

3

Contactors

CA1315/02, CA1315/04

3 pole
AC traction contactors
for permanent magnet
traction motors

Catalogue [C28.en](#)



CA1315/02, CA1315/04 3 pole AC traction contactors for permanent magnet traction motors

CA Series – AC traction contactors for permanent magnet motors

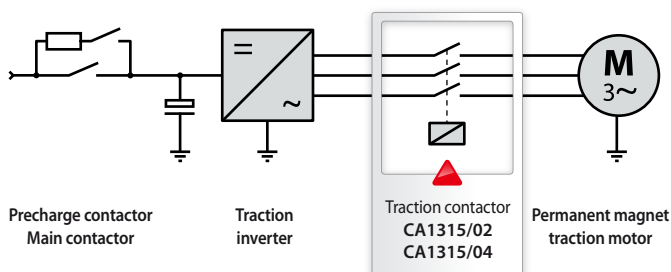
With the CA contactor series Schaltbau is introducing an innovative contactor concept to the market. It ensures the reliable disconnection of the motors from the traction inverter of electric multiple units. Disconnecting the motors becomes necessary in the event of a short-circuit in the output circuit of the inverter in order to prevent the drive from being blocked. The outstanding feature of this new contactor series is the controlling of modern traction motors with frequencies up to 400 Hz!

Due to its technical features, its compact design, its high switching functionality and reliability, the CA Series contactor offers flexibility and versatility found in no other contactor. The product family comprises a number of various design versions catering to a wide range of uses.

Features

- Innovative design: compact, rugged, reliable
- High short-circuit breaking capacity for frequencies up to 400 Hz
- Double-break contacts
- 3 pole version
- Easy maintenance:
 - Easy inspection and replacement of contacts
 - Easy replacement of arc chute
- Drive with coil tolerance according to railway standard
- Insulation coordination:
 - Functional insulation of main circuit
 - Basic insulation between main circuit and protective earth
 - Reinforced insulation between main circuit and control circuit / auxiliary circuit

Applications



CA Series contactors are designed for load-free switching of traction motors of electric multiple units. In the event of a system fault, e.g. a short circuit in the traction inverter, the traction motors are instantly and reliably switched off, irrespective of the operating situation of the motor.

Do you need support for a special application?

Please, do not hesitate to contact us!

We would be glad to assist you in the selection of the contactor that suits your application best.

Standards

- **IEC 60077-1:** Railway applications – Electric equipment for rolling stock - Part 1: General service conditions and general rules
- **IEC 60077-2:** Railway applications – Electric equipment for rolling stock - Part 2: Electrotechnical components - General rules
- **IEC 61373:** Railway applications - Rolling stock equipment - Shock and vibration tests

Ordering code

Series CA

Example: **CA1315/04 110ET-09**

Series

CA13 3 pole NO contactor

Nominal voltage

15 $U_n = 1,500 \text{ V} / 400 \text{ Hz}$

Conv. thermal current

02 $I_{th} = 250 \text{ A}^{*1, *7}$
04 $I_{th} = 350 \text{ A}^{*1} / I_{th} = 540 \text{ A}^{*2}$

Coil voltage

72 / 110 V DC ^{*3}

Coil tolerance

E -30 % ... +25 %

Coil circuit

T Suppressor diode, standard
CM Integrated double coil controller (for automatic coil changeover)

Auxiliary contacts

00 1x S870 ^{*4} (a₁)
1x S870 ^{*4} (b₀)
2x S826 ^{*5/*6}
02 4x S826 ^{*5/*6}
09 2x S970 ^{*4} (a₁)
2x S970 ^{*4} (b₀)
11 1x S970 ^{*4} (a₁)
1x S970 ^{*4} (b₀)

^{*1} with suppressor diode «T», standard

^{*2} with double coil controller «D», increasing performance considerably

^{*3} Others upon request

^{*4} Aux. contact, refer to catalogue D70

^{*5} Aux. contact, refer to catalogue D26

^{*6} Aux. contact, version with magnetic blowout

^{*7} Series in development



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:

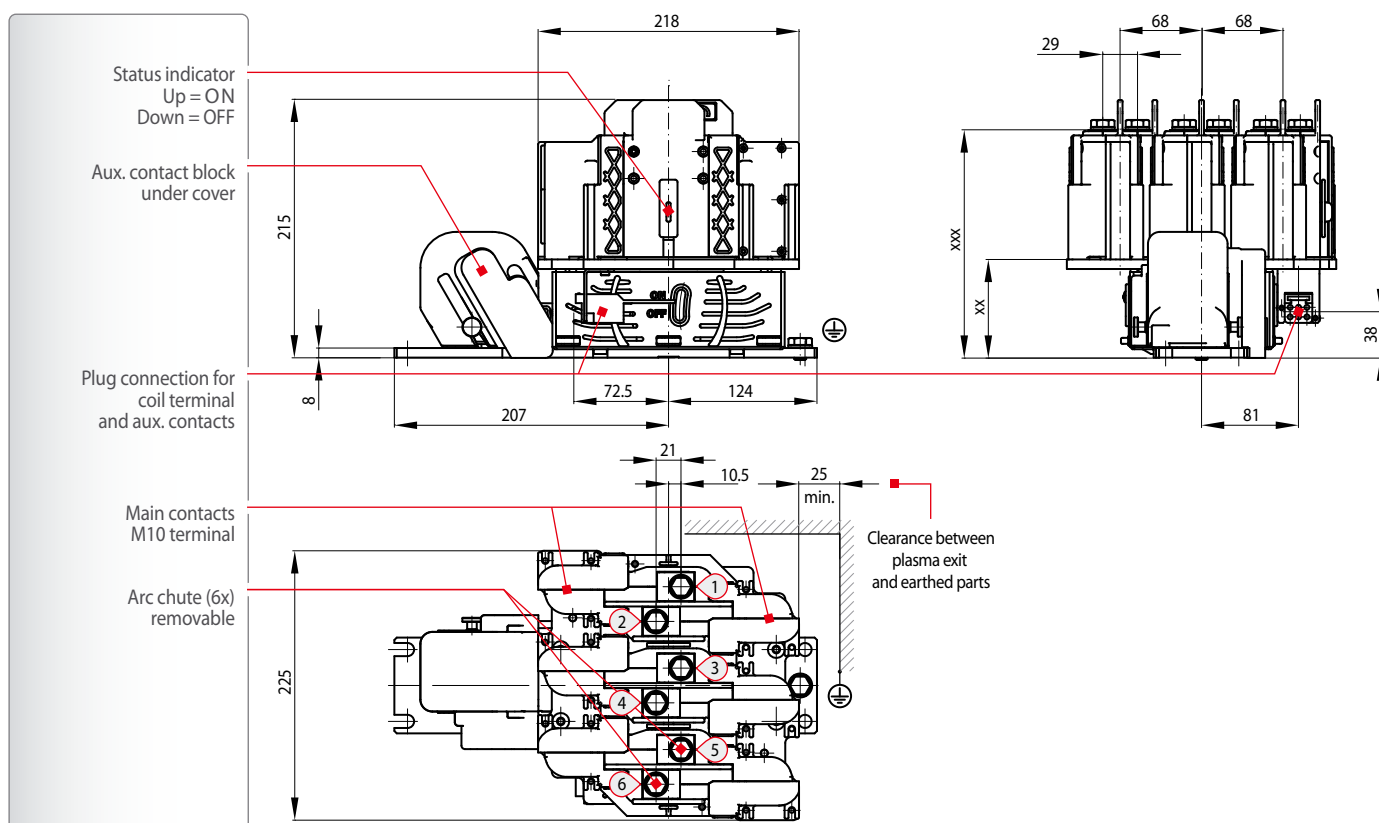
If you need a special variant of the contactor, please do not hesitate to contact us. Maybe the type of contactor you are looking for is among our many **special designs**. If not, we can also supply **customized designs**. In this case, however, minimum order quantities apply.

Series CA

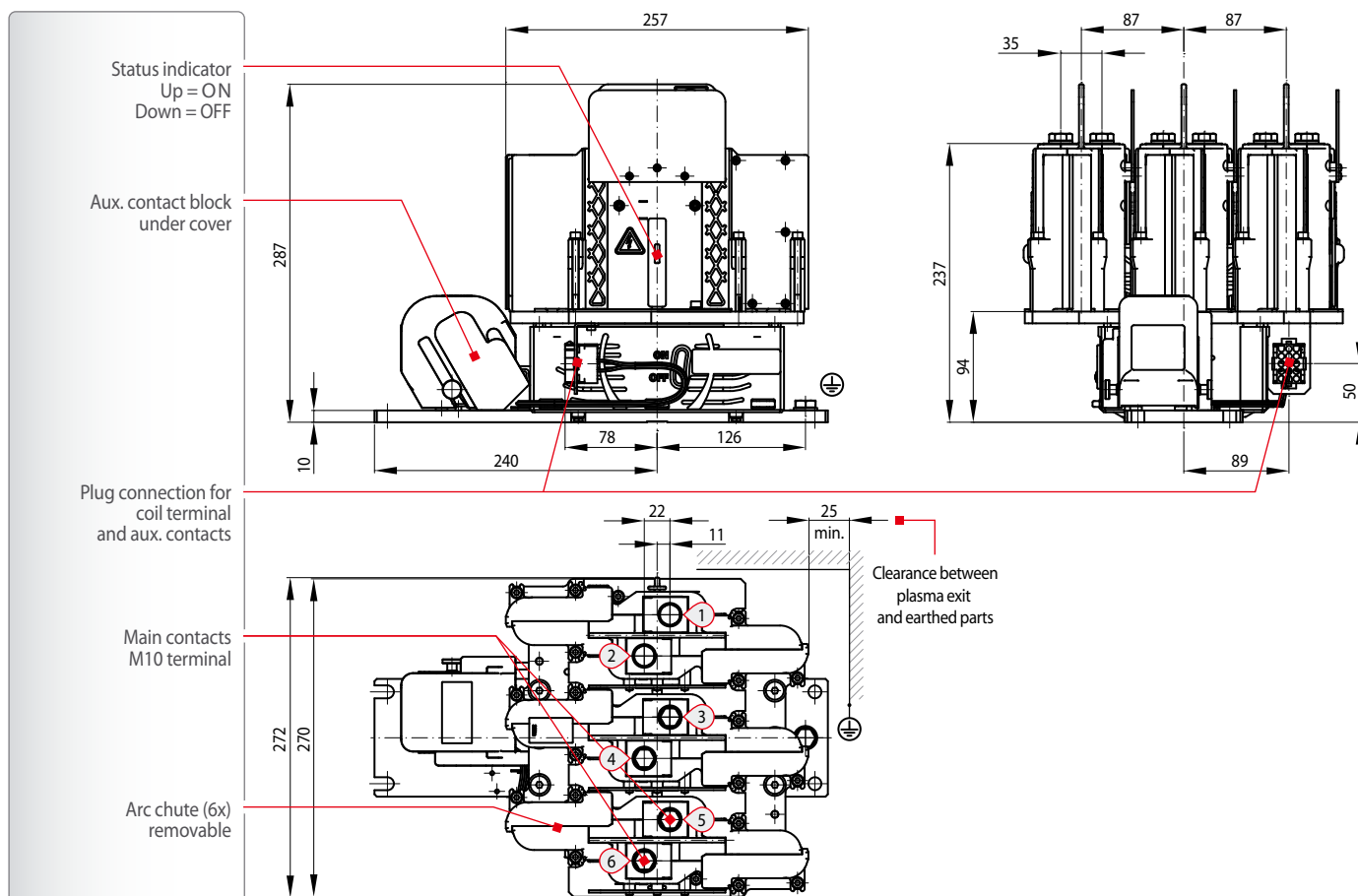
- **EN 50124-1:** Railway applications - Insulation coordination Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment
- **EN 50125-1:** Railway applications - Environmental conditions for equipment - Part 1: Equipment on board rolling stock

CA1315/02 Dimension diagram 3 pole AC traction contactor for 1,500 V and 200 A

Series CA

**CA1315/04** Dimension diagram 3 pole AC traction contactor for 1,500 V and 400 A / 540 A

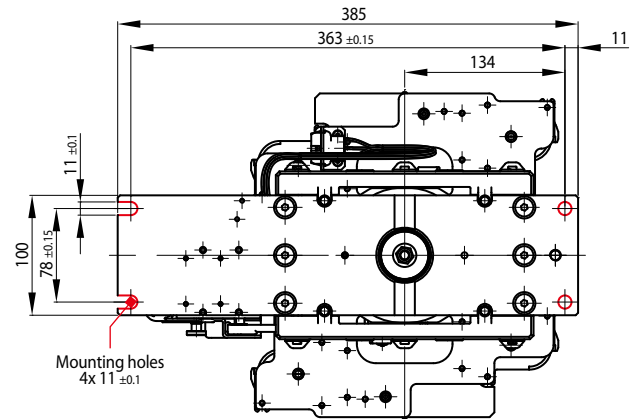
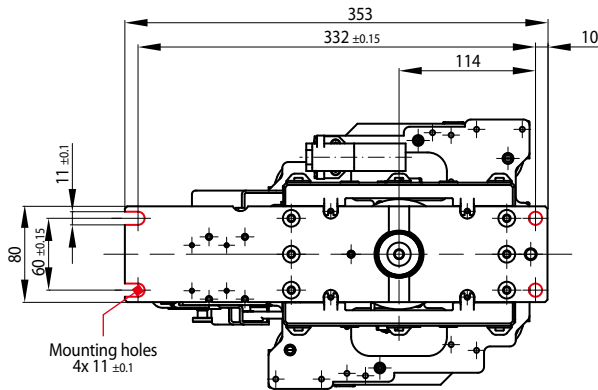
Series CA



CA1315/02 Mounting holes

CA1315/04 Mounting holes

Series CA



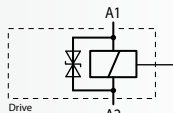
Circuit diagram

Series CA

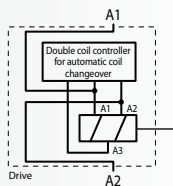
Drive, terminal and coil circuit

Coil circuit:
«T» Suppressor diode, standard

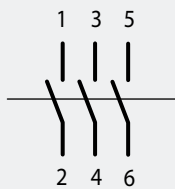
- Conv. thermal current
 $I_{th} = 250 \text{ A}$
- Conv. thermal current
 $I_{th} = 350 \text{ A}$

Coil circuit:
«CM» Integrated double coil controller

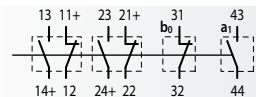
- Conv. thermal current
 $I_{th} = 540 \text{ A}$



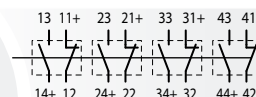
Main contacts



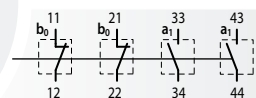
Aux. contacts, terminal



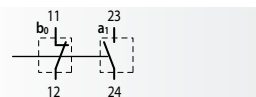
Aux. contact block «00»
2x S826 / 1x S870 (b_1) /
1x S870 (a_1)



Aux. contact block «02»
4x S826



Aux. contact block «09»
2x S870 (b_0) /
2x S870 (a_1)



Aux. contact block «11»
1x S870 (b_0) /
1x S870 (a_1)

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!

Maintenance instructions

Safety instructions

Series CA



For detailed maintenance, safety and mounting instructions please refer to our operating manual C28/04-M.en!

- C A1300 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. The design of the CA1300 contactor series allows for easy replacement of the main contacts. For detailed information please refer to our manual C28/04-M.en.

- 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.



Defective parts must be replaced immediately!

Specifications 3 pole AC traction contactors

Series CA

Series	CA1315/02*1	CA1315/04
Type of voltage	AC ($f \leq 400$ Hz)	AC ($f \leq 400$ Hz)
Main contacts	3x Schließer	3x Schließer
Nominal voltage U_n	1,500 V	1,500 V
Rated operating voltage U_e	1,800 V	1,800 V
Rated insulation voltage U_{Nm}	2,000 V	2,000 V
Rated impulse withstand voltage U_{Ni}	15 kV	15 kV
Pollution degree / Overvoltage category	PD3 / OV3	PD3 / OV3
Conventional thermal current I_{th}	250 A *2	350 A *2 / 540 A *3
Component category (IEC 60077-2)	A2	A2
Switching frequency class	C1	C1
Short-circuit making capacity	Please contact us	Please contact us
Short-circuit breaking capacity	Optimized for switching off 400 Hz	Optimized for switching off 400 Hz
Rated short-time withstand current I_{cw} ($T < 100$ ms)	Please contact us	Please contact us
Main contacts Contact material Terminals Torque	AgSnO ₂ M10 20 Nm max.	
Auxiliary contacts Number and type Contact material S826 switching capacity ($T = 5$ ms) Terminals	1x S970 (a ₁), 1x S970 (b ₀) or 2x S970 (a ₁), 3x S970 (b ₀) or 1x S870 (a ₁), 1x S870 (b ₀), 2x S826 or 4x S826 *4 Silver 16 A at 24 V DC; 13.5 A at 80 V DC; 7 A at 110 V DC Plug connection / Screws M3 / Flat tabs 6.3 x 0.8 mm *5	
Magnetic drive (coil suppression »T«, suppressor diode) Pollution degree / Overvoltage category Coil voltage U_s Coil tolerance Power dissipation at U_s and $T_a = 20$ °C Pull-in voltage, typical at $T_a = 20$ °C Pull-in time, typical at $T_a = 20$ °C Drop-off voltage, typical at $T_a = 20$ °C Drop-off time, typical at $T_a = 20$ °C Coil suppression Coil terminal	PD3 / OV2 72 / 110 V DC -30 % ... +25 % U_s Cold coil: 65 W / Warm coil: 45 W 0.6 x U_s 150 ms 0.1 x U_s 50 ms Suppressor diode *2 Plug connection *5	PD3 / OV2 72 / 110 V DC -30 % ... +25 % U_s Cold coil: 100 W / Warm coil: 75 W 0.6 x U_s 200 ms 0.1 x U_s 70 ms Suppressor diode *2 or Coil changeover *3 Plug connection *5
Ingress protection rating	IP00	
Mechanical endurance	> 250,000 operating cycles	
Vibration / Shock (IEC 61373)	Category 1, class B	
Mounting position	Any	
Ambient conditions Operating / storage temperature Altitude Humidity (EN 50125-1)	-40 °C ... +70 °C / -40 °C ... +85 °C < 2,000 m above sea level < 75 % yearly average	
Weight	14 kg	20 kg

*1 Series being developed

*2 $I_{th} = 250$ A / $I_{th} = 350$ A: Coil suppression »T« suppressor diode, standard*3 $I_{th} = 540$ A: Economy circuit »CM« integrated double coil controller for automatic coil changeover

*4 a1 and b0 according to IEC60077

*5 Optional; standard is connection of cables to aux. switches; coil terminal with cage clamp

Schaltbau GmbH

For detailed information on our products and services visit our website – or give us a call!

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with compliments:



Schaltbau GmbH manufactures in compliance with RoHS.



The production facilities of Schaltbau GmbH have been IRIS certified since 2008.



Certified to DIN EN ISO 14001 since 2002. For the most recent certificate visit our website.



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

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