



Installation Guide

For Pro DC External Electric Thruster Models
SXP35, SXP50



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Warnings and Safety

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It is essential to follow all information within this document to avoid potential personal injury, death, damage to existing products, damage to the vessel, and/or the new product during installation or operation. Failure to follow information within this document will render all warranties given by Sleipner Motor as VOID.

Warnings and situations where extra caution is required are outlined. Take extra consideration when warnings are outlined within the documentation.



WARNING

Indicate a potentially hazardous situation that, if not avoided, could result in death or severe injury.



CAUTION

Indicates a potentially hazardous situation that could result in minor or moderate injury or critical damage to vessel integrity if not avoided.



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General:

- The installer must read this document to ensure necessary familiarity with the product before installation.
- Directions outlined in this document cannot be guaranteed to comply with all international and national regulations, including but not limited to health and safety procedures. It is the installer's responsibility to adhere to all applicable international and national regulations when installing Sleipner products.
- This document contains general installation guidelines intended to support experienced installers. Contact professional installers familiar with the vessel and applicable regulations if assistance is required.
- If local regulation requires any electrical work to be performed by a licensed professional, seek a licensed professional.
- To accommodate for future service and inspection requirements, ensure appropriate access to Sleipner products during the installation planning phase.

For Sleipner thruster systems:

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- Do not install the thruster system in any position that requires modifying the stiffener/ stringer/ supports, which may jeopardize the hull integrity. Consult with the boat builder to see if this can be done safely if absolutely necessary.
- Never run the thruster out of water without load. Without load or resistance, the thruster propeller RPM will reach extremely high speed, damaging the system.
- The thruster motor must be handled with care. Do not rest the thruster on its drive shaft, as its weight can damage it.

For externally mounted electric motor driven systems:

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- Ensure enough space inside and outside the transom when planning the thruster's position. The thruster must not interfere with existing equipment inside the boat, such as motor bedding, steering links, etc.
- Avoid interference from the thruster's propulsion water flow from elements such as stern drives or trim tabs. Interference will considerably reduce the thrust effectiveness.
- Avoid cables overheating by not running cables from the thruster to the control box near any heat sources.

For lithium batteries for proportional thruster systems:

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If a lithium battery system is installed to supply proportional thrusters such as SEP and E-series thrusters, ensure the battery is designed to output a continuous supply of the required thruster current. An under-rated battery management system can suddenly disconnect the load which may lead to dangerous situations. Ensure that you operate with high-quality batteries intended for maritime use.

- All Sleipner proportional thrusters will work well with Lithium batteries, as the included PPC unit will control the output voltage to safe levels for the thruster. **(NB: Ensure you have the latest embedded software installed. The firmware version of the Proportional Power Controller (PPC) must be of version 1.033 or later if the PPC is connected to a lithium battery).**
- All Sleipner eVision / E-series thrusters have built-in functionality to limit the maximum voltage delivered to the thruster.

(NB: Operating the thruster outside specified ratings will void the warranty).

For Sleipner S-Link™ systems:

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When installing an S-Link™ system, connect ONLY original Sleipner S-Link™ products or other authorized control equipment directly to the S-Link™ bus. When connecting non-authorized third-party equipment, it must always be connected through a Sleipner-supplied interface product.

Any attempt to directly control or connect to the S-Link™ control system without a designated and approved interface from Sleipner will void all warranties and responsibilities of the connected Sleipner products. If you interface 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.

For Ignition Protected systems:

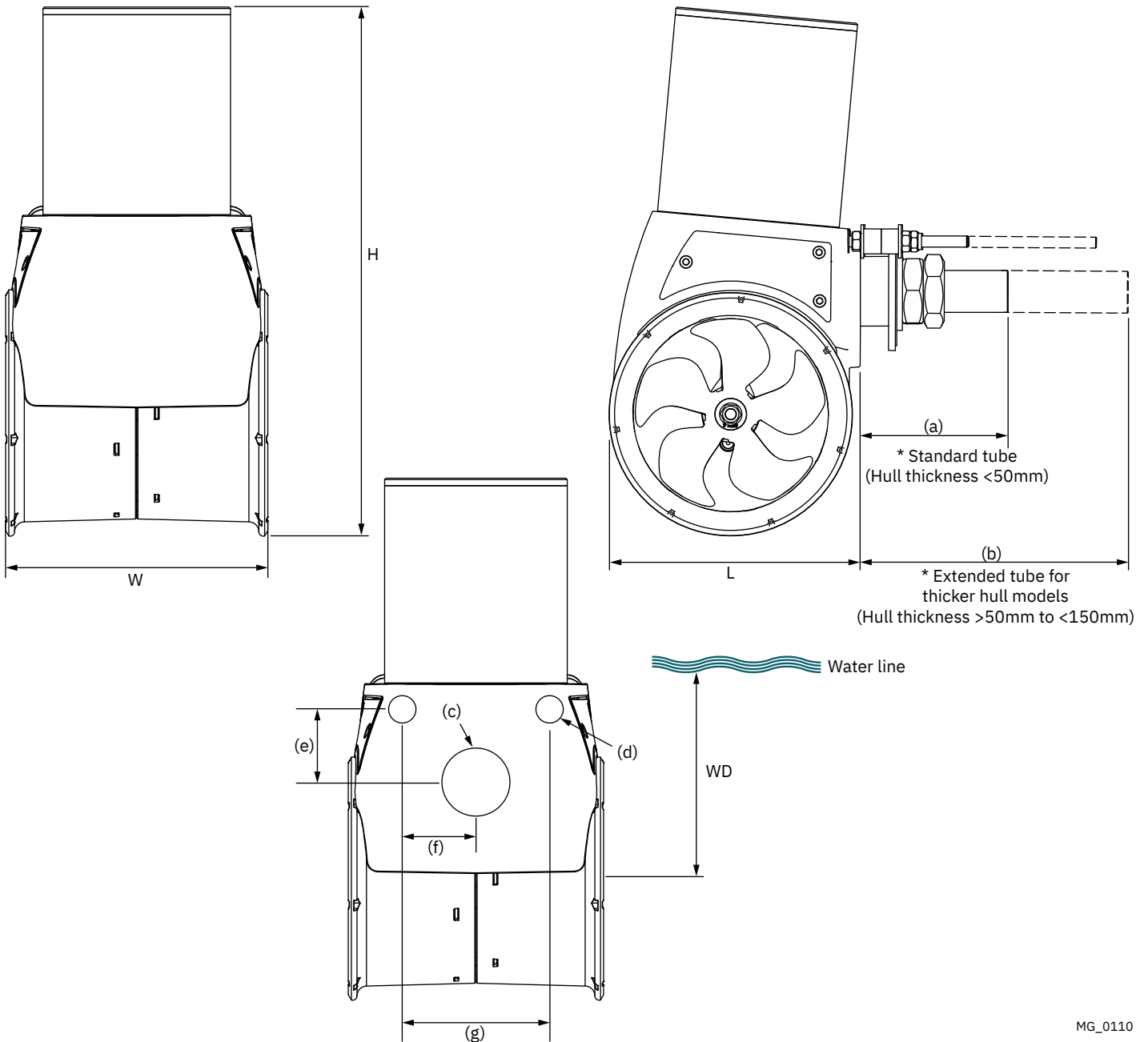
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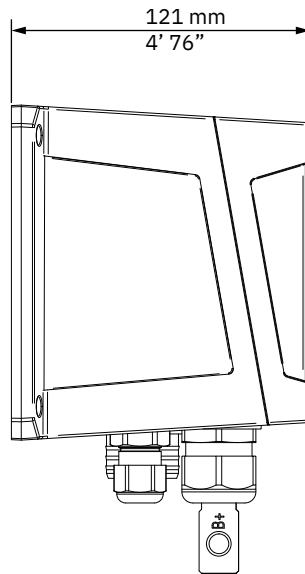
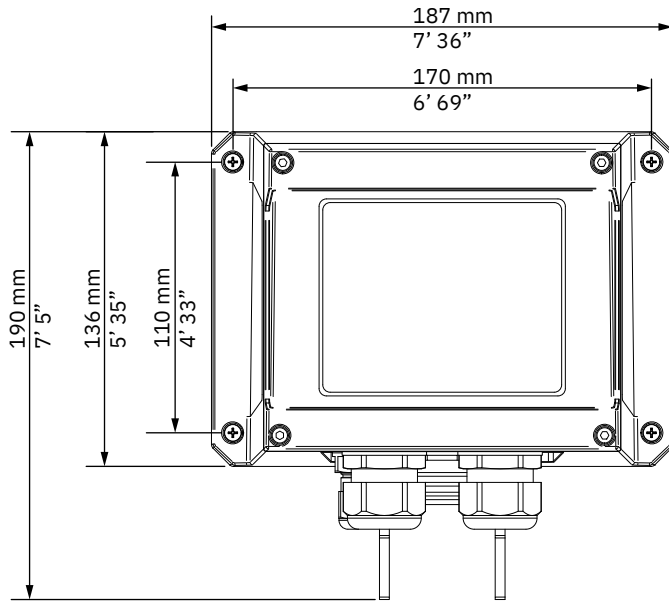
CAUTION

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.

Measurement code	Measurement description	mm	inch
H	Motor Height	374	14.72
W	Width	183	7.20
L	Length	171	6.7
WD	Minimum Water Depth	140	5.5
(a)	Standard tube length	171	6.7
(b)	Extended tube length for thicker hulls	276	10.9
(c)	Main tube diameter	50	2
(d)	Support bolts diameter	18	0.7
(e)	Height of support bolts from tube	35.8	1.4
(f)	Distance of support bolts from tube	65	2.6
(g)	Distance of support bolts	130	5.1



Product Measurements



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SX/P Thruster

Description	SX35 SXP35	SX50 SXP50
Nominal Voltage	12V	12V
Thrust 12V	43 kg / 94 lbs	62 kg / 136 lbs
Thrust 10.5V	35 kg / 77 lbs	50 kg / 110 lbs
Maximum Operation Time	S2 motor at 2 - 3 min. duty cycle at 20°C (ambient temperature)	S2 motor at 2 - 3 min. duty cycle at 20°C (ambient temperature)
Power	1.8kw / 2hp	2.8kw / 3.75hp
Weight	15.3 kg / 33.73 lbs	15.3 kg / 33.73 lbs

SX/P Control Box

Product	SX35 SXP35	SX50 SXP50
Nominal voltage	12V	12V
Max current	250A	380A
Motor duty cycle	Short time duty (S2)	Short time duty (S2)
Max ambient temp	50°C	50°C
Min ambient temp	-25°C	-25°C

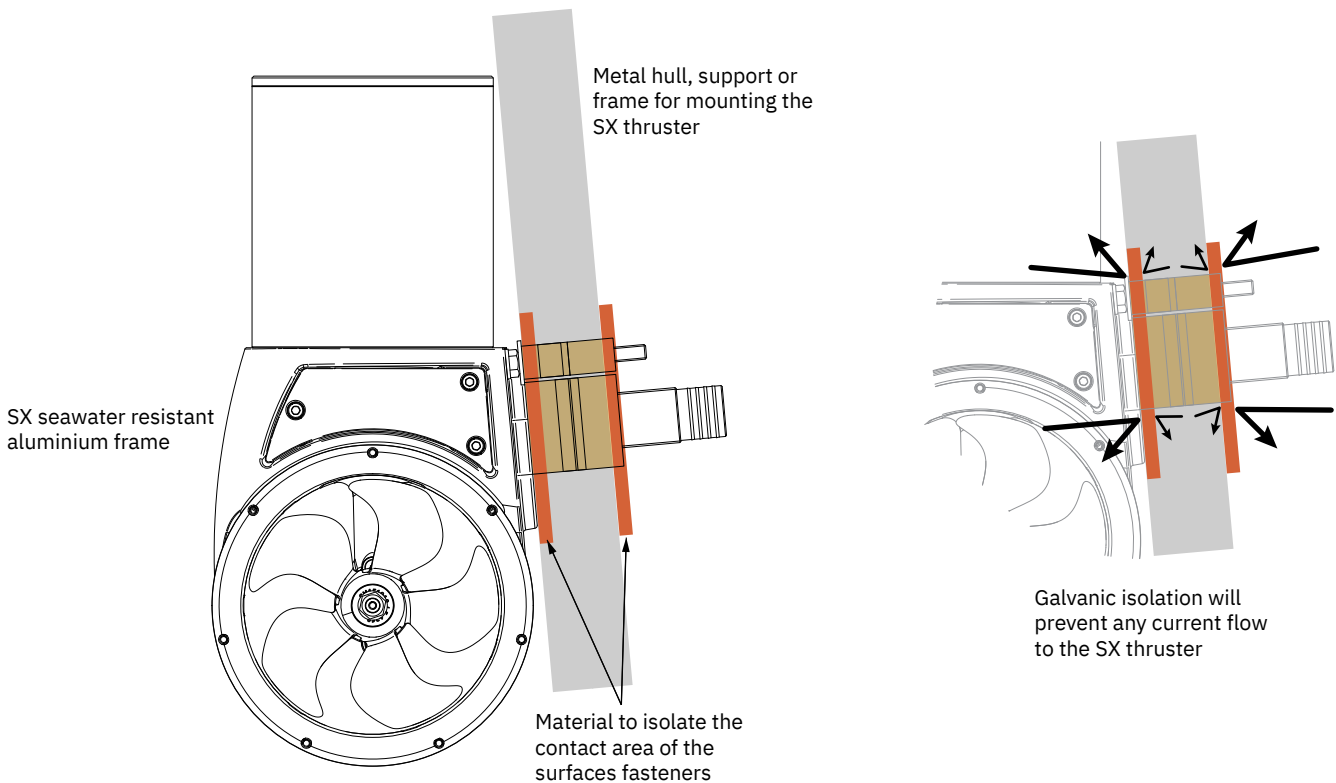
Galvanic Isolation

The SX models are produced with a seawater resistant aluminium frame. Without galvanic isolation from other electrical sources the SX seawater resistant aluminium frame will act as an anode on the vessel. This will add considerable corrosion to the SX thruster frame.



CAUTION

IF installing on any metal surface with contact to the SX seawater resistant aluminium frame or fasteners (vessel hull, supports or frames) the SX thruster must include a galvanic isolation solution.



For best performance, Install the thruster as deep on the stern as possible. Ensure the desired location does not disturb the natural water flow dynamic of the hull as the vessel travels. At higher speeds, if the thruster is installed too low in the vessels water flow under the hull it can cause damage to the thruster, additional drag and unwanted water splashing.

Installing the thruster as deep under the waterline as possible ensures:

1. The thruster does not suck air from the surface which will reduce performance and increase operational noise levels.
2. To receive maximum efficiency in turning force.

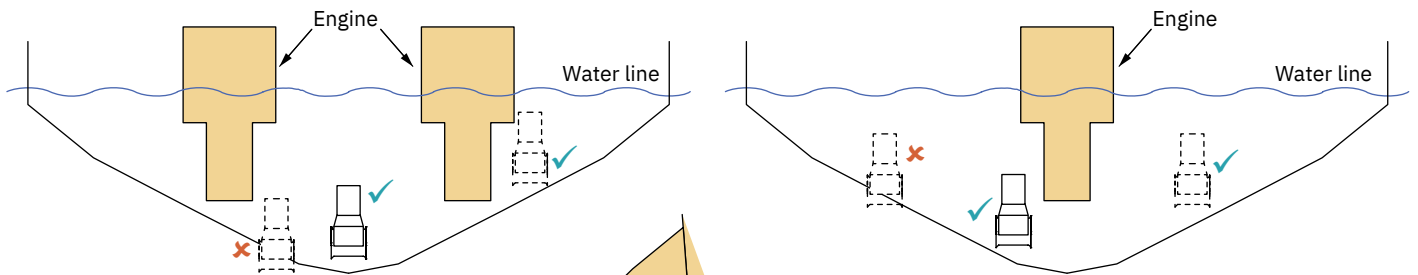
Additionally ensure the propulsion water flow from the SX thruster is not obstructed by other objects. Objects that obstruct the water flow from the thruster will greatly reduce the thrust output.

SX Thruster positioning on the stern

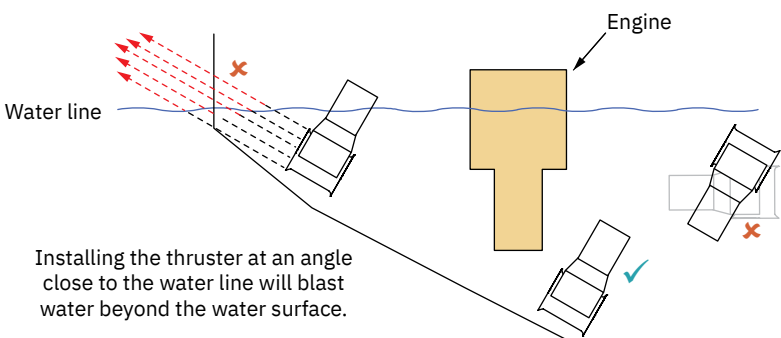
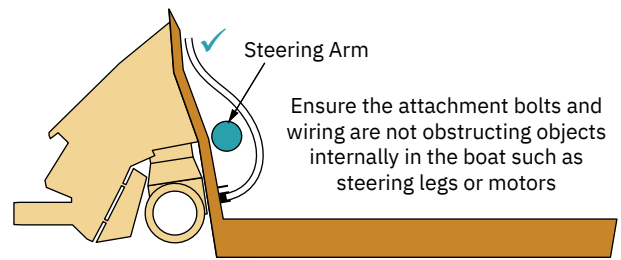
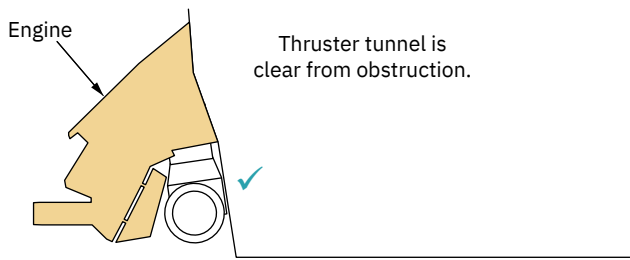
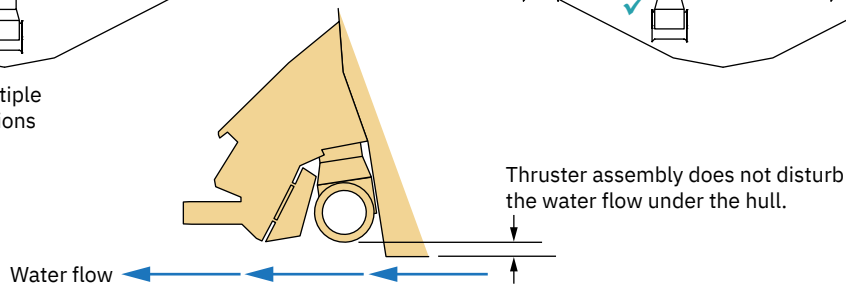
The thruster can be installed in multiple locations on the boat transom. Installing the thruster slightly off centre will not affect the overall effectiveness of the thruster. **(NB: Installing the thruster off centre may be required to avoid any obstructions externally or internally on the vessel.)**

Alignment

The thruster can be installed at a slight angle if required for the water flow to avoid obstructions. These obstructions can include propellers systems, trim tabs or the hull. The average force the thruster propels water is 5-7 meters per sec, therefore angled installations must be as deep as possible under the water to minimise spray breaking beyond the water surface. **(NB: install the thruster at an angle only if no other suitable location can be found.)**



The thruster can be installed in multiple locations based on object obstructions on the stern.



CAUTION
Do not install the SX thruster inverted or at an angle over a reasonable level to deliver appropriate thrust.

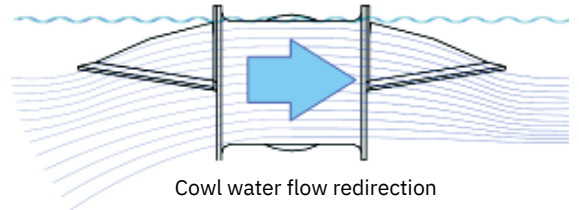
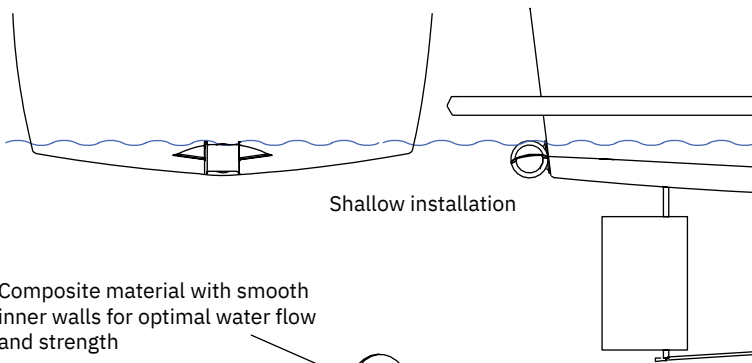
Installing a stern thruster cowl for stern thrusters that will allow installations in boats with shallow drafts or due to other obstructions on the stern. These can include obstacles such as trim tabs, jets or surface drive propeller systems where shallow installation of a stern thruster is the only option.

Cowls:

Designed to aid in water redirection and reduce air entering the tunnel in shallow installations.

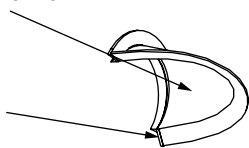
Grid's:

Designed to protect the thruster from objects while in use.



Composite material with smooth inner walls for optimal water flow and strength

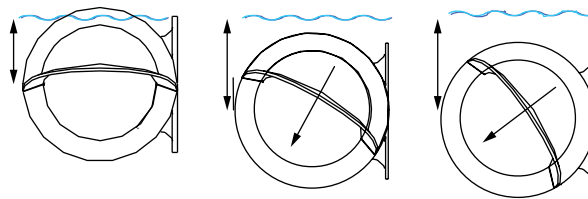
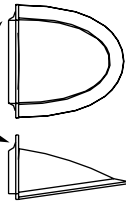
Radius corners prevent turbulence



An angled edge further preventing air attraction into the tunnel



Easy installation for easy bolt-on fitting



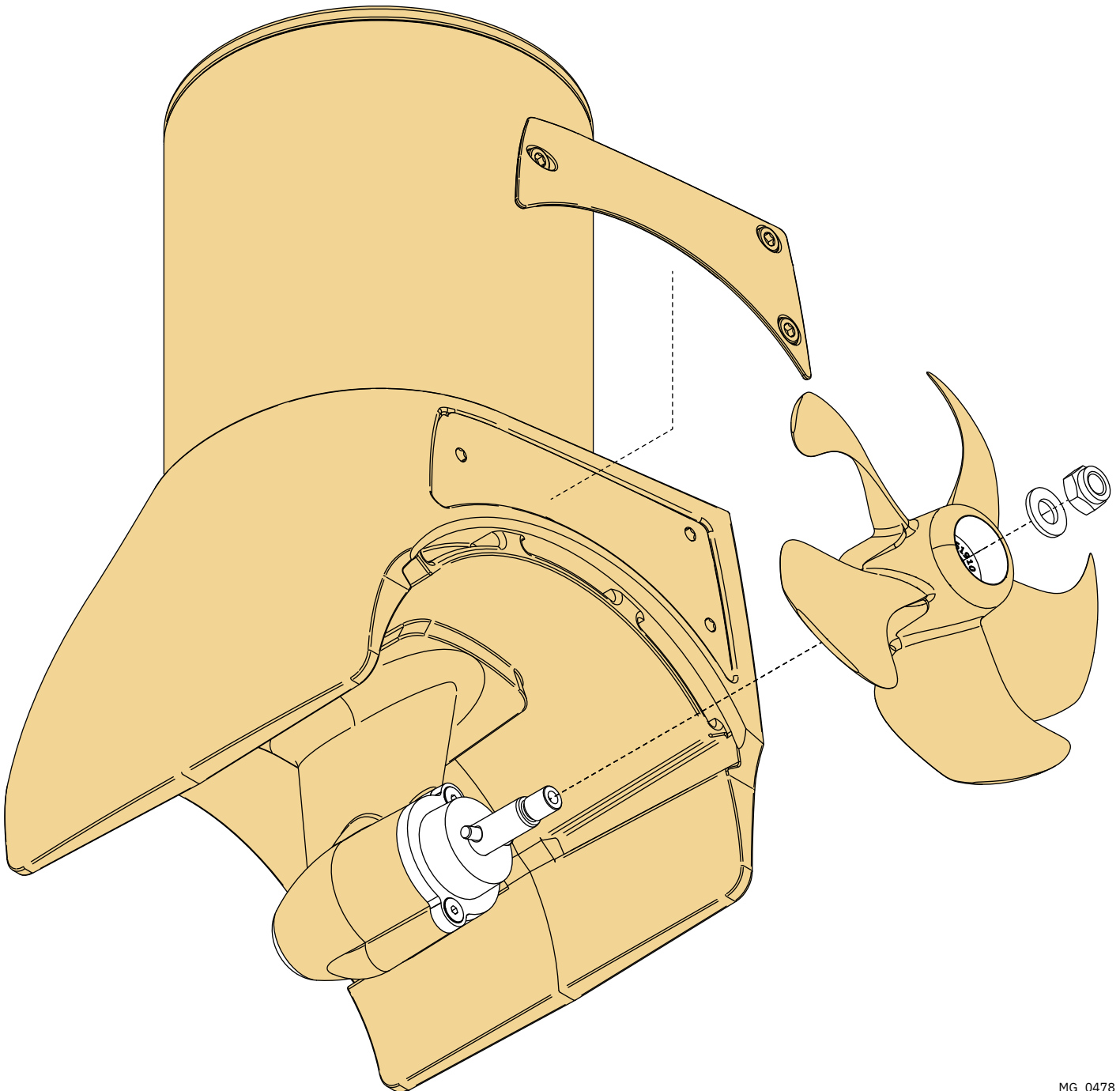
Angled cowls out of horizontal, must be installed deeper to avoid air entry in the thruster tunnel

Cowls to change the water flow direction to avoid obstructions on the stern

Cowls help prevent air from the water surface entering the tunnel in shallow installations

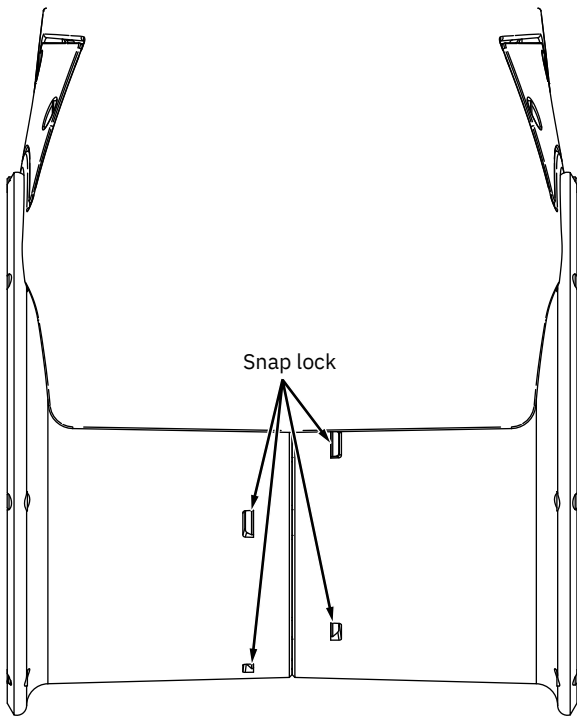
1. Centre the drive pin and Insert the propeller onto the shaft spine. Rotate the propeller until the drive pin aligns with the internal slot in the propeller.
2. Insert the washer to the end of the shaft spline. Tighten with the propeller lock-nut.
3. Apply anti fouling to the gear leg and propeller. Do not apply anti fouling to any rubber elements of the gear leg or anodes if applicable.
(NB: Ensure to paint under plastic covers.)

(NB: Do not use abrasive tools damaging the existing Epoxy coating when preparing for antifouling paint.)



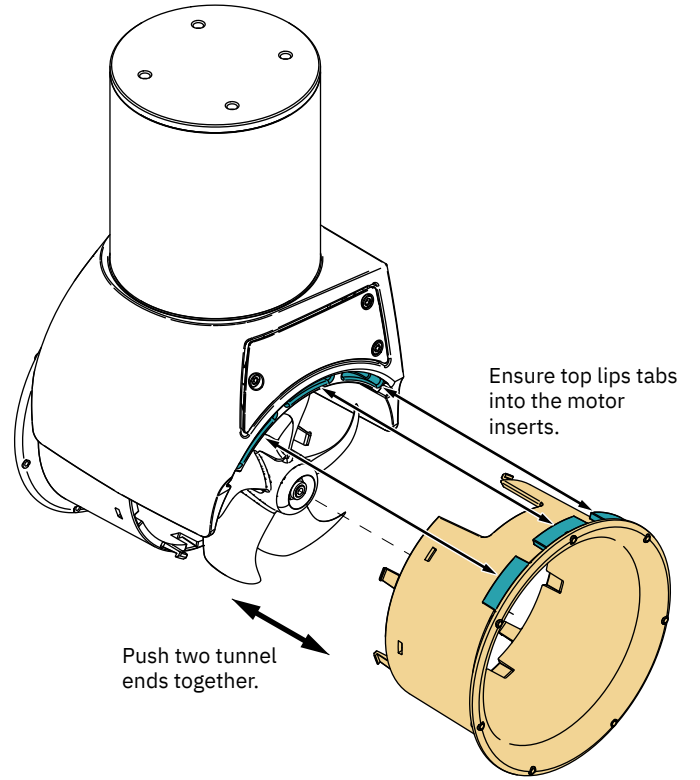
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1. Connect both ends of the tunnel to the thruster motor. All hooks must be completely interlocked making the inside of the tunnel smooth. **(NB: Ensure tunnel moulding around the gear leg and tunnel top align and all snap-lock positions are correctly connected into place.)**



1

Check snap lock positions around the tunnel.



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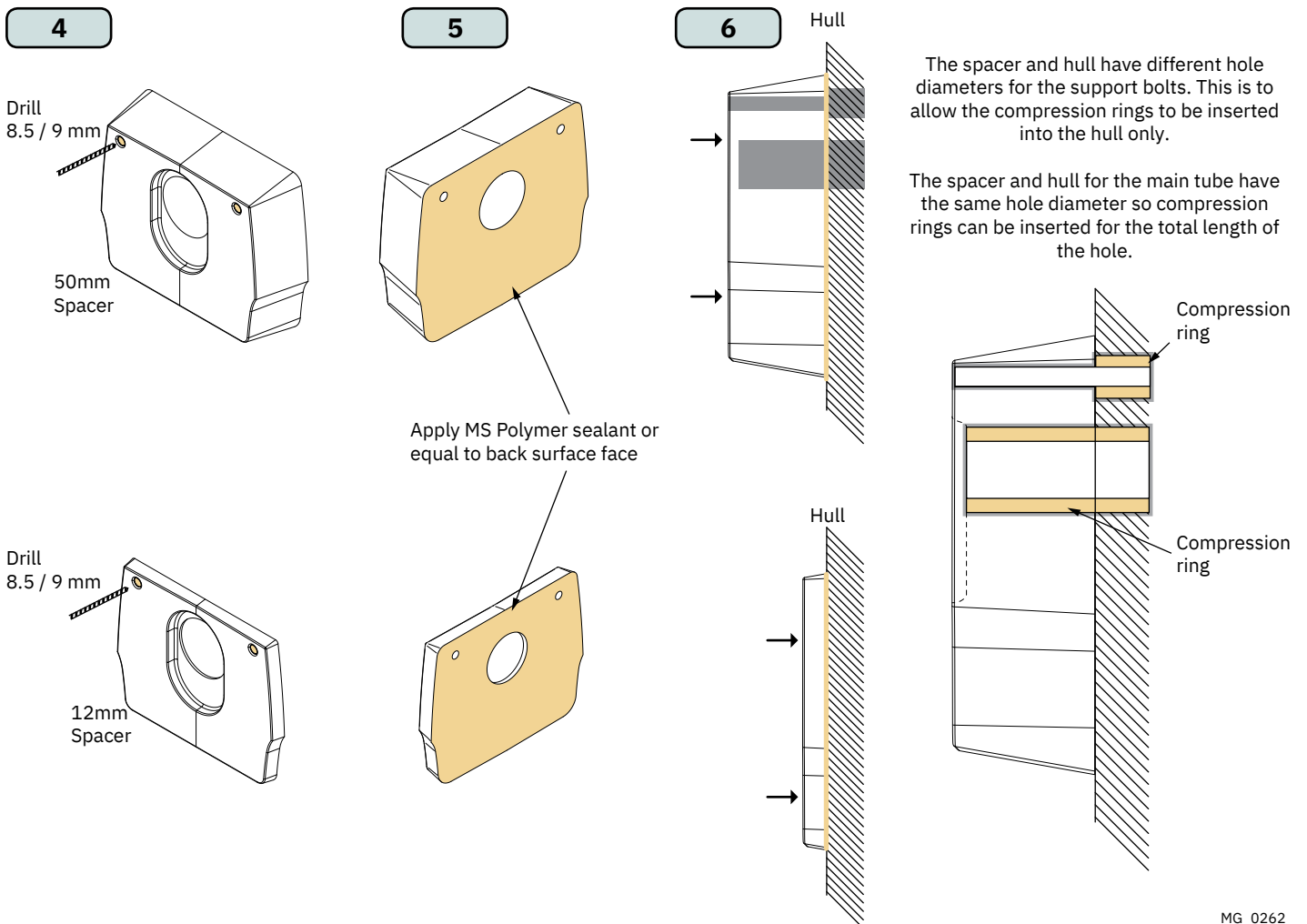
Follow the installation of the SX thruster in the **Motor Installation** to step 3. see next page

1. Define the location to install the thruster. **(NB: Ensure the thruster does not protrude past the transom profile on any side and there is no obstruction to the thrusters water flow. Also, check internally the thruster will not obstruct any objects.)**
2. Mark the locations of the three drill holes using the defined measurements in this manual or from a template. **(NB: Maximum hull thickness is 50mm including optional spacer or 150mm for extended hull thickness models.)**
3. Drill main hole, then two support bolt holes. Clean the area from dust for installation of the thruster. **(NB: Hull holes must be drilled first before attaching the spacer as the top support holes are larger than the spacers.)**

-
4. Drill out the two support bolt holes in the spacer.
 5. Apply MS Polymer sealant or equal to the back surface face of the spacer.
 6. Place the spacer to the hull.

Continue the installation of the SX thruster from step 4 in the **Motor Installation**.

(NB: If using the 50mm spacer ensure you have the extended tube SX model.)



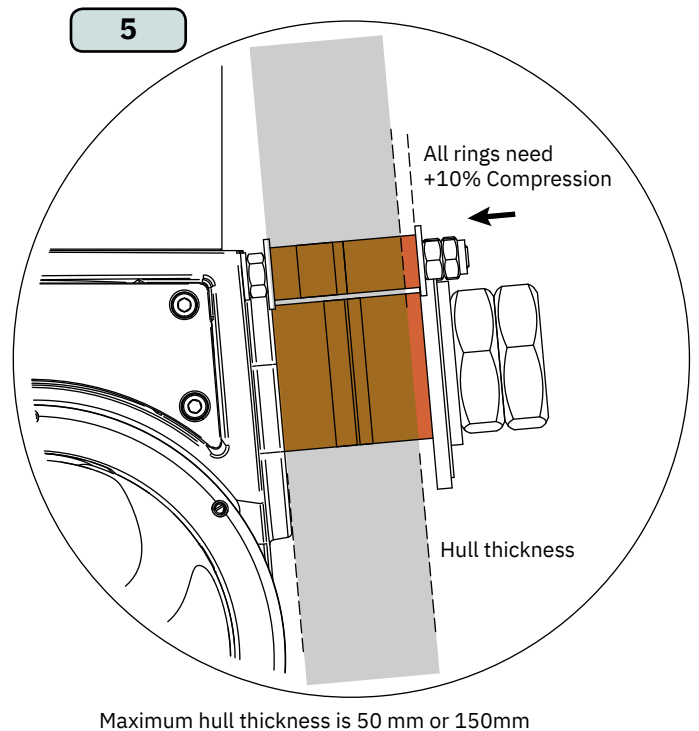
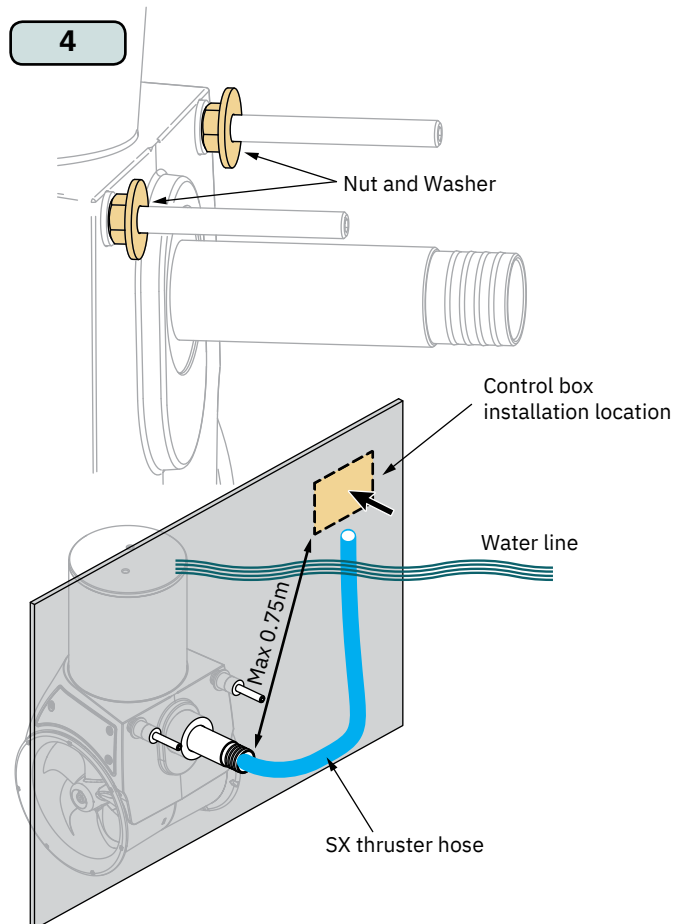
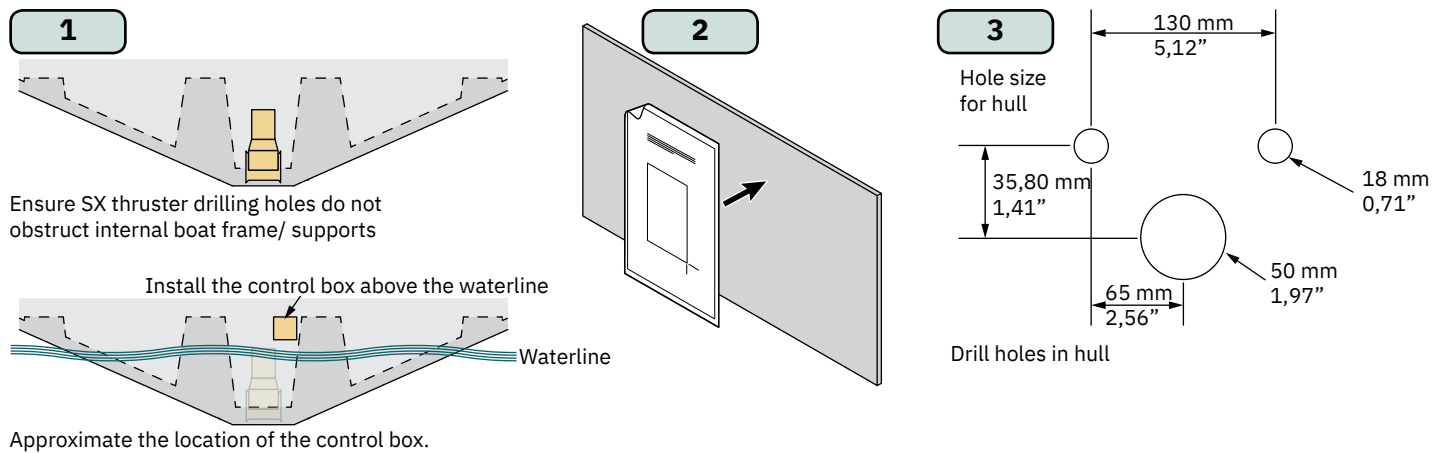
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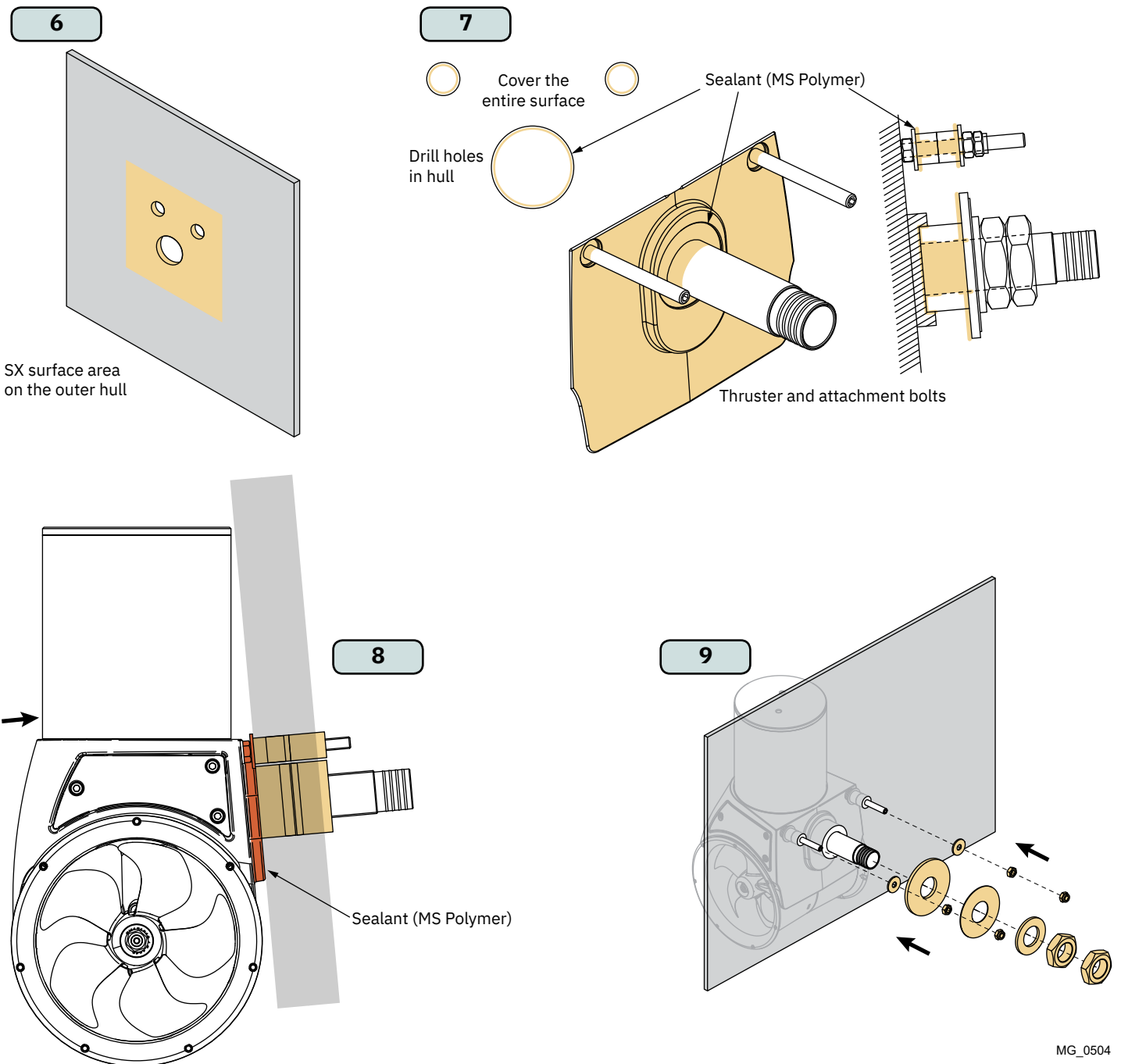
CAUTION

Before installations all aluminium parts of the thruster must be coated with an epoxy primer before anti-fouling process.

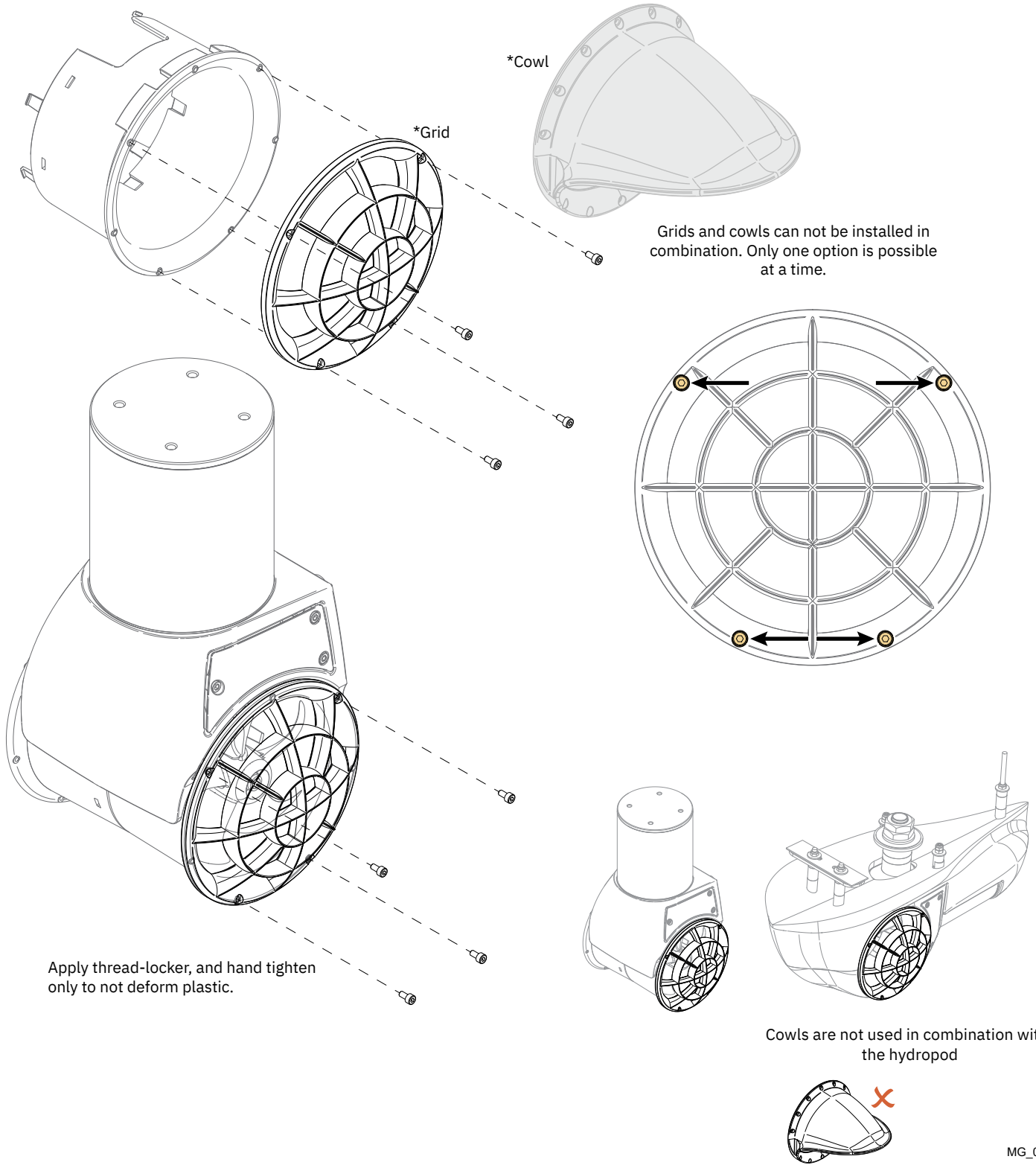
1. Define the location to install the thruster. **(NB: Ensure the thruster does not protrude past the transom profile on any side and there is no obstruction to the thrusters water flow. Also, check internally the thruster will not obstruct any objects. Ensure cables internally do not obstruct any objects. Do not place cables or control box close to high heat radiating parts EG. Turbo/ exhaust manifolds etc.)** Roughly estimate the location of the control box inside the vessel. Plan for the control box to be installed above the waterline.
2. Mark the locations of the three drill holes using the defined measurements in this manual or from a template. **(NB: Maximum hull thickness is 50mm including optional spacer or 150mm for extended hull thickness models.)**
3. Drill main hole, then two support bolt holes. Clean the area from dust for installation of the thruster.
4. Install a bolt and washer to ensure top bolts contact surface area is level with the main tube. Temporarily place the thruster through the holes to ensure correct fitting. Using the cable leads from the thruster define the final location within the vessel for the installation of the control box. **(NB: If using a spacer the support bolt and washer are not required.)**
5. Check the length of the compression rings. Compression rings must be longer than hull thickness to allow for compression **(NB: Cut compression sealants to length top achieve 10% compression.)**



6. The thruster assembly must sit flush on the transom. Grind and sand the area if required to ensure a secure fit. **(NB: Use caution when grinding/sanding surfaces as to not remove too much fibreglass.)**
7. Ensure both bolts and washers to the support bars on the thruster are attached.
Prepare surface according to sealant supplier specification:
 - the inside surface of the cut-out holes on the hull.
 - To the surface of the washer to the thread and
 - in the recess of the main tube to the thread.
 - 1cm deep inside all compression ring.
 place all compression rings to bolt threads. **(NB: Ensure ample sealant (MS Polymer) around the bolts and centre tube for a watertight fitting.)**
8. Insert the thruster with compression rings into the hole.
9. Fasten the thruster



1. Attach the cowls or grids with included bolts. **(NB: If installation of the cowls ensure the appropriate twist of the cowl to direct water away from obstacles. Cowls are not used in combination with the hydropod.)**



- Plan the location of all electrical components before starting with the electrical installation. Main electrical components will typically consist of battery, fuse, main switch, Proportional Power Controller (PPC) and Control Box, see Wiring Diagram chapter for an overview.

For safety reasons it is always recommended to install a fuse and a main switch on the power cable and as close as possible to the positive battery pole. Distance between battery and fuse should be less than 1 meter. The main switch must be installed such that is easily accessible to disconnect the thruster when not on-board or in the case of an emergency. 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 does also turn on the automatic main switch. When the control panel is turned off the automatic main switch is also turned off. This ensures that the control electronics and motor is only energized when the control panel is turned on. Sleipner offers AMS supporting either S-Link or ON/OFF control panels. Ensure to select a main switch with voltage and current ratings according to the specifications of the chosen thruster motor. Note that the AMS requires separate power supply which should be protected by a dedicated fuse.

For installations which requires ignition protected equipment ensure to use ignition protected fuse and main switch. Ensure to follow your national regulations.

- Estimate the total length of the power cables to determine the recommended cross section. The total power cable length is defined as the distances from the positive battery pole, via fuse, main switch and PPC to the Control Box and all the way back to the negative battery pole. Compromising the cable sections named B+, M- and B- on the drawing in the Wiring Diagram chapter.
- Find the recommended power cable cross section for you installation by using the estimated total power cable length and the table shown in Electrical Reference Guide chapter. Note that maximum cross section that fits through the grommet of the Control Box is 70mm². Maximum cross section that fits with the power cable terminal inside the Control Box is 50mm². If a 70mm² cable is used some of the wire strands must be cut off to fit the cable inside the terminal. If recommended cross section exceeds 70mm² it is recommended to use as short as possible cables between PPC and Control Box with maximum 70mm² cross section. The recommended cross section or larger should then be used for the rest of the power cables.
- Find the recommended fuse rating by using the table shown in Electrical Reference Guide chapter. Use slow blow rated fuses to hold stated nominal current for minimum 5 minutes.
- Select appropriate dimensioned battery with Cold Cranking Amps (CCA) according to recommendations in Electrical Reference Guide chapter. Battery voltage must be compliant with the voltage rating of the thruster motor and control circuitry. Capacity and rated discharge current of battery should be according to rated nominal current drawn and typical duty cycle for thruster operation. Nominal current drawn is listed in Electrical Reference Guide chapter. The actual voltage at the motor while running the thruster determines the motor RPM and thrust. Cable losses can reduce the voltage level and result in reduced thrust. Use larger cable cross section and high-capacity battery for improved performance.
- Install the Control Box according to instructions in Control Box Installation chapter.
- Install the PPC according to instructions in PPC Installation manual.
- Install the control panel according to instructions in the installation manual of the selected Control Panel.
- Install the battery, fuse, main switch and wiring according to instructions in Wiring Diagram chapter and installation manual of selected fuse and main switch.



CAUTION

Check the following with the main switch is set to off. After all electrical connections have been completed check with an ohm meter that there is no electrical connection between

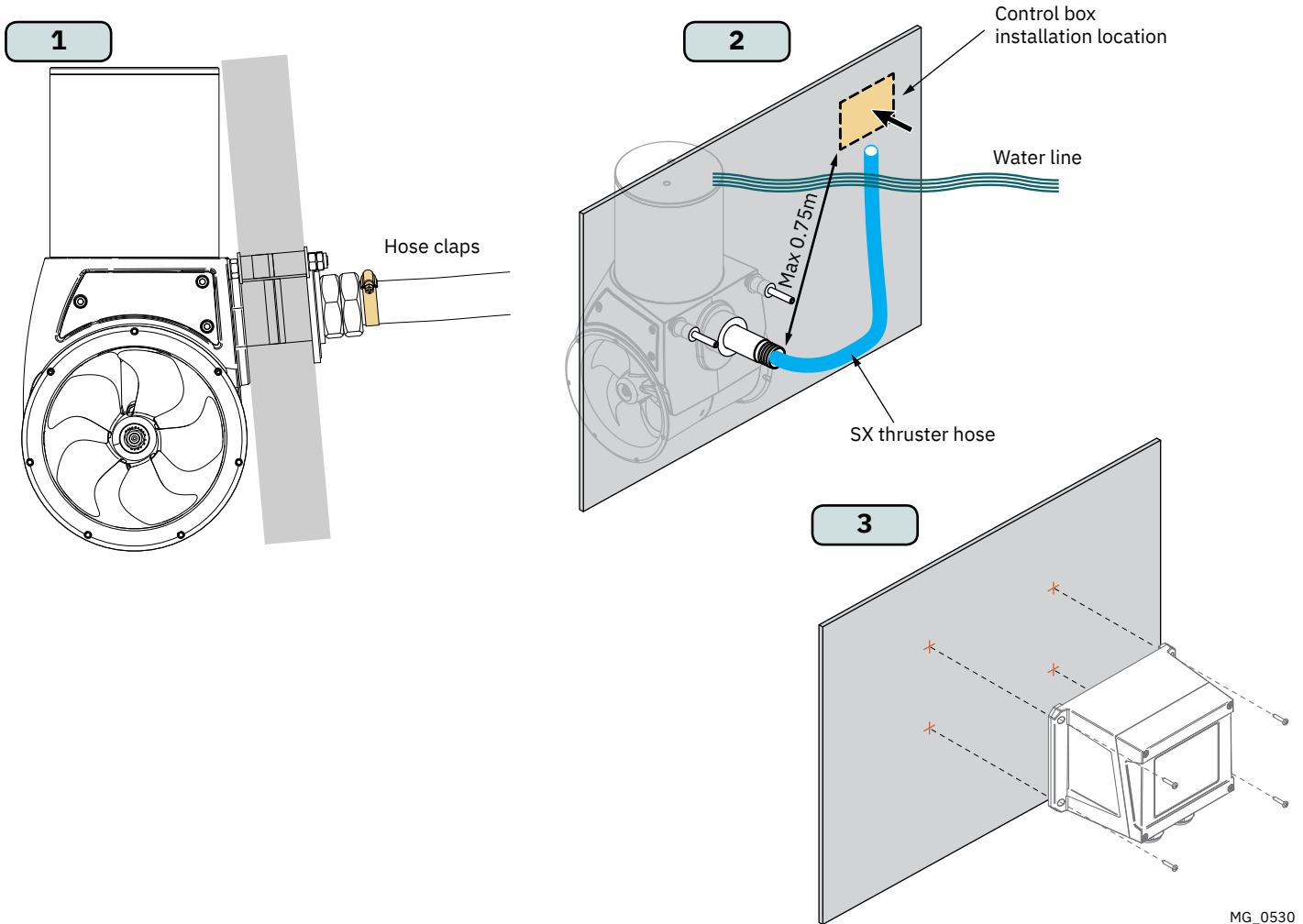
1. Electric motor flange and the positive terminal on the motor
 2. Electric motor flange and the battery negative terminal on the motor
- (If unsure contact skilled personnel.)

Electrical Reference Guide

Model Size	System Voltage	Nominal current draw	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.
35/140	12V	245 A	DIN: 200 SAE: 380 EN: 330	ANL 150	mm ²	35	50	50	70	70	95	95	120	120	2 x 70	2 x 70	2 x 95
					AWG	2	1/0	1/0	2/0	2/0	3/0	3/0	4/0	4/0	2 x 2/0	2 x 2/0	2 x 3/0
50/140S	12V	370 A	DIN: 350 SAE: 665 EN: 600	ANL 325	mm ²	50	50	70	95	120	2 x 70	2 x 70	2 x 95	2 x 95	2 x 120	2 x 120	2 x 120
					AWG	1/0	1/0	2/0	3/0	4/0	2 x 2/0	2 x 2/0	2 x 3/0	2 x 3/0	2 x 4/0	2 x 4/0	2 x 4/0

Follow the below steps to install the Control Box. Additional installation details can be found in the corresponding graphics.

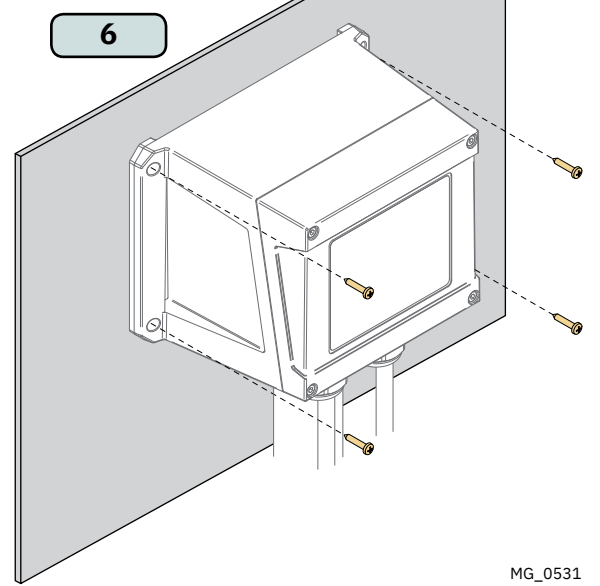
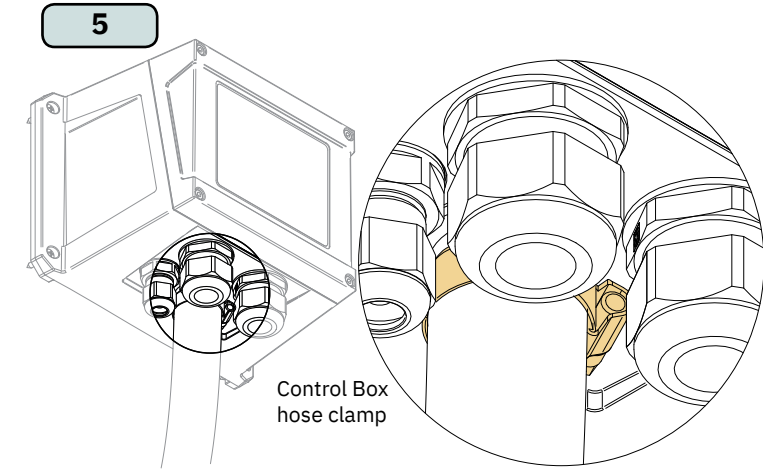
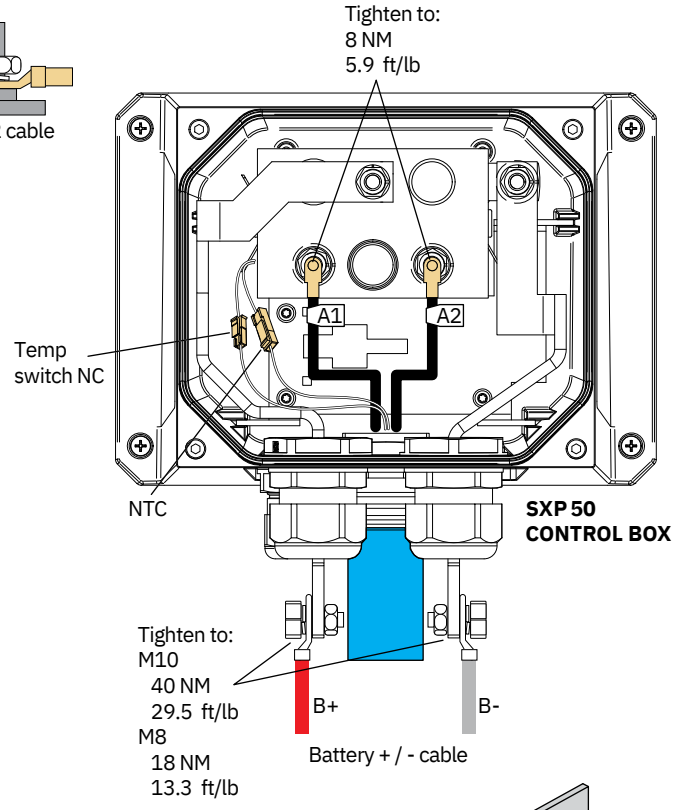
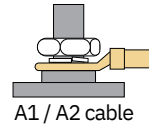
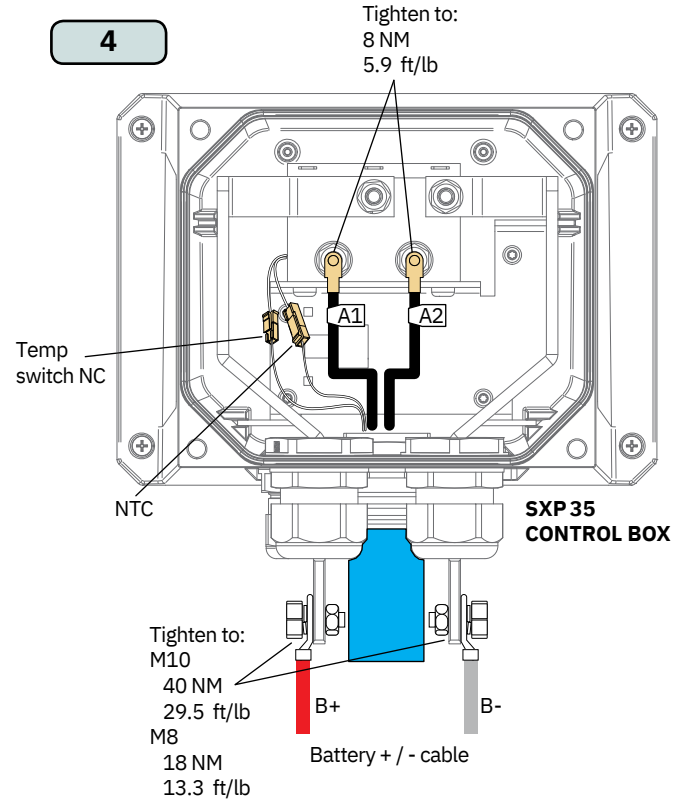
1. Pull the blue SX Thruster Hose around the cable harness coming out of the SX Thruster. Fasten the hose clamp.
2. Define the location to install the Control Box. It can be mounted in any orientation, preferably with cables facing down. The control box must be positioned within 0.75 meters from the thruster attachment bolts. Ensure that the SX Thruster Hose will not obstruct any objects and not placed near any object that radiate high temperatures.
3. Mark the locations of the four drill holes and drill the holes. Ensure that the back wall where the Control Box is to be mounted have sufficient thickness and strength.



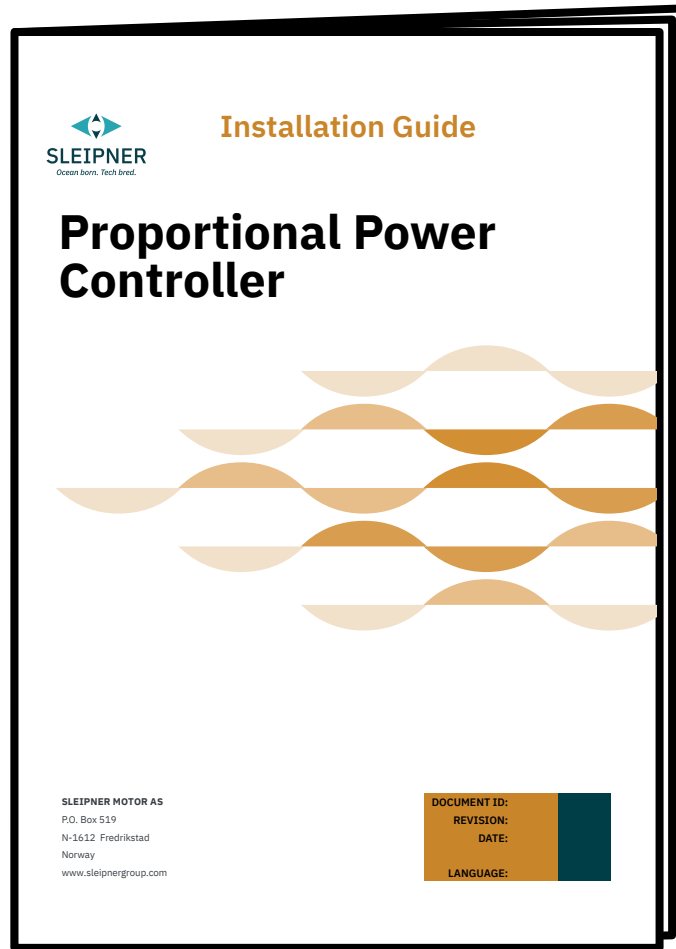
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4. Follow the cable marking and fasten motor power cables coming from the SX Thruster in the control box. The motor power cables are marked A1 and A2 and should be fastened to the terminal with corresponding marking. Place the ring cable lug connected to the white wire between the lug of the motor power cable and the nut. Fasten the nut with recommended torque. Ensure that the ring cable lug is kept at same terminal as originally placed.
 - Insert the B+ and M- power cables to the external connectors as shown in figure below. Fasten the power cables to the terminals with recommended torque.
 - Connect the Temp Switch (**NB: Additionally connect the NTC connector for proportional thrusters.**)
5. Tighten hose clamp on Control Box.
6. Fasten the control box to the hull.

CAUTION
It is the installers full responsibility to follow instructions and ensure total Ignition Protection.



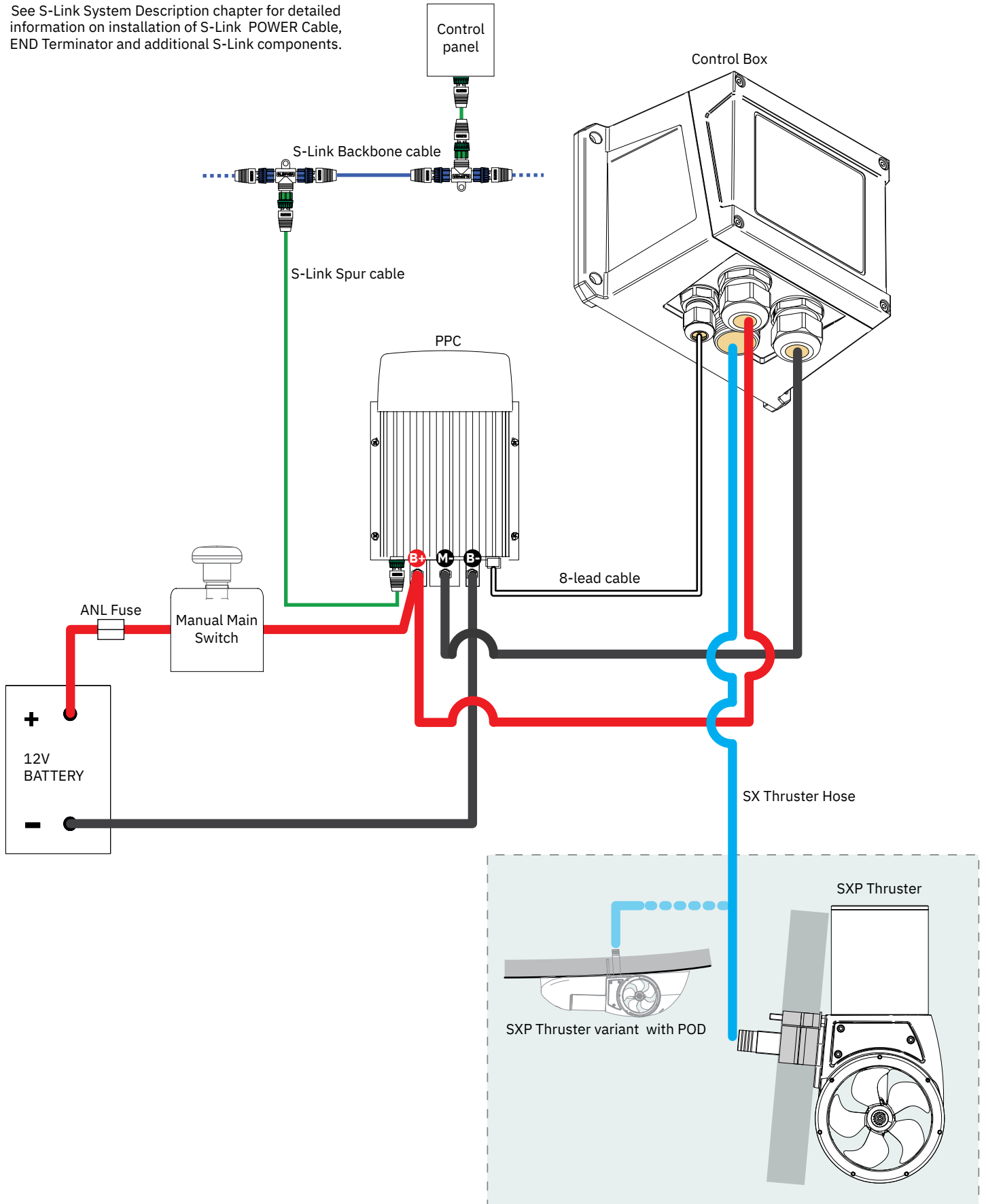
For **PPC** installation please refer to the Installation Guide accompanying the Proportional Power Controller.



Manual Main Switch Wiring Diagram 12V S-Link SXP Thruster

Selection of battery, fuse, main switch and cable cross section is described in *Electrical Installation* chapter.

See S-Link System Description chapter for detailed information on installation of S-Link POWER Cable, END Terminator and additional S-Link components.

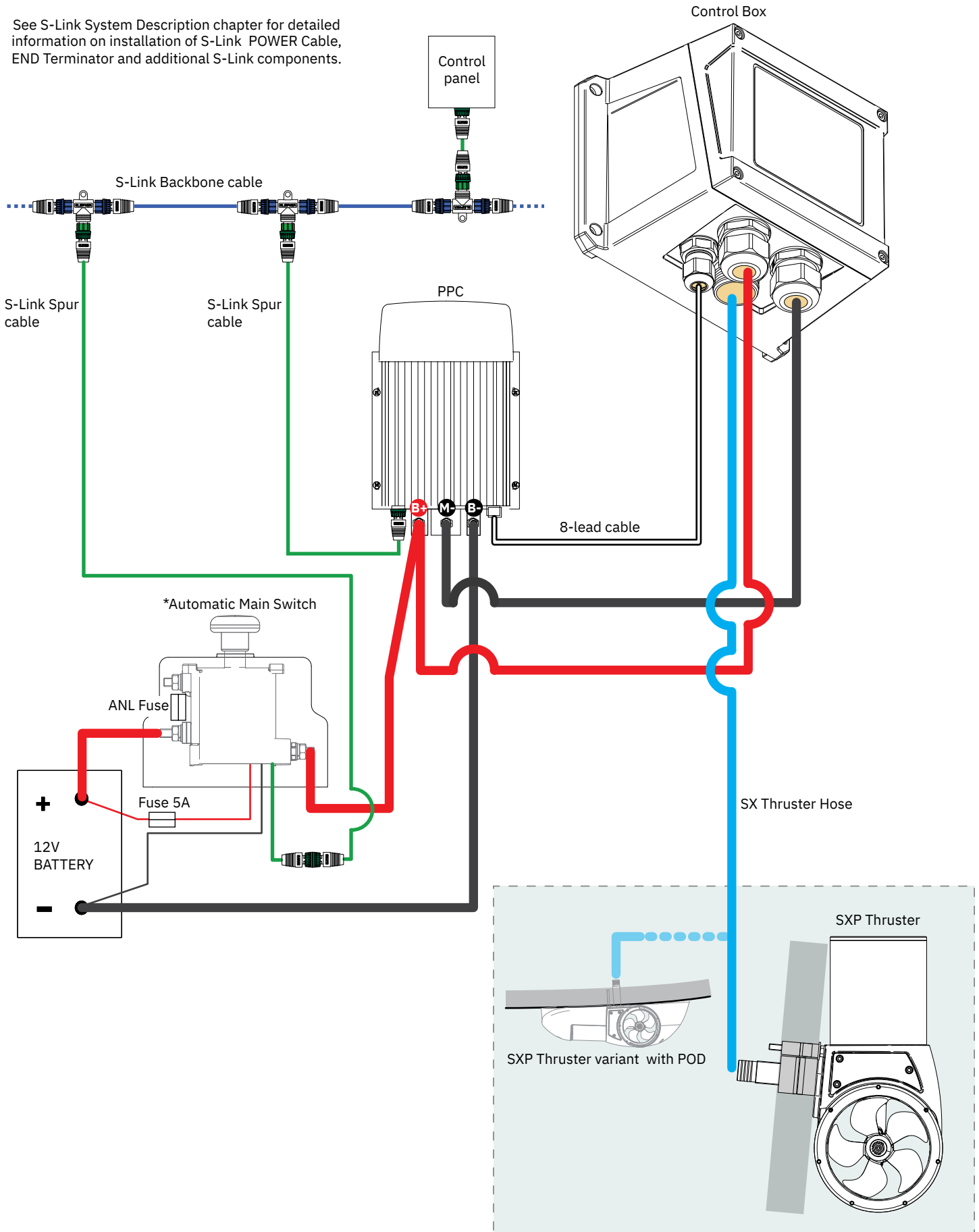


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Automatic Main Switch Wiring Diagram 12V S-Link SXP Thruster

Selection of battery, fuse, main switch and cable cross section is described in *Electrical Installation* chapter.

See S-Link System Description chapter for detailed information on installation of S-Link POWER Cable, END Terminator and additional S-Link components.



MG_0126

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.

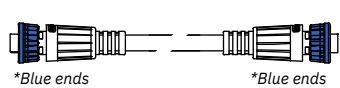
Installation of S-Link cables:

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.

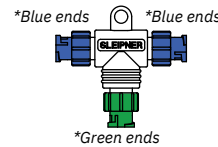
The POWER Cable should ideally be connected around the middle of the BACKBONE bus to ensure an equal voltage drop at each end of the BACKBONE Cable. The yellow and black wire in the POWER Cable shall be connected to GND and the red wire connected to +12VDC or +24VDC.

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.

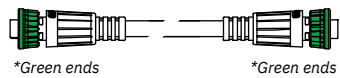
SPUR cables can be left unterminated to prepare for the installation of future additional equipment. In such cases, ensure to protect open connectors from water and moisture to avoid corrosion in the connectors.



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



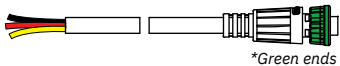
T-Connector
Used for connection of SPUR or POWER Cable to the BACKBONE Cable. One T-Connector for each connected cable.



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.



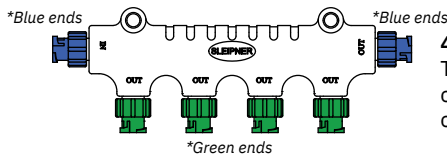
BACKBONE Extender
Connects two BACKBONE Cables to extend the length.



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

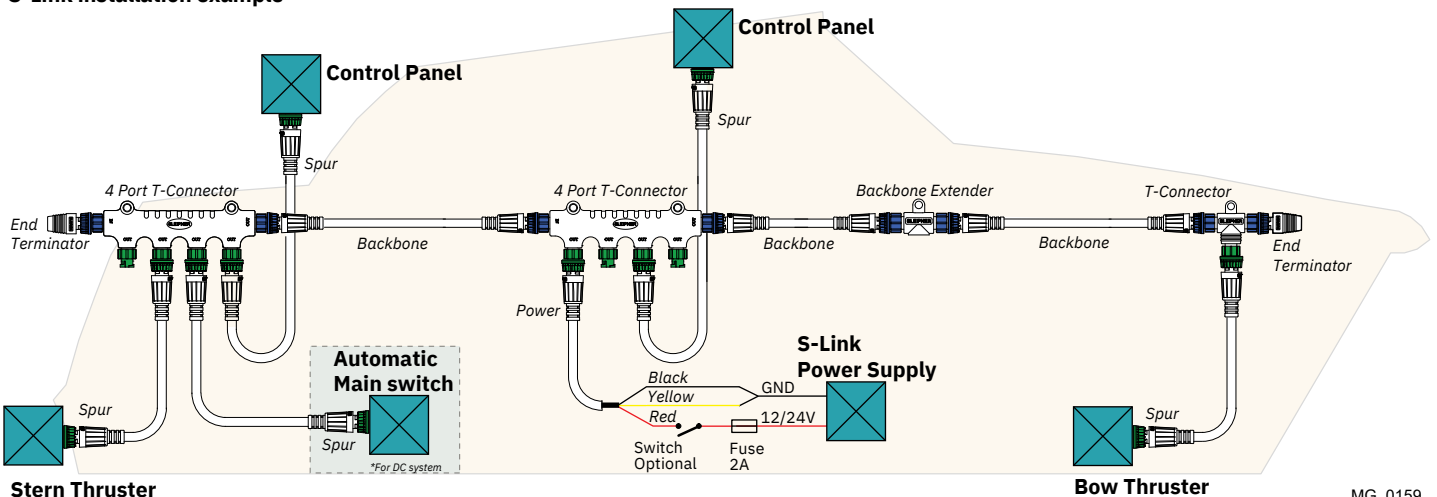


END Terminator
Must be one at each end of the BACKBONE bus.



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



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



- Propeller is fastened correctly to the shaft.
- Propeller turns freely in tunnel.
- Primer and anti-fouling have been applied to the gear house and propeller but NOT on the anode or the gear house lid where the propeller is fastened. **(NB: Do not use abrasive tools damaging the existing Epoxy coating when preparing for antifouling paint.)**
- Correct drive direction as per control panel.
- The bolts holding the thruster to the hull are tightened correctly.
- All electrical connections are clean, dry and tight, and the correct cable, fuse and main switch size.
- No water leakage around hull penetrated studs

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

Signed:

Date:

Extra pre-delivery tests by installer / yard who does not use other quality control systems !

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

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