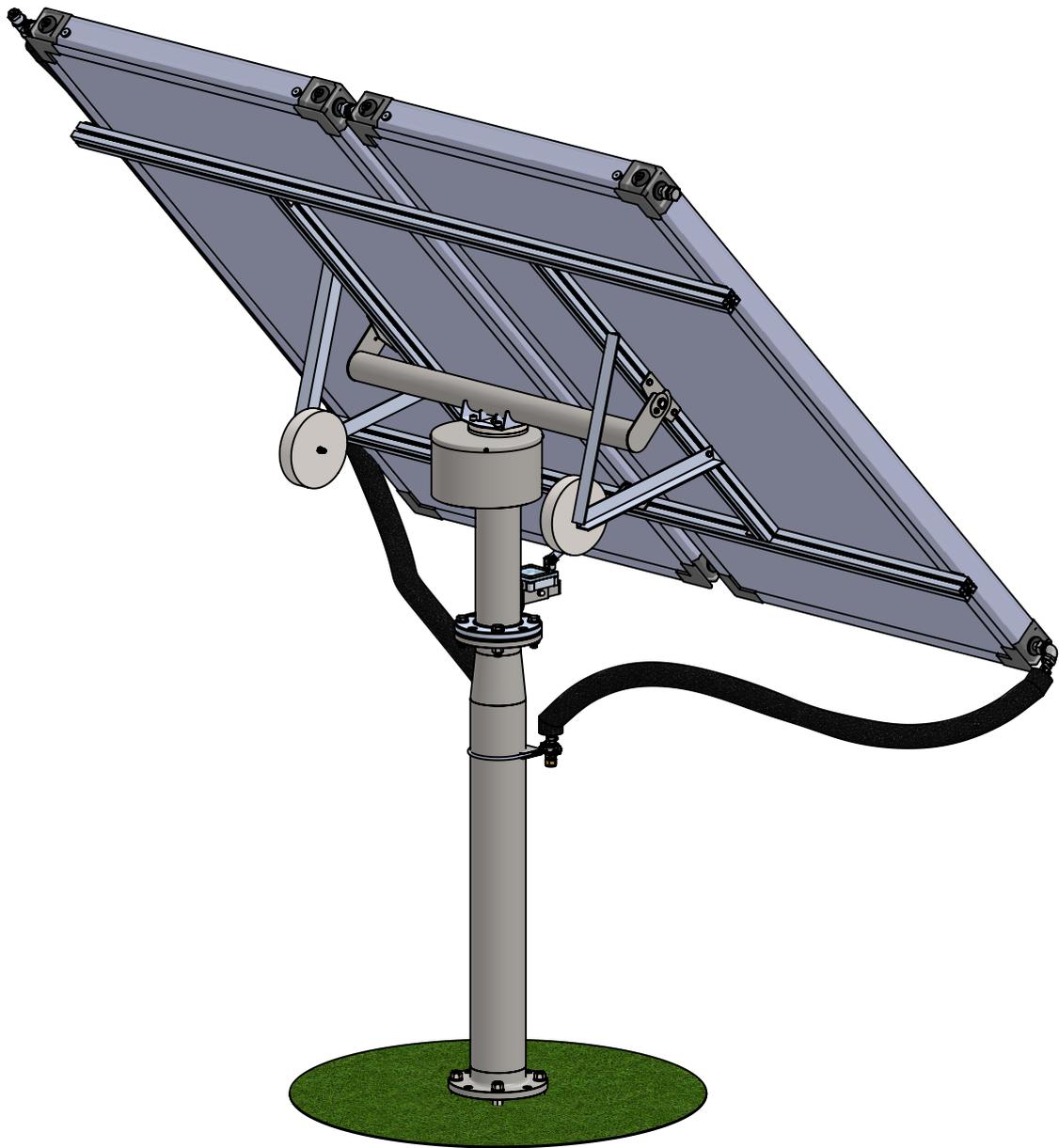
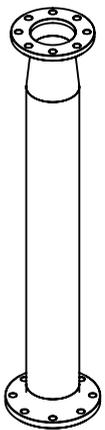
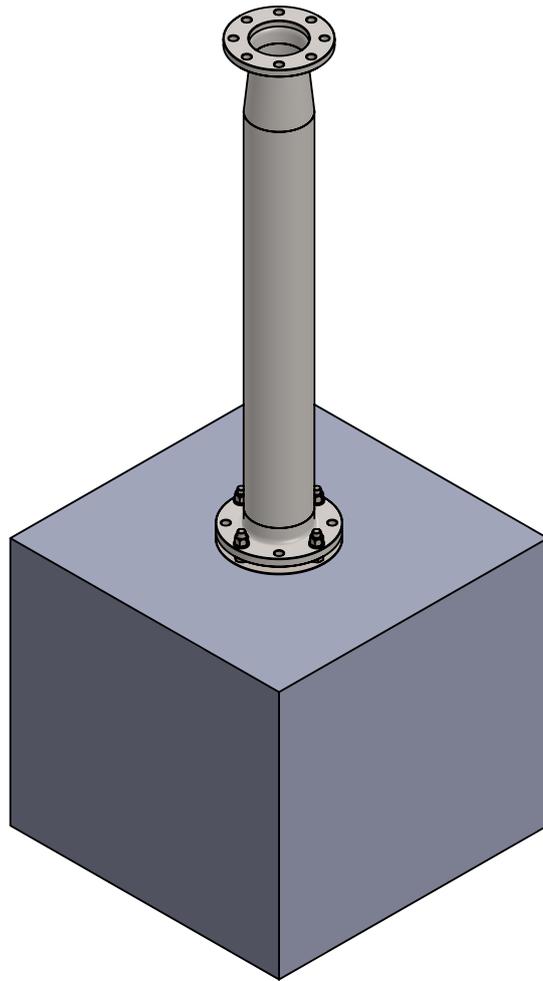


HELIOMOTION

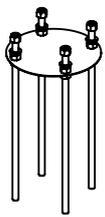
QUICK ASSEMBLY GUIDE TC-2



PART I - FOUNDATION

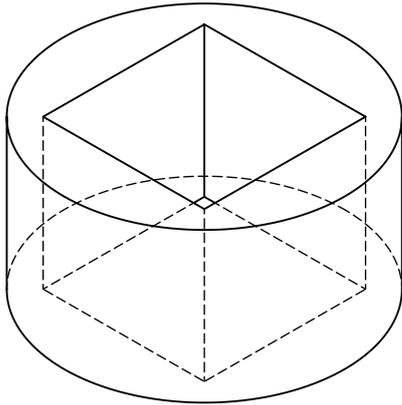


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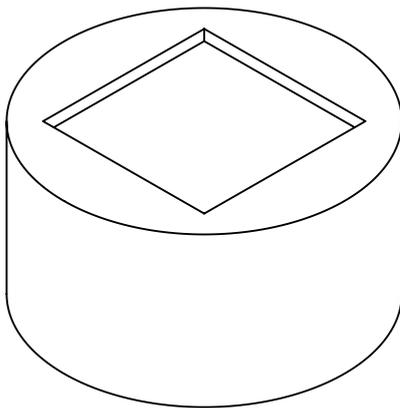
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1



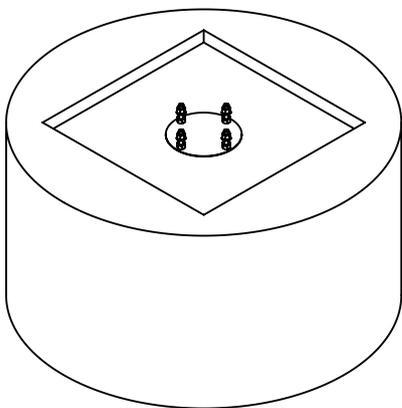
Make a hole for the concrete at your chosen location. Refer to the manual for recommended volume.

2



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

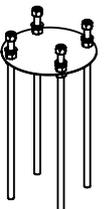
3



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

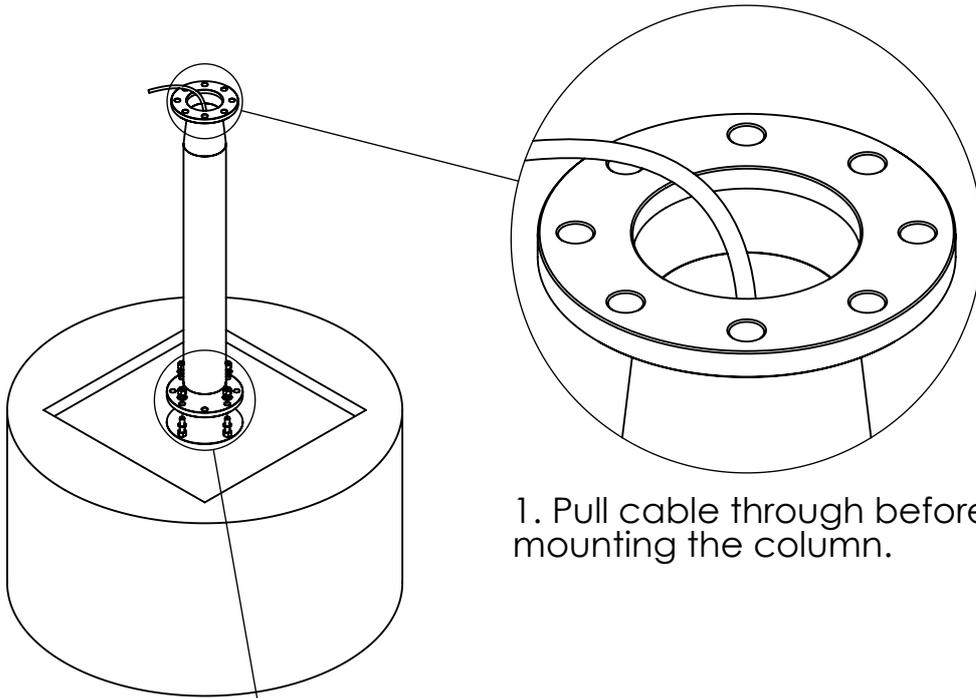
Allow the concrete at least 1 week to set before assembling the remainder of the power plant. Cover the concrete with soil after it has cured for 4 weeks.

Rod unit

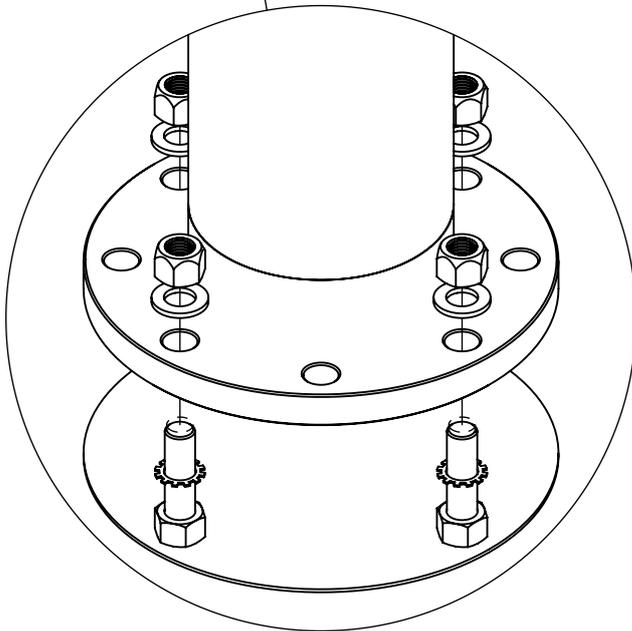


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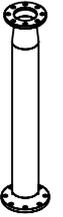


1. Pull cable through before mounting the column.



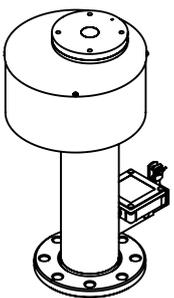
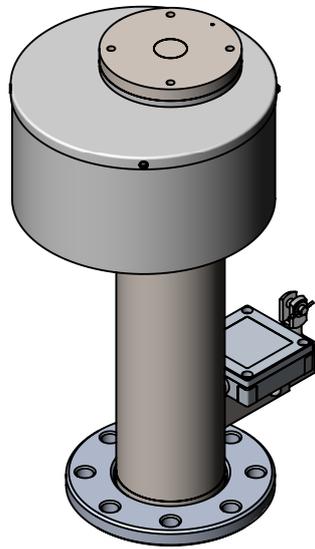
2. Adjust bottom nuts to vertically align the column.

3. Tighten top stop nuts to secure the column.

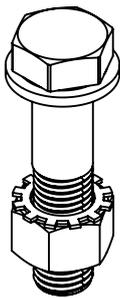


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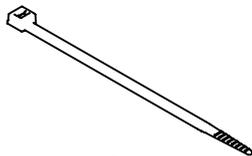
PART II - TRACKER



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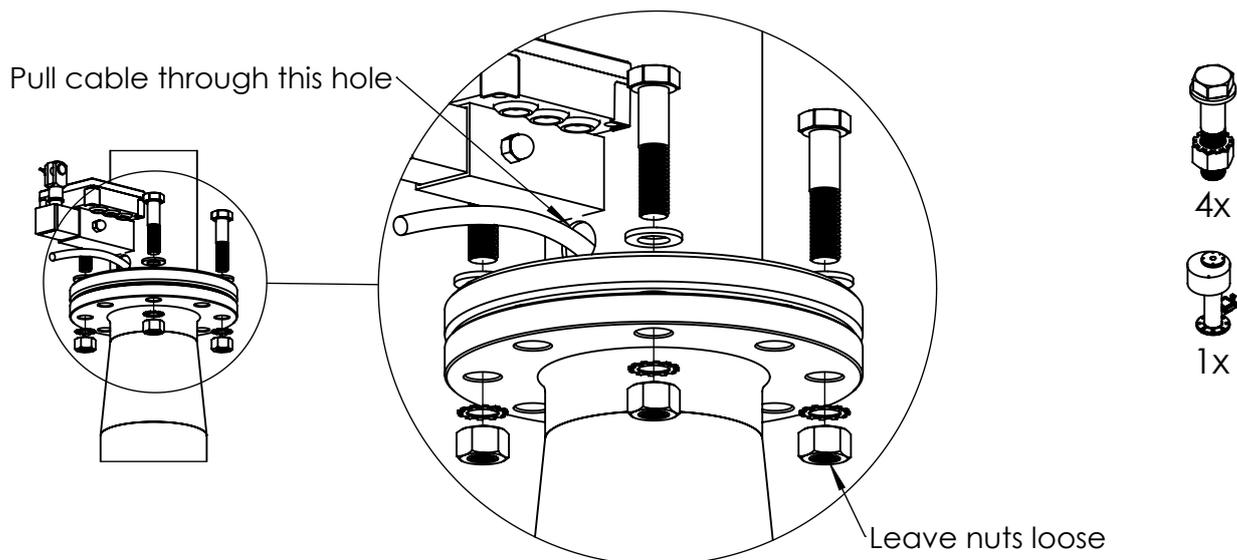


4x

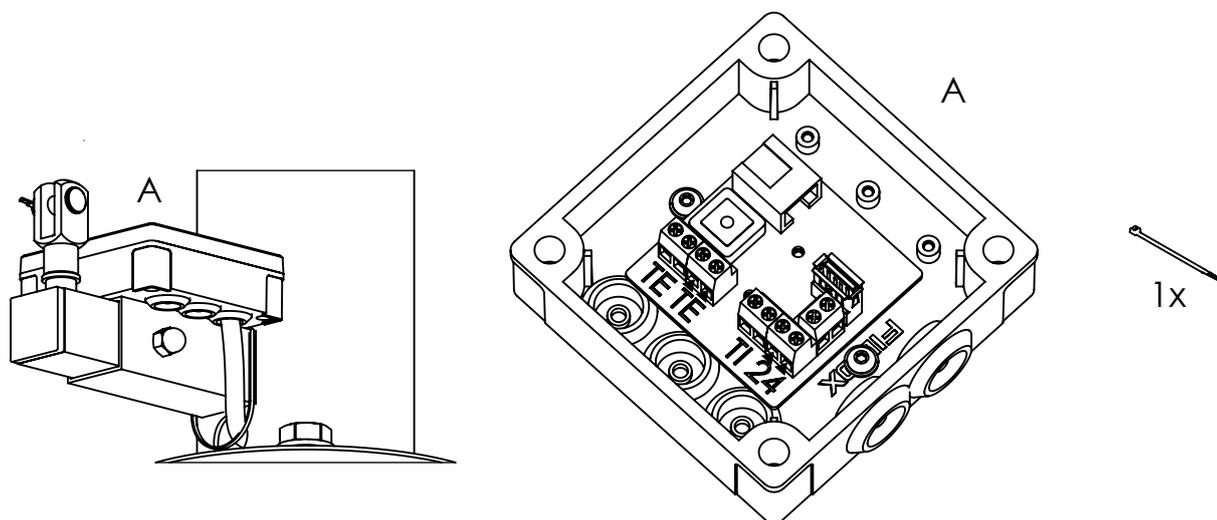


1x

1



2



1. Remove the cover from the junction box (A) and make a hole through the nearest elastic membrane.

2. Remove 40 mm of outer insulation from the cable and 7 mm of inner insulation from all four wires.

3. Push the wires through the elastic membrane until the outer insulation enters the box, so that the cable is protected from water penetration.

4. Connect the wires to the $\pm 24V$ terminal and the nearest TE terminal. Make a note of which wire color is connected to which terminal and polarity.

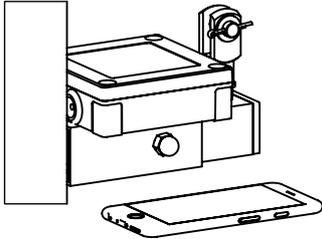
5. Put a cable tie around the balk and the cable to relieve strain.

6. Wire the underground cable to the house and then bury it below ground. To provide access to the buried cable in the future it is advisable to run the underground part of the cable through a flexible conduit.

7. It is necessary to add additional grounding to the structure in order to provide a safe path for accumulated charges to discharge. This is done by attaching a 6mm² copper wire to one of the threaded rods at the foundation. For an on-grid system the wire is to be grounded through the utility ground in the indoor junction box that will be installed later. For an off-grid system the wire can be grounded by connecting it to at least one copper-plated rod driven deep into the ground near the structure.

3

The tracker needs to be turned to face true south in the northern hemisphere or true north in the southern hemisphere. To do so follow these steps.



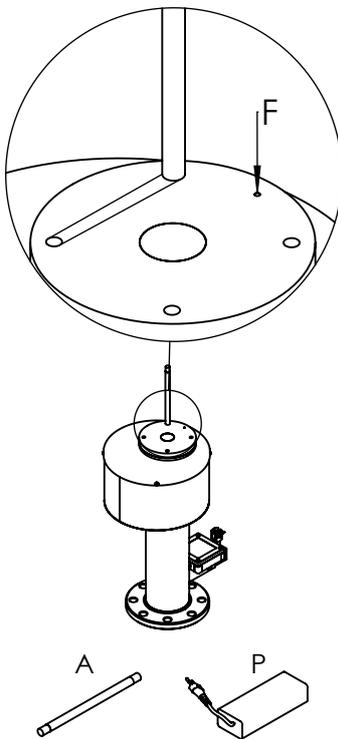
Alternative 1:

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. Turn the tracker so that the edge of the balk lines up with the edge of the phone. Make sure the compass is not distorted by being too close to any metal objects.

4. Tighten the bolts holding the tracker to the foundation column.



Alternative 2:

1. Connect the 24V power adapter (P) to the the $\pm 24V$ terminal in the junction box. The red wire from the adapter is +24V.

2. Power on the tracker by plugging in the power adapter.

3. The tracker will calibrate itself using GPS and then proceed to the sun's calculated position.

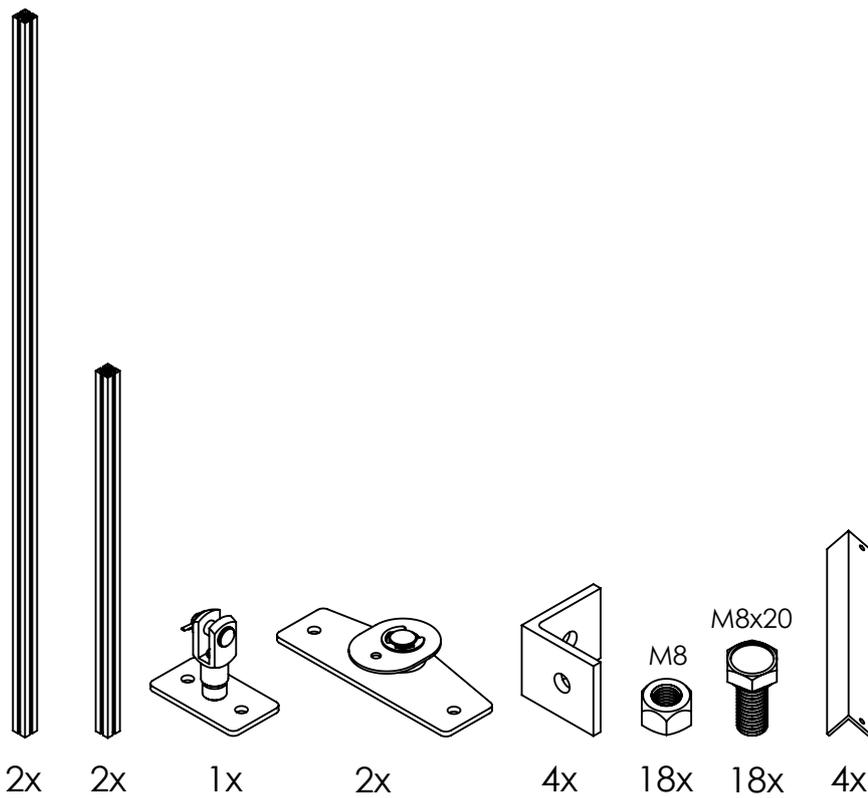
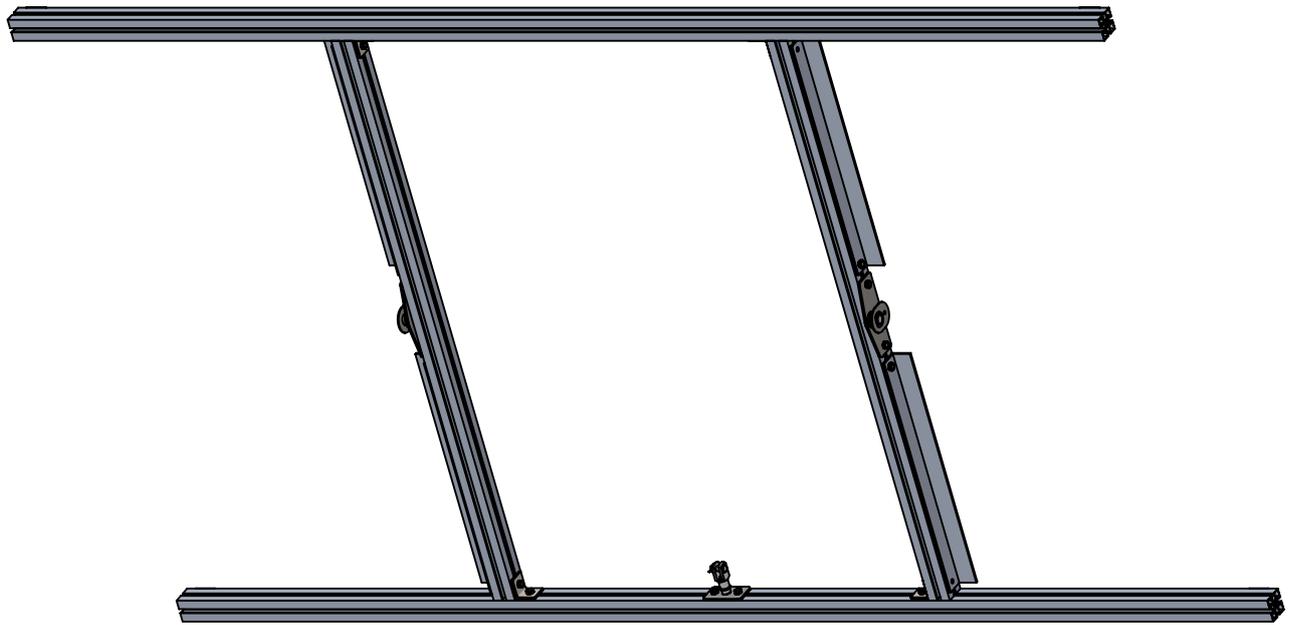
4. Temporarily fasten the angle rod (A) to the flange on top of the tracker in one of the holes next to the forward marker (F).

5. When the tracker has reached the sun's calculated position, rotate the tracker so that the shadow from the rod aligns with the hole behind it. This step requires sunshine.

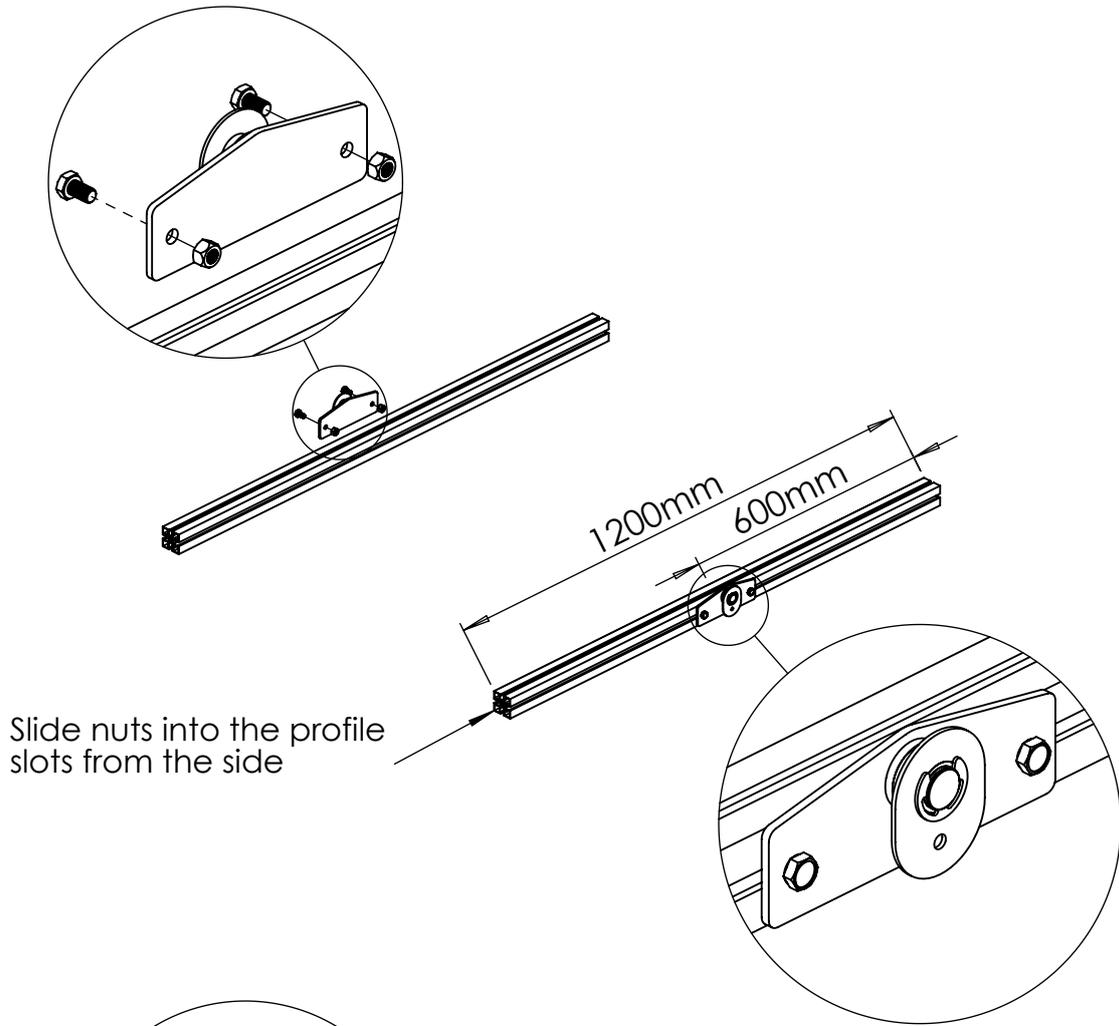
6. Unplug the power adapter and remove it along with the angle rod.

7. Tighten the bolts holding the tracker to the foundation column.

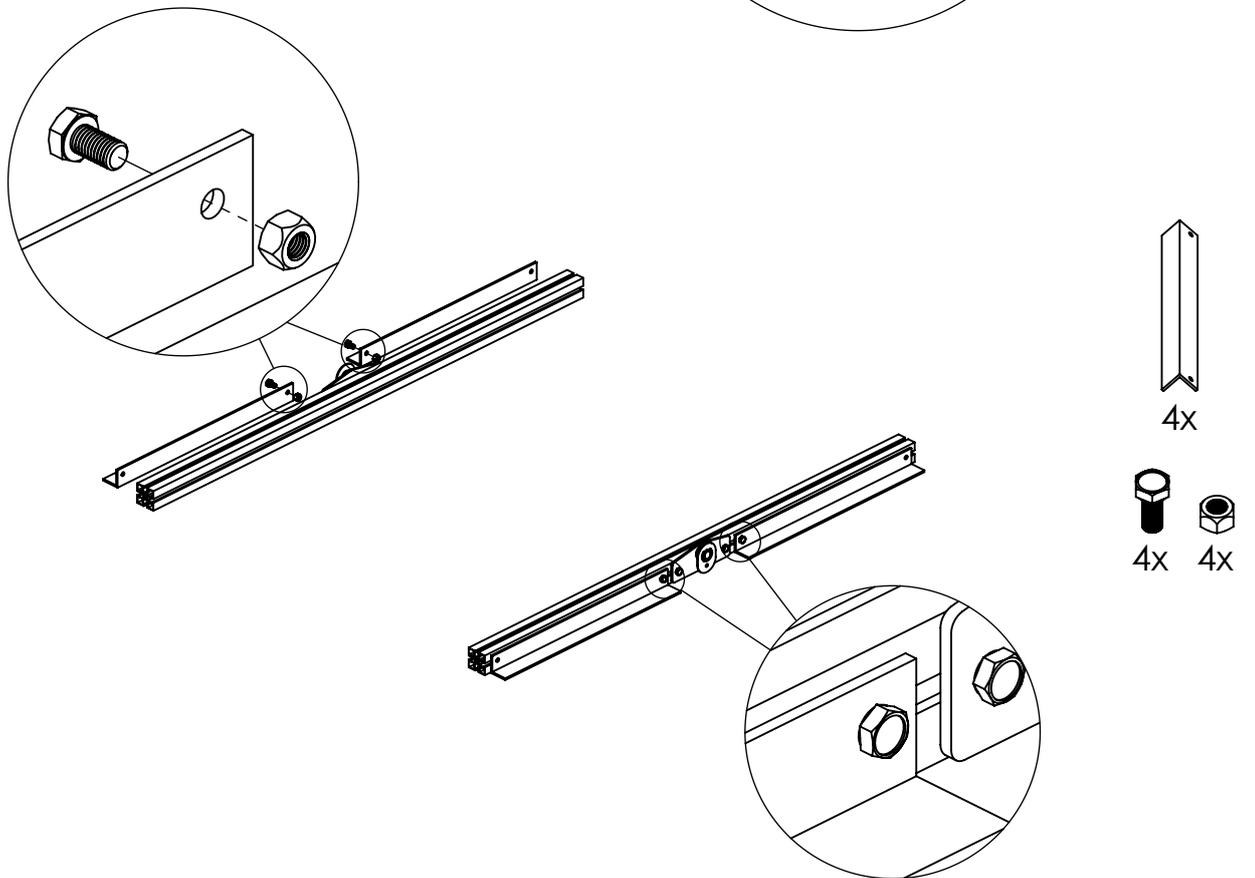
PART III - FRAMEWORK



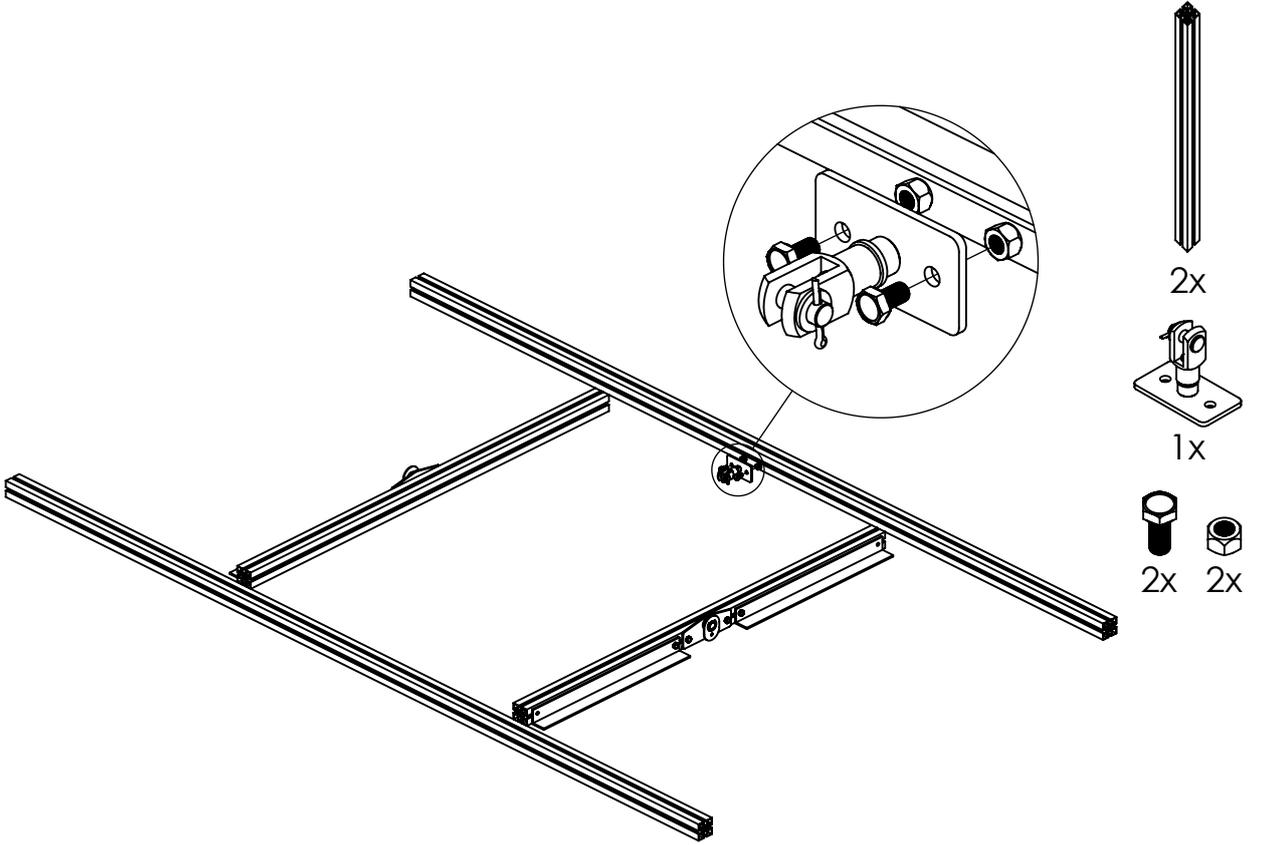
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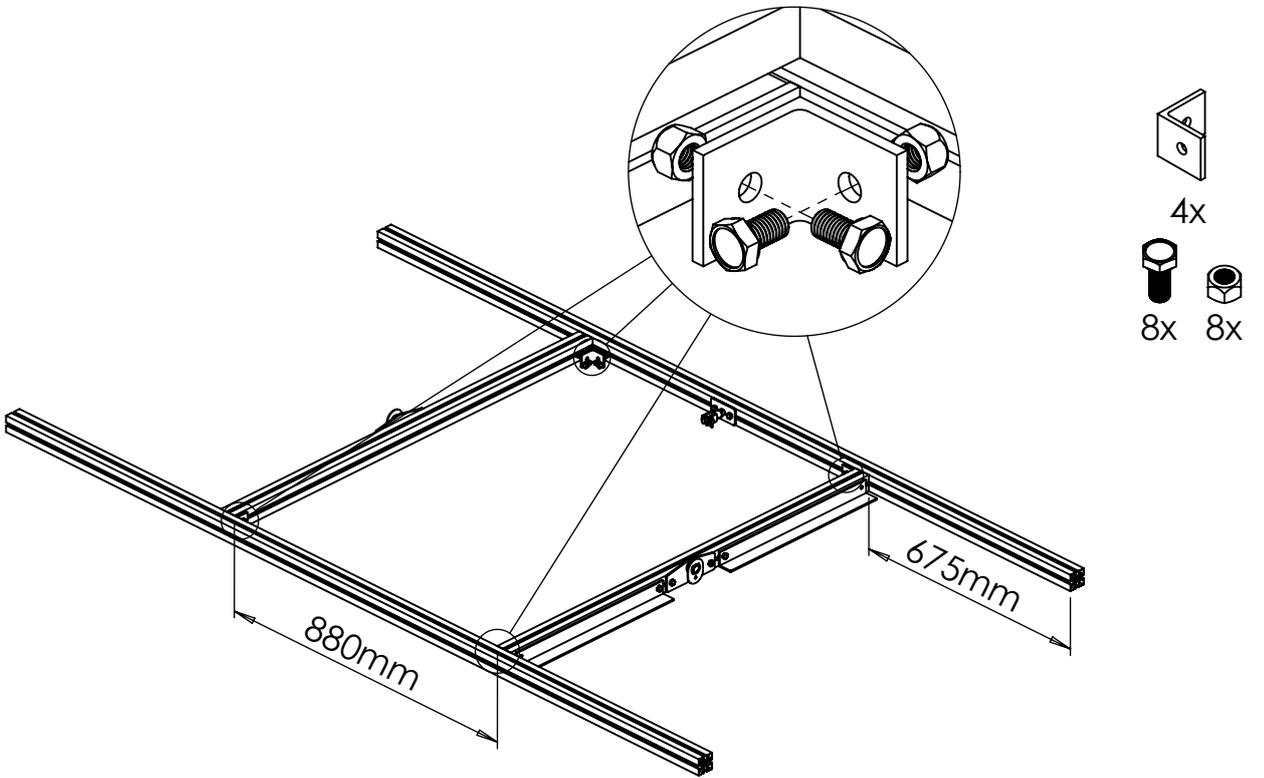
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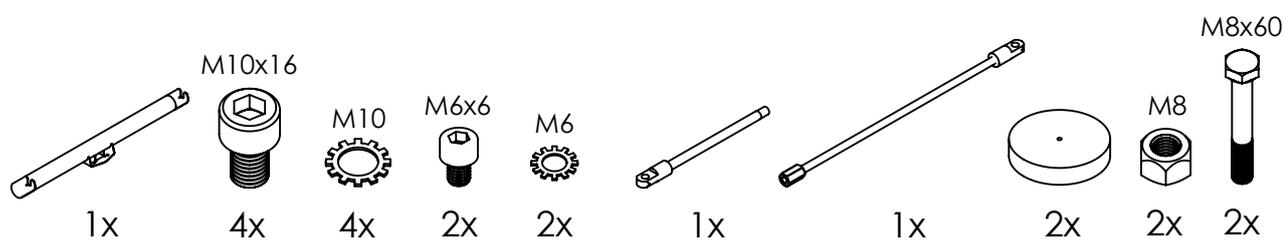
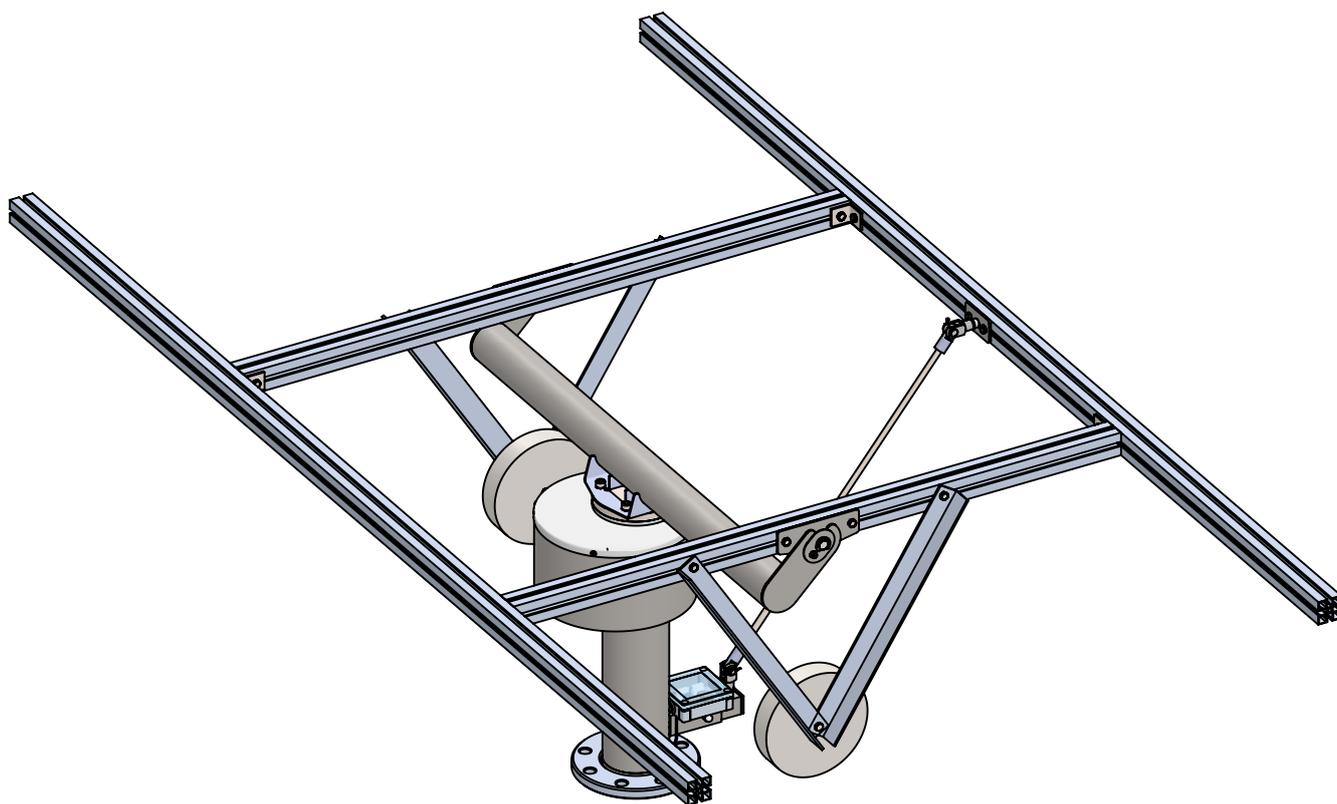
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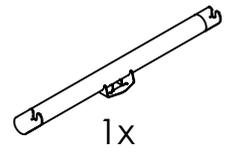
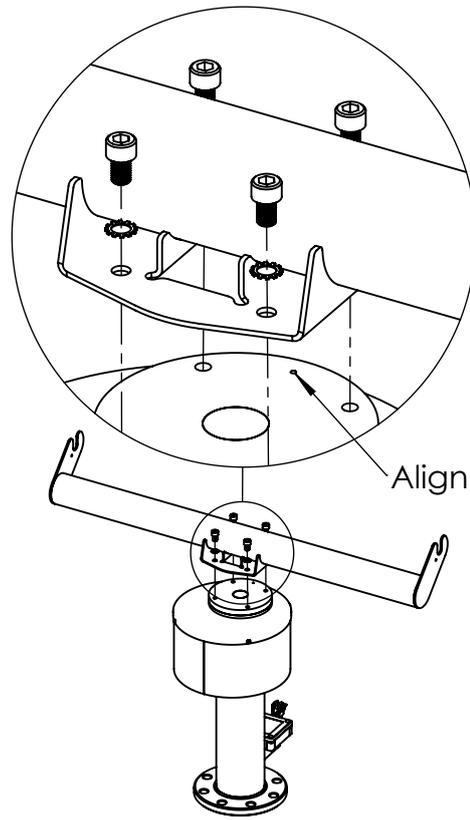
4



PART IV - FORK

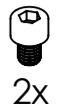
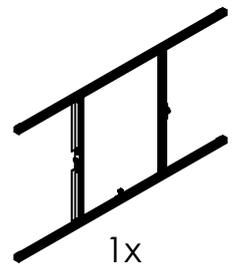
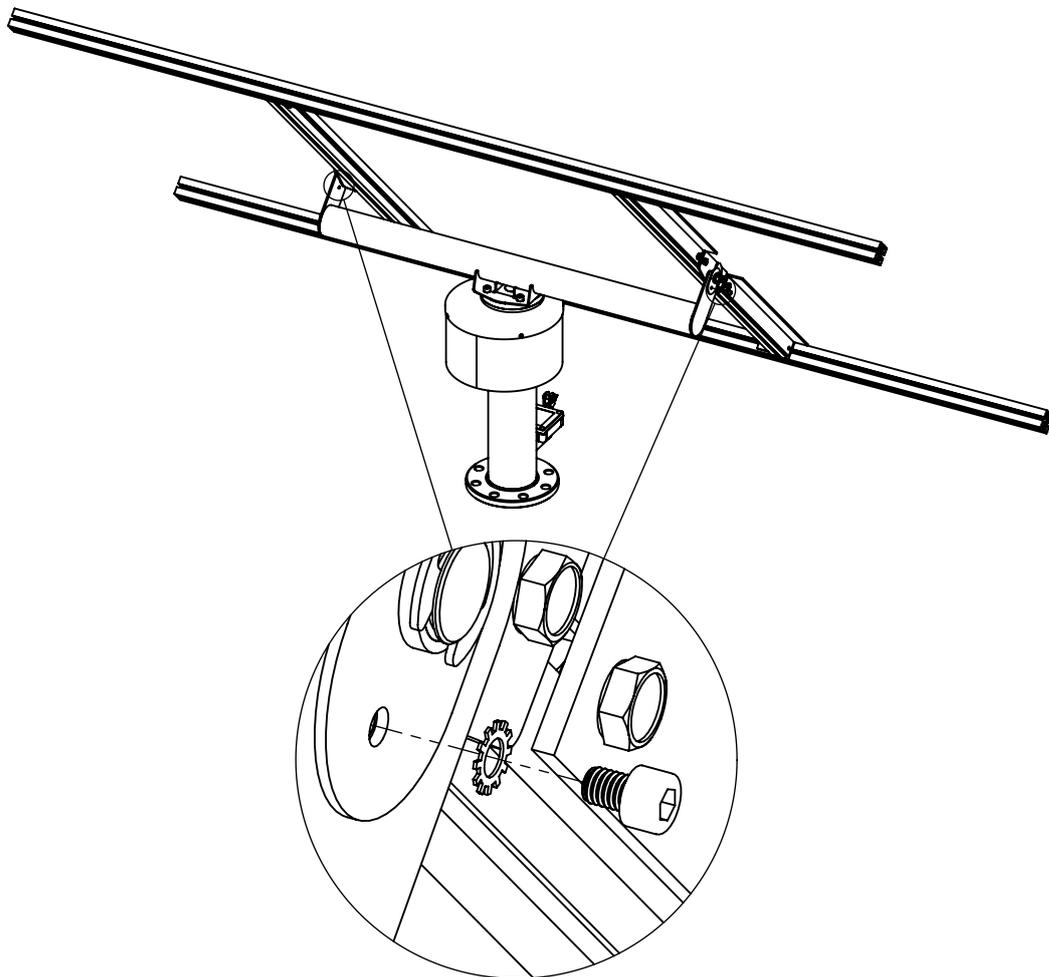


1

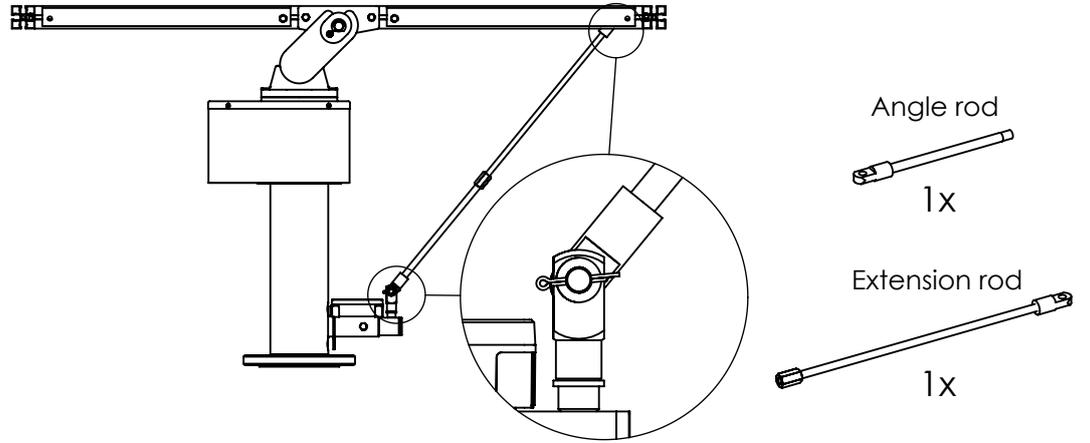


Align fork with forward marker

2

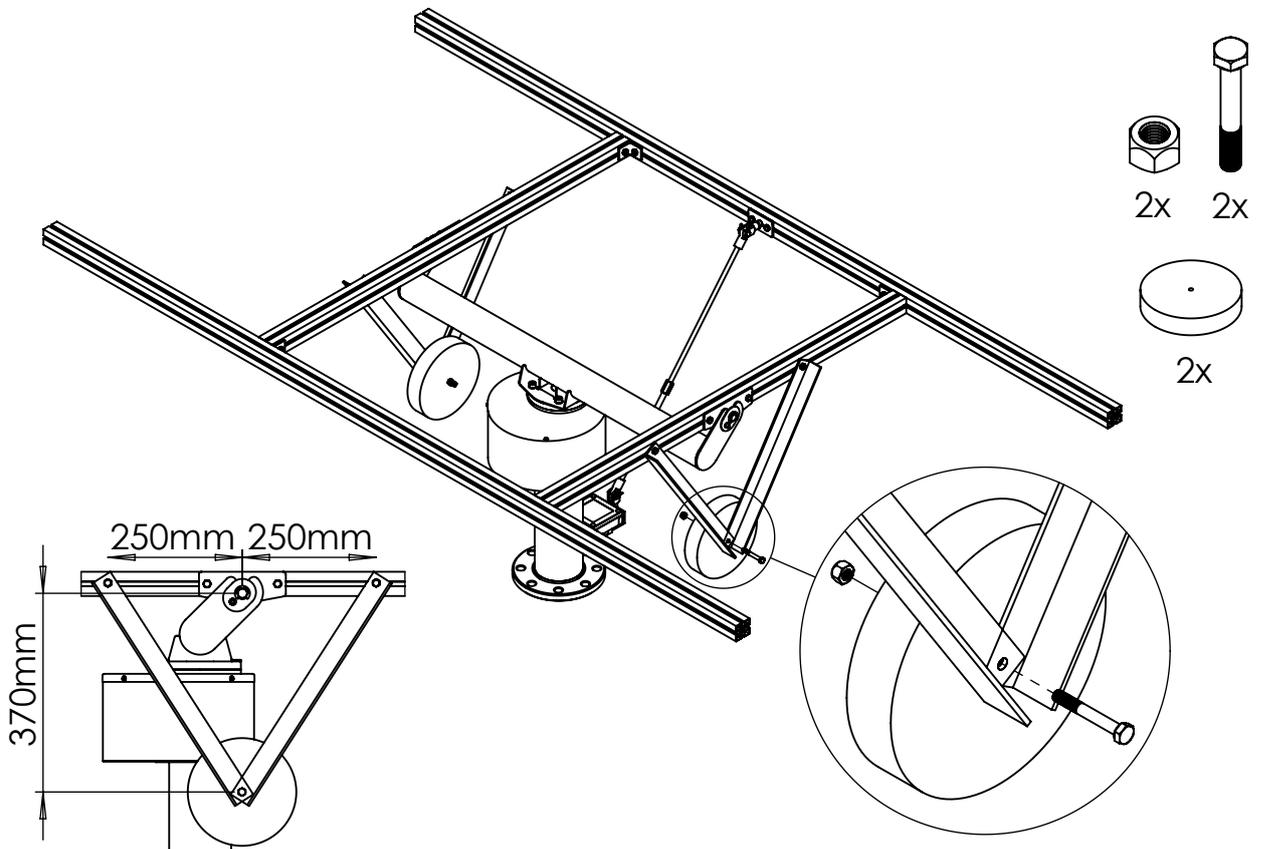


3

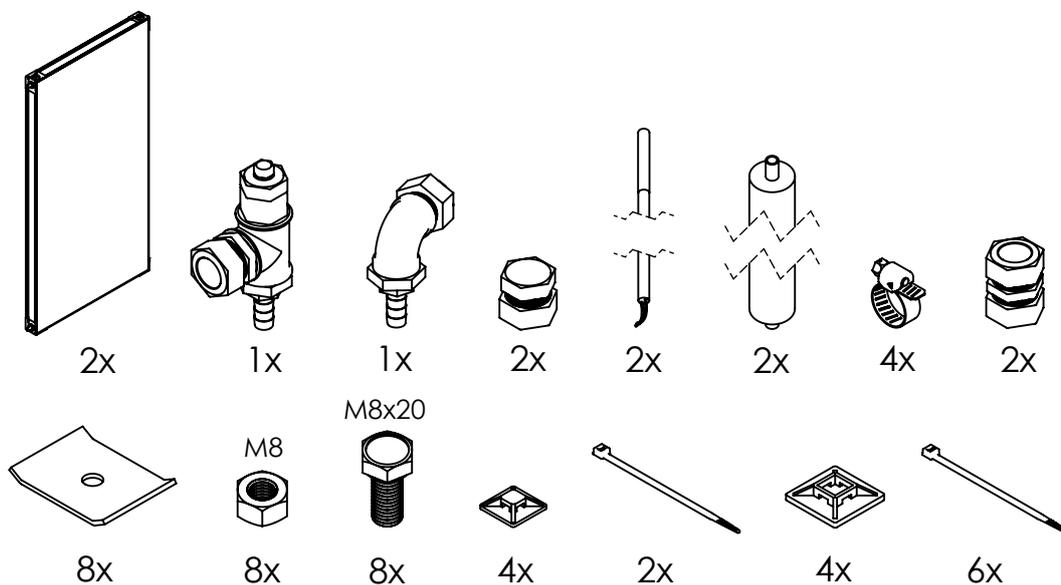
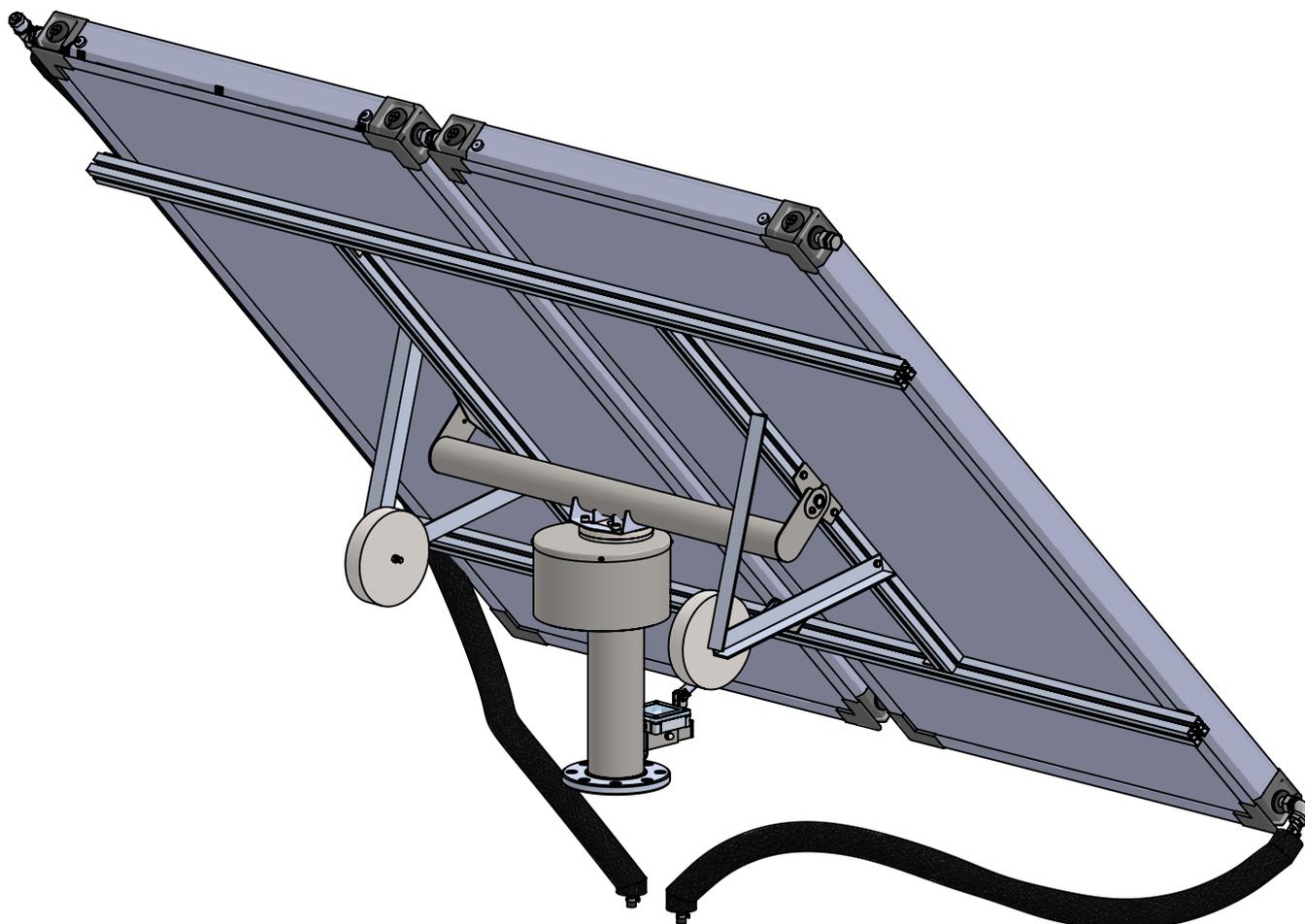


1. Combine the angle rod and the extension rod.
2. Make sure both fork joints are unscrewed one turn.
3. Attach the rod ends to the fork joints.

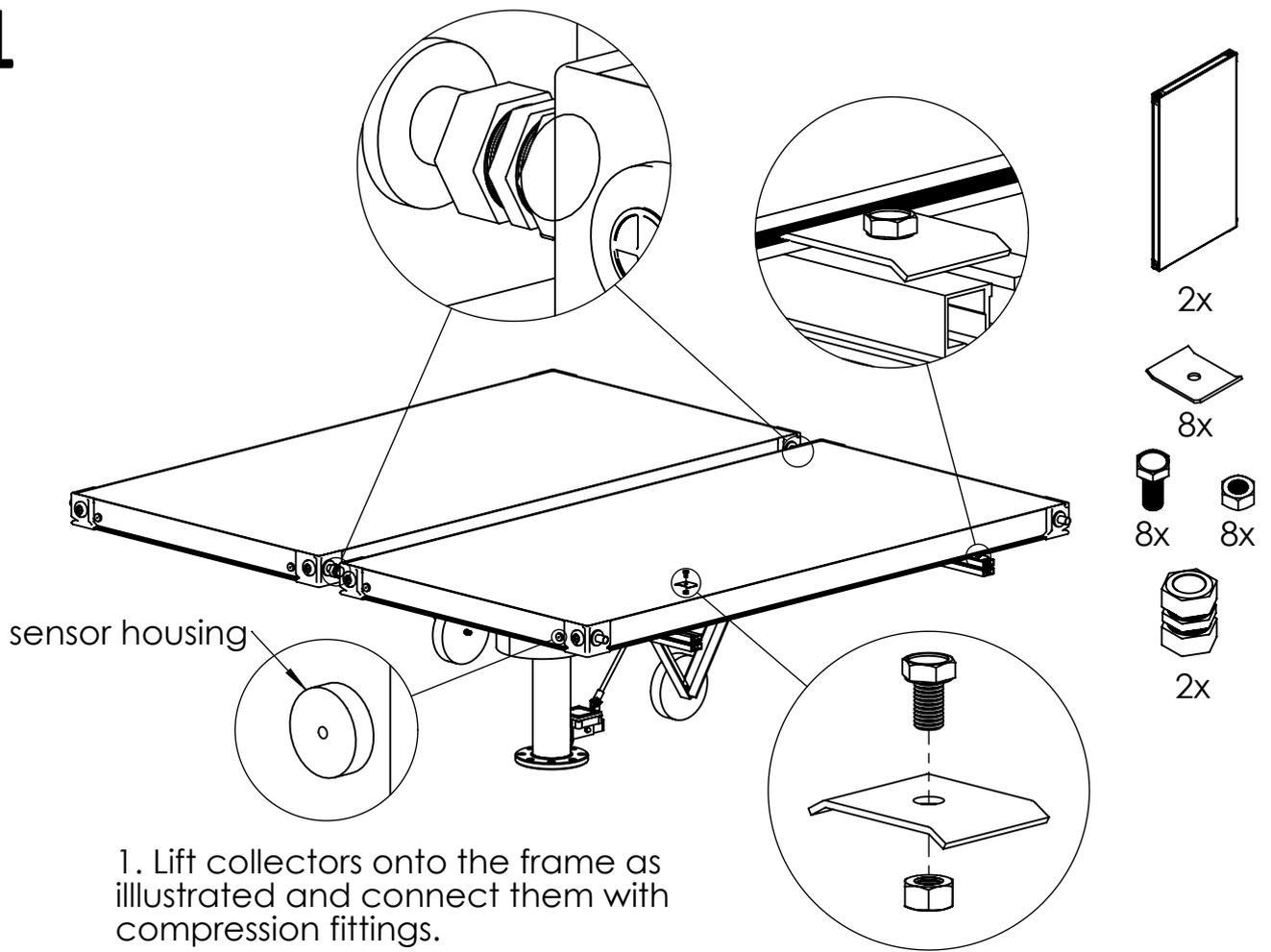
4



PART V - COLLECTOR



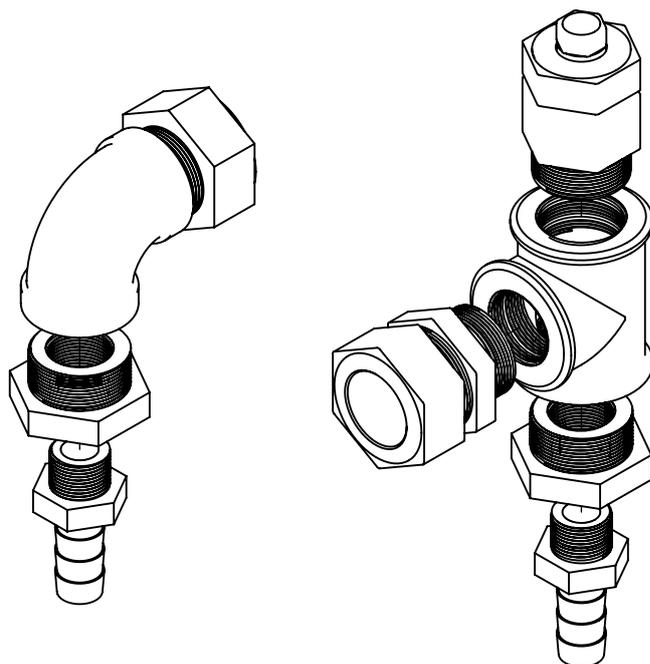
1



1. Lift collectors onto the frame as illustrated and connect them with compression fittings.

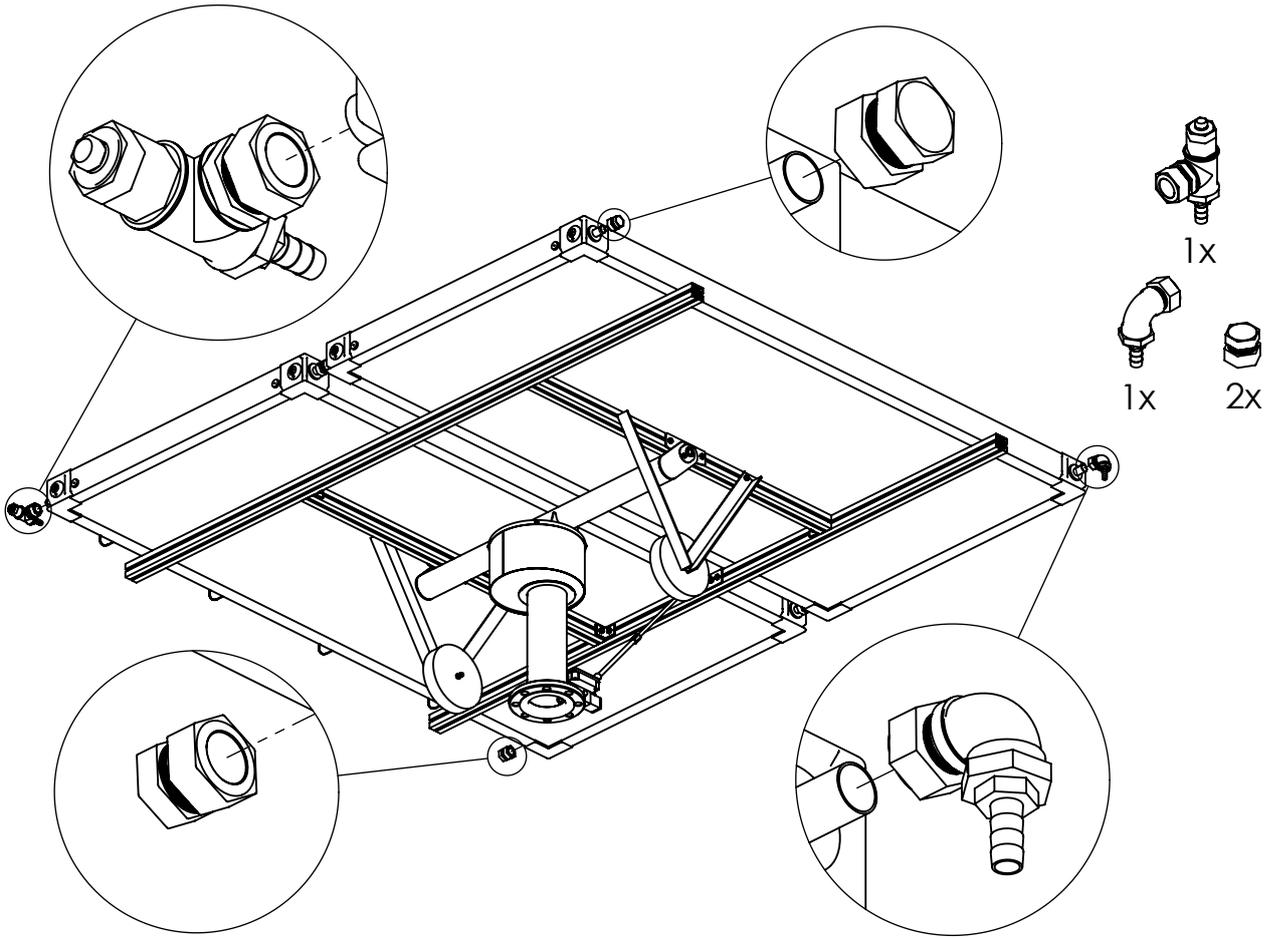
2. Center align collectors and lock them in place using eight panel clamps.

2

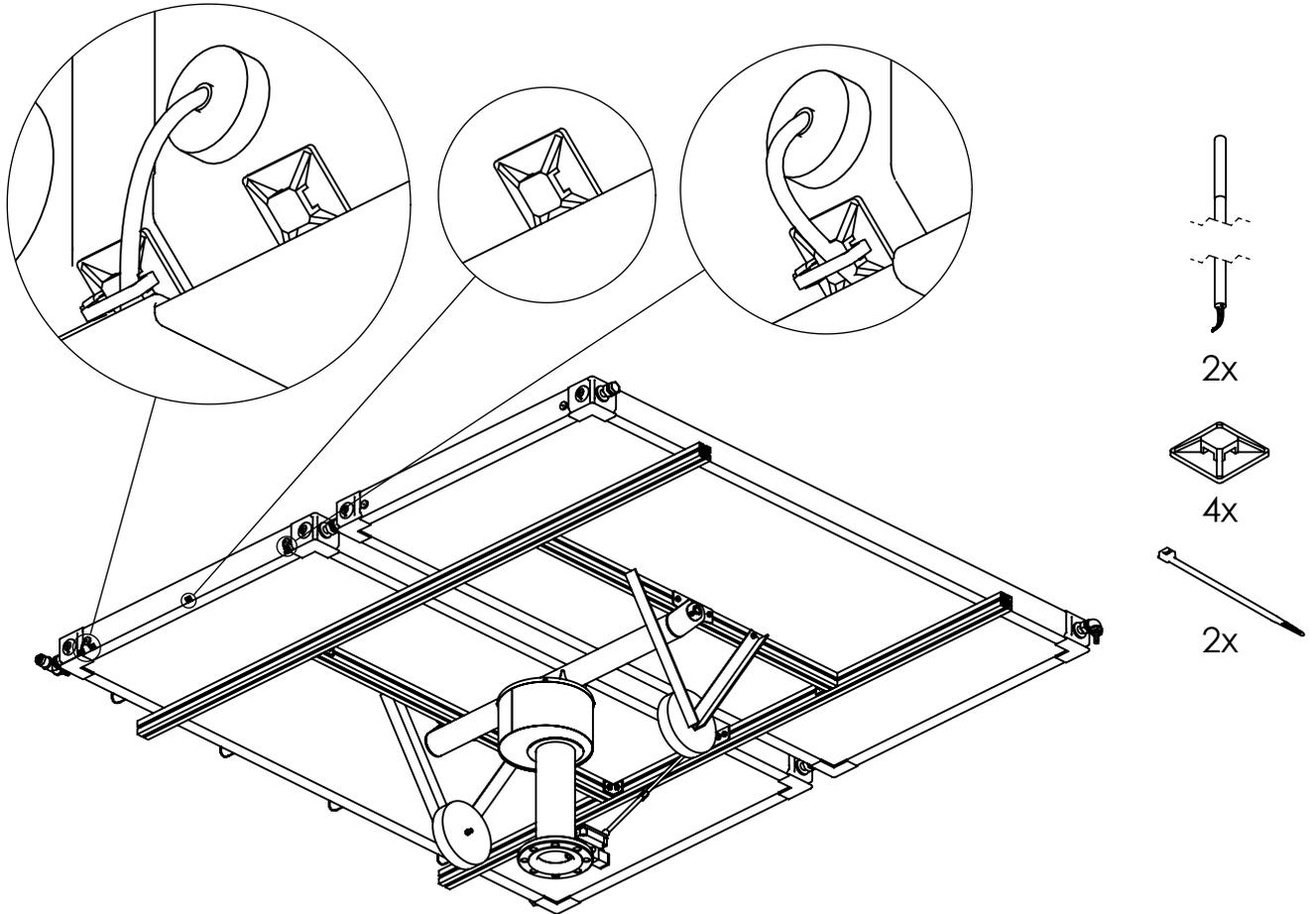


Seal threaded pipe joints using plumber's hemp and paste.

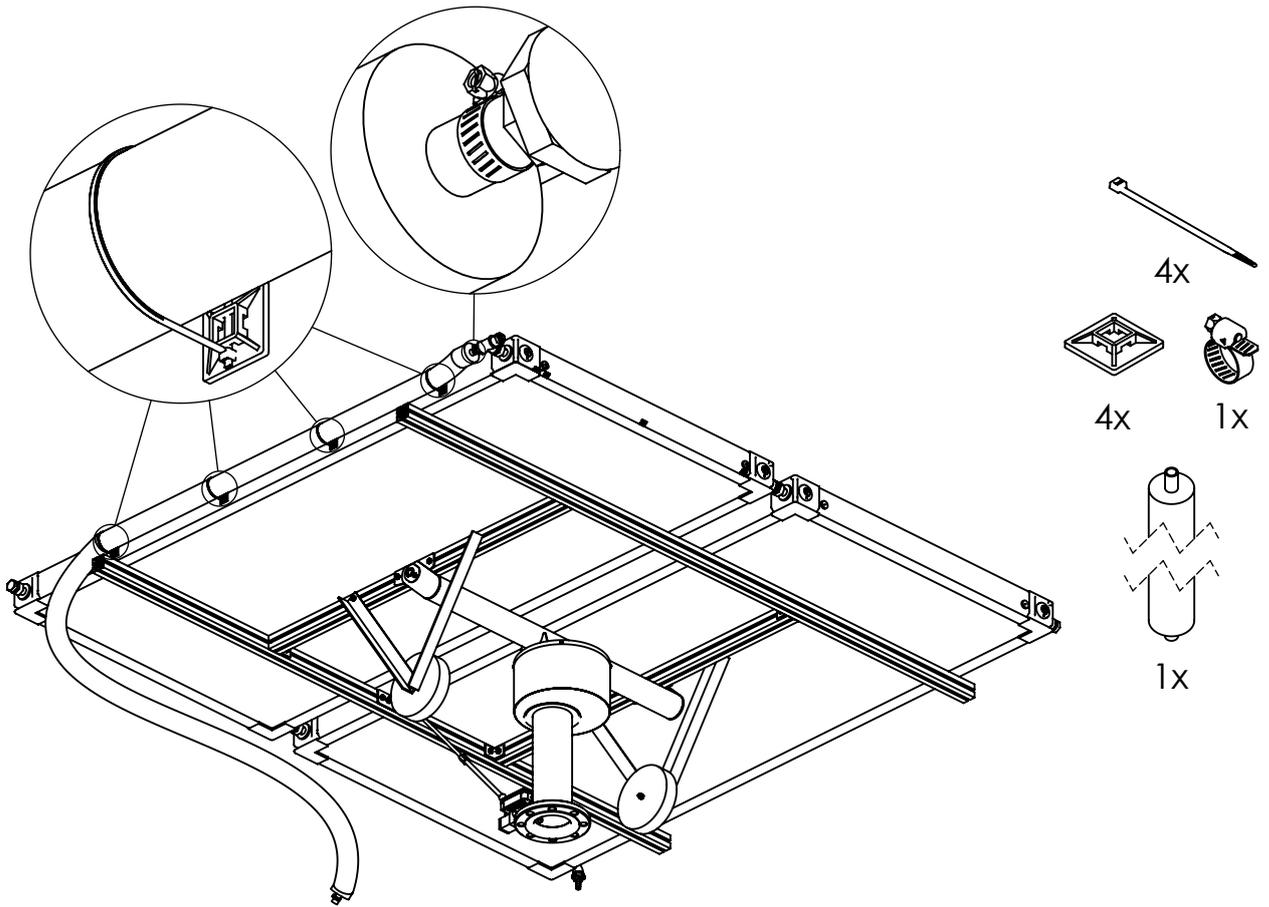
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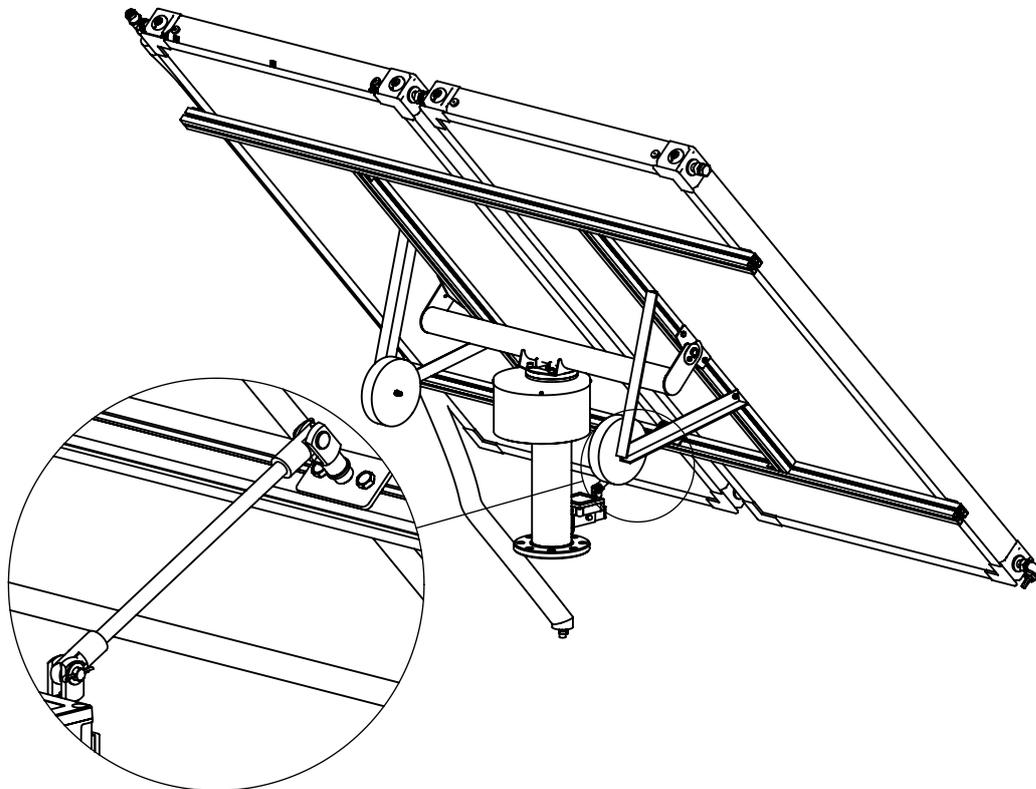
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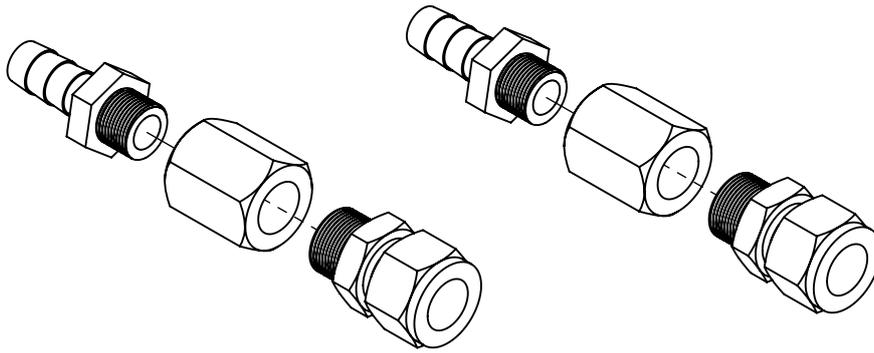


6



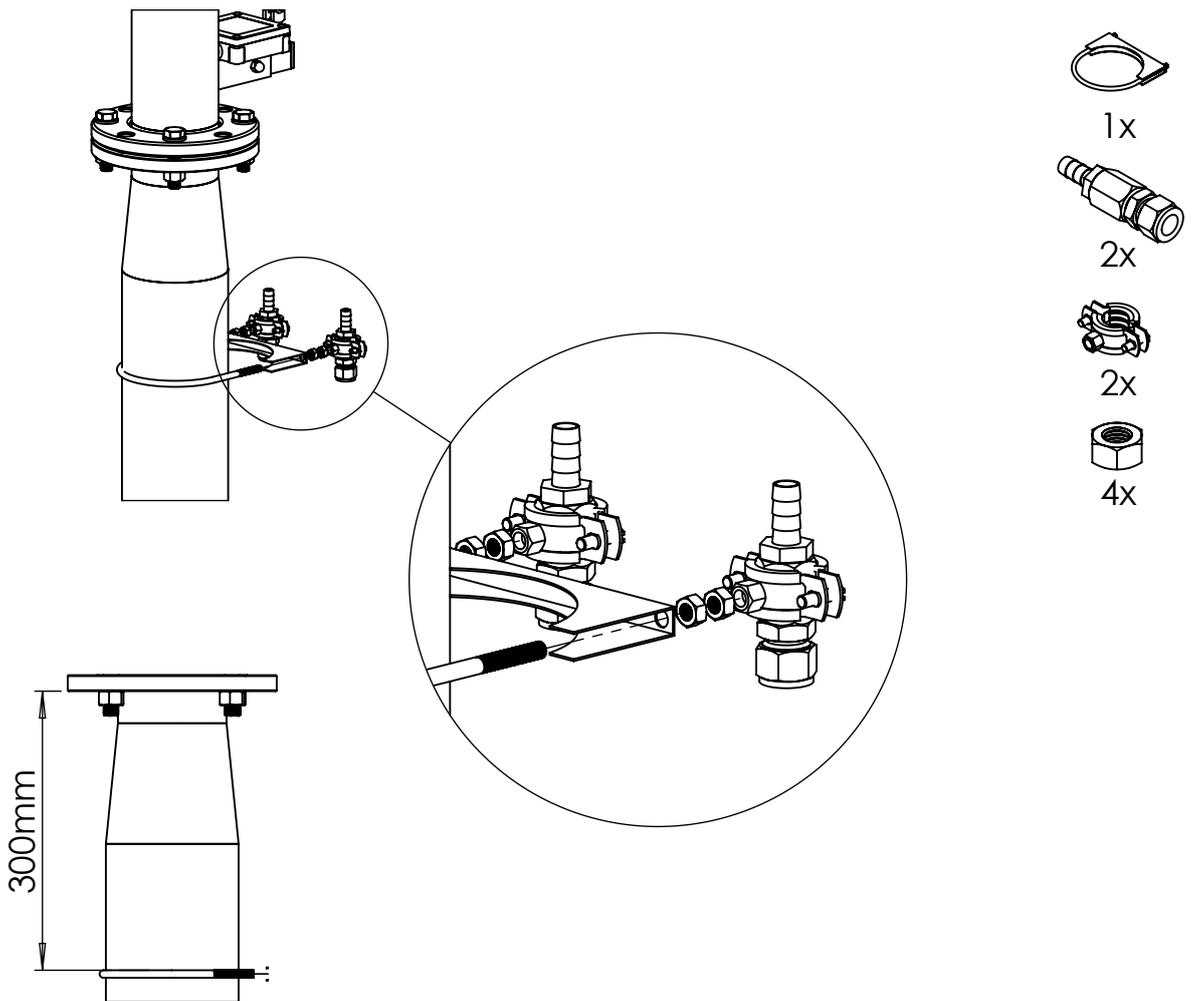
Remove extension rod
and attach angle rod

7

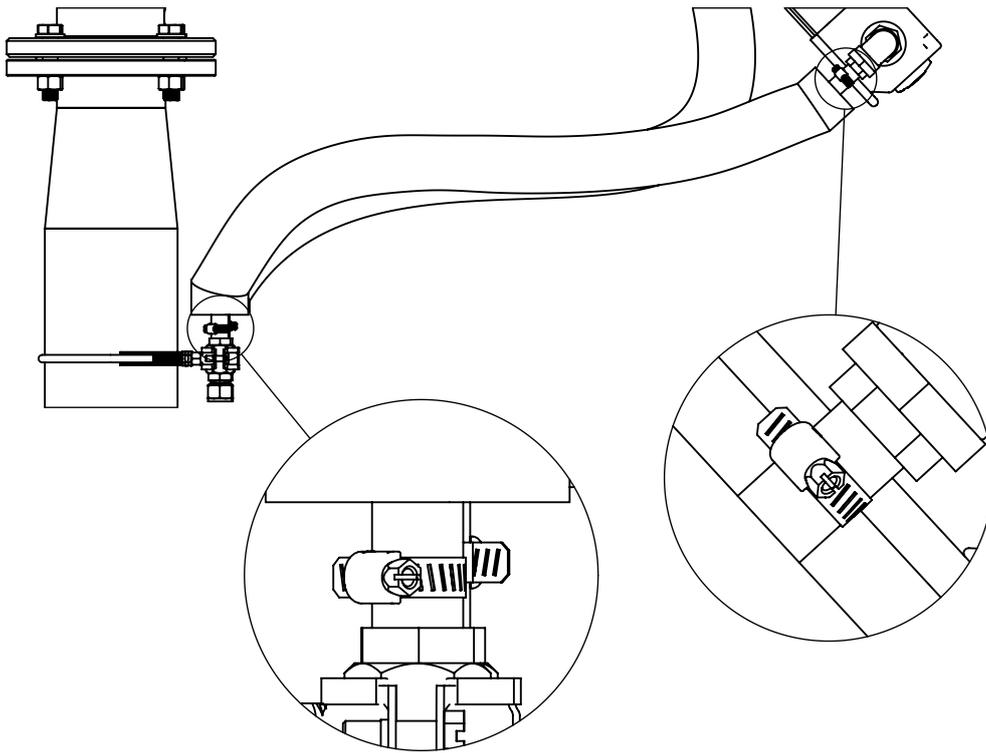


Seal threaded pipe joints using plumber's hemp and paste.

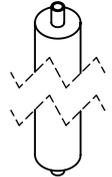
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9

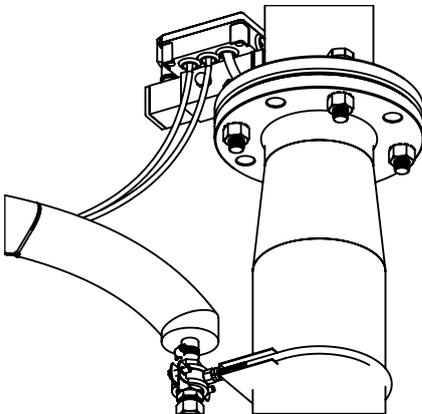


3x



1x

10



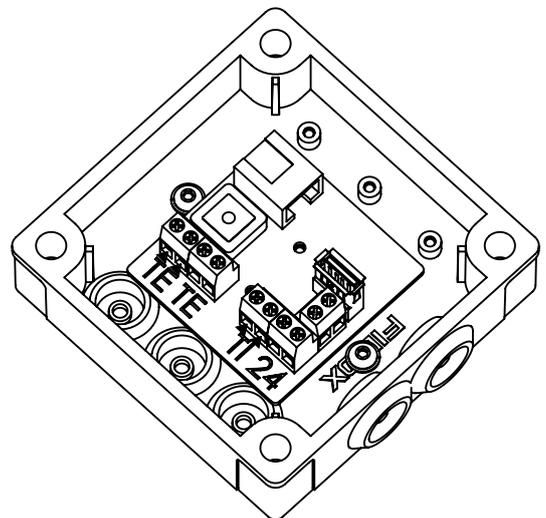
1. Wire the two PT-1000 temperature sensors along the hose using cable ties and then push the sensor cables into the junction box.



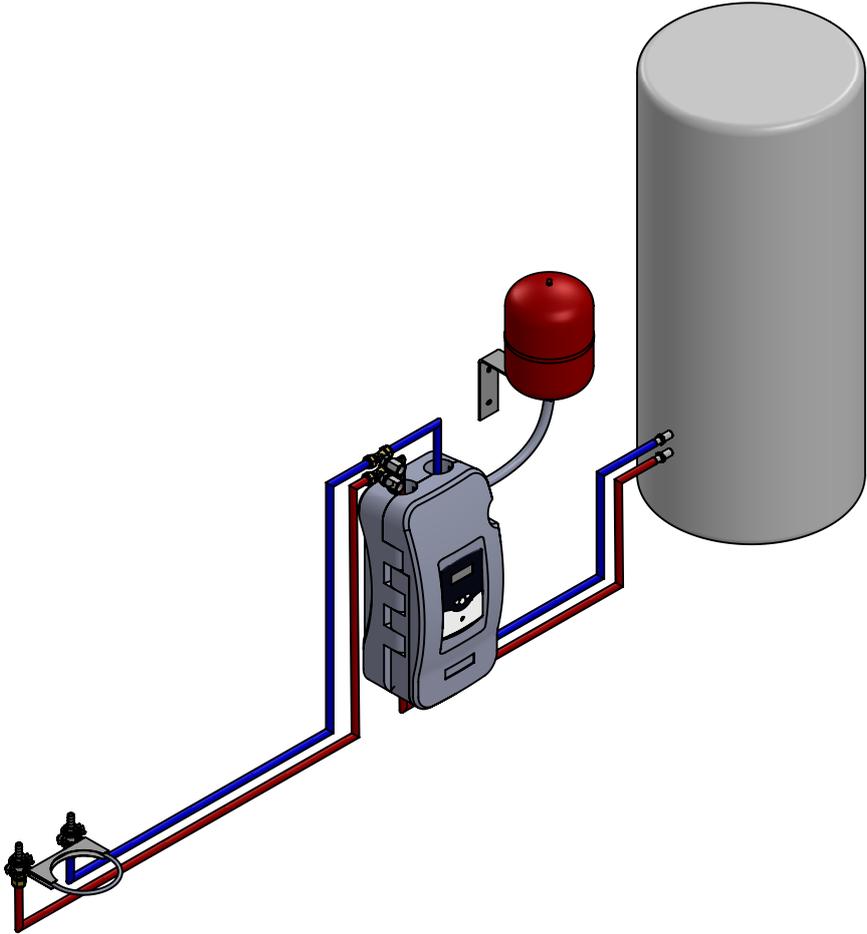
2x

2. Connect one sensor to the remaining TE screw terminal. Polarity does not matter. The TE terminals are joined.

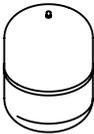
3. Connect the remaining sensor to the TI terminal. This terminal is used for the temperature alarm.



PART VI - HVAC



1x



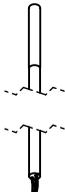
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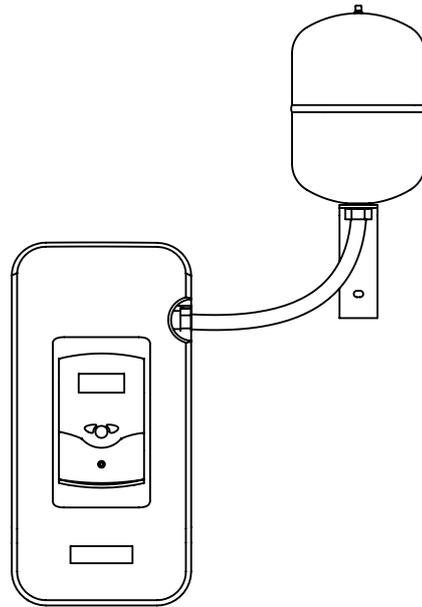


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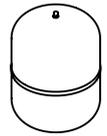


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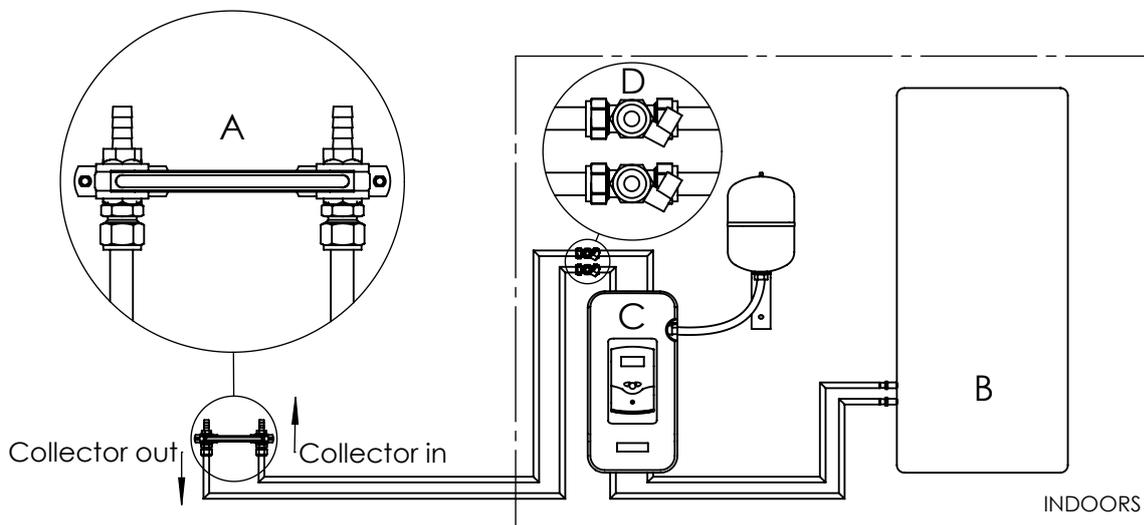


1x

1. Mount the pump system and expansion vessel on a wall close to the water tank.

2. Couple the expansion vessel and pump system using the flexible tube.

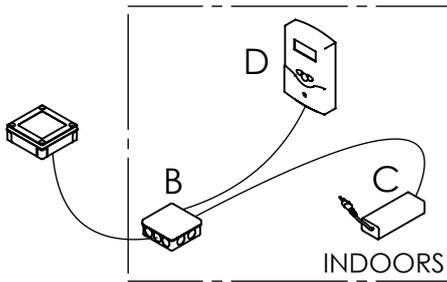
2



Connect the pipework between the collector interface (A), the water heating tank (B), and the pump system (C) as illustrated. To simplify air removal, make sure air vents are installed in any high points (D).

Using 18mm pipes with at least 20mm insulation is recommended. If the tank has more than one heat exchanger using the bottom exchanger is preferred for solar heating.

3



1. Mount a junction box (B) indoors and insert the 4-wire cable into it.



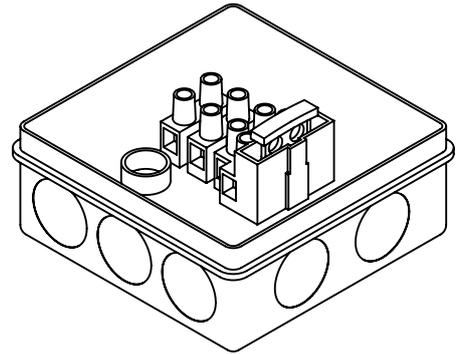
1x

2. Connect the wires to the terminals in the box. The +24V wire is to be run through the fused terminal.



1x

3. Connect the 24V power adapter (C) to the junction box's terminals for +24V and ground. The red wire from the adapter is +24V.



4



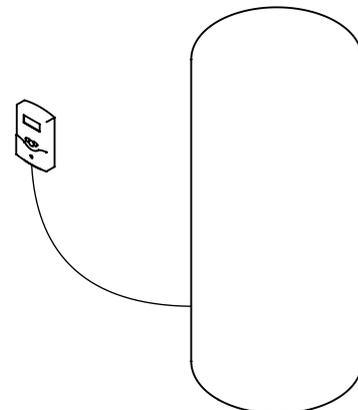
1. Open up the solar regulator (D) with a screwdriver to reveal the sensor terminals.

2. Install a 2-wire cable between the S1 terminal of the solar regulator and the junction box. Connect these wires to the remaining terminals used for the collector's temperature sensor.

3. Mount a temperature sensor in the tank sensor housing nearest the used heat exchanger.

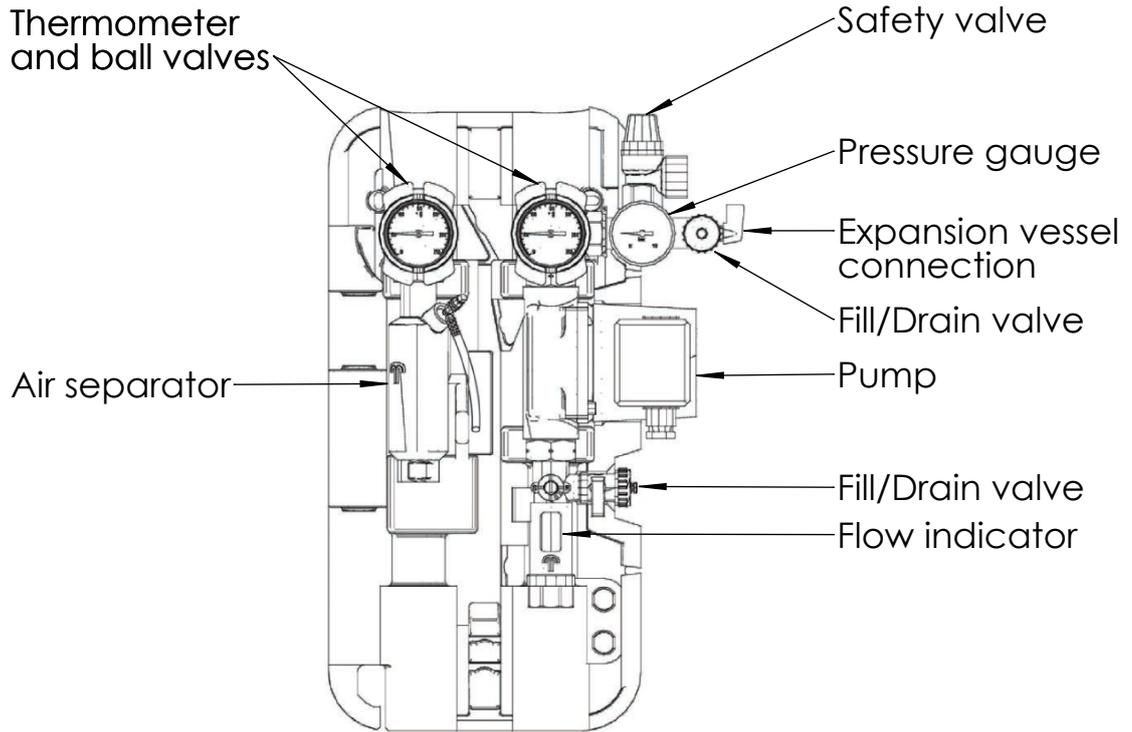
4. Connect this sensor to the solar regulator's S2 terminal.

5. Replace the solar regulator cover.



1x

5



1. Fill the system with heat transfer fluid through the fill valve of the pump station. 2 bar operating pressure is recommended. The minimum pressure that should be maintained is 1 bar.
2. Let trapped air out through the bleed valves at the top of the collector and above the pump station while filling.
3. Plug in the pump system and check the solar regulator display to ensure temperature sensors are properly connected.
4. Test run the pump manually (see solar regulator manual).
5. Check the pump system's integrated flow indicator to ensure the fluid is circulating. A flow rate of 4 liters per minute is recommended. Trapped air will hamper circulation. Air rises to the top, so make sure air vents are installed in any high points.
6. The pump system has an integrated air separator which serves to remove dissolved gases. Empty the air separator, along with the bleed valves, periodically during at least 15 minutes while the fluid is circulating.
7. Resume automatic pump control after air has been removed.
8. Check pipe connections to ensure there are no visible leaks.
9. Insulate all exposed sections of the piping to improve system efficiency.
10. Plug in the 24V power adapter to start the solar tracker. The Heliomotion TC system is now operational.