



**EXTURN**<sup>®</sup>  
DOCK IT EASY



# INSTALLATION AND OPERATION MANUAL

EXTURN Simplex | Compact | Duplex

v3.2 | Januar 2013



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## 1. PREPARATION

### 1.1. Introduction

Thank you for choosing SLEIPNER-MARINNO's worldwide first external bow and stern thruster:



The driving power of the **EXTURN** bow and stern thruster depends on the boat length and assembly position: the efficiency, apart from the hull form, depends on various other factors, like, among other things, boat weight, freeboard surface, operational area and wind force.

The indicated power will be achieved under optimal circumstances. In order to ensure this, the choice of the assembly position, the assembly, as well as the electrical installation and wiring should be conducted with care and by specialists.

**EXTURN** has a substantial task: To increase safety and comfort on board. Regular maintenance work is not necessary. With professional assembly and with consideration of the recommendations contained in this manual, **EXTURN** will soon become indispensable for manoeuvring your boat.



### 1.2. Safety Regulations

Read this manual carefully. Provide the safety regulations also to all persons who are engaged with the assembly or the operation of **EXTURN**.

- The electrical installation must principally be accomplished by a specialist!
- During the operation of **EXTURN** never touch moving parts!
- Do not operate **EXTURN**, neither in the water nor outside of the water, if there are people standing close to the bow and stern thruster!
- When working on the **EXTURN**, always switch off the **EXTURN** main switch!
- Always switch the **EXTURN** main switch off when the bow and stern thruster is not used for a longer period!
- When craning, the belt may not be placed where it touches the **EXTURN** bow and stern thruster!

### 1.3. Necessary Tools

For the assembly of the **EXTURN** bow and stern thruster the following tools are needed depending on the mounting variant:

- Measuring tape
- Cord or levelling rule
- Hand drill
- Drill bits Ø 1,8 mm, 6 mm, 9 mm, 12 mm, 18 mm
- Hole saw Ø 50 - 51 mm
- Hole saw Ø 62 mm
- Pipe wrench size SW46
- Socket wrench size SW13
- Flat wrench size SW10
- Allen wrench size SW4
- Suitable sealant (e.g. Sikaflex)

## 2. PRODUCT CONTENTS

### 2.1. Mounting kit "Basic" (Article No. 50151)

Attachment "distance" (Article No. 50395):

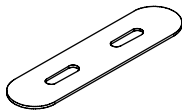
4x safety nut M8



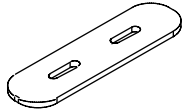
4x disk M8



1x sheet  
(B01.M5.003.B3)



1x isolator  
(B01.M5.005.B3)



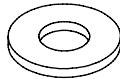
2x sealing D18 12,5 mm  
(B01.M5.006.B3)



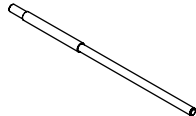
4x sealing D18 25 mm  
(B01.M5.004.B3)



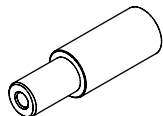
2x tefl on-washer



2x mounting bolt 250  
(B01.M3.002.B3)

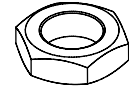


2x distance piece  
(B01.M5.001.B3)



Attachment "main connection" (Article No. 50396):

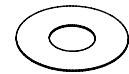
2x hexagon nut



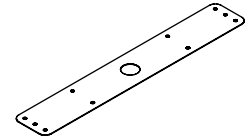
1x disk M30



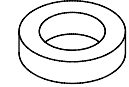
1x disc  
(B01.M1.002.03)



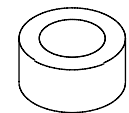
1x metal sheet  
(B01.M1.001.03)



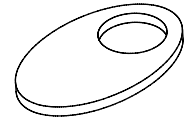
1x Dichtung D50 12,5 mm  
(B01.M1.003.03)



3x sealing D50 25 mm  
(B01.M1.004.03)



1x pad  
(B01.M1.005.03)



1x isolator  
(B01.M7.001.03)



## 2.2. Mounting kit "Adapter" (Article No. 50152)

Attachment "adapter" (Article No. 50390):

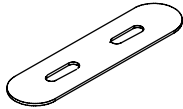
4x safety nut M8



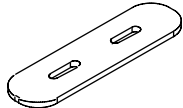
4x disk M8



1x sheet  
(B01.M5.003.B3)



1x isolator  
(B01.M5.005.B3)



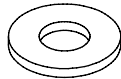
2x sealing D18 12,5 mm  
(B01.M5.006.B3)



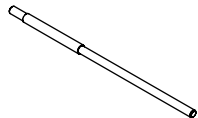
4x sealing D18 25 mm  
(B01.M5.004.B3)



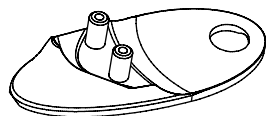
2x tefl on-washer



2x mounting bolt 250  
(B01.M3.002.B3)

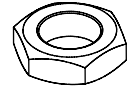


1x adapter  
(B01.M3.001.B3)



Attachment "main connection GRP" (Article No. 50391):

2x hexagon nut



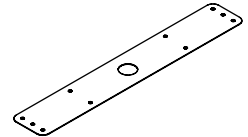
1x disk M30



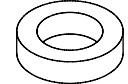
1x disk  
(B01.M1.002.03)



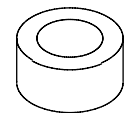
1x metal sheet  
(B01.M1.001.03)



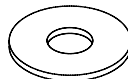
1x sealing D50 12,5 mm  
(B01.M1.003.03)



3x sealing D50 25 mm  
(B01.M1.004.03)



1x isolator  
(B01.M7.001.03)



### 2.3. Electronics and reference sticker

1x i-BOX

2x crane operator reference sticker (black)

2x crane operator reference sticker (white)



Fig. 2: i-BOX



Fig. 3: crane operator reference sticker

### 2.4. Control Elements (separately available)

To operate **EXTURN**, one of the following separately available control elements is necessary:

- Control Element „single joystick panel“ (Article No. 8960X):
- Control Element „dual joystick panel“ (Article No. 8940X):
- Control Element „touch panel“ (Article No. 8950X)
- Control Element „radio remote control“ (Article No. RC10-XE)

### 2.5. Cable Sets (separately available)

Likewise, for the connection between i-BOX and control panel, a control cable with appropriate length is required:

6 1277-04M	Control cable 4 meter, 4-lead
6 1277-07M	Control cable 7 meter, 4-lead
6 1277-09M	Control cable 9 meter, 4-lead
6 1277-12M	Control cable 12 meter, 4-lead
6 1277-15M	Control cable 15 meter, 4-lead
6 1277-18M	Control cable 18 meter, 4-lead
6 1277-22M	Control cable 22 meter, 4-lead
6 1274	Y-connector for multiple control panels, 4-lead

If an automatic main switch is used, a 5-lead cable from control panel to the automatic main switch is required:

6 1277-04M	Control cable 4 meter, 5-lead
6 1277-07M	Control cable 7 meter, 5-lead
6 1277-09M	Control cable 9 meter, 5-lead
6 1277-12M	Control cable 12 meter, 5-lead
6 1277-15M	Control cable 15 meter, 5-lead
6 1277-18M	Control cable 18 meter, 5-lead
6 1277-22M	Control cable 22 meter, 5-lead
6 1274	Y-connector for multiple control panels, 5-lead

### 3. MOUNTING GENERAL

#### 3.1. Mounting Variant

The areas of application of the respective **EXTURN** mounting kits constitute as follows:

Area of application	Mounting kit „Basic“	Mounting kit „Adapter“
bow thruster ROUND CHINE	+	+
bow thruster HARD CHINE	-	+
stern thruster ROUND CHINE	+	+
stern thruster bathing platform	+	+
stern thruster “vertical transom”	+	-

#### 3.2. Restrictions

**EXTURN** as bow thruster:

- The permitted driving speed for the use of **EXTURN** is 35 knots (no constant load!).
- From approx. 15 knots driving speed **EXTURN** must be outside the water!
- Not to be installed on planing hulls of less than 8.5 m or semi-planing hulls of less than 9 m hull length.

**EXTURN** as stern thruster:

- The mounting on the slide surface of a glider is not permitted!
- On GRP-boats with a speed from 12 knots the hull construction must comply to the guidelines of GL (Germanic Lloyd)!
- It has to be assured that the incident flow of the rudder and drive is not affected!
- The propeller needs free sight at starboard and port, so it is not permitted to mount two **EXTURNs** side by side in one axis!

**CAUTION!**

The permitted driving speed for the use of **EXTURN** is 35 knots!

**CAUTION!**

The mounting on the slide surface of a glider is not permitted!

### 3.3. Choice of the mounting position

The mounting of the **EXTURN** bow and stern thruster is unbelievably simple and can be carried out without large expenditure of time. Nevertheless, it should principally be done by a specialist.

In order to achieve the optimal efficiency of **EXTURN** when used as bow thruster, it should be positioned as far down and in front as possible, though 30 cm under the waterline is sufficient.

When operated as a stern thruster, naturally, it should be positioned as far down and in the back as possible, however, again, 30 cm under the waterline is sufficient.



Fig. 6: mounting sailboat

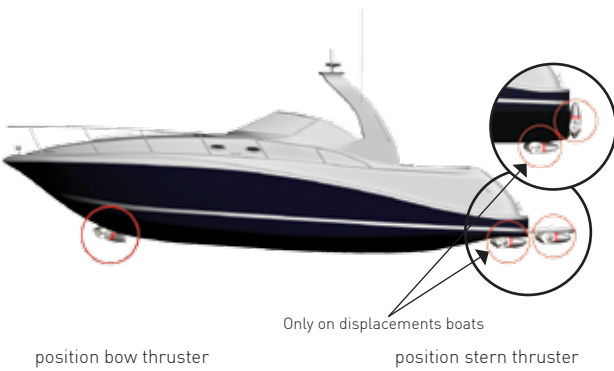


Fig. 7: mounting motorboat

### 3.4. Measuring of the mounting position

The **EXTURN** bow and stern thruster must be positioned exactly on the middle line of the boat. In order to determine this, it is recommended to draw a line from the keel to the bow or stern with a cord or a measuring tape and fix it. Subsequently, by means of this line, the desired position can be shifted easily forward or backward.

For the choice of the mounting position, it is to be likewise made certain that the required hole with a diameter of 50 - 51 mm is not drilled at an unsuitable position (e.g. bulkhead). The metal sheet to be used (except on steel and aluminium boats) has a width of 80 mm. So that it can be placed without problems, the borehole must be at least 60 mm from the next bulkhead. For the reasons mentioned above, the positioning should be measured exactly in any case before the execution of the drilling, also inside the boat.

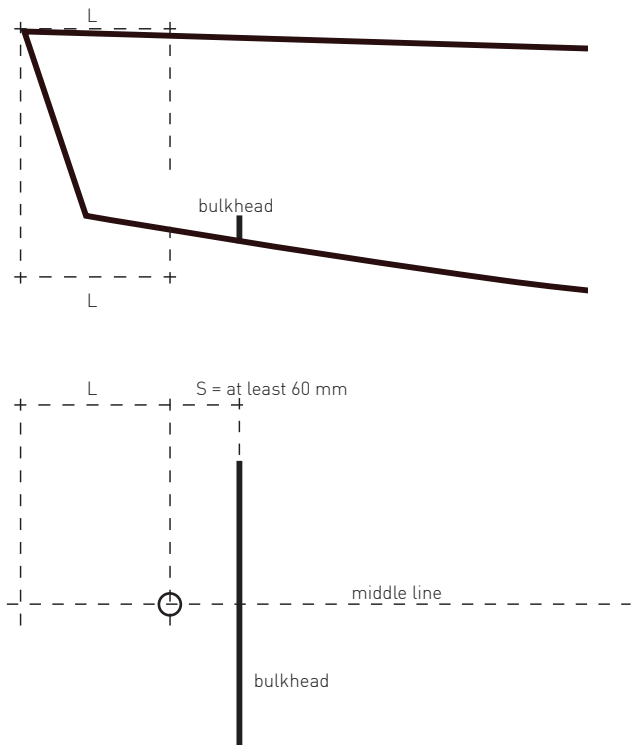


Fig. 8: example measuring



When mounted on a planing boat, waterline and gliding line have to be marked with tape. The bottom edge of the **EXTURN** has to be clearly above the gliding line!



Fig. 9: Measurements, planing boat

**CAUTION!**

Mounting on planing boats over 9m possible!  
On a planing hull, the bottom edge of the **EXTURN** has to be clearly above the gliding line!

### 3.5. Main drilling and sealing

The drilling for the hollow shaft needs a diameter of 50 - 51mm. It is recommended to use a hand-held drill.

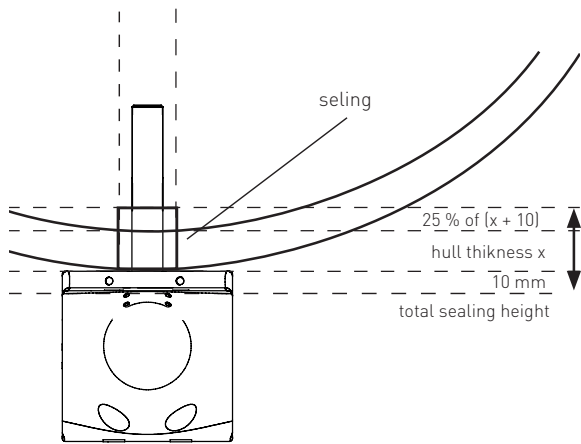


Fig. 10: Drilling and total sealing height

Subsequently, exactly measure the height of the drill hole, it is very important for the sealing. Depending on the hull thickness, several seals must be used. It is to be considered that the seals are compressed by about 25% when tightening the bolts.

The total sealing height results as follows:

$$\text{Hull thickness} \times 1,25$$

Example: Total sealing height with hull thickness of 30mm

$$30 \times 1,25 = 40 \text{ mm}$$

### 3.6. The reference sticker

After the mounting is completed, the reference stickers for the crane operator should be attached to both sides of the boat hull as shown in fig. 11 to illustrate the position of the bow and stern thruster.

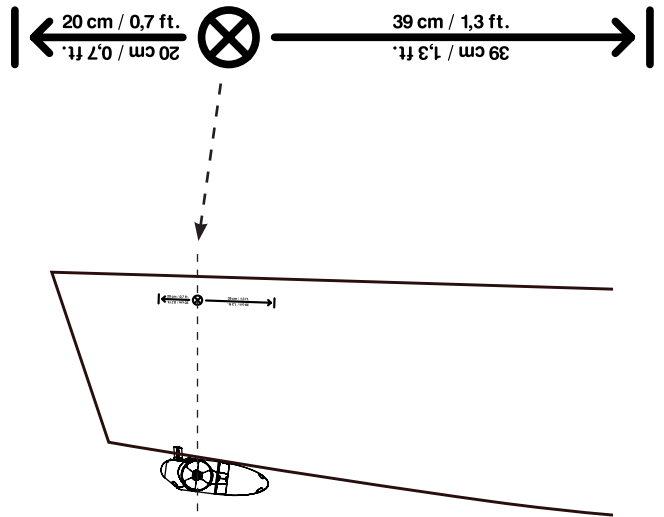


Abb. 11: Attaching the crane operator sticker

**CAUTION!**

The lifting strap must not be placed where it touches the **EXTURN** bow or stern thruster

### 3.7. Redox reaction and mounting adjustment

It is necessary to pay attention to special material properties to avoid redox reaction between **EXTURN** and the boat hull. (see table).

Since mounting with welded bolts is possible on hulls out of steel or aluminium, it has to be adjusted to the respective hull. However, it is recommended to use the provided mounting kits.

	GRP	Steel	Aluminium	Wood
Specifics	none	direct contact prevention between EXTURN and fastening elements and hull	direct contact prevention between fastening elements and hull	none
Critical range	none	8 mm	2 mm	none
Usage of welded mounting bolts	-	must be isolated from EXTURN with rubber	must not be isolated from EXTURN	-
Usage sealing "main connection"	compelling	compelling	compelling	compelling
Usage "metal sheet"	compelling	no!	no!	yes
Usage "isolator"	no	compelling	compelling	no

#### CAUTION!

On hulls out of steel or aluminium after mounting it has to be verified with a multimeter that there is no direct connection between the **EXTURN** bow and stern thruster and the boat hull!!!

## 4. MOUNTING KIT BASIC

### 4.1. Measuring of the mounting bolts

First the pad (1) must be glued on the bow thruster. Afterwards mount the thruster temporary via the main connection and mark the front boreholes for the mounting bolts.

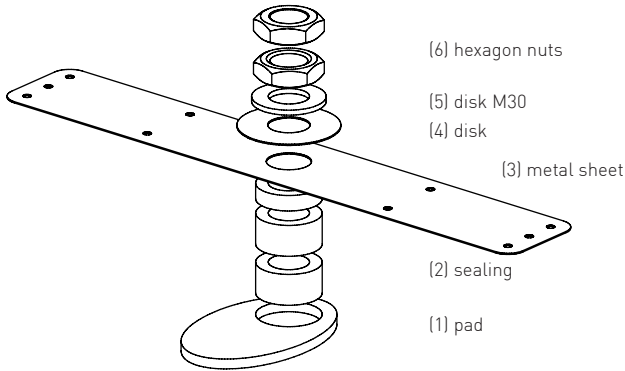


Fig. 12: main connection GRP

Measure the length for the distance pieces (fig. 13) and demount the thruster. Then make the drillings for the mounting bolts with diameter 18 mm and cut the distance pieces as measured before (fig. 14).

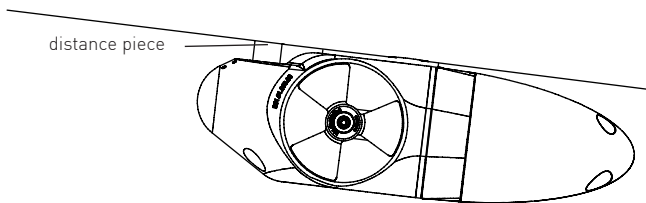


Fig. 13: distance piece length

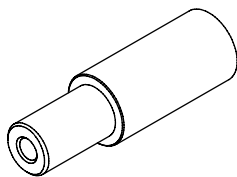


Fig. 14: distance piece

### CAUTION!

On hulls out of steel or aluminium it is compellent to use the isolator instead of the metal sheet!

### 4.2. Bolting and sealing

Bolt down the thruster via the main connection, thereby paying attention to the right number of seals (fig. 10). The sequence corresponds to the one in fig. 12, whereby, depending on the hull thickness, several seals (2) must be used. It is to be considered that those seals are compressed by about 25 % when tightening the bolts (fig. 10).

Ideally, coat the metal sheet (3) at the lower surface with sealant (e.g. Sikaflex). Don't press it to the hull by hand so that the metal sheet can adapt to the hull shape automatically when tightening the bolts. Apply disk (4) and disk M30 (5) and tighten the two hexagon nuts (6) firmly. Thereby the sealings (2) are compressed and fill out the drill hole completely. It is recommended to press against the thruster from the outside to prevent the sealings from being pressed out of the borehole when tightening the bolts. The metal sheet (3) adapts to the hull shape.

On hulls out of steel or aluminium it is compellent to use the isolator instead of the metal sheet (see 4.4. Mounting illustration steel and aluminium)!

Finally plug the distance pieces on the thruster. Insert the mounting bolts like illustrated in fig. 15 cutting them in the boat interior as necessary. Apply seals (2) according to the hull thickness (note: hull thickness + 25 %). On hulls out of GRP and boreholes of 9 mm the seals (2) can be omitted by using suitable sealant (e.g. Sikaflex).

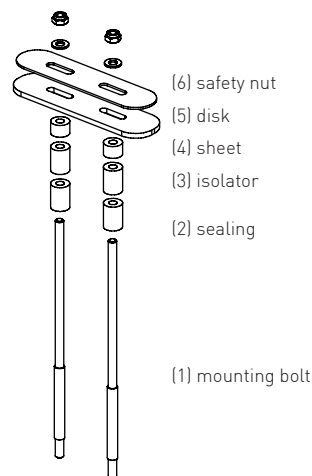


Fig. 15: assembly mounting bolts

Total sealing height for mounting bolts:

hull thickness x 1,25

Example: total sealing height with hull thickness 30 mm:

$30 \times 1,25 = 37,5 \text{ mm}$

4.3. Mounting illustration GRP

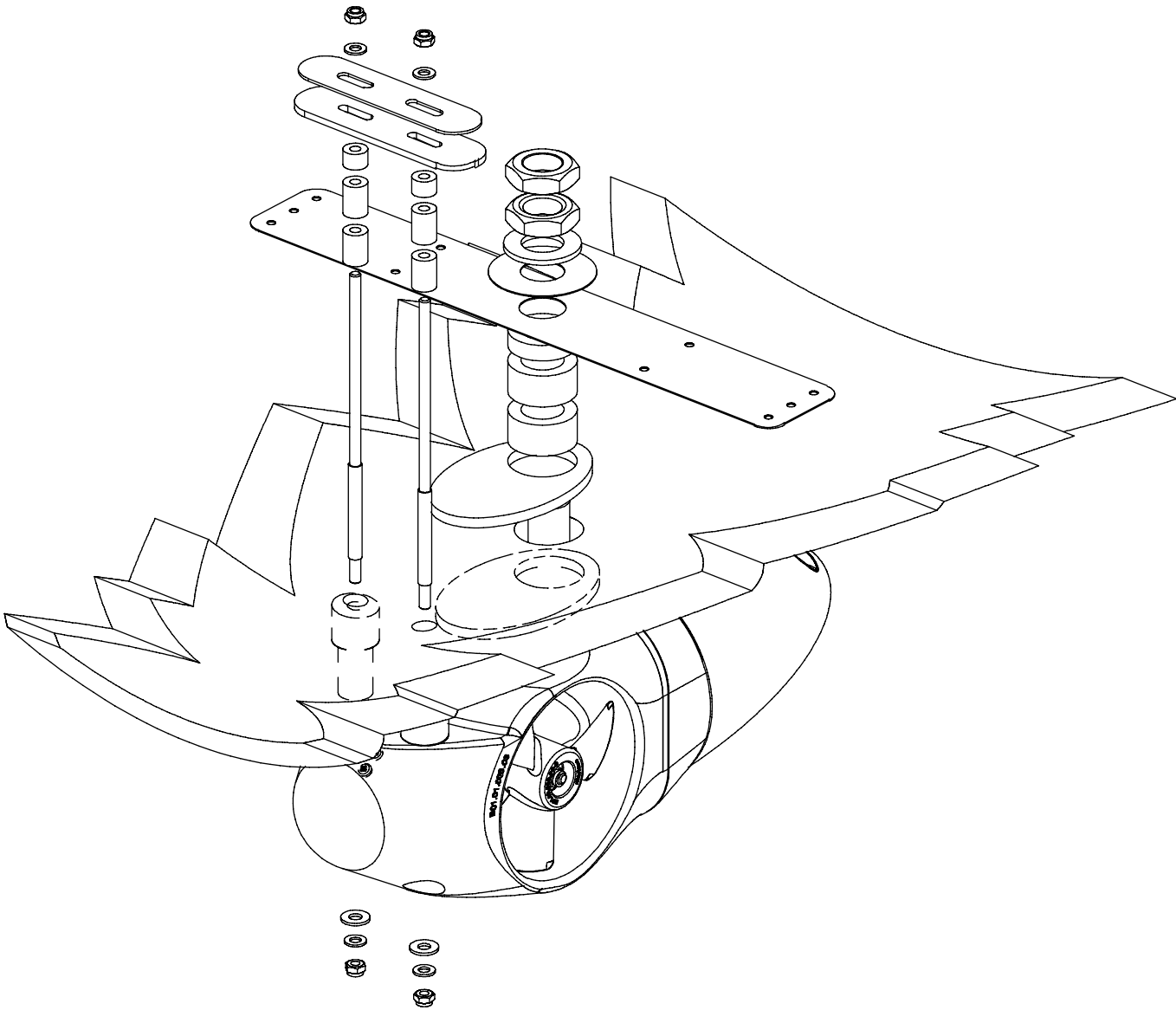


Fig. 16: Mounting „Basic“ on GRP

4.4. Mounting illustration steel and aluminium

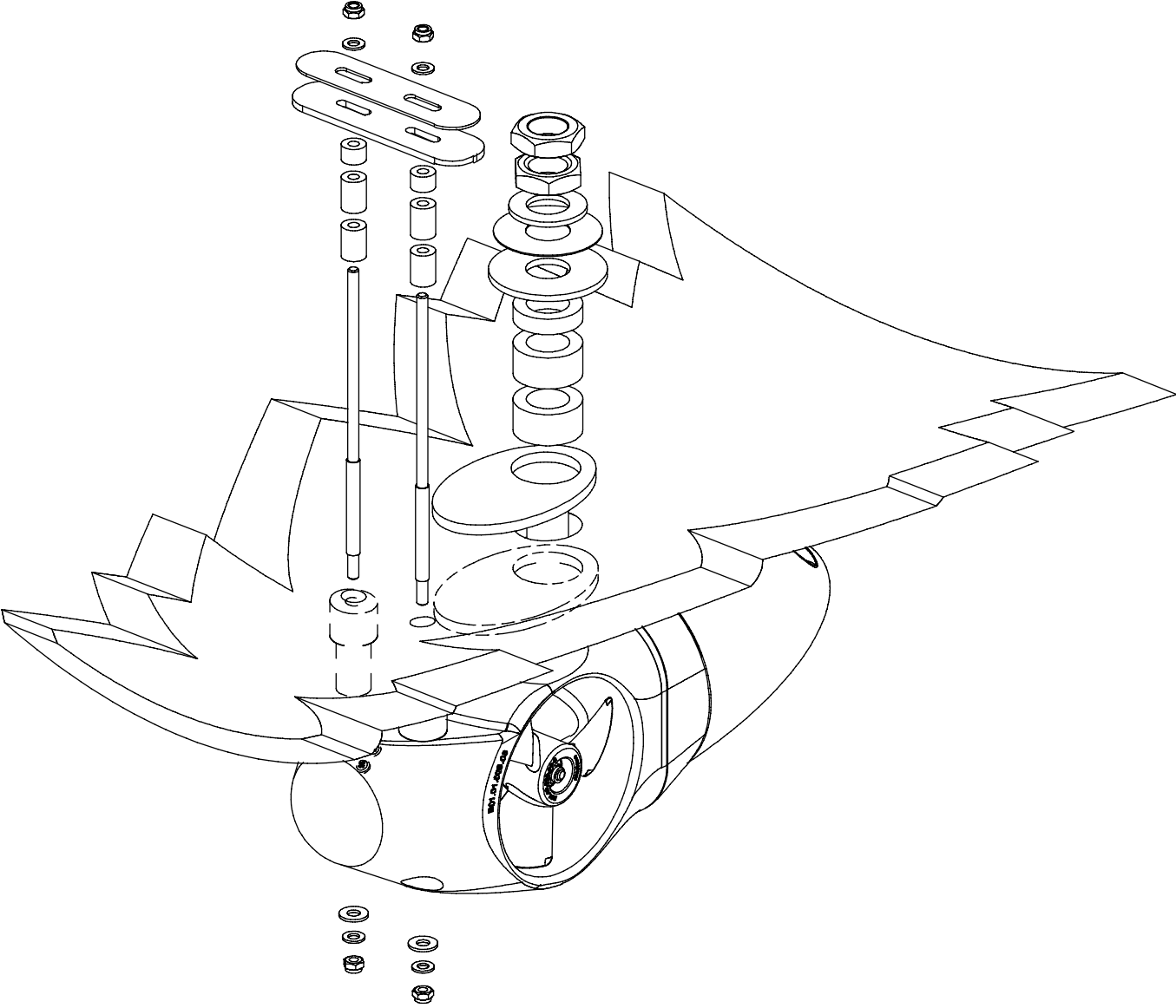


Fig. 17: Mounting „Basic“ on steel and aluminium

## 5. MONUTING KIT ADAPTER

### 5.1. Adapter positioning (round chine)

First plug the adapter (fig. 18) on the thruster and mount it temporary via the main connection. Mark the front boreholes for the mounting bolts.

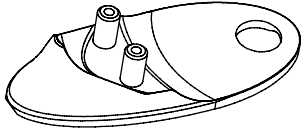


Fig. 18: Adapter

Afterwards turn the thruster with plugged-on adapter to the side and drill the holes for the mounting bolts with diameter 18 mm.



Fig. 19: mounting bolts drilling

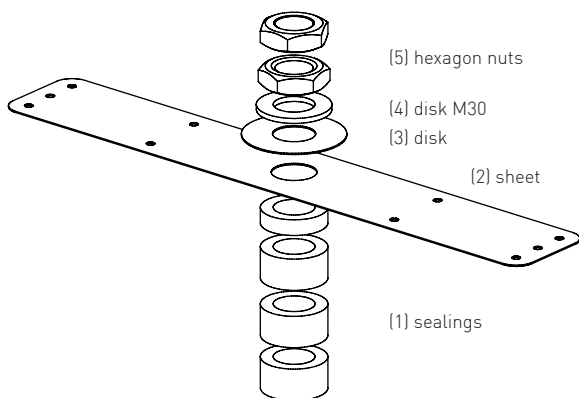


Fig. 20: main connection GRP

**CAUTION!**

On hulls out of steel or aluminium it is compellent to use the isolator instead of the metal sheet!

### 5.2. Bolting and sealing

Bolt down the thruster via the main connection, thereby paying attention to the right number of seals (fig. 10) The sequence corresponds to the one in fig. 20, whereby, depending on the hull thickness, several seals (1) must be used. It is to be considered that those seals are compressed by about 25 % when tightening the bolts (fig. 10).

Ideally, coat the metal sheet (2) at the lower surface with sealant (e.g. Sikaflex). Don't press it to the hull by hand so that the metal sheet can adapt to the hull shape automatically when tightening the bolts. Apply disk (3) and disk M30 (4) and tighten the two hexagon nuts (5) firmly. Thereby the sealings (1) are compressed and fill out the drill hole completely. It is recommended to press against the thruster from the outside to prevent the sealings from being pressed out of the borehole when tightening the bolts. The metal sheet (2) adapts to the hull shape.

On hulls out of steel or aluminium it is compellent to use the isolator instead of the metal sheet (see 5.5. Mounting illustration steel and aluminium)!

Finally screw together the mounting bolts like illustrated in fig. 21 cutting them in the boat interior as necessary. Apply seals (2) according to the hull thickness (note: hull thickness + 25 %).

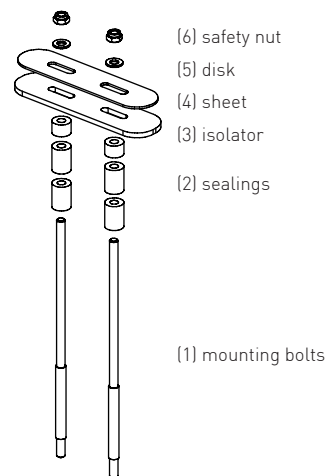


Fig. 21: assembly mounting bolts

Total sealing height for mounting bolts:  
 $\text{hull thickness} \times 1,25$

Example: total sealing height with hull thickness 30 mm:  
 $30 \times 1,25 = 37,5 \text{ mm}$

If there remains a gap between adapter and boat hull it is recommended to fill it out with suitable sealant (e.g. Sikaflex).

Note: In order to protect the outside edges of the drill holes, it is recommended to apply a suitable sealant (e.g. gel coat).

With the mounting kit "Adapter" on a round chine **EXTURN** is mountable within one hour (without electrical installation).



Fig. 22: **EXTURN** mounted with mounting kit „Adapter“

### 5.3. GRP adapter installation (see Fig. 23)

1. Determine the installation site and mark the positions on the hull.
2. Align the adapter lengthwise and crosswise on the stern and clamp it using a mounting bracket.
3. Measure the distance to the stern at the front edge of the adapter. Next, using a suitable marking tool (e.g. a compass or a block of wood with a pencil), transfer the measured distance from the contact edge between the adapter and the hull to the adapter at an angle.
4. Saw off the adapter along the line you've drawn using a suitable tool (e.g. an angle grinder or a jigsaw).
5. The foam must also be cut flush with the GRP edge using a suitable tool (e.g. finger polisher or router).
6. Hold the adapter in place against the hull again and examine the fit. Care must be taken that the GRP adapter lies flat against the area of the main stud at the stern. Repeat steps 2 – 5 if necessary.
7. If you have accidentally removed too much foam, it can be replaced by firm filling paste (epoxy or fibre glass bridging filler).
8. Remove the anti-fouling under the adapter and coarsely whet and degrease the hull.
9. Place the adapter on the device, put the seals in place and mount the adaptor together with the device. Waterproof adhesives such as polyurethane sealants should be used in order to achieve adhesion between the hull and the adapter.
10. Remove any adhesive that has leaked, slightly whet the adapter and coat it with epoxy primer and anti-fouling (like on the hull).

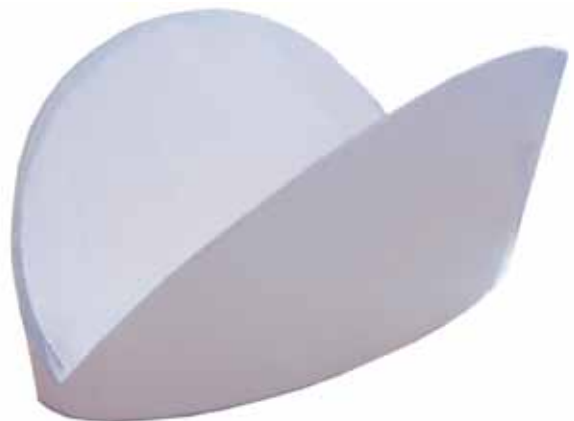


Fig. 23: GRP adapter

Next, prepare the contact surface (V-shaped, made of hardwood) for bolting the fastening on the inside (Fig. 24). To do so, drill two holes with a diameter of 8 mm at a distance of 65 mm.



Fig. 24. Contact surface using a wooden wedge as an example

EXTURN can be mounted on a hard chine hull within five hours using the "Adapter" assembly kit (without electrical installation)



Fig. 26: EXTURN varnished and mounted



Fig. 25: Screw connection GRP in the boat interior

**CAUTION!**

It is essential to prevent contact between the adapter and fuel, oil, grease, white spirit, solvents such as toluol, dichloromethane, trichloroethane, cellulose thinner or concentrated nitric or sulphuric acid.



5.4. Mounting illustration GRP

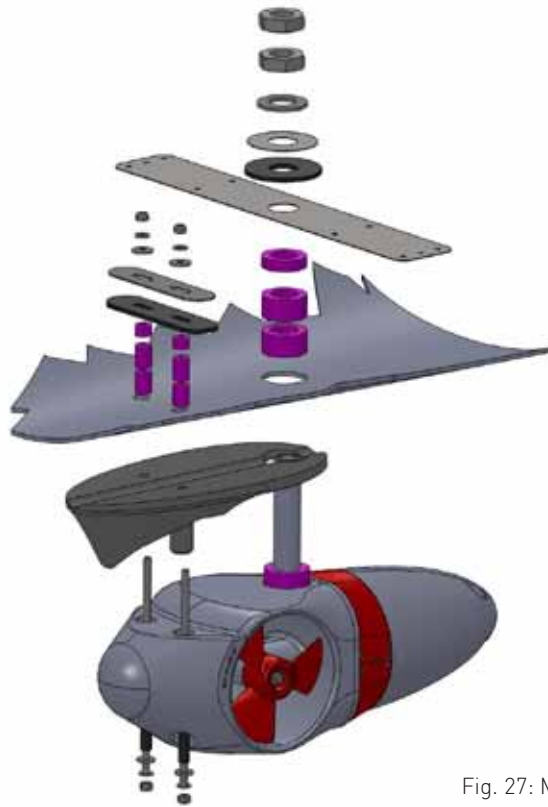


Fig. 27: Mounting "Adapter" on GRP (round chine)

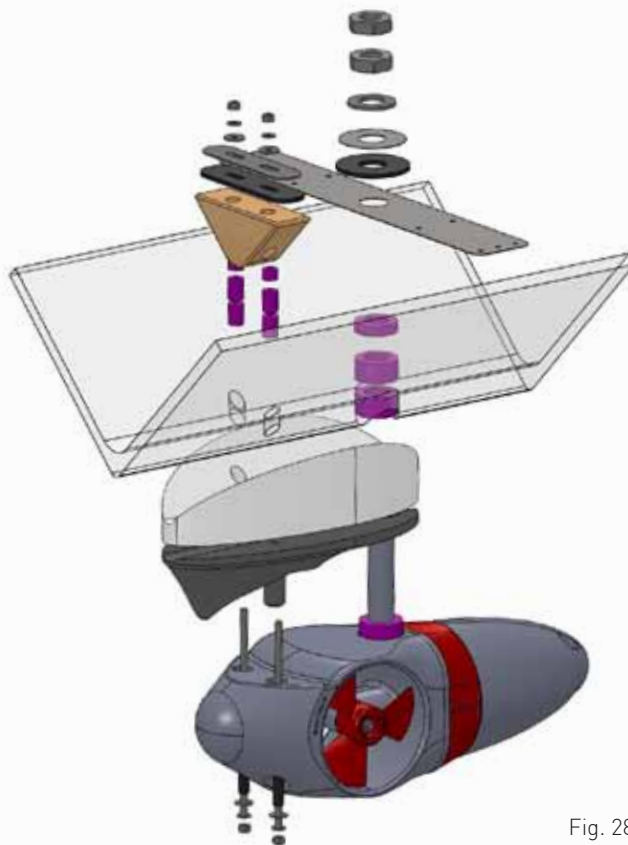


Fig. 28: Mounting "Adapter" on GRP (hard chine)



## 6. MOUNTING EXTURN COMPACT

Installation of the **EXTURN Compact** is almost identical to that of the **EXTURN Simplex**. It differs in that the **EXTURN Compact** is mounted vertically on the reflector of the motorboat.

The **EXTURN Compact** is mounted using the boardlocks 250 at the back end (two small holes) next to the main threaded bolt (identical to the **EXTURN Simplex** assembly – the intermediate layer is absolutely necessary).

In addition, the assembly differs in that the black plastic spacer must be used for assembly (see the **EXTURN Compact** figure). The side with the thinner opening is inserted into the small holes in the **EXTURN Compact**. The boardlocks are then passed through them (see the **EXTURN Compact** figure).

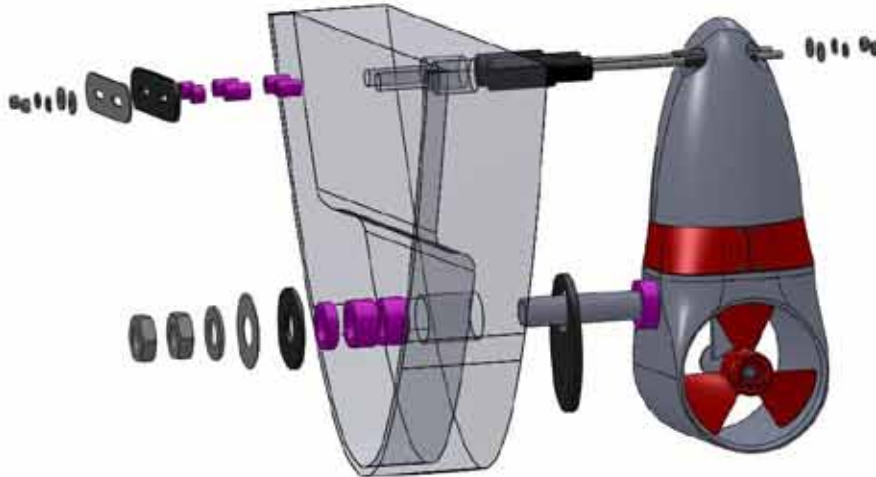
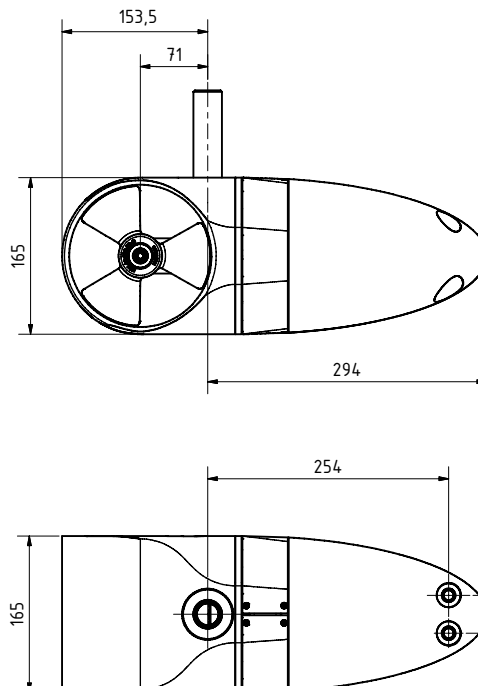


Fig. 31: Mounting **EXTURN Compact**



## 7. MOUNTING DUPLEX

### 7.1. General Instructions

- The **EXTURN** Duplex has two motors and therefore is to be handled like two single **EXTURN**s during mounting.
- The hole center distance of the two hollow shafts has to exactly comply with the dimension sheet (see Dimensions on page 33).
- The mounting surface for the **EXTURN** Duplex must be in-plane, if necessary a socket has to be developed accordingly (Fig. 32).

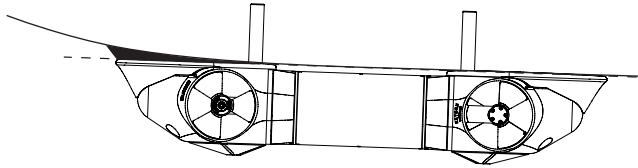


Fig. 32: **EXTURN** Duplex mounting surface

### 7.2. Measuring of the mounting position

The **EXTURN** bow and stern thruster must be positioned exactly on the middle line of the boat. In order to determine this, it is recommended to draw a line from the keel to the bow or stern with a cord or a measuring tape and fix it. Subsequently, by means of this line, the desired position can be shifted easily forward or backward.

The **EXTURN** Duplex requires two holes with a diameter of 50 – 51 mm. The hole center distance has to exactly comply with the dimension sheet (see Dimensions on page 33). Check the distance between the boreholes before drilling!

For the choice of the mounting position, it is to be likewise made certain that the required holes are not drilled at an unsuitable position (e.g. bulkhead). The metal sheets to be used (except on steel and aluminium boats) have a width of 80 mm. So that they can be placed without problems, the boreholes must be at least 60 mm from the next bulkhead.

For the reasons mentioned above, the positioning should be measured exactly in any case before the execution of the drilling, also inside the boat.



Fig. 33: **EXTURN** Duplex mounted

## 8. ELECTRICAL INSTALLATION

### 8.1. General Instructions

- The electrical installation is principally to be accomplished by a specialist.
- All contacts, plugs and connections must be installed in a way that they always remain dry.
- The i-BOX must be placed in such a way that it always remains dry.
- All screws must be pulled tight before start-up.

The general instructions refer to **EXTURN** Simplex and also to **EXTURN** Duplex.

### 8.2. EXTURN Performance Specifications

Model	Power (kW)	Thrust (kgf)	Voltage (V)	Nominal Current (A)
<b>EXTURN</b> 130S	1,3	35	12	140
<b>EXTURN</b> 180S	1,8	56	12	187
<b>EXTURN</b> 230S	2,3	74	24	120
<b>EXTURN</b> 300S	3,0	94	24	175
<b>EXTURN</b> 400D	4,0	110	12	2x187
<b>EXTURN</b> 600D	6,0	180	24	2x175

\* Thrust equivalent (kgf x 1.4 due to positional advantages)

### 8.3. Fuse protection and wire cross section

Model	Fuse (NH00) (A)	Cross Section 0 - 8 m* (mm <sup>2</sup> )	Cross Section 8 - 16 m* (mm <sup>2</sup> )	Battery recommendation**
<b>EXTURN</b> 130S	100	35	70	1x Optima 900 BlueTop - 55 Ah
<b>EXTURN</b> 180S	125	50	70	1x Optima 900 BlueTop - 55 Ah
<b>EXTURN</b> 230S	80	25	50	2x Optima 900 BlueTop - 55 Ah
<b>EXTURN</b> 300S	100	50	70	2x Optima 900 BlueTop - 55 Ah
<b>EXTURN</b> 400D	2x125	50	70	2x Optima 900 BlueTop - 55 Ah <sup>1</sup>
<b>EXTURN</b> 600D	2x125	50	70	4x Optima 900 BlueTop - 55 Ah <sup>2</sup>

\* wire length is the sum of + and - wire.

\*\* The several models have been optimized for a runtime of 10 minutes without recharging.

<sup>1</sup> Optima battery bank (2x Optima 900 BlueTop - 55 Ah, connected parallel) or 1x 100 Ah gel battery

<sup>2</sup> 2x Optima battery bank (2x2 Optima 900 BlueTop - 55 Ah, connected in series) or 2x 100 Ah gel batteries connected in series

## 8.4. Choice of battery

The overall capacity of the battery must be coordinated with the power setting of the respective **EXTURN** model (see 8.2. **EXTURN** Performance Specifications and 8.3. Fuse protection and wire cross section). It is recommended to use one or more separate starter batteries (no consumer batteries!) for each **EXTURN** and to place these as close as possible to the bow or stern thruster to minimise cable length or cable thickness and power losses.

Always use batteries with matching type and capacity!

With the employment of an **EXTURN** model with 24 V with a board voltage of 12 V, it is recommended to connect two 12 V-batteries in series, in order to achieve the necessary voltage for the bow or stern thruster. A 12 V / 24 V battery charger and voltage converter is available on request.

## 8.5. Wiring

The cable length of **EXTURN** is 0,75 m. The i-Box should therefore be placed as close as possible to the bow or stern thruster.

The minimum cable diameter is to be coordinated with the power setting of the **EXTURN** model used (see 8.3. Fuse protection and wire cross section), in order to keep the power loss between battery and bow or stern thruster as low as possible.

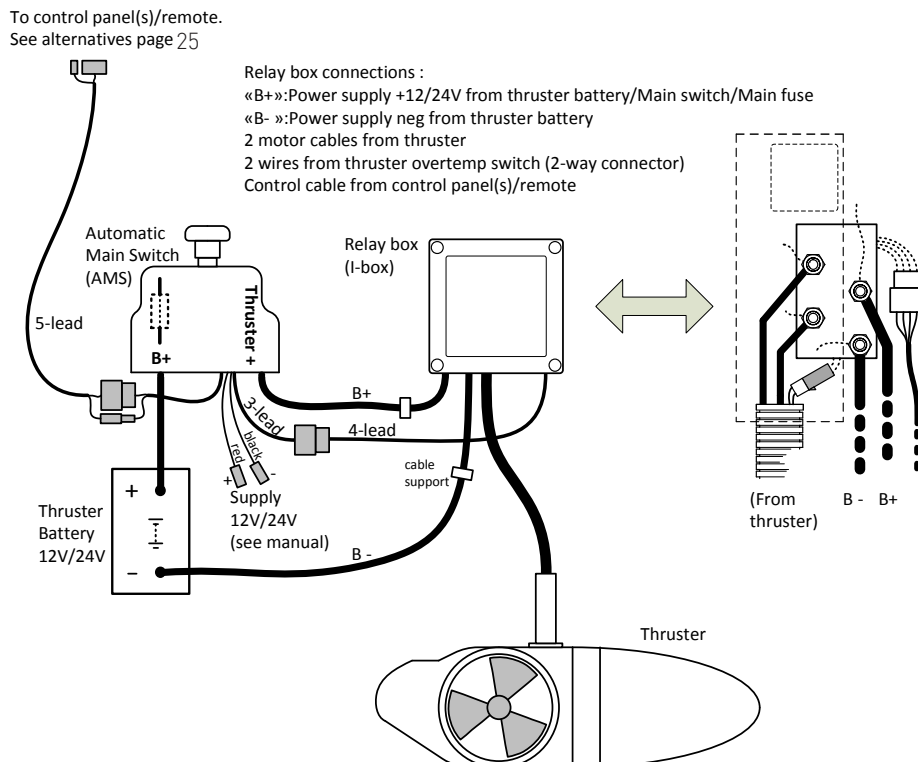
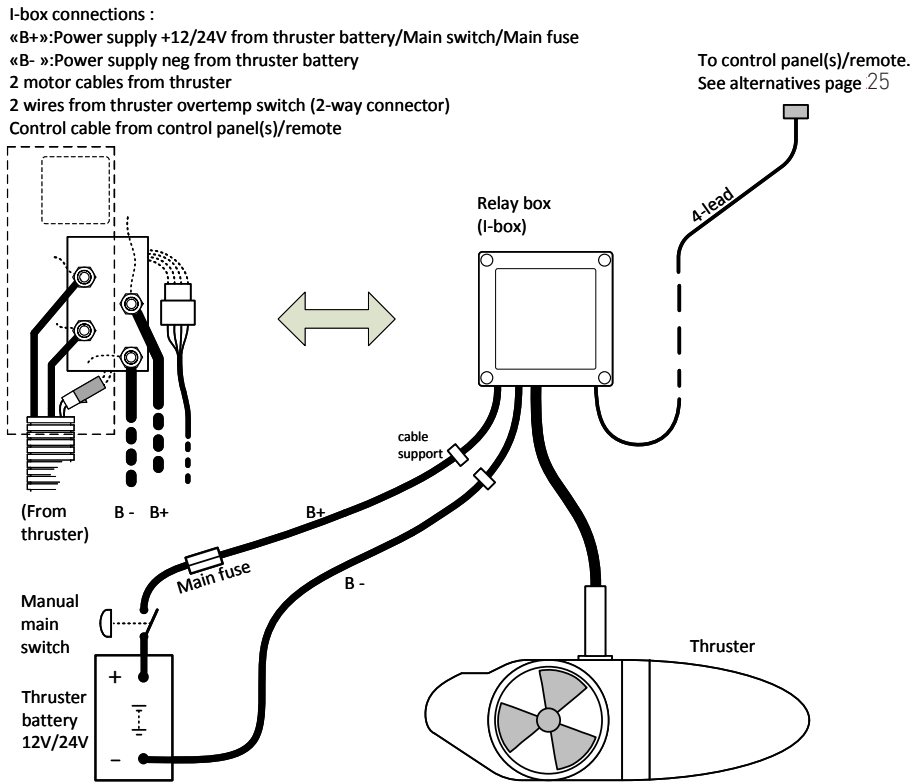
In order to protect **EXTURN** from overloading and to protect the electrical system from short-circuit both a main switch and a protection fuse must be integrated into the positive wiring loom (see 8.3. Fuse protection and wire cross section).

The **EXTURN** main switch should be installed in an easily accessible place, thus the power for the bow or stern thruster can be switched off in emergencies, without influencing the other electrics on board. With non-operation, the **EXTURN** main switch should generally be switched off.

### 8.6. Installation of the i-BOX

The i-BOX is the central control element, to which several control panels can be attached. It should be mounted with the cable connections facing down..

Fig. 34



Note: It is not possible to operate two EXTURNS independently by means of one i-BOX!

### 8.7. Installation of joystick and touch panel (optional)

Find a comfortable position for the panel where it does not obstruct or are obstructed by other controls. Use the enclosed cut-out pattern to mark the area. Cut out the circular area as shown on pattern. If the front surface around your cut out is jagged or chipped, use a sealant to assist the gasket.

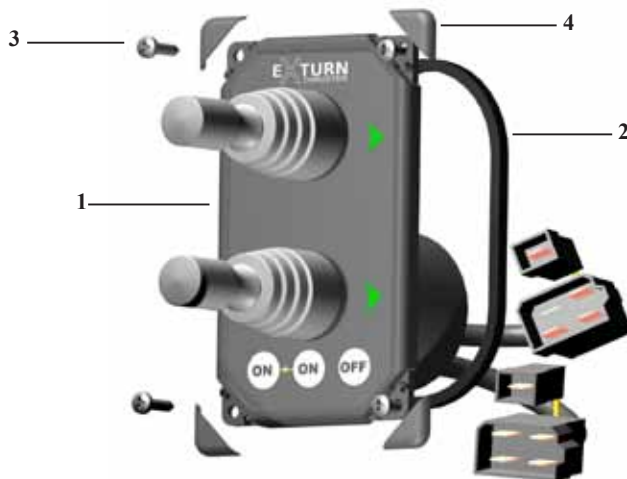
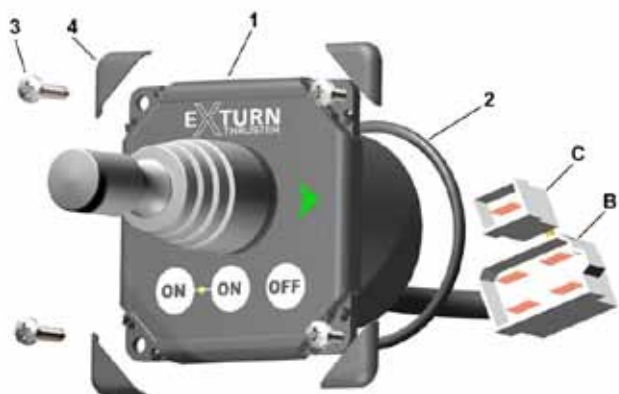
- A Put the gasket (2) in its designated track in the back face of the panel (1).
- B Connect the contact with the control cable from the thruster, use 5-lead control cable if automatic main switch is used.
- C Put the panel (1) in place and screw in and tighten the four screws (3).
- D Press gently each of the four corner clips (4) into their corner slot.

NB ! If the thruster runs the opposite way of the panel, swap positions of the grey and the blue control cables in one contact, either in the i-Box or by the panel.

### 8.8. Installation of the radio remote control (optional)

Please refer to the separate radio remote manual.

Fig. 35



Partslist

Ref:	Pcs.	Parts:
1	1 x	Control panel
2	1 x	Gasket
3	4 x	Screws (A4)
4	4 x	Corner clips

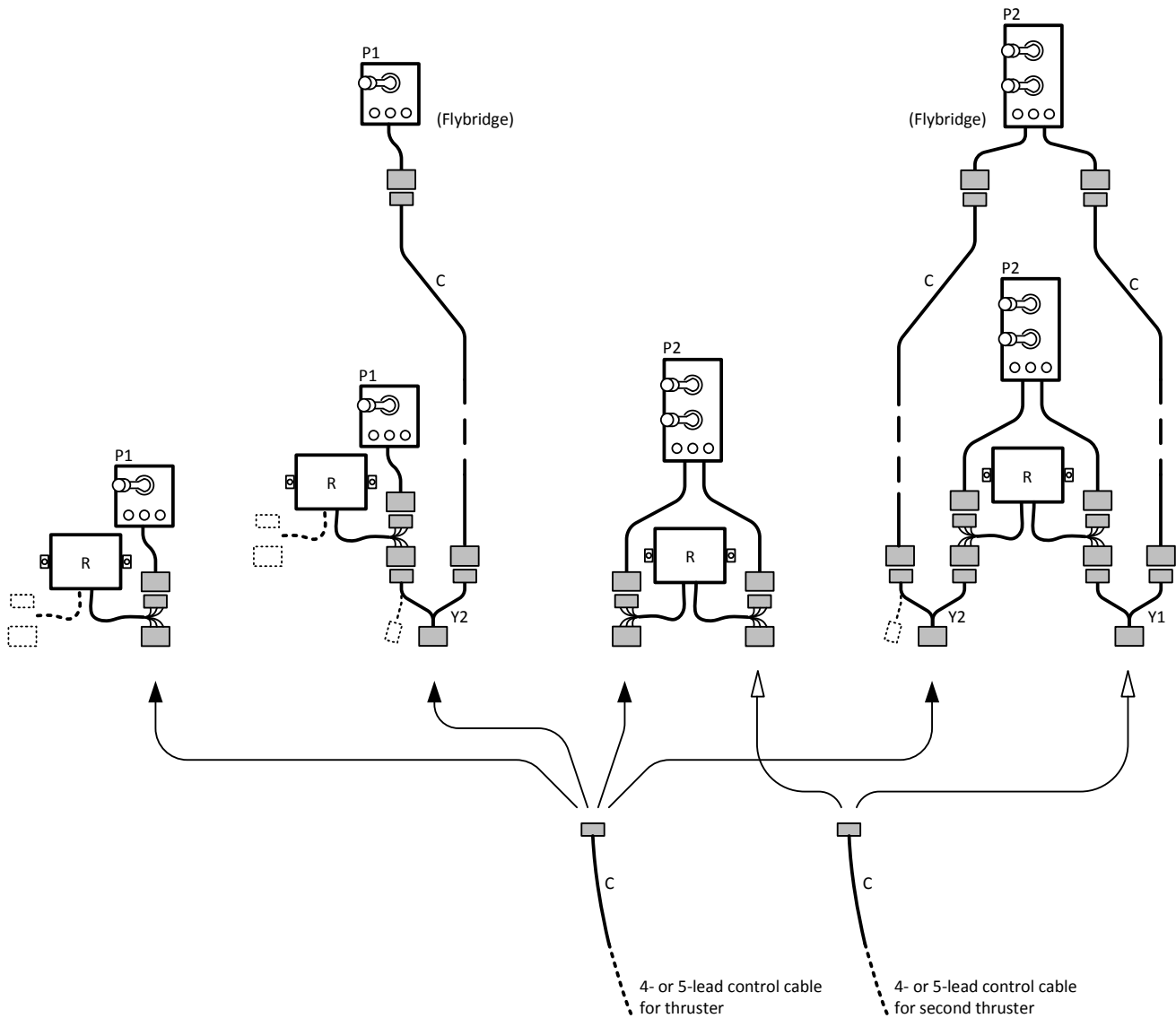


### 8.9. Installation of multiple control elements

The i-BOX offers the possibility of attaching several control elements (e.g. joystick and touch panel) to the same **EXTURN**.

You can install as many panels as you wish by using optional Y-connectors. If two or more panels are operated at the same time in opposite directions, the electronic control box will stop the thruster until it only receives a signal to go in one direction.

Fig. 36



9. OPERATION

9.1. EXTURN as bow thruster

1. Switch on the EXTURN main switch.
2. Turn the control panel on by pushing both "ON" buttons on the panel simultaneously. If another type of control is installed, engage the On/Off switch for the bowthruster.
3. The panel will shut off automatically after 6 minutes of inactivity
4. Move the joystick in the respective direction (joystick panel) or push the respective key (touch panel, remote control) in order to manoeuvre the bow in the desired direction:

RED = port  
GREEN = starboard

5. Depending on the speed of the movement, stop steering before reaching the desired goal position, as the bow will move a little more in the chosen direction.
6. If necessary, make yourself familiar with the control of EXTURN on open waters, in order to get a feeling for it.
7. Always turn off the EXTURN main switch when leaving the boat.

9.2. EXTURN as stern thruster

1. Switch on the EXTURN main switch.
2. Turn the control panel on by pushing both "ON" buttons on the panel simultaneously. If another type of control is installed, engage the On/Off switch for the thruster.
3. The panel will shut off automatically after 6 minutes of inactivity
4. Move the joystick in the respective direction (joystick panel) or push the respective key (touch panel, remote control) in order to manoeuvre the bow in the desired direction:

RED = port  
GREEN = starboard

5. Depending on the speed of the movement, stop steering before reaching the desired goal position, as the bow will move a little more in the chosen direction.
6. If necessary, make yourself familiar with the control of EXTURN on open waters, in order to get a feeling for it.
7. Always turn off the EXTURN main switch when leaving the boat.



Fig. 37: EXTURN as bow thruster



Fig. 38: EXTURN as stern thruster

### 9.3. Bow and stern thrusters combined

The use of both a bow thruster and a stern thruster allows the movement of the boat sideways or turns it around its own axis. It is however necessary to install for both **EXTURN**s to have their own i-BOX (see 8. Electrical Installation).

The operation corresponds to the instructions for **EXTURN** as bow thruster and **EXTURN** as stern thruster.



Fig. 44: bow and stern thrusters combined

### 9.4. Operation with multiple control elements

The i-BOX offers the possibility of attaching several control elements (e.g. joystick and touch panel) to the same **EXTURN**.

You can install as many panels as you wish by using optional Y-connectors. If two or more panels are operated at the same time in opposite directions, the electronic control box will stop the thruster until it only receives a signal to go in one direction.

### 9.5. Important User Information

- Do not allow **EXTURN** to run for more than 5 seconds when not immersed in water! **EXTURN** is not a toy. It is a technical auxiliary motor used to help manoeuvre a ship. With normal use (e.g. brief activation while mooring), Exturn has an operational life span of about 10 years (250 to 300 hours of operating time).
- Do not operate **EXTURN** outside of the water if there are people near the bow or stern thruster.
- When working on **EXTURN** (e.g. applying antifouling, replacing the propeller) always switch off the **EXTURN** main switch.
- If the drive direction of the bow or stern thruster does not correspond to the directions on the control element, main circuit cables of **EXTURN** (blue/gray) have to be inverted on the control element, blue and grey wire on the contactor in the I-box have to be interchanged. (see 11.2 or 11.3)
- **EXTURN** has a continuous runtime of 3 to 5 minutes depending on the water temperature. Afterwards the overheat protection is activated and the thruster will stop. The thruster will need to cool down before operation can resume

## 9.6. Maintenance

The **EXTURN** bow and stern thruster is absolutely maintenance-free. In order to avoid fouling, it is important to coat the bow or stern thruster with antifouling. Therefore use an aluminium primer and then the according antifouling.

**EXTURN**, except of the plastic parts (covers, propeller), is resistant against all prevalent detergents. For cleaning purposes it is recommended to use a high-pressure cleaner. Persistent dirt should be removed by hand brush!

Note: With work on **EXTURN** (e.g. applying antifouling, changing the propeller) always switch off the **EXTURN** main switch!

## 9.7. Troubleshooting

The **EXTURN** bow or stern thruster cannot be started:

- The main switch is not switched on.
- The control panel is inactive, no LED light.
- The main fuse tripped.
- The thruster motor is overheated.

The **EXTURN** bow or stern thruster runs in the wrong direction:

- Blue and grey wire on the contactor in the i-Box have to be interchanged (see 11.2 or 11.3).

The **EXTURN** bow or stern thruster has insufficient power:

- The battery is not sufficiently charged.
- The electrical connections are bad (e.g. because of corrosion).
- The necessary minimum voltage of 10 V or 21 V is not reached.
- The propeller is blocked (e.g. by fouling, wood, line).

## 10. WARRANTY

1. **Sleipner-Marinho** GmbH (in following short: "**MARINNO**") issues to his customer 3 years guarantee on purchase of an **EXTURN** bow- and stern thruster (in following short "product"). **MARINNO** guarantees that the product is free of deficiencies in material and construction.

2. The 3 years term starts on the date of delivery to the end user, at the last on the date of invoice to the end user.

3. In case of deficiency, covered by the guarantee, **MARINNO** is authorized to choose either to remedy the deficiency himself or by an authorised partner or to replace the defect product by an equal substitute. Replaced spareparts or products become property of **MARINNO**.

4. The following applies when processing a warranty claim:

a. The buyer must mail a detailed description of the fault(s) including the date and place of purchase, photographs of all connections (device, relay, battery etc.) and the installer's address to **MARINNO** or to the local **MARINNO** distributor by e-mail or by post (not by fax!) (see the form on the last page of these operating instructions). Photos of the interior fastening of the bow thruster (if the boat is out of the water, the outside fastening as well) must be included with the COMPLETELY FILLED OUT complaint form, photos of the electrical connections at the i-Box and a photo of the defective part (e.g. the joystick), if necessary, as well as a photo of the i-Box connection to the on-board power supply.

b. After evaluating the photo material and the description of the defect on the complaint form, **MARINNO** will ask the customer to send in the i-Box (if the defect is expected to be in the bow-stern thruster) or the defective part concerned (e.g. the joystick), provided the connection and the assembly are correct.

c. The i-Box is read by **MARINNO**. Based on these data, **MARINNO** will decide on the further procedure within a brief period of time. This can be:

- The customer receives a new part (e.g. joystick exchange)
- The customer receives a new bow/stern thruster after paying a deposit of 50 % on account (current original price plus analysis costs) with the request that the old device incl. photographs taken from all 8 sides (to rule out that any transport damage is assessed incorrectly later on) be returned. The defective bow/stern thruster is tested. If the warranty claim is justified, a credit note is issued to the customer, and the amount which has been paid shall be refunded. If the warranty claim is not justified (e.g. if the device has

been manipulated, or in the event of collision damage), the remaining amount invoiced is due promptly following notification to the customer.

- The customer receives notification that a warranty claim does not exist. This can also happen as soon as the photo material has been evaluated. In this case, the costs incurred thus far (see warranty analysis costs) shall be invoiced to the customer.

5. There are no warranty obligations if the defect or the damage was caused by incorrect or inadequate installation, incorrect operation or use (chapters 1 – 9), improper maintenance or repair, or dismantling of the product, or adaptations or modifications to the product, by unauthorised persons. This includes in particular shortening the shaft as well as the engine wiring. Only the main circuit fuses offered by **MARINNO** (EXT-HSA 80/100/125) may be used. Alternatively, fuses that have exactly the same specifications can be used instead.

6. Expenses for installation and removal, cranes and/or other expenses shall not be reimbursed. If a warranty claim is valid, only the defective device will be removed free of charge.

7. Warranty analysis costs:

- a. Assessment on the basis of the damage report and the photo material (EUR 150.00)
- b. Assessment on the basis of point a) and reading the i-Box (EUR 350.00)
- c. Assessment on the basis of points a), b) and analysis of the bow/stern thruster sent in (EUR 500.00 plus the current selling price of the new replacement device). If the new replacement device is returned to **MARINNO** in the original packaging and unused, the amount invoiced will be credited to the customer accordingly, and the amount already paid for the bow thruster will be returned. A device that has already been used or mounted will not be accepted back.

8. No other claims shall arise from this warranty, especially all types of claims for compensation.

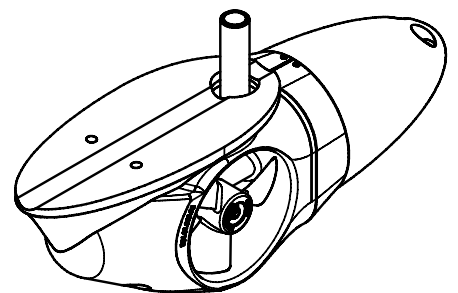
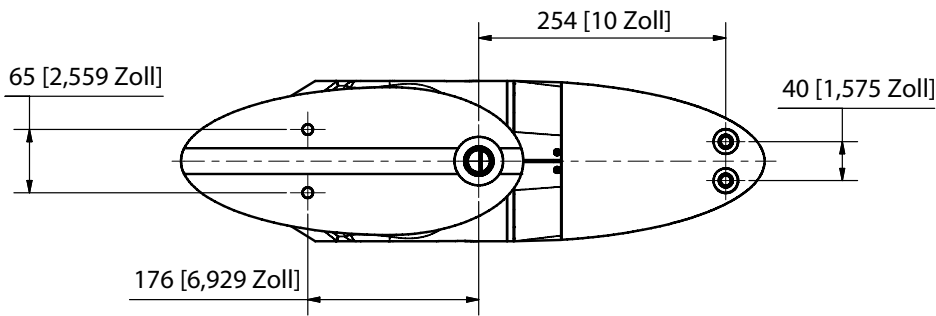
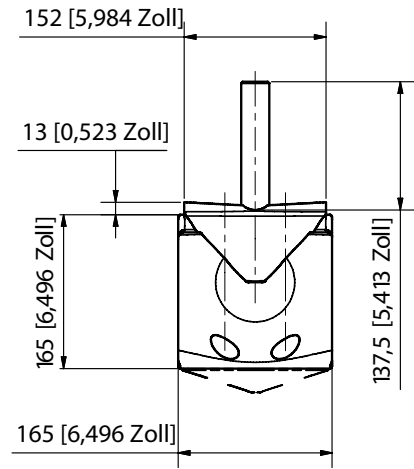
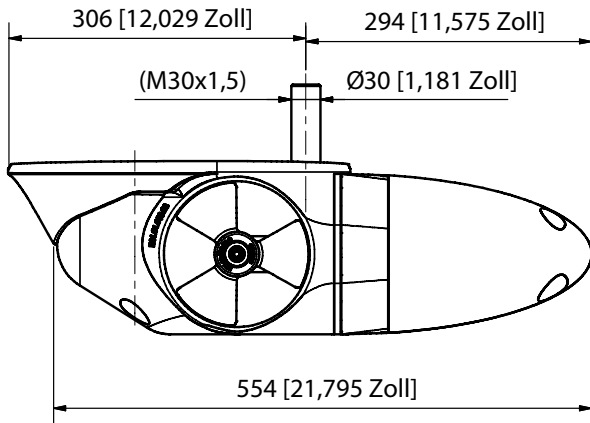
9. The present warranty shall not limit the legal rights, especially warranty claims against the seller and potential claims arising against **MARINNO** as a manufacturer from the Product Liability Law.

The warranty does not apply if any changes have been made to the device (shortening the hollow threaded bolt, lengthening/shortening the cables etc.)!

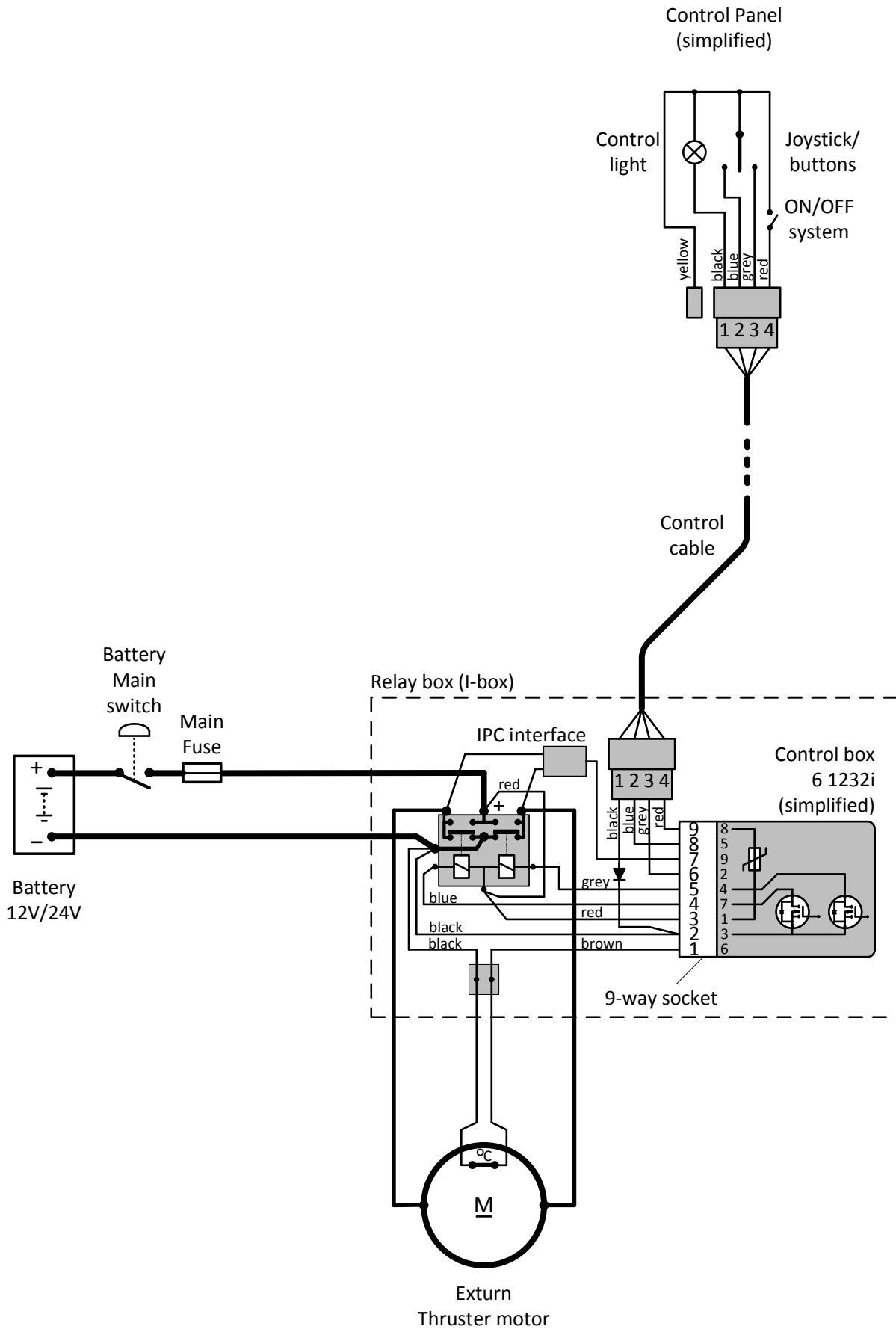
Any costs incurred shall be invoiced and referred to a court to obtain payment, if necessary. By signing the complaint sheet, the customer agrees to the procedure used for the warranty/complaint process and is aware that the costs listed above will be billed to him if the warranty claim is not valid.

11. APPENDIX

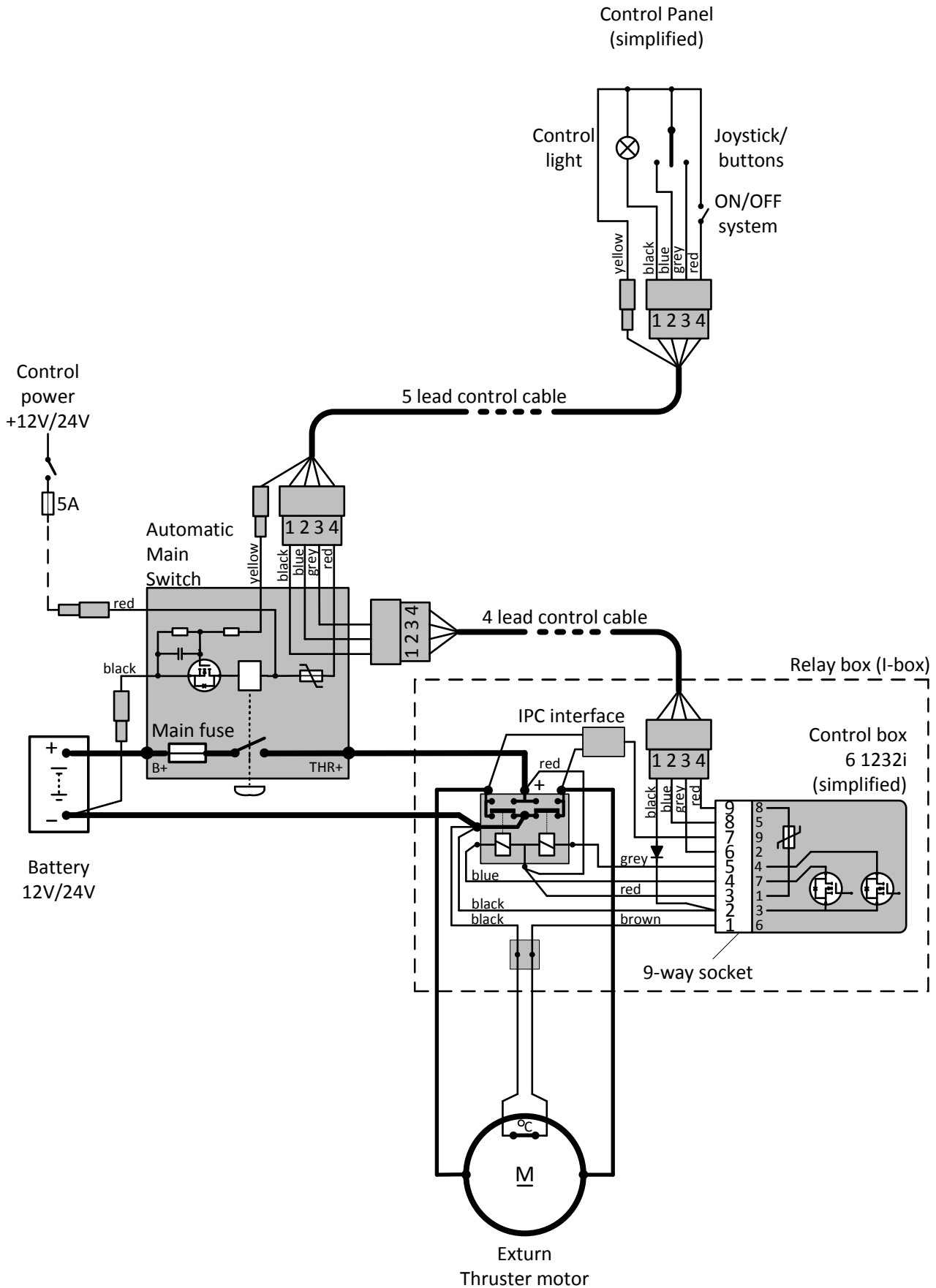
11.1. Dimension sheet **EXTURN** Simplex



11.2.Wiring diagram EXTURN Simplex - Manual main switch

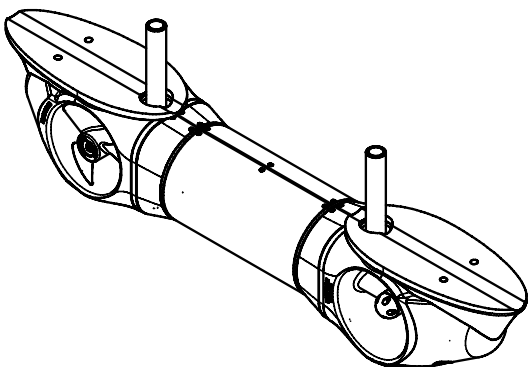
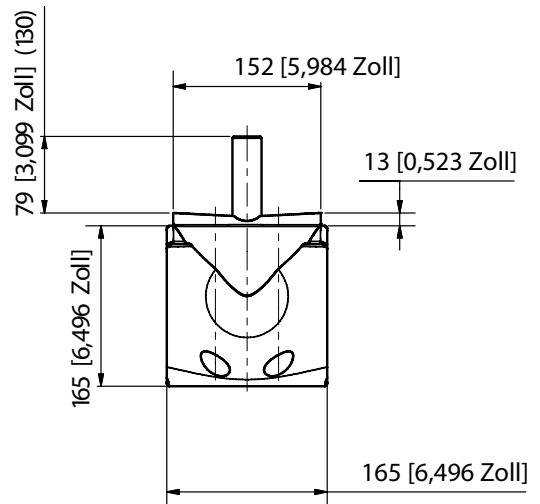
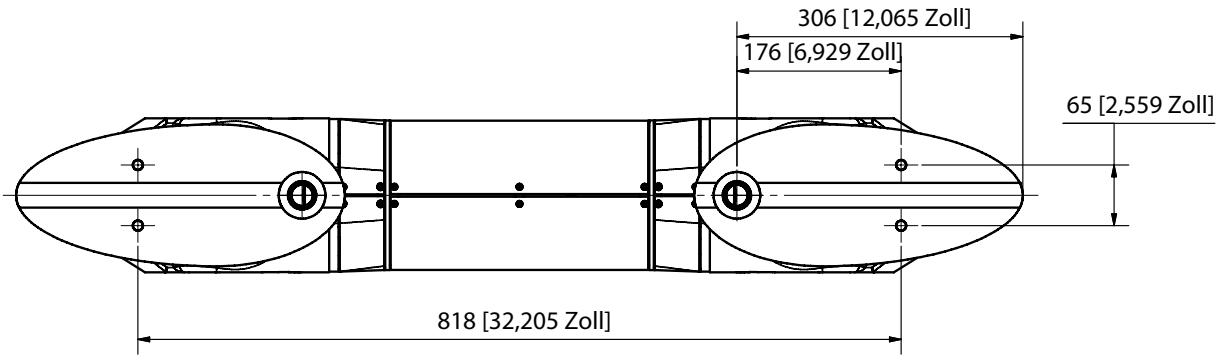
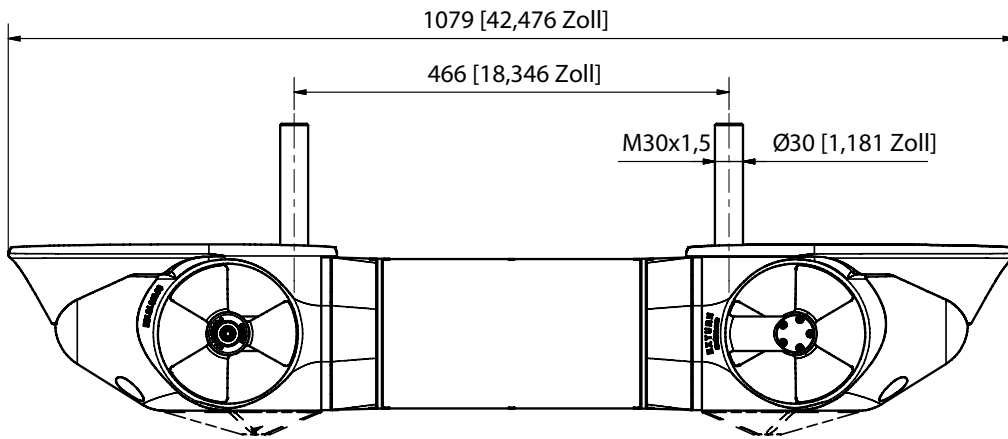


11.3. Wiring diagram EXTURN Simplex - Automatic main switch

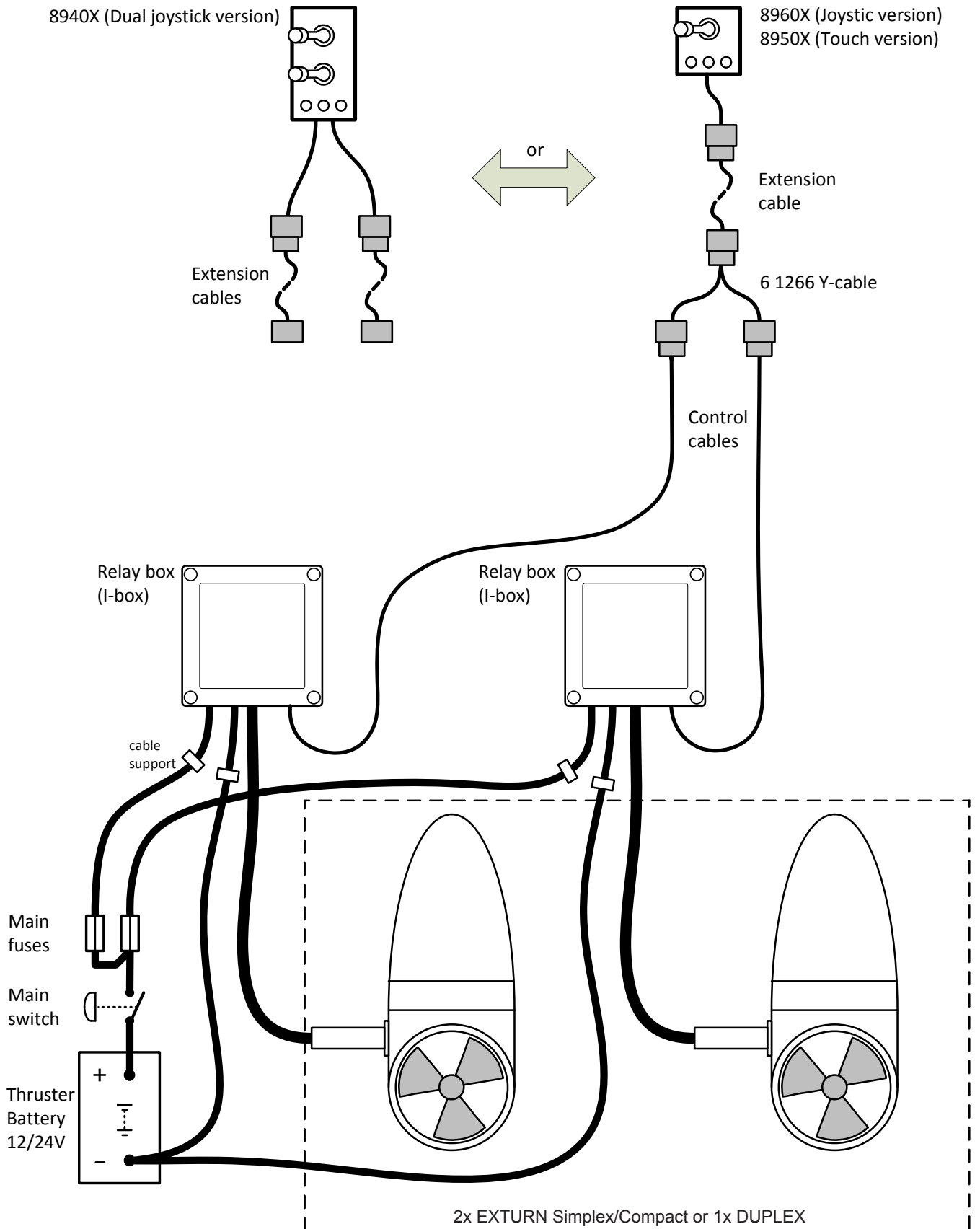




11.4. Dimension sheet **EXTURN** Duplex



11.5. Control Circuit Scheme EXTURN Duplex





## 11.6. Technical Facts

**EXTURN Simplex 130**

Power (kW)	1,3
Thrust (kgf)	35
Voltage (V)	12
Nominal Current (A)	140
Length (cm)	55
Weight (kg)	19,5
Diameter (cm)	16,5 x 16,5
Propeller (type)	B010901803-C
recommended boat size (m)	7 - 9
recommended boat size (ft.)	23 - 30

**EXTURN Simplex 180**

Power (kW)	1,8
Thrust (kgf)	56
Voltage (V)	12
Nominal Current (A)	187
Length (cm)	55
Weight (kg)	19,5
Diameter (cm)	16,5 x 16,5
Propeller (type)	B010901803-C
recommended boat size (m)	8 - 11
recommended boat size (ft.)	26 - 36

**EXTURN Simplex 230**

Power (kW)	2,3
Thrust (kgf)	74
Voltage (V)	24
Nominal Current (A)	120
Length (cm)	55
Weight (kg)	19,5
Diameter (cm)	16,5 x 16,5
Propeller (type)	B010903003-C
recommended boat size (m)	10 - 13
recommended boat size (ft.)	33 - 43

**EXTURN Simplex 300**

Power (kW)	3,0
Thrust (kgf)	94
Voltage (V)	24
Nominal Current (A)	175
Length (cm)	55
Weight (kg)	19,5
Diameter (cm)	16,5 x 16,5
Propeller (type)	B010903003-C
recommended boat size (m)	12 - 15
recommended boat size (ft.)	39 - 49

**EXTURN Duplex 400**

Power (kW)	4,0
Thrust (kgf)	110
Voltage (V)	12
Nominal Current (A)	374
Length (cm)	98
Weight (kg)	35
Diameter (cm)	16,5 x 16,5
Propeller (type)	2x B010901803-C
recommended boat size (m)	14 - 18
recommended boat size (ft.)	46 - 59

**EXTURN Duplex 600**

Power (kW)	6,0
Thrust (kgf)	180
Voltage (V)	24
Nominal Current (A)	350
Length (cm)	98
Weight (kg)	35
Diameter (cm)	16,5 x 16,5
Propeller (type)	2x B010903003-C
recommended boat size (m)	17 - 20
recommended boat size (ft.)	56 - 66

## 11.7. Propeller Replacement

The propeller has to be replaced depending on the particular **EXTURN** model:

- Propeller **EXTURN** 130/180 (Article No. 50320)
- Propeller **EXTURN** 230/300 (Article No. 50321)

The space between the plastic disk [2] and the sealing of the housing has to be filled with propeller grease [7]. It is not necessary to remove pre-existing grease. The space between plastic disk [2] and propeller [4] should not be filled with grease. The thread definitely must stay free from grease.

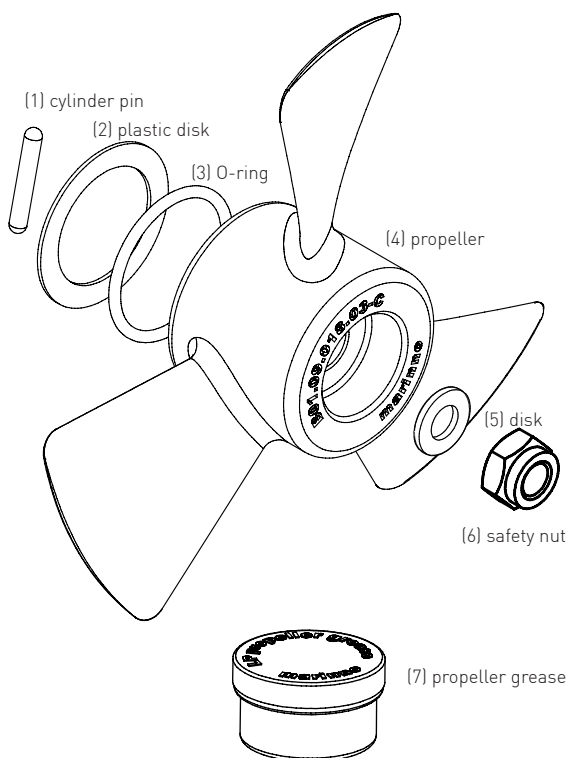


Fig. 40: propeller set

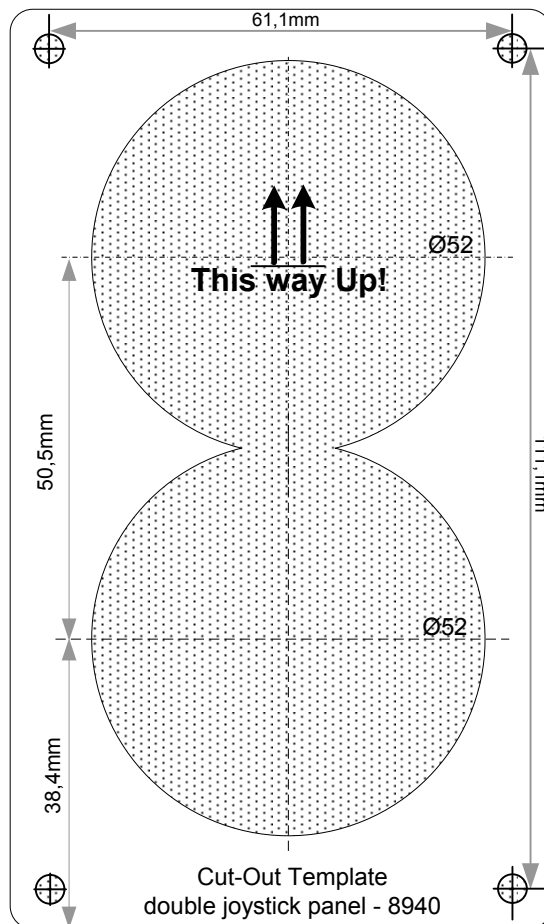
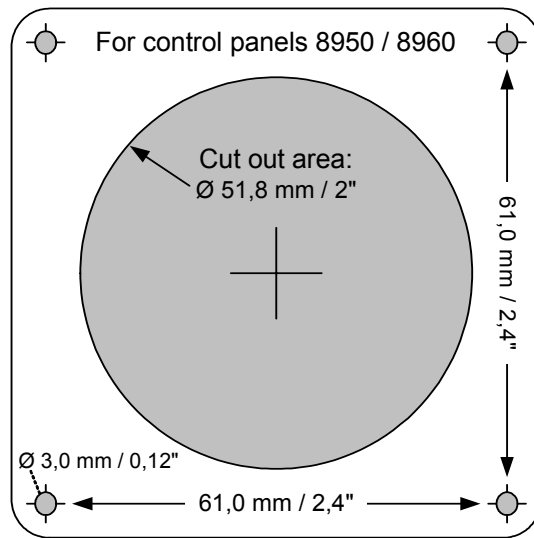
### CAUTION!

During propeller replacement it is compulsory to fill the space between plastic disk and sealing of the housing completely with propeller grease!

### CAUTION!

During propeller replacement always switch off the **EXTURN** main switch!

11.8. Template for joystick and touch panel



# CLAIM FORM

**Consignee:**

Sleipner-Marinno GmbH & Co KG  
 Alemannenweg 49  
 6830 Rankweil  
 Austria  
 + 43 5522 44273  
 info@marinno.com

**Customer:**

Name:  
 Address:  
 Country:  
 Tel / E-Mail:  
 Customer Number:  
 Order Number / Delivery Note / Invoice:  
 Part Number:

We apologise for the trouble caused. Please return the defect material with the filled claim-form to us. We will arrange the replacement after receipt and inspection of the defect material.

**Customer Complaint (Please describe the defect exactly):**

Inspection of defect material:	<table border="0"> <tr> <td style="text-align: center;">Yes</td> <td></td> <td style="text-align: center;">No</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">Date: _____</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	Yes		No	<input type="checkbox"/>	Date: _____	<input type="checkbox"/>
Yes		No					
<input type="checkbox"/>	Date: _____	<input type="checkbox"/>					
Valid complaint:	<table border="0"> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/>	<input type="checkbox"/>						
Warranty:	<table border="0"> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	<input type="checkbox"/>	<input type="checkbox"/>				
<input type="checkbox"/>	<input type="checkbox"/>						
Replacement:	<table border="0"> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;">Date: _____</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	<input type="checkbox"/>	Date: _____	<input type="checkbox"/>			
<input type="checkbox"/>	Date: _____	<input type="checkbox"/>					
Application engineer - inspection:	<input style="width: 100%; height: 20px;" type="text"/>						
Contact - processing:	<input style="width: 100%; height: 20px;" type="text"/>						

# EXTURN<sup>®</sup>

DOCK IT EASY

