3

Contactors

CL1115/02, CL1215/02, CL1315/02,
1, 2 and 3 pole
AC and DC NO contactors
for voltages up to 1,500 V

Catalogue C25.en
CL1115/02, CL1215/02, CL1315/02  1, 2 and 3 pole AC and DC NO contactors for voltages up to 1,500 V

The economical solution for switching medium power AC and DC loads

CL Series contactors are available as 1, 2 and 3 pole AC and DC versions. They guarantee reliable, low-wear switching of rated voltages up to 1,500 V and amperages up to 250 A. The compact contactors come with an arc chute that has proven itself many times over and are suitable for universal use in the harsh environmental conditions of industrial applications as well as in AC and DC railway networks.

Especially robust and environmentally friendly materials - from plastics featuring low smoke and low content of toxic gases up to cadmium-free contact tips - are used for the CL Series. The contactors have been tested and approved by independent laboratories.

Features

- Compact, rugged design
- Long life
- Maintenance free in normal operation
- Rated voltage 1,500 V, current rating 250 A max.
- Double-break, cadmium free main contacts
- 1, 2 and 3 pole AC and DC versions available
- Drive system with coil tolerance according to railway standard
- Functional insulation for main circuit
- Basic insulation between main circuit and protective earth

Applications

- Precharge contactor: CL Series contactors are the ideal complement to our CT range. Used as precharge contactors the switchgear is best suited for switching medium power AC and DC loads.
- Line contactor: CL Series contactors are particularly suited as main switches of electric heating systems or starter and compressor motors and for switching field circuits of motors.

Ordering code

Example: CL1115/02 P 110ET-U2

Series

<table>
<thead>
<tr>
<th>Series</th>
<th>CL11</th>
<th>CL12</th>
<th>CL13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main contacts: Rated voltage</td>
<td>1 pole NO contactor</td>
<td>2 pole NO contactor</td>
<td>3 pole NO contactor</td>
</tr>
<tr>
<td>15</td>
<td>U_n = 1,500 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main contacts: Conv. thermal current</td>
<td>02</td>
<td>I_{th} = 250 A</td>
<td></td>
</tr>
<tr>
<td>Polarity of main contacts</td>
<td>P</td>
<td>DC with blowout and arc chute with brass baffels (with 2 and 3 pole versions: for parallel connection)</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>DC with blowout and arc chute with brass baffels (only for series connection of 2 pole versions)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>AC, no blowout, but arc chute with steel baffles</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Aux. contacts: type and number of

- 2x snap switches S870 W1D1 a 012
- U2 Contact material: silver (standard)
- Suppressor diode
- T
- -30 % ... +25 %
- E
- Coil voltage
- 24 / 36 / 72 / 110 V DC

Note:

Presented in this catalogue are only stock items which can be supplied in short delivery time.

For some variants minimum quantities apply. Please do not hesitate to ask for the conditions.

Special variant:

If you need a special variant of the contactor, please do not hesitate to contact us. Maybe the type of contactor you are looking for is among our many special designs. If not, we can also supply customized designs. In this case, however, minimum order quantities apply.

*1  DC contactors are fitted with permanent magnetic blowouts. Select P with 2 and 3 pole versions for parallel connection. Select G only for series connection of 2 pole versions.

Observe polarity marking, * on the arc chute of the contactor.

*2  For S870 Series snap-action switches, refer to catalogue D70.
# Specifications

## Series CL

<table>
<thead>
<tr>
<th>Type of voltage</th>
<th>DC, AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage $U_n$</td>
<td>1,500 V</td>
</tr>
<tr>
<td>Rated operating voltage $U_e$</td>
<td>1,800 V</td>
</tr>
<tr>
<td>Rated insulation voltage $U_{Lim}$</td>
<td>2,200 V</td>
</tr>
<tr>
<td>Rated impulse withstand voltage $U_{Imp}$</td>
<td>12 kV</td>
</tr>
<tr>
<td>Pollution degree / Overvoltage category</td>
<td>PD3 / OV3</td>
</tr>
<tr>
<td>Switching surge overvoltage $U_{e}$</td>
<td>$&lt; 6.6$ kV</td>
</tr>
<tr>
<td>Conventional thermal current $I_{Th}$</td>
<td>250 A / 200 A</td>
</tr>
<tr>
<td>Component category (IEC 60077-2)</td>
<td>A2</td>
</tr>
<tr>
<td>Short-circuit making capacity $I_{cm}$</td>
<td>1,5 kA</td>
</tr>
<tr>
<td>Breaking capacity $I_{cn}$</td>
<td>200 A</td>
</tr>
<tr>
<td>Critical current range</td>
<td>None</td>
</tr>
<tr>
<td>Main contacts</td>
<td>AgSnO2, M8</td>
</tr>
<tr>
<td>Contact material</td>
<td>6 Nm max.</td>
</tr>
<tr>
<td>Terminals</td>
<td>Flat tabs 6.3 x 0.8 mm</td>
</tr>
<tr>
<td>Magnetic drive</td>
<td>DC13: 110 V / 1.2 A / 24 V / 2 A</td>
</tr>
<tr>
<td>Pollution degree / Overvoltage category</td>
<td>2x S870</td>
</tr>
<tr>
<td>Coil voltage $U_c$</td>
<td>Silver / Gold</td>
</tr>
<tr>
<td>Coil tolerance</td>
<td>24 / 72 / 110 V DC</td>
</tr>
<tr>
<td>Power consumption at $U_c$ and $T_a = 20 ^\circ C$</td>
<td>$&lt; 29$ W / $&lt; 21$ W</td>
</tr>
<tr>
<td>Pull-in time, at $T_a = 20 ^\circ C$ typ.</td>
<td>80 ms</td>
</tr>
<tr>
<td>Drop-off voltage, at $T_a = 20 ^\circ C$ typ.</td>
<td>$&lt; 31$ W / $&lt; 22$ W</td>
</tr>
<tr>
<td>Drop-off time, at $T_a = 20 ^\circ C$ typ.</td>
<td>$&lt; 42$ W / $&lt; 30$ W</td>
</tr>
<tr>
<td>Switching frequency at $T_a = 20 ^\circ C$ and 1.25 $U_e$</td>
<td>4 operations/minute</td>
</tr>
<tr>
<td>Coil suppression</td>
<td>Suppressor diode</td>
</tr>
<tr>
<td>Coil terminals</td>
<td>M4 screws</td>
</tr>
<tr>
<td>Ingress protection rating (IP code)</td>
<td>IP00</td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>&gt; 3 million operating cycles</td>
</tr>
<tr>
<td>Vibration / Shock (EN 61373)</td>
<td>Category 1, Class 8</td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>Horizontal / Vertical</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>Operating / Storage temperature</td>
</tr>
<tr>
<td>Operating / Storage temperature</td>
<td>-40°C...+70°C...-40°C...+85°C</td>
</tr>
<tr>
<td>Humidity (EN 50125-1)</td>
<td>&lt; 2000 m above sea level</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt; 2.7 kg</td>
</tr>
</tbody>
</table>

Subject to change
- **Dimensions**

  ![Dimensions Diagram](image)

- **Mounting holes**

  ![Mounting holes Diagram](image)

- **Circuit diagram**

  **DC contactors**: polarity sensitive main contacts »P«

  ![DC Circuit Diagram](image)

  **AC contactors**: non-polarity sensitive main contacts »X«

  ![AC Circuit Diagram](image)
- **Dimensions**

- **Mounting holes**

- **Circuit diagram**

Subject to change / Dimensions in mm
CL1315/02  3 pole NO contactor – Dimensions, mounting, circuit diagram

- **Dimensions**

- **Mounting holes**

- **Circuit diagram**

AC contactor: non-polarity sensitive main contacts »X«
Mounting instructions

Mounting

CL Series contactors can be mounted horizontally or vertically. Use mounting plates or mounting frames which are strong enough to carry the weight of the contactor even under shock and vibration. This is especially true for use of the contactors in the rough railway environment.

Depending on the number of contacts, the contactors are to be affixed with 3 or 4 M6 screws. Use suitable screws with washers and observe tightening torque of the mounting screws:

- CL1115/02: 3 x M6 or 4 x M6
- CL1215/02: 3 x M6
- CL1315/02: 4 x M6

Tightening torque: 10 Nm max.

Mounting orientations

<table>
<thead>
<tr>
<th>Horizontal (H)</th>
<th>Vertical (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Horizontal diagram" /></td>
<td><img src="image2" alt="Vertical diagram" /></td>
</tr>
</tbody>
</table>

Electrical requirements

- Observe clearance to non-insulated live parts and earth.
- When switching high loads, the minimum time between switching operations is 30 seconds. After 3 switching operations make sure that there is a fault closure for 10 minutes.
- To prevent flashovers and excessive contact wear, ensure adequate ventilation of the contactor.
- Observe the minimum cross sections of wires and current bars that are to be connected to the main terminals of the contactor and to its PE terminal.

Spare parts

<table>
<thead>
<tr>
<th>Items</th>
<th>Description</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC arc chute, complete with fixed contacts and contact bridge</td>
<td>1-2757-336205</td>
</tr>
<tr>
<td>1</td>
<td>DC arc chute, complete with fixed contacts and contact bridge</td>
<td>1-2757-336206</td>
</tr>
<tr>
<td>1</td>
<td>S870 Series auxiliary switch</td>
<td>1-1570-198424</td>
</tr>
</tbody>
</table>

Safety instructions

- The switching device meets the requirements of basic insulation. Make sure the plate onto which the drive of the contactor is mounted is earthed in a vibration resistant way.
- Do not use contactor without properly mounted arc chute.
- The contactor has non-insulated live parts and carries a label that warns of the hazard. This caution must be observed and the label must not be removed in any way.
- Observe the required clearance of live parts to ground and other parts of the contactor as well as the safety regulations of the applicable standards.
- Switching at maximum breaking capacity might require larger clearance! Do not hesitate to ask our advice for dimensioning.
- Coil suppression for reducing surges when the coil is switched off is optimally attuned to the contactor’s switching behaviour. The existing opening characteristic must not be negatively influenced by parallel connection with an external diode.
- Improper handling of the contactor, e.g. when hitting the floor with some impact, can result in breakage, visible cracks and deformation.

Standards

- IEC 60077: Railway applications – Electric equipment for rolling stock
- EN 50124-1: Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment
- IEC 61373: Railway applications - Rolling stock equipment - Shock and vibration tests

Maintenance instructions

- CL Series contactors are maintenance free with normal use.
- Make regular inspections once or twice a year. So when installing the contactor, make sure that there is enough space to remove and replace the arc chute with ease and that the main contacts become accessible for inspection.
- Frequent switching or switching under high load may lead to increased wear of the main contacts. In this case replacement of the main contacts may become necessary.

For detailed maintenance, safety and mounting instructions please refer to our operating manual C25/02-M.en!
Electrical Components and Systems for Railway Engineering and Industrial Applications

Connectors
- Connectors manufactured to industry standards
- Connectors to suit the special requirements of communications engineering (MIL connectors)
- Charging connectors for battery-powered machines and systems
- Connectors for railway engineering, including UIC connectors
- Special connectors to suit customer requirements

Snap-action switches
- Snap-action switches with positive opening operation
- Snap-action switches with self-cleaning contacts
- Enabling switches
- Special switches to suit customer requirements

Contactors
- Single and multi-pole DC contactors
- High-voltage AC/DC contactors
- Contactors for battery powered vehicles and power supplies
- Contactors for railway applications
- Terminal bolts and fuse holders
- DC emergency disconnect switches
- Special contactors to suit customer requirements

Electrics for rolling stock
- Equipment for driver's cab
- Equipment for passenger use
- High-voltage switchgear
- High-voltage heaters
- High-voltage roof equipment
- Equipment for electric brakes
- Design and engineering of train electrics to customer requirements

We reserve the right to make technical alterations without prior notice. For updated product information visit www.schaltbau-gmbh.com. Issued 03-2017