On-load tap-changers, type UZE and UZF
Welding and mounting instruction
Original instruction

The information provided in this document is intended to be general and does not cover all possible applications. Any specific application not covered should be referred directly to ABB, or its authorized representative.

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**Recommended practices**

ABB recommends careful consideration of the following factors when installing on-load tap-changers:

Before you install or commission a unit, make sure that the personnel doing the job have read and fully understood the installation and commissioning guide provided with the unit.

To avoid damaging the unit, never exceed the operating limits stated in delivery documents and on rating plates.

Do not alter or modify a unit without first consulting ABB.

Follow local and international wiring regulations at all times.

Use only factory authorized replacement parts and procedures.

**Safety warnings**

The following warnings and notes are used in the manual:

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⚠️ **WARNING**

WARNING indicates an imminently hazardous situation, which if not avoided will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING also indicates a potentially hazardous situation, which if not avoided could result in death or serious injury.

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⚠️ **CAUTION**

CAUTION indicates a potentially hazardous situation, which if not avoided may result in minor or moderate injury. It may also be used to alert of unsafe practices.

CAUTION may also indicate property-damage-only hazards.

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ℹ️ **INFO**

INFO provides additional information to assist in carrying out the work described and to provide trouble-free operation.
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1 Introduction

This instruction deals with installation in case the tank is not included in the delivery. The transformer manufacturer designs the tank as an integral part of the transformer tank.

Chapter 3 deals with installation with the rear wall of the tap-changer in a vertical position. Chapter 4 describes the case with inclined assembly.

<table>
<thead>
<tr>
<th>Type designation</th>
<th>Lifting yoke upright assembly Article No.</th>
<th>Lifting yoke inclined assembly Article No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UZE..200/...</td>
<td>LL 114 007-C</td>
<td>LL 114 007-G</td>
</tr>
<tr>
<td>UZE..380/...</td>
<td>LL 114 007-D</td>
<td>LL 114 007-H</td>
</tr>
<tr>
<td>UZE..550/...</td>
<td>LL 114 007-E</td>
<td>LL 114 007-N</td>
</tr>
</tbody>
</table>

1.1 Required tools
- Welding equipment
- Lifting yoke for tap-changer, Table 1
- Lifting yoke for motor-drive mechanism, article no. LL 322 006-2.

Most information on safety precautions and receiving, and all information on drying, oil filling and electrical connection and testing is to be found in the Installation and commissioning guide, 1ZSE 5492-115.
Do not break the plastic bag until the tap-changer shall be mounted!

Check that the serial numbers of the tap-changer and the motor-drive mechanism are the same.

2.1 Temporary storage before assembly
If the tap-changer is not to be installed on the transformer immediately, it must be kept warm and dry once the delivery has been approved. Let the unit be kept in its plastic enclosure and leave the drying agent until assembly.

Fig. 1. Location of serial numbers.
Weld the frame and flange to fit the motor-drive mechanism BUF 3. Also fit an oil valve for filling and draining of the oil at the lowest possible position. On top of the tank there should be a connection to a conservator, and the conservator must have a breathing device.

3.1 Welding of the flange and frame for the motor-drive mechanism
Weld the flange to the end plate of the tap-changer tank. Dimensions A, B, C and tolerances are shown in Fig. 2 and Tables 2 and 3. Then weld the frame of the motor-drive mechanism (LL 322 007-F) to the end plate. Finally weld the bracket (LL 114 006-7) to the end plate inside the tank.

Table 2. Dimensions D and E and tolerances are also shown in Fig. 2.

<table>
<thead>
<tr>
<th>(1) End plate</th>
<th>(2) Flange</th>
<th>(3) Hole in end plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>T = 8 mm</td>
<td>LL 322 006-3</td>
<td>D = 280 mm</td>
</tr>
<tr>
<td>T = 10-12 mm</td>
<td>LL 322 006-4</td>
<td>D = 280 mm</td>
</tr>
<tr>
<td>T = 16 mm</td>
<td>LL 322 006-5</td>
<td>D = 305 mm</td>
</tr>
</tbody>
</table>

Table 3. Assembly kit for flange (2): LL 322 005-A

<table>
<thead>
<tr>
<th>Type designation</th>
<th>Dimensions (mm)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>UZE... 200/...</td>
<td>164</td>
</tr>
<tr>
<td>UZE... 250/...</td>
<td>164</td>
</tr>
<tr>
<td>UZE... 380/...</td>
<td>238</td>
</tr>
<tr>
<td>UZE... 550/..., 650/...</td>
<td>313</td>
</tr>
</tbody>
</table>

Fig. 2. Dimensions and weldings.
3.2 Installing the tap-changer and the motor-drive mechanism in the tank
First install the tap-changer and then the motor-drive mechanism.

⚠️ CAUTION
Leave the locking devices for transportation on until both the tap-changer and motor-drive mechanism have been installed.

3.2.1 Installation of the tap-changer
Select a lifting yoke from Table 1 and fit it as shown in Fig. 3.

⚠️ CAUTION
The support according to Fig. 3 must be attached before raising the tap-changer to vertical position. The link should not be attached.

Raise the tap-changer to a vertical position by means of the lifting yoke and an overhead crane. Attach the link after raising the tap-changer, see Fig. 4, and then remove the support.

⚠️ CAUTION
The link according to Fig. 4 must be attached before taking away the support.

Install the tap-changer in the tank and bolt it to the tank with
the gasket between the tank and the tap-changer. For tap-changers BIL 550 and BIL 650, install shields at the same time as shown in Fig. 5.

When the tap-changer is fixed to the tank, remove the lifting yoke and tighten the nuts by torque 42 Nm (oil-greased nuts, M12). Remove the glass-fibre stud used as transport support. Finally, install the support for the geneva gear as shown in Fig. 7.

Fig. 5. Shield installation (only on tap-changers BIL 550 and BIL 650).
3.2.2 Installation of the motor-drive mechanism

Fit the O-ring, included in mounting kit LL 322 005-A, to flange (LL 322 006-3, LL 322 006-4 or LL 322 006-5) in the cabinet. Lift the motor-drive mechanism in the hole Ø 40 mm on the frame by the lifting yoke, see Fig. 6, and mount it to the flange in the cabinet. Make sure that the driving pin of the tap-changer engages into the slot of the driving disc of the motor-drive mechanism, see Fig. 7. Secure the motor-drive mechanism with four M12-nuts and spring washers. When the tap-changer and the motor-drive mechanism are assembled, remove the locking devices, see Figs. 7 and 8.

**WARNING**

The motor-drive mechanism must be fitted in the slot on the lifting yoke during lifting.

**CAUTION**

The locking devices seen in Figs. 7 and 8 must not be removed before the tap-changer and the motor-drive mechanism have been joined.
3.3 Mounting of fittings for motor-drive mechanism cabinet

Fig. 9 shows fittings and other details to be installed after the frame and door have been painted.

Ordering No. for the fittings: LL 322 005-K.

Ordering No. for the door, painted with primer: LL 322 007-B
4 Welding instruction for inclined assembly

4.1 Welding of flange and frame for motor-drive mechanism
Weld the flange to the end plate of the tap-changer with dimensions A, B, C and tolerances as shown in Fig. 10 and Tables 2 and 3. Weld the frame to the end plate. Finally weld the bracket to the end plate inside the tank.

Dimensions D and E and tolerances are also shown in Fig. 10 and Tables 2 and 3.
4.2 Mounting of the tap-changer

When handling the tap-changer, use lifting yokes (according to Table 1) which are mounted as shown in Fig. 13. Strap the tap-changer to the lifting yoke. When the tap-changer is raised, remove the straps, see Fig. 14, and mount the tap-changer to the tank as described in section 3.2.1.

Fig. 11. Arrangement of lifting yoke.

Fig. 12. Lifting after raising.
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