SMF

SYNCHRONIZED MAIN FURLING
& ELECTRIC MAIN FURLING

597-216-E
2025-01-13

User guide
Electric furlin mast RB & RC Mk II

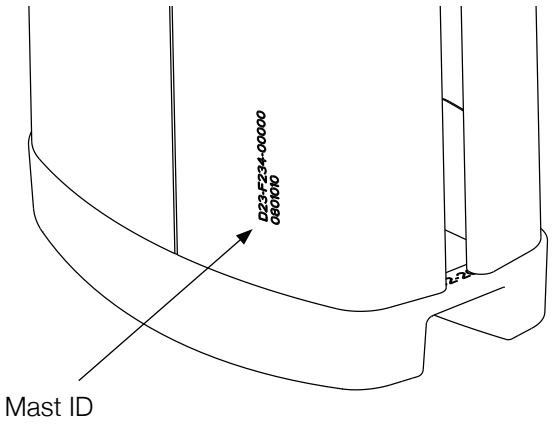
SELDÉN

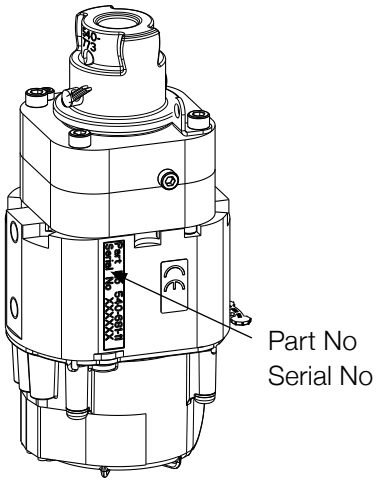
Contents

1. Introduction

Congratulations on the purchase of your new SMF system.

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

t

Safety notes

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

ATTENTION

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

WARNING

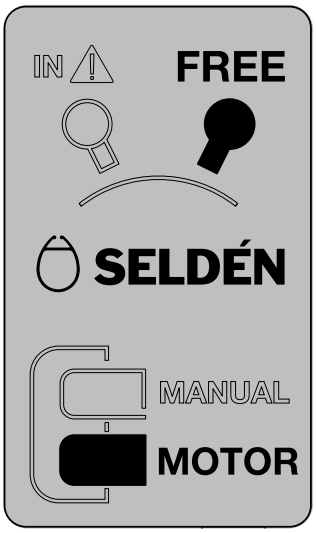
This symbol indicates a potentially hazardous situation. If not avoided, this could result in serious personal injury or damage to property.

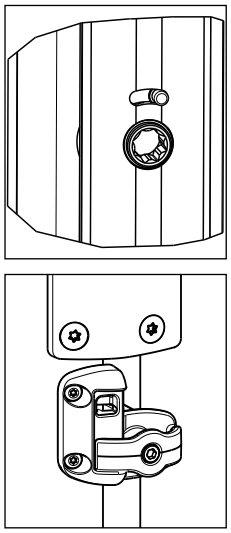
Turn off the electric power during installation of the electrical equipment.

Turn off the electric power when the system is not in use to prevent unintentional activation.

Always monitor the entire furling process! Stop immediately in case of malfunction.

Keep body parts away from the sail groove, winches and any other moving parts during operation.





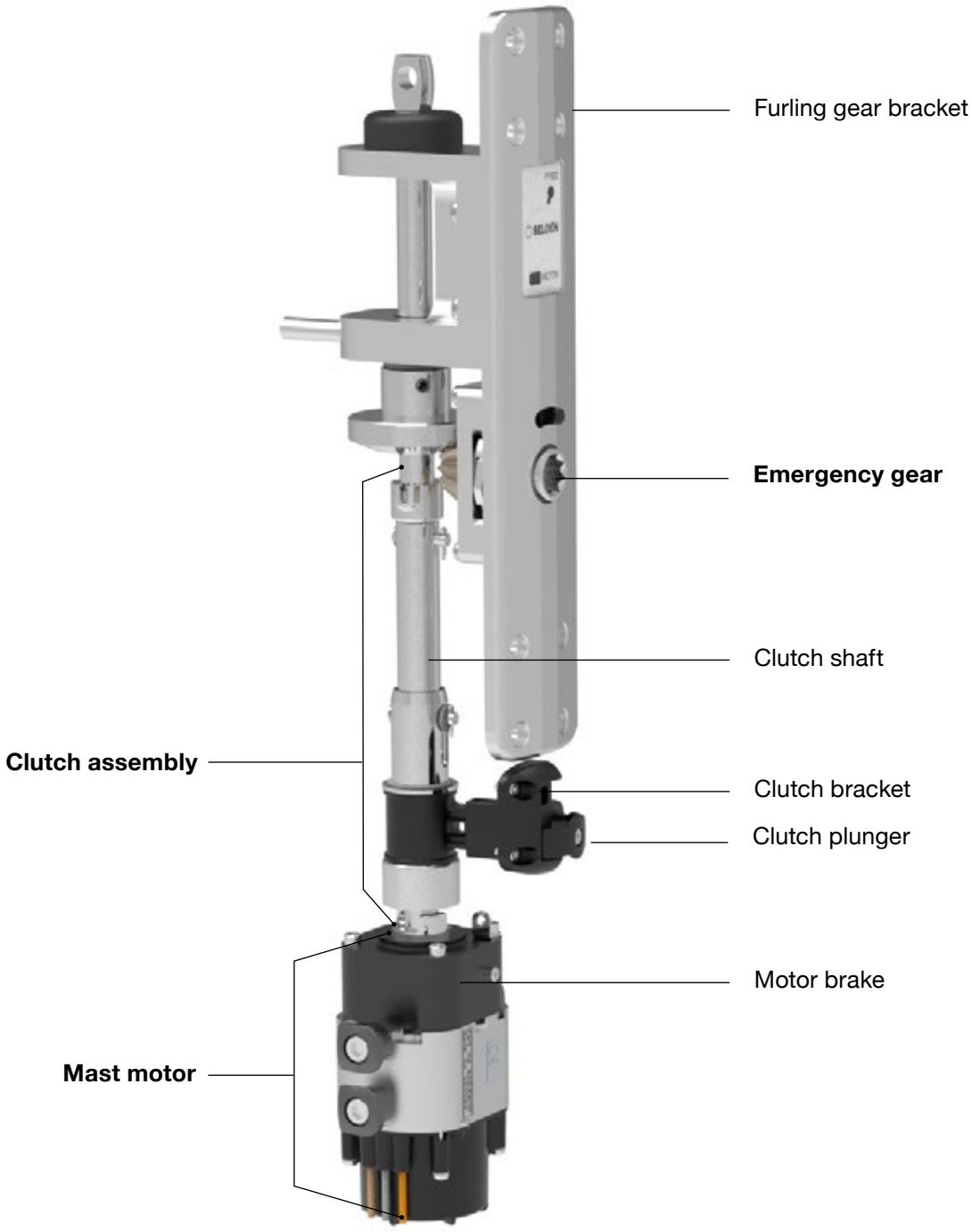
The electric motor can be disengaged and engaged by shifting the clutch plunger position between MOTOR and MANUAL. When set to MANUAL, use a winch handle in the winch handle socket to manually operate the furling gear.

The manual gear should be set to “FREE” when connected to the electric motor.

2 System overwiev

2.1 Mechanical parts

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



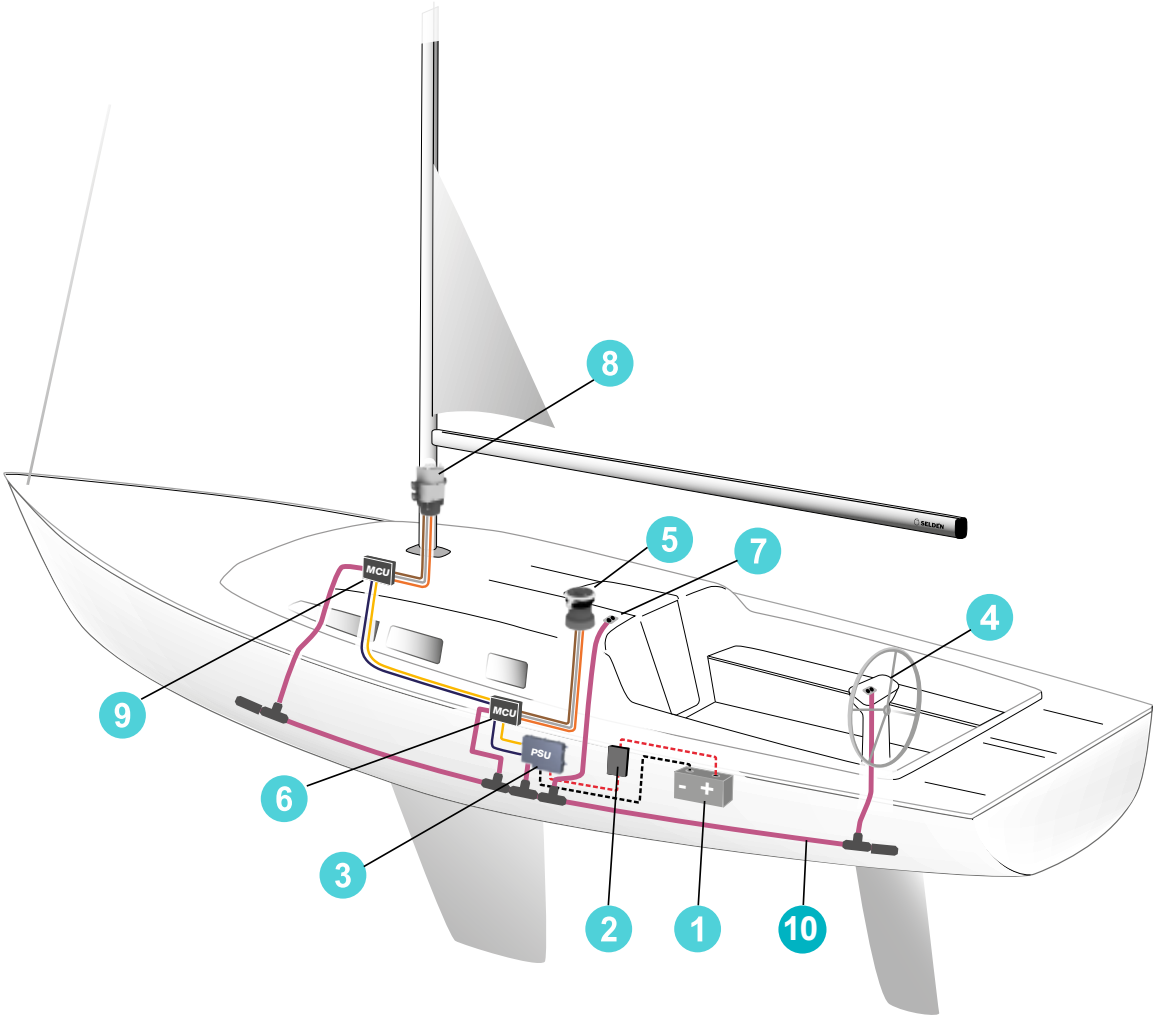
2.2 Power supply and SEL-Bus system

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)
2. Main switch/fuse
3. Power supply unit (PSU)
   Converts 12/24V to 42V
4. Push buttons for Synchronized Main Furling
5. Electric winch
6. Motor Control Unit (MCU), Electric winch
7. Push buttons for Electric winch
8. Mast motor
9. Motor Control Unit (MCU) Furling mast
10. SEL-Bus backbone cables and connections

2.3 Technical specification

	RB		RC	
Mast motor	**OUT**	**IN**	**OUT**	**IN**
Peak Torque (Nm)	8	89	16	170
Low speed (max) (RPM)	49	37	37	37
High speed (max) (RPM)	74	74	74	74
Max power (full torque) (W)	144	600	175	740
Full load current* (A) 12V 24V		50 23		60 29
Nominal current* (A) 12V 24V	5,5	16 7,5	15 7,5	20 10

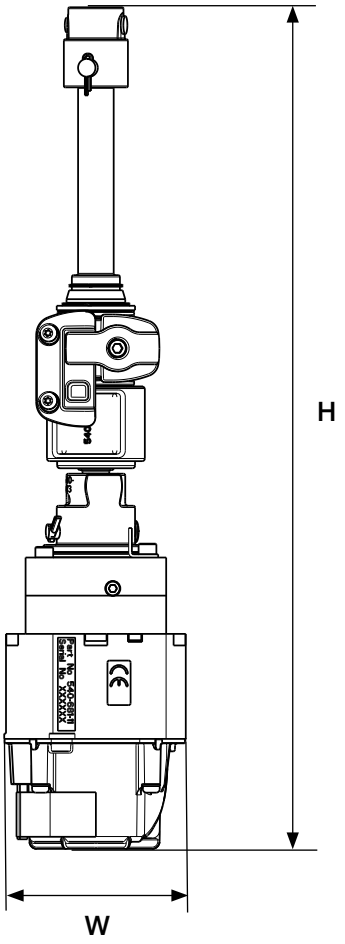
*Consumption incl. MCU and PSU.

Synchronized winch OUT	**RB**	**RC**
Limited outhaul force**	1800N	2200N

**When used as an outhaul winch (using the MAIN control button “OUT”), the force is limited.
When run as a standard winch (using the winch buttons ”1” and ”2”), the winch will not be limited or synchronized with the furling mast motor. For technical data of the winch, see separate winch manual.

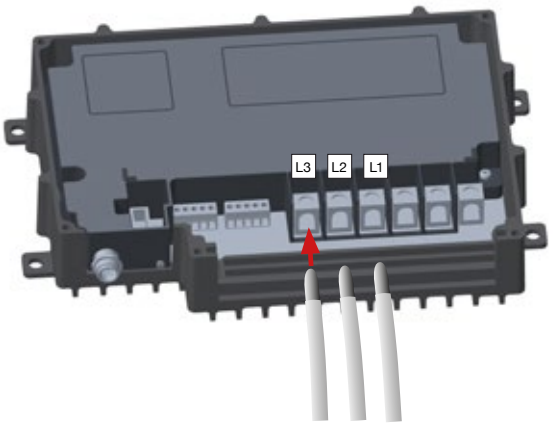
Mast motor and clutch assembly	
Height, H [mm]	472
Width, W [mm]	102
Weight [kg]	5,3

Mast motor and clutch fit inside the mast section.



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:

L3= Grey L2= Orange L1= Brown	

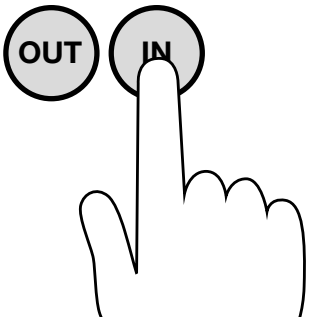
The cables need to be connected to the MCU in the correct position/sequence. Incorrect positioning of the cables can damage the mast motor and the break mechanism.

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 without synchronized winch

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.

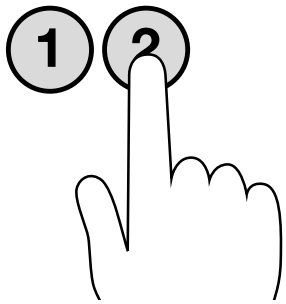
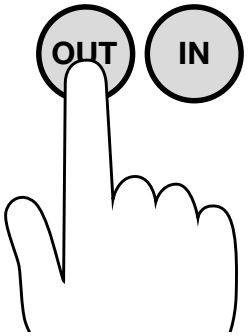
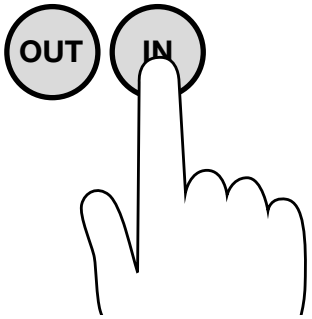
A. Configure **Furling mast MCU** to the MAIN OUT/IN buttons	Press the configuration button, on **Furling mast MCU**. Push and hold IN until the mast motor generates the start-up signal. 

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 Synchronized Main Furling

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.

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

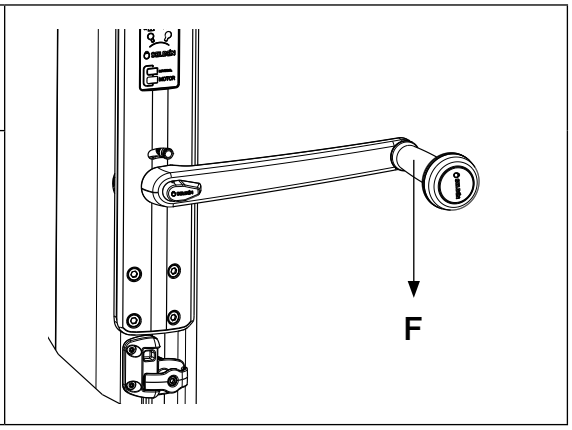
If the signal tone is generated when the Power supply and SEL-Bus system is turned on (without any button being pressed) turn the power off immediately. Inspect the push button connections; cables from SEL-Bus converter to push button must be installed as “normally open” not “normally closed”.

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. Control and adjustment of luff tension can be made on both a stepped and unstepped mast.

The luff extrusion should be prevented from rotating. Use a torque wrench in the furling gear winch handle socket to measure the tensioning torque. Alternatively, measure the torque with a spring balance or similar combined with an ordinary winch handle. Tension to the correct value as required. It is important that the mast is straight while tensioning. If no spring balance is available, hold the luff extrusion from turning with your hand and turn the winch handle. When it slips you are good.

Type	**Torque**	**Force (F)** Measured with 10” winch handle	
RB system	5 Nm	20 Nm	
RC system	8 Nm	32 Nm	

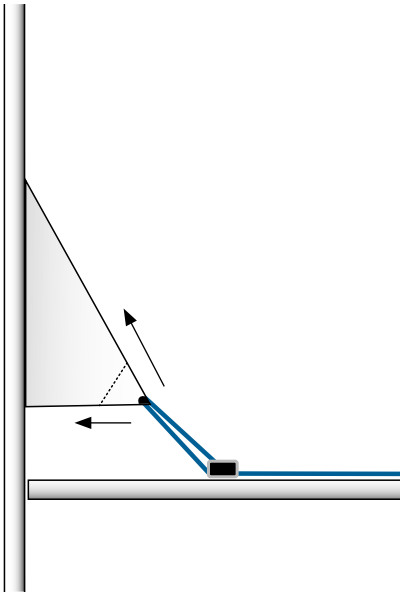
Always release backstay tension before adjusting luff extrusion. Tensioning the luff extrusion with the backstay tensioned can damage the luff extrusion joints when the backstay tension is released.

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

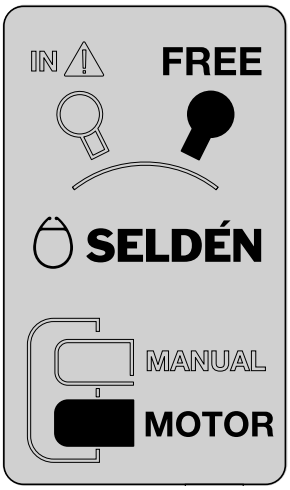
Examine outhaul car and outhaul turning points for excessive friction. Replace old and worn blocks if needed. Outhaul routing with as low friction as possible will improve the unfurling process.

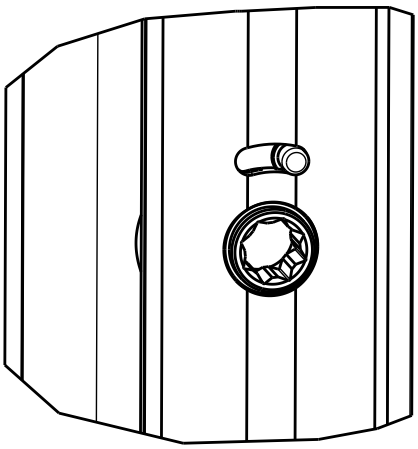
Synchronized outhaul winch

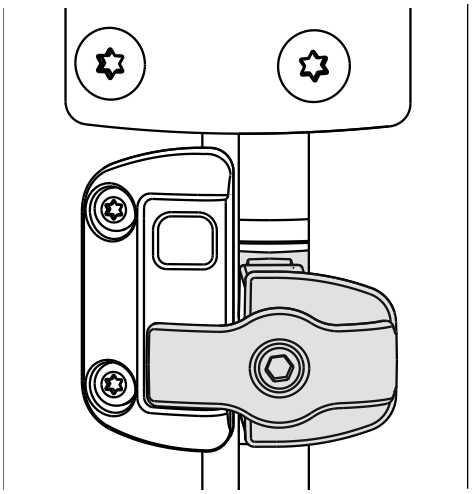
The force limit in the synchronized outhaul winch is based on the line force at winch entry. High friction in the outhaul routing will result in the actual force in the outhaul clew being significantly lower than at the winch, which can negatively affect the synchronization.

5 Sailing

The manual furling gear must be set to FREE when connected to the electric motor. The clutch plunger should be positioned in the lower seat (MOTOR).







5.1 Preparations for furling and unfurling

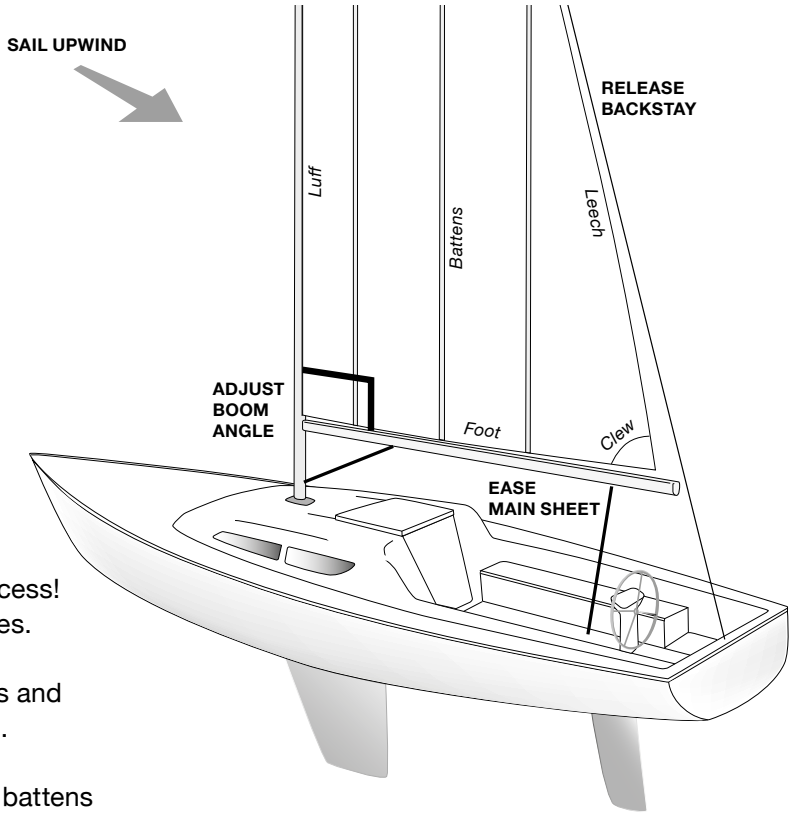
There are many factors to consider for a successful furling operation. Get familiar with the furling system in light conditions and pay attention to the following details before furling out and in. How important these adjustments are for the furling result can vary between boats, sail designs and other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

1.
Sail upwind.

2.
Release backstay tension (if very tight) to straighten the mast.

3.
Adjust the boom angle to keep the leech tight and battens parallel to mast. Use kicker/topping lift.

4.
Ease the main sheet.



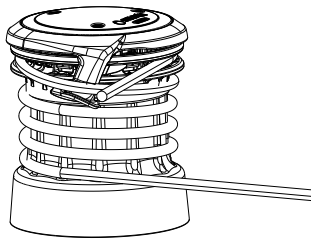
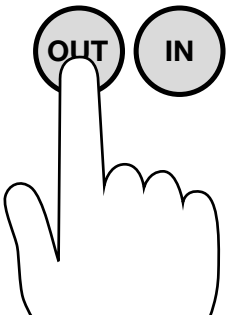
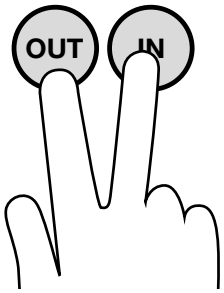
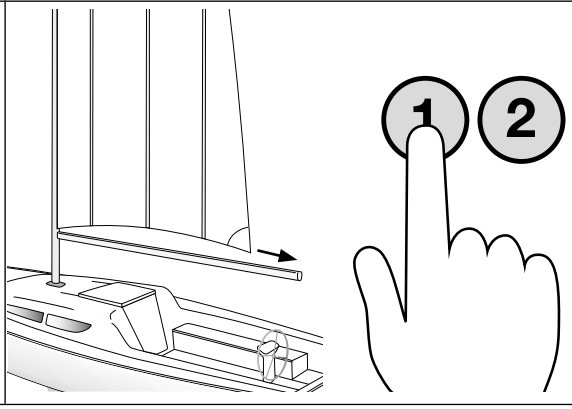
Always observe the entire furling process! Stop immediately in case of any issues.

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)

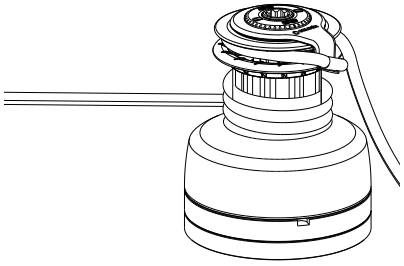
For operation with separate electric winch, see 5.3

1. Apply and secure the outhaul to the synchronized electric winch.	
2. Press “Furl Out”. The outhaul winch will make a short warning signal before starting to run. 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.	
3. Whilst holding down “OUT”, press the second button to increase the speed, if wanted.	
4. **Full sail** Hold button(s) pressed. The synchronized system will recognize a fully unfurled sail and stop automatically. **Reduced sail area** Release button(s) when sail is in desired position.	The motor will make a short rotation when unfurling is finished, to activate the break mechanism.
5. If needed, the outhaul can be trimmed using the winch buttons. Be careful when using the winch buttons, as this activates the full power of the winch.	

5.3 Unfurling with separate electric winch.

1.

Apply and secure the outhaul to the electric winch.

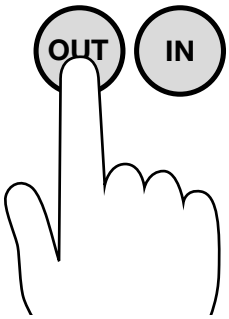


Check that the outhaul line is not excessively tensioned as this may prevent the mast motor brake to unlock.

2.

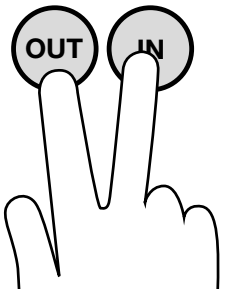
Press “Out”. Wait 3 seconds

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.



3.

Whilst holding down the “OUT” button, press the winch button to pull out the sail. For higher speed, press the ”OUT” and ”IN” button simultaneously. If the mast motor buttons are accidentaly released, push the ”OUT” button first to continue unfurling operation. Do not allow the outhaul winch to over-load the sail.



4.

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.

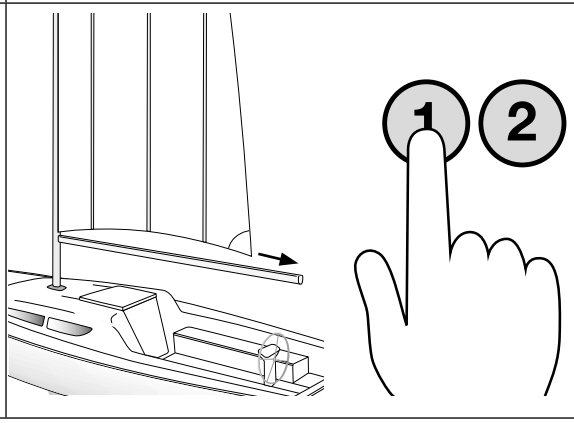
Unfurl to reduced sail area
Hold buttons pressed. Release button(s) when sail is in desired position. Release winch buttons before mast motor buttons.

The 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.

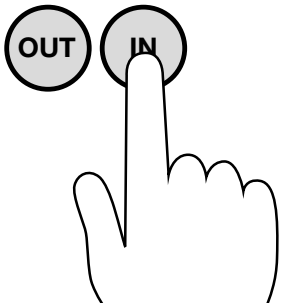
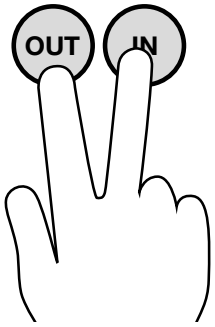
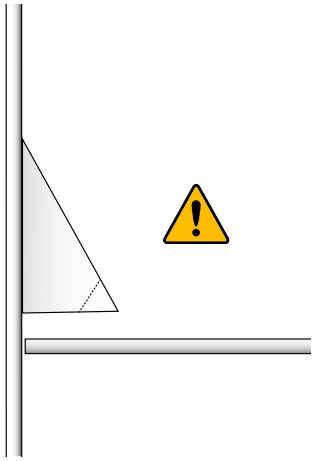
5.

If needed, the outhaul can be trimmed using the winch buttons.

Be careful when using the winch buttons, as this activates the full power of the winch.



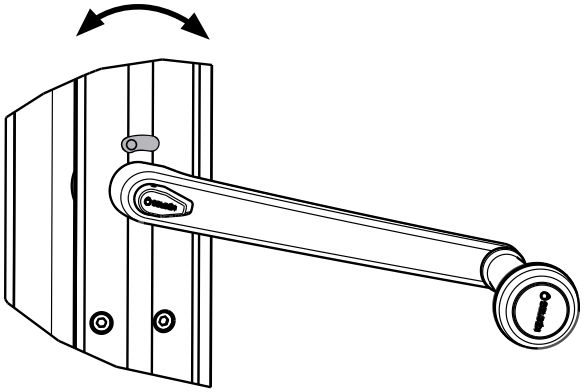
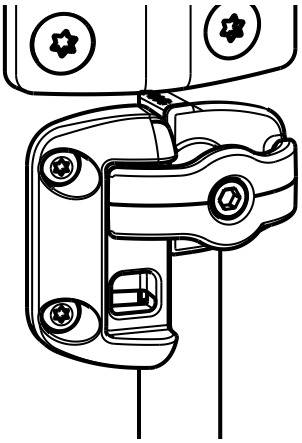
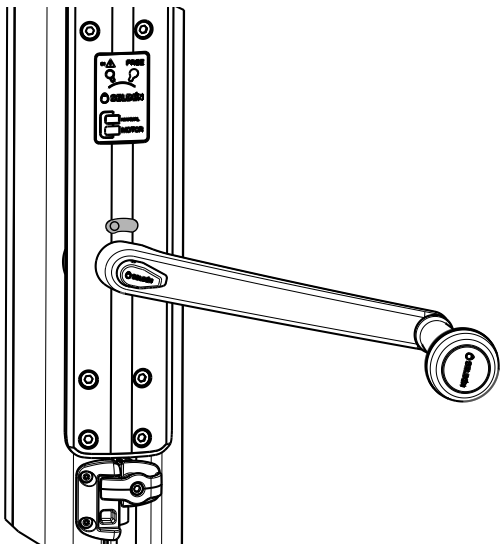
5.4 Furling

1. Free the outhaul and keep it tensioned (about one turn on the winch). Press “IN” and simultaneously slacken the outhaul line while the sail is reefed.	
2. Whilst holding down “IN”, press the second button to increase the speed.	
3. Release the button(s) and stop reefing at desired sail area or when sail is fully furled in. 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.	

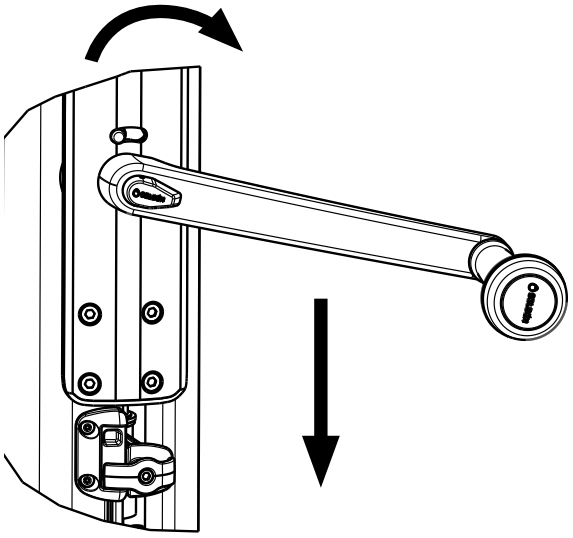
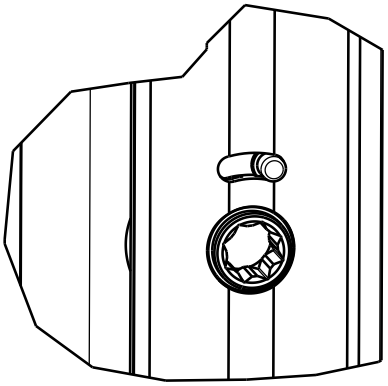
5.5 Manual drive

In case of electric or mast motor failure, the sail can be manually reefed by disengaging the motor from the manual gear:

Disconnect mast motor

1. Turn power off! Press the controller knob down and move to left (”IN”) position. This engages the ratchet function in the manual gear winch.	
2. If there is sail-load on the system; fit a winch handle in socket and turn slightly clockwise to unload the clutch. Pull the Clutch Plunger out and up, switching to the upper position. The mast motor is now disconnected from the furling gear.	
3. **Furling/reefing:** Ratchet knob in ”IN” position. Use a winch handle to manually furl in the sail at the mast. **Unfurling:** If the sail is partially out, start with furling it fully in to unload the ratchet control. Press and move the ratchet control knob to position ”Free”. If the ratchet control does not operate easily, use a winch handle and turn slightly clockwise to unload the mechanism during knob operation. Remove winch handle. Pull the outhaul line to unfurl the sail entirely. Set ratchet control in ”IN” position. Use winch handle to furl to desired sail area. Pull the outhaul line.	
4. Remove winch handle from socket when done.	

Reconnect electric motor:

1. Pull the Clutch Plunger out and down to the lower position. If needed, rotate the linedriver manually to adjust the angle of the clutch shaft inside the mast, until the shaft connects to the motor and you are able to secure the clutch plunger in the lower position.	
2. Put furling gear in FREE mode The gear should always be in FREE mode when motor is engaged.	

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
Mast motor makes a constant signal tone when Power Supply and SEL-Bus system is turned on. 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.	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.	Disconnect mast motor from manual gear (see section 5.4). Remove outhaul line from winch. Idle run mast motor “IN”, minimum 30 sec. Idle run winch on high speed, minimum 30 sec.

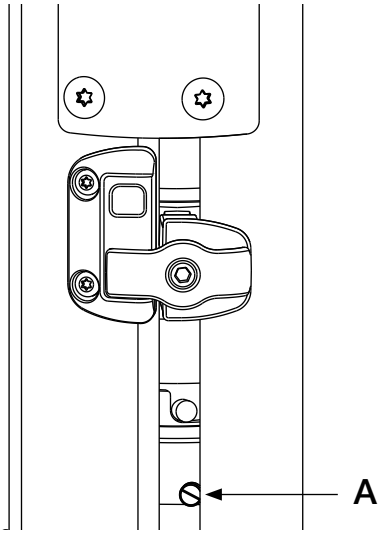
For trouble shooting of Seldén Power supply and SEL-Bus system, see installation and trouble shooting guide 597-275-E.

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

1. Through the sail groove, remove the screw to the lubrication hole (A).	
2. Apply WD-40 in the hole and simultaneously rotate the mast motor minimum one turn. Remount screw.	

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.

597-216-E Printed in Sweden

SELDÉN

www.seldenmast.com