Description
The 14.105.1 clutch comprises a stator (1) with an epoxy potted coil, a rotor (2) fitted with friction material and an armature (5-7 fig. 1) using the formerly patented Lenze spring. The stator (1) should be fastened to the machine surface, central to the shaft and the rotor fitted to the shaft with a key to transmit the torque. Designs 1.3 and 1.5 are particularly suitable for through-shaft applications, design 1.1 for split-shaft use. On applying a direct current to the coil, the magnetic field produced pulls the armature over the airgap into contact with the friction material embedded in the rotor (2). Torque will then be transmitted without backlash. On switching off the electric current, the Lenze prestressed spring pulls the armature plate back into its original position, and the clutch is positively released with no residual torque.

The bearing mounted 14.105.3 clutch is specially designed for shaft mounting. The stator is held to the rotor with a sealed ball bearing and prevented from rotating by a small torque arm. The rotor, fitted with its friction material, will be fixed to the shaft and thus centring is automatic. On applying a direct current to the coil, the magnetic field produced pulls the armature over the airgap into contact with the friction material embedded in the rotor (2). Torque will then be transmitted without backlash. On switching off the electric current, the Lenze prestressed spring pulls the armature into its original position, and the clutch is positively released with no residual torque.

Lenze 14.115 brakes comprise a stator (4) with an epoxy potted coil and fitted with friction material, and an armature (5, 6, 8 in Fig. 1) using the formerly patented Lenze spring. The stator (4) should be fastened to the machine surface, central to the shaft and the armature fitted to the shaft with a key to transmit the torque. On applying a direct current to the coil, the magnetic field produced pulls the armature over the airgap into contact with the friction material embedded in the stator (4). Torque will then be applied to the braked shaft, without backlash. On switching off the electric current, the Lenze prestressed spring pulls the armature plate back into its original position, and the brake is positively released with no residual torque.
Before assembling armatures 1, 2 and 3 to the permanent magnet brakes, the necessary nominal d.c. voltage must be applied.

The armatures 1, 2 and 5 are pushed on to the shaft. The maximum permissible concentricity of the shaft dimension 'Zw' to be taken from table 1. Airgap 'SLü' (table 1) to be adjusted by using feeler gauges (see figures 5 and 6). For the exact airgap setting and for later wear reserve use an assorted set of shims. The armatures have to be located axially.

When you finally fit the rotor, you should ensure that dimension 'M' (table 1) is correct within 0.2 mm. Then you should secure the rotor axially (fig. 5).

When using the bearing mounted clutch (design 3) you do not need a stator mounting surface, as the centring is done by the built-in bearing and rotor. A small torque arm is needed to stop the stator rotating with bearing friction, and you should restrain this without putting any strain on the bearing assembly.

The armature of design 3 is to be fitted to the appropriate driving or driven component, by using cylinder screws to DIN 84 or DIN 6912. To secure these screws you use Schnorr safety washers. For the rivet heads provide counter bores with ample clearance.

When using screws for the fitting of armature 3 (item 6) where the thread is not cut right up to the head then the tapped holes have to be counter sunk. The depths of the counter sunk bore must have the length of the thread free screw shaft and the diameter of the counter sunk hole up to m6 is nominal + 0.1 mm and from M8 is nominal + 0.2 mm. Generally correct screws will be provided with the armature to avoid this problem.

### Mounting

#### 1.1 Type No. Key

<table>
<thead>
<tr>
<th>Type</th>
<th>Design of stator</th>
<th>Design of Armature</th>
</tr>
</thead>
</table>

| Armature bore | Rotor bore | Coil voltage | Lenze part no. |

#### 1.2 Designs

| Type 14.105. | 1.1 (Pos. 1, 2 u. 5) |
| Type 14.105. | 1.3 (Pos. 1, 2 u. 6) |
| Type 14.105. | 1.5 (Pos. 1, 2 u. 7) |
| Type 14.105. | 3.1 (Pos. 3a, 3b u. 5) |
| Type 14.105. | 3.3 (Pos. 3a, 3b u. 6) |
| Type 14.105. | 3.5 (Pos. 3a, 3b u. 7) |
| Type 14.115. | 1.1 (Pos. 4 u. 5) |
| Type 14.115. | 1.2 (Pos. 4 u. 8) |
| Type 14.115. | 1.3 (Pos. 4 u. 6) |

### Table 1

<table>
<thead>
<tr>
<th>Size</th>
<th>SLü mm</th>
<th>b mm</th>
<th>c max mm</th>
<th>ZK mm</th>
<th>ZW mm</th>
<th>M mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>0.2±0.05</td>
<td>0.04</td>
<td>2.5</td>
<td>0.1</td>
<td>0.05</td>
<td>24</td>
</tr>
<tr>
<td>08</td>
<td>0.2±0.05</td>
<td>0.05</td>
<td>3.5</td>
<td>0.15</td>
<td>0.05</td>
<td>26.5</td>
</tr>
<tr>
<td>10</td>
<td>0.2±0.05</td>
<td>0.06</td>
<td>4</td>
<td>0.15</td>
<td>0.05</td>
<td>30</td>
</tr>
<tr>
<td>12</td>
<td>0.3±0.1</td>
<td>0.07</td>
<td>5</td>
<td>0.15</td>
<td>0.05</td>
<td>33.5</td>
</tr>
<tr>
<td>16</td>
<td>0.3±0.1</td>
<td>0.09</td>
<td>6.5</td>
<td>0.2</td>
<td>0.1</td>
<td>37.5</td>
</tr>
<tr>
<td>20</td>
<td>0.5±0.15</td>
<td>0.11</td>
<td>7.5</td>
<td>0.2</td>
<td>0.1</td>
<td>44</td>
</tr>
<tr>
<td>25</td>
<td>0.5±0.15</td>
<td>0.14</td>
<td>10</td>
<td>0.25</td>
<td>0.1</td>
<td>51</td>
</tr>
</tbody>
</table>

2. Fitting the Clutch or Brake

Keep friction surfaces grease and oil free. Only use oil and grease type ball bearings.

The stator of clutch or brake of the design 1 is to be centred internally (fig. 2) or externally (fig. 3). (Dimension ZK for concentricity to be observed, as in table 1). The fitting surface should have a maximum 'wobble' error 'b' as shown in table 1, and also should not be convexed. When using the inner centring methods (fig. 2 and 4) the centring should be relieved. With permanent magnetic brakes the length of the centring 'c' (see table 1) must not be exceeded.
Electrical connection

Maintenance disassembly

3. Electrical connections

The connection is to d.c. voltage (observe the voltage stamp on the stator) permissible voltage deviation according to VDE 0580 paragraph 22 + 5 to -10%. Excessive voltage of more than 5% \( I_{\text{dn}} \) may lead to particle de-magnetisation when using permanent magnet brakes.

For example

\[
14.105.10.1 = 24V/28W/77/10/VDE0580
\]

<table>
<thead>
<tr>
<th>Stator description</th>
<th>Coil voltage/ Specification power</th>
</tr>
</thead>
</table>

If no d.c. voltage is available voltage is supplied via transformer and rectifier (fig. 7). For this we can supply Simplavolt transformer rectifier. For the direct feeding of Lenze electromagnetic clutches and brakes from the a.c. mains we recommend the use of a Lenze bridge rectifier (connecting voltage of the coil is 190 V d.c.). Clutches and brakes should be switched on the d.c. side as this causes short switching on and switching off times. When switching on the d.c. side we recommend the use of a Universal spark suppressor to prevent damage to the contacts. Other operating conditions according to VDE 0580 paragraph 23.

All of these clutches and brakes have flying leads which have the ends ready stripped for fitting to suitable terminals. The external wires are of the ‘Dipotherm’ type, varying in size according to the coil power. These wires are a multi-strand copper cable with multi-layer insulating and strengthening layers. One of these layers is transparent and difficult to see. When stripping the wire, ensure you have removed it, or you will get an open circuit. The outer layer is made of polyurethane.

4. Maintenance

The Lenze electromagnetic clutches and brakes are maintenance free. Only with applications where a very high friction work has to be carried out is it necessary to check the airgap from time to time. If it exceeds 2.5 times the \( S_{\text{Lg}} \) value (table 1), the airgap must be adjusted. With permanent magnetic brakes apply the voltage when setting the airgap. The shims mentioned in paragraph 2 can be removed or distance bushes can be shortened.

Lenze clutches and brakes run-in after a certain time. Therefore, you can ignore a slight scoring of the armature surface, as this is quite normal. Do not reface the friction faces!

Note: Under no circumstances allow any lubricant to contaminate the friction faces.

5. Disassembly

To dismantle the armature design 1 or 2 for the rotor, the axial location device (fig. 8) (circlip or shaft end disc) has to be removed. With permanent magnet brakes apply voltage when removing the armature. Thereafter the rotor or armature flange hub can be withdrawn from the shaft by using the withdrawal tapped holes \( d \) (see figures 8 and 9 and table 2). To reset the airgap after drawing the armature off, according to size of airgap \( S_{\text{Lg}} \) (fig. 5, 6 and table 1) remove shims and later reassemble these between the step and flanged hub.

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Machinery Directive – Declaration of Incorporation

Lenze clutches and brakes models 14.100, 102, 105, 110, 112, 115, 116, 118 are constructed to the following standards.


These products should only be installed by qualified personnel in accordance with these fitting and operating instructions. The machine into which they are incorporated should not be put into service until it has been declared to be in conformity with the Machinery Directive.
6. **Spare parts**

Although Lenze clutches and brakes have considerable wear capacity, the time will come, after several adjustments when replacement will be required. Clutches must have rotor and armature changed together, and brakes replaced entirely. When you order your spare parts, they must be accurately described, so please use the method shown in the ordering example below, in conjunction with the drawing and the associated table.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flanged clutch stator (design 1)</td>
</tr>
<tr>
<td>2</td>
<td>Rotor for flanged clutch (design 1)</td>
</tr>
<tr>
<td>3</td>
<td>Bearing mounted clutch stator/rotor assembly</td>
</tr>
<tr>
<td>4</td>
<td>Brake stator 14.115</td>
</tr>
<tr>
<td>5</td>
<td>Armature 1</td>
</tr>
<tr>
<td>6</td>
<td>Armature 3</td>
</tr>
<tr>
<td>7</td>
<td>Armature 5</td>
</tr>
<tr>
<td>8</td>
<td>Armature 2</td>
</tr>
<tr>
<td>10</td>
<td>Grubscrew</td>
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<tr>
<td>11</td>
<td>Ball bearing</td>
</tr>
<tr>
<td>12</td>
<td>Distance bush</td>
</tr>
<tr>
<td>13</td>
<td>Circlip</td>
</tr>
<tr>
<td>14</td>
<td>Key</td>
</tr>
<tr>
<td>15</td>
<td>Spring ring</td>
</tr>
<tr>
<td>16</td>
<td>Brake stator 14.116</td>
</tr>
</tbody>
</table>

**Ordering example**

Spare part for Lenze clutch

<table>
<thead>
<tr>
<th>Series</th>
<th>Size</th>
<th>Part 1</th>
<th>Spare part no.</th>
<th>24 V Variant</th>
</tr>
</thead>
</table>

Spare part for Lenze brake

<table>
<thead>
<tr>
<th>Series</th>
<th>Size</th>
<th>Part 8</th>
<th>Spare part no.</th>
<th>40 mm Variant</th>
</tr>
</thead>
</table>

When ordering stators the description must be supplemented by adding the coil voltage and coil power (see paragraph 3 electrical connection) with rotor and armature components orders, please also give their bore diameters.