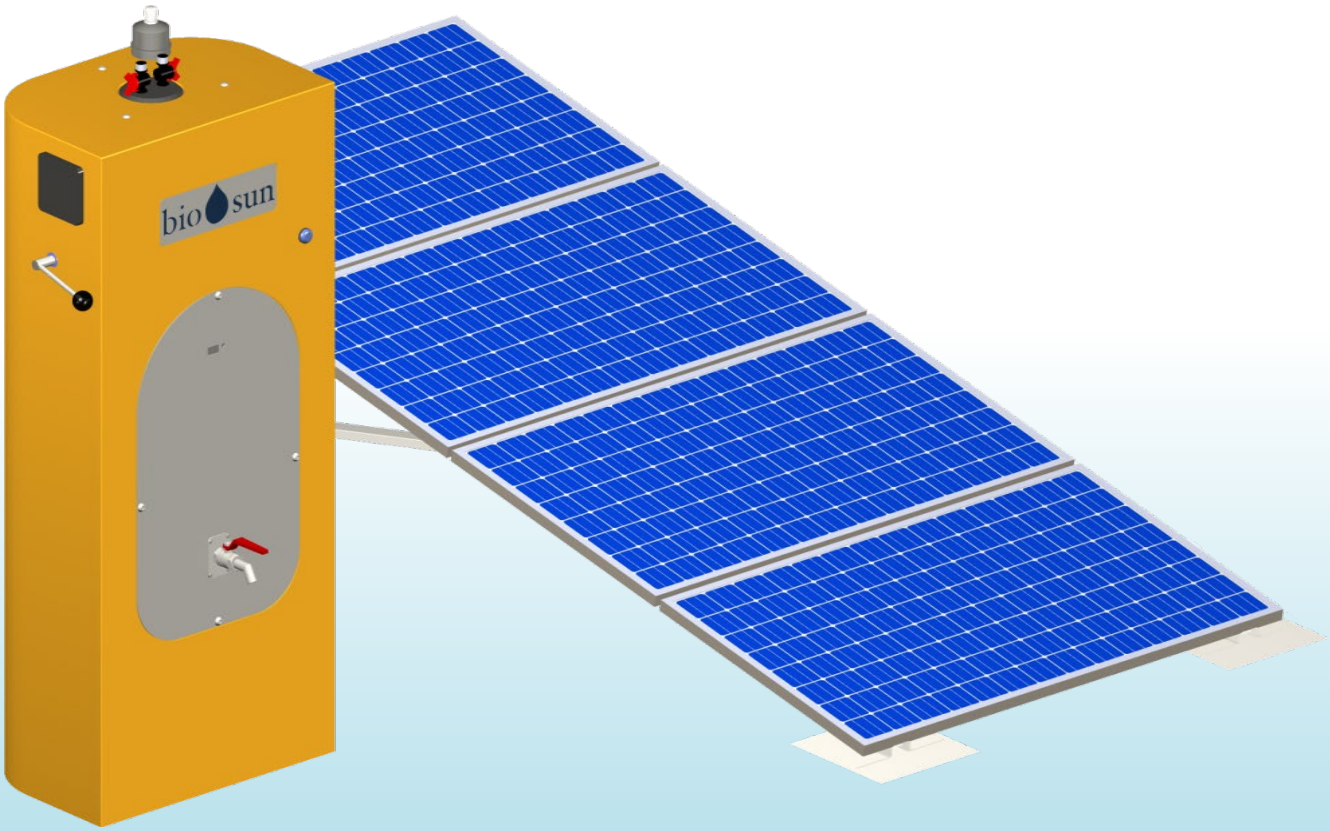
BIO UV
Ultraviolet Solutions

BIOSUN
340W

INSTALLATION AND MAINTENANCE MANUAL



BIOSUN-340_(Anglais) - DOC012466 - Ind. B03 - 21/06/2017

We thank you for choosing BIOSUN.
Our equipment has been designed to give you reliable and safe operation for many years to come.
The BIOSUN terminals have been designed for speed and ease of installation.
Their design also makes them easy to maintain.
Read these instructions carefully in order to optimize the operation of your device.

TABLE OF CONTENTS:

Pages

A. TECHNICAL CHARACTERISTICS

BIOSUN RANGE	UNIT	BIOSUN 340
FUNCTIONAL CHARACTERISTICS		
Flow rate	l/h	500
Number of hours of production per day	h	4
Volume produced per day	m3	2
Standalone operating time	day	3
Draw-off	-	Standalone operating time
Volume meter	-	Draw-off
UV reactor ON/OFF switch	-	Yes, with integrated LED
WATER SUPPLY		
Tank volume	l	21
tank materials	-	304L stainless steel
Supply type	-	Manual or gravity filling < 1 bar
Max. pressure	bar	1
Pump	Vdc	24 (with a built-in pressure switch)
FILTERING		
Filtering media	-	Zeolite
filter volume	l	7
filtering threshold	µm	<10
backwashing	-	With manual handle
cartridge size (optional)	inch	10
Filter cartridge type (optional)	-	10µm, activated carbon
UV REACTOR		
UV lamp power	W	14
UV power delivered	W	4.6
UV operating light	-	Yes
Dose delivered	mJ/cm²	40
Ballast	-	Electronic (24VDC)
Supply voltage	Vdc	24
Average life expectancy for one stop/start per day	year	1
FRAME		
Dimensions	mm	1400 x 600 x 400
Material	-	Fiberglass + polyester complex: special for outdoor use
PHOTOVOLTAIC POWER SUPPLY		
Panel size (unit)	mm	1200 x 600
Number of solar panels	-	4
Panel power	W	85
Panel voltage	V	12
Panel attachment	-	Remote support (roof, floor, etc.)
Number of batteries	-	2
Battery type	-	70Ah(C100), 60Ah(C20), 12V
OPTION WITHOUT PHOTOVOLTAÏC PANELS Recommended spare parts list to be provided by the customer		
Solar panel	-	4
Number of batteries	-	2
Battery type	-	70Ah(C100), 60Ah(C20), 12V
Controller	-	According to panel model specified by the customer
Converter	-	24Vdc 100W

B. SAFETY WARNINGS

- Switch off the device 10 minutes before any intervention to let the lamps cool down.
- **Stop the system in the event of a prolonged stop of the water flow**

- **Never expose yourself to the radiation of the ultraviolet lamps when lit.** This may cause severe injuries or burns and may even lead to loss of eyesight.
- When the lamps are running, **do not take the lamps of the reactor out or remove the protection covers**

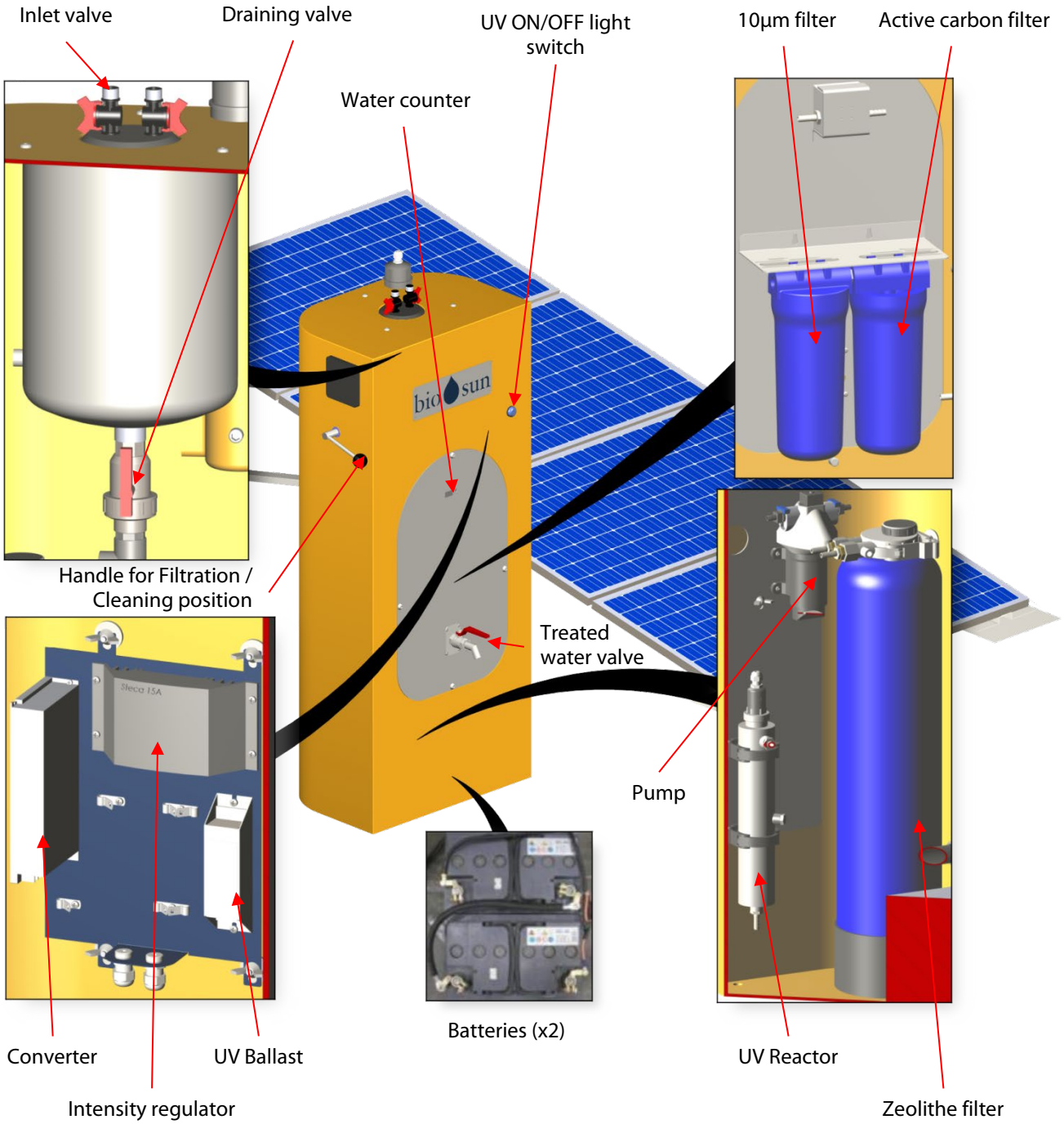
- When dismounting UV lamp or quartz tube, it is necessary to wear **protection gloves** not to let fingerprints that could affect the UV emissions quality

- Do not use the reactor if the **power supply wire is worn or damaged**. In this case it should be replaced.
- To avoid electric short-circuits, **do not place the electric wires or the reactor in the pool water** or in any other maintenance or cleaning fluid.
- Do not perform electrical measurement on ballast output (risk of overvoltage)
- Never disconnect solar panels during the charge

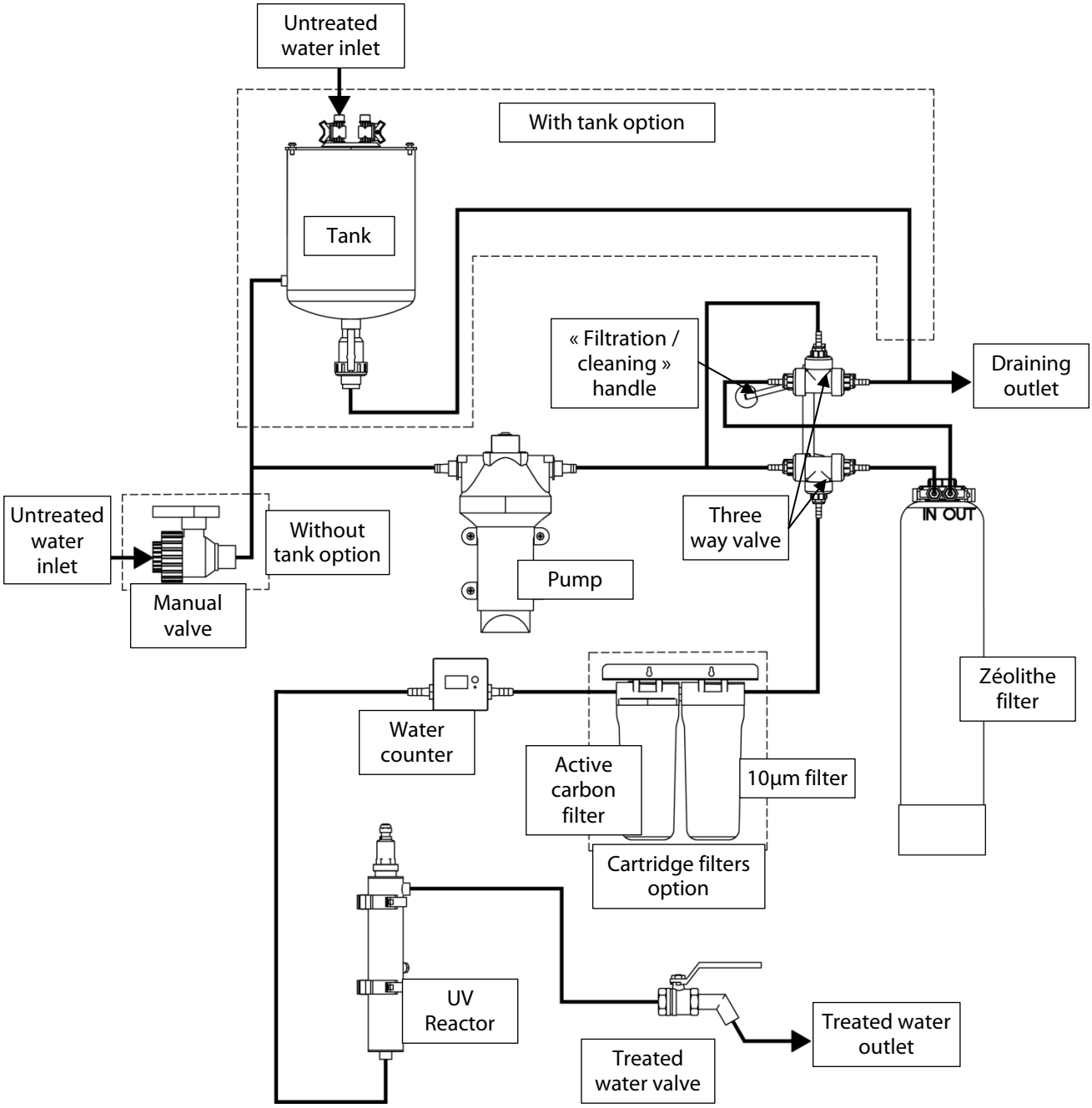
- Never unscrew the quartz tube sealing nut **when the reactor is on load** as the quartz tube could be blown out of the reactor with force and injure you.
- In case of a microleakage, the reactor must be isolated and drained to perform maintenance as soon as possible.
- Do not use the BIO-UV reactor for any other use than that for which it was designed.

C. BIOSUN TERMINAL DESCRIPTION

1. Overview



2. Hydraulic diagram



D. INSTALLATION GUIDE

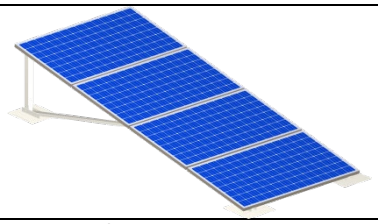
1. Foreword

Read all the instructions in this manual before switching on the reactor.

IMPORTANT: BIOSUN 340 is designed to be connected to a low pressure system (< 1 bar)

If the operating pressure exceeds 1 bar, the BIOSUN 85 model must be used

2. Detail of provided elements

	
Solar panels with frame (to be mounted and wired) (The parts list of the frame supporting the solar panels is specified on page 9.)	BIOSUN terminal
	
2 12V Batteries	Junction box with connecting lugs
	
Cables for terminal / solar panels connection (Do not reduce length)	Cables to connect solar panels together (Do not reduce length during wiring)
	
Switch key	Anti-theft wrench
	
Supply valve (if no tank option)	Teflon roll

3. Mounting of photovoltaic panels

a.) Preparation

Before starting mounting, the concrete foundation should have been done first.

a-1. Description of the symbols used

Safety tips:
This symbol indicates a warning, which, if ignored, could result in risks to people or equipment. Read these passages carefully.
Example:

Risk of injuries
- Risk of serious injury to the hands
- Wear protective gloves!

Information
This symbol indicates information on the most appropriate procedure.
Example:

Use a screwdriver to tighten the screws

a-2. Use a screwdriver to tighten the screws

When assembling the aluminium structure and the module, be sure to follow these safety tips:

Risks of cuts
- Cuts to the hands due to incorrectly deburred parts.
- Wear safety gloves!

Risks of burns
- Risk of burns from parts exposed to high heat.
- Check the temperature of parts and wear gloves!

Risks of explosions
- Risk of explosion due to improper use of batteries
- Do not smoke or bring a naked flame near the batteries!

Risks of chemical burns
- The acid in the batteries can cause chemical burns.
- Wear an apron and ant-acid gloves!

a-3. Table for adjusting the solar panel tilt angle

LATITUDE	TILT ANGLE
Latitude < 20°	15°
20° < latitude < 35°	Latitude + 10°
Latitude > 35°	Latitude + 15°

The minimum tilt angle value of 15° provides for "self-cleaning" of the photovoltaic panel and limits the risk of residual moisture.

a-4. Dimensions table

Foundation	Fixing points	Profiles length
F1 : 1844 mm	A : 80 mm	Profile P1 (2 parts) : 2340 mm
F2 : 1245 mm	B : 380 mm	Profile P2 (2 parts) : 802 mm
F3 : 263 mm	C : 1300 mm	Profile P3 (2 parts) : 300 mm
F4 : 720 mm	D : 80 mm	Profile P4 (2 parts) : 1013 mm
F5 : 525 mm	E : 160 mm	Profile P5 (1 part) : 640 mm
	F : 120 mm	

a-5. Parts list

You will find the various parts of the structure supporting the modules

 Rope clamp	 Clamping bolt	 Ring bolt	 Thimble	 Short screw (20mm)
 Short screw (30mm)	 Nut HU M8	 Flat washer L d=8	 Tensioner	 Shackle
 Large U profile	 Small U Profile	 I-module fixation	 T-module fixation	 Flat washer M d=8
 P1 type formed section	 P1 type formed section	 P1 type formed section	 P1 type formed section	 P1 type formed section

a-6. Required tools

The tools required to assemble the module support structure are indicated below

 Spirit level	 Flat wrench (Size 13, Size 10)	 Cutting pliers	 Folding meter rule	 Allen wrench (Size 6)

b.) Assembly

b-1. Foundations for the aluminium support structure

Pre-tighten the screws during the assembly period and firmly tighten only after assembling the whole structure with its modules.

Danger

Risks of cuts

- Cuts to the hands due to structural parts not deburred.
- Wear safety gloves!

When the concrete foundation is completely dry, drill the attaching holes in the floor.

- Using figure 01, measure and make marks on the concrete
- Drill the concrete with a hammer drill using a 12 mm diameter drill bit.

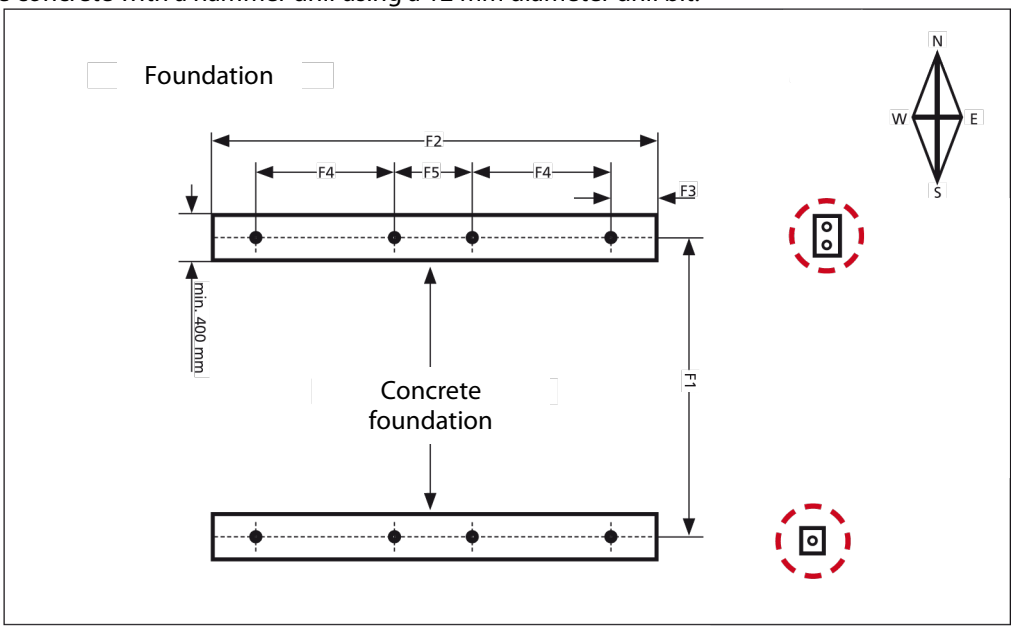


Figure 01

b-2. Assembling the aluminium support structure

b-2.1. Mounting the base

For this step, you will need four anchoring studs, two narrow U formed sections (3 holes) and two wide U formed sections (5 holes).

Before attaching, make sure you have properly positioned the wide U formed sections for the part pointing towards the foundations pole and the narrow U formed sections for the part pointing towards the equator (see Figure 01, red circles).

- Fit the four anchoring bolts in the four holes drilled in step 2.1, and make sure to attach them the right way round!
- Fit the U formed sections to the threaded rods (see figure 02) of the anchoring studs and then bolt the whole assembly together.

Ä The bolts are now attached in the holes.

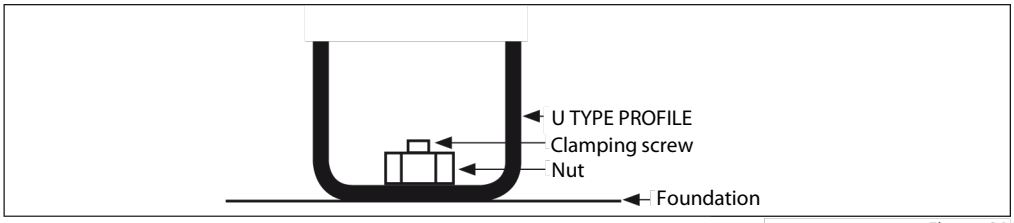


Figure 02

b-2.2. Installing the two P2 type formed sections

In the next steps, install the P2 and P5 type formed sections. Figure 03 provides an overview of the structure showing the use of the formed sections (red circles).

First assemble the three formed sections together on the floor. Then attach them to the foundations, otherwise the screws cannot be tighten!

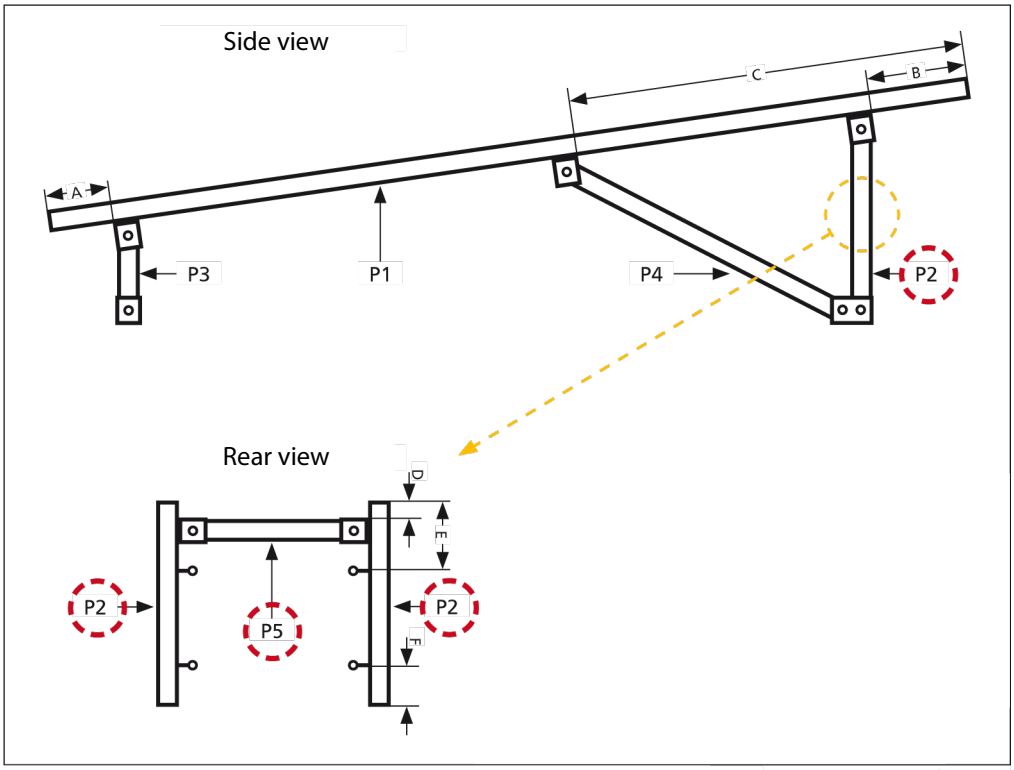


Figure 03

b-2.3. Fitting the eye nuts to the P2 type formed sections

For this step, you will need four eye nuts (see figure 04, red circles), four L 8 mm dia plain washers, eight HU M8 nuts and two P2 type formed sections.

<u>Option</u>: If you have the version with the GCB support (support for junction box), you also need to fit the support in this step! (see next paragraph)

The following figure shows you what the structure should look like after this step.

- If you do not fit the GCB support - assemble the eye nuts (see figure 04).

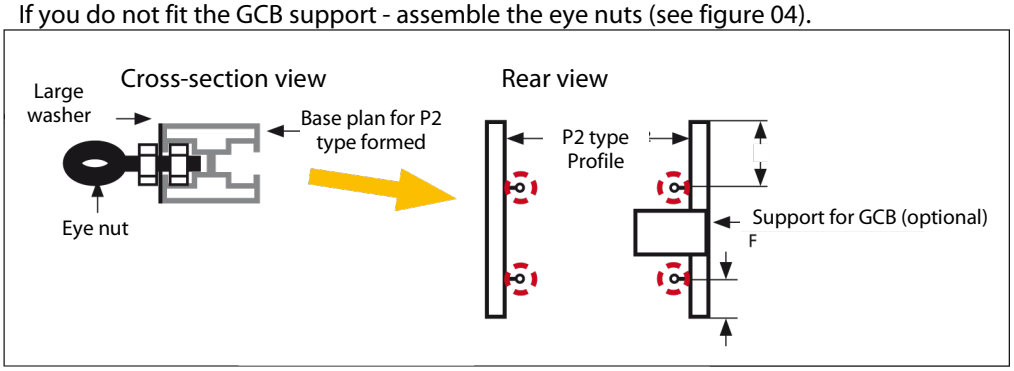


Figure 04

b-2.4. Fitting the eye nuts and the GCB support

The eye nuts are fitted in the same way as in the previous step! But make sure to fit the support between the eye nuts on the outside (rear view)

How to install the GCB support:

- Prepare two narrow U formed sections as shown in figure 05 (below).

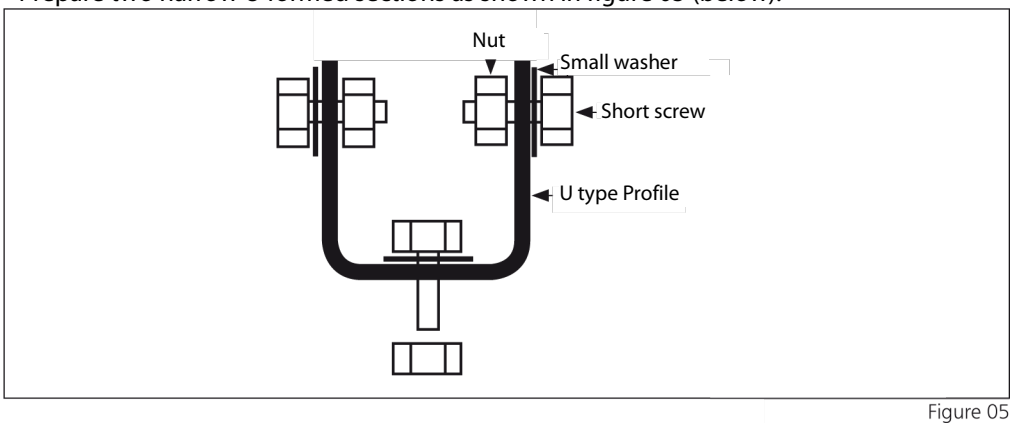


Figure 05

- Fit the GCB support to the two U formed sections as shown in the following diagram (figure 06)

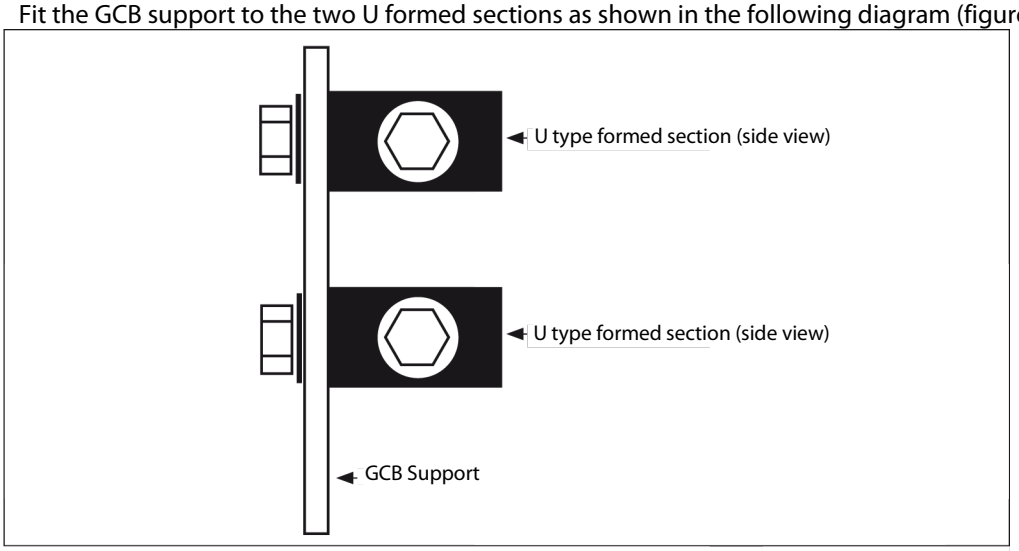


Figure 06

- After fitting the first eye nut, fit the GCB support with the two U formed sections to the two P2 type formed sections (rear view) (see figure 07)

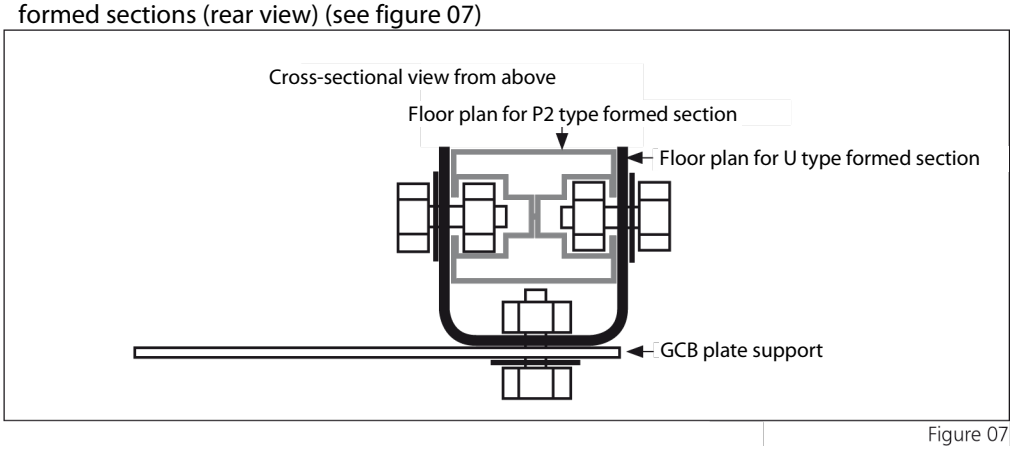


Figure 07

b-2.5. Fitting the P5 type formed section

For this step you need the P5 type formed section, two narrow U formed sections, six short screws, six M plain washers d= 8 and six HU M8 nuts.
Figure 03 shows you where the formed sections are located in the overall construction (red circles)

- Prepare two narrow U formed sections as shown in the following figure (figure 08)

Do not tighten nuts at this point, as you will have to handle the formed sections in the next step!

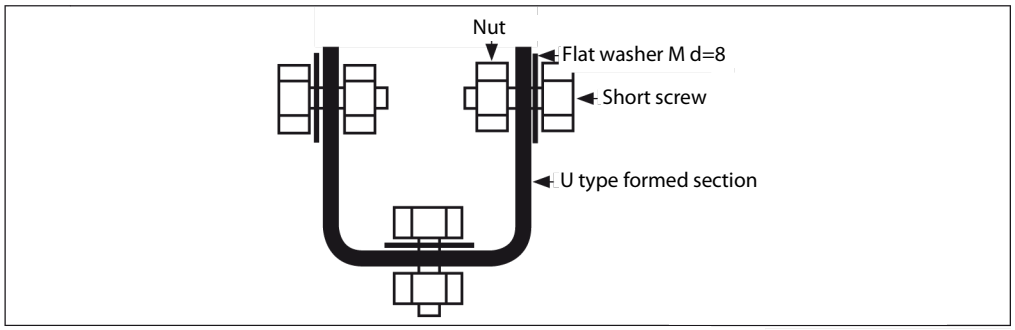


Figure 08

- Fit the two U formed sections prepared with the two P2 type formed sections, as shown in figure 09.

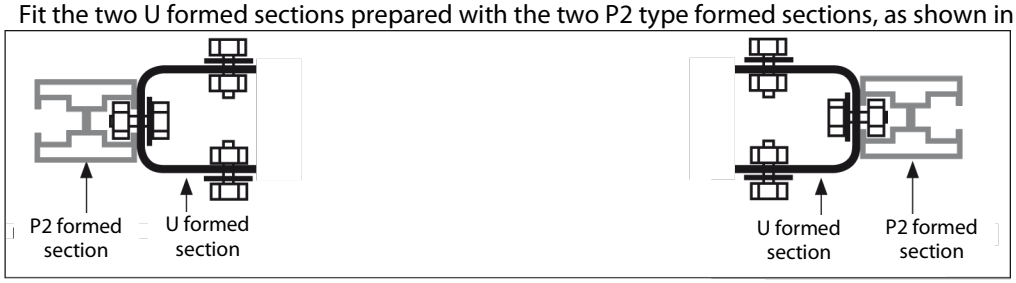


Figure 09

- Attach the P5 type formed section to one of the U formed sections (see figure 10 below) - the attachment is similar to the attachment you performed previously.

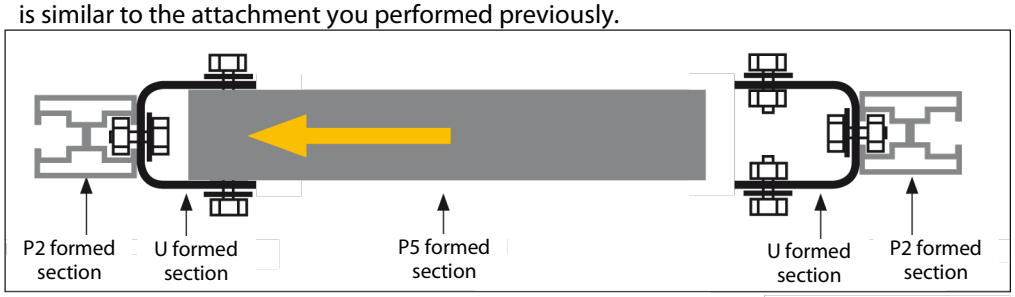


Figure 10

- Tighten the nuts of the U formed section, in which you attached the P5 type formed section
- Attach the P5 type formed section to the second U formed section, which is itself already attached to the second P2 type formed section

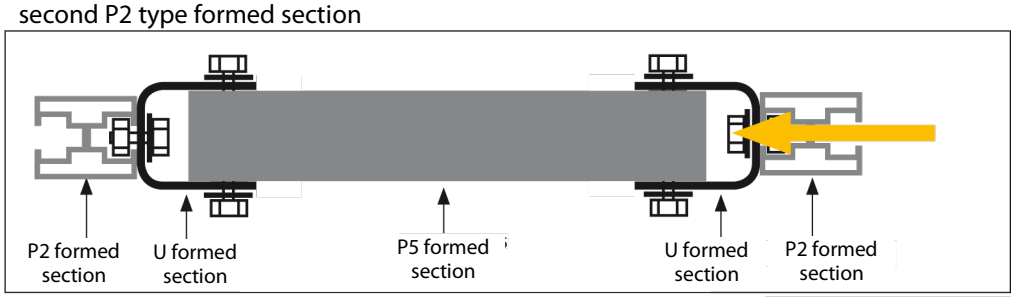


Figure 11

- Tighten the nuts of the U formed section, in which you attached the P5 type formed section
  Ä Your structure should look as shown in the diagram below!

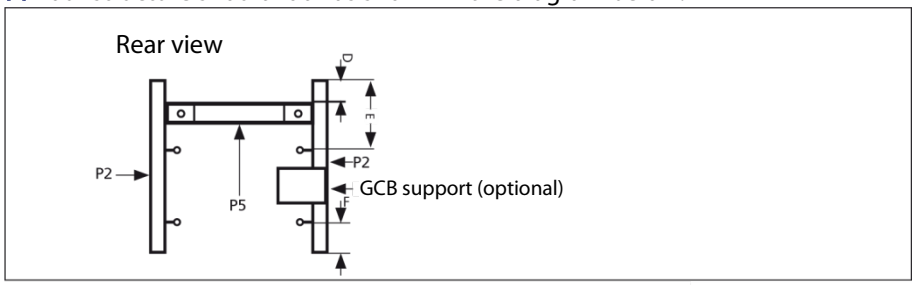


Figure 12

b-2.6. Fitting the P2/P5 constructions to the foundations

Fit the screws, the nuts and the plain washers in the holes in the opposite direction to the equator of the wide U formed sections!!! See figure below (figure 13)

- Fit the two short screws (20mm) in the "Pole" holes of one of the wide U formed sections that you have already fitted to the foundations. You will need a nut and an M 8 mm dia plain washer for each screw. Figure 14 shows how to assemble the bolts.

Do not tighten the screws at this point, as you will need to handle the formed sections in the next step!

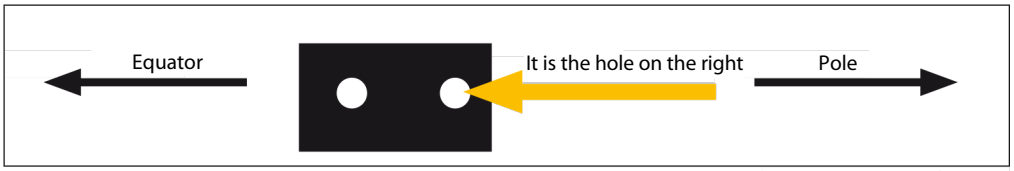


Figure 13

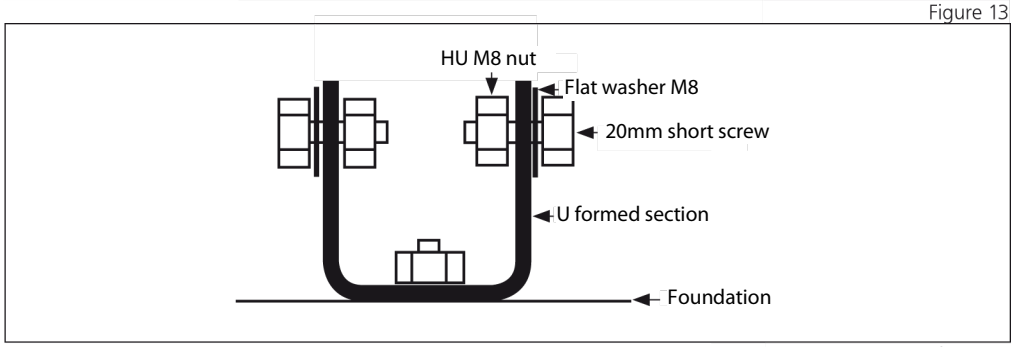


Figure 14

- Repeat this procedure for the other U formed section!
- Attach the screws to the two sides of the P2 type formed section, as indicated in figure 15

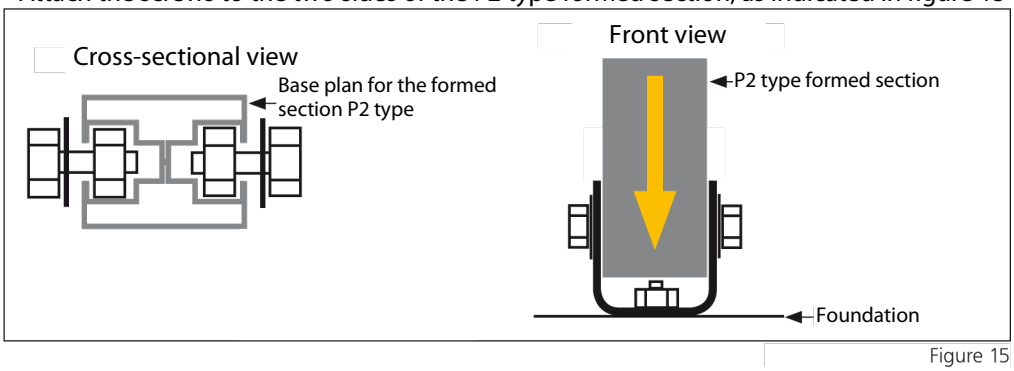


Figure 15

- Make sure that the construction makes a right angle (90) relative to the foundation
- Tighten the screws on both sides
  Ä Both P2 formed sections are now firmly secured to the base (floor).

b-2.7. Fitting the P3 type formed sections

Do not tighten the screws at this point, as you will need to handle the formed sections in the next step!

- Fit two short screws (20mm) to the U formed sections you previously fitted to the foundations. You will need a nut and a small washer for each screw.
  Figure 16 shows how to assemble the screws.

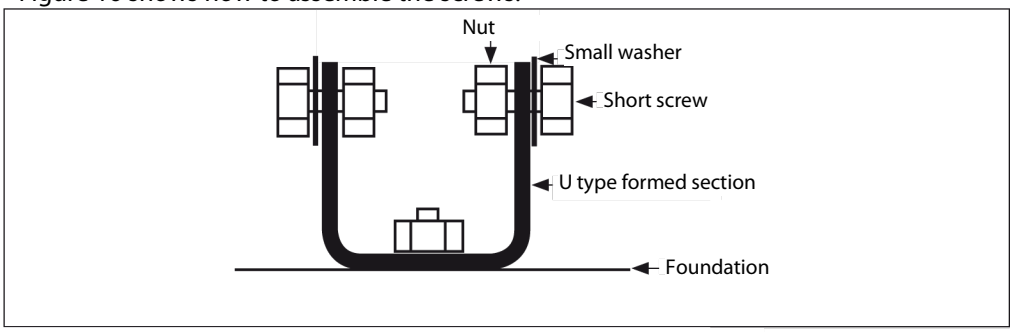


Figure 16

- Repeat this procedure for the other narrow U formed section!
- Attach the screws to the P3 type formed section as indicated in figure 17 on both sides

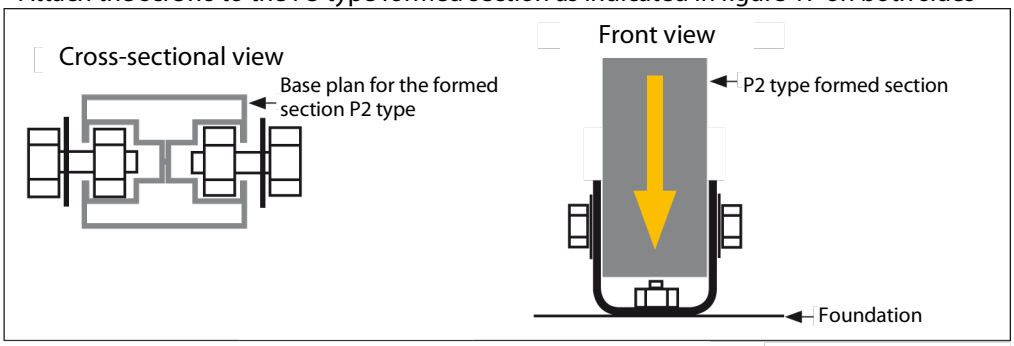


Figure 17

- Make sure that the construction makes a right angle (90) relative to the foundation
- Attach the screws on both sides
  Ä Both P3 formed sections are now screwed to the floor

b-2.8. Preparing the P1 type formed sections

For this step, you will need P1 type formed sections, six narrow U formed sections, 18 short screws and 18 small washers. Figure 18 shows you where the formed sections should be installed in the overall structure (red circles).

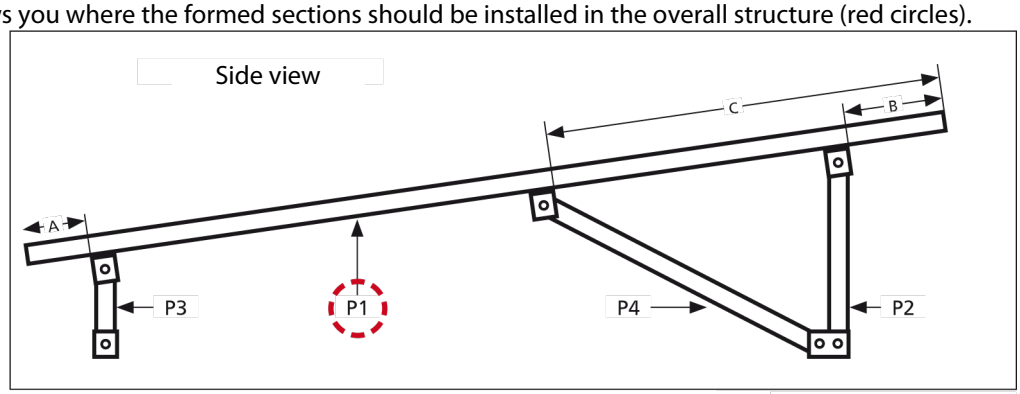


Figure 18

- Prepare six narrow U formed sections as shown in figure 19.

Do not tighten the screws at this point, as you will need to handle the formed sections in the next step!

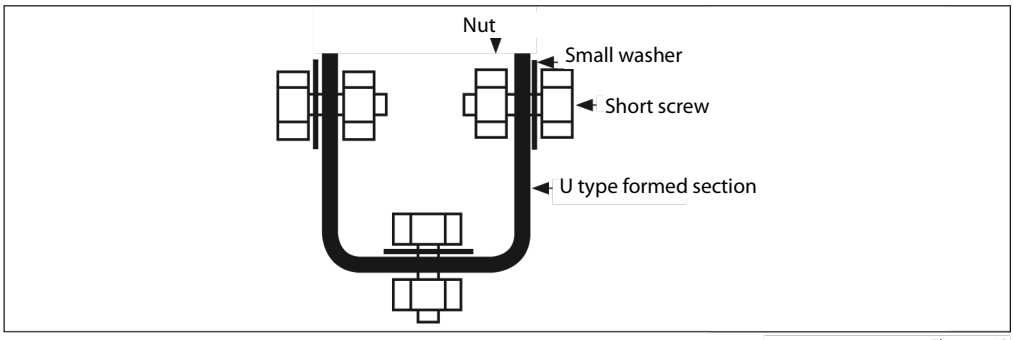


Figure 19

- Install three of the prepared U formed sections to the first P1 type formed section (see figure 20) - Make sure to comply with the distances A, B and C (see figure 21).

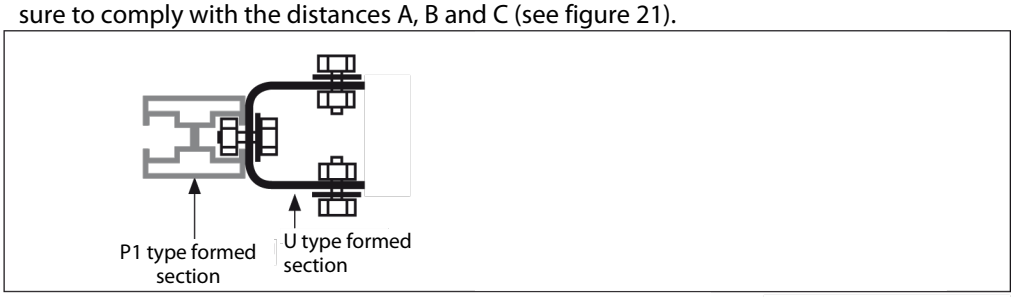


Figure 20

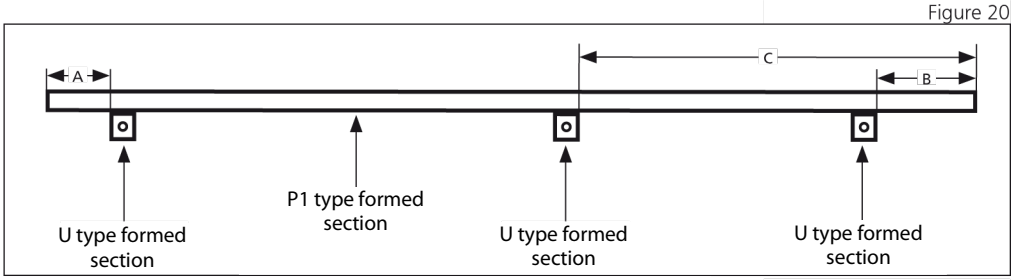


Figure 21

- Repeat this procedure with the other P1 type formed section
- Tighten the screws fitted to the P1 type formed sections
  - Ä Both P1 type formed sections are now ready to be assembled to the P3 and P2/P5 type formed section

b-2.9. Fitting the P4 type formed sections

For this step, you need P4 type formed sections, 4 small washers and 4 nuts.
Figure 22 shows where the formed sections are fitted in the overall structure (red circle).

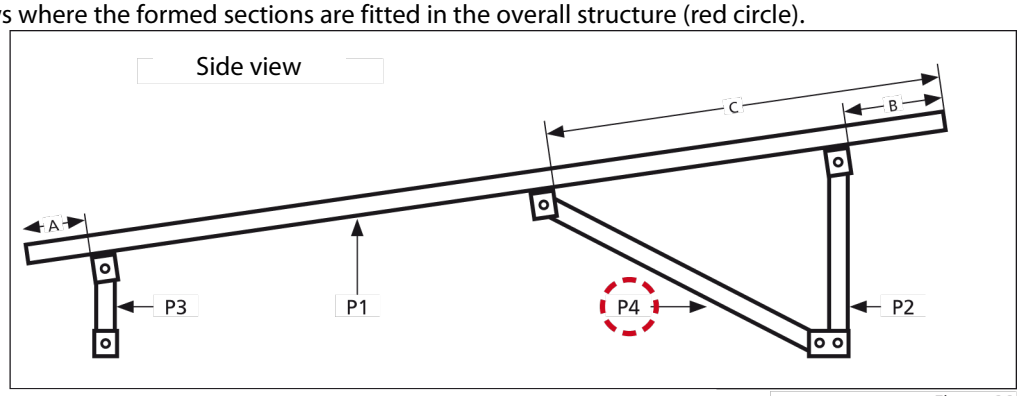


Figure 22

- Fit the short screws (20mm) in the remaining hole in one of the wide U formed sections that you have already attached to the foundations. You will need a nut and a small washer for each screw. Figure 23 shows how to assemble the screws.

Do not tighten the screws at this point, as you will need to handle the formed sections in the next step!

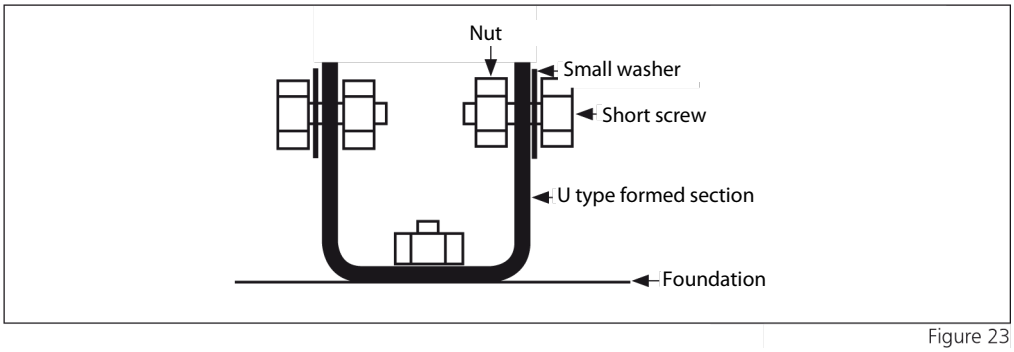


Figure 23

- Mount the Profile P4 into the U-Profile like shown in figure 15 (angle is not so important yet and will be arranged in the next steps automatically
- Repeat this procedure for the other Profile P4
  - Ä The Aluminum Support Structure is ready to mount the Profiles P1

b-2.10. Fitting the P1 type formed sections

For this step, you will need the previously prepared P1 type formed sections.

- Fit the P1 type formed sections to the P4, P2 and P3 formed sections as shown in figure 24 below.

Slight differences can be balanced by adjusting the U formed sections. But make sure that the parts are fitted the right way round!

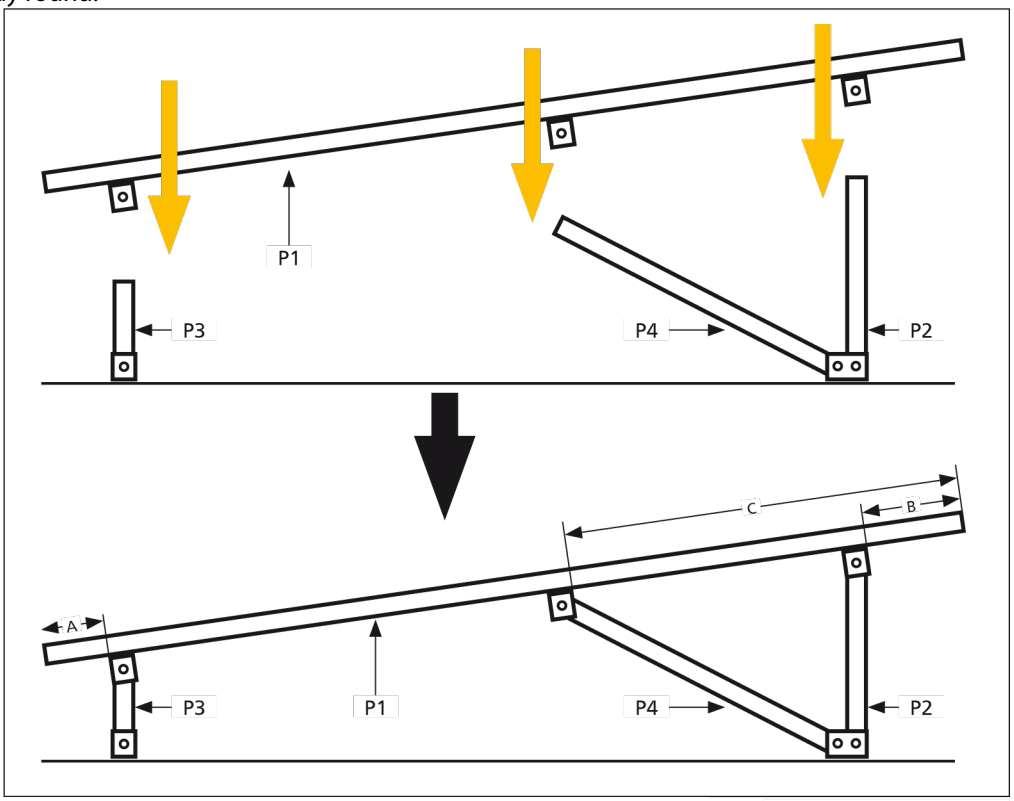


Figure 24

b-2.11. Fitting the safety cables

For this step, you need four shackles, four core lugs, eight cable clamps, two turnbuckles and steel cable.

- Check the length between the eye nuts (diagonally), (see figure 25 - red lines)

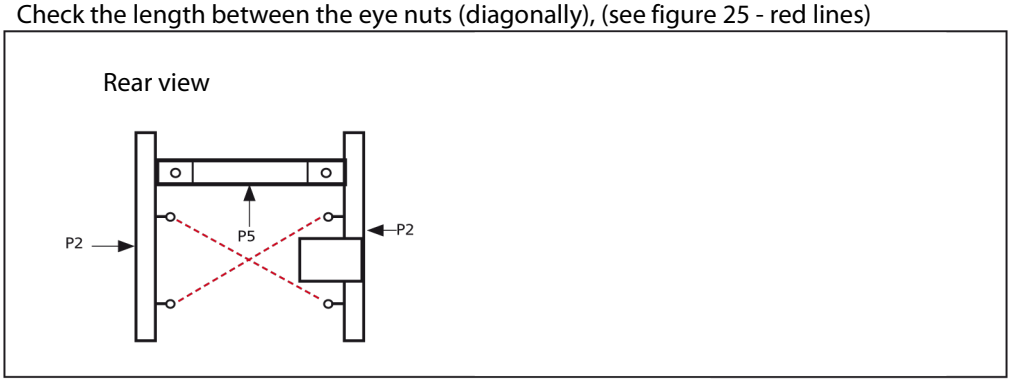


Figure 25

- Assemble the wiring as shown in Figure 26, and make sure that they are the right length.

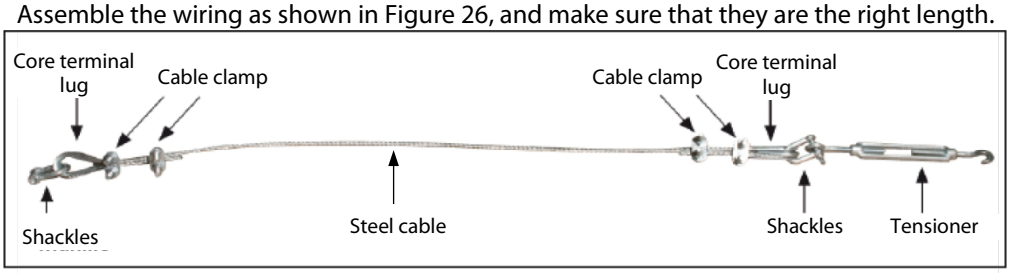


Figure 26

- Attach both cables as shown in figure 25 (red dashed lines) and tighten the cables using the tensioners

b-2.12. Fitting the photovoltaic modules

For this step, you will need fasteners for T and L type modules. Make sure that you have screws and nuts - long screws for attaching T modules and short screws for attaching L modules.

- Prepare two L fasteners as shown in figure 27.

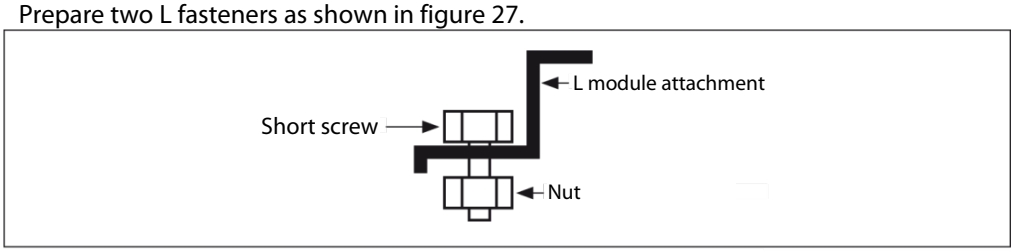


Figure 27

- Screw the L fasteners into each of the two P1 type formed sections as shown in figure 28.

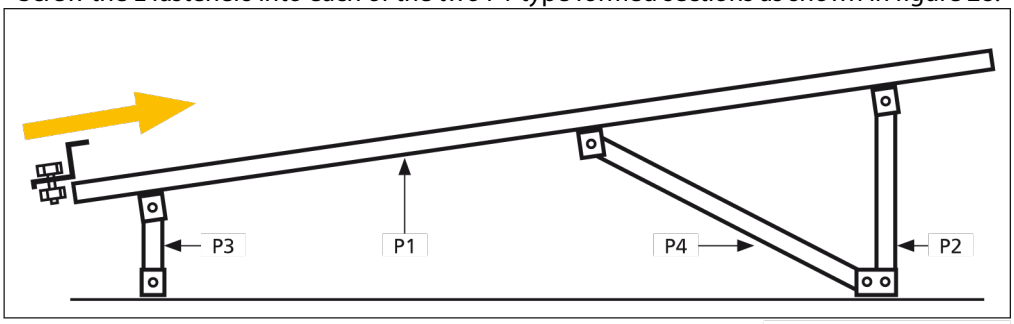


Figure 28

- Fit the photovoltaic module to the two P1 type formed sections and tighten the L attaching screws (see figure 29)

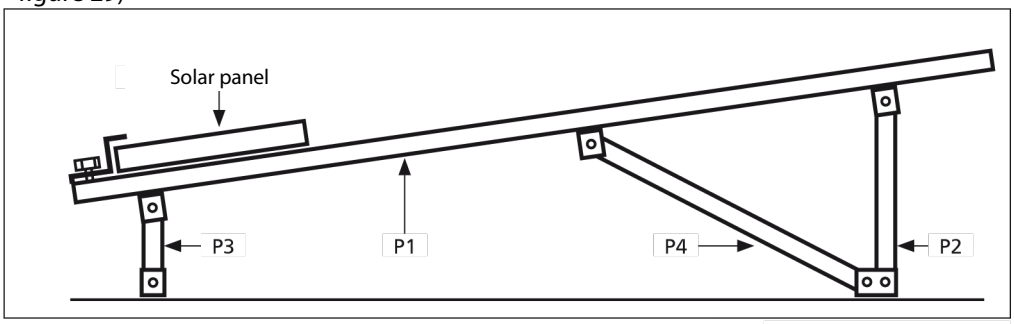


Figure 29

- Prepare two T fasteners (see figure 30)

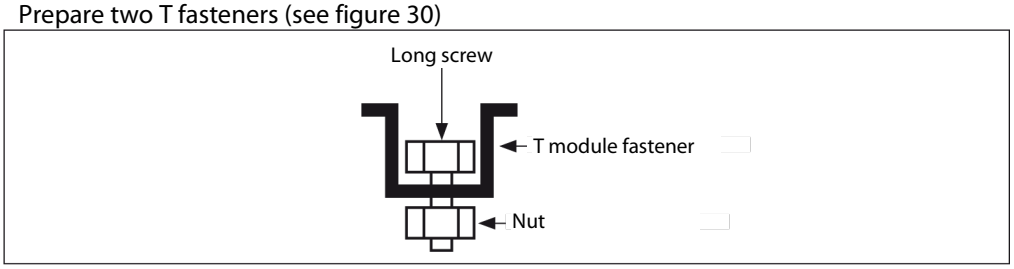


Figure 30

- Fit a T fastener to each of the two P1 formed sections (see figure 31)

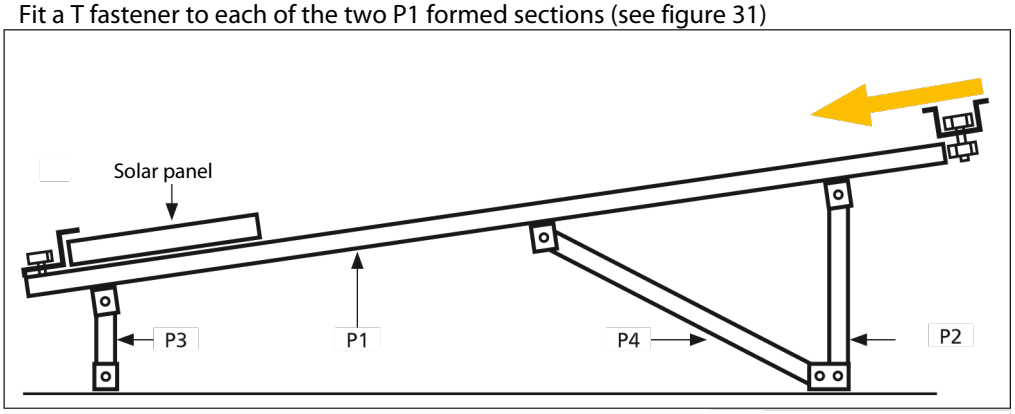


Figure 31

- Fit the second photovoltaic module to the two P1 type formed sections and tighten the T fasteners as shown in figure 32.

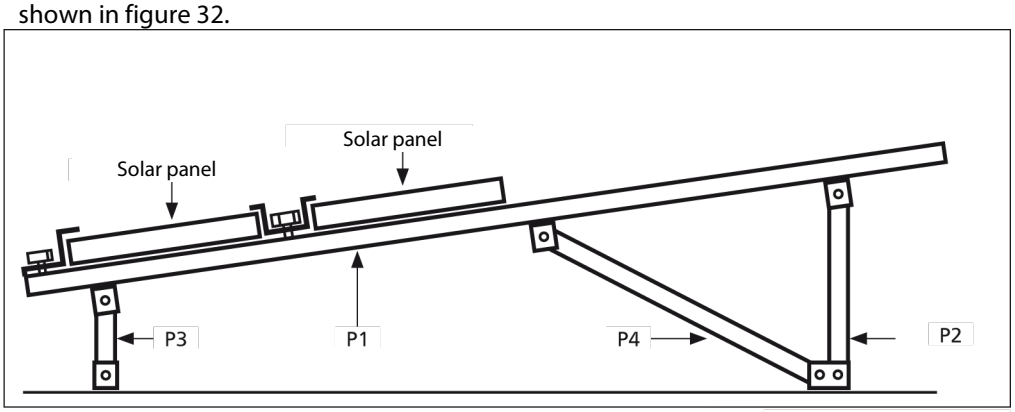


Figure 32

- Continue this procedure until all the modules have been fitted (see figure 33)

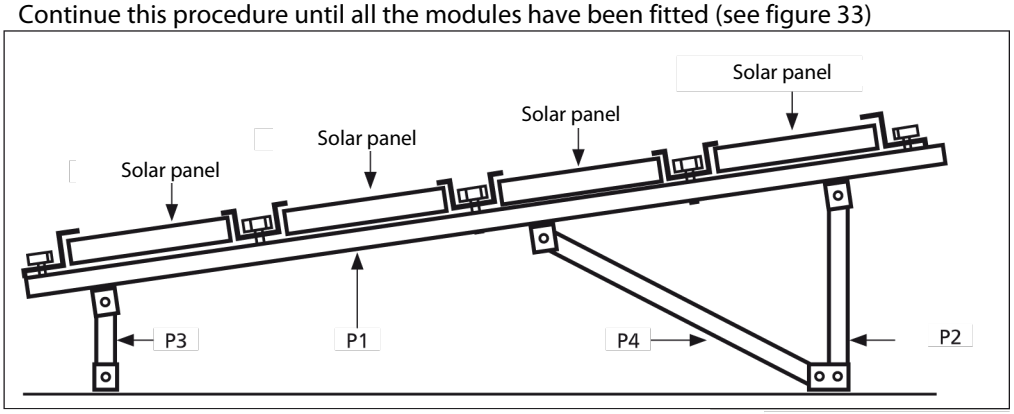


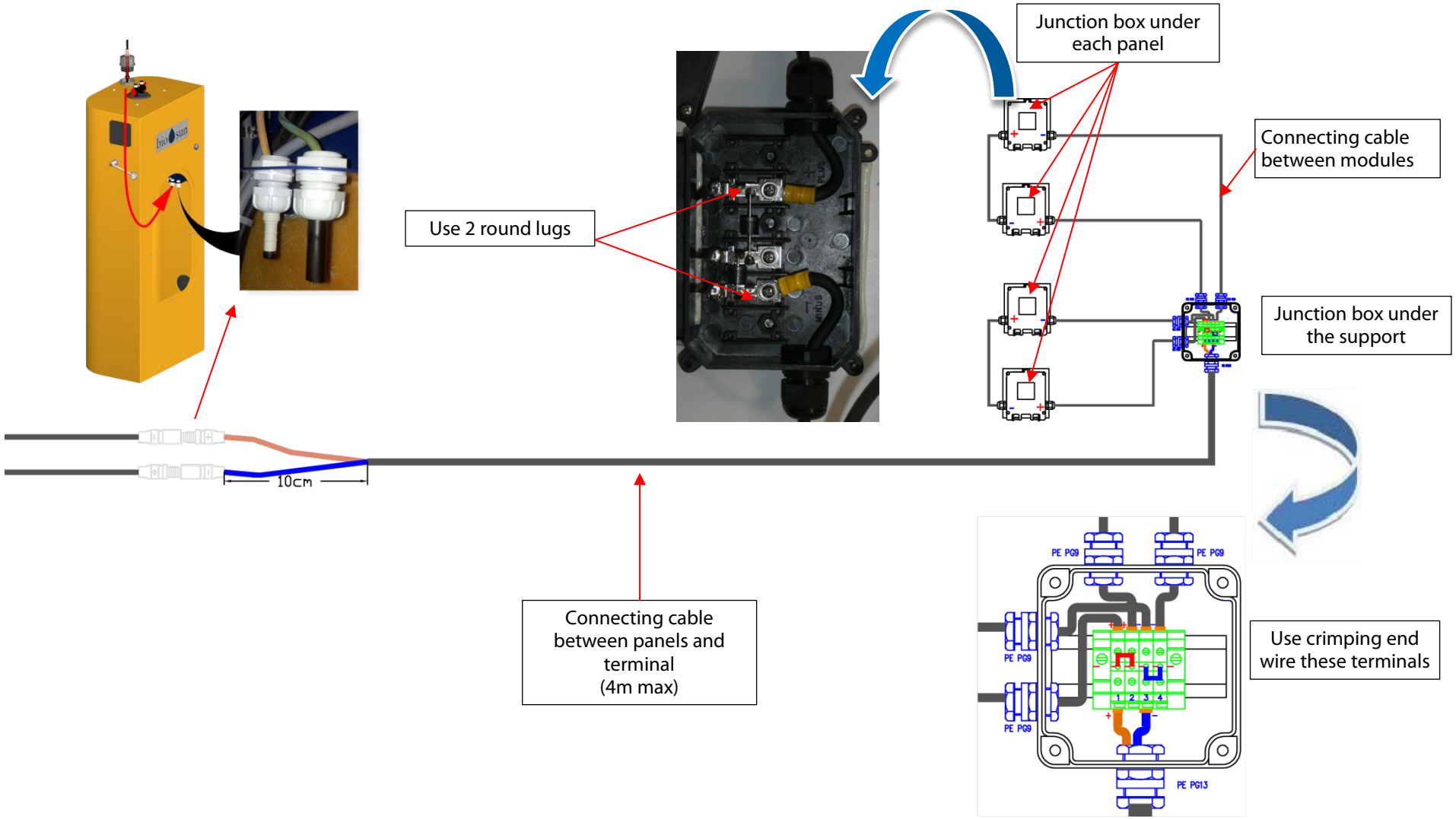
Figure 33

Danger

High risk of injury

- Injury and damage may be caused by structural parts during high winds
- Firmly tighten all the screws to stiffen the whole structure!

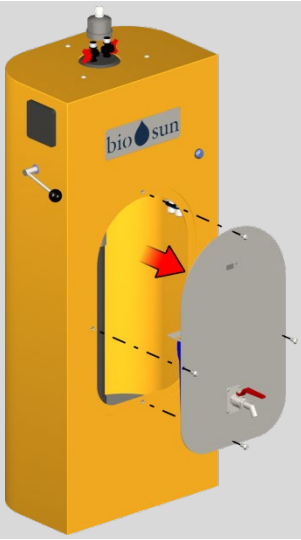
4. Wiring of photovoltaic panels



5. Instruction to mount the BIOSUN 340 terminal

Before starting the installation of the BIOSUN terminal, a concrete foundation must be provided corresponding to the dimensions of the terminal (see template below)

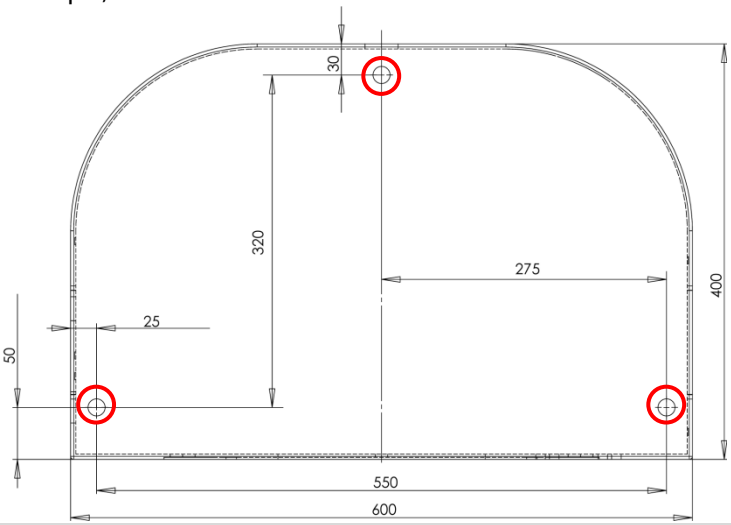
1



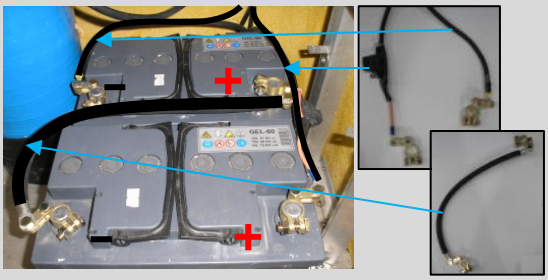
Carefully remove the BIOSUN module front panel with the profided anti-theft Allen wrench , taking care not to damage the hydraulic connections and wiring.

2

Attach the BIOSUN terminal to the floor:
for example, use the 16 mm threaded rod sealed in the floor.

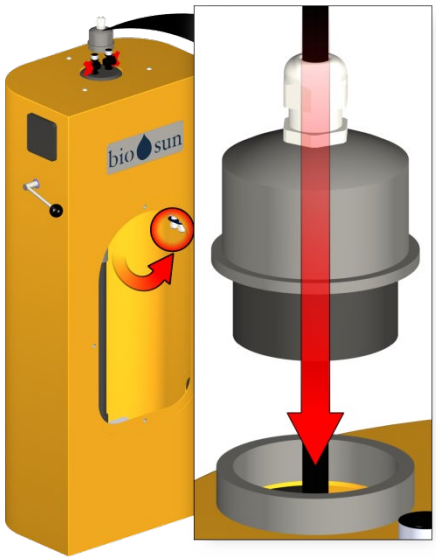


3



Place the battery inside the terminal
Remove the connection covers of the batteries
Connect the batteries in series observing the polarities indicated on the batteries connections.
Mount back the covers on each connection.

4



Feed through the photovoltaic panel cable (after mounting the panels)

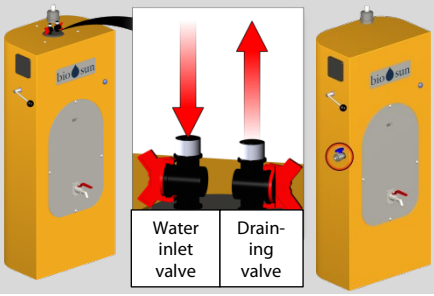
5

Plug the solar panels connectors to the supply connectors inside the BIOSUN terminal (male/female connectors)

6

Refit the BIOSUN terminal front panel

7



Connect water supply :

- On inlet valve if the terminal is equipped with a tank
- On the manual valve placed on terminal side if there is no tank

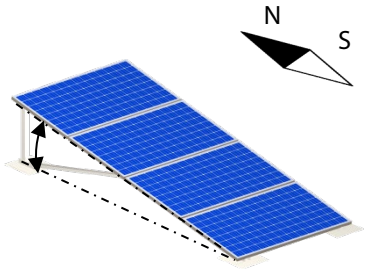
In any case, a ½ BSP threaded fitting will be required to connect a pipe.

E. INSTRUCTIONS FOR THE FIRST COMMOSSIONING OF THE BIOSUN 340 TERMINAL

Check orientation of the solar panel to the SOUTH

LATITUDE	TILT ANGLE
Latitude < 20°	15°
20° < latitude < 35°	Latitude + 10°
Latitude > 35°	Latitude + 15°

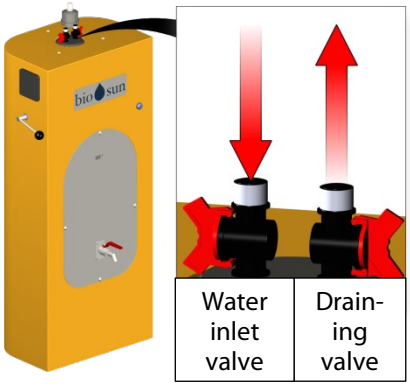
The minimum tilt angle value of 15° provides for "self-cleaning" of the photovoltaic panel and limits the risk of residual moisture.



Charge the batteries with the solar panels for 3 days of sunshine: do not use the terminal.

For terminals equipped with a tank, bleed the air :

- Connect water supply to be treated
- Open both manual valves
- Open water supply
- Close the draining valve once water comes out



Proceed to « **VACCINATION** » of piping :

- Open the valve to discharge about 20 liters then close again
- **Proceed to filter backwash** (see paragraph G.1.Backwashing the filter, page 27)
- **Make flow water with chlorine through the whole circuit**.
- Open slightly the treated water valve **to let water flow during 10mn**

F. INSTRUCTIONS TO USE THE BIOSUN 340 TERMINAL

IMPORTANT

- **USE A CLEAN DRUM:** must be suitable to store drinking water and must be regularly cleaned
- STORE THE DRUM IN A PLACE AS SHELTERED FROM LIGHT AND EXTREME TEMPERATURES AS POSSIBLE
- CONSUME THE STORED WATER DURING THE DAY.

1. Production

- The terminal should **not operate for more than 10 hours a day**, i.e. when set to the "ON" position with the blue LED light lit (see below).
- The terminal produces 2000 liters or 540 gallons a day: This production ensures the correct operation of the batteries and the terminal's standalone operating time of 3 days.
- The BIOSUN 340 terminal should be set to the ON position for the entire planned production time: do not switch the BIOSUN 340 terminal on or off according to the flow.
- If the BIOSUN 340 terminal's flow drops very significantly, the filter should be backwashed (see G.1. Backwashing the filter, page 27).

2. Start-up the terminal

1 Switch ON the BLUE button : it should light on

Set the volume to zero:

2
- Open the valve to make the water flow and thus turn on the water counter
- Press RESET for 5 seconds on the water counter

3 Before using the BIOSUN terminal, wait for 5 minutes that UV lamp is warmed then let flow and discard about 1 liter of water

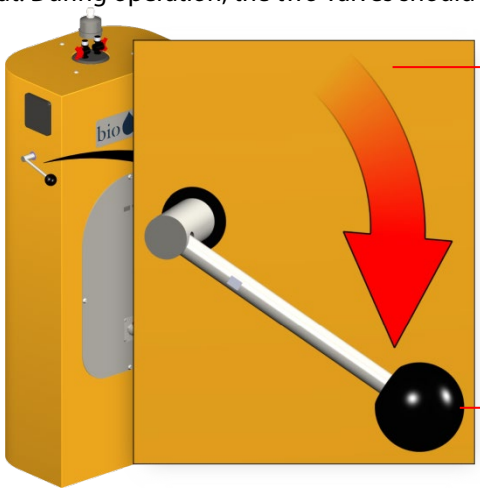
4 The BIOSUN terminal is ready for production

- The daily production should be monitored using the water counter, so as not to exceed a production of 2 m3 of water per day.
- It is important to use the BIOSUN terminal on a regular basis. If the terminal has not been used for several days, a disinfection rinse is required (see G.4. Preventive disinfection).

G. INSTRUCTIONS FOR SERVICING OF THE BIOSUN 340 TERMINAL

1. Backwashing the filter

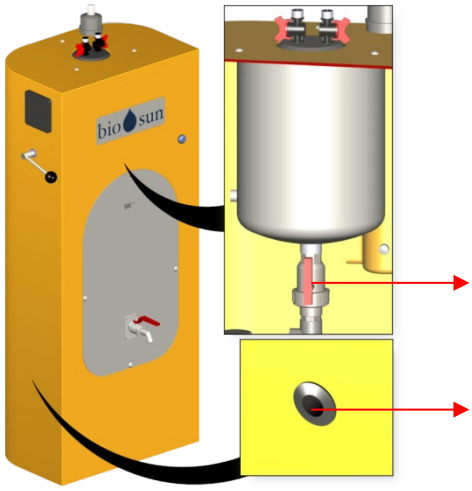
It is recommended that a filter backwashing operation be performed once a week as a preventive measure.
When the flow rate of BIOSUN terminal decreases, this means that the filter is clogged: A filter backwashing operation should be carried out. During operation, the two valves should be set to the "filtered" position.



To backwash, lower the handle to the "Cleaning" position for a few seconds until water comes out clear. During this operation, the water exits through the drain hole at the rear of the terminal.

2. Tank draining

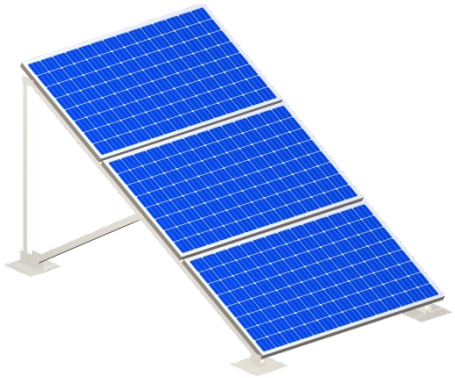
When suspended solids have settled at the bottom of the tank, they must be removed using the draining valve



The tank draining valve should always remain closed when the terminal is in normal operation

3. Solar panel cleanliness

Regularly, make sure that the solar panels remain clean.



4. Preventive disinfection

Once a year, the terminal must be vaccinated:

- Place some bleach in the full tank and let the water run until it smells of chlorine.
- Leave to act for 2 hours.
- Drain the tank and rinse twice.

5. Functional check of the photovoltaic power supply

The solar charging regulator consists on the following components:

1. Information LED
2. 4 LEDs indicating the charging status (red, yellow, green 1 and green 2)
3. Junction box for connecting the solar panel
4. Junction box for connecting the battery
5. Junction box for connecting the electrical components

LED displays

LED	State	Meaning
Information LED	Green comes on	Normal operating mode
	Red flashing	Error status (see "Errors and resolution")
Red LED	Flashes quickly	Battery discharged, charging state <40%. Charging is disconnected if the decrease in the charging state is more significant.
	Flashing	Charging disconnection, charging state <30%
Yellow LED	Comes on	Battery charge low, charging state <50%
	Flashing	Re-engagement threshold not reached after charging disconnection, state of charge between 40% and 50%
1st green LED	Comes on	Battery normal, charging state >50%
2nd green LED	Comes on	Battery fully charged, charging state >80%
	Flashes quickly	Battery fully charged, charging regulation enabled (charging current decreases)

H. PROCEDURE FOR LAP, QUARTZ SLEEVE OR SEALS REPLACEMENT

These operations should be done at least once a year and:

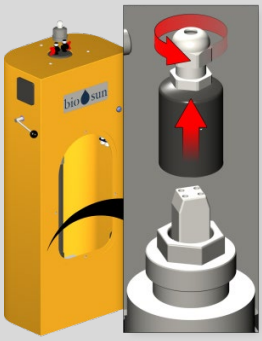
- At each replacement of lamp (**once a year**), quartz sleeve or seal
- To check/clean the quart sleeve

1 

The terminal must be POWERED OFF, with the WATER SUPPLY CLOSED and DRAINED (treated water valve open).

2 

Remove the front plate to access inside of the terminal

3 

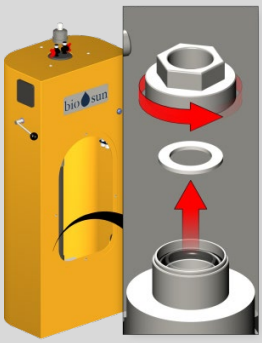
Unscrew the gland to release the lamp cable
Remove the reactor cover

4 

Grasp the 4-pin connector and pull the lamp gently upwards.
When the lamp has been withdrawn by a few centimeters, **remove** the connector, grasp the socket and **disengage** the lamp from the quartz sleeve remaining well aligned with the axis.

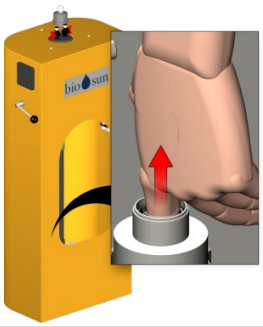
 **Carry out this operation carefully** without touching the glass of the lamp with the hands

 **Do not let the lamp fall into the quartz sleeve, it could break off into the quartz sleeve and damage the quartz**

5 

Unscrew the stainless steel nut.
Remove the flat washer.

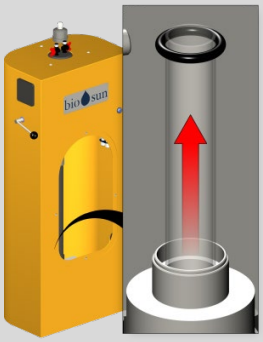
6



<u>Remove carefully the quartz sleeve :</u>

Insert a thumb or finger in the sleeve and withdraw it gently until the seal comes free from its housing, while remaining well aligned with the axis.

7

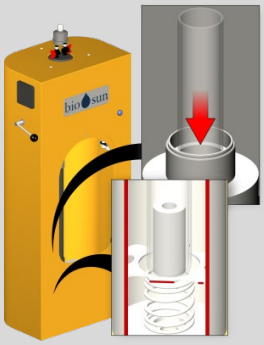


Take hold of the quartz sleeve and extract it fully, making sure that you keep it **ABSOLUTELY** well aligned with the axis.

8

Clean the quartz sleeve with acid or white vinegar or replace it if necessary.

9



Make sure the tubular sleeve is in place at the bottom of the quartz sleeve

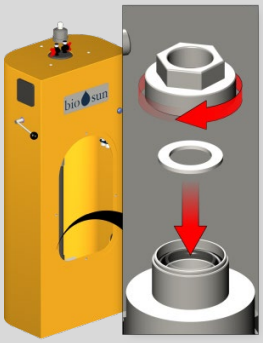
While remaining well aligned with the axis, introduce the clean quartz sleeve into the reactor to its guide at the bottom of the reactor.
With your finger inside the sleeve position the quartz into the spring seat at the bottom of the reactor. The quartz should be slightly out.
If the quartz is correctly positioned in the seat, flexibility can be felt by pressing on it (spring effect).

10

<u>Replace the o-ring :</u>
(Mount a new seal at each lamp replacement)

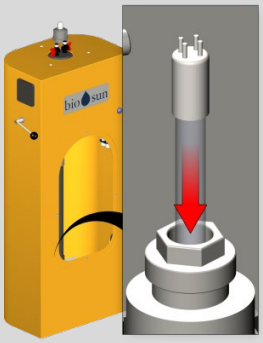
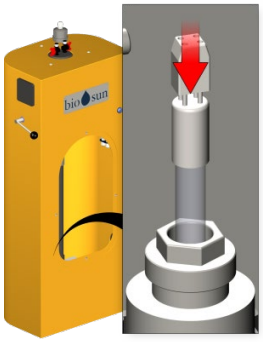
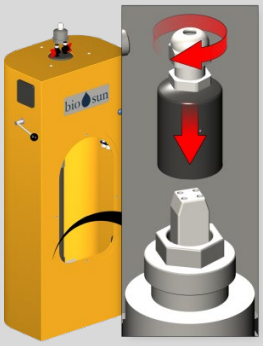
- Apply water and soap on the seal,
- Position it around the quartz sleeve,
- Fully push it into its location with the finger or the flat washer (do not use tools).

11



Replace the flat washer.

Screw back normally the stainless steel nut with hand

12		Put the installation back in pressure **before** the reassembly of the lamp and **check that there is no leakage in the quartz sleeve**.
13		Take hold of the new lamp taking care not to place your fingers outside the cap. (if you do, clean the lamp with a soft cloth and some methylated spirits). Insert carefully to the three quarters of the new lamp into the quartz sleeve.
14		After engaging the lamp to the three quarters, **plug** again the connectos on the lamp. **Do not force** (there is a way to plug it). **Engage** fully the lamp into the quartz sleeve.
15		Mount the cover. Fully push the cable and tight the gland.
16		Mount the front cover on the terminal
17		The device is ready for operation.

I. REPLACEMENT OF THE FILTER CARTRIDGES (OPTION)

1

Unscrew the transparent filter bowl.
It is a good idea to place an empty bucket under the filter before removing it.
Recover the water.

Replace the cartridge.
Do not invert the cartridges !

2

1. Active carbon cartridge

2. 10µ Cartridge

3

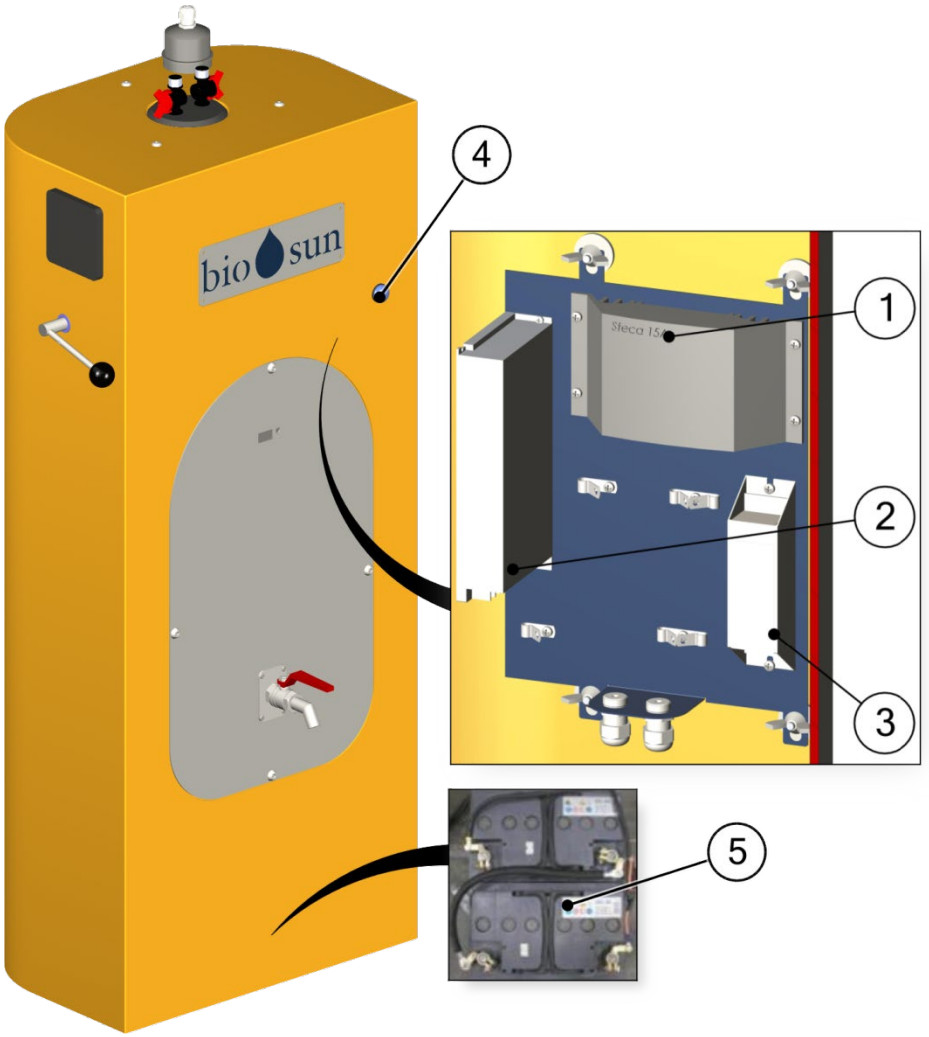
Place the cartridge in the transparent filter bowl and screw the bowl back onto the filter head.

J. MAINTENANCE FILE

AUTION:
This sheet must be kept up to date.
It provides a record of the **reactor's operating cycle**.

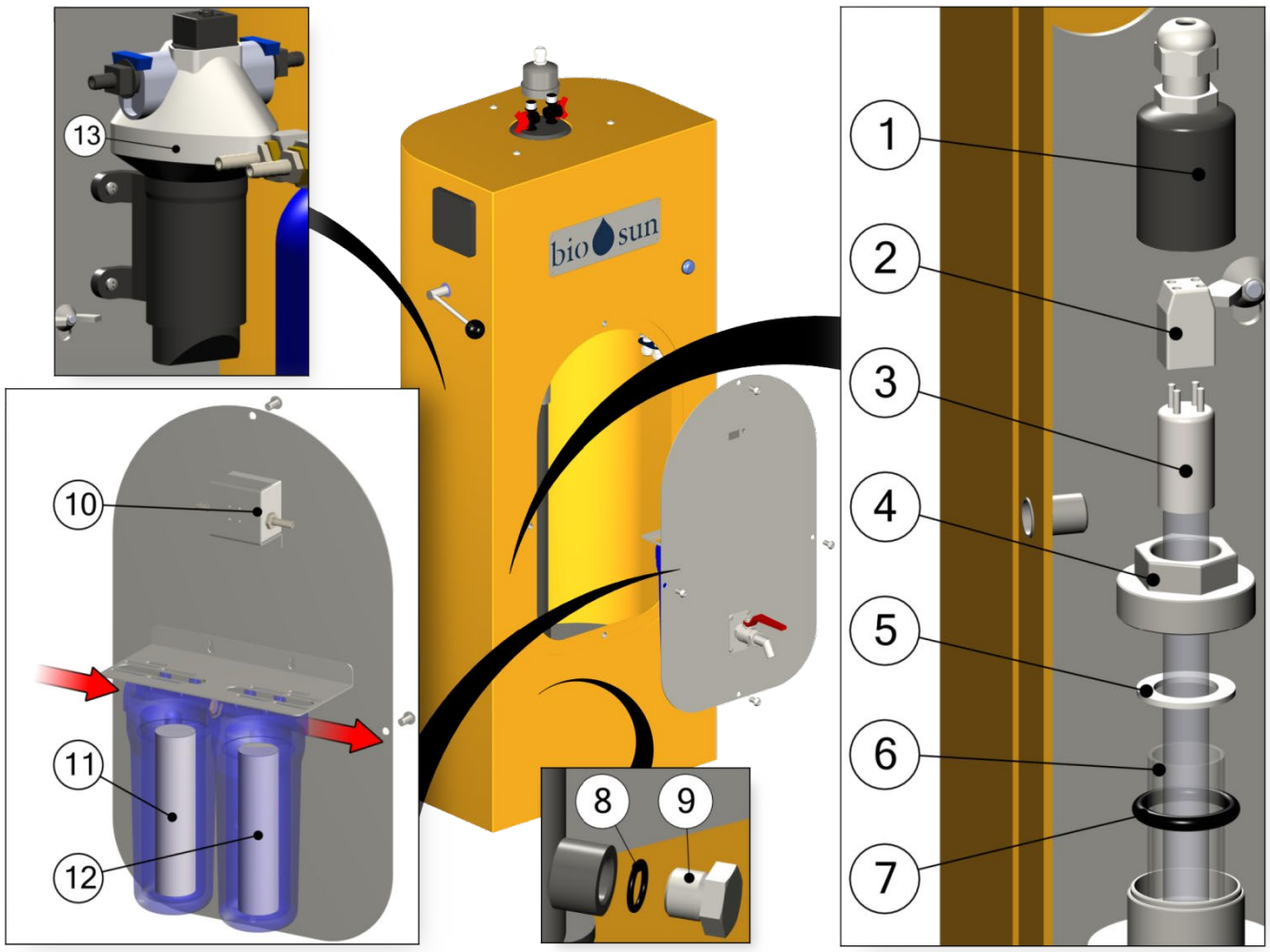
Date	Counter	Carried out action	Done by

K. ELECTRICAL DESCRIPTION



TAG	DESIGNATION	REFERENCES	QUANTITY
1	Photovoltaic power supply 15A	ELE006460	1
2	Converter 19-36VDC/24VDC	ELE006742	1
3	Ballast	BAL005248	1
4	On/Off lamp button	ELE006352	1
	NO Contact	ELE000275	1
	Blue light	ELE006353	1
5	Battery	ELE006462	2

L. BLOWN UP VIEW



TAG	DESIGNATION	REFERENCE
1	Nut protection	VIS004279
2	Lamp socket	ELE002603
3	Lamp	LPE004432
4	Sealing nut	USI004134
5	Protection washer	PIE000659
6	Quartz sleeve d25	QUA000016
7	O ring d25	JTS000100
8	O ring d10	JTS000230
9	Draining plug	ACC000410
10	Water counter	ELE006480
11	Filtering cartridge 10µm	CAR004467
12	Filtering cartridge with active carbon	CAR004468
13	Pump	PPE006459

M. ERRORS AND REMEDIAL ACTION: REGULATOR

Error	Cause	Remedial action
No display	Battery voltage too low	Precharge the battery
	Blowing of the external fuse in the battery connecting cable	Replace the external fuse
	The battery is not connected	Connect the battery observing the polarities the right way round
	Battery connection polarities reversed	
	Faulty battery	1.Disconnect all the connections 2.Re-connect the (new) battery with the polarities the right way round 3.Reconnect the solar panel and electrical components
Information LED flashing red	Charging interrupted due to the charging current being too high	Charging continues automatically when the charging current has reached an authorized level again
Electrical components cannot operate or are inhibited for a short period + Information LED flashing red	The output of the electrical components is disconnected due to high current consumption	¶Decrease the current consumption and disconnect or unplug the electrical components if necessary. ¶Check the electrical components.
	The output of the electrical components is disconnected due to a short-circuit at this level.	1. Disconnect the electrical components. 2. Eliminate the short-circuit cause. 3. Reconnect the electrical components.
	The output of the electrical components is disconnected due to overheating of the solar charging regulator.	The output of electrical components reconnects automatically when the solar charging regulator has cooled down. ¶Improve the air flow for cooling. ¶Prevent any influence from other heat sources. ¶Check the operating terms and the installation site.
Consumer operation not possible + Information LED flashing red + The battery red LED light flashes	The output of the electrical components is disconnected due to the battery voltage being too low.	The output of electrical components reconnects automatically as soon as the battery voltage reaches the threshold value. ¶Precharge the battery. ¶Fit any electrical components connected directly to the battery with a system providing protection against deep discharges. ¶Check the battery and replace it if necessary.
Electrical components cannot operate + info LED flashes red + 2nd LED flashes green	The output of the electrical components is disconnected due to the battery voltage being too high.	The output of electrical components reconnects automatically when the battery voltage reaches an authorized level.
	Faulty grounding.	¶ Check the grounding.
	No voltage limitation for external charging sources.	¶ Check the external charging sources. ¶ Disconnect any external charging sources, if applicable.
Electrical components cannot operate + Green information LED	Faulty consumer or faulty installation.	¶ Connect the consumer correctly. ¶ Replace the consumer.
The battery is not charged	The solar panel is not connected	¶Connect the solar panel
	Solar panel connection polarity reversed	¶Re-connect the solar panel with the polarities the right way round
	Solar panel input short-circuited	¶Eliminate the short-circuit cause
	Solar panel voltage incorrect	¶Use the solar panel with the required voltage
	Faulty solar panel	¶Replace the solar panel
The battery display jumps quickly	High pulse current	¶Adjust the absorbed current to the battery's capacity
	Faulty battery	¶Replace the battery
The terminal's flow rate decreases	Filter clogged	The filter should be backwashed (see page 27) With the cartridge filter option: if filter backwashing does not solve the problem, the filter cartridges must then be renewed or cleaned if they are cleanable.

The front panel blue light does not come on	Problem on regulator, UV lamp or ballast power supply	Check the battery charging light Red LED: Charge Low Green LED: charge OK 
		Make sure that the voltage across the DC/DC converter terminals is 24V +/- 1V. ¶ If the voltage is too low, refer to the next question. ¶ If the battery is charged, replace the UV lamp ¶ If replacing the UV lamp does not solve the problem, then replace the ballast.
The converter output voltage is low: it must be 24 V +/- 1V	Bad wiring	Check the wiring; all connectors must be properly tightened.
	Battery charging in progress	Check the battery charging level: If it is low (red LED), then let the battery charge without using the BIOSUN terminal until the battery charging indicator is green.
	Converter out of order	If the two previous operations have no effect, the converter must then be replaced.

N. FREQUENTLY ASKED QUESTIONS

Questions	Answers
Operating characteristics	
What are the technical reasons for limiting use to 4 hours a day?	Because after 4 hours, the batteries are too discharged, and the BIO-SUN terminal operation can no longer be ensured for the following days (as it is calculated on the basis of statistics depending on sunshine). The service life of the batteries would also be significantly penalized.
Motor-drive pump feeding? Under what conditions, terminal tank pressurized?	The desired information are shown in the BIO-SUN 85 column, for the pressurized supply model: . Supply type - 1.5 bar pressurized system . Maximum pressure: 3 bars.
Is a timer used to program the terminal for a battery life of 3 days with a daily use of 4 hours?	No.
What is the difference between BIO-SUN 85 and BIO-SUN 340?	The BIO-SUN 85 terminal does not have a built-in pump and is fitted with one solar panel (for pressure feed) and one battery. The BIO-SUN 340 terminal has a built-in pump and is fitted with four solar panels and two batteries.
And what about the number of production hours: 4hours/day mentioned in the catalogue. Can the unit be used for 8 hours in one day assuming that it will then only have a battery operating time of two days instead of three days?	No, the terminal must be used under the defined conditions.
How much sunlight time is needed to fully charge the battery?	3 days, which is why, on commissioning, the BIO-SUN should not be used for 3 days.
After 2m3 of water treated in a day, does the UV lamp go off to mean that the water is no longer drinkable? Or does the battery stop working after 4 hours of operation?	It's manual, the volume meter acts as a control. There is no automation: it's intentional.
Should the battery be used until discharged to ensure it has a longer service life?	Absolutely not.
Can BIO-SUN units be used directly on the normal power grid (220V)?	The battery supply is 12 V. As the principle of the BIO-SUN is standalone operation, it cannot be connected to the normal power grid (220V).
UV reactor	
What is the service life of the UV lamp?	The UV lamp should be replaced once a year.
Water supply	
Where is the outlet for evacuating the dirty water?	At the rear of the terminal.
Maximum permitted turbidity	about 5 NTU.
in the event of high turbidity: what is the recommended treatment upstream?	Filtering possibly with coagulation/flocculation, but this really depends on the water qualities, and there is no absolute rule.
Filtering	
How long does the zeolite filter guarantee last?	There's no guarantee on the media itself On the filter body itself = terminal guarantee, in other words for one year.
In what case is the activated carbon filter recommended?	this serves to reduce organic matter, pesticides and heavy metals.
Is there a signalling/indication/alarm system? For example, to confirm that the water coming out is well purified or to indicate when the cartridges/filters need replacing.	There is no signalling/indication/alarm system on our cartridge filters (for example, carbon filter): the filter cartridges should be replaced every 3 months or so Zeolite washable filter: guaranteed for 1 year, service life 5 years.
How long does it take to filter 20 gallons of water?	The water treatment is instantaneous, and the maximum flow rate is 500 liters/hour.
How do you replace the cartridges and filters?	By unscrewing them.
And what if the water entering the unit (tap or river water) has a certain taste (bleach/other)?	In this case, choose the cartridge filter option as this is what the activated carbon is intended for.
Water quality	
What if the water entering the unit is acidic, which is often the case in the mining sector in RDC?	BIO-SUN's primary objective is to make water bacteriologically safe. However, BIO-SUN does not address acidity issues.

O. WARRANTY TERMS

The terms of guarantee for the equipment in the BIO-UV range are as follows:

- **2 years** for all components with the exception of the UV lamp (consumable).
  Exclusions:
  The electrical components are not guaranteed against overvoltage or lightning strikes.
  Modification and addition of components in the electrical cabinets
  Use of spare parts that do not originate from BIO-UV
  Non-compliance with the installation instructions
  Reactor having been operated without being full
  Non-compliance with the operating and maintenance instructions.

Note: the housing, the quartz sleeve and the lamp are not guaranteed against breakage.

- **Faulty parts must be sent back to BIO-UV** with details of the **type** and the **equipment serial number.** BIO-UV will replace them after carrying out a technical survey.
- **The cost of shipping will be shared** between the retailer and BIO-UV.
- **The guarantee** takes effect on the day of the installation of the equipment: this date must be communicated to BIO-UV by sending the guarantee validation by post or by fax.

Note: If the guarantee validation is not sent back in the month following purchase of the equipment, BIO-UV will take the date of effect of the guarantee as being the month and the year the equipment was manufactured.

- **If the installation rules and instructions for use are not complied with**, BIO-UV cannot be held liable and the guarantee cannot be invoked.

The BIO-UV team, at your service.

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ANNEX 1:
Clearance dimensions, Blown up view, Designation

ANNEX 2:
Electrical diagrams