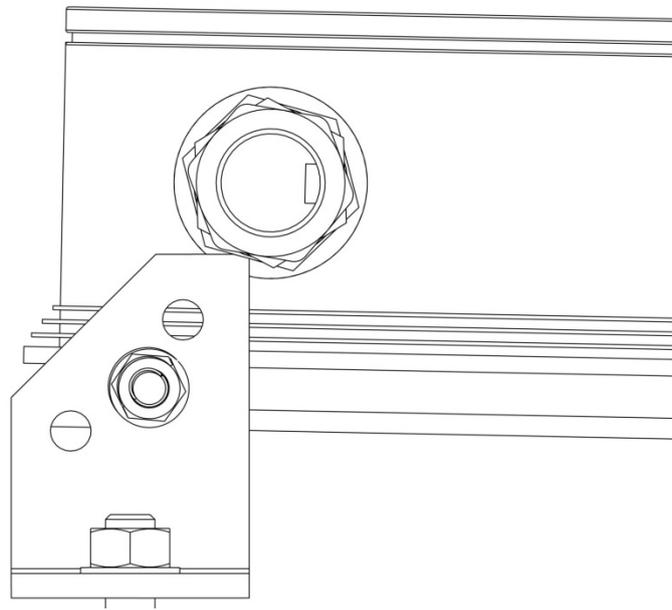
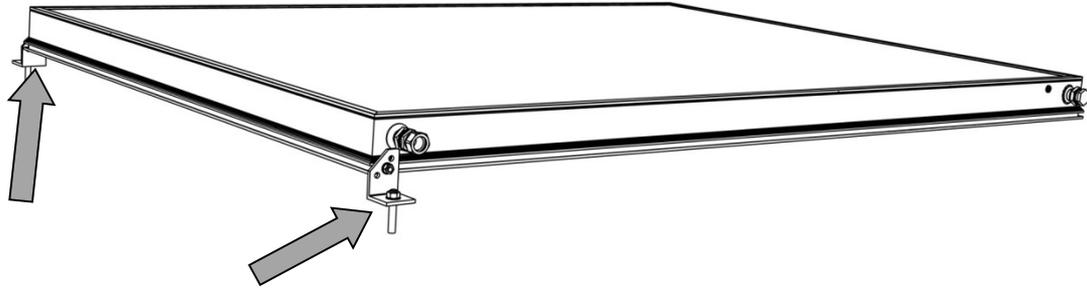


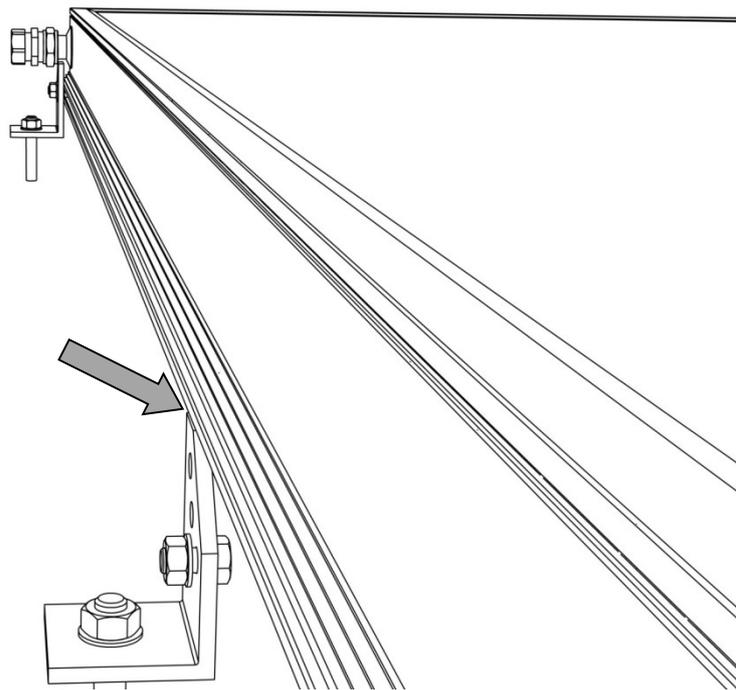
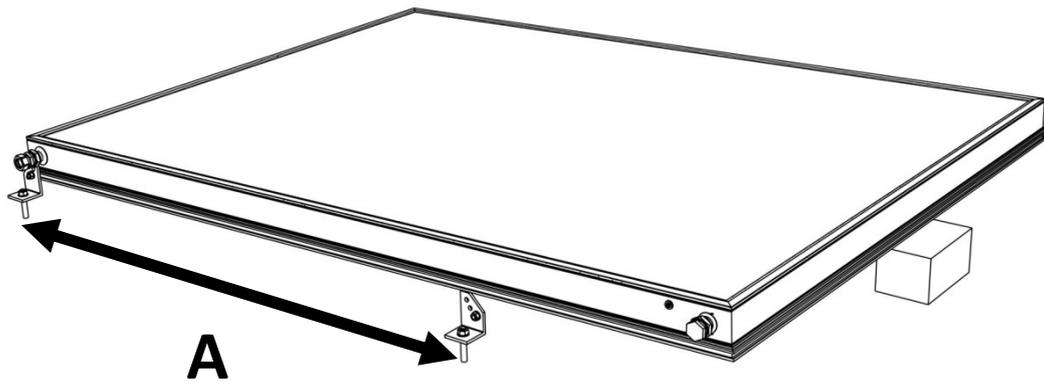
IX) INSTALLATION OF STAND ALONE COLLECTORS ON A FLAT ROOF



STEP 1

Place the collector on the roof floor and attach the collector feet on the collector as shown in the figure above. Tighten the bolts so as to prevent any free play while still allowing rotation of the collector. Attach the collector feet on the roof floor. Follow the instructions for positioning the system in Chapter III. Use fasteners of appropriate length and type to ensure that the collector feet are secured onto the structural layer of the roof and not on the insulation. Use an appropriate sealing material to prevent moisture from penetrating the roof material.

IMPORTANT: DO NOT REMOVE COLLECTOR COVER SHEET BEFORE CONNECTING THE SYSTEM!

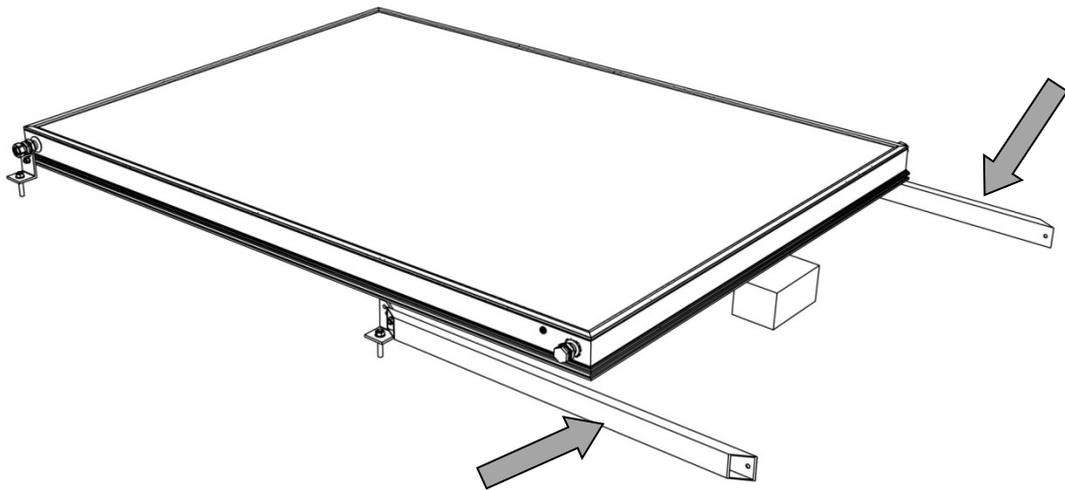


STEP 2

Use a small object to raise the top side of the collector from the floor just enough to be able to install the support strut feet at a distance A [mounting hole to mounting hole] according to Table 1. For best installation results the mating surfaces of the collector side and the support strut feet should be tangential as shown in the figure above.

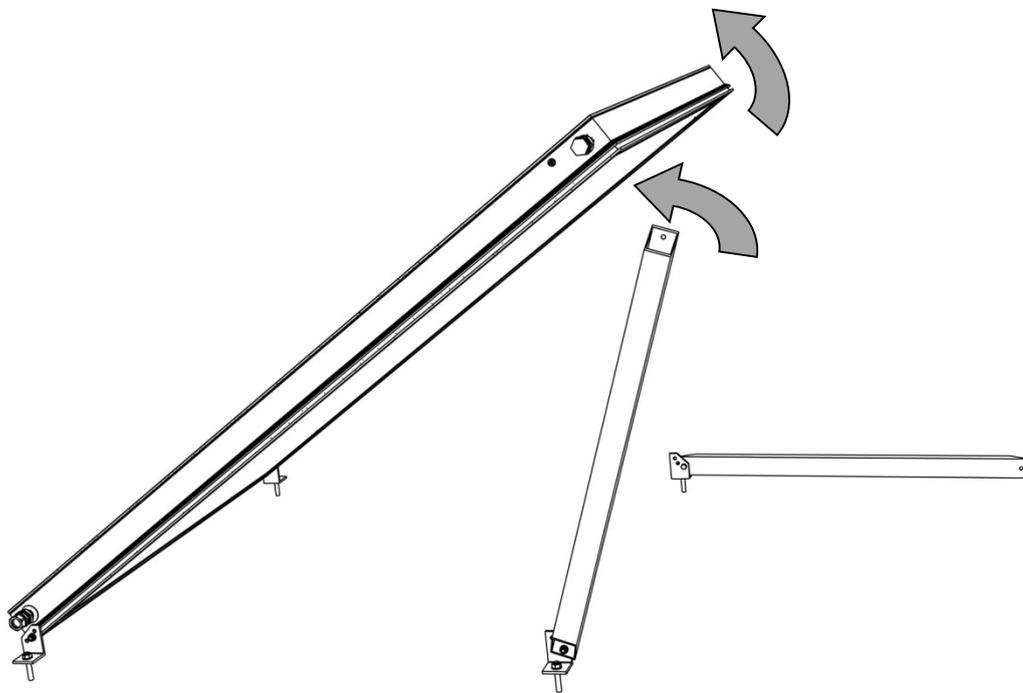
TABLE 1

| COLLECTORS | M5-210 | M5-260 | M5-260H | M5-300 | M5-300H |
|-------------------------|---------------|---------------|----------------|---------------|----------------|
| DISTANCE A [mm] | | | | | |
| 45 degrees installation | 972 | 1240 | 697 | 1240 | 972 |
| DISTANCE A [mm] | | | | | |
| 30 degrees installation | 1390 | 1765 | 1007 | 1765 | 1390 |
| | | | | | |



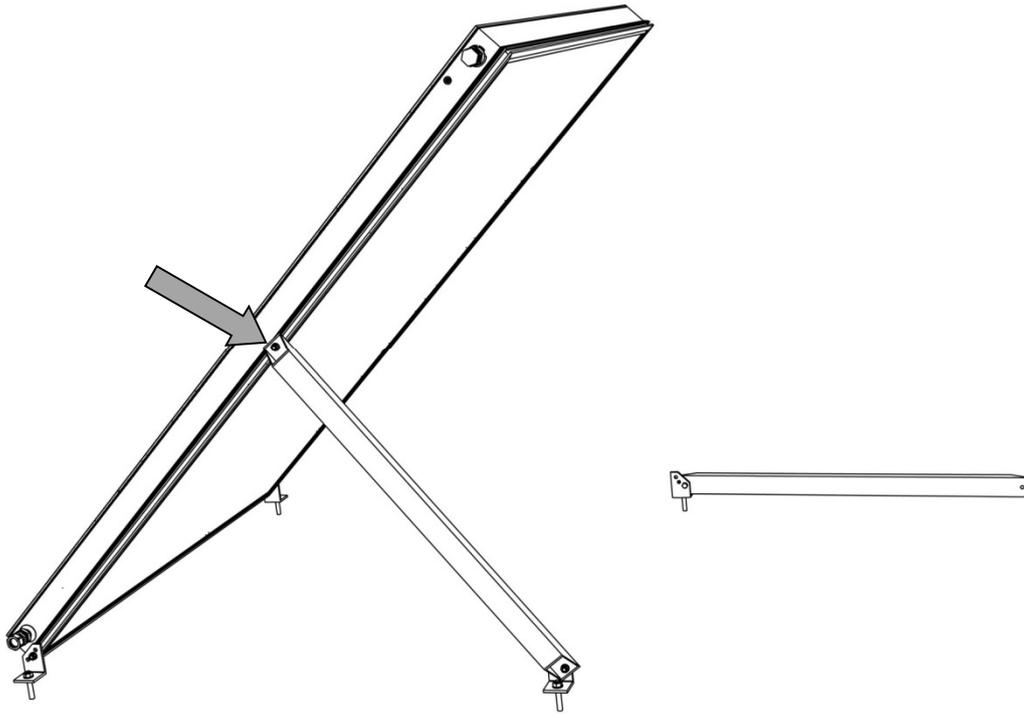
STEP 3

Attach both support struts onto the support strut feet. Tighten the bolts until they are loose enough to allow rotation.



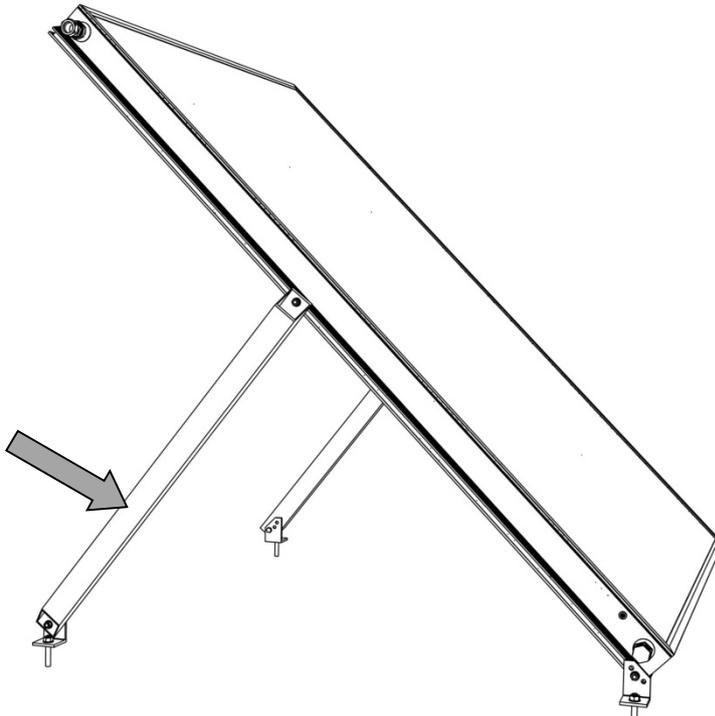
STEP 4

Lift the collector from its top while raising one of the support struts.



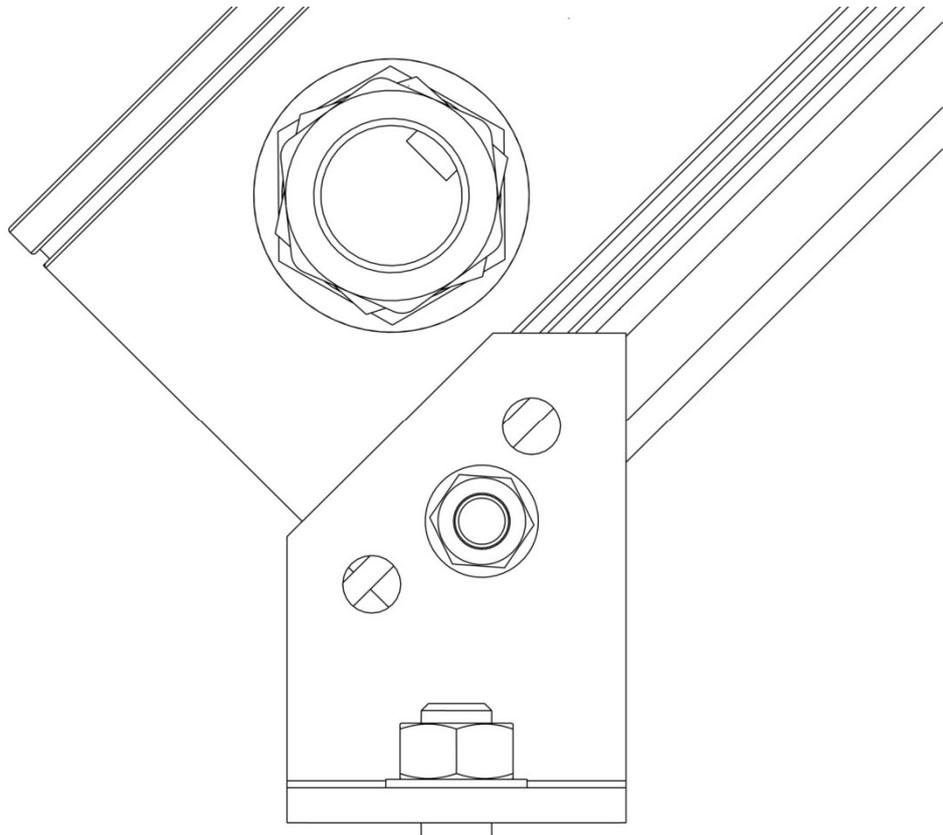
STEP 5

Connect the top end of the support strut with the bolt on the collector side. Do not tighten the bolt fully.



STEP 6

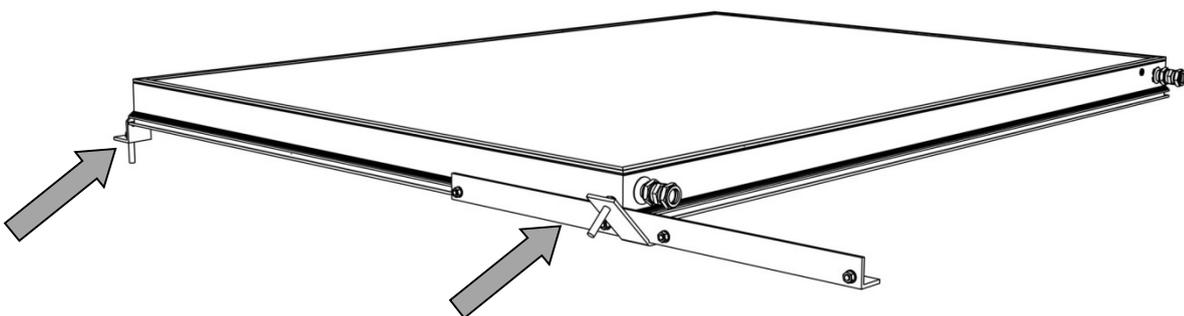
Connect the remaining support strut. Do not tighten the bolt fully.

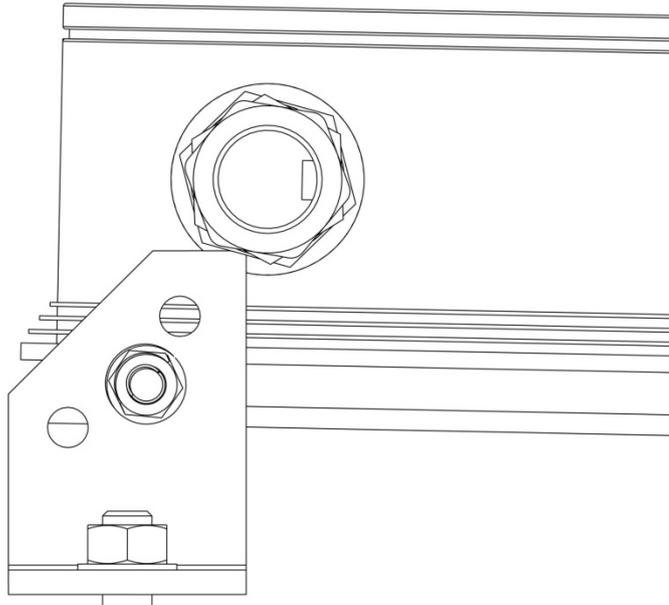


STEP 7

Ensure that the collector is set up to the appropriate angle. The collector support feet can be used as guides in setting the angle as they are cut at 45 degrees. The angle between the bolt, the bottom hole and the horizontal is 30 degrees. When the correct angle is set tighten all 8 bolts [4 collector bolts and 4 bolts at the bottom part of the support struts].

X) INSTALLATION OF COLLECTOR ARRAYS ON A FLAT ROOF



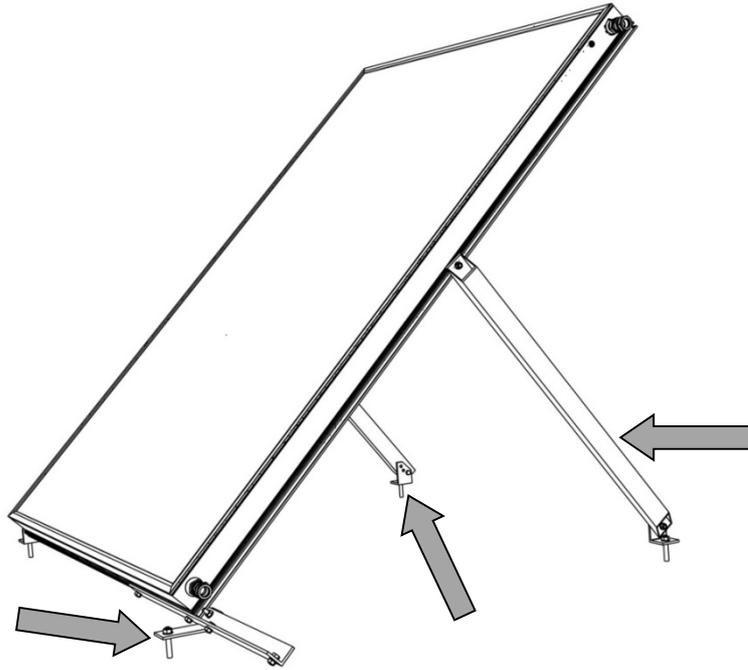


STEP 1

Place the first collector on the roof floor and attach the collector foot on the collector on the end of the array as shown in the figure above. Tighten the bolt so as to prevent any free play while still allowing rotation of the collector. Attach the collector foot on the roof floor. Follow the instructions for positioning the system in Chapter III. Use fasteners of appropriate length and type to ensure that the collector feet are secured onto the structural layer of the roof and not on the insulation. Use an appropriate sealing material to prevent moisture from penetrating the roof material.

IMPORTANT: DO NOT REMOVE COLLECTOR COVER SHEET BEFORE CONNECTING THE SYSTEM!

On the side where the next collector will be installed attach the bottom brace. Tighten the bolts securing it on the collector but do not attach it on the floor.



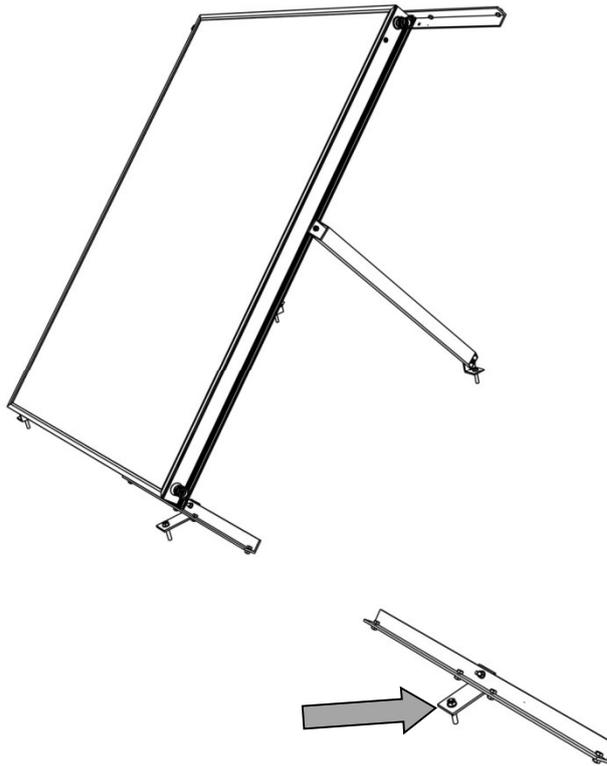
STEP 2

Follow Steps 2-7 of Chapter VII to connect the support struts to the collector and set it at the appropriate angle. Once the struts are secured secure the bottom brace to the floor.



STEP 3

Attach the top brace at the top of the collector.



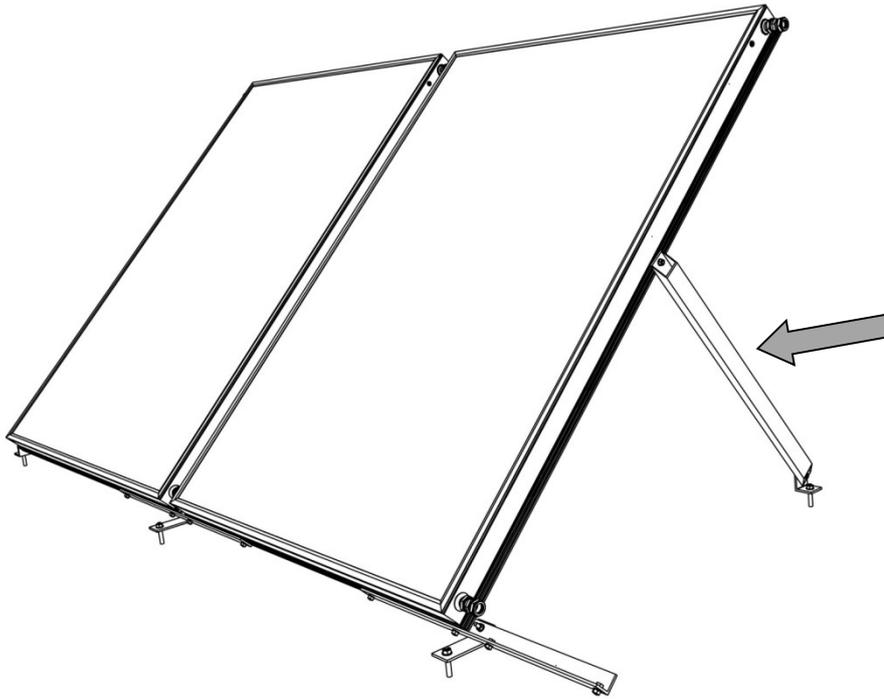
STEP 4

Install the next bottom brace at a distance equal to the width of the collector (1300mm, from hole to hole on the floor). Ensure that the two braces are in line.



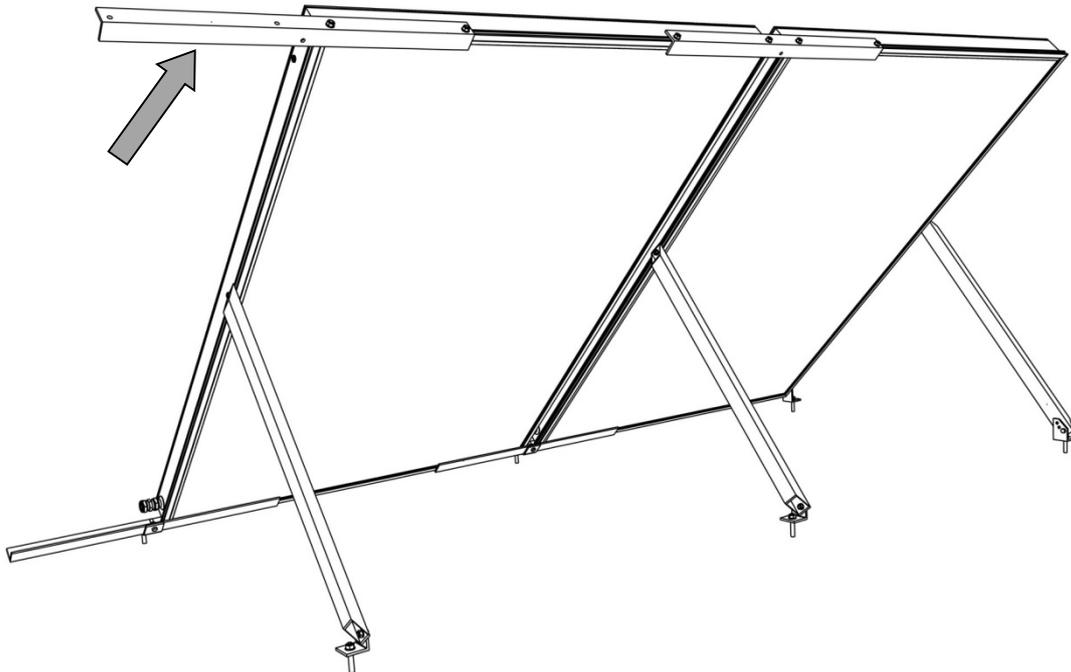
STEP 5

Place the next collector on the braces. Install the bolts and tighten them enough to prevent free play while allowing the collectors to slide towards each other. Tighten the hydraulic connections between the two collectors and then the collector securing bolts.



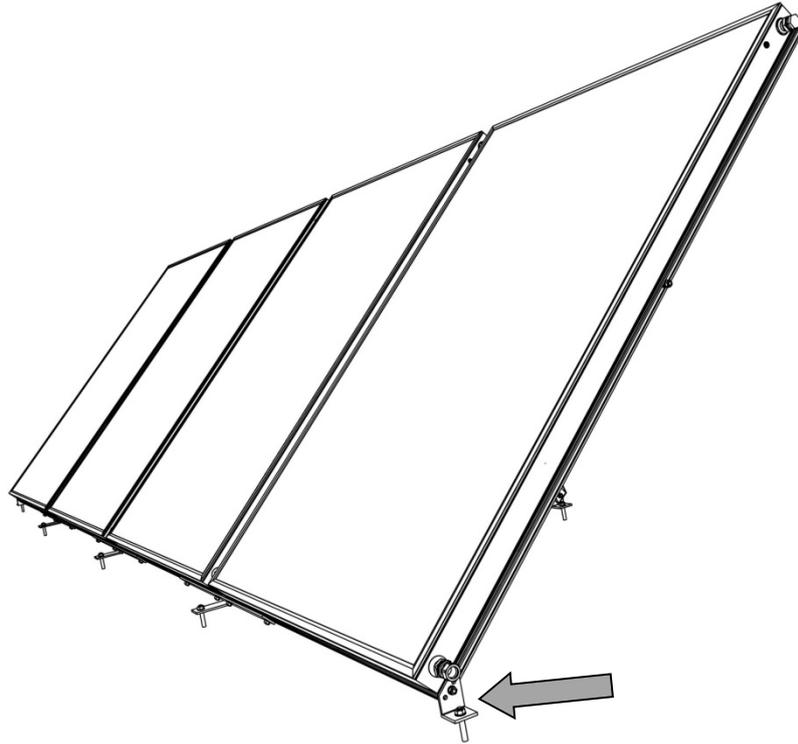
STEP 6

Install the support strut. Before tightening the collector securing bolts ensure that the edge of the collector is set at the appropriate angle.



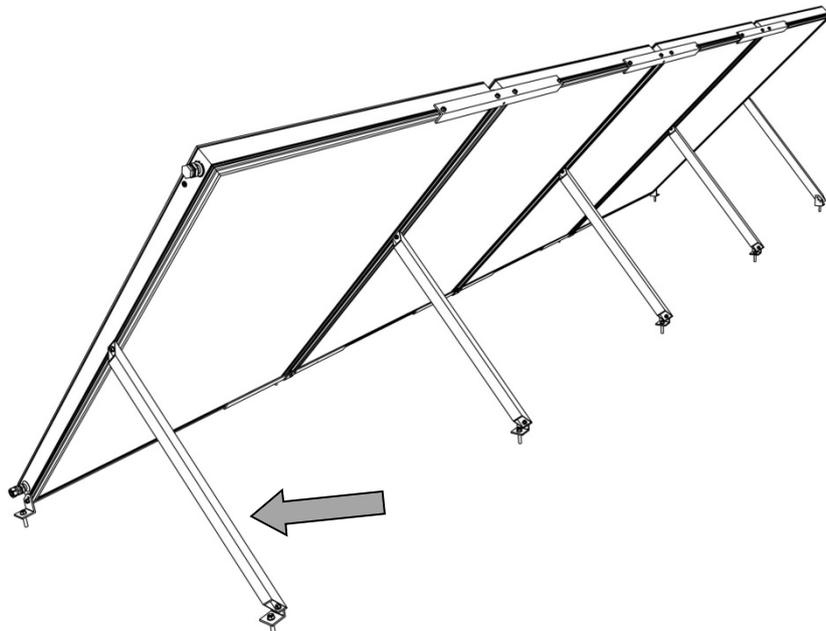
STEP 7

Attach the top brace at the top of the collector.



STEP 8

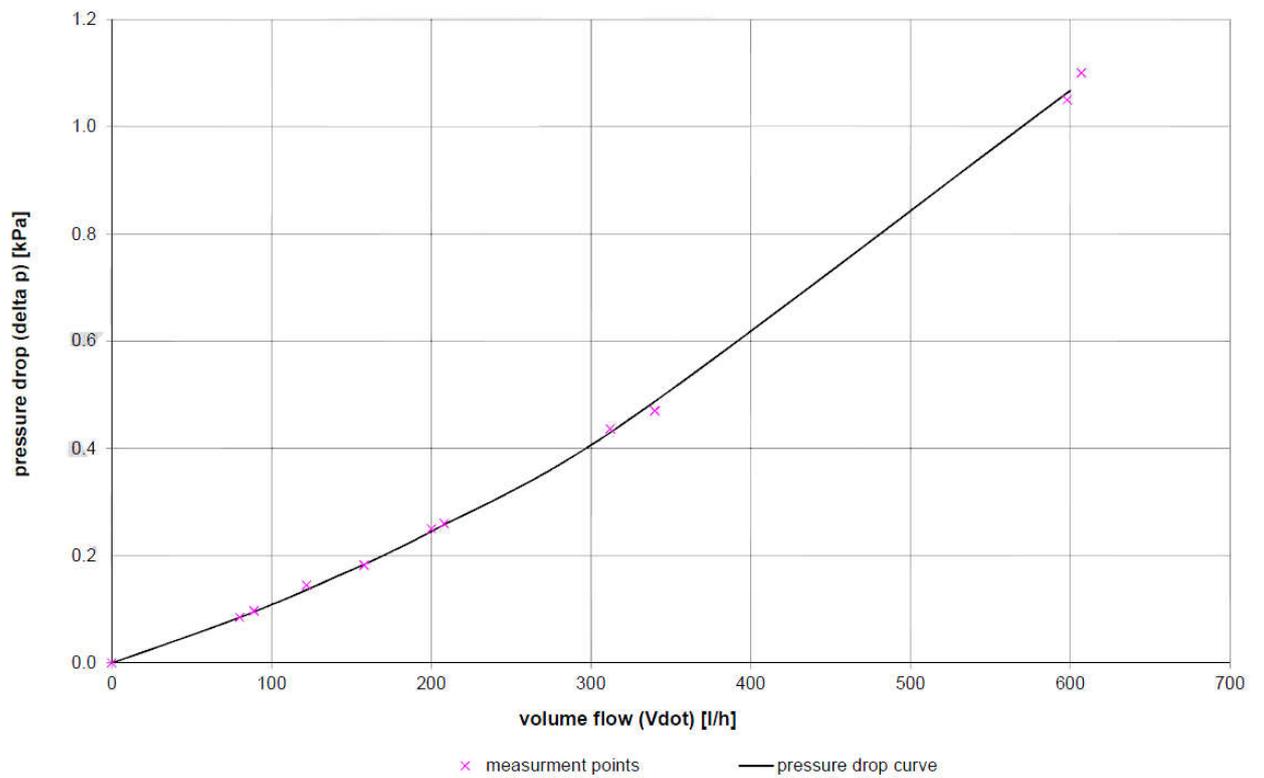
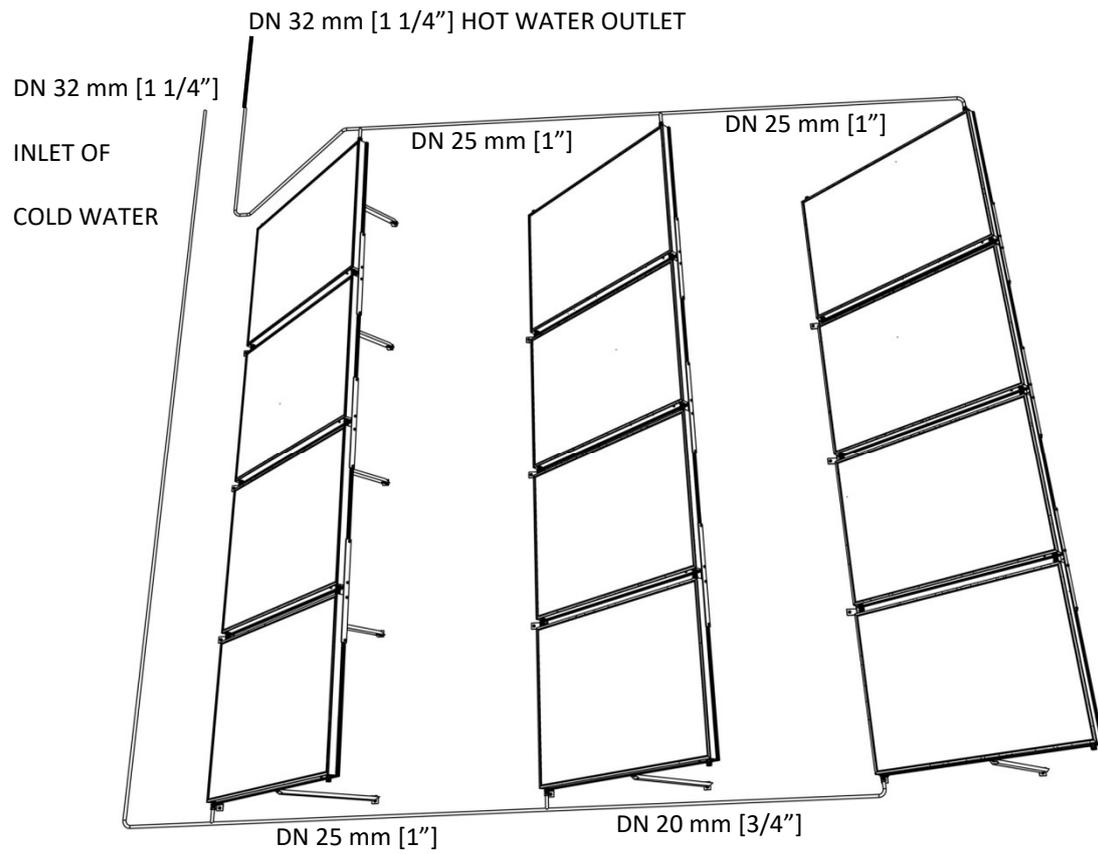
Continue with the installation of the remaining required collectors following steps 4-7. The last collector of the array should have a foot already attached before installation onto the braces. Tighten the securing bolts on the braces first and then attach the collector foot to the floor.



STEP 9

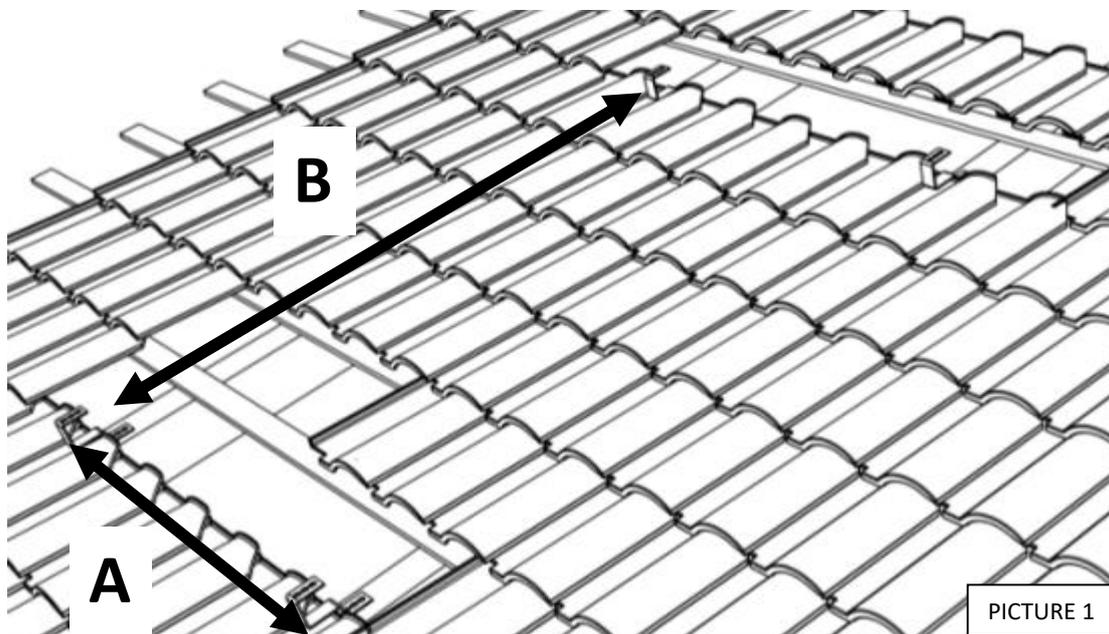
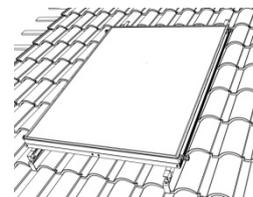
Install the last support strut.

XI) INSTALLATION OF COLLECTOR ARRAYS UP TO 20m²

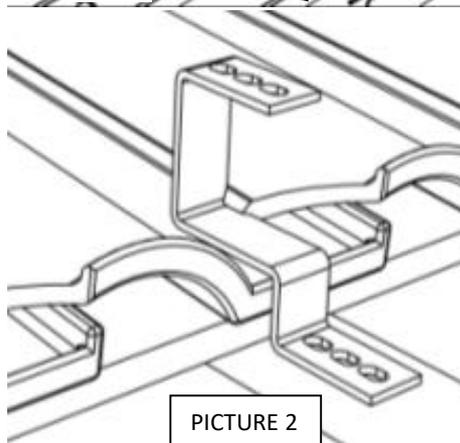


XII) INSTALLATION OF STAND ALONE COLLECTOR ON INCLINED ROOF

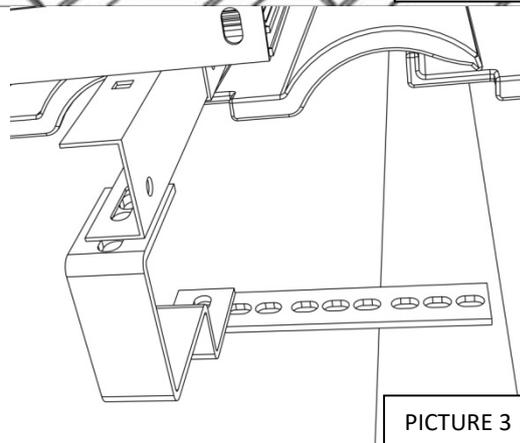
CAUTION: Check the capacity of the roof structure to bear the solar heater load in operation with the constructor of the building or contact the local authorities.



PICTURE 1



PICTURE 2



PICTURE 3

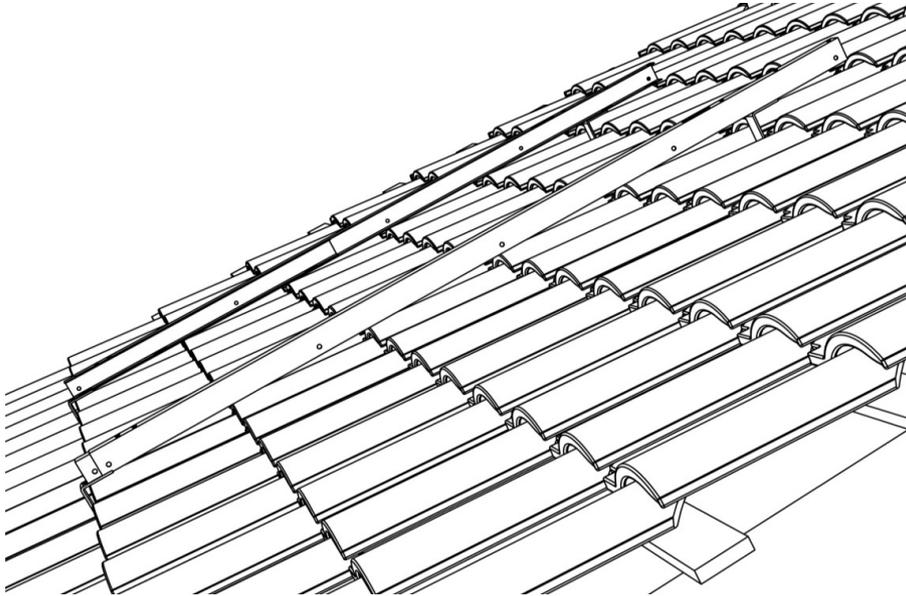
STEP 1

Uncover the roof tiles at the lowest and the highest part of the area where the system will be installed. Install the 4 AGG brackets (or the AT – triangular type or the AR – special screw, if needed) on the vertical, load bearing beams with appropriate screws, as shown on the drawing above (pic.2). Make sure that the distances A and B (pic.1) between any of the top holes on each bracket are set according to Table 1. You may take advantage of the fact that there are 3 holes on the top of each bracket to accommodate for different tile sizes. In case the AGG brackets do not coincide with the roof beams, use the additional 20 cm extension piece for AGG brackets (pic.3).

TABLE 1

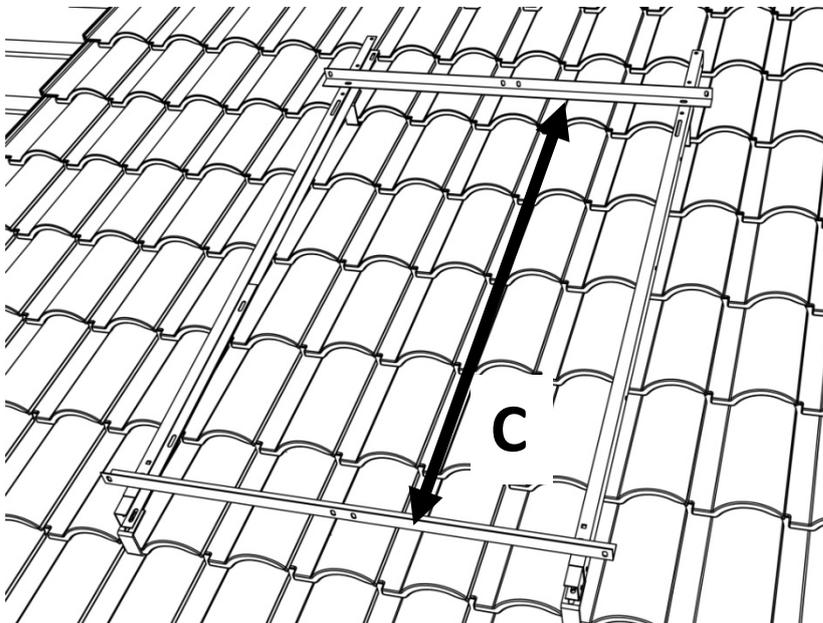
| COLLECTOR (S) | M5-210 | M5-260 | M5-260H | M5-300 | M5-300H | 2x M5-210 | 2x M5-260 |
|------------------|--------|--------|---------|--------|---------|-----------|-----------|
| DIMENSION A [MM] | 940 | 940 | 940 | 940 | 940 | 1160 | 1160 |
| DIMENSION B [MM] | 1930 | 2050 | 1700 | 2050 | 1770 | 1930 | 2050 |

Note: The dimension B may be extended up to 700 mm so that the AGG enter the finishing tiles.



STEP 2

Replace the roof tiles and install the two longitudinal base sections onto the AGG brackets. Make use of the telescopic feature of the sections to adjust them to the appropriate length.

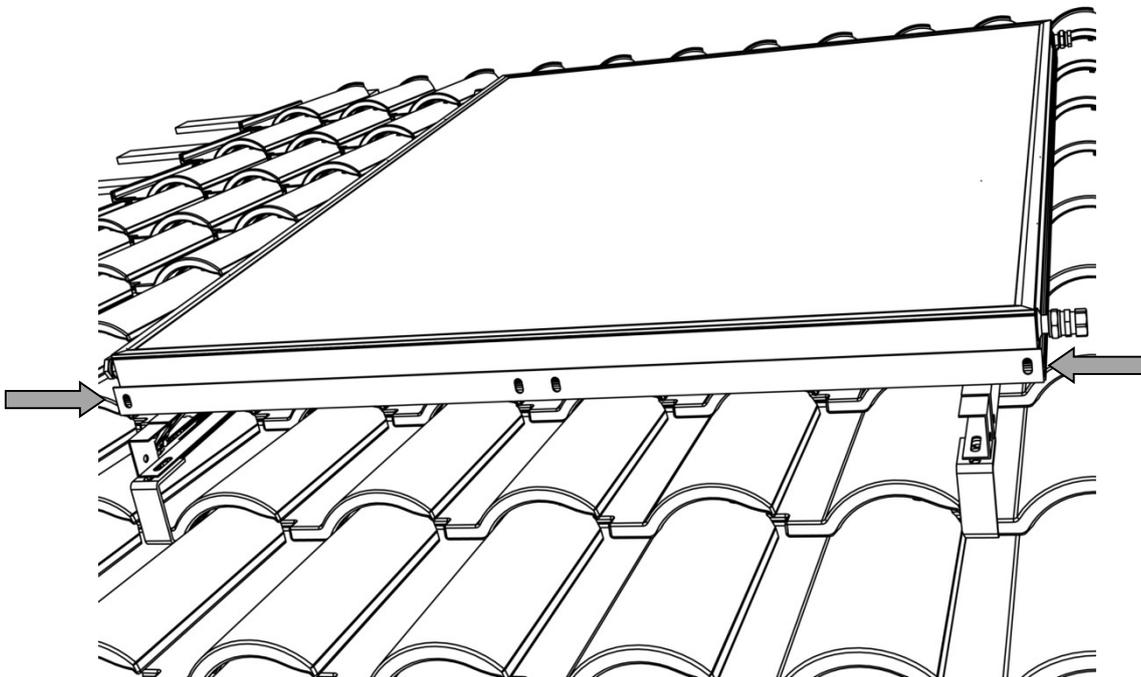


STEP 3

Install the two L beams supporting the collector. The distance C between the vertical mounting faces of two beams should be set according to Table 2 to fit the height of the collector. Secure only the bottom beam and slide the top beam upwards to ease collector installation.

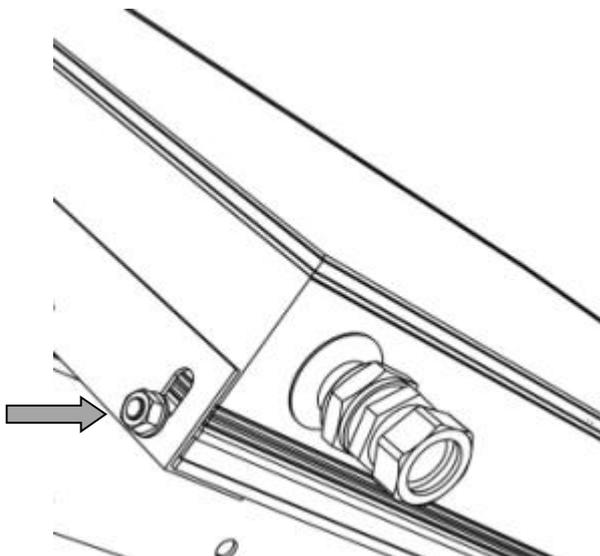
TABLE 2

| COLLECTOR (S) | M5-210 | M5-260 | M5-260H | M5-300 | M5-300H | 2x M5-210 | 2x M5-260 |
|------------------|--------|--------|---------|--------|---------|-----------|-----------|
| DIMENSION C [MM] | 1711 | 2121 | 1244 | 2011 | 1514 | 1711 | 2121 |



STEP 4

Place the collector(s) on the base assembly. Tighten the bottom securing bolts against the bottom support beam.



STEP 5

Slide the top support beam against the collector and tighten the support bolts. Tighten the support beam onto the longitudinal base sections.

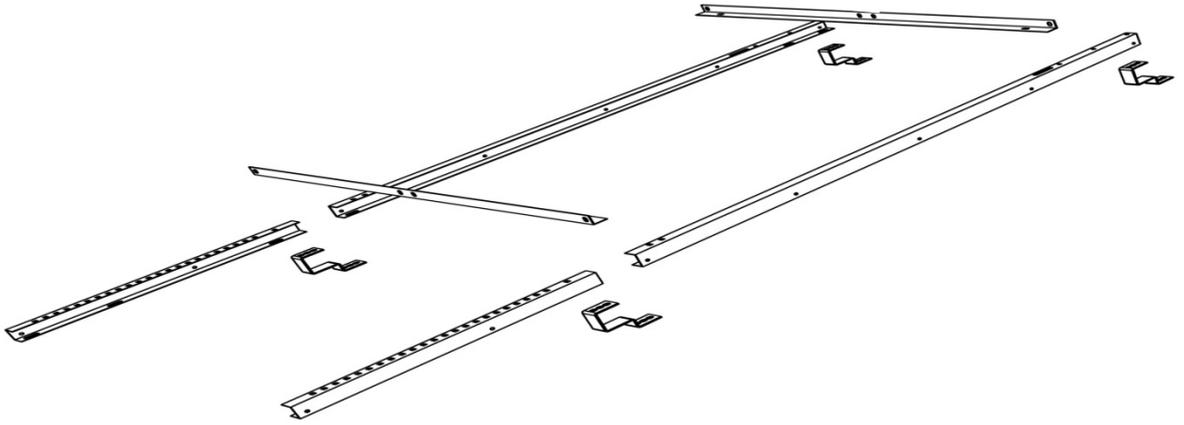


Figure 1: Components of the inclined roof base system.

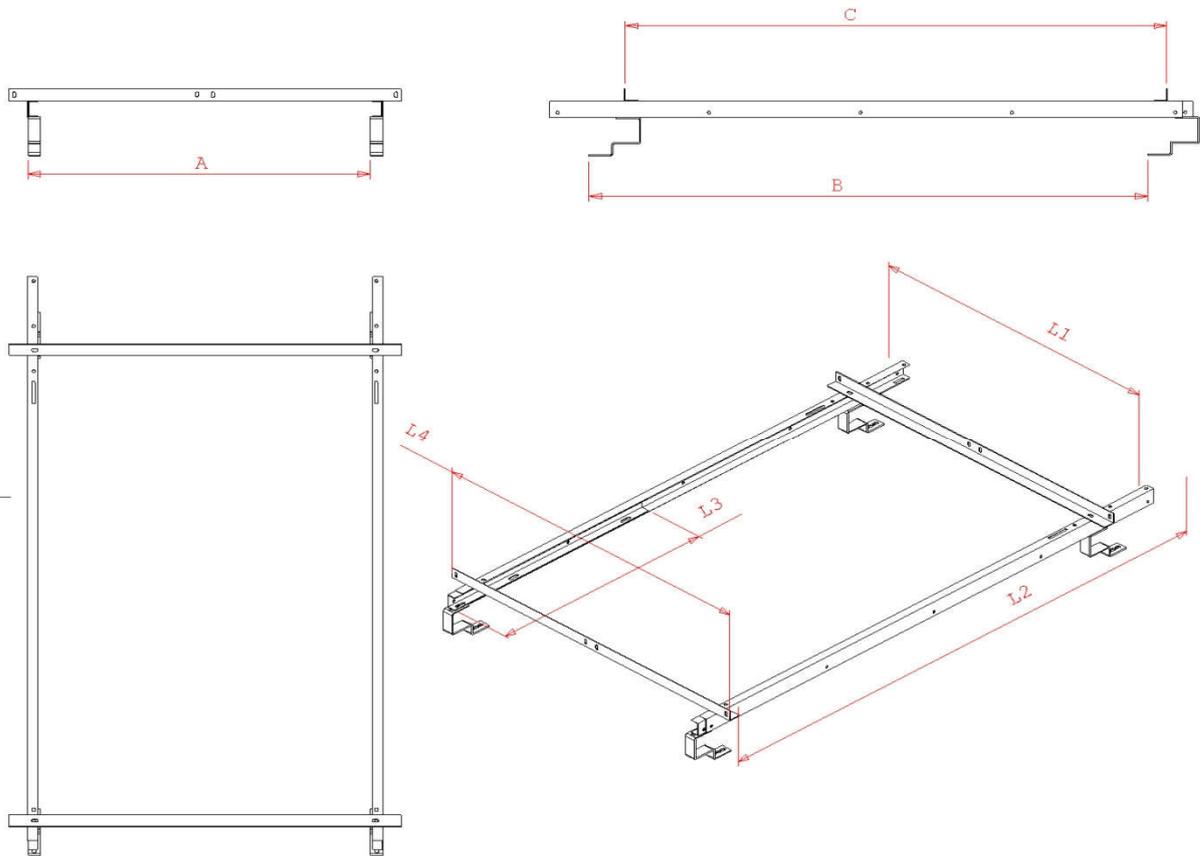


Figure 2: Installation and base system dimensions.

| COLLECTOR (S) | M5-210 | M5-260 | M5-260H | M5-300 | M5-300H | 2x M5-210 | 2x M5-260 |
|------------------|--------|--------|---------|--------|---------|-----------|-----------|
| DIMENSION A [MM] | 940 | 940 | 940 | 940 | 940 | 1160 | 1160 |
| DIMENSION B [MM] | 1930 | 2050 | 1700 | 2050 | 1770 | 1930 | 2050 |
| DIMENSION C [MM] | 1711 | 2121 | 1244 | 2011 | 1514 | 1711 | 2121 |

| COLLECTOR(S) | BASE DIMENSIONS | | | |
|--------------|-----------------|------|-----|------|
| | L1 | L2 | L3 | L4 |
| M5 210 | 974 | 2000 | 866 | 1240 |
| M5 260 | 974 | 2000 | 866 | 1240 |
| M5 260H | 974 | 1720 | 866 | 1240 |
| M5 300 | 974 | 2000 | 866 | 1240 |
| M5 300H | 974 | 2000 | 866 | 1240 |
| 2 x M5 210 | 1194 | 2000 | 866 | 2000 |
| 2 x M5 260 | 1194 | 2000 | 866 | 2000 |