

HYDROGENERATEUR H240 INSTALLATION MANUAL

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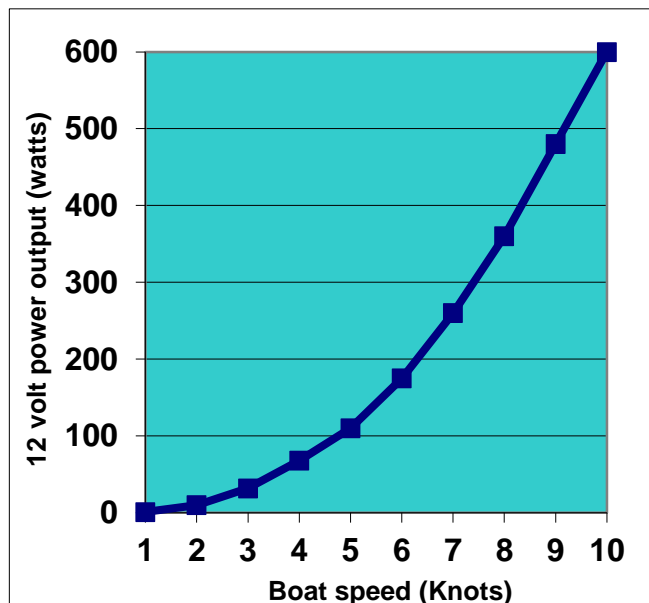
1. Scope of application of hydro Save Marine H240

1.1 Energy production

The hydro Save Marine H240 is a device for converting the mechanical energy of a fluid into electrical energy. Specifically, it can charge the batteries of your sailboat. It is designed to produce energy from 1m / s (less than 2 knots).

The production increases with the boat speed according to the following curve to reach a maximum of 600W at 10 knots:

These performance values are given as an indication. Actual values depend on the installation conditions, use, navigation and charging status of batteries.



Beyond 10 knots, the controller stabilizes the power generation to 600W maximum.

Operating limit: The hydro is optimized for speeds between 3 and 8 knots. **From 10 knots it is requested to raise it.**

In case of Overspeed or shock the automatic Clamcleat activates and release the hydro which floats horizontally (see description below).

1.2 Battery Compatibility

This product is designed to recharge service batteries of a cruising sailboat and not to be connected directly to another device.

Currently three types of batteries can be combined with this material:

- Lead acid batteries with liquid electrolyte.
- The AGM batteries (gel electrolyte).
- The Lithium-Ion batteries only if they are equipped with their own charge controller.

2. Safety instructions for the user

The hydro is not harmless because of the pale rotational movement and power generation. Please read carefully the following safety instructions.

2.1 Dangers mécaniques

The rotation of the turbine blades can be carried out at high rotational speeds and is potentially dangerous:



Never touch the blades when rotating.



Never try to stop them by hand.

The hydro has a hinged mechanism to enter and exit the water quickly and easily:



Do not insert fingers in the hydro mechanism as you pull on one of the ends meet.



When bathing, do not climb on the boat relying on hydro.
It is advisable to remove it for swimming, the handling of the Annex and port maneuvers.

2.2 Electrical hazards



The flow of electricity on a boat is a potential danger. All precautions are taken to avoid a sealing problem of wiring the hydro (waterproof cables, custom made and IP65 connectors). If the material is deteriorated prematurely (friction, crushing the cables ...), immediately stop using the hydro.



The electronic box provided with hydro has a heat sink to dissipate the heat: Do not touch the electronic box in operation. Avoid putting it in direct contact with materials that can be affected by heat (for example tissues).

2.3 List of parts supplied

- A. Check for the following items before starting assembly onboard Marine hydroH240 Save:
- B. a hydro
- C. a control arm
- D. docking plate
- E. a counter plate
- F. mounting hardware of the home plate and the counter plate
- G. an electronic box
- H. the electronic box mounting hardware
- I. a black 5m cable which is connected, a connector on one side and a through-hull on the other
- J. through-hull fastening screws
- L. a black 3m cable which is connected to a connector on one end and a terminal eyelet of the other
- M. a red 3m cable which is connected to a connector on one end and a terminal eyelet of the other
- N. two lugs M8 eyelet for batteries
- O. A drilling template for the through-hull
- P. A Rapporteur paper to identify the angle
- Q. A "disconnecter" to remove the connections and adjust the length of the cables (blue tool).

2.4 Materials not provided but to be provided for the installation of the hydro:

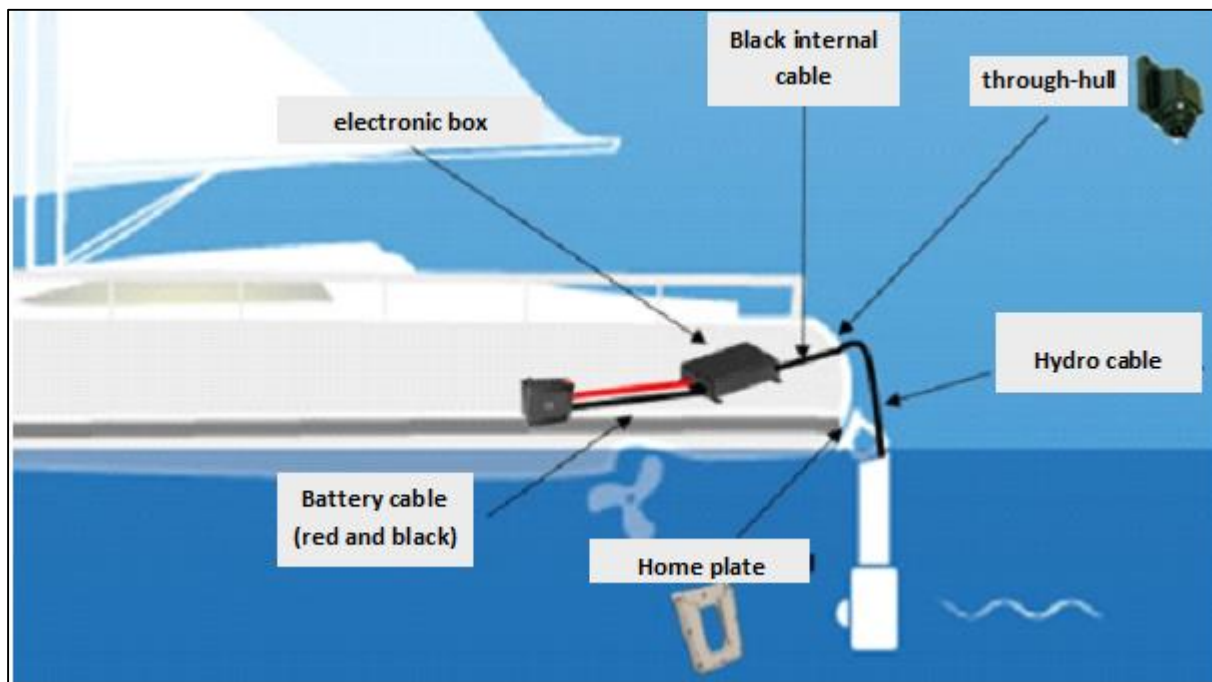
- 1) Drill Ø 6mm
- 2) Screwdriver
- 3) hole saw Ø 30mm
- 4) Sikaflex 292-i
- 5) pistol for cartridges Sikaflex
- 6) Acetone
- 7) Chiffons
- 8) Knife / cutteur
- 9) Screwdriver
- 10) Crimping tool
- 11) Wire Stripper
- 12) Bubble level

3. Installation of equipment on board

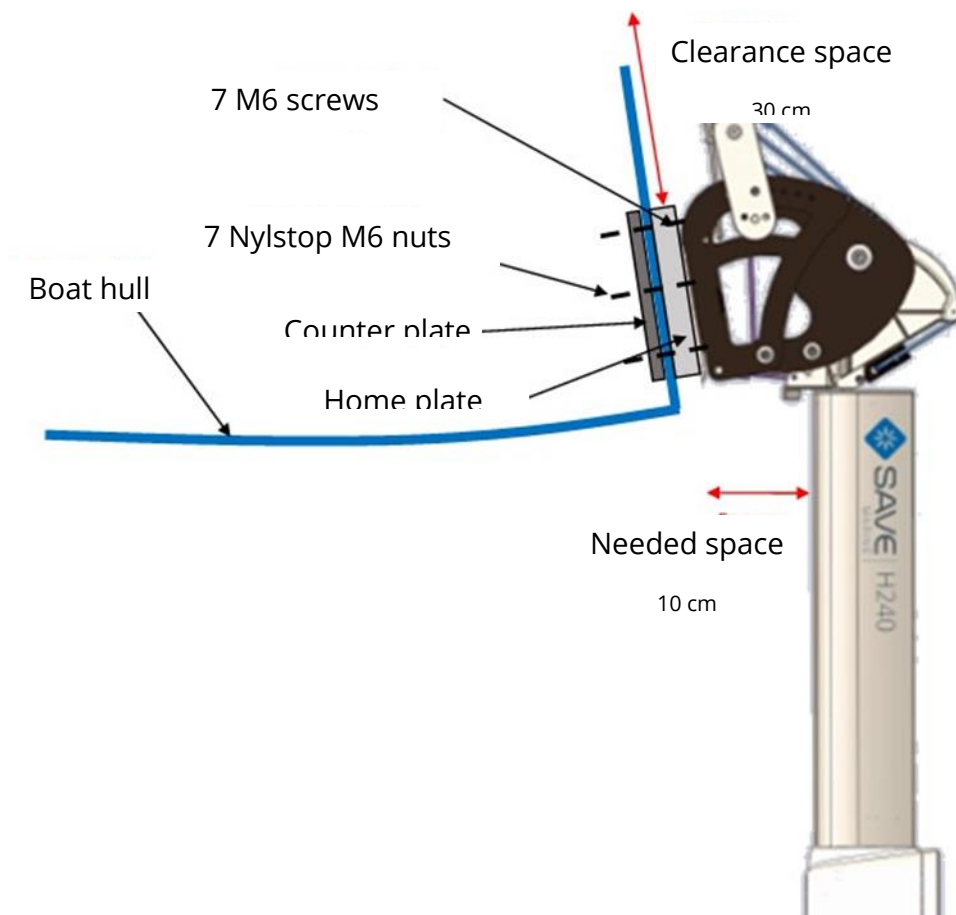
The installation of certain elements of the hydro Save Marine H240 requires making holes. Therefore it is recommended to determine the location of each item by following the steps below before beginning the installation.

Location of fixed elements of the hydro

The hydro is designed to be easily and quickly removed from its operating position in order to be



stored. The rest of the equipment is fixed to the boat. The wiring of the hydro (shown in the following diagram) must be as short as possible to enhance its performance. Indeed, the shorter the wire is the less loss. We will show in "4.2.4 Connecting to realize" where and how to shorten the cables.



3.1 Select the location of the home plate:

The hydro should be positioned as shown below:

1. The part on which is fixed the reception plate must be flat.
2. The space within the boat at the wall must be accessible for fastening the counter plate.
3. The recommended positioning varies with the type of boat:

> For monohulls:

- ♣ The home plate must be placed as centrally as possible on the transom. This ensures that the turbine remains submerged when the boat is heeling when sailing whatever the board.
- ♣ The lower part of the home plate should be placed at the waterline transom while the boat is loaded under normal conditions of navigation. It should not be placed higher so that the turbine remains immersed when hilling and limit disruptions related to algae (which usually float on the surface).

> For multihulls:

- ♣ Place the home plate in the same way on the hull of your choice. The profile arm of the hydro for multihulls is shorter than for monohull (40 cm instead of 65 cm).
- 1. A clearance of 30 cm above the home plate should be free to put in place and pull the hydro.
- 2. A space of 10 cm is necessary between the hull and the profile arm of the hydro.

Warning: Before installing the home plate check that the transom is strong and rigid enough to support the weight of the hydro and effort when in operation. If this is not the case, reinforce inside the boat with a marine plywood glued and stratified plate before installing the plywood.

Examples of installations:



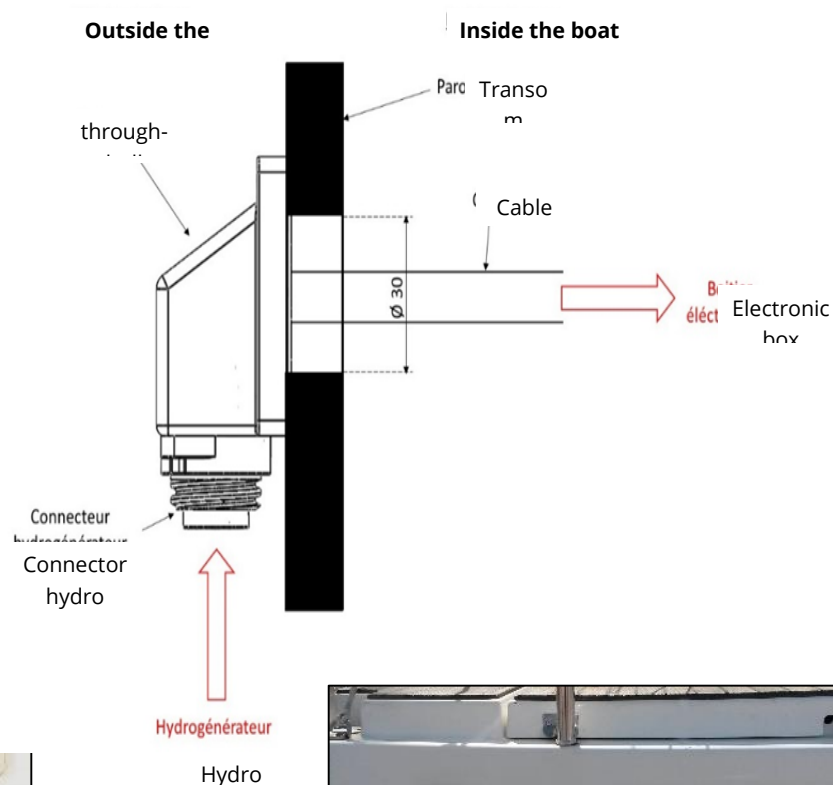
3.2 Choose the location of the through-hull

The characteristics of the through-hull location:

- A minimum surface 6x6cm
- available inside the boat across the transom

- closest to the electronic box and battery
- the highest relative to the surface of the water to be able to connect and disconnect easily.

Examples of installation location



3.3 Choose the location of the electronic box:

The control unit allows the regulation of the output signal of the hydro to optimize battery charge. It is specially developed for this application. This box is designed to be waterproof, however it is

necessary to set it inside the boat. It is not useful to have regular access to the electronic box since it is not provided with any control instrument. However you need to reach it if a malfunction of the electrical system requires you to access it (see maintenance).

Examples of possible locations:

- In the upper part of a chest: ensure that it can not receive direct projection of sea water and it is not likely to be hit by manipulations of stored objects.
 - In one cabin: ensure that it is not in a place of passage.
- In both cases, it is recommended to set the electronic unit:
- on a vertical surface to improve thermal dissipation.
 - On a wall that can support its weight (3 kg).
 - So that the direction of the fins is from top to bottom.
 - Leaving a distance of at least 40 cm between the top of the housing and the trunk or cabin ceiling.
 - The closest possible to the battery.
 - Connectors can be either facing downwards or upwards.

3.3.1 Attaching the hydro elements and connections

The home plate, the through-hull and the regulator are definitively fixed on the boat. We therefore recommend that you follow the following steps to properly realize their fixtures.

- a) Attaching the home plate

Reminder: Before installation of the home plate check that the transom is strong and rigid enough to support the weight of the hydro and effort when in operation. If this is not the case, reinforce inside the boat with a marine plywood glued and stratified plate before installing the plywood.

- b) Identify the outside location of the home plate.
- c) Check inside the boat that the intended location allows to set the counter plate and you have access to all the screws.
- d) Drill a hole first with a drill Ø6 (not supplied) and screw.
- e) Draw the 6 other holes. Drill using the home plate as a drilling template. Remove the plate.

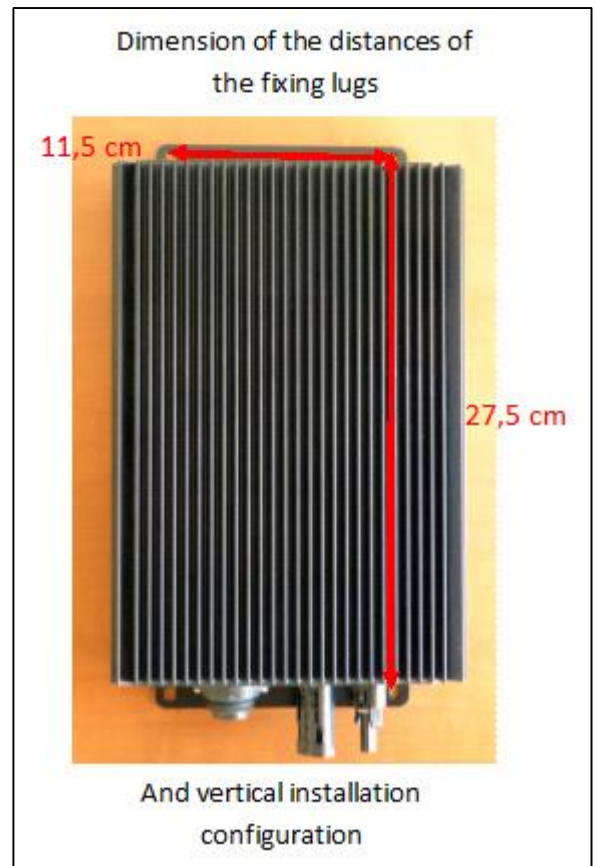
NB: do not drill the hull at the hole at the top and center of the plate, it is not used to secure it.

- f) Put Sikaflex 292-i (not supplied) on the back of the home plate around screw holes for sealing.
- g) Put Sikaflex 292-i on the counter plate like on the home plate.

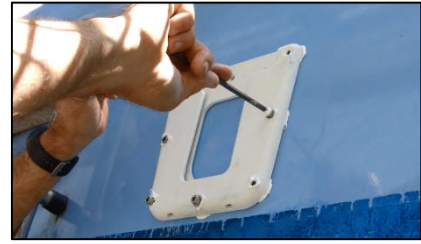


- h) Clean and degrease the home plate locations and counterplate with acetone (not supplied).

- i) Outside the boat, position the home plate on the transom, the insert the 7 M6x25 screws.



- j) Inside the boat, insert the counter plate through the M6x25 screw until it contacts the inner wall. Insert the 7 M6 washers on the screws M6x25. Screw the bolts on the 7 M6x25 NYLSTOP M6 screws.
- k) Clean the excess of Sikaflex. The installation of the home plate is closed.



- 1) Attaching the through-hull and the inner cable
- 2) Use the through-hull to trace the location of the 5 holes.
- 3) Drill the center hole with a hole saw Ø30 (not supplied).
- 4) Drill 4 holes with a drill Ø6.
- 5) Put Sikaflex-292 around the screw holes on the through-hull.
- 6) Flatten the through-hull against the transom and insert the 4 screws M5x25.
- 7) Inside the boat, the insert M5 washers on the M5x25 screws.
- 8) Screw the NYLSTOP M5 nuts on the M5x25 screws.
- 9) Clean surplus of Sikaflex.



The installation of the through-hull is complete.

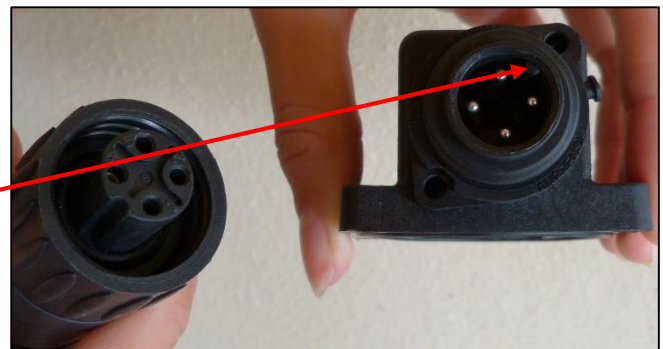
3.3.2 Attaching the electronic box

Four mounting lugs are provided for securing the box to an inner wall of the boat. A sachet containing M5x25 screws, washers and nuts M5 nylstop, is provided with the electronic box. Connections to be made

From the the hydro to the through-hull:



Unscrew the plugs of each connector and plug the hydro cable in to the through-hull. An alignment key into the connectors prevents the user from mistaking when connecting.



NB: It is not necessary to disconnect the hydro when you stop using it and it's out of the water.

From the through-hull to the electronic box

The internal cable from the through-hull has a right female connector at its end. This connector is to plug into the male header connector of the electronic box as shown in the photo.

It is recommended to reduce the length of this cable if possible to improve performance.



3.3.3 To reduce the cable length



Carefully follow the instructions because this procedure is a risk of malfunction of hydro.

1) Disconnect the hydro from the through-hull.



2) Unscrew the rear part of the connector and slide it on the cable.

3) Unscrew the four small screws allowing to block the wire into the connector with a flat screwdriver.

4) Cut the cable at the desired length.



5) Strip the cable to 2 cm.

6) Strip 0.5 cm on each wire.



7) Insert the wires on each hole in the connector and screw them one by one.

Warning: For the first wire you plug the hole you can use your choice, but for the following you must observe the order of exit wire of black sheath and never cross them.

NO: the white and blue wire are crossed



8) Close the connector.



From the electronic box to the battery.

Two cables of the same section, but of different colors (red and black) are provided with hydro. These two cables are equipped with solar connectors on one side and fixing systems for the batteries of the other side.



3.3.4 Connection to the electronic box:



Both cables have different connectors so it is not possible to make mistakes connections.

Connect the two cables as shown against.

To disconnect the cables from the electronic box:

A special tool is provided for disconnecting the two connectors of the electronic box. Insert the clamp in each connector to unlock it.

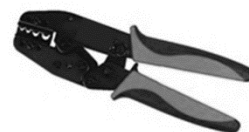
3.3.5 Connecting to the battery:

Both cables are equipped with M8 eyelet terminals to fit your batteries.

1. Connect the red cable with red terminal to the positive (+) terminal of the battery.

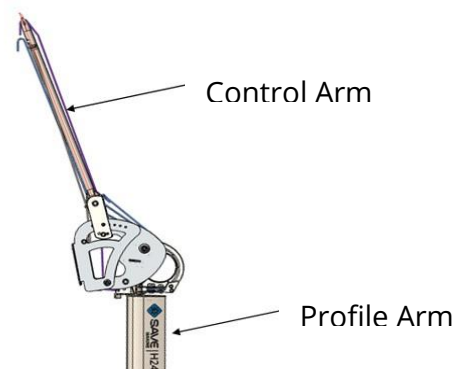
2. Connect the black cable to the negative (-) battery.

Tip: It is recommended to reduce the length of the cables if possible to improve performance. In this case, reduce the cable at the connection to the battery. To do this, ensure that you have a crimping tool for cable 10mm². Without crimping pliers it is not possible to achieve a truly effective connection.



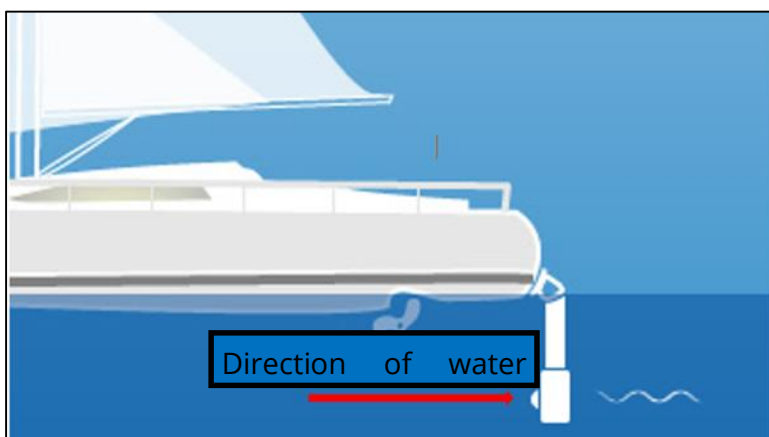
4. Adjust the orientation of the hydro

The hydro Save Marine H240 has two major settings: adjusting the orientation of the profile arm and the adjustment of the orientation of the control arm. Thus, the hydro may be adapted to transoms at an angle of 0 to 30 ° without specific development of an adapter piece.



4.1 Adjusting the orientation of the profile arm

The adjustment of the orientation of the profile arms is essential because the performance of the hydro is optimal when the turbine is facing the water flow.



Follow the steps below to properly perform this setting:

In operation, the profile arm of the the hydro must be vertical.

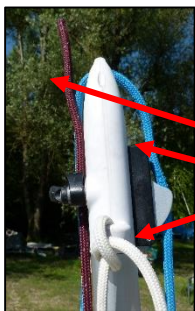
To adapt it to the tilt of your transom you have 7 adjustment holes to fix the stop pin in the low position:

1. Select the hole that you think is more suitable,
2. Turn the hydro in low operating position,
3. Check that the profile arm is vertical,



4.2 The command arm

4.2.1 Composition



It is equipped with three ropes:

- A red tip with jam cleat to raise the turbine,
- A blue end with an automatic Clamcleat to hold it in position.
- A white tip to unlock the hydro and remove it,

> To put in place the command arm. Simply insert it into the fork. The jam cleat should be positioned forward and the Clamcleat backward.

> To set it up:

Insert it fully into the tube for this purpose.

> To remove it:

Simultaneously press the two locking fingers and lift the arm.



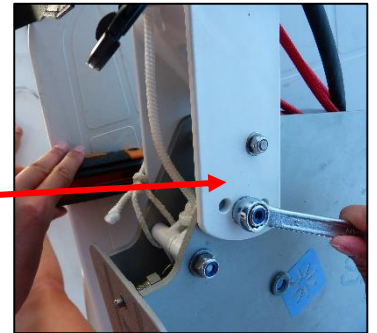
4.2.2 The correct position of the command arm



The upper part should be easy to access.
The ideal is to tilt the arm for it to enter slightly inside of the rear deck without obstructing traffic on it.

For this, the bottom of the fork you have 3 holes in the fork and three holes on the plate, which gives the

possibility of 6 different angles to the control arm. Simply position the rod in the appropriate holes and screwing the nut.



4.2.3 The automatic clamceat

It ensures that the rope maintains the turbine in a low position.
This is an additional security element:

If the submerged part of the hydro strikes a heavy object or if the boat is in overspeed, the opening of is triggered is automatically activated and releases the rope, allowing the turbine to get up.

We equipped the clam of a pivoting finger at two positions:

- To release the clam finger switch on the left,
- To reset the Clamcleat it suffices to engage the moving part in its initial position and to rotate the finger on the right.

