

# Installation Guide

*For E-vision Electric Retractable Thruster Models*  
**ER-L&V130, ER-L&V170, ER-V210**



**SLEIPNER MOTOR AS**

P.O. Box 519

N-1612 Fredrikstad

Norway

[www.sleipnergroun.com](http://www.sleipnergroun.com)

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Accidental activation of the retract mechanism can cause serious injury due to the high-pressure force used for closing the hatch. IF operating the hatch during any work/ maintenance around or inside the retract hatch, USE CAUTION.

MC\_0411



Sleipner Motor AS  
P.O. Box 519, Arne Svendsensgt. 6-8  
N-1612 Fredrikstad, Norway

MC\_0020

**Failure to follow the considerations and precautions can cause serious injury, damage and will render all warranties given by Sleipner Motor as VOID.**

MC\_0411

## Responsibility of the Installer

MC\_0038

The installer must read this document to ensure necessary familiarity with the product before installation.

Instructions in this document cannot be guaranteed to comply with all international and national regulations. It is the responsibility of the installer to follow all applicable international and national regulations when installing Sleipner products.

The recommendations given in this document are guidelines ONLY, and Sleipner strongly recommends that advice is obtained from a person familiar with the particular vessel and applicable regulations.

This document contains general installation instructions intended to support experienced installers. If you are not skilled in this type of work, please contact professional installers for assistance.

If required by local regulation, electrical work must be done by a licensed professional.

Appropriate health and safety procedures must be followed during installation.

Faulty installation of Sleipner products will render all warranties given by Sleipner Motor AS.

## General Installation Consideration and Precaution Guidelines

MC\_0440

### For retract thrusters

MC\_0474

- Stern mounted retract thrusters must not be installed to conflict with the main boat propellers or its water trail. **(NB: consult a naval architect for an exact position.)**
- Paint inside the retract housing with anti-fouling. **(NB: Do not paint the drive shaft.)**

### For thruster systems

MC\_0425

- Do not install the thruster in a position where you need to cut a stiffener/ stringer/ support that may jeopardise the hull integrity without checking with the boat builder this can be done safely.
- Paint the gear house and propellers with anti-fouling. **(NB: Do not paint the anodes, sealing, rubber fittings or propeller shafts)**
- There is only room for a thin coat of primer and two layers of anti-fouling between the tunnel and the props.
- Never run the thruster out of water without load.

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- There is only room for a thin coat of primer and two layers of anti-fouling between the tunnel and the props.
- Never run the thruster out of water without load.

### Lithium Batteries for proportional thrusters models

MC\_0502

- If a lithium battery system is installed for supply of proportional thrusters, ensure the battery is designed for continuous supply of the required thruster current. Under-rated battery management system can suddenly disconnect the load which may lead to dangerous situations. The firmware version of Proportional Power Controller (PPC) must be of version 1.033 or later if the PPC is to be connected to a lithium battery. Operating the thruster outside specified ratings will void warranty.

When installing an S-Link™ system connect ONLY original Sleipner S-Link™ products or other authorized control equipment directly to the S-Link™ bus. Connecting non-authorized third-party equipment, it must always be connected through a Sleipner supplied interface product. Any attempt to directly control or connect into the S-Link™ control system without a designated and approved interface will render all warranties and responsibilities of all of the connected Sleipner products. If you are interfacing the S-Link™ bus by agreement with Sleipner through a designated Sleipner supplied interface, you are still required to install at least one original Sleipner control panel to enable efficient troubleshooting if necessary.

MC\_0105

**NEVER Disassemble any part of the Ignition Protected assembly. Tampering with the Ignition Protected assembly will cause it to lose this safety feature. If there is a problem with your Ignition Protected motor, please contact your dealer.**

MC\_0007

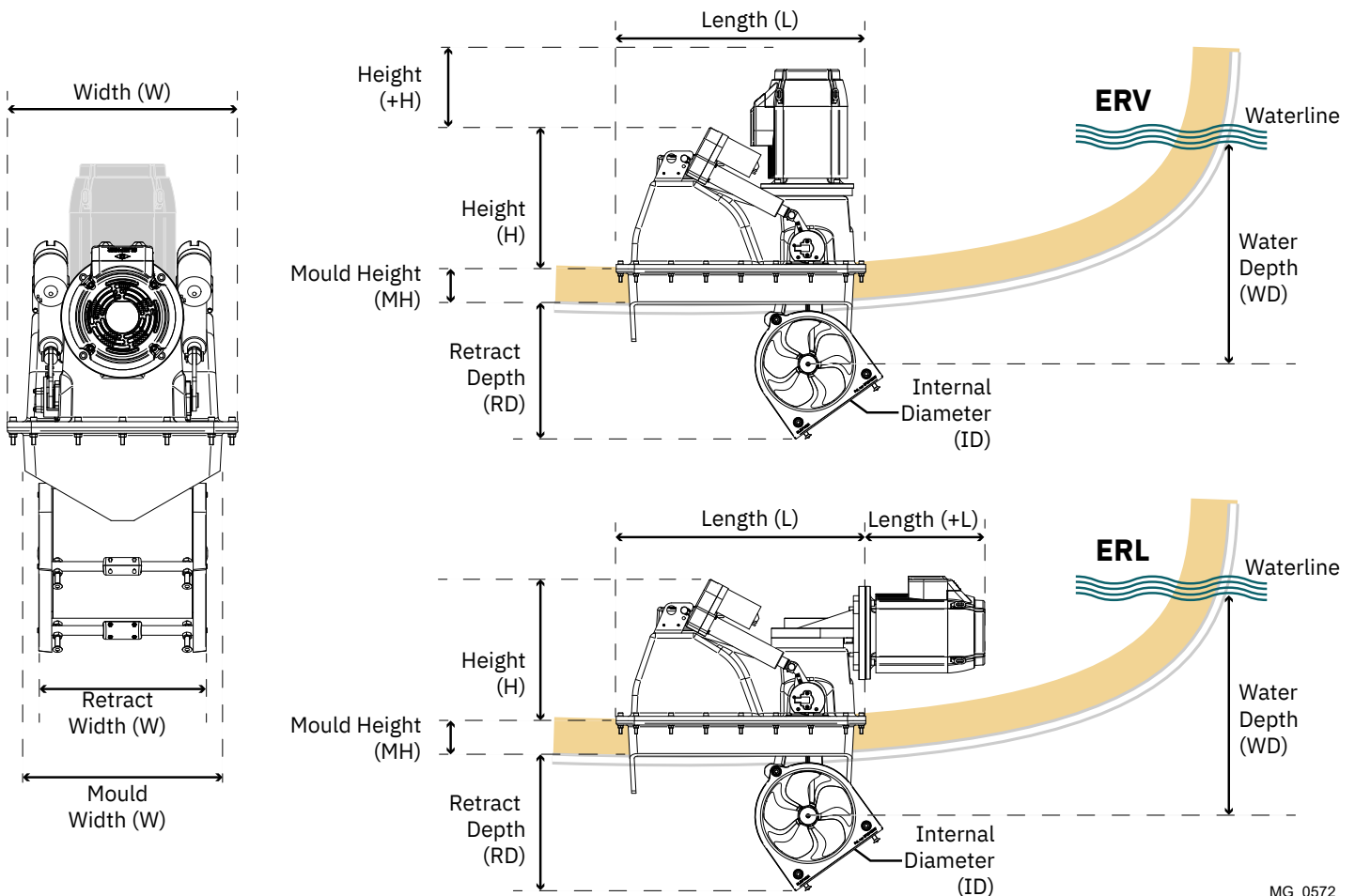
**For Sleipner eVision electric motors**

MC\_0452

- When installing the thruster electric motor in small compartments, ensure the compartment is well ventilated to allow for cooling of the electric motor.
- If the height of the room you are installing the thruster is limited, the thruster can be installed horizontally or at any angle in-between.
  - If the electro motor is positioned more than 30 degrees off vertical, it must be supported separately.
  - Beware of keeping installation within advised measurements. No part of the propeller or gear house must be outside the tunnel.
- The electric motor, components and cables must be mounted so they remain dry at all times.
- Do not finish the inside of the tunnel with a layer of gel-coat/ topcoat or similar. There is only room for a thin coat of primer and two layers of anti-fouling between the tunnel and the props.
- Don't install the electric motor close to easily flammable objects or equipment
- Do not store items close to the thruster motor. Any loose items near the thruster motor is a potential fire hazard and can cause undesired short-circuiting.
- Do not lift it by internal cable connections, main terminals.
- The thruster power supply circuit must include the recommended sized fuse and a battery isolation switch.
- The electric/ hydraulic motor must be handled with care. Do not rest the thruster motor on its drive shaft as its weight can damage the shaft.
- eVision Thruster Motor must be upgraded to firmware version V1.015 or newer. eVision Thruster Motors shipped before November 28, 2022 needs to be upgraded.
- Control panel PJC2xx must be upgraded to firmware version V3.018 or newer. Control panel PJC2xx with hardware V2.000 or older will not support eVision Thruster Motors. Sleipner stopped the production of PJC2xx with HW version V2.000 in Q2 2020. Note that no mechanical modifications are required to replace older PJC2xx panels with PJC2xx HW version V3.000 or newer. Hardware version can be found in the panel info menu or using S-Link programmer. From HW version V3.000, the version is printed on the serial number label. Control panel PJC42x must be upgraded to firmware version V1.002 or newer. Control panel PJC3xx will not support eVision Thruster Motors.
- Retract controller SR150000 must be upgraded to firmware version V1.036 or newer. Function must be configured to "ERV/ERL" on both SR150000 and eVision Thruster Motor. Retract controller SR 6 1242 will not support eVision Thruster Motors.
- Automatic Main Switch works with eVision Thruster Motor without additional firmware update. But an upgrade to the latest firmware is always recommended.
- Gateway works with eVision Thruster Motor without additional firmware update. But an upgrade to the latest firmware is always recommended.
- ESI-1 works with eVision Thruster Motor without additional firmware update. But an upgrade to the latest firmware is always recommended.
- 8730 works with eVision Thruster Motor without additional firmware update. But an upgrade to the latest firmware is always recommended.
- S-link remote controller works with eVision Thruster Motor without additional firmware update. But an upgrade to the latest firmware is always recommended.

Measurement code	Measurement description	ERV130 <sup>24V</sup>		ERV130 <sup>48V</sup>		ERV170 <sup>24V</sup>		ERV170 <sup>48V</sup>		ERV210 <sup>24V</sup>		ERV210 <sup>48V</sup>	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
L	SRF flange & motor housing length	687	27,04	687	27,04	687	27,04	687	27,04	687	27,04	687	27,04
+H	Motor supplementary measurement (Height)	120	4,72	120	4,72	120	4,72	120	4,72	159	6,2	159	6,2
H	Motor housing height	389	15,3	389	15,3	389	15,3	389	15,3	389	15,3	389	15,3
MH	SRF flange height	91	3,6	91	3,6	98	3,85	98	3,85	98	3,85	98	3,85
RD	Retracted hatch supplementary measurement	371	14,6	371	14,60	378	14,6	378	14,6	378	14,6	378	14,6
ID	Tunnel diameter	250	9,84	250	9,84	250	9,84	250	9,84	250	9,84	250	9,84
W	SRF flange & motor housing width	481	18,9	481	18,9	481	18,9	481	18,9	481	18,93	481	18,93
RW	Retracted hatch width	349	13,7	349	13,7	349	13,7	349	13,7	349	13,7	349	13,7
MW	SRF flange inner frame width	417	16,4	417	16,4	414	16,29	414	16,29	417	16,4	417	16,4

Measurement code	Measurement description	ERL130 <sup>24V</sup>		ERL130 <sup>48V</sup>		ERL170 <sup>24V</sup>		ERL170 <sup>48V</sup>	
		mm	inch	mm	inch	mm	inch	mm	inch
L	SRF flange & motor housing length	687	27,04	687	27,04	687	27,04	687	27,04
+H	Motor supplementary measurement (Height)	9	0,35	9	0,35	9	0,35	9	0,35
H	Motor housing height	389	15,3	389	15,3	389	15,3	389	15,3
MH	SRF flange height	91	3,9	91	3,9	91	3,9	91	3,9
RD	Retracted hatch supplementary measurement	378	14,7	378	14,7	378	14,7	378	14,7
ID	Tunnel diameter	250	9,84	250	9,84	250	9,84	250	9,84
W	SRF flange & motor housing width	480	18,9	480	18,9	481	18,93	481	18,93
RW	Retracted hatch width	349	13,7	349	13,7	349	13,7	349	13,7
MW	SRF flange inner frame width	417	16,4	417	16,4	417	16,4	417	16,4



## Product Specifications

MC\_0500

Product	Nominal Operating Voltage	Maximum Operating Voltage	Thrust is kg / lbs at (V)	Power Output kW / Hp	Weight kg / lbs	Maximum Operation Time
ERV130 24V	21V	31V	130 kg / 284 lbs (21V)	5.1 kW / 6.8 hp	TBA	Runtime @ 100% thrust: Continuous @ 22°C ambient, typically limited by battery capacity
ERV130 48V	42V	62V	130 kg / 284 lbs (42V)	5.1 kW / 6.8 hp	TBA	
ERL130 24V	21V	31V	130 kg / 284 lbs (21V)	5.1 kW / 6.8 hp	TBA	
ERL130 48V	42V	62V	130 kg / 284 lbs (42V)	5.1 kW / 6.8 hp	TBA	
ERV170 24V	21V	31V	170 kg / 374 lbs (21V)	7.3 kW / 9.9 hp	TBA	
ERV170 48V	42V	62V	170 kg / 374 lbs (42V)	7.3 kW / 9.9 hp	TBA	
ERL170 24V	21V	31V	170 kg / 374 lbs (21V)	7.3 kW / 9.9 hp	TBA	
ERL170 48V	42V	62V	170 kg / 374 lbs (42V)	7.3 kW / 9.9 hp	TBA	
ERV210 24V	21V	31V	210 kg / 462 lbs (21V)	10.4 kW / 14 hp	TBA	
ERV210 48V	42V	62V	210 kg / 462 lbs (42V)	10.4 kW / 14 hp	TBA	

## Hull Specifications

MC\_0609

Use sealants, adhesives or bonding material compatible with the materials of your vessels hull and Sleipner product.

## Positioning of the Retract thruster

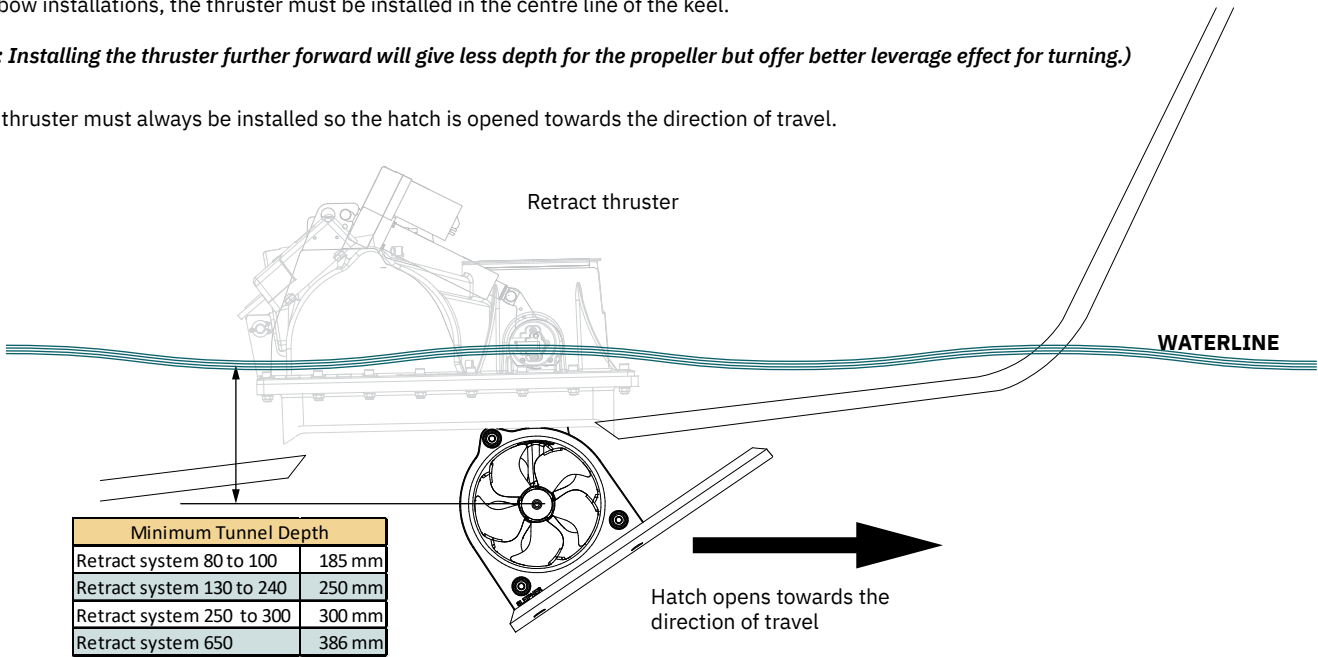
### Bow

The thruster must be installed as far forward as possible. Allow for 100mm around the thruster for moulding the retract frame and the depth of the propeller when extended is a minimum of the vaule defined below under the waterline.

For bow installations, the thruster must be installed in the centre line of the keel.

*(NB: Installing the thruster further forward will give less depth for the propeller but offer better leverage effect for turning.)*

The thruster must always be installed so the hatch is opened towards the direction of travel.



### Stern

The thruster must be installed as far forward as possible. Allow for 100mm around the thruster for moulding the retract frame and the depth of the propeller when extended is a minimum of the vaule defined below under the waterline.

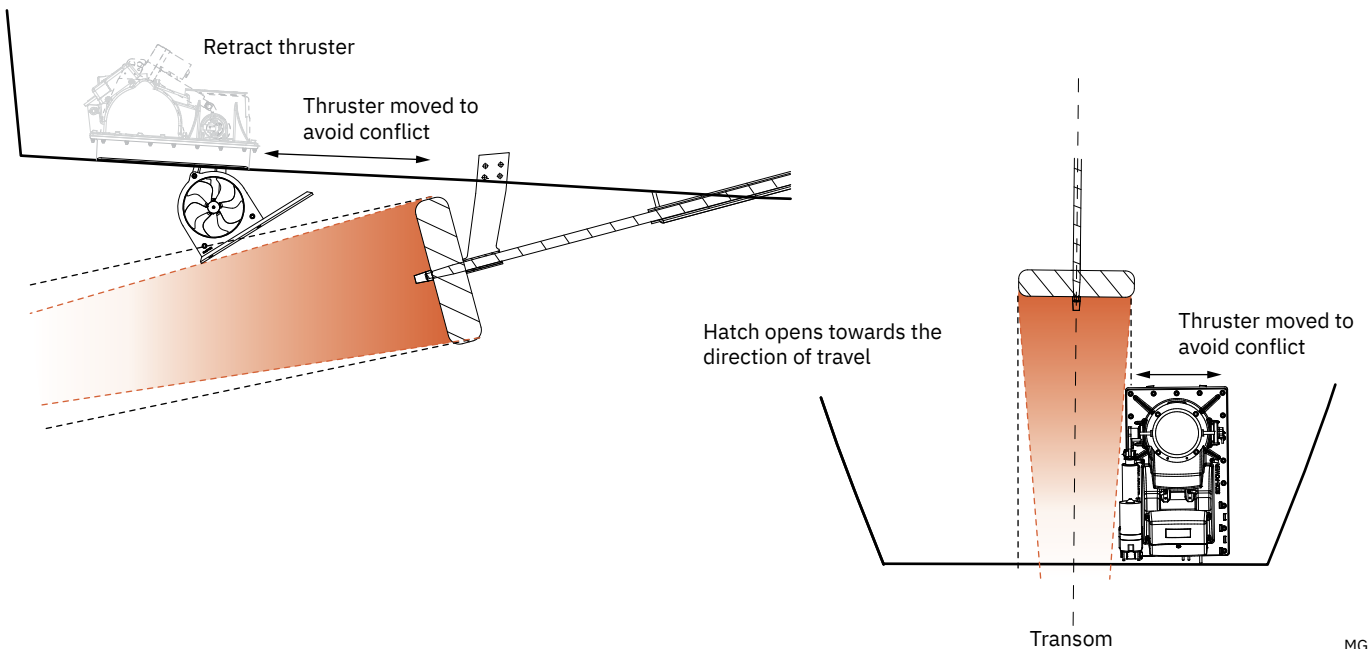
Minimum Tunnel Depth	
Retract system 80 to 100	185 mm
Retract system 130 to 240	250 mm
Retract system 250 to 300	300 mm
Retract system 650	386 mm

The thruster while retracted must not conflict with any other component of the vessel such as stern drives/ propellers, trim tabs or rudders. Therefore stern installations do not require to be installed on the hulls keel centre line and can be installed off centre.

Installing the thruster below the waterline as outlined is important for two reasons:

1. So that it does not suck air down from the surface which will reduce performance and increase noise levels.
2. To get as much water pressure as possible to receive maximum efficiency from the thruster.

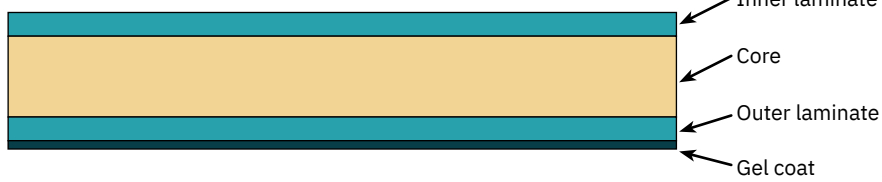
Always ensure enough space for the complete SR unit including motor, actuators, retract frame, future service and for installation moulding to the hull.



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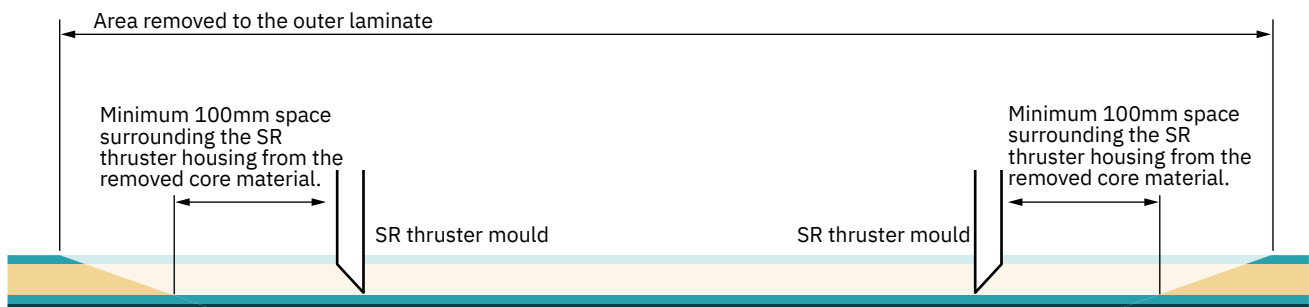
For vessels with sandwich hull construction, additional reinforcement of the area around the retract flange is required.

**Cross section of a sandwich core hull**



1. To achieve maximum strength and bonding in the area around the installation of the retract thruster remove the inner and core material to expose the outer laminate. Remove enough area for a 100mm (minimum) clearance surrounding the retract thruster housing.
2. Reinforce the area with bonding to strengthen the hull for the operation of the retract thruster.
3. During the process of attaching the retract thruster housing build this area up to ensure enough strength of the hull.  
*(NB: Consult an experienced boat builder)*

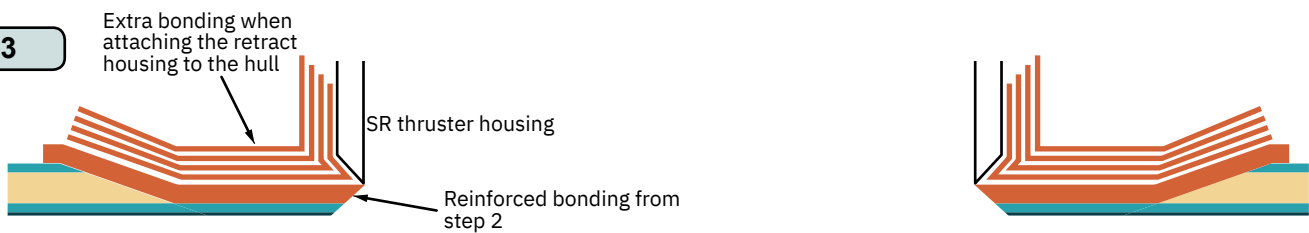
**1**



**2**



**3**

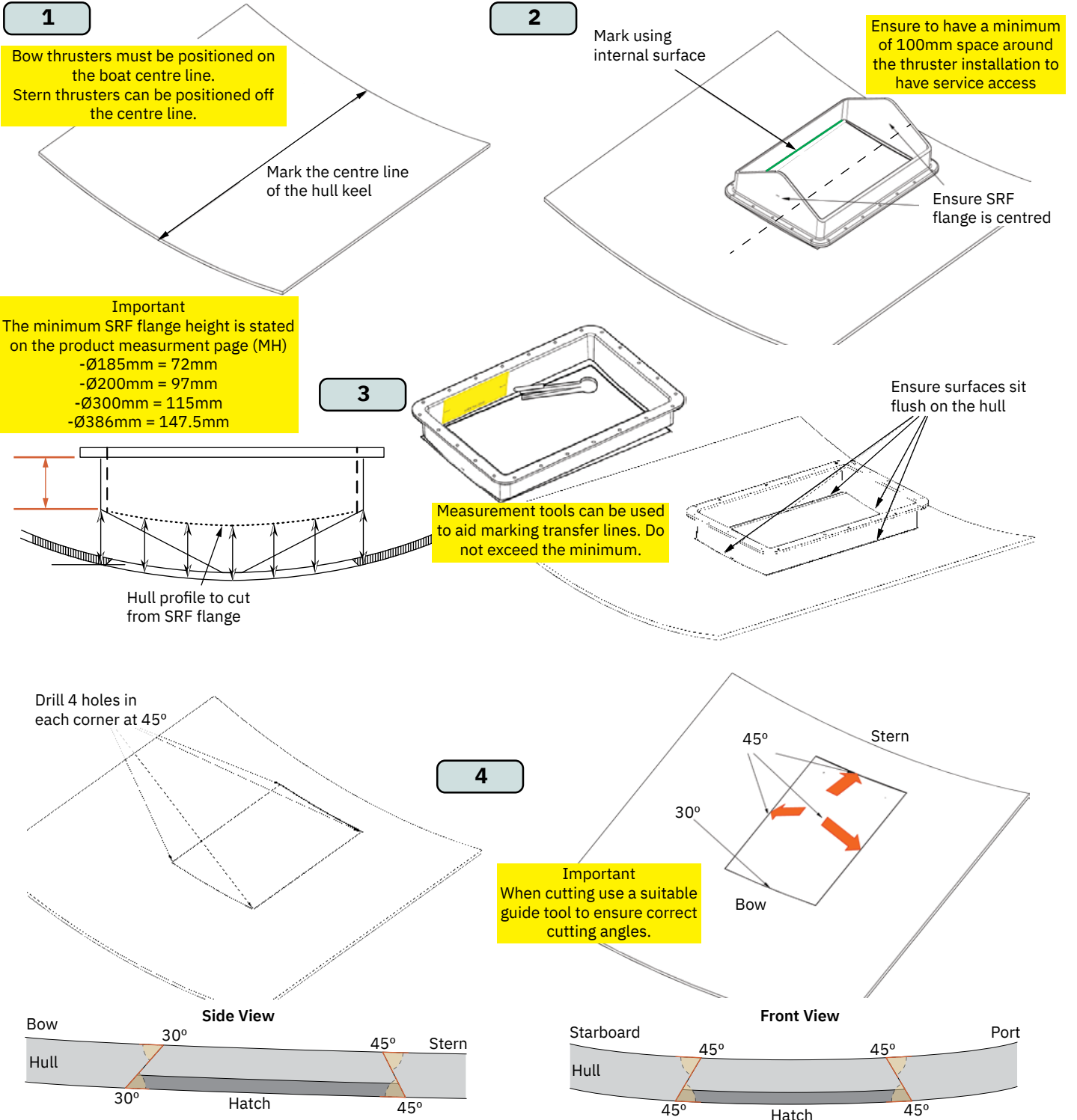


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**! Please refer to the graphic for special considerations relating to your model !**

1. Identify the location of the thruster considering space required for installation, operation and future maintenance.
2. Mark the keel centre line on the inside of the hull. Flip the SRF flange upside down and use the internal surface to mark the hull for cutting the thruster hatch. **(NB: Ensure the mould is centred. For stern installation the hull is normally flatter in this area. To avoid conflicts with propeller systems the thruster can be offset from hull centre line. Consider water flow direction from the thruster, adjusting horizontal level of the thruster to achieve free flow from the propeller tunnel and ensure free water flow direction inwards.)**
3. The SRF flange must sit so the two side rails run flush with the length of the hull. To do so the SRF flange tabs must be trimmed down to match the hull profile curvature. **(NB: Consult a naval architect for methods to transfer the hull profile to the SRF flange. DO NOT cut the SRF flange length edge.)**
4. Cut the hatch door. The hatch opening must be cut at an angle of 45° on three sides and 30° on the bow face. This allows any water forces hitting the hatch while closed to be absorbed by the hull, not the thruster. **(NB: Use a suitable cutting tool able to be set to the desired angle. If cutting from outside the hull drill 4 holes from the internal marked corners to see the required profile from the outside.)**



Temporarily set up the complete installation to ensure no conflicts during the final operation of the thruster.

1. Use epoxy filler in the 4 corners of the SRF flange and set it over the hatch. Attach the retract housing retract flange with 4 corner screws to hold. Use polyester or resin to attach the hull hatch to the retract unit. **(NB: Ensure correct orientation for the thruster to open the hatch facing the direction of water flow. Remember attachment is for temporary checking of thruster operation only.)**
2. Temporarily connect DC cables **(NB: Refer to the label on actuators for correct voltage)** to the cables on the terminals on the controller. Set switch no. 4 on the DIP-switch marked "SETTINGS" to ON. Deploy thruster and remove the red distance part located above the tunnel.
3. Press "DOWN" to extend the tunnel and check the hatch opens fully without touching the hull. If the hatch is obstructed by the hull in the front, lift the aft end of the SRF flange maintaining the reference height in front - until the hatch clears the hull when opened.
4. Press "UP" to retract the tunnel. Ensure when the hatch is closed extra pressure is on the contact surface between the hatch and the hull only. If the hatch is not closing with pressure on the contact surfaces the entire SRF flange must be raised.

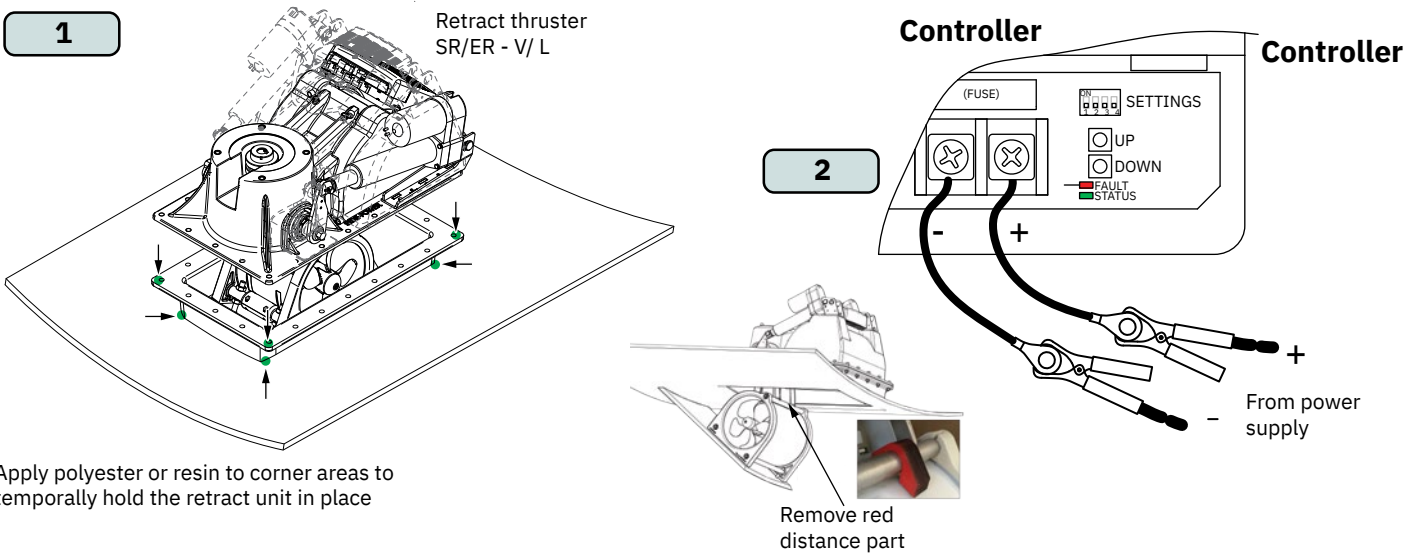
**IMPORTANT**

The hatch contact edges and the hull contact edges **MUST** work as the mechanical end stop. During cruising, slamming forces from the water must be absorbed by these areas, not the thruster.

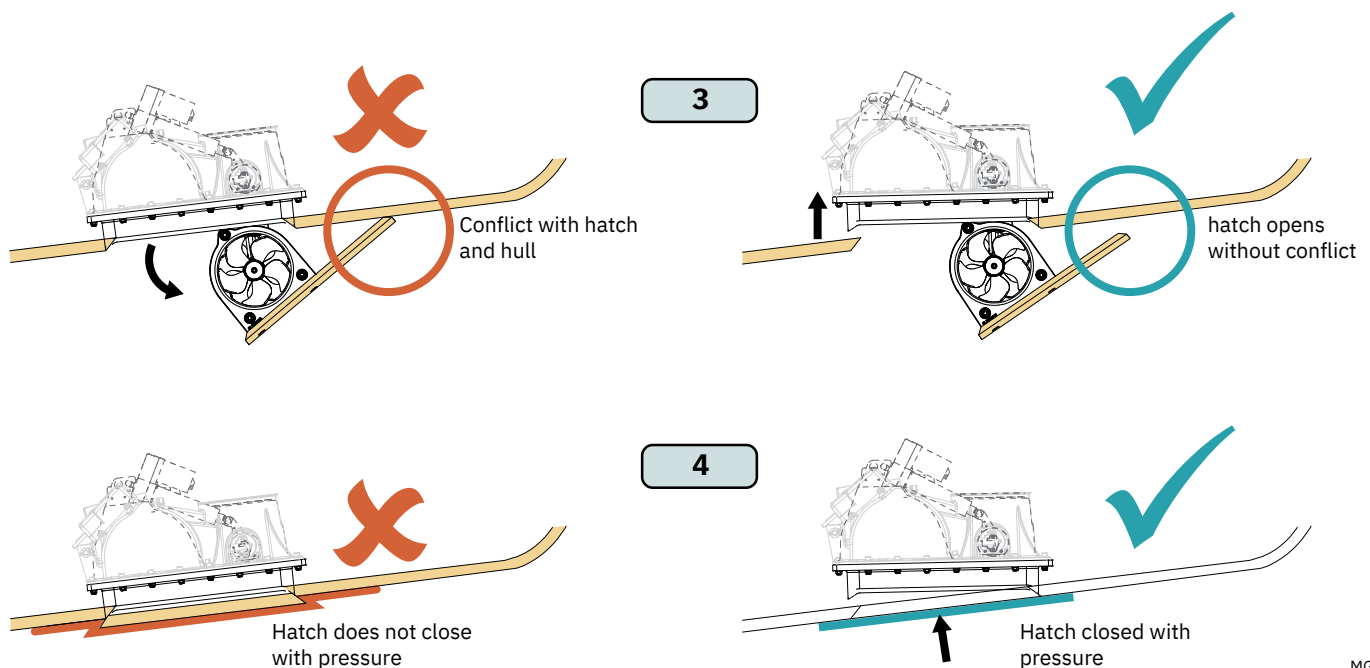


**Accidental activation of the retract mechanism can cause serious injury due to the high-pressure force used for moving the hatch. IF operating the hatch during any work/ maintenance around or inside the retract hatch, USE CAUTION.**

After all, pre-checks are completed the retract system can be installed.



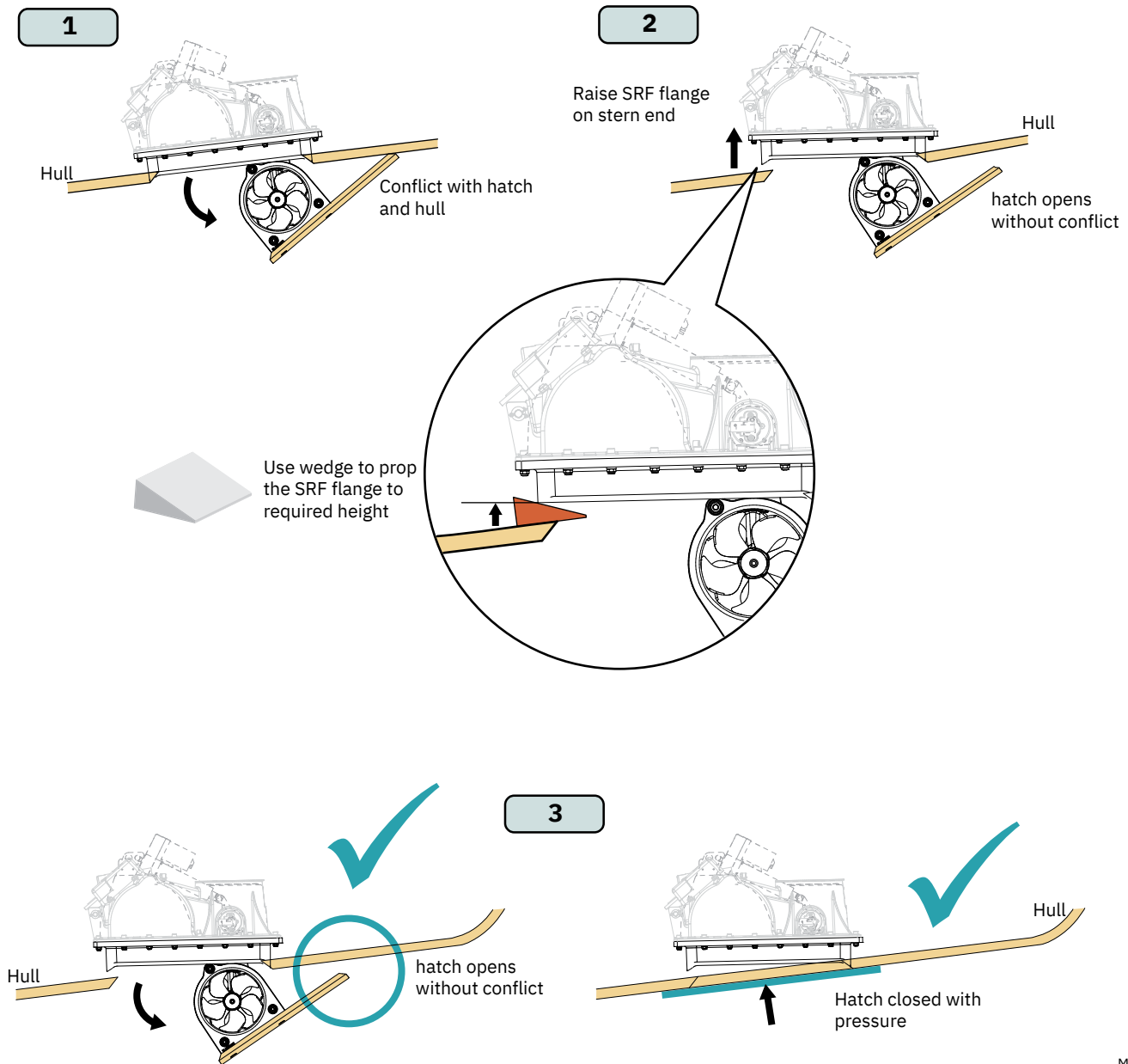
Apply polyester or resin to corner areas to temporarily hold the retract unit in place



**! Please refer to the graphic for special considerations relating to your model !**

To increase the space between the hatch and the hull the entire SRF flange and motor must be raised at the stern end.

1. With the hatch in the open position raise the stern end of the SRF flange and motor until the appropriate clearance is achieved. **(NB: continue to raise the stern height until this is obtained.)**
2. Use a wedge to keep the thruster stable.
3. Open and close the hatch to ensure:
  - Clearance between the hull and hatch when the thruster is open
  - Hatch closes flush with the hull with full contact between hatch and hull.
4. Record the height and keep the wedges in place and secure the position of the SRF flange with epoxy filler in the corners with epoxy filler in the corners.



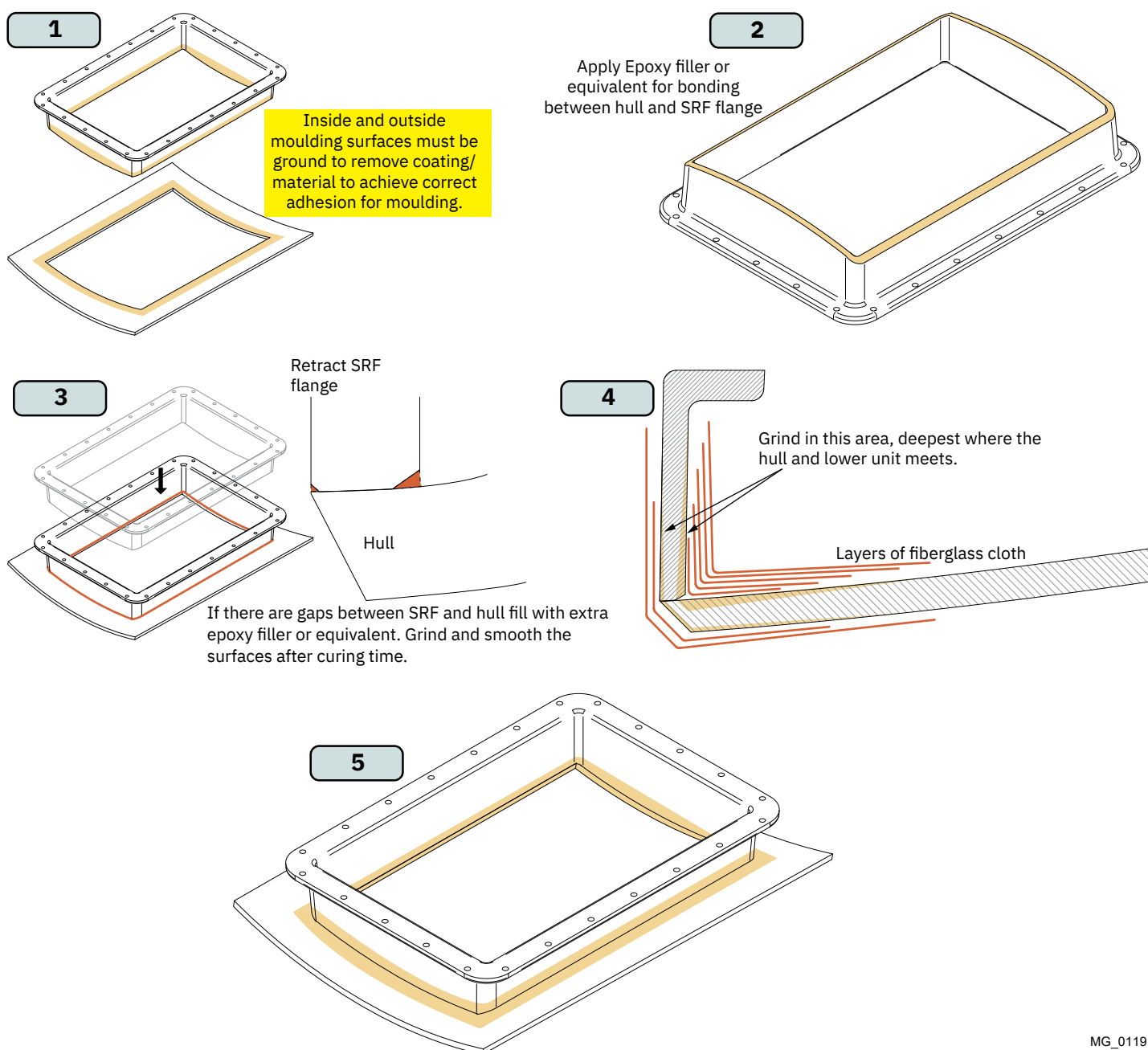
MG\_0133

**! Please refer to the graphic for special considerations relating to your model !**

Start the laminating with a strong attachment point in each corner between the hull and the outside of the lower unit. Use epoxy and fibreglass cutting or similar, which laminating material is the boat builders responsibility.

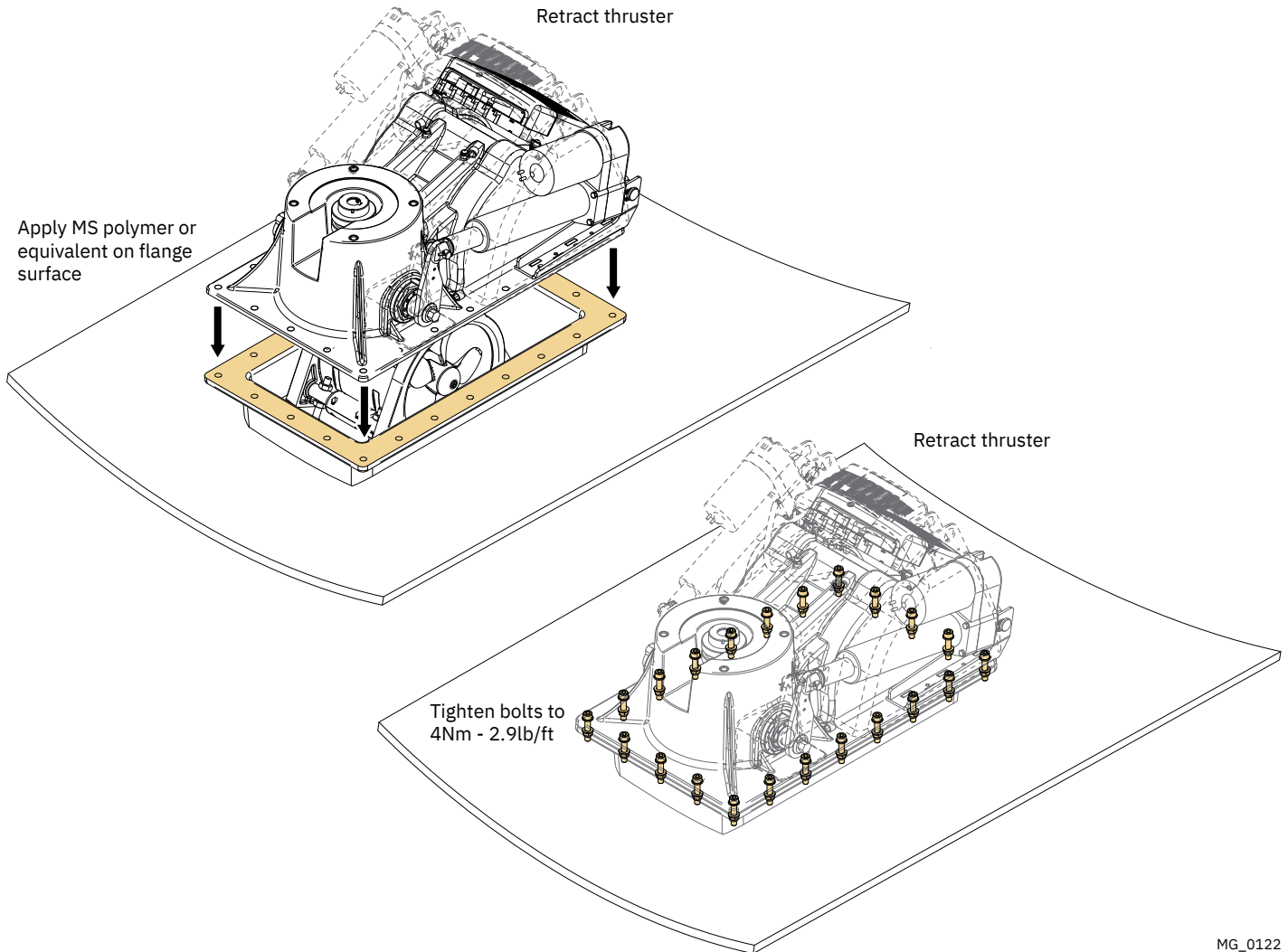
1. Before grinding of hull and SRF flange, precautions must be taken against grinding dust inside the boat. Surfaces to be moulded/ bonded must be ground to remove coating and material to achieve sufficient adhesion.
2. Apply epoxy filler or equivalent on bottom edges of SRF flange or on the hull for bonding between connection surfaces. Ensure the filler is compatible with hull materials.
3. Place the SRF flange into position ensuring the correct orientation. If there are gaps between SRF and hull fill with extra epoxy filler or equivalent. Grind and smooth the surfaces after curing time.
4. Laminate the inside and outside of the SRF flange solid to the hull by applying. Apply several layers of fibreglass and ensure that the resin and fibreglass is compatible with hull materials.
5. After curing time, smooth all moulded surfaces and apply coating. Apply putty before coating if necessary.

After moulding in SRF flange is completed, the upper thruster case is ready to be installed.



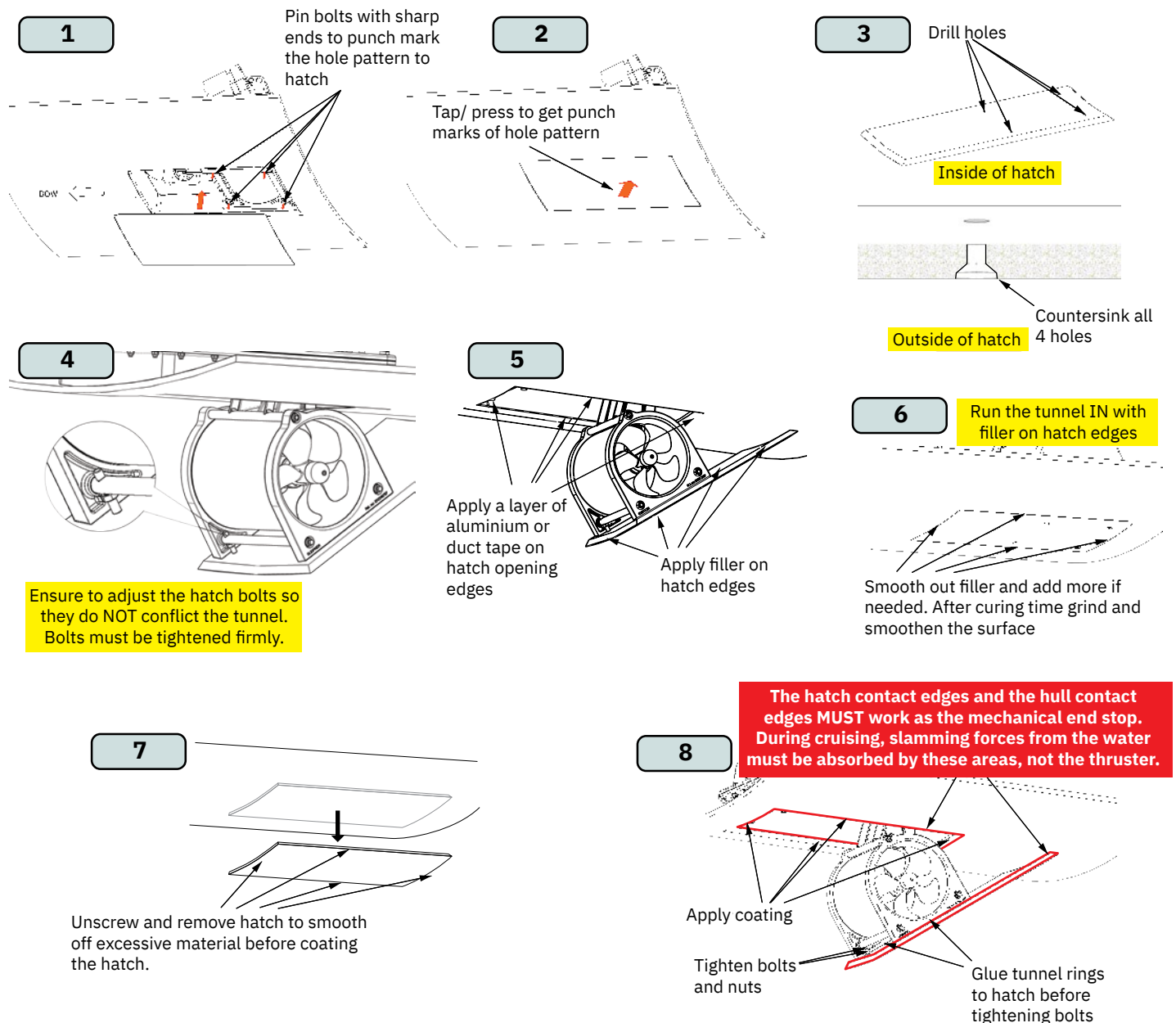
**! Please refer to the graphic for special considerations relating to your model !**

1. Apply MS Polymer or equivalent on SRF flange top surface to seal and avoid water leakage. **(NB: Ensure that glue is compatible with SRF and thruster case materials.)**
2. Place the upper thruster Housing down on the SRF flange.
3. Insert and fasten bolts. Start with the 4 corner bolts followed by the remaining to required torque.



**! Please refer to the graphic for special considerations relating to your model !**

1. Fit pin bolts to the lower tunnel rods. The ends of the bolts must be sharp to create marks in the hatch. The pin bolts must be at the correct height so the hatch will fit in its inner position.
2. Place hatch in its inner position, then press or tap with a hammer to create punch marks inside of the hatch.
3. Drill 4 marked holes and countersink the outer hull side. **(NB: drill holes vertical to the hatch surface.)**
4. Temporary fit the hatch to the tunnel rings. Ensure the bolts do NOT conflict with the propeller tunnel. **(NB: Bolts can be cut, depending on hatch thickness.)**
5. Apply a layer of aluminium or duct tape on hatch opening edges on the hull. Apply Epoxy filler or equivalent to hatch edges to create a perfect seal connection between hatch and hull.
6. Operate the thruster to "IN" position. Smooth out the filler and add more if needed. After curing time, grind and smooth the surface.
7. Unscrew and remove hatch to smooth off excessive material before coating the hatch.
8. Apply epoxy glue or similar on to tunnel rings contact surface, so the hatch will be secured properly. Now re-install hatch in its correct position. Tighten bolts so hatch will fit properly.
9. Apply coating inside and outside of the hatch and on the hull.

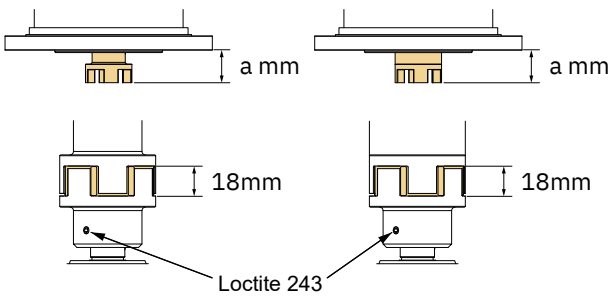
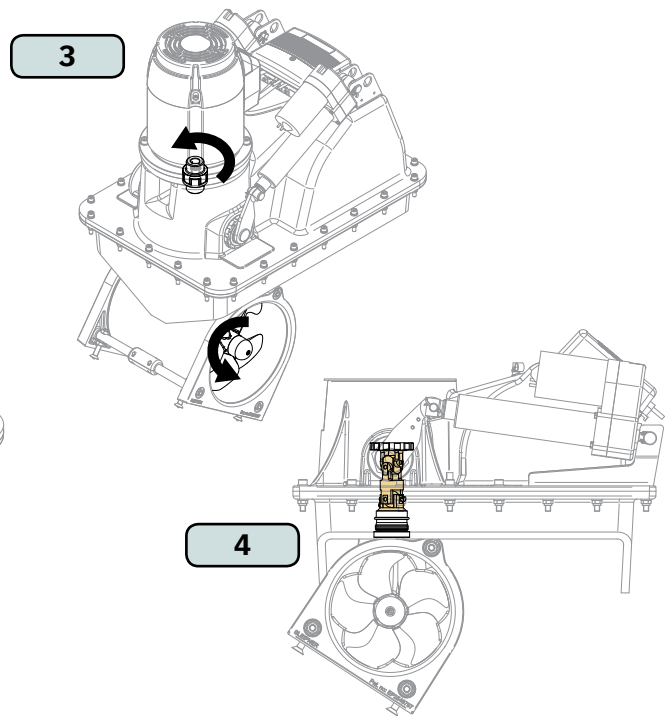
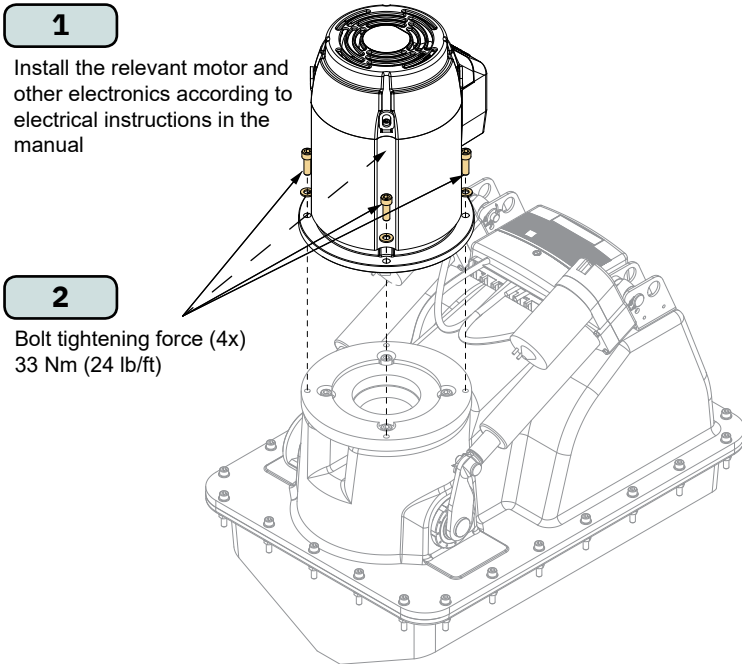




**! Please refer to the graphic for special considerations relating to your model !**

1. Install the motor onto the motor bracket ensuring the couplings and the drive shafts have locked together. **(NB: depending on your coupling you may need to wiggle the motor into place. Ensure the couplings are engaging correctly. Ensure the motor cable terminals are accessible for electrical installation later.)**
2. Fasten the bolts holding the motor to the motor bracket with the defined torque.
3. Check the drive shafts engage by rotating the propeller. It is required the propeller can rotate via hand power. **(NB: Rotating the propellers can be hard because of the gear reduction and the motor.)**
4. Apply grease to the internal drive shaft. We advise painting the gear house and propellers with anti-fouling. **(NB: Do not paint the anodes, sealing, rubber fittings or propeller shafts)**

**(NB: The motor must be covered to avoid dust from fabrication/ maintenance operation entering the motor or the solenoids. After fabrication maintenance operations have ceased the cover must be removed before operating the thruster.)**



Example:  
height A = 47mm - 48mm.  
The correct placement of the lower flexible coupling unit should be measured from the top surface of the motor bracket to the bottom inner surface of the lower flexible coupling. **(NB: The extra 1mm is added to eliminate the risk of compression to the rubber element between the two couplings.)**

**IMPORTANT!**  
The rubber/plastic element must be in its correct position, fully inserted but not compressed.

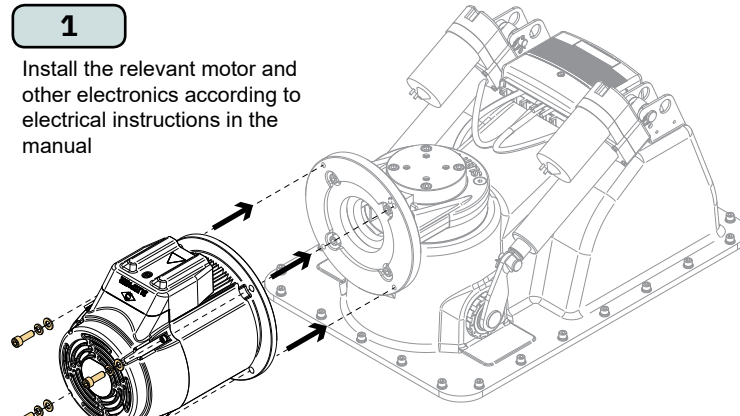
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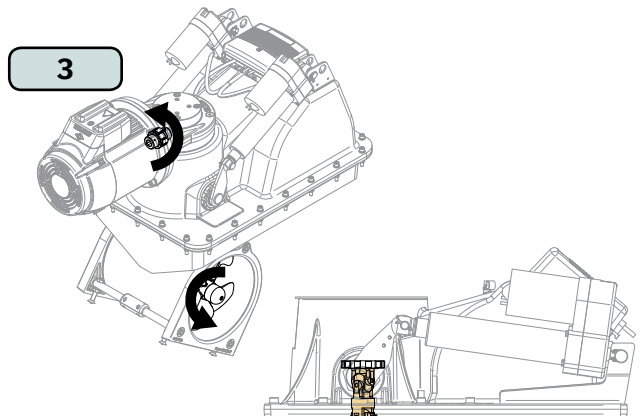
**(NB: The motor must be covered to avoid dust from fabrication/ maintenance operation entering the motor or the solenoids. After fabrication maintenance operations have ceased the cover must be removed before operating the thruster.)**

**1**

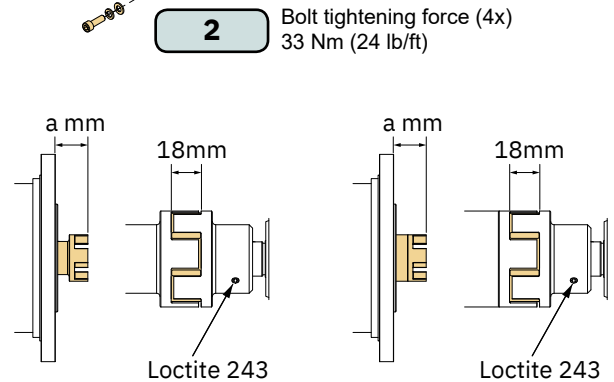
Install the relevant motor and other electronics according to electrical instructions in the manual



**3**

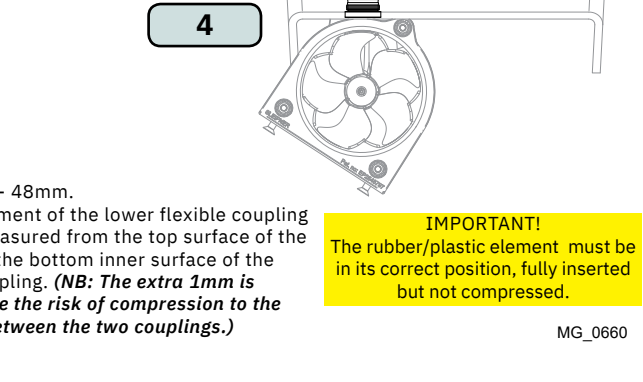


**2** Bolt tightening force (4x)  
33 Nm (24 lb/ft)



Example:  
height A = 47mm - 48mm.  
The correct placement of the lower flexible coupling unit should be measured from the top surface of the motor bracket to the bottom inner surface of the lower flexible coupling. **(NB: The extra 1mm is added to eliminate the risk of compression to the rubber element between the two couplings.)**

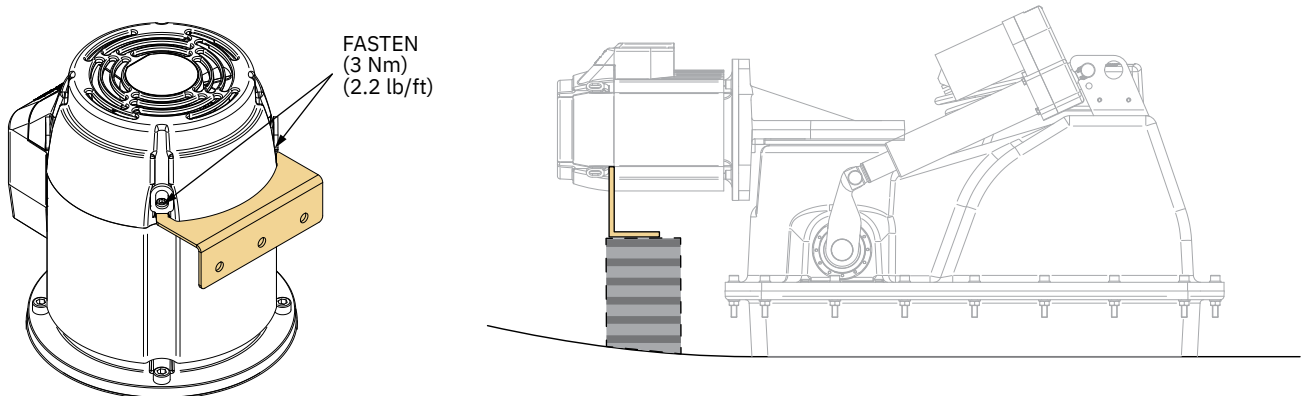
**4**



**IMPORTANT!**  
The rubber/plastic element must be in its correct position, fully inserted but not compressed.

## Support For the Motor

If you are installing the motor at an angle of more than 30 degrees off vertical, the motor will require separate/ additional support.



**FASTEN**  
(3 Nm)  
(2.2 lb/ft)



1. Plan the location of electrical components before starting with the electrical installation. Main electrical components will typically consist of battery, fuse, main switch and thruster motor, see Wiring Diagram chapter for an overview.

Sleipner offers both manual main switches and Automatic Main Switches (AMS). Sleipner AMS is controlled by the control panel in addition to the option of manual operation. Turning on the control panel also turn on the automatic main switch. When the control panel is turned off the automatic main switch is turned off. This ensures that the control electronics and motor are only energized when the control panel is turned on. Sleipner offers AMS supporting either S-Link or ON/OFF control panels. Note that the AMS requires a separate power supply which should be protected by a dedicated fuse. Ensure to select an AMS with a voltage rating according to the chosen motor- and battery voltage.

Electrical products installed in gasoline engine spaces or other areas potentially exposed for explosive gases must be Ignition Protected. Products installed in such locations should conform to the ISO 8846, SAE J1171 or UL 1500 standard.

2. Estimate the total length of the power cables to determine the recommended cross-section. The total power cable length is defined as the distance from the positive battery terminal, via fuse, main switch, and thruster motor, and all the way back to the negative battery terminal.
3. Find the recommended power cable cross-section for the installation by using the estimated total power cable length and the table shown in the chapter Electrical Reference Guide.
4. Select the recommended fuse size by using the table shown in the chapter Electrical Reference Guide.
5. Use an appropriate dimensioned battery with Cold Cranking Amps (CCA) according to recommendations given in the Electrical Reference Guide chapter. Battery voltage must be compliant with the voltage rating of the thruster motor and control circuitry. The capacity and rated discharge current of the battery should be according to the rated nominal current drawn and the typical duty cycle for thruster operation. The nominal current drawn is listed in the Electrical Reference Guide chapter.

The actual voltage at the motor while running the thruster determines the motor current draw. Using a smaller cross-section than recommended or a low-capacity battery could reduce performance and efficiency.

Installing a battery close to the thruster reduces the length of the power cables and potentially increases the performance, due to lower voltage drop in the power cables. For installations on large vessels with bow and stern thrusters or catamarans a dedicated battery for each thruster should be considered.

6. Install the cable from the retract mechanism as described in the chapter Retract Thruster Controller Cable Installation.
7. Install and connect the electrical components according to the applicable Wiring Diagram chapter.

For safety reasons it is always recommended to install a fuse and a main switch on the power cables and as close as possible to the positive battery terminal. The main switch must be installed such that it is easily accessible so that the thruster can be electrically disconnected to a safe state when not on-board or in the case of an emergency.

For dual thruster systems using only one battery bank a dedicated fuse and main switch should be installed for each thruster. These should be installed close to the battery bank.

Follow the instructions in the Motor Lug Connection chapter when fastening the power cables to the motor.

**WARNING**

**Battery terminal polarity must be observed and connected correctly**

8. Fuse and main switch should be installed according to the installation manual accompanying the products.
9. Install the control panel according to the instructions in the Installation Guide included with the control panel.
10. See the S-Link System Description chapter for detailed information on the installation of the S-Link Power cable and additional S-Link components.

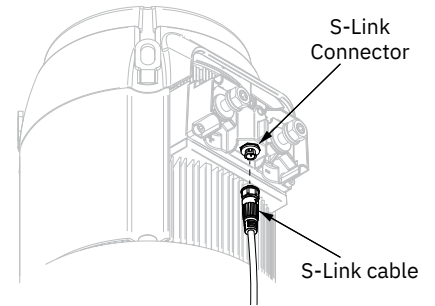
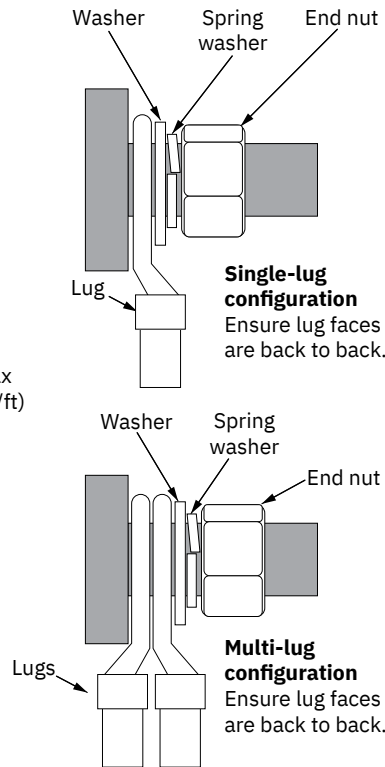
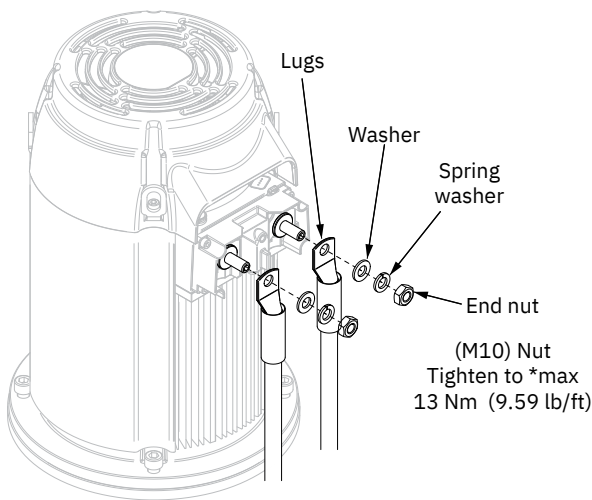
**WARNING**

**After all electrical connections have been completed, turn off main switch and check the following with an ohmmeter:**

1. There is no electrical connection between motor flange and the positive terminal on the motor.
2. There is no electrical connection between motor flange and the negative terminal on the motor.

**If unsure contact skilled personnel.**

## Motor Lug Connection



**IMPORTANT**  
Do NOT use washers between lugs, this causes overheating and fire. Spring washers must be placed in the outer position before tightening the nut.

MG\_0523

## Electrical Reference Guide

MC\_0532

Model Size	System Voltage	Nominal current	*Min. battery CCA	Rec. fuse	Cross Section Guide for Power Cables												
					Unit	<7m total + & -		7-14m total + & -		15-21m total + & -		22-28m total + & -		28-35m total + & -		36-45m total + & -	
						Min.	Rec.	Min.	Rec.	Min.	Rec.	Min.	Rec.	Min.	Rec.	Min.	Rec.
ERV/L 130/250	24V	295 A	DIN: 400 SAE: 760 EN: 680	ANL 250	mm <sup>2</sup>	50	50	50	70	70	95	95	120	120	2 x 70	2 x 95	2 x 95
					AWG	1/0	1/0	1/0	2/0	2/0	3/0	3/0	4/0	3/0	2 x 2/0	2 x 3/0	2 x 3/0
ERV/L 130/250	48V	180 A	DIN: 400 SAE: 760 EN: 680	ANL 125	mm <sup>2</sup>	50	50	50	70	70	95	95	120	120	2 x 70	2 x 95	2 x 95
					AWG	1/0	1/0	1/0	2/0	2/0	3/0	3/0	4/0	3/0	2 x 2/0	2 x 3/0	2 x 3/0
ERV/L 170/250	24V	420 A	DIN: 560 SAE: 1064 EN: 940	ANL 400	mm <sup>2</sup>	70	70	70	95	95	120	120	2 x 95	2 x 95	2 x 95	2 x 120	2 x 120
					AWG	2/0	2/0	2/0	3/0	3/0	4/0	4/0	2 x 3/0	2 x 3/0	2 x 3/0	2 x 4/0	2 x 4/0
ERV/L 170/250	48V	220 A	DIN: 560 SAE: 1064 EN: 940	ANL 200	mm <sup>2</sup>	70	70	70	95	95	120	120	2 x 95	2 x 95	2 x 95	2 x 120	2 x 120
					AWG	2/0	2/0	2/0	3/0	3/0	4/0	4/0	2 x 3/0	2 x 3/0	2 x 3/0	2 x 4/0	2 x 4/0
ERV 210/250	24V	600 A	DIN: 560 SAE: 1330 EN: 940	ANL 500	mm <sup>2</sup>	95	95	95	120	120	2 x 70	120	2 x 70	2 x 70	2 x 95	2 x 95	2 x 120
					AWG	3/0	3/0	3/0	4/0	4/0	2/0	4/0	2 x 2/0	2 x 2/0	2 x 3/0	2 x 3/0	2 x 4/0
ERV 210/250	48V	320 A	DIN: 560 SAE: 1330 EN: 940	ANL 300	mm <sup>2</sup>	70	70	70	95	95	120	120	2 x 70	2 x 70	2 x 95	2 x 95	2 x 120
					AWG	2/0	2/0	2/0	3/0	3/0	4/0	4/0	2 x 2/0	2 x 2/0	2 x 3/0	2 x 3/0	2 x 4/0

eVision thrusters have high efficiency and can therefore offer long run times. The proposed cable cross sections in above table are only for reference. Dependent on system voltage, the stated nominal current is measured with 21V or 42V at the motor terminals.

Lower voltage level at the motor terminals will increase the current drawn by the thruster. To avoid significant voltage drop and excessive heat generation in cables and other system components selection of battery and cable cross section is critical.

Higher current consumption can also be caused by incorrect thruster installation and marine growth in the tunnel and on the propeller.

Current draw will depend on many factors such as but not limited to:

- Voltage drop
- Battery health
- Cable lengths and dimensions
- Performed tunnel installation
- Ventilation
- Obstructing marine growth

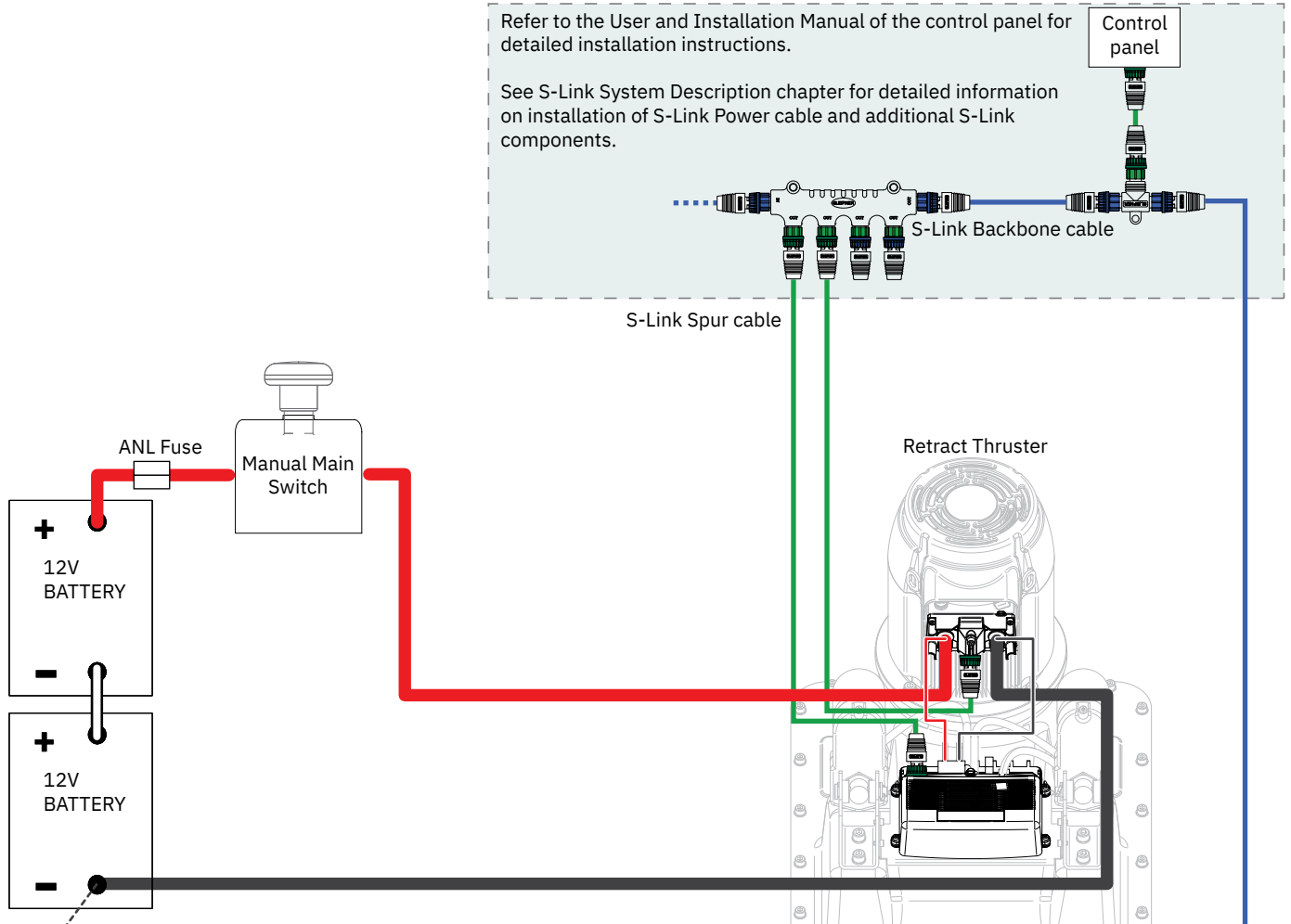
For each installation an experienced electrician should be consulted for cable cross section calculations and selection of fuses, main circuit and batteries.

# Manual Main Switch Wiring Diagram 24V Retract Thruster

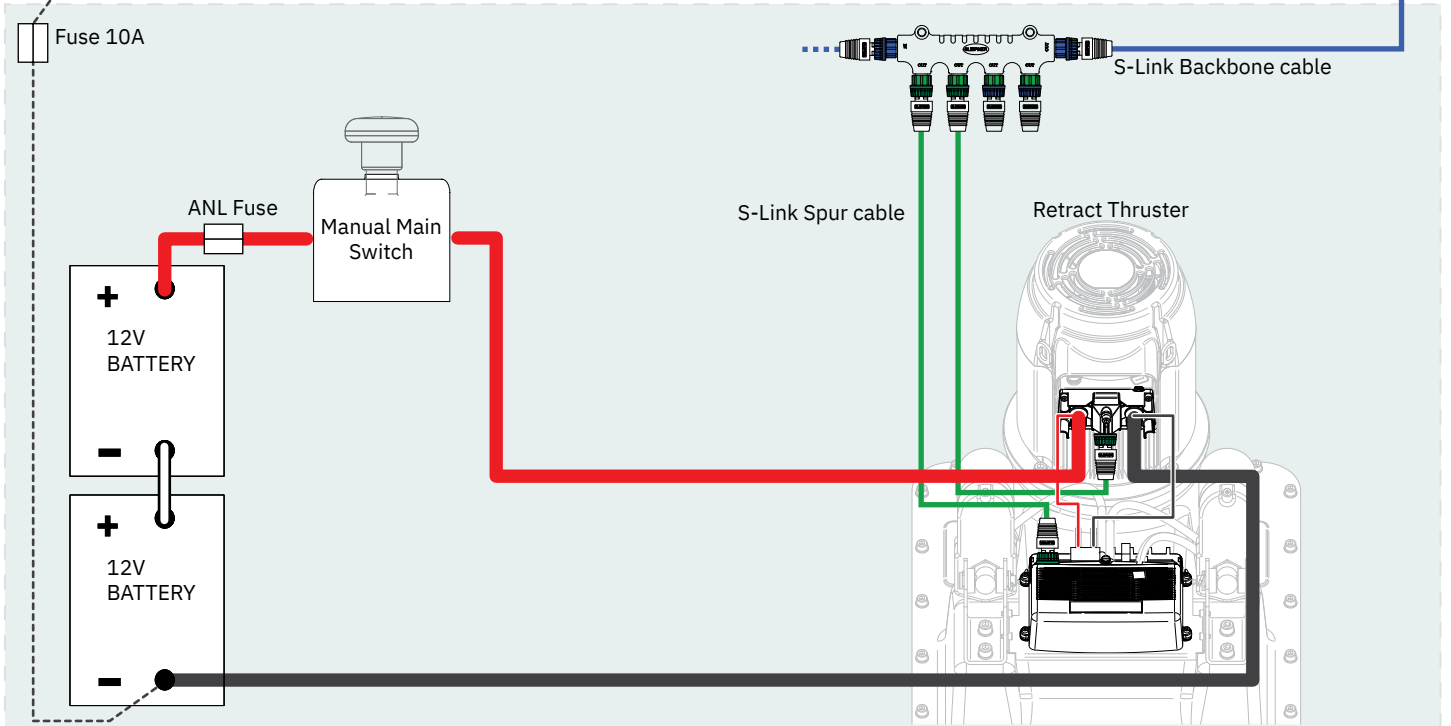
The Top wiring diagram is for a single bow or stern thruster system

Refer to the User and Installation Manual of the control panel for detailed installation instructions.

See S-Link System Description chapter for detailed information on installation of S-Link Power cable and additional S-Link components.



The top and bottom wiring diagram is for a dual thruster system, for example a bow and stern installation.



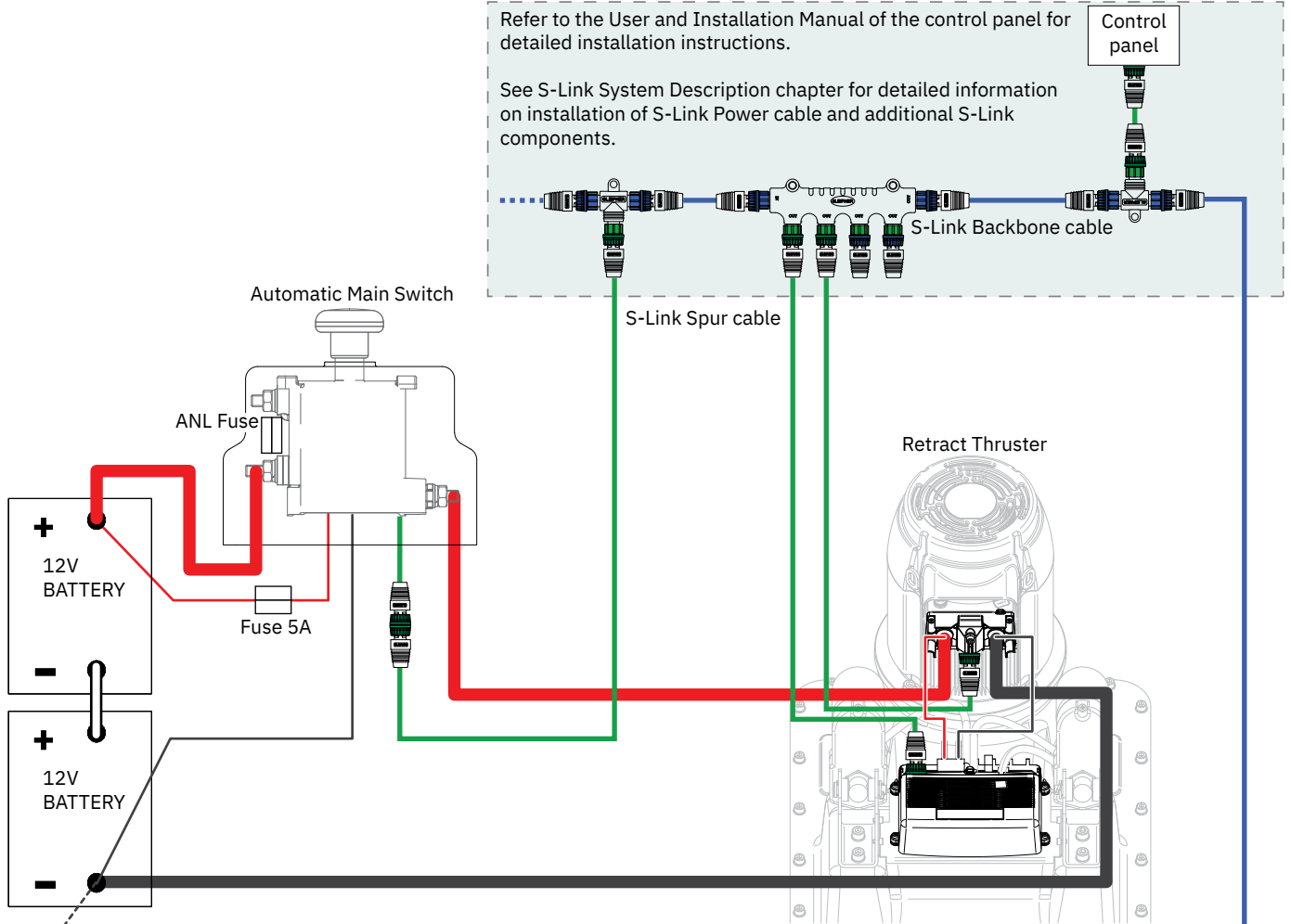
MG\_0625

# Automatic Main Switch Wiring Diagram 24V Retract Thruster

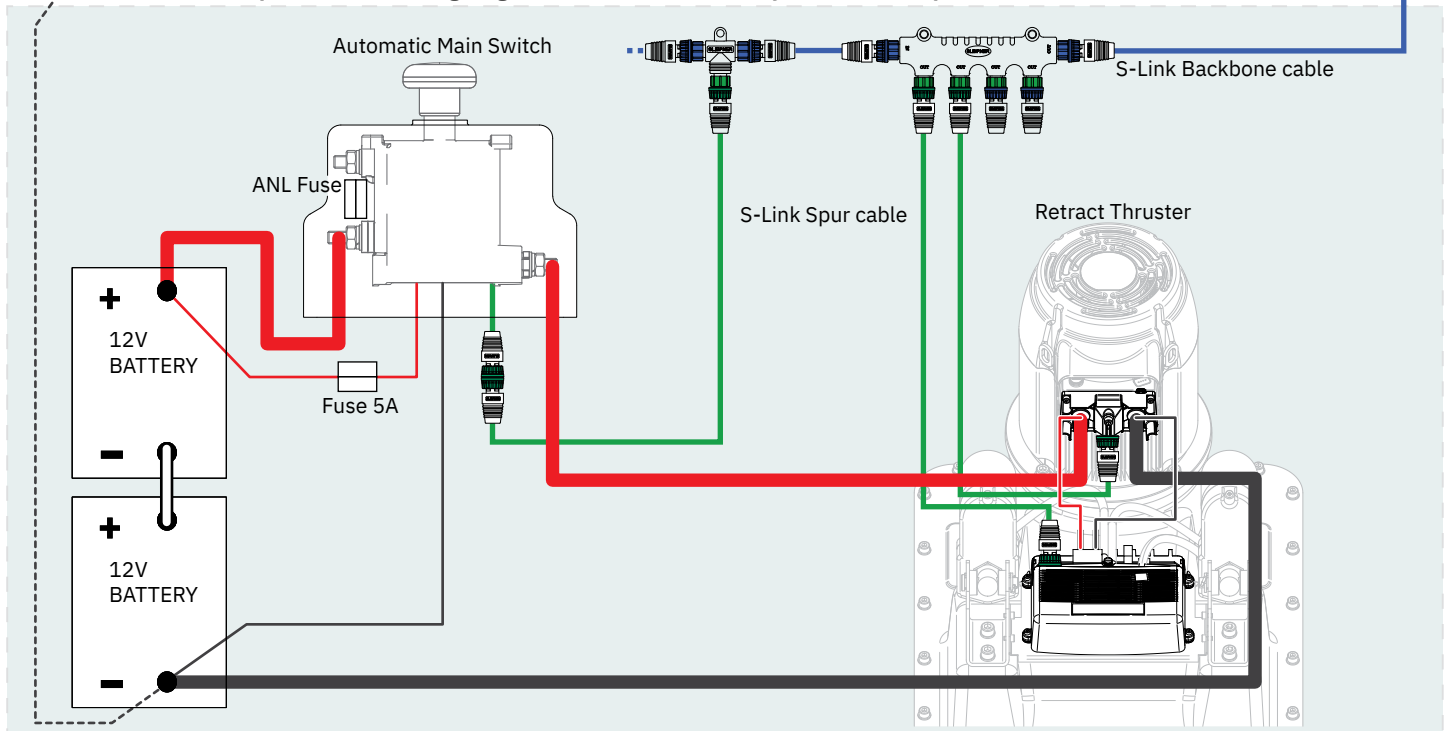
The Top wiring diagram is for a single bow or stern thruster system

Refer to the User and Installation Manual of the control panel for detailed installation instructions.

See S-Link System Description chapter for detailed information on installation of S-Link Power cable and additional S-Link components.



The top and bottom wiring diagram is for a dual thruster system, for example a bow and stern installation.



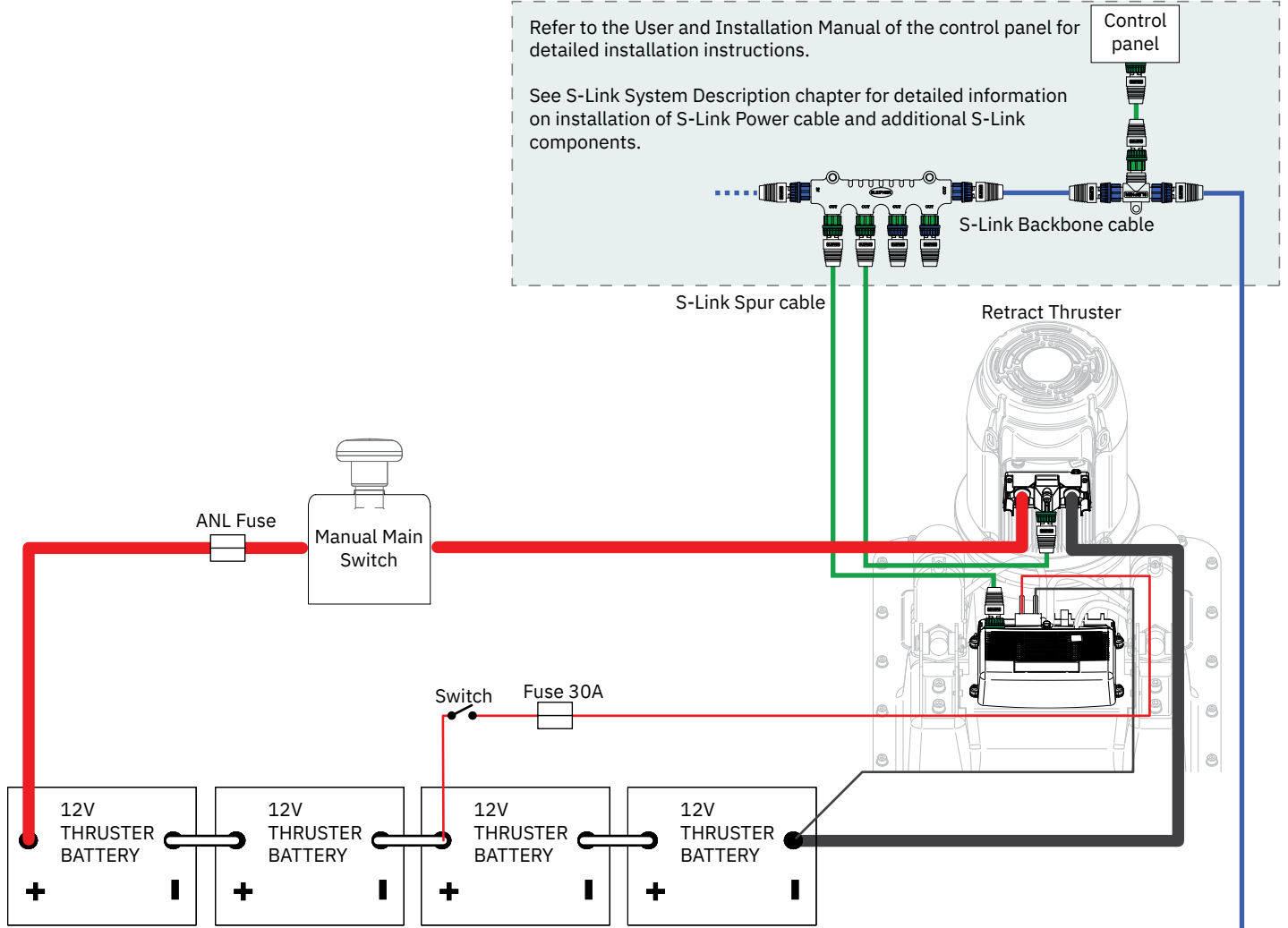
MG\_0585

# Manual Main Switch Wiring Diagram 48V Retract Thruster

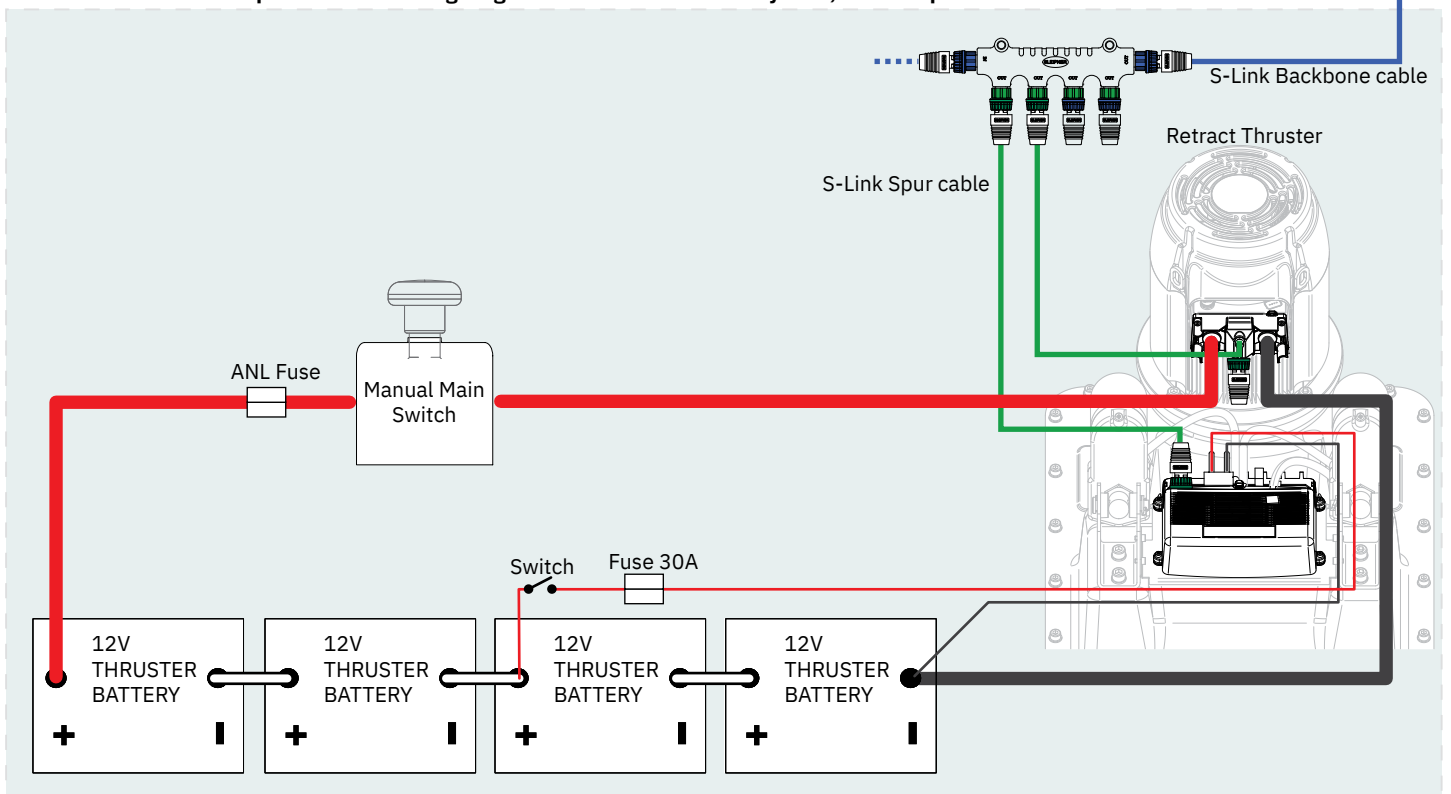
The Top wiring diagram is for a single bow or stern thruster system

Refer to the User and Installation Manual of the control panel for detailed installation instructions.

See S-Link System Description chapter for detailed information on installation of S-Link Power cable and additional S-Link components.

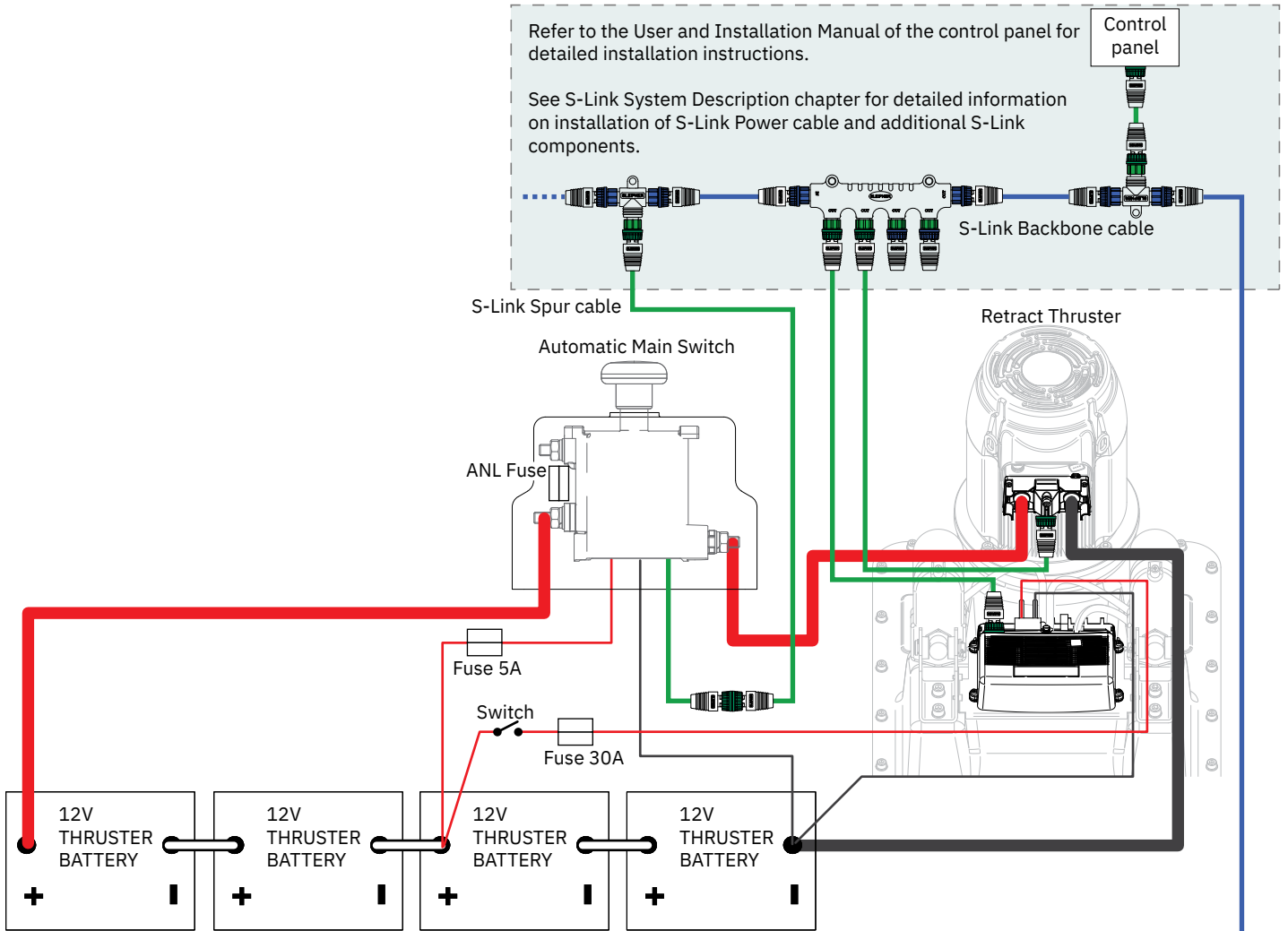


The top and bottom wiring diagram is for a dual thruster system, for example a bow and stern installation.

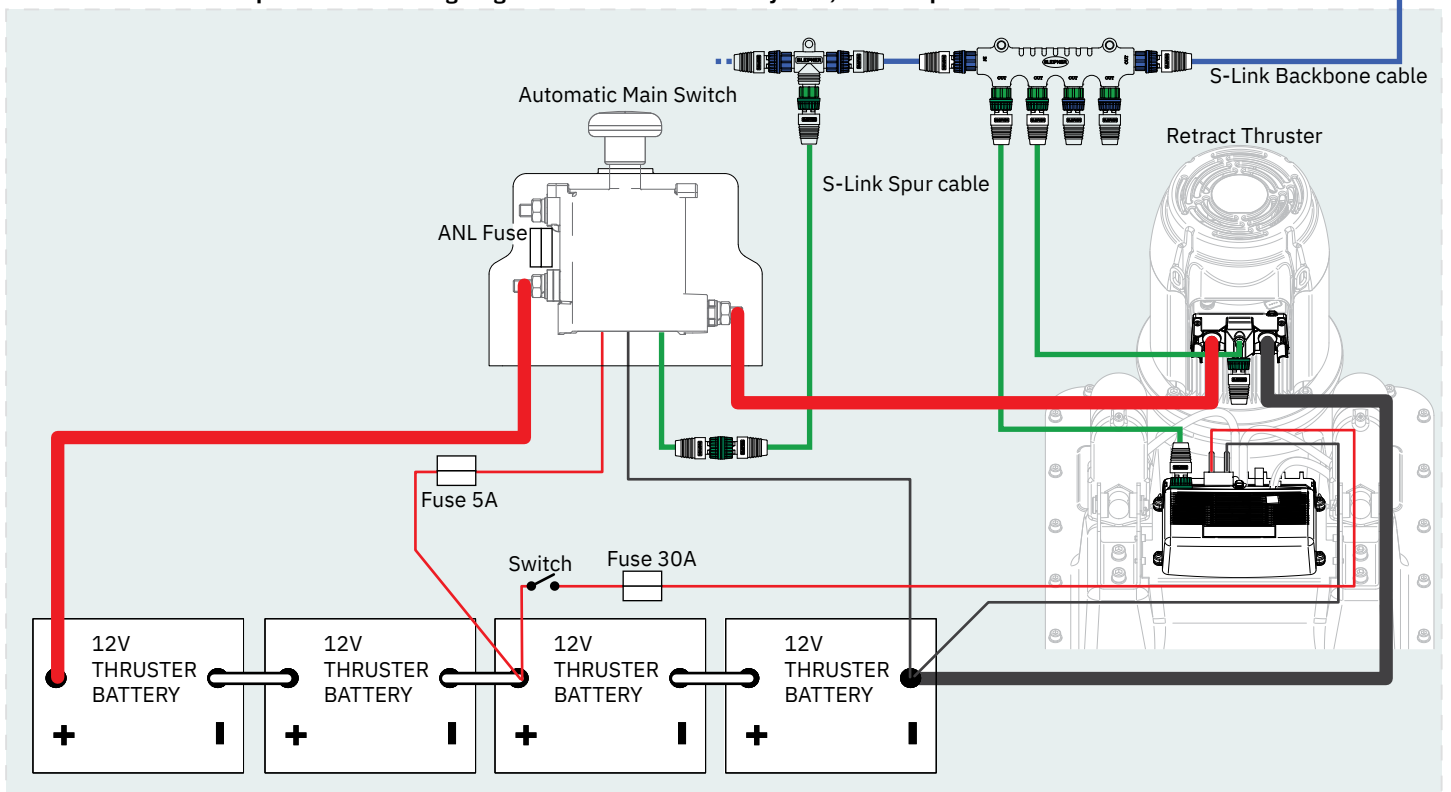


# Automatic Main Switch Wiring Diagram 48V Retract Thruster

The Top wiring diagram is for a single bow or stern thruster system



The top and bottom wiring diagram is for a dual thruster system, for example a bow and stern installation.



MG\_0586

S-Link is a CAN-based control system used for communication between Sleipner products installed on a vessel. The system uses BACKBONE Cables as a common power and communication bus with separate SPUR Cables to each connected unit. Only one S-Link POWER cable shall be connected to the BACKBONE Cable. Units with low power consumption are powered directly from the S-Link bus.

**Main advantages of S-Link system:**

- Compact and waterproof plugs.
- BACKBONE and SPUR Cables have different colour coding and keying to ensure correct and easy installation. BACKBONE Cables have blue connectors and SPUR Cables have green connectors.
- Different cable lengths and BACKBONE Extenders make the system scalable and flexible to install.

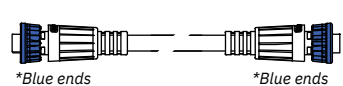
**Installation of S-Link cables:**

Select appropriate cables to keep the length of BACKBONE- and SPUR Cables to a minimum. In case of planned installation with total BACKBONE Cable length exceeding 100 meters please consult your local distributor. The S-Link cables should be properly fastened when installed to avoid sharp bend radius, cable chafing and undesired strain on connectors. Locking mechanism on connectors must be fully closed. To ensure long lifetime, cables, T-Connectors and Extenders should not be located so that they are permanently immersed in water or other fluids. It is also recommended to install cables such that water and condensation do not run along the cables and into the connectors.

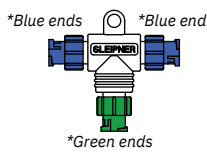
The POWER Cable should ideally be connected around the middle of the BACKBONE bus to ensure an equal voltage drop at each end of the BACKBONE Cable. The yellow and black wire in the POWER Cable shall be connected to GND and the red wire connected to +12VDC or +24VDC.

To reduce the risk of interference, avoid routing the S-Link cables close to equipment such as radio transmitters, antennas or high voltage cables. The backbone must be terminated at each end with the END Terminator.

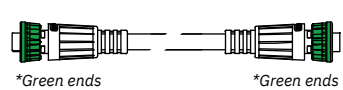
SPUR cables can be left unterminated to prepare for the installation of future additional equipment. In such cases, ensure to protect open connectors from water and moisture to avoid corrosion in the connectors.



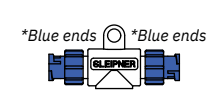
**BACKBONE Cable**  
Forms the communication and power bus throughout a vessel. Available in different standard lengths.



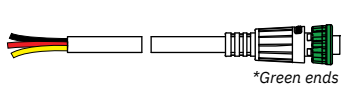
**T-Connector**  
Used for connection of SPUR or POWER Cable to the BACKBONE Cable. One T-Connector for each connected cable.



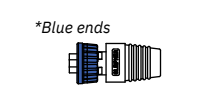
**SPUR Cable**  
Used to connect S-Link compliant products to the backbone cable. One SPUR Cable must be used for each connected component, with no exceptions. Recommended to be as short as practically possible. Available in different standard lengths.



**BACKBONE Extender**  
Connects two BACKBONE Cables to extend the length.

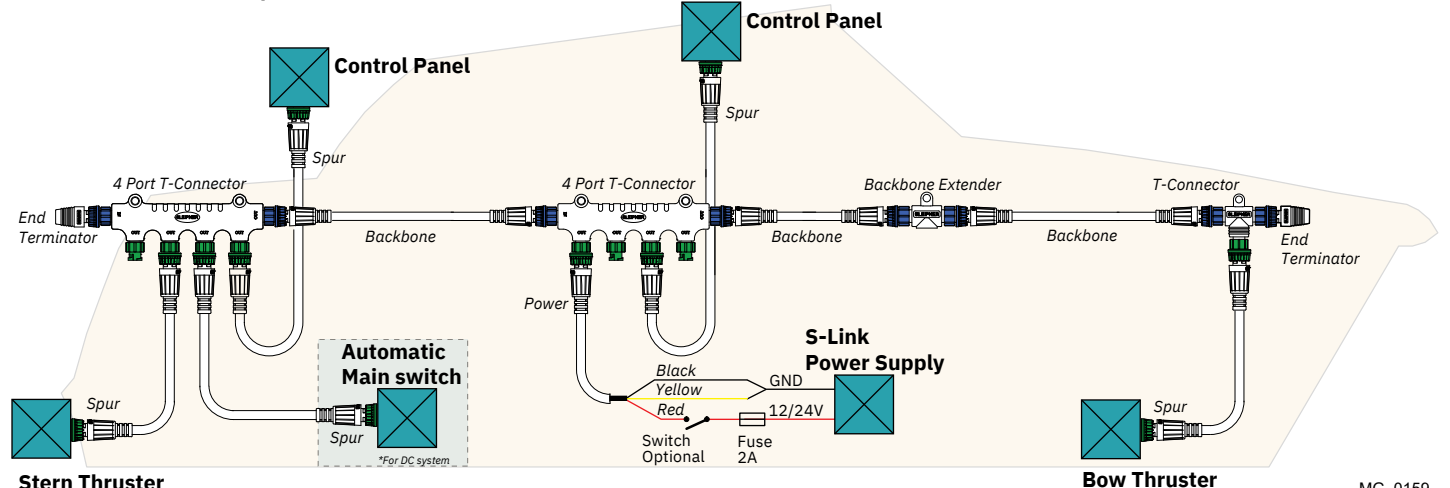


**POWER Cable**  
Required in all installations for connection of BACKBONE Cable to a power supply and should be protected with a 2A fuse.



**4-Port T-Connector**  
The 4-PORT T-connector allows multiple SPUR Cables to be connected. The 4-PORT T-connector comes with two sealing caps to protect unused ports.

**S-Link installation example**





## IMPORTANT

Before the thruster motor is operated, check the drive shaft alignment is completely straight when it reaches the end position from the control panel operation:

- 1) Connect power to thruster and S-link system.
- 2) Set DIP-switch on the controller to 0000.
- 3) Turn on the panel. (The drive shaft deploys.)
- 4) The actuator lever arm is set to alignment marking on the nut
- 5) If marks align, turn panel off. Drive shaft retracts.
- 6) If the marks do not align, proceed to calibrate drive shaft.

# Calibrate drive shaft alignment

**(NB: The drive shaft is correctly aligned when manufactured)**

- 1) With dip-switches select 'Service Mode'.
- 2) Align the arrow on the actuator arm with the calibration mark, using the UP/DOWN buttons.
- 3) With dip-switches select 'Sensor Calibration Mode'.
- 4) Press and hold both UP and DOWN buttons until STATUS LED light up green.

**(NB: If FAULT LED light-up red, then the calibration is out of position (wrong align mark).**

- 5) With dip-switches select 'Operation Mode', thruster retracts.

# Actuator Configuration

Dip-switch number 1 & 2 configures the actuator(s).

No.1 set to OFF when the retract has two actuators.

No.1 set to ON when the retract only has one actuator.

No.2 set to OFF when the retract does not have P8 type actuator(s).

No.2 set to ON when the retract has the P8 type actuator(s).

If dip-switch no.2 is set to ON and the actuator gives a rattling noise when the door closes, then there probably is not P8 actuator(s) and dip-switch no.2 needs to be set to OFF.

The actuator is a P8 type:

- If the actuator has a plastic cap at the back where you can adjust the actuator manually.
- If it is marked with a sticker with P8
- If the manufacturer label says P8

# LED Indication

## Continuous red light:

Motor over-temp, Controller over-temp, Controller no communication, Motor relay failure, Low battery voltage, Position sensor failure, No power to actuators, Retractable unit failure, Temp sensor open circuit.

## Flashing red light:

Red light fast blinking: Dip-switch in an invalid position.

Red light short flash every 2 seconds: Shaft not calibrated, or shaft calibrated out of range.

## Continuous green light:

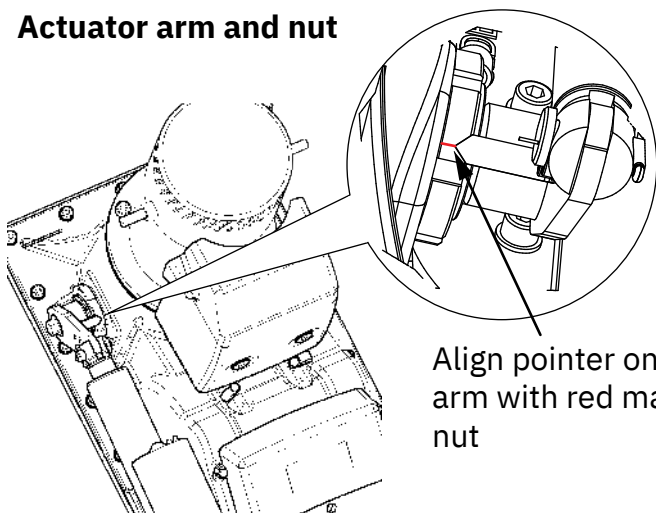
Normal mode, Service mode (actuators operated by UP/DOWN buttons).

Re-calibrated "down"-position.

## Flashing green light:

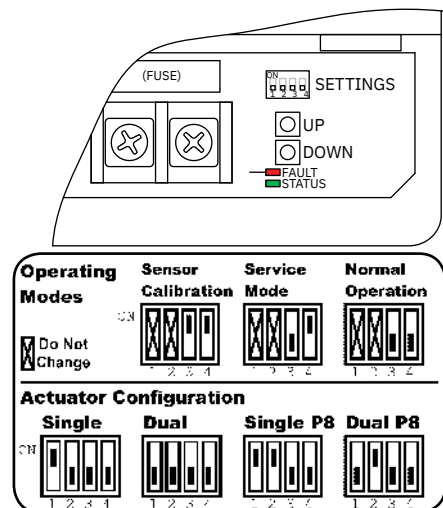
No S-Link communication.

## Actuator arm and nut



Align pointer on lever arm with red mark on nut

## Controller





For **Control Panel** installation please refer to the Installation Guide accompanying the control panel to be installed.



- ..... The bolts holding the gear house and main bracket together are tightened correctly.
- ..... The bolts holding the motor to its bracket are tightened correctly.
- ..... All electrical connections are clean, dry and tight, and the correct cable, fuse and main switch size.
- ..... Check that there is no electrical connection between the electro motor body and positive terminal on the motor, and between the electro motor body and the negative terminal on the motor with an ohm meter.
- ..... Anti-fouling has been applied to the gear house and propeller but NOT anodes, sealing/ rubber fittings or propeller shafts.
- ..... Propeller is fastened correctly to the shaft.
- ..... Propeller turns freely in tunnel.
- ..... The anode and/ or holding screw is tightened well with thread glue.
- ..... Check the boat for potential water leakage around installation areas.
- ..... Correct drive direction as per control panel.
- ..... User Manual is supplied to the owner.

**The thruster has been installed as per the instructions in this manual and all points in checklist above have been controlled.**

Signed: .....

Date: .....

Thruster type: .....

Serial number:.....

Date of delivery:.....

Correct drive direction as per control panel: .....

The compartment for the thruster has been isolated from general bilge water and has no obvious or suspected risks for flooding:

.....  
.....  
.....

Other comments by installer: .....

.....  
.....

**Find your local professional dealer from our certified worldwide network for expert service and support. visit our website [www.sleipnergrouper.com/support](http://www.sleipnergrouper.com/support)**

## Product Spare Parts and Additional Resources

**For additional supporting documentation, we advise you to visit our website [www.sleipnergrouper.com](http://www.sleipnergrouper.com) and find your Sleipner product.**

## Warranty statement

1. Sleipner Motor AS (The “Warrantor”) warrants that the equipment (parts, materials, and embedded software of products) manufactured by the Warrantor is free from defects in workmanship and materials for purpose for which the equipment is intended and under normal use and maintenance service (the “Warranty”).
2. This Warranty is in effect for two years (Leisure Use) or one year (Commercial and other Non-leisure Use) from the date of delivery/purchase by the end user, with the following exceptions;
  - (a) For demonstration vessels, or vessels kept on the water, the dealer is considered as the end user from 6 months after their launch of the vessel;
  - (b) The warranty period starts no later than 18 months after the first launch of the vessel.
 Please note that the boat manufacturer and dealer must pay particular attention to correct maintenance and service both by the products manuals as well as general good practice for the location the boat is kept in the period the boat is in their care. In cases where the 6 and 18 months grace periods for boat builders and dealers are passed, it is possible to obtain a full warranty upon inspection and approval of the warrantor or such representative.
3. Certain parts, classified as wearable or service parts, are not covered by the warranty. A failure to follow the required maintenance and service work as described in the product manual render all warranty on parts or components directly or indirectly affected by this void. Please also note that for some parts, time is also a factor separately from actual operational hours.
4. This Warranty is transferable and covers the equipment for the specified warranty period.
5. The warranty does not apply to defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically designed as waterproof.
6. In case the equipment seems to be defective, the warranty holder (the “Claimant”) must do the following to make a claim:
  - (a) Contact the dealer or service centre where the equipment was purchased and make the claim. Alternatively, the Claimant can make the claim to a dealer or service centre found at [www.sleipnergrouper.com](http://www.sleipnergrouper.com). The Claimant must present a detailed written statement of the nature and circumstances of the defect, to the best of the Claimant’s knowledge, including product identification and serial nbr., the date and place of purchase and the name and address of the installer. Proof of purchase date should be included with the claim, to verify that the warranty period has not expired;
  - (b) Make the equipment available for troubleshooting and repair, with direct and workable access, including dismantling of furnishings or similar, if any, either at the premises of the Warrantor or an authorised service representative approved by the Warrantor. Equipment can only be returned to the Warrantor or an authorised service representative for repair following a pre-approval by the Warrantor’s Help Desk and if so, with the Return Authorisation Number visible postage/shipping prepaid and at the expense of the Claimant.
7. Examination and handling of the warranty claim:
  - (a) If upon the Warrantor’s or authorised service Representative’s examination, the defect is determined to result from defective material or workmanship in the warranty period, the equipment will be repaired or replaced at the Warrantor’s option without charge, and returned to the Purchaser at the Warrantor’s expense. If, on the other hand, the claim is determined to result from circumstances such as described in section 4 above or a result of wear and tear exceeding that for which the equipment is intended (e.g. commercial use of equipment intended for leisure use), the costs for the troubleshooting and repair shall be borne by the Claimant;
  - (b) No refund of the purchase price will be granted to the Claimant, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. In the event that attempts to remedy the defect have failed, the Claimant may claim a refund of the purchase price, provided that the Claimant submits a statement in writing from a professional boating equipment supplier that the installation instructions of the Installation and Operation Manual have been complied with and that the defect remains.
8. Warranty service shall be performed only by the Warrantor, or an authorised service representative, and any attempt to remedy the defect by anyone else shall render this warranty void.
9. No other warranty is given beyond those described above, implied or otherwise, including any implied warranty of merchantability, fitness for a particular purpose other than the purpose for which the equipment is intended, and any other obligations on the part of the Warrantor or its employees and representatives.
10. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives based on this Warranty for injury to any person or persons, or damage to property, loss of income or profit, or any other incidental, consequential or resulting damage or cost claimed to have been incurred through the use or sale of the equipment, including any possible failure or malfunction of the equipment or damages arising from collision with other vessels or objects.
11. This warranty gives you specific legal rights, and you may also have other rights which vary from country to country.

## Patents

At Sleipner we continually reinvest to develop and offer the latest technology in marine advancements. To see the many unique designs we have patented visit our website [www.sleipnergrouper.com/patents](http://www.sleipnergrouper.com/patents)

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**SLEIPNER GROUP**

P.O. Box 519

N-1612 Fredrikstad

Norway

[www.sleipnergroun.com](http://www.sleipnergroun.com)

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