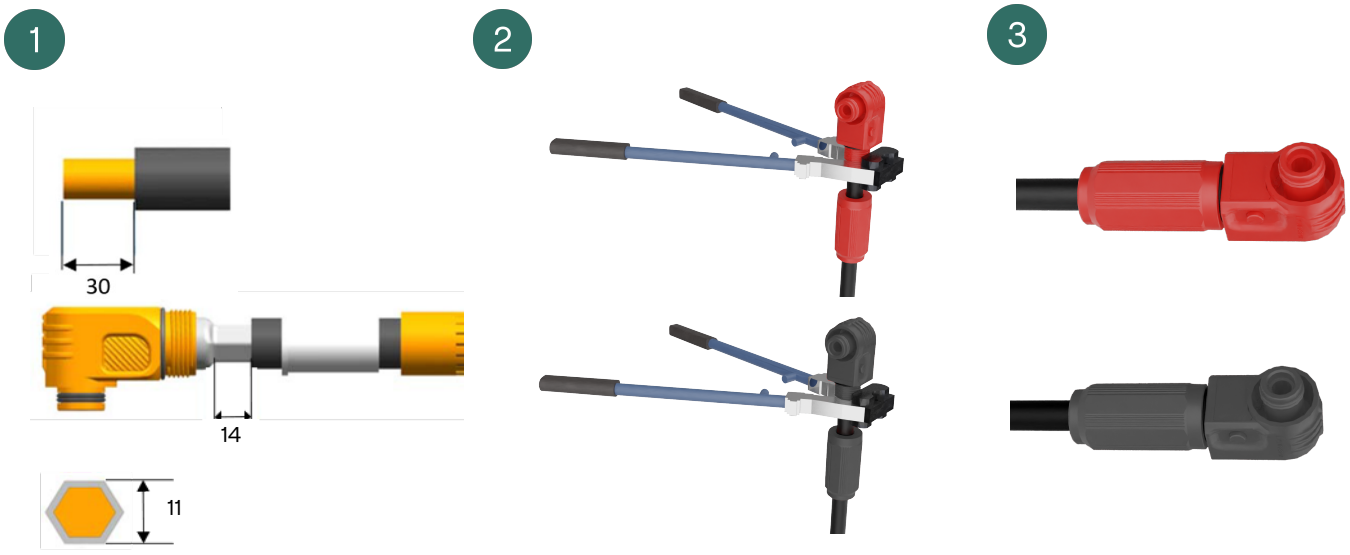
X1

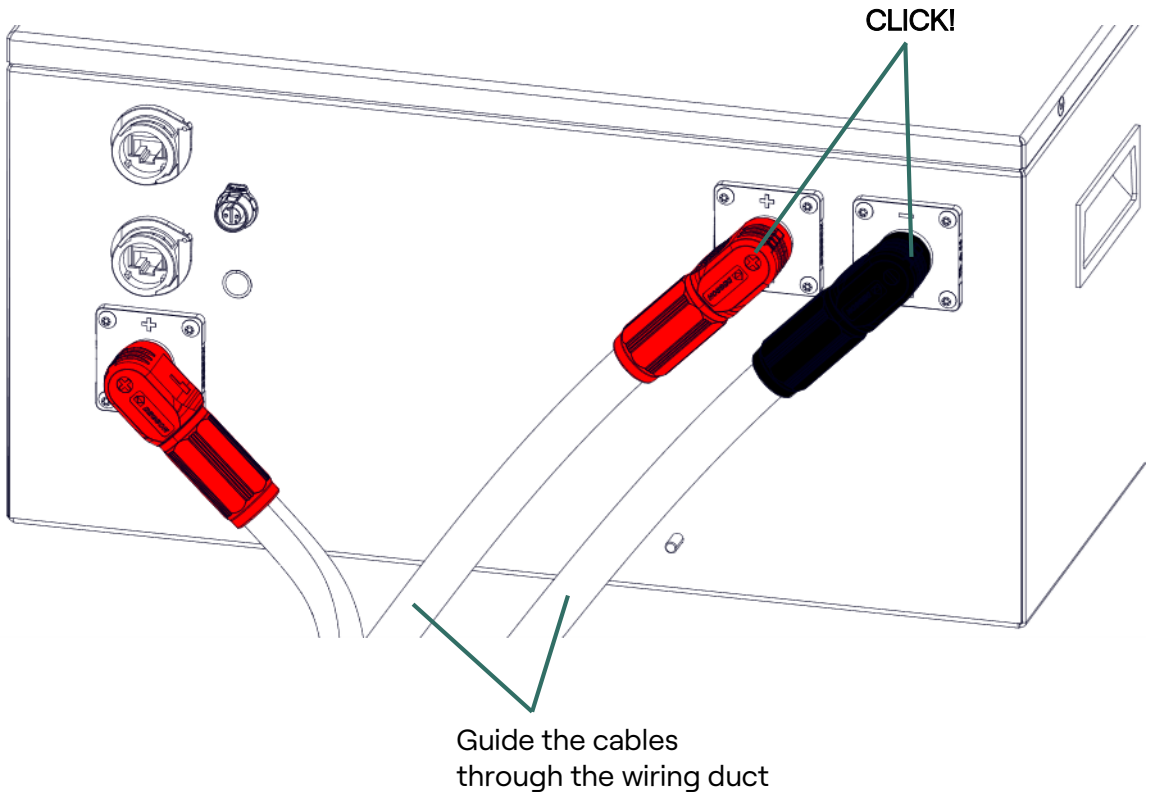


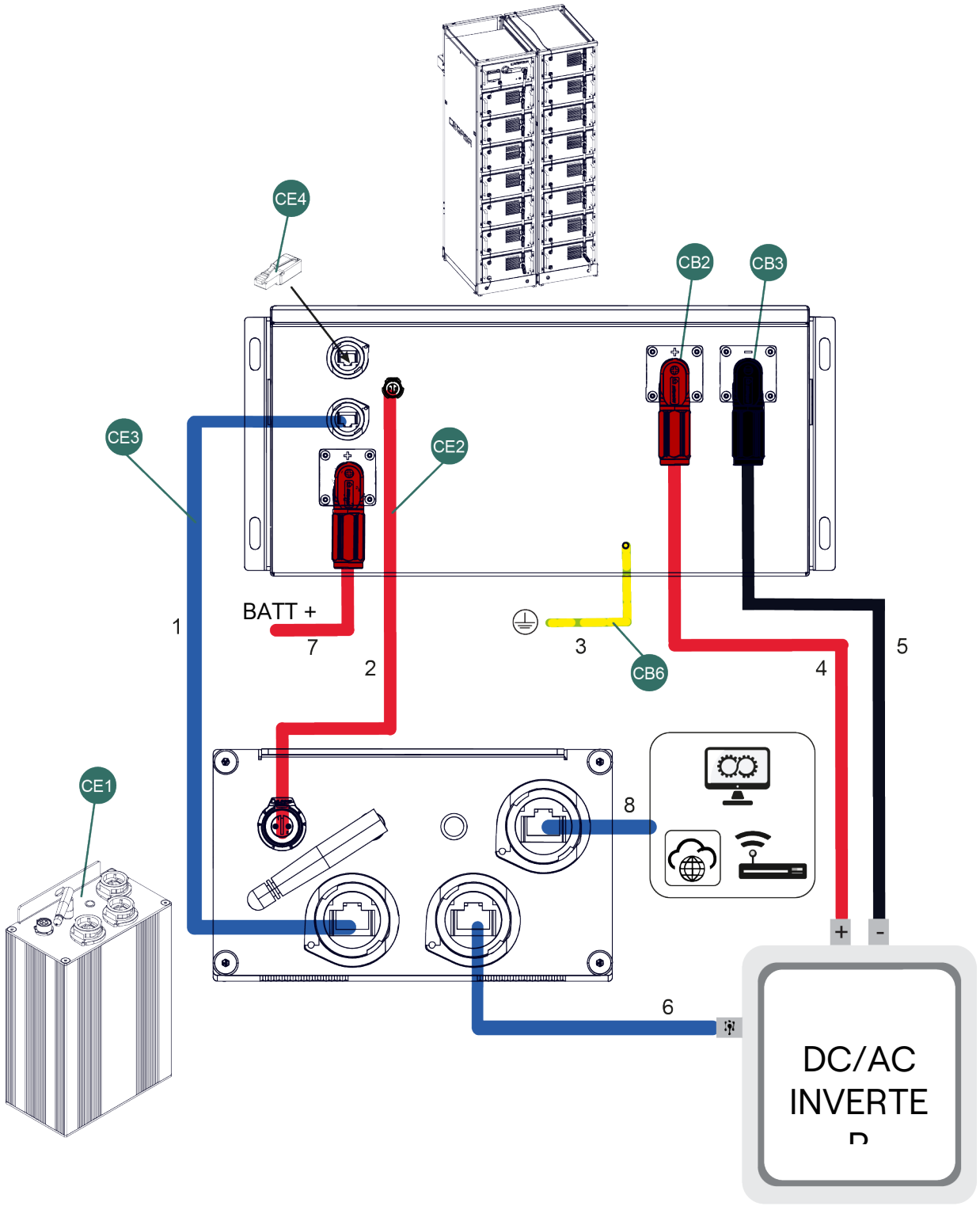
Use of M6 metal expansion bolts is recommended.
Not provided by CEGASA.

5 CONNECTIONS

5.1 CONNECTING A STRING





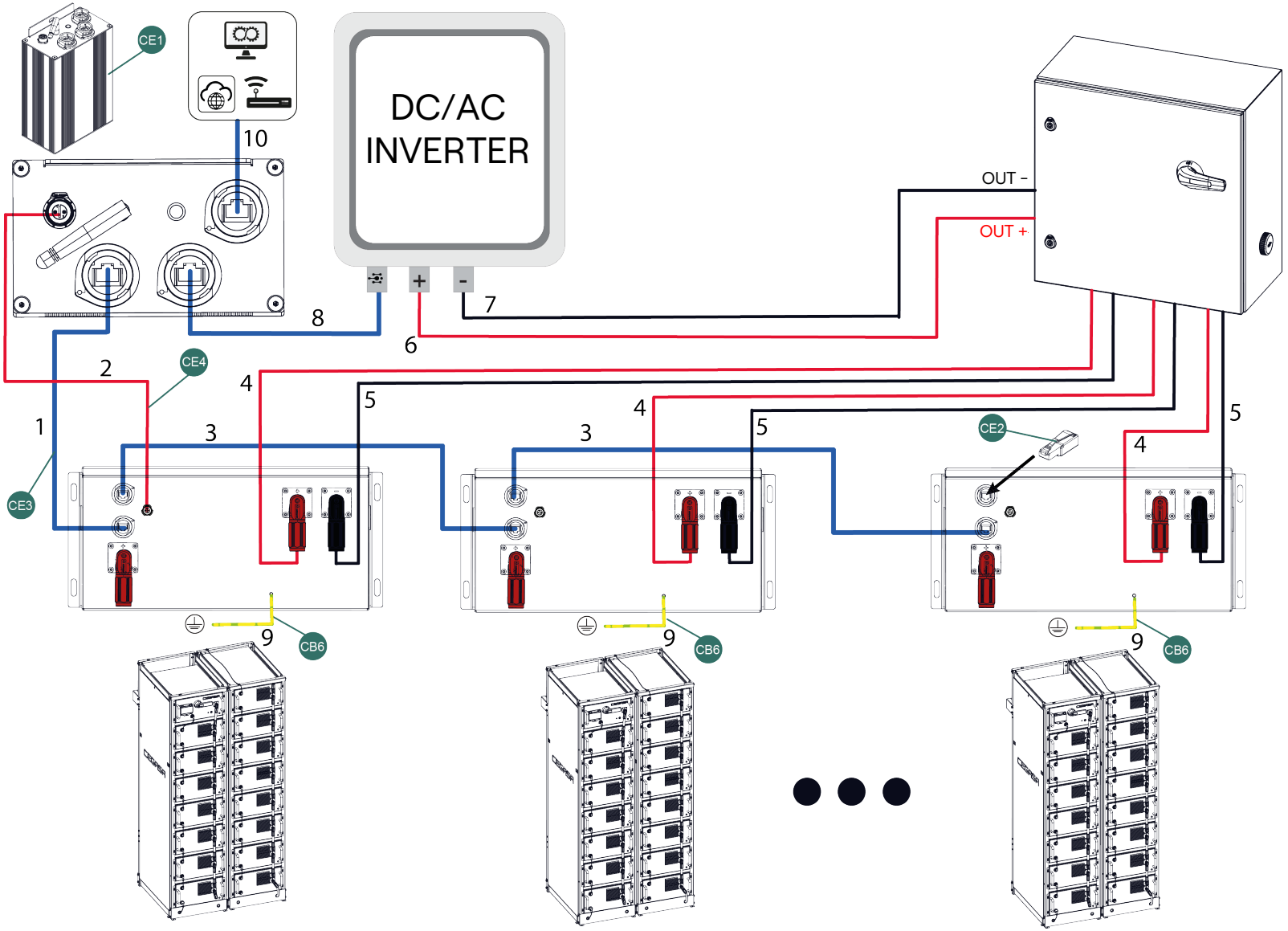


* Always connect the ground terminal to the rack

ITEM	TYPE OF CABLE	FEATURES
1	EXpand Master-BMU COMMS cable	Cat5e (min.) UTP network cable, standard parallel.
2	EXpand Master external power cable	Cable with 0.5 mm^2 section.
3	Earthing cable	Earthing cable with 10 mm^2 section.
4	OUT (+) power cable	1000 Vdc cable with 70 mm^2 section (not included).
5	OUT (-) power cable	1000 Vdc cable with 70 mm^2 section (not included).
6	COMMS (CAN bus) cable to the Inverter	Cat5e (min.) UTP network cable, standard parallel (not included).
7	BATT (+) power cable	1000 Vdc cable with 70 mm^2 section (not included).
8	COMMS (MODBUS) cable to PC	Cat5e (min.) UTP network cable, standard parallel (not included).

*

5.2 CONNECTING SEVERAL STRINGS



ITEM	TYPE OF CABLE	FEATURES
1	EXpand Master-BMU COMMS cable	Cat5e (min.) UTP network cable, standard parallel.
2	EXpand Master external power cable	Cable with 0.5 mm^2 section.
3	InterBMU COMMS cable	Cat5e (min.) UTP network cable, standard parallel (not included).
4	OUT (+) power cable	1000 Vdc cable with 70 mm^2 section (not included).
5	OUT (-) power cable	1000 Vdc cable with 70 mm^2 section (not included).
6	OUT (+) power cable Cabinet-Inverter	1000 Vdc cable with 70 mm^2 section (not included).
7	OUT (-) power cable Cabinet-Inverter	1000 Vdc cable with 70 mm^2 section (not included).
8	COMMS (CAN bus) cable to the Inverter	Cat5e (min.) UTP network cable, standard parallel (not included).
9	Earthing cable	Earthing cable with 10 mm^2 section.
10	COMMS (MODBUS) cable to PC	Cat5e (min.) UTP network cable, standard parallel (not included).

6 CONFIGURATION OF THE MASTER MCS UNIT

The unit must be configured according to the communication protocol with the inverter it is going to work with. There are two possibilities depending on the communication protocol with the inverter.

6.1 MODBUS TCP/IP COMMUNICATION PROTOCOL

The factory settings of the unit are valid. No action is required.

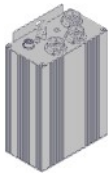
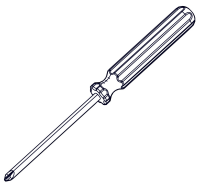
6.2 CAN BUS COMMUNICATION PROTOCOL

The unit is configured at CEGASA to work using this communication protocol with the following inverters:

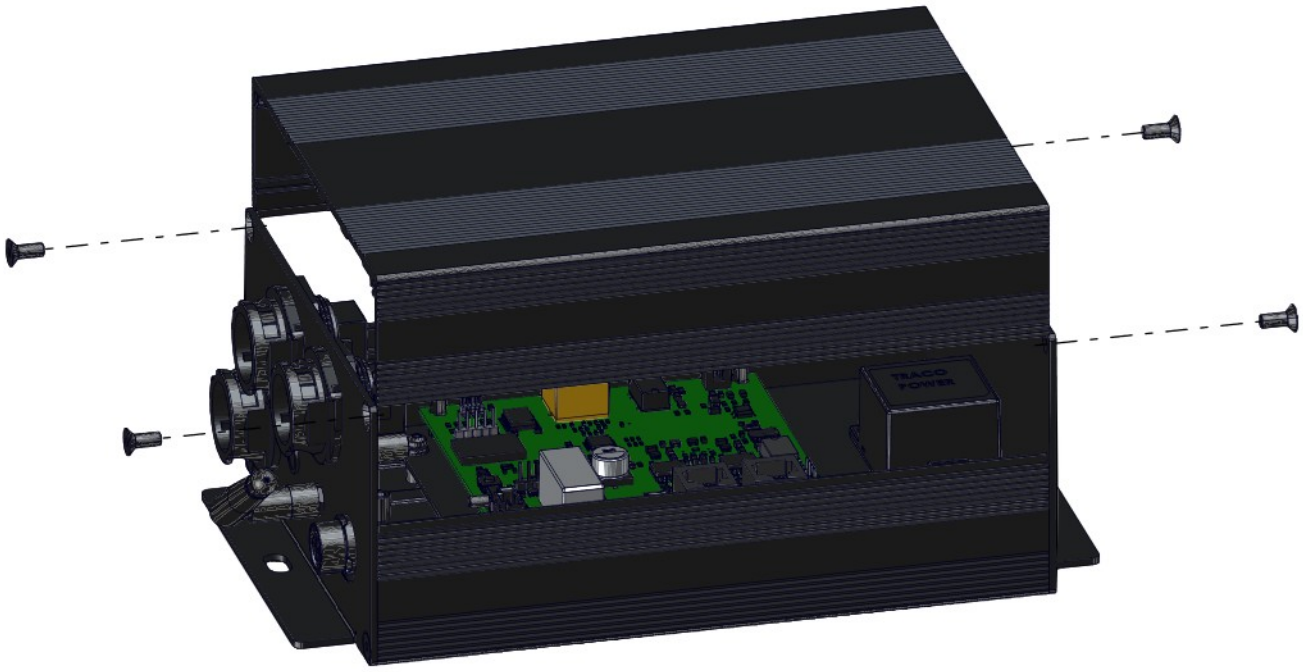
- ✓ **Solis S6-EH3P**
- ✓ **Solinteg-MHT**
- ✓ **Ingeteam Sun Storage 3Play 100TL**
- ✓ **Sosen SSE-HH100K-125K-P3EU**
- ✓ **SUNNY ISLAND X 30 / 50**

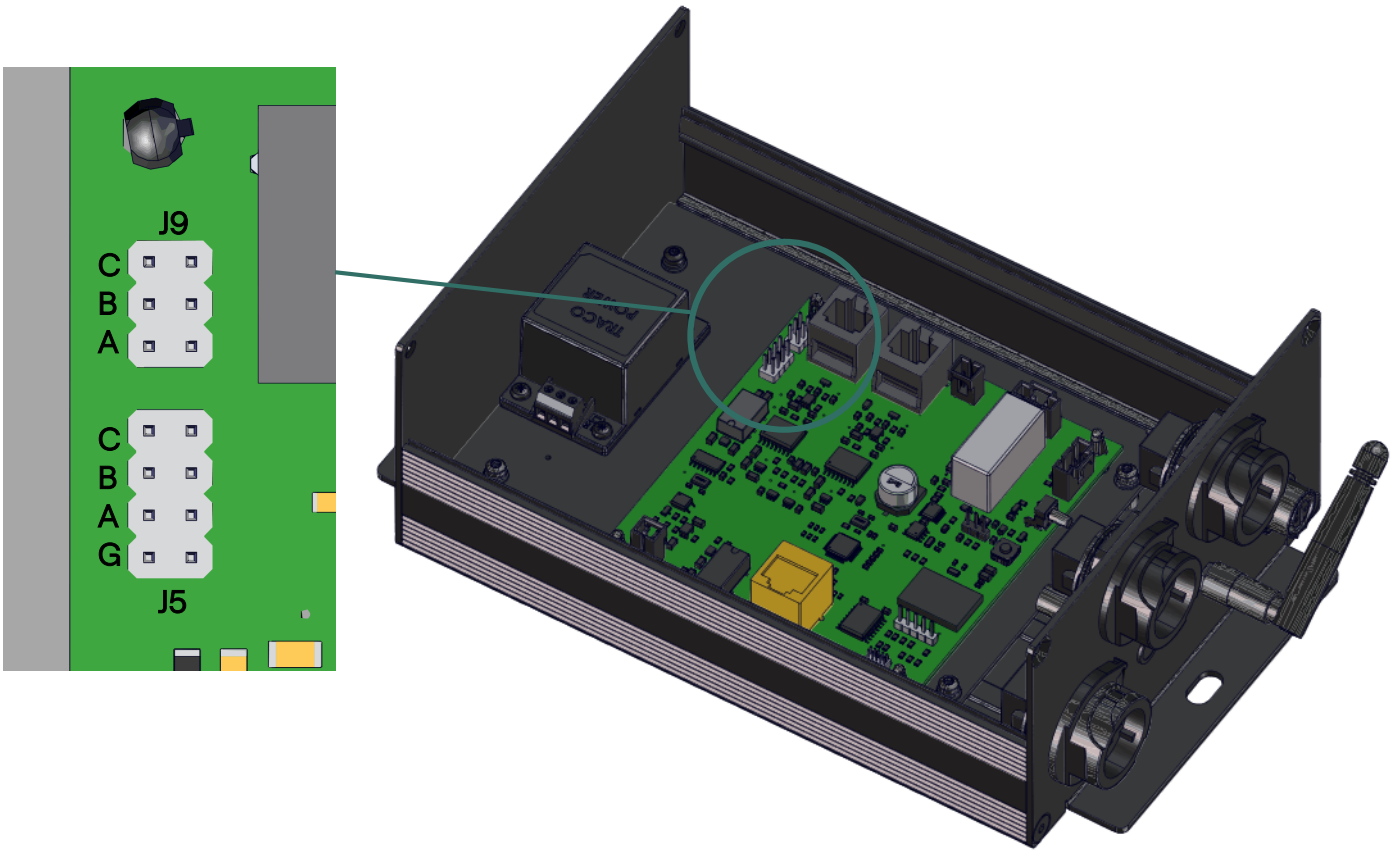
SIGNAL	PIN
CAN_H	4
CAN_L	5

With any other inverter in which the communication protocol is via CAN bus, it will be necessary to modify the "pinout" of the card as follows:

1	CE1	T10
	 EXpand Master MCS Unit 110202 X1	 Phillips screwdriver

Open the upper cover by loosening the four top screws and carefully separating the cover.





Once opened, identify the jumpers on the card and make the necessary changes according to the inverter to be used.

Inverter	J5	J9
Victron Multi HS19	CG	C
Selectronic SP PRO	A	A
Enjoypowers EPCS125-AM	A	A
Sinexcel PWS2-30P-EX	A	A

Finally, close the unit again doing the first step in this section in reverse.

Energy you can trust

CEGASA

Spain. Production Centre
Cegasa Energía S.L.U.
Parque Tecnológico de Álava, Calle Marie Curie 1
01510 Miñano, Vitoria-Gasteiz (Álava, Spain)

www.cegasa.com
hello@cegasa.com