

Installation Guide

For Hydraulic Retractable Thruster Models
SRHV240, SRHV320



SLEIPNER MOTOR AS

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Products

SE20/110S - SE20 Tunnel thruster, 12V
 SE25/110S - SE25 Tunnel thruster, 12V
 SE30/125S2 - SE30 Tunnel thruster, 12V
 SE40/125S2 - SE40 Tunnel thruster, 12V



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MC_0020

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 Considerations and Precautions 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.)**

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.
- We advise painting 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.

If an original Sleipner hydraulic system is NOT installed, please ensure the following:

MC_0009

- Install an oil filter to keep the oil clean.
- Fit an oil cooler or use an oil tank to ensure the maximum oil temperature is 43 - 50 degrees Celsius.
- Hydraulic thrusters are supplied with hydraulic motors only.
- The installed hydraulic system is the responsibility of the fitter/ installer and must be within the limitations outlined in this manual to ensure no damage is caused to the thruster.
- The hydraulic valve must have flow and pressure limits that are either set within or can be adjusted to the limits of the thrusters capability.
- We strongly advise that a shock valve is fitted and set to 10% - 15% above the chosen maximum pressure set in the valve. This will prevent the system from being damaged if the propellers are blocked for any reason.
- It is required that a device is installed to ensure that the drive direction cannot be suddenly changed, as this can severely damage the gear house. **(NB: By adding an electronic time-lapse/delay safety on the electric control system or by using a valve that has this type of protection built in will prevent this issue. *The required time delay is 1 second.)**

When installing an S-Link™ system DO NOT connect any other control equipment directly to the S-Link™ bus except original Sleipner S-Link™ products.

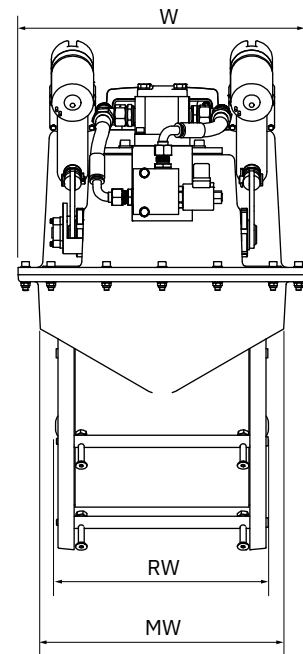
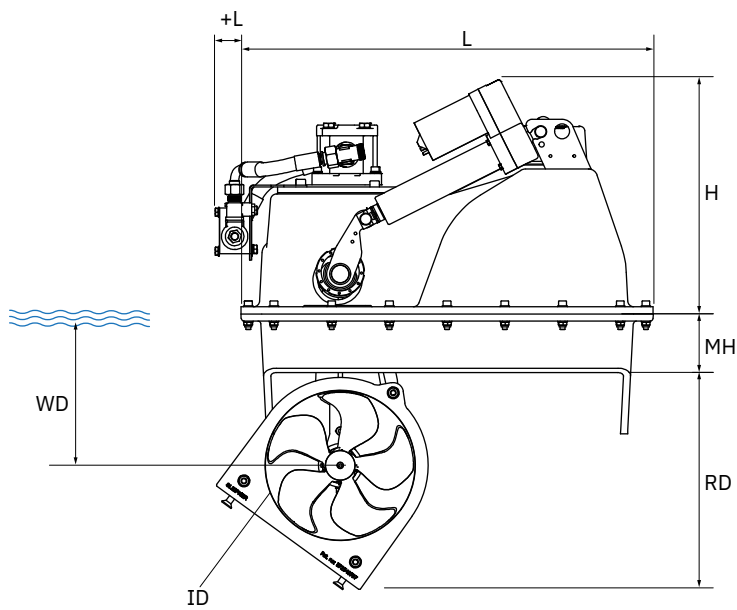
In case of connecting third-party equipment, it must always be connected through a Sleipner-supplied interface product.

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.

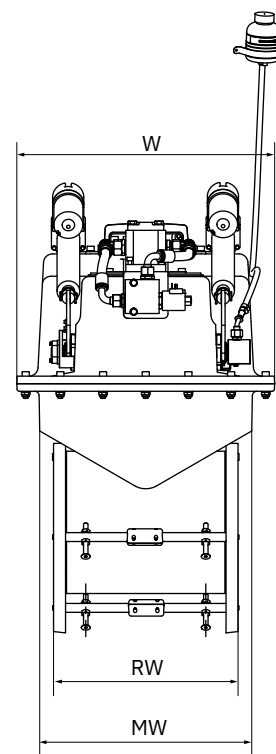
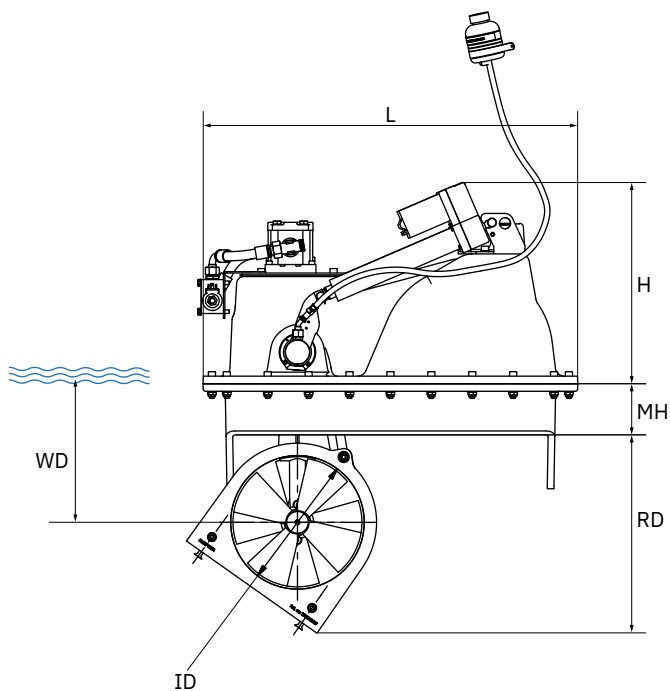
MC_0105

Measurement code	Measurement description	SRH 240	
		mm	inch
H	Height	390	15.4
L	Length	688	27.1
+L	Additional Length	42	1.7
W	Width	481	18.9
ID	Internal Diameter	250	9.80
WD	Water Depth	250	9.80
RD	Retract Depth	361	14.2
RW	Retract Width	347	13.7
MW	Mould Width	414	16.3
MH	Mould Height	98	3.9



MG_0422

Measurement code	Measurement description	SRH 320	
		mm	inch
H	Height	455	17.9
L	Length	843	33.2
W	Width	580	22.83
ID	Internal Diameter	300	11.8
WD	Water Depth	300	11.8
RD	Retract Depth	445	17.5
RW	Retract Width	415	16.3
MW	Mould Width	480	18.9
MH	Mould Height	115	4.5



MG_0421

Product Specifications

MC_0169

Product	Lubrication	Light Duty Thrust is kg	Heavy Duty Thrust is kg	Power Output kW / Hp	Weight kg / lbs	Maximum Operation Time
SH240	Sealed - Oil bath from tank EP-90	240 kg / 529 lbs	220 kg / 440 lbs	14.9 kW / 20 hp	13.5 kg / 29.76 lbs	Continuous
SH320	Sealed - Oil bath from tank EP-90	320 kg / 705 lbs	270 kg / 594 lbs	17.16 kW / 23.3 hp	17.16 kg / 37.83 lbs	

Flow and Pressure Specifications

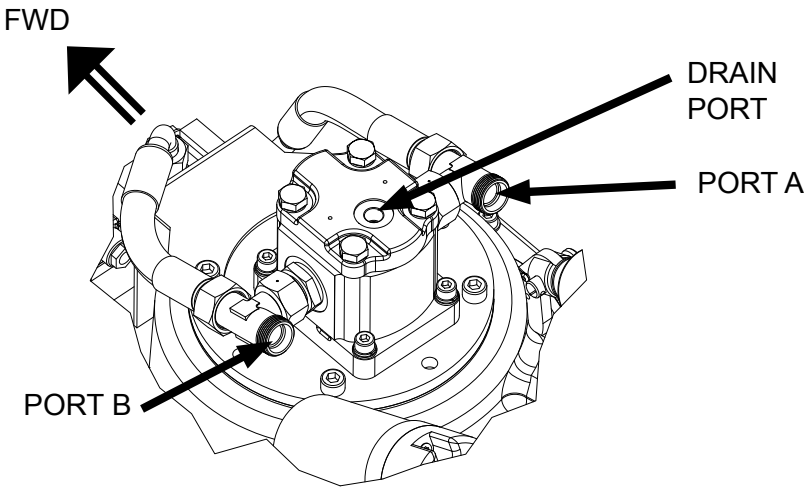
MC_0169

Thruster model	Motor type		60 %		80 %		100 %	
			Flow	Pressure	Flow	Pressure	Flow	Pressure
SH240	U,G,P 8	L/min-Bar	19.1	217	21.4	275	21,4	275 ¹⁾
		USG-PSI	5.05	3147	5.65	3988	5.65	3988 ¹⁾
	U,G,P 10	L/min-Bar	23.8	174	27.5	232	30	275 ²⁾
		USG-PSI	6.29	2523	7.23	3364	7.93	3988 ²⁾
	U,G,P 11	L/min-Bar	26.2	158	30.2	211	33,8	264
		USG-PSI	6.9	2291	8.0	3060	8.9	3828
	U,G,P 14	L/min-Bar	33.1	124	38.2	166	42.7	207
		USG-PSI	8.7	1798	10.1	2407	11.3	3002
	U,G,P 16	L/min-Bar	38.1	109	44.0	145	49.2	181
		USG-PSI	10.1	1581	11.6	2103	13.0	2625
	U,G,P 19	L/min-Bar	45.1	92	52.1	122	58.3	153
		USG-PSI	11.9	1334	13.8	1769	15.4	2219

1) Max. thrust: 182kg
2) Max. thrust: 228kg

Thruster model	Motor type		60 %		80 %		100 %	
			Flow	Pressure	Flow	Pressure	Flow	Pressure
SH320	U,G,P 11	L/min-Bar	23.8	249	24.9	274	24.9	274 ¹⁾
		USG-PSI	6.29	3611	6.58	3973	6.58	3973 ¹⁾
	U,G,P 14	L/min-Bar	30.1	196	34.7	261	35.6	274 ²⁾
		USG-PSI	7.95	2842	9.17	3785	9.41	3973 ²⁾
	U,G,P 16	L/min-Bar	34.6	171	39.9	229	43.7	274 ³⁾
		USG-PSI	9.14	2480	10.54	3321	11.55	3973 ³⁾
	BA 16	L/min-Bar	33.8	172	39.0	230	43.6	287
		USG-PSI	8.93	2494	10.30	3335	11.52	4162
	U,G,P 19	L/min-Bar	41.0	144	47.3	193	52.9	241
		USG-PSI	10.83	2088	12.50	2799	13.98	3495
	BA 19	L/min-Bar	40.1	145	46.3	194	51.8	242
		USG-PSI	10.59	2103	11.44	2813	13.69	3509
	U,G,P 23	L/min-Bar	49.4	121	57	162	63.8	202
		USG-PSI	13.05	1755	15.06	2349	16.86	2929

1) Max. thrust: 211kg
2) Max. thrust: 269kg
3) Max. thrust: 307kg



Motor type	Port A/B	Drain Port
G16	22L, Metric DIN 2353	1/4" BSP
G19	22L, Metric DIN 2353	1/4" BSP
G23	22L, Metric DIN 2353	1/4" BSP

Positioning of the Retract thruster

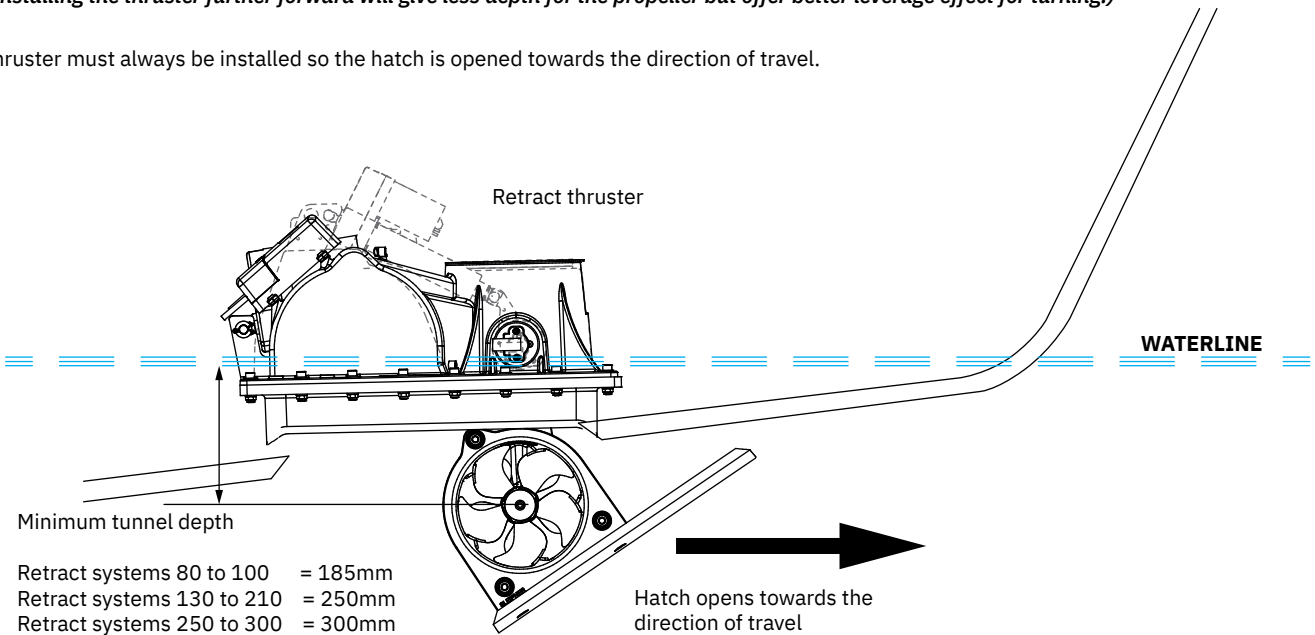
Bow

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 retracted propeller is a minimum of:

(185mm for retract systems 80 to 100) (250mm for retract systems 130 to 210) (300mm for retract systems 250 to 300)
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

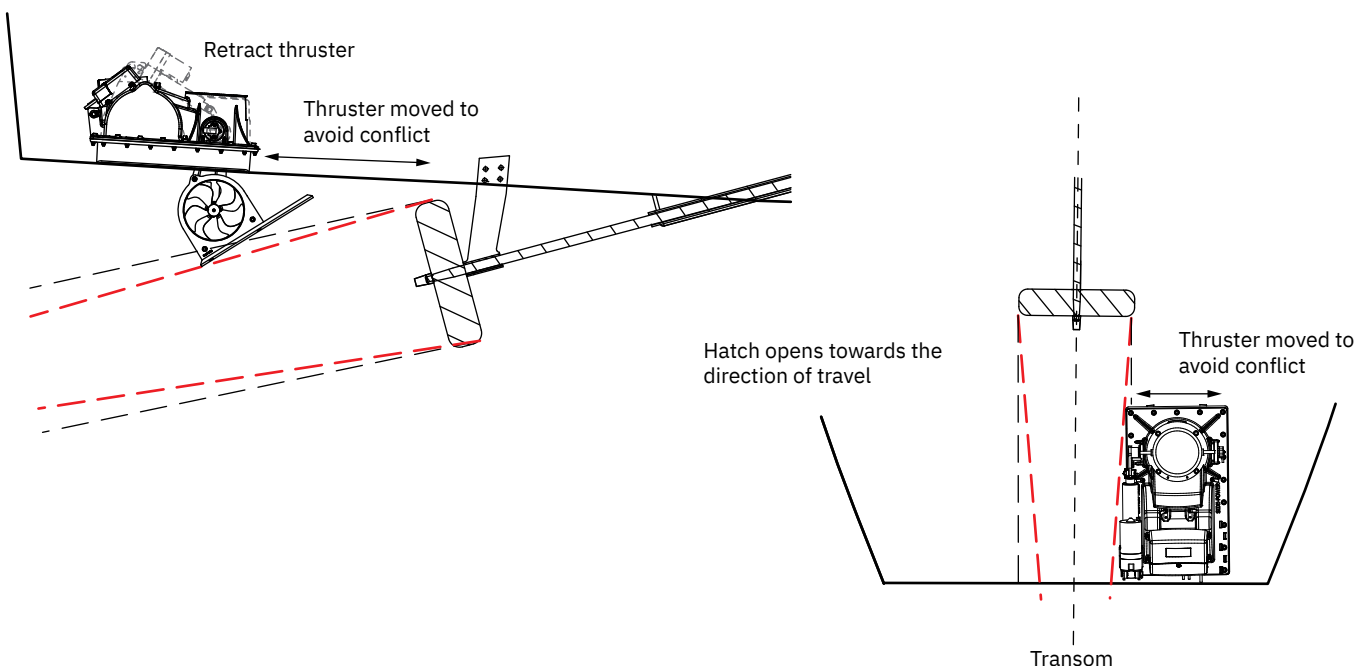
The thruster must be installed as far forward as possible. Allow for 100mm around the thruster for moulding the retract frame and the depth of the retracted propeller is a minimum of:

(185mm for retract systems 80 to 100) (250mm for retract systems 130 to 210) (300mm for retract systems 250 to 300)
under the waterline. 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.

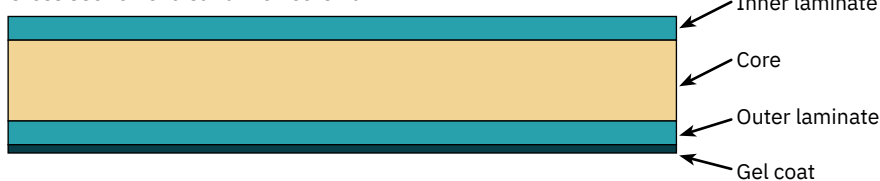
Always ensure enough space for the complete SR unit including motor, actuators, retract frame, future service and for installation moulding to the hull.



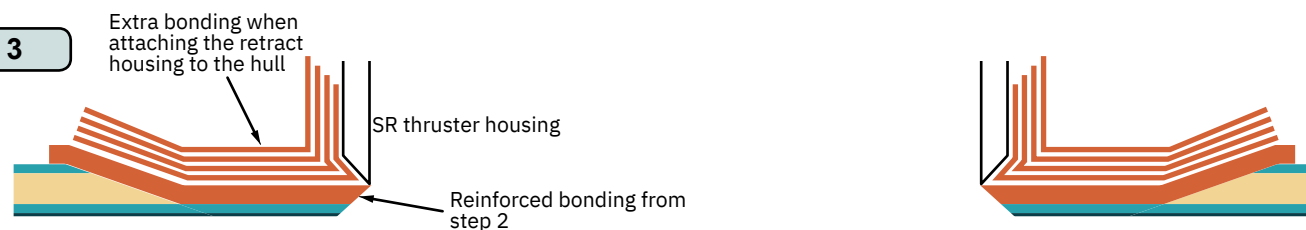
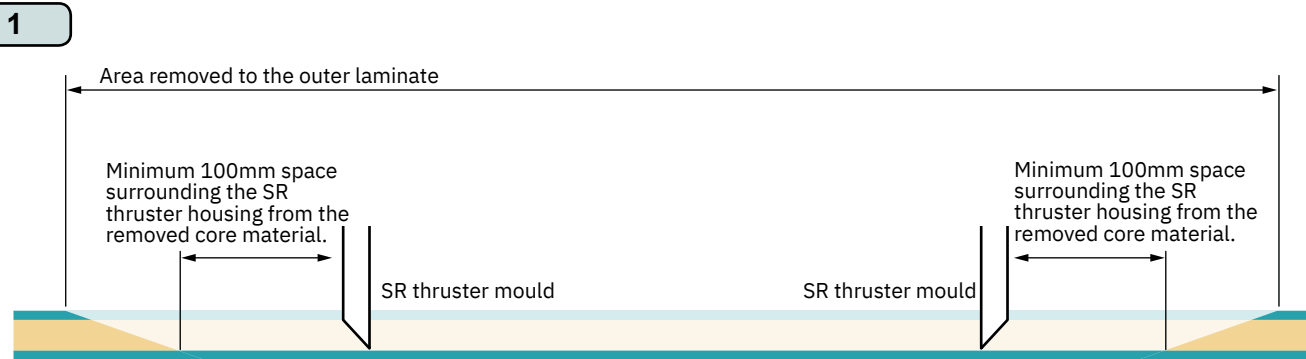
MG_0121

Hull construction typical in many vessels is a composite layering method called a sandwich. To ensure the retract thruster is installed securely to these hull types, additional hull structure reinforcement is required to strengthen the area around the Slepner retract housing mould.

Cross section of a sandwich core hull



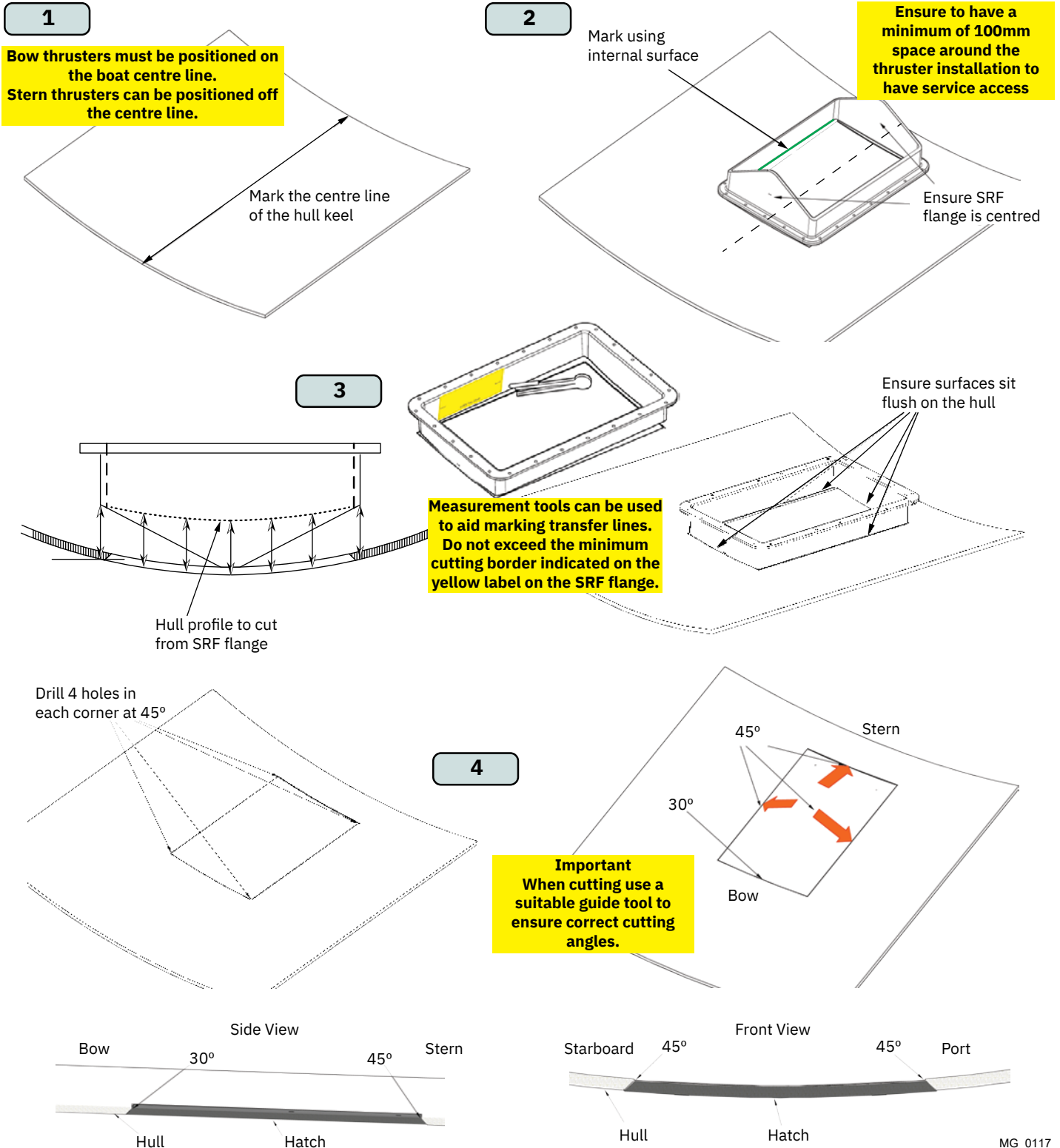
1. To achieve maximum strength and bonding in the area around the installation of the retract thruster remove the inner and core material to expose the outer laminate. Remove enough area for a 100mm (minimum) clearance surrounding the retract thruster housing.
2. Reinforce the area with bonding to strengthen 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)



MG_0472

! 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.)**
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.)**



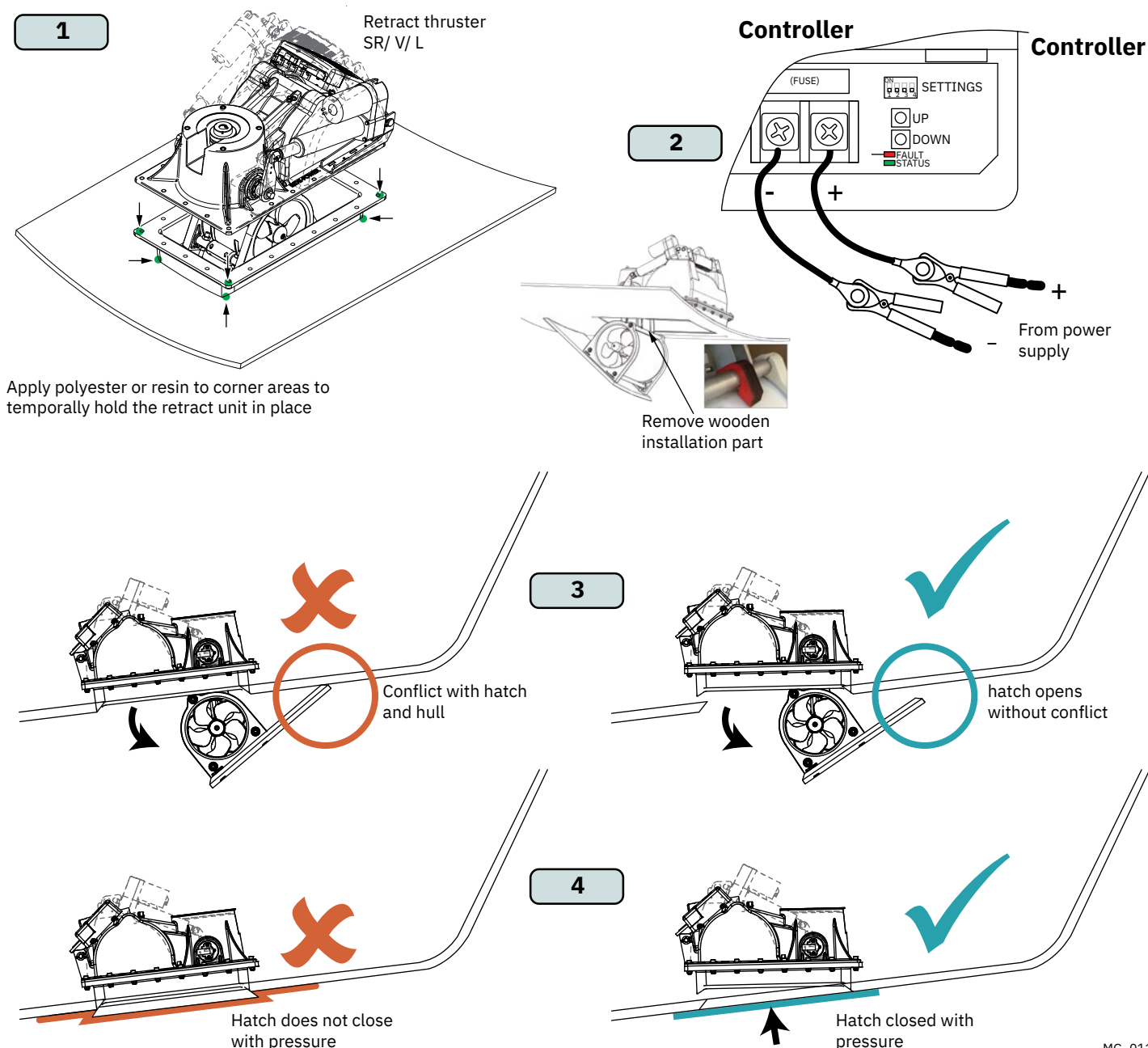
! Please refer to the graphic for special considerations relating to your model !

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

1. Use polyester or resin in the 4 corners of the lower retract mould and set it over the hatch. Attach the upper retract mould to the lower retract mould with 4 corner screws to hold them securely in place. 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 12 or 24 DC cables (refer to the label on actuators for correct voltage) to the 6 mm cables on the terminals on the controller. Set switch no. 4 on the DIP-switch marked "SETTINGS" to ON. Remove the wooden safety part located above the tunnel.
3. Press "DOWN" to extend the retract mechanism and check the hatch opens fully without touching the hull. If the hatch is obstructed by the hull, 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 propeller mechanism. 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.

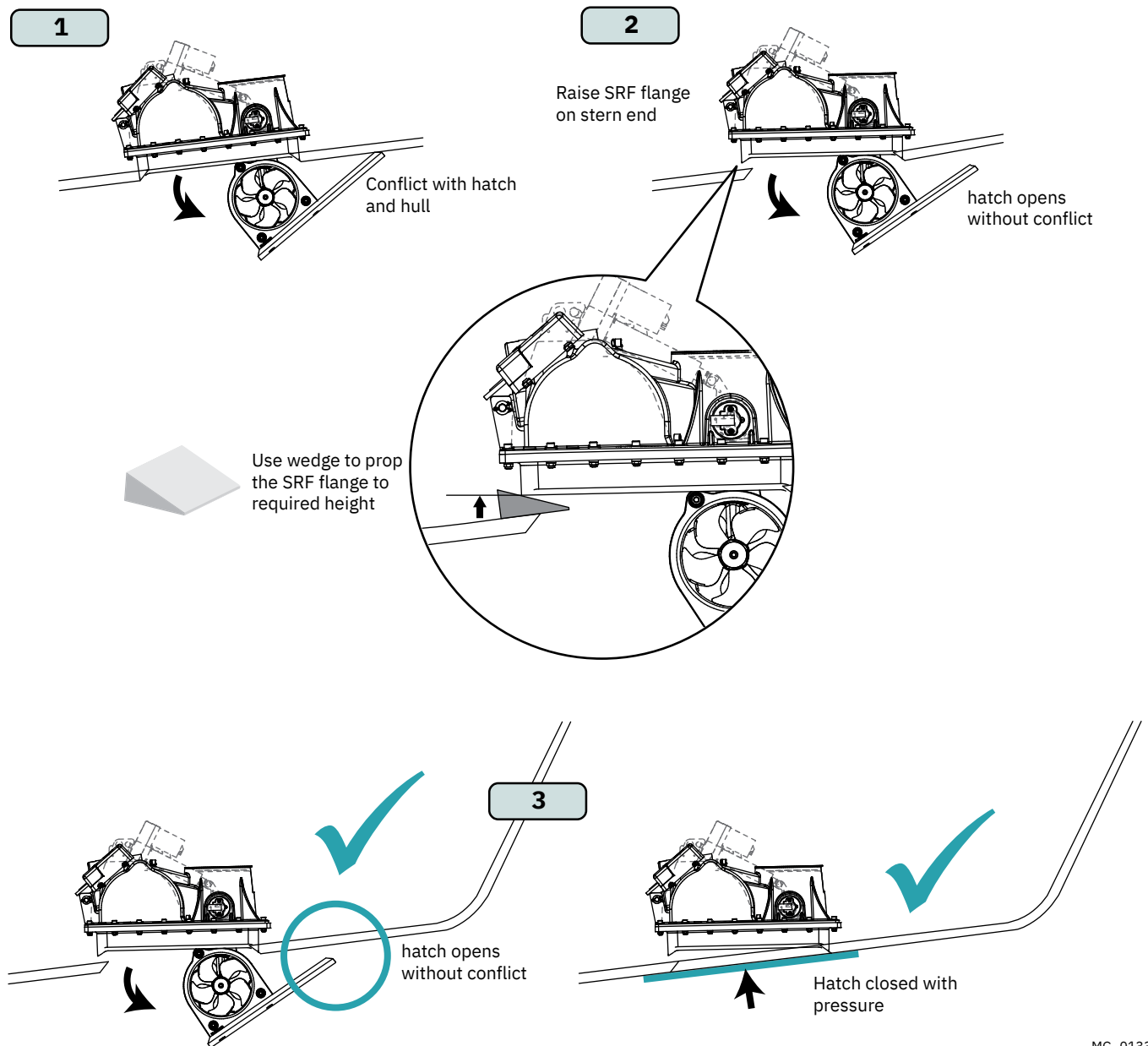


MG_0118

! 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 multiple times to ensure:
 - Clearance between the hull and hatch when the thruster is open
 - Hatch closes flush with the hull and extra force is transferred to the hull.
4. Record the height and keep the wedges in place for future moulding of the SRF flange.



MG_0133

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

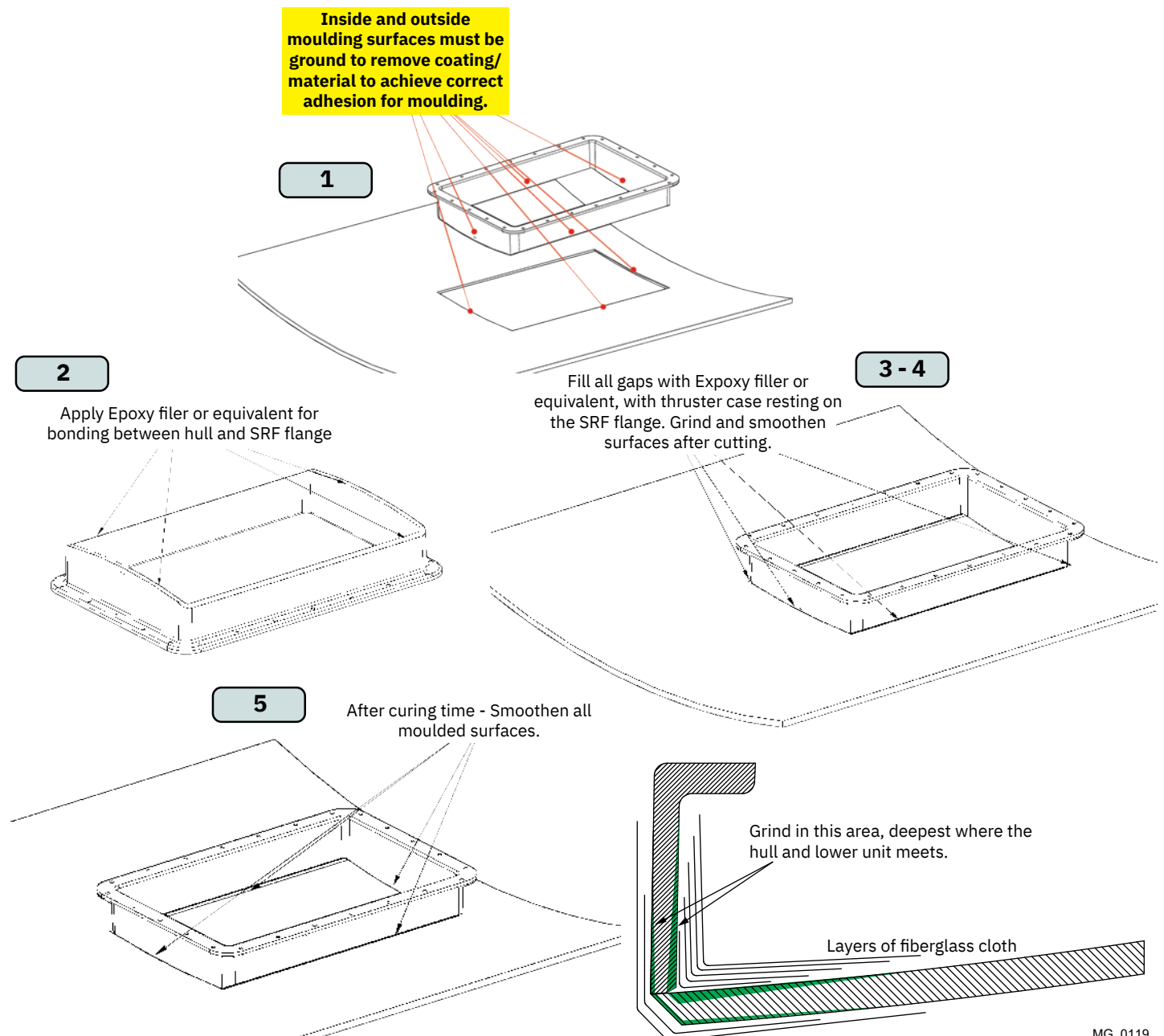
1. Surfaces to be moulded/ bonded must be ground to remove coating and material to achieve sufficient adhesion.
2. Apply Epoxy filler or equivalent on bottom edges of SRF flange or on the hull for bonding between connection surfaces. Ensure the filler is compatible with hull materials.
3. Place the SRF flange into position ensuring the correct orientation. Fill gaps between SRF and hull with Epoxy filler or equivalent. Grind and smooth the surfaces after curing time.
4. Apply layers of fibre glass and ensure that resin 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.

General Moulding process

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 actual boat builders responsibility. Cover the upper part if grinding is necessary. After moulding material have cured, run the retract mechanism down, disassemble the hatch and remove the upper part from the unit.

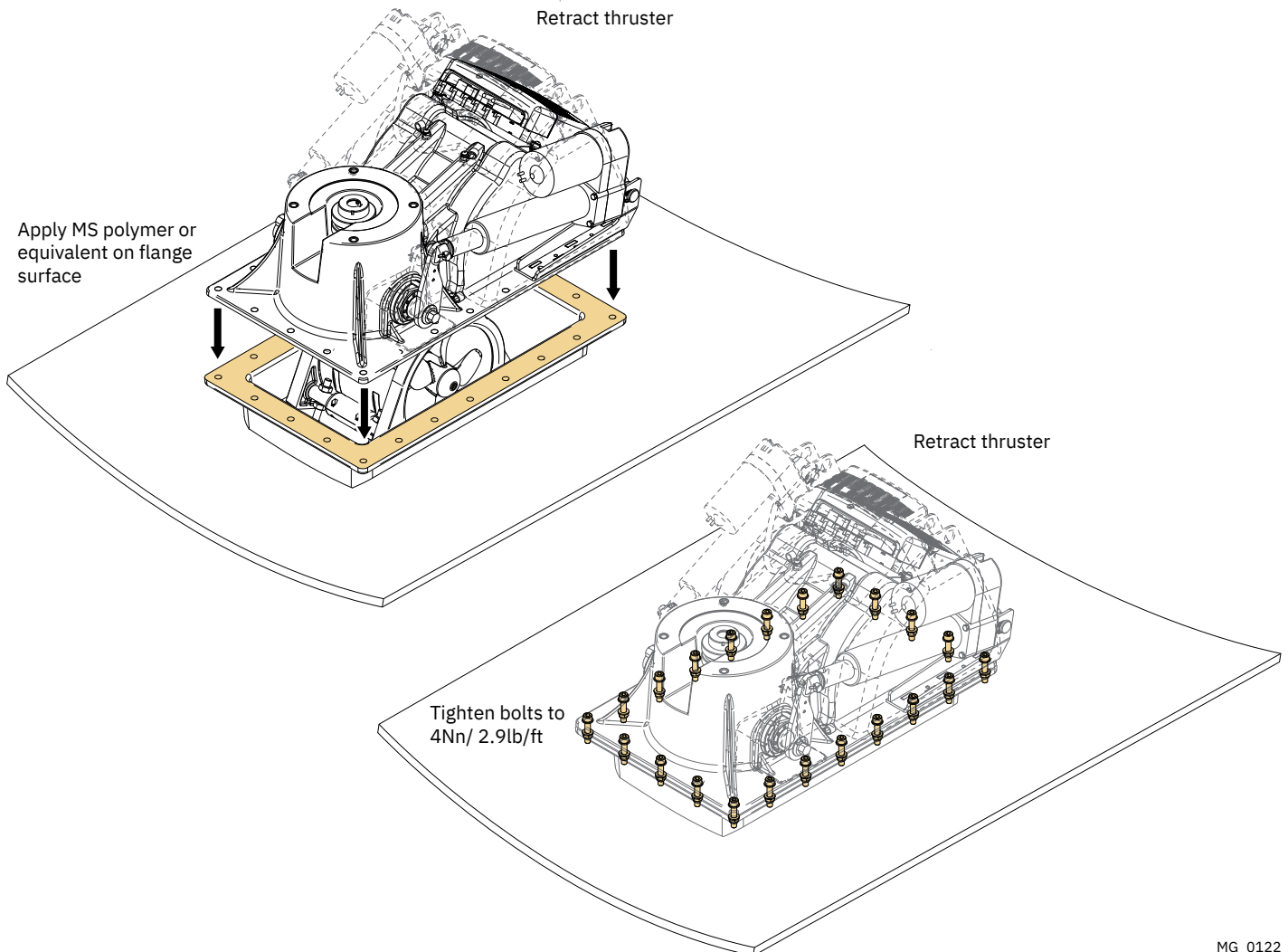
Laminate the inside and outside of the SRF flange solid to the hull. Use appropriate fibreglass cloth (which laminating material is the actual boat builders responsibility). Before grinding of hull and SRF flange, precautions must be taken against grinding dust inside the boat. Grind deepest where the hull and SRF flange meets.



MG_0119

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

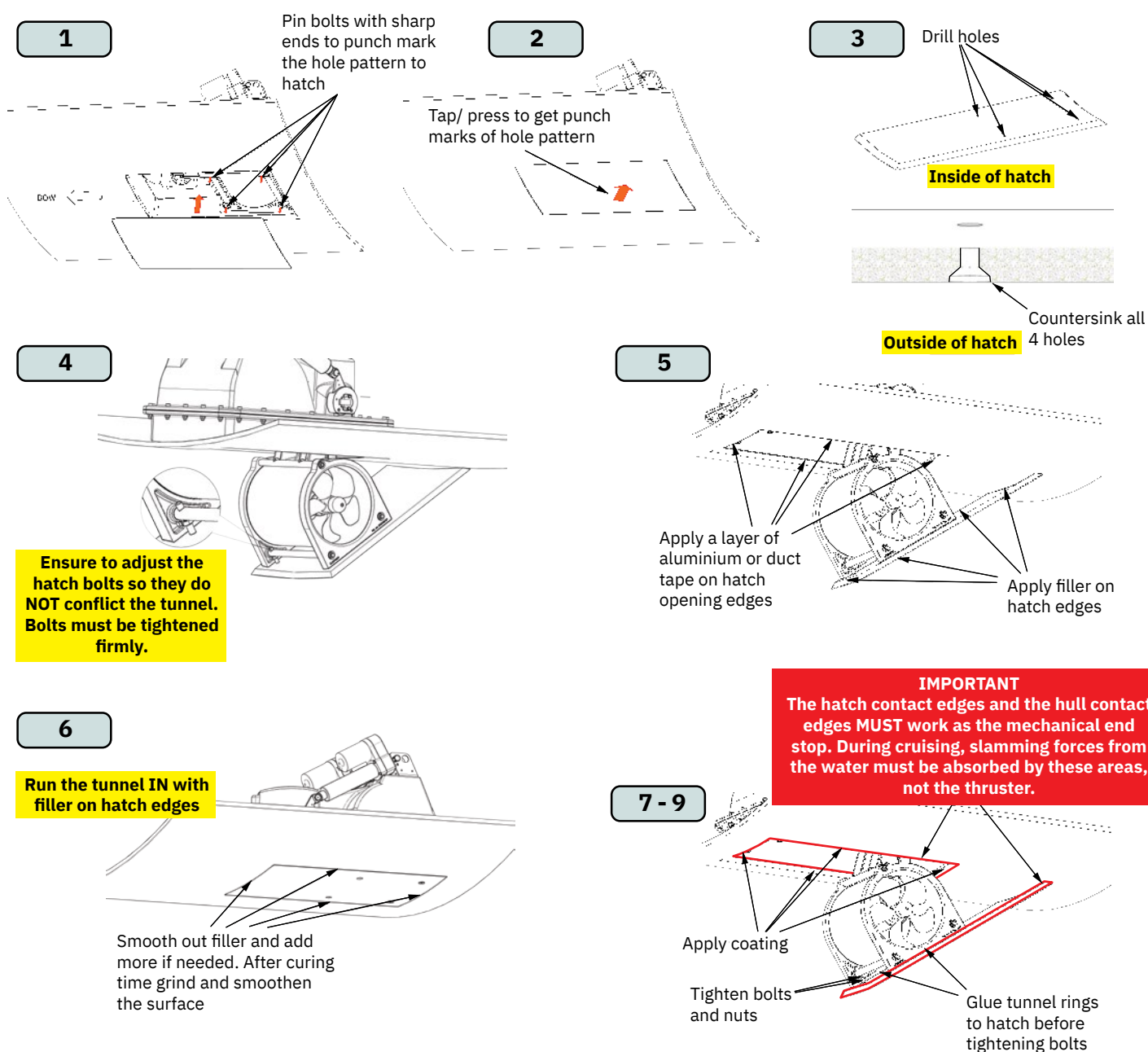
1. Apply MS Polymer or equivalent on SRF flange top surface to seal and avoid water leakage. **(NB: Ensure that glue is compatible with SRF and thruster case materials.)**
2. Place the upper thruster Housing down on the SRF flange.
3. Insert and fasten bolts. Start with the 4 corner bolts followed by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



MG_0122

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

1. Fit custom made pin bolts to the tunnel rings. The ends of the bolts must be sharp to create marks in the hatch. The pin bolts must be in 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 90 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 hull thickness.)**
5. Fill the gap between hatch and hull edges.
6. 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.
7. Operate the thruster to "IN" position. Smooth out the filler and add more if needed. After curing time, grind and smooth the surface.
8. Unscrew and remove hatch to smooth off excessive material before coating the hatch.
9. Apply filler 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.
10. Apply coating inside and outside of hatch opening on hull.



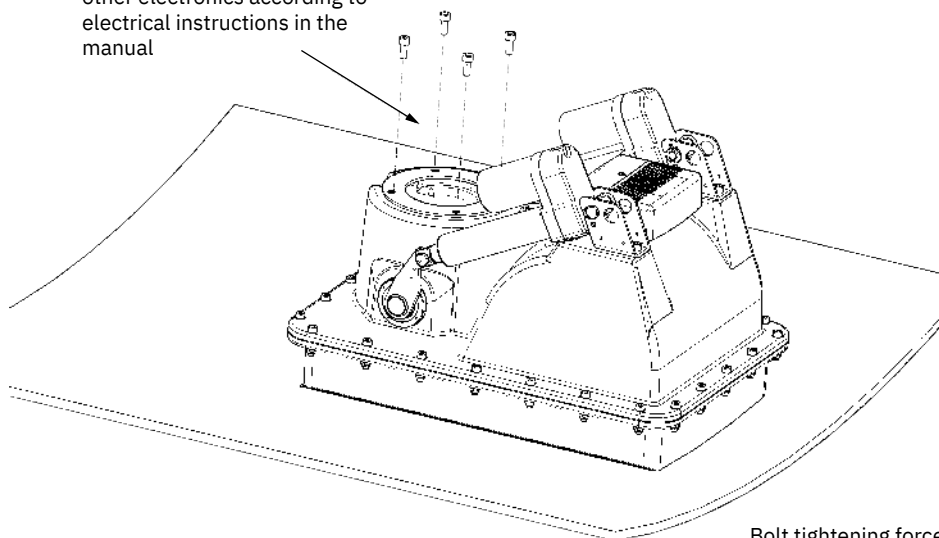
MG_0129

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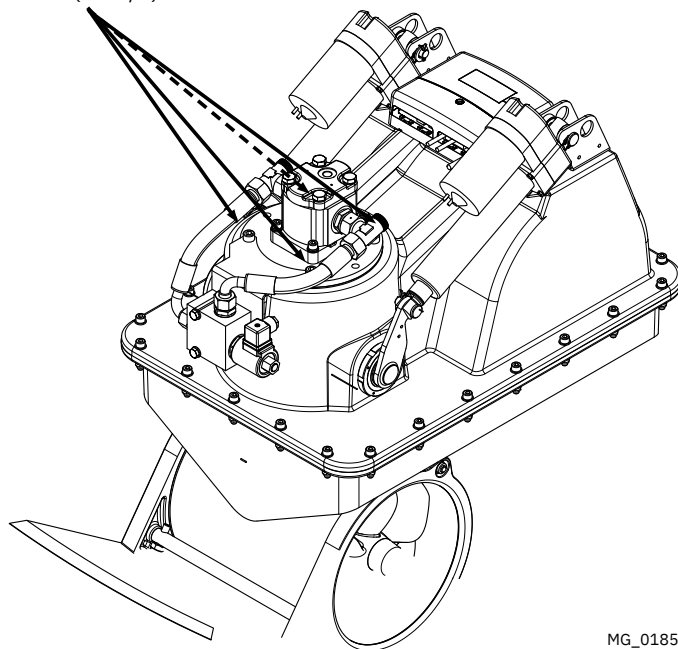
1. Install the motor onto the motor bracket ensuring both the couplings and the drive shafts have locked together. The motor must be installed with the solenoid facing the control box. **(NB: depending on your coupling you may need to wiggle the motor into place. Ensure the connection couplings are engaging 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 above 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 the gear leg and propeller with anti-fouling designed for propellers. Do not apply to the propeller drive shaft, the anodes or the end of the gear leg facing the propellers.

(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.)

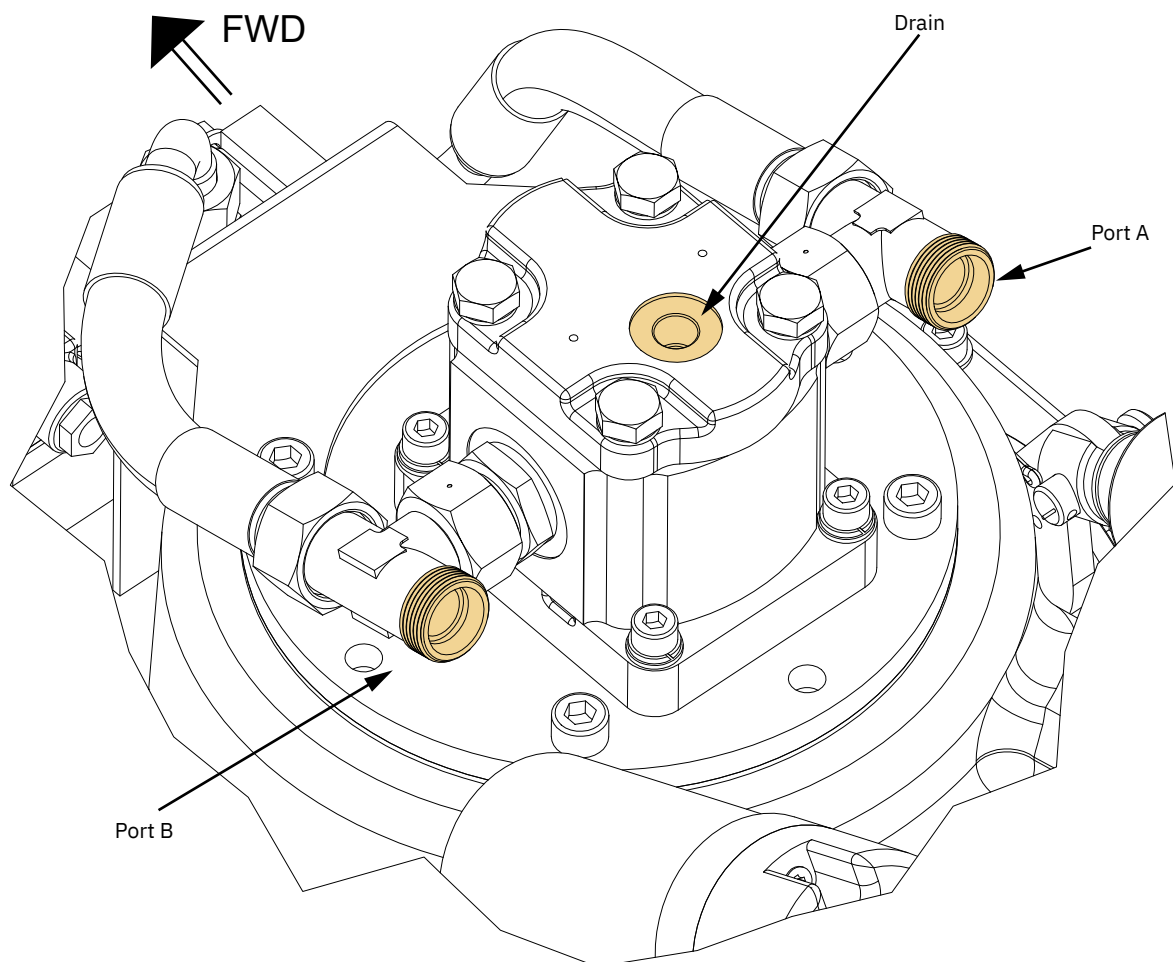
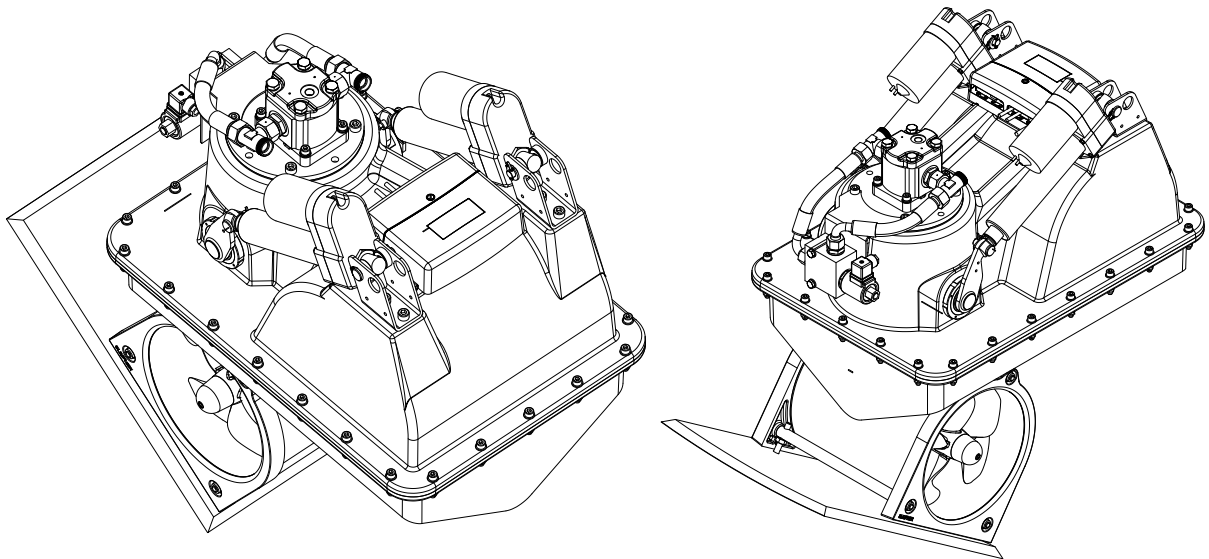
Install the relevant motor and other electronics according to electrical instructions in the manual



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



MG_0185

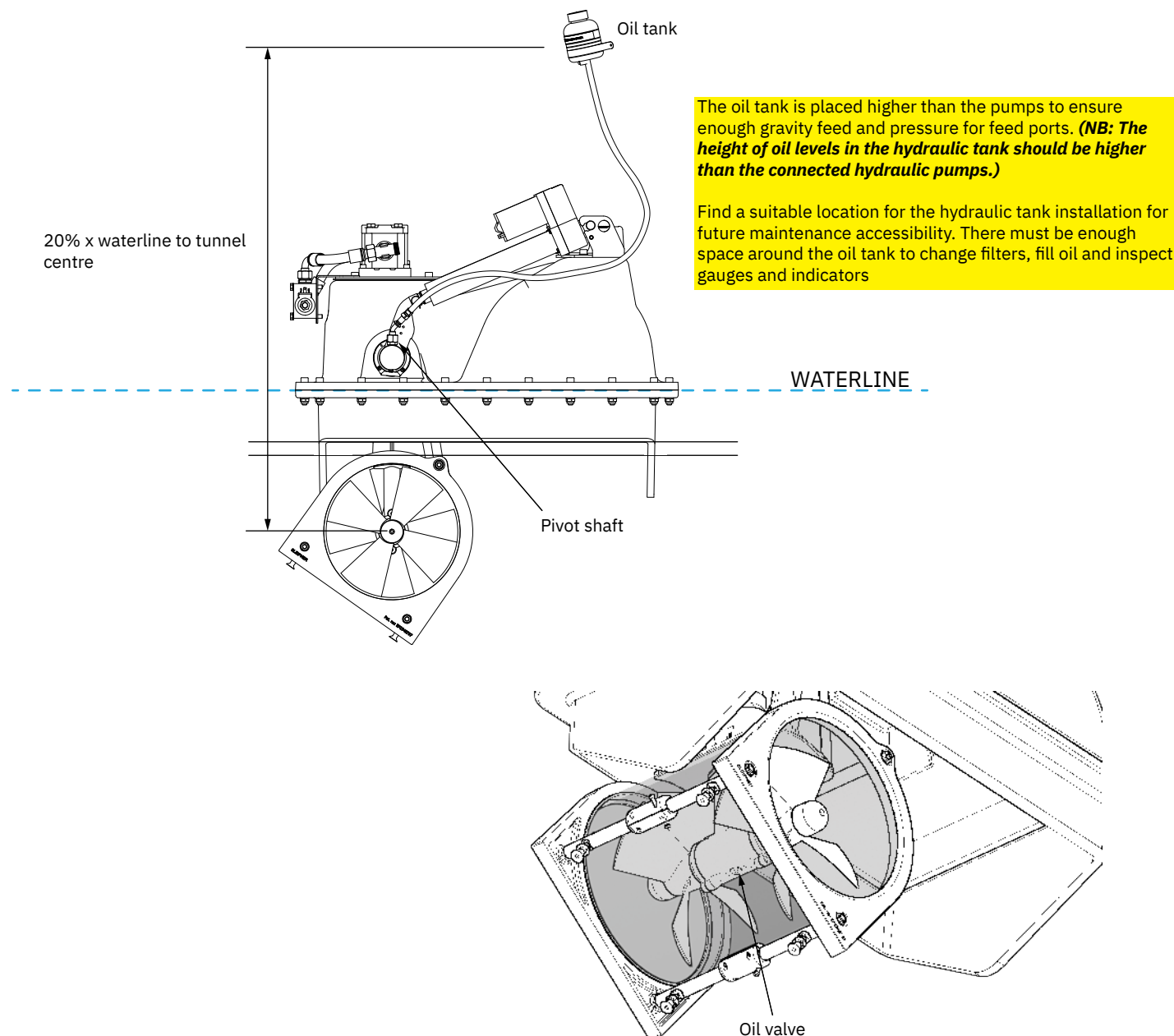


MG_0186

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

1. Install the oil tank above the waterline by at least 20% of the distance from the waterline to the centre of the tunnel. This ensures enough overpressure for the oil in the gear leg.
2. Install the oil tube from the tank oil tank to the feed nipple on the motor bracket. Fasten the two tube clamp screws. **(NB: Ensure the oil tube has no loops and forms an airlock to stop the oil flow. Ensure the oil tube angle is sufficient to allow oil to flow freely into the gear leg.)**
3. Fill the oil tank with the same gear oil used in the gear leg. The oil tank works as an indicator to ensure there is oil in the gear leg at all times.

(NB: Fill and drain the gear leg simultaneously while replacing the oil to ensure the system is never empty.)



MG_0184

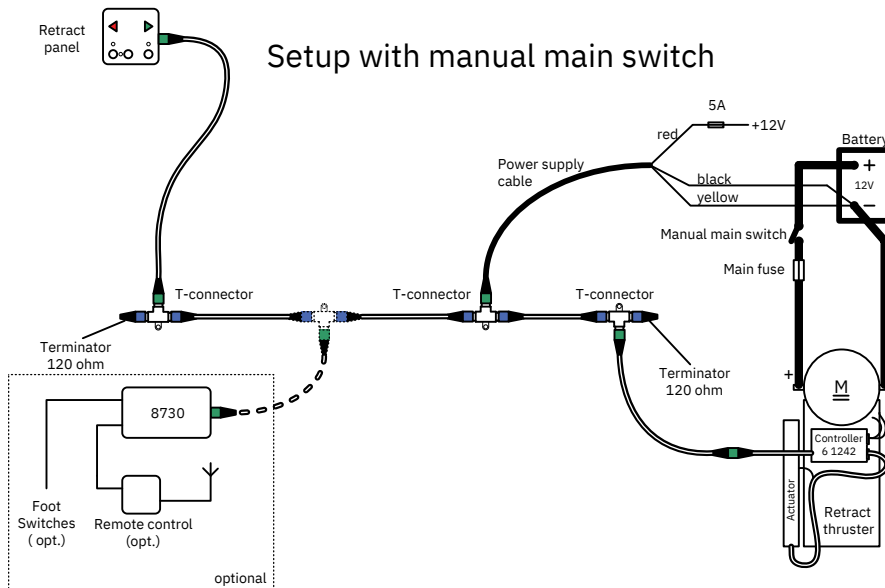
! Please refer to the graphic for special considerations relating to your model !

- All Sleipner control panels can be used in any combination.
- All control panels can be installed using:
 - Y-connectors - for standard on/off
 - T-connectors - for S-Link proportional power system.

(NB: If two or more control panels are operated at the same time in opposite directions, the electronic control box will stop the thruster until it receives a single signal or thrust in one direction.)

- Sleipner on/off equipment it is entirely “plug & play” and require no additional configuration setup.

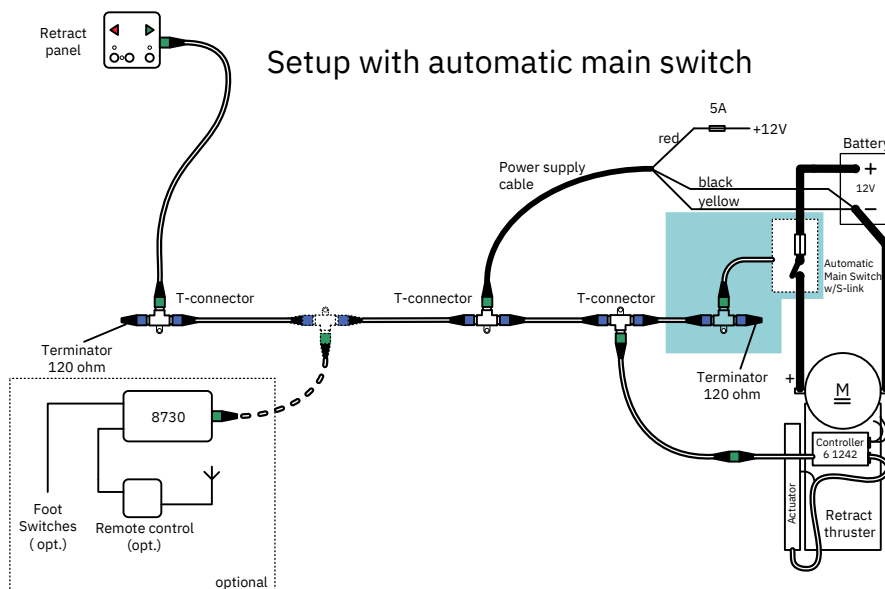
See the Control panel manual for more information.



Controller



Supply Voltage	7-31 VDC, Powered at B+ & B-
Power consumption	Less than 1.5 Watt in standby
Fuse @ 12V	40 Amp
Fuse @ 24V	40 Amp
Minimum Voltage at B+/B- for deployment	11.7 Volt for 12 Volt thruster 23.4 Volt for 24 Volt thruster
Operating temperature	-10°C to 60°C (14°F to 140°F)
Weight	500g/17,6oz



MG_0106

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. Units with low power consumption are powered directly from the S-Link bus therefore one power cable must be connected to the BACKBONE Cable through a T-Connector.

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 makes the system scalable and flexible to install.

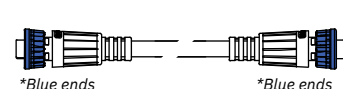
Installation of S-Link cables:

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 installed to ensure sharp bend radius's is avoided. 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 Cable 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.

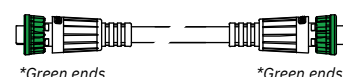
To reduce the risk of interference, avoid routing the S-Link cables close to equipment such as radio transmitters, antennas or high voltage cables. The backbone must be terminated at each end with the END Terminator.

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.



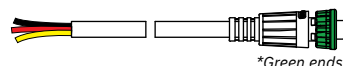
BACKBONE Cable

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



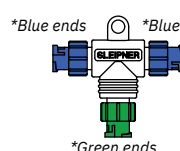
SPUR Cable

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.



POWER Cable

Required in all installations for connection of BACKBONE Cable to a power supply. It shall not be more than one POWER Cable in an installation.



T-Connector

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



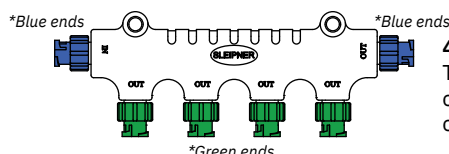
BACKBONE Extender

Connects two BACKBONE Cables to extend the length.



END Terminator

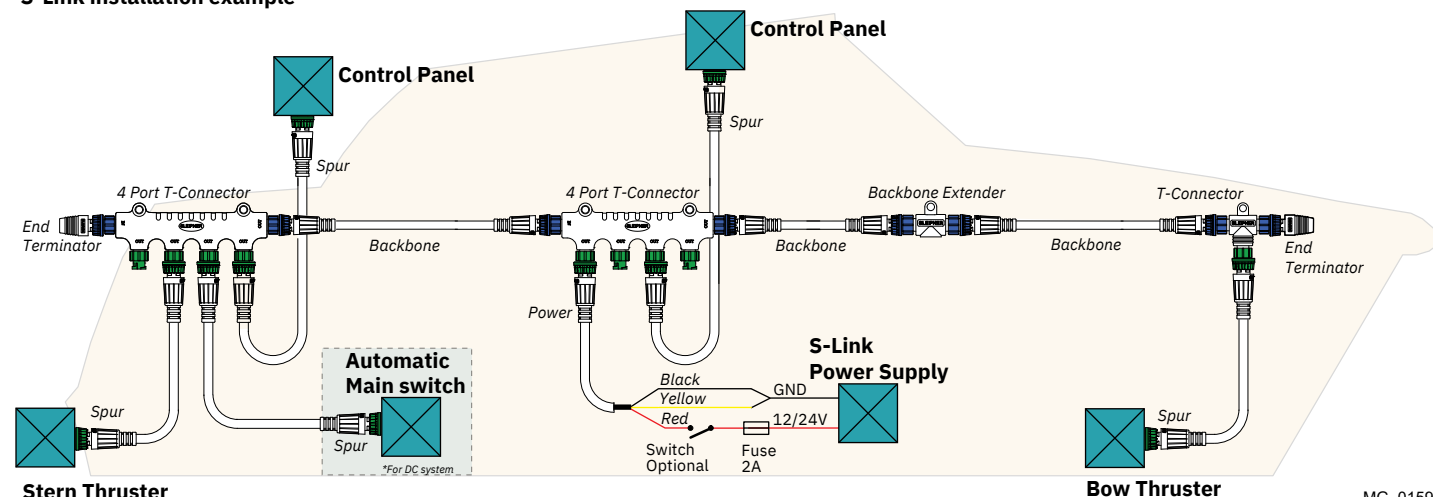
Must be one at each end of the BACKBONE bus.



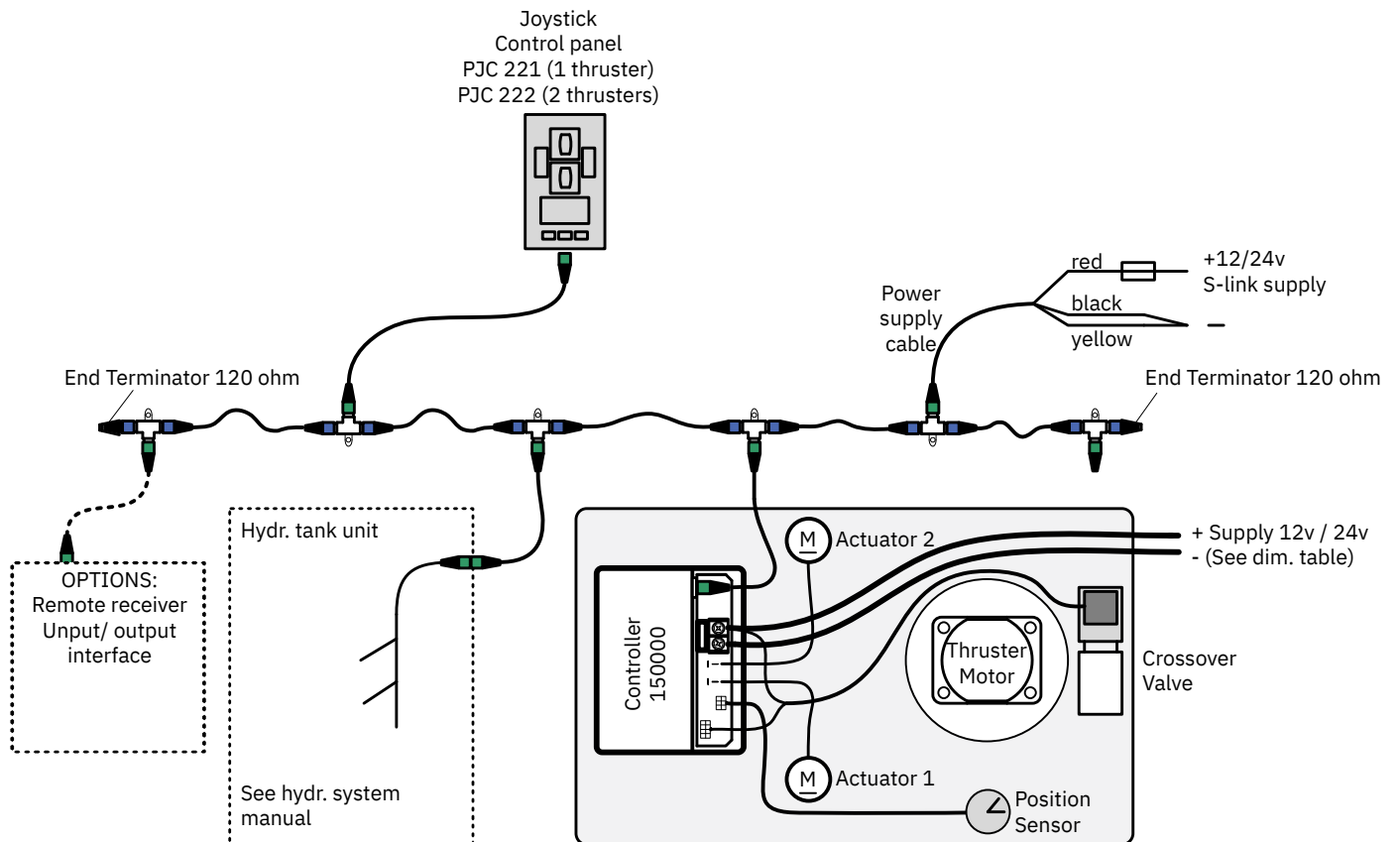
4-Port T-Connector

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.

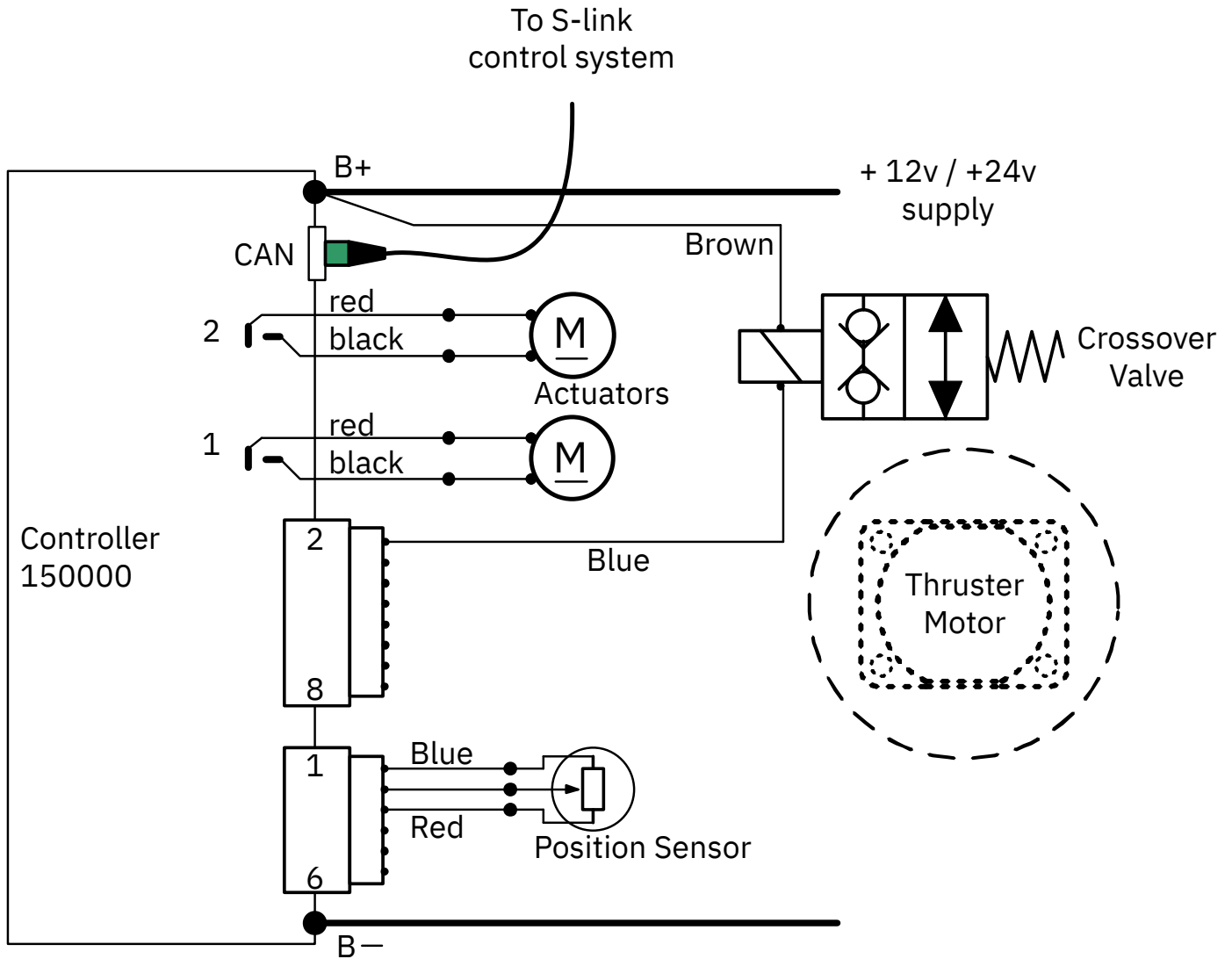
S-Link installation example



Visual Wiring Diagram



Technical Wiring Diagram



Suggested supply cable dimensioning:
Max total length. Sum of pos and neg cable.

	6 mm ²	10 mm ²	16 mm ²	25 mm ²
12v	—	4.2m	6.7m	10.5m
24v	10m	16.8m	26.9m	42m
Fuse	25A	35A	35-50A	35-50A

IMPORTANT

Before the thruster motor is operated, check the drive shaft alignment is completely straight when it reaches the end position form 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 and the bearing are set to alignment marking
- 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:

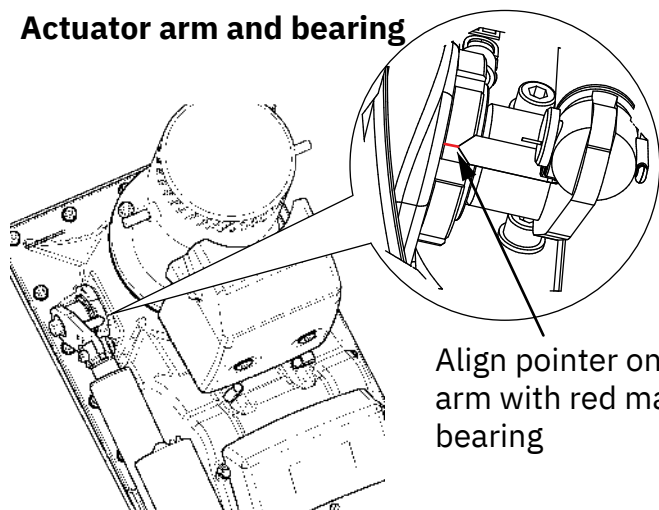
Normal mode, Service mode (actuators operated by UP/DOWN buttons).

Re-calibrated "down"-position.

Flashing green light:

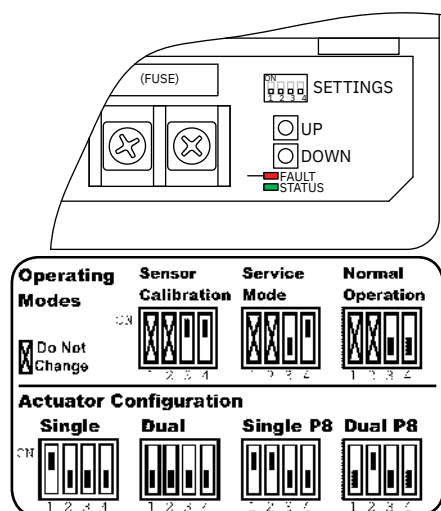
No S-Link communication.

Actuator arm and bearing



Align pointer on lever arm with red mark on bearing

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 motor 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 (A1) 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

Product Spare Parts and Additional Resources

For additional supporting documentation, we advise you to visit our website 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. 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

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