SHP SERIES

HYDRAULIC USER MANUAL

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Important Thruster User Considerations and Precautions

• Always turn the main power switch off before touching any part of the thruster, as an accidental start while touching moving parts can cause serious injuries.
• Always turn the control device off when the thruster is not in use.
• With the boat on land, only run the thruster for a fraction of a second, as without resistance it will accelerate very fast to a damaging rpm.
• While the thruster is in the air, ensure that the propellers have come to a complete stop before performing a directional change of the thruster, as it might cause damage to the thruster.
• When leaving the boat always turn off the main power switch for the thruster.
• Make sure that only one control is used at the same time. If two panels are operated in opposite 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 the thruster is not performing or functioning as usual, the cause must be found and corrected as soon as possible to avoid causing any other or further damage to the equipment. You must also turn off the main battery switch immediately in case the problem is of electric origin.
• It is the owner/captain/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.
• The primary purpose of the thruster is to manoeuvre/dock the vessel. Forward/reverse speed must not exceed 4 knots when operated.

IMPORTANT
Failure to follow the Considerations and precautions can cause serious injury/damage and will render all warranty given by Sleipner Motor AS VOID.

Never use thrusters when close to objects/persons or pets in the water. The thruster will draw objects into the tunnel and the rotating propellers. This will cause serious injuries and damage the thruster.
Important Thruster User Considerations and Precautions

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Thruster Operation

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

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

How to use the Thruster
1. Turn on the main power switch for the thruster. *(NB: Always turn off the main power switch when not on-board.)*
2. Turn on the control panel by pushing both "ON" buttons on the Side-Power panel simultaneously.
   * Turn off the control panel by pushing both "OFF" button

**Joystick Control**
To Turn the bow in the desired direction move the joystick in the direction you wish the bow to move.

**Button Control**
To Turn the bow in the desired direction push the red button for port movement or the green button for starboard.

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

**How to use a combined bow and stern thruster**
The combination of a bow and stern thruster offers total manoeuvrability to the boat and the ability to move the bow and the stern separately from each other. This enables you to move the boat sideways in both directions and turn the boat around its axis 360° staying stationary.

*NB: At speed (±1-2 kn) the side thruster will have little effect to steer the vessel.*

**Proportional control thruster**
For proportional control move the joystick equivalent to the amount of thrust you intend to receive.
Thruster Operation

*Developed for Hydraulic Thrusters
Compatible for all DC and AC thrusters

*Developed for DC and AC Thrusters
Not compatible for hydraulic thrusters

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

PROPORTIONAL CONTROL PANEL

Developed for Hydraulic Thrusters
Compatible for all DC and AC thrusters

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   (NB: Always turn off the main power switch when not on-board.)

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To turn the bow in the desired direction move the joystick in the direction you wish the bow to move.

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NB: At speed (+1-2 kn) the side thruster will have little effect to steer the vessel.

Proportional control thruster

For proportional control move the joystick equivalent to the amount of thrust you intend to receive.

Activating the bow thruster

Holding function for auto running the thrusters together in the direction of the arrows at selected power Press “+” for more and “-” for less power.

Press and hold “ON” button for 1 second to activate control panel.
Press and hold for 3 seconds to activate menu.

Activating the stern thruster

Holding function for auto running the thrusters together in the direction of the arrows at selected power Press “+” for more and “-” for less power.

Press to deactivate control panel, cancel, go back in the menu system or to mute internal alarm buzzer.
Press and hold both “ON” button for 1 second to activate control panel.
Press and hold for 3 seconds to activate menu.

Activating both bow and stern thruster to push the boat sideways

Activating both bow and stern thruster to rotate the boat on axis

*Control panel example

Information display, see following pages for details.

Emergency stop button

Activating both bow and stern thruster to rotate the boat on axis

Activating both bow and stern thruster to push the boat sideways

*Control panel example

Holding function for auto running the thrusters together in the direction of the arrows at selected power Press “+” for more and “-” for less power.
Proportional Thruster Display

Status indicators for bow thruster. (Port bow thruster in a dual bow thruster setup).

Runtime indicator will be shown here in a single DC electric bow thruster setup.

Status indicators for stern thruster. (Port bow thruster in a dual stern thruster setup)

Runtime indicator will be shown here in a single DC electric stern thruster setup.

Examples of display view for different panels applications:

- **PJC211:** DC Electric Bow thruster
- **PJC221:** Hydraulic Bow thruster
- **PJC222:** AC Electric Bow thruster

- **PJC221:** Dual AC Electric Bow thrusters
- **PJC222:** Dual Hydraulic Bow thrusters
- **PJC222:** Dual AC Electric Bow thrusters

- **PJC221:** Dual Hydraulic Bow thrusters
- **PJC222:** Dual AC Electric Bow thrusters
- **PJC222:** Dual Hydraulic Bow thrusters

BOW  BOW-STB

STERN  STERN-STB

**Examples of display view for different panels applications:**

- **PJC211:** DC Electric Bow thruster
- **PJC211:** DC Electric Stern thruster
- **PJC212:** Dual DC Electric Bow thrusters
- **PJC212:** Dual DC Electric Stern thrusters
- **PJC221:** Dual AC Electric Bow thrusters
- **PJC221:** Dual Hydraulic Bow thrusters
- **PJC222:** Dual AC Electric Bow thrusters
- **PJC222:** Dual Hydraulic Bow thrusters
Proportional Thruster Display Symbols

**DC Thrusters:**
- Battery indicator. From 8.5V to 12V for 12V thrusters, 15V to 24V for 24V thrusters
- Motor temperature indicator. From 70°C/158°F to 130°C/266°F.
- Symbol shown when a DC Thruster is used in a dual bow or dual stern setup:
  - Battery indicator. From 8.5V to 12V for 12V thrusters, 15V to 24V for 24V thrusters
  - Motor temperature indicator. From 70°C/158°F to 130°C/266°F.

**AC Thrusters:**
- Motor temperature indicator.

**Hydraulic Thrusters:**
- Hydraulic oil temperature indicator.

**Retractable Thrusters:**
- Symbol shown when the thruster deploys.
- Symbol shown when the thruster retracts.
- Symbol shown when the thruster is in position OUT:
  When the thruster is deployed and no input is given via the joysticks/buttons over a 10 second period, the panel will give an audible signal every 10th second to tell that the thruster is still deployed.

**Thrust power and direction, Bow thruster(s):**
- Input from bow joystick on this panel.
- The thrust indicator will be shown in this position on a single joystick panel if the thruster is defined as a bow thruster.

**Thrust power and direction, Stern thruster(s):**
- Input from stern joystick on this panel.
- The thrust indicator will be shown in this position on a single joystick panel if the thruster is defined as a stern thruster.

Indicating amount of thrust set by other control units in the system, i.e. additional PJC panels, 8700 Retract panel, input via 8730 S-link external switch interface, S-link remote control etc.

If two or more units are set to run the thruster in opposite direction, this information will not be shown.
**HOLD Function**

The ‘HOLD’ function is for auto-running of bow and stern thrusters together in the direction of the arrows at selected power.

Press “+” for more and “-” for less power (6 steps). The ‘HOLD’ function is normally used to hold the boat into the dock while mooring. The ‘HOLD’ function can be deactivated by running any thruster in the opposite direction from any control unit.

**Calibration**

The ‘HOLD’ function can be calibrated to get balanced thrust from the bow and stern thruster.

See the PJC control panel manual on how to calibrate.

**Warning Signals When Using ‘HOLD’ Function**

The internal and external (if fitted) buzzer will give the following warning signals:

<table>
<thead>
<tr>
<th>Warning signals</th>
<th>Cause</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Single short beep every 2.4 sec.</td>
<td>• Voltage below 9.3V/17.5V (12V/24V system). • Temperature above 85°C/185°F.</td>
<td>None</td>
</tr>
<tr>
<td>2. Two short beeps every 2.4 sec.</td>
<td>• Voltage below 8.9V/16.3V (12V/24V system). • Temperature above 100°C/212°F.</td>
<td>None</td>
</tr>
<tr>
<td>3. Red backlight in display and continuous short beeps.</td>
<td>• Voltage below 8.5V/15V (12V/24V system). • Temperature above 110°C/230°F.</td>
<td>None</td>
</tr>
<tr>
<td>4. Red backlight in display and continuous short beeps.</td>
<td>If one or more of the thrusters enters an alarm state - Voltage below 8.0V/12.0V (12V/24V system) or temperature above 120°C/248°F. ”HOLD” function are cancelled and both thrusters will stop. Temperature must drop below 110°C/230°F before the thruster can be operated again. Low Voltage alarm must be reset from panel.</td>
<td>None</td>
</tr>
</tbody>
</table>

Move around in menus by using joystick.
Follow instructions on the screen and press the buttons below the symbols indicated on LCD screen.
Access menu system by pressing and holding Menu button for 3 seconds.

**MAIN MENU ITEMS:**
Move between main menu items with the (stern) joystick.

<table>
<thead>
<tr>
<th>Language</th>
<th>Stabilizer (if installed)</th>
<th>Setup</th>
<th>Info</th>
<th>Default settings</th>
<th>Panel setup</th>
</tr>
</thead>
</table>

**BUTTON SYMBOLS**
On the bottom line of the display, a symbol will be shown over the buttons below. These symbols will show what function each corresponding button has in the selected menu entry.

- Return to previous menu.
- Select highlighted menu text / Save edited parameter.
- Edit highlighted parameter.
- Cancel editing without saving.

This symbol indicates that the (stern) joystick is used to move between menu items / parameters.
**LANGUAGE**

- Choose language by moving joystick: English, Norwegian, German, French, Spanish, Italian and Danish.
- Press the button below to set the language to the highlighted menu entry. A star (*) on each side indicates the language set.

**DEFAULT SETTINGS**

- Reset all settings to factory default
  - follow instructions on screen
- Press the button below to confirm reset
- The following parameters/values will be set to the factory settings:
  
Language = English  
Backlight Level = 5  
Backlight Night Colour = Green  
Backlight Nightlevel = 1  
Timer Auto-Off = 05 min  
Hold Calibration = 70% Bow and Stern

All system devices will be erased from memory.  
(Setup procedure must be followed to reconfigure the system)

**STABILIZER**

(Shown only for yachts equipped with a Side-Power Stabilizer system)

Press the button below to edit the selected parameter.  
ON/OFF will start to blink, use joystick to alter value.  
Press the button below to save edited parameter to device.

1. Stabilizer:
   - Values: ON/OFF
   - Switches the stabilizer ON or OFF.

2. AnySpeed:
   - Values: ON/OFF
   - Switches the zero speed/anchor stabilization ON or OFF.
### Alarm Descriptions

<table>
<thead>
<tr>
<th>Err. No.</th>
<th>Errors shown in display</th>
<th>&quot;Auto Reset&quot;</th>
<th>&quot;Ext. buzzer activation at Alert Level&quot;</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Motor Overcurrent</td>
<td>2², 3</td>
<td></td>
<td>Motor current too high.</td>
<td>&quot;Thruster must be serviced by authorized personnel, reset or power OFF/ON PPC(¹).&quot;</td>
</tr>
<tr>
<td>2</td>
<td>Motor Overtemp</td>
<td>Yes</td>
<td>2², 3</td>
<td>&quot;Motor temp has been over 120°C/248°F.&quot;</td>
<td>Motor cool down below 110°C/230°F.</td>
</tr>
<tr>
<td>3</td>
<td>Controller Overtemp</td>
<td>2², 3</td>
<td></td>
<td>&quot;PPC(¹) temp has been over 80°C/176°F.&quot;</td>
<td>PPC(¹) cool down below 45°C/113°F.</td>
</tr>
<tr>
<td>4</td>
<td>Controller Overtemp</td>
<td>2², 3</td>
<td></td>
<td>&quot;SR150000 temp has been over 80°C/176°F.&quot;</td>
<td>SR150000 cool down below 45°C/113°F.</td>
</tr>
<tr>
<td>5</td>
<td>Low Voltage</td>
<td>2², 3</td>
<td></td>
<td>Low motor voltage alarm when motor is running. 12V thruster below 8.00V 24V thruster below 12.00V</td>
<td>Recharge battery, reset or power OFF/ON device.</td>
</tr>
<tr>
<td>6</td>
<td>Thermoswitch</td>
<td>Yes</td>
<td>2², 3</td>
<td>Thermo switch input is activated and there is an open circuit.</td>
<td>The thruster needs to cool down before operating again.</td>
</tr>
<tr>
<td>7</td>
<td>IPC Error</td>
<td>2², 3</td>
<td></td>
<td>Motor relay fault</td>
<td>&quot;Turn off thruster battery main switch. Thruster must be serviced by authorized personnel.&quot;</td>
</tr>
<tr>
<td>8</td>
<td>Critical Error</td>
<td>2², 3</td>
<td></td>
<td>PPC(¹) output fail</td>
<td>PPC(¹) must be sent for service.</td>
</tr>
<tr>
<td>9</td>
<td>Low Motor Current</td>
<td>2², 3</td>
<td></td>
<td>Thruster uses no power</td>
<td>Check thruster connections or motor dead!</td>
</tr>
<tr>
<td>10</td>
<td>Motor Contactor</td>
<td>2², 3</td>
<td></td>
<td>No current on motor relay coil.</td>
<td>Check motor relay connections, short circuit or relay dead!</td>
</tr>
<tr>
<td>11</td>
<td>System Error</td>
<td>2², 3</td>
<td></td>
<td>Fatal error</td>
<td>Device must be serviced by authorized personnel</td>
</tr>
<tr>
<td>12</td>
<td>No Communication</td>
<td>2², 3</td>
<td></td>
<td>No communication with device</td>
<td>Check S-Link cables and power connections.</td>
</tr>
<tr>
<td>13</td>
<td>Motor Temp Sensor</td>
<td>2², 3</td>
<td></td>
<td>Motor temperature sensor fail</td>
<td>Check for an open circuit on the temp sensor on the motor</td>
</tr>
<tr>
<td>14</td>
<td>Supply Voltage Fault</td>
<td>2², 3</td>
<td></td>
<td>No power</td>
<td>Check power connections</td>
</tr>
<tr>
<td>15</td>
<td>Fuse Blown</td>
<td>2², 3</td>
<td></td>
<td>Fuse blown</td>
<td>Replace fuse or check if main cable from battery and main cable to thruster has been switched</td>
</tr>
<tr>
<td>16</td>
<td>Manual Override</td>
<td>Yes</td>
<td>2², 3</td>
<td>Main switch manually overridden</td>
<td>Pull main switch</td>
</tr>
<tr>
<td>17</td>
<td>Motion OUT Fault</td>
<td>2², 3</td>
<td></td>
<td>Retract obstructed while deploying</td>
<td>Turn off all panels. Go for lower speed/deeper water and retry.</td>
</tr>
<tr>
<td>18</td>
<td>Motion IN Fault</td>
<td>2², 3</td>
<td></td>
<td>Retract obstructed while retracting</td>
<td>Turn panel on and manually override main switch. Remove obstruction and try again.</td>
</tr>
</tbody>
</table>

1. PPC520, PPC820, PPC800, PPC840
2. Buzzer is only activated when any device is sending thrust on the S-link bus.
# Alarm Descriptions

<table>
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<tr>
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<th>&quot;Ext. buzzer activation at Alert Level&quot;</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Actuator Fault</td>
<td>2(^2), 3</td>
<td></td>
<td>Actuator not getting any power</td>
<td>&quot;Check actuator connection or power to actuator. Reset alarm in alarm menu on PJC 211/212/221/222 or recycle power.&quot;</td>
</tr>
<tr>
<td>20</td>
<td>Pos.Sensor Fault</td>
<td>2(^2), 3</td>
<td></td>
<td>Retract position sensor fail</td>
<td>Check position sensor cables and for sensor damage.</td>
</tr>
<tr>
<td>21</td>
<td>In Service Mode</td>
<td>Yes</td>
<td>2(^2), 3</td>
<td>&quot;Retract controller in service mode. Switch no. 4 is ON.&quot;</td>
<td>Check dip switch setting on retract control box.</td>
</tr>
<tr>
<td>22</td>
<td>High Oil Temp</td>
<td>Yes</td>
<td>1, 2(^2), 3</td>
<td>&quot;Hydraulic oil temperature is higher than 75°C /167°F.&quot;</td>
<td>&quot;Stop running and wait for temperature to drop. Check if cooling pump is running.&quot;</td>
</tr>
<tr>
<td>23</td>
<td>Low Oil Level</td>
<td>1, 2(^2), 3</td>
<td></td>
<td>Hydraulic oil level is to low</td>
<td>Fill more hydraulic oil to the hydraulic tank.</td>
</tr>
<tr>
<td>24</td>
<td>Warning Return Filter</td>
<td>Yes</td>
<td>2(^2), 3</td>
<td></td>
<td>Return filter element required replacing.</td>
</tr>
<tr>
<td>25</td>
<td>Warning Pressure Filter</td>
<td>Yes</td>
<td>2(^2), 3</td>
<td></td>
<td>Pressure filter element required replacing.</td>
</tr>
<tr>
<td>26</td>
<td>Warning High Speed</td>
<td>Yes</td>
<td>1, 2(^2), 3</td>
<td>&quot;WARNING! High Speed. Stabilizer not active!&quot;</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Stabilizer Fault</td>
<td>Yes</td>
<td>1, 2(^2), 3</td>
<td>Any Stabilizer alarm.</td>
<td>See stabilizer panel for more info.</td>
</tr>
<tr>
<td>28</td>
<td>AC Motor Overtemp</td>
<td>Yes</td>
<td>1, 2(^2), 3</td>
<td>&quot;Hydraulic AC motor power pack overtemp. Higher than 120°C/248°F.&quot;</td>
<td>Stop running and wait for temperature to drop.</td>
</tr>
<tr>
<td>29</td>
<td>AC Motor Sensor Fail</td>
<td>2(^2), 3</td>
<td></td>
<td>&quot;Hydraulic AC motor power pack temp sensor open circuit&quot;</td>
<td>Check sensor cables.</td>
</tr>
<tr>
<td>30</td>
<td>Temperature Warning</td>
<td>Yes</td>
<td>2(^2), 3(^2)</td>
<td>High temperature warning.</td>
<td>Warns that the motor temperature is getting high.</td>
</tr>
<tr>
<td>31</td>
<td>Motor Overtemp</td>
<td>Yes</td>
<td>1, 2(^2), 3</td>
<td>High temperature Alarm.</td>
<td>See SAC manual for more details.</td>
</tr>
<tr>
<td>32</td>
<td>VFD Warning</td>
<td>Yes</td>
<td>2(^2), 3</td>
<td>There is an warning from VFD.</td>
<td>Check VFD for more details.</td>
</tr>
<tr>
<td>33</td>
<td>VFD Not Ready</td>
<td>Yes</td>
<td>2(^2), 3</td>
<td>The VFD is not ready.</td>
<td>Check VFD for more details.</td>
</tr>
<tr>
<td>34</td>
<td>VFD Fault</td>
<td>1, 2(^2), 3</td>
<td></td>
<td>VFD has an Alarm.</td>
<td>Check VFD for more details.</td>
</tr>
<tr>
<td>35</td>
<td>Warning Low Voltage</td>
<td>Yes</td>
<td>2(^2), 3(^2)</td>
<td>Low motor voltage warning when motor is running. 12V thruster below 9.30V 24V thruster below 17.50V</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Not Calibrated</td>
<td>Yes</td>
<td>2(^2), 3</td>
<td>Shaft Not Calibrated</td>
<td>See manual for how to calibrate.</td>
</tr>
<tr>
<td>37</td>
<td>VFD Com. Fault</td>
<td>2(^2), 3</td>
<td></td>
<td>No Modbus communication with VFD</td>
<td>Check VFD Modbus cables and power.</td>
</tr>
<tr>
<td>38</td>
<td>Cooling Fan Fault</td>
<td>2(^2), 3</td>
<td></td>
<td>Cooling fan stopped running, or running too slow</td>
<td>Device must be sent for service</td>
</tr>
</tbody>
</table>
| 39         | Interlock                | 2\(^2\), 3  |                                        | S-link communication between PPC and retract controller are missing | -Check PPC or retract controller has power. 
-Check S-Link connections to PPC and retract controller. 
-Check if not PPC or SR150000/ SR61242 is wrongly setup as SRP or SRVP/SRLP. |

1. PPC520, PPC820, PPC800, PPC840
2. Buzzer is only activated when any device is sending thrust on the S-link bus.
<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Cause</th>
<th>Action</th>
</tr>
</thead>
</table>
| 10500.0.10 | PHC Oil Level - Level Low | Hydraulic oil level is low | *“Limit use of thruster.
-Inspect hydraulic oil level
-Check system for leaks and refill hydraulic oil” |
| 10500.0.13 | PHC Oil Level - Open Circuit | Analog oil level sensor open circuit | *“Sensor not connected or wire break.
-Verify sensor type in parameter 0201
-Disconnect sensor and measure that sensor resistance value is in range 5-180Kohm” |
| 10501.0.11 | PHC Oil Temp - Level High | Oil temperature higher than 75°C (167°F) | *“Limit use of thruster to prevent temperature to rise.
-Check if cooling pump is running and there is cooling water flow.
-Inspect seawater filter
-Verify that cooling pump is enabled in parameter 0301” |
| 10501.0.13 | PHC Oil Temp - Open Circuit | Analog oil temp sensor open circuit | *“Sensor not connected or wire break.
-Disconnect sensor and measure that sensor resistance value is in range 104ohm-147Kohm
-Wrong sensor is defined in parameter 0201” |
| 10501.0.16 | PHC Oil Temp - Short Circuit | Analog oil temp input short circuit | *“Input shorted to GND, check wiring/sensor
-Disconnect sensor and measure that sensor resistance value is in range 104ohm-147Kohm” |
| 10502.0.13 | PHC Stablizier Pressure - Open Circuit | Stablizer pressure sensor open circuit | *“Sensor not connected or wire break.
-System incorrectly configured with stabilizer, parameter 1001
-Replace sensor” |
| 10502.0.16 | PHC Stablizier Pressure - Short Circuit | Stablizer pressure sensor short circuit | *“Wires shorted or sensor defective, check wiring/sensor
-Replace sensor” |
| 10502.19 | PHC Stablizier Pressure - Under Limit | Stablizer pressure has dropped below 20bar. | *“Check accumulator charge pressure
-Check PTO pressure (if PTO powered)
-Check system for oil leaks
-Check generator power supply to the VFD (is VFD motor speed maximum when pressure alarming low)” |
| 10502.20 | PHC Stablizier Pressure - Over Limit | *“Stablizer pressure is higher than:
-parameter 1013 PTO OVER-PRESSURE FAULT LEVEL running from PTO (FW V1.029 an older, set point + 30bar running from PTO)
or set point + 15bar running from AC motor” | *“Check Parameter 1013 PTO OVER-PRESSURE FAULT LEVEL
-Check PTO pressure setting
-Check accumulator charge pressure
-Check unload valve operation” |
| 10502.26 | PHC Stablizier Pressure - VALUE MAX | Stablizer pressure reached sensor max value. | *“Check that correct sensor is fitted
-Check that sensor range parameter 1010 match the sensor
-Check PTO pressure setting” |
| 10503.0.13 | PHC System Pressure - Open Circuit | System pressure sensor open circuit | *“Sensor not connected or wire break.
-Verify system pressure, parameter 0104” |
| 10503.0.16 | PHC System Pressure - Short Circuit | System pressure sensor short circuit | *“Wires shorted or sensor defective, check wiring/sensor
-Replace sensor” |
| 10504.0.13 | PHC AI 1 - Open Circuit | Analog Input 1 (4-20mA) sensor open circuit | -Sensor not connected or wire break. |
| 10504.0.16 | PHC AI 1 - Short Circuit | Analog Input 1 (4-20mA) sensor short circuit | *“Wires shorted or sensor defective, check wiring/sensor
-Replace sensor” |
| 10505.0.13 | PHC AI 2 - Open Circuit | Analog Input 2 (4-20mA) sensor open circuit | -Sensor not connected or wire break. |
| 10505.0.16 | PHC AI 2 - Short Circuit | Analog Input 2 (4-20mA) sensor short circuit | *“Wires shorted or sensor defective, check wiring/sensor
-Replace sensor” |
| 10508.0.13 | PHC DOUT AC PUMP UNLOAD - Open Circuit | AC Pump Unload valve open circuit | *“Check for open circuit, power consumption < 5.0 Watt
-System incorrectly configured with stabilizer, parameter 1001” |
| 10508.0.51 | PHC DOUT AC PUMP UNLOAD - Current High | AC Pump Unload valve current higher than 4.0A | -Check wires and connections for short circuit |
| 10509.0.13 | PHC DOUT ACCUMULATOR DUMP - Open Circuit | Accumulator Dump valve open circuit | *“Check for open circuit, power < 5.0 Watt
-System incorrectly configured with stabilizer, parameter 1001” |
| 10509.0.51 | PHC DOUT ACCUMULATOR DUMP - Current High | Accumulator Dump valve current higher than 4.0A | -Check wires and connections for short circuit |
| 10510.0.13 | PHC DOUT STABILIZER - Open Circuit | Stablizer valve open circuit | *“Check for open circuit, power consumption < 5.0 Watt
-System incorrectly configured with stabilizer, parameter 1001” |
| 10510.0.51 | PHC DOUT STABILIZER - Current High | Stablizer valve current higher than 4.0A | -Check wires and connections for short circuit |
| 10511.0.13 | PHC DOUT COOLING PUMP HYDRAULIC - Open Circuit | Hydraulic Cooling Pump valve open circuit | *“Check for open circuit, power consumption < 5.0 Watt
-Wrong cooling pump configured, parameter 0301” |
| 10511.0.51 | PHC DOUT COOLING PUMP HYDRAULIC - Current High | Hydraulic Cooling Pump valve current higher than 4.0A | -Check wires and connections for short circuit |
| 10512.0.13 | PHC DOUT LS DUMP - Open Circuit | LS-Dump valve open circuit | *“Check for open circuit, power consumption < 5.0 Watt
-System wrong configured with thrusters, parameter 2001 or 2101” |
| 10512.0.51 | PHC DOUT LS DUMP - Current High | LS-Dump valve current higher than 4.0A | -Check wires and connections for short circuit |
| 10513.0.51 | PHC DOUT PUMP #2 - Current High | Pump #2 valve current higher than 4.0A | -Check wires and connections for short circuit |
| 10514.0.13 | PHC DOUT 5 - Open Circuit | Digital Output 5 is configured as crossover and output is open circuit | *“Check for open circuit, power consumption < 5.0 Watt
-Output configured wrong, parameter 0505” |
| 10514.0.51 | PHC DOUT 5 - Current High | Digital Output 5 current higher than 4.0A | -Check wires and connections for short circuit |
| 10515.0.13 | PHC DOUT 6 - Open Circuit | Digital Output 6 is configured as crossover and output is open circuit | *“Check for open circuit, power consumption < 5.0 Watt
-Output configured wrong, parameter 0508” |
| 10515.0.51 | PHC DOUT 6 - Current High | Digital Output 6 current higher than 4.0A | -Check wires and connections for short circuit |
| 10516.0.13 | PHC DOUT 3 - Open Circuit | Digital Output 3 is configured as crossover and output is open circuit | *“Check for open circuit, power consumption < 5.0 Watt
-Output configured wrong, parameter 0503” |
### PHC-3 Alarm Descriptions

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>10516.0.51</td>
<td>PHC DOUT 3 - Current High</td>
<td>Digital Output 3 current higher than 4.0A</td>
<td>-Check wires and connections for short circuit</td>
</tr>
<tr>
<td>10517.0.13</td>
<td>PHC DOUT 2 - Open Circuit</td>
<td>Digital Output 2 is configured as crossover and output is open circuit</td>
<td>*Check for open circuit, power consumption &lt; 5.0 Watt <em>Output configured wrong, parameter 0502</em></td>
</tr>
<tr>
<td>10517.0.51</td>
<td>PHC DOUT 2 - Current High</td>
<td>Digital Output 2 current higher than 4.0A</td>
<td>-Check wires and connections for short circuit</td>
</tr>
<tr>
<td>10518.0.13</td>
<td>PHC DOUT 1 - Open Circuit</td>
<td>Digital Output 1 is configured as crossover and output is open circuit</td>
<td>*Check for open circuit, power consumption &lt; 5.0 Watt <em>Output configured wrong, parameter 0501</em></td>
</tr>
<tr>
<td>10518.0.51</td>
<td>PHC DOUT 1 - Current High</td>
<td>Digital Output 1 current higher than 4.0A</td>
<td>-Check wires and connections for short circuit</td>
</tr>
<tr>
<td>10519.0.13</td>
<td>PHC DOUT 4 - Open Circuit</td>
<td>Digital Output 4 is configured as crossover and output is open circuit</td>
<td>*Check for open circuit, power consumption &lt; 5.0 Watt <em>Output configured wrong, parameter 0504</em></td>
</tr>
<tr>
<td>10519.0.51</td>
<td>PHC DOUT 4 - Current High</td>
<td>Digital Output 4 current higher than 4.0A</td>
<td>-Check wires and connections for short circuit</td>
</tr>
<tr>
<td>10520.0.51</td>
<td>PHC ECI Cooling Pump POWER FEED - Current High</td>
<td>ECI cooling pump power current higher than 8.0A</td>
<td>*Check pump cable for damage and short circuits *Make sure the connector on the cooling pump is correct inserted. <em>Replace ECI cooling pump</em></td>
</tr>
<tr>
<td>10521.0.51</td>
<td>PHC Bow Thruster Power - Current High</td>
<td>Bow thruster PVG feed current higher than 3.0A</td>
<td>-Check PVG wires and connections for short circuit</td>
</tr>
<tr>
<td>10522.0.51</td>
<td>PHC Stern Thruster Power - Current High</td>
<td>Stern thruster PVG feed current higher than 3.0A</td>
<td>-Check PVG wires and connections for short circuit</td>
</tr>
<tr>
<td>10523.0.51</td>
<td>PHC Thruster Power - Current High</td>
<td>Bow or Stern PVG feed current higher than 3.0A</td>
<td>Check all bow and stern PVG signal wires for short circuits</td>
</tr>
<tr>
<td>10524.0.51</td>
<td>PHC ECI Cooling Pump - Current High</td>
<td>ECI cooling pump current higher than 13.0A</td>
<td>*Check ECI cooling pump cable for damage and short circuits <em>Replace ECI cooling pump</em></td>
</tr>
<tr>
<td>10524.0.53</td>
<td>PHC ECI Cooling Pump - Overvoltage</td>
<td>ECI cooling pump overvoltage, voltage higher than 33.0V</td>
<td>*Check PHC-3 input voltage is below 33.0V <em>Replace ECI cooling pump</em></td>
</tr>
<tr>
<td>10524.0.54</td>
<td>PHC ECI Cooling Pump - Undervoltage</td>
<td>ECI cooling pump under voltage, voltage is lower than 18.0V</td>
<td>*Check PHC-3 input voltage is higher than 18.0V <em>Replace ECI cooling pump</em></td>
</tr>
<tr>
<td>10524.0.55</td>
<td>PHC ECI Cooling Pump - Overtemp</td>
<td>ECI cooling pump temperature higher than 100°C (212°F)</td>
<td>*Check ECI cooling pump for damages <em>Replace ECI cooling pump</em></td>
</tr>
<tr>
<td>10524.1.00</td>
<td>PHC ECI Cooling Pump - No Communication</td>
<td>No communication with ECI cooling pump</td>
<td>*Check if ECI pump is connected *Check wires to ECI pump for open circuits *Check power supply cooling pump <em>Wrong cooling pump configured, parameter 0301</em></td>
</tr>
<tr>
<td>10524.2.05</td>
<td>PHC ECI Cooling Pump - HW FAULT</td>
<td>ECI cooling pump hardware fault</td>
<td>-Replace ECI cooling pump</td>
</tr>
<tr>
<td>10526.0.8</td>
<td>PHC ECI Cooling Pump Blocked - -</td>
<td>ECI cooling pump is blocked</td>
<td>*Reset fault and if fault reappears, cooling pump need service or replacement <em>Check pump inlet for obstacles</em></td>
</tr>
<tr>
<td>10527.1.0</td>
<td>PHC VFD Not Ready Instance 1 -</td>
<td>VFD not ready</td>
<td>-VFD external run enable/power available signal is lost.</td>
</tr>
<tr>
<td>10528.1.10</td>
<td>PHC VFD ABB Parameter Instance 1 Level Low</td>
<td>ABB ACS550 parameter values 2001 or 2002 cannot be a negative value.</td>
<td>-Check ABB ACS550 parameter 2001 and 2002.</td>
</tr>
<tr>
<td>10529.0.19</td>
<td>PHC ECI Cooling Pump Speed - Under Limit</td>
<td>ECI pump motor speed under limit, below 100rpm</td>
<td>*Check hose for dirt <em>Check pump inlet for obstacles</em></td>
</tr>
<tr>
<td>10530.0.201</td>
<td>PHC PTO ENGINE INSTANCE - INIT FAIL</td>
<td>Parameter 1011-PTO ENGINE INSTANCE is not defined</td>
<td>-Set parameter 1011-PTO ENGINE INSTANCE</td>
</tr>
<tr>
<td>36000.1.24</td>
<td>ABB ACS550 Instance 1 Fault</td>
<td>ABB ACS550 fault</td>
<td>Se ABB ACS550 drive for more details</td>
</tr>
<tr>
<td>36002.1.24</td>
<td>VACON Instance 1 Fault</td>
<td>VACON VFD Fault</td>
<td>Se VACON drive for more details</td>
</tr>
<tr>
<td>36003.1.24</td>
<td>ABB ACS580 Instance 1 Fault</td>
<td>ABB ACS580 fault</td>
<td>Se ABB ACS580 drive for more details</td>
</tr>
<tr>
<td>36100.1.100</td>
<td>VFD Instance 1 No Communication</td>
<td>Lost communication with VFD</td>
<td>&quot;VFD not powered up VFD communication cable not connected or incorrectly wired*</td>
</tr>
<tr>
<td>36103.1.0</td>
<td>VFD IN LOCAL Instance 1 -</td>
<td>VFD in local mode</td>
<td>-Switch VFD to remote mode</td>
</tr>
</tbody>
</table>

### PDC-301 Alarm Descriptions

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Description</th>
<th>Cause</th>
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</tr>
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<tbody>
<tr>
<td>10600.0.208</td>
<td>SIR15000 Fault - INTERLOCK</td>
<td>Retract Interlock</td>
<td>-Check if retract is deployed. *No communication with Retract Controller, check Retract Controller has power. *Check PDC-301 and Retract Controller setup.</td>
</tr>
<tr>
<td>36100.1.24</td>
<td>VFD Instance 1 Fault</td>
<td>VFD faulted</td>
<td>-See VFD for more information</td>
</tr>
<tr>
<td>36101.1.100</td>
<td>VFD Instance 1 No Communication</td>
<td>PDC-301 has no MODBUS communication with VFD.</td>
<td>-Check communication cable with VFD *Check if VFD has power</td>
</tr>
<tr>
<td>36101.1.200</td>
<td>VFD PMS Instance 1 Timeout</td>
<td>VFD is not ready within 60 after power request.</td>
<td>-Check if VFD has power</td>
</tr>
<tr>
<td>36101.1.204</td>
<td>VFD PMS Instance 1 SIGNAL LOST</td>
<td>Lost Power Management signal from VFD, VFD not available anymore.</td>
<td>-Check VFD for more information</td>
</tr>
<tr>
<td>36103.1.0</td>
<td>VFD IN LOCAL Instance 1 -</td>
<td>VFD in Local or Hand Mode</td>
<td>-Change mode in VFD panel.</td>
</tr>
</tbody>
</table>
Maintenance

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

- The propeller is fastened securely to the gear leg.
- Bolts holding the thruster components together are fastened securely.
- The area around the thruster is clean and dry. Ensure there are no signs of water.
- 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. Ensure to use anti-fouling designed for drivers*)
- 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. (*NB: In some water conditions, it may be necessary to install an extra anode to ensure that it lasts for the whole period between regular service lifts of the boat. Consult your dealer for information on how to do this.*)
- 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 gear house every time the boat is out of the water.
- If there is a problem with your Ignition Protected stern thruster, please contact your dealer.

Oil Change

OIL LUBRICATION GEAR LEGS: There must always be oil in the oil reservoir. Refill if necessary with gear oil EP90. Change the gear oil a minimum of every second year. Check the gear oil quality in the gear house every time the boat is out of the water.

1. To drain the gear leg unscrew lower oil drain screw.
2. Unscrew upper oil drain screw.
3. The oil will drain out from the gear leg.
4. Attach oil filling equipment to the lower oil drain hole. (M8)
5. Pump oil until oil is flowing out of the upper oil drain hole. (Approx. 200ml)
6. Tighten upper oil drain screw.
7. Remove oil filling equipment.
8. Tighten the lower oil drain screw.
KEY:
1. Hydraulic Motor
2. Mounting Plate
3. Motor bracket
4. Flexible coupling
5. Gear Leg (Pre-filled)
6. Propeller
7. Anode
8. Drive pin
9. Washer
10. Lock Nut
11. Fastening Screw for anode
12. Oil drain screw
13. Shaft Key
14. Anode pins
<table>
<thead>
<tr>
<th>CHECK TO PERFORM</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The propeller is fastened securely to the gear leg.</td>
<td></td>
</tr>
<tr>
<td>Bolts holding the thruster components together are fastened securely.</td>
<td></td>
</tr>
<tr>
<td>The area around the thruster is clean and dry. If there are signs of water, try to find the source and eliminate it.</td>
<td></td>
</tr>
<tr>
<td>Paint the propeller and gear leg with anti-fouling.</td>
<td></td>
</tr>
<tr>
<td>Batteries are in good condition.</td>
<td></td>
</tr>
<tr>
<td>All electrical connections are clean and fastened firmly.</td>
<td></td>
</tr>
<tr>
<td>Check the drive shaft in the retract mechanism is lubricated.</td>
<td></td>
</tr>
<tr>
<td>Check for excess movement in the break-away rings securing the actuator.</td>
<td></td>
</tr>
<tr>
<td>Change the zinc anode.</td>
<td></td>
</tr>
<tr>
<td>Check oil in the oil reservoir.</td>
<td></td>
</tr>
<tr>
<td>*REPLACE EVERY 2 YEARS</td>
<td></td>
</tr>
</tbody>
</table>
CHECK TO PERFORM

- The propeller is fastened securely to the gear leg.
- Bolts holding the thruster components together are fastened securely.
- The area around the thruster is clean and dry. If there are signs of water, try to 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.
- Check the drive shaft in the retract mechanism is lubricated.
- Check for excess movement in the break-away rings securing the actuator.
- Change the zinc anode.
- Check oil in the oil reservoir.

*REPLACE EVERY 2 YEARS

For the most up to date documentation, we advise you to visit our website **www.side-power.com** for the spare parts list.

For additional supporting documentation, we advise you to visit our website **www.side-power.com** for the spare parts list.

**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.