



Installation Manual

SAC2200

User Manual

Warnings & Safety3

Product dimensions4

Dimensions PDC5

Dimensions VFD5

Product specifications.....6

Positioning of the tunnel/thruster7

Tunnel length8

Water deflection.....9

Tunnel ends10

Tunnel installation11

Gear leg and motor bracket installation12

Propeller installation15

Motor bracket filler16

Gearleg and motor bracket installation (cont)17

Motor support, horizontal installation.....18

Motor support, vertical installation.....18

Motor dimensions19

Motor installation20

Oil tank installation and filling22

Electrical diagrams.....23

PDC 30126

Startup and comissioning27

Functions and operation28

S-link system description.....29

Sleipner Group Waste disposal and recycling guide30

Service and support31

Product spare parts and additional recources.....31

Warranty statement.....31

Patents31

To prevent personal injury, death, or damage to this product, the vessel, or other equipment, it is essential that you carefully follow all instructions in this manual during installation and operation. Failure to follow these instructions will immediately void all warranties provided by Sleipner Motor.

Warnings and notices throughout this document highlight situations that require special caution. Always pay close attention when these appear.



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury or damage to the product.

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 installers 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, Sleipner products 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.
- When planning the installation of Sleipner products, ensure easy access to the products for future service and inspection requirements.

For Sleipner thruster systems:

MC_0425

- Do not install the thruster system in any position that requires modification of hull stiffeners or stringers. This might 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. The propeller will reach extremely high speed, damaging the thruster.
- The thruster motor must be handled with care. Do not rest the motor on its drive shaft, as its weight can damage it.

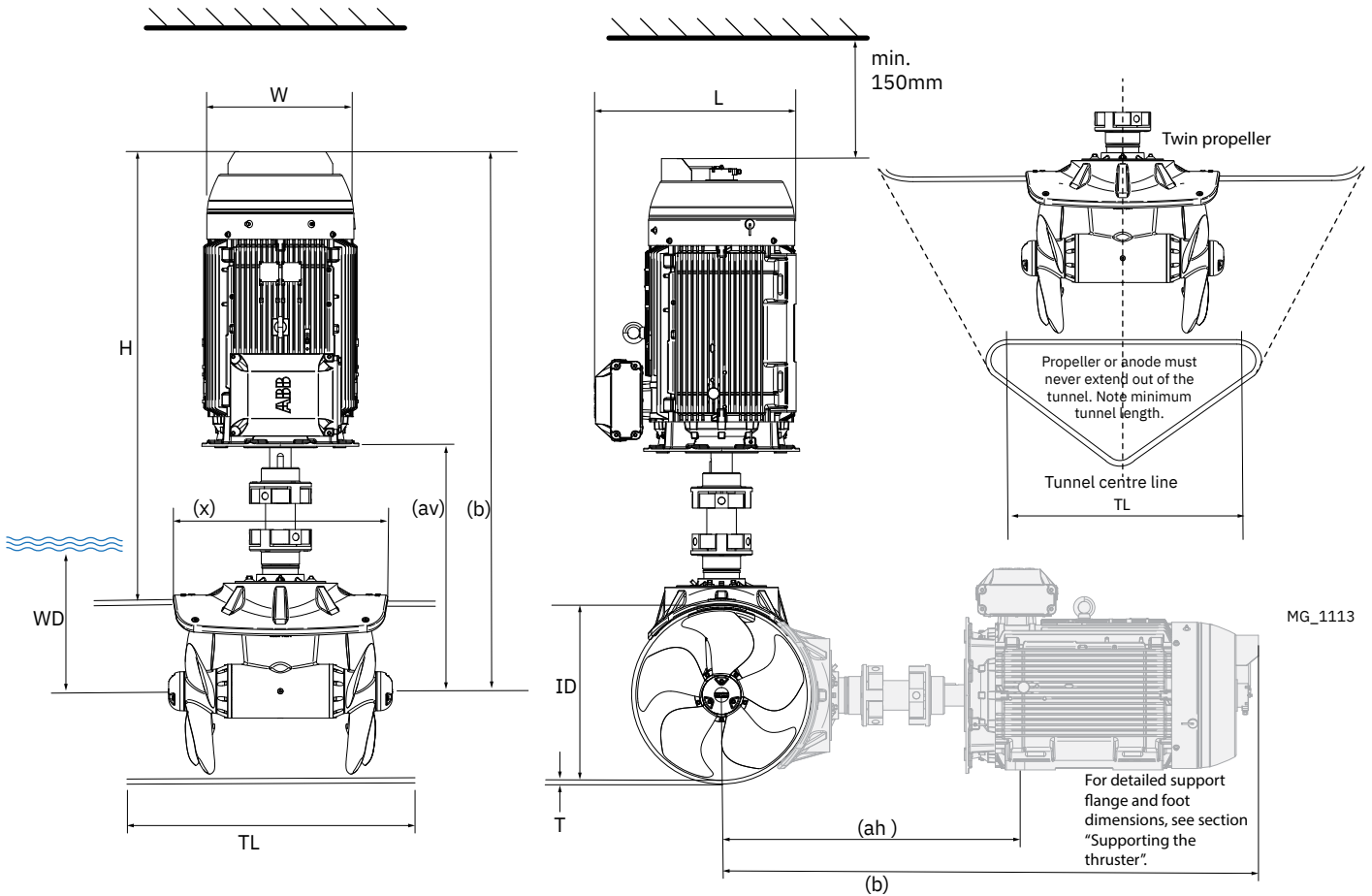
For Sleipner S-Link™ systems:

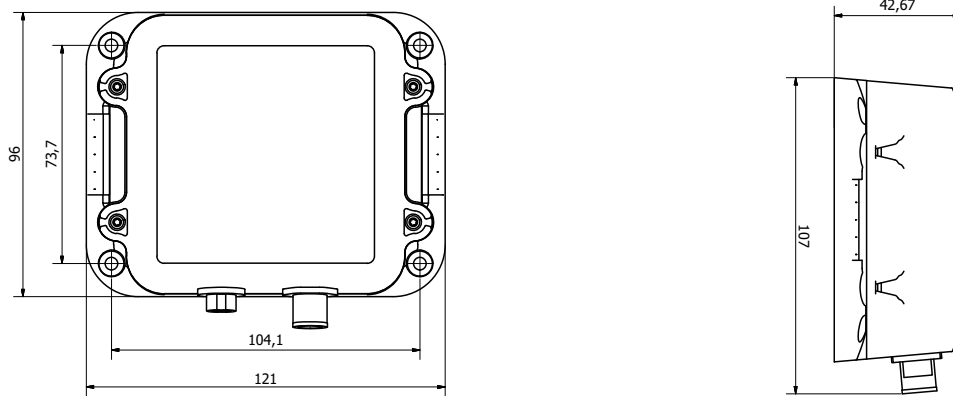
MC_0105

- Only Sleipner S-Link™ products or authorized 3rd party control equipment can be directly connected to the S-Link™ bus. Non-authorized 3rd party equipment must always be connected through a Sleipner interface product.
- Any attempt to connect to the S-Link™ bus without an authorized 3rd party control equipment will void all warranties for the connected Sleipner products.
- If 3rd party control equipment is interfaced the S-Link™ bus through a Sleipner interface product, it is required to install at least one Sleipner control panel to enable efficient troubleshooting.

Measurement code	Measurement description	SAC2200/730-I		SAC2200/730-C	
		mm	inch	mm	inch
ID (min)	Internal tunnel diameter, min.	730	28.7	730	28.7
T (min)	Tunnel thickness, min.	12	0.5	12	0.5
T (max)	Tunnel thickness, max.	30	1.2	30	1.2
TL (min)	Tunnel length, min.	1100	43.3	1100	43.3
TL (recommended)	Tunnel length, recommended	1500	59.1	1500	59.1
WD	Water depth, recommended	1400	55.1	1400	55.1
WD (minimum)	Water depth, min.	1100	43.3	1100	43.3
H	Actual dimension will vary depending on tunnel outside diameter	1767	69.6	1888	74.3
W		567	22.3	645	25.4
L		762	30.0	852	33.5
(av) Vertical	Gear center to the motor flange	999	39.3	1029	40.5
(ah) Horizontal	Gear center to the first mounting point	1189	46.8	1245	49.0
(b)	Distance from the center of the gear to the motor top	2145	84.4	2266	89.2
(x)	Tunnel bracket length	902	35.5	902	35.5
Weight assembly (kg/lbs)		1342/2958		1602/3531	
Weight motor (kg/lbs)		890/1962		1150/2535	

MC_1108





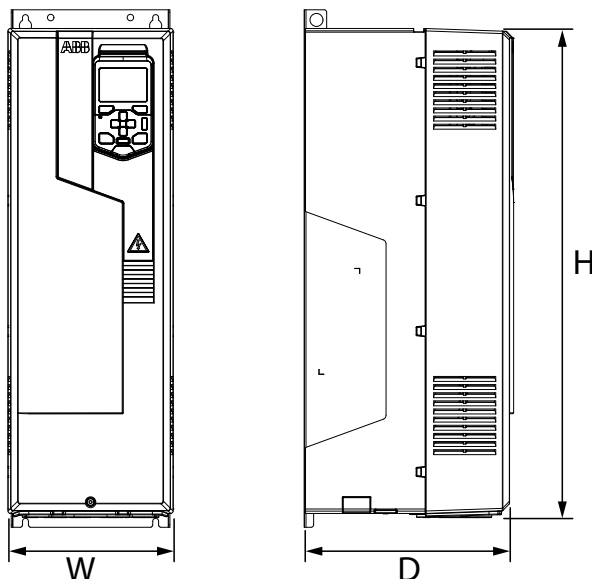
MC_0155N

Dimensions VFD

MC_1120

Thruster model	VFD model	Frame size	Voltage range VAC	IP	Weight kg	D mm	W mm	H mm
SAC2200/730-I-4-H(V)	ACS880-01-293A-3	R8	380-415	55	74	452	300	963
SAC2200/730-I-4L-H(V)	ACS880-37-293A-5	R11	380-500	54	750	698	1230	2315
SAC2200/730-I-7-H(V)	ACS880-01-174A-7	R8	690	55	74	452	300	963
SAC2200/730-I-7L-H(V)	ACS880-37-174A-7	R11	690	54	750	698	1230	2315
SAC2200/730-C-4-H(V)	ACS880-01-293A-3	R8	380-415	55	74	452	300	963
SAC2200/730-L-4-H(V)	ACS880-37-293A-5	R11	380-500	54	750	698	1230	2315
SAC2200/730-C-7-H(V)	ACS880-01-174A-7	R8	690	55	74	452	300	963
SAC2200/730-C-7L-H(V)	ACS880-37-174A-7	R11	690	54	750	698	1230	2315

-C operation mode
 -I operation mode. See specification table
 SAC2200/730 thruster model
 730 tunnel diameter
 2200/ thrust value



MG_1122

	SAC2200/730-I-4(L)-H(V)	SAC2200/730-I-4(L)-H(V)
Performance		
Tunnel inside diameter (mm/in)	730/28,7	730/28,7
Thrust, continous (kg/lbs)	2000/4410	2200/4850
Thrust, max. (kg/lbs)*	2200/4850	NA
Motor output (kW/Hp)	138/188	138/188
Voltage range, 3-phase supply, model specific	380-690	380-690
Motor IP	55	55
Current draw max:(A)**		
400V systems	270	270
690V Systems	157	157
Generator load max: (kVA)***	165	165
Features		
DNV type approved gearleg	Yes	Yes
Lubrication	Gravity feed. On water oil change	Gravity feed. On water oil change
Galvanic separation (Optional galvanic separation kit)	No	No

MC_1123

*) Max thrust is available until the motor winding temperature exceeds 130°C and the dynamic thrust limitation gradually decrease the thrust to continuous rated performance.

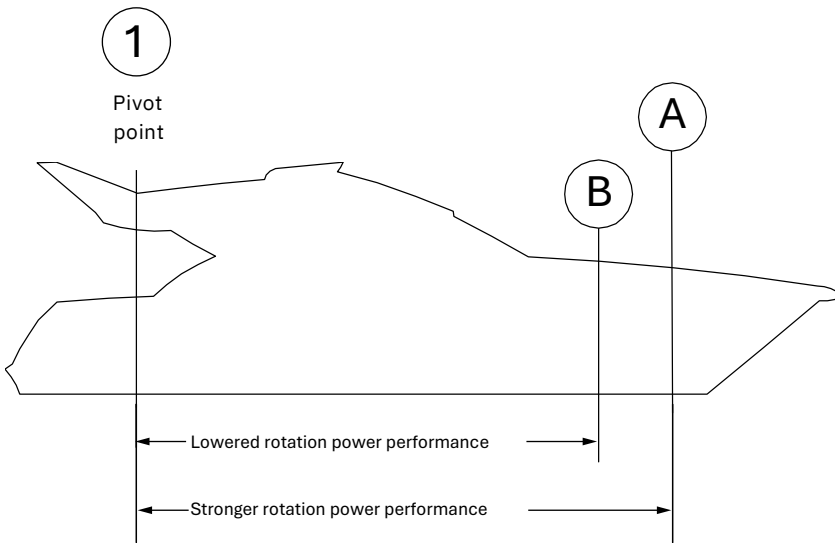
**) Current draw values are max values set in the VFD parameter setup.

***) **Note: Listed generator load is the maximum load value at standard thruster setup. Note that this value is different from the required generator capacity. Required generator capacity will vary depending on generator characteristics and other loads on the system and have to be selected in cooperation with generator supplier. Sleipner SAC thrusters are in standard version powered by standard Variable Frequency Drives. Low harmonic drives (THD <5%) can be supplied on request. Indicative, recommended generator capacity to be 2 x listed generator load.**

1. **Aim to install the thruster as far forward as possible**
 Due to the leverage effect around the boats' pivot point. The distance difference from the boat pivots' point to the thruster will determine the amount of real rotation power for the boat.
2. **Aim to install the thruster as deep as possible.**
 Deeper installations prevent air from being sucked into the tunnel from the surface, resulting in reduced thrust performance and increase noise levels during operation. Deeper installations increase water pressure for maximum efficiency from the thruster.

The tunnel depth is of great importance for optimal thrust. *(Refer to product measurements to define your products recommended depth below the waterline.)* The installer must make evaluations based on thruster performance, boat type and operating conditions. As a general recommendation, the position of the tunnel should not be a minimum of 1/4 of the diameter of the tunnel from the boat keel. *(NB: This can be overlooked depending on the installation methods defined in this manual.)*

MC_1100



MG_0001N

Optimal tunnel length

Achieving the correct tunnel length depends on many factors from the hull type, operation and environmental conditions. Tunnels should avoid being longer than 4 x the tunnel diameter as this will reduce thruster performance. *(NB: Installing long length tunnels can flex/ bend over time and may require additional support. Consult with a naval architect.)*

1. Do not allow the variable length of the tunnel walls to vary in length excessively. EG. The top tunnel wall is x 4 longer than the bottom wall.
2. If the tunnel is too long, the friction inside will reduce the water speed and thereby the thrust.
3. If the tunnel is too short (typically only in the bottom section of the tunnel) cavitation problems can occur as water flow will not be able to "straighten" itself before reaching the propeller. This cavitation will reduce performance and increase noise during operation.

Thruster within the tunnel

It is important the propellers and the lower unit/ gearleg must be entirely inside the thruster tunnel. Propellers that protrude from the tunnel will not perform as intended.

4. Standard Use

Tunnel length must be long enough to ensure the propellers are not extruding the tunnel. *(NB: Refer to product measurements to define your products recommended tunnel length.)*

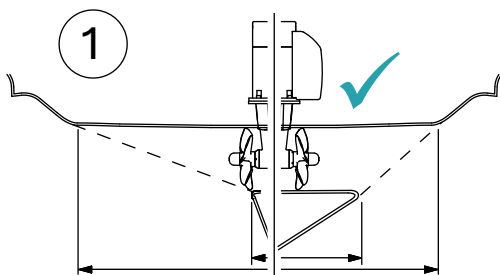
5. Flat Bottom Hull

Tunnel lengths must be longer than the standard measurement outlined within the manual to ensure a circular vacuum is not created between the thruster and the bottom of the boat.

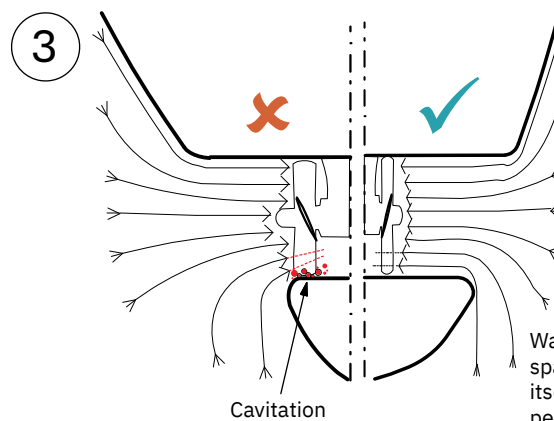
6. High-Speed Boats

Tunnel lengths must be increased to protect the propeller from damage when crashing against the water surface during high-speed cruising. *(NB: This can include the length of a spoiler)*

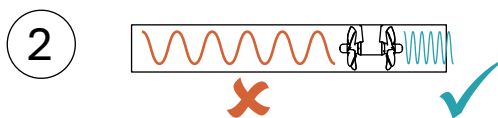
MC_1101



Do not allow the variable length of the tunnel walls to vary in length excessively. EG. the top tunnel wall is x 4 longer than the bottom wall.



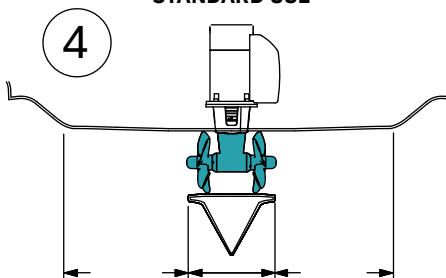
Water flow must have space to "straighten" itself for best performance.



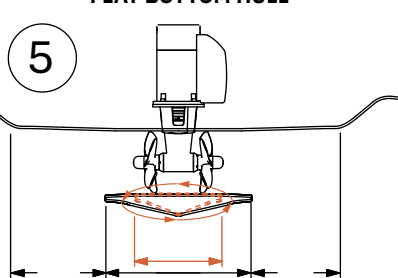
STANDARD USE

FLAT BOTTOM HULL

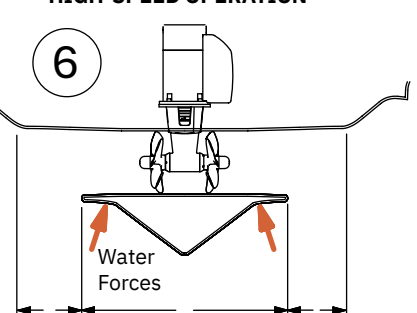
HIGH-SPEED OPERATION



The gearleg/ propeller(s) must never extend out of the tunnel



Increase tunnel length to prevent a circular water vacuum cavity between the propeller and the hull of the boat.



Increase tunnel length to protect the propeller from water forces when high-speed cruising.

MG_0048N

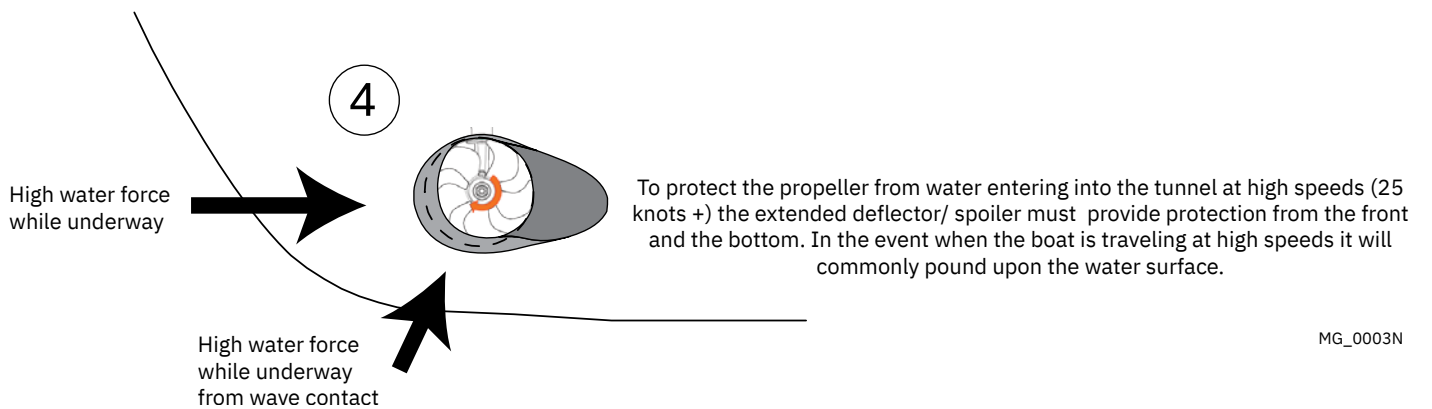
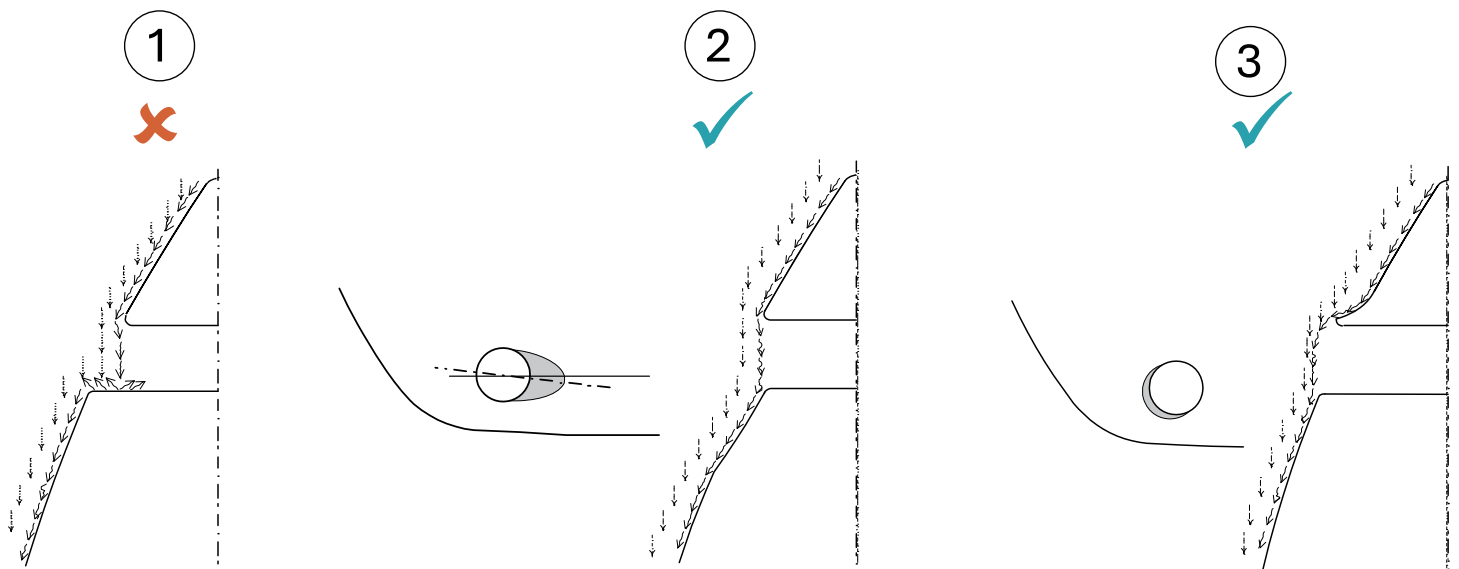
1. A possible problem in sail boats or fast powerboats is that a non-rounded surface can generate drag from the back face of the tunnel, as it creates a “flat” area facing the flow of water.

This problem can be solved in two different ways, depending on what is possible or easier to perform.

2. The best solution which generally reduces the most drag is to make a recess in the hull at the back of the tunnel. As the back face is removed water can flow freely past the tunnel entry. The depth and shape of this recess will depend on the boat and the angle facing up/ down aft of the tunnel insert. Normally it is angled slightly down because of the water flow on this area.
3. Making a deflector/ spoiler in front and underneath the tunnel can also reduce damage to the thruster and drag. The deflector/ spoiler will push the water flow out from the hull so water can pass by the back face of the tunnel. The shape and size of this deflector/ spoiler will depend on the hull shape. The easiest way of making the deflector/ spoiler is to retain a part of the lower forward area of the tunnel while installing the tube. Use this area as support to mould a soft curve/spoiler shape from the hull.
4. The thruster propeller can spin (passively) producing noise while sailing or cruising as water is forced through the tunnel. Water-flow directed through the tunnel at high speeds, during turning or as the boat bumps waves while underway can also damage the thruster.

(NB: As a rule, you should not see the back face of the tunnel when standing directly in front of the boat looking aft.)

MC1102



MG_0003N

Rounded tunnel ends will maximise thrust and minimise noise and cavitation.

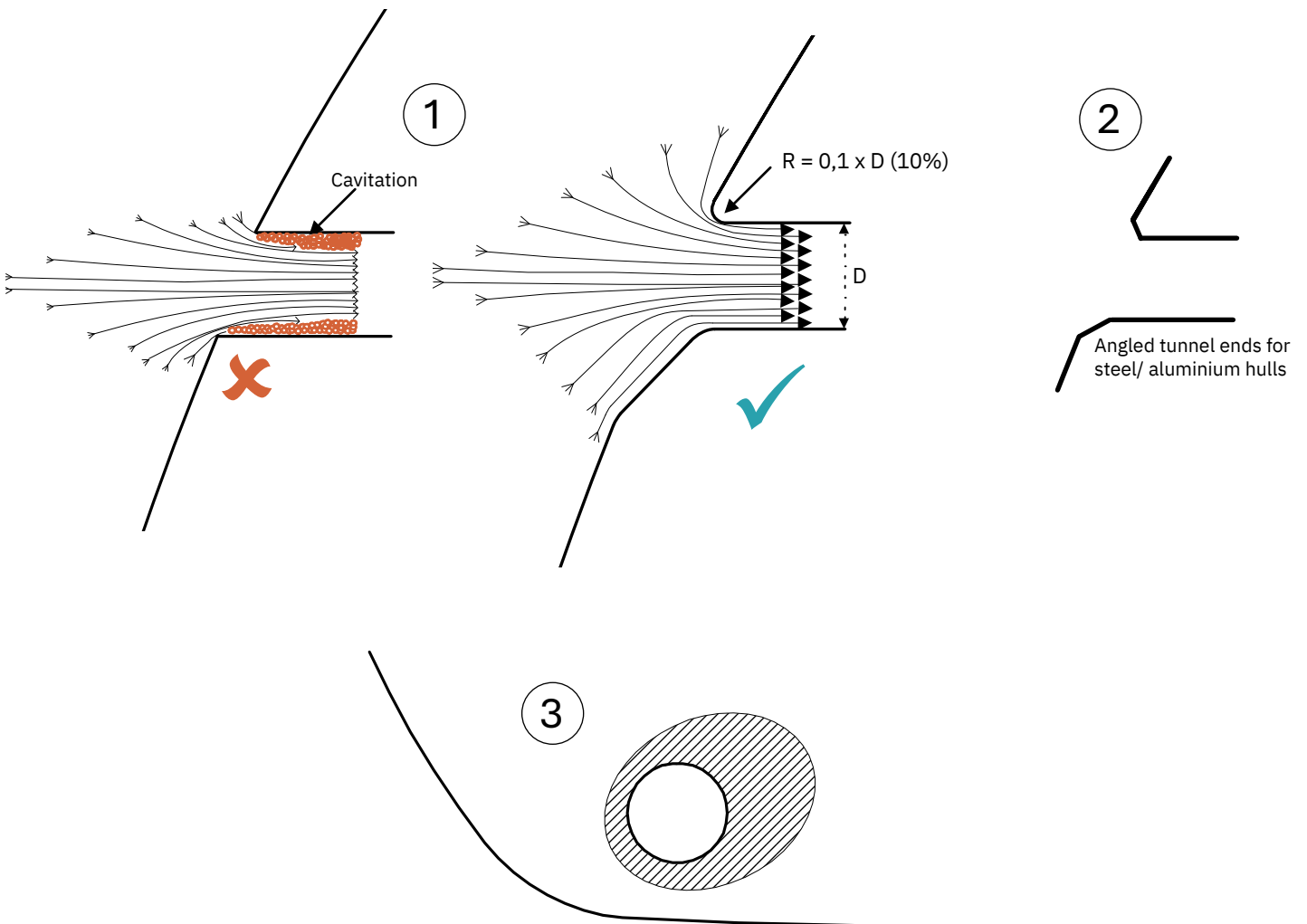
For best performance round the tunnel connection to the hull-side as much as possible. The minimum rounding has a radius of 10% of the diameter of the tunnel.

Significant advantages of a rounded tunnel over a sharp tunnel to hull connections are:

1. A rounded tunnel end will prevent the creation of turbulence/ cavitation created from a sharp tunnel end when water passes by the tunnel.
 - The turbulence/ cavitation will block the outer area of the tunnel and thereby reduces the effective tunnel diameter and thrust.
 - Turbulence/ cavitation on the propeller will lessen the thrusters performance and create excess noise.
2. For steel/ aluminium hulls angled tunnel ends also offer similar performance as a rounded connection.
3. A rounded tunnel end makes the thruster draw water from along the hull-side, creating a vacuum that will suck the boat sideways and thereby give additional thrust.
 - With a sharp tunnel end, the thruster will be unable to take water from along the hull-side, and you will not gain the desired vacuum and additional thrust. This “free” extra thrust in optimal installations be 30 - 40% of the total thrust.

(NB: A Sleipner thruster propeller does not produce cavitation at working speed. Therefore, any cavitation and cavitation noise in the tunnel will be caused during improper tunnel installation.)

MC_1103

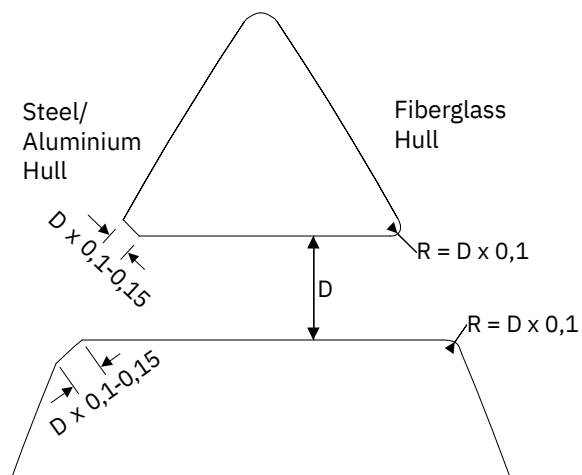


MG_0002N

With tunnel installed and cast.

- Round the edges with a radius of 10% of the tunnel diameter.
- For steel/ aluminium hulls make a slope with a length of 10-15% of the tunnel diameter.
(NB: If this is not possible, round the tunnel end as much as possible.)
- Coordinate with a ship designer to safeguard the structural strength of the hull when installing the tunnel.
- Follow the same method if making the deflector/ spoiler.

MC_1090



MG_1091

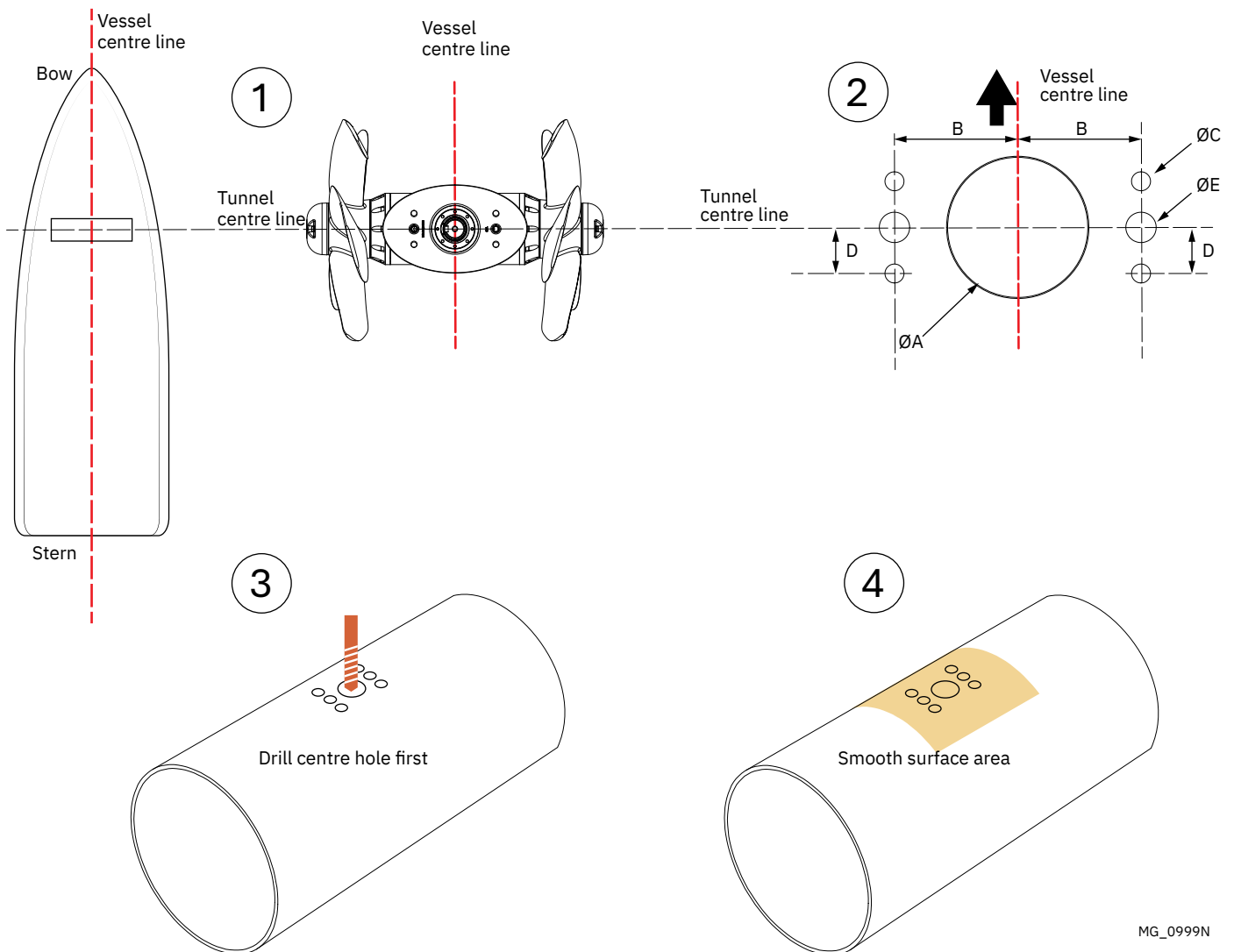
Important installation notice:

- Do not mount the thruster directly to the metal hull without galvanic isolation. Contact your dealer for purchasing the correct isolation kit, incl. installation instructions.
- Use only approved Sleipner isolation components.
- Follow the installation instructions included with the isolation kit.

1. Mark the tunnel centreline and the boat's centreline.
2. Use the gasket or template (recommended) to mark the hole centres and double-check the measurements. The centre hole MUST be placed using the boat centreline as shown above. **(NB: All holes must be in-line with the tunnels' centreline for correct installation, clearance between the propeller and the tunnel is minimal.)**
3. Drill the main centre hole followed by the bolt holes. See dimensions in the table below.
4. Smooth the area where the thruster components will be in contact with the tunnel.

MC_1097

Truster model	Measurements									
	ØA		B		ØC		D		ØE	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
SAC/SH2200	160	6.30	130	5.12	26	1.02	50	1.97	37	1.46

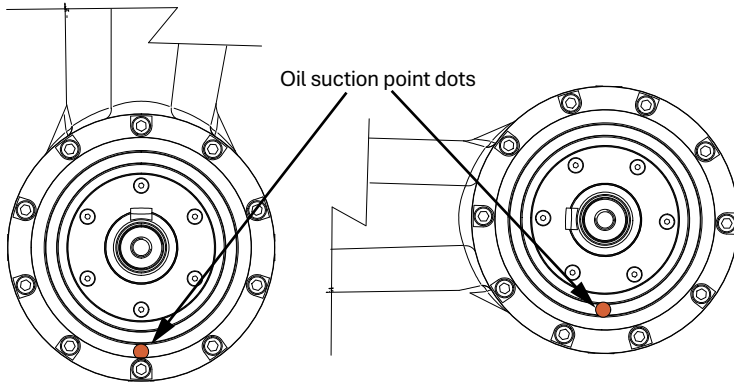


MG_0999N

Important note:

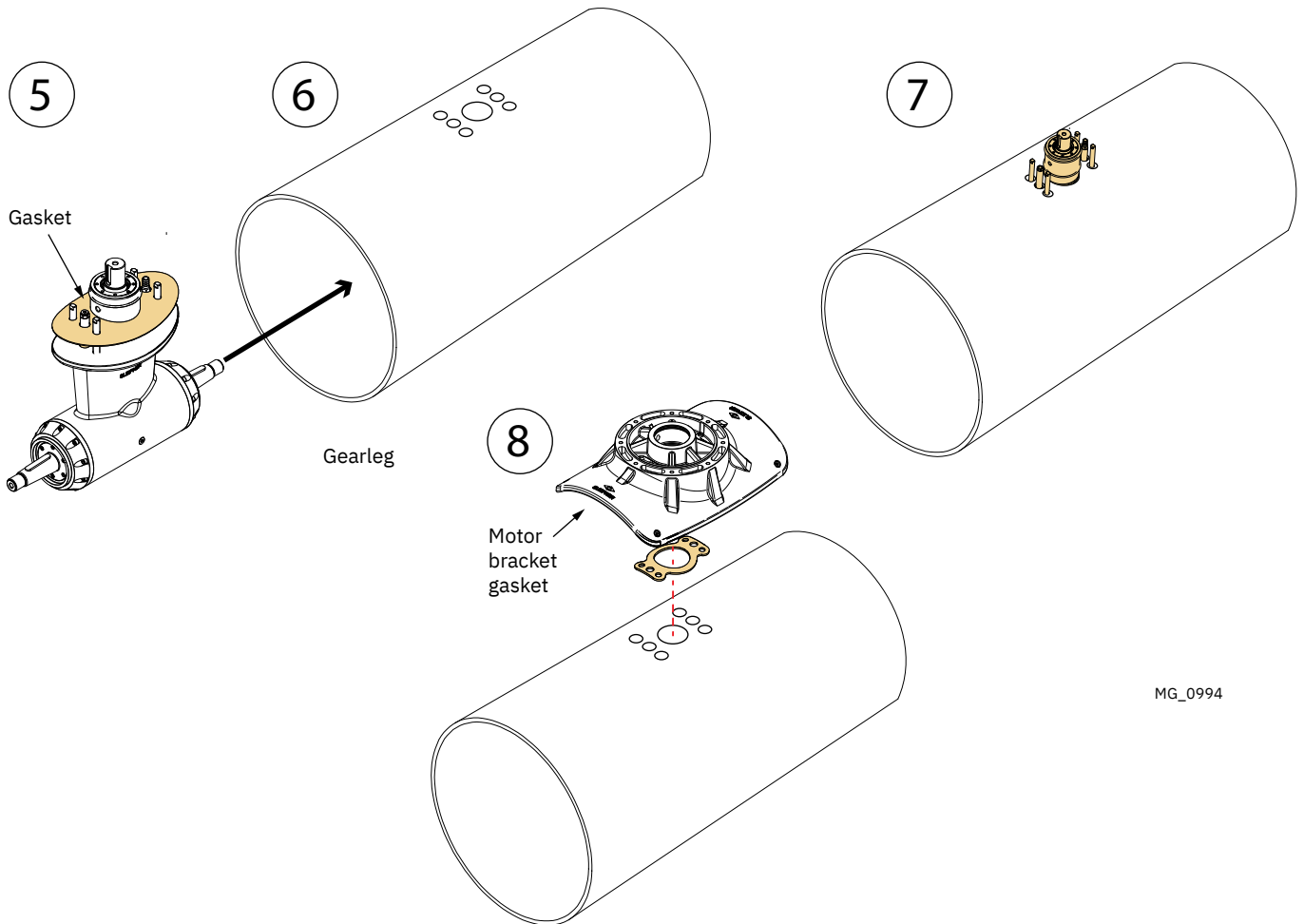
- Gearleg will be marked with a dot indicating suction point orientation.
- Gearleg must be installed with suction point at the lowest position.
- For horizontal installation, gearleg might need to be flipped 180° to get suction at the lowest point.

MC_1077



MG_1136

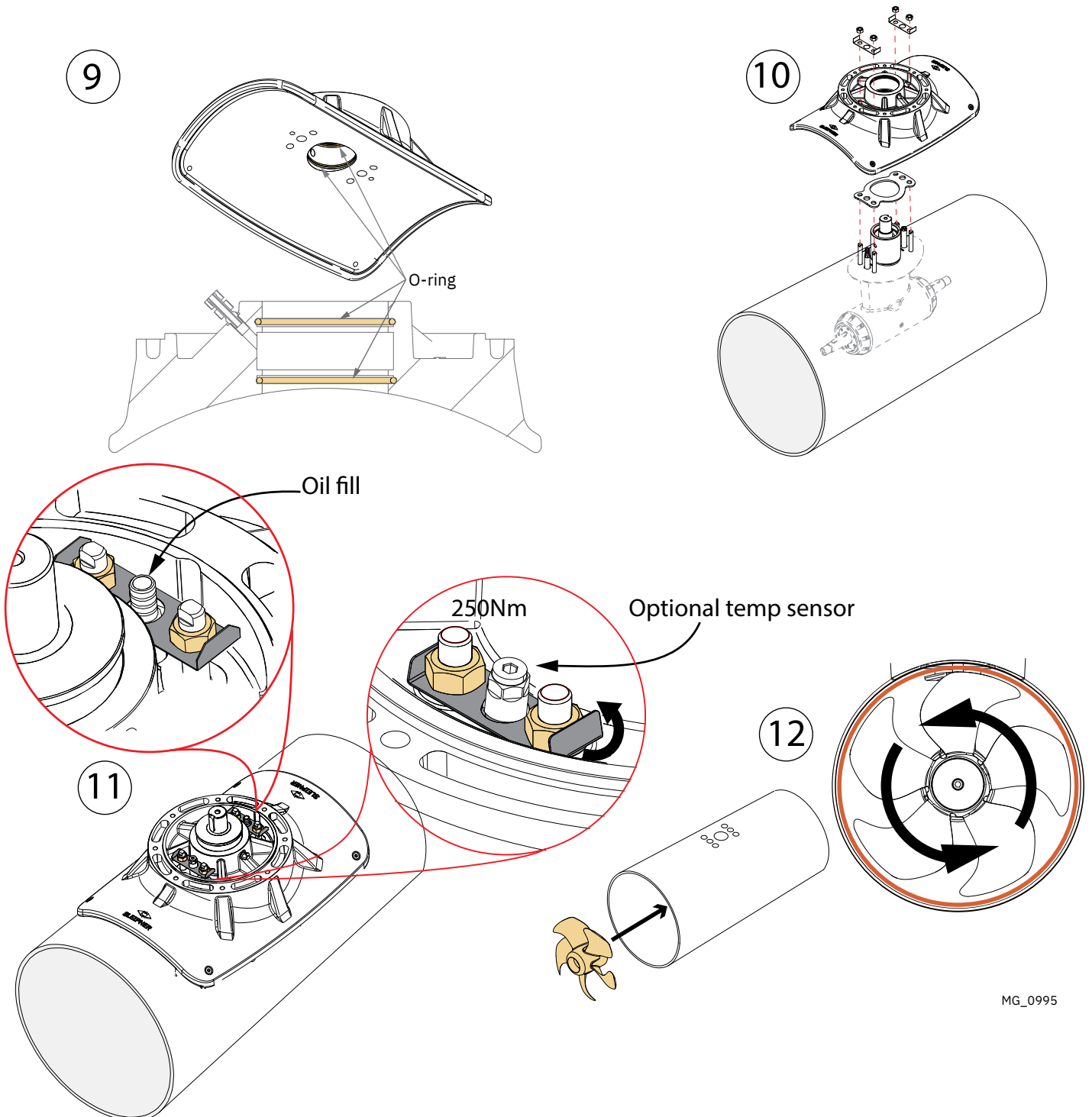
5. Apply an appropriate sealant to both sides of the gasket and place the gasket on the gearleg boss.
See your sealant data sheet for the correct application process.)
6. Enter the gearleg in the tunnel.
Note that there are threaded holes in both the propeller and the motor shafts, where the purpose is to enter an eye bolt for supporting the push and lift movement of the gearleg.
7. When the gearleg is in alignment with the predrilled holes in the tunnel, lift the gearleg to enter these holes.
8. Keep the gearleg in correct position by supporting it with a wood block or similar underneath.



MG_0994

9. Apply oil or grease on the O-rings in the motor bracket before mounting it together with the gear house, to prevent damaging the O-rings during insertion. *(NB: The gearleg neck and the inner surface of the motor bracket must remain clean.)*
10. Install the top motor bracket, the gasket and gearleg gently together.
11. Fasten the gearleg and the motor bracket with the bolts provided. Tighten to torque as shown. **Apply thread paste to the threads when entering to prevent the nut and bolt from seizing and get stucd.**
12. Position the propeller onto the tapered shaft until it seats fully. Do not tighten or lock the propeller at this stage. Confirm that the propeller rotates unobstructed within the tunnel, ensuring adequate clearance and freedom of movement.

MC_1077

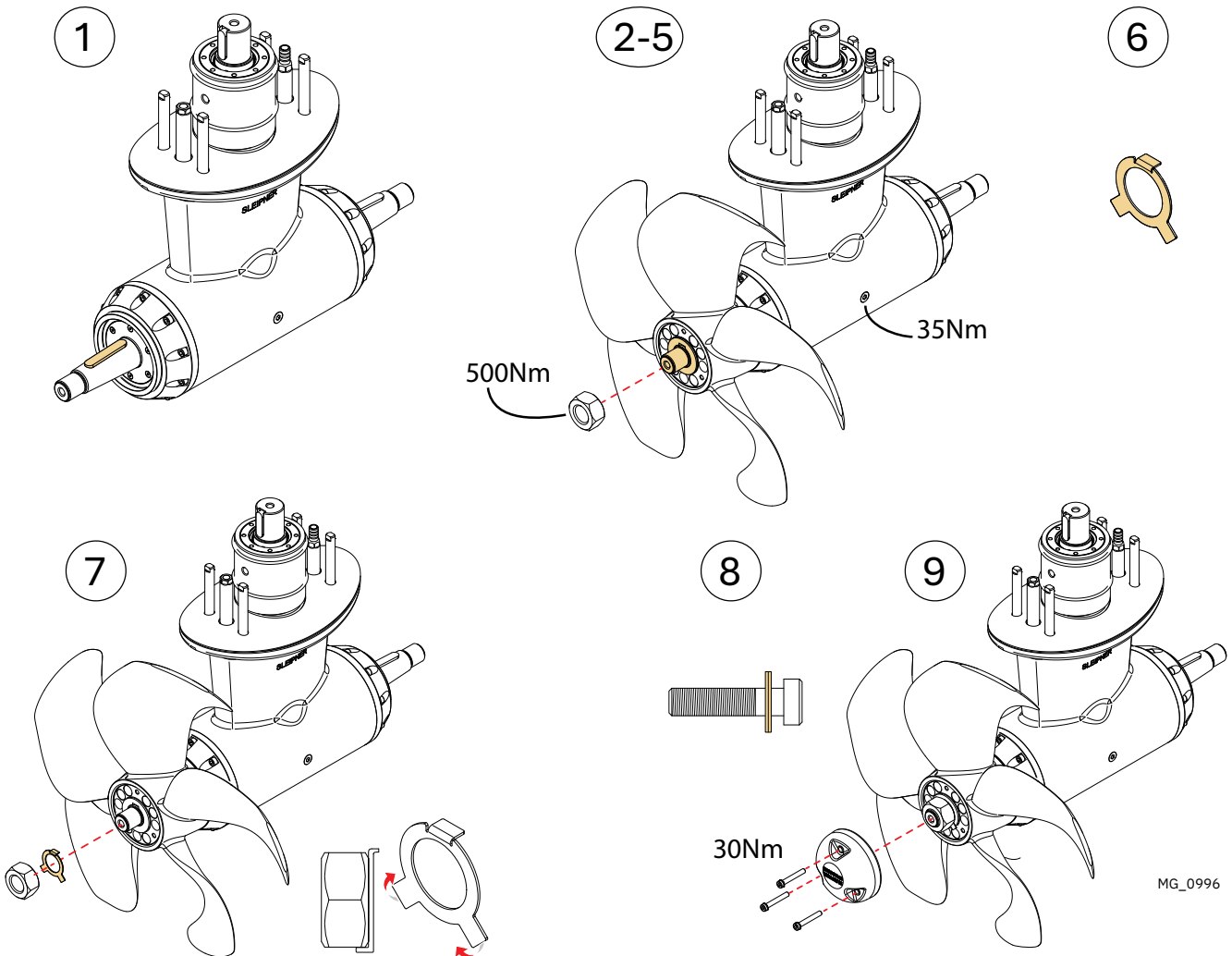


MG_0995

NOTE: Only install one of the propellers at this stage. The second propeller must be installed after the oil filling procedure.

1. Rotate the propeller shaft so the shaft key way is facing up. Remove the tape holding the parallel key in place on the propeller shaft.
2. Insert the propeller onto the propeller shaft until the propeller key aligns into the slot/ groove in the propeller. **(NB: Installation requires almost no gap (approximately 1mm) between the propeller and the gearleg.)**
3. Apply waterproof grease only to the thread where the bolt will be fastened to achieve required torque tension. **Do NOT apply grease to the internal propeller core.**
4. Without the washer, fasten the propeller lock-nut to the required torque.
5. Remove the propeller lock-nut from the shaft.
6. Grease the washer surface facing the propeller lock-nut.
7. Insert the washer on the propeller shaft and re-fasten the propeller lock-nut to required torque tension. **(NB: Ensure the washer tab is inserted into the slot/ groove in the propeller. Fold the tab washer over the nut after fastening).**
8. Attach the anode hub to the propeller shaft, and enter and tighten the bolt(s) holding the anode.

MC_1001



MG_0996

In order to ensure a stable mechanical contact surface against the tunnel, the gap between the motor bracket and tunnel must be filled with an epoxy casting resin.

To achieve an optional filling of the gap, Sleipner recommend a epoxy resin filler. One example may be **Sicom SR CA 85** in combination with **SD8701** hardener.

Post curing may be required to achieve optimal mechanical strength. Refer to the datasheet for that process.

Ensure that the cast material data is within the specified values in the table below.

Recommended data and considerations for filler material							
	Initial viscosity	Pot life	Tg max onset	Tensile modulus	Flexion modulus	Compression yield	Charpy Resilience
Units	mPa.a	h	°C	N/mm ²	N/mm ²	N/mm ²	kJ/m ²
Value	<3000	>1	>60	>5000	>4000	>80	>7

It is four resin filler ports (**Reference 1**), and two bleed ports (**Reference 2**).

For vertical installations:

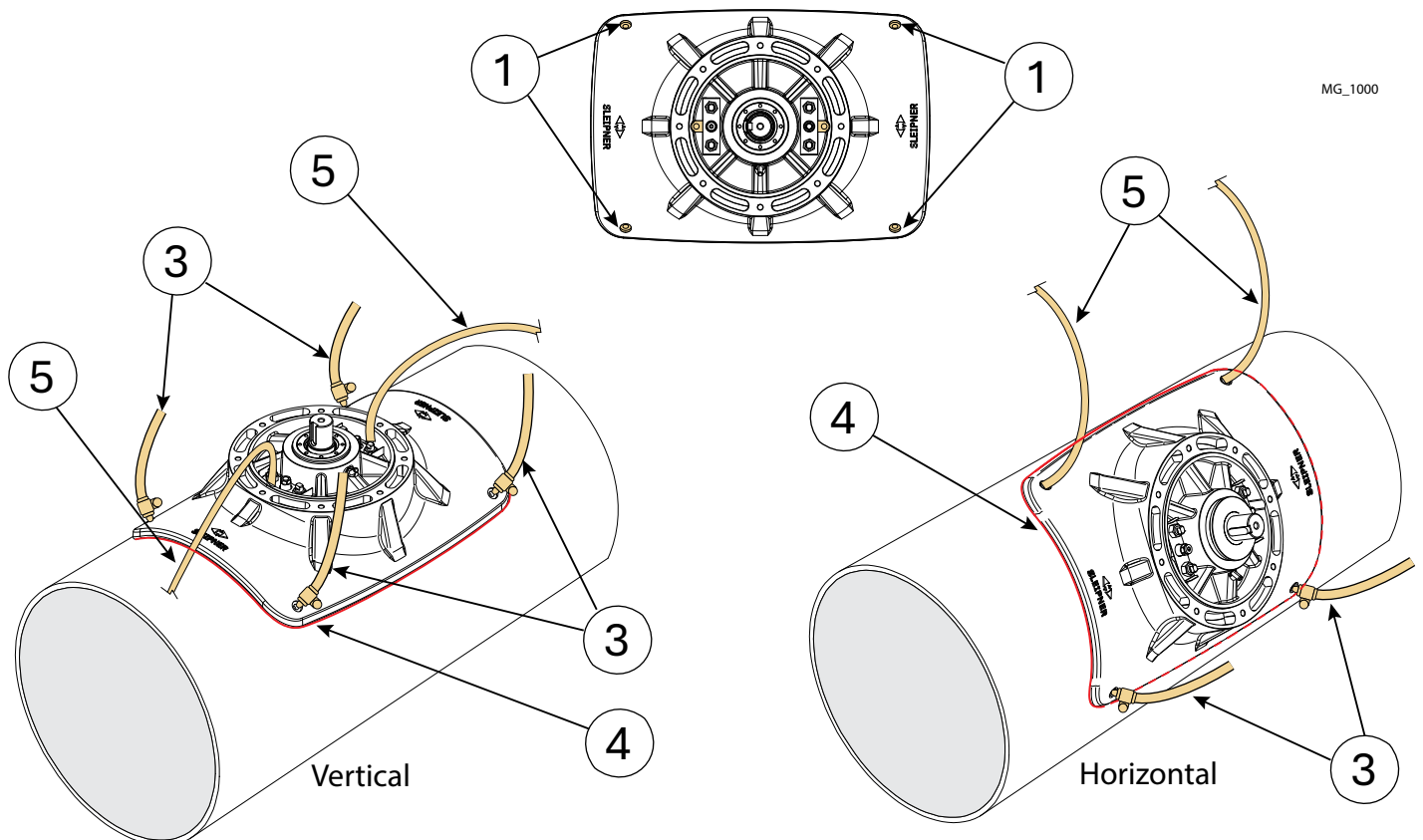
- Insert resin filler injector nozzles (**Reference 3**) in the four filler ports. To avoid spillage of fill material, it would be beneficial to attach a hose to the bleed ports to direct any excess away from the engine bracket. (**Reference 5**).
- Continue filling until the resin are visible in the bleed ports.
- Enter and tighten the screws in the bleed ports (**Tightening torque 28Nm**).
- Remove excessive filler that oozing out from the edges of the motor bracket. (**Reference 4**).
- When the resin filler has cured, remove the injector nozzles and enter and tighten the screws in the filler ports. (**Tightening torque 28Nm**).

For horizontal installations:

- Ensure that the vertical bleeding points (**Reference 2**) is closed.
- Insert resin filler injector nozzles (**Reference 3**) in the two lower filler ports.
- Add bleed hoses to the upper filling points (**Reference 5**).
- Continue filling until the resin are visible in the bleed ports (**Reference 5**)

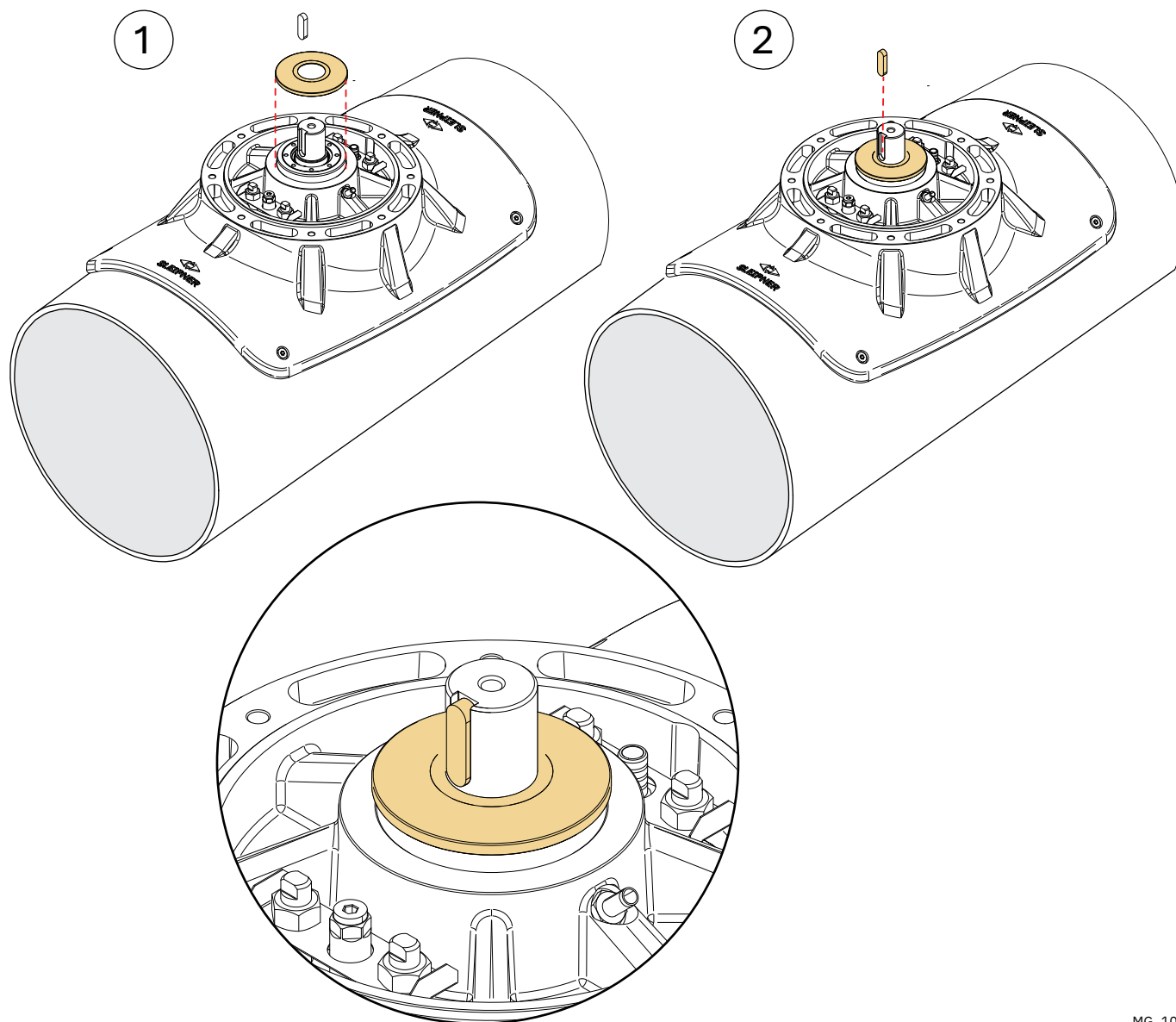
MC_0990

MG_1000



1. Insert the protection cover over the shaft and press it all the way down on the shaft.
2. Insert the parallel key into the keyway on the shaft and make sure it stays in place when installing the coupling in the next

MC_1060

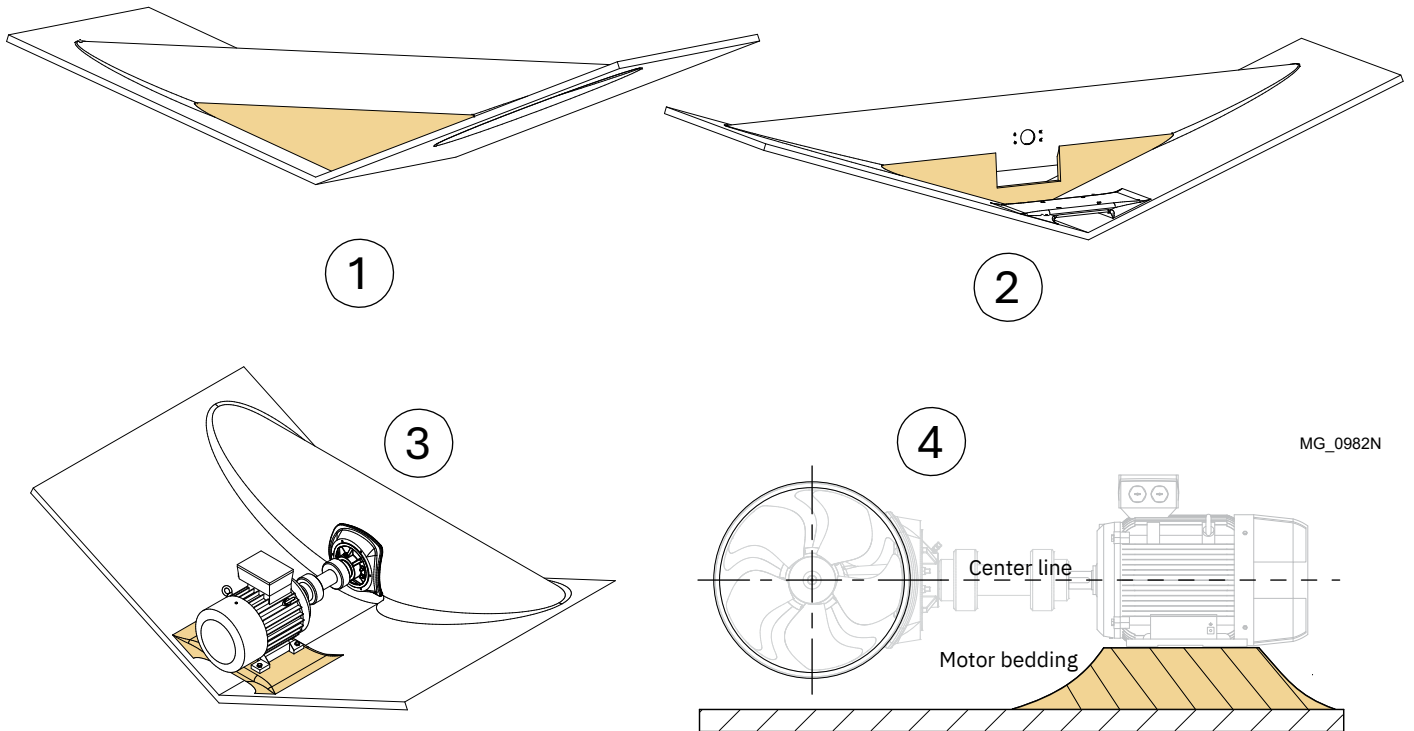


MG_1064

Consult a naval architect regarding these issues.

- Verify if added support is required between the tunnel and the hull. **(Reference 1 & 2).**
- The motor must be mounted on a separate bedding. **(Reference 3).** The bedding must be rigid and dimensioned to support the weight and torque specified in the technical data of the product.
- The bedding must be in the correct height and angle. The angle of the cardan shaft must not exceed +/- 1.5 degrees **(Reference 4).**
- Reference the distance from the centreline of the tunnel to the top of the bedding for the specific thruster/ motor combination. Ensure that the bedding is parallel to the centreline by checking the distance in both ends of the bedding.
- Mounting holes in the bedding should be drilled according to measurements for the specific thruster/ motor model.

MC_1110



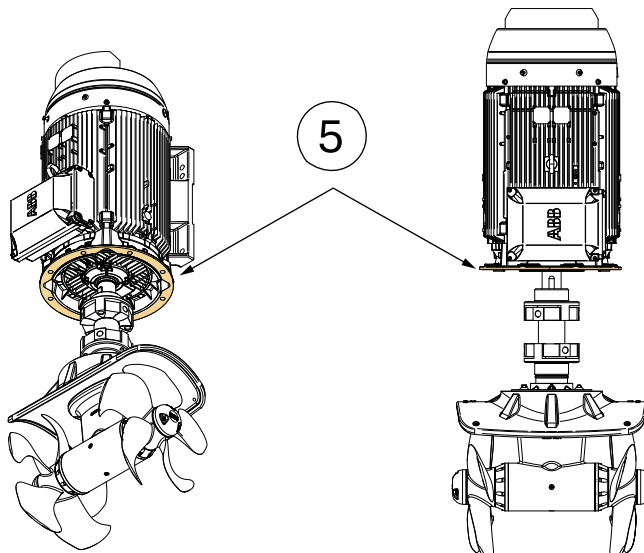
Motor support, Vertical installation

Consult a naval architect regarding these issues.

Use the motor flange as support for vertical installations. **(Reference 5).**

A bracket must be manufactured for fastening the motor. This bracket must be designed so that the specified installation dimensions for the relevant motor are maintained, and also be adapted to the actual hull structure. Consult a naval architect for this purpose.

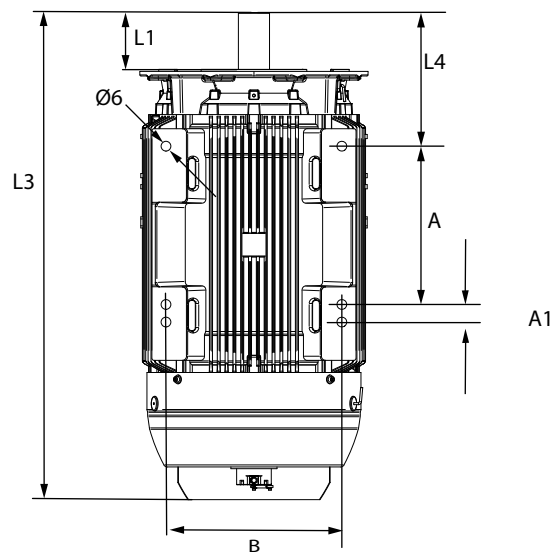
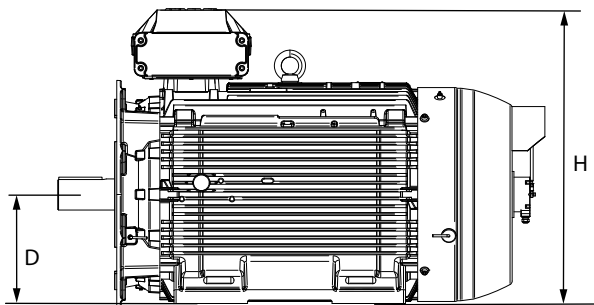
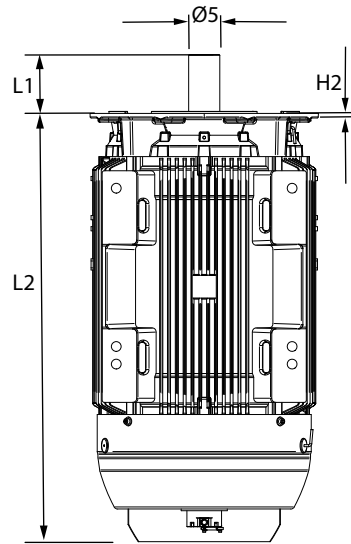
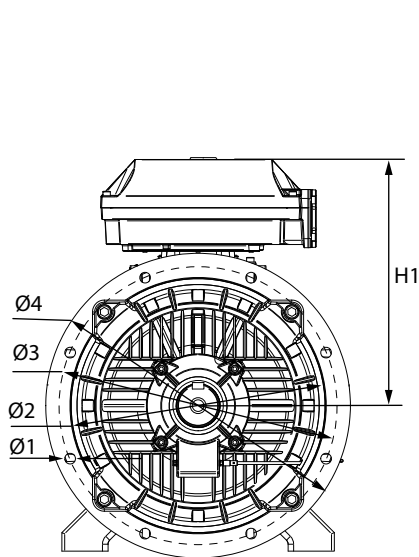
MC_1111N



MG_1114

	Weight	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	H	H1	H2	L1	L2	A	A1	B	D	L3	L4
	kg/lbs	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
SAC2200/730-C	1150/2535	23	550	600	660	90	28	847	532	5.5	170	1237	457	51	508	315	1407	386
SAC2200/730-I	890/1962	18	450	500	550	75	24	762	482	11	140	1146	419	38	457	280	1284	230

MC_1112



MG_1115

Parts must be aligned with precision to ensure the longevity and effectiveness of the coupling, consider the combination of axial, radial and angular misalignment.

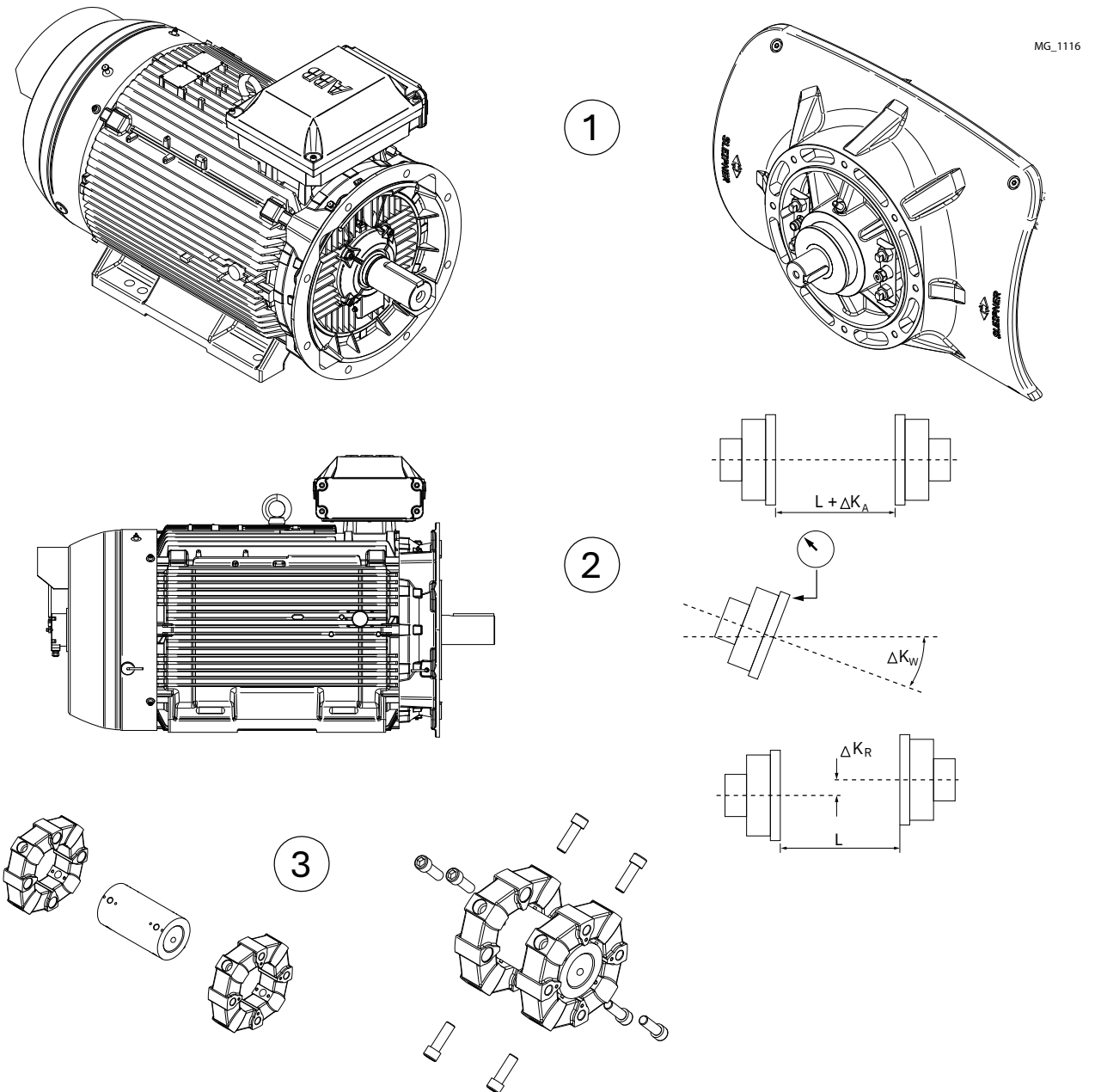
NOTE:
Only use original bolts delivered with the Sleipner thruster. Also, avoid contact between the AC motor shaft and the coupling drive shaft.

Centa has applied retention Inbus Plus all glue to all bolts. **(NB: The glue will harden within 4-5 hours at 20° C.)** Additional use of any loctite or anaerobic adhesives will destroy the natural vulcanisation of the rubber. Do not use oil or grease on bolts except a small amount of grease at the contact areas between bolt heads and rubber element bushings. Grease will avoid the twisting of the rubber element during bolt fastening.

1. Insert the flange hub on AC motor shaft and gearleg shaft. **(NB: Insert the Gear leg shaft flange hub against the limit stop/ shaft shoulder.) Insert the AC motor shaft flange hub according to hub depth.)**

NOTE: The fit between the shaft and the flange is tight, and the flange must be heated in order to fit onto the shaft.

2. Install and line up the AC motor according to tolerances given in the provided table. MC_1113
3. Insert the drive shaft inside the rubber elements. Insert radial bolts into radial sections of the rubber elements, and fasten 2-3 threads only into the drive shaft.



4. Install the pre-mounted rubber elements and shaft between the two flange hubs. Insert the Axial bolts and fasten 2-3 threads only into the flange hubs.
5. First fasten radial bolts, then the axial bolts according to the table above. *(NB: Ensure rubber elements are not twisted during fastening the bolts.)*

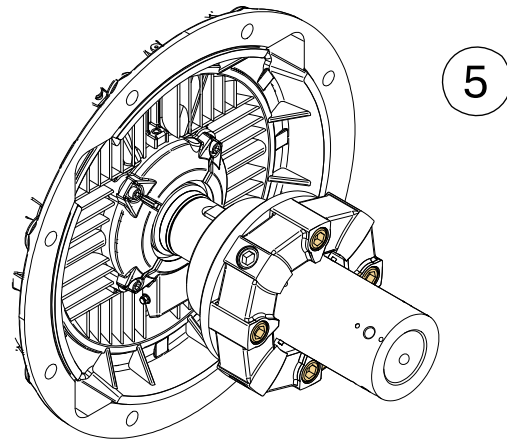
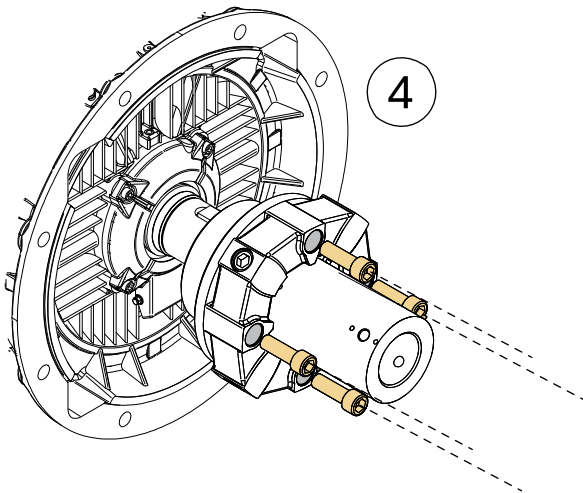
NOTE:
Fastening bolts by hand/ user judgment is not sufficient as this will result in a final bolt torque too low for operation. A low bolt torque will allow the bolts to loosen over time, destroying the shaft. A torque wrench must be used to fasten bolts to specified torque tension.

Maintenance and Safety Precaution:

The coupling is entirely maintenance free. Avoid contact with oil and similar substances since the natural rubber is not oil resistant. For a detailed Universal Joint Shaft installation manual, contact your Sleipner dealer. Add protection to the Universal Joint Shaft according to relevant safety regulations. *(NB: A protection guard is not a part of Sleipner delivery).*

MC_1014

Model	Coupling size	Axial and radial bolts		L *)	Axial tolerances Complete shaft	Angular misalignment Each joint	Radial tolerance
		Dim.	Torque	mm		ΔK_w	ΔK_R
SAC2200/730-X	140	M20x65	500Nm +/-5%	250	+/- 1°	0.15°	0.5mm
SAC2200/730-X	140	M20x65	500Nm +/-5%	250	+/- 1°	0.15°	0.5mm



MG_1117

Oil type: Meropa EliteSyn XM 150

Oil volume including container: 10l

Install the oil container 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 gearleg.

Note the orientation of the bleed- and fill nipple on vertical versus horizontal installation.

- Install the oil tube from the oil container to the feed nipple on the motor bracket. Secure by fasten both the tube clamp screws.
- Install the bleed tube from the oil container to the bleed nipple on the motor bracket.
- **(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 gearleg.)**

- Fill with **Meropa EliteSYN XM 150** gear oil. Two methods may be used:

1. Gravity Feed:

Allow the oil to flow naturally into the system using gravity.

- Open oil container valve, close fill valve
- Fill oil container, and re-fill until system is filled (about 10l)

MC_1089

This may take a long time due to narrow oil channels.

2. Pressure Feed:

- Connect a pressure assisted filling device to the fill valve. (3/8" BSPP). Close the oil container valve and open the fill valve. Apply pressure to the oil source to assist in filling.

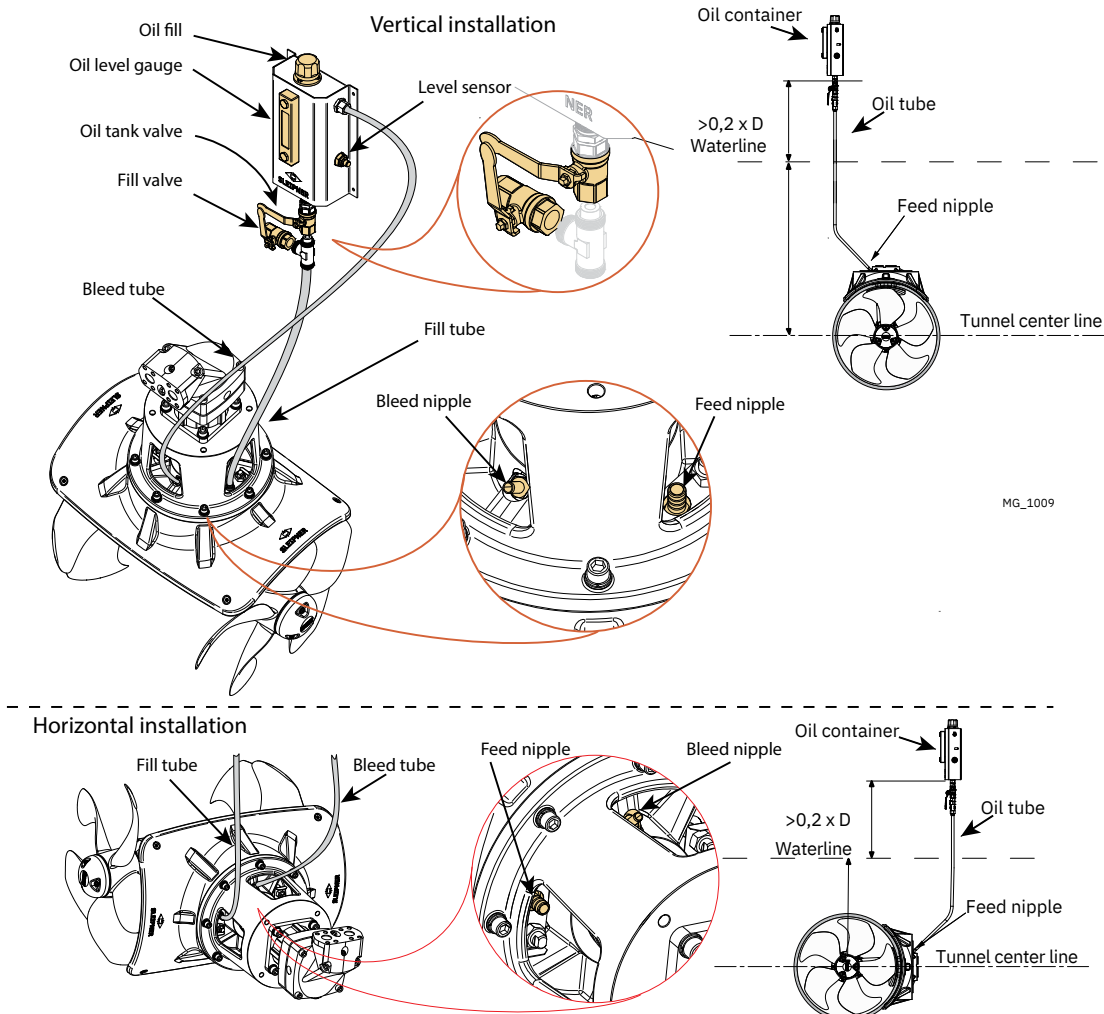
Important: The applied pressure must not exceed 1 bar to avoid damage to the system or risk of leakage.

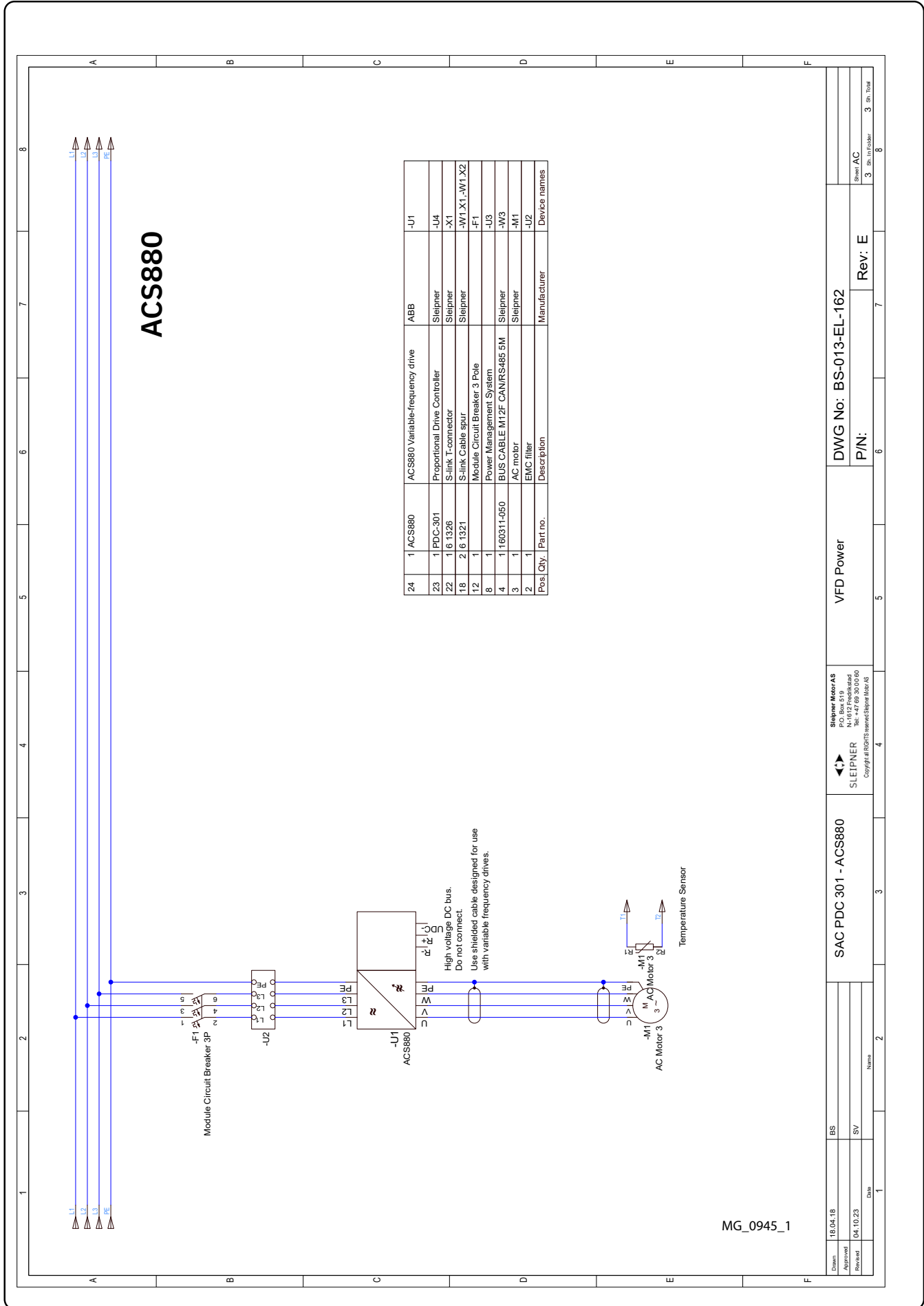
- Keep filling oil until the oil level has a correct and stable level in the oil container.
- When filling is completed, close the fill valve and open the oil container valve. Secure oil fill valve in closed position, and oil container valve in open position.

Oil drain and replacement

Procedure for draining and replacing the gear oil.

- Open the Fill valve. Keep the oil tank valve closed.
- Remove the oil by applying vacuum to the fill valve.
- Fill new oil according to the procedure described above.





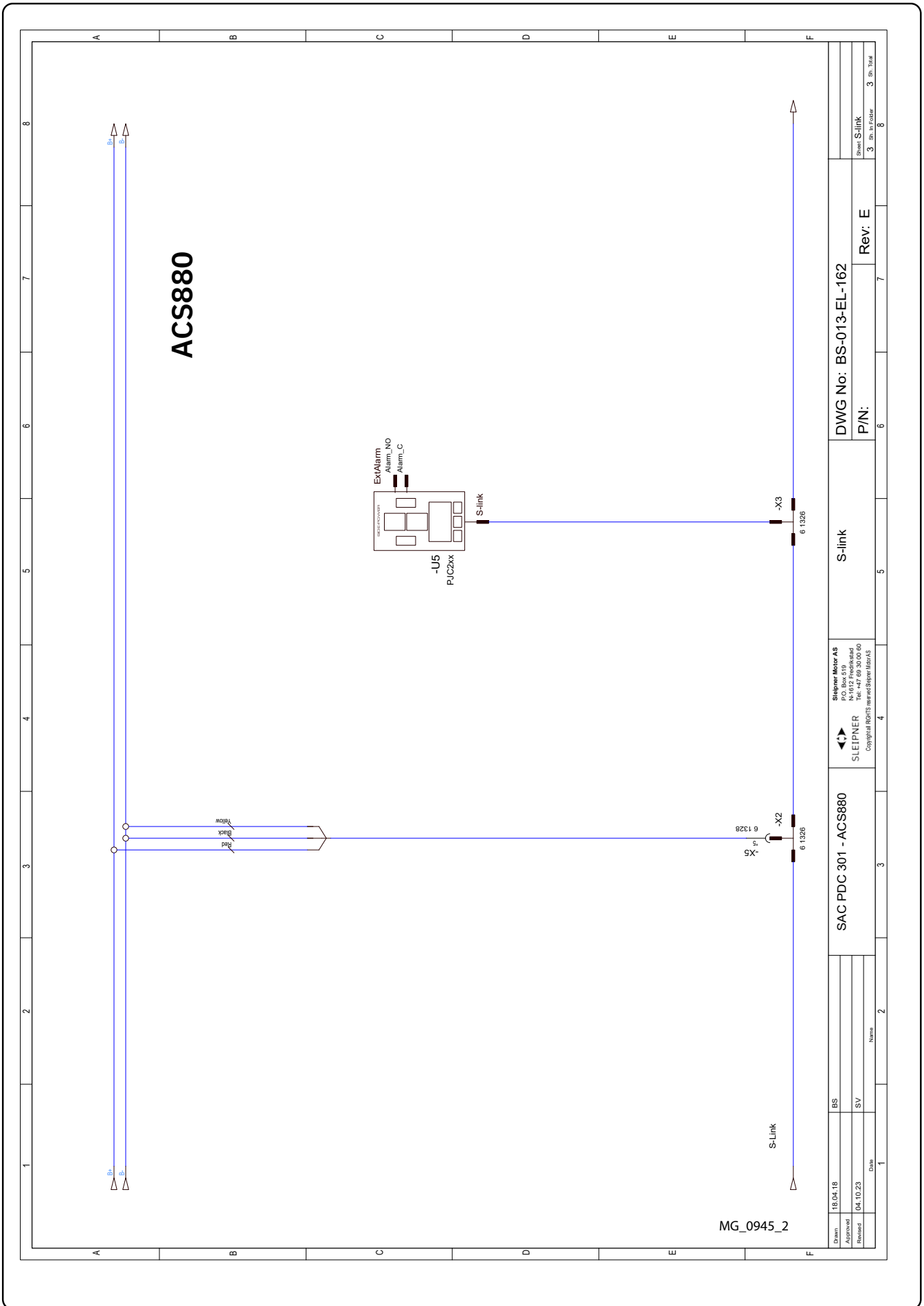
ACS880

24	1	ACS880	ACS880 Variable-frequency drive	ABB	-U1
23	1	PDC-301	Proportional Drive Controller	Sleipner	-U4
22	1	16 1326	S-link T-connector	Sleipner	-X1
18	2	1321	S-link Cable spur	Sleipner	-W1 X1 -W1 X2
12	1		Module Circuit Breaker 3 Pole		-F1
8	1		Power Management System		-U3
4	1	1160311-050	BUS CABLE M12F-CAN/RS485 SM	Sleipner	-W3
3	1		AC motor	Sleipner	-M1
2	1		EMC filter		-U2
		Pos. Qty.	Part no.	Manufacturer	Device names

High voltage DC bus.
Do not connect.
Use shielded cable designed for use
with variable frequency drives.

Drawn	16.04.18	SAC PDC 301 - ACS880	VFD Power	DWG No: BS-013-EL-162	Rev: E
Approved					
Reviewed	04.10.23				
Date					
Sleipner Motor AS P.O. Box 619 SLEIPNER Copyright © 2018 Sleipner Motor AS		P/N:		Rev: E	
3		3		3	
8		8		8	

MG_0945_1



ACS880

MG_0945_2

Drawn: 18.04.18	BS	Sleipner Motor AS P.O. Box 519 N-1470 Sandness Tel: +47 69 30 00 00	SLEIPNER Copyright © SLEIPNER AS	SAC PDC 301 - ACS880	S-link	DWG No: BS-013-EL-162	Rev: E	Sheet S-link
Approved: 04.10.23	SV							3
Revised:	Name:							3

The PDC 301 proportional drive controller controls the speed and direction signals for the Variable Frequency Drive (VFD) controlling the electric motor. The user control panels transmit this information to the Controller. VFD status and alarm signals, as well as motor speed feedback is received by the PDC 301 and transmitted to the control panels. **(NB: Installation of the VFD must be done by certified electricians, and according to the VFD installation manual.)**

PDC-301 Controller Technical Specifications	
Supply Voltage	9-31V, Powered from the S-link bus
Power consumption	Less than 1W
Operating temperature	-20°C to 70°C (-4°F to 158°F)
Weight	150g/5.3oz
IP Rating	IP-66

S-Link LED status	
Continuous GREEN	Flashing GREEN
S-link communication is OK	No S-link communication
VFD (RS-485) LED status	
Continuous GREEN	Flashing GREEN
communication with VFD is OK	No communication with VFD

MC_0157N



Before the first start ensure the propeller shaft rotates freely, and the thruster is safe to operate. **(NB: The ABB variable frequency drive-controlling the motor will perform a motor ID run on the first start.)** If the control panel displays the “Set-up Assistant”, select “Exit & don’t show at power up”. The drive is already correctly set up before delivery.

1. Place the VFD in local mode on the front panel by pressing the Loc/Rem button. **(NB: The panel should display Local in the upper left corner.)**
2. Start the drive by pressing the Start button on the VFD panel. The panel will indicate that the ID run is in progress and when it has completed. **(NB: This procedure takes a few seconds.)**
3. Press the Stop button when the ID run is complete.
Configure the drive in Remote mode by pressing the Loc/Rem button. After being placed in Remote mode, the thruster can now operate from the Side-Power joystick panels.

(NB: The PDC-301 drive controller is configured as a bow thruster By default. If operated as a stern thruster or in a catamaran configuration, change the thruster instance from the setup menu of the PJC-2xx/PJC-4xx control panel.)

PMS (Power Management System) ~ Optional:

The thruster control system comes preconfigured for the thruster, but additional configuration is required if integration to a Power Management System.

For ACS580 to activate PMS, the VFD parameter 20.12 “Run enable 1 source” must be set to DI1. It is set by default to “Not selected”.

For ACH580 to activate PMS, the VFD parameter 20.40 “Run permissive” must be set to DI1. It is set by default to “Not selected”.

For ACS880 to activate PMS, the VFD parameter 20.12 “Run enable 1 source” must be set to DI1L. It is set by default to “Not selected”.

When any panel is turned on the PDC-301 will activate the relay output on the VFD for Thruster power request from PMS. Then when the PMS is ready it sends a Thruster Enable signal back to the VFD as a “ready signal” before the thruster can run. If the PDC-301 is not getting the “Thruster Enable” signal within 60 seconds, it will fault displaying fault code 36101.1.200 VFD PMS TIMEOUT. If the Thruster enable signal is lost while the thruster is running it will fault displaying fault code 36101.1.204 PMS SIGNAL LOST.

MC_0412N

Motor protection functions:

Dynamic thrust limitation:

If the electric motor winding temperature exceeds 130°C, the PDC 301 limits the maximum thrust output. The maximum thrust permitted will decrease proportionally to increasing temperatures higher than 130°C. **(NB: Joystick panel will give an alert when the temperature exceeds 130°C. In this situation, the thruster can still be operated. Motor temperature can be monitored from the PJC panel)**

Motor over temperature shut-down:

If the electric motor winding temperature exceeds 150°C the motor will stop and 'Motor Over-temp' is displayed on the connected control panels. The thruster is prohibited from running until the motor has cooled down.

Limited Power ~ Optional:

By default, the digital input DI2 on the VFD is set to limit the power by limiting the VFD torque when the input is +24V. When in "Limited Power" mode a flashing "LIMITED POWER" text alert will display on the PJC panel.

To change the torque level, change these VFD parameters:

30.23	Minimum torque 2	-50.0 % (default value)
30.24	Maximum torque 2	50.0 % (default value)

Emergency Stop:

Where an Emergency Stop circuit is required, Sleipner recommend implementing the circuit based on the ABB STO(Safe Torque Off) function.

This safety circuit require two parallel circuits switching simultaneously. The circuit diagram can be found in figure xx.

For further information on the STO circuit, refer to ABB HW manual for the drive model installed, where the Safe Torque Off function is described in detail.

MC_0158N

Power cable dimension

CAUTION

Installation must be done by certified electricians, and according to the VFD install manual. This table is a general recommendation and installer must consider relevant regulations, temperature conditions and cable lengths.

MC_1119

Introduction:

At Sleipner Group, we prioritize sustainability and encourage the repair and re-manufacturing of products to extend their life cycles. If disposal is necessary, please follow these guidelines to recycle and manage waste responsibly, ensuring our efforts align with environmental protection efforts.

Electric Motors and Electronics:

- Disconnect from any power sources and dismantle them carefully.
- Recycle components through certified e-waste recycling centers that can adequately handle and recover electronic materials.
- Dispose of any non-recyclable electronic parts according to local environmental regulations.

Metals:

- Collect and sort metal parts for recycling as scrap metal.
- To increase recycling efficiency, ensure that metals are clean and free from non-metal attachments.

Plastics:

- Identify recyclable plastics based on local recycling guidelines.
- Remove any non-plastic components and clean them before recycling to improve the quality of the recycled material.

Hazardous Materials:

- Correctly identify any hazardous substances within components, such as batteries or capacitors etc.
- Follow local regulations for the safe disposal of hazardous materials to prevent pollution and protect environmental health.

General Disposal Instructions:

- Consult local recycling programs to determine the acceptability of various materials.
- Use authorized disposal services to ensure compliance with environmental standards.

Safe Disposal Practices:

- Adhere to local laws and regulations for waste management to minimize environmental impact and ensure community safety.

This guide is designed to help reduce our products' environmental footprint through responsible end-of-life management. Please contact your local waste management supplier or our support team for more specific disposal information or further assistance.

MC_0848

Find your local professional dealer from our certified worldwide network for expert service and support. visit our website www.sleipnergroupp.com/support

Product spare parts and additional resources

For additional supporting documentation, we advise you to visit our website www.sleipnergroupp.com and find your Sleipner product.

Warranty Statement

- 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”).
- 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:
 - 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;
 - 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.
- 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.
- This Warranty is transferable and covers the equipment for the specified warranty period.
- 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.
- In case the equipment seems to be defective, the warranty holder (the “Claimant”) must do the following to make a claim:
 - 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.sleipnergroupp.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;
 - 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.
- Examination and handling of the warranty claim:
 - 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;
 - 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.
- 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.
- 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.
- 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.
- 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.sleipnergroupp.com/patents



SLEIPNER

Ocean born. Tech bred.

SLEIPNER MOTOR AS

P.O. Box 519

N-1612 Fredrikstad

Norway

www.sleipnergroup.com

Made in Norway

© Sleipner Motor AS, All rights reserved

The information given in the document was right at the time it was published. However, Sleipner Motor AS cannot accept liability for any inaccuracies or omissions it may contain. Continuous product improvement may change the product specifications without notice. Therefore, Sleipner Motor AS cannot accept liability for any possible differences between product and document. Learn more about our products at www.sleipnergroup.com