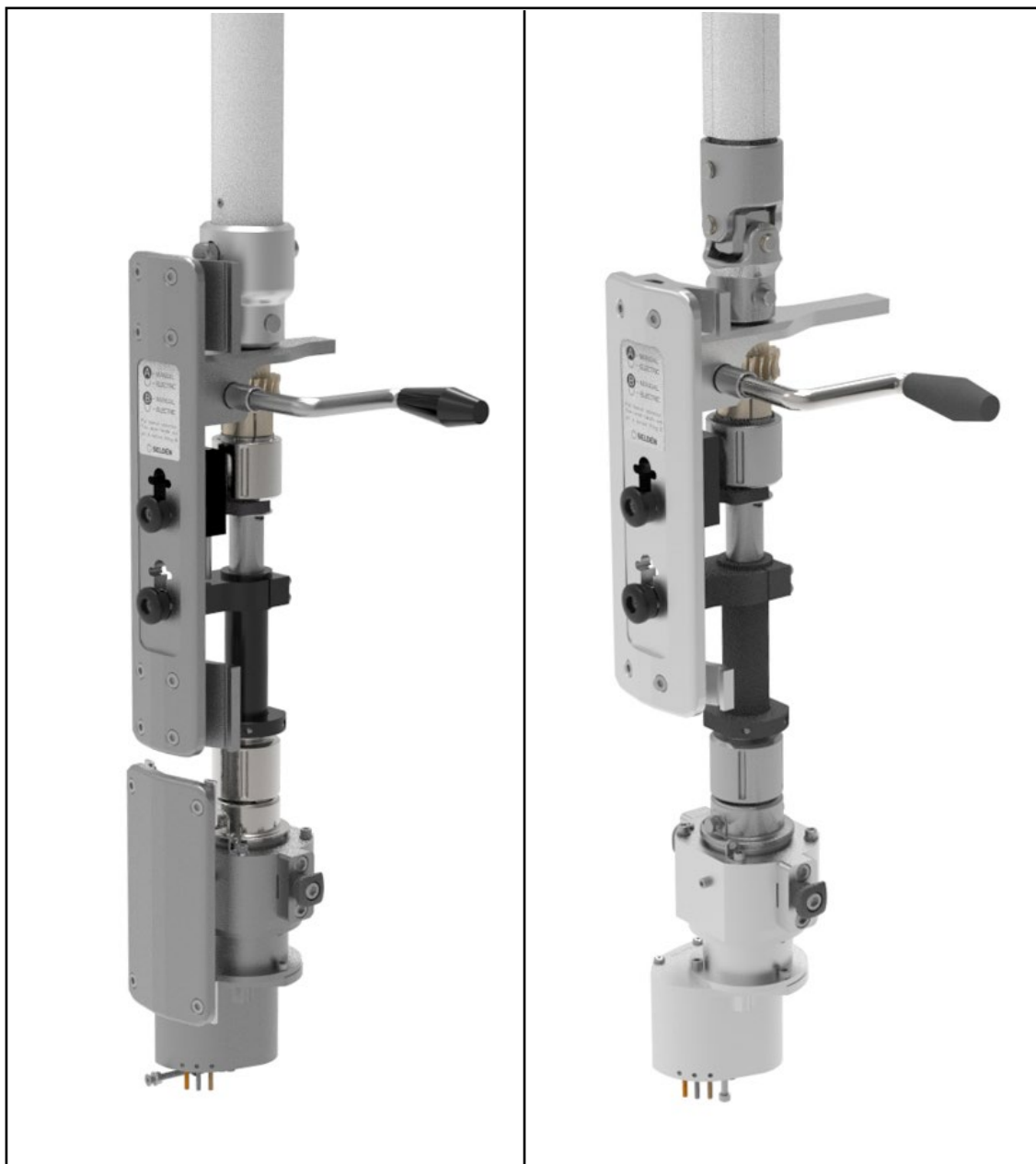


Electric furling mast RD Mk II

Synchronized with electric outhaul winch (SMF) or hydraulic outhaul (HPS)

User guide



This manual is valid for RD electric furlin gears starting 2024, item numbers 540-294-XX & 540-301-XX.

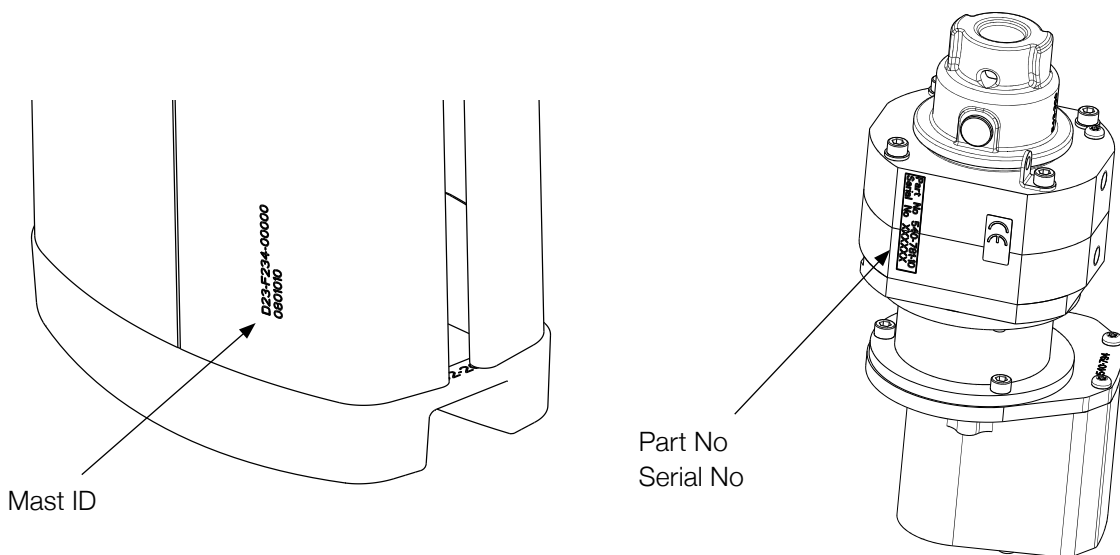
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1. Introduction

Congratulations on the purchase of your new electric furlin mast.

The part number and serial number of the mast motor is found on the aft side of the mast motor facing the sail groove. Always use the mast ID and part and serial number of mast motor as reference in any support case.



Please read the entire manual before use of the product and keep it available for future reference. The latest version is available at www.seldenmast.com.

Related installation manuals and user guides:

597-275-E Installation of Seldén Power Supply and SEL-Bus system

597-283-E Seldén Power Supply and SEL-Bus system order guide

595-540-E Hints and Advise

Safety notes

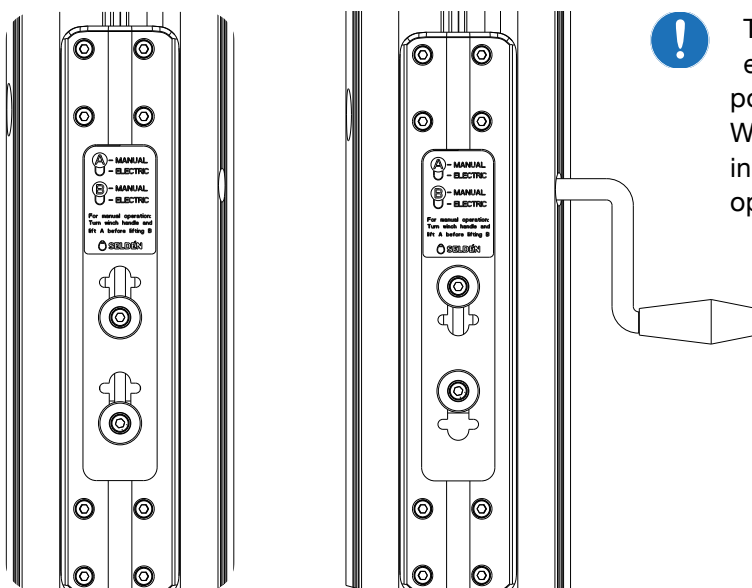
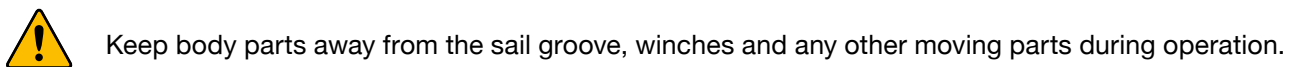
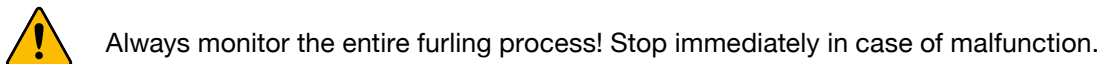
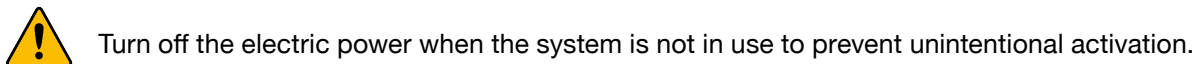
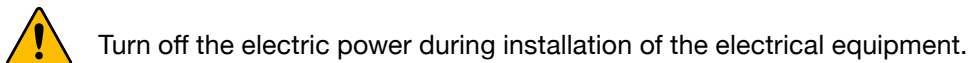
Pay careful attention to, and follow the instructions with the following symbols:



This symbol indicates a critical moment in the assembly or technical advice.



This symbol indicates a potentially hazardous situation. If not avoided, this could result in serious personal injury or damage to property.

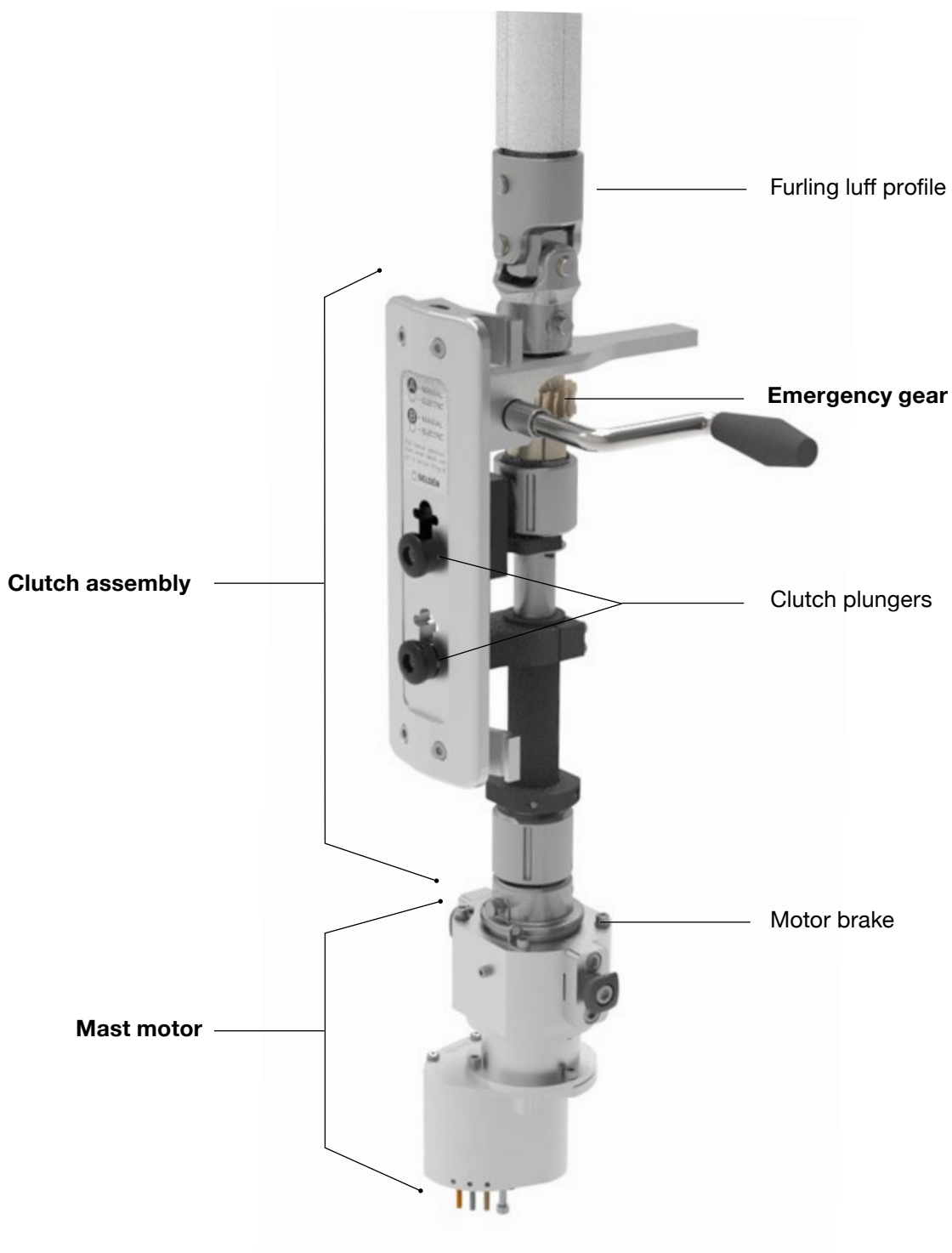


The electric motor can be disengaged and engaged by shifting the clutch plungers positions between ELECTRIC and MANUAL. When set to MANUAL, use a winch handle in the winch handle socket to manually operate the furling gear.

2 System overview

2.1 Mechanical parts

The drive unit key components are; mast motor, clutch assembly and emergency gear. The mast motor is installed inside the mast and controlled by connection cables linked to the Seldén Power Supply and SEL-Bus system.



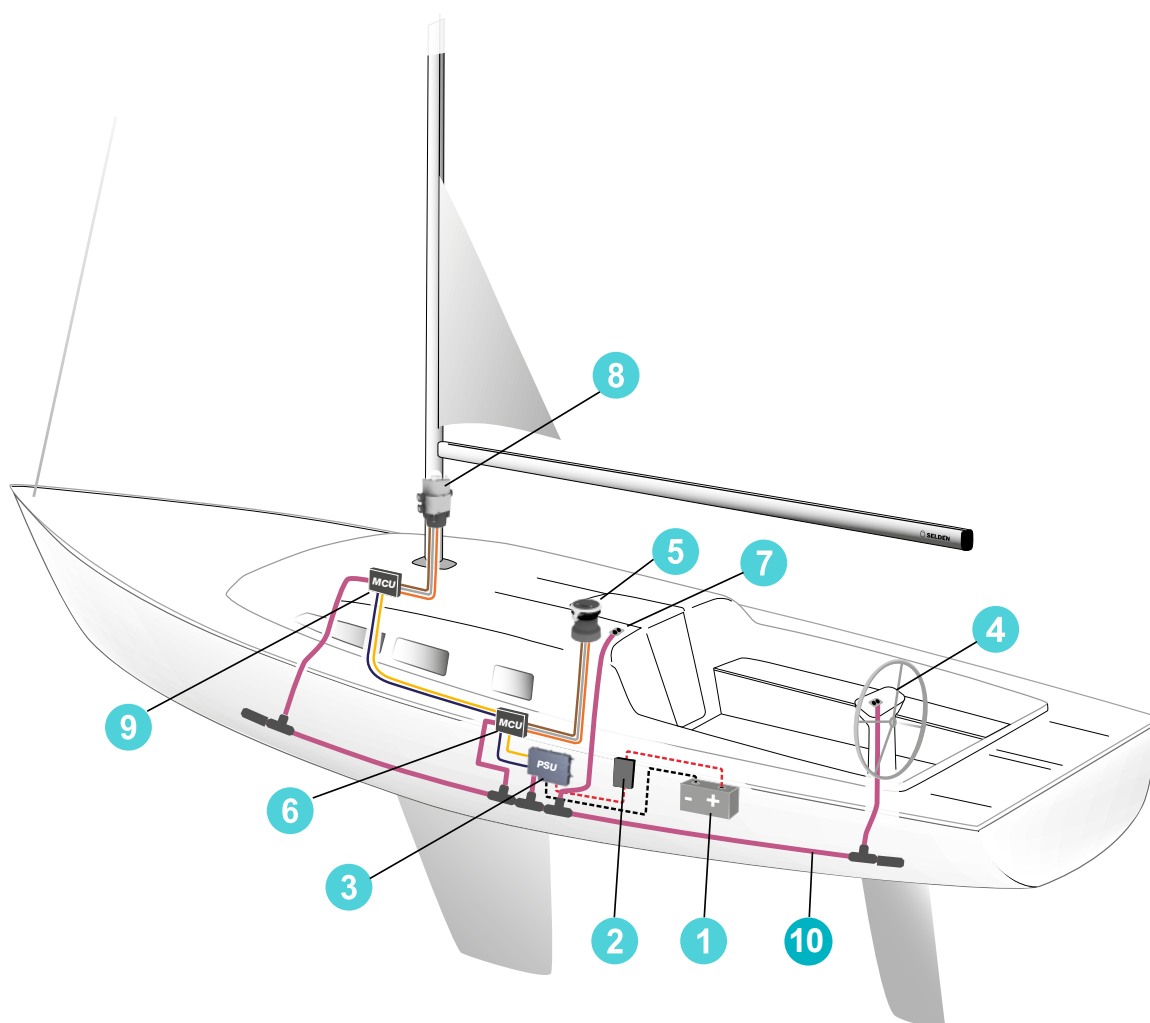
2.2 Power supply and SEL-Bus system

The mast motor is used together with a Seldén Power supply and SEL-Bus system. For synchronized outhaul (SMF), a Seldén electric winch is also required.

The mast motor is connected to motor control unit (MCU) for furling masts. Via the SEL-Bus network, the furling mast MCU can communicate with the winch MCU and OUT/IN control buttons. Seldén's electric winch, all power supply and SEL-Bus system parts are sold separately. Parts and packages are described in Seldén Power Supply and SEL-Bus system: Order guide 597-283-E.

System illustration

The illustration shows an example of a Synchronized Main Furling network installation. The complete Power Supply and SEL-Bus system of each customer will vary and can include additional units and functions.



- | | |
|--|---|
| 1. Battery (not included) | 6. Motor Control Unit (MCU), Electric winch |
| 2. Main switch/fuse | 7. Push buttons for Electric winch |
| 3. Power supply unit (PSU) Converts 12/24V to 42V | 8. Mast motor |
| 4. Push buttons for Synchronized Main Furling | 9. Motor Control Unit (MCU) Furling mast |
| 5. Electric winch | 10. SEL-Bus backbone cables and connections |

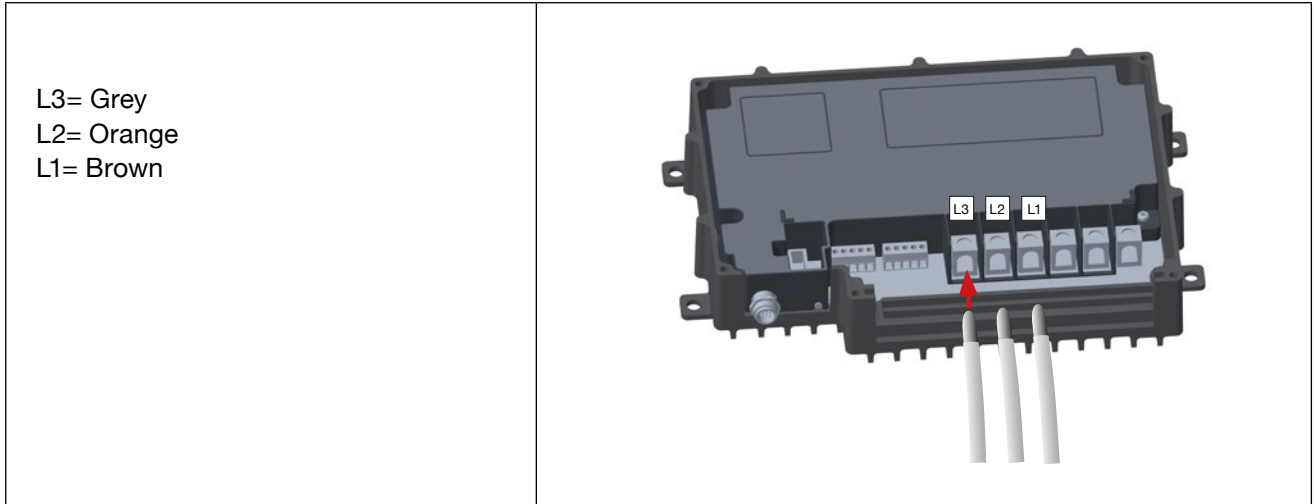
2.3 Technical specification


| Mast motor | IN |
|-----------------------------------|-----------|
| Peak Torque (Nm) | 230 |
| Max power (full torque) (W) | 1000 |
| Full load current* (A) 12V 24V | 100 50 |
| Nominal current* (A) 12V 24V | 40 20 |

*Consumption incl. MCU and PSU.

3 Connection to Seldén Power Supply and SEL-Bus system

Install the three control cables from the mast motor to the motor control unit (MCU) “Furling mast”. Carefully note the position of cable colour and connector:




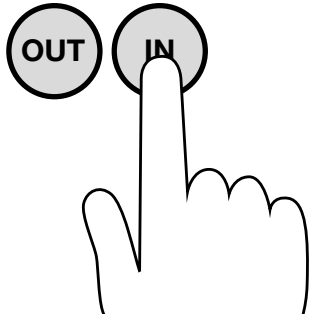
 The cables need to be connected to the MCU in the correct position/sequence. Incorrect positioning of the cables can damage the mast motor and the break mechanism.


For correct positioning of the Motor Control Unit, installation of the complete Power supply and SEL-Bus system, see separate manual 597-275-E.

3.1 Configuration of control buttons for Mast motor with synchronized outhaul cylinder (HPS).

For synchronized main furling, configuration of the control buttons for both the winch and furling mast must be done in the following order.


 For complete information about how to configure Motor control unit, MCU, to the control buttons, read installation manual 597-275-E.

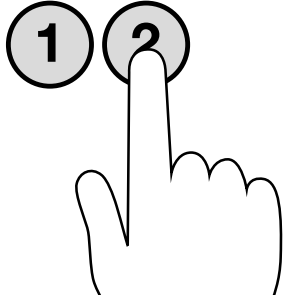
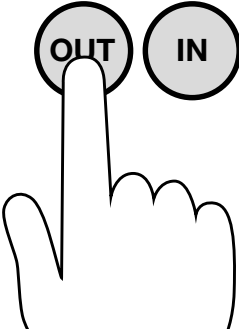
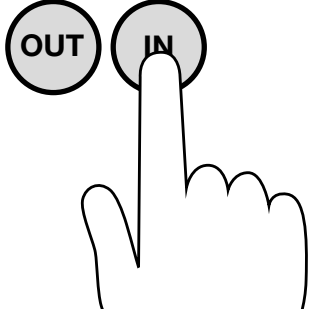
| | |
|--|--|
| <p>A. Configure Furling mast MCU to the MAIN OUT/IN buttons</p> | <p>Press the configuration button, on Furling mast MCU.</p> <p>Push and hold IN until the mast motor generates the start-up signal.</p>  |
|--|--|


 If the signal tone is generated when the Power supply and SEL-Bus system is turned on (without any button being pressed) turn the power off immediately. Inspect the push button connections; cables from SEL-Bus converter to push button must be installed as “normally open” not “normally closed”.

3.2 Configuration of control buttons for mast motor with synchronized winch (SMF).

For synchronized main furling, configuration of the control buttons for both the winch and furling mast must be done in the following order.

 For complete information about how to configure Motor control unit, MCU, to the control buttons, read installation manual 597-275-E.

| | |
|--|--|
| <p>A. Configure Winch MCU to winch buttons</p> | <p>Press the configuration button on Winch MCU.</p> <p>Push and hold winch button 1 or 2 until the winch generates the start-up signal.</p>  |
| <p>B. Configure Winch MCU to the MAIN OUT button (for synchronized outhaul)</p> | <p>Press the configuration button on Winch MCU.</p> <p>Push and hold MAIN OUT until the winch generates the start-up signal.</p>  |
| <p>C. Configure Furling mast MCU to the MAIN OUT/IN buttons</p> | <p>Press the configuration button, on Furling mast MCU.</p> <p>Push and hold IN until the mast motor generates the start-up signal.</p>  |

 If the signal tone is generated when the Power supply and SEL-Bus system is turned on (without any button being pressed) turn the power off immediately. Inspect the push button connections; cables from SEL-Bus converter to push button must be installed as “normally open” not “normally closed”.

4 Preparations before sailing

4.1 Tensioning the luff extrusion

It is important that the luff extrusion inside the mast is correctly tensioned. An untensioned or over-tensioned luff extrusion can lead to increased furling load or unnecessary wear of the system.

Lift/disconnect the locking tube from the tack assembly. Grip the luff extrusion with your hand at the upper access hole. Disconnect the motor and use the emergency winch function to tension the luff profile until you can not stop the extrusion from rotating with your hand. Note! Do not use the motor for tensioning as you risk injury if your hand gets caught.



Always release backstay tension before adjusting luff extrusion. Tensioning the luff extrusion with the backstay tensioned can damage the luff extrusion joints when the backstay tension is released.

4.2 Rig tuning

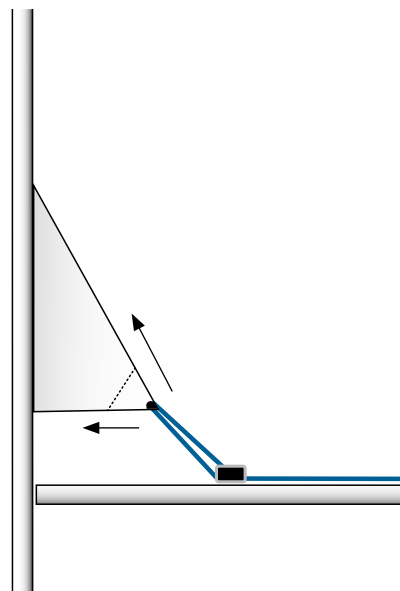
Furling in and out will work best on a mast tuned with limited prebend.

Read 595-540-E Hints and Advise for tuning instructions.

4.3 Outhaul car stop

The position of the outhaul car stop on the boom will affect tension in the sail foot and leech. E.g. if the outhaul is positioned too far aft, the force from the outhaul clew will keep the foot tighter than the leech which can cause the sail to jam in the top of the mast.

The ideal position can vary between boats due to rig, sail and batten designs. It is recommended to place the outhaul stop 500 mm from the aft mast wall as default, and then adjust it forward or aft if necessary.



4.4 Outhaul routing

Examine outhaul car and outhaul turning points for excessive friction. Replace old and worn blocks if needed. Outhaul routing with as low friction as possible will improve the unfurling process.

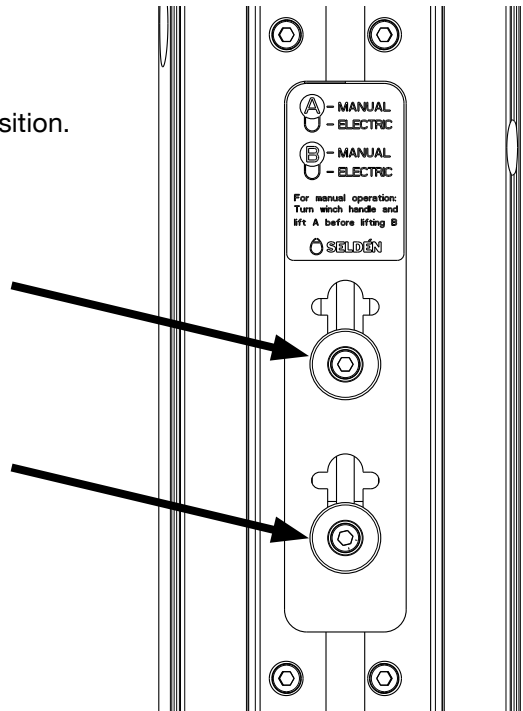
Synchronized outhaul winch



The force limit in the synchronized outhaul winch is based on the line force at winch entry. High friction in the outhaul routing will result in the actual force in the outhaul clew being significantly lower than at the winch, which can negatively affect the synchronization.

5 Sailing

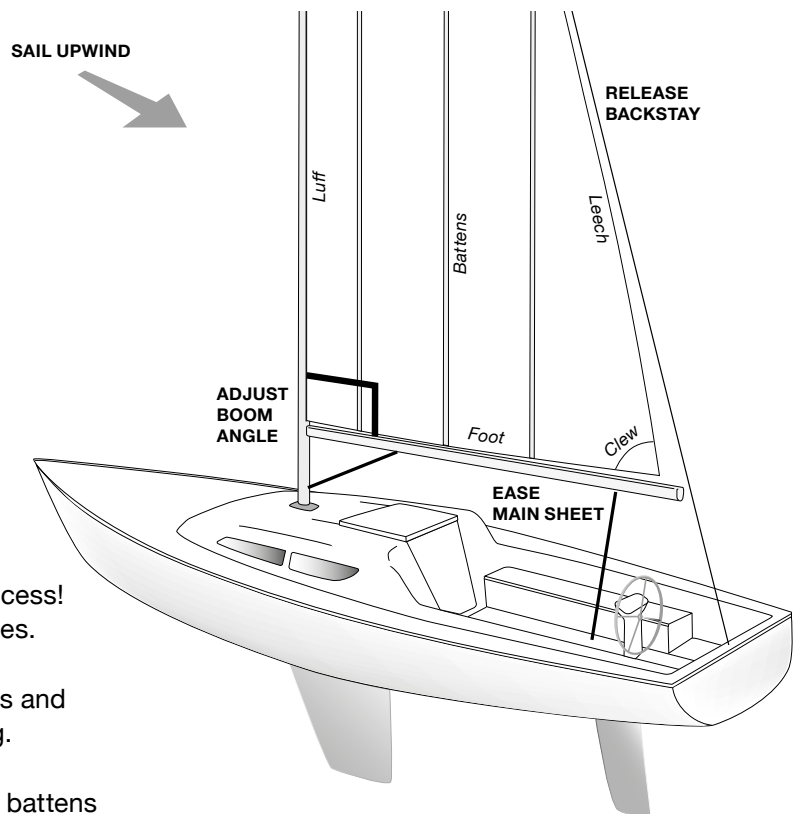
Both clutch plungers should be in their lower position.






5.1 Preparations for furling and unfurling

There are many factors to consider for a successful furling operation. Get familiar with the furling system in light conditions and pay attention to the following details before furling out and in. How important these adjustments are for the furling result can vary between boats, sail designs and other factors.

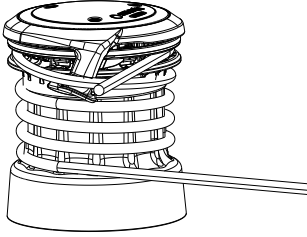

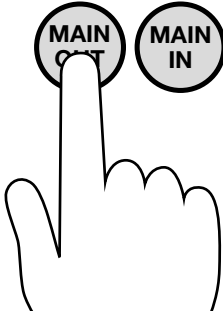
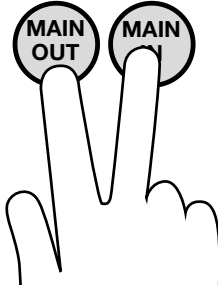


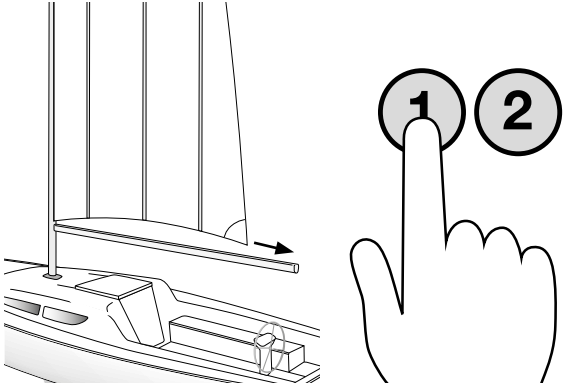
1. Sail upwind.
2. Release backstay tension (if very tight) to straighten the mast.
3. Adjust the boom angle with the vang to keep the leech tight and battens parallel to mast. Use kicker/topping lift.
4. Ease the main sheet.



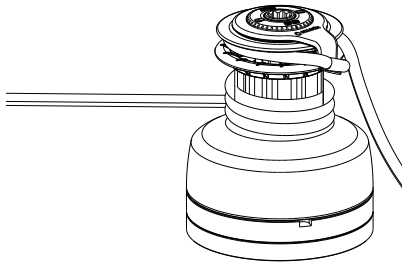

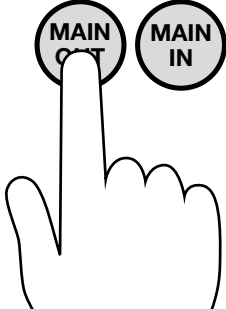
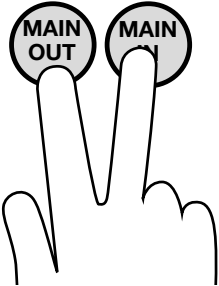


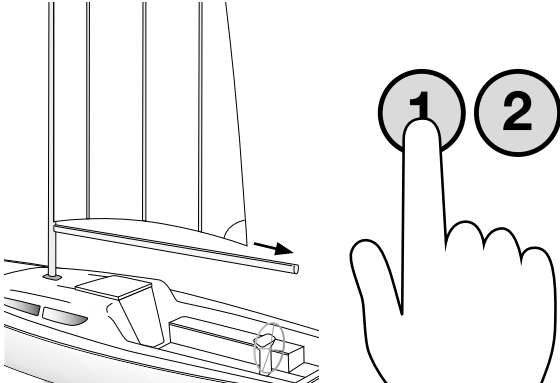
-  Always observe the entire furling process! Stop immediately in case of any issues.
-  Keep away from the sail slot, winches and any other moving parts during furling.
-  Avoid reefing to a position where the battens are riding on the sail slot.

5.2 Unfurling with synchronized electric winch (SMF)

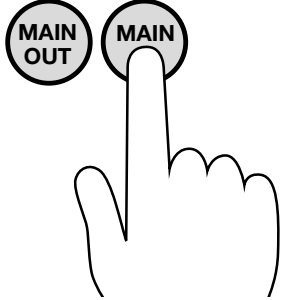
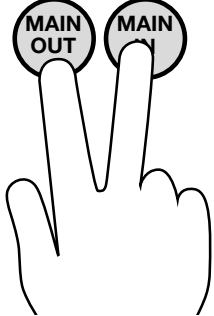

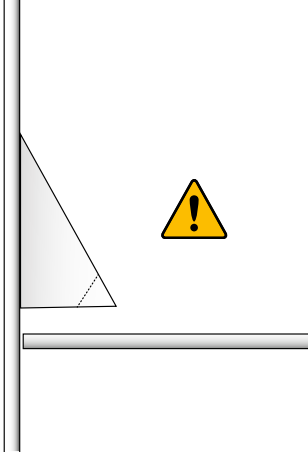
For operation with separate electric winch, see 5.3

| | |
|--|--|
| <p>1. Apply and secure the outhaul to the synchronized electric winch.</p> |  |
| <p>2. Press MAIN OUT.</p> <p>The outhaul winch will make a short warning signal before starting to run.</p> <p> Remote control of a boat winch is hazardous. Always observe the unfurling process and ensure nothing can interfere with the winch, outhaul line or sail groove in the mast.</p> |  |
| <p>3.</p> <p>Whilst holding down MAIN OUT, press the second button to increase the speed, if wanted.</p> |  |
| <p>4. Full sail Hold button(s) pressed. The synchronized system will recognize a fully unfurled sail and stop automatically.</p> <p>Reduced sail area Release button(s) when sail is in desired position.</p> | <p> The motor will make a short rotation when unfurling is finished, to activate the break mechanism.</p> |
| <p>5. If needed, the outhaul can be trimmed using the winch buttons.</p> <p> Be careful when using the winch buttons, as this activates the full power of the winch.</p> |  |

5.3 Unfurling with non synchronized electric winch.

| | |
|---|--|
| <p>1.</p> <p>Apply and secure the outhaul to the electric winch.</p> |  <p>Check that the outhaul line is not excessively tensioned as this may prevent the mast motor brake to unlock.</p> |
| <p>2.</p> <p>Press MAIN OUT. Wait 3 seconds</p> <p> Remote control of a boat winch is hazardous. Always observe the unfurling process and ensure nothing can interfere with the winch, outhaul line or sail groove in the mast.</p> |  |
| <p>3.</p> <p>Whilst holding down the MAIN OUT button, press the winch button to pull out the sail. For higher speed, press the MAIN OUT and MAIN IN button simultaneously.</p> <p>If the mast motor buttons are accidentally released, push the MAIN OUT button first to continue unfurling operation. Do not allow the outhaul winch to overload the sail.</p> |  |
| <p>4.</p> <p>Unfurl to full sail Hold mast motor button(s) pressed. When the sail is completely unfurled the mast motor will stop automatically. Release the winch button at this time. Thereafter, release the mast motor buttons.</p> <p>Unfurl to reduced sail area Hold buttons pressed. Release button(s) when sail is in desired position. Release winch buttons before mast motor buttons.</p> | <p> The mast motor will make a short rotation when unfurling is finished, to activate the break mechanism. Mast motor locking procedure can not be done with fully tensioned outhaul.</p> |
| <p>5.</p> <p>If needed, the outhaul can be trimmed using the winch buttons.</p> <p> Be careful when using the winch buttons, as this activates the full power of the winch.</p> |  |


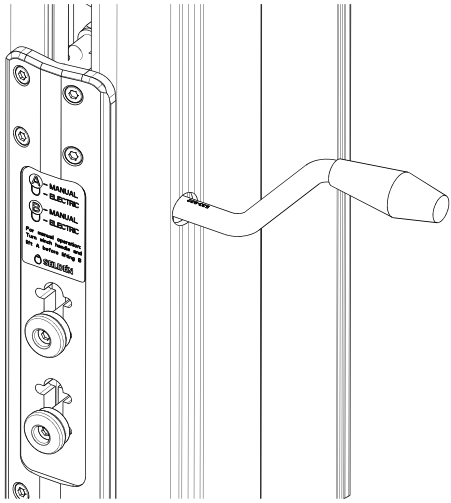
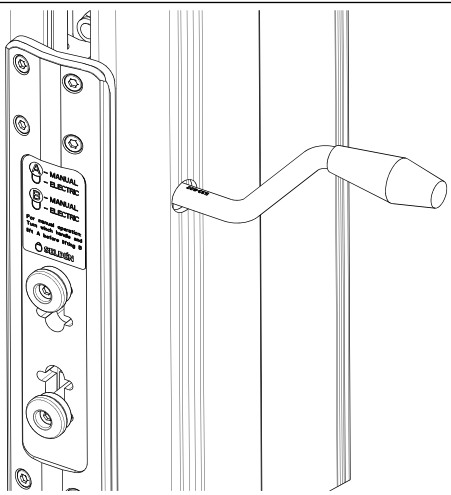
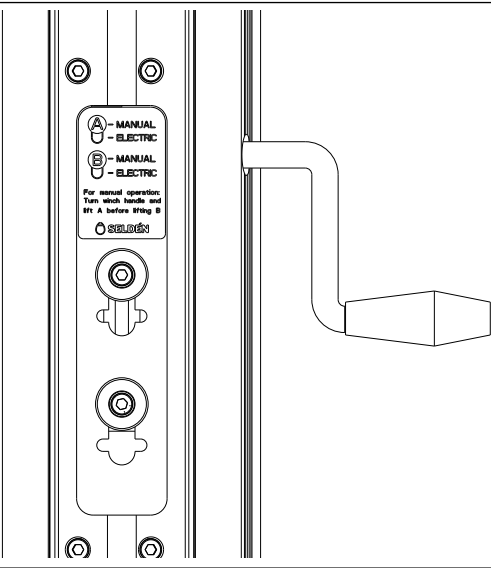


5.4 Furling

| | |
|---|--|
| <p>1.</p> <p>Free the outhaul and keep it tensioned (about one turn on the winch). Press MAIN IN and simultaneously slacken the outhaul line while the sail is reefed.</p> |  <p>A line drawing of a right hand with the index finger pointing upwards. Above the index finger is a circular button labeled 'MAIN IN'. To the left of this button is another circular button labeled 'MAIN OUT'.</p> |
| <p>2.</p> <p>Whilst holding down MAIN IN, press MAIN OUT to increase the speed.</p> |  <p>A line drawing of a right hand with the index and middle fingers pointing upwards. Above the index finger is a circular button labeled 'MAIN IN'. Above the middle finger is a circular button labeled 'MAIN OUT'.</p> |
| <p>3.</p> <p>Release the button(s) and stop reefing at desired sail area or when sail is fully furled in.</p> <p> The motor will NOT automatically stop during furl in. Run the last turns with low speed and keep attention to the position of the outhaul block to prevent it from being pushed into the sail groove and damage the mast.</p> |  <p>A technical diagram showing a vertical mast on the left and a horizontal outhaul line extending to the right. A triangular outhaul block is attached to the line. A yellow warning triangle with an exclamation mark is placed to the right of the block, indicating a potential hazard.</p> |

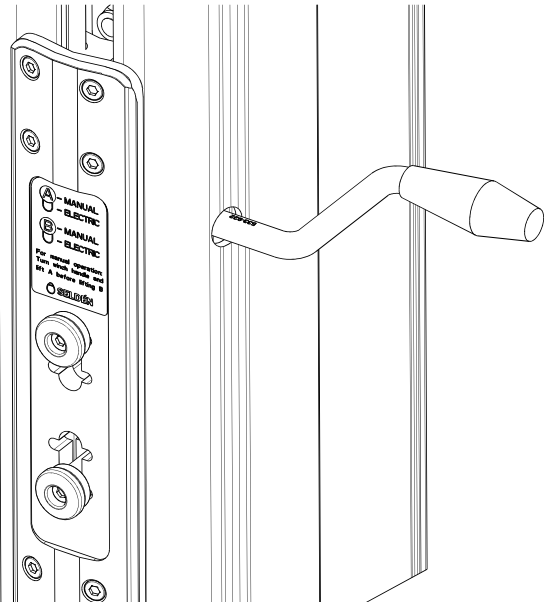
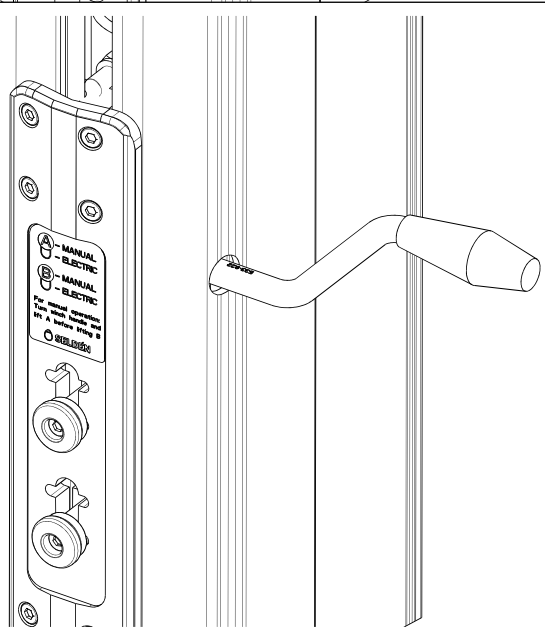
5.5 Manual operation

In case of electric or mast motor failure, the sail can be manually reefed by engaging an emergency gear and disconnecting the electric drive unit.

Disconnect mast motor

| | |
|--|--|
| <p>1.</p> <p> Turn power off!</p> <p>Insert emergency handle on starboard side of mast. Turn the handle any direction as you pull the upper lever (A) aft and up. You might have to turn up to 10 turns to get the clutch find it's position and allow connection of the manual drive.</p> <p>The luff profile is now connected to the handle socket via a worm gear, and the electric drive can be disconnected.</p> |  |
| <p>2.</p> <p>To disconnect the electric drive, pull the lower lever (B) aft and up as you turn the winch handle slightly clockwise to unload the connection between electric drive and luff profile.</p> |  |
| <p>3.</p> <p>You can now use the handle to furl the sail in and out. The gear has a high ratio so it takes a lot of turns on the handle.</p> <p>A power tool with 1/2" socket is therefore a good option.</p> |  |
| <p>4.</p> <p> Remove winch handle from socket when done.</p> |  |

Reconnect electric motor

| | |
|---|---|
| <p>1.</p> <p>Turn the handle any direction as you pull the lower lever (B) aft and up. Up to 10 turns on the handle might be required to find the correct position for the clutch to engage.</p> |  |
| <p>2.</p> <p>Pull the upper lever (A) aft and down as you turn the winch handle slightly clockwise to unload the connection between manual gear and luff profile. When both levers (A&B) are in their lower positions the sail can be controlled by the electric drive.</p> |  |

5.6 Unfurling with manual winch and electric mast motor.

If the synchronized winch is not to be used, the outhaul can be pulled manually without disconnecting the furling mast motor.

1. Press and hold “MAIN OUT”. The mast motor will start to rotate but pauses automatically if the outhaul is not pulled, to avoid the sail being unfurled inside the mast.
2. Keep “MAIN OUT” button pressed. Pull the outhaul manually. The furling motor will start to rotate when it detects that the outhaul is being pulled. Proceed until desired sail area is reached. When OUT button is released, the mast motor will activate the brake.

6 Trouble shooting

| Problem | Problem cause | Action |
|--|--|---|
| Mast motor makes a stuttering sound and unfurling does not work | Incorrectly installed connection cables to MCU. | Change position of connection cables in MCU according to section 3.6 |
| <p>Mast motor makes a constant signal tone when Power Supply and SEL-Bus system is turned on.</p> <p>Mast motor starts to run when Power Supply and SEL-Bus system is turned on, and stops when Furling MAIN OUT/IN button is pressed.</p> | Cables from SEL-Bus converter to push button is installed as “Normally closed” instead of “Normally open”. | Change position of push button cables to “Normally open”, see separate instruction sheet for push button. |
| Synchronized unfurling is not smooth. | Incorrect tension in luff profile, rig tuning, outhaul car position, outhaul routing. | See chapter 4. |
| Top of sail is jamming | Incorrect tension in luff profile, rig tuning, outhaul car position, outhaul routing. | See chapter 4. |
| Unfurling is unusually slow (in cold conditions). | Cold motors. | <p>Disconnect mast motor from manual gear (see section 5.4).</p> <p>Remove outhaul line from winch.</p> <p>Idle run mast motor “IN”, minimum 30 sec.</p> <p>Idle run winch on high speed, minimum 30 sec.</p> |

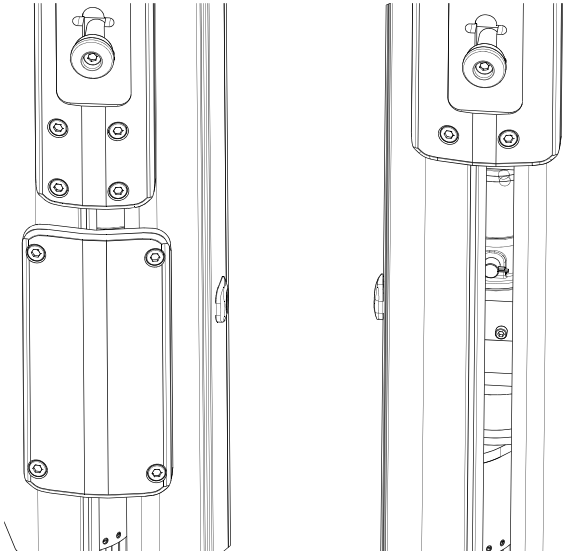
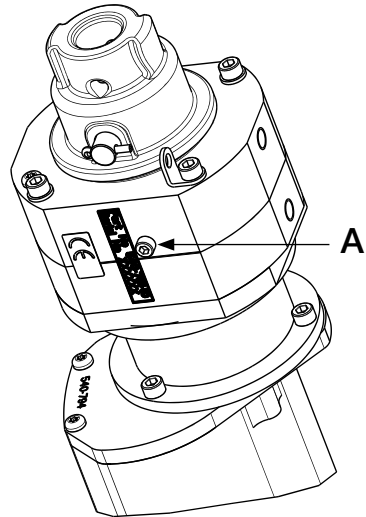
For trouble shooting of Seldén Power supply and SEL-Bus system, see installation and trouble shooting guide 597-275-E.

7 Service and maintenance

Always keep the manual furling system in good condition, following the service and maintenance procedures described in each respective manual furling mast instruction.

7.1 Annual maintenance

Lubricate motor brake

| | |
|---|--|
| <p>1.</p> <p>There are two different layout options, one with a separate motor cover (to the left) and one without (to the right).</p> |  |
| <p>2.</p> <p>Remove the screw to the lubrication hole, A. This can be accessed via the sail opening or by removing the motor cover. To enable removal of the motor cover, the mast should be straight and the rig tension released.</p> |  |
| <p>3.</p> <p>Apply WD-40 in the hole and simultaneously rotate the mast motor minimum one turn.</p> <p>Remount screw.</p> | |

7.2 Extended maintenance

Professional service should be made on the mast motor every 5th year. Contact an authorized Seldén dealer for service management.

8 Disposal

The crossed out wheelie bin symbol on the product or product package means that used electrical and electronic equipment (WEEE) should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge. Alternatively, in some countries, you may be able to return your products to your local retailer upon purchase of an equivalent new product.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Please contact your local authority for further details of your nearest designated collection point.



9 Warranty

Seldén Mast AB guarantees SMF retrofit kit for 2 years. The guarantee covers faults arising from defective design, materials or workmanship.

The guarantee is only valid if the SMF retrofit kit is assembled, operated and maintained in accordance with this manual and is not subjected to loads in excess of those indicated in the brochure and instructions.

Complete shipment and warranty conditions are to be found on Seldén's website www.seldenmast.com. See Resources/Partners information/General information/General conditions of sale (595-546-E).

If the system is repaired or modified by anyone other than Seldén Mast AB or one of our authorized dealers, the guarantee ceases to be valid.

Seldén Mast AB reserves the right to alter the content and design without prior warning.



www.seldenmast.com