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Contactors

C195 series
Single pole compact universal NO and changeover contactors
Catalogue B195.en
C195 Series  Single pole NO and changeover contactors plus bidirectional variants

Compact universal contactors for battery voltages up to 220 V and high voltages up to 1,500 V

Being of compact size and featuring double-break contacts that are covered for the most part, the C195 Series contactors provide high-performance current breaking. Depending on the version you choose C195 series contactors come with blowouts and/or arc chutes. The coils are fitted as standard with varistors for limiting surge voltages. For coil terminal connections you do not need to observe polarity.

*With the C195 X there is also a bidirectional version, for which the direction of the current is irrelevant, as required for battery storage systems of public utilities. And with 320 A, the C195 X is also characterised by a higher current-carrying capacity.

In addition to that, there is the option of a SPDT version of the C195 series contactor which has an added galvanically isolated NC contact.

Features

- Compact universal contactors up to 1,500 V
- Unidirectional, bidirectional and latching contactor variants
- Broad range of possible applications
- Suitable for years of continuous operation
- Intended for high ambient temperatures
- Double-break contacts that are covered for the most part
- Versions for AC and DC operation available
- DC versions coming with magnetic blowout
- Extended coil tolerance according to railway standard

Applications

The contactors are typically used:

- for traffic engineering equipment, particularly in heating circuits and for air conditioning (HVAC equipment)
- as line contactor in mainline AC and DC rail networks – or in combination with a precharging contactor for a host of applications in trains, multiple units, rail cars and light rail vehicles
- for central inverters of complex power supplies
- for battery storage systems of utilities, specifically in grid stabilisation where bidirectional switching is a requirement

Ordering code

Example: C195 A/24EV-U2

Series  C195
Main contacts: type, nominal voltage $U_n$
X/  NO contactor with blowouts and arc chamber, $U_n = 1,500$ V
A/  NO contactor with blowouts and arc chamber, $U_n = 1,000$ V DC
B/  NO contactor with arc chamber, $U_n = 1,000$ V AC
S/  NO contactor, $U_n = 220$ V DC
T/  Changeover (SPDT) contactor, $U_n = 220$ V DC
W/  

Aux. contacts*2: # of, type
2x snap-action switches S870 W1D1a 012, silver contacts
2x snap-action switches S870 W1D4a 012, gold contacts

Coil voltages
24 / 36 / 48 / 60 / 72 / 80 / 96 / 110 V DC

Coil suppression
Diode
Varistor

Coil tolerance
-30 % … +25 %
-40 % … 0 %

CAUTION: 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 conditions.

Special variants: 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.

Standards

Industry standards:
- IEC 60947-4-1:2012 Low-voltage switchgear and controlgear – Part 4-1: Contactors and motor starters - Electromechanical contactors and motor starters.

Railway standards:
### Specifications

#### C195 Series, versions

<table>
<thead>
<tr>
<th>C195 Series, versions</th>
<th>X/</th>
<th>A/</th>
<th>B/</th>
<th>S/</th>
<th>T/</th>
<th>W/</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main contacts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of voltage</td>
<td>AC, DC bidirectional</td>
<td>DC unidirectional</td>
<td>AC</td>
<td>DC unidirectional</td>
<td>AC</td>
<td>DC unidirectional</td>
</tr>
<tr>
<td>Number of, type</td>
<td>1x NO</td>
<td>1x NO</td>
<td>1x NO</td>
<td>1x NO</td>
<td>1x NO</td>
<td>1x SPDT</td>
</tr>
<tr>
<td>Bistable contactor, optional</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Nominal voltage $U_i$</td>
<td>1,500 V</td>
<td>1,000 V</td>
<td>1,000 V</td>
<td>220 V</td>
<td>220 V</td>
<td>220 V</td>
</tr>
<tr>
<td>Rated insulation voltage $U_{i_{res}}$</td>
<td>1,800 V</td>
<td>1,200 V</td>
<td>1,200 V</td>
<td>1,200 V</td>
<td>1,200 V</td>
<td>600 V</td>
</tr>
<tr>
<td>Rtd impulse withstand voltage $U_{imp}$</td>
<td>10 kV</td>
<td>8 kV</td>
<td>8 kV</td>
<td>8 kV</td>
<td>8 kV</td>
<td>6 kV</td>
</tr>
<tr>
<td>Overvoltage category</td>
<td>OV3</td>
<td>OV3</td>
<td>OV3</td>
<td>OV3</td>
<td>OV3</td>
<td>OV3</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>PD3</td>
<td>PD3</td>
<td>PD3</td>
<td>PD3</td>
<td>PD3</td>
<td>PD3</td>
</tr>
<tr>
<td>Conventional thermal current $I_{th}$</td>
<td>NO</td>
<td>NC</td>
<td>320 A</td>
<td>250 A</td>
<td>250 A</td>
<td>250 A</td>
</tr>
<tr>
<td>Short time (3 minutes)</td>
<td>NO</td>
<td>NC</td>
<td>550 A</td>
<td>450 A</td>
<td>450 A</td>
<td>450 A</td>
</tr>
<tr>
<td>@ $T_a = 50^\circ$C</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Making capacity</td>
<td>NO</td>
<td>NO</td>
<td>1,800 A</td>
<td>2,300 A</td>
<td>1,800 A</td>
<td>1,800 A</td>
</tr>
<tr>
<td>(resistive, $T = 0$ ms), (inductive, $T &gt; 5$ ms),</td>
<td>NO</td>
<td>NO</td>
<td>2,300 A</td>
<td>2,300 A</td>
<td>2,300 A</td>
<td>2,300 A</td>
</tr>
<tr>
<td>(resistive, $T = 0$ ms), (inductive, $T &gt; 5$ ms),</td>
<td>NC</td>
<td>NC</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Breaking capacity</td>
<td>NO</td>
<td>NC</td>
<td>950 V DC, $T = 1$ ms: 320 A</td>
<td>950 V DC, $T = 1$ ms: 240 A</td>
<td>950 V DC, $T = 1$ ms: 40 A</td>
<td>220 V DC, $T = 0$ ms: 2,000 A</td>
</tr>
<tr>
<td>(at rated operating voltage)</td>
<td>---</td>
<td>---</td>
<td>1,200 V AC, 50 Hz cosφ = 1.0: 210 A</td>
<td>1,200 V AC, 50 Hz cosφ = 0.8: 150 A</td>
<td>220 V AC, 50 Hz cosφ = 1.0: 1,500 A</td>
<td>220 V DC, $T = 0$ ms: 1,500 A</td>
</tr>
<tr>
<td>Short-circuit current</td>
<td>NO</td>
<td>NC</td>
<td>2,300 A</td>
<td>2,300 A</td>
<td>2,300 A</td>
<td>2,300 A</td>
</tr>
<tr>
<td>Arc chamber for DC</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Magnetic blowout</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Arc chamber for AC</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Contact material</td>
<td>AgSnO₂</td>
<td>AgSnO₂</td>
<td>M8 screw</td>
<td>M8 screw</td>
<td>NO: 12 Nm max. / NC: 6 Nm max.</td>
<td></td>
</tr>
<tr>
<td>Terminals</td>
<td>Flat tabs 6.3 x 0.8 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torque</td>
<td>10 Nm max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auxiliary switch</td>
<td>2x snap-action switches S870⁴; SPDT silver contacts, optional gold contacts (see catalogue D70⁵)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver contacts⁶</td>
<td>Silver contacts⁶: AC-15: 1.5 A at 230 V AC; DC-13: 0.5 A at 60 V DC or 2.0 A at 24 V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminals</td>
<td>Flat tabs 6.3 x 0.8 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coil</td>
<td>24 / 36 / 48 / 60 / 72 / 80 / 96 / 110 V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coil voltage $U_{s}$</td>
<td>Coater tolerance</td>
<td>E, B: -30 % ... +25 % at $T_a = 70^\circ$ C max. / J: -40 % ... 0 % at $T_a = 40^\circ$ C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold coil approx. 27 W at $U_{max}$, $T_a = 20^\circ$ C / warm coil approx. 13.5 W at $U_{max}$, $T_a = 20^\circ$ C</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Coater temperature</td>
<td>155° C at $T_a = 70^\circ$ C and $U_{max}$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coater suppression</td>
<td>Varistor / Diode</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coater terminals</td>
<td>Flat tabs 6.3 x 0.8 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP rating (IP code to IEC 60529)</td>
<td>IP00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical endurance, operating cycles</td>
<td>&gt; 3m</td>
<td>&gt; 3m / latch: 100.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical endurance, operating cycles</td>
<td>250,000 @ $U_i = 750$ V DC, $I_i = 70$ A, $T = 1$ ms</td>
<td>1 million @ $U_i = 750$ V DC, $I_i = 30$ A, $T = 1$ ms</td>
<td>upon request</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock / Vibration</td>
<td>Category 1, Class B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duty cycle</td>
<td>100 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>any, except: do not mount with mounting plate pointing upwards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>Operating temperature $T_{a}$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature $T_{i}$</td>
<td>-25°C ... +50°C for industrial applications / -40°C ... +70°C for railway applications⁷⁸</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>3 kg</td>
<td>2 kg / 2.4 kg⁹</td>
<td>1.9 kg</td>
<td>1.6 kg</td>
<td>1.6 kg</td>
<td>1.9 kg</td>
</tr>
</tbody>
</table>

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* See footnote page 2  
* 1x S870 Series snap-action switch for latching contactors  
* Data for gold contacts upon request  
* -25°C ... +70°C for latch versions  
* latch versions  

Subject to change
**C195 X/ Single pole NO AC / DC contactor, bidirectional**

- **Dimension diagram**
  - Aux. switch
  - 2x S870
  - Main contacts
  - M8 screw
  - Arc chute (on both sides)
  - Gap
  - Plasma exit (on both sides)
  - Coil suppression
  - Varistor
  - Coiltional
  - Staff tab A6.3x0.8
  - Clearance between plasma exit and earthed parts
    - x = 40 mm
    - y = 60 mm

- **Circuit diagram**

- **Mounting holes**

**C195 A/ Single pole NO contactor, unidirectional DC**

- **Dimension diagram**
  - Aux. switch
  - 2x S870
  - Main contacts
  - M8 screw
  - Arc chute
  - Gap
  - Plasma exit
  - Coil suppression
  - Varistor
  - Coiltional
  - Staff tab A6.3x0.8
  - Clearance between plasma exit and earthed parts
    - x = 40 mm
    - y = 60 mm

- **Circuit diagram**

- **Mounting holes**

Dimensions in mm / Subject to change
C195 A/...BD Single pole NO latching contactor, unidirectional DC

- Dimension diagram
- Circuit diagram
- Mounting holes

C195 B/ Single pole NO AC contactor

- Dimension diagram
- Circuit diagram
- Mounting holes

Subject to change / Dimensions in mm
**C195 S/...BD** Single pole NO latching contactor, unidirectional DC

- **Dimension diagram**
  - Aux. switch
  - Main contacts
  - M8 screw
  - Gap
  - Plasma exit
  - Coil suppression
  - Varistor
  - Coil terminal
  - Flat tab A6.3x0.8

- **Circuit diagram**
  - M8, torque 12 Nm max.

- **Mounting holes**
  - Dimensions in mm / Subject to change

**C195 W/ Single pole changeover (SPDT) contactor, unidirectional DC**

- **Dimension diagram**
  - Main contacts
  - M8 screw
  - Gap
  - Plasma exit
  - Coil suppression
  - Varistor
  - Coil terminal
  - Flat tab A6.3x0.8

- **Circuit diagram**
  - M8, torque 12 Nm max.

- **Mounting holes**
  - Dimensions in mm / Subject to change
### Safety instructions

- The device must be used according to the intended purpose as specified in the technical documentation. You are obliged to observe all specifications depending on operating temperature, degree of pollution etc. that are relevant to your application.
- Contactors are only suitable for use in cable cars and lifts with separate safety consideration by the system integrator.
- Without further safety measures the contactors are not suited for use in potentially explosive atmospheres.
- In case of malfunction of the device or uncertainties stop using it any longer and contact the manufacturer instantly.
- Tampering with the device can seriously affect the safety of people and equipment. This is not permitted and leads to an exclusion of liability and warranty.
- Coil suppression for reducing surges when the coil is switched off is optimally attuned to the contactors switching behaviour. The existing opening characteristic must not be negatively influenced by parallel connection with an external diode.
- Contactors running permanently may heat up. So make sure that the contactor has sufficiently cooled down before you start any inspection or maintenance work.
- When installing contactors with magnetic blowout make sure to do it in such a way that no magnetizable parts can be attracted by the permanent magnets that are also capable of destroying all data of swipe cards.
- Strong electromagnetic induction caused when switching off can influence other components installed near the contactor.
- Improper handling of the contactor, e.g. when hitting the floor with some impact, can result in breakage, visible cracks and deformation.

### Mounting orientation, Maintenance

- **Possible mounting orientations:**
  
<table>
<thead>
<tr>
<th>C195 X/</th>
<th>C195 A/ C195 S/</th>
<th>C195 W/</th>
</tr>
</thead>
<tbody>
<tr>
<td>![90°]</td>
<td>![90°]</td>
<td>![360°]</td>
</tr>
</tbody>
</table>

- **Maintenance**

  ![Defective parts must be replaced immediately!]

  For detailed instructions on safety, maintenance and mounting refer to our manual 195-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
- 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