Marine Isolating transformers

**Type LS**
Isolating transformer - for safe and correct connection of AC shore power to your boat's AC system. An isolating transformer eliminates any electrical continuity between shore power and the boat. Shore power is fed to the primary side of the transformer and the boat is connected to the secondary; this completely isolates the boat from the shore ground and will prevent any unsafe situation, and at the same time avoid galvanic corrosion.

A soft start feature prevents the shore power fuse from blowing due to the inrush current of the transformer, which would otherwise occur.

**Technical specifications**
- Input voltage: 230 V
- Frequency: 47-63 Hz
- Output voltage: 115 V / 230 V
- According to: EN61558-2-4
- Test/insulating voltage: 2.3 kV AC RMS
- Construction class: II
- Insulation class: B (130°C)
- Max ambient temp. (t): 40°C
- Degree of protection: IP43

**Standard types**

<table>
<thead>
<tr>
<th>Type</th>
<th>Voltage</th>
<th>Voltage</th>
<th>Current</th>
<th>Power</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Art. no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>230 / 115V</td>
<td>230</td>
<td>115</td>
<td>14,0</td>
<td>1600</td>
<td>400x368x130</td>
<td>18</td>
<td>3-080-000509</td>
</tr>
<tr>
<td>LS14-115</td>
<td>230</td>
<td>115</td>
<td>28,0</td>
<td>3200</td>
<td>400x368x130</td>
<td>24</td>
<td>3-080-000508</td>
</tr>
<tr>
<td>230 / 230V</td>
<td>230</td>
<td>230</td>
<td>10,0</td>
<td>2300</td>
<td>400x368x130</td>
<td>18</td>
<td>3-080-000503</td>
</tr>
<tr>
<td>LS10-230</td>
<td>230</td>
<td>230</td>
<td>16,0</td>
<td>3600</td>
<td>400x368x130</td>
<td>24</td>
<td>3-080-000481</td>
</tr>
</tbody>
</table>
**Noratel marine isolation transformers - Type LS**

In order to eliminate galvanic corrosion a isolating transformer separating the shore AC power from the boat's 230 Volts (or 115 volts) should be installed.

An Isolating transformer eliminates the galvanic currents, and thus protect propellers and propeller shafts from corrosion.

Noratel LS transformers is double insulated and the ground wire from the shore side supply should NOT be connected to the transformer.

LS transformer has "softstart" feature which prevents the shore power fuse from blowing due to the inrush current of the transformer - connection to most shore power system is possible without fusetripping problems.

**Installation:** Type **LS10-230** (art. nr. 3-080-000503) and **LS16-230** (art. nr. 3-080-000481)

The LS10-230 and LS16-230 transformers are equipped with overload and short-circuit protection (circuit breaker) on each phase for maximum security on board.

Noratel recommend that the boat's grounding wire connects to the transformers centertap (M) on the secondary side.

*Alternative:
If the boat has a "floating" ground system similar to the IT-net on shore - no ground connection should be made to the transformer. Point M is not connected.

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**Installation:** Type **LS14-115** (art. nr. 3-080-000509) and **LS28-115** (art. nr. 3-080-000508)

In case the boat's AC power system is 115 Volts, it is recommended by Noratel that the N2 phase is connected to the boat's grounding system.

The LS14-115 and LS28-115 transformers are equipped with overload and short-circuit protection (circuit breaker) on the primary side of the transformer.

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*Shore side AC power connects to N1 og L1
Do not connect ground wire
The boats AC power system connects to L2 and N2.
Phase N2 can be connected to the boats grounding system. This means that the boats 115 V AC system will be a TN-S system (TN-S system as used in Europe except from Norway)*

*Alternative:
If the boat is supposed to have a IT-net do not connect any ground connection to the transformer. The boats power system will then be of the same type used on-shore in Norway.*