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1. Safety

1.1 Safety instructions

Make sure that any person installing and operating the pressure relief device:

- Are technically qualified and competent
- Fully comply with these assembling instructions

Improper operations or misuse could cause danger to:

- Life and limb
- To the equipment and other assets of the operator
- To the proper function of the equipment

Safety instructions in this manual are shown in three different forms to emphasize important information.

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>This information indicates particular danger to life and health. Disregarding such a warning can lead to serious or fatal injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>This information indicates particular danger to equipment and/or other property of the user. Serious or fatal injury cannot be excluded.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>This note gives important and specific information concerning the equipment.</td>
</tr>
</tbody>
</table>

1.2 Specified applications

The pressure relief device protects the transformer against non-permissible increases in pressure. Once a specific predetermined value of pressure has been reached, the pressure relief device will open, reduce the pressure, and reseal itself tightly after achieving the required reduction in pressure.

It is important to observe the limit values indicated on the nameplate and in this manual before commissioning the device.

1.3 Safety notes on the equipment operation

Electrical installation is subject to the relevant national safety rules. It is mandatory to connect the grounding cable.

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation, electrical connection and fitting the device may only be performed by qualified personnel and only in accordance to this instruction manual. It is the responsibility of the user to ensure that the device is used for specified application only. For safety reasons, please avoid any unauthorized and improper usage.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>All relevant fire regulation must be strictly followed.</td>
</tr>
</tbody>
</table>
2. Pressure Relief Device LPT

2.1 Drawings

The following are the external overall dimensions for the pressure relief device LPT:

[Diagram of pressure relief device with dimensions labeled]
2.2 Operating principle

Although the pressure relief device is available in different models, its design and mode of operation are always identical.

The housing flange (fig.2/1) of the pressure relief device is mounted on the transformer tank or on the on-load tap-changer. An internal O-Ring gasket (fig.2/2) and an external sealing gasket (fig.2/3) are attached to the housing flange. The valve cover (fig.2/4) is pressed against the gasket by a spring assembly (fig.2/5). The spring assembly is held down by a stainless steel counter-plate (fig.2/6) fastened to the flange with four bolts (fig.2/7) and four M10 screws (fig.2/8).

**WARNING**

The counter-plate preloads the spring assembly and is secured with n.4 screws M10.
Never under any circumstances unscrew these screws!!!
The operating pressure value will be modified.
Danger of injury!!!
The manumission of the screws determined the expiration of the warranty.

The device is available with different tripping pressures. If the pressure under the valve cover exceeds the tripping pressure of the spring assembly, the valve cover will open, causing an abrupt normalization of the pressure. Afterwards the spring assembly closes the valve cover tight again.

When the valve trips, a red signal pin (fig.2/9) is raised out of the housing. It signals the user that the valve has been tripped. The red optical signaliser, when is pressed out, activates the micro-switches (fig.2/10) that are between the duct (fig.2/11) and the the duct cover (fig.2/12).

The duct presents an outlet pipe (fig.2/13) for the expelled oil during the tripping of the valve.

### 2.3 Technical features

| Material | All the external parts are resistant to transformer oils, salt fog and UV rays. All the internal parts are die-cast aluminum and AISI316 stainless steel. The springs are powder painted steel. |
| Colour | RAL 9002* |
| Ambient temperature | -40°C + +100°C (-40°F + 212°F) |
| Degree of protection | IP65 in accordance with EN60529 |
| Weight | 19 Kg (42 lb) |
| Ventilation valve | One to prevent the formation of condensation |
| Cable gland | n.1 M25x1.5 |
| Terminal box | Screw clamp 2.5 mm² (0.0038 inc²) |
| Cable | Max 2.5 mm² (0.0038 inc²) |
| Micro-switches | From n.1 to n.3 chance over contact |
| Micro-switches supply | 24 V + 230 V ac/dc |
| Breaking and making capacity | Voltage | Uninterrupted current (making capacity) | Interrupted current (breaking capacity) |
| | 24 Vdc ÷ 230 Vdc | 2 A | 100 mA L/R<40 ms |
| | 230 Vac | 2 A | 2 A cosφ>0.5 |

*For critical environmental conditions please contact COMEM*

### 2.4 Operating pressure

<table>
<thead>
<tr>
<th>Model</th>
<th>kPa</th>
<th>bar</th>
<th>psi</th>
<th>Model</th>
<th>kPa</th>
<th>bar</th>
<th>Psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPT 20 kPa</td>
<td>20</td>
<td>0.2</td>
<td>2.9</td>
<td>LPT 90 kPa</td>
<td>90</td>
<td>0.9</td>
<td>13.1</td>
</tr>
<tr>
<td>LPT 30 kPa</td>
<td>30</td>
<td>0.3</td>
<td>4.3</td>
<td>LPT 100 kPa</td>
<td>100</td>
<td>1</td>
<td>14.5</td>
</tr>
<tr>
<td>LPT 40 kPa</td>
<td>40</td>
<td>0.4</td>
<td>5.8</td>
<td>LPT 110 kPa</td>
<td>110</td>
<td>1.1</td>
<td>16</td>
</tr>
<tr>
<td>LPT 50 kPa</td>
<td>50</td>
<td>0.5</td>
<td>7.2</td>
<td>LPT 120 kPa</td>
<td>120</td>
<td>1.2</td>
<td>17.4</td>
</tr>
<tr>
<td>LPT 60 kPa</td>
<td>60</td>
<td>0.6</td>
<td>8.7</td>
<td>LPT 130 kPa</td>
<td>130</td>
<td>1.3</td>
<td>18.9</td>
</tr>
<tr>
<td>LPT 70 kPa</td>
<td>70</td>
<td>0.7</td>
<td>10.1</td>
<td>LPT 140 kPa</td>
<td>140</td>
<td>1.4</td>
<td>20.3</td>
</tr>
<tr>
<td>LPT 80 kPa</td>
<td>80</td>
<td>0.8</td>
<td>11.6</td>
<td>LPT 175 kPa</td>
<td>175</td>
<td>1.75</td>
<td>25.4</td>
</tr>
</tbody>
</table>

From 20 kPa to 90 kPa the tolerance range is ±5 kPa / +7 kPa in accordance with EN50216-5_A2.
From 100 kPa to 175 kPa the tolerance range is ±10 kPa.
3. Installation

CAUTION
The operating and the installation requirements described in this manual must be strictly following. If not, the device can be damaged or a malfunction can occur.

CAUTION
The contact surface must be well leveled with a good degree of roughness (Ra=3.2).
Remove all welding burrs to ensure that the welding seams of the studs do not interfere with the housing flange holes (flange slits).
During assembly it is advisable to apply a few drops of cyanoacrylate glue on the gasket, this securing correct seal and preventing its damaging during fastening.

The pressure relief device can be installed horizontally or vertically. Please be sure to leave sufficient space above the valve (min. 70 mm / 2.75 mm) so that the optical signaller can be completely pressed out of the housing when the device is tripping.

3.1 Mounting of the valve
To install the pressure relief device remove the duct first (fig.4/1). Unscrew the 4 screws M6x60 (fig.4/2).
The pressure relief device has to be mounted on the preventively machined flange according the drawing (fig.3) using (fig.5/3):
- n.6 nuts M16 UNI5588,
- n.6 grower washers Ø16 UNI1751,
- n.6 plane washers Ø16 UNI 6592.
Screw the nuts with recommended torque (25 Nm / 18.4 Ft·Lbs).
During the valve mounting pay attention to insert the 2 O-Ring gasket included in the delivery (fig.4/4 e fig.4/5).

3.2 Bleeding of the valve
If installed vertically pay attention that the bleed screw (fig.4/6) will be placed in the highest point.
In any case, both with horizontal and with vertical mounting, is necessary to bleed the valve after the transformer oil is filled.
Unscrew partly the bleed screw (fig.4/6), to allow to the excess air to come out.
Then screw the bleed screw.

3.3 Closing of the valve
The pressure relief device musto to be closed after the installation with the duct.
Put the duct on the housing flange centering the screws M6x60 (fig.4/2) on the hole. It is possible to close the valve mounting the duct in the 4 possible positions, with an angle of 90° respect the position of the housing flange.
Screw the 4 screws with recommended torque (8 Nm / 5.9 Ft-Lbs).

CAUTION
The locking system (fig.4/11) must be removed before powering up the transformer.
The locking system has to be used only for the pressure test of the transformer with pressure until 200 kPa (fig.4/11).
4. Connection

**CAUTION**
Electrical connections may only be carried out by qualified, skilled personnel trained in the applicable health and safety regulations of the relevant country.

**WARNING**
Dangerous electrical voltages!!!
It is imperative to deactivate the power supply during wiring of the device.

**CAUTION**
During the terminal box assembly pay attention not to damage the O-ring gasket (fig.4/7). If it happened, substitute it.

Remove the duct cover (fig.4/7) unscrewing the 4 screw M6x40 (fig.4/8). Insert the multi-polar cable through the cable gland (fig.4/9) (remove it if necessary) and make the connection on the terminal box (fig.4/10) with the relevant electric diagram (fig.5 e fig.6).

5. Operation and maintenance

The pressure relief device is ready for operation after installation and electrical connection. To check the micro-switches pull the signaller out of the housing to activate the micro-switches. Then press the signaller back into the housing to switch back the micro-switches.

5.1 Operating

If the optical signaller is in the normal operating position, this means that the pressure relief device has not been tripped. If the micro-switches report a signal anyway, the cause may be in the tripping circuit. In this case, check the tripping current circuit.

If the optical signaller is in the "alarm" outlet position, this means that the pressure relief device has been tripped. If the micro-switches don’t report a signal, the cause may be in the tripping circuit. In this case, check the tripping current circuit.

In this case contact the transformer manufacturer or the on-load tap-changer manufacturer.

5.2 Maintenance

Regular maintenance is not required.
We recommend inspecting of the external condition of the built-in device for damage and dirt. Remove dirt as necessary.

5.3 Storage

The LPT pressure relief device storage has to be done in its packaging, in dry place with temperature in the range -10°C ÷ +40°C.

Upon receiving the pressure relief device, please check:
- the outer surface of the packaging to check that it is intact;
- that there are no breakages.

If damages are found, please contact Comem, quoting the data provided in the shipping list and the serial number of the LPT pressure relief device.