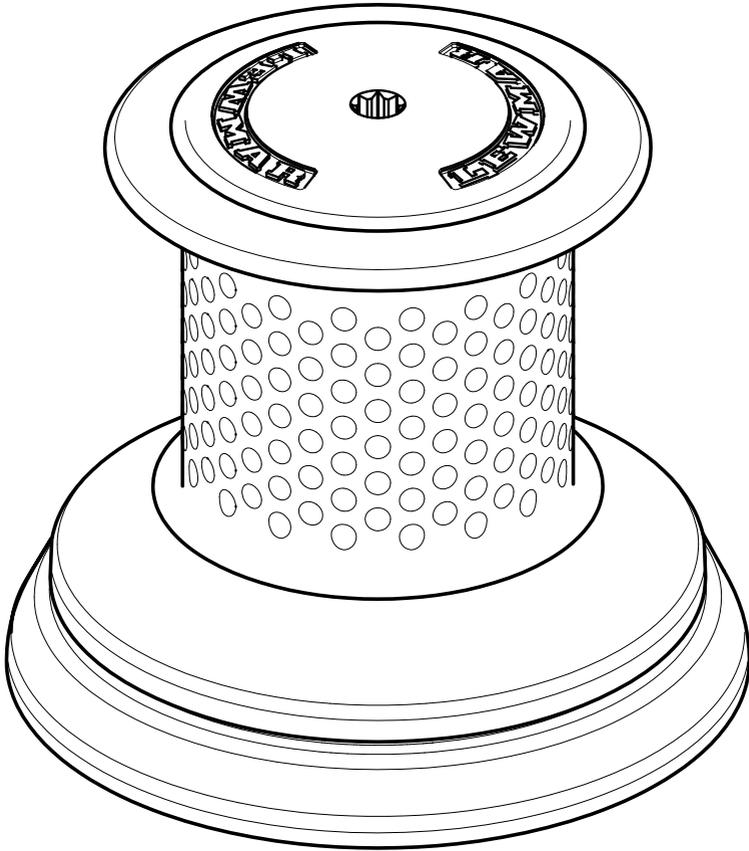


# C6 Capstan

## Product manual



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## 1- Introduction

Dear Customer,

Thank you for choosing Lewmar. Lewmar products are world renowned for their quality, technical innovation and proven performance. With a Lewmar product you will be provided with many years of outstanding service.

### Product support

Lewmar products are supported by a worldwide network of distributors and Authorised Service Representatives. If you encounter any difficulties with this product, please contact your national distributor, or your local Lewmar dealer. Details are available at: [www.lewmar.com](http://www.lewmar.com)

### CE Approvals

For CE approval certificates contact Lewmar.

### Important information about this manual

Throughout this manual, you will see safety and product damage warnings. You must follow these warnings carefully to avoid possible injury or damage.

## 2- Safety Notice

 WARNING!

IMPORTANT: Read these notes before continuing.

### 2.1 Capstan general

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- ▶ Capstan used incorrectly could cause harm to equipment or crew.
- ▶ Capstans are powerful equipment and as such should be used with care and treated with respect.
- ▶ Boating, like many other activities can be hazardous. Even the correct selection, maintenance and use of proper equipment cannot eliminate the potential for danger, serious injury or death.
- ▶ Keep limbs, fingers, clothing and hair clear of capstan.
- ▶ Do not use capstans for ANY purpose other than the control of mooring lines
- ▶ Neither the capstan nor its deck mounting is designed to withstand anchoring loads generated under storm conditions.
- ▶ Do not wrap chain around a capstan.
- ▶ A circuit breaker/isolator should always be used with this capstan to protect the motor and cable from overheating and damage.
- ▶ Electric motors become hot during (and for sometime after) use.  
- DO NOT TOUCH THE MOTOR GEARBOX!
- ▶ Always switch off this capstan at the circuit breaker/isolator when not in use.
- ▶ It is the unavoidable responsibility of the owner or master or other responsible party to assess the risk of any operation on the vessel.

### 2.2 Fitting

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- ▶ This equipment must be installed and operated in accordance with the instructions contained in this manual. Failure to do so could result in poor product performance, personal injury and/or damage to your boat.
- ▶ Consult the boat manufacturer if you have any doubt about the strength or suitability of the mounting location.

### 2.3 Electrical

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- ▶ Make sure you have switched off the power before you start installing this product.
- ▶ This product requires installation by a suitably qualified electrical engineer.

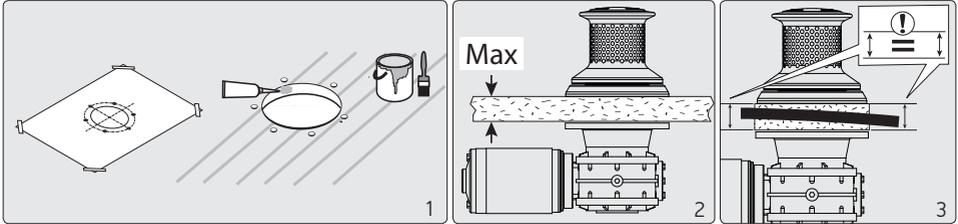
### 3- Installation

Lewmar recommends capstans are specified and installed by competent marine engineers.

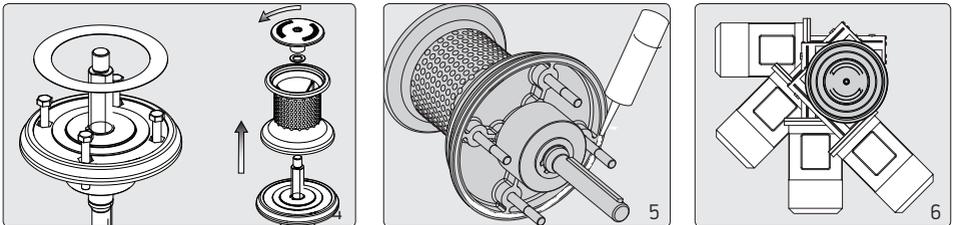
⚠ **WARNING!** Extremely heavy, use mechanical lift aid.

Plan location carefully:

- ▶ Ensure the rope feed correctly.
- ▶ Check space available under deck for electric/hydraulic motor unit and cable runs
- ▶ With the handle inserted, check that the drum can rotate through 360 degrees.



1. Drill and cut the holes to the size detailed on the template. With a sandwich construction, it is important to seal the exposed surfaces.
2. Maximum deck thickness 75mm.
3. If the deck is not flat a suitable mounting pad may be required above and below deck to take up camber or sheer. Care must be taken to ensure that the top and bottom mounting surfaces are parallel for correct alignment.



1. Remove the drum cap, washer and drum by undoing the cap with the handle provided. Select M12 bolts of suitable length (not supplied by Lewmar) and insert into baseplate, locating heads of bolts in hexagonal recesses. Remove backing paper from adhesive washer and attach washer to baseplate trapping bolts in place. Re-assemble drum, washer and drum cap.
2. Apply a bead of suitable sealant/bedding compound and mount the capstan through the deck.
3. Under deck, lightly coat the shaft with grease. Ensure the drive key is in place and, selecting the most suitable positions (electric motor only), slide the motor/ gearbox into position. Assemble the nuts and washers and secure tightly.

**DO NOT** use a permanent adhesive/sealant

## 4- Electrical wiring

If you are not sure you understand these guidelines, seek professional help. Ensure that the installation complies with USCG, ABYC, NMMA or other local regulations.

### 4.1 Electric cable selection

Lewmar recommends the installer source and install cable that meets the requirements of the standards and regulations relevant to the installation and codes of practice.

The cable table gives recommended cable sizes based on total length of cable required, from the battery, following the route of the cables.

Capastan's performance is directly related to cable size and length. Voltage drop over the complete wiring run must not exceed 10%.

| MODEL  | CABLE SIZING FOR LENGTH OF CABLE RUN |             |                    |            |                    |            |
|--------|--------------------------------------|-------------|--------------------|------------|--------------------|------------|
|        | up to 7 m                            | up to 23 ft | 7 - 15 m           | 23 - 50 ft | 15 - 22 m          | 50 - 73 ft |
| C6 24V | 10 mm <sup>2</sup>                   | 8 AWG       | 16 mm <sup>2</sup> | 4 AWG      | 25 mm <sup>2</sup> | 2 AWG      |

### 4.2 Wiring

Plan the position of the control box near to the capstan, preferably in a dry environment.

The wiring system should be of the fully insulated type, which avoids possible electrolytic corrosion problems. We recommend the use of type III stranded, tinned copper wire with copper crimp terminals. Most modern installations are negative return (negative ground) but polarity should be checked.

Overload protection, in the form of the circuit breaker must be built into the windlass wiring circuit.

- NOTE: The circuit breaker should be positioned close to the battery in a dry, readily accessible place.
- The breaker must be manually reset should an overload occur that causes it to trip to the off position.

The AC motor features an integral electromagnetic brake which is pre-wired to the motor. If using a 3rd party control using variable speed control, this brake must be powered separately. Contact Lewmar for advice.

#### Lewmar D.O.L. Control Boxes

| MODEL          | VOLTAGE     | CONTROL BOX | CONTACTOR | CIRCUIT BREAKER     |
|----------------|-------------|-------------|-----------|---------------------|
| C6 24V DC      | 24V DC      | 68000130    | 68000318  | 110A (68000350)     |
| C6 200V AC 3kW | 200/220V AC | 68000985**  |           | 13A (non supplied)* |
| C6 400V AC 3kW | 380/400V AC | 68000977**  |           | 8A (non supplied)*  |

\* Use 3-pole isolator circuit breaker

\*\* Requires 24V DC supply

### 4.3 Control Switch Installation

Find a suitable position for the electric safety deck switch(es) in view of the capstan.

Connect up the switch wiring (Follow the mounting instructions supplied with the switch).

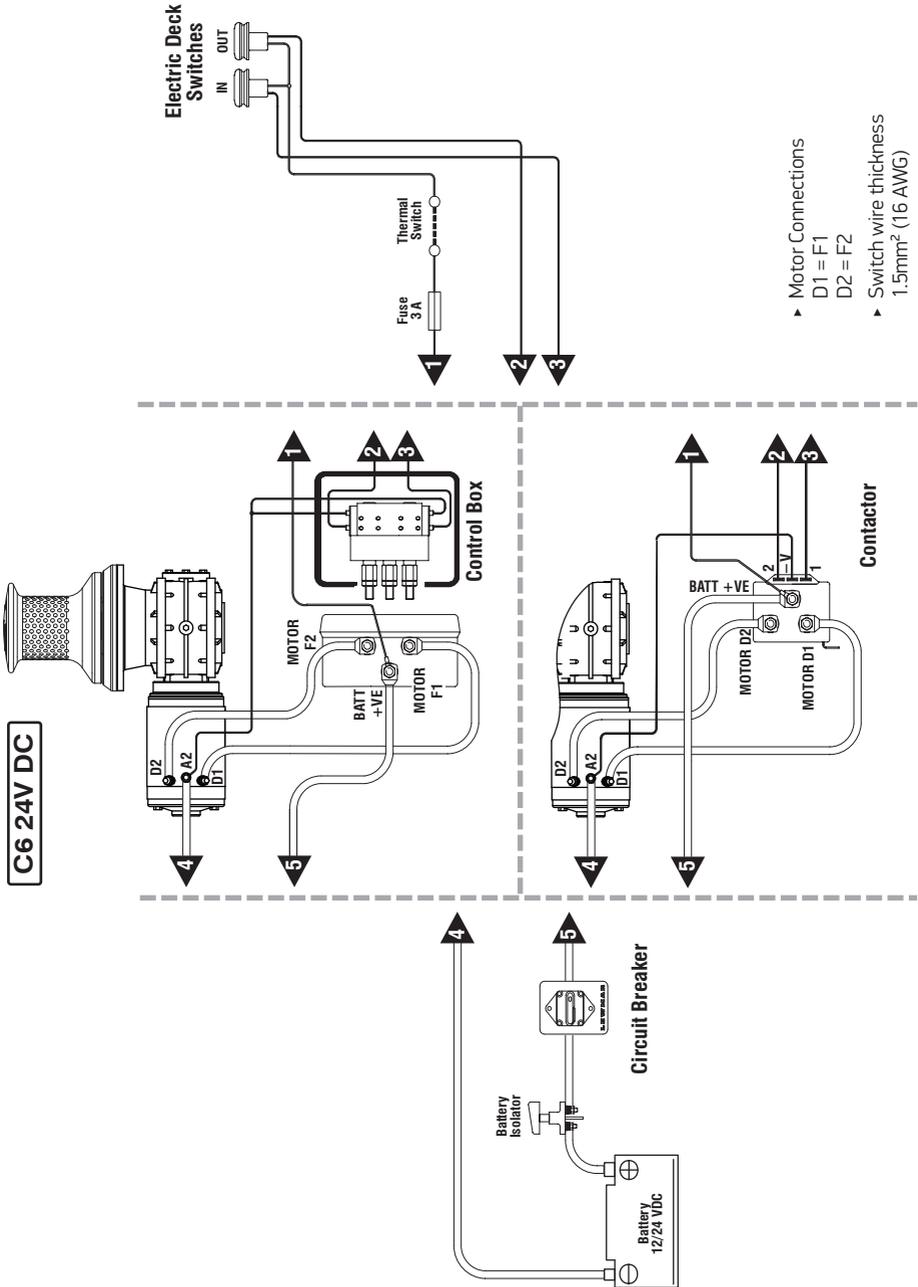
NOTE: In a multi station installation all switches must be wired in a parallel circuit.

#### Check

The capstan operates in the correct direction from all switches.

## C6 24V DC Wiring Diagram

Installation instructions are supplied separately with any accessories.



## 5- Hydraulic system

### 5.1 Installation

NOTE: Hydraulic system installation is NOT covered in this publication.

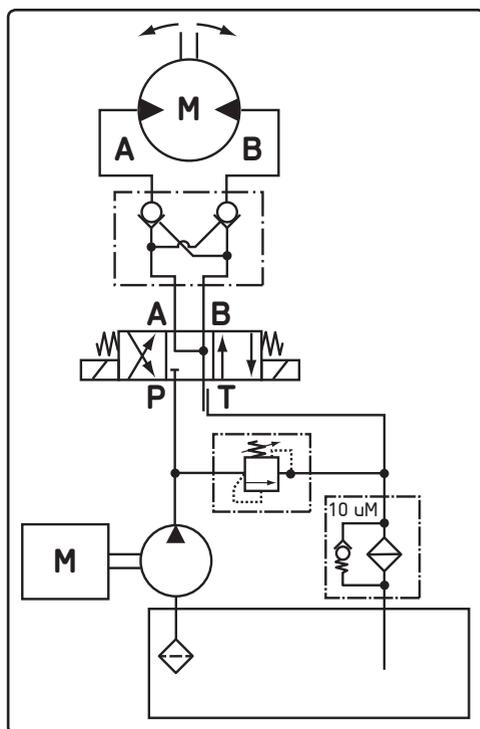
Lewmar hydraulic capstans have been designed for ease of installation and follow a straightforward hydraulic and mechanical installation procedure.

Capstan unit should be connected to a hydraulic powerpack with directional control valve installed to control the capstan movement.

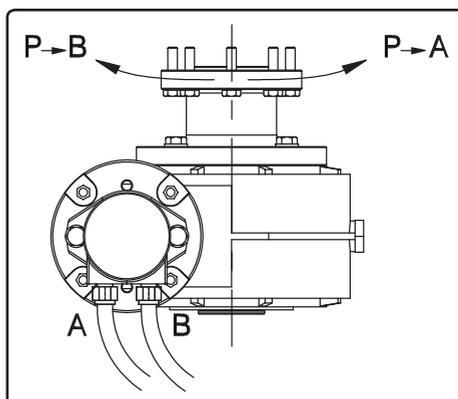
A typical hydraulic circuit is shown below

The purpose of this manual is to provide the reader with sufficient information to install and operate a hydraulic windlass. It assumes the reader will be familiar with sailing craft, marine hydraulics and mechanical installation and safety requirements. If in any doubt consult a qualified marine engineer.

The installation of hydraulic systems requires a high level of cleanliness. The ingress of dirt will dangerously impair the safe operation of the system and cause premature wear of hydraulic components.



**Hydraulic installation schematic**



**⚠ WARNING!**

The installation of hydraulic systems requires a high level of cleanliness. The ingress of dirt will dangerously impair the safe operation of the system and cause premature wear of hydraulic components.

## 5.2 C6 Hydraulic motor/gearbox

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The hydraulic motor/gearbox consists of a high torque hydraulic motor fitted to a worm/wormwheel gearbox. Refer to section 5.3 for flows and pressures information.

The motor gearbox is self sustaining.

## 5.3 Pressures and Flow rates

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| MODEL | MAXIMUM PRESSURE |      | FLOW RATE |            |
|-------|------------------|------|-----------|------------|
|       | bar              | psi  | l/min     | US gal/min |
| C6    | 175              | 2573 | 10-60     | 2.6-15.8   |

## 5.4 Hose types

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For reliable operation and safety it is essential to use reinforced braid hose for connecting to the motor A and B ports which conforms to SAE100R2A or DIN 20 021 Part 2.

The recommended hose sizes are:

- ▶ Up to 30 l/min +  $\frac{1}{2}$ " (13mm) bore diameter.
- ▶ Up to 50 l/min +  $\frac{5}{8}$ " (16mm) bore diameter.
- ▶ Up to 70 l/min +  $\frac{3}{4}$ " (19mm) bore diameter.

Ref: 3.78 litres = 1 US gallon

4.54 litres = 1 Imperial gallon

## 5.5 Recommended Oil

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Lewmar recommends Mineral based non-foaming, anti-wear, water tolerant 32 centistokes at 40°C to ISO32

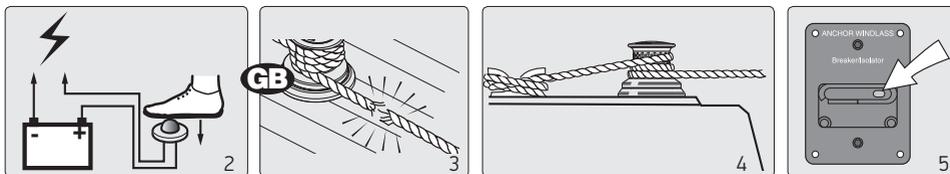
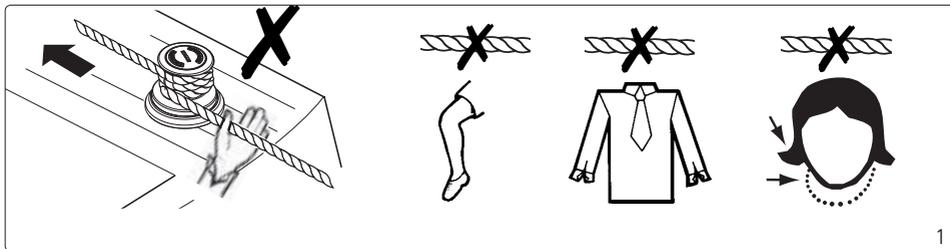
## 5.6 Motor ports

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The Lewmar hydraulic motor ports are:

A & B ports  $\frac{1}{2}$ " BSPP

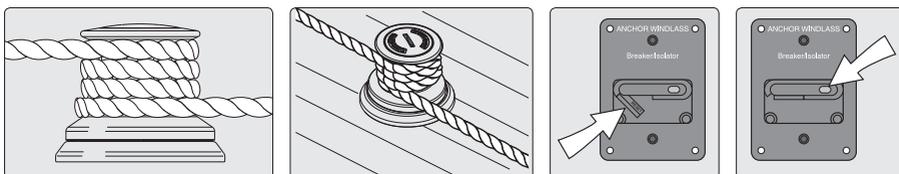
## 6- Operation



1. Keep limbs, fingers, clothing and hair clear of capstan.
2. Use footswitch to operate the capstan.
3. Do not overload capstan. Avoid stalling capstan.
4. Secure rope to independent strong point, e.g. cleat, to prevent release.

**⚠ WARNING!**

5. When not in use, you must isolate the capstan electrically at the circuit breaker/isolator.



### Warping

Docking or Anchor warp should be laid onto the drum, three turns in a clockwise direction. The operator should stand in a comfortable position to activate the deck switch whilst tailing the warp behind and into the storage area, if possible.

### Apply Tension

Apply a light even tension to the warp before activating the switch. If very heavy pulls are necessary apply power in short bursts of about 10 seconds duration. The speed of hauling depends on the load on the rope.

**⚠ WARNING!**

Should the capstan stall, switch off and wait a few seconds before trying again. If the recommended breaker/isolator has tripped, it will require to be manually reset before the capstan can operate again. It is important to the future, good performance of the capstan's motor that the capstan is not allowed to stall for more than a few seconds and therefore, sensible to avoid stalling your capstan whenever possible.

### Power off

Turn the power isolator OFF after use.

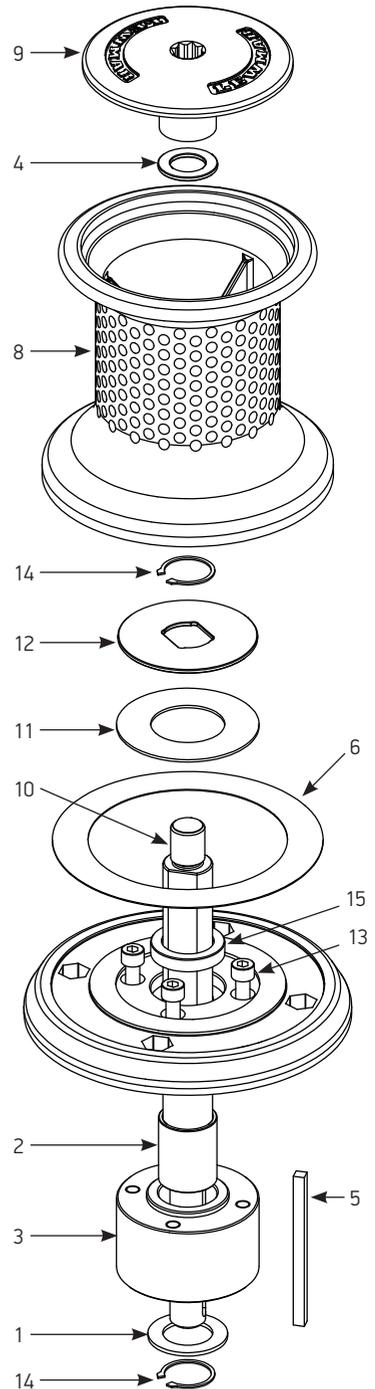
## 7- Servicing

### Regularly

- ▶ Wash down the windlass using fresh water.
- ▶ Examine all electrical connections for corrosion, clean and lightly grease.
- ▶ Check mounting bolts and nuts for tightness and condition.

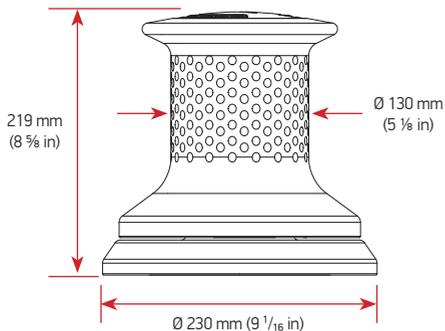
### Anually

- ▶ Check electric cables for damage. Repair/renew as required.
- ▶ Strip the above deck components, clean and lightly grease.
- ▶ Inspect condition of motor/gearbox and repaint when necessary

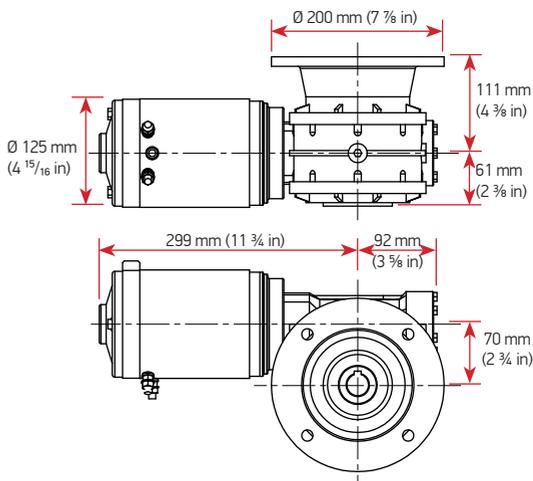


| ITEM | PART NO  | DESCRIPTION         | QTY |
|------|----------|---------------------|-----|
| 1    | 15003572 | Washer              | 1   |
| 2    | 65001485 | Plain Bearing       | 1   |
| 3    | 65001477 | Downtube            | 1   |
| 4    | 65001319 | Washer, top nut     | 1   |
| 5    | 65000772 | Key                 | 1   |
| 6    | 65001478 | Adhesive Washer     | 1   |
| 7    | 65001429 | Base                | 1   |
| 8    | 65001430 | Drum                | 1   |
| 9    | 65001431 | Top nut             | 1   |
| 10   | 65001432 | Mainshaft           | 1   |
| 11   | 65001433 | Rubbing washer      | 1   |
| 12   | 65001434 | Retaining disc      | 1   |
| 13   | B0845    | Socket HD cap screw | 4   |
| 14   | B2352    | ext virclip 35mm    | 2   |
| 15   | B7030    | Rotary seal         | 1   |

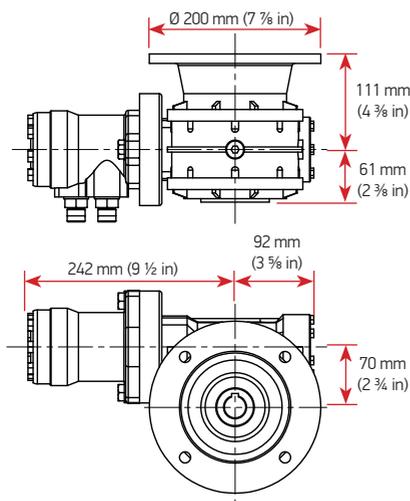
## 8- Specification



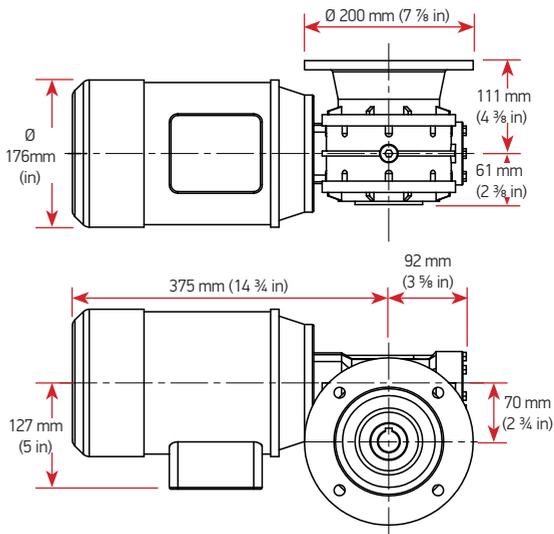
Deck unit



C6 24V 2kW Motor Gearbox



C6 Hydraulic Motor Gearbox



C6 400V AC & C6 208V AC Motor Gearbox

## 8- Warranty

### Limited Warranty and Key Terms of Supply by Lewmar

Lewmar warrants that in normal private pleasure boat usage and with proper maintenance its products will conform with their specification for a period of three years from the date of purchase by the end user, subject to the conditions, limitations and exceptions listed below. Any product, which proves to be defective in normal usage during that three-year period, will be repaired or, at Lewmar's option, replaced by Lewmar.

#### A CONDITIONS AND LIMITATIONS

- i Lewmar's liability shall be limited to the repair or replacement of any parts of the product which are defective in materials or workmanship.
- ii Responsibility for the selection of products appropriate for the use intended by the Buyer shall rest solely with the Buyer and Lewmar accepts no responsibility for any such selection.
- iii Lewmar shall not be liable in any way for Product failure, or any resulting loss or damage that arises from:
  - a. use of a product in an application for which it was not designed or intended;
  - b. corrosion, ultra violet degradation or wear and tear;
  - c. a failure to service or maintain the product in accordance with Lewmar's recommendations;
  - d. faulty or deficient installation of the product (unless conducted by Lewmar);
  - e. any modification or alteration of the product;
  - f. conditions that exceed the product's performance specifications or safe working loads.
- g. Abuse
- iv Product subject to a warranty claim must be returned to the Lewmar outlet that supplied the product for examination unless otherwise approved by Lewmar in writing.
- v This warranty does not cover any incidental costs incurred for the investigation, removal, carriage, transport or installation of product.
- vi Service by anyone other than authorized Lewmar representatives shall void this warranty unless it accords with Lewmar guidelines and standards of workmanship.
- vii Lewmar's products are intended for use only in the marine environment. Buyers intending to use them for any other purpose should seek independent professional advice as to their suitability. Lewmar accepts no liability arising from such other use.

#### B EXCEPTIONS

Cover under this Warranty is limited to a period of one year from the date of purchase by the end user in the case of any of the following products or parts of products:

- Electric motors and associated electrical equipment
- Electronic controls
- Hydraulic pumps, valves and actuators
- Hatch & Portlight weather seals
- Products used in "Grand Prix" racing applications
- Products used in commercial or charter applications
- Anchor rode

#### C LIABILITY

- i Lewmar's liability under this warranty shall be to the

exclusion of all other warranties or liabilities (to the extent permitted by law). In particular (but without limitation):

- a. Lewmar shall not be liable for:
  - Any loss of anticipated turnover or profit or indirect, consequential or economic loss;
  - Damages, costs or expenses payable to any third party;
  - Any damage to yachts or equipment;
  - Death or personal Injury (unless caused by Lewmar's negligence).
 Some states and countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you
- b. Lewmar grants no other warranties regarding the fitness for purpose, use, nature or satisfactory quality of the products.
- ii Where applicable law does not permit a statutory or implied warranty to be excluded, then such warranty, if permitted by that state or country's law, shall be limited to a period of one year from the date of purchase by the end user. Some states and countries do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you.

#### D PROCEDURE

Notice of a claim for service under this warranty shall be made promptly and in writing by the end user to the Lewmar outlet that supplied the product or to Lewmar Limited at Southmoor Lane, Havant, Hampshire PO9 1JJ, England.

#### E SEVERANCE CLAUSE

If any clause of this warranty is held by any court or other competent authority to be invalid or unenforceable in whole or in part, the validity of the remaining clauses of this warranty and the remainder of the clause in question shall not be affected.

#### F OTHER RIGHTS

This warranty gives you specific legal rights, and you may also have other legal rights, which vary from state to state and country to country.

In the case of European States a Consumer customer (as defined nationally) has legal rights under the applicable national law governing the sale of Consumer Goods; this Warranty does not affect those rights.

#### G LAW

This warranty shall be governed by and read in accordance with the laws of England or the state or country in which the first end user is domiciled at the time of purchase of the product.

#### H DISPUTES

Any dispute arising under this warranty may, at the option of the end-user, be referred to alternative dispute resolution under the rules of the British Marine Federation or to the Courts of the State whose law shall govern the warranty or to the Courts of England and Wales.

The British Marine Federation may be contacted at Marine House, Thorpe Lea Road, Egham, England, TW20 8BF

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