



BENIFERRO.eu
plug & play products



Manual EPDM solar heating

XXX



Manual

Table of content

Content of the box.....	3
Product description.....	3
Assembly	6
Fastening the solar panels	10
Safety precautions	12
Automatic or manual 3-way valve	13
Maintenance	15



Content of the box

When opening the box, take care not to cut into the EPDM solar heating. Please ensure that the following materials are present:

The box will contain :

- 3 pre-assembled EPDM heaters (length 2,3,4,5 or 6 meter) fitted with a collector at each end.
- 8 O-rings
- 8 ty-rips
- 2 connectors (50-38-32 mm)
- 2 closed collector ends

Product description

The 33,33cm long collectors are made from ASA, which is more UV-resistant than ABS. Furthermore, the solar panels consist of tiny tubes made from EPDM rubber. EPDM rubber has several advantages compared to other materials:

- Frost resistant
- UV resistant
- Protected against damages from chemicals (only use normal quantities)
- Resistant against stretching

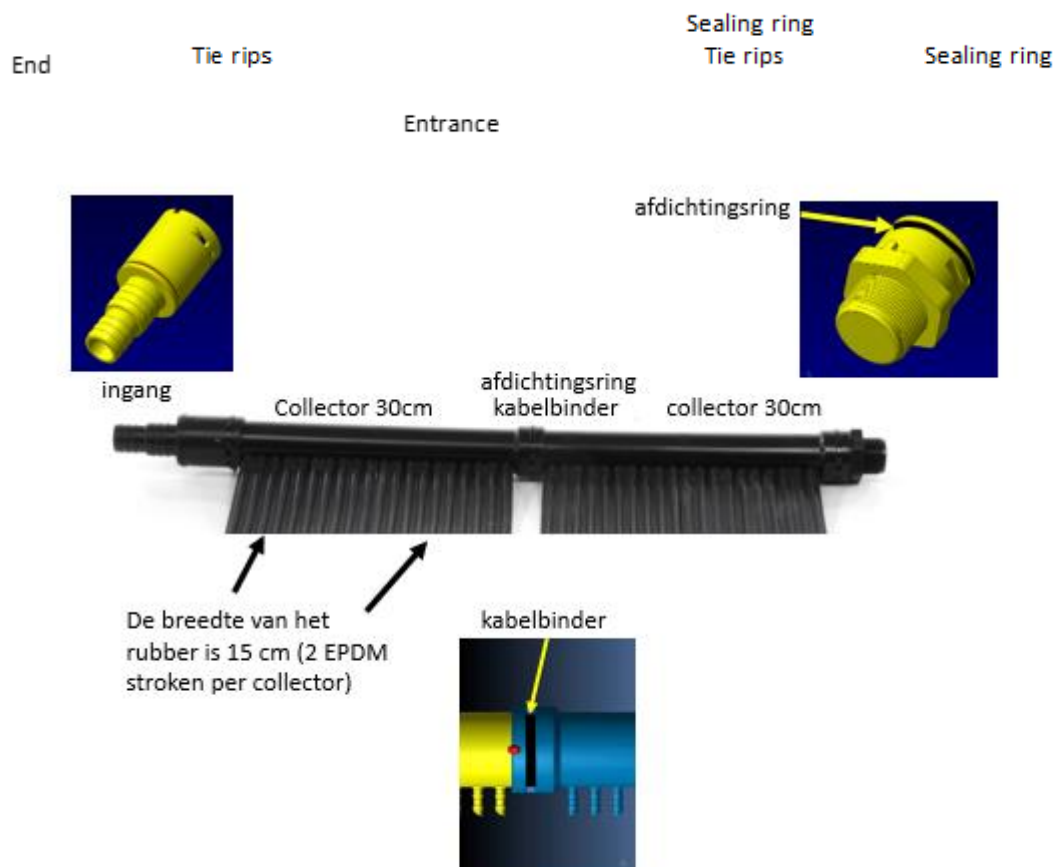
The collectors can be easily connected to one another with tie rips. The sealing O-ring guarantees that the collectors are completely waterproof.

The standard lengths are 2, 3, 4, 5 or 6 metres, but it is also possible to order custom made solar heating. The width of a standard kit is fixed at 1 meter, which consists out of 3 rolls of 33 cm wide. The width can be extended indefinitely, by increments of 33 cm (one collector). Only the end pieces remain to be assembled.





The width of the EPDM rubber is 15 cm (2 EPDM strips per collector)



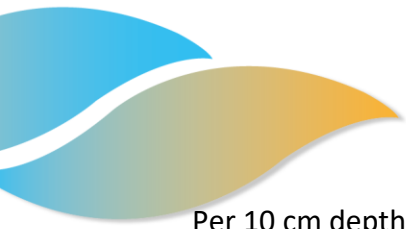
Since the entrance and exit are located diagonally from each other, the water will be heated in the most efficient manner. It is recommended to place the exit at a higher level than the entrance in order to push the bubbles out of the collector.

In order to obtain the best results, the solar panels have to be located towards the south (45° France, 37° Belgium). When you place the collectors horizontally, 15% more solar panels are required to be installed in order to receive the same efficiency.

Hereby the calculations for a swimming pool with a depth of 1,5 meters **for West Europe:**

- Swimming pool without cover: 125% of the swimming pool surface
- Swimming pool with bubble cover: 75% of the swimming pool surface
- Swimming pool with pool cover (Enclosure): 50% of the swimming pool surface





Per 10 cm depth extra, 10% more panels are needed. With the right amount of solar panels, the temperature of the swimming pool can rise up to 6° per day.

Please consult www.harmopool ... for more detailed heating calculations

Attention!

- If the solar panels will be placed on a roof, it is recommended to use safety equipment or to hire a professional.
- The Beniferro solar panels have a warranty of 2 years covering manufacturing defects. The warranty does not cover damages caused by poor installation or external factors including, for example, weather conditions or chemicals. The transport costs and labour hours are not covered by the warranty.
- In order to receive the best results, the collectors have to be placed fully in the sun. Furthermore, the water has to enter the panels at the bottom and exit the panels at the top in order to push the air out of the tubes.
- When the solar panels are placed higher than 6m, it is recommended to install an aerator. When the pump stops, the aerator will automatically empty the collectors. This prevents under pressure in the EPDM tubes when the pump is off.





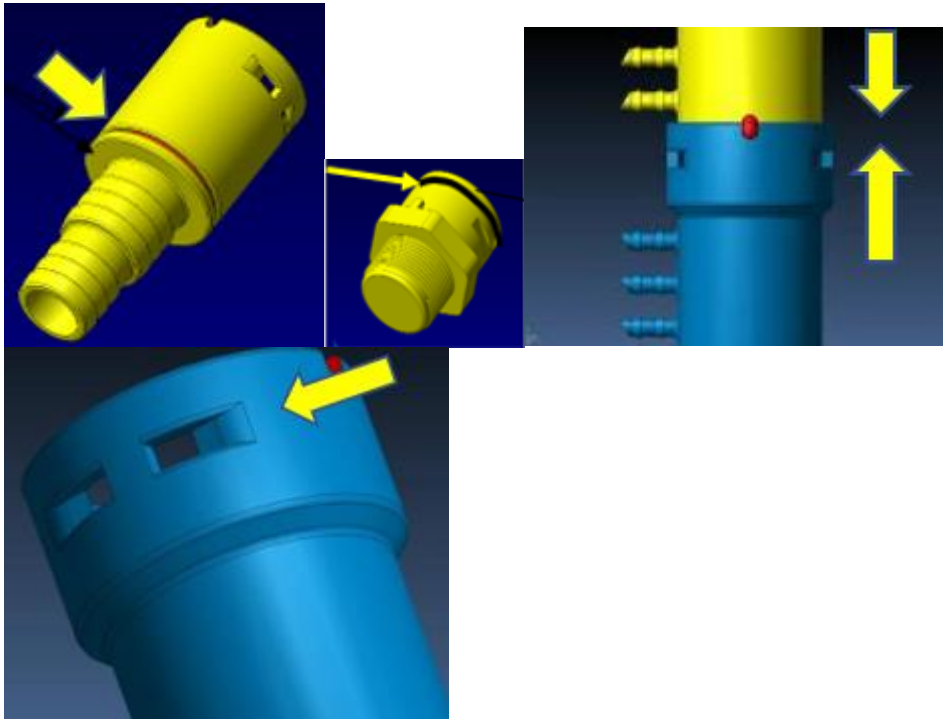
Aerator

Assembly

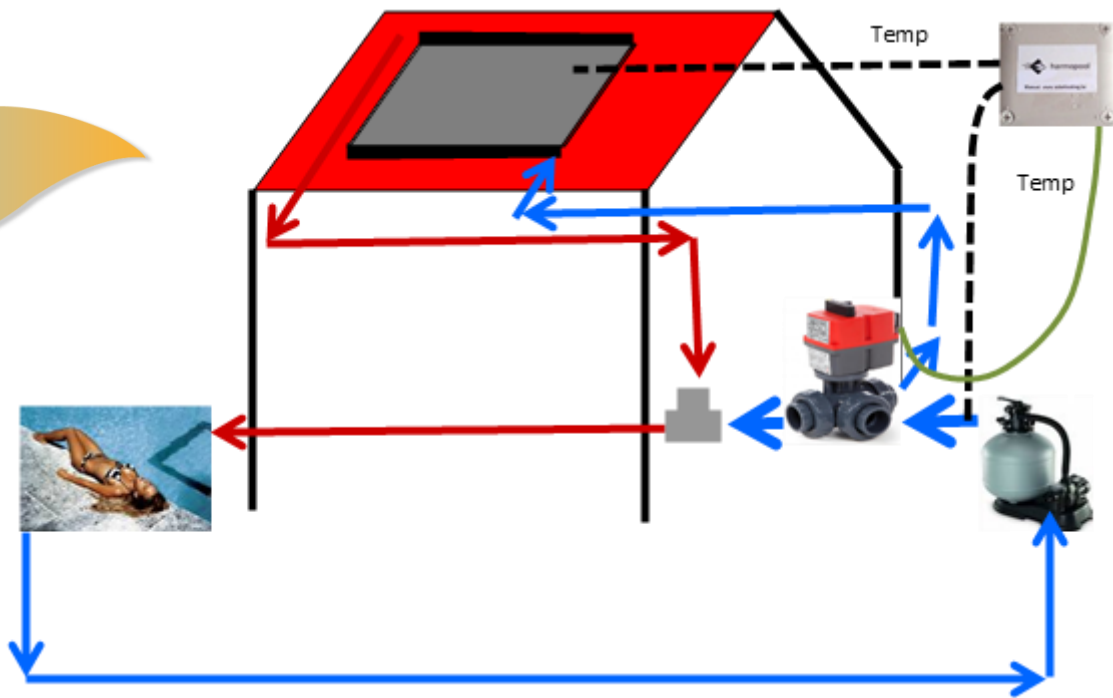
1. Put the 3 heating mats next to each other. Put the O-ring around each collector end and around the 2 closed collector ends.



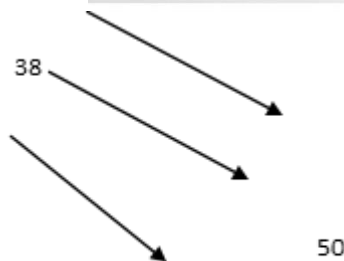
2. Click the collectors in each other and put the sealing rings around the foreseen nick and connect the tubes. It will be easier to connect the tubes after applying a small amount of soap. After connecting the tubes, they have to be secured with the tie-rips.

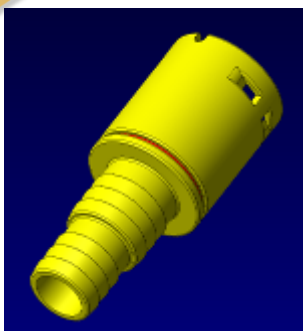


4. Put the collectors on the desired place: roof, wall, floor Desired angle is 35 to 45° for the optimal efficiency. Make sure no sharp objects can pierce the collectors. Fix the collectors to the underground using webbing strap or special silicones all available from your dealer. The ideal location of the EPDM mats is just after the filter, before the heatpump. In all cases, the water treatment has to be done after the heating mats, never before. We recommend to use a (automated) 3-way valve to bypass the solar heating in case the roof temperature is colder than the pool water temperature. See the connection scheme.



5. The inlet of the collector should be diagonally placed to the outlet of the other collectorside; The water in and out connection pieces are fit for flexible tubes with a diameter of 32, 38 and hard / flexible PVC tubing 50 mm. To connect a 50mm tube, cut off the 32/38mm connexions with a saw. Make a cut on the red stripe (see fig. 1) Place the sealing caps at the female ends and the connectors at the male ends of the collector.





32

Sealing ring



6. Optional: Drill a hole in the sealing caps, so they can be easily emptied during the winter. The hole can be closed with a 1 ¼ cap inch thread [ZALX3010] (The 1 ¼ cap is not included).





Fastening the solar panels

With the nylon strap, the solar panels can be placed either horizontally or vertically.



Vertical placement

The strap can:

1. Fasten the solar panels

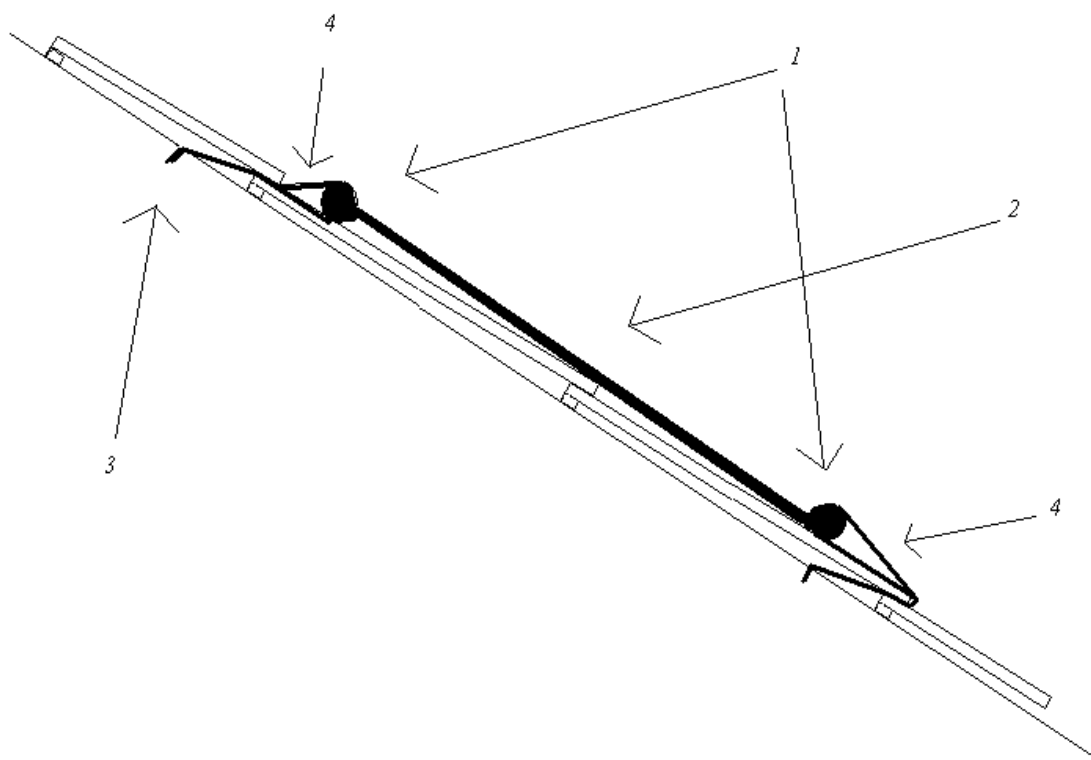


2. Fasten the heating system by weaving the strap horizontally through the rubber. The strap is included with the solar panels. The solar panels can also be attached directly to the roof with silicones (Versa bond,..).



Horizontal placement

It is also possible to assemble the straps underneath the roof tiles by connecting them to the slating battens with screws. In this case, one attachment per collector is needed.





1. Collectors – placed horizontally
2. EPDM
3. Screw (Not included)
4. Strap (1m)

It is also possible to fasten the collectors with a concrete steel net.

Flat roof

The same methods can be used. The collectors can be connected to roof tiles, a concrete steel net or silicones.

On the ground

It is recommended to place the solar panels in an area without plants or sharp objects. When plants grow underneath the solar panels, it could damage them. Please refrain from walking over the collectors to prevent damage.

Pagina-einde

Safety precautions

- Do not put the EPDM heating in a environment higher than 60 °C
- Do not pressure higher than 1.5 bar on the EPDM heating
- Do not circulate water with pH lower than 7.2 or higher than 7.6 through the heating mats.
- Do not circulate water with free chlorine content higher than 1ppm over the heating mats.
- Do not walk over the collectors
- Use appropriate safety precautions / equipment when working in height

ATTENTION !: Like all materials, rubber ages after 10-15 years. This results in little particles of rubber that can come off and these can end up in your pool. This is totally normal. You can filter them before coming into your pool by using a nylon stocking and putting it over the inlet in your pool.

Be carefull though. If the pH of the water does not lie between 7.2 - 7.6, the EPDM will get damaged and crumble much quicker. Be carefull (especially at start-up of your pool in spring) that you control the pH level of the water.

Winterizing

Empty the collectors before winter. EPDM rubber will not freeze, the collectors will freeze when left full with water.





Automatic or manual 3-way valve

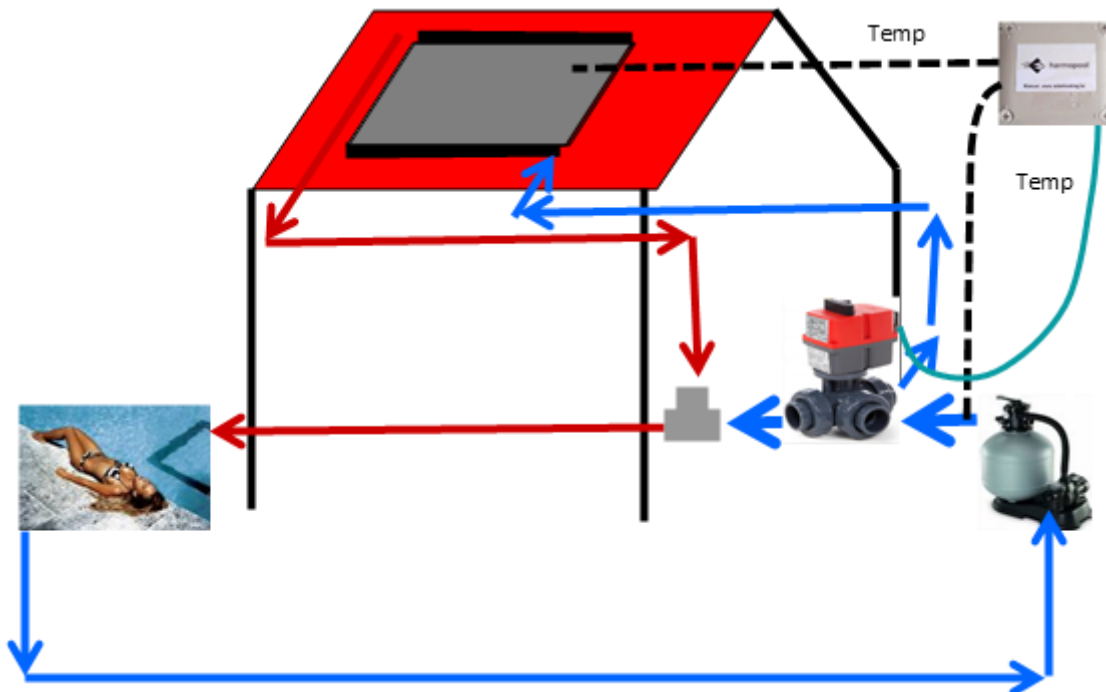
The drawing below shows how a bypass can be made using a 3-way valve.

Using a Beniferrosol temperature controller, it is possible to regulate an automated 3-way valve, which will send the water to the solar heating only when it is appropriate (temperature solar heating higher than swimming pool temperature).

The Beniferrosol measures the difference between the water temperature and air temperature. When the difference of the temperature exceeds the data given in the settings, the electric valve will open/close. As a result, the water will run or stop running through the collectors causing the water temperature to drop/increase.

Using a manual valve is also possible, but the manual valve will be less effective than the automatic valve.

A detailed manual of the valves can be found on www.beniferro.eu.





Creating a separate circuit

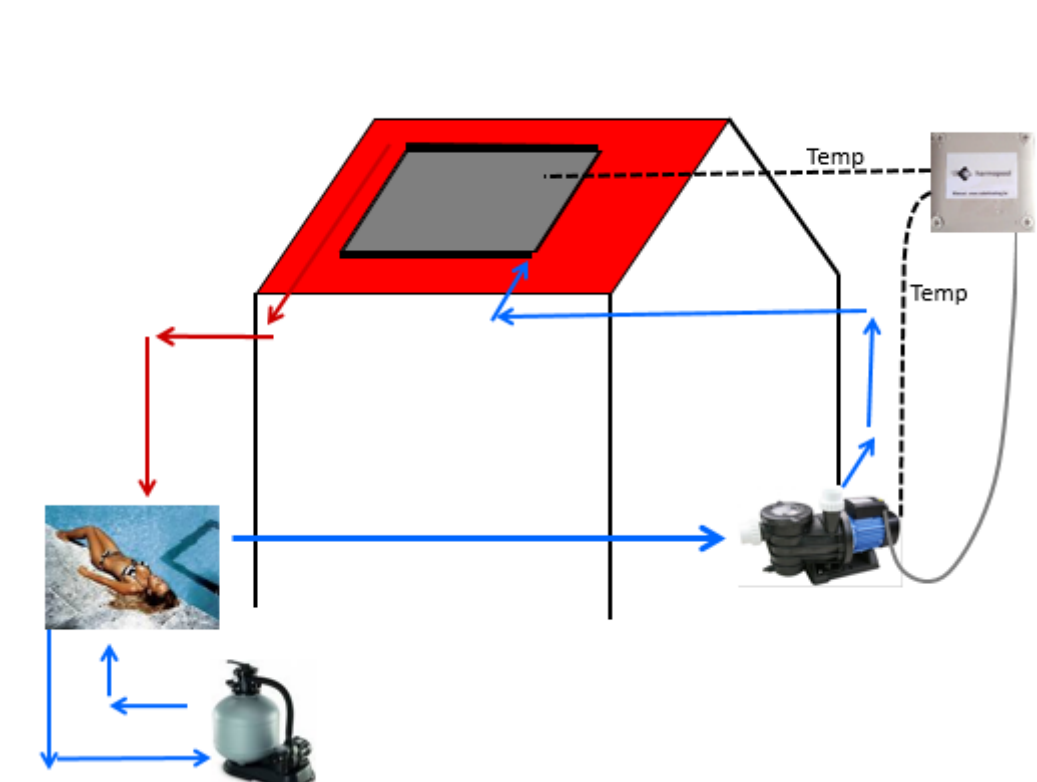
A second pump can be installed in a separate circuit. A low power swimming pool pump (e.g. 250 Watt) runs only when the sun shines.

The pump can be started/stopped by the Beniferrosol controller.

The Beniferrosol measures the difference between the water temperature and air temperature. When the difference of the temperature exceeds the data given in the settings, the pump will start/stop. As a result, the water will run or stop running through the collectors causing the water temperature to drop/increase.

Using a manual start-stop is also possible, but the manual operation will be less effective than the automatic valve.

A detailed manual of the valves can be found on www.beniferro.eu.





Maintenance

In order to prevent damage, please read the following tips:

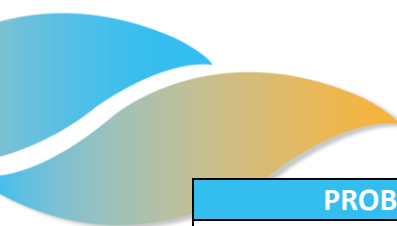
- During a chlorine-shock treatment, it is recommended to close the collectors in order to prevent damage.
- Before the winter, pure water has to run through the collectors. Afterwards, the collectors have to be emptied.
- Information about the maintenance of the accessories can be found in the manuals on www.beniferro.eu.

Avoiding and solving problems

A few youtube videos have been

made where a repair of occurring problems are fixed in under 5 mins. --

> <https://www.youtube.com/channel/UCFTxtvZNYAWObHXoKOD-SpQ>



PROBLEM	CAUSE	SOLUTION
COLORED WATER	Copper, iron, or manganese in water connects with chlorine during initial chlorine treatment	Bring pH level to proper level. Run filter pump constantly and change filter regularly
PIECES OF EPDM IN SWIMMING POOL	Incorrect pH value of the pool or too high chlorine concentration (max: 1 ppm) causes the EPDM to crumble. This causes pieces of EPDM to get into the pool and possibly cause a blockage of the filter.	Make sure the pH is between 7.2 and 7.6. Check that the concentration of chlorine does not go over 1 ppm. The affected rubber cannot be healed. If black particles continue to come off, a new heating mat is recommended.
HOLE IN EPDM PANEL (MIDDLE)	Hole made by 1. vermin 2. gnawing and pecking animals 3. stepping on to it 4. wear and tear 5. poor placement	Cut the tube where the hole is. At this spot, you can use a repair nipple to attach the two tubes back together.
HOLE IN EPDM PANEL ON ONE OF THE ENTRANCES OR INTRANCES OF COLLECTOR	Hole made by 1. vermin 2. gnawing and pecking animals 3. stepping on to it 4. wear and tear 5. poor placement	Cut off the broken piece of the tube. Pull the undamaged part over the collector's nozzle and make it tighter if necessary with a strap.
TOO LITTLE FLOW	The EPDM is pinched by the tension strap or EPDM is blocked inside by dirt	Check that pipes are not pinched by ribbon or kink. In case of blockage: Drain panels and remove blockage.