

RC12-HD
Vertical Windlass

© Copyright: VETUS-Maxwell APAC Ltd.

All rights reserved

VETUS-Maxwell APAC Ltd. reserves the right to make engineering changes to all products without notice. Illustrations and specifications not binding as to detail.

P103151 Rev. 7.00

06/08/19

Printed in New Zealand

Contents

1.0	INTRODUCTION.....	2
1.1	PRE-INSTALLATION NOTES.....	2
1.2	IMPORTANT INFORMATION	2
1.3	ROPE AND CHAIN SELECTION	2
1.4	SPECIFICATIONS	3
1.5	PRODUCT CONFIGURATIONS	5
2.0	INSTALLATION.....	6
2.1	SELECTION OF POSITION FOR THE WINDLASS.....	6
2.2	PREPARATION OF MOUNTING AREA	7
2.3	INSTALLATION PROCEDURE	7
2.4	WIRING INSTRUCTIONS.....	8
2.5	POWER CONECTIONS TO DC MOTOR	9
2.6	SELECTION OF MOTOR STARTER.....	9
2.7	POWER CONNECTIONS TO AC MOTOR.....	10
2.8	POWER CONNECTIONS TO HYD MOTOR	10
2.9	NOTE TO BOAT BUILDER.....	10
3.0	OPERATION	11
3.1	PERSONAL SAFETY WARNINGS	11
3.2	OPERATING THE WINDLASS.....	11
3.3	OPERATING THE WINDLASS MANUALLY.....	12
4.0	MAINTENANCE.....	13
4.1	WINDLASS MAINTENANCE.....	13
4.2	PRESSURE ARM REPLACEMENT	14
4.3	RECOMMENDED LUBRICANTS	15
4.4	SPARE PARTS.....	15
4.5	TOOLS FOR MAINTENANCE.....	16
5.0	TROUBLESHOOTING.....	16
	APPENDIX A - Dimensional Drawings.....	18
	APPENDIX B – Spare Parts.....	20
	APPENDIX C – Installation Schematics	24
	24V DC Electric Wiring	24
	AC Electric Wiring.....	25
	Hydraulic GT Type 1 Plumbing	26

1.0 INTRODUCTION

1.1 PRE-INSTALLATION NOTES

- Read this manual thoroughly before installation and using the windlass. Failure to adhere to the correct procedures, recommendations and guidelines described in this Owner's Manual may invalidate the warranty.
- Correct selection of windlass together with correct installation, care in use and maintenance, are essential for long life and reliable performance.
- In addition to this instruction manual, the following components should be included with the windlass:
 - Clutch Handle
 - Emergency Retrieval handle
 - 24V reversing solenoid (24V DC Only)
 - Deckplate Gasket
 - Deck Cutout Details (at rear of manual)
 - Small parts
 - Nuts (x 5)
 - Flat washers (x 5)
 - Spring washers (x 5)
- The following accessories may be required to complete your installation:
 - Remote up/down control panel
 - Circuit breaker/isolator panel (required but not supplied)

1.2 IMPORTANT INFORMATION

- The RC12 windlass must have a minimum pull capacity of three times the combined weight of the anchor and rope/chain.
- Keep hands, feet, loose clothing and hair well clear of the windlass and rope/chain during operation.
- Never operate the windlass from a remote station without having a clear view of the windlass.
- Do NOT use the windlass as a mooring point. When anchoring or mooring, secure the line directly to a bollard or deck cleat.
- Do NOT use the windlass to pull the boat forward when raising the anchor. Use the boat's engine to drive the boat up to the anchor.
- Do NOT attempt to break free a fouled anchor with the windlass. Secure the line to a bollard or cleat and use the boat's engine to break the anchor out.
- Always firmly tie down the anchor when under way or in heavy seas. Do not rely on the windlass as a securing device.
- Always turn the circuit breaker/isolator switch off when the windlass is not in use and before you leave the boat.
- Do NOT use the windlass to haul a person up a mast.

1.3 ROPE AND CHAIN SELECTION

- Correct fit of rope and chain to chainwheel is essential for the windlass to operate properly.
- The ground tackle should be selected taking into account:
 - Boat size, displacement and windage.
 - Conditions of operation such as maximum depth of water, type of bottom and likely weather conditions.
 - Holding power and size of anchor, taking special note of the manufacturers' recommendations.
 - Please refer Specifications on page 3 for rope and chain selection.

Note: For your nearest retailer, service agent or representative please refer to our website www.maxwellmarine.com

1.4 SPECIFICATIONS

General		
Chain size:	RC12HD-12	12/13mm (1/2") short link
	RC12HD-11	11mm (3/8" G30/G43) short link
	RC12HD-10	10mm (3/8" BBB) short link
Rope size:	RC12HD-12	20 mm (7/8") to 22mm (3/4")
	RC12HD-11	16 mm (5/8") to 20mm (7/8")
	RC12HD-10	16 mm (5/8") to 20mm (7/8")
Static Hold		2200 kg (4840 lbs)

Electric DC Drive 24 V	
Maximum Pull	1820 kg (4000 lbs)
Continuous Pull	300 kg (660 lbs)
Line speed at continuous pull	12 m/min (39 ft/min)
Working Load limit (10min run time)	610 kg (1335 lbs)
Maximum line speed	22 m/min (72 ft/min)
Motor Power	2000W (2.7 HP)
Net Weight LP version	37 kg (81 lbs)
Net Weight Capstan version	40 kg (88 lbs)

Electric 3 Phase AC Drive	
Maximum Pull	1820 kg (4000 lbs)
Continuous Pull	620 kg (1360 lbs)
Line speed at continuous pull (50hz motor) (60hz motor)	12 m/min (39 ft/min) 14m/min (46 ft/min)
Working Load limit (10min run time)	750 kg (1650 lbs)
Maximum line speed (50hz motor) (60hz motor)	12 m/min (39 ft/min) 14m/min (46 ft/min)
Motor Power	2200W (3 HP)
Net Weight LP version	51 kg (112 lbs)
Net Weight Capstan version	54 kg (118 lbs)

Hydraulic Drive (type 2 motor - 138 bar)	
Maximum Pull	1250 kg (2750 lbs)
Continuous Pull	1250 kg (2750 lbs)
Line speed at continuous pull	15 m/min (49 ft/min)
Working Load limit (10min run time)	1250 kg (2750 lbs)
Maximum line speed	22 m/min (72 ft/min)
Recommended hydraulic oil flow	32 l/min (8.5 US gal/min)
Maximum hydraulic oil flow	47 l/min (12.5 US gal/min)
Maximum hydraulic oil pressure	138 bar (2000 PSI)
Motor port size	7/8" (SAE 10)
Net Weight LP version	28.5 kg (63lbs)
Net Weight Capstan version	31.5 kg (69lbs)

Hydraulic Drive GT (type 1 motor - 120 bar)	
Maximum Pull	1820 kg (4000 lbs)
Continuous Pull	1250kg (2640 lbs)
Line speed at continuous pull	15 m/min (49 ft/min)
Working Load limit (10min run time)	1500 kg (3300 lbs)
Maximum line speed	15 m/min (49 ft/min)
Recommended hydraulic oil flow	47 l/min (12.4 US gal/min)
Maximum hydraulic oil flow	49 l/min (12.5 US gal/min)
Maximum hydraulic oil pressure	120 bar (1750 PSI)
Motor port size	½" BSP
Drain size	9/16" UN (Dash -6)
Net Weight LP version	31 kg (68 lbs)
Net Weight Capstan version	34 kg (75 lbs)

Hydraulic Drive GT (type 1 high pressure motor - 205 bar)	
Maximum Pull	1820 kg (4000 lbs)
Continuous Pull	1250kg (2640 lbs)
Line speed at continuous pull	15 m/min (49 ft/min)
Working Load limit (10min run time)	1500 kg (3300 lbs)
Maximum line speed	15 m/min (49 ft/min)
Recommended hydraulic oil flow	28.5 l/min (7.6 US gal/min)
Maximum hydraulic oil flow	29.7 l/min (7.85 US gal/min)
Maximum hydraulic oil pressure	205 bar (3000 PSI)
Motor port size	½" BSP
Drain size	9/16" UN (Dash -6)
Net Weight LP version	31 kg (68 lbs)
Net Weight Capstan version	34 kg (75 lbs)

Hydraulic Drive GT (type 1 high flow motor – 85 bar)	
Maximum Pull	1820 kg (4000 lbs)
Continuous Pull	1250kg (2640 lbs)
Line speed at continuous pull	14.2 m/min (46.6 ft/min)
Working Load limit (10min run time)	1500 kg (3300 lbs)
Maximum line speed	14.2 m/min (46.6 ft/min)
Recommended hydraulic oil flow	64 l/min (16.9 US gal/min)
Maximum hydraulic oil flow	64 l/min (16.9 US gal/min)
Maximum hydraulic oil pressure	85 bar (1250 PSI)
Motor port size	1 1/16" -12 UN (Dash -12)
Drain size	9/16" UN (Dash -6)
Net Weight LP version	31 kg (68 lbs)
Net Weight Capstan version	34 kg (75 lbs)

1.5 PRODUCT CONFIGURATIONS

The RC12HD is available in Clockwise or Anticlockwise rotation, with or without a capstan warping drum, 100mm (standard) or 200mm deck clearance and DC electric, AC electric or Hydraulic.

2.0 INSTALLATION

2.1 SELECTION OF POSITION FOR THE WINDLASS

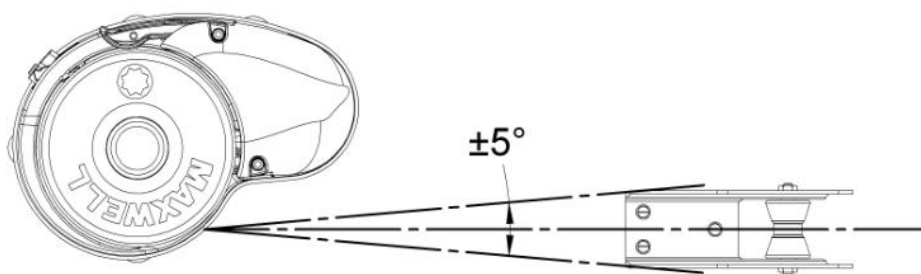
Identify any bulkheads, wiring or piping under the deck that should be avoided.

Position the windlass so the rope/chain falls directly into the rope/chain locker with at least 200mm (8") unobstructed fall from the lowest part of the windlass.

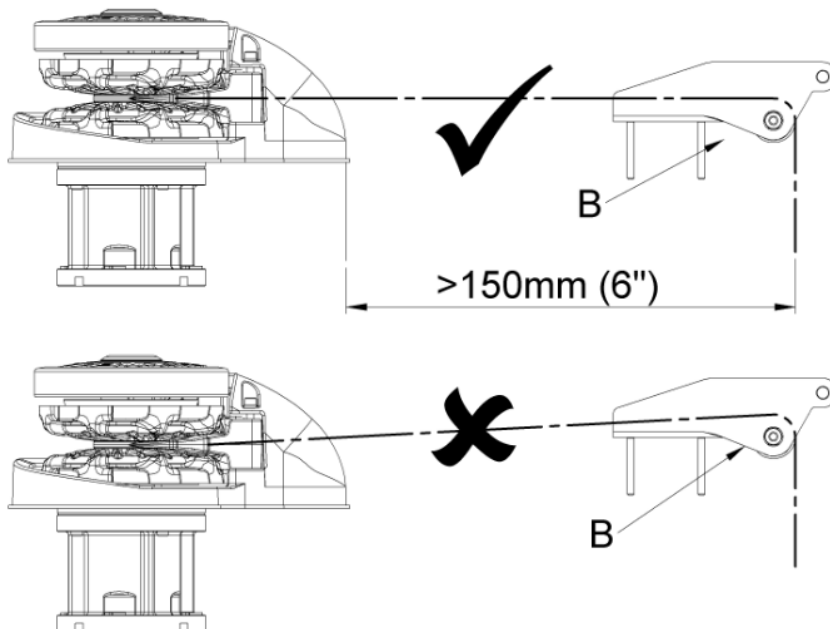
Ensure the rope/chain does not foul on the windlass motor

"UP" is the clockwise rotation when looking down on the windlass.

The windlass must be positioned to allow the rope/chain to have a clear run from the bow roller (B) to the chainwheel without deflection.



The deck plate should be mounted pointing in the direction of the incoming rope/chain. This arrangement allows the rope/chain to have maximum engagement with the chainwheel.



The deck plate should be mounted so that the chain leads into the chainwheel parallel to the deckplate base this will ensure the chain feeds into the chainwheel correctly. A plinth may be necessary to raise the deckplate to the correct height, it is also acceptable to angle the deck plate mounting so that the deckplate is parallel to chain line.

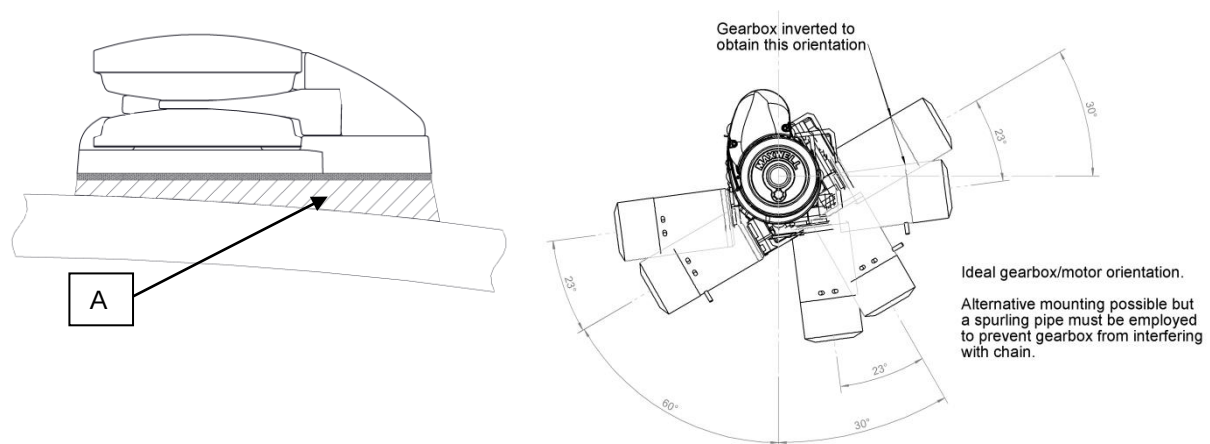
A minimum distance of 150mm (6") is recommended between the bow roller and the windlass.

2.2 PREPARATION OF MOUNTING AREA

Ensure the deck is flat, if not; a plinth (A) will be required to ensure the windlass sits on a flat surface.

It is imperative that the deck and under-deck pad (not supplied) are of sufficient thickness and structural strength to support the loads imposed on or by the windlass.

An under-deck pad should spread the load as widely as possible.



Make sure that the area of deck between the windlass and the bow roller is clear of obstructions.

The bow roller should have a central groove suitable for the chain size. Use a chain guide if necessary to prevent the chain from running against the deckplate and potentially causing damage to the windlass.

2.3 INSTALLATION PROCEDURE

Use the Deck Cutout Details drawing, as a guide for marking and cutting the holes.

Tip: On GRP boats, running the drill in reverse first will reduce chipping of the gel coat.

Using hole saws, cut the holes for the spacer tube and rope/chain pipe.

On GRP or wooden decks, seal the edges of the holes with epoxy to avoid ingress of moisture.

Place the gasket onto the deck. Use of sealant, to seal the windlass to the deck, is recommended

Note: For installations where the deckplate is to be mounted directly to aluminium we recommend the windlass, studs, nuts, washers and chain are fully insulated from the aluminium.

1. Bolt the deckplate to the deck using mounting studs washers and nuts. Tighten the nuts progressively and evenly. Do NOT use power tools. Make sure the installation is firm, but do not over tighten the nuts.
2. Offer up, from below deck, the drive assembly sliding the mainshaft through the deckplate, taking care not to damage the deck bearing.
3. After aligning them correctly, bolt the deckplate and spacer tube together, from above deck, using the M10 hex head screws and spring washers. Tighten them evenly to 35-40 Nm (25-30 ft lb). Make sure the installation is firm, but do not over tighten the nuts.
4. Re-check that the position of the drive assembly is satisfactory and convenient for connecting power supply lines to the motor. Also, make sure that the drive is not in the way of rope/chain coming into the locker.
5. If a chain counter is used, its sensor should be fitted into the Ø15mm hole in the deckplate, currently covered with a plastic plug. Make sure the deck is drilled below for the sensor cable. See brochure supplied with chain counter or detailed assembly instructions.
6. Insert the two retaining clips into the upper groove in the mainshaft; apply some grease to help keep them in position.
7. Apply anti-seize compound generously over the mainshaft and keyway. Insert key into the keyway on the mainshaft.

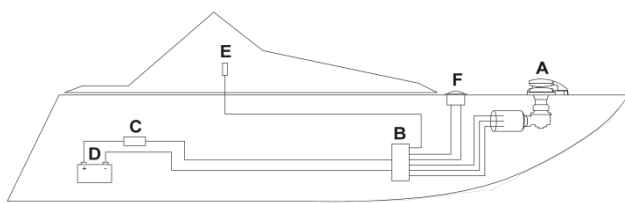
8. Assemble the lower clutch cone making sure it sits nicely on the retaining clips. Apply lithium based marine grease generously to the conical surface of the clutch cone, to assist with free falling the anchor.
9. Put the Belleville washer on top of the lower clutch cone and install the chainwheel assembly. Put the other Belleville washer on top of chainwheel assembly.
10. Insert key on mainshaft and install upper clutch cone, after applying marine grease to its conical surface
11. Insert key on mainshaft, assemble drum and washer (Capstan models only).
12. Assemble clutch nut .
13. Put retaining washer on top of the mainshaft and secure it with the screw.
14. Insert the cap into the clutch nut.

2.4 WIRING INSTRUCTIONS

Installation must be carried out in accordance with USCG, ABYC, NMMA or other relevant local electrical requirements.

We recommend that connection of the power lines and control circuitry to the windlass be done by qualified technicians, to ensure reliable and safe operation of the windlass.

After all connections have been made and system tested, seal terminals against moisture by spraying with: CRC2043 "Plasti-Coat", CRC3013 "Soft Seal" or CRC2049 "Clear Urethane".



Solenoid pack (Required)

The solenoid pack (B) should be located in a dry area close to the windlass, not in the rope/chain locker.

Circuit breaker/isolator (Required)

! FOR SAFETY - The winch circuit requires protection provided by an isolator switch and either a fuse or circuit breaker, rated as follows:

RC12-HD 24V : 135amp

Position the circuit breaker/isolator (C) no further than 1.8 m (6 ft) away from the battery (D) in an accessible and dry location.

Remote control panel (Recommended)

The remote control panel (E) should be mounted in a convenient location (such as the bridge, helm or cockpit) so that the operator can see the windlass.

Footswitch (Optional).

For safe operation, the footswitch (F) should be approximately 500 mm (20") from the windlass (A).

The below-deck part of the footswitch must be in a dry environment and the breather holes must be kept clear.

The arrows on the footswitch should be arranged to indicate the direction of operation.

Fit the switch according to the instructions supplied. Connect wiring as shown.

2.5 POWER CONECTIONS TO DC MOTOR

See Table 2.1 to select the appropriate cable size for power supply. The recommendation assumes that the cable insulation has a minimum temperature rating of 90°C and sizes allow for a maximum 10% voltage drop over the total length.

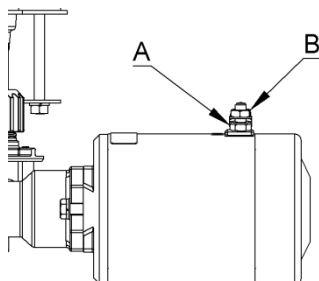
Cable lengths given are from the battery terminal to the terminal on the motor, via the solenoid box, and then back to the battery.

Where a portion of cable runs through the engine room, a size increase should be made as indicated.

After connecting the cables, spray all terminals with anti-corrosive waterproof coating, "CRC 3013 Soft Seal" or equivalent.

24v Systems				
Total Cable Length from battery to winch then back to battery	Wire Size		Engine Room Wire Size Correction*	
	mm ²	AWG	mm ²	AWG
Up to 25m (82')	25	4	35	2
From 25m-35m (82'-114')	35	2	35	2
From 35m-45m (114'-148')	50	1	-	-

Table 2.1
Recommended wire sizes



Motor

When tightening the cables to the motor, ensure the lower nut (A) is secure against turning when tightening the upper nut (B). This will prevent damage occurring within the motor

2.6 SELECTION OF MOTOR STARTER

Several AC motor starter options for windlasses are available, each with characteristic current demands and start load limitations. Maxwell recommends that selection of the best motor start system be entrusted to experienced persons familiar with anchoring procedures and the vessels generating capacity.

"Direct On Line" starter is the simplest way of starting an AC motor and it will allow the windlass to start under full rated load. However, this method requires high momentary starting current, which may have adverse effect to the rest of the electrical system on board.

"Star-delta" and "soft starters" will limit starting currents but also limit windlass starting torque to about 25% of rated capacity, these types of starters are therefore not recommended for starting windlass motors. Since these motors often have to start under load (when retrieving the ground tackle), they might not be able to move until they reach the full voltage and torque. The benefit of starting at lower

current would therefore be lost. Also, the motor brake would release immediately on start-up, which could cause short movement of the chain in opposite direction.

The Variable Frequency Drives (VFD) offer accurate control of current during start up period while keeping high motor torque. They also offer various other benefits like:

- infinite speed control
- running the windlass over its nominal speed
- accurate current overload and thermal overload control

Both “Direct On Line” starters and Variable Frequency Drives are suitable and available from Maxwell, customised to suit the anchor windlass and stern capstan application.

! The selection of the type of motor starter should be done by a qualified electrical engineer, taking into consideration the power generating capacity on board. Maxwell offers both advice and different types of custom made starters to complement our windlasses.

! The “up” and “down” start contactors must be mechanically or electrically interlocked to safeguard the motor, in the event that an accidental attempt is made to start the motor in both directions simultaneously.

2.7 POWER CONNECTIONS TO AC MOTOR

Remove the motor terminal box cover and take care not to misplace the sealing gasket and screws.

Select a suitably sized, waterproof cable gland for the armoured supply cable. The selected gland fitting must fit the terminal box, be capable of anchoring the armoured cable, and allow an effective waterproof entry seal to be made.

Make the line connections to motor terminals. Make also an effective earth connection.

Separately and similarly, enter the 2 thermistor cables to the motor terminal box, and connect to the two auxiliary terminal connectors of the thermistor circuit.

Check:

- Is the direction of rotation of the motor correct?
- Are cables satisfactorily fixed?
- Are cable entry points to motor terminal box satisfactorily waterproofed?

Spray the cable gland, cable entry points and motor terminal box with anti-corrosive waterproof coating “CRC 3013 Soft Seal” or equivalent.

2.8 POWER CONNECTIONS TO HYD MOTOR

A basic hydraulic schematic is shown in Appendix C.

Port sizes on the hydraulic motor and minimum hose sizes are specified in Section 1.4.

The motor has pressure and return ports (bigger) and a case drain ports. The pressure and return ports should be connected to a solenoid controlled valve (not supplied by Maxwell).

After connecting the power lines, spray all ports and fittings with anti-corrosive waterproof coating, “CRC 3013 Soft Seal” or equivalent.

2.9 NOTE TO BOAT BUILDER

Experience has shown that, on long ocean deliveries, sulphur from the ship's exhaust can settle on polished surfaces, which can affect the quality of the finish.

Please ensure that, upon completion of installation, the windlass is treated with suitable corrosion protective coating (“CRC 3097 Long Life”) and wrapped in plastic film. This ensures that your customer receives the windlass from you in the same top quality condition as you received it from Maxwell.

3.0 OPERATION

3.1 PERSONAL SAFETY WARNINGS

- As with all load carrying equipment, the consequences of heavy overload, neglect or misuse may be unexpected failure and exposure of crew and/or vessel to risk. Operate the capstan with extreme care at all times.
- Before testing the windlass for the first time, check that all the wiring has been done correctly.
- When using the windlass at all times practice good seamanship and adhere to the following rules in order to avoid any likelihood of injury or accident.
- Run the engine whilst using the windlass. This is not only a safety precaution but also helps minimise the drain on the batteries.
- Do not use windlass as a bollard or mooring point. When at the anchor, always tie off directly to a bollard or sampson post.
- At all times keep hands, feet, loose clothing, cordage, your hair and other people on board WELL CLEAR.
- When the windlass is not in use, make sure the power supply is isolated, making an accidental operation thereby impossible.
- The circuit breaker/isolator provides high current protection for the main supply cables as well as the means to isolate the circuit.

3.2 OPERATING THE WINDLASS

Lowering the Anchor

Insert the clutch handle into the clutch nut and tighten the clutches by turning the nut clockwise. Only tighten sufficiently so that you can easily pull up the anchor. Remove the clutch handle.

Operate the windlass by pressing the toggle switch down on the remote up/down control panel to pay out the rope/chain (or press the "Down" footswitch if fitted).

Pay out sufficient rope/chain to set the anchor.

Watch as the rope/chain is being fed out. Any jam might cause damage to the windlass.

Always use a chainstopper, snubber or cleat to tie off when anchoring. This will protect the windlass from shock loading.

Raising the Anchor

Insert the clutch handle into the clutch nut and tighten the clutches by turning the nut clockwise. Only tighten sufficiently so that you can easily pull up the anchor. Remove the clutch handle. NOTE: Over tightening the clutches can cause damage to the motor when docking the anchor.

Operate the windlass by pressing the toggle switch up on the remote up/down control panel (or press the "Up" footswitch if fitted).

Motor up to the anchor while retrieving it. Do not use the windlass to pull the boat to the anchor.

To avoid damaging the bow fitting, retrieve the last meter (3') of rope/chain slowly and take care when docking the anchor.

Note: To avoid applying the full force of the windlass to the bow fitting when docking the anchor, adjust the clutch nut so that there is some slippage when docking the anchor.

DO NOT use the windlass to secure the anchor into the bow roller. Use an appropriate tensioner or snubber.

Free falling the Anchor

1. Check that the rope/chain has unrestricted travel over the bow roller.
2. Standing well clear of the chain, insert the clutch Handle into the clutch nut and loosen by slowly turning the handle anticlockwise.
3. Tightening the clutch nut clockwise will control the rate of descent.

CAUTION: Do not allow the chainwheel to free wheel uncontrolled as this will allow dangerously high speeds to build up.

3.3 OPERATING THE WINDLASS MANUALLY

Raising the Anchor Manually

1. Tie off the rope/chain so that it does not pay out when the clutch is released.
2. Insert the clutch handle into the clutch nut and turn anticlockwise to loosen the clutch. Remove cap, washer, screw and clutch nut... (capstan and key if capstan version)
3. Fit emergency handle on shaft.
4. Use clutch handle to tighten emergency handle on shaft.
5. Ensure that emergency handle pawl is engaged with upper chainwheel (not sitting above)
6. Engage pawl with chainwheel to stop freefall
7. Release rope/chain and use lever to pull in line.
Tie off the rope/chain before removing emergency handle.



Using the Capstan Drum for Rope Warping:

The vertical capstan can be used independently from the chainwheel. This is ideal for handling mooring or docking lines, or retrieving a second anchor. For safety reasons, a footswitch is highly recommended.

To haul in using the capstan:
Make sure the anchor is secured.

Insert the clutch handle into the clutch nut and turn anticlockwise until rotation stops. This will release the mechanism so that the chainwheel remains stationary while you operate the capstan.

Wind up to three turns of rope onto the drum in a clockwise direction. Maintaining a light 'tailing' pull on the free end, start the capstan using the UP foot switch.

As the capstan rotates, increase pull and 'tail' hand over hand to haul the rope. Reduce pull to slip the rope if required.

To hold, stop the capstan while maintaining pull on the rope.

4.0 MAINTENANCE

4.1 WINDLASS MAINTENANCE

Every Trip

- Ensure clutch is adjusted correctly
- Wash down topworks with fresh water
- Check rope for wear and wash down with fresh water
- Spray fresh water into drainage slot on gearbox, to breakdown and flush away any build up of salt/debris which may have accumulated

Every 3 Months

- Remove chainwheel. Strip and grease clutch
- Split gearbox from spacer tube, clean and re-grease mating faces
- Clean the Windlass with a cloth damp with Kerosene (paraffin). Spray preferably with CRC3097 "Long Life" or alternatively, CRC6-66 or WD40. Polish off with a clean non-fluffy cloth.
- The under deck components should be sprayed, preferably with CRC 3097 "Long Life" or alternatively, CRC6-66 or WD40.
- Check tightness of all fasteners.

Every Year.

- The motor should be serviced by a qualified technician
- Remove any rust build up from the casing and paint with a suitable coating

Every 3 Years

- The gearbox should be inspected for damage to the seals, the gearbox is lubricated for life so does not require replacing the oil..

! Failure to carry out the maintenance and service, as described herein, will invalidate warranty.

! Before doing any maintenance work on electric motor, starter units and wiring, make sure the power supply is switched off.

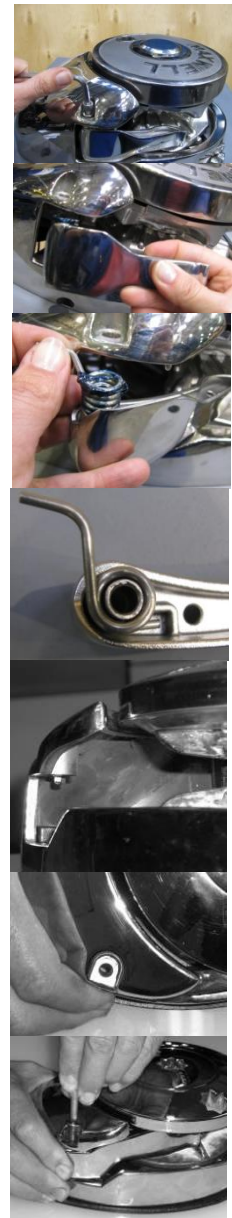
! Use synthetic oils only. Never mix two oils, even if they are from the same manufacturer.

WARNING:

When re-assembling care must be taken to ensure the key/keys are properly seated in the shaft.
DO NOT wrap the motor with grease cloth as this prevents the cooling of the motor.

4.2 PRESSURE ARM REPLACEMENT

1. Using a 5mm hex key undo the capscrew on chaincover. Be careful when releasing the capscrew as the pressure arm spring may spring out.
2. Remove the spring and pressure arm
3. Apply liberal amounts of grease to the spring and insert it into the pressure arm
4. Ensure the lower spring pin sits in the groove of the pressure arm as shown.
5. With the spring in the pressure arm, align the spring pin into the groove located inside of the chaincover, and slide the pressure arm in.
6. Looking from above align the pressure arm with the hole for the capscrew.
7. While holding the pressure arm in this position.
8. Assemble the capscrew.



4.3 RECOMMENDED LUBRICANTS

Greases

Lithium complex base NLG1 consistency No. 2

- | | |
|------------|----------------|
| • CASTROL | LMX |
| • DUCKHAMS | Keenol |
| • FINA | CERAN WR 2 |
| • SHELL | Retinex LX |
| • MOBIL | Mobilgrease HP |

Gearbox Oils

ISO 3448 VG 320 - approximately 560mls

- | | |
|-----------|-----------------|
| • CASTROL | Alphasyn PG 320 |
| • SHELL | Omala S4 WE 320 |
| • MOBIL | Glygoyle HE 320 |

Anti-Corrosive Coatings

- CRC 3013 Soft Seal
- Boeshield T9
- Lanocote

Anti-Seize Coating

- | | |
|------------------------|-------------|
| • International Paints | Res-Q-Steel |
|------------------------|-------------|

! Never mix greases, use only one type. If in doubt, remove the previous lubricant and clean the parts thoroughly before applying the new one.

4.4 SPARE PARTS

Maxwell recommends a modest quantity of spare parts to be ordered as familiarity with the windlass is developed during installation. As small parts can be lost during maintenance, keeping spares (and spare tools) is recommended.

We recommend the following list of spare parts per windlass to be carried on board:

Part No.	Description	Qty
P104750	Retaining cap & o-ring	1
3150	Drum key	1
4635	Gearbox key	1
SP2799	Deck seal	1
SP0879	Circlip	1

If any other spare part is required, please refer to Appendix B for the correct part number and contact one of our distributors worldwide (Appendix B). When ordering spare parts, please quote:

- Windlass model
- Serial number of the windlass
- Part number (see Appendix B)
- Part description
- Quantity required

4.5 TOOLS FOR MAINTENANCE

We recommend the following tools be kept on board for disassembling and assembling the windlass:

- Set of metric hexagon keys (Allan keys), sizes 5, 6 and 8mm
- Ring / open end spanner 13mm & 15mm
- Flat screwdriver 10mm blade width
- Circlip pliers

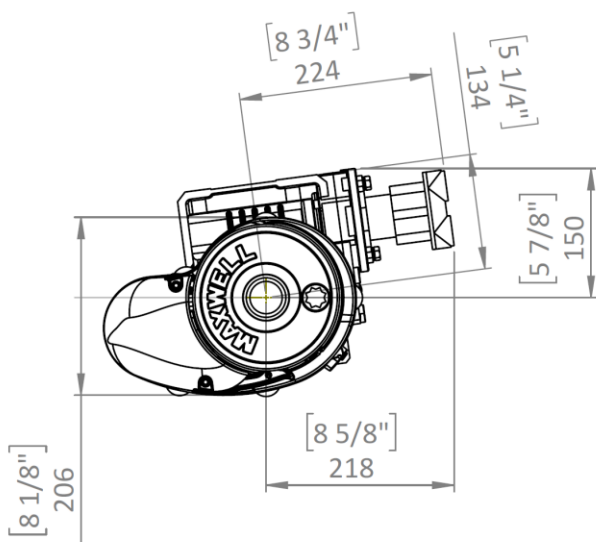
5.0 TROUBLESHOOTING

Problem	Possible Cause	Solution
Windlass does not rotate.	No electric power to controls.	Make sure the isolator switch for the windlass controls is ON. Check the fuse on power supply to controls. Make sure the wiring is correct and check it for damage. If there is more than one type of control (pendant unit, footswitch, helm switch), check them all in an effort to isolate the problem Check isolator switch and fuse on Variable Frequency Motor Control, if supplied. Check the power supply to controls from the source, step by step, and identify the point where it stops.
	Incorrect or incomplete wiring.	Check wiring against diagrams supplied.
	No power supply to the capstan.	Check power supply lines. Check main isolator switch.
	Faulty thermistor relay	To confirm, check resistance between terminals 21 and 22. If it is above 500 ohms, contact Maxwell.
	Damaged thermistors on the motor	To confirm, check resistance across thermistors, it should be between 50 and 500 ohms. When doing that, do not use voltage.
Windlass is not able to pull the specified load.	Motor voltage does not match the power supply on board.	Check name plate on the motor. If confirmed, contact Maxwell.
	Hydraulic relief valve not set correctly.	Check valve setting
Motor draws high current but struggles to pull the load.	The mounting bolts of the motor are touching the motor winding.	Make sure the bolts have spring washers and/or adjust bolt lengths.

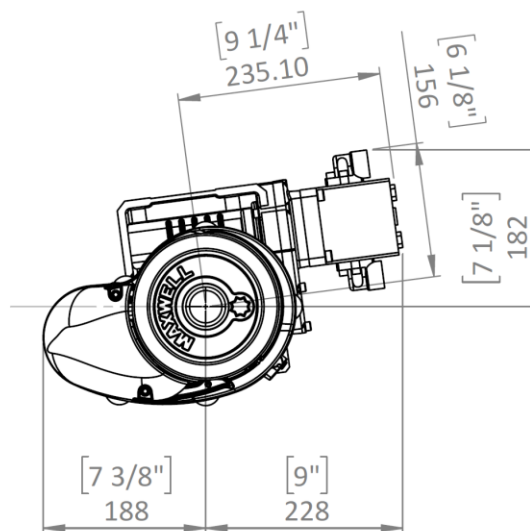
Motor stops after prolonged heavy use.	The motor has been overloaded and has reached its maximum operating temperature.	Leave it to cool down and reset the circuit breaker.
Windlass runs but the chainwheel stays stationary.	The clutch is not fully engaged.	Tighten the clutch up, as described in Section 3.2. If the problem persists, contact Maxwell.
	Band brake is engaged.	Release band brake.
	Topworks key(s) not installed.	Install the key.
The anchor does not free fall.	The clutch cones are not greased.	Disassemble the cones , clean and grease them as described in Section
	The clutch is not fully disengaged.	Disengage the clutch fully.
	The band brake is not disengaged.	Disengage the band brake fully.
	Disc springs not fitted.	Fit disc springs as described in.
	Pawl engaged.	Disengage pawl.
Chain jumps / slips on the chainwheel.	The chainwheel not selected correctly.	Contact Maxwell with correct identification of the chain used on board.
	Chain twisted between windlass and bow roller.	Untwist the chain.
	Vertical angle of incoming chain bigger than 2 degrees.	Check the installation. If the problem persists, some height adjustments might have to be made.

APPENDIX A - Dimensional Drawings

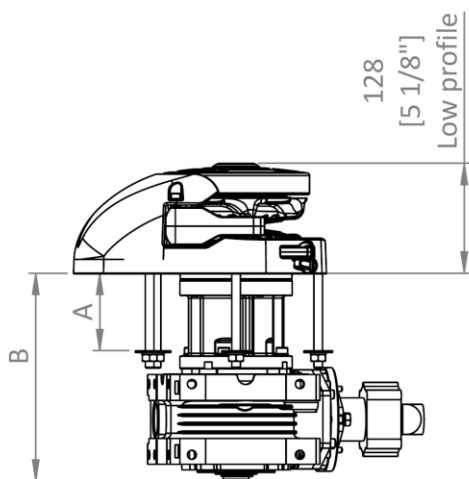
Hydraulic
(Motor Type 2)



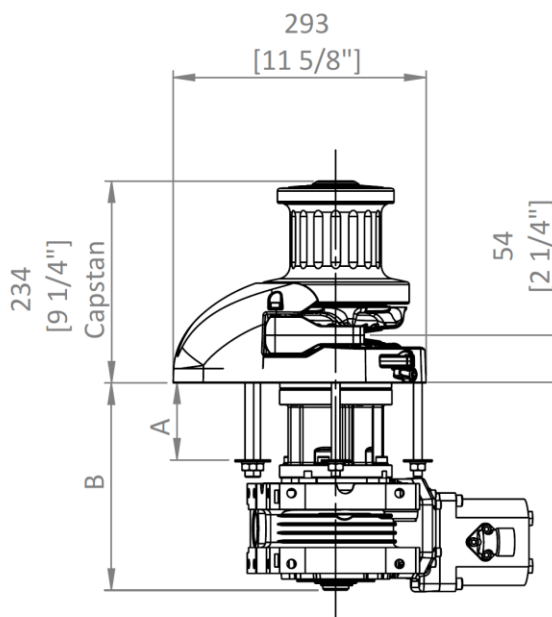
Hydraulic GT
(Motor Type 1)



Low Profile Versions



Capstan Versions

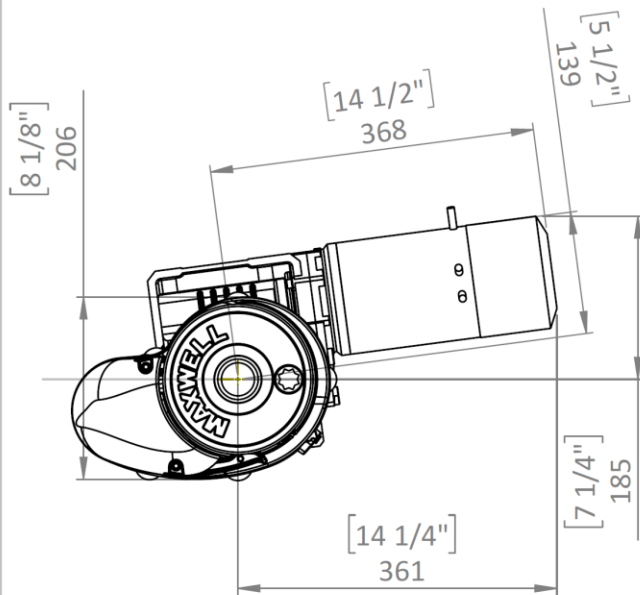


	100TDC	200TDC
A	95 [3 3/4"]	195 [7 3/4"]
B	241 [9 1/2"]	348 [13 3/4"]

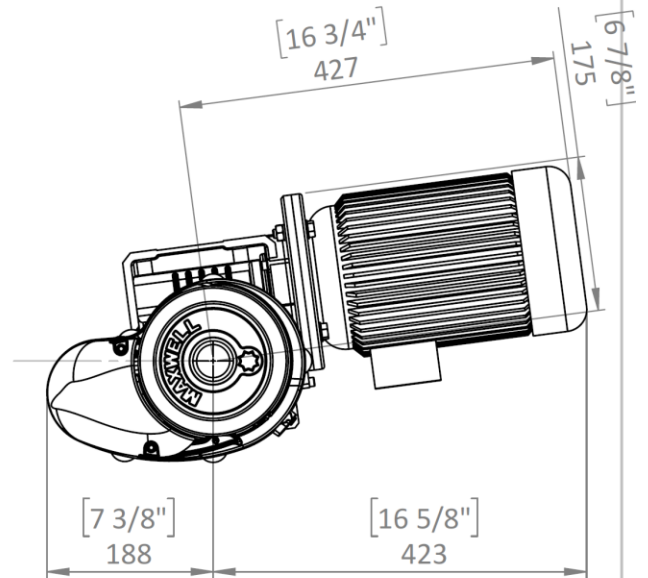
Sht Size	Scale	Dwg Type	Sheet	Description	Pbv/Dwg No.
A4	1:7.5	DFTED	1 of 2	RC12HD Hydraulic Versions	P104968

File location: W:\Product Data\assemblies\P104000-P104999\P104968_1.00_pbv_RC12 HD 12mm Overall dimensions for manual incl Hyd

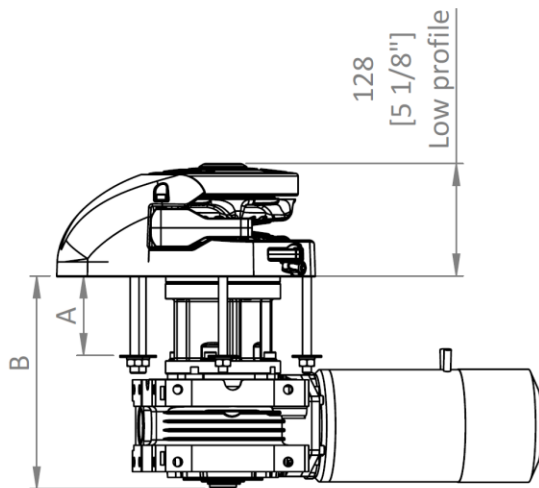
24V DC Electric



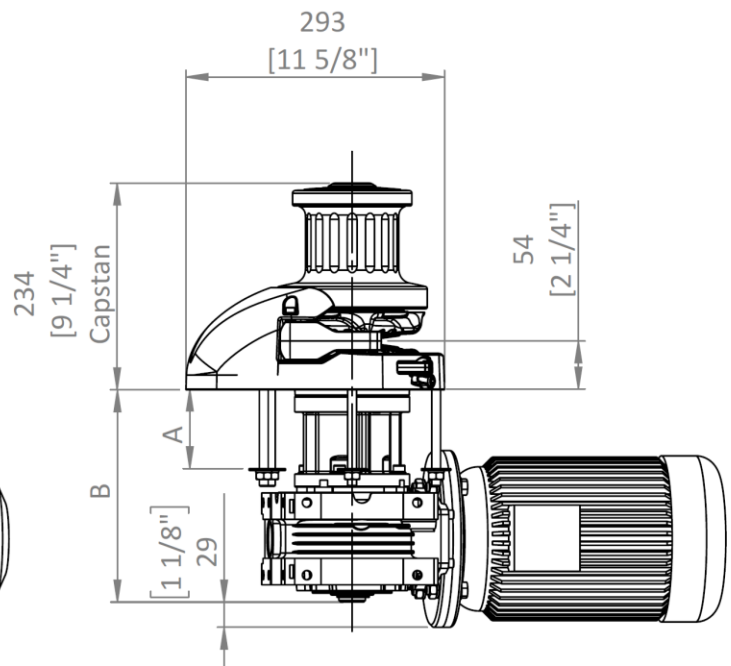
3ph AC Electric



Low Profile Versions



Capstan Versions

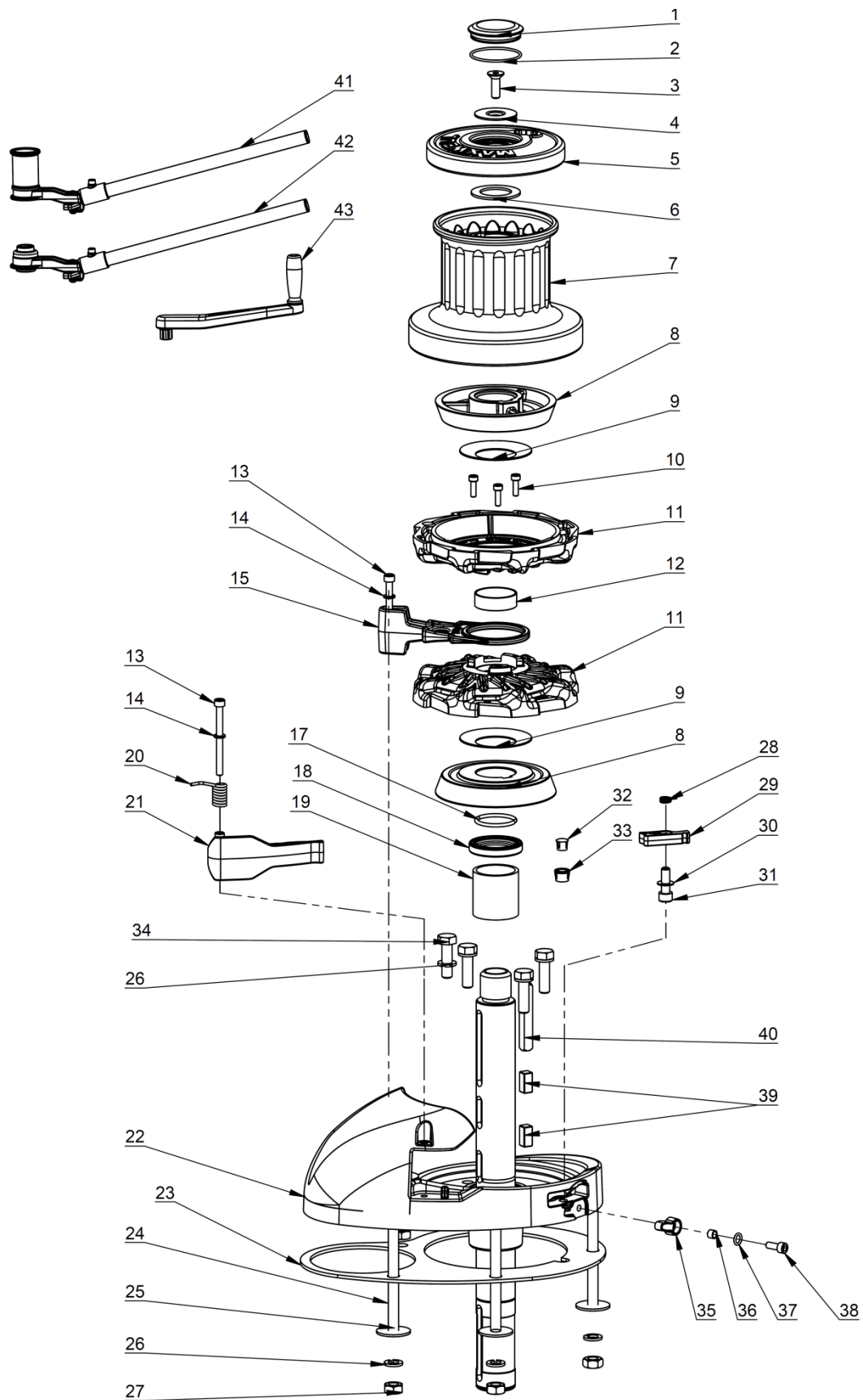


	100TDC	200TDC
A	95 [3 3/4"]	195 [7 3/4"]
B	241 [9 1/2"]	348 [13 3/4"]

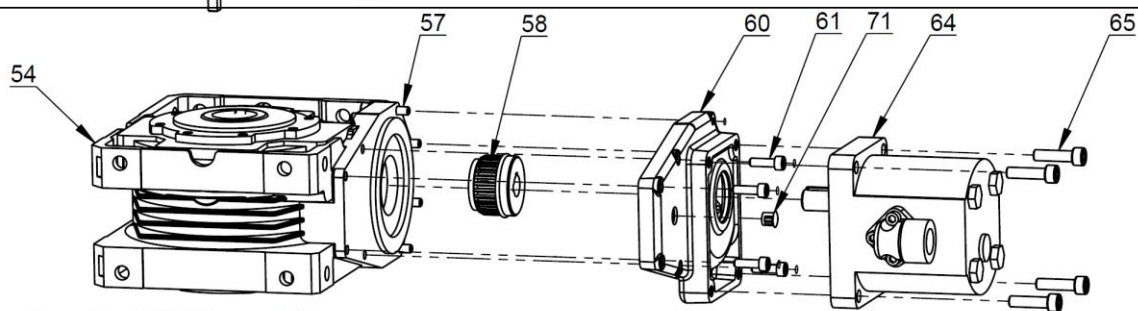
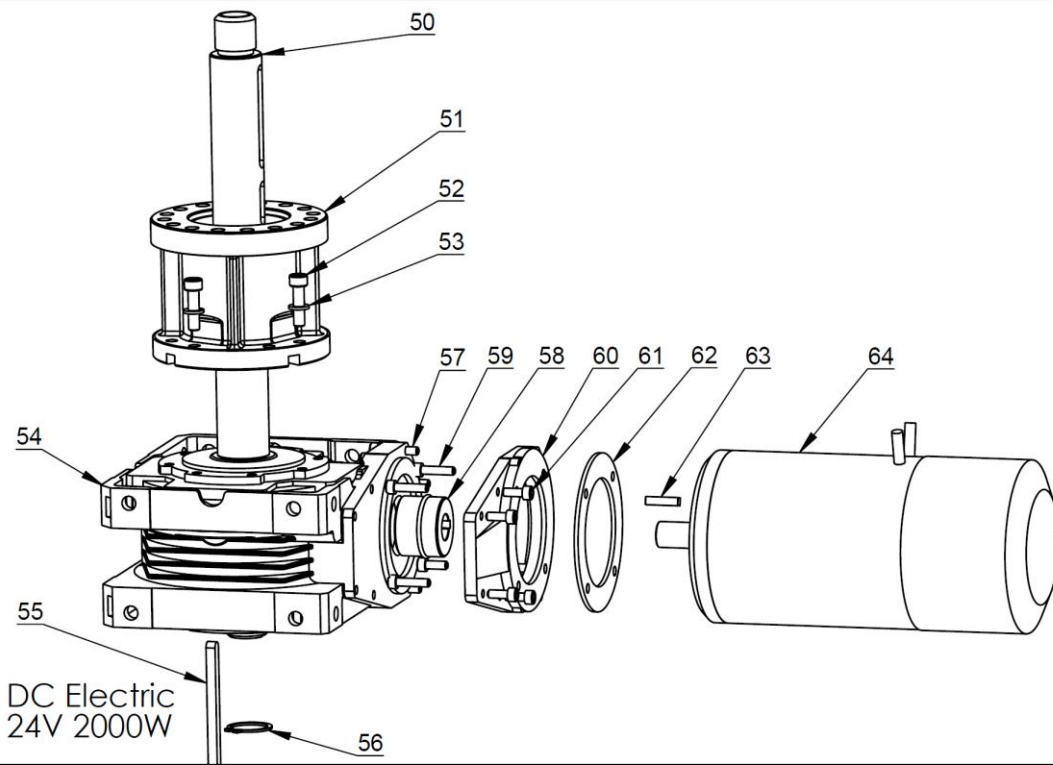
Sht Size	Scale	Dwg Type	Sheet	Description	Pbv/Dwg No.
A4	1:7.5	DFTED	2 of 2	RC12HD Electric Versions	P104968

File location: W:\Product Data\assemblies\P104000-P104999\P104968_1.00_pbv_RC12 HD 12mm Overall dimensions for manual incl Hyd

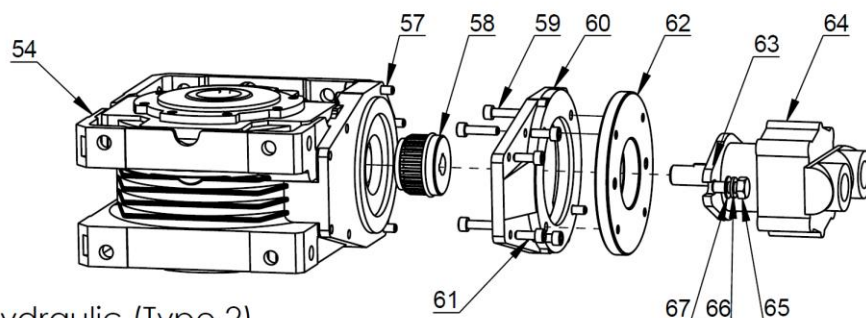
APPENDIX B – Spare Parts



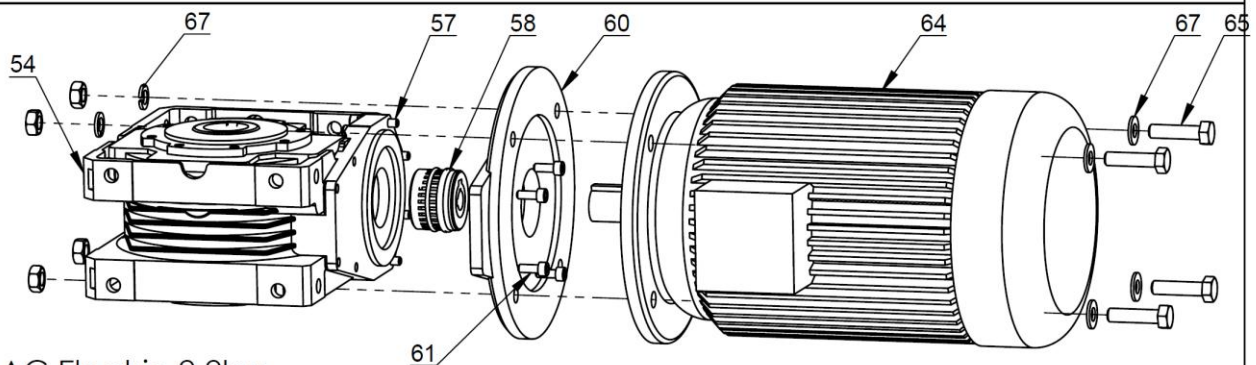
Item	Component description	Qty	Part to order	Includes
1	Cap	1	7191	
2	O-ring	1	SP2790	
3	Screw CSK M8 x 24	1	SP0095	
4	Retaining Washer	1	3267	
5	Clutch Nut	1	7440	
	Clutch Nut Capstan	1	7441	
6	Washer - Capstan only	1	7527	
7	Capstan	1	7443	
8	Clutch Cone	2	7439	
9	Bellville Washer	2	5015	
10	Cap screw -M5 x 16	3	SP0178	
11	Chainwheels – refer table pg 19	1	Ref table pg19	10(x3),11,12,15
12	Bush	1	7544	
13	Cap screw -M6 x 70	2	SP4509	
14	Spring washer	2	SP0474	
15	Stripper	1	7444	
17	Retaining Clip	2	2311	
18	Seal	1	SP2799	
19	Bearing	1	SP0657	
20	Spring CW	1	7037	
	Spring ACW	1	7436	
21	Pressure Arm	1	7435	
22	Deckplate CW	1	7430	
	Deckplate ACW	1	7431	
23	Gasket	1	7515	
24	Stud - 90TDC	4	5225	
	Stud - 90TDC	1	7652	
	Stud - 190TDC	4	7482	
	Stud - 190TDC	1	4710	
25	Washer	5	SP0473	
26	Spring Washer	9	SP0466	
27	Nut - M10	5	SP0371	
28	Spring	1	7458	
29	Pawl	1	7456	
30	Washer	1	SP0413	
31	Cap screw -M8 x 25	1	SP0158	
32	Plug	1	SP3519	
33	Bush	1	SP3518	
34	Screw -M10 x 35	4	SP3221	
35	Pawl	1	7457	
36	Bush	1	7480	
37	O-ring	1	SP2785	
38	Cap screw -M6 x 16	1	SP0170	
39	Key	2	7465	
40	Key – Capstan	1	3150	
41	Emergency Handle - Capstan CW	1	P103320	
	Emergency Handle - Capstan ACW	1	P103324	
42	Emergency Handle - LP CW	1	P103319	
	Emergency Handle - LP ACW	1	P103323	
43	Bi-square Handle 10"	1	P103865	



Hydraulic GT (Type 1)



Hydraulic (Type 2)



AC Electric 2.2kw

Sht Size	Scale	Dwg Type	Sheet	Description	Pbv/Dwg No.
A4	1:5	DFTED	1 of 1	RC12HD Bottomworks	P103792

File location: W:\Product Data\assemblies\P103000-P103999\P103792_3.00_pbvint_Bottomworks RC12HD 100TDC 24V DC motor

Item	Component description	Qty	Part to order
50	Shaft -LP-100TDC	1	7951
	Shaft -Capstan -100TDC	1	7952
	Shaft -LP-190TDC	1	7953
	Shaft -Capstan - 190TDC	1	7954
51	Spacer tube - 100TDC	1	5497
	Spacer tube - 200TDC	1	7955
52	Cap Screw -M10 x 35	4	SP0171
53	Spring washer	4	SP0467
54	Gearbox (excludes items #58 & #60)	1	SP5029
55	Key	1	4635
56	Circlip	1	SP0879
57	Cap screw M6x30- DC & Hyd type 2	4	SP2459
58	Splined Drive bush – DC Electric	1	SP5044
	Splined Drive bush – Hydraulic Type1	1	8620
	Splined Drive bush – Hydraulic Type2	1	8619
	Splined Drive bush – AC Electric	1	SP5069
59	Cap screw M6 x 30	4	SP0175
60	Gearbox input flange – DC & Hyd type 2	1	SP5026
	Gearbox input flange – Hydraulic type 1	1	8426
	Gearbox input flange – AC Electric	1	SP5067
61	Cap screw M6 x 20	4	SP0172
62	Motor Adaptor – DC Electric	1	7942
	Motor Adaptor – Hydraulic type 2	1	7957
63	Key – DC Electric	1	4577
	Key – Hydraulic type 2	1	7974
64	Motor – DC electric 2000W 24V	1	SP5027
	Motor– Hydraulic type 1 Gearmotor (120bar)	1	SP2273
	Motor– Hydraulic type 1 Gearmotor (205bar)	1	SP2274
	Motor– Hydraulic type 1 Gearmotor (85bar)	1	SP2271
	Motor– Hydraulic type 2 Gerotor	1	SP0996
	Motor – AC Electric 2.2kw 3ph 50hz	1	SP5068
	Motor – AC Electric 2.2kw 3ph 60hz	1	SP5083
65	Hex hd bolt M8 x 20 – Hydraulic type 2	2	SP0254
	Cap Screw M8 x 30 – Hydraulic type 1	4	SP0171
	Hex hd bolt M10 x 40 – AC Electric	4	SP0280
66	Spring washer – Hydraulic type 2 only	2	SP0467
	Spring washer – AC Electric	4	SP0466
67	Flat washer – Hydraulic type 2 only	2	SP0413
	Flat washer – AC electric	4	SP0434
70	Nut hex – AC Electric	4	SP0371
71	Plug plastic	1	SP3519

Some listed parts are only sold as part of a kit.

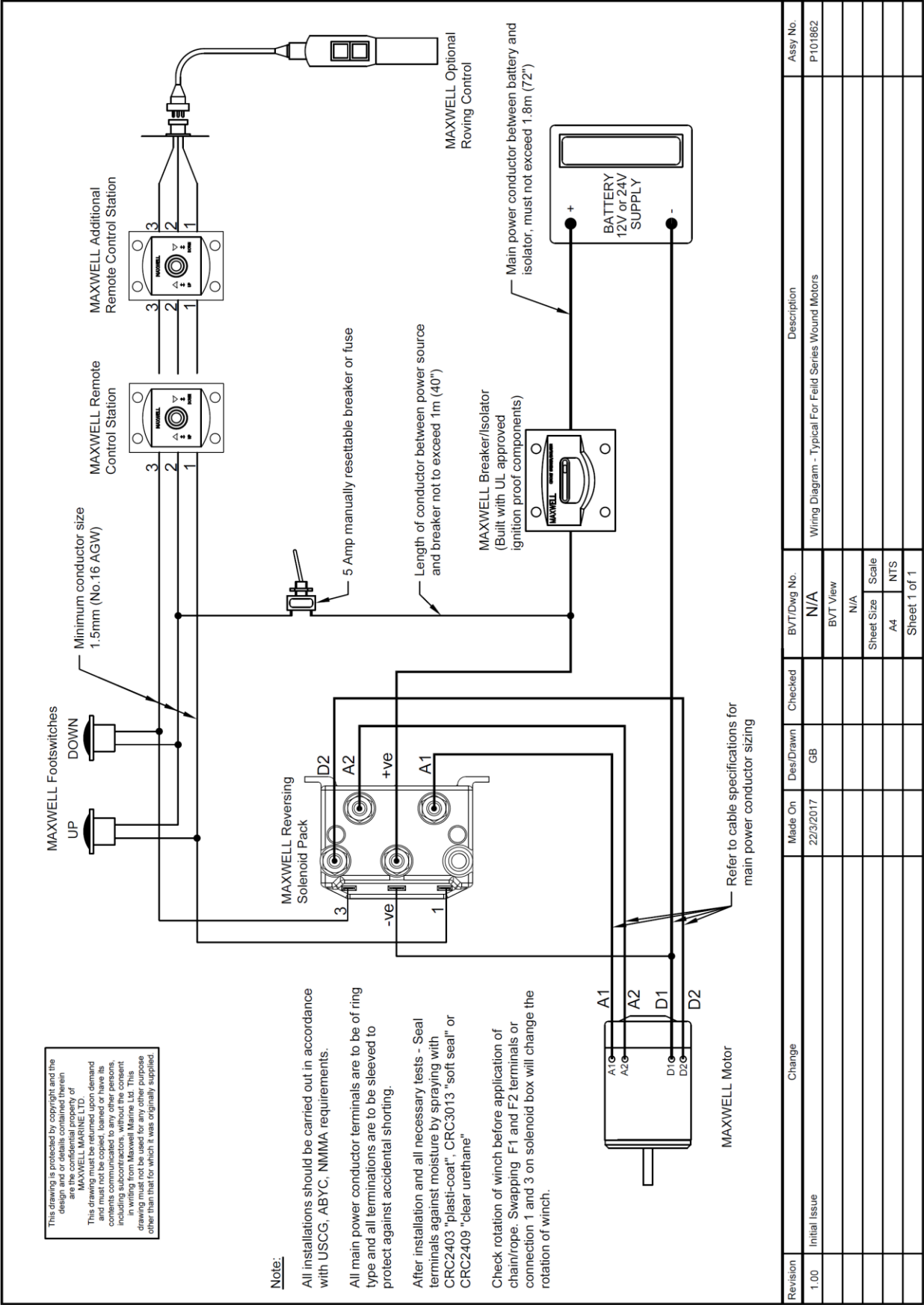
CW - clockwise ACW – anticlockwise

* Chainwheel Listing

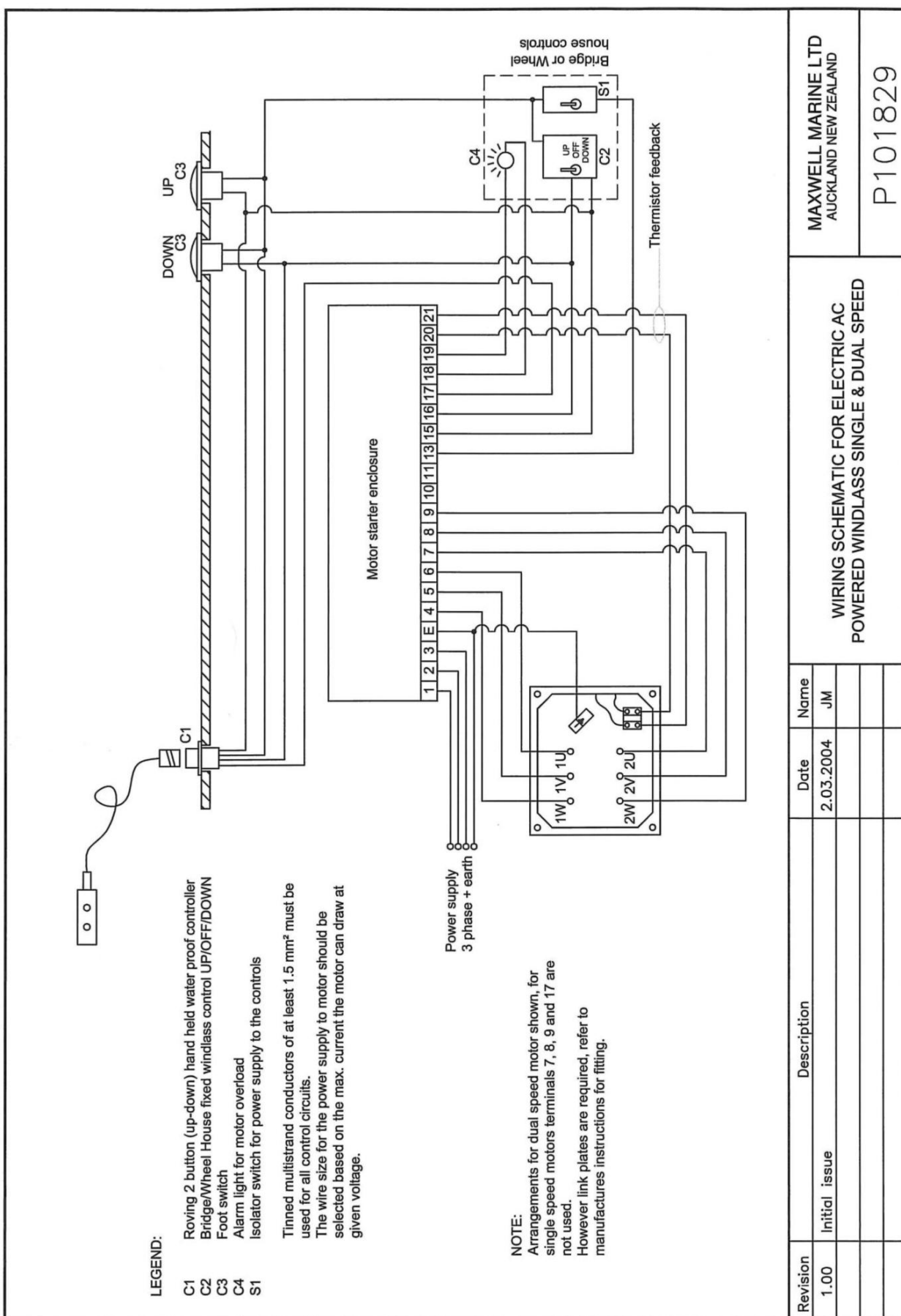
	Upper Chainwheel	Lower Chainwheel	Chainwheel assembly
10mm -3/8" Chainwheel CW	part no: 7448	part no: 7447	P103317
Chainwheel 11mm- 3/8" CW	part no: 7757	part no: 7756	P103325
12mm/13mm -1/2" Chainwheel CW	part no: 7452	part no: 7451	P103318
13mm DIN 766 Chainwheel CW	part no: 8664	part no: 8663	P103328
10mm -3/8" Chainwheel ACW	part no: 7447	part no: 7448	P103321
Chainwheel 11mm- 3/8" ACW	part no: 7756	part no: 7757	P103326
12mm/13mm -1/2" Chainwheel ACW	part no: 7451	part no: 7452	P103322
13mm DIN 766 Chainwheel ACW	part no: 8663	part no: 8664	P103329

APPENDIX C – Installation Schematics

24V DC Electric Wiring



AC Electric Wiring



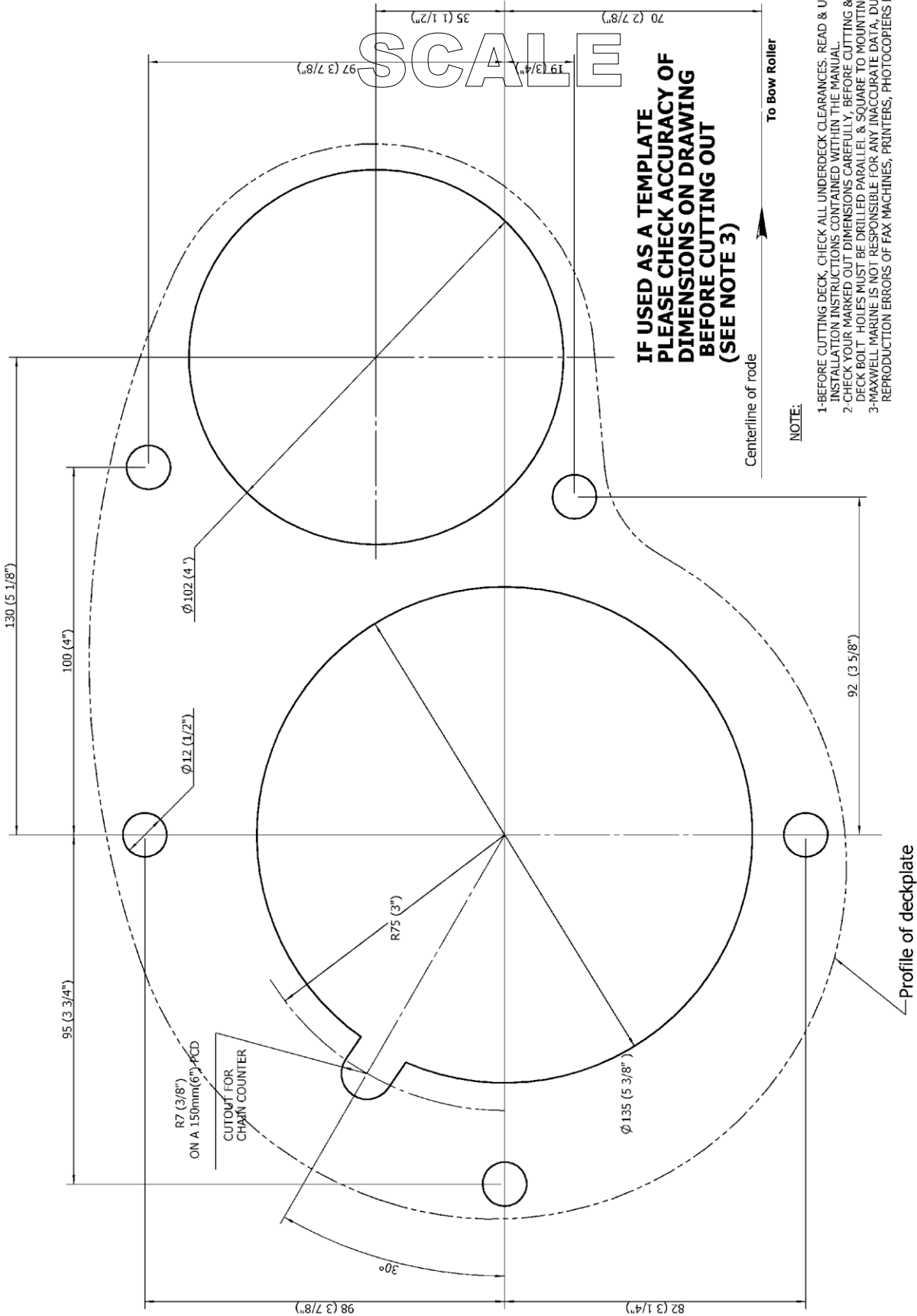
Hydraulic GT Type 1 Plumbing

Standard schematic Riser loop for case drain Hyd. Motor Case Drain Max 10 bar Dual Direction solenoid control valve open centred in neutral Relief valve		For Improved Backwind Prevention: Riser loop for case drain Hyd. Motor Case Drain Max 10 bar Dual direction counterbalance valve Dual Direction solenoid control valve open centred in neutral Relief valve																
Single Direction Riser loop for case drain Hyd. Motor Case Drain Max 10 bar Check Valve Single Direction solenoid control valve open centred in neutral Relief valve		Hydraulic schematic for worm gearbox (windlass/capstan) With case drain																
Note: Ensure that selected hydraulic components are adequate for recommended flow rate. For maximum pressure & recommended flow see specification page in Product Manual.		File location: V:\Product Data\assemblies\P101000-P101999\P101869-2.00.plt Hydraulic schematic for worm gearbox (windlass capstan) with case drain																
Rev. <table><tr><th>Rev.</th><th>Change</th><th>Made on</th><th>Des/Drawn</th><th>Checked</th></tr><tr><td>1.00</td><td>Initial issue</td><td>15/02/18</td><td>DH</td><td>CP</td></tr><tr><td>2.00</td><td>Case drain pressure revised from 1.7 to 10bar ECN 19-088</td><td>05/08/19</td><td>GB</td><td>CP</td></tr></table>		Rev.	Change	Made on	Des/Drawn	Checked	1.00	Initial issue	15/02/18	DH	CP	2.00	Case drain pressure revised from 1.7 to 10bar ECN 19-088	05/08/19	GB	CP	Phw/Dwg No. P101869	
Rev.	Change	Made on	Des/Drawn	Checked														
1.00	Initial issue	15/02/18	DH	CP														
2.00	Case drain pressure revised from 1.7 to 10bar ECN 19-088	05/08/19	GB	CP														

For improved backwind prevention : Dual direction Single direction	Standard schematic Note: Ensure that selected hydraulic components are adequate for recommended flow rate. For maximum pressure & recommended flow see specification page in Product manual.	Copyright Maxwell Marine International

This page intentionally left blank

NOT TO SCALE



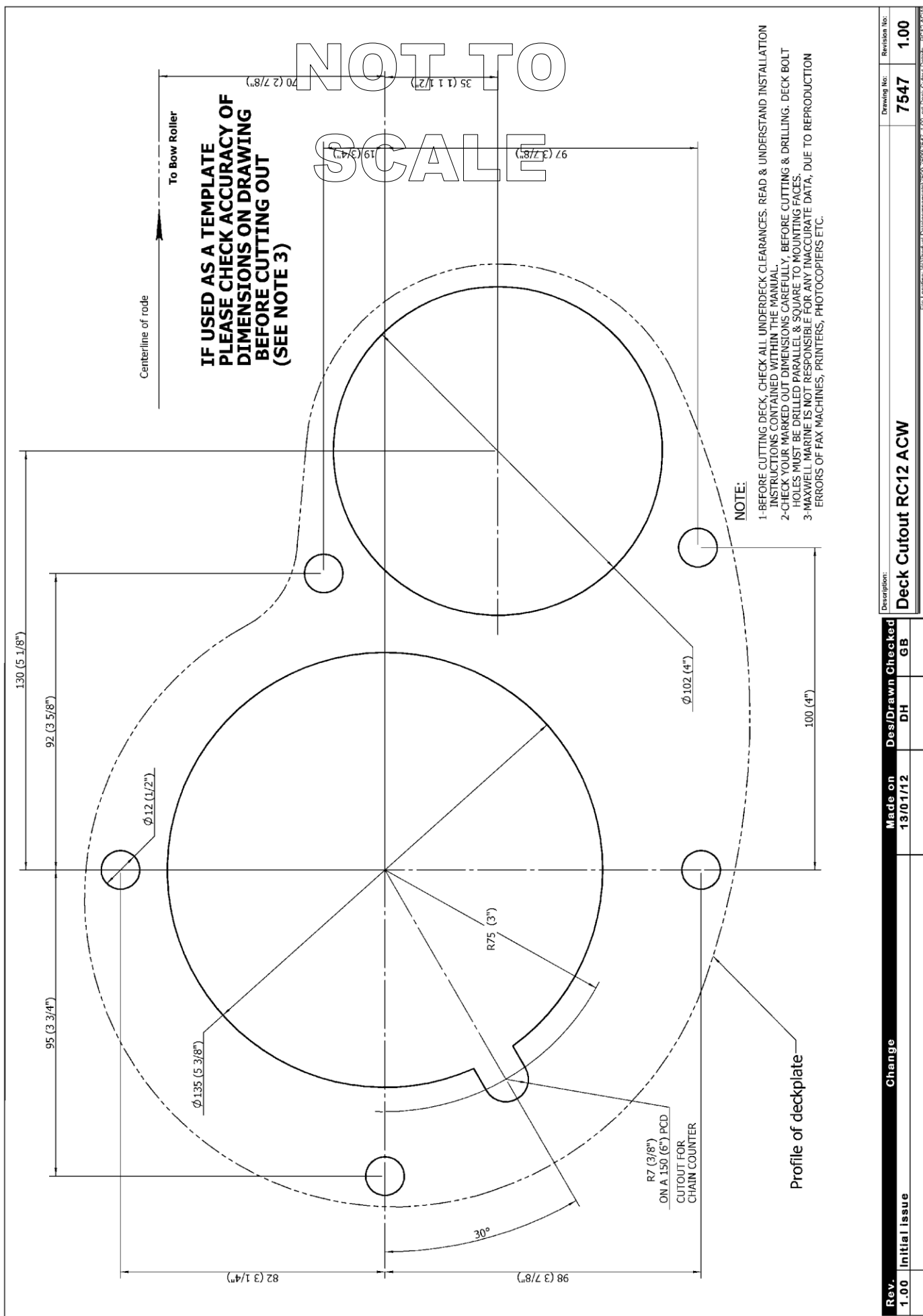
**IF USED AS A TEMPLATE
PLEASE CHECK ACCURACY OF
DIMENSIONS ON DRAWING
BEFORE CUTTING OUT
(SEE NOTE 3)**

NOTE:

- 1-BEFORE CUTTING DECK, CHECK ALL UNDERDECK CLEARANCES. READ & UNDERSTAND INSTALLATION INSTRUCTIONS CONTAINED WITHIN THE MANUAL.
- 2-CHECK YOUR MARKED OUT DIMENSIONS CAREFULLY, BEFORE CUTTING & DRILLING. DECK BOLT HOLES MUST BE DRILLED PARALLEL & SQUARE TO MOUNTING FACES.
- 3-MAXWELL MARINE IS NOT RESPONSIBLE FOR ANY INACCURATE DATA, DUE TO REPRODUCTION ERRORS OF FAX MACHINES, PRINTERS, PHOTOCOPIERS ETC.

Rev.	Change	Made on	Des/Drawn	Checked	Description:	Drawing No.	Revision No.
1.00	Initial issue	22/01/11	DH	GB	Deck Cutout RC12 CW	7516	1.00

File Location: \\Product Data\output\rc12\7516_01 Deck Cutout Details - RC12



Rev.	Initial Issue	Change	Made on	Des/Drawn	Checked
1.00			13/01/12	DH	GB

Description:	Deck Cutout RC-12 ACW	Drawing No:	7547	Revision No:	1.00
File Location: W:\Product Data\components\RC12\RC12 ACW\7547-1.00-RC12 ACW.dwg					

LIMITED WARRANTY

Warranty: VETUS-Maxwell APAC Ltd (Maxwell) provides a three year limited warranty on all windlasses for pleasure boat usage, and a one year limited warranty for those systems used on commercial or charter vessels. Warranty, service and parts are available around the world. Contact your nearest Maxwell office for a complete list of service centres and distributors.

This warranty is subject to the following conditions and limitations:

- This Warranty will be null and void if
 - there is any neglect or failure to properly maintain and service the products.
 - the products are serviced, repaired or maintained improperly or by unauthorised persons.
 - loss or damage is attributed to any act, matter or omission beyond the reasonable control of Maxwell or the purchaser.
- Maxwell's liability shall be limited to repair or replacement (as determined by Maxwell) of the goods or parts defective in materials or workmanship.
- Determination of the suitability of the product and the materials for the use contemplated by the buyer is the sole responsibility of the buyer, and Maxwell shall have no responsibility in connection with such suitability.
- Maxwell shall not be liable for any loss, damages, harm or claim attributed to:
 - use of the products in applications for which the products are not intended.
 - corrosion, wear and tear or improper installation.
 - improper use of the product.
- This Warranty applies to the original purchaser of the products only. The benefits of the Warranty are not transferable to subsequent purchasers.
- Maxwell shall not be responsible for shipping charges or installation labour associated with any warranty claims.
- There are no warranties of merchantability, fitness for purpose, or any other kind, express or implied, and none shall be implied by law. If any such warranties are nonetheless implied by law for the benefit of the customer they shall be limited to a period of three years from the original purchase by the user.
- Maxwell shall not be liable for consequential damages to any vessel, equipment, or other property or persons due to use or installation of Maxwell equipment.
- This Warranty sets out your specific legal rights allowed by Maxwell; these may be varied by the laws of different countries. In addition, the purchaser may also have other legal rights which vary from country to country.
- To make a claim under this Warranty, contact your nearest Maxwell office or distributor. Proof of purchase and authorisation from Maxwell will be required prior to any repairs being attempted.

Purchaser

Name:

Telephone:

Facsimile

To be eligible for warranty protection, please either complete the form below at the time of purchase and return it to the appropriate retailer or supplier of the goods, or fill out the electronic warranty form on our website, www.maxwellmarine.com

Address:

Supplier / Dealer

Name:

Telephone:

Facsimile

Address:

Windlass Model

Serial Number

Date of Purchase

Boat Type

Windlasses Supplied

- ☐ With boat
- ☐ Fitted by boat yard/dealer
- ☐ Purchased from dealer/chandler

Name

L.O.A.

Built by

