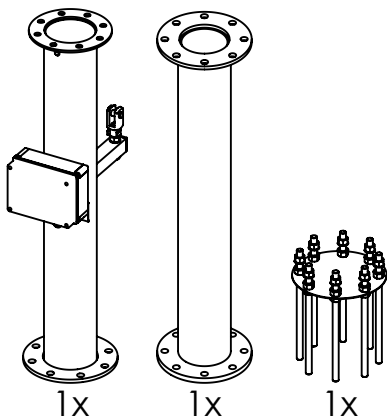
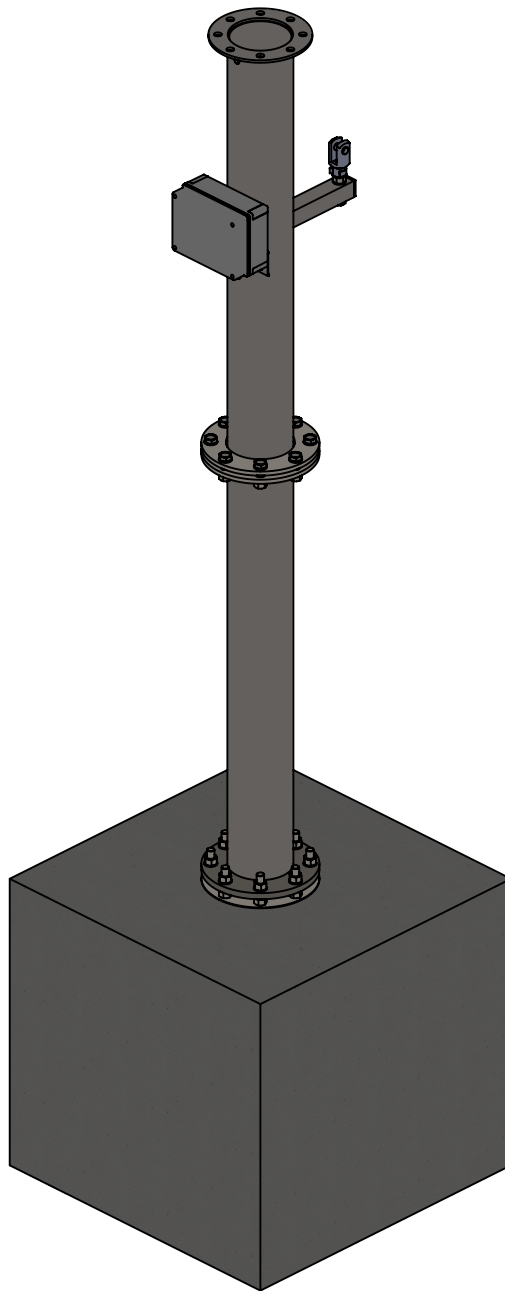


HELIOMOTION

QUICK ASSEMBLY GUIDE PV-4+ (72-cell)

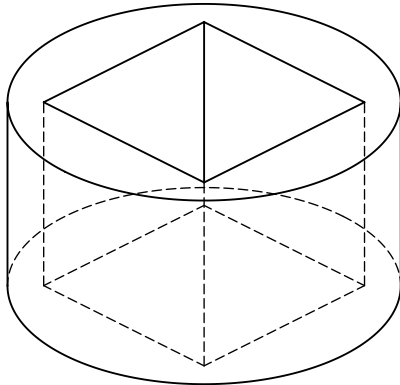


PART I - FOUNDATION



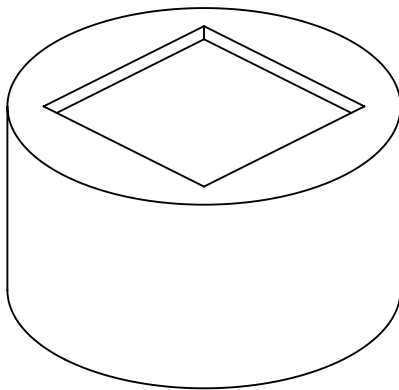
Soil foundation

1



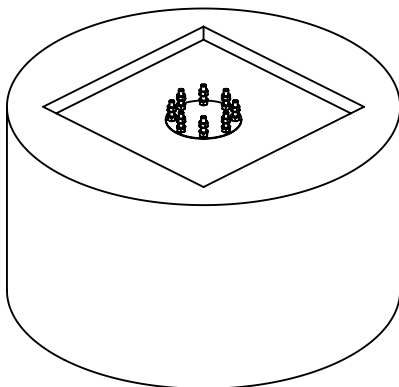
Make a hole for the concrete at your chosen location. The hole for a PV-4+ should be at least 80x80 cm, 1 m deep (~600 liter). Refer to the manual for more information.

2



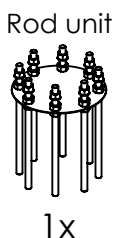
Fill the hole with concrete up to a few centimeters below ground level.

3



Push the rod unit into center of the concrete and let the flange rest on top of the concrete. Use a spirit level to align the flange horizontally.

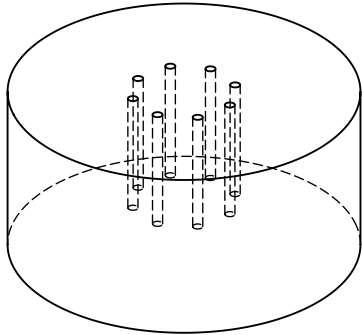
Allow the concrete time to harden before assembling the remainder of the power plant. The concrete can be covered with sand after it has cured for 2 weeks.



1x

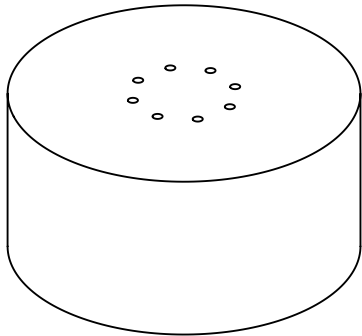
Bedrock foundation

1



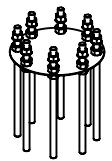
Drill eight holes vertically into the bedrock using the rod unit as a template. Make the holes 20 mm wide and 250 mm deep. Use compressed air to remove any debris and water from the holes to ensure a clean bonding surface.

2

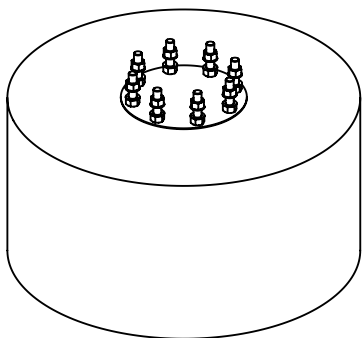


Make sure the rod unit fits well into the holes.

Rod unit

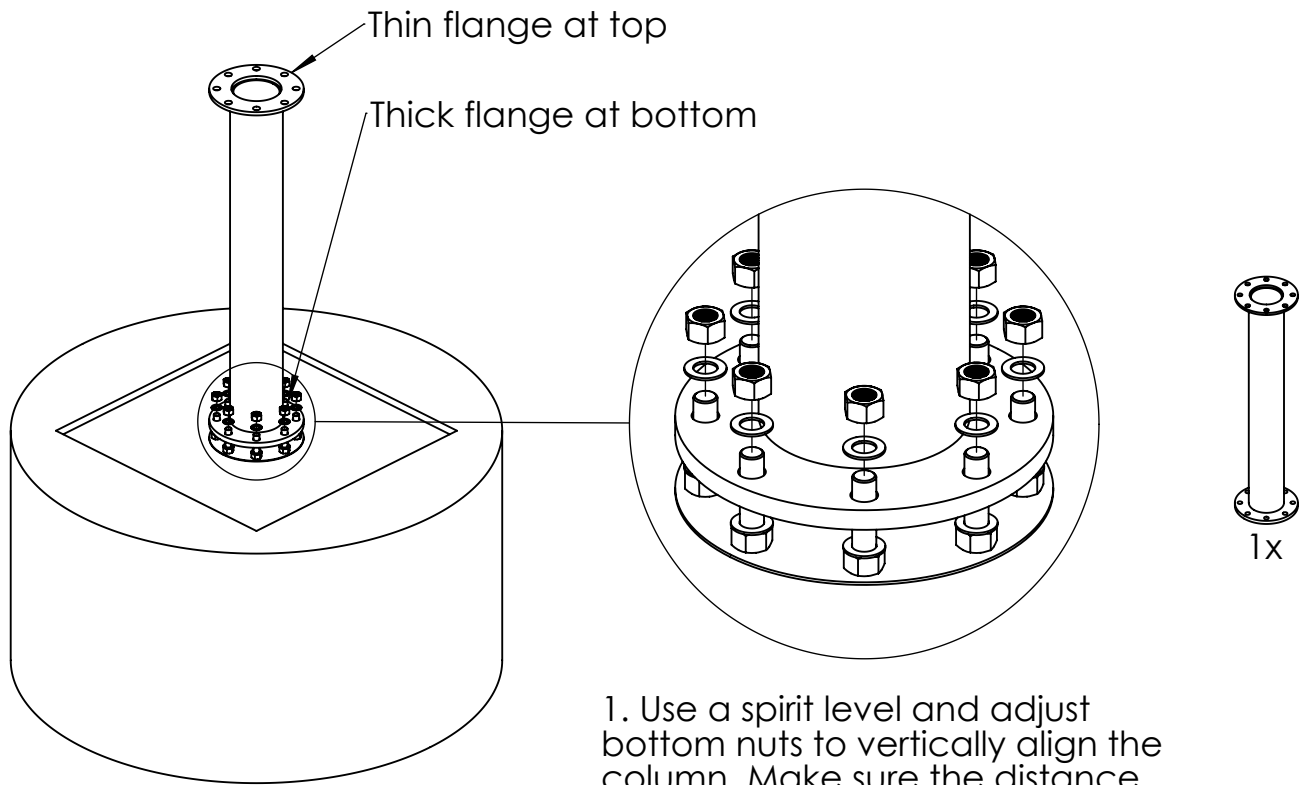


3



Fill the holes 2/3 full with chemical anchor adhesive (400-500 ml). Push the rod unit into the holes and give the adhesive time to cure before continuing the assembly.

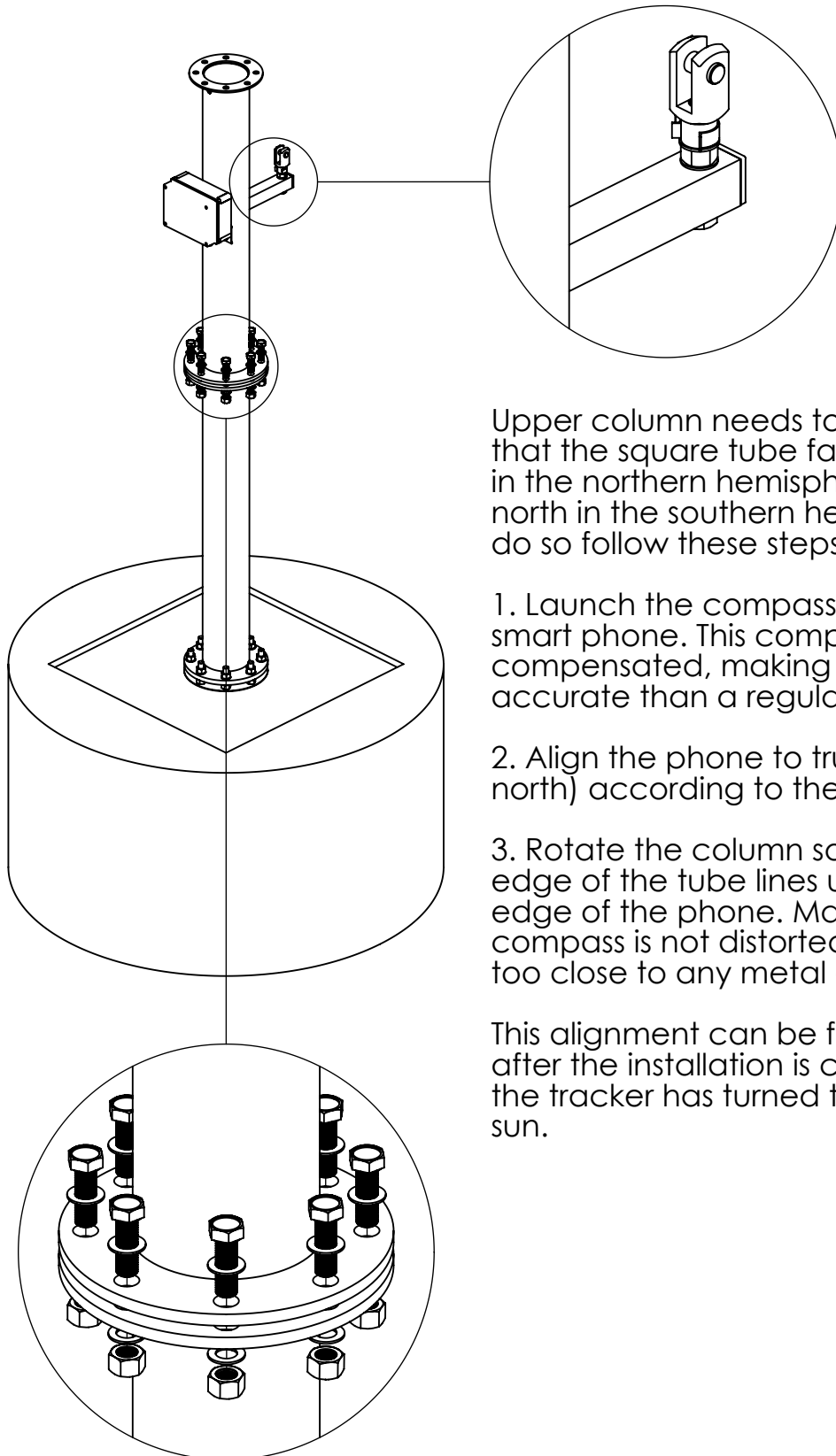
4



1. Use a spirit level and adjust bottom nuts to vertically align the column. Make sure the distance from the ground is sufficient to allow the cable to enter the column.

2. Tighten top and bottom nuts to secure the column.

5



Upper column needs to be turned so that the square tube faces true south in the northern hemisphere or true north in the southern hemisphere. To do so follow these steps:

1. Launch the compass app on your smart phone. This compass is GPS compensated, making it more accurate than a regular compass.

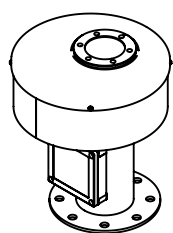
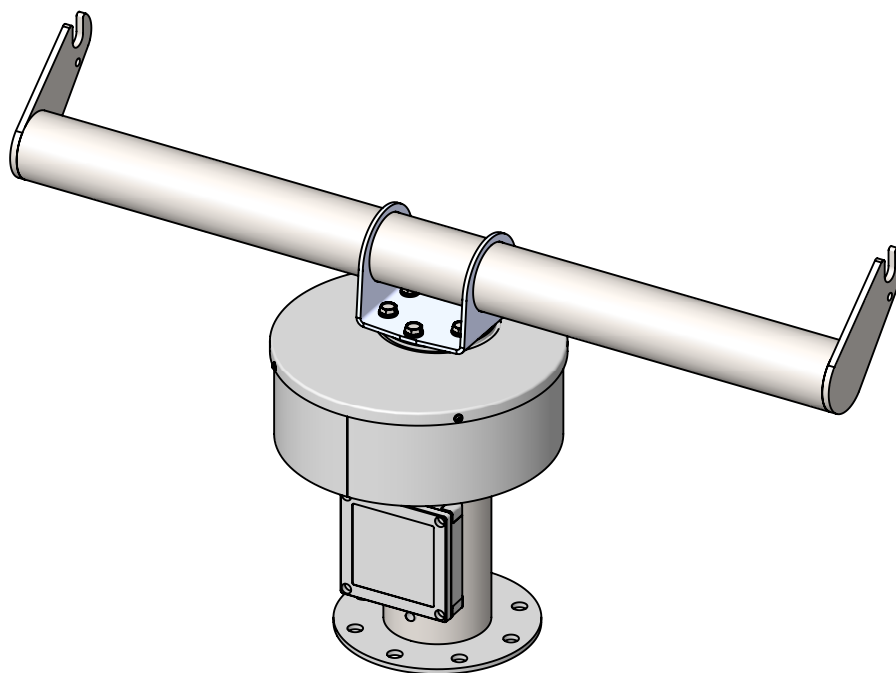
2. Align the phone to true south (or north) according to the compass.

3. Rotate the column so that the edge of the tube lines up with the edge of the phone. Make sure the compass is not distorted by being too close to any metal objects.

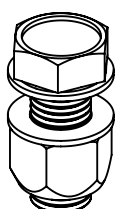
This alignment can be fine-tuned after the installation is complete and the tracker has turned towards the sun.

4. Tighten top and bottom nuts to secure upper column.

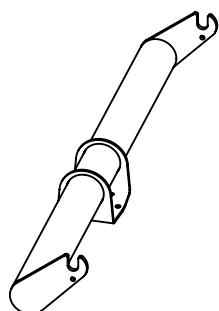
PART II - TRACKER



1x



4x

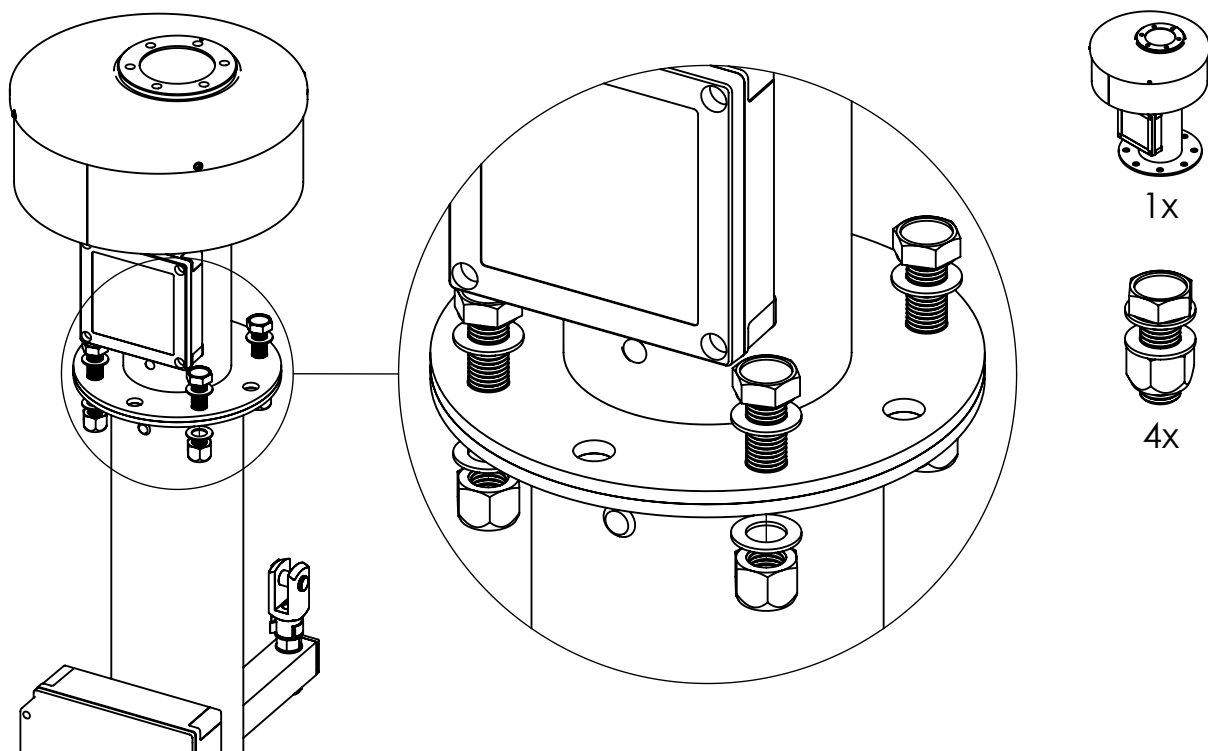


1x

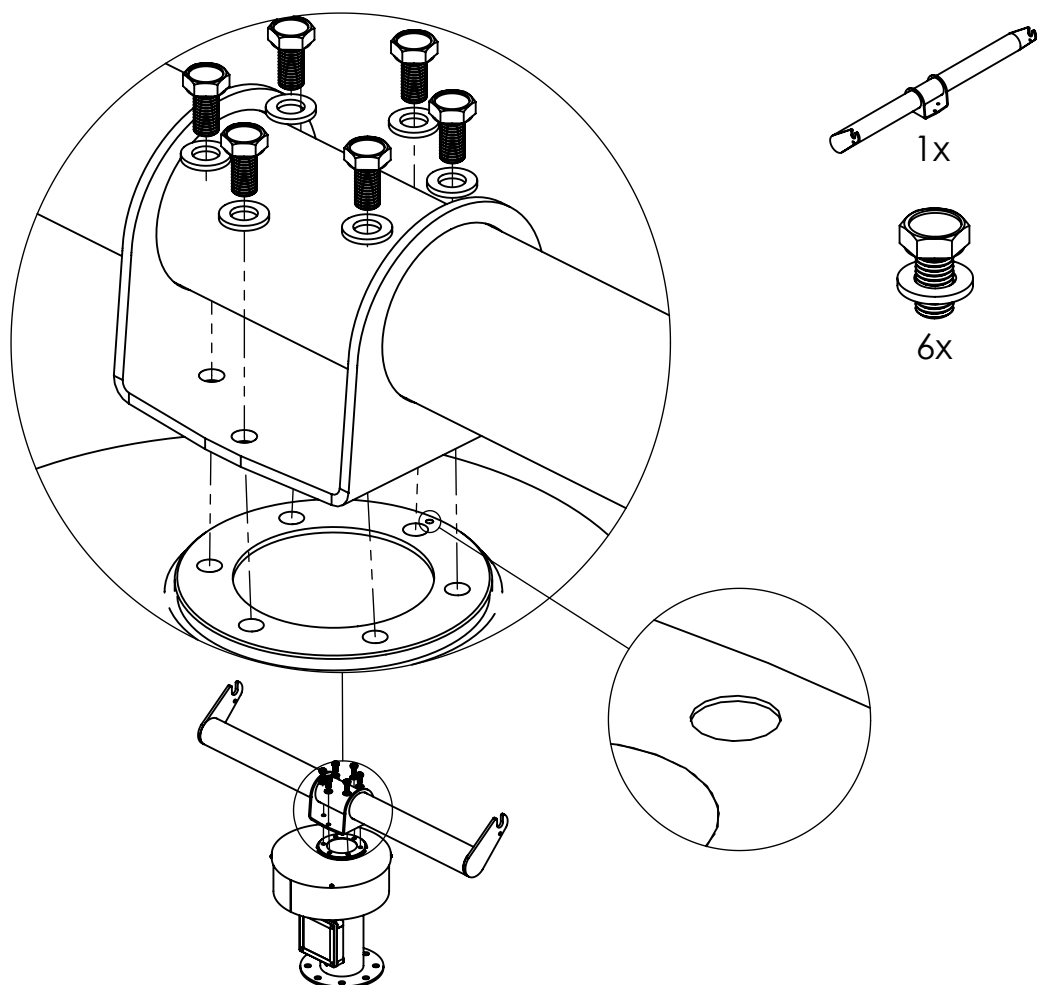


6x

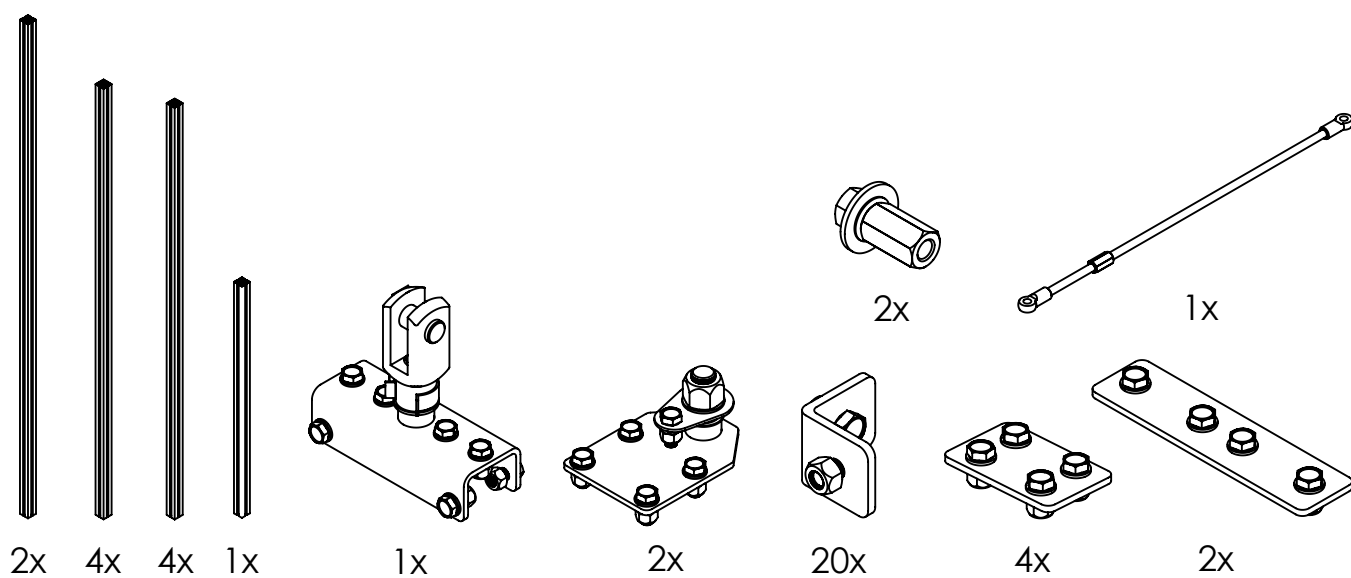
1



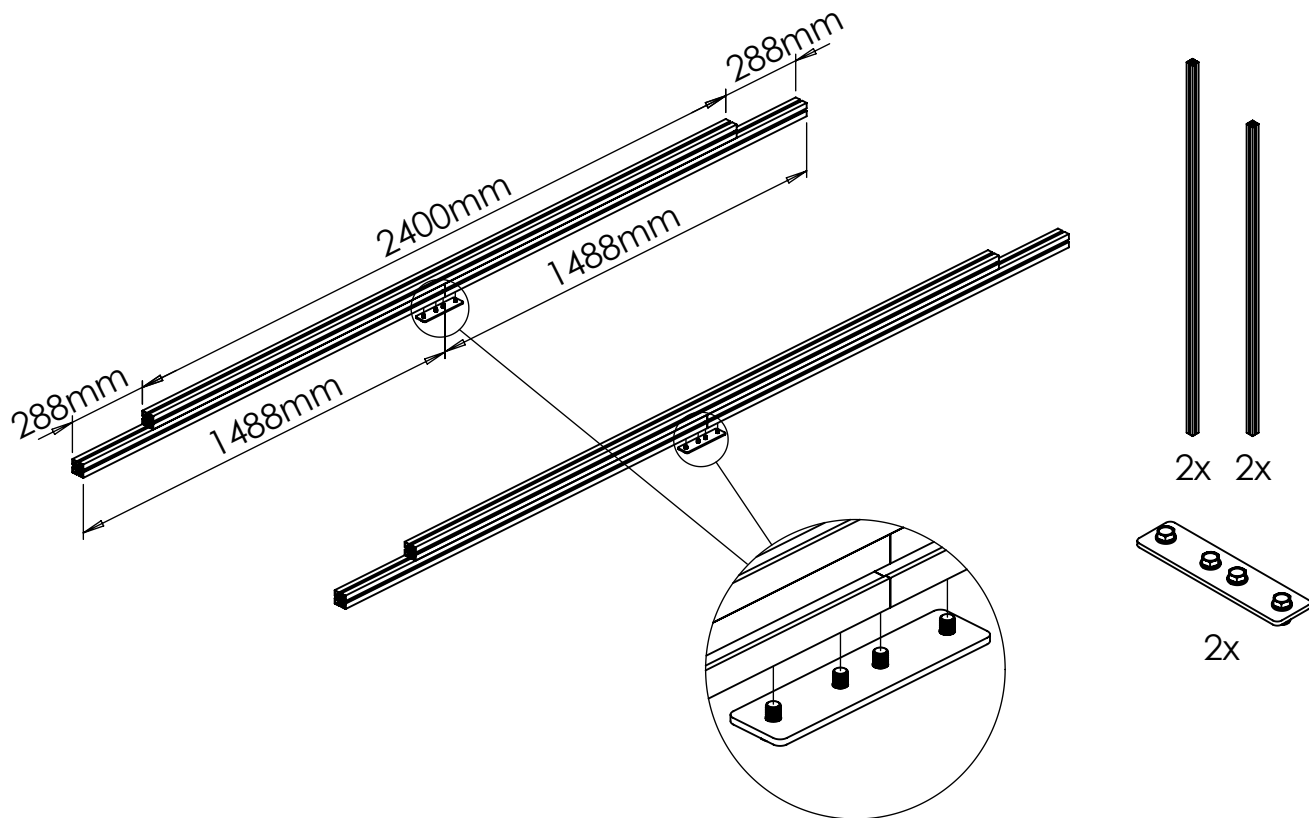
2



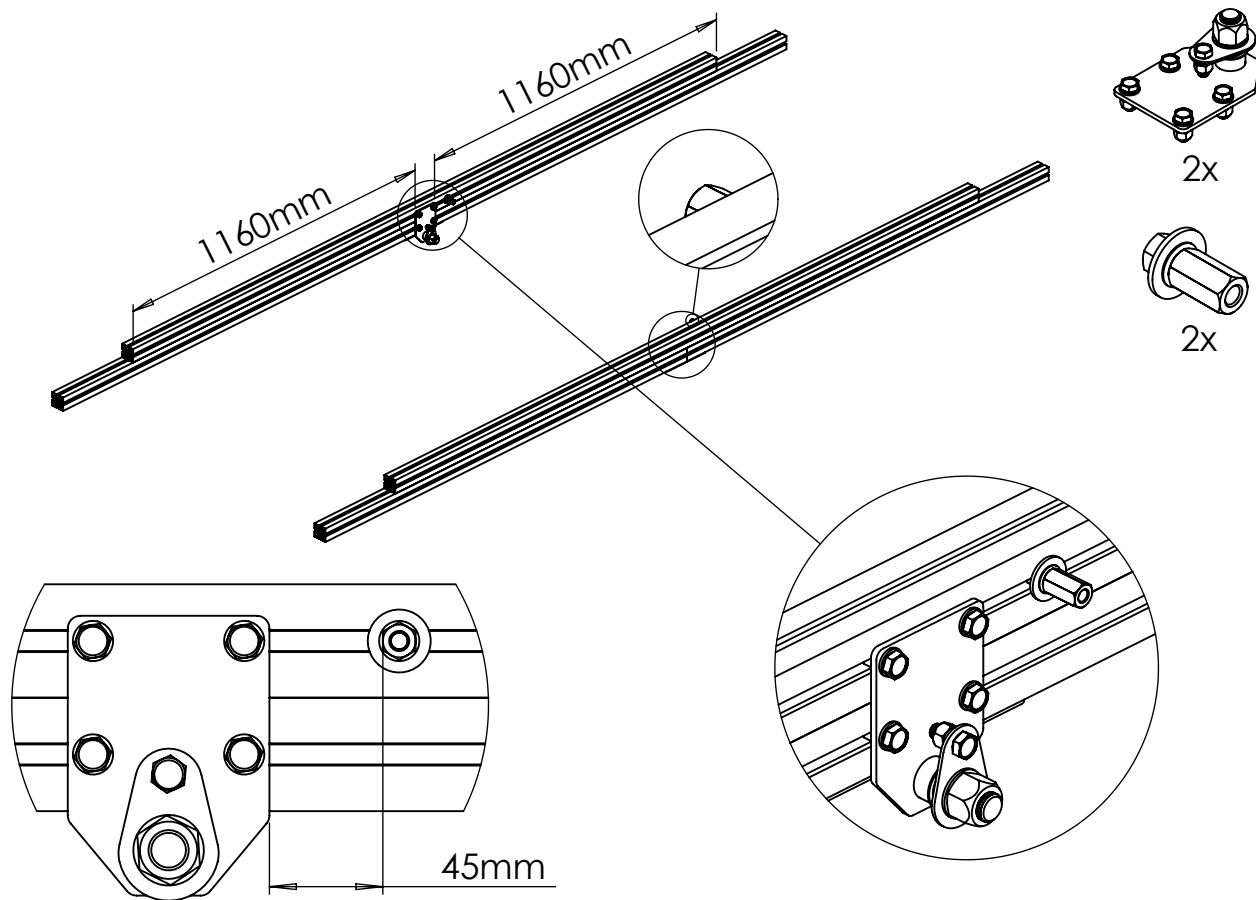
PART III - FRAMEWORK



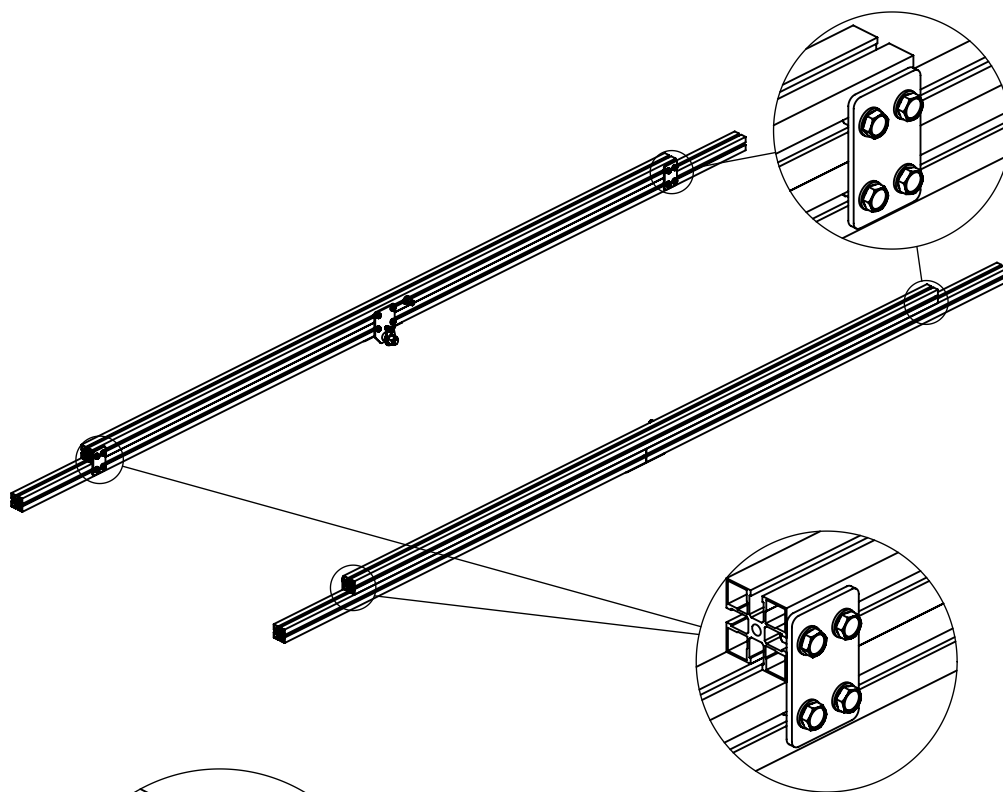
1



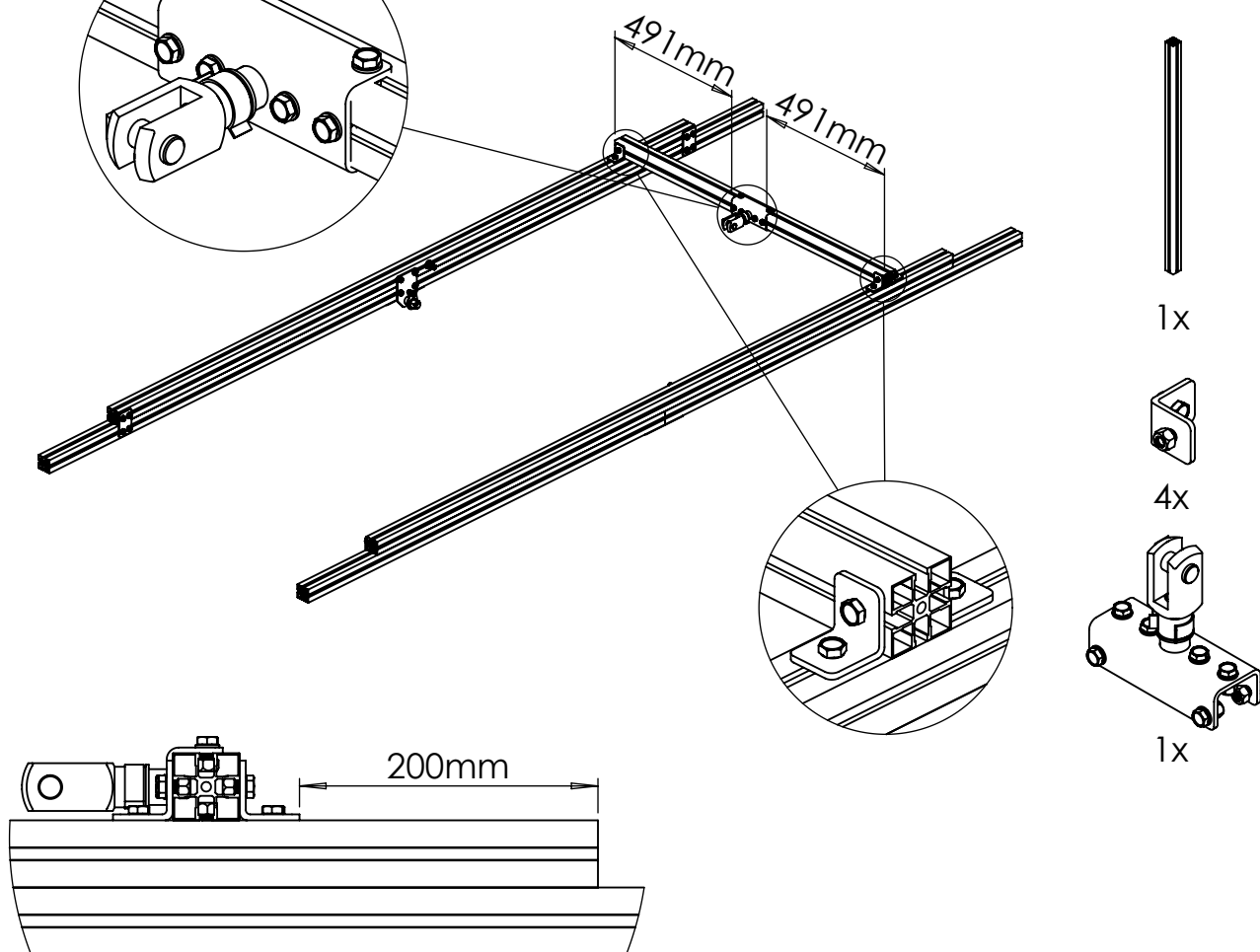
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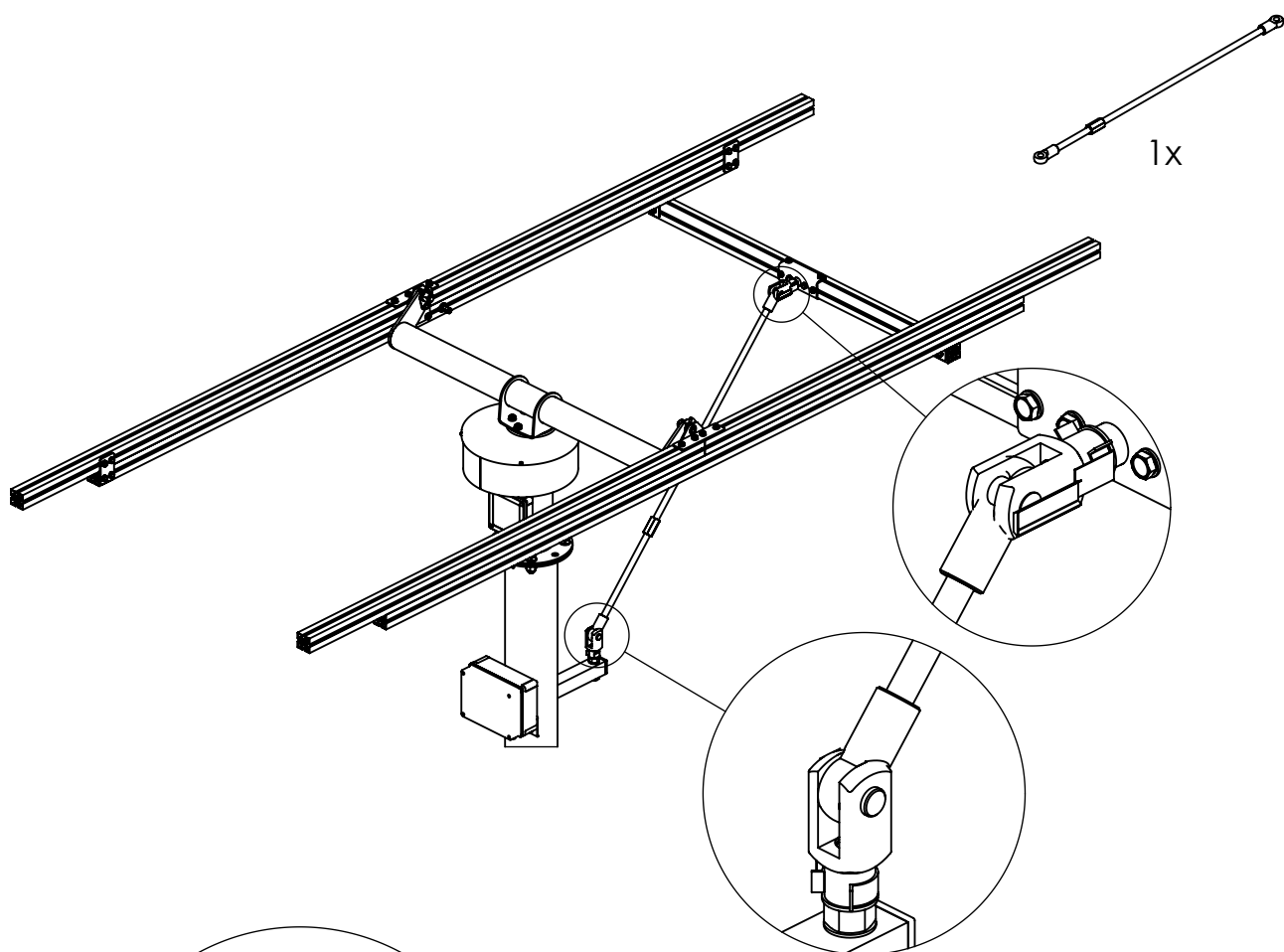
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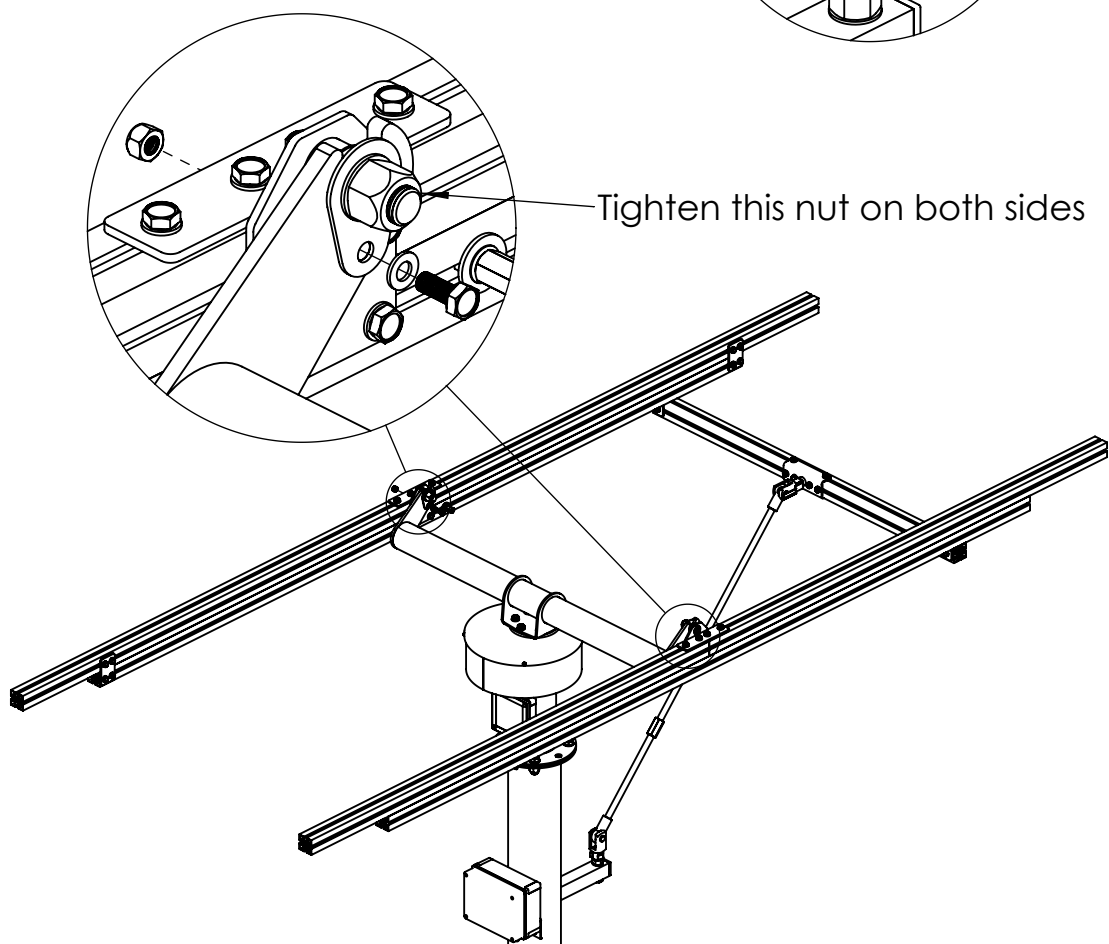
4



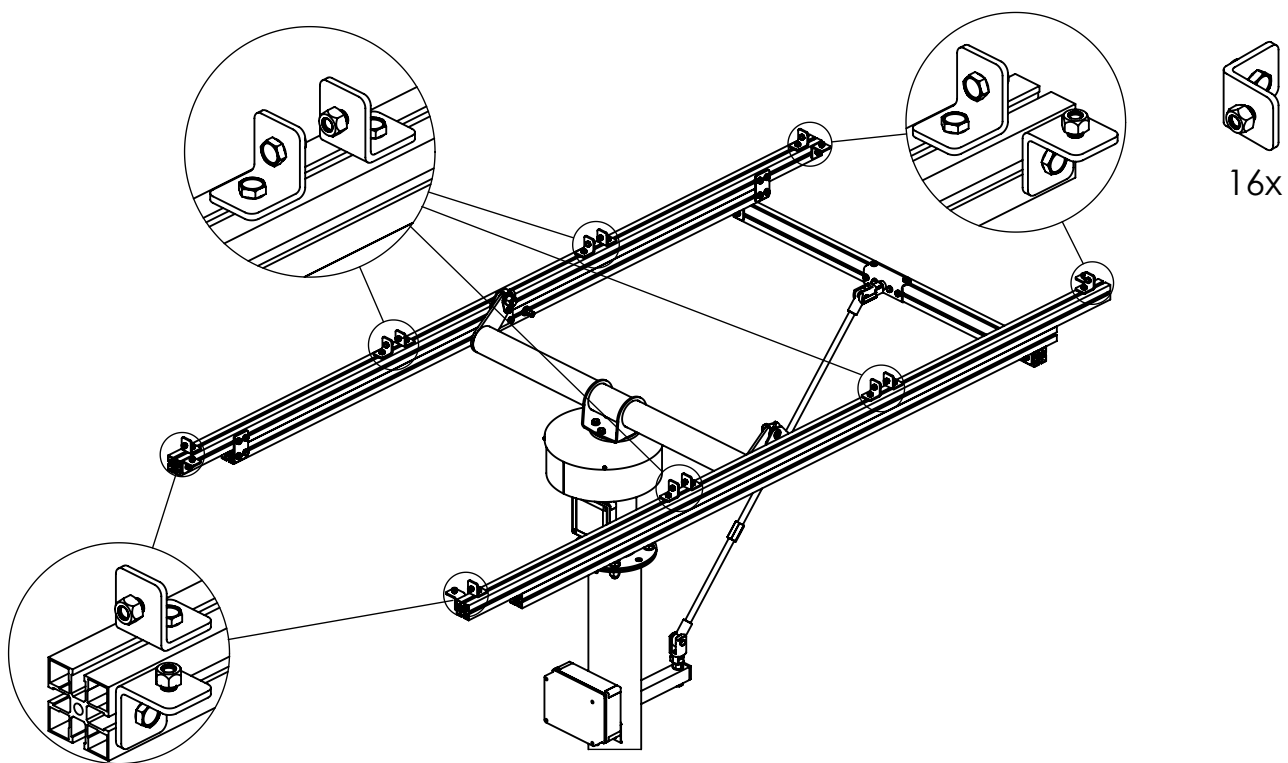
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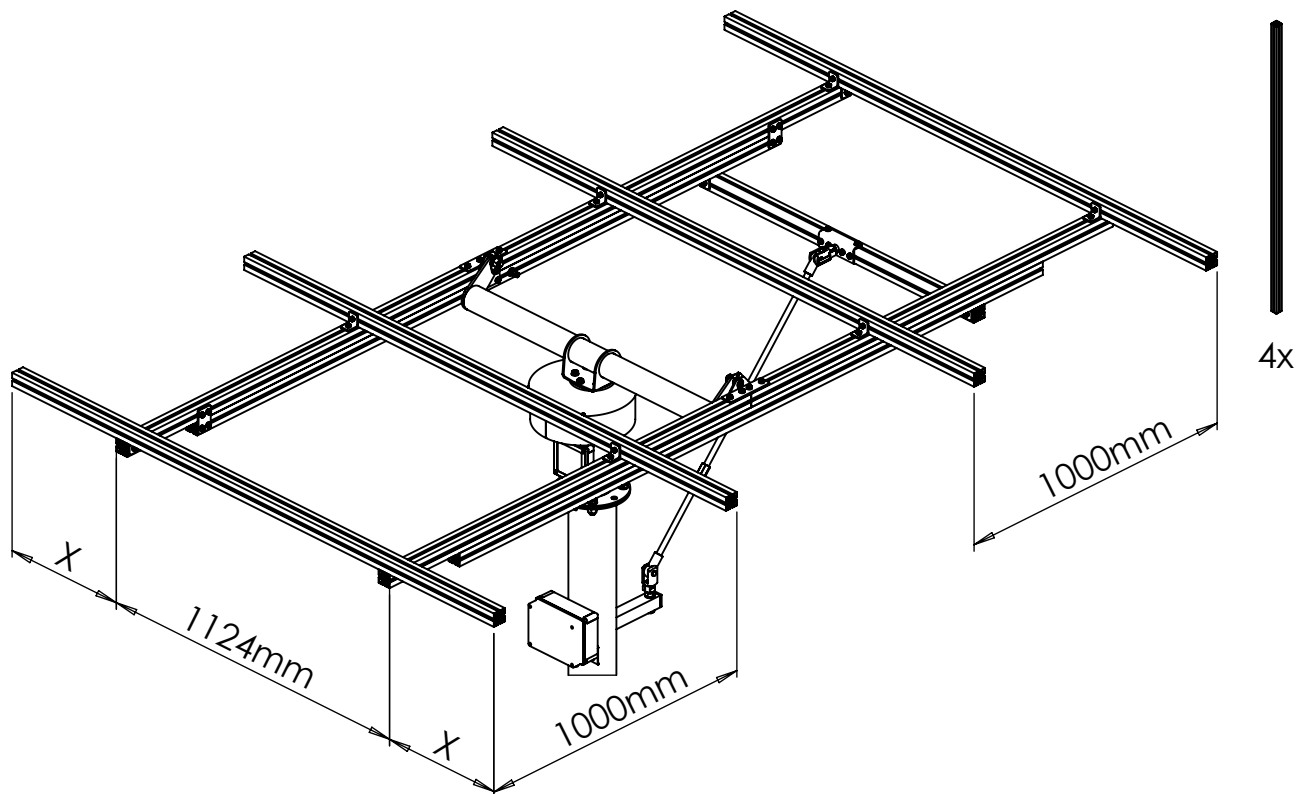
6



7



8

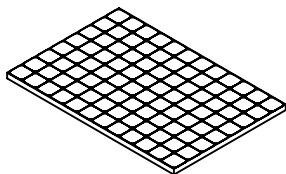
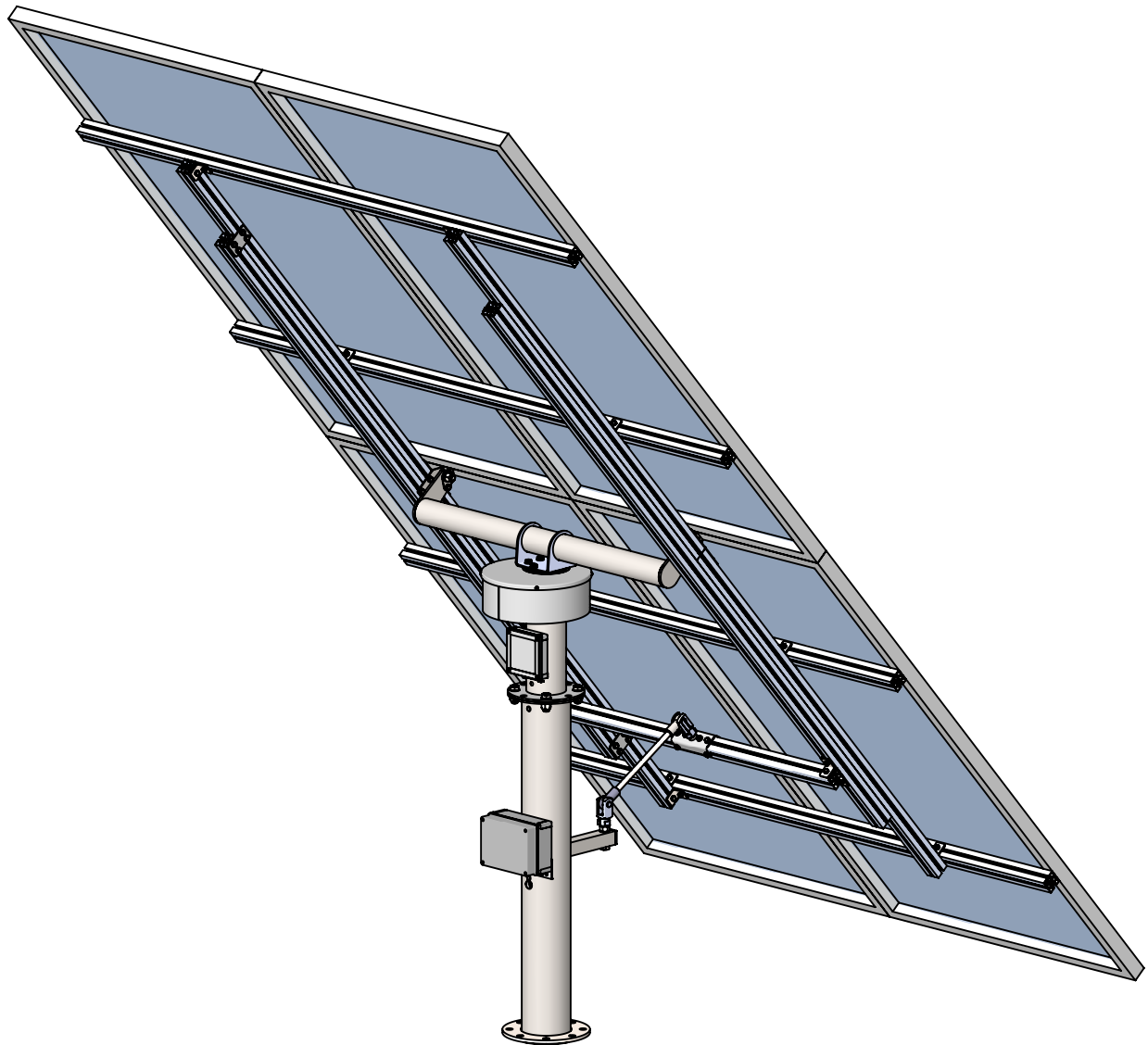


$$X = (\text{Panel width} * 2 - 1124) / 2$$

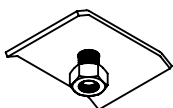
Amerisolar: X = 430mm

Maysun: X = 430mm

PART IV - PANELS



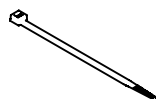
4x



16x

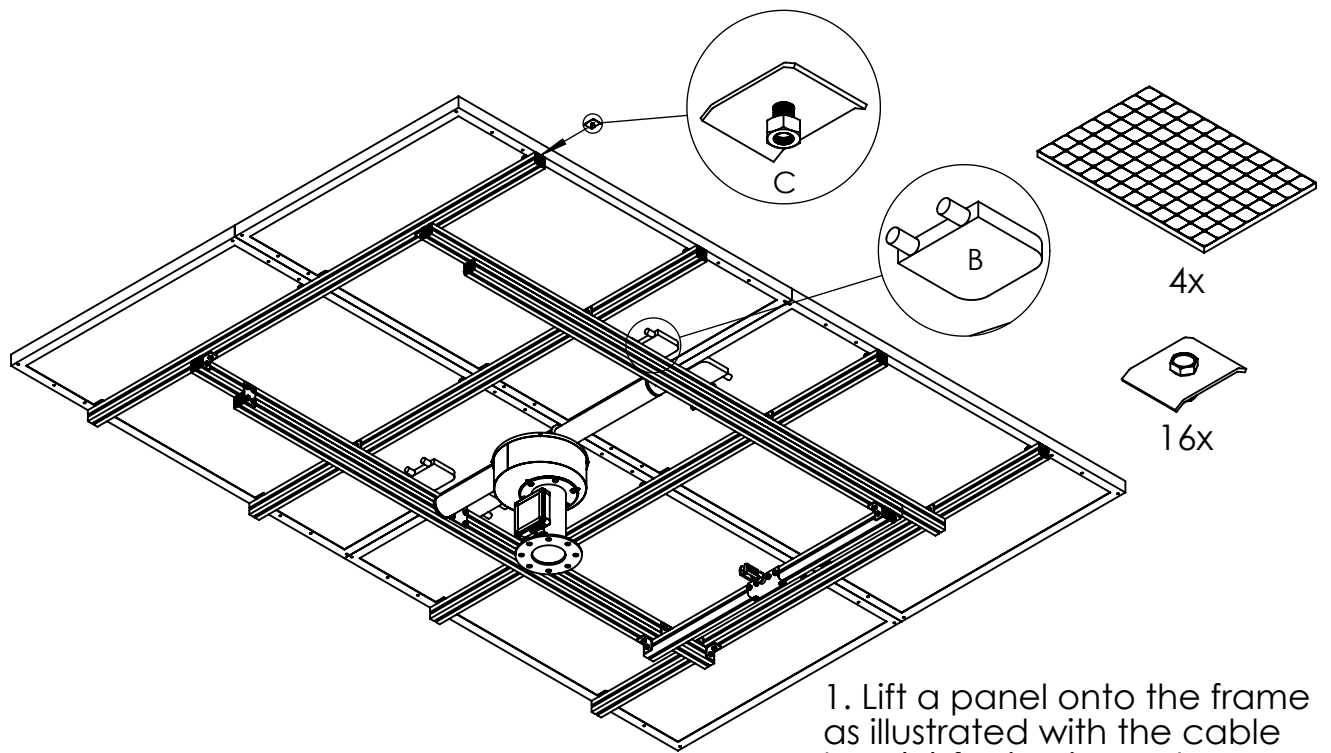


10x



10x

1

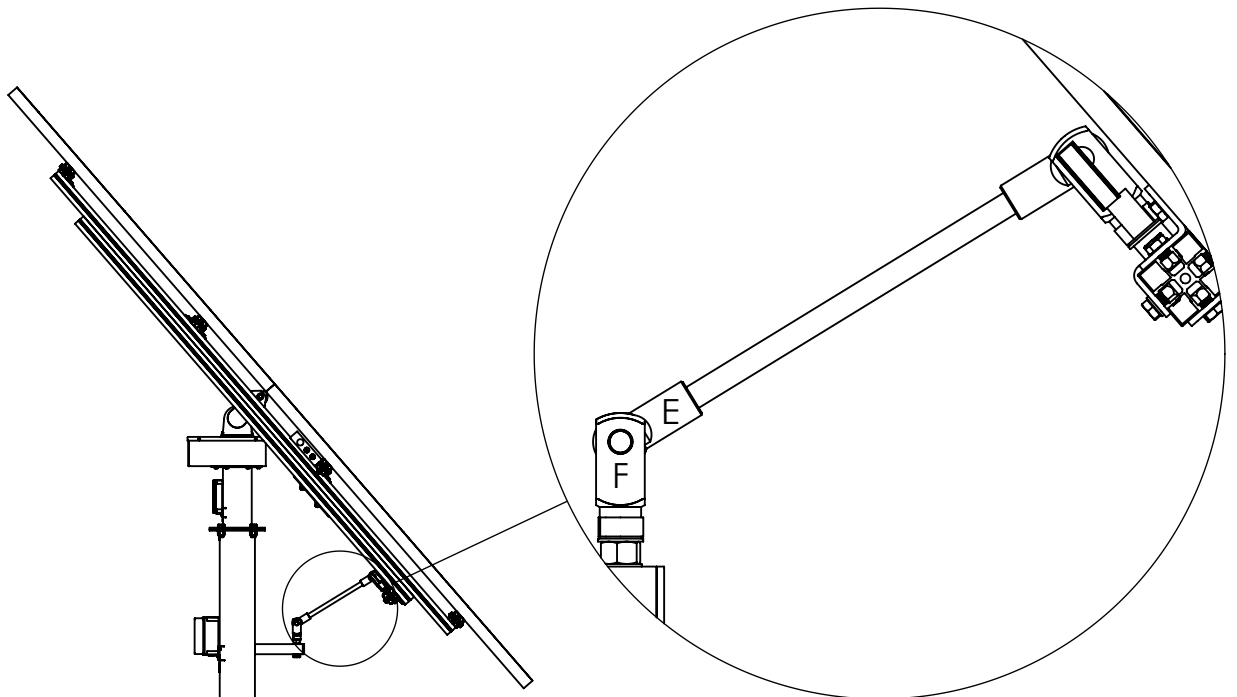


1. Lift a panel onto the frame as illustrated with the cable box (B) facing inwards.

2. Lock the panel to the frame with four panel clamps (C).

3. Repeat these steps for the remaining panels.

2



Remove the extension rod and attach only the shorter angle rod. Make sure to prevent the panels from swinging downwards when changing the rod.

Leave both fork joints (F) and one of the clevis eye mating pieces (E) unscrewed half a turn to allow for full range of movement.

3

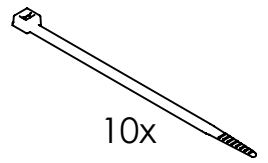
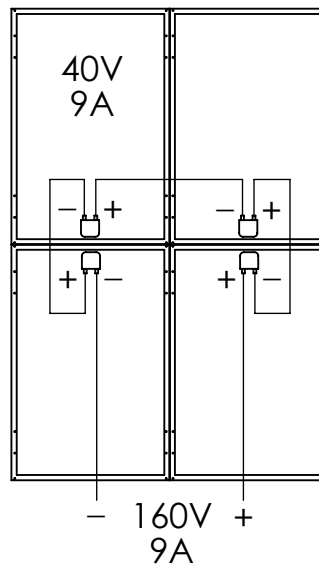
1. Attach PV cables to the frame using cable ties and self-adhesive clip anchors.

2. Have the electrician connect the PV cables together according to application. Standard applications are listed below.

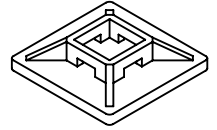
Battery-tied application

MPPSolar PIP5048MG solar charger/inverter supports 120-430VDC PV input. Therefore, all 4 panels (when using 33V-55V panels) can be connected in series.

Series



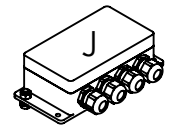
10x



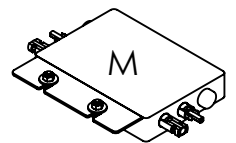
10x

Grid-tied application

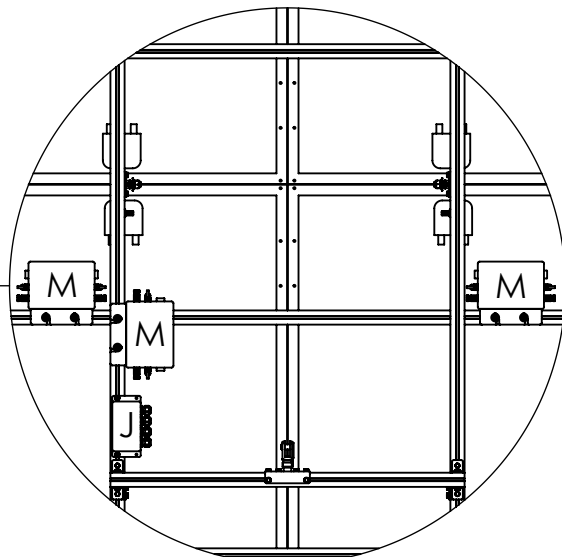
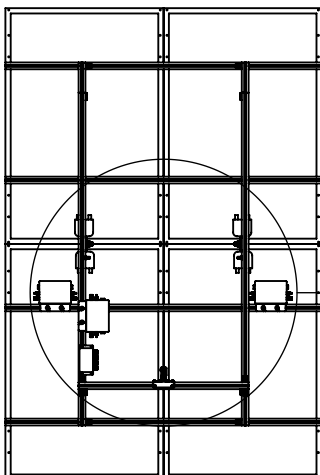
Kaideng WVC-700 grid-tied microinverter has two PV inputs, each supporting a panel with voltage 36-50 Voc. Mount the Microinverters (M) and Junction box (J) as illustrated so that they can connect to the panels.



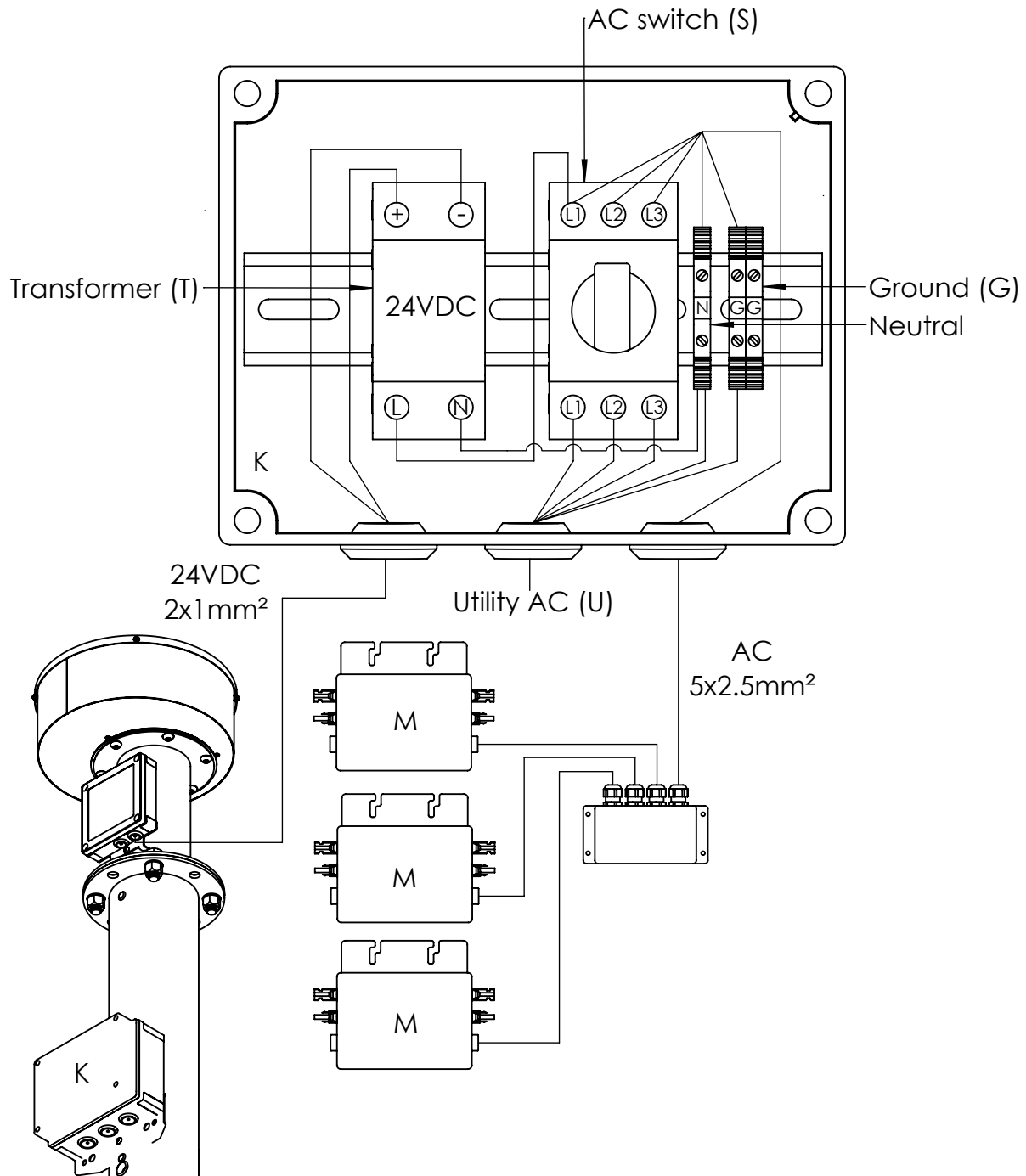
1x



3x



Grid-tied system



The PV solar panels, microinverter (M) and utility AC (U) must be connected by a certified electrician. However, preparation work may be done by a layman as long as local code requirements are followed.

AC wires must be at least 1.5mm² thick and use an outdoor cable. Be mindful of the AC labels and wire colors: Neutral (N) is blue, Phase 1 (L1) brown, Phase 2 (L2) black, Phase 3 (L3) gray and ground (G) green-yellow.

Grid-tied system

1. Acquire an outdoor underground cable long enough to reach from the junction box (K) on the column to the nearest fuse box inside the house. A 1-phase system needs a cable with two wires plus a surrounding shield (1-phase cable), whereas a 3-phase system needs a cable with four wires plus the shield (3-phase cable). The thickness of the wires should be at least 2.5mm² for cable lengths up to 40 meter or 6mm² for cable runs up to 100 meter. Indoor cable sections can use an indoor cable of the same size and with the same number of conductors. Please consult your electrician for the exact cable to use according to local code requirements.

2. Wire the cable from the junction box (K) to the fuse box. A strong string can be used to pull the cable up through the bottom of the column and out of the hole beneath the junction box. It is recommended to pull underground sections through a cable duct. The duct needs to be buried so that the top of the duct is 35 cm below ground. If the cable runs over bed-rock it needs to be protected by a strong hose (or a metal U-profile).

3. Make sure that all cable sections above ground are properly attached and protected so the cable cannot be accidentally moved or damaged. Sections coming out of the ground need to be protected by for example a metal U-profile.

4. Fill out and attach the included self adhesive warning labels. These labels need to be provided near the solar installation, the fuse box, and the utility meter, to indicate the presence of on-site generation and the placement of the AC switch (S).

Contact a certified electrician and have them inspect the installation and carry out the remaining tasks.

1. Make the electrical connections as illustrated on the previous page.

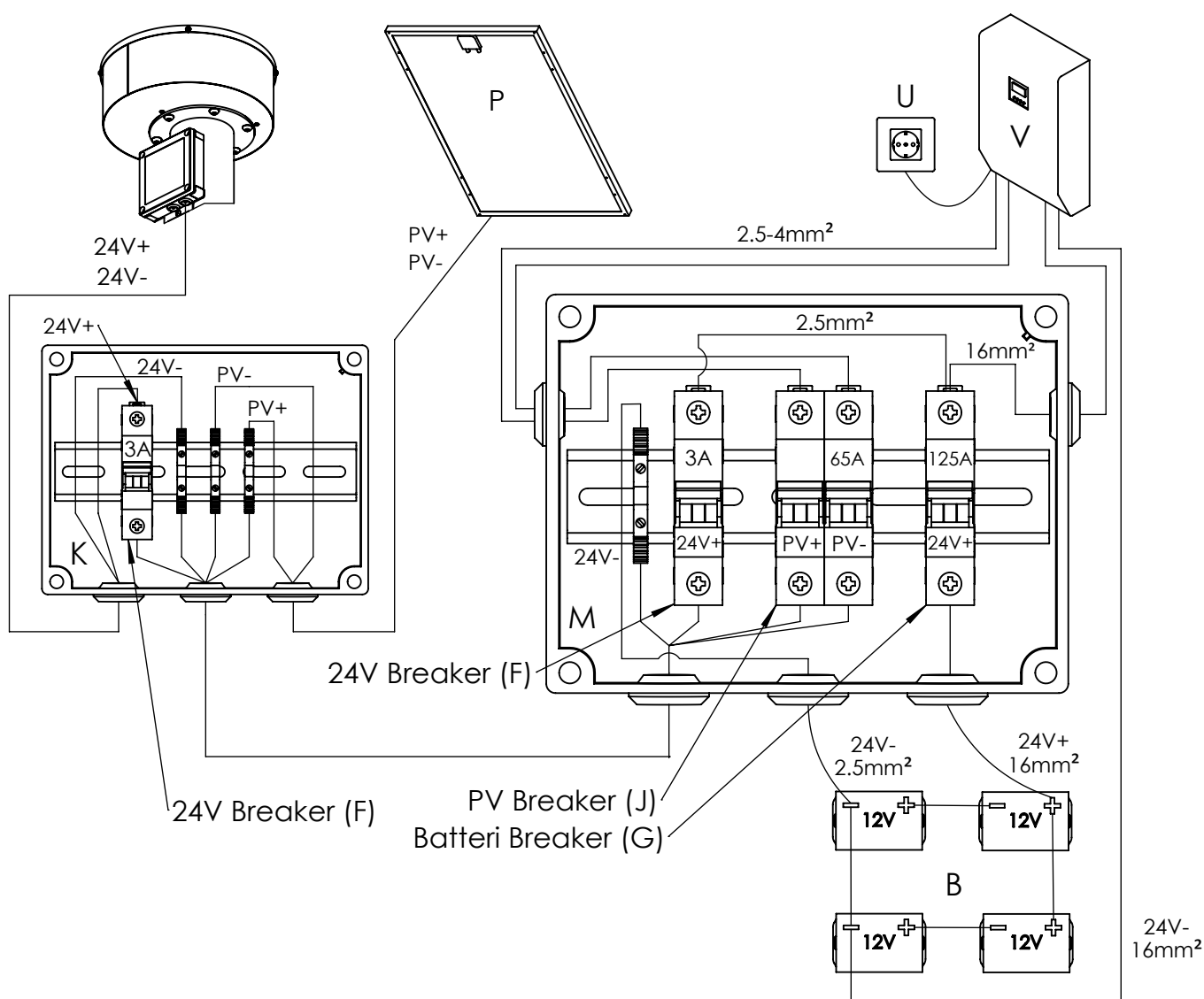
2. Connect the AC cable to the selected phase(s) through fuse(s) in the fuse box.

3. Connect the solar panels to the PV input terminals of the microinverters.

4. Turn on the AC switch (S) in the junction box to power the inverter(s) and solar tracker. It takes a few minutes for the tracker to find a GPS signal before it start to track the sun.

5. Check the status lights on the inverter(s). Grid feed-in starts after about 30 seconds during sunshine.

Battery-tied system



The solar panels (P) and AC connection (U) must be installed by a certified electrician. However, the preparation work may be done by a layman as long as local code requirements are followed. Please read the solar station's user manual for additional information on how to install and configure the station.

1. Mount the solar station (V) indoors on a wall where you want it, preferably at face level. Use a small screwdriver to remove the service panel at the bottom of the station to access its terminals.
2. Put up the junction box (M) on the wall below the solar station. Make sure all switches are turned off.
3. Connect the batteries (B) together to get the required voltage for the solar station. Be very careful to avoid short circuiting the batteries. Use a voltage meter to confirm you have wired the batteries correctly.
4. Wire cables as illustrated in the wiring diagram above.

Battery-tied system

5. Wire an underground cable (MCMK) with four conductors (4x2.5mm²) from junction box (A) to junction box (K). It is recommended to pull underground sections through a cable duct. Make sure that cable sections above ground are properly attached. Sections coming out of the ground need to be protected by for example a U-profile made of metal.

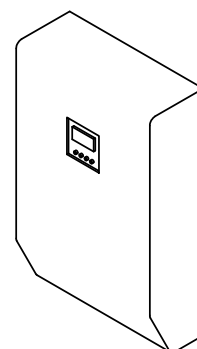
6. Note that the solar tracker is powered by 24 VDC and must not be connected to 48 VDC. 24 VDC can be taken either from two 12V batteries connected in series from the battery array, or from the provided 24 VDC power transformer which then in turn is powered by the inverter.

Contact a certified electrician and have them inspect the installation and carry out the remaining tasks.

1. Connect the wires as illustrated on the previous page.
2. Wire the AC output from the solar station to the fuse box to distribute power to outlets (U). Bear in mind that the sine wave from the solar station is not synchronized to the utility grid and can therefore not be used to power any 3-phase loads.
3. If the building has utility power then connect it to the AC input terminal on the solar station.
4. Connect the PV cable's connectors to the solar panels (P). Make sure that the polarity is correct at the PV switch (J) and from there to the solar station (V).
5. Reattach the service panel to the bottom of the solar station.
6. Switch on the 24V breakers (F) in the junction box (K) to start the solar tracker. It takes a few minutes for the tracker to begin following the sun.
7. Turn on the battery switch (G) to power on the solar station (V). The station will beep for a few seconds.
8. Turn on the PV switch (J) to enable solar charging.
9. Turn on the solar station's inverter using the switch found at the bottom right or right side of the device.

Battery-tied system

The solar station can be configured using the buttons below the display. To access the settings hold the enter button on the right side of the display for a few seconds. Recommended changes from the default settings are listed in red in the table below. Please refer to the solar station's manual for more information.



Number	Description	Setting
01	230VAC output source priority	SbU (solar or battery)
02	Maximum charging current	60A
03	AC input voltage range	APL
04	Power saving mode	SdS (disabled)
05	Battery type	Gel
06	Auto restart on overload	LtE (enabled)
07	Auto restart on high temperature	TtE (enabled)
12	Voltage point back to utility	22V (44V)
13	Voltage point back to battery	FUL (full charge)
16	Charge source priority	OSO (only solar)
18	Alarm control	bOF (alarm off)
19	Auto return to default screen	EPS (yes)
20	Backlight control	LON (on)
22	Beep when primary source interrupted	AOF (off)
23	Overload bypass	byE (enabled)

Keep in mind that batteries should not be left completely discharged for any longer period of time as it reduces their max capacity and lifespan. If the winter season has little or no sunshine care must be taken to prevent the batteries from being drained in one of the following ways:

1. If utility or generator power is available, setting 16 (charging priority) of the solar station can be switched from OSO (charge only from the sun) to CSO (charge from the sun if available, otherwise from utility/generator).

2. If the system is not used during winter the batteries should be left fully charged and completely disconnected from all loads.

Note: The solar station's inverter consumes power to maintain 230VAC, about 20 watt for the 24V model and 40 watt for the 48V model. It is possible to turn off only the inverter without turning off the solar charger using the button below the inverter. Alternatively, power saving mode (04) can be enabled to reduce the inverter's consumption. The inverter will then only switch on when there is a detectable load connected.