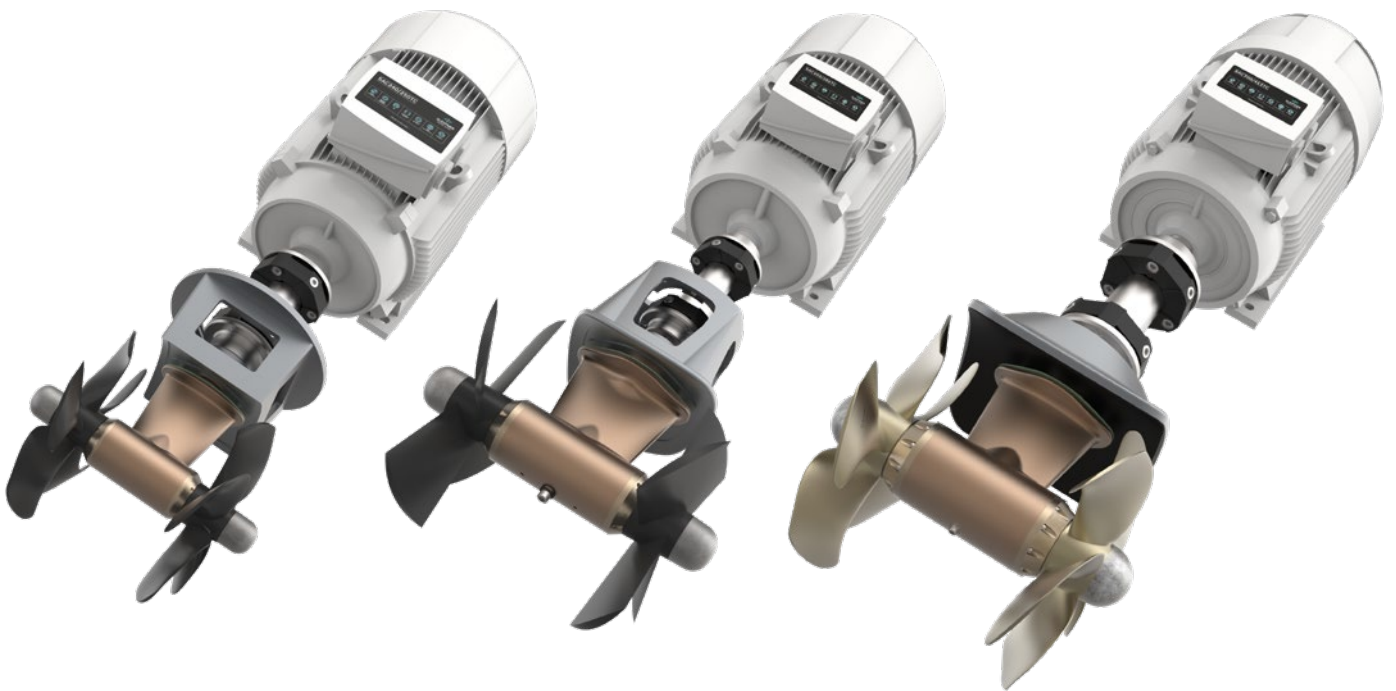


Keep this  
manual onboard!



# User Manual

For Thruster Models  
AC Electric



#### SLEIPNER GROUP

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## Products

SAC320/300-I-2-H - AC Thruster ø300mm 230V  
SAC240/250-C-4-VX01 - AC Thruster ø250mm 400V  
SAC240/250-C-4-V - AC Thruster ø250mm 400V  
SAC520/386-I-4-V - AC Thruster ø386mm 400V  
SAC400/300-C-4-V - AC Thruster ø300mm 400V  
SAC900/513-I-X-X01 - AC Thruster ø513mm 400V  
SAC320/300-I-2-V - AC Thruster ø300mm 230V  
SAC320/300-I-X01 - AC Thruster ø300mm 400V  
SAC700/412-C-X01 - AC Thruster ø412mm 230/400V  
SAC320/300-I-4-H - AC Thruster ø300mm 400V  
SAC450/386-C-4-H - AC Thruster ø386mm 400V  
SAC1100/513-I-4-V - AC Thruster ø513mm 400V  
SAC450/386-C-5-X01 - AC Thruster ø386mm 690V  
SAC700/412-C-4-V - AC Thruster ø412mm 400V  
SAC520/386-C-4-H - AC Thruster ø386mm 400V  
SAC400/300-C-5-X01 - AC Thruster ø300mm 660V  
SAC900/513-I-4-H - AC Thruster ø513mm 400V  
SAC450/386-C-4-V - AC Thruster ø386mm 400V



Sleipner Motor AS  
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MC\_0020

## **General Operation Considerations and Precautions Guidelines**

### **For the operation of thrusters**

**Never use thrusters when close to objects, persons or animals in the water. The thruster will draw objects into the tunnel and the rotating propellers. This will cause serious injuries and damage the thruster.**

**Always turn the main power switch off before touching any part of the thruster. An incidental start while touching moving parts can cause serious injuries.**

**It is the owner, captains or other responsible parties full responsibility to assess the risk of any unexpected incidents on the vessel. If the thruster stops giving thrust for some reason while manoeuvring you must have considered a plan on how to avoid damage to persons or other objects.**

- Always turn the control device off when the thruster is not in use or when leaving the boat.
- When leaving the boat always turn off the main power switch for the thruster.
- Never use thrusters out of water without load.
- If the thruster stops giving thrust while running, there is possibly a problem in the drive system. You must immediately stop running the thruster and turn it off. Running the thruster for more than a few seconds without resistance from the propeller can cause serious damage to the thruster.
- If two panels are operated with conflicting directions at the same time the thruster will not run. If both are operated in the same direction, the thruster will run in this direction.
- If you notice any faults with the thruster switch it off to avoid further damage.
- The primary purpose of the thruster is to manoeuvre or dock the vessel. Forward or reverse speed must not exceed 4 knots when operated.

### **For the operation of electric thrusters**

**Never store items (e.g. equipment, sails, ropes etc.) in the same compartment as the thruster. When the thruster runs for an extended period, it can reach 150°C and will cause damage to nearby items or cause a fire.**

**Any loose items near the thruster motor can cause problems with electrical wiring coming loose and short-circuiting.**

- Ensure you know the location of the main battery switch that disconnects the thruster from all power sources (batteries) so the thruster can be turned off in case of serious malfunction.
- We advise keeping the main engine(s) running while using the thruster. This will keep the batteries in a good charge condition. It will also give better performance to the thruster.
- If the performance of the thruster is reduced check the battery system or check the tunnel for marine growth.
- The electric motor, its components, contacts/ plugs or other joints in the control cables must be mounted so they will remain dry at all times.

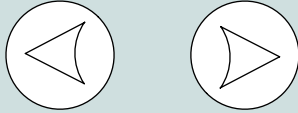
**! Please refer to the graphic for special considerations relating to your model !**

The following is an operation guide to ALL Sleipner control products. Ensure to familiarise yourself with the functionality and operation of your specific control device.

**Take time to practice operation in open water to become familiar with the thruster and to avoid damages to your boat or people.**

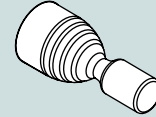
### General operation

1. Turn on the main power switch for the bow thruster. *(NB: Always turn off the main power switch when not on-board.)*
2. Turn on the control panel by pushing the/ both "ON" button(s) on the original Sleipner panel simultaneously.  
\*Turn off the control panel by pushing the "OFF" button
3. To Turn the bow/ stern in the desired direction:



#### Button control panels

For button control, push the button in the corresponding direction you wish the bow/ stern to move.



#### Joystick control panels

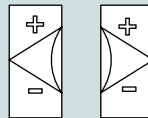
For joystick control, move the joystick in the direction you wish the bow/ stern to move.

*(NB: If equipped for proportional control move the joystick equivalent to the amount of thrust you intend to receive.)*

\* For other controls like foot switches or toggle-switches please refer to that products user manual for detailed operational use.

### Hold functionality

If equipped with 'hold' functionality push the button in the corresponding direction you wish the thrusters to engage a holding pattern:



#### Hold Button

+ or -

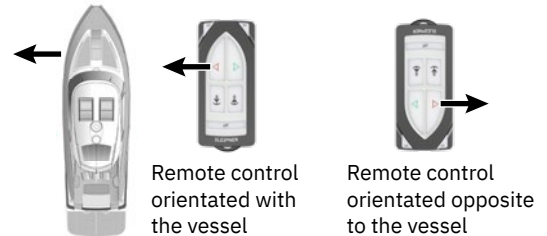
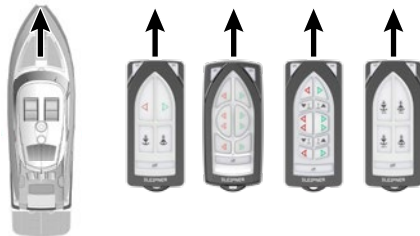
Will increase or decrease the holding force output of the thrusters

### Operating a combined bow and stern thruster

The combination of a bow and stern thruster offers total manoeuvrability to move the bow and the stern separately from each other or in unison. This enables the boat to move sideways in both directions or turn the boat around a 360° axis while staying stationary.

### Remote controls

The remote control design reflects the vessel for orientation guidance. Be aware of the remote control orientation during operation.



Remote control orientated with the vessel

Remote control orientated opposite to the vessel

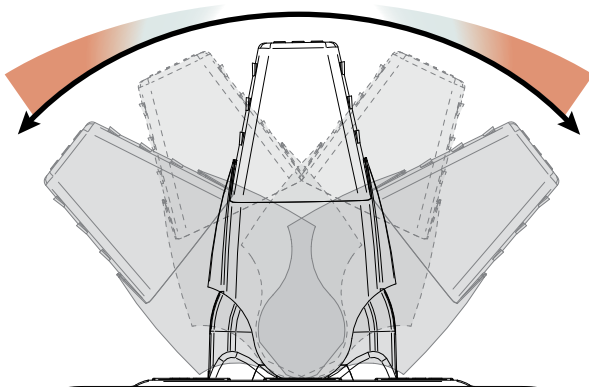
### Drift

Depending on the sideways speed of the bow/ stern, you must disengage the control device shortly before the vessel is in the desired position.

*(NB: Be aware the boat will continue to move after disengaging the thruster control.)*

**At any significant cruising speed (+1-2 kn) the side thruster will have little effect to steer the vessel.**

## Proportional Control



Variable thrust power for proportional thrusters is dependent on the extent of the joystick/ throttle.

For minimal thrust slightly move the joystick/ throttle in one direction.

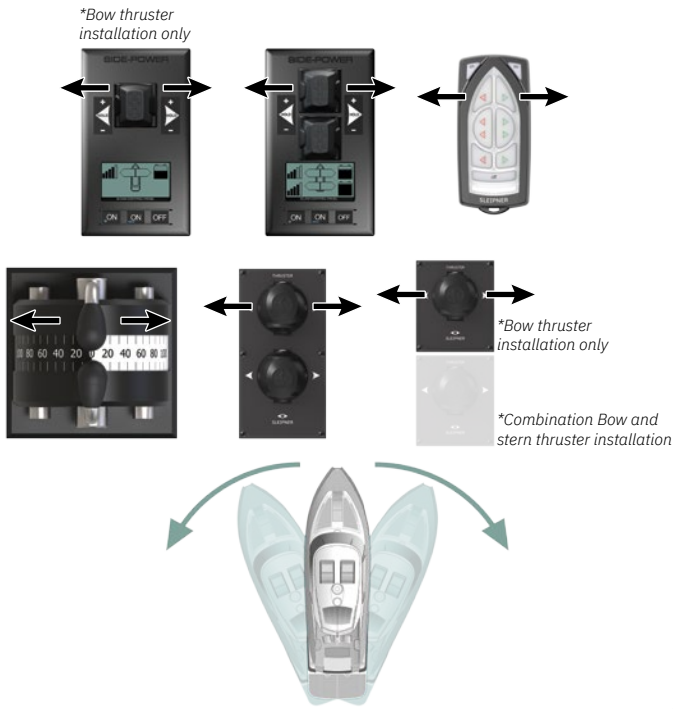
For Maximum thrust move the joystick/ throttle to its end point.

# Proportional Control Panel

## Activating the bow thruster

Using your control device/ panel Press the button or move the joystick in the direction you intend to turn the boat. Ensure to use the control device/ panel designated for the bow thruster.

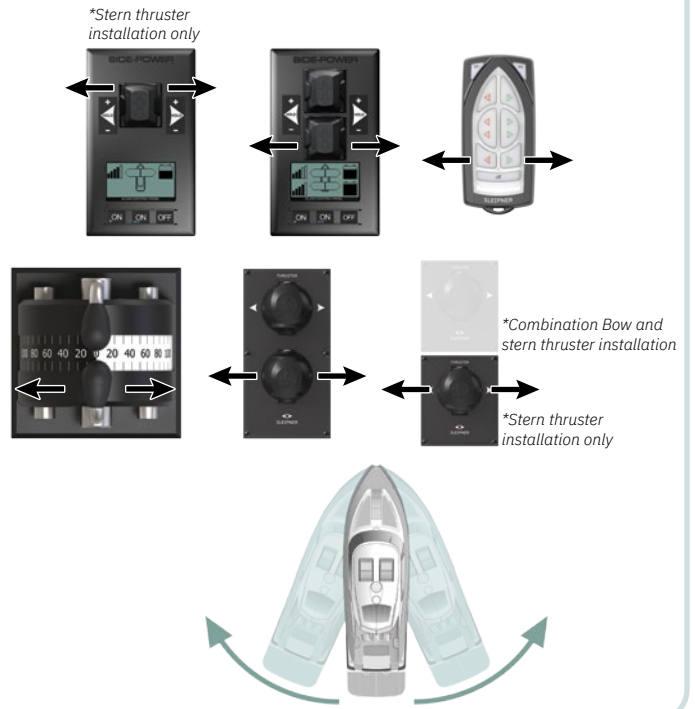
\*Control panel example



## Activating the stern thruster

Using your control device/ panel Press the button or move the joystick in the direction you intend to turn the boat. Ensure to use the control device/ panel designated for the stern thruster.

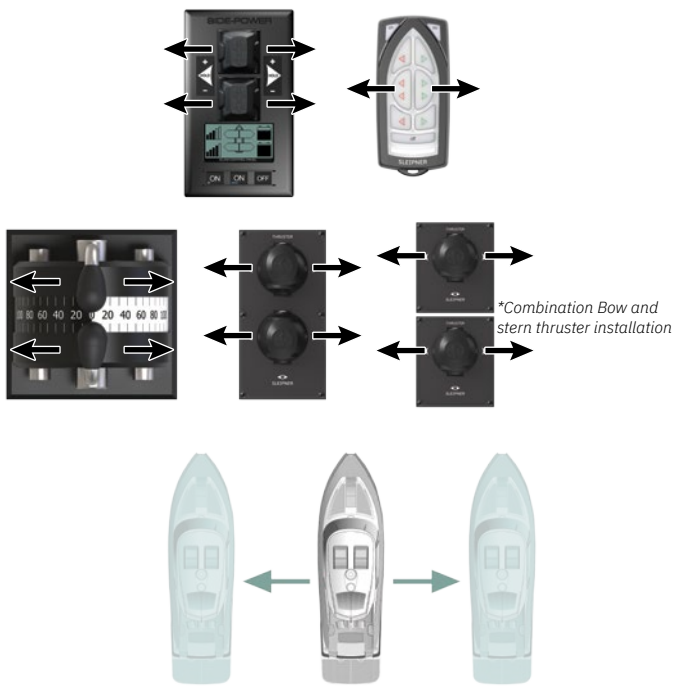
\*Control panel example



## Activating full sidwards maneuverer

Using your control device/ panel Press both buttons or move the joysticks in the same direction you intend to move the boat. Requires both a bow and stern thruster to preform.

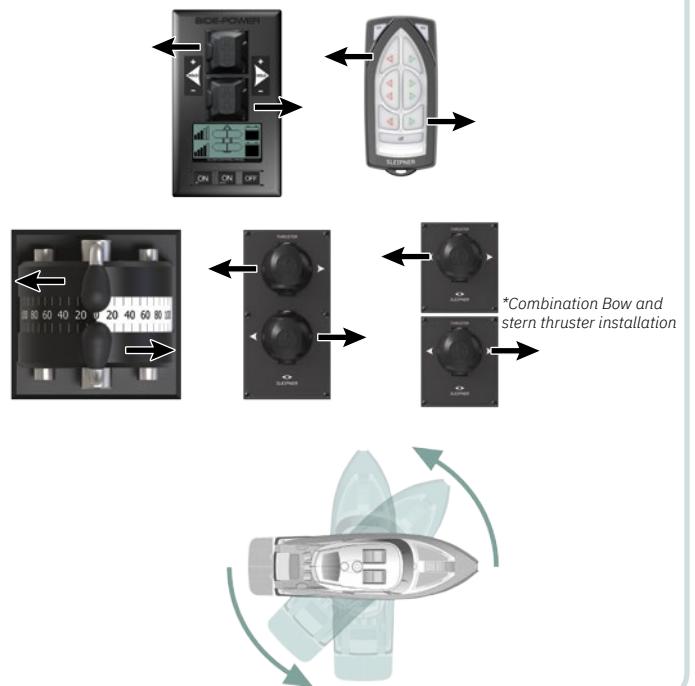
\*Control panel example



## Activating stationary spin to rotate the boat on its axis

Using your control device/ panel Press both buttons or move the joysticks in opposing directions. Requires both a bow and stern thruster to preform.

\*Control panel example



For additional information on your control panel or device refer to your control devices user manual

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

**As a part of the seasonal service of your Thruster before every season, always check that:**

**In Water**

- The area around the thruster inside the boat is clean and dry. Ensure there are no signs of water/oil leaks.
- All electrical connections are clean and fastened firmly.
- Ensure that your batteries are in good condition.

**Out of Water**

- Check the propeller(s) or tunnel for any damage for example impact damage.
- The propeller(s) is fastened securely to the gear leg.
- Check all components of thruster are fastened securely.
- Clean the tunnel and gear leg from marine growth.
- Paint the propeller and gear leg with anti-fouling before every season to keep it clean from sea growth. **(NB: Never paint the anode, sealing or propeller shaft. Ensure paint does not enter the space between the propeller and the gear leg.)**
- Change the anode before every season, or when half the anode has eroded. Always use a sealant or thread glue on the holding screw to ensure that it does not fall off.
- (IF) your product uses an external oil tank, ensure the oil level remains the same.
- (IF) using an Ignition Protected thruster and there is a problem with your motor, please contact your dealer.

## Gear Leg Oil Change

There must always be oil in the oil reservoir. Refill if necessary with gear oil EP90.

**IMPORTANT**

Drain oil after first 50 hours of runtime, then with 500 hours runtime intervals. Refill with GL-5 gear oil if needed.  
Change the gear oil a minimum of every second year. Check the gear oil quality in the guardhouse every time the boat is out of the water.

**Out of Water - Draining the gear leg oil**

1. Unscrew lower oil drain screw.
2. Unscrew upper oil drain screw.
3. The oil will drain out from the gear leg.

**Out of Water - Filling the gear leg oil**

1. Attach oil filling equipment to the lower oil drain hole. (M8)
2. Pump oil until oil is flowing out of the upper oil drain hole.  
**(NB: Refer to chart for gear leg oil volume)**
3. Tighten upper oil drain screw.
4. Remove oil filling equipment.
5. Tighten the lower oil drain screw

## Gear Leg Oil Volume

<b>SAC Model</b>	450, 520	700	750, 900, 1100	1300, 1400
<b>Oil Volume</b>	0.76L	1 L	3.3 L	3.7 L

## Variable Frequency Drive

**The variable frequency drive, delivered as part of the SAC thruster kit, is preconfigured and tuned for the specific thruster and motor. No additional setup is required after installation.**

**Maintenance**

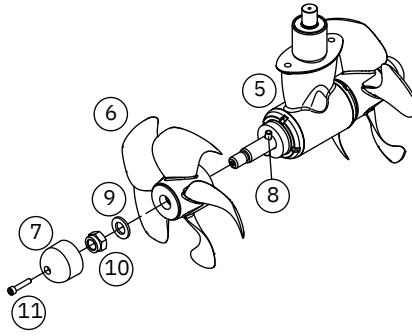
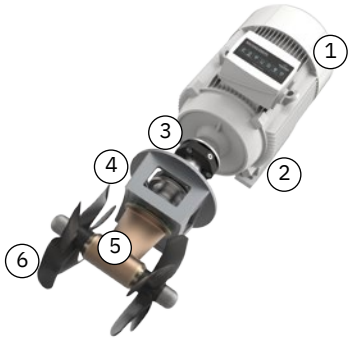
See own manual for VFD

**IMPORTANT**

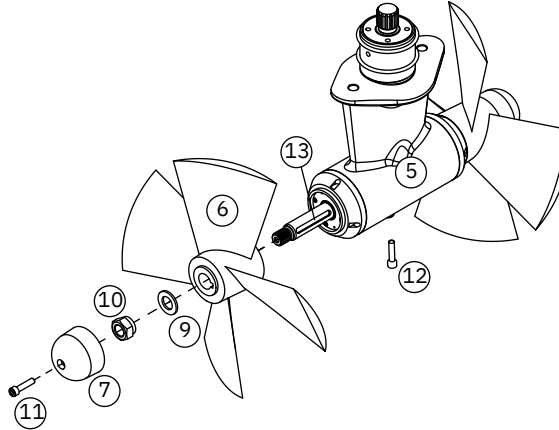
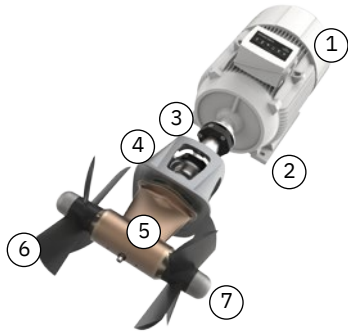
**VFD comes pre-configured from the manufacturer. DO NOT personally reconfigure any settings on the VFD.**



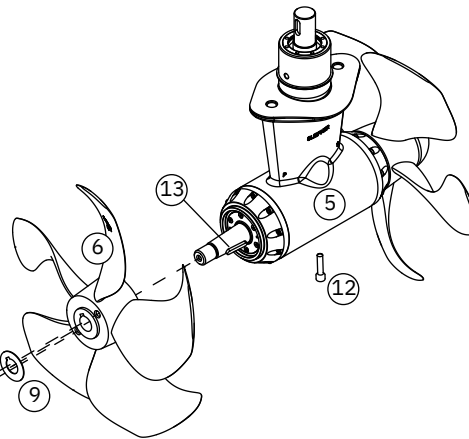
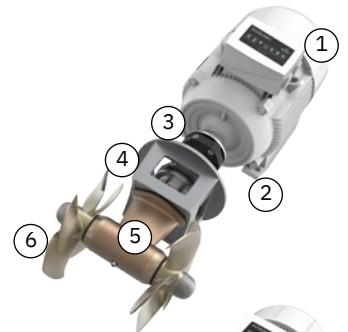
AC  
\*240  
\*320  
\*360



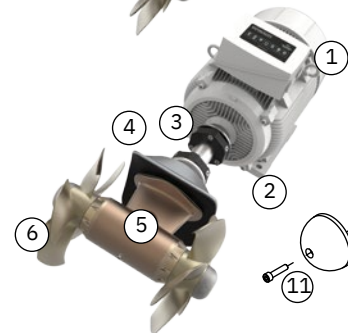
AC  
\*450  
\*520



AC  
\*400



AC  
\*700  
\*750  
\*900  
\*1100  
\*1300  
\*1400



- KEY:**
- 1. Motor
  - 2. Mounting feet
  - 3. Cardan shaft with flexible coupling
  - 4. Bracket for gear leg support
  - 5. Gear leg
  - 6. Propeller
  - 7. Anode
  - 8. Drive pin
  - 9. Washer
  - 10. Lock Nut
  - 11. Fastening Screw for anode
  - 12. Oil drain screw with washer
  - 13. Holding Key
  - 14. Pin Bolts

**PDC-301 Load Sharing**

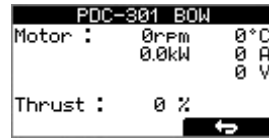
The Load Sharing limitation allows the system to limit the combined load on the generator from a bow and stern thruster when both thrusters are used at the same time. The load sharing will dynamically limit the thrust request for each thruster depending on the joystick position and limit settings. Load Sharing is configured by adjusting the PDC-301 parameter "Load share limit" in SETUP from any PJC2xx panel.

**Example of Load Share operation:**

The Bow PDC-301 "Load share limit" is set to 60%, and the Stern PDC-301 "Load share limit" is set to 80%. In the example, if the Bow thruster is operated at 100% thrust, output is reduced proportionally down to the limit value of 60% when the Stern joystick exceeds 60% signal. If the stern thruster is operated at 100% thrust, output is reduced proportionally down to the limit value of 80% when the Bow joystick exceeds 80% signal. In the example, the bow thruster will run at 60% and stern at 80% if both joysticks are at full in any direction.

**How to find SAC thruster power load in kW**

In PJC2xx panel, enter *SETUP->INFO->THRUSTER INFO* select *Bow PDC-301*. You will see this info screen for the Bow PDC-301:



Motor: speed (rpm), temperature (°C/°F), Power (kW), AC current (A) & AC voltage (V).  
Thrust: Joystick thrust (%)

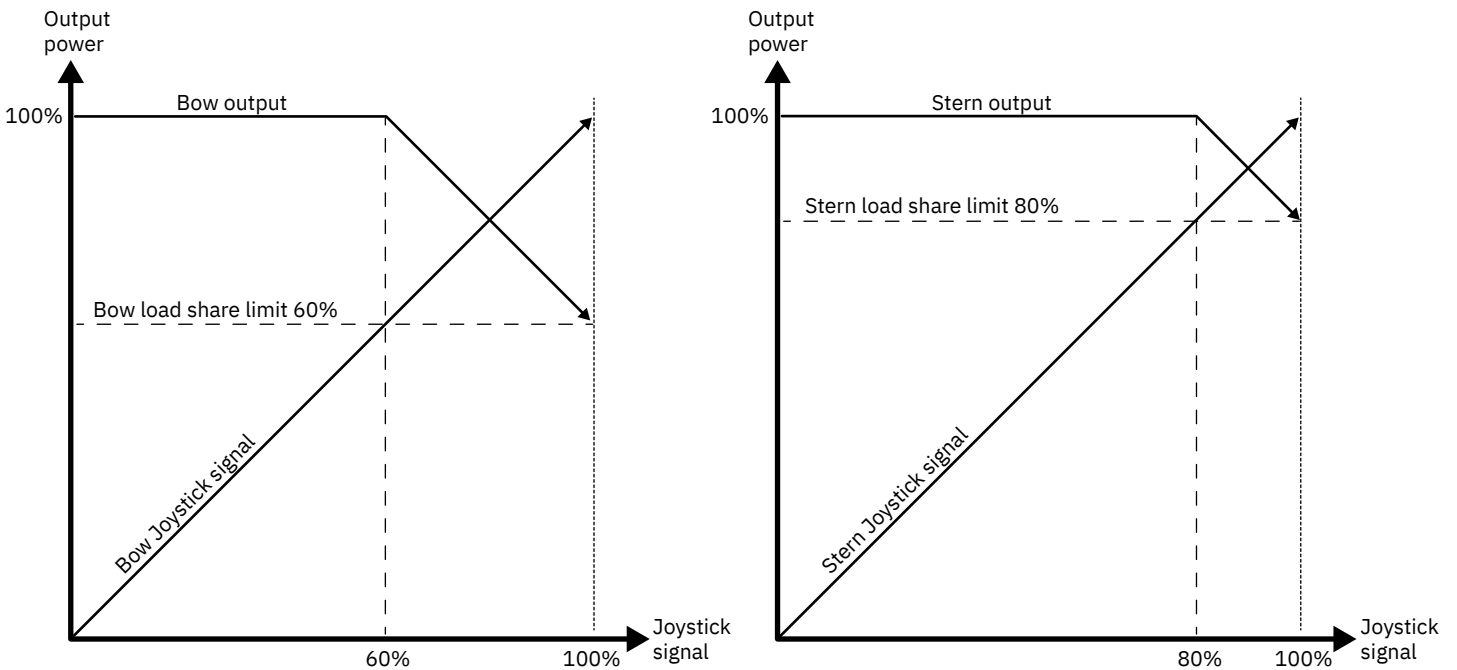
Ensure it is safe to run thruster at full speed before the next step. Run the Bow SAC thruster with 100% thrust (to starboard or port) and read the maximum power consumption (in kW) of the Bow SAC thruster in the display. Do the same for Stern SAC thruster.

If the installation has two Bow and/ or Stern SAC thrusters, read power from each PDC-301 and add them together.

**How to limit SAC thrusters to a fixed maximum power load**

Bow SAC thruster maximum power consumption is 40kW and Bow Load share limit is set to 60%.  
Stern SAC thruster maximum power consumption is 30kW and Stern Load share limit is set to 80%.  
The maximum load is then calculated when running Bow and Stern at 100% joystick signal.  
Bow thruster load = 40kW \* 60% = 24kW  
Stern thruster load = 30kW \* 80% = 24kW  
Total thruster load = Bow 24kW + Stern 24kW = 48kW

The limit levels for bow and stern thruster can be set to best balance different thruster sizes or to prioritize one of the thrusters in the limit state.





Before seeking assistance from the website help desk from your Sleipner dealer/ distributor, please perform these tests.  
**(NB: If you are unable to understand or perform these checks, you must consult a Sleipner distributor.)**

CHECK	SOLUTION
<b>The motor runs, but there is no thrust</b>	
Check propellers are fitted, fastened correctly and there is no damage to the prop shaft.	Re-fasten or replace if necessary
* Check the flexible coupling between the motor and drive shaft is fitted correctly and not damaged.	Replace if necessary
* Check the gear leg is not damaged.	Replace if necessary
<b>The thrusters performance is reduced</b>	
Check the propeller, gear house and tunnel are free from growth/ barnacles or debris and damage.	Remove growth and clean. <b>(NB: If there is obstruction in the tunnel it will disturb/ block the water flow and significantly reduce performance.)</b>
Check the battery is in a good working condition.	<b>(NB: Keep the main engine(s) running in use to have a continuous charge to the batteries)</b> <ul style="list-style-type: none"> <li>Check batteries are not worn out or in a bad charged condition</li> <li>Check electrical connections/ wiring for damage or wear (corrosion)</li> <li>Check cables are the correct size per the product manual</li> <li>Tighten/ re-adjust connections</li> </ul>
<b>The thruster does not start/ works in only one direction or does not turn off</b>	
Check the main switch is active/ on.	Open the main switch if it is closed.
Check all battery fuses are in good condition.	<ul style="list-style-type: none"> <li>Check batteries</li> <li>Check electrical connections/ wiring for damage or wear (corrosion)</li> <li>Tighten/ re-adjust and clean connections</li> </ul>
The thruster is not shutting off after the Joy Stick/ panel is disengaged.	Hit the main switch to disengage the thruster. Contact and consult a Sleipner distributor as the control system has been damaged.
<b>The thruster works in only one direction</b>	
Damaged relay.	Hit the main switch to disengage the thruster. Contact and consult a Sleipner distributor as the control system has been damaged.
<b>The thruster runs in a pulsing action</b>	
This is a build-in error response. -Solenoids failure	Hit the main switch to disengage the thruster. Contact and consult a Sleipner distributor.
The solenoid might be in a lock-in/ auto stop position.	Hit the main switch to disengage the thruster. Contact and consult a Sleipner distributor.

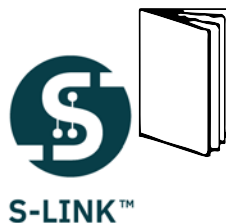
\* Not applicable to SX thrusters.

## Advanced Control Panel Troubleshooting

**Control panels operating on the S-link system display all faults via the control panel interface or via other warning methods.**

**To review any issues of your product refer to the appropriate user manual for a complete list of fault codes and troubleshooting guides.**

**For additional supporting documentation, we advise you to visit our website [www.sleipnergrou.com](http://www.sleipnergrou.com)**



CHECK TO PERFORM	DATE
The thruster components are fastened securely.	
The area around the thruster is clean and dry. If there are signs of water or oil leaks, find the source and eliminate it	
Paint the propeller and gear leg with anti-fouling.	
Batteries are in good condition.	
All electrical connections are clean and fastened firmly.	
Change the anode.	
Check oil in the oil reservoir.	

	SAC240/250-C	SAC320/300-I	SAC360/300-C	SAC400/300-C	SAC450/386-C	SAC520/386-I	SAC520/386-C	SAC700/412-C	SAC750/513-I	SAC900/513-I	SAC1100/513-I	SAC1100/513-C	SAC1300/610-I	SAC1400/610-I
<b>Performance &amp; sizing</b>														
Tunnel inside diameter (mm • in)	250 • 9.8	300 • 11.8	300 • 11.8	300 • 11.8	386 • 15.2	386 • 15.2	386 • 15.2	412 • 16.2	513 • 20	513 • 20	513 • 20	513 • 20	610 • 24	610 • 24
Thrust, continuous (kg • lbs)	240 • 529	280 • 617	360 • 794	400 • 882	450 • 992	450 • 992	520 • 1146	700 • 1543	600 • 1323	750 • 1653	900 • 1984	1100 • 2425	1100 • 2425	1200 • 2646
Thrust, max. (kg • lbs) *	-	320 • 705	-	-	520 • 1146	520 • 1146	-	750 • 1653	750 • 1653	900 • 1984	1100 • 2425	-	1300 • 2866	1400 • 3086
Motor output (kW • Hp)**	14 • 19	21 • 27	27 • 37	30 • 41	28 • 38	35 • 48	35 • 48	42 • 57	41 • 56	53 • 72	70 • 95	70 • 95	74 • 101	83 • 113
Typical boat size (m • ft)	13-23 • 42-75	17-31 • 55-100	18-33 • 59-108	18-33 • 59-108	22-35 • 75-110	25-40 • 85-140	25-40 • 85-140	29-44 • 95-145	29-44 • 95-145	30-45 • 100-150	32-49 • 105-160	32-49 • 105-160	40-52 • 130-170	40-55 • 130-175
Voltage range, 3-Phase supply	208-240/380-440V	208-240/380-440V	208-240/380-440V	208-240/380-440V	208-240/380-440V	208-240/380-440V	208-240/380-440V	208-240/380-440V	380-440V	380-440V	380-440V	380-440V	380-440V	380-440V
Current draw max. ***														
230V Systems:	51A	80A	106A	115A	106A	127A	127A	150A	153A	193A	-	-	-	-
400V Systems:	28A	46A	62A	65A	62A	73A	73A	87A	84A	106A	134A	134A	143A	160A
Generator load max:****	19,5 KVA	29 KVA	36 KVA	39 KVA	37 KVA	47 KVA	47 KVA	56 KVA	49 KVA	61 KVA	81 KVA	81 KVA	86 KVA	97 KVA
<b>Features</b>														
CE approved	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DNV-GL type approved gear leg		Yes						Yes	Yes	Yes	Yes	Yes	Yes	Yes
Proportional speed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Propulsion system	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter	Twin Counter
Lubrication	Sealed	Sealed	Gravity feed	Gravity feed	Gravity feed	Gravity feed	Gravity feed	Gravity feed	Gravity feed/ On water change (optional)	Gravity feed/ On water change (optional)	Gravity feed/ On water change (optional)	Gravity feed/ On water change (optional)	Gravity feed/ On water change (optional)	Gravity feed/ On water change (optional)
Galvanic separation	No	No	No	No	No	No	No	No	No	No	No	No	No	No

\*) 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.

\*\*) Motor output @ 230/400V supply. Actual value may vary depending on supply voltage and thruster install.

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

\*\*\*\*) 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. Side-Power 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.

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

## Product Spare Parts and Additional Resources

**For additional supporting documentation, we advise you to visit our website [www.sleipnergrou.com](http://www.sleipnergrou.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.sleipnergrou.com](http://www.sleipnergrou.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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