CONTROL TO THE MAX

Hydraulic Tunnel Thruster

Series CT HYD 125

INSTALLATION OPERATION MAINTENANCE

Serial N° : ----------

Date of Installation : ----------

THIS MANUAL MUST BE KEPT ON BOARD AT ALL TIMES

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E-mail: contact@max-power.com

To ensure a proper installation, correct usage and long-lasting enjoyment of this equipment, please take time to read this manual thoroughly.

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Your thruster is a high quality technical product and should be treated as such. The employment of qualified marine personnel, with experience in bow thruster installation, is strongly advised. Where possible, the boat manufacturer's architects, design departments and/or shipyards should be consulted, prior to installation taking place. For any boat requiring official classification, bodies of approval should also be consulted at the earliest opportunity. In any case, all other bodies, governmental or otherwise, should be contacted to ensure conformity with legal regulations relating to the boat in question.

<u>Your thruster should be delivered with the following parts:</u>

Hydraulic Motor & Coupling	Motor Support	Controller HYD	Drive Leg, Propeller Pin(s) & Coupling
Propellers (2)	Safety Stickers x 2	Manual	

1) GENERAL INSTALLATION GUIDLINES

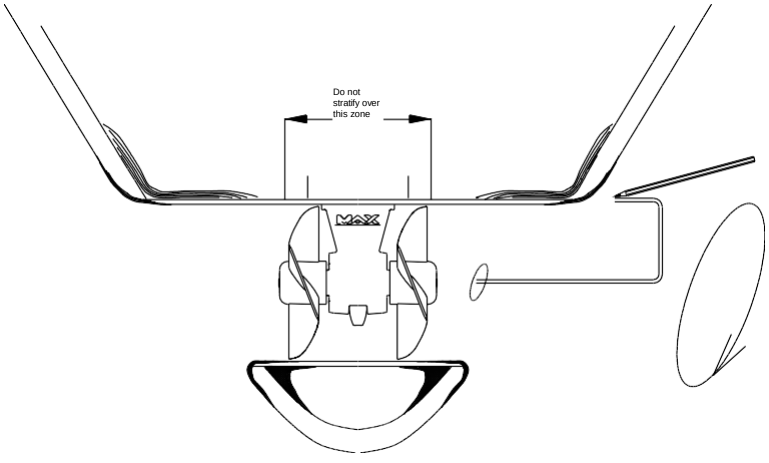
Decide on the best location for the MAX POWER. (See drawing: “Positioning & Measurements” at back of manual)
The tunnel must be as low as possible and as far forward as possible.
The propellers must not protrude beyond the hull line.
The ideal position of the tunnel is such that there is at least the depth of one tunnel diameter from the water line to the top of the fitted tunnel.
Decreased performance of the MAX POWER due to inadequate immersion depth can be compensated by fitting the tunnel as far forward as possible (increasing lever arm movement).
The MAX POWER hydraulic thrusters can be fitted vertically, horizontally or tilting.

IMPORTANT: When using tunnels of different thickness (example: metallic tunnel) it is imperative that the area between the drive leg/gasket and the motor support, matches the thickness as indicated in the table on the drawing “Positioning & Measurements” at back of manual and that the motor support is stable.
If you have less than 6 mm thickness, you will require an extra hard rubber gasket between the motor support and the tunnel.

2) TUNNEL

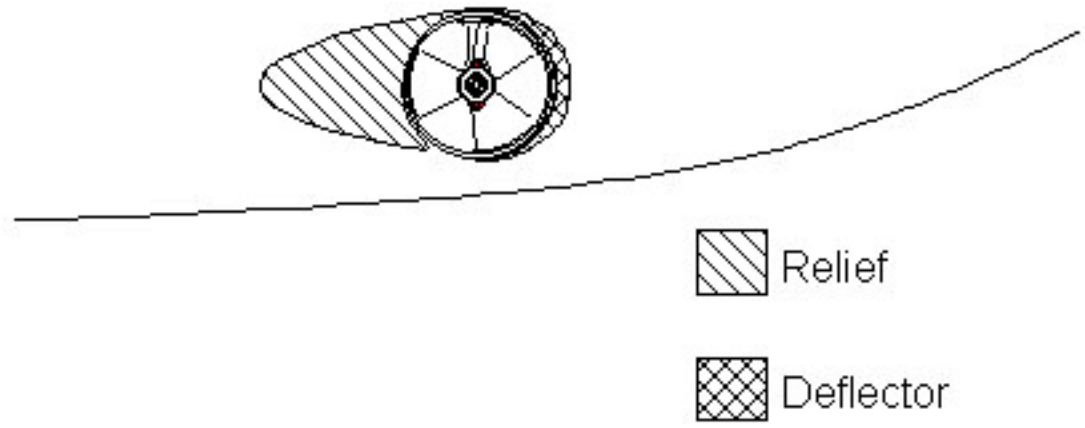
When the final tunnel position is determined (and all dimensions have been checked), mark the centre of the tunnel’s position and drill a Ø 10 mm hole. Make up a metal compass from 8 mm rod.

Fit compass into the Ø 10 mm holes and trace the form of the tunnel on to the hull (elliptical).
After cutting out the elliptic hole, disc the interior surface of the hull, by approx. 10 to 15 cm around the holes.
The outside surface of the tunnel is then ready to be fibre-glassed.



Fit the tunnel and mark the areas to be fiber glassed. Sand these areas inside and out.
In certain installations it is preferable to drill the position of the thruster support before the installation of the tunnel.
Refit the tunnel. Apply reinforced fiberglass filler to all areas, taking care that you fill the gap between hull and tunnel. Stratify with a minimum of 8 coats of material and ISOPHTALIQUE RESINE alternating with mat and roving.
In inaccessible areas (i.e. under the tunnel), it is possible to simply apply reinforced filler.

CAUTION: Do not apply fiberglass to the area of the motor support.
It is recommended to lightly sand down the area where the motor support is fitted.
On the outside, when the ISOPHTALIQUE RESIN has set, finish with an application of resin and material, followed with an additional coat on the hull, in the tunnel area.
To optimize the flow of water while sailing, deflectors & a relief should be fashioned.
These can be made up with several coats of reinforced filler in order to obtain the required hydrodynamic lines.



Once all fiberglass work is complete, apply a coat of epoxy or gel-coat to waterproof the entire area.

3) PROPELLER DRIVE LEG & MOTOR SUPPORT

The leg's gasket and the motor's support can be used to mark up the drilling position, in some cases it might be easier, to mark out the position, and drill before the stratification of the tunnel.
Centre and trace the drilling positions for the leg and its support.
Fit the leg along with the gasket, in the tunnel.
Check general positioning of the propellers.
Small pieces of folded cardboard can be used to check the spacing between the propeller tips and the tunnel is even all round. Slight adjustment to align the leg in its tunnel may be necessary.
After checks, remove leg etc; remount the assembly, covering the gasket with an oil and salt water resistant jointing compound. After fitting, remove all excess compound.
The gasket must be between the leg and the tunnel, and not between the motor support and the tunnel.
Care must be taken at all times when fitting the leg into the motor support to ensure that the mating components are dirt free and covered with a light film of grease.
IMPORTANT: GRAPHITE GREASE MUST NOT BE USED.
Torque values: screw Ø 8 mm = 30 Nm screw; tighten the two fixing screws alternately.

The installation of the composite drive leg is identical to that of bronze leg, except for the following points: The composite drive leg is lubricated for life.
The composite drive leg does not require an anode.
The composite drive leg MUST NOT BE DISMANTLED, even partially.

<u>Once tightened, ensure that the propeller/s turn freely without touching the tunnel.</u>

4) THE HYDRAULIC MOTOR AND ITS ADAPTER

Do not separate the motor from its adapter.
Insert the lower metal coupling on the greased leg shaft.
Fit the flexible coupling, then the motor and its adapter, tighten the screws (∅ 10mm) to a torque of 40 Nm.

IMPORTANT: Using a screwdriver push the lower coupling up towards the motor, the contact between these parts must be without any slack or play.
Tighten locking screw for drive key (Allen Key of 3 mm with white mark).

5) PROPELLERS

Check the tightness of the oil drain screw (8 mm Allen Key) and the anode (a 10 mm key).

IMPORTANT: To prevent limestone deposits from forming (causing damage to the joints), we highly recommend applying silicone grease to the shaft and the joints before assembling the propellers.

Fit the propeller pins and propellers

NOTE: Position the propeller blades opposed and not in line with one another.

Make sure that the propellers turn freely. A certain amount of resistance from the motor is normal.
Tighten the screws (3 mm Allen key), only 2 mm should be visible above the hub/boss of the propeller.

WARNING: If more than 2mm is visible, the propeller is not correctly placed, as the screws are not in the shaft groove.

6) PROTECTION GRILLS

With a shallow tunnel installation, we recommend that you protect the propellers by fitting horizontal protection grills. These grills will however modify thruster performance.

7) HYDRAULIC (general remarks)

A typical installation of the hydraulic power thruster requires the following elements:

- oil reservoir/tank
- hydraulic pump
- directional control valve
- hydraulic motor
- circuit piping
- oil cooler (depending on type of installation)

The oil reservoir/tank with return filter and suction strainer should be as close to the pump as possible and on charge. Meaning that the level of the oil should be above the pump.

For future maintenance, make sure that the return filter is easily accessible. An isolation valve can be fitted to the suction.

The pump can be driven by either an internal combustion engine (crankshaft pulley or gearbox PTO) or an electric motor. Depending on the speed and choice of drive, but should always comply with the rated pressure/flow of the thruster.

For an internal combustion engine with fixed or variable speed, 3 types of pumps can be used, depending on the unit to be fitted:

Direct PTO:
- Fixed flow pump (***)
- Variable displacement pump, depending on the model (**) (*)
- Fixed flow pump with bypass (**) (*)

PTO with clutch:
- Fixed flow pump (**) (*)
- Variable displacement pump depending on the model (**) (*)
- Fixed flow pump with bypass (**) (*)

On a DC or AC electric motor the following types of pumps can be used:

DC MOTOR:
- Fixed flow pump (*)

AC MOTOR:
- Fixed flow pump or other (**) (*)

(***) always require oil cooler
(**) require oil cooler when time of operation exceeds 15 minutes,
(*) oil cooler not necessary
Note: The above choices also depend on capacity of the oil tank etc.

The hydraulic directional control valve (DCV) must be equipped with a pressure gauge and pressure relief valve and should preferably be placed as close as possible to the thruster unit.

The piping can be flexible or a mix of rigid and flexible type and should have crimp-connected fittings.
The piping should match interior diameters and the service pressure equal or above that which has been recommended.
The circuits must be as direct as possible and avoid any bends and joints.
The circuits must be clean and closed-off until final connection takes place.
The thruster hoses arriving at the thruster must be of the thermo-plastic non-conductive type.
The hydraulic motor drain line and the return T-line of the DCV should each go separately and directly, back into the top of the oil tank.

Use synthetic, mineral or vegetable hydraulic oil, to ISO standard 32 to 48.

8) HYDRAULIC SPECIFICATIONS

MAX POWER Series 125 HYD: Flow = 30/35 liters/Min Pressure = 130 / 140 bars

Detailed instructions and diagrams are delivered with each pack, specific to the installation chosen.

9) HYDRAULIC CUSTOM PACK.

Tailor made according to specifications.

ELECTRO PUMP PACK: 1 x Electro Pump 24Volt 8 kW
1 x Power Relay
1 x Fuse Holder
1 x Power Fuse

HYDRAULIC CONTROL PACK (12 V / 24 V):
1 Directional Control Valve (Including pressure gauge & Pressure Relieve Valve)
1 Control Panel.

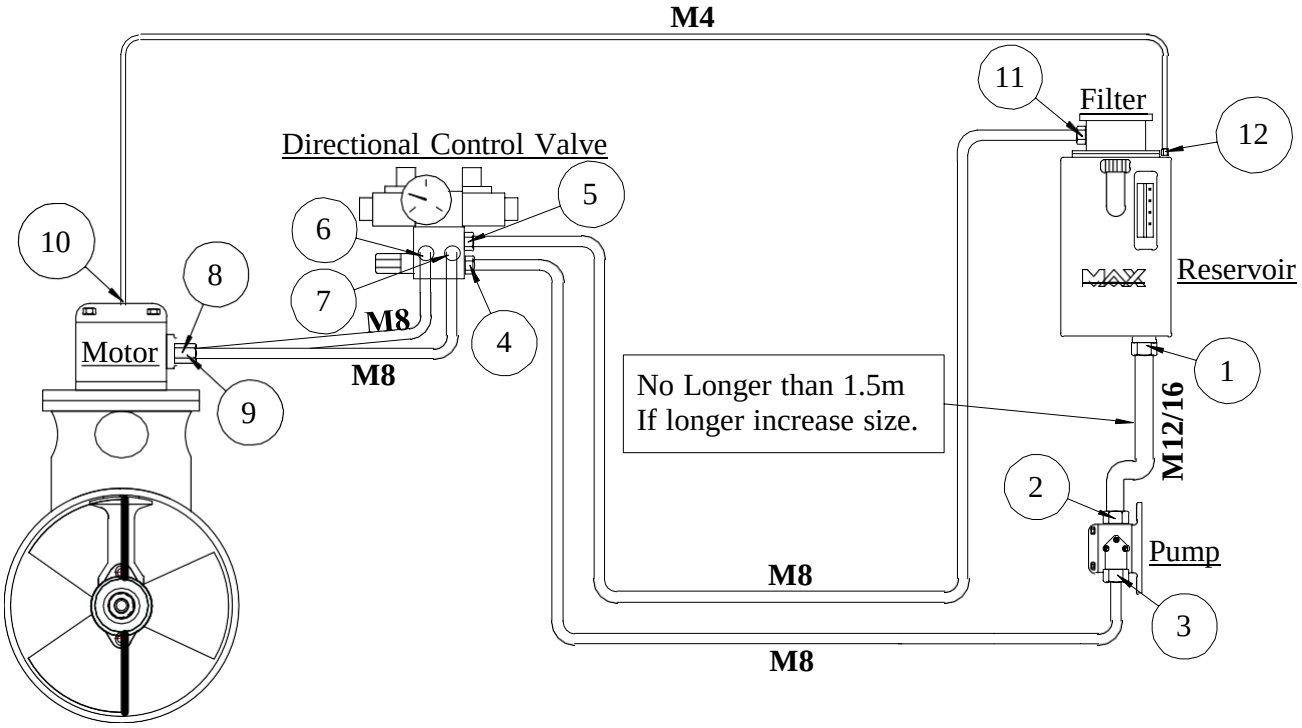
RESERVOIR PACK
Oil Reservoir 8 / 12 / 18 / 40 liters including: Return Filter
Suction Strainer
Oil Level Sight Gauge/ Thermometer
Filler Cap
Motor Drain Connection

INTERIOR DIAMETERS AND MODULES of the piping between the hydraulic elements:

M4 = 1/4''	M5 = 5/16''	M6 = 3/8''	M8 = 1/2''
M10 = 5/8''	M12 = 3/4''	M16 = 1''	

INTAKE DIAMETERS of standard hydraulic elements MAX POWER:

1 / 2 / 11 = Female BSP 3/4" 3 / 6 / 7 / 8 / 9 = Female BSP 1/2",
4 / 5 = Female BSP 3/8" 10 / 12 = Female BSP 1/4"



10) MAINTENANCE

In order to ensure peak performance from your thruster, the tunnel, the leg and thepropellers must be kept clean.

IMPORTANT: In order to prevent chalky deposits, which cause damage to the oil seals, we recommend cleaning the shaft and the oil seals first, then applying a layer of silicon oil before assembling the propellers.

ANNUAL BASIS: CHANGE the anode (if necessary).
CHANGE drive leg oil, if classic (bronze) leg.
CHECK the oil and the hydraulic filtration circuit (only if necessary).

EVERY 5 YEARS: DRAIN hydraulic oil system and change the filter and refill.

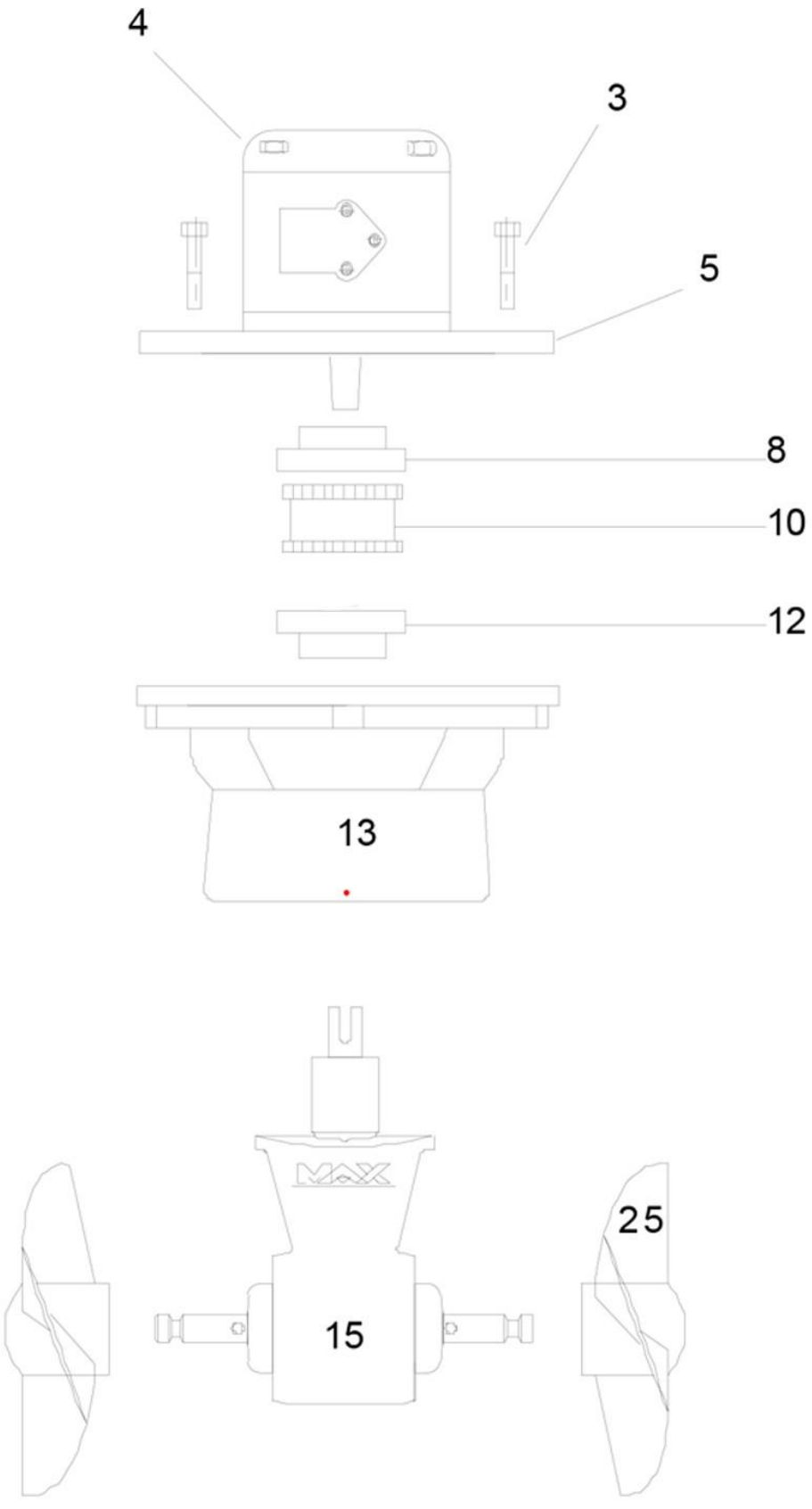
THE MAX-POWER TEAM WISHES YOU SUCCESSFUL MANOEUVRING AND ENJOYABLE CRUISING.

IT IS IMPORTANT TO KEEP THIS MANUAL ON BOARD!

Installation Notes

SPARE PARTS LIST					
MP 125 HYD					
N°	DESCRIPTION	Composite MPHYC800	Classic MPHY0800	References	New Code
4	Hydraulic motor	1	1	MPHY 6010	633761 HYD Motor for 317589 633762 HYD Motor for 317590 313388 HYD Motor for 317588
5	Adapter plate	1	1	MPHY 5012	633752
8	Upper shaft coupling Hydraulic	1	1	MP205027	633747
10	Rubber coupling	1	1	MP205023	633743
12	Lower shaft coupling	1	1	MP205029	633746
13	Motor support + heightening	1	1	MP088120	313714
15	Composite drive leg	1		MP08 8100	35035
25	Propeller D 185	2	2	MPOP 8080	35040

MAX POWER 125



1. Thruster Battery Bank (High CCA, Starting Type Batteries)
2. Power Circuit Fuse
3. Electric Battery Isolator (Optional with Electro-Hydr. Pump)
4. Power Relay
5. Electro-Hydraulic Pump (with N/O heat sensor)
6. Hydraulic Oil Resevoir (with N/O alarm sensor)
7. Service Valve (D.C.V.)
8. Independent Battery Bank for Control Circuit Power Supply.
9. Electronic Thruster Controller
10. Control Panel

Yachts Main DC Equipment Breaker Board

Independent Battery Bank for Control Circuit Supply

8 A

Optional

2 x 2 mm² (Depending on cable lenght)

6 Wire Control Cable

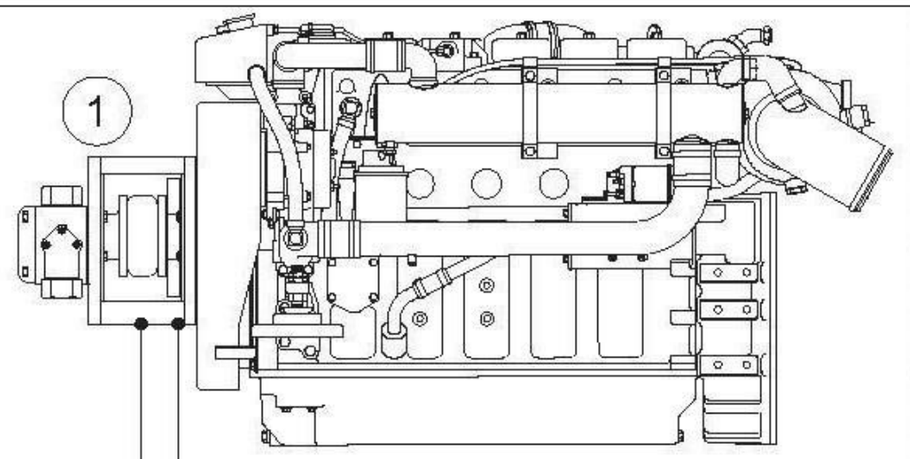
Cable Connector

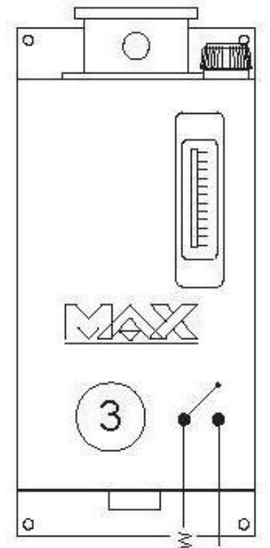
Control Box 315311

TITLE: Control System Connections: Using Electro-Hydraulic Pump.		REVISION: 00	PART NO.
REF.	MATERIAL		
DRAWN	CHECK	RELEASE 01	HEAT TREAT & FINISH
DATE	DATE	DATE	

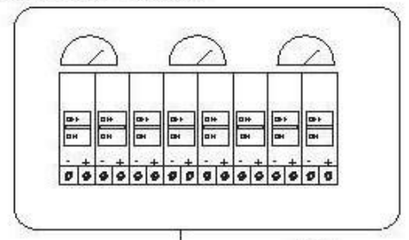
MAX POWER

1. Clutch or Bypass
2. Bi-Polar Clutch Relay
3. Hydraulic Oil Resevoir (with N/O alarm sensor)
4. Service Valve (D.C.V.)
5. Independent Battery Bank for Control Circuit Power Supply
6. Electronic Thruster Controller
7. Control Panel

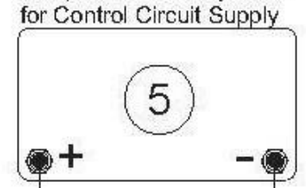




Yachts Main DC Equipment Breaker Board



Independent Battery Bank for Control Circuit Supply

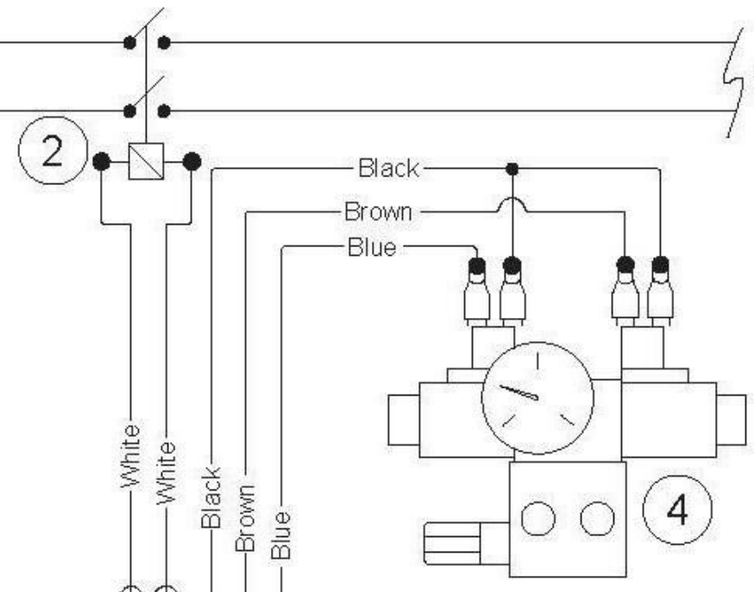


8 A

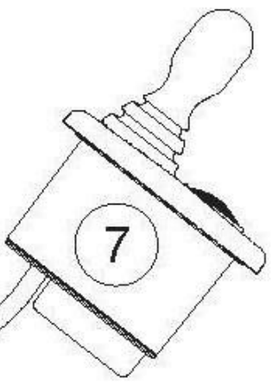
Red

Black

Supply to Clutch



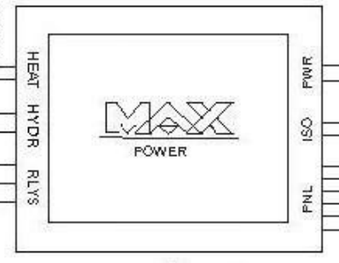
Yellow
Yellow
Red
Black
2 x 2 mm² (Depending on cable lenght)



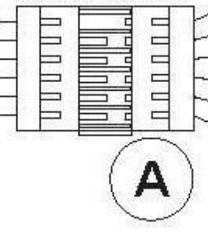
Cable Connector

White
Red
Brown
Blue
Black
Yellow
6 Wire Control Cable

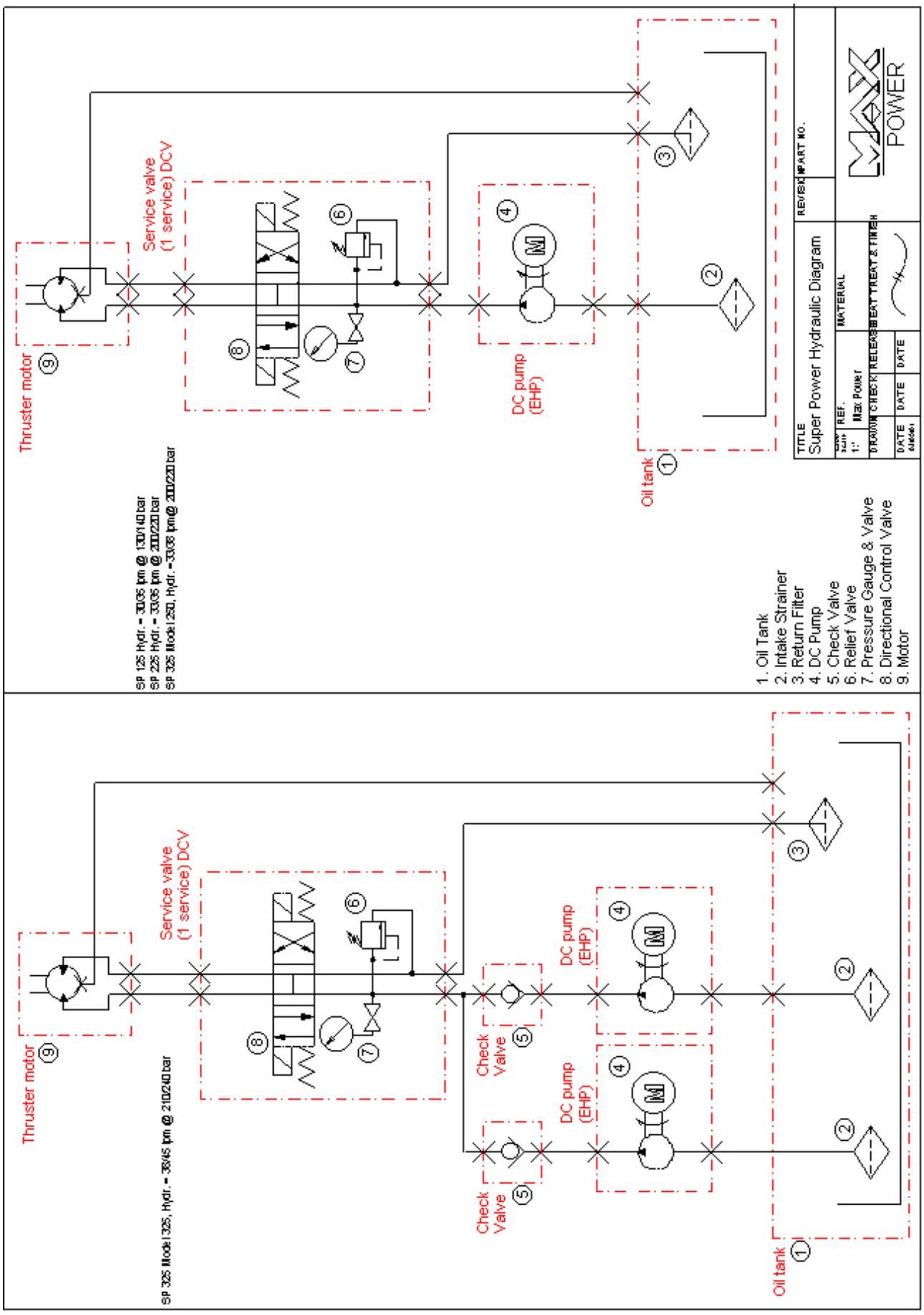
Black
Brown
Blue
White
White
Yellow
Yellow
Red
Black
Grey
Grey



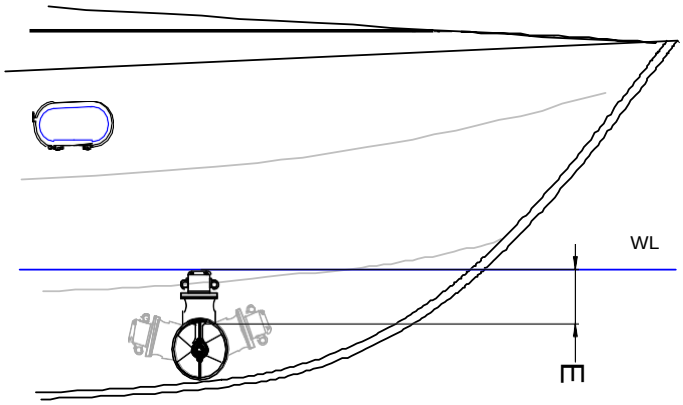
Cable Connector

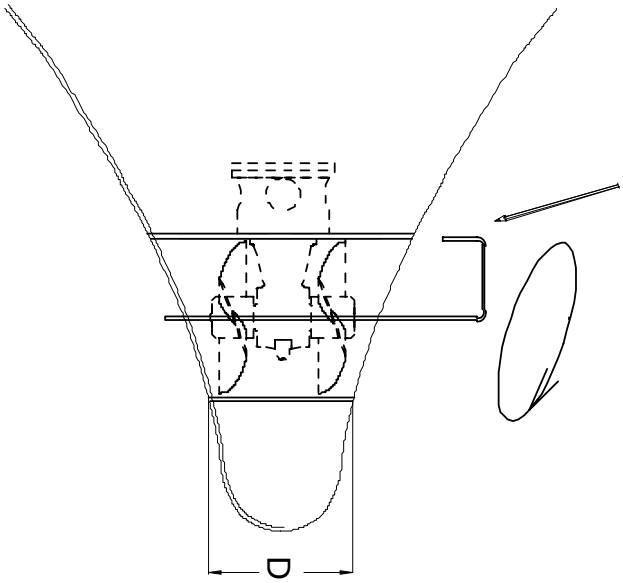


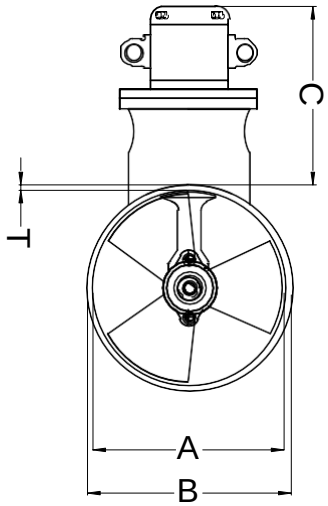
TITLE				REVISION	PART NO.
Control System Connections: Using Motor with Clutched PTO.				00	
	REF.		MATERIAL		
DRAWN	CHECK	RELEASE 01	HEAT TREAT & FINISH		
DATE	DATE	DATE		MAX POWER	


Thruster motor
Service valve
(1 service) DCV
DC pump
(EHP)
Oil tank
SP 125 Hydr. - 3035 lpm @ 130/140 bar
SP 225 Hydr. - 3305 lpm @ 210/220 bar
SP 325 Model 250, Hydr. - 3305 lpm @ 210/220 bar
1. Oil Tank
2. Intake Strainer
3. Return Filter
4. DC Pump
5. Check Valve
6. Relief Valve
7. Pressure Gauge & Valve
8. Directional Control Valve
9. Motor
TITLE
Super Power Hydraulic Diagram
REVISED PART NO.
MATERIAL
HEAT TREAT & FINISH
POWER
Thruster motor
Service valve
(1 service) DCV
Check
Valve
DC pump
(EHP)
Oil tank
SP 325 Model 325, Hydr. - 3645 lpm @ 210/240 bar

Hydraulic: Positioning and Measurements







Dim (mm) \ Model	125	225	325
A	185	250	315
B	197	264	333
C	210	210	220
D	190	220	280
T	6	7	9
E Ideal	185	250	315
E Mini	110	140	160
Weight	9 Kg	12 Kg	20 Kg

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 Centers

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 1 year free extended warranty coverage (3 years in total). The quickest and easiest method to register your warranty is to visit our website:

https://www.max-power.com/warranty

Warranty Document Cont.

4) Warranty Terms

If the material is used for anything other than for pleasure craft, the guarantee is limited to a six-month period.

Year 1 -All factory testing, diagnosis, repairs and replacements are performed at no chargeto the End User. All parts and up to two hours of labor are covered for repairs and replacements conducted in the field.

Year 2 -All factory testing, diagnosis, repairs and replacements are performedat no charge to the End User. This excludes any damage or faults occurring from normal wear and tear on the following items: engine, oil seals, relay contacts (If warranty is registered within the 3 month period following installation)

5) Warranty Exclusions

Damage due to modifications or installation contrary to published specifications
Cost of hauling the boat
Damage due to repairs performed by an unauthorized service centre
Damage due to lack of normal maintenance services
Damage due to water
Parts replaced due to normal wear and tear
Repairs performed without knowledge of manufacturer (please contact dealer to receive Repair Authorization Number)
Tampering of equipment by the End User
Cost of travel to and from the job site
Cost of economic loss, including injury to any person, damage to property, loss of income or profit, communication, lodging, inconvenience
Consequential damage due to failure, including those arising from collision with other vessels or objects

6) Procedural Guidelines

PLEASE VIEW THE TROUBLE SHOOTING LIST TO ASCERTAIN OR SOLVE ORIGIN OF PROBLEM PRIOR TO CONTACTING THE DEALER/INSTALLER

1) Contact your dealer/installer to report the problem.
   a. If you do not know who this is contact the nearest Max Power distributor
   b. If you are in foreign waters please contact the nearest Max Power distributor
2) Ensure you have your serial number and model number to hand (top right hand corner of warranty)
3) Dealer/Installer will come to site to decipher the cause of the fault
4) If the cause of fault is due to a manufacturing problem the dealer will contact Max Power to receive Repair Authorization Number.
5) If the problem is due to an installation error please contact your installer.

IF POSSIBLE: PLEASE TAKE PHOTOGRAPHS OF THE THRUSTER TO SHOW PROBLEM

The warranty as outlined above is only applicable to Max Power manufactured thrusters and optional equipment as used in marine pleasure industry. The supplier holds the exclusive right to test the product and determine whether it is defective.

DISTRIBUTER CONTACT LIST:

SOUTHERN EUROPE:

CYPRUS OCEAN MARINE EQUIPMENT LTD Limassol Tel: + 357 53 69 731 Fax: + 357 53 52 976 Email: oceanm@spidernet.com.cy	**CYPRUS** TUTI MARE TRADING Limassol Tel: + 357 25 431 313 Fax: + 357 25 431 300 Email: tutimare@cytanet.com.cy
FRANCE ACCASTILLAGE BERNARD Cannes La Bocca Tel: + 33 493 90 47 47 Fax: + +33 5 46 45 49 53 Email: t.barrez@accastillage-bernard.fr	**GREECE** ALEX MARINE Piraeus Tel +30 10 41 29 539 Fax: + 30 10 41 12 932 Email: alexmarine@otenet.gr
ITALY Siemens VDO Trading srl via Vialba, 50 20026 Novate Milanese (MI) Tel: + 39 02 3568 04 81 Fax: + 39 02 35680325 info.soem@siemensvdo.com	**PORTUGAL** PLASTIMO PORTUGAL (SIROCO) Lisbon Tel: + 351 21 362 04 57 Fax: + 351 21 362 29 08 Email: plastimo@siroco-nautica.pt
SPAIN ACASTIMAR Cambrils Tarragona Tel: + 349 77 36 2118/9074 Fax: + 349 77 36 2687 Email: acastimar@acastimar.com	**TURKEY** EGEMAR Tuzla - Istanbul Tel:+90 216 494 21 68 Fax:+90 216 494 22 18 Email: sales@egemar.com
CROATIA ANORTI ADRIA Mirosevecka c 122, Zagreb Tel: +385 98 1896 770 Fax: +385 23 386 075 Email: info@anortiadria.hr	**SLOVENIA** ANORTI Kavciceva 66 Ljubljana Tel: +386 1 544 6436 Fax: +386 1 544 6435 Email: info@anorti.si
MALTA STRAND MARINE Triq Is Sebh, Qormi Tel: +356 21 472 336 Fax: +356 21 472 338 Email: info@strandmarinemalta.com	

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Serial N°:

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 Owner:

Name of Owner:..... Contact No. :.....
Address: ..... E-mail: .....
Country:.....Postcode: .....
Name of Skipper:..... Contact No. :.....
Signature of Owner: ..... Date: .....

To Be Completed by Installer:

Installation Details:

Thruster Model :..... Electric/Hydraulic :.....
Date of Installation :..... Date of Launching Boat : .....
Type and model of Boat : ..... Builder:..... Build Year: .....
Pleasure or Commercial craft?:..... Sail or Motor: ..... Rig:.....
Navigates at Sea or River or Canals?..... Hull construction material :.....
L.O.A. :.....L.W.L. :..... Beam :..... Free Board:.....
Displacement Weight at Full Load: :..... Height & Length of Superstructure:.....
Tunnel Diameter, Thickness, Material & Length: .....
If Electric, Battery Type, Size & Number: .....

Installation Checks:

		Before Operating Thruster	While Operating
Thruster			
Electrical:	Voltage at Batteries	.....	.....
	Voltage at Thruster Motor	.....	.....
	Charge at Alternator in Amps	.....	
	Ampere in Motor Power Circuit	.....	

Mechanical: Verify if drive coupling between motor and drive leg is correctly tightened:..Yes / No
Verify if all cable connections is sufficiently tightened: ..... Yes / No
If hydraulic verify all hydraulic connections: ..... Yes / No

Thruster installation tested and working correctly: .....Yes / No

Important: Refer to installation manual for full installation details.

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

https://www.max-power.com/warranty