



NV-19, NV-19A

NV-20, NV-20A, ARADO

**INSTALLATION AND
USER'S MANUAL**

WWW.ITALWINCH.COM



VERTICAL WINDLASS

Rev.07

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INTRODUCTION

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.

Be mindful that the correct selection of windlass for each application, together with correct installation, normal care in use and maintenance, are essential for long life and reliable performance.

Inspect your windlass carefully when unpacked. Any damage or lack of components should be reported immediately to your Italwinch distributor.

The windlass is supplied with chainwheel, as specified on purchase order. Make sure it is the appropriate one for the chain being used on board. Correct fit of the chain to chainwheel is essential for reliable and safe operation of the windlass. This can be guaranteed only when calibrated chain to a recognised international standard is used and the chain is correctly identified to MZ Electronic, or if a chain sample is provided to Italwinch to develop a custom chainwheel.

The windlass is designed for use in conjunction with chain stopper and tensioner of the appropriate size. Their use is an important safety feature.

For side pocket anchors, a chain roller should be installed above the hawse pipe to ensure smooth and quiet travel of the chain from deck to hawse pipe. The roller requires a central groove to align chain and flat faces (for stud length chains) to support and avoid bending the chain links.

The connection of the power lines and control circuitry to the windlass must be done by skilled technicians, to ensure reliable and safe operation of the windlass.

SAFETY INFORMATION

Safety standards and certifying bodies require peremptorily that, during the standing of the anchor, the load must be held by a chain stopper or a high resistance fixing point. The user is responsible for guaranteeing that during navigation the anchor is properly stowed and fixed. This precaution is more important when the navigation speed is higher and sea conditions are worse. Indeed, an anchor paid out by mistake during navigation can have very serious effects.

Considering its position and not always frequent use, the anchor windlass is particularly exposed to oxidation and corrosion risk; therefore, it is necessary to arrange a constant inspection of its parts and a due maintenance.

Make sure to have read and understood every part of this manual before proceeding with installation and use.

Only persons who know how to operate should be authorised to use the anchor windlass. Should there be doubts on its installation or use, refer always to a skilled consultant.

- Anchor windlasses used in an inappropriate way can cause damages to persons and/or things.
- Pay the utmost attention during the use of powerful equipment.
- Even the most careful use can be a source of damages, even serious.
- Italwinch products are supplied exclusively for recreational nautical use. Italwinch declines all responsibility for improper uses.
- Pay the utmost attention so that arms, legs, fingers, hair, and clothes do not get entangled in the chain or chainwheel.
- Before operating the capstans, make sure that there are no persons in water in the vicinity.
- When the capstan is not used, the anchor must always be fixed to a solid point in order to avoid damages.
- The anchor windlass must never be used as mooring point. The load must always be held by a specific leat or solid point.
- The capstan must not be used for functions other than paying out or weighing the anchor.
- The chain must never be used on the warping drum.
- The system must always be protected by a suitable circuit breaker.
- Disconnect always the circuit through the circuit breaker when the anchor windlass is not in use.

SPECIFICATIONS

Please note that all the values below are for the standard solution. All can change in base a different gearbox ratio and chainwheel size.

NV-19, NV-20, NV-19A, NV-20A				
Power	5,5 kW	7.5 kW	HYD-1	HYD-2
Motor Supply voltage	230/400 3ph	230/400 3ph	-	-
Maximum lift load	5025 kg	6900 kg	3450 Kg	4000 Kg
Lift working load	2500 kg	3450 kg	3450 Kg	4000 Kg
Line speed	12 m/min			
Weight	305Kg --> 330 Kg		275 Kg --> 310 Kg	

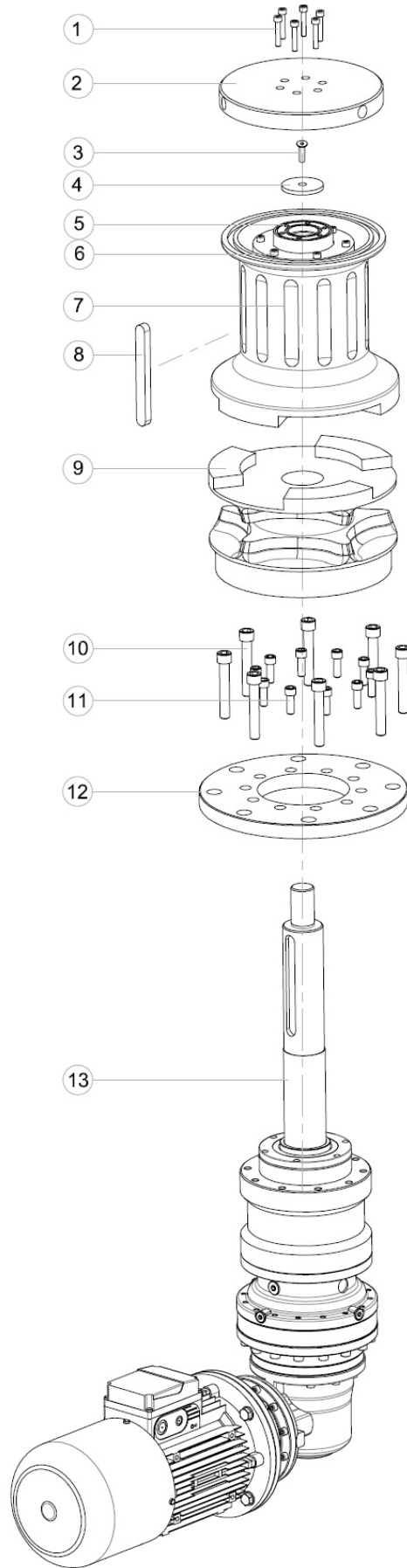
ARADO 19 mm			
Power	5,5 kW	7.5 kW	HYD-1
Motor Supply voltage	230/400 3ph	230/400 3ph	-
Maximum lift load	5025 kg	6900 kg	3450 Kg
Lift working load	2500 kg	3450 kg	3450 Kg
Line speed	12 m/min		
Weight	305 kg		275 kg

ARADO 20,5 mm			
Power	5,5 kW	7.5 kW	HYD
Motor Supply voltage	230/400 3ph	230/400 3ph	-
Maximum lift load	5025 kg	6900 kg	5000 kg
Lift working load	2500 kg	3450 kg	5000 kg
Line speed	12 m/min		
Weight	320 kg		290 kg

ARADO 22 mm			
Power	7.5 kW	9,2 kW	HYD
Motor Supply voltage	230/400 3ph	230/400 3ph	-
Maximum lift load	6900 kg	7000 kg	6000 kg
Lift working load	3450 kg	4400 kg	6000 kg
Line speed	12 m/min		
Weight	375 kg		345 kg

INSTALLING THE WINDLASS ARADO, NV-19A and NV-20A

Refer to picture for help with identifying components and installing them correctly.



Extra care should be exercised when handling polished parts to avoid any damage to polished surfaces. Apply an anti-seize compound generously over thread of all screws, before fastening them.

Follow the steps below to disassemble the windlass ready for installation:

1. Unscrew the top cover (2) by turning counterclockwise until it stops. Use the handle supplied.
2. Remove the n.6 M8 capscrews (1) from the top cover (2) and remove it.
3. Unscrew the M8 screw (3) and remove the stop washer (4).
4. Unscrew completely the brass bush (5) until all its thread is out from the main shaft. Two of the M8 screws (1) will be helpful to do this operation.
5. Do not remove the other screws (6)
6. Lift the capstan (7) using the two M12 lifting eyes
7. Lift the chainwheel (9) using the two M12 lifting eyes
8. Remove the key (8).
9. Unscrew the n.10 M12 capscrews (11) securing the drive and mainshaft (13) to the deckplate (12).
10. Carefully slide the drive and mainshaft (13) from the deckplate (12)

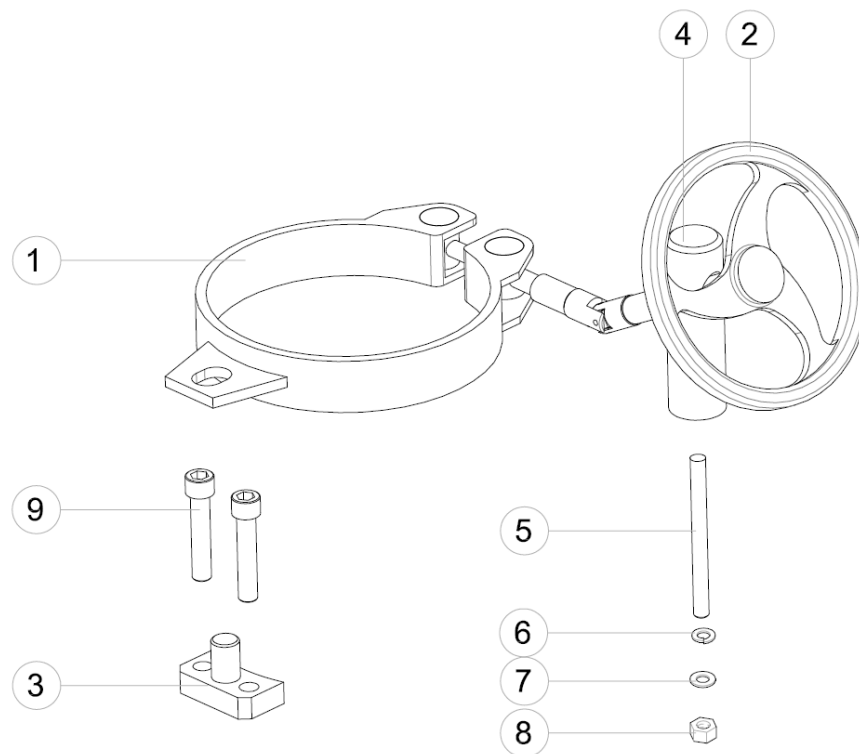
To install in the vessel:

1. Cut the hole in the deck as per the deckplate template. All holes must be drilled.
2. Bolt the deckplate in place using an appropriate bedding/sealing compound. Tighten the n.8 M16 capscrews (10) to 150Nm.
3. Fit the drive and mainshaft (13) from below Carefully slide the drive and mainshaft (13) into the deckplate (12). The lifting eye (M12) can be installed in the end of the shaft to lift from above.
4. Install the n.10 M12 capscrews (10) securing the drive and mainshaft (13) to the deckplate (12). Tighten to 60Nm.
NB: Confirm the drive and gearbox are clear of the chain and able to be connected to power.
6. Apply grease to the mainshaft (13) and fit the chainwheel (9).
7. Fit band brake assembly (see dedicated section)
8. Grease keyway on main shaft (13) and fit key (8).
9. Slide the capstan (7) onto the main shaft (13).
10. Screw completely the brass bush (5) until all its thread is completely screwed on the main shaft. Two of the M8 screws (1) will be helpful to do this operation.
11. Fix the stop washer (4) by the M8 screw (3)
12. Fix the top cover (2) by the n.6 M8 capscrews (1). Take care that all the seal are in the right position and apply grease on all the seal and on the top of shaft.



To install band brake:

Refer to the band brake drawing for identification of components.



1. Open the band brake (1) by turning counterclockwise the handwheel (2).
2. Fit the band brake (1) on the chainwheel.

Note that all the brake assembly can be positioned on either the port or starboard side of the windlass by turning over the band brake.

3. Slip the heel block (3) into the band brake and position the band brake to the desired location.
4. Make sure the band sits on the shoulder at the lower end of the chainwheel and tighten the band brake. Line up both parts of the handle shaft in one vertical plane and make sure the bottom surface of the shaft guide sits firmly on the deck
5. Mark up the position of the shaft guide (4), remove the guide and drill 17 mm clearance hole for the M16 Stud (5).
6. Apply the same bedding/sealing compound as used under the deckplate, replace the shaft guide and retain it from underneath, using the M16 Stud (5), washers (6.7) and nut (8).
7. Mount the heel block (3) by drilling 2 holes to suit M20 x 70 S/S cap screws (9).

INSTALLING THE WINDLASS NV-19 AND NV-20

Extra care should be exercised when handling polished parts to avoid any damage to polished surfaces. Apply an anti-seize compound generously over thread of all screws, before fastening them.

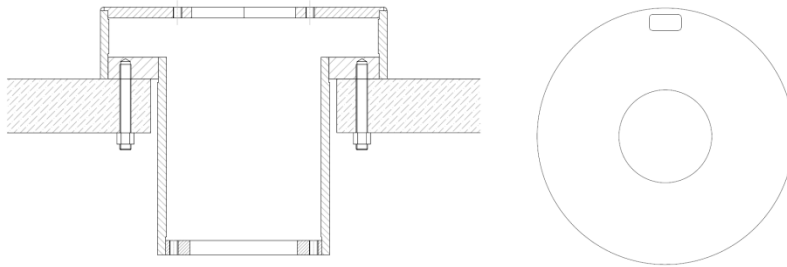
To install in the vessel:

Dismount the windlass before installation:

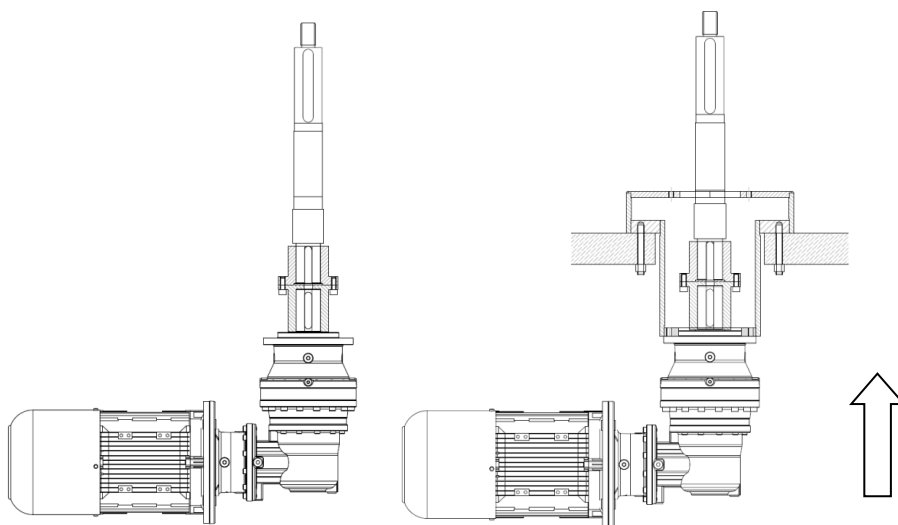
1. Remove the drum unscrewing the top cap till it will be free from the shaft. Remove also its key from the shaft
2. Remove the stopper spacer unscrewing the three nuts
3. Remove the chainwheel and band brake
4. Remove the bearing and seal holder and the chainwheel spacer
5. Remove the windlass base from the gearbox unscrewing the n.10 M12 screws

Mount the windlass on the deck:

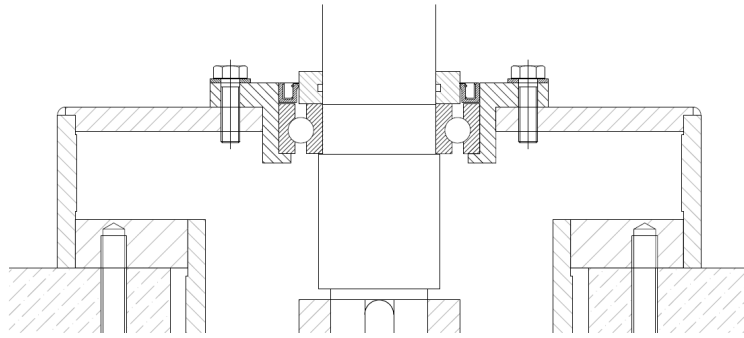
1. Fix the windlass base to the deck in the needed position by the n.8 M16 screws.
The band brake stopper block welded on the base will define the position of the hand wheel brake command



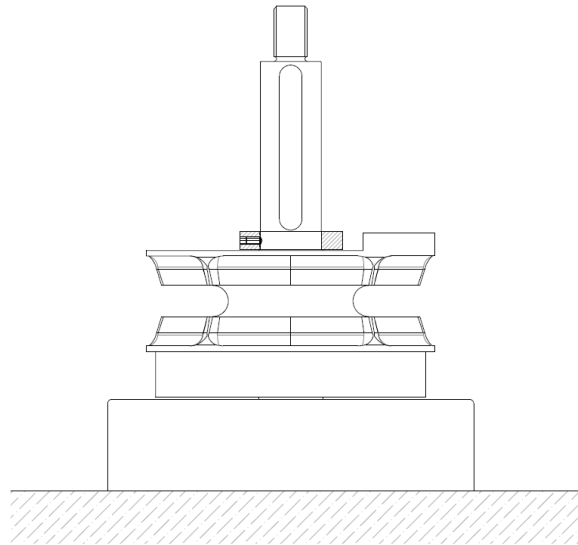
2. Fix the supplied screwed bush on the top of the main shaft and use it to lift the motor-gearbox from the chain locker into the base in the needed position. Fix it by n.10 M12 screws.



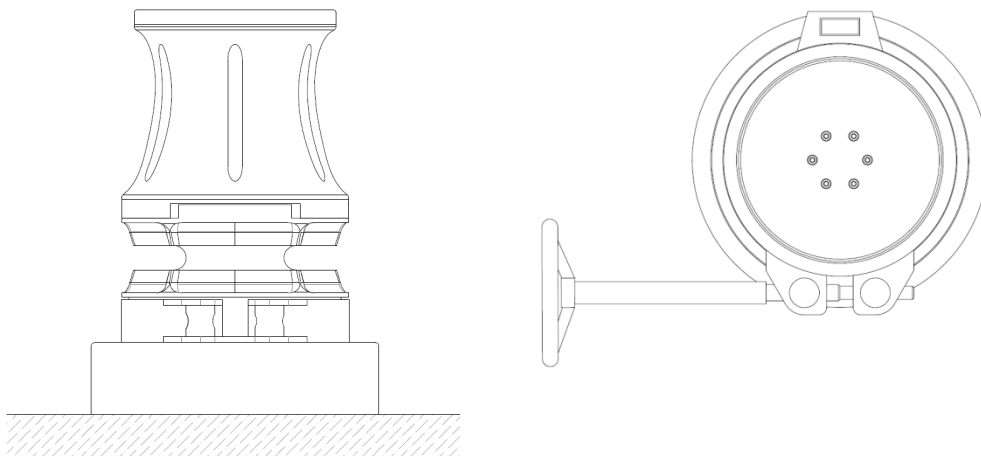
3. From the top fix the bearing and seal holder on the base. insert the chainwheel spacer on the shaft in its position



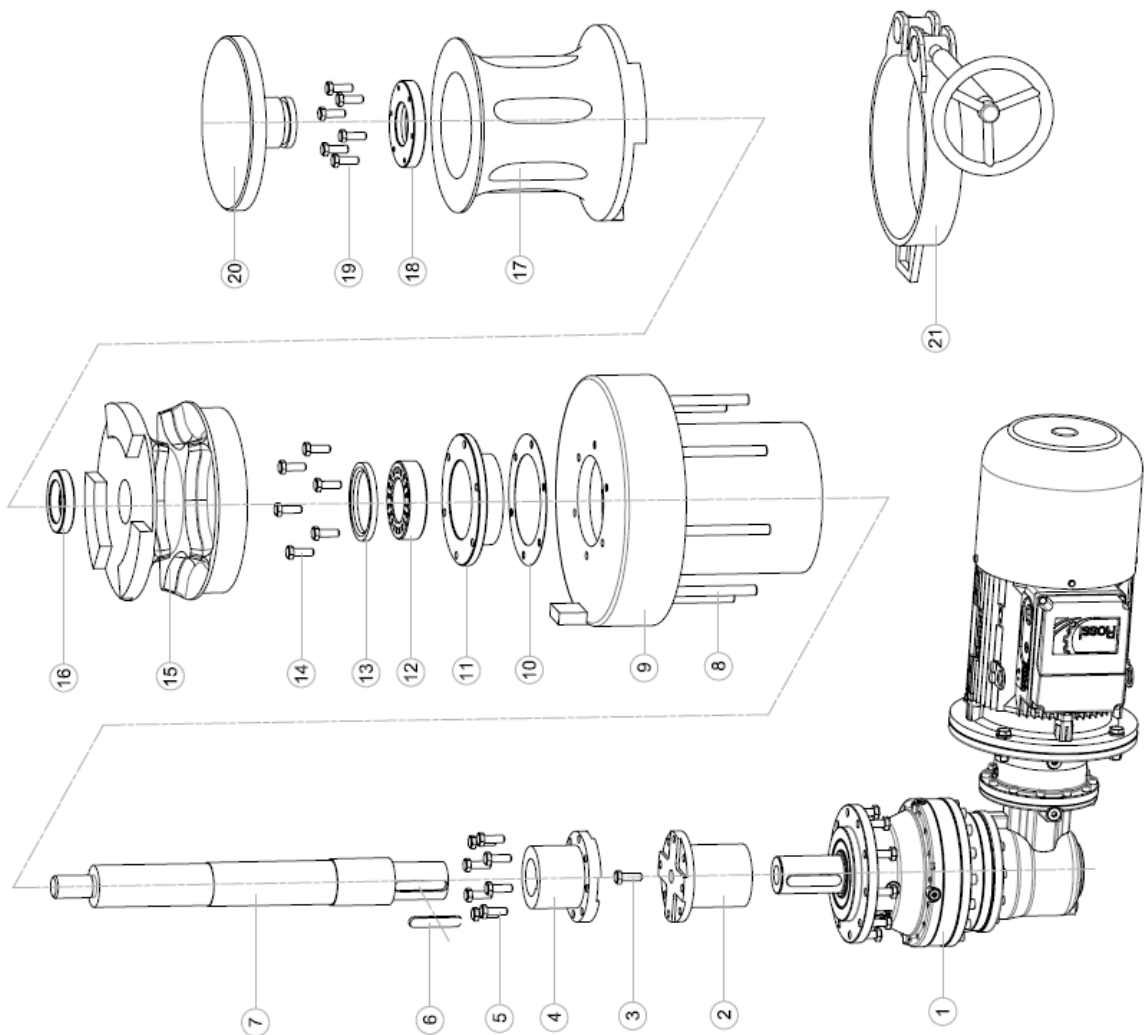
4. Insert the chainwheel on the shaft and block it by the stopper spacer. Screw the three nuts. Check that the chainwheel is free to rotate. Insert the key on its seat on the shaft



5. Insert the drum and screw completely the top cap. Insert the band brake with brake stopper seat on the brake stopper block



ATTENTION: Apply grease to the main shaft and on each screw before fit all the parts



N	DESCRIPTION	Q.TY
1	Motor-gearbox	1
2	Gear joint	1
3	Screw	1
4	Shaft joint	1
5	Screws	6
6	Key	1
7	Shaft	1
8	Screws	1
9	Base	1
10	Gasket	1
11	Bearing holder	1
12	Bearing	1
13	Seal	1
14	Screws	8
15	Gypsy	1
16	Spacer	1
17	Drum	1
18	Disk	1
19	Screws	6
20	Drum top cap	1
21	Band brake	1



WINDLASS CONNECTION

SELECTION OF MOTOR STARTER

Several windlass motor starter options are available, each with characteristic current demands and start load limitations. Italwinch 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 the motor and it will allow the windlass to start under full rated load, but this method requires high momentary starting current, which the generators may not be able to supply. See specifications for current values at 400V and make sure to recalculate it for the voltage used on board. Start current may be limited to about half the above amount by using a "Star-Delta" starter. However, start torque is thereby limited to loads of about 25-30% of the windlass rated capacity.

"Star-delta" and "soft starters" are not recommended for starting windlass motors as the motor torque is severely limited during start up period. Since those motors often have to start under load (when retrieving the ground tackle), they might not be able to start under lower voltage at all. The benefit of starting at lower current would therefore be lost. Also, the motor brake would release immediately on start-up, which would cause short movement of the chain in opposite direction.

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

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

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 as per motor nameplate or motor card. Fit link plates correctly, if required. Make also an effective earth connection.

Our AC motors are equipped with a disc brake to stop back winding when the windlass stops under load. The brake should be wired as follows:

'Direct on Line' start, single speed motor

On single speed motors, the brake rectifier is already connected to motor terminal block and no additional wiring is required.

'Direct on Line' start, dual speed motor

In case of using a two-speed, pole changing motor, a separate power supply for the brake is required. Remove the existing connection from motor terminals to the brake rectifier and bring in brake power supply from contactor in the starter unit.

VFD controller

If the VFD, controller is used, the brake also needs a separate power supply from the VFD unit to ensure appropriate timing of engaging and disengaging the brake. As above, remove the existing brake power supply and connect the brake to the appropriate terminals in the VFD unit (see wiring diagram of VFD unit, supplied with the unit).

Replace the terminal box cover and sealing gasket. Evenly tighten the four securing screws.

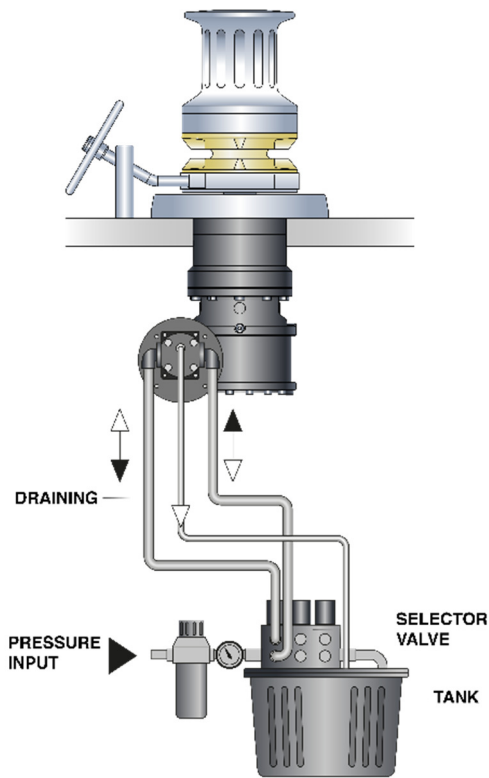
POWER CONNECTIONS TO HYDRAULIC MOTOR

Italwinch advises that only skilled hydraulic technicians should be entrusted with this installation. Check that the valve block assembly has not suffered any damage through handling and is correctly coupled to the hydraulic motor.

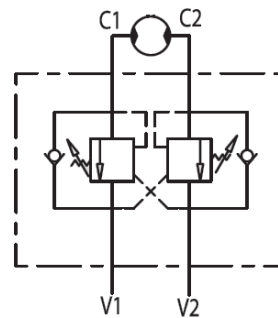
Make sure that hydraulic supply lines are fixed out of the path of chain.

The windlass is supplied with a valve block comprising a relief valve for lowering the ground tackle and a counterbalance valve to prevent overspeeding and to hold the chain when the motor is off (Appendix C).

Spray the hydraulic line connection fittings and valve cartridges after assembly with an anti-corrosive waterproof coating.



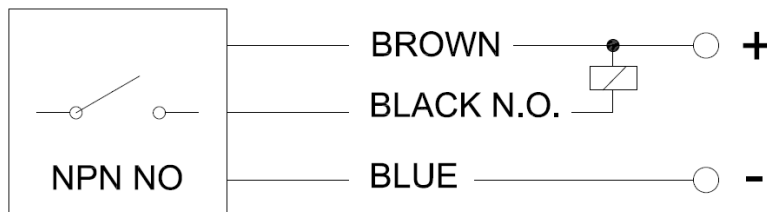
Block valve scheme



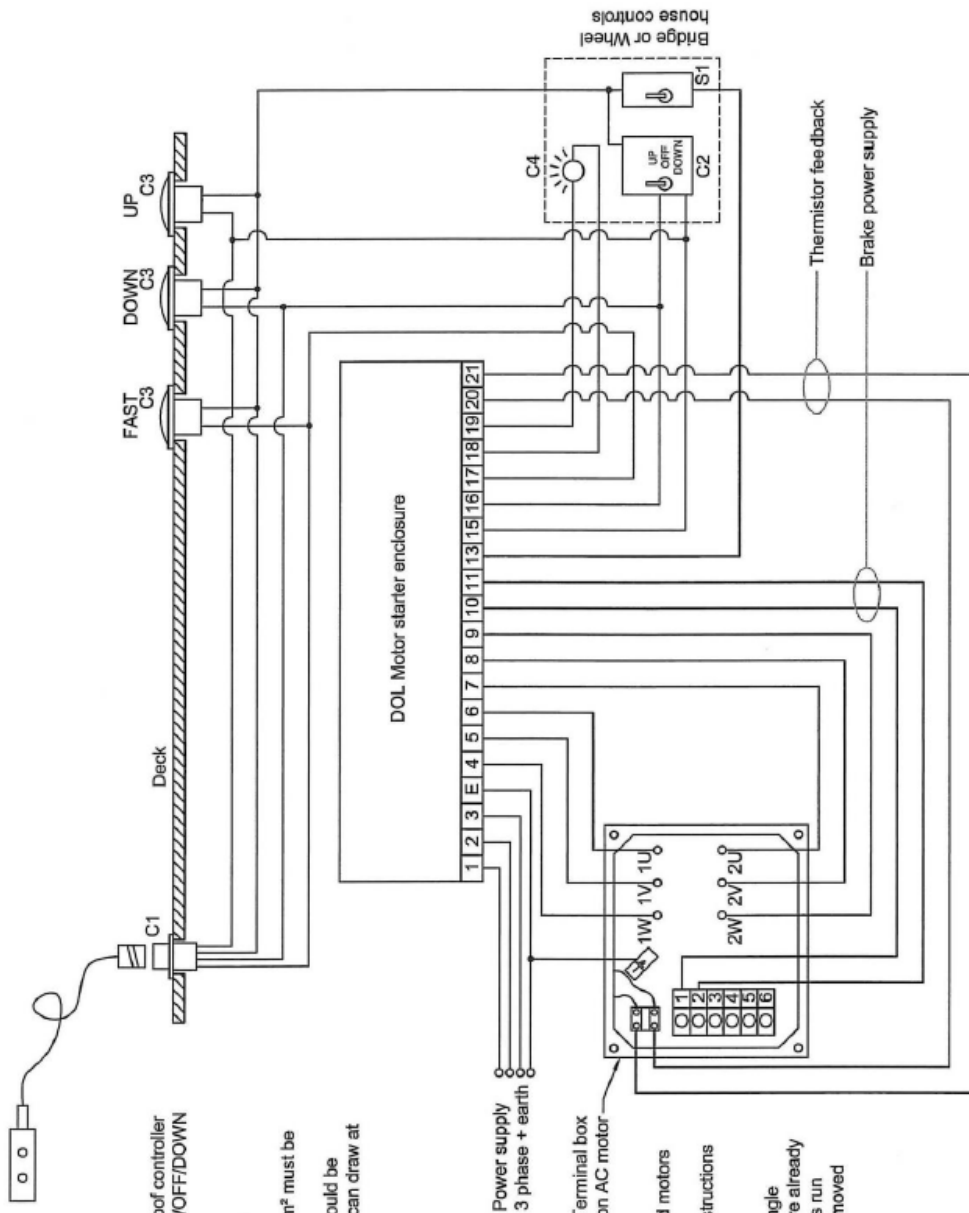
$$V1 - V2 = G1/2$$

CHAINCOUNTER SENSOR (Optional)

Where present, the meter-counter sensor is composed of 3 wires to be connected in the following way:



Wiring diagram for AC motor



LEGEND:

- C1 Roving 2 button (up-down) hand held water proof controller
- C2 Bridge/Wheel House fixed wireless control UP/OFF/DOWN
- C3 Foot switch
- C4 Alarm light for motor overload
- S1 Isolator switch for power supply to the controls

Tined multistrand conductors of at least 1.5 mm² must be used for all control circuits.
 The wire size for the power supply to motor should be selected based on the max. current the motor can draw at given voltage.

NOTE:

Arrangement for dual speed motor shown, for single speed motors terminals 7, 8, 9, 10, 11 and 17 are not used.
 However link plates are required, refer to manufactures instructions for fitting.
 Power to the brake is supplied to terminals 1 and 2. For single speed motors, started direct on line, the brake terminals are already connected to the main power supply terminals. If a motor is run through a frequency controller, this connection must be removed and the brake should be powered from the controller.



USE OF THE WINDLASS

LOWERING THE ANCHOR UNDER POWER

- Ensure the clutch is fully engaged by inserting the clutch handle in the recess on top of the windlass, and turning clockwise firmly.
- Remove clutch handle.
- Ensure the band brake is released.
- Ensure the chain stopper is disengaged and the chain tensioner released. To disengage the chain stopper pawl the windlass may require momentary jogging in the up direction.

The windlass may now be lowered under power by operating with control, remote control or footswitch.

After lowering the anchor engage chain stopper and tensioner.

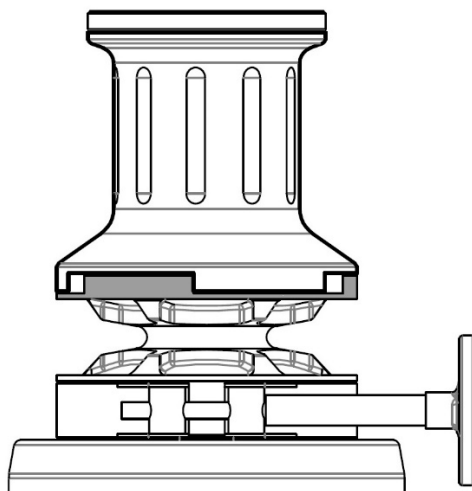
RETRIEVING THE ANCHOR UNDER POWER

- Ensure clutch is engaged and band brake is released.
- Remove clutch handle.
- Release chain stopper and tensioner.
- The windlass may now be operated to raise the anchor.
- After retrieving the anchor engage chain stopper and tensioner.



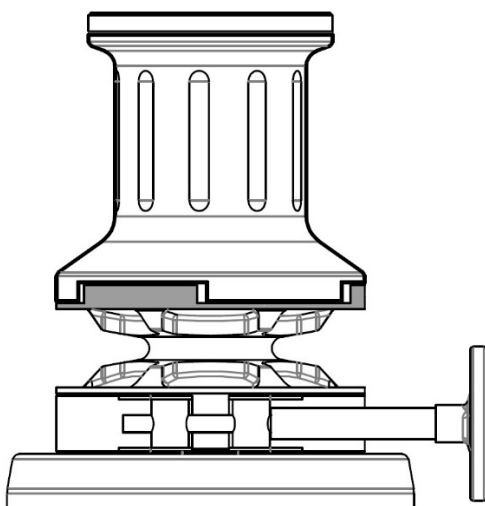
LOWERING THE ANCHOR UNDER MANUAL CONTROL

This method will normally be employed to lower the anchor quickly, to lower it in "quiet ship" and in emergencies (power loss or control failure). Proceed as follows:



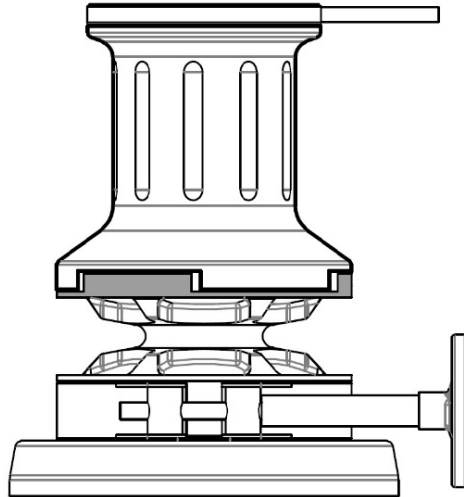
1) CLOSE THE BAND BRAKE

2) NOW WINDLASS DRUM IS ENGAGED WITH THE CHAINWHEEL

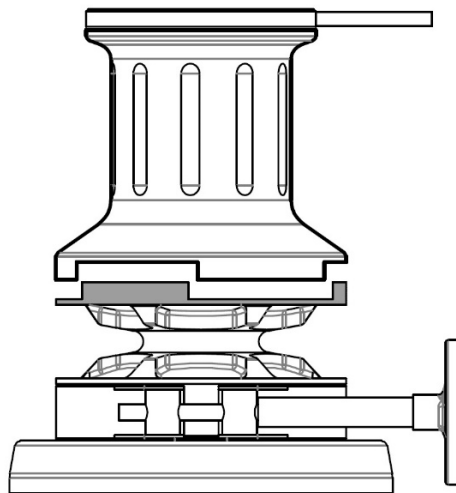


3) RELEASE THE CHAIN FROM THE CHAINSTOPPER AND REMOVE THE DEVIL CLAW

4) ACTIVATE THE WINDLASS GIVING A SINGLE SHOT IN A WAY TO UNLOAD THE TENSION OF THE CHAIN AND DISENGAGE THE DRUM FROM THE CHAINWHEEL



5) INSERT THE HANDLE IN THE TOP OF THE DRUM



- 6) TURN THE HANDLE RAISING THE DRUM; DO IT UNTIL THE DRUM IS NO LONGER ALIGNED WITH THE CHAINWHEEL
- 7) SLOWLY RELEASE THE BAND BRAKE IN A CONTROLLER MANNER. THE CHAIN SHOULD NOW RELEASE, THE WEIGHT OF THE ANCHOR BEING SUFFICIENT TO DRAW OUT THE CHAIN
- 8) WHEN THE REQUIRED AMOUNT OF CHAIN IS OUT, TIGHTEN THE BAND BRAKE AND ENGAGE THE CHAIN STOPPER

OPERATING THE WARPING DRUM INDEPENDENTLY

The drum can be operated independently of the chainwheel and can be used to manage docking lines. To use it that way, proceed as follows:

Repeat the operations of the previous paragraph "**LOWERING THE ANCHOR UNDER MANUAL CONTROL**" up to point nr. 6. The drum may now be rotated independently of the chainwheel.

Italwinch recommends all warping operations be controlled by the footswitch. That makes it a one-person operation and offers better control of the capstan in case of emergency.

Take several turns of the warping line around the drum and pull on the rope tail with sufficient manual force to provide good grip of the line to the drum, whilst operating the footswitch.

Do not engage more turns on the drum than are necessary to accomplish the task. Whilst docking, wind and tide can impose sudden and excessive line tension, which it is often recommended to be managed by allowing slip to occur at the drum. This will protect the capstan, docking lines and vessel from damage.

WINDLASS MAINTENANCE

EVERY SIX MONTHS

Remove capstan and chainwheel from the Main Shaft

Inspect all the seals and replace if necessary.

Clean all components inspect them for damage and excessive wear, re-grease and reassemble.

Use Lithium complex base - waterproof grease for gear teeth and threads on Driven gear and Clutch Actuator, and Res-Q-Steel for screw threads, Main Shaft and Key.

Clean and re-grease the thread on the band brake

Inspect under deck components, check particularly for corrosion, chipped paint etc, clean, and touch up the paint if necessary.

BAND BRAKE MAINTENANCE

The frequency of brake lining renewal will depend entirely on its usage. Should visual inspection reveal that the lining thickness has worn to below 2mm or if the ends of brake band can touch each other when tight, renewal of brake lining is necessary.

Grease the band brake lead screw at least every three months.

Avoid grease contamination of brake friction linings.



GEARBOX

At machine rest, verify every year:

- all external surfaces are clean and air passages to the gear reducer are free, in order that cooling remains fully effective.
- oil level and deterioration degree
- correct fastening screws tightening.

During operation, check periodically:

- noise level;
- vibrations;
- sealings;

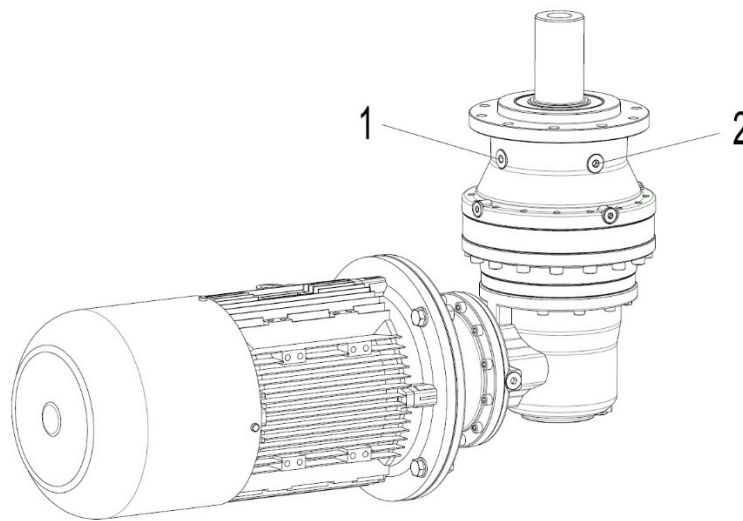
Use only lubricants of the same type stated on lubrication nameplate or these or the following alternatives. Never mix different makes of synthetic oil.

Manufacturer	PAO synthetic oil ISO VG 320	mineral oil ISO VG 150 ... 460
ADDINOL	Eco Gear S	Eco Gear M
AGIP	Blasia SX	Blasia
ARAL	Degol PAS	Degol BG
BP	Energyn EPX	Energol GR XP
CASTROL	Alphasyn T	Alpha SP
KLÜBER	Klübersynth GEM4	Klüberoil GEM1
MOBIL	Mobil SHC Gear	Mobilgear 600 XP
SHELL	Omala S4 GX	Omala S2 G
TOTAL	Carter SH	Carter EP

The frequency of oil change will depend entirely on its usage. Here the reference table:

Oil temperature [°C]	Oil-change interval [h]	
	synthetic oil	mineral oil
≤ 65	12 500	5 600
65 ÷ 80	10 000	2 800
80 ÷ 95	6 300	1 400

Introduce the necessary quantity of oil with a syringe through the ports in points 1 and 2:



Oil quantity for ARADO, NV-19, NV-19A, NV-20 and NV-20A: 3,6 Kg

WARRANTY CONDITIONS

Italwinch warrants that in normal private pleasure boat usage and with proper maintenance its products will conform with their specification for a period of two 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 two-year period, will be repaired or, as determined by MZ Electronic, replaced.

CONDITIONS AND LIMITATIONS:

Italwinch's liability shall be limited to repair or replacement of parts of the product which are defective in materials or workmanship.

Italwinch shall not be liable in any way for Product failure, or any resulting loss or damage that arises from:

- use of a product in an application for which it was not designed or intended
- corrosion, ultra violet degradation or wear and tear
- a failure to service or maintain the product in accordance with Italwinch's recommendations faulty or deficient installation of the product
- any modification or alteration of the product
- conditions that exceed the product's performance specifications or safe working loads

Product subject to a warranty claim must be returned to the Italwinch outlet that supplied the product for examination unless otherwise approved by Italwinch in writing.

This warranty does not cover any incidental costs incurred for the investigation, removal, carriage, transport or installation of product.

Service by anyone other than authorized Italwinch representatives shall void this warranty.

Italwinch's products are intended for use only in the marine environment. Italwinch accepts no liability arising from such other use.

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:

- Products used in commercial or charter applications

LIABILITY

Italwinch'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): Italwinch 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 Italwinch's negligence).

This warranty sets out your specific legal rights allowed by MZ Electronic; these may be varied by the laws of different counties. In addition, the purchaser may have other legal rights which vary from country to country.

PROCEDURE

Notice of a claim for service under this warranty shall be made promptly and in writing by the end user to the Italwinch outlet that supplied the product or to Italwinch Via Bainsizza 2, 20900 Monza Italy . Proof of purchase and authorization from Italwinch will be required prior to any repairs being attempted.

To be eligible for warranty protection, please either complete the form below at the time of purchase and return it to Mz Electronic. Or fill out the electronic warranty form on our website, www.mzelectronic.it.



PRODUCT IDENTIFICATION

Copy in this box the serial number written on the base of the winch as the most powerful and safe traceability.

Italwinch declines any liability for possible inaccuracies due to print errors in this manual and reserves the right to introduce any changes deemed appropriate.

For this reason, Italwinch does not guarantee the accuracy of the manual after the date of issue and declines all liability for possible errors and omissions.

PRODUCT COMPLIANT WITH EC REGULATIONS

Manufactured and distributed by:

MZ Electronic srl

info@mzelectronic.it

www.mzelectronic.it

