Contactors

CA1315/04, CA1330/08

3 pole power contactors for AC applications

Catalogue C28.en
### CA1315/04, CA1330/08  Power contactors for AC applications

3-pole AC contactors for higher supply voltage frequencies

With the CA series contactors, Schaltbau provides a switchgear concept for the safe disconnection of inverters.

In the New Energy sector, the CA contactor safely disconnects the central inverter from the mains and reconnects it to the mains when required. However, the switchgear can also switch much higher frequencies than the 50 to 60 Hertz customary in the grid: for example, up to 400 Hertz in the drive system of multiple units. Due to their technical features, compact design, high switching functionality and reliability, CA contactors can be used flexibly and with an eye to the future. The product family includes different versions, matched to a wide range of applications.

<table>
<thead>
<tr>
<th>Features</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Innovative design:</strong></td>
<td><strong>Power contactors in photovoltaic or wind power systems</strong></td>
</tr>
<tr>
<td>• 3-pole AC power contactor in the performance class up to 3,000 volts nominal voltage and 800 amps continuous current</td>
<td>The switching devices are used on the AC side in the output circuit of inverters and are capable of disconnecting large loads. The switchgear is thus a cost-effective alternative to circuit breakers for safely disconnecting central inverters from the mains and reconnecting them to the mains.</td>
</tr>
<tr>
<td>• High short-circuit breaking capacity for frequencies up to 400 Hertz</td>
<td><strong>Traction contactors in electrically operated multiple units</strong></td>
</tr>
<tr>
<td>• Double-break contacts</td>
<td>CA contactors are required for reliable disconnection of inverter-fed permanent magnet drive motors (PEM) in the event of a fault, for example in the event of a short circuit in the output circuit of the traction converter. The contactors are particularly suitable for permanently excited drive motors with higher supply voltage frequencies.</td>
</tr>
<tr>
<td>• Compact, rugged design</td>
<td><strong>Excellent insulation properties:</strong></td>
</tr>
<tr>
<td><strong>Easy maintenance:</strong></td>
<td><strong>CA series</strong></td>
</tr>
<tr>
<td>• Easy inspection and replacement of main contact tips</td>
<td></td>
</tr>
<tr>
<td>• Easy to replace arc chute</td>
<td></td>
</tr>
</tbody>
</table>

### Ordering code

**Example:** CA1330/08 110ET-09

<table>
<thead>
<tr>
<th>Series, contact configuration</th>
<th>Auxiliary switches, number and type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CA13</strong> 3-pole AC contactor</td>
<td>1x S870 (a_1) + 1x S870 (b_2) + 2x S826</td>
</tr>
<tr>
<td>Nominal voltage/conv. thermal current</td>
<td>00</td>
</tr>
<tr>
<td>15/04 [U_n = 1.500 \text{V}, 400 \text{Hz} / I_{th} = 350 \text{A}]</td>
<td>4x S826</td>
</tr>
<tr>
<td>30/08 [U_n = 3.000 \text{V}, 400 \text{Hz} / I_{th} = 800 \text{A}]</td>
<td>2x S970 (a_1) + 2x S970 (b_2)</td>
</tr>
<tr>
<td><strong>Coil voltage</strong></td>
<td>09</td>
</tr>
<tr>
<td>24 / 36 / 48 / 72 / 110 V DC*3</td>
<td>1x S970 (a_1) + 1x S970 (b_0)</td>
</tr>
<tr>
<td><strong>Coil tolerance</strong></td>
<td>11</td>
</tr>
<tr>
<td>E -30 % ... +25 %</td>
<td><strong>Coil suppression</strong></td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Special variant:</strong></td>
<td>Suppressor diode, standard</td>
</tr>
<tr>
<td>*1 with suppressor diode «T»</td>
<td>Double coil controller with integrated suppressor (\text{CM}) diode for magnetic drives with double winding coil</td>
</tr>
<tr>
<td>*2 with DCC module «CM»</td>
<td></td>
</tr>
<tr>
<td>*3 others on request</td>
<td></td>
</tr>
</tbody>
</table>

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**Do you need support for a special application? Please contact us! We would be glad to assist you in the selection of the contactor that suits your application best.**

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### Standards

**CA series**

- IEC 60077-1: Railway applications – Electric equipment for rolling stock – Part 1: General service conditions and general rules
- IEC 61373: Railway applications – Rolling stock equipment – Shock and vibration tests
- IEC 62497-1: Railway applications – Insulation coordination Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment
- EN 50125-1: Railway applications – Environmental conditions for equipment – Part 1: Equipment on board rolling stock
### Specifications

<table>
<thead>
<tr>
<th>Series</th>
<th>CA1315/04</th>
<th>I CA1330/08</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of voltage</strong></td>
<td>AC (f ≤ 400 Hz)</td>
<td>3x SPST-NO</td>
</tr>
<tr>
<td><strong>Main contacts, configuration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nominal voltage U_n</strong></td>
<td>1,500 V</td>
<td>3,000 V</td>
</tr>
<tr>
<td><strong>Rated operating voltage U_e</strong></td>
<td>1,800 V</td>
<td>3,600 V</td>
</tr>
<tr>
<td><strong>Rated insulation voltage U_{im}</strong></td>
<td>2,000 V</td>
<td>4,800 V</td>
</tr>
<tr>
<td><strong>Rated impulse withstand voltage U_{im}</strong></td>
<td>15 kV</td>
<td>25 kV</td>
</tr>
<tr>
<td><strong>Pollution degree / Overvoltage category</strong></td>
<td>PD3 / OV3</td>
<td>PD2 / OV3</td>
</tr>
<tr>
<td><strong>Conventional thermal current I_Th</strong></td>
<td>350 A</td>
<td>800 A</td>
</tr>
<tr>
<td><strong>Component category</strong></td>
<td>IEC 60077-2</td>
<td>A2</td>
</tr>
<tr>
<td><strong>Switching frequency class</strong></td>
<td>C1</td>
<td></td>
</tr>
<tr>
<td><strong>Short-circuit breaking capacity</strong></td>
<td>Please contact, optimized for switching off 400 Hz</td>
<td></td>
</tr>
<tr>
<td><strong>Rated short-time withstand current I_{cw} T &lt; 100 ms</strong></td>
<td>Please contact, optimized for switching off 400 Hz</td>
<td></td>
</tr>
</tbody>
</table>

#### Auxiliary contacts

<table>
<thead>
<tr>
<th>Number and type</th>
<th>Snap-action switches</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contact material</strong></td>
<td>AgSnO₂</td>
</tr>
<tr>
<td><strong>Torque</strong></td>
<td>M10</td>
</tr>
<tr>
<td><strong>20 Nm max.</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### Magnetic drive (coil suppression Tn, suppressor diode)

<table>
<thead>
<tr>
<th>Pollution degree / Overvoltage category</th>
<th>PD3 / OV2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coil voltage U_s</strong></td>
<td>24 / 36 / 48 / 72 / 110 V DC</td>
</tr>
<tr>
<td><strong>Coil tolerance</strong></td>
<td>-30 % ... +25 % U_s</td>
</tr>
<tr>
<td><strong>Coil suppression</strong></td>
<td>Suppressor diode *1 or Coil changeover *2</td>
</tr>
<tr>
<td><strong>Power dissipation at U_s and T_a = 20 °C</strong></td>
<td>Cold coil: 100 W / warm coil: 75 W</td>
</tr>
<tr>
<td><strong>Switching capacity, Snap-action switch S826, T = 5 ms</strong></td>
<td>Cold coil: 280 W / warm coil: 27 W</td>
</tr>
</tbody>
</table>

#### Ingress protection rating

| **IP00** | |

#### Mechanical endurance

| **> 500,000 operating cycles** | |

#### Vibration / Shock

| **IEC 61373** | Category 1, class B |

#### Mounting position

| **Any** | |

#### Ambient conditions

| **Operating / storage temperature** | -40 °C ... +70 °C / -40 °C ... +85 °C |
| **Humidity** | < 2,000 m above sea level / < 75 % yearly average |

| **Weight** | 20 kg |
|**25 kg** | |

*1 I_{Th} = 250 A / I_{Th} = 350 A: Coil suppression Tn suppressor diode, standard

*2 I_{Th} = 540 A: Economy circuit CM integrated double coil controller for automatic coil changeover

*3 a1 and b0 according to IEC 60077
CA1315/04 Dimension diagram 3 pole AC power contactor for 1,500 V and 350 A / 540 A CA series

Status indicator
Up = ON
Down = OFF

Aux. contact block under cover

Coil terminal WAGO 264 under cover

Main contacts M10 terminal
Torque 20 Nm max.

Earthing terminal M10
Torque 15 Nm max.

Arc chute (6x) removable

Clearance between plasma exit and earthed parts

CA1330/08 Dimension diagram 3 pole AC power contactor for 3,000 V and 800 A CA series

Status indicator
Up = ON
Down = OFF

Aux. contact block under cover

Coil terminal WAGO 264 under cover

Main contacts M10 terminal
Torque 20 Nm max.

Earthing terminal M10
Torque 15 Nm max.

Arc chute (6x) removable

Clearance between plasma exit and earthed parts

Subject to change / Dimensions in mm
CA1315/04 Mounting holes

CA1330/08 Mounting holes

Circuit diagram

Drive, terminal and coil circuit

Coil circuit: «Ti» Suppressor diode, standard
- CA1315/04 $I_{th} = 350$ A
- CA1330/08 $I_{th} = 540$ A

Coil circuit: «CM» Integrated double coil controller
- CA1315/04 $I_{th} = 540$ A
- CA1330/08 $I_{th} = 800$ A

Main contacts

Aux. contact block «01»
2x S826*1 + 1x S870*2 (b0) + 1x S870*2 (a1)

Aux. contact block «02»
4x S826*1

Aux. contact block «09»
2x S970*2 (b0) + 2x S970*2 (a1)

Aux. contact block «11»
1x S970*2 (b0) + 1x S970*2 (a1)

Coil circuit:
- «T» Suppressor diode, standard
- CA1315/04 $I_{th} = 350$ A

Note:
Optionally, we offer separate plug connections for coil and auxiliary contacts. We also supply customized designs. In this case, however, minimum order quantities apply. So do not hesitate to contact us!

Aux. contact block «00»
2x S826*1 + 1x S870*2 (b0) + 1x S870*2 (a1)

Aux. contact block «02»
4x S826*1

Aux. contact block «09»
2x S970*2 (b0) + 2x S970*2 (a1)

Aux. contact block «11»
1x S970*2 (b0) + 1x S970*2 (a1)

Maintenance instructions

- CA 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 information please refer to our manual.

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 unprotected 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.
- The required clearance of live parts to ground and other parts of the contactor is to be observed 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.
- Do not use contactor without protective covers (for coil terminals and auxiliary switches).
- 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.

Note:
- *1 Aux contact, version with blowout magnetics, see also catalogue D26
- *2 Aux contact, see also catalogue D70

For detailed maintenance, safety and mounting instructions please refer to our operating manual C28-M.en!

Dimensions in mm / Subject to change
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
- Snap-action switch made of robust polyetherimide (PEI)
- Snap-action switch with two galvanically isolated contact bridges
- 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

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Certified to DIN EN ISO 9001 since 1994. For the most recent certificate visit our website.