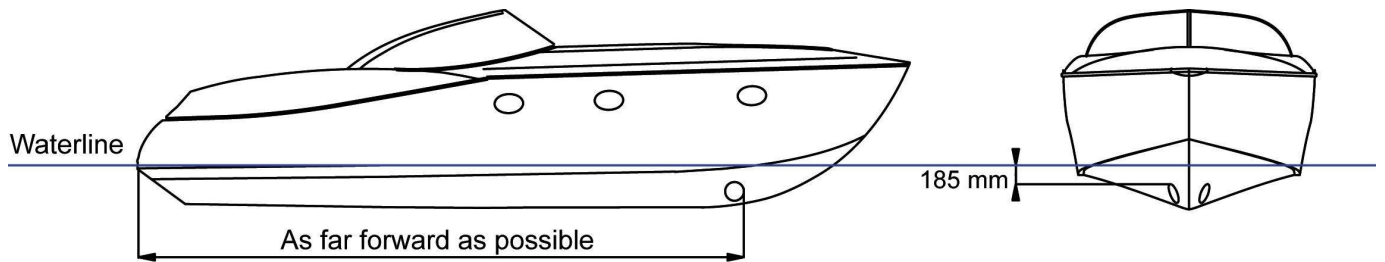






## 1. GENERAL INSTALLATION GUIDELINES

In order to install the thruster in the most efficient position, follow the instructions below:



- The **minimum** acceptable tunnel position is 139mm below the waterline
- **The tunnel is ideally positioned when the distance between the waterline and the top of the installed tunnel is 185mm**
- The tunnel must be installed as far forward as possible

NB: A thruster turbine installed above its ideal position towards its minimum depth will lead to a progressive loss of performance.

Whether inclined or horizontal, it is recommended to support the electric motor.

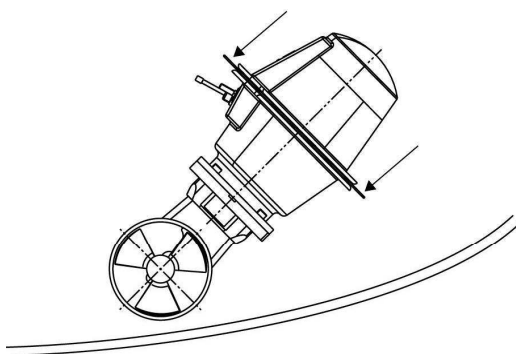
The batteries used by the thruster must be charged by both the main engine's alternator and an appropriate battery charger.

If the thruster is installed using a dedicated battery bank, this must be as close as possible to the thruster in order to reduce voltage loss in the electric cables.

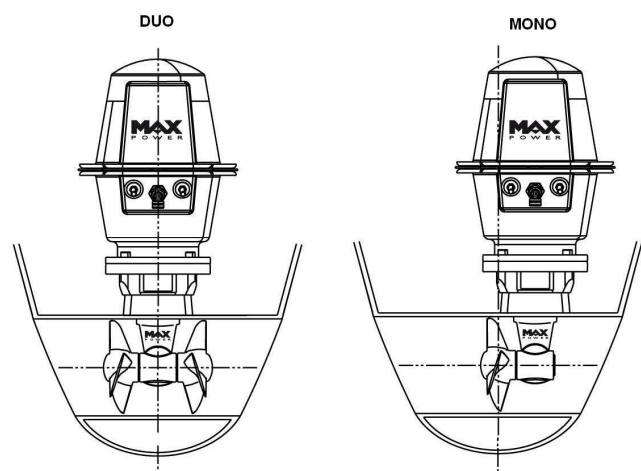
For the **CT60-IP** mono, the **propeller** must be **centred** in the tunnel.

In the case of the **CT80-IP** duo, the drive leg must be centered in the tunnel

**In no case should the propellers of either models protrude out of the tunnel.**

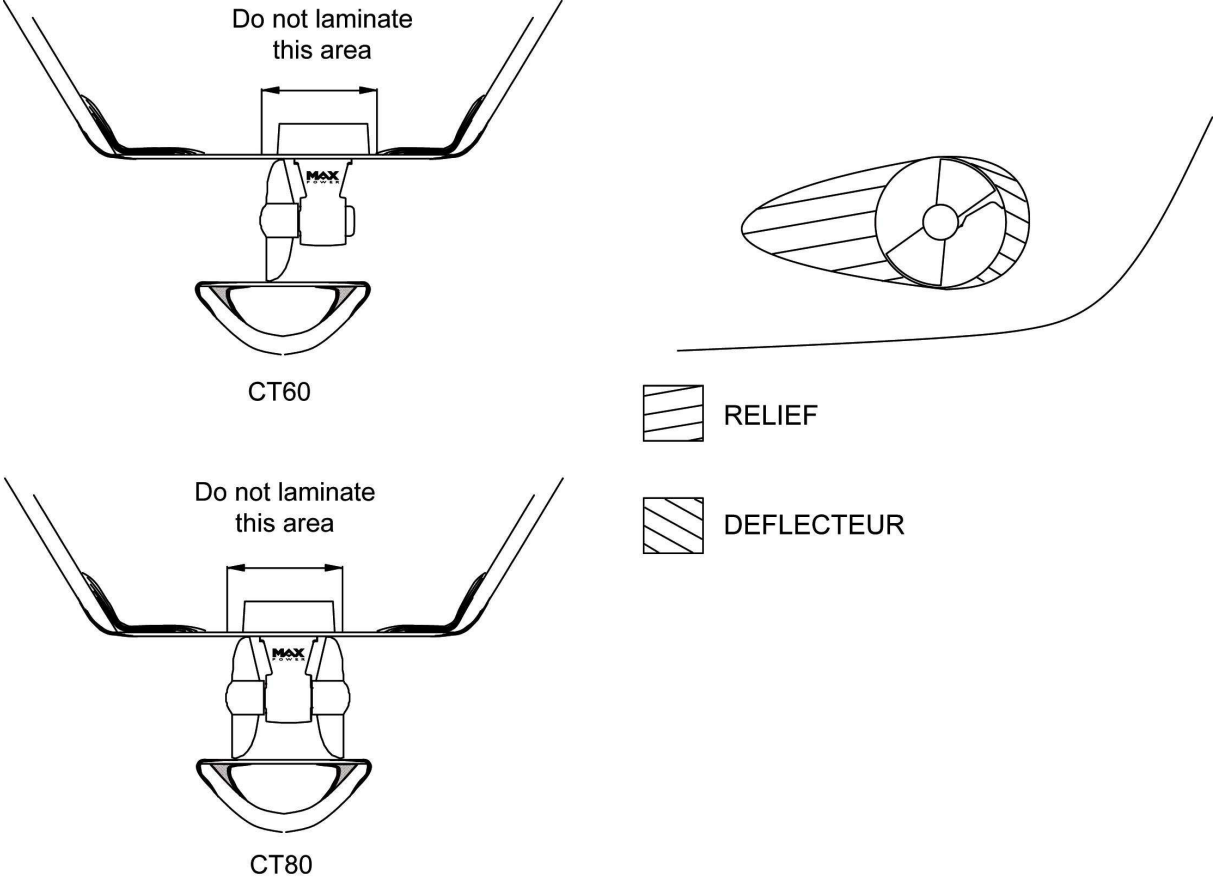


NB: Two metal brackets can be found on the front and back of the casing which can be used to hold the thruster in place if necessary.





**DO NOT LAMINATE THE AREA OF THE TUNNEL TO WHICH THE ELECTRICAL MOTOR SUPPORT WILL BE FIXED.**



**3. COMPOSITE MOTOR SUPPORT AND DRIVE LEG**

**For the CT60-IP (Mono):**

The propeller must be at the center of the tunnel. The motor support and the drive leg will therefore not be centered in the tunnel.

**For the CT80-IP (Duo):**

The motor support and the drive leg will be centered in the tunnel.

**For both models:**

Locate and mark the intended position of the holes for the fixing screws and the leg hub. You can use the motor support and the leg's gasket to mark these holes.

In some cases it will be easier to mark and drill these holes BEFORE laminating the tunnel.

After drilling, use the gasket to verify the holes' axes and adjust them with a round file where necessary.

These holes must be completely **clean** before inserting the screws.

Position the leg, the gasket (**between the leg and the tunnel**) and the motor support, and then tighten the the two screws alternatively. Finally, mount the propeller(s) to control the general alignment.

If the general set-up is correct, remove the propeller(s), the leg and the gasket. Apply a thin coating of silicon grease or sealing compound to both sides of the gasket (this must be resistant to hydrocarbons and water). Re-assemble all parts as before,





**It is essential to install a manual battery isolator and if possible an electric battery isolator at the base of the thruster motor power line.**

When using a manual battery isolator it must be visible, clearly marked & easily accessible.

**Thruster motor power supply:**

These values are given as an indication, assuming that the batteries are charged at 100% and in charge, that is either 13.8V or 25.4V.

The performance data of the CT60-IP / CT80-IP is measured with an approx. consumption of 400A and 11V (12V) or 280A and 22V (24V) at the motor's connections.

Please refer to the characteristics given by the manufacturer of the batteries that will be used (see section 9 "Batteries").

**Power wiring:**

Measure the shortest and most direct route possible between the battery(ies) and the electric motor; remembering to allow for both "positive **and** negative" cables.

**Recommended cable sections:**

Cable lengths	CT60-IP / CT80-IP 12V	CT60-IP / CT80-IP 24V
L ≤ 5 m (2,5 x 2)	50mm <sup>2</sup>	35mm <sup>2</sup>
5 < L ≤ 10 m (5 x 2)	70mm <sup>2</sup>	50mm <sup>2</sup>
10 < L ≤ 15 m (7,5 x 2)	95mm <sup>2</sup>	70mm <sup>2</sup>
15 < L ≤ 20 m (10 x 2)	120mm <sup>2</sup>	95mm <sup>2</sup>

For all connections, use appropriate terminals for the cable sections chosen. It is possible to reduce the cable section to facilitate easy connection but **only over a short distance**. In this case, appropriated crimp fittings should be used at the connections.

**Please consult the "Electrical installation" diagram p. 11 for more information**

**8. MAIN POWER FUSE**

Fuse sizes for overcurrent protection are to be determined on the basis of the cable sections in the circuit and NOT the amperage drawn by the appliance (thruster motor) in the circuit.

Thruster	Maximum Amperage	Max Power Fuse size
CT60-IP / 12V	330A	160A
CT60-IP / 24V	180A	125A
CT80-IP / 12V	360A	200A
CT80-IP / 24V	200A	125A

**9. BATTERIES**

Thrusters are high amperage consumers with instantaneous demands, thus, we recommend you use maintenance-free "starting" type batteries, with high CCA outputs.

Example:

Battery: Exide Maxxima900 12V  
Capacity: 55 Ah  
CCA: 800

Thruster	Batteries number
CT60-IP & CT 80-IP 12 V	2 serials
CT60-IP & CT 80-IP 24 V	2 parallels

## 10. ELECTRONIC CONTROL BOX

**WARNING:** The electronic controller must be positioned outside of the zone at risk in which there may be potentially flammable gases.

Install a fused circuit breaker / switch in the boat's main DC distribution panel marked BOW THRUSTER.

This circuit breaker / switch should ideally be supplied from a different battery bank to the one used for powering the thruster.

The installer must protect the positive supply cable of the thruster's control box by means of a 8A fuse. The size of the power cables (red & black) depends on the length of the cable run, the voltage drop in these cables should not exceed 5% of the nominal battery voltage.

For safety reasons, and in order to obtain all the functions provided by the thruster controller, an electric battery isolator needs to be installed in the thruster motor positive supply cable.

Max Power advises the use of an electric battery isolator ref. OPTI3160/3 (12V) OPTI3170/3 (24V).

If an electric battery isolator is not used then simply seal-off the two grey wires coming out of the control box. It is important to isolate the thruster motor power circuit by means of a manual battery isolator after having used the thruster.

***Please refer to the drawing "Relay and control box connections" p. 12 for more detail on the wiring of the control box to the thruster.***

## 11. CONTROL PANEL AND THRUSTER CONTROL BOX FUNCTIONS

To switch the thruster ON or OFF follow the instructions given in the diagrams on the following page.

When switched ON the control panel will beep once and the green LED in the red push-button will light up.

When switched OFF the control panel will beep twice and the green LED in the red push-button will go out.

The thruster controller provides a time delay between left and right thrust in order to avoid rapid direction changes. There is no delay when thrusting to same side.

If the thruster motor overheats the control panel will start beeping and the green LED will flash until the thruster motor has cooled down.

As soon as the overheating alarm sounds, there are 10 seconds of actual thruster use before the unit automatically shuts down. It will then not be possible to switch the thruster on until the motor has cooled down.

**If the thruster has not been used for a period of thirty minutes it will automatically switch itself off.**

Before switching off automatically the control panel will beep once followed by a second beep a few seconds later, after which the thruster switches itself off.

In order to isolate the thruster motor power circuit, as described in the previous two paragraphs, it is necessary to install an electric battery isolator, as advised by Max Power.

***Please consult the "Electrical installation" diagram p. 11 for more information***





## 14. ELECTRICAL MEASUREMENTS

In normal “usage” mode, i.e. thrusters running, boat in the water, with fully charged batteries under ongoing charge (alternator), electrical measurements should be made at the following points:

At the batteries

At the battery cut-off switch

At the fuse

At the electric motor’s connections

At the power supply arriving at the thruster control box

These measurements will enable you to detect voltage drop.

**NOTE:** the voltage reading between the motor’s negative and positive connections should be approximately **10.5V for 12V models or 22V for 24V models during operation.**



The cumulative effect of voltage drops at these points can severely impair the thruster's performance.

Should the voltage measured be too low, the following points need checking:

Are the batteries of sufficient capacity ?

Are the batteries good quality?

Are the batteries sufficiently charged?

Are appropriate cable sections being used?

Are the connections sufficiently tightened?

## 15. OPERATION

With the control system circuit breaker/ switch and manual battery isolator switched on:

Switch on the control panel, as previously described in the manual.

Push the red button or incline the joystick to the left and the boat moves to the left.

Push the green button or incline joystick to the right and the boat moves to the right.

If, during tests the boat moves in the wrong direction, change around the blue and the brown wires on your power relay.

When manoeuvring remember that the boat’s momentum continues after you release the joystick / button, therefore remember to release the control prior to reaching your desired position.

Care must be taken not to use the thruster in areas where there may be people swimming or floating debris.

Maximum running time: 2-3 min (depending on ambient temperature).

## 16. ALARMS OR THERMAL SWITCH-OFF

The thruster's electric motor is fitted with a thermal switch as standard. If the thruster motor overheats the buzzer in the control panel will start beeping and the green LED in the red-push button will flash until the thruster motor has cooled down again.

As soon as the overheating alarm sounds, there are 10 seconds of actual thruster use before the unit automatically shuts down. The unit will then not be able to be switched on again until the motor has cooled down.

**17. SAFETY**

Switch off means to cut the power at both the DC equipment panel (control power supply) & the thruster battery isolator (thruster power supply) after having used the thruster. Under no circumstances should any flammable products be stored next to the electric components of the thruster. Care must be taken not to use the thruster in areas where there may be people swimming or in the water close to the thruster.

**CAUTION:** Never tamper with the thruster / thruster turbine if not 100% sure that both the control and power circuits have been isolated, except if taking electrical measurements on the thruster motor or relay.

**18. MAINTENANCE**

**WARNING: Under no circumstances should the thruster casing be opened.**  
Opening or modifying the thruster may result in it no longer being Ignition Protected. In case of a problem please contact your local Max Power distributor

Control panels should be protected from the natural elements while the thruster is not in use.

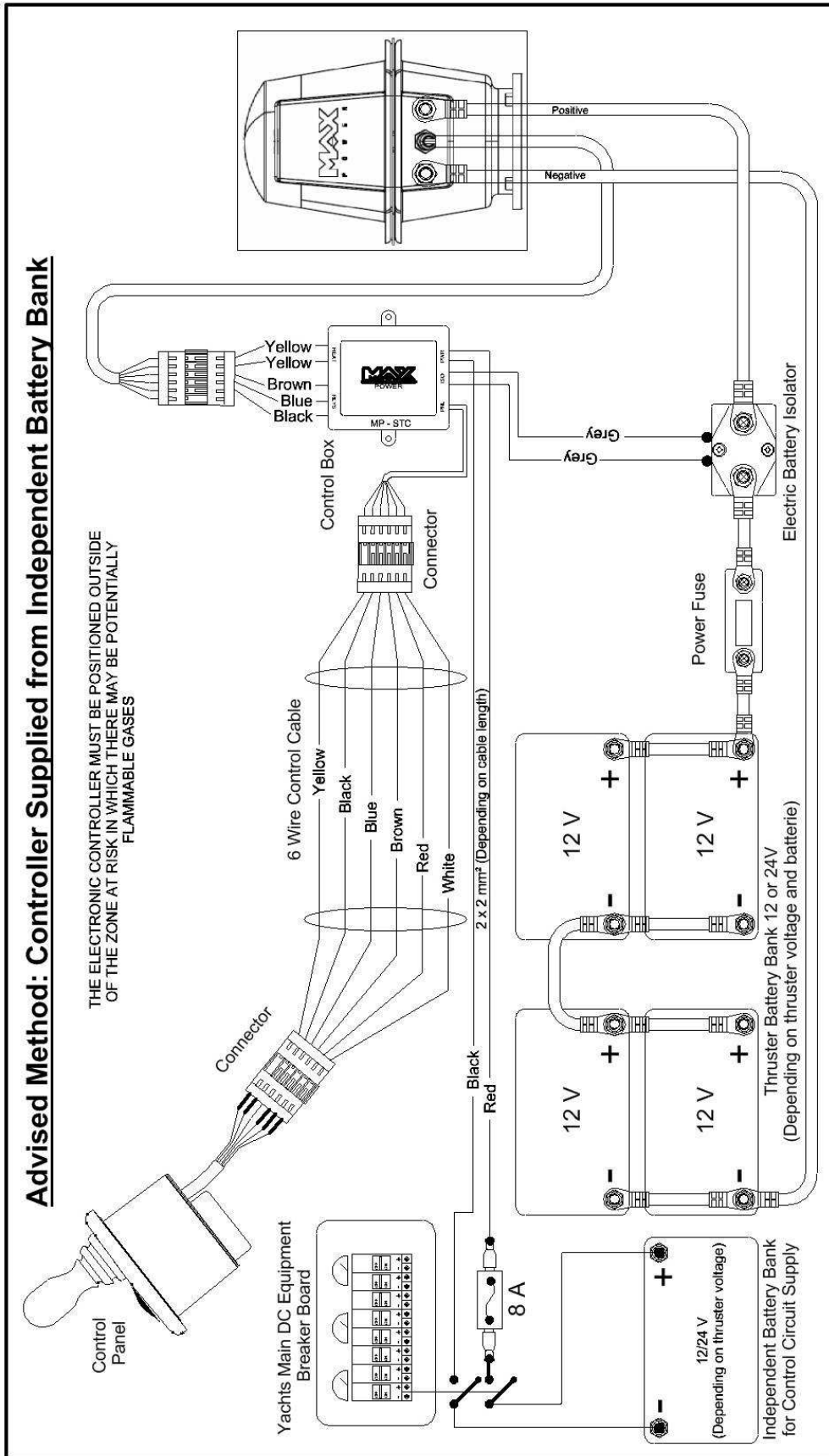
The thruster requires a minimum of ongoing maintenance:  
Check the condition and charge of the batteries regularly, as voltage drop is the most frequent cause of rapid deterioration of the relay.  
Carry out a regular check of all electric components: batteries, connections, power cables.

**NOTE:** All maintenance should be carried out by qualified and authorised personnel.

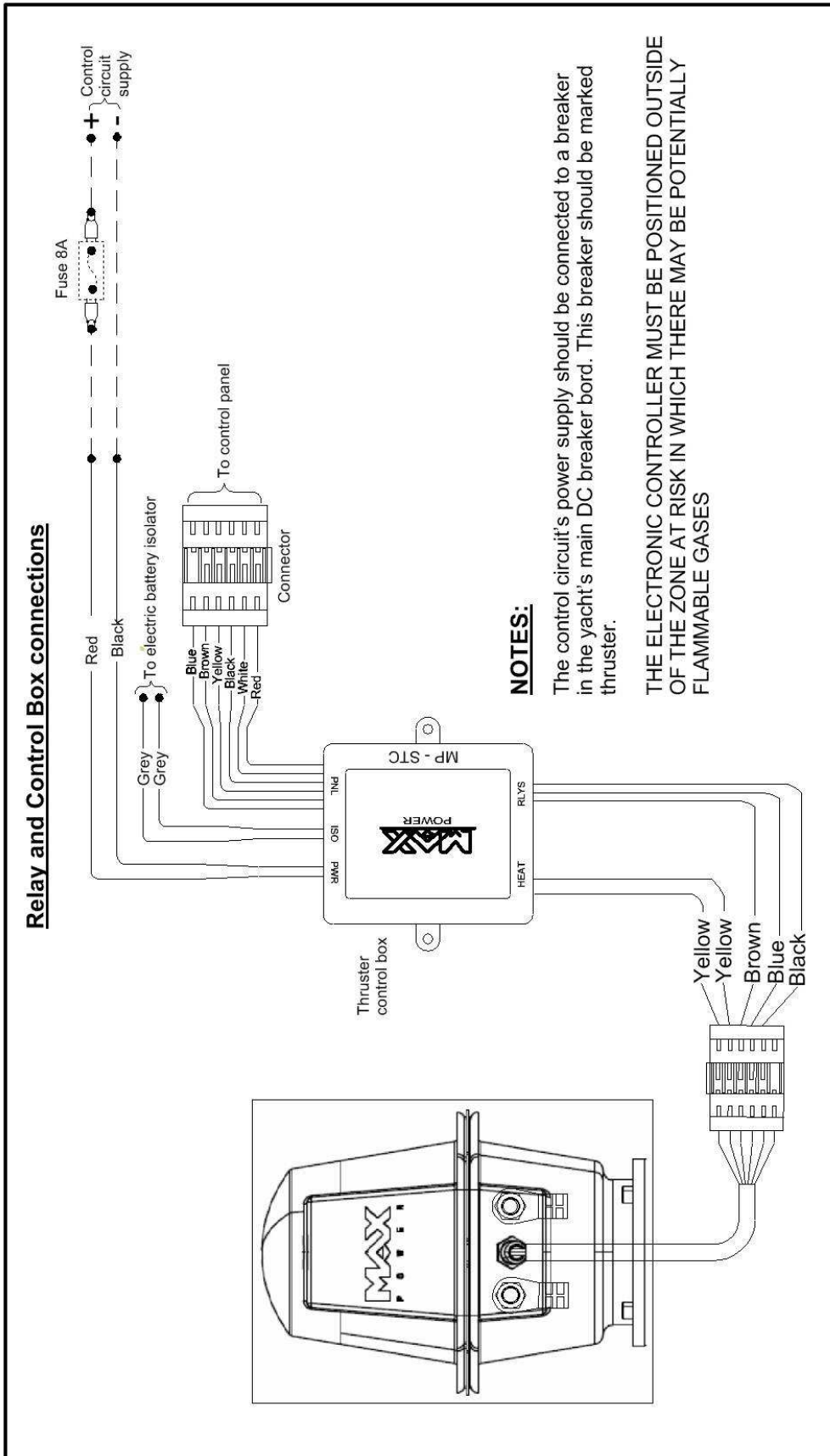
**Composite drive leg and propellers:**  
The composite drive leg is pre-filled with oil and sealed for life. It does not require the oil changing.  
The composite drive leg does not require an anode.  
The composite drive leg must not be disassembled, even partially (this would void the warranty).  
When the boat is out of the water, check that there are no fishing lines, plastic bags, etc. caught in the propellers.  
Paint the drive leg and propellers with antifouling (make sure that they were well prepared and primer has been used).  
Always keep the propellers and tunnel clean.  
To prevent the build up of calcium on the drive shafts, which would damage the oil seals, cover the drive shaft and the oil seals' stainless steel covers with silicon grease before fitting the propeller(s). This should be done on an annual basis after the cleaning of the outside of the leg. Do not use aggressive solvents as they may damage drive leg seals.  
If drive leg oil seals are found to be worn, replace the drive leg with a standard exchange unit.

**THE MAX-POWER TEAM WISHES YOU SUCCESSFUL MANOEUVRING AND ENJOYABLE CRUISING**

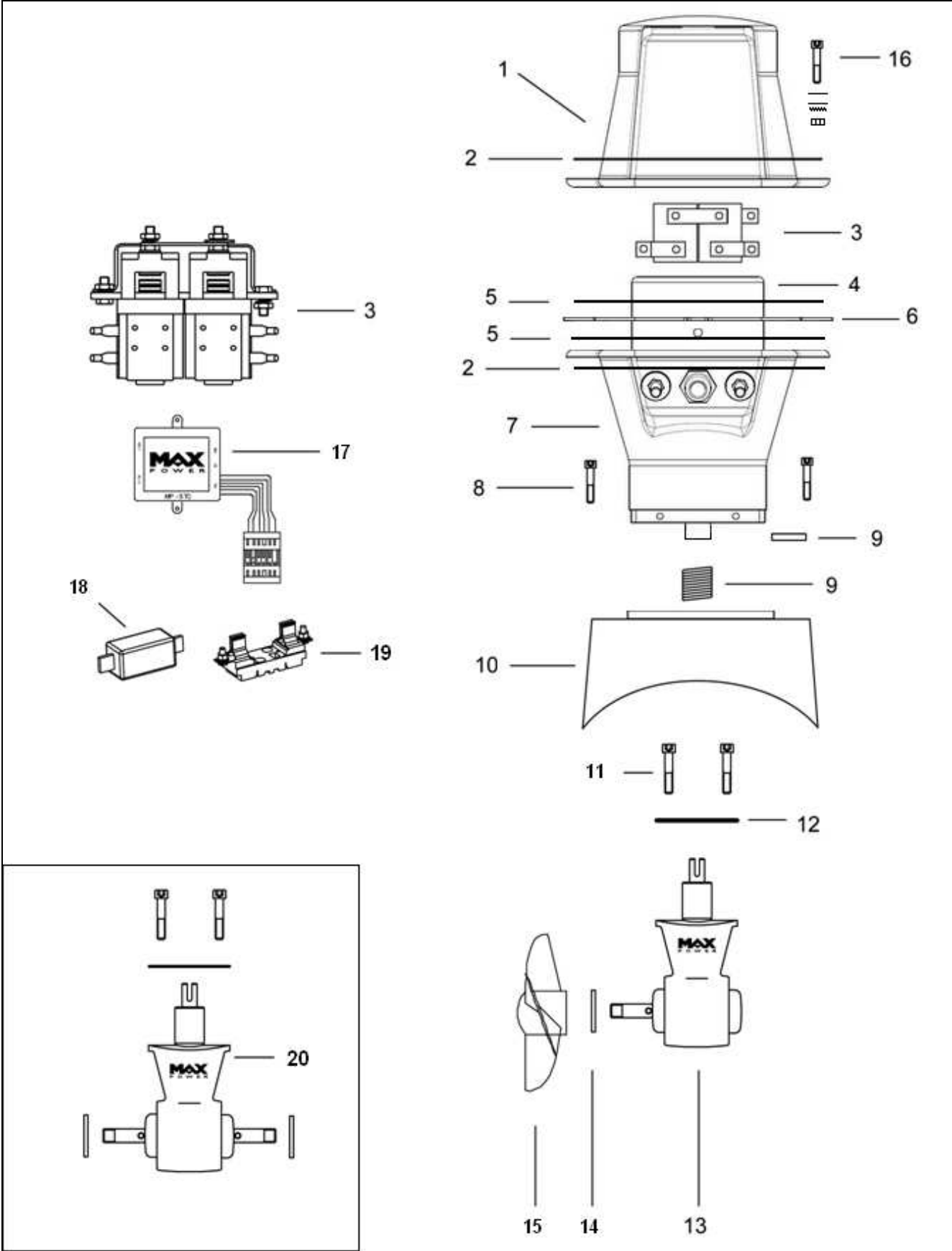
## 19. ELECTRICAL INSTALLATION DIAGRAM



## 20. RELAY AND CONTROL BOX CONNECTIONS



### 21. SPARE PARTS DIAGRAM



## 22. SPARE PARTS LIST CT60-IP / CT80-IP

N°	Description	Quantités	Référence
1	Upper motor casing	1	MPOP5836/SUP
2	Backing flange	2	MPOPO5217
3	Complete relay 12V	1	MP083056/2
3	Complete relay 24V	1	MP083057/2
4	Electric Motor CT60-IP / CT80-IP 12V	1	MP053030
4	Electric Motor CT60-IP / CT80-IP 24V	1	MP053031
5	Flange gasket	2	MPOP5832
6	Centre flange	1	MPOP5216
7	Lower motor casing	1	MPOP5836/INF
8	Motor fixing screws	4	MPOP5241
9	Motor drive pin and spring	1	MP058033 MP058032
10	Motor support	1	MP058035
11	Drive leg fixing screws	2	MPOP4130
12	Drive leg / tunnel fibre seal	1	MPOP2060
13	Composite drive leg CT60	1	MP058100
14	Propeller drive pin	1 ou 2	MPOP5221
15	Propeller	1 ou 2	MPOP8080
16	Motor casing screw kit	16	MPOP4051
		16	MPOP4049
		16	MPOP4048
		32	VP084200
17	Electronic control box	1	MPOP5701
18	Fuse CT60-IP 12V (160A)	1	OPTI3115
18	Fuse CT80-IP 12V (200A)	1	OPTI3112
18	Fuse CT60-IP & CT80-IP 24V (125A)	1	OPTI3114
19	Fuse holder T1	1	OPTI3119
20	Composite drive leg CT80	1	MP088100
-	Fuse extraction handle	1	OPTI3118

**23. TROUBLESHOOTING GUIDE**

Before contacting your nearest Max Power distributor, please check the below troubleshooting guide.

Problem	Check
The control panel does not light up	<ul style="list-style-type: none"> <li>• Check the 6 wire connector behind the joystick</li> <li>• Check the thruster's electronic control box 6 wire connector</li> <li>• Check the circuit breaker / switch in the boat's main DC distribution panel</li> <li>• Check the control box's power fuse (8 A)</li> </ul>
The relay is clicking but the motor is not running	<ul style="list-style-type: none"> <li>• Check the motor's power fuse</li> <li>• Check the main battery isolator</li> <li>• Check battery conditions and connections</li> <li>• Check the internal relay contacts</li> </ul> <p style="text-align: center;"><b><u>WARNING</u></b>  <b>Only a qualified technician should check these points to ensure that the thruster is correctly reassembled and remains Ignition Protected.</b></p>
The motor is running but the thruster is not working	<ul style="list-style-type: none"> <li>• Check the propellers are fitted</li> <li>• Check the motor / drive leg assembly</li> <li>• Check that the tunnel is not obstructed or the propellers blocked</li> </ul>
The thruster lacks power	<ul style="list-style-type: none"> <li>• Check the propellers are fitted</li> <li>• Check the size of the batteries</li> <li>• Check the batteries are sufficiently charged</li> <li>• Check the connections are tightened correctly</li> <li>• Check the power cables sections  <i>(See p. 6 : Recommended cable sections)</i></li> </ul>

**24. WORLDWIDE DISTRIBUTION NETWORK**

To locate the nearest Max Power distributor, please consult the section "Worldwide Distribution" on our website: [www.max-power.com](http://www.max-power.com)



## 25. WARRANTY COVERAGE

### Introduction

The purpose of this document is to set out the terms of warranty cover offered in relation to products purchased by the End User from Max Power or its approved network of resellers. This document will adhere to the following format:-

Section 1	Definitions
Section 2	Period of Coverage
Section 3	Warranty Registration
Section 4	Warranty Terms
Section 5	Warranty Exclusions
Section 6	Procedural Guidelines
Section 7	Service Centres

### 1) **Definitions**

- Authorized Repair Number* – The number given by Max Power on reporting a fault with your thruster
- Dealer* – An authorized Max Power sales centre
- End User* – The boat supplied with supplied equipment and the owner thereof
- Installer* – The authorized centre responsible for the installation of your thruster
- Manufacturer* – supplier of the equipment under warranty
- Pleasure Craft* – Vessels used for owner’s personal use that have no commercial use (i.e Charter boats or work boats)
- Resellers* – Max Power approved distributors and dealers
- Serial Number* – Number in upper right hand corner of Warranty document
- Supplier* – The manufacturer (Max Power)
- Warranty* – The terms and conditions that are covered by the manufacturer

### 2) **Period of Coverage**

The equipment manufactured by the Supplier is guaranteed to be free from defective workmanship, components and materials under normal usage conditions for a period of two years from the date of purchase by the End User. This warranty is transferable to subsequent owners of this equipment during the period of coverage.

### 3) **Warranty Registration**

Register your purchase now to receive free extended warranty coverage. This can be done using one of the following methods (NB. proof of purchase must be included to establish that equipment is still under warranty):

- a) The quickest and easiest method to register your warranty is to fax the attached installation check list and warranty registration to the Manufacturer (Fax: +33 4 92 19 60 61)
- b) Mail in your warranty registration document, please ensure that you make a copy before sending it. (10 Allée F Coli, 06210 Cannes-Mandelieu, France)



Serial No.:

**26. WARRANTY FORM**

**VERY IMPORTANT: Please complete this form and fax a COPY to Max Power with a copy of the installation invoice or the invoice of the yacht/boat in order for the warranty to come into effect.**

**To be completed by the owner:**

Name of owner:	Tel.:
Address:	Email:
Postcode:	Country:
Name of skipper:	Tel:
<b>Owner's signature:</b>	<b>Date:</b>

**To be completed by the installer:**

Installation details

Thruster model:	Electric/Hydraulic:
Installation date:	Date of launching boat:
Model and hull number of boat:	Builder: Build year:
Pleasure or commercial boat? :	Hull construction material:
L.O.A:	Width:
Waterline length:	Poids total en charge:
Tunnel Diameter, Thickness, Material & Length:	If Electric, Battery Type, Size & Number:

Installation checklist:

<b>Electric :</b>	<b>Before using thruster</b>	<b>During use:</b>
Voltage at batteries		
Voltage at thruster motor		
Ampere in motor power circuit		

<b>Mechanical:</b>	<b>YES / NO</b>
Check if the drive coupling between the motor and drive leg is correctly tightened:	
Check cable connections are sufficiently tightened:	
The thruster installation has been checked and the thruster functions correctly?	

**Important: Please consult this manual for more details**

**Name of Installer:** ..... **Signature:**.....

<p><b>PLEASE RETURN BY FAX: + 33 4 71 00 61 00 TO GAIN YOUR WARRANTY COVERAGE</b></p>
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