Code: 8TAV00005

INSTALLATION MANUAL

10 DTH V2

Forced circulation systems

Contents

Safety measures

a. General instructions

The system operator should:

- Keep this manual carefully.

- Make sure that the collectors cannot be accessed by unauthorized or unaccompanied persons (minors, non-maintenance personnel etc.).

b. Installation instructions

Installation, charging, maintenance and repairs must only be carried out by a qualified installer, in compliance with the following safety instructions:

- Comply with current legislation of each country regarding accident prevention and environmental safety.

- Install the entire solar system according to the current regulations and recognized technical practices for the installation of such equipment.

- Follow the accident prevention regulations established by professional trade associations, in particular the wearing gloves and protective goggles to avoid injury and a safety harness, which should be anchored to the lifeline, when working roofs.

- Do not carry out repairs on components that have safety functions. These must be periodically checked and, if necessary, replaced.

- Components must only be replaced using Thermics Energie original spare parts. Failure to do so will void the warranty.

- Avoid contact with high temperature components or with escaping steam as they can cause scalds or burns.

- Only remove the protective film from the collector after the solar system has been charged and put into operation. Give the film to the user so that it can be reused.

- Comply with the standards and directives regarding lightning protection and equipotential bonding, which are specific to the country of installation.

- Connect the parts that conduct electricity to the lightning protection system in accordance with the specific regulations in force in the country of installation.

- If working close to overhead power lines, adopt suitable measures to prevent both stray and induced electric currents, and to comply with safety distances.

- Incorrect installation can damage the collector and its components, so follow these instructions carefully. Use the fixing systems provided by the manufacturer and use suitable tools for installing them.

- Installation must only be carried out by qualified personnel according to the national and regional regulations in force.

- Only use the fixing systems provided for the Thermics Energie collectors and read the current regulations provided in these instructions in order to install them correctly.

- Do not pass under raised or suspended loads; falling objects can cause injury.

- Comply with the regulations in force regarding working at the specific height and cordon off and mark the area to ensure that it is clearly visible, as required by the regulations.

- Comply with the required distances from the edge of the roof when installing the collector.

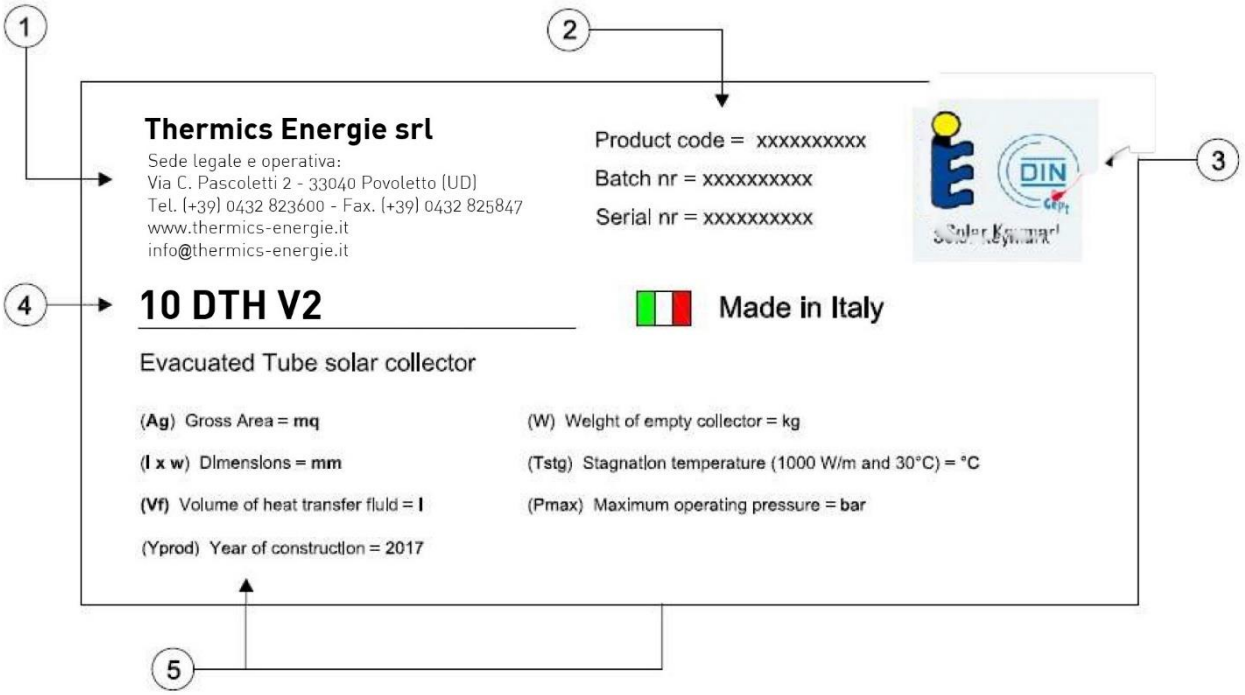
Panel description

c. Panel information

High performance sophisticated and technologically advanced evacuated tube solar collector. Equipped with a compound parabolic trough type concentrator reflector specifically designed for this product. It has the highest annual energy yields among solar collectors for hot water production.
Designed for use in large solar fields of medium/large plants, where not only the efficiency of the individual panel but also its ability to optimize the efficiency of the entire solar field are a fundamental aspect for the economics of the investment. The specific design objectives of the Thermics Energie solar collector allows the carrier fluid distribution lines to be simplified and significantly reduced and the available spaces to be optimized. The Thermics Energie solar collector is a robust, high quality product that guarantees long-lasting performance. This is achieved by the manufacturing process and the materials used, together with the numerous and stringent in-house checks carried out directly on the production lines. Some are conducted on every single component or subsystem.

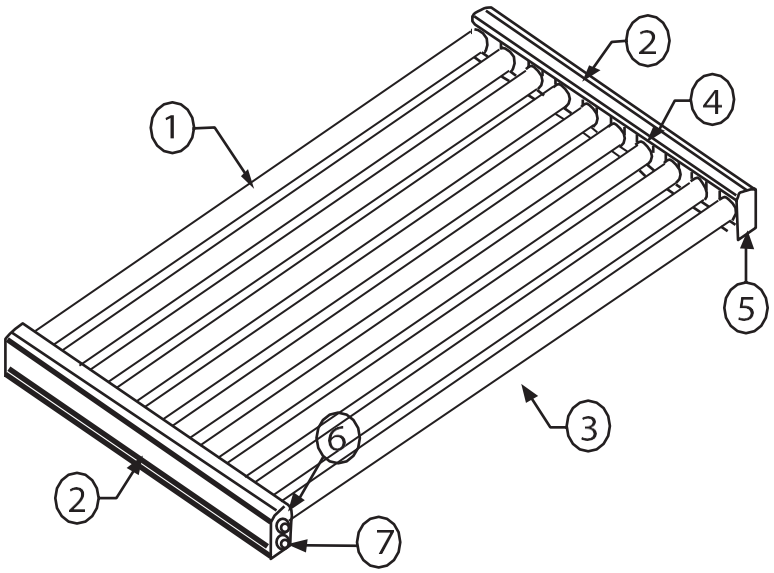
d. Description of label

The following label on the panel, located at the top right of the frame, is as follows:



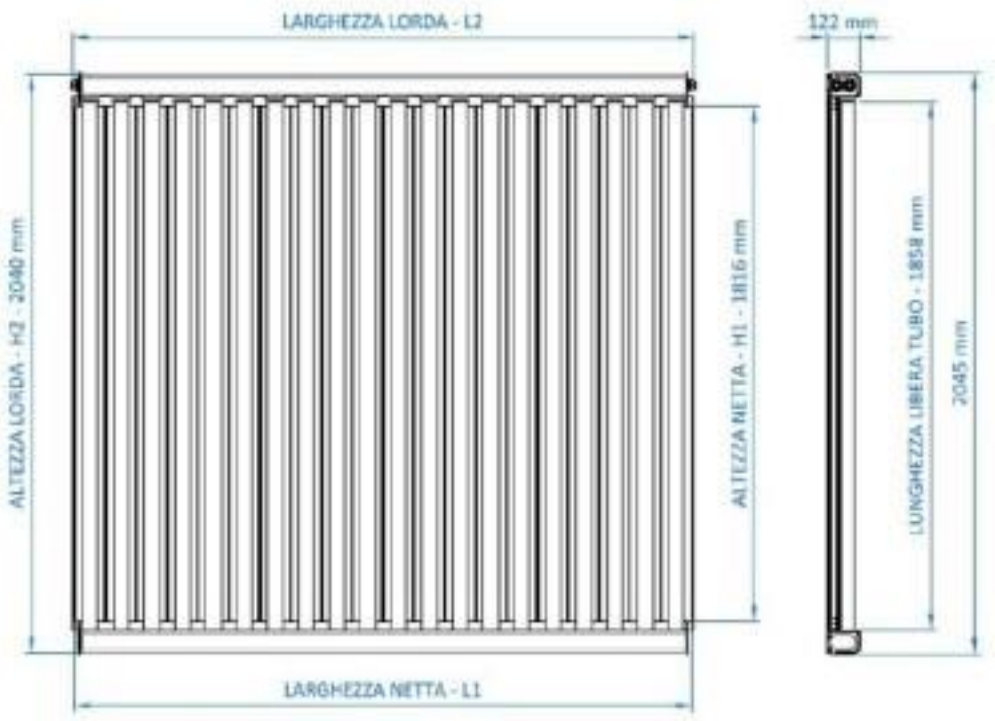
1. Manufacturer details
2. Product details
3. Solar Keymark certification label
4. Panel name
5. Technical information

e. Panel overview



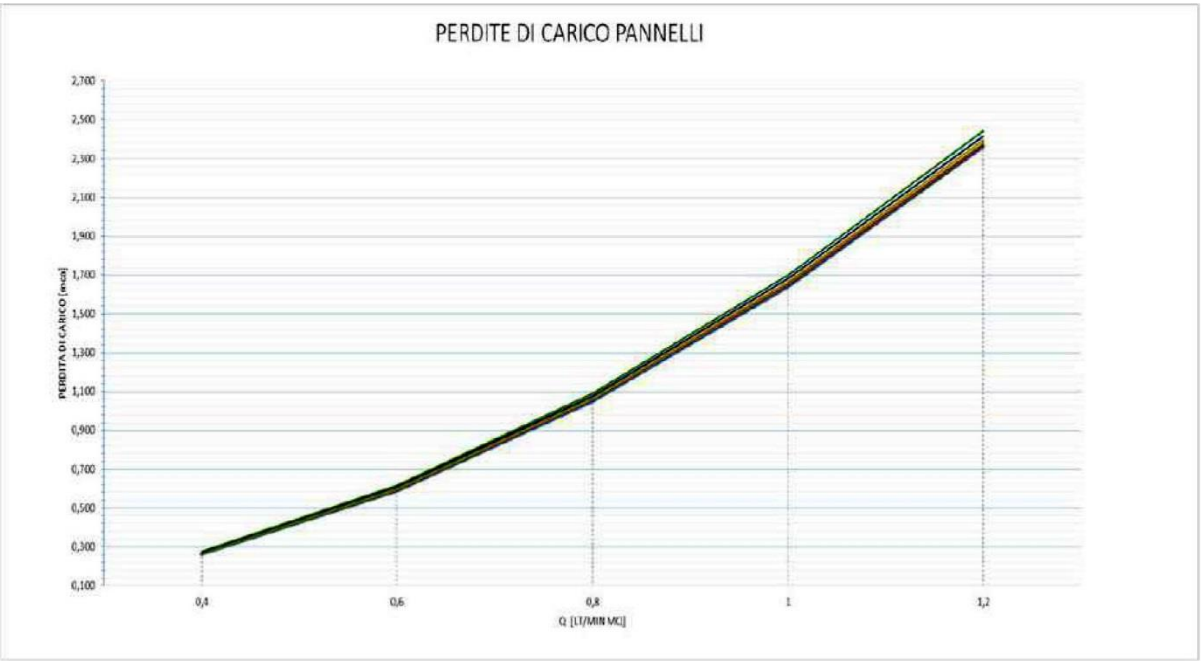
1. Evacuated tube Dn 58 mm
2. Aluminium frame cover
3. Aluminium panel frame
4. Evacuated tube seal
5. Blank end cap
6. End cap with holes
7. Water connections

f. Panel technical specifications

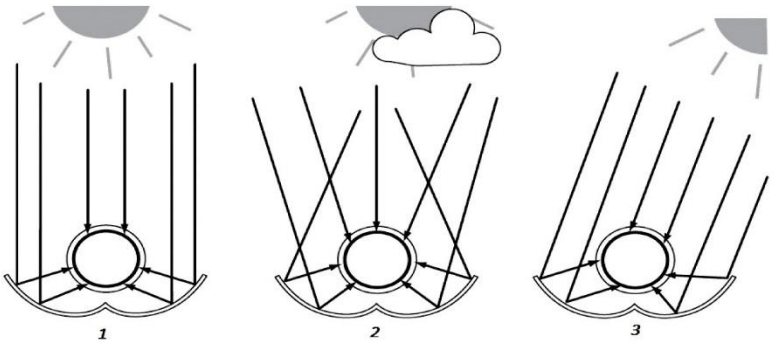


Model	10 DTH V2
N° Tubes	10
L1 net	1150mm
L2 net	1166mm
Net area	2.09 sq.m
Gross area	2.38 sq.m
Fluid volume	2.23 l
Dry weight	52 Kg
Connections	Copper Dn22

Pressure drop



Dettaglio irraggiamento sullo specchio CPC



g. Suggestions regarding sizing

Reference can be made to some general guidelines for the sizing of small Thermics Energie solar systems as a starting point for the detailed executive design that the system, designer or qualified professional technician should carry out according to current technical practices and legislation:

- *Solar collector orientation;*

Azimuth angle
Angle formed on the horizontal plane between the orientation of the panels and geographic South. If the panel faces south, the azimuth angle is 0°; if it faces east or west it is 90°.

Orientamento ottimale = 0° Sud

Maximum recommended orientation = 30° south / east - 30° south / west. If the orientation of the roof pitch is greater than 30° with respect to the south, you can also consider installing it on a double EAST-WEST pitch.

It is very important to make sure that there are no obstructions on the horizon line that could affect the irradiation of the collector during the transit of the sun. Any obstructions should be reported as this information affects the sizing of the solar collectors and can reduce their yield.

Note It is recommended that you follow the orientation indicated in this manual. Any other orientation will not guarantee the optimal performance of the panels installed. Please contact the Thermics Energie technical department if you require suggestions.

- *Conditions of use and period of use*

Conditions	Southern Italy	Central Italy	Northern Italy
Water produced (45°C) per square metre of solar surface installed	*110 - 120 L*	*90 - 100 L*	*80 - 90 L*
Surface of integrated LT heating systems for each square metre of solar surface installed	*20 - 25 sq.m*	*15 - 20 sq.m*	*10 - 15 sq.m*
Ratio of solar surface to pool area for summer use only	*40 % - 45 %*	*30 % - 35 %*	*25 % - 30 %*

Note For preliminary DHW sizing, the total requirements of the family have to be considered, assuming a water consumption (45°C) of between 45 and 70 l/day per person. Also ascertain and check the simultaneous use of the DHW and the period of use.

- *Main components of the solar system:*

Solar antifreeze

Sum the following to calculate the approximate amount of antifreeze needed by the solar system.

Fluid volume of the panel installed	Capacity of the solar circuit expansion vessel	The amount of antifreeze contained in each metre of tubing (copper)	The amount of antifreeze contained in each metre of tubing (stainless steel)	The amount of antifreeze for each boiler installed
10 DTH V2- 2.23 l	*1/3*	*DN 18 = 0.20 litres*	*DN 16 = 0.29 litres*	*6 litres from 200 to 300 L*

Solar circuit expansion vessel

To calculate the approximate volume of the expansion vessel, consider 8 litres per square metre of solar surface installed. The specific calculation of the vessel should be carried out by the system designer or contact Thermics Energie technicians.

Solar filed reference flow rate

The nominal flow rate of Thermics Energie panels is established by considering a value from 0.6 to 0.85 l/min per sq.m. The circulation unit also has to be selected and sized accordingly, considering the area of the solar surface installed, the pressure drops of the solar field and the circuit (local and distributed).

Quick guide to selecting tubing for Thermics Energie solar systems with a maximum delivery and return distance from the boiler of 15 metres

Capacity	Total solar surface sq.m	Flow rate	N° collectors	Recommended tubing
200L	2.38 sq.m	170 l/h	1	Copper 18 mm
300L	4.76 sq.m	228 l/h	2	Copper 18 mm
500L	7.14 sq.m	340 l/h	3	Copper 18 mm
800L	11.90 sq.m	569 l/h	5	Copper 22 mm
1000L	14.28 sq.m	681 l/h	6	Copper 22 mm
1500L	21.42 sq.m	1022 l/h	9	Copper 22 mm
2000L	28.56 sq.m	1363 l/h	12	Copper 28 mm

Note For complex systems with particular dimensions and characteristics, specific calculations have to be made in order to determine the appropriate diameters.

Panel installation

h. Notes regarding installation

We recommend that you follow the installation and safety instructions indicated below in order to avoid damage to the system, people and property.

- The additional weight of the collectors, the people involved in the installation and the load impose by wind and snow on the roof. Before installation, you should check, together with the designer, what the maximum load of the system is and carry out an on-site inspection to assess the usability, accessibility, freedom of movement and quality of the building support for anchoring the collector support devices. The same assessment procedures should be carried out for a wall installation.

- We recommended that you check, during the preliminary phase, the loading due to wind and snow according to the position of the installation, its location, height from the ground, exposure and the climatic conditions of the area etc. according to the provisions of the Decree of the Ministry of Infrastructure and Transport of 14 September 2005 “Technical standards for constructions” and subsequent decrees. A maximum sustainable load of 0.90 kN/m² perpendicular to the surface of the collector should be taken into account in the calculations for evaluating the load stress from single and combined loads due to wind and snow. The solar collector has been designed to withstand the most severe combined wind and snow conditions that are characteristic of Italy, as required by the reference standard. However, if load situations that exceed the maximum load of the panel are expected, it is recommended that you provide additional protection, such as tie rods, reinforcements and additional ballasts, to be decided on site.

- The maximum angle of inclination is 90°.

- Use safety harnesses, scaffolding and ladders to prevent falls and objects connected to them.

- Make sure that the materials supplied are complete and do not show any signs of damage.

- The solar collectors must not be exposed to the sun's rays until they have been charged, otherwise the guarantee will be voided. Only remove the protective film included in the factory packaging from them after the solar system has been charged and tested, within a maximum of four weeks. For longer times, it is recommended that you cover the collectors with a suitable sheet.

- Avoid shade and orient the collector as much as possible towards the south.

- The solar field connection pipes must be made of copper or stainless steel. Do not use other materials such as galvanized steel, multilayer etc. when using copper or stainless steel pipes.

- It is recommended to use quick couplings for stainless steel and screw-on or weld-on fittings for copper pipes. The use of other materials may affect the tightness of the joints or connections over time. It is always recommended to use Teflon for high temperatures on the solar circuit when making connections to the boiler.

- There should always be a certified safety valve in the solar circuit. All Thermics Energie solar stations and modules are fitted with a certified safety valve.
  Also install a metal drain at the outlet of the safety valve in a special brass container as per regulations.

- Make sure that the thermal insulation of all the solar circuit pipes and all the fittings can withstand high temperatures of up to 150°C.

- The heat transfer fluid supplied is specific for solar collectors and is ready for use. It guarantees protection down to -12°C. Contains corrosion inhibitors and must not be mixed with other fluids or diluted with water, it must only be topped up with Thermics Energie antifreeze.

- Always install high temperature manual bleed valves at the highest points of the solar circuit to be able to bleed the entire circuit.

- After installing the products, make sure that the pre-charge pressure of the vessel complies with that of the project. Make sure that the probes are correctly connected to the control unit. Make sure that the control unit is correctly connected to the power circuit and that the parameter settings comply with those indicated during the selection and design phase.

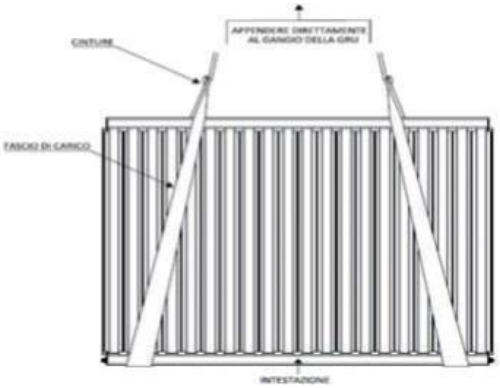
i. Transport and handling

In addition to the usual standard precautions to take when handling items and products containing fragile components, you should also bear in mind the following:

- Use the factory packaging for transport and handling, which includes wooden pallets that can be handled by a forklift truck.

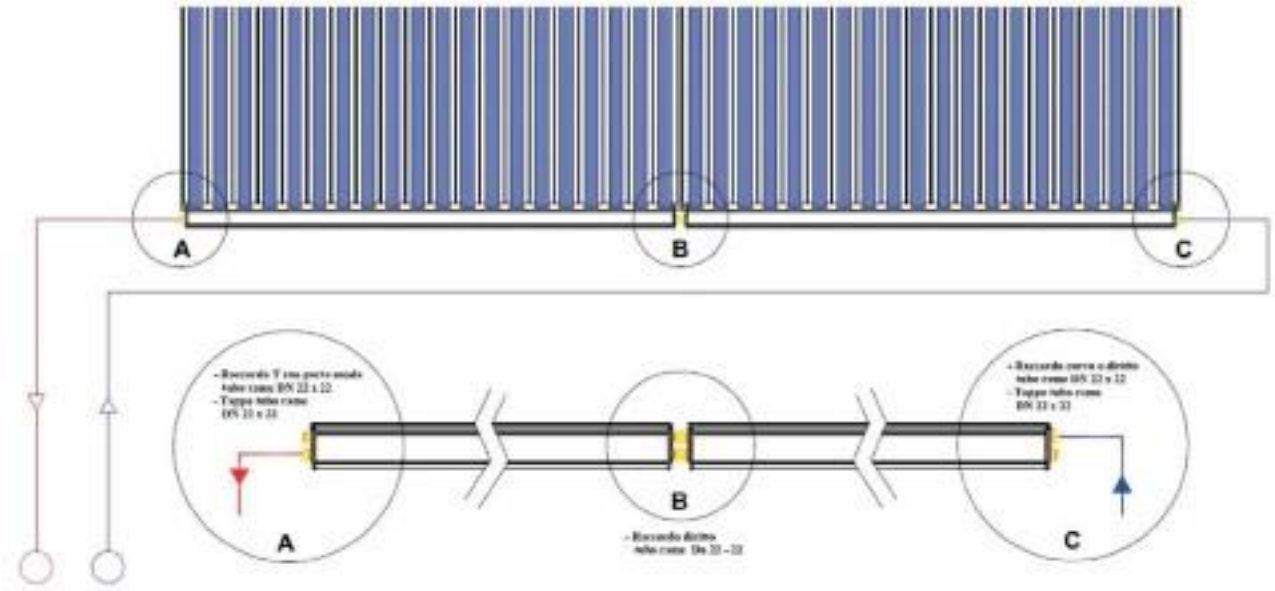
- For lifting to upper floors or onto the roof by crane, use fabric slings. Connect them directly to the pallet (recommended lifting method). If a single panel has to be lifted, always do so by using the straps with the head with the connections facing downwards (see figure). Alternatively, you can slide the screws (at least 2) into the guide at the bottom of the head (under the panel) to which you can secure hooking systems (such as eyebolts for example.

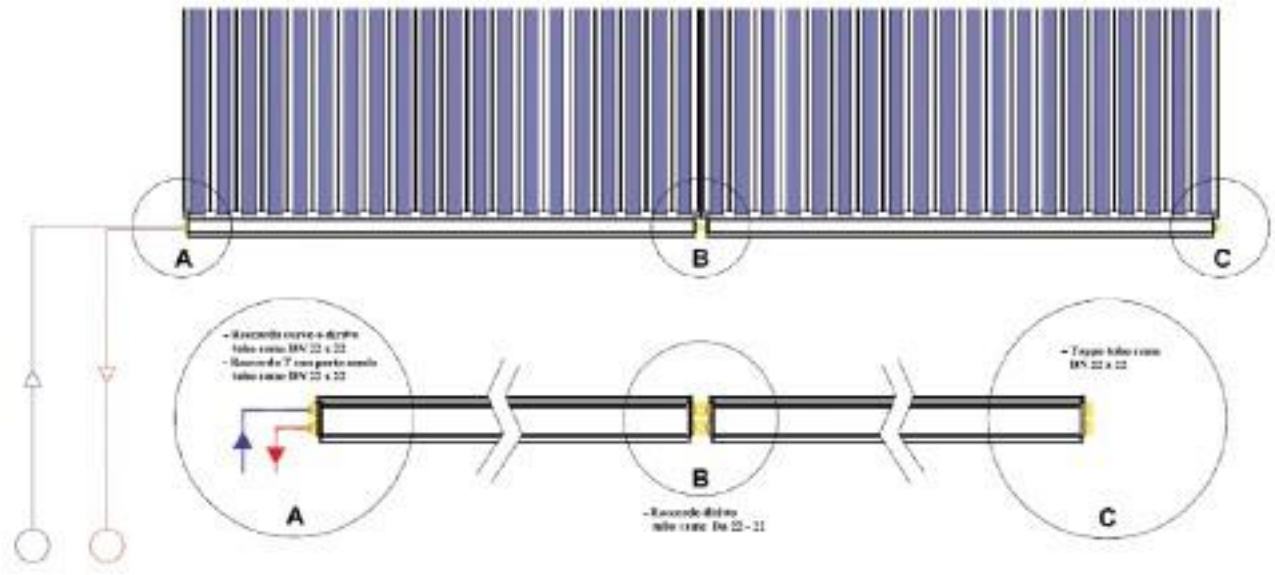
- Pay attention to movements caused by wind.



j. Choice of hydraulic connection and examples

Thermics Energie panels can be connected in series in a battery having a total surface area up to 35 sq.m. The hydraulic inlet and outlet connections to the panel can be installed one on one side and one on the other, either on the right or left, or both on the same side, either right or left.

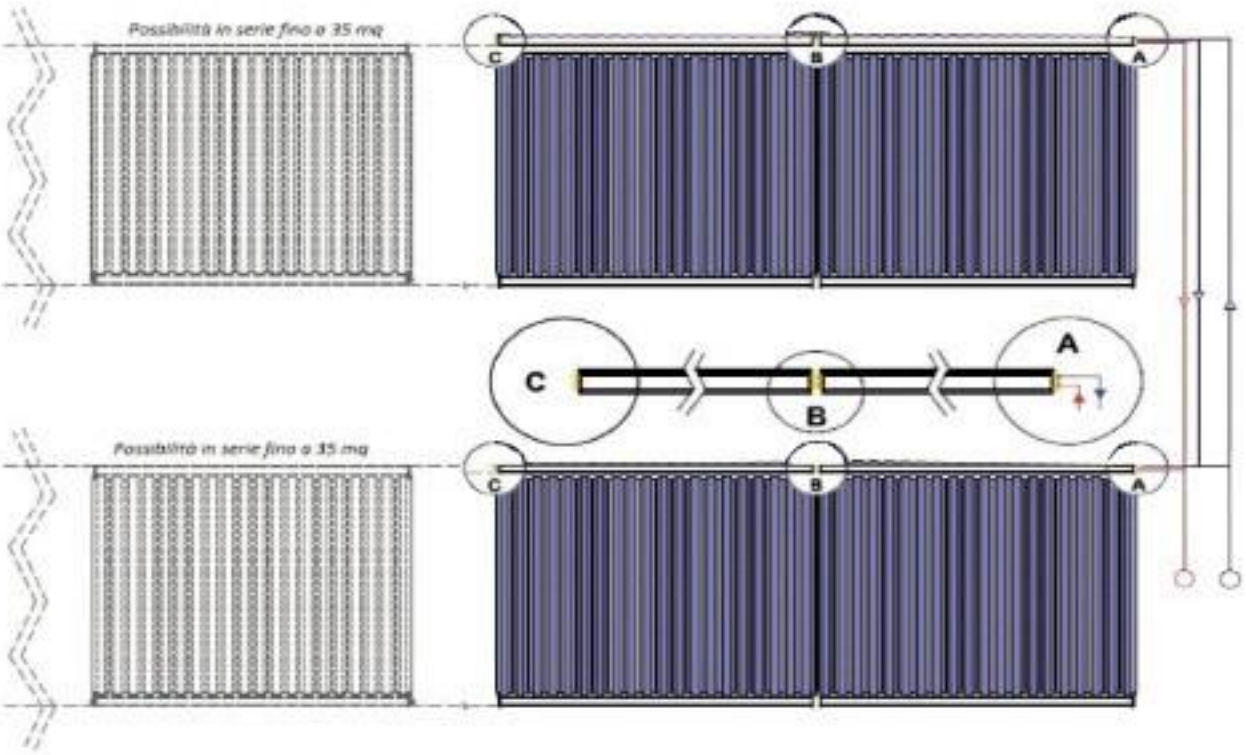




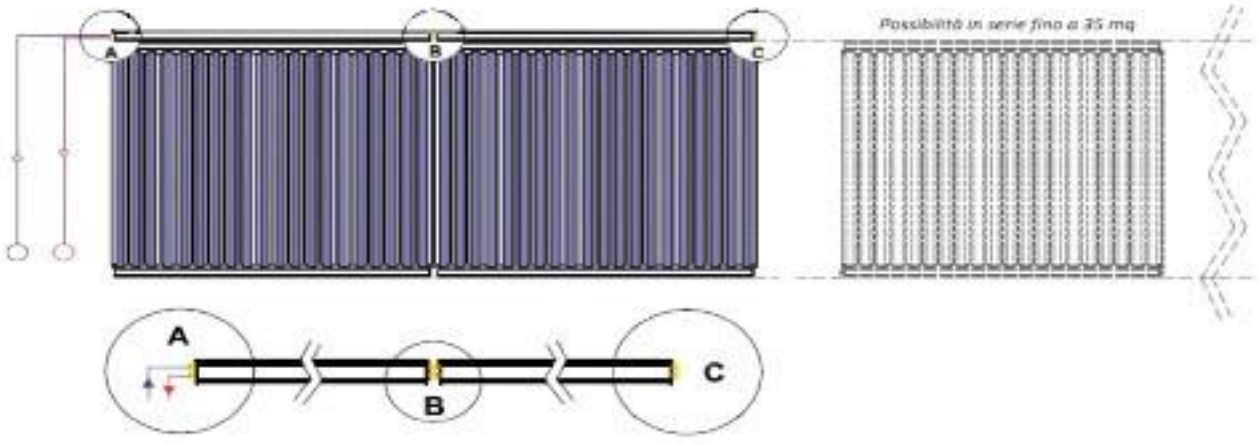
The following connection possibilities are available for 10 DTH V2 panels:

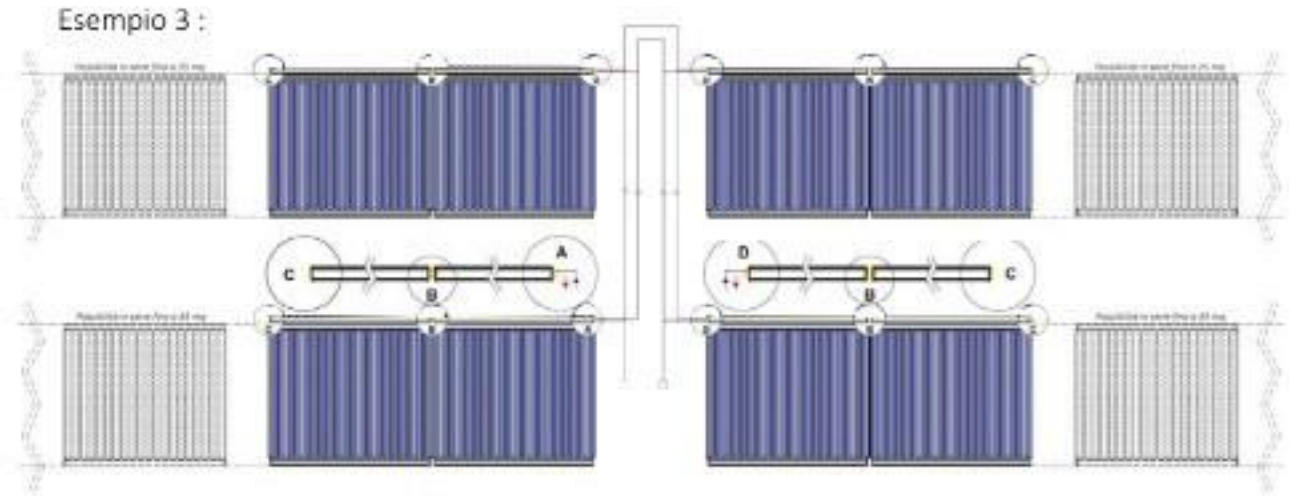
- *Conditions of use and period of use*

Esempio 1 :



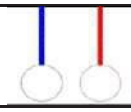
Esempio 2 :





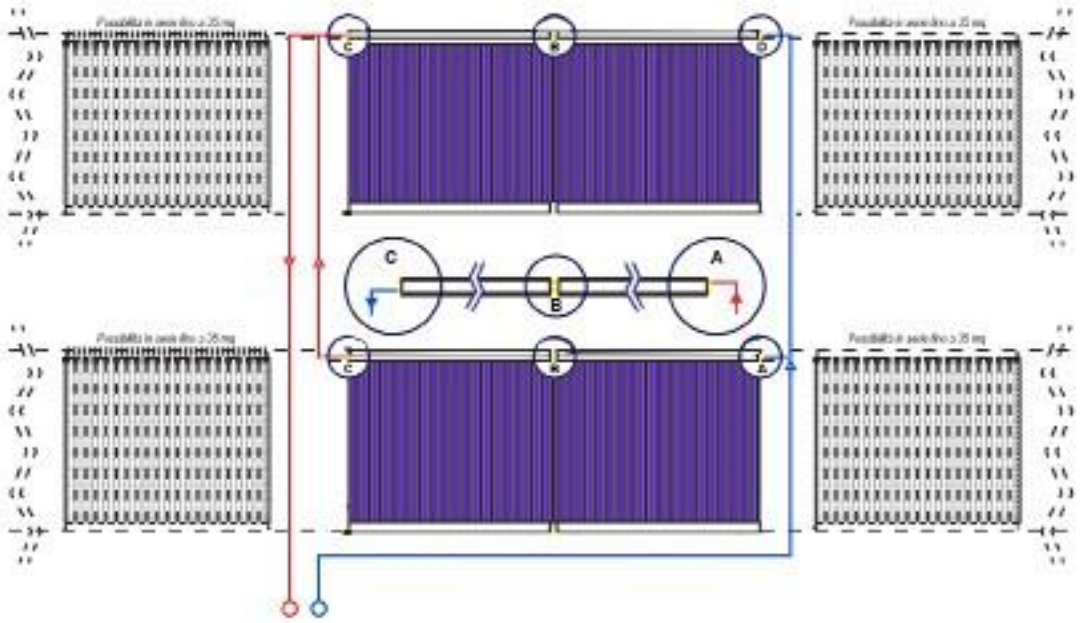
Note For collectors in rows of batteries it is recommended to keep a distance of at least 1500 mm between one battery and another for flat roof installations and at least 300 mm for pitched roof installations. However, it is essential that sufficient space is provided to allow operator access the space between one battery and another.

Key to details and connection examples

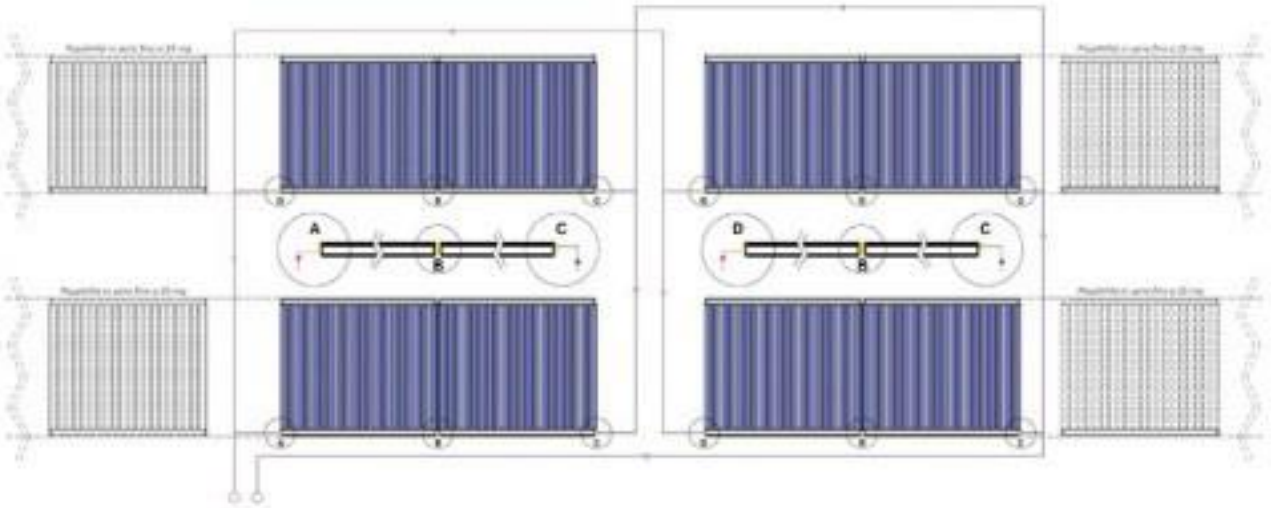
Detail	Description
A	*Curved or straight compression fitting for copper pipe Dn22 Compression T fitting with thermowell for copper pipe Dn22*
B	*Straight compression fitting for copper pipe Dn22*
C	*Caps for copper pipe Dn22*
D	*Curved or straight compression fitting for copper pipe Dn22*
	*Delivery and return from boiler*

- *Series of collectors connected with Tichelman reverse-return system*

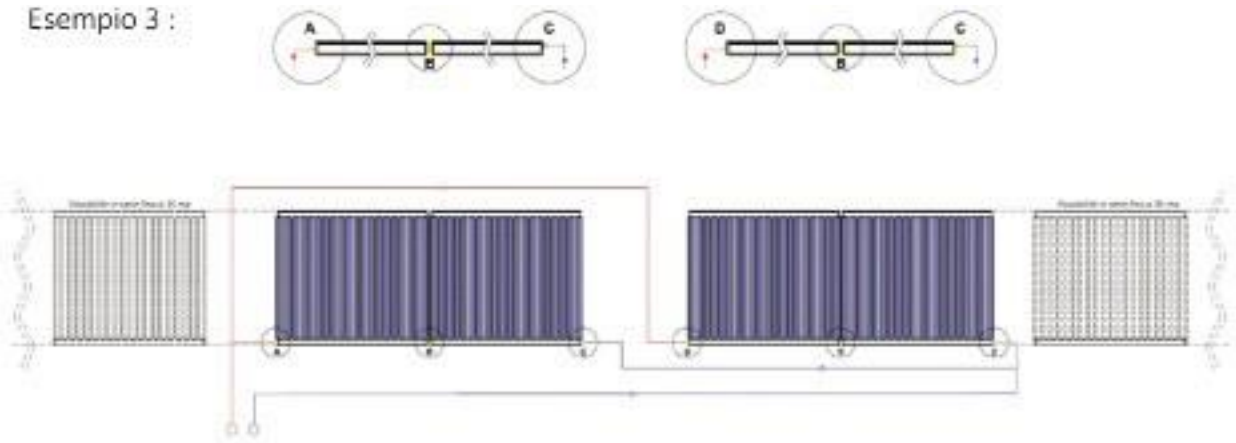
Esempio 1 :



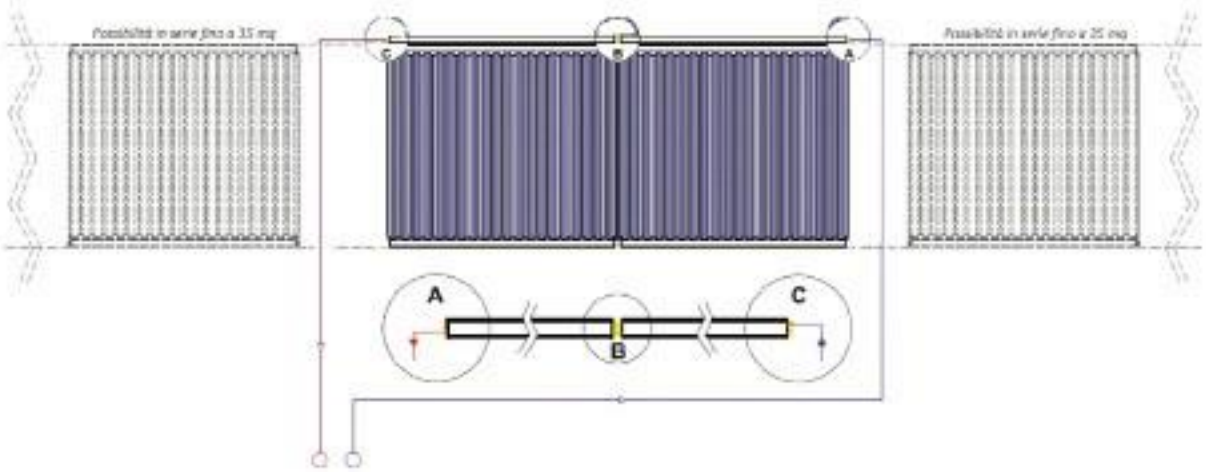
Esempio 2 :



Esempio 3 :



Esempio 4 :



Key to details and connection examples

Detail	Description
A	*Compression T fitting with thermowell for copper pipe Dn22* *Cap for copper pipe Dn22*
B	*Straight copper - copper pipe fitting Dn 22 x 22*
C	*Curved or straight compression fitting for copper pipe Dn22* *Cap for copper pipe Dn22*
D	*Curved or straight compression fitting for copper pipe Dn22* *Cap for copper pipe Dn22*

Detail	Description
A	*Quick coupling 4-way fitting with stainless steel - copper probe thermowell Dn 16 x 22*
B	*Straight copper - copper pipe fitting Dn 22 x 22*
C	*Quick coupling for copper - stainless steel pipe Dn 22 x 22*
D	*Quick coupling for copper - stainless steel pipe Dn 22 x 22*

**the diameter of the "stainless steel" fittings varies according to the pipe*

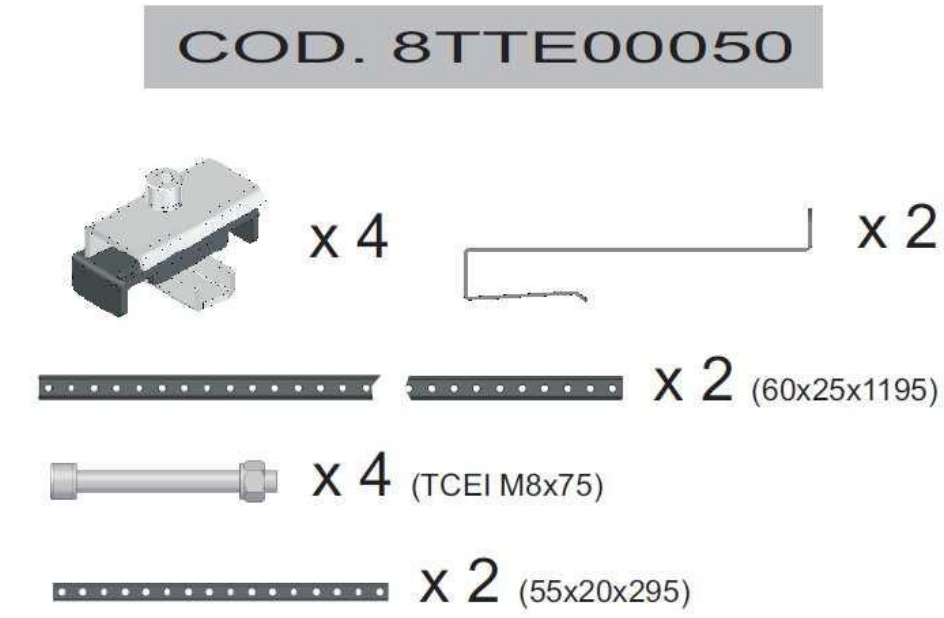
k. Installation methods

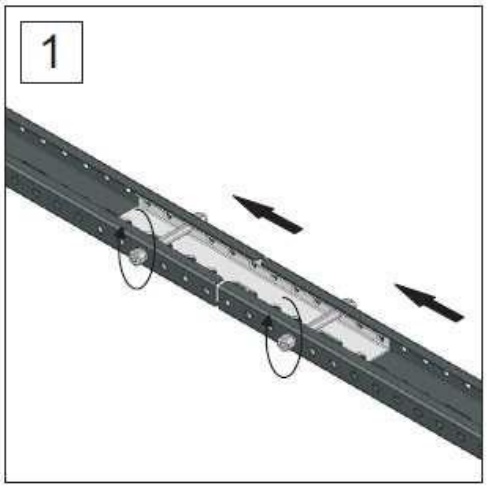
The DTH-CPC collectors can be installed in different ways according to the anchoring surface available:

- pitched roof and long screws or brackets
- pitched roof and trestle
- flat roof and trestle
- façade

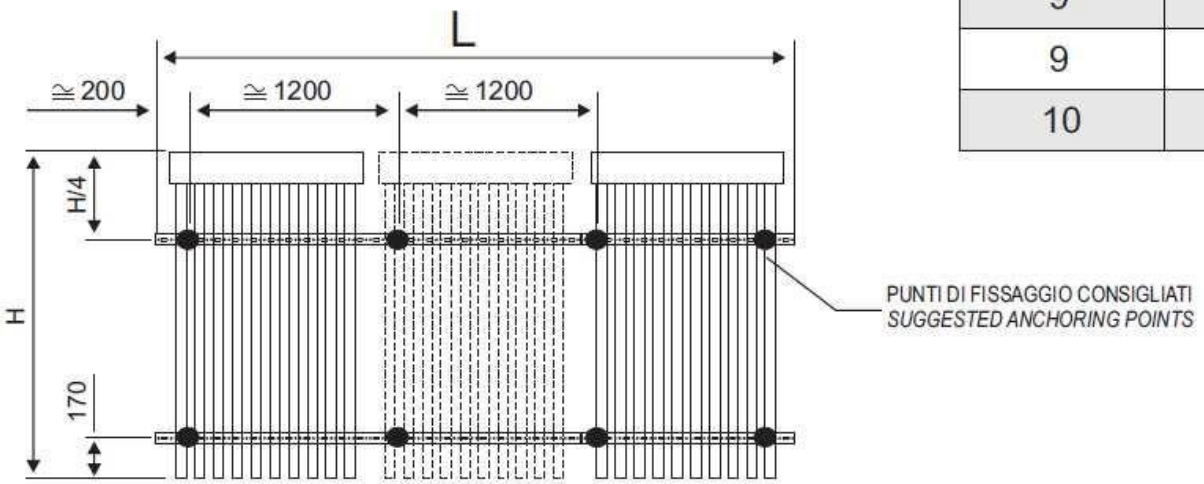
l. Standard support (composition)

In order for the Thermics Energie panels to be installed correctly, please follow the instructions below for positioning the brackets on a sloping roof.



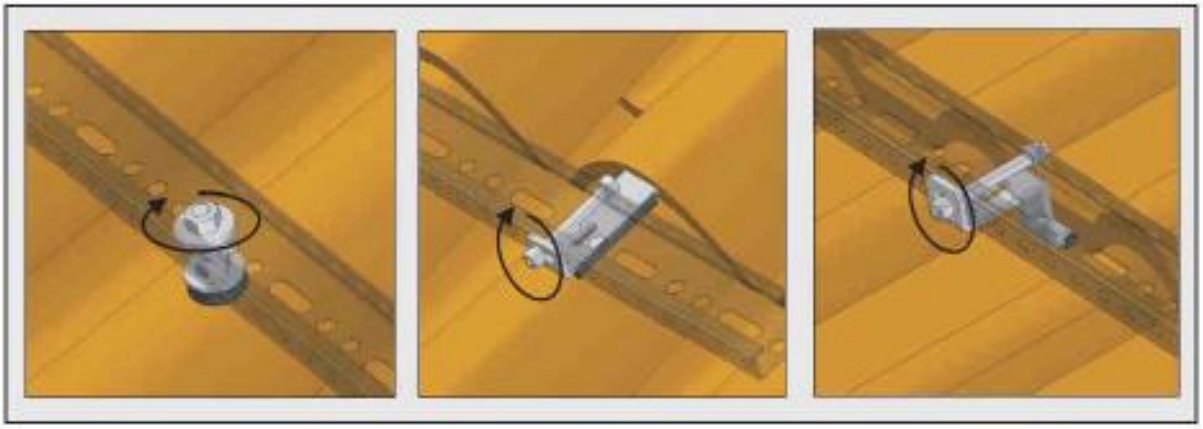


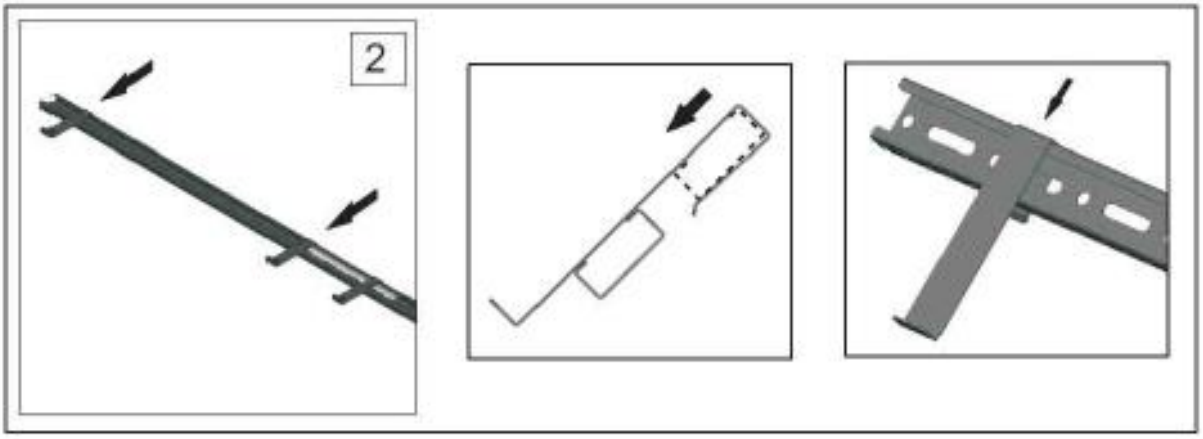
N° collettori	L(mm)=
1	1195
2	2395
3	3595
4	4795
5	5995
6	7195
7	8395
9	9595
9	10795
10	11995



● = PUNTI DI FISSAGGIO CONSIGLIATI
SUGGESTED ANCHORING POINTS

Il carico consentito per il tetto e i punti di fissaggio devono essere controllati sul posto da un esperto di staticaconsiderando le norme vigenti in loco.
Maximum roof load and anchoring points must be verified on site, by an engineer according to local regulations

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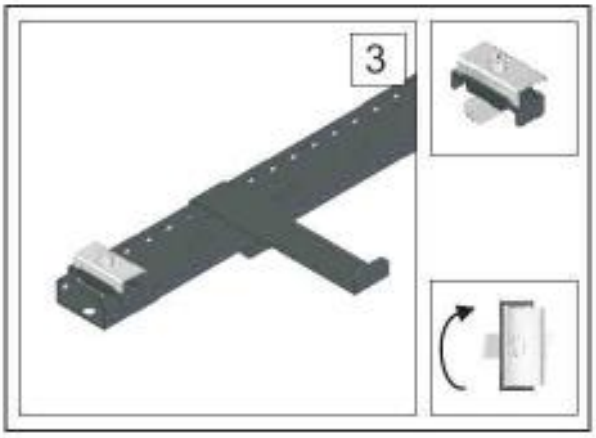
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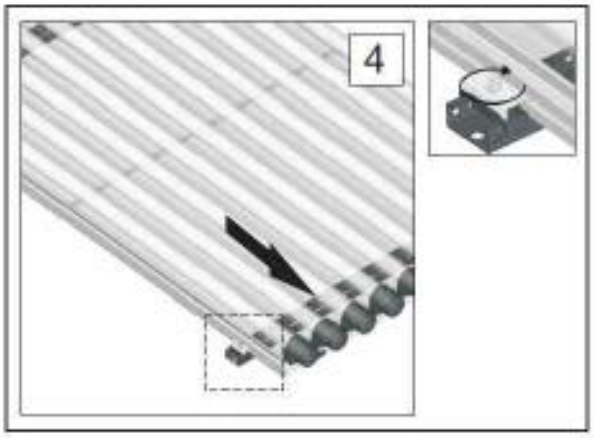
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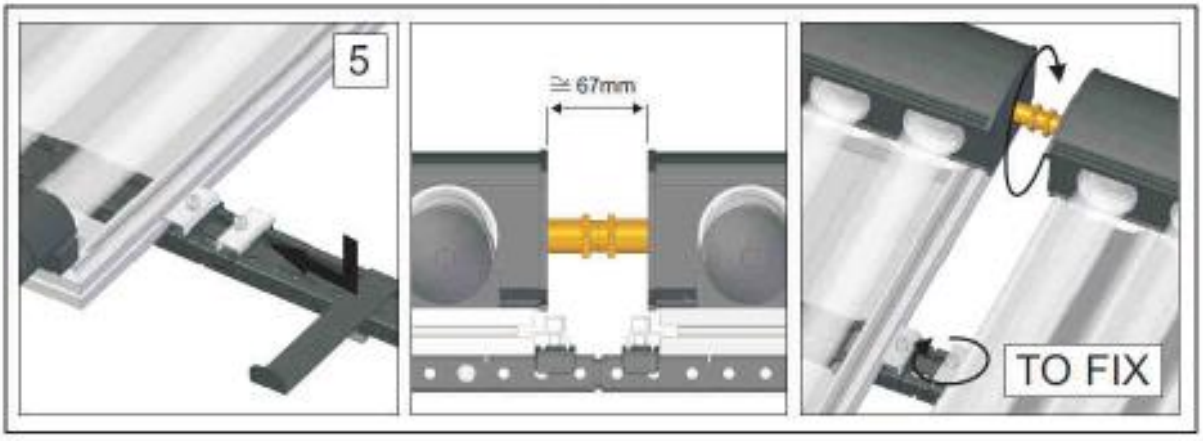
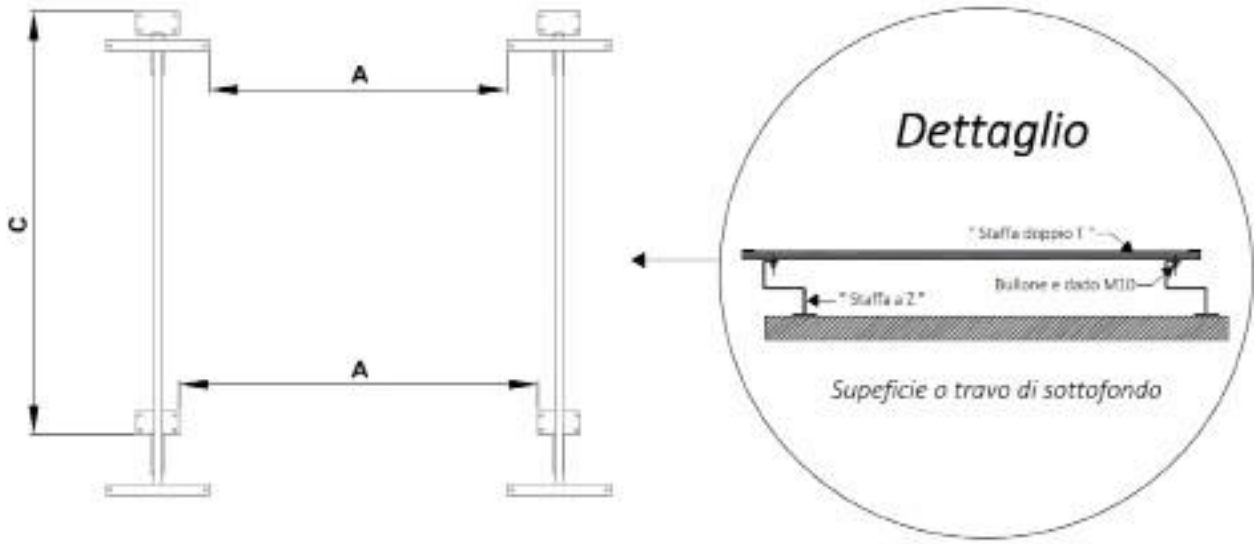

5
≅ 67mm
TO FIX

- *Distance between panels*

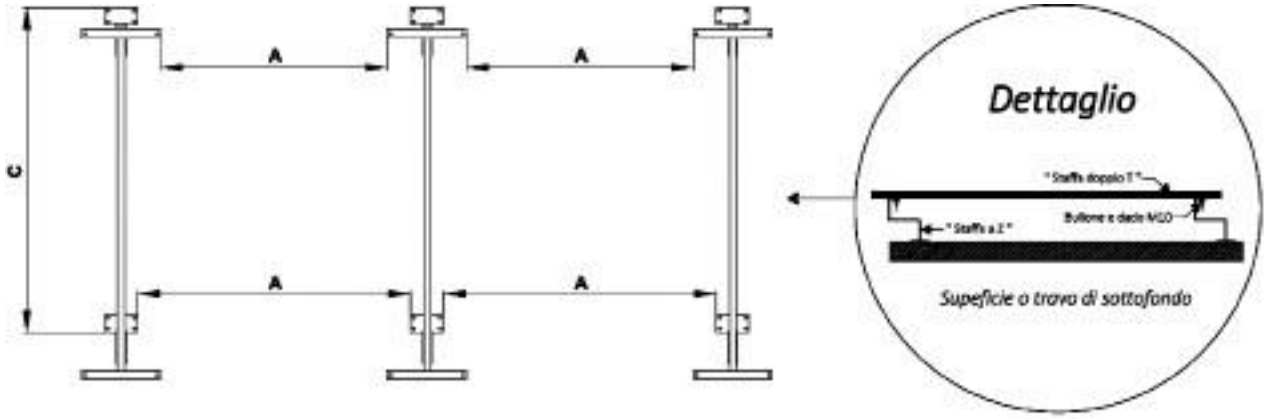
Below are examples of installations with one or more panels in series mounted on pitched roof brackets: Installation of one 10 DTH V2 collector



Panel	A max (mm)	C max (mm)
10 DTH V2	*640*	*1600*

Note The slot at the bottom of the *"Double T bracket"* allows the value of C to be varied according to the anchoring requirements of the substrate. The installation of a single collector requires 2 kits per collector installed.

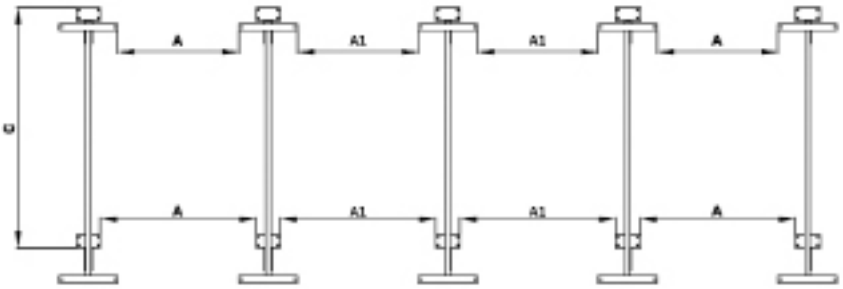
Installation of two 10 DTH V2 collectors in series.

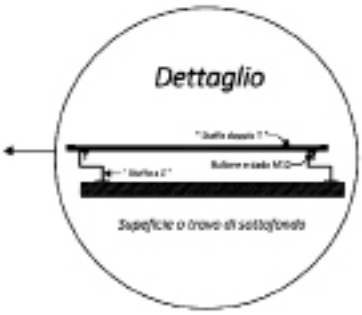


Panel	A max (mm)	C max (mm)
10 DTH V2	*820*	*1600*

Note The slot at the bottom of the *"Double T bracket"* allows the value of C to be varied according to the anchoring requirements of the substrate. The installation of two collectors in series requires *1 bracket kit per n° collectors in series +1.*

Installation of three or more 10 DTH V2 collectors in series

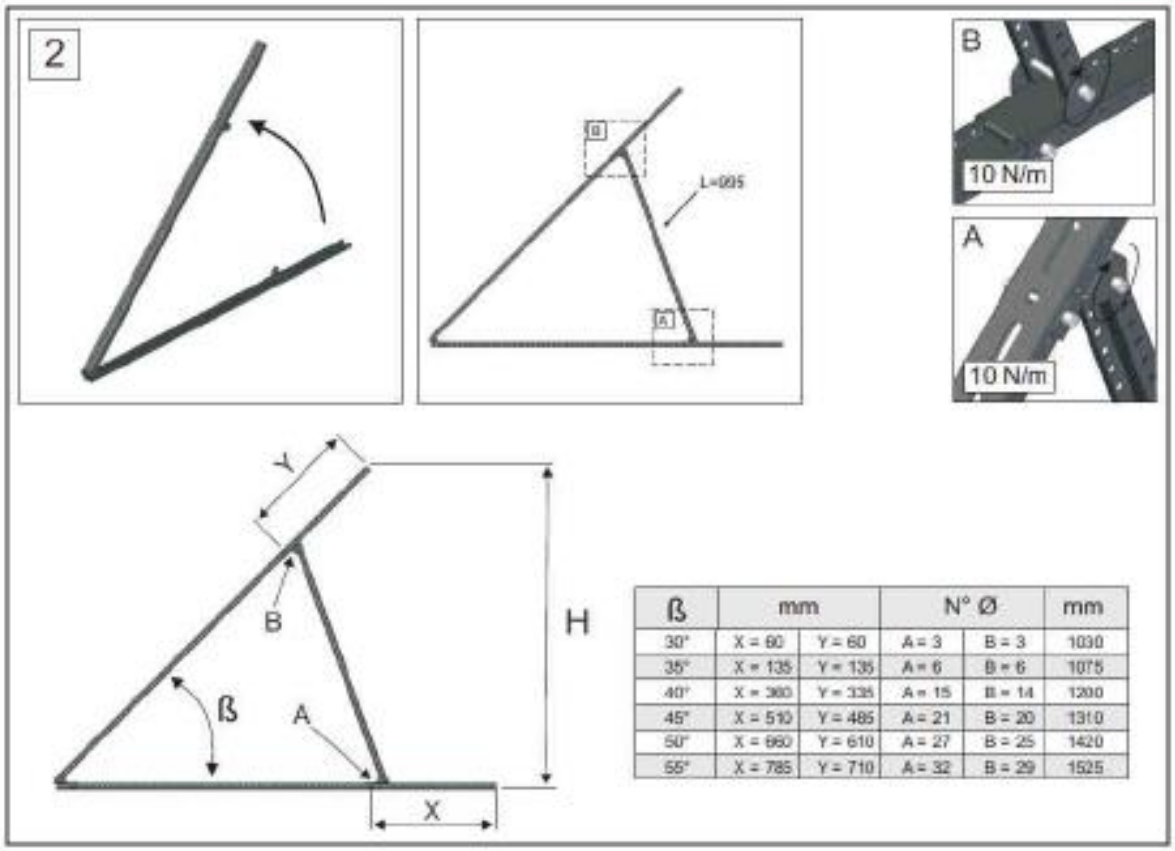




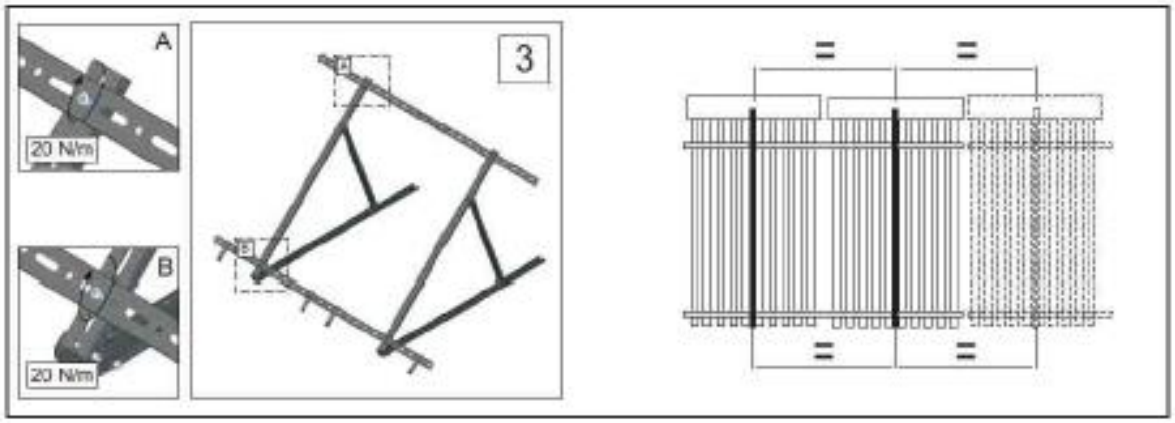
Panel	A max (mm)	A1 max (mm)	C max (mm)
10 DTH V2	*820*	*1024*	*1600*

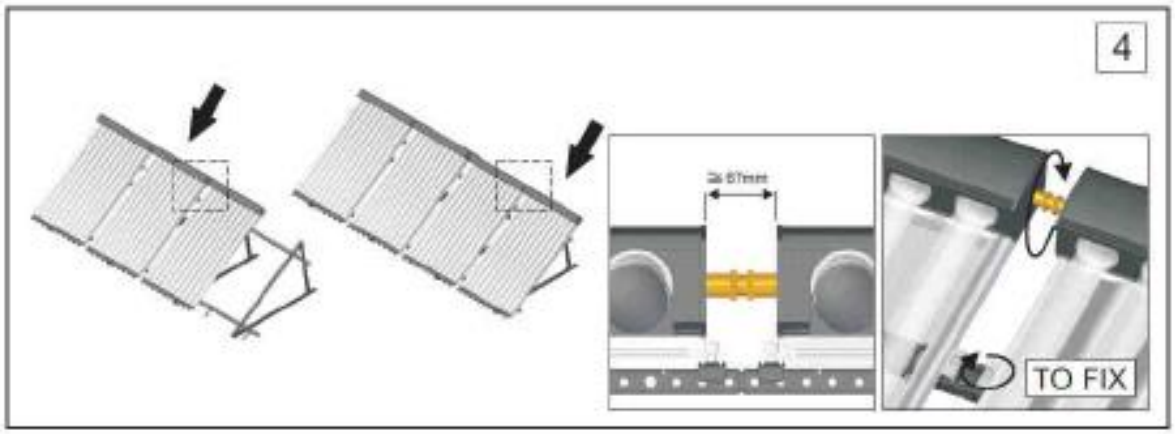
Note The slot at the bottom of the *"Double T bracket"* allows the value of C to be varied according to the anchoring requirements of the substrate. The installation of three or more collectors in series requires *2 bracket kits per n° collectors in series +1.*

m. Flat roof installation with trestle



ß	mm		N° Ø		mm
30°	X = 60	Y = 60	A = 3	B = 3	1030
35°	X = 135	Y = 135	A = 6	B = 6	1075
40°	X = 360	Y = 335	A = 15	B = 14	1200
45°	X = 510	Y = 485	A = 21	B = 20	1310
50°	X = 660	Y = 610	A = 27	B = 25	1420
55°	X = 785	Y = 710	A = 32	B = 29	1525

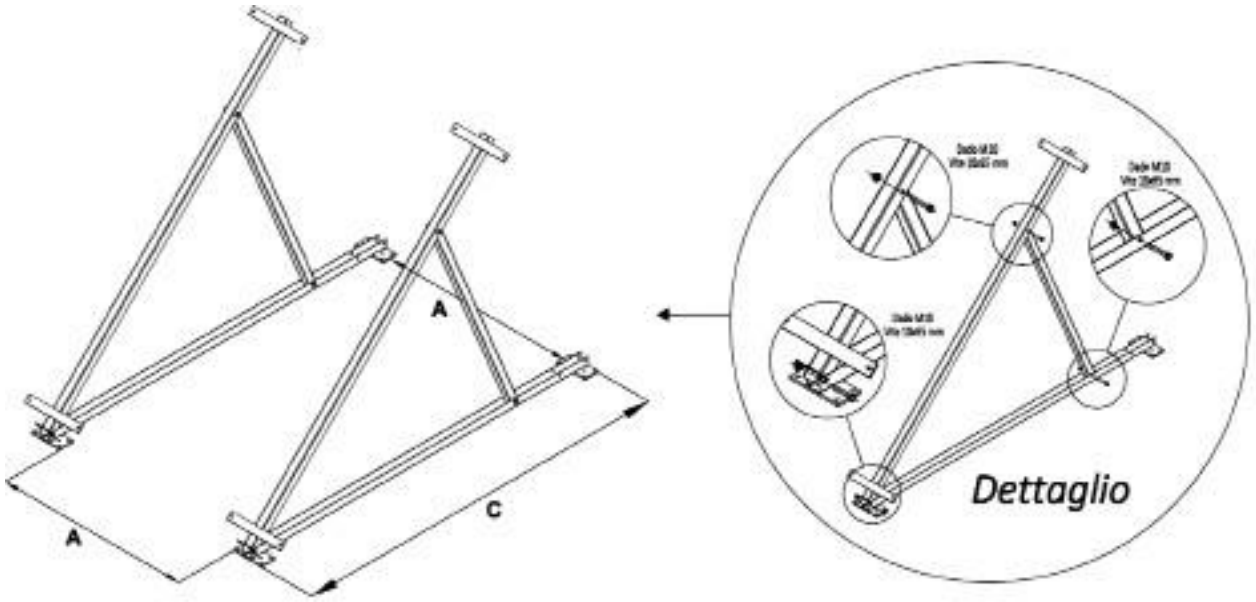




- *Distances between panels:*

Examples of installations with a panel on flat roof brackets are shown below:

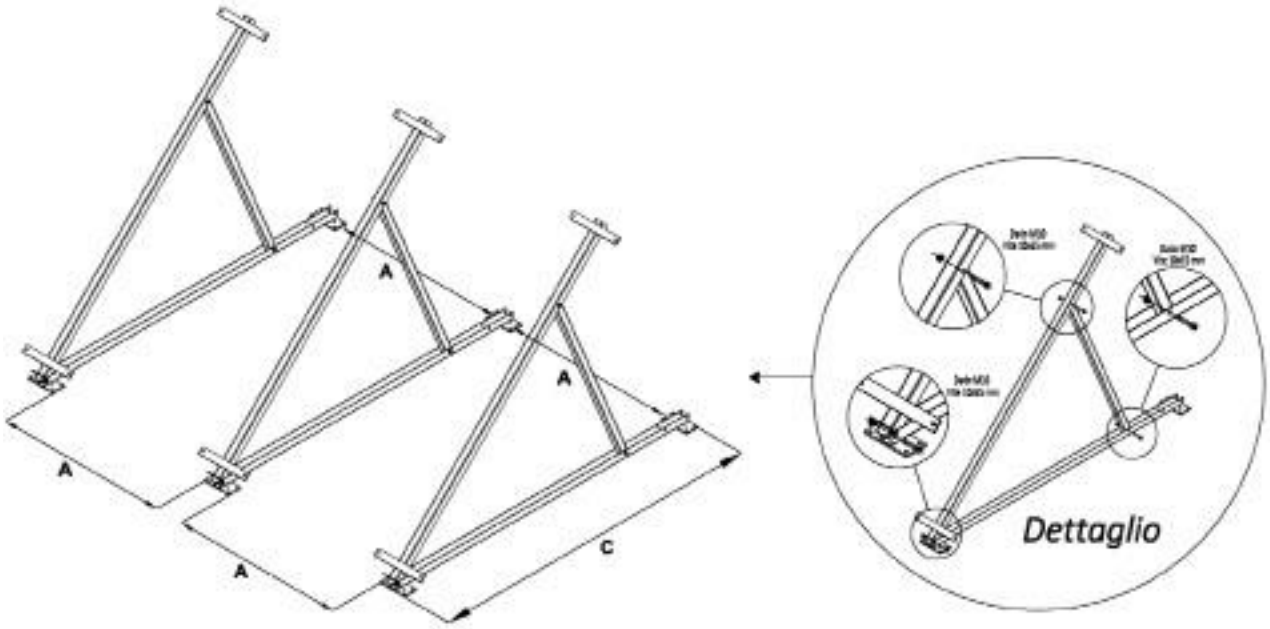
Installation of one 10 DTH V2 collector



Panel	*A max (mm)*	*C max (mm)*
10 DTH V2	*640*	*2020*

Note As explained above, you should select the angle required before installing the kits. The installation of a single collector requires 2 kits per collector installed.

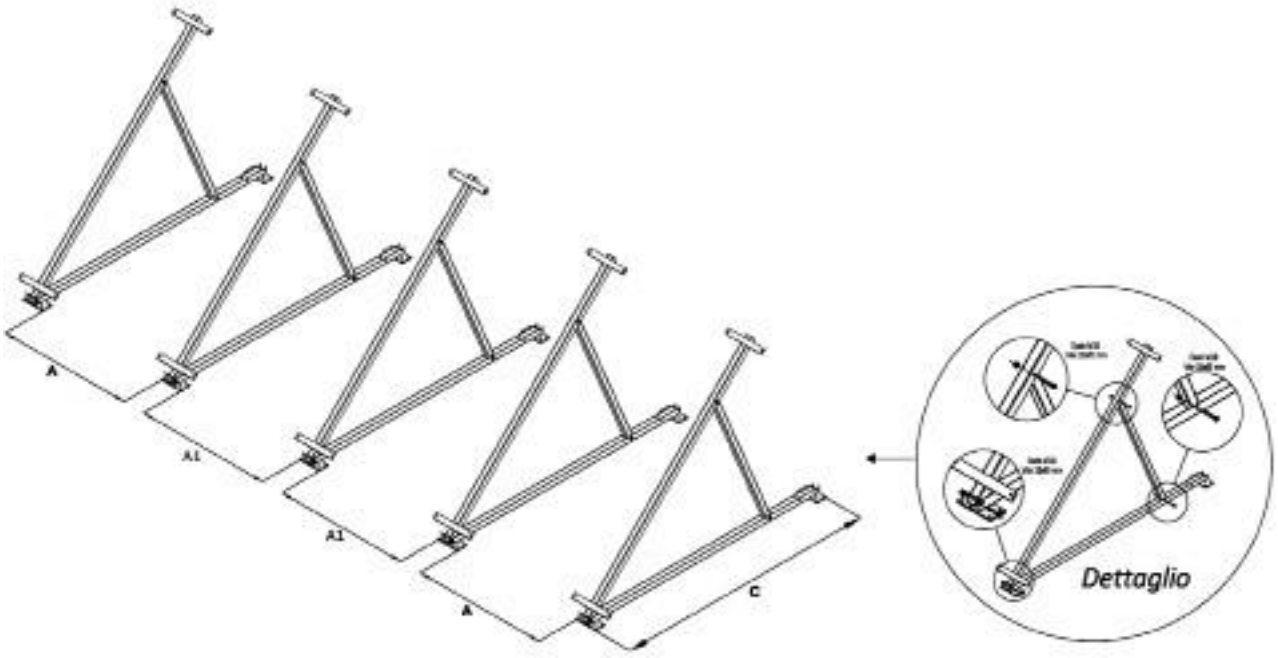
Installation of two 10 DTH V2 collectors in series.



Panel	A max (mm)	C max (mm)
10 DTH V2	*820*	*2020*

Note As explained above, you should select the angle required before installing the kits. The installation of two collectors in series requires 1 bracket kit per n° collectors in series +1.

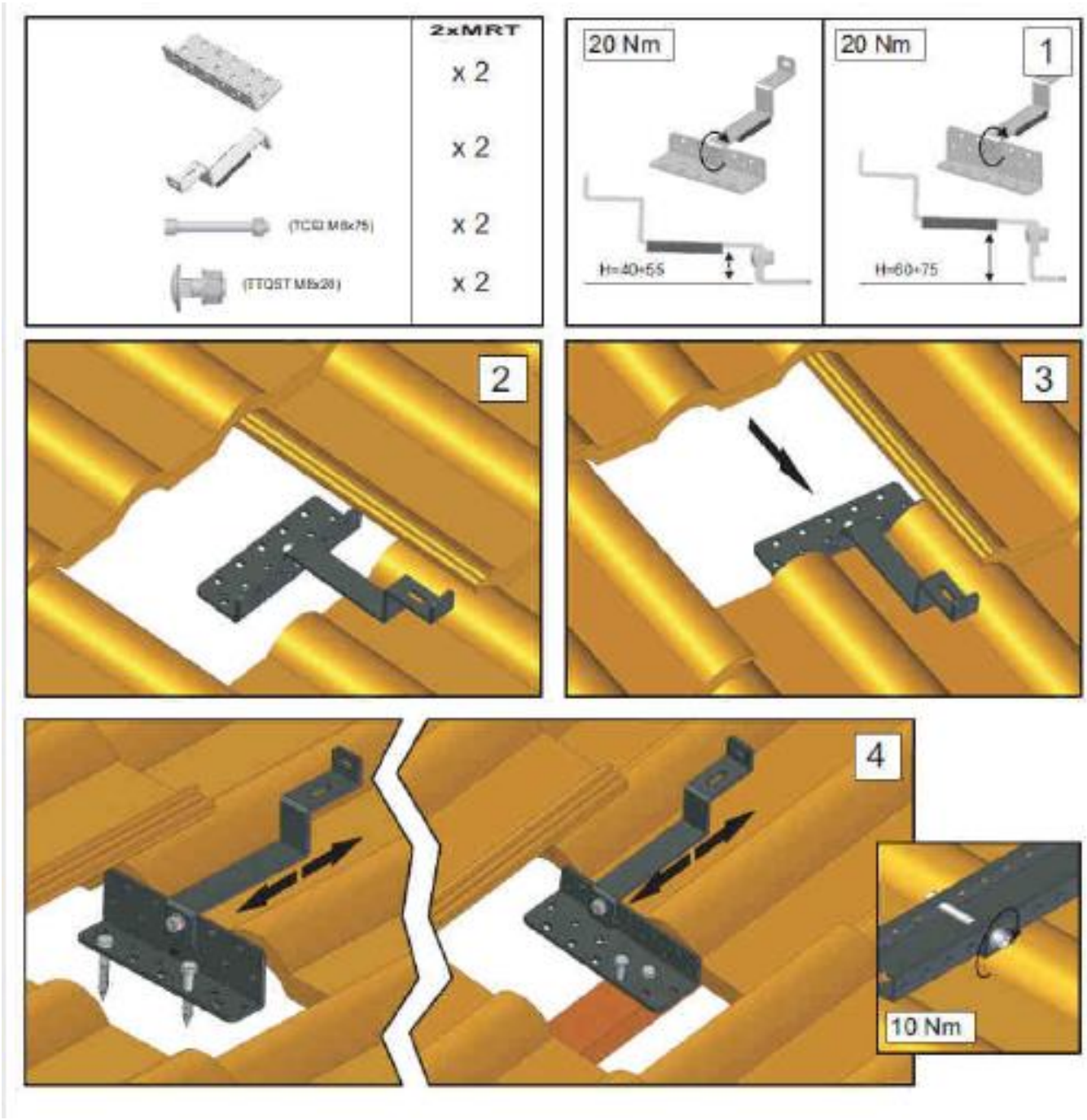
Installation of three or more 10 DTH V2 collectors in series



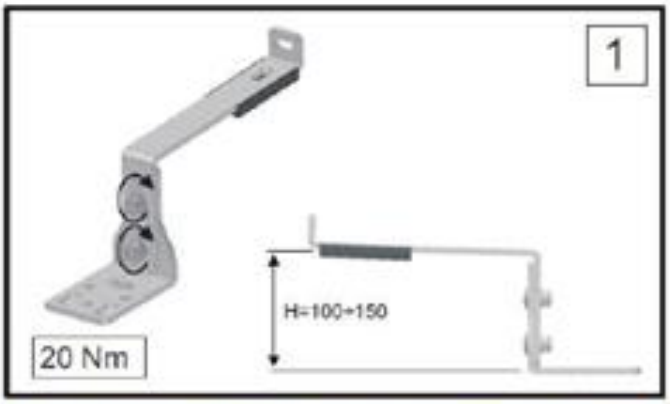
Panel	A max (mm)	A1 max (mm)	C max (mm)
10 DTH V2	*820*	*1024*	*2020*

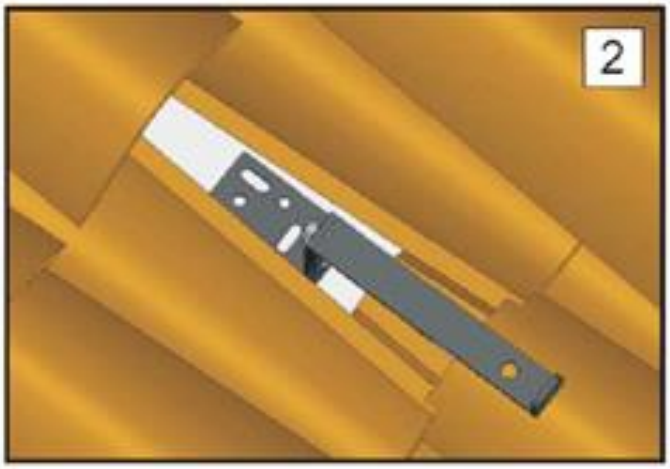
Note As explained above, you should select the angle required before installing the kits. The installation of three or more collectors in series requires 1 bracket kit per n° collectors in series +1.

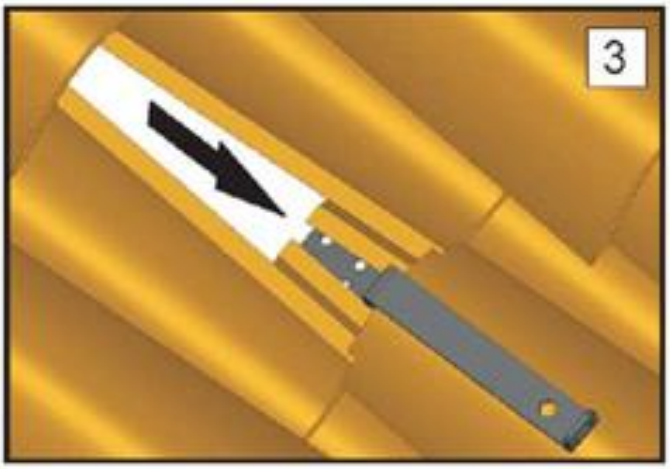
n. Installation with brackets

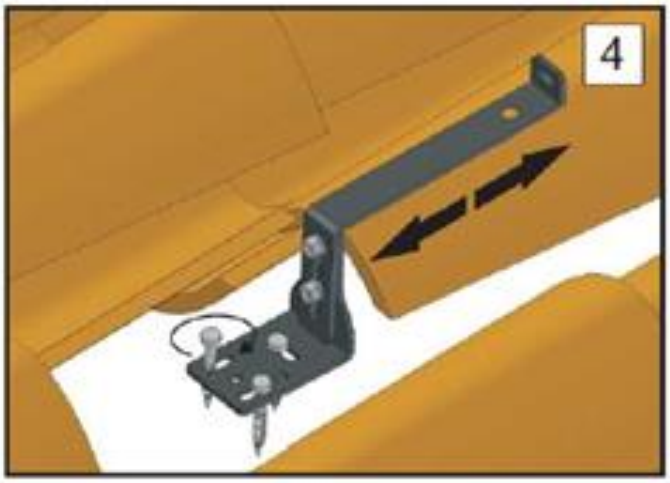



2xMR
x 2
x 2
x 2
x 4


1
H=100÷150
20 Nm


2


3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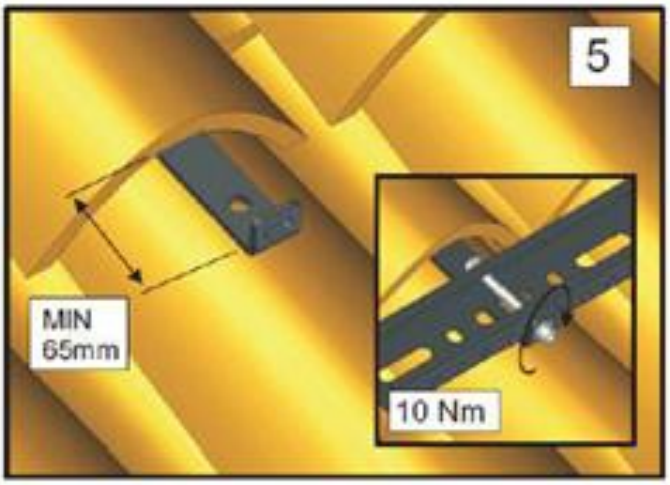

5
MIN
65mm
10 Nm

0. Hydraulic system assembly

Both sides of the Thermics Energie panel have a delivery and a return connection DN22.

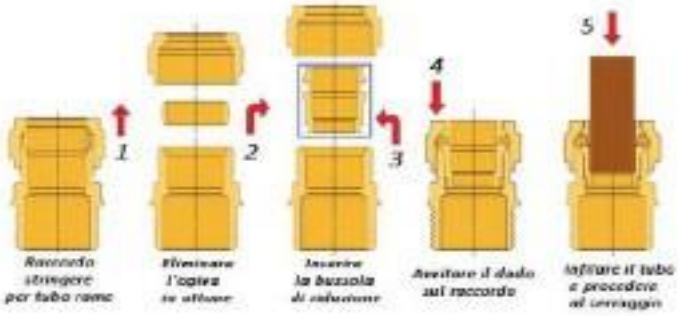



Depending on the connection used, the panel can be connected on the right or left, with delivery and return on different sides or the delivery and return on the same side (see diagrams on page 13). Each connection can also be used both as a delivery and as a return; the corresponding connection on the other side will be closed with the cap.

- Detail of the curved or straight compression fitting connection at the input to the panel:

- Detail of the connection of the compression T fitting with thermowell at the outlet from the panel:

Note If the inlet or outlet pipe is Dn 18, the reduction bush that is included in the Thermics Energie systems, and which can also be purchased as an accessory, can be used.



- Detail of the screw-on fitting with flat face for connecting the inlet and outlet of the panel with corrugated stainless steel hose:

Depending on the type of connection, the panel can be connected on the right or left, with delivery and return on different sides or with the delivery and return on the same side.
Each connection can also be used both as a delivery and as a return; the corresponding connection on the other side will be closed with the cap.

- Detail of Pt 1000 probe installation at panel outlet:

Position of probe at panel outlet

Note the probe (that can be recognized by the grey silicone cable) must be installed in the thermowell of the T fitting, on the hot outlet. If there are several batteries of panels connected to each other, the probe must be positioned on the hot outlet of the last battery from which the hot delivery line to the heating system starts. The probe itself must be inserted so that it touches the bottom of the well, taking care to secure it in place using the tightening nut included in the fitting. If the probe is installed Incorrectly, the temperature readings may be incorrect, making the system inefficient.

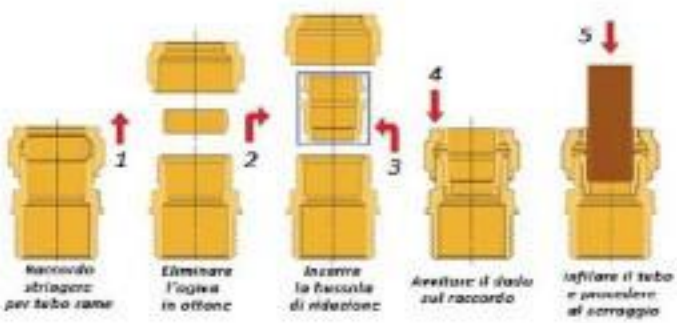
- Detail of connecting panels with straight compression fitting:

Important The tightening of the panels to the bracket kits must be done only after the panels have been connected (as shown in the figure) using the nipples already supplied and positioned on the collector.

- Detail of closing panels with the caps - showing configuration with input and output from the same side:

- Detail of copper pipe connection to the solar station using a female copper pipe fitting with flat seat DN 22 x 3/4" or 1":

Note When installing the solar station using copper pipe, we recommend using the fitting shown in the first and second photos including the HT seal (available as an accessory). Also in this case, if the inlet or outlet pipe is Dn 18, a reduction bush can be used, which can be purchased as a separate accessory. For coil lengths of greater than 6 metres, expansion joints (e.g. stainless steel bellows) should be provided as indicated in the executive design.

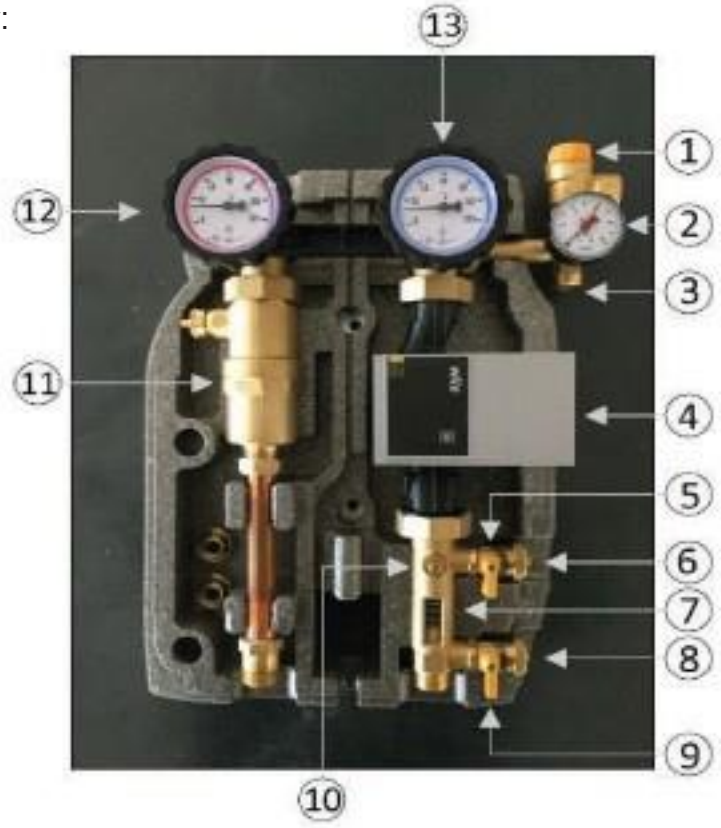


p. Charging the solar circuit and putting it into operation

It is recommended to use Thermics Energie Mayline FSP transfer fluid in order to prevent freezing or corrosion of the solar pipework. Mayline FSP is a glycol-based fluid specially designed for evacuated tube thermal solar collector applications. In areas where no freezing occurs, treated water and corrosion inhibitor additives can be used.
If treated water (desalinated etc.) is used, this must meet the following chemical characteristics:
Please follow the instructions below in order to charge and operate the Thermics Energie panels correctly:

Treated water characteristics:

-Cl^- < 50 ppm
-SO^{4-} < 100 ppm
-Absence of NH^{4+}
-PH > 7
-Hardness < 12° f



Detail	Description
1	Safety valve
2	Pressure gauge
3	Vessel hose connection
4	AE circulator
5	Filling valve
6	Drain valve cap
7	Flow regulator
8	Drain valve cap
9	Drain valve
10	Ball valve
11	De-aerator
12	Boiler outlet thermometer
13	Cold delivery thermometer

- *Filling the boiler:*

Open the utilities hot water tap and leave it open, open the mains water inlet to the boiler and fill it. Once the boiler is completely full, close the utilities hot water tap and wash the solar circuit.

- *Washing and checking the system fittings for leaks:*

- Unscrew the caps (6-8) and insert the hose connector.
- Make sure that all the shut-off valves and any other valves in the circuit are open.
- Close the ball valve (10) by turning it clockwise, open the filling valve (5) and add water until it exits from the drain valve (9). Let it flow for a few minutes.
- Visually check the seal and check for any leaks from the fittings.
- Turn the thermometer (13) clockwise by 45°C to stop adding the washing fluid and the empty the system.
- Close the filling and drain valves (5 - 9).
- Turn the thermometer (13) anticlockwise by 45°C.
- Open the ball valve (10) by turning it anticlockwise and screw the caps (6 - 8) back on the two valves (5 - 9).
- Empty the fluid from the entire circuit by turning the thermometer (13) clockwise by 45°C, open the valves (5-9) and remove the two caps (6-8).
- Wait for the system to empty.
- Empty the fluid from the entire circuit and close the valves (5-9). Replace the two caps (6-8) and turn the thermometer (13) anticlockwise by 45°C.
- Ready for loading and pressurizing.

-Charging and pressurizing the solar circuit:

- Before starting to charge the system, check that the panels are covered, as indicated above, and keep them covered until the system has been put into operation.
- Unscrew and remove the caps (6-8) from the valves (5-9) and insert the hose connector.

- Connect the delivery (filling) and return (drain) lines to the filling and drain valves (5-9).

- Close the ball valve (10) by turning it clockwise, open the filling valve (5) and drain valve (9) and add the Mayline FSP antifreeze by turning on the charging pump so that it circulates in the same direction as for normal operation.

- Leave the loading pump running for as long as necessary to allow the system to become deaerated. Make sure there is sufficient flow rate to deaerate the circuit properly. Allow the filled system to rest for about two hours. Then recharge the system by starting the pump in order to deaerate the solar circuit properly. N.B. Repeat this procedure several times for large solar fields.

- If the solar line contains a diverter valve, make sure it is open in manual mode to allow the antifreeze to circulate in both circuits.
  After having done this, put the valve back to automatic mode.

- Quickly open and close the thermometer (13) for a few seconds, remembering to leave it in the "open" position after having done so.

- Close the drain valve (9) and open the ball valve (10). Bring

- the system up to a pressure of 2.5 bar, which can be seen on

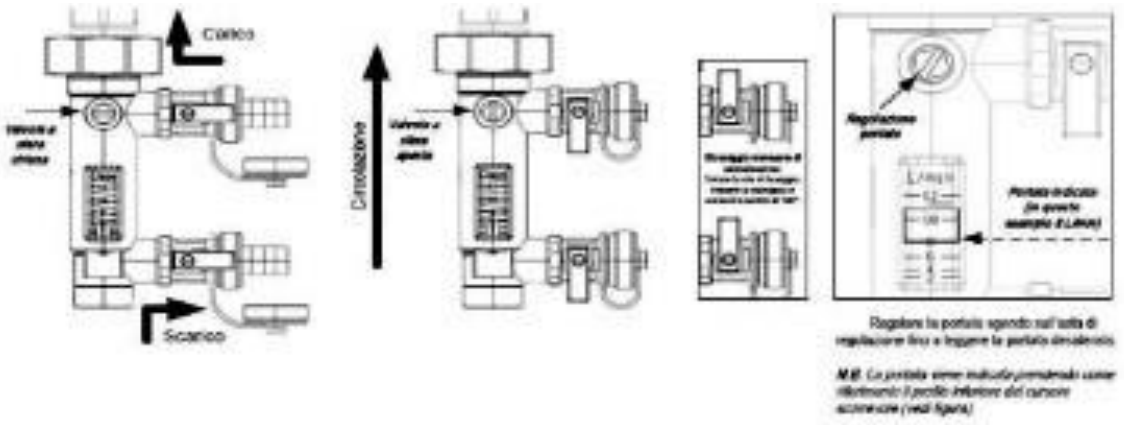
- the pressure gauge (2). Close the filling valve (5).

- Switch off the charging pump and put back the two caps (6 - 8) on the valves (5 - 9).

- The circuit must remain under pressure for at least half an hour without showing a pressure drop.

- Use the ball valve (10) to set the flow regulator to a value that is suitable for the size of the system and uncover the panels.

  N.B. For medium / large systems, it is recommended to provide high deaeration points on the supply columns to the series of panels.



Panel maintenance and repair

q. Annual inspection of the panel and solar system

When visually inspecting the collectors, check the following:

- Make sure that the panels are not damaged and that the evacuated tubes are not defective. The latter can be recognized when the silver coloured coating in the lower area turns into a whitish patina.
- Check that all the connections are watertight.
- Check that there are no loose fastenings on the collector elements and tube supports that could cause abnormal movements.
- Check the insulation of the tubes and replace any defective ones if necessary.
- Use a special tester to check the effectiveness of the antifreeze before the onset of winter.
- Check the system pressure, paying attention to anything that may cause a pressure drop (system leaks, vessel pre-charge too low, discharge from the safety valve).
- Check the anti-corrosive properties of the antifreeze fluid.
  The one supplied has a variable pH from 9.0 to 10.5. Replace it if it is lower than 7.

r. Safety systems

There are several safety systems that should be checked periodically:

- *Expansion vessel:*

The correct sizing of the expansion vessel allows you to handle expansion caused

by the steam generated as a result of stagnation, without causing the safety valves to open and vent.

- *Safety valve:*

Each solar station that has a circulation pump is fitted with a safety valve with a threshold pressure of 6 bar. The theoretical maximum pressure that can be reached within the solar circuit is set using this device.

- *Solar control unit:*

The control unit allows the circulator to be stopped if the temperatures at the solar collector exceed the set limit T (measured by the PT 1000 probe). It allows the circulator to be stopped if temperatures in the storage tank is higher than 80 - 90°C (measured by the NTC probe in the boiler). It also allows ANTIFREEZE to circulate at a settable minimum T <T (measured in the pipework via an NTC probe). It is recommended to use Thermics Energie control units as they are tested and pre-set for the system to operate correctly and to optimize the yield of Thermics Energie solar field.

- *Lightning:*

It is mandatory to ground the system. The solar collector must have potential balancing for protection against lightning, in compliance with the regulations in force in the country of installation. The frame of the solar collector frame and the ground should be equipotentially bonded. A very effective earth conductor connection should be provided with a copper cable having a minimum section of 10 mm. If there is already a lightning protection system, connect the frame to the existing equipotential conduit. The connection must also intercept the delivery and return pipes in addition to the frame. For very large solar systems, consider a connection to the equipotential conduit for every 200 sq. m.

s. Faulty or damaged evacuated tube replacement

Warning For systems with solar fields of >15m2 or for large solar fields, it is necessary to provide > a system for the disposal of thermal energy that is not utilized by the user (dry cooler, static dissipaters etc.). Avoid thermal shocks to the solar collectors. Warning Danger of injury due to damaged vacuum tubes.
Caution Evacuated tubes must not be replaced with the circuit at high temperature or when stagnant or when in the sun. Before replacing a tube, the temperature of the battery in which the panel with the tube to be replaced is located, should be lowered, for example by covering it.
Danger Burns due to hot components (system in operation).
Note During the replacement of damaged or defective tubes, the solar system can remain in operation and without having to discharge the circuit even if the battery is kept at a boiling or lukewarm temperature.
To remove and replace the tubes from the collector, proceed as follows:

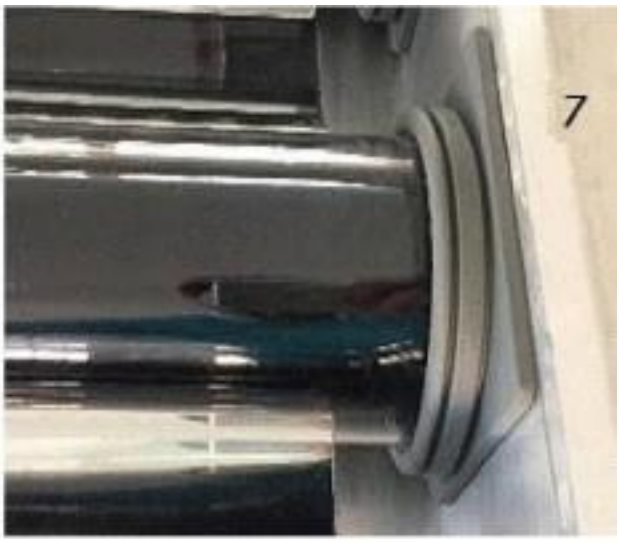
- Unscrew the end caps of the frame without attachments.

- Remove the lid of the frame:

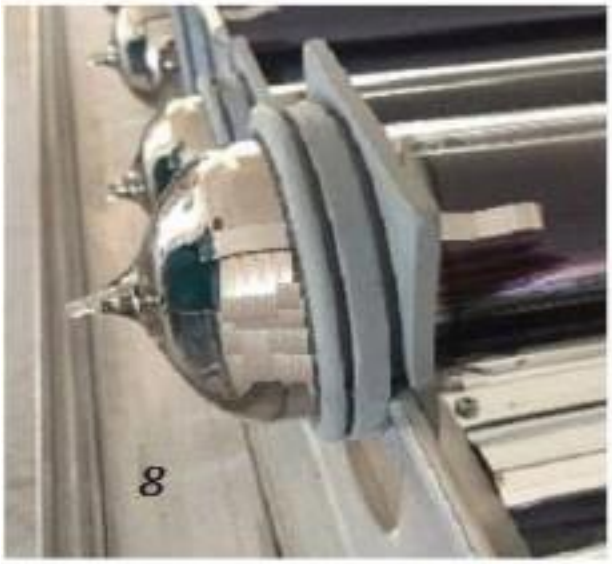
- Lift the tube to be replaced just enough to remove it.

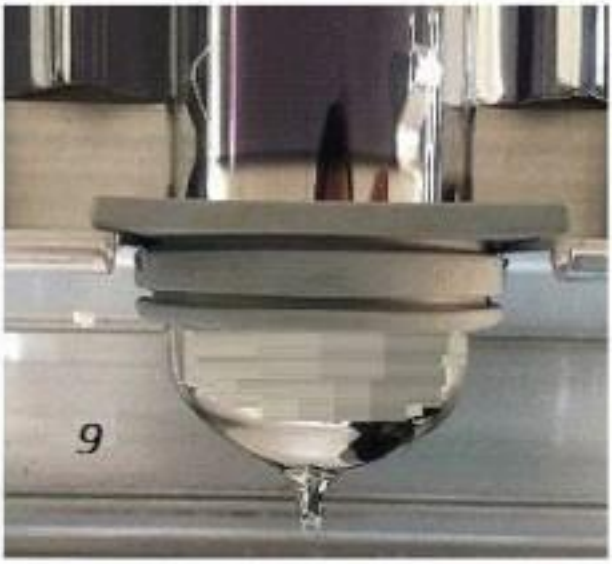
- Lift and remove the tube to be replaced from the head with the hydraulic connections:

- Carefully insert the replacement tube:



- Replace the seal and position the tube in the housing by sliding the seal downwards:





t. Waste and panel disposal

The solar panel, accessories and packaging consist mainly of recyclable raw materials (98% of the 10 DTH V2 collector). In this case, they can be disposed of at special collection centres in compliance with the national and local regulations in force.
The packaging and accessories can be disposed of by the installer who assembles the system, while the disposal of the collector at the end of its service life is the responsibility of the owner. Alternatively, it can be done by Thermics Energie who will collect and dispose of it at a recycling centre (any removal, shipping or other costs associated with collection will be charged to the owner).

Thermics Energie s.r.l.

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