SIDE-POWER
Stabilizer Systems

Operation and User guide
Stabilizer Systems

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AU Patent AU2013335369
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2013 DAME DESIGN AWARD METS
OVERALL WINNER

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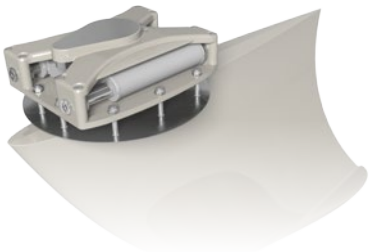
Revision: 4

Contents

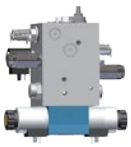
CE All Side-Power products fulfill the requirements of the relevant CE-directives.

Typical component layout in the boat

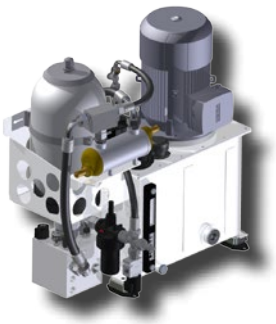
1 **The actuators and fins** are normally fit in the aft end of the living area, usually the owners stateroom or bathroom & wardrobe. The actuators are quiet so it is no problem to have in living space beneath the floor or furniture. The fins wich is attached to each actuator are working outside of the hull.



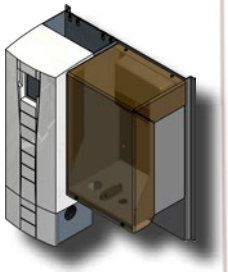
2 **The proportional valves** (one for each actuator) are placed outside of living space, in sound proofed area.



3 **The electrohydraulic powerpack** with tank, filtration and cooling is normally placed in the engine room.



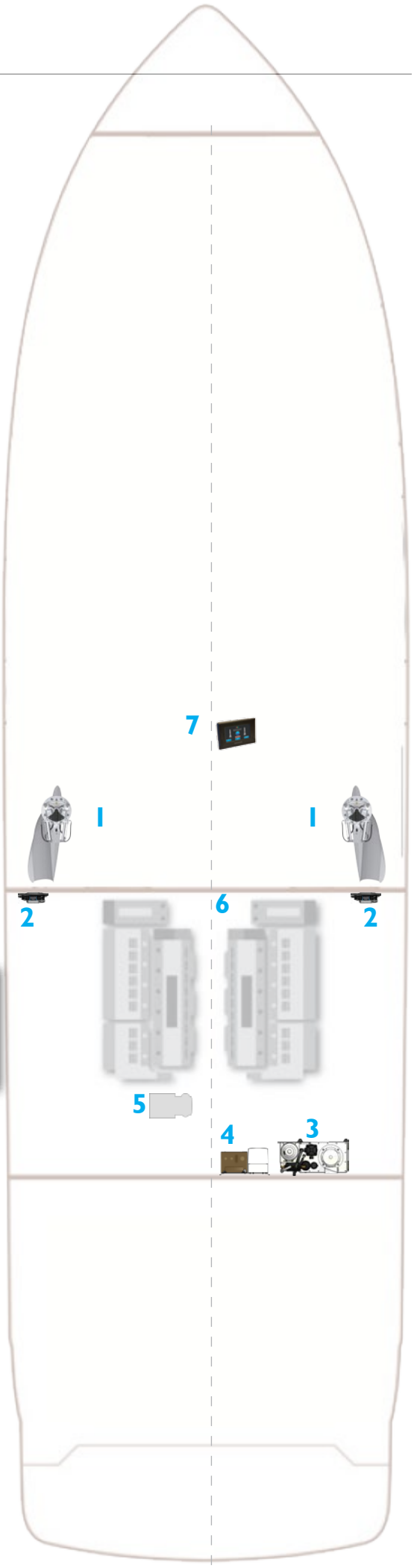
4 **The controller / driver for the powerpack** is located relatively close to the powerpack. Thereby, often fitted above the powerpack/tank on a wall. This contains a high voltage VFD so it should be placed to ensure to be dry at all times.



5 **The DC 24V electric or hydraulic cooling water pump**, if fitted, is typically installed in an easily accesible and identified position (because it often needs venting after the boat has been on land) well below the waterline - close to the powerpack.

6 **The main ECU** with sensors is placed on a bulkhead, central in the boat. (In most cases)

7 **The Control Panel** is placed on the dashboard(s) of the yacht



Information

Thank you for selecting a Side-Power Stabilizer System. We hope your Stabilizer System will meet your expectations and increase your comfort level on board.

Important!

This guide is intended as a quick guide for the operator of the vessel. More detailed instructions including drawings, schematics and diagrams are available in the installation instructions and service manual. Sleipner Motor AS is not responsible for injury or damage as a result of the use of the Stabilizer system.

Before activating the stabilizer system, ensure that:

(It is recommended that following notes are included in the boats main checklist)

- Always ensure that there are no leakages, hydraulic oil level is correct and cooling pump is running. Always check/monitor system temperature and pressure from the panel when system is running.
- There are no risk of the fins hitting anything, the dock, dock mooring lines or any other submerged objects close to the boat when they start moving.
- There are no people in the water swimming or bathing around the boat.
- You either have one or both main engines running, or an alternative hydraulic power source (like the AC powerpack).

Always keep the stabilizer system active when running the boat in planning or "fast" semi-planning mode - also when on calm water.

- The reason for this is to perform their stabilizing function to the required level, the fins are a large part of the boats directional and heel stability, especially at high speeds when the boats wet surfaces and direct hull forces are reduced. If you leave the fin stabilizer system off so the fins are left in a fixed position, this can make the boat behave differently then expected at high speeds.
- With the stabilizer system active, it will ensure that the boats behaviour is predictable and as comfortable as possible at all times, improving comfort also on calm water.
- If, due to a malfunction or other reason you are unable to run with the stabilizers active, we strongly recommend that you run at a maximum speed where the boat is not planning so that the boats own directional and heel stability is the dominant factor.

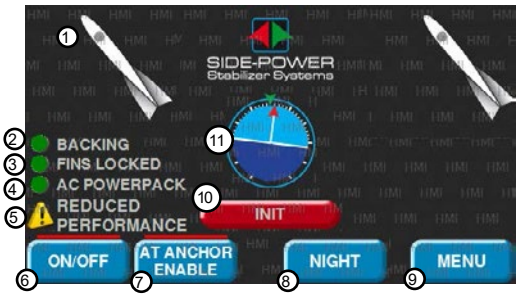
Reverse the boat in minimal speed if the fins are not in LOCKED position.

- The fins should automatically center and lock if you put the boat in reverse, but if this should not happen for some reason (hydraulic failure, reverse sensor malfunction etc.) it is important that you only reverse the boat as slow as possible.

Letters between brackets (x) refer to content headline topic in the Advanced Stabilizer panel setup.(For installer and distributor only)

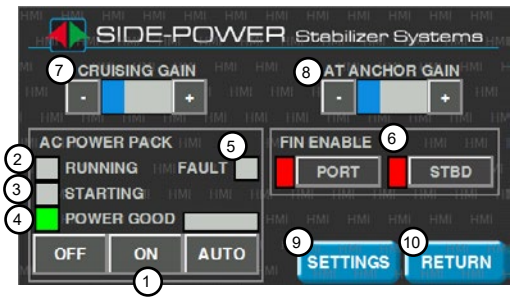
CONTROL PANEL

MAIN screen description:



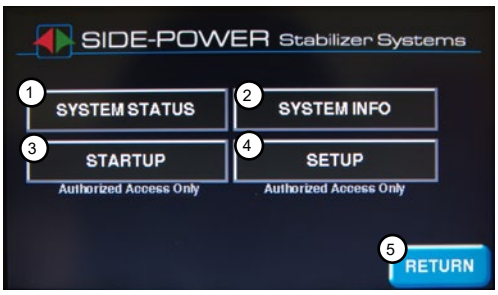
1. Shows fin position.
2. If lit - the system is sensing backing and goes into suspend mode
3. If lit – Fins are locked (and centered)
4. If lit – The AC powerpack is ON
5. If showing «Reduced Performance», one fin is deactivated – ref. MENU screen (B.6)
6. Turns stabilizer ON / OFF - name in button will change to function it will do when pressing
7. Must be activated (green line above) for the stabilizers to go into «At Anchor» mode (below 3 knots) – ON must also be active.
8. Darkens the screen for night time use
9. Takes you to more choices - MENU Screen (B)
10. STATUS INDICATOR
    Background colour: Green = running Red = not running
    INIT: needs startup
    OFF: is not on
    CRUISING: active in cruising mode
    AT ANCHOR: active in «at anchor mode»
    SUSPENDED: temporarily «off» because of backing or thruster running
    HALTED: The system is shut down because of a fault alarm
    FINS NOT CENTRED - A fin (or both) is not centred. When engine(s) or powerpack is started, hydraulic power is available and fin(s) will re-center.
11. Shows boat angle

MENU screen



1. OFF – shuts off the AC pump
   ON – starts the AC pump
   AUTO – if enabled, and newer system let the system decide to run or not (depending on sensed pressure from engine driven pumps
2. If lit – the AC power pack is running
3. If lit – the AC power pack is in its startup process
4. If lit – the AC power pack has AC power to it
   If NOT lit, there is no power so you can not start it.
5. Indicates a fault on the AC motor VFD (Variable Frequency Drive) or other starting equipment fitted.
6. Allows you to individually disable one of the fins, for example if there is a technical problem with one fin only and you want to still have 50% stabilization function, or if you are mored close to a dock or another boat on one side but still want some stabilization
   Green light = Enabled (ON)
   Red light = Disabled (OFF)
8. Increase or decrease the stabilizers function in CRUISING. + = more agressive / - = less agressive
9. Increase or decrease the stabilizers function in At Anchor. + = more agressive / - = less agressive
10. Brings up the SETTINGS screen (C).
11. Returns to the MAIN screen (A).

SETTINGS screen

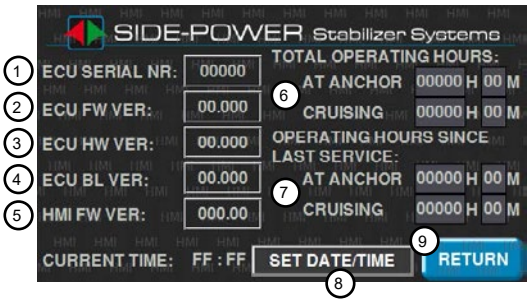


1. Goes to «SYSTEM STATUS» page (D)
2. Goes to «SYSTEM INFO» page (E)
3. Goes to «STARTUP» page (F)
4. Goes to «SETUP» page (G)
5. Returns to MENU (B)

SYSTEM STATUS screen

1. If lit – the system is getting a valid GPS signal
   (if not the stabilizer will not work)
2. Shows info about:
   GPS SPEED : the actual speed input from GPS
   SYSTEM STATE : the state the system is in at present
   (Cruising, At Anchor, Off, Init, Suspended)
   SYSTEM PRESSURE : Shows the hydraulic pressure at present
3. Returns to SETTINGS menu (C)

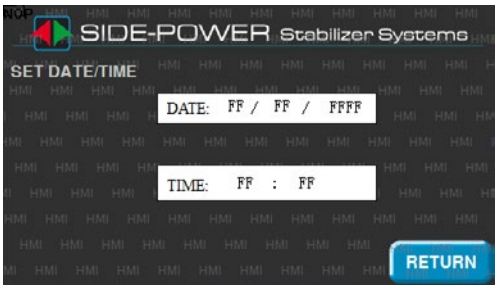
SYSTEM INFO screen



1. ECU = Main controller serial number
2. ECU = Main controller software version
   (programmable by S-link)
3. ECU = Main controller Hardware version
4. ECU = Main controller bootloader version
   (may need update through S-link to support
   further updates later)
5. Control panel software version.
   Seperate update directly in panel – not by S-link
6. Shows the total operating hours of the system
7. Shows the operating hours of the system since main authorized service.
   See seperate section in manual for service intervals
8. Press to program date and time
9. Returns to SETTINGS menu (C)

SET DATE/TIME screen

Shows current date/time.
Touch date/time numbers to change.



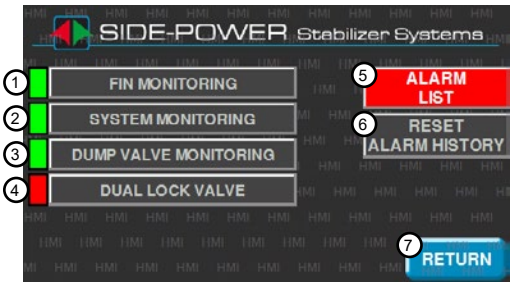
ALARMS / SYSTEM MONITORING

The stabilizer system is equipped with several internal monitoring functions to ensure safe operation of the system.
This includes monitoring of the various valves electric operation, hydraulic pressure, level and temperatures as well as internal monitoring of the electronics.
If an ALARM occurs, the system will automatically center and lock the fins and shut down operation so to ensure that it can not actively do anythying wrong. However, with some faults, for example hydraulic hose breakage/leaks, it might not be possible for the system to centre and lock the fins in which case you must proceed with special caution as described later.

If you get an alarm - this shows up on your control panel.
Press the "SHOW ALARMS" button, and this will take you to the alarms page which shows you what the system is alarming for.
There, you can "ACKNOWLEDGE ALARM" and the system will then try to re-start.
If the problem persist by the alarm re-appearing the issue needs to be checked and rectified before the system will work again - and you need to OPERATE THE BOAT WITH SPECIAL ATTENTION in case of some of these alarms.
Please see the table on the next page for a quick reference to actions to be taken.

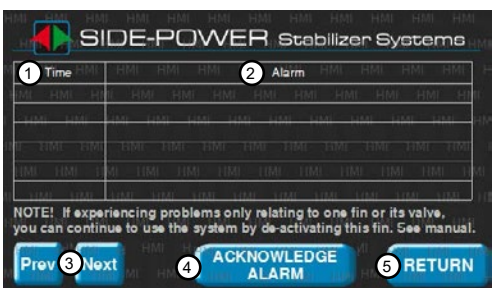
If in doubt of the meaning or explanation - Please make sure to contact a Side-Power service representative to ensure safe operation of your boat and avoid further potential damage to your systems.

ALARM SETTINGS

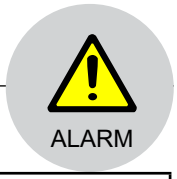


1. Turn monitoring of fins On or Off.
   Light indicator (green if on) shows what is activated.
2. Turn monitoring of hydraulic system On or Off,
   Light indicator (green if on) shows what is activated.
3. Turn monitoring of Dump valve On or Off,
   Must be off if no dump valve present. Light indicator (green if on) shows what is activated.
4. Turn monitoring of Dual lock valve On or Off. Light indicator (green if on) shows what is activated.
5. Goes to «ALARM LIST» page (K)
6. Resets the alarm history (deletes it)
   Only to be done in trouble free systems by authorized service personell
7. Goes back to «Setup» menu

ALARM LIST

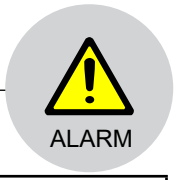


1. Time stamp for when the alarm occured
2. Alarm description. See alarm list page for explanation
3. Scroll up and down in the alarm list if necessary!
4. ACKNOWLEDGE ALARM IMPORTANT !
   This MUST be pressed to enable the system to try to resume operation. Should of course only be done after ensuring that the reason for the alarm is no longer present
5. Goes back to «Setup» menu (G)



ALARM	Reason	Check/Action	Boat handling see details below
Fin centring error	The system is unable to center one or both fins.	Make sure you have hydraulic pressure. Go to the system status menu and check pressure, or read the pressure from the pressure gauge located on the accumulator valve unit. Depending on system specifications, pressure shall be between 70 and 100 bar. Pressure from 25-40 bar indicates that the electrical or manual accumulator dump valve is open. Pressure below 25 bar indicates a hydraulic system failure, LS signal failure or AC pump failure. All pressure readings to be done with stabilizers “ON” Pressure readings should be carried out first with main engines running, then with AC pump running (at anchor mode) If pressure is ok: Check cables and their connections between ECU and fin position sensor.	L2
Fin x motion	The system is unable to put the fin in the desired position, or there is a problem with the sensor.	Make sure you have hydraulic pressure. Go to the system status menu and check pressure, or read the pressure from the pressure gauge located on the accumulator valve unit. Depending on system specifications, pressure shall be between 70 and 100 bar. Pressure from 25-40 bar indicates that the electrical or manual accumulator dump valve is open. Pressure below 25 bar indicates a hydraulic system failure, LS signal failure or AC pump failure. All pressure readings to be done with stabilizers “ON” Pressure readings should be carried out first with main engines running, then with AC pump running (at anchor mode)	L2
Fin x position	Encoder is reading invalid angle	Check cables and their connections between ECU and fin position sensor. Check encoder belt and pulleys.	L2
Hydraulic Oil level low	The oil level in the hydraulic tank is below the accepted minimum level	Check Oil level on visible gauge on the tank to see if it is a real low level alarm, or if it is a sensor fault. Oil level to be at the upper half of the level indicator upper window (with the stabilizers active). Refill if necessary with mineral based hydraulic oil ISO VG 46. Check for leaks. A signal failure (broken signal cable) will cause low level alarm.	L4
Hydraulic Oil temp high	The oil temperature is too high	Check oil temperature from the system status menu. Alarm point=75˚C. Check that the cooling pump is running and water is flowing. Check seawater inlet strainer for contamination. Do not run the system except in case of emergency if oil temp. rise above 75˚C!	L3
VFD Not Ready	VFD Not Ready	Verify that VFD is in REMOTE mode. Check wiring.	L2
VFD Fault	VFD Fault	Check fault description on VFD.	L2
Pressure Sensor Wire Break	Pressure Sensor Wire Break	There is a break in the 4-20mA sensor loop. Inspect wiring.	L2
Servo Valve current out of limits	Servo Valve current out of limits	Contact Side-Power for assistance	L2

Alarms and System monitoring



ALARM	Reason	Check/Action	Boat handling see details below
ECU temp high	The stabilizer controller is getting too hot.	Ventilate the room were ECU is sitting	L1
Decouple valve x Current Sense	The ECU is reading that there is either a fault with the electric activation of the mentioned valve or a cable or cable connection issue	Do not run the system except in case of emergency if oil temp. rise above 75˚C!	L2
Lock Valve xx Current Sense	The ECU is reading that there is either a fault with the electric activation of the mentioned valve or a cable or cable connection issue	Check control cables between the ECU and the related fin control valve.	L2
Servo Valve xx Current Sense	The ECU is reading that there is either a fault with the electric activation of the mentioned valve or a cable or cable connection issue	Check control cables between the ECU and the related fin control valve.	L2
Dump Valve Current Sense	The ECU is reading that there is either a fault with the electric activation of the mentioned valve or a cable or cable connection issue	Check control cables between the ECU and the accumulator valve block. When shutting down the boat you will need to manually release pressure in the accumulator tank	L1
GPS Signal Missing	The ECU has lost the GPS input signal after a valid signal was present.	Reset the alarm and see if the signal have returned. Rare loss of GPS coverage might occur. If the alarm is triggered more than once, check the cables and connectors between the ECU and the GPS antenna.	L2
PHC Communication Error	The ECU have lost contact with the PHC hydraulic controller. The controller is fitted to the hydraulic tank assembly. It communicates with the ECU using S-link.	Check that the green LED on the PHC controller is lit. Check S-link cables and connections.	L2
SHD Communication Error	The ECU have lost contact with the SHD power pack controller. The controller is fitted to the hydraulic tank assembly or in a separate enclosure. It communicates with the ECU using S-link.	Check that the green LED on the SHD control board is lit. Check S-link cables and connections.	L2
NMEA2000 Gear Status Unavailable	Stabilizer system can not read NMEA 2000 data from engine controls.	Check GW-1 connections and wires. Inspect LED indications on GW-1.	L1
Hydraulic Pressure High	Faulty or shorted Stabilizer pressure sensor.	Check wiring for shorts or replace sensor.	L1

If an alarm occurs so the stabilizer system is not running, but the fins are centred and locked, you can operate the boat normally, remembering the general warning about high speeds and inactive stabilizers as well as ensuring safe engine running without damaging central hydraulic parts - last section in table below. If the fins are NOT centered and locked, please see table below for operational limitations of the boat.

BOAT HANDLING RESTRICTIONS	**L1**	**L2**	**L3**	**L4**
Remember the general warning about high speed running without active stabilizers	X	X	X	X
Do not reverse the boat in more than absolute minimal speed		X	X	X
Do not run forward in more than the minimum necessary steering speed		X	X	X
If you have severely overheating oil - do not operate any hydraulics - run main engines (if pumps are connected) at less load while giving the oil time to cool down.			X	
If you are running out of oil in your tank - beware that the pumps will be destroyed if run dry and can then also cause other damage to the power source driving them. If you have to run engines with pumps directly fitted, disconnect mechanically the pump first so that it does not pump. If you have severely overheating oil - do not operate				X

FIN ACTUATOR UNITS

The stabilizer system is in general a low maintenance product, but as all moving parts some degree of preventive maintenance will increase the lifetime and reliability of the system.
A chart for recommended check and service points is thereby offered at the end of this section.

For all new installations, or after a major parts change, a basic check should be done after the first 100 hours of operation or after the first week of proper use:

- Check that all hydraulic fittings are tight.
- Check all hoses for chaffing, and ensure they are not in contact with any moving parts.
- Inspect hydraulic cylinder rods and gland seals for damage, leaking, or scratches.
- Inspect the dirt indicator on the return oil filter.
- "Shake" the fins from the outside to feel if there is any play in any connection.
- Open the fins manual decouple valve (at the acuator point ot allow movement) and manually move the fin fully to both sides to feel that there is not specific tough spot in the bearings.

Every time the boat is out of the water for service or other reason, we recommend that you take this opportunity to more thorougly check some points that is not possible when the boat is in the water. A proper cleaning and check of the fins anodes (if fitted, can also be bonded to boats large anode system) is also appropriate during a haul out.

- Axial and radial play in the shaft can also be checked at this time; see the table below that details play allowances. A dial indicator is recommended for this procedure.

  o Radial play should be checked with the indicator/micrometer positioned just below the seal housing between the top of the fin and the underside of the hull.

  o Axial play should be checked by measuring the relative distance between the top of the axle shaft and hull plate. By using a crow bar on the twin yoke, moving and feeling the tightness of the bearings inside the boat while measur ing from a fixed point with a micrometer.

	Shaft Radial Play (mm) Maximum	Shaft Axial Play (mm) Maximum
SPS 65/66	0.10	0.20
SPS 55/90/91/92/93	0.15	0.30

NOTE!

Because of the big variation in different vessels actual use and operation, system specifications and maintenance, it is not possible to accurately predict the anticipated service life of the main shaft bearings. Thereby, Sleipner recommends that the bearing clearances be checked periodically when possible so to avoid extra halout between normal service need.

The service timing indicated in the chart is based calculations and experience, but please note that because of the variations in use and load, both due to different operation and for example different fin sizes allowed on the same actuator size, the life of bearings and seals can be both longer and shorter than indicated by the maintenance chart.

FINS

It is recommended that a thorough inspection of the fins be performed when the vessel is lifted out of water for maintenance. Damages on the fin surface must be repaired with vinylester/epoxy done by professionals

HYDRAULICS

The pressure filters require periodic element changes as per the maintenance schedule. The valves and manifolds are to be inspected regularly for external damage. To avoid corrosion and deterioration, a water inhibitor such as WD-40 or similar should be applied to the valves and fittings immediately after wash-down of the equipment.

***Filter replacement:**

We recommend to replace pressure and return line filter elements after the initial start up and test period, and latest at 50 operating hours. Thereafter every 2000 operating hours or every 2nd year.

Both pressure filter and return filter have pressure drop indicators. Check indicators every 6th month. The check have to be done with oil temperature above 40˚C, and the most flow demanding consumer active. Filter element replacement are required if indicators are in the red area.

Hydraulic oil replacement:
Every 4000 operating hours or every 3rd year. For heavy duty applications and commercial use, we recommend oil sample analyses every year.
***Check oil color every 6th month. White or grey oil indicates water ingress or heavy condensation. This will require filter replacement, oil replacement and flushing of the system. See schedule and Hydraulic system manual.

CONTROL SYSTEM
With the exception of keeping the electrical parts and wiring clean, dry and damage-free, no maintenance is required for these parts. In general, all electrical equipment should be periodically checked to ensure that there are no mechanical damage or water build-up.

POWER UNIT
The power unit and its associated components require maintenance and have a lifetime so will in the future require replacement which can be done preventively as indicated within the charts here, to avoid potential follow damage to other parts.

The hydraulic oil integrity must be checked as per the schedule by extracting a sample from the system for analyzis to ensure it is withing the standards of its spesifications.

The hydraulic power unit motor should not stay unused for longer periods, and either manually rotated every 3 months or started to ensure proper lubrication of the shafts and bearings on its shaft and bearings.

PREVENTATIVE MAINTENANCE SCHEDULE
The maintenance schedules in this section indicate the recommended preventative maintenance intervals for equipment supplied by Side-Power. Components utilized in Side-Power Stabilizer Systems but not supplied by Side-Power are not included in the maintenance schedule or under any Side-Power warranty.

The maintenance intervals are listed in hours of operation and time where relevant. Maintenance is to be performed according to this schedule utilizing time or hour intervals, whichever comes first. . The maintenance schedule incorporates the minimum required maintenance to ensure correct operation of the system. Should these guidelines not be followed, the warranty for those items will be void.

To perform maintenance, replacement parts may need to be purchased. Refer to the recommended spares list and/or drawings for associated part numbers.

☎ Contact a Authorized Side-Power technician.
* If analysis of the scheduled oil sample indicates an elevated level of brass particles in the hydraulic system, the pumps should be replaced or overhauled as soon as possible. Delay in component removal and system flushing will lead to contamination problems throughout the hydraulic system. Erratic component operation may be a symptom of hydraulic fluid contamination.

*** 2000 operating hours or annually, whichever occurs first.

**** Fins should be inspected annually by diver if possible

The data in the table below is provided to assist the vessel in scheduling the appropriate service staff and coordination of vessel docking (haul out) for maintenance procedures.

Level	Description
1	Onboard maintenance possible at sea No shore support required
2	Shore supported maintenance and corrective measures
3	Trained personnel required - Side-Power personnel or equivalent
D	Dry - Vessel must be out of water to perform task
W	Wet - Vessel can be in water to perform task

A. HULL UNIT

Maintenance schedule	Service level	250h	500h	2000h	4000h	8000h	12000h	When out of water	When required	Months/ Year
1. Change oil in bearing assembly ☎	**1 D**				✓					36/3rd
2. Inspect spherical bearings, and Main Cylinders for external leakage	**1 W**			✓						
3. Inspect Stabilizer Manifolds	**1 W**			✓						
4. Inspect Stabilizer Manifolds Electrical Connections	**1 W**			✓						
5. Inspect Fin Angle Sensor Belts	**1 W**			✓						
6. Inspect Twin Yoke Area	**1 W**			✓						
7. Inspect Hydraulic Hoses	**1 W**			✓						
8. Check Shaft Clearances ☎	**3 D**							✓		
9. Replace Lower Shaft Seals ☎	**3 D**								✓	
10. Replace Main Shaft Bearings ☎	**3 D**								✓	
11. Inspect and replace Spherical Bearings and Cylinder Pins if necessary. (NOT relevant for SPS55)☎	**2 W**				✓				✓	
12. Rebuild/Replace Cylinders ☎	**3 W**				✓				✓	
13.Replace the Fin Angle Belt	**1 W**				✓				✓	
14. Replace hydraulic actuator hoses	**3 W**				✓				✓	36/3rd

B. FINS

Maintenance schedule	Service level	250h	500h	2000h	4000h	8000h	12000h	When out of water	When required
1. Inspect Fin Surfaces	**1 D ******			✓********				✓	

C. HYDRAULIC POWER UNIT

Maintenance schedule	Service level	250h	500h	2000h	4000h	8000h	12000h	When out of water	When required	Months/ Year
1. Inspect the Dirt Indicator of the return filter, replace when required	**1 W**		✓							6/0.5
2. Inspect Flexible Hoses	**1 W**		✓							
3. Inspect Suction Hoses	**1 W**		✓							
4. Inspect Electrical Connections	**1 W**			✓						
5. Inspect Cooling Pump	**1 W**		✓							
6. Inspect Oil Cooler Tubes	**1 W**						✓			
7. Inspect Pump Drive Coupling	**1 W**				✓					
8. Inspect Motor and Frame Mounts	**1 W**			✓						
9. Test Hydraulic Oil Quality by means of taking sample***	**2 W**			✓					✓	12/1st
10. Replace Return Filter Element*	**1 W**			✓					✓	24/2nd
11. Replace Pressure Filter Element*	**1 W**			✓					✓	24/2nd
12. Change Oil. Refill with mineral based hydraulic oil ISO - VG46	**1 W**				✓				✓	36/3rd
13. Replace Drive Coupling Element	**3 W**					✓				
14. Rebuild/Replace Cooling Pump	**3 W**								✓	
15. Replace Hydraulic Hoses	**3 W**								✓	
16. Replace Oil Cooler	**3 W**								✓	
17. Replace Hydraulic Pumps*	**3 W**								✓	

D. CONTROL SYSTEM

Maintenance schedule	Service level	250h	500h	2000h	4000h	8000h	12000h	When out of water	When required
1. Clean the Cooling Fan of the VFD ①	**1/3 W**			✓					
2. Test the Emergency Stop Button	**1/3 W**				✓				

Warranty Statement

1. The equipment manufactured by Sleipner Motor AS (The "Warrantor") is warranted to be free from defects in workmanship and materials under normal use and service.
2. This Warranty is in effect for of two years (Leisure Use) or one year (Commercial use) from the date of purchase by the user. Proof of purchase must be included, to establish that it is inside the warranty period.
3. This Warranty is transferable and covers the product for the specified time period.
4. In case any part of the equipment proves to be defective, other than those parts excluded in paragraph 5 below, the owner should do the following:
   (a) Prepare a detailed written statement of the nature and circumstances of the defect, to the best of the Owner's knowledge, including the date of purchase, the place of purchase, the name and address of the installer, and the Purchaser's name, address and telephone number;
   (b) The Owner should return the defective part or unit along with the statement referenced in the preceding paragraph to the warrantor, Sleipner Motor AS or an authorized Service Centre, postage/shipping prepaid and at the expense of the Purchaser;
   (c) If upon the Warrantor's or Authorized Service Centre's examination, the defect is determined to result from defective material or workmanship, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense;
   (d) no refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. Prior to refund of the purchase price, Purchaser must submit 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;
   (e) warranty service shall be performed only by the Warrantor, or an authorized Service Centre, and any attempt to remedy the defect by anyone else shall render this warranty void.
5. There shall be no warranty for 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. No other express warranty is hereby given and there are no warranties which extend beyond those described in section 4 above. This Warranty is expressly in lieu of any other expressed or implied warranties, including any implied warranty of merchantability, fitness for the ordinary purposes for which such goods are used, or fitness for a particular purpose, and any other obligations on the part of the Warrantor or its employees and representatives.
7. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any person or persons, or damage to property, loss of income or profit, or any other consequential or resulting damage or cost which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure or malfunction of the equipment, or part thereof.
8. The Warrantor assumes no liability for incidental or consequential damages of any kind including damages arising from collision with other vessels or objects.
9. This warranty gives you specific legal rights, and you may also have other rights which vary from country to country.

Worldwide sales and service

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