ENVIRONMENTAL TESTING

PART 2: Tests – Test Db and guidance: Damp heat, cyclic

This test instruction is based on the following standards:

EN 60068-2-30:2005

It complies with these standards in all respects and provides additional information ensuring a suitable degree of repeatability of the tests between the different test stations.

Valid from: 2012-01-16

Dr. Saverio Manganaro
Chairman of LOVAG Technical Committee
PREAMBLE

This test instruction refers to IEC and EN documents.

For convenience in the use of this test instruction, paragraphs are numbered according to the clauses in the referred standard (IEC and/or EN as indicated).

Test must be carried out according to the standard; this test instruction only adds a few specific details.

Test Instructions of the relevant product standards shall be used as an addendum to this LTI.

Verifications before and after damp heat cycle shall be carried out according Table 1, Verifications during damp heat cycle shall be carried out according Table 2.

The level of the test severity is to be defined according IEC / EN 60068-2-30 and the product specification or manufacturer’s declaration.
## 5. and 9. Verifications Before and/or After Damp Heat

### Table 1

<table>
<thead>
<tr>
<th>Verification</th>
<th>60269</th>
<th>60439</th>
<th>61439</th>
<th>60898</th>
<th>60947</th>
<th>61008</th>
<th>61009</th>
<th>61095</th>
<th>61131</th>
<th>61812</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete visual inspection or temperature rise test</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>High voltage power frequency withstand test after damp heat cycle.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requirement according to the product standard during 1s.</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>Normal function according to the product standard (without load)</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Trip / time characteristics of releases after damp heat cycle at ambient temperature.</td>
<td>-</td>
<td>-</td>
<td>X *)</td>
<td>X</td>
<td>-</td>
<td>X *)</td>
<td>X *)</td>
<td>-</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Requirement according to the product standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual inspection with special attention to deformation and wear / cracks</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Continuity of the protective circuit(s) *)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Continuity of state of logic components *)</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

*) - If applicable

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IEC/EN 60269 Low-Voltage Fuses
IEC/EN 60439 Low-Voltage Switchgear And Controlgear Assemblies
IEC/EN 61439 Low-Voltage Switchgear And Controlgear Assemblies
IEC/EN 60898 Miniature Circuit Breakers
IEC/EN 60947 Low-Voltage Switchgear And Controlgear
IEC/EN 61008 RCCBs
IEC/EN 61009 RCBOs
IEC/EN 61095 Electromechanical Contactors for Household Use
IEC/EN 61131 PLC Systems
IEC/EN 61812 Specified Time Delay Relays For Industrial Use

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7. Verifications During Damp Heat

These verifications apply only in case the product is intended to operate under environmental conditions which include damp heat. The verifications are to be carried out at the specified conditions.

<table>
<thead>
<tr>
<th>Verification</th>
<th>Product Category in Accordance With EN...</th>
<th>60269</th>
<th>60439</th>
<th>61439</th>
<th>60898</th>
<th>60947</th>
<th>61008</th>
<th>61009</th>
<th>61095</th>
<th>61131</th>
<th>61812</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal functioning according to the product standard, test without load at rated supply voltage **)</td>
<td>X X X X X X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Trip / time characteristics of releases during damp heat cycle.</td>
<td>X X X X X X - X X</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>No tripping at operational current in thermal equilibrium</td>
<td>- X X X X X X - X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position of contacts:</td>
<td>- X X X X X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contacts in &quot;I&quot; position shall remain closed *)</td>
<td>- X X X X X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contacts in &quot;O&quot; position shall remain open *)</td>
<td>- X X X X X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity of state of logic components **)</td>
<td>- X X X - X X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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*) - Time interval of change of state shall be declared by the manufacturer
**) - If applicable