SCHALTBAU

Connect · Contact · Control

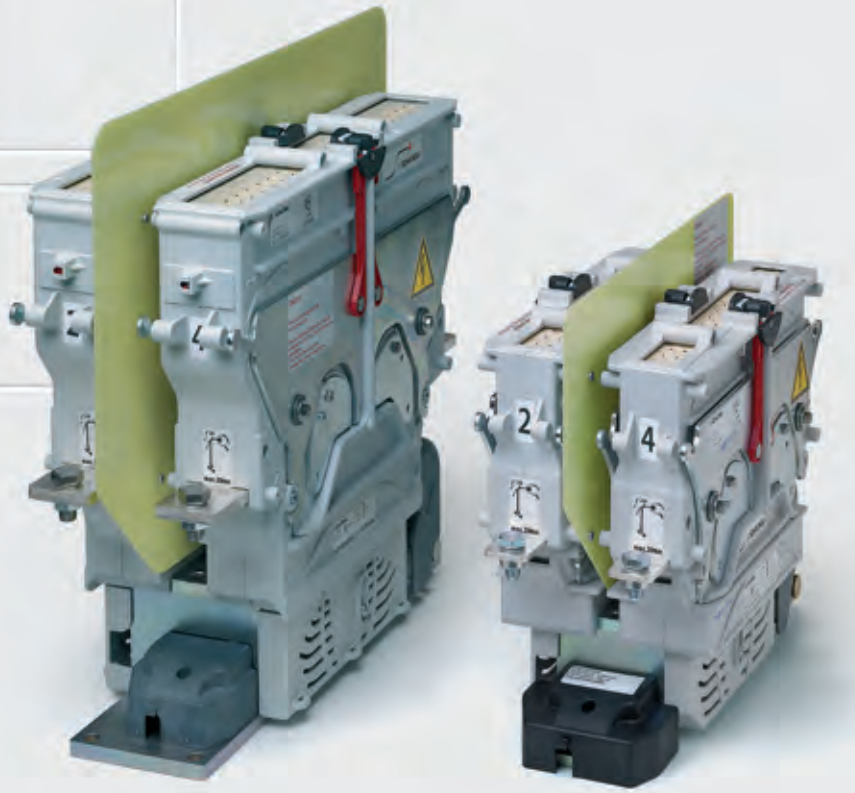
3

Contactors

CT1215/04, CT1230/04
CT1215/08, CT1230/08

Double pole
power contactors
for AC and DC

Catalogue **C21**.*en*



more information here:
schaltbau-gmbh.com

CT1215/04, CT1230/04, CT1215/08, CT1230/08 Double pole power contactors for AC and DC

CT Series – revolutionary method of arc quenching for both DC and AC

With the new double pole CT series contactors Schaltbau expands its product line of state-of-the-art power contactors. The outstanding technical feature is the innovative combination of electromagnetic and permanent-magnetic blowout technology for electric arc control. The successful combination of these two principles greatly improves both switching functionality and reliability and forms a practical and economically impressive device concept.

The CT contactor concept is flexible and can be adapted to suit the needs of the customer. Due to its technical characteristics, its economical advantages, its compactness and versatility, the CT power contactor series is simply predestined for use in industrial and railway applications alike. The contactors are especially suited for use in locomotives, cranes, and converters of wind turbines and PV installations, but also in mining.

Features

- Compact, rugged innovative design
- Rated operating voltage 1,500 V or 3,000 V
- Double-break contacts, (normally open)
- 1, 2*1, and 3*2 pole versions
- Easy inspection and replacement of main contact tips as well as arc chute
- Drive system with coil tolerance according to railway standards
- Functional insulation for main circuit
- Basic insulation between main circuit and protective earth
- Reinforced insulation between main circuit and control circuit / auxiliary circuit

Applications

Double pole CT Series contactors comprise a number of various design versions catering to a wide range of uses, such as:

- **Main contactor for:**
  Traction converters and inverters for auxiliary equipment
- **Contactor for:**
  Field circuits of motors, conventional resistor based traction units (retrofit), starter and compressor motors, and heating circuits

Ordering code

Series CT, 2 pole

Example: **CT1230/04 H 110ET-00**

Series

CT11	1 pole NO contactor *1
CT12	2 pole NO contactor
CT13	3 pole NO contactor *2

Main contacts: Nominal voltage

15	U_n = 1,500 V
30	U_n = 3,000 V

Main contacts: Conventional thermal current

04	I_{th} = 400 A*4.1
06	I_{th} = 600 A*3/*4.2
08	I_{th} = 800 A*4.2
11	I_{th} = 1,100 A*3/*4.2
15	I_{th} = 1,500 A*3/*4.1/*5

Mounting position

H	horizontal (lock bar yellow)
V	vertical (lock bar red)

Coil voltage

24 / 36 / 48 / 72 / 110 V DC

Auxiliary contacts

1x S870*6.2 (a1), 1x S870*6.2 (b_0), 2x S826*6.1/*6.3	M3 screw-type terminals	00
1x S870*6.2 (a1), 1x S870*6.2 (b_0)	M3 screw-type terminals	01
2x S826*6.3	Flat tabs 6.3 x 0.8	
4x S826*6.3	M3 screw-type terminals	02
4x S826*6.3	Flat tabs 6.3 x 0.8	03

Surge suppression/type of coil

Suppressor diode / standard coil *4.3	T
Double coil controller (DCC) / double coil *4.4	CM

Coil tolerance

-30 % … +25 %	E

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 See catalogue C20*
**2 Special design, upon request*
**3 Series in development*
**4.1 Suppressor diode / standard coil*
**4.2 Double coil controller (DCC), integrated / double coil*
**4.3 For main contacts I_{th} = 400 A*
**4.4 For main contacts I_{th} > 400 A*
**5 Single pole version: 2x main contacts I_{th} = 800 A, parallel connected*
**6.1 Aux. contact, blowout version*
**6.2 Aux. contact: snap-action switch S826, see also catalogue D26*
**6.3 Aux. contact: snap-action switch S870, see also catalogue D70*

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Specifications Double pole power contactors for AC and DC — Series CT, 2 pole

Series	CT1215/04	CT1230/04	CT1215/08	CT1230/08
Type of voltage	DC (bidirectional), AC (f < 60 Hz)		DC (bidirectional), AC (f < 60 Hz)	
Main contacts, number of, configuration	2x NO		2x NO	
Nominal voltage U_n	1,500 V	3,000 V	1,500 V	3,000 V
Rated operating voltage U_e	1,800 V	3,600 V	1,800 V	3,600 V
Rated insulation voltage U_{Nm}	3,000 V	4,800 V	3,000 V	4,800 V
Rated impulse withstand voltage U_{Ni}	15 kV	25 kV	15 kV	25 kV
Pollution degree / Overvoltage category	PD3 / OV3	PD3 / OV3	PD3 / OV3	PD3 / OV3
Switching surge overvoltage				
U_e = 1,800 V	<9 kV	---	<9 kV	---
U_e = 3,600 V	---	< 15 kV	---	< 15 kV
Conventional thermal current $_{th}$	400 A *1	400 A *1	800 A	800 A
Component category (IEC 60077-2)	A2	A2	A2	A2
Short-circuit making capacity	2.5 kA (new contacts) / 5 kA (used contacts)		3.5 kA (new contacts) / 8 kA (used contacts)*2	
Rated operating current I_e (2 poles connected in series, at operational frequency C2)				
DC, U_e = 1,200 V (T2 = 15 ms)				
DC, U_e = 1,800 V (T2 = 15 ms)	450 A		800 A	
DC, U_e = 3,600 V (T2 = 15 ms)	---	350 A (extrapolated value)	---	800 A
Rated operating current I_e (per pole, at operational frequency C2)				
DC, U_e = 1,200 V (T2 = 15 ms)				
DC, U_e = 1,800 V (T2 = 15 ms)	300 A		450 A	---
DC, U_e = 3,600 V (T2 = 15 ms)	---	200 A	---	320 A
Breaking capacity (2 poles connected in series, T2 = 15 ms)				
DC, U_e = 1,200 V	1,400 A		2,000 A	---
DC, U_e = 1,800 V	800 A	1,200 A	1,400 A	2,000 A
DC, U_e = 3,600 V	---	750 A	---	1,200 A *3
Breaking capacity (2 poles connected in series, T2 = 1 ms)				
DC, U_e = 1,200 V	2,600 A		4,200 A	---
DC, U_e = 1,800 V	1,800 A	upon request	3,000 A	3,400 A
DC, U_e = 3,600 V	---	upon request	---	2,300 A *3
Breaking capacity (per pole, cosφ = 0.8)				
AC, U_e = 1,200 V (f = 16,7 / 50 Hz)	1,000 A / 700 A		1,900 A / 1.400 A	--- / ---
AC, U_e = 1,800 V (f = 16,7 / 50 Hz)	800 A / 500 A	1,600 A / 900 A	1,500 A / 1.000 A	2,300 A / 1,500 A
AC, U_e = 3,600 V (f = 16,7 / 50 Hz)	--- / ---	900 A / 500 A	--- / ---	1,300 A / 900 A
Breaking capacity (per pole, cosφ = 1)				
AC, U_e = 1,200 V (f = 16.7 / 50 Hz)	1,300 A / 1,000 A		2,200 A / 1,600 A	--- / ---
AC, U_e = 1,800 V (f = 16.7 / 50 Hz)	1,000 A / 700 A	2,100 A / 1,200 A	1,900 A / 1,200 A	2,900 A / 1,700 A
AC, U_e = 3,600 V (f = 16.7 / 50 Hz)	--- / ---	1,300 A / 800 A	--- / ---	1,600 A / 1,300 A
Rated short-time withstand current I_{cw} (T < 100 ms)	5 kA	5 kA	8 kA*2	8 kA*2
Critical current range	None	None	None	None
Main contacts				
Contact material	$AgSnO_2$		$AgSnO_2$	
Terminals	M10		M12	
Torque	20 Nm max.		30 Nm max.	
Auxiliary contacts				
Number and type	1x S870 (a_1), 1x S870 (b_0), 2x S826 or 4x S826) *4		1x S870 (a_1), 1x S870 (b_0), 2x S826 or 4x S826) *4	
Contact material	Silver		Silver	
S826 switching capacity (T = 5 ms)	16 A at 24 V DC; 13.5 A at 80 V DC; 7 A at 110 V DC		16 A at 24 V DC; 13.5 A at 80 V DC; 7 A at 110 V DC	
Terminals	Screws M3 / Flat tabs 6.3 x 0.8 mm		Screws M3 / Flat tabs 6.3 x 0.8 mm	
Magnetic drive				
Pollution degree / overvoltage category	PD3 / OV2		PD3 / OV2	
Coil voltage U_s	24 / 36 / 48 / 72 / 110 V DC		24 / 36 / 48 / 72 / 110 V DC	
Coil tolerance	-30 % ... +25 % U_s		-30 % ... +25 % U_s	
Coil power consumption at U_s and T_a = 20 °C	cold coil: 70 W / warm coil: 50 W		pull-in (1s max.): 280 W max. / hold: 27 W	
Pull-in time, typical at T_a = 20 °C	85 ms		100 ms	
Drop-off voltage, typical at T_a = 20 °C	> 0.08 x U_s		> 0.08 x U_s	
Drop-off time, typical at T_a = 20 °C	50 ms		100 ms	
Switching frequency at T_a = 20 °C and 1.25 U_s			4 operations/minute max.	
Type of coil	Standard coil		Double coil	
Surge suppression	Suppressor diode		Double coil controller with integrated suppressor diode	
Coil terminal	Cage clamp		Cage clamp	
Ingress protection rating (IP code)	IP00		IP00	
Mechanical endurance	> 2 million operating cycles		> 2 million operating cycles	
Vibration / Shock (EN 61373)	Category 1, Class B		Category 1, Class B	
Mounting position	horizontal / vertical		horizontal / vertical *5	
Ambient conditions				
Operating temperature / storage temperature	-40 °C … +70 °C / -40 °C … +85 °C		-40 °C … +70 °C / -40 °C … +85 °C	
Altitude	< 2,000 m above sea level		< 2,000 m above sea level	
Humidity (EN 50125-1)	< 75 % yearly average		< 75 % yearly average	
Weight	18 kg	22 kg	30 kg	35 kg

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*1 With frequent switching under load the conv. thermal current I_{th} must be limited to 350 A.

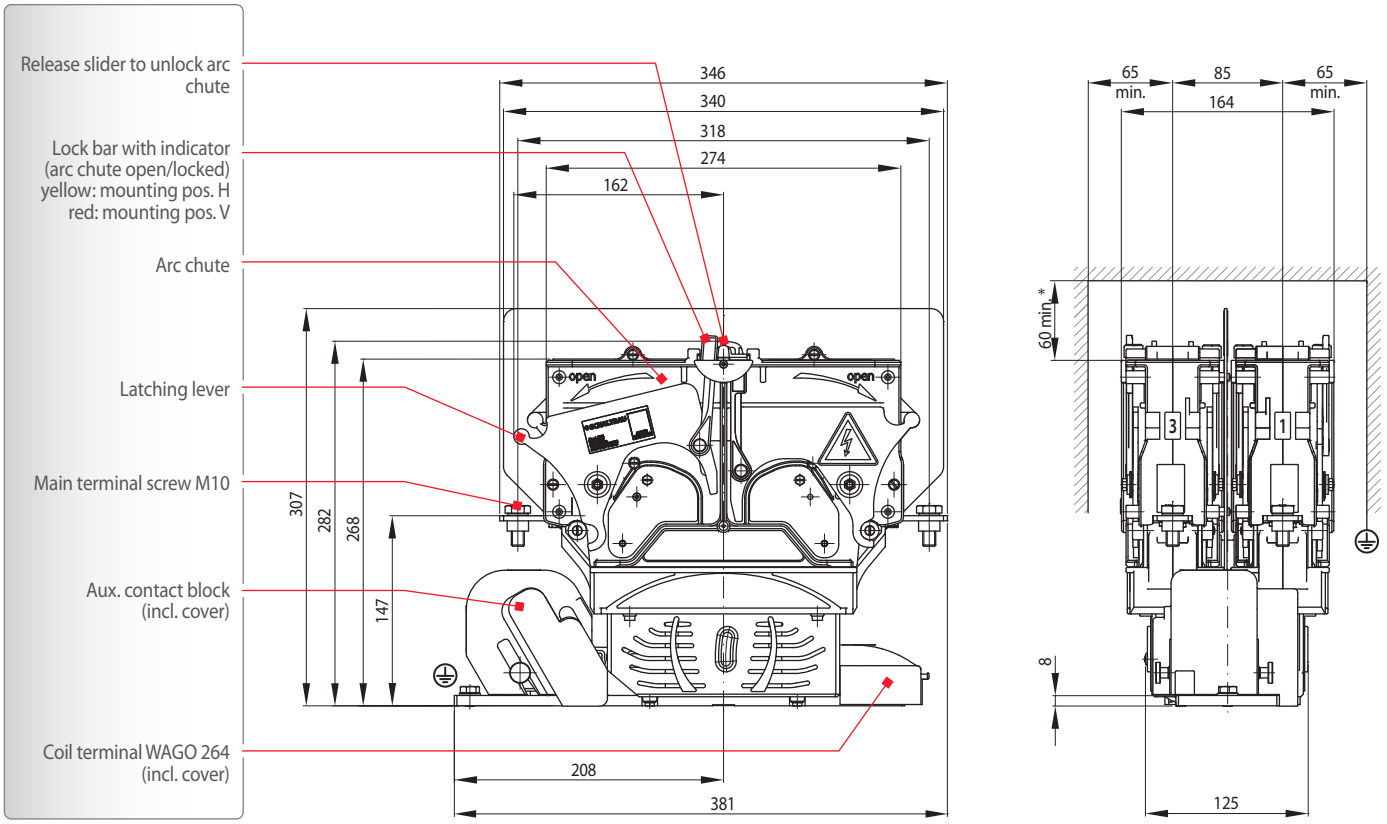
*2 Preliminary values

*3 »Observe dimensioning instructions for C1230/08 Series on page 6

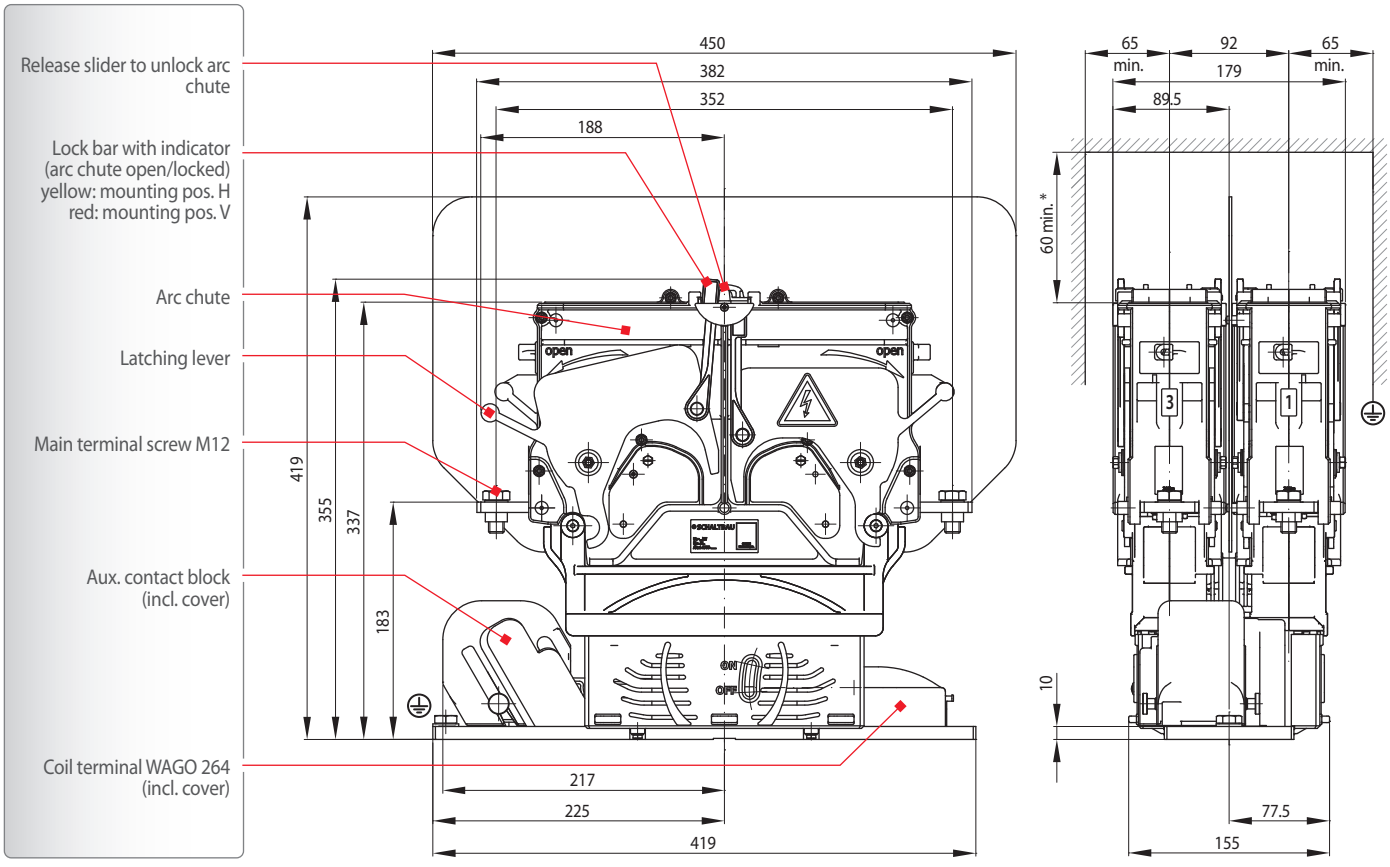
*4 a1 and b0 according to IEC60077

*5 For frequent load switching use contactors for vertical mounting (red lock bars).

CT1215/04 Dimension diagram double pole NO contactor for 1,500 V / 400 A (standard version) — Series CT, 2 pole



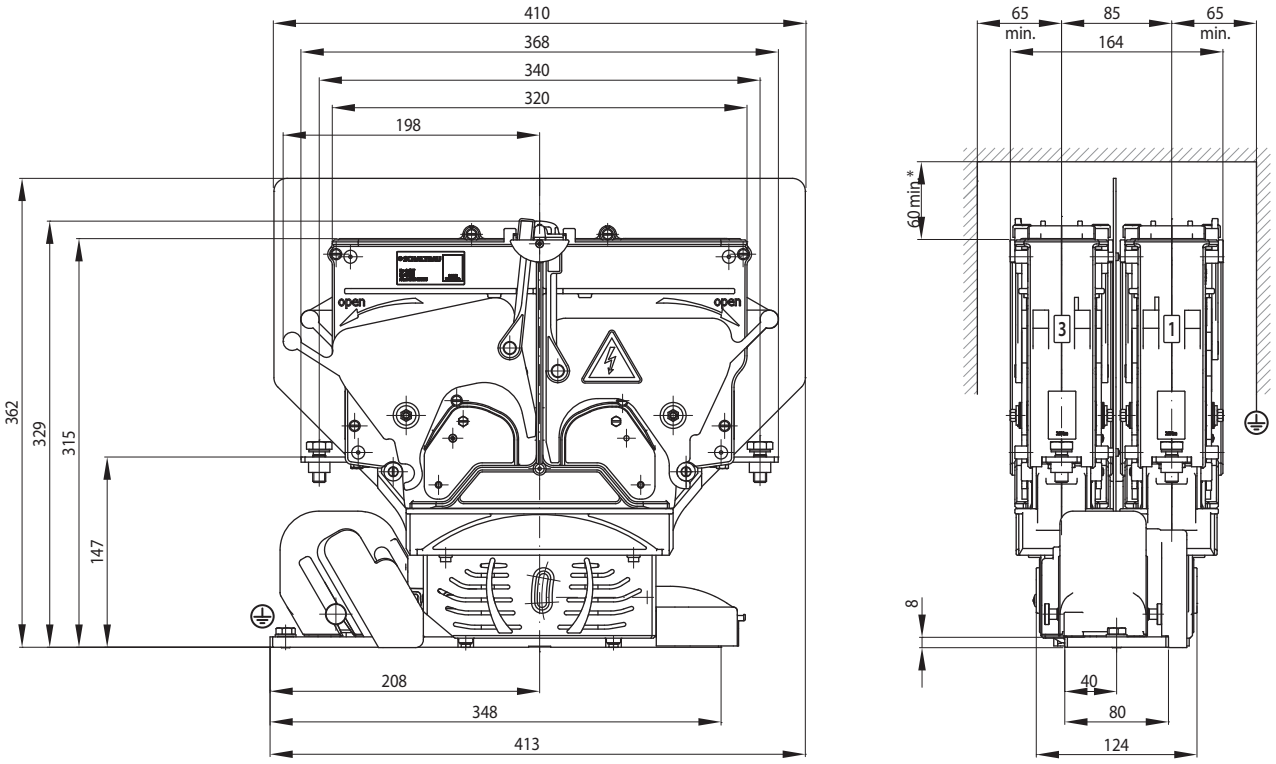
CT1215/08 Dimension diagram double pole NO contactor for 1,500 V / 800 A (standard version) — Series CT, 2 pole



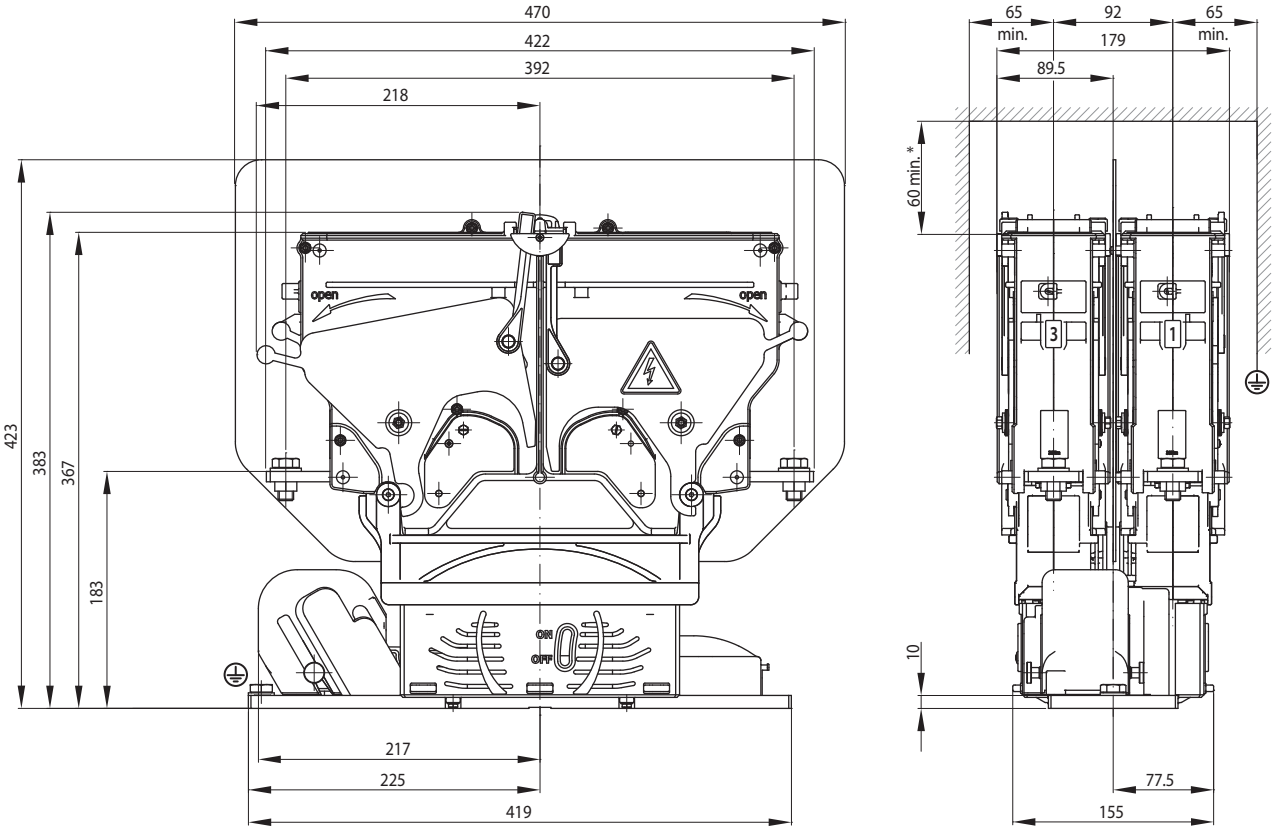
⚠ **** Minimum clearance:***
Interrupting at maximum capacity could require larger clearance!
Feel free to contact us, we will be happy to assist you with dimensioning.

Dimensions in mm

CT1230/04 Dimension diagram double pole NO contactor for 3,000 V / 400 A (standard version) — Series CT, 2 pole



CT1230/08 Dimension diagram double pole NO contactor for 3,000 V / 800 A (standard version) — Series CT, 2 pole

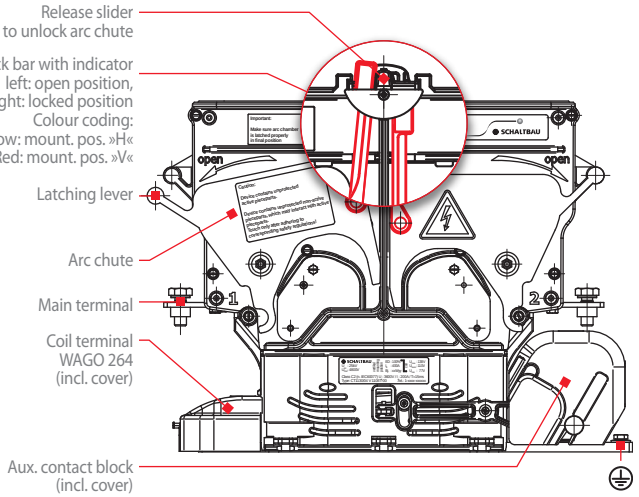


⚠ **** Minimum clearance:***
Interrupting at maximum capacity could require larger clearance!
Feel free to contact us, we will be happy to assist you with dimensioning.

Dimensions in mm

Mounting instructions

Series CT, 2 pole



Start up

Before initial start up make sure that:

- the arc chute is mounted properly and the lock bars are locked in position
- the protective covers are mounted properly
- the contactor is earthed (PE terminal on mounting plate)

Removal of arc chute

1. Push both release sliders in the direction indicated by the arrow and hold them in this position.
2. Move all four levers for unlocking the arc chute in the direction indicated by the arrow.
3. The arc chute incorporating the stationary main contacts can now be lifted from the contactor.

Mounting the arc chute

1. Mount the arc chute onto the magnetic drive. Note: The arc chute has keys on one side to fit into slots on the corresponding side of the contactor. So you cannot mount it the wrong way round.
2. Move all four levers for unlocking the arc chute into the original position.
3. Check: The arc chute is locked properly, if all four lock bars click into place and cannot be opened without pushing the release slider.

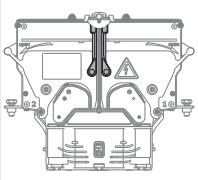
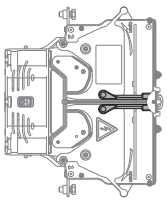
Removal of protective covers

- Protective cover auxiliary switches: Dismount arc chute first, then loosen knurled head screws and remove protective cover.
- Protective cover coil terminals: Unscrew cover and take it off.

Mounting of protective covers

- Protective cover auxiliary switches: Position protective cover and screw in both knurled head screws. Then mount arc chute.
- Protective cover coil terminals: Introduce protective cover into the groove of the coil drive and locate in position. Then tighten screws.

Mounting positions

Mounting position	»H« horizontal	»V« vertical
Lock bars, colour	YELLOW	RED
Mounting position Please observe the mounting position as shown on the nameplate	»H« horizontal 	»V« vertical 

Dimensioning instructions

- Do you need some help? For selecting the contactor that suits your application best do not hesitate to ask our advice.
- For dimensioning CT12xx/xx Series contactors please observe the following instructions:
  1. For connection of the main contacts Schaltbau recommends the use of busbars with the following dimensioning:
     - Conv. thermal current I_{th} = 400 A: 60 x 5 mm
     - Conv. thermal current I_{th} = 800 A: 80 x 8 mm
  2. Observe clearance of live parts to arc chute! Refer to dimension drawings on page 4 and 5 for data.
  3. CT1230/08: For frequent load switching use contactors for vertical mounting (red lock bars).
  4. For nominal voltages $U_n \geq$ 3,000 V DC ask for our special design CT1230/08 ... 200.

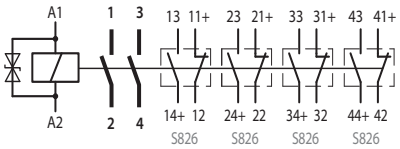
Surge suppression

- **CT12xx/04 Series with main contacts designed for I_{th}=400 A:**
  Surge suppression/coil type »T«: Standard coil with suppressor diode. The use of a suppressor diode for limiting transient overvoltages occurring on opening of the coil 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.
- **CT12xx/08 Series with main contacts designed for I_{th}=800 A:**
  Surge suppression/coil type »CM«: Double coil with integrated double coil controller (DCC module).
  Observe correct polarity of coil terminals. Do not add any extra suppressor diodes to the configuration.

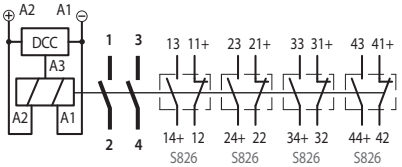
Circuit diagrams

- **Versions to industry standard**

2x NO I_{th} = 400 A,
Standard coil ,
Aux. contacts 4 x S826

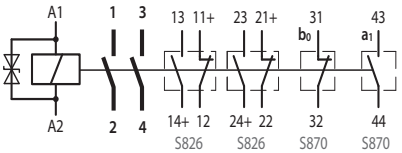


2x NO I_{th} = 800 A,
Double coil with
double coil controller,
Aux. contacts 4 x S826

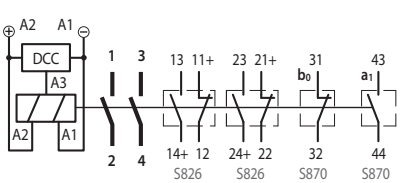


- **Versions to railway standard IEC 60077**

2x NO I_{th} = 400 A,
Standard coil,
Aux. contacts (IEC 60077)
2 x S826, 1 x S870$_{(b0)}$,
1 x S870$_{(a1)}$



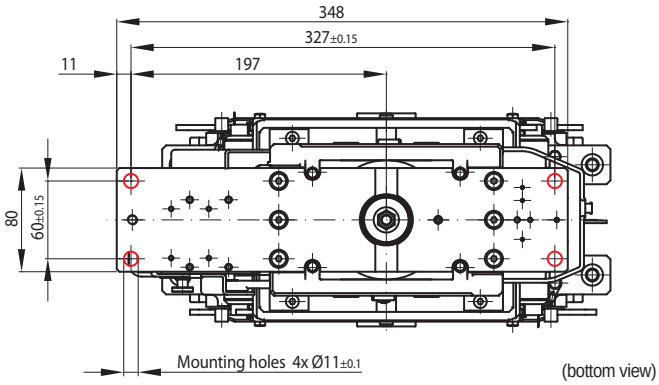
2x NO I_{th} = 800 A,
Double coil with
double coil controller,
Aux. contacts (IEC 60077)
2 x S826, 1 x S870$_{(b0)}$,
1 x S870$_{(a1)}$



Mounting holes

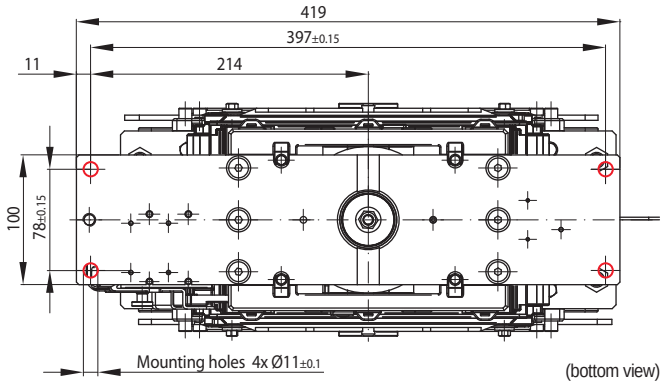
Series CT, 2 pole

- **2 pole standard contactor, CT1215/04, CT1230/04 Series**



(bottom view)

- **2 pole standard contactor CT1215/08, CT1230/08 Series**



(bottom view)

Spare parts

Series CT, 2 pole

Items	Spare part, description	Ordering code CT1215/04	CT1230/04	CT1215/08	CT1230/08
1	Set of two stationary contacts	MC CT1015/04	MC CT1030/04	MC CT1015/08	MC CT1030/08
1	Contact bridge with mounted contact holder, mounting position »H« horizontal	CBH CT1215/04	CBH CT1230/04	CBH CT1215/08	CBH CT1230/08
1	Contact bridge with mounted contact holder, mounting position »V« vertical	CBV CT1215/04	CBV CT1230/04	CBV CT1215/08	CBV CT1230/08
1	Protective cover coil terminals	CC CT1030/04		CC CT1030/08	
1	Protective cover aux. switches	CA CT1030/04		CA CT1030/08	
1	Snap-action switch (SPDT)	S826 a L			
1	Contact block of 2x S870 (momentary switches a1, b0)	AS S870			

Maintenance instructions

For detailed maintenance, safety and mounting instructions please refer to our operating manuals C21/04-M.en and C21/08-M.en!

- CT12xx/xx 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 CT contactor series allows for easy replacement of the main contacts. For detailed information please refer to our manuals C21/04-M.en and C21/08-M.en respectively.

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.

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

Defective parts must be replaced immediately!

Dimensions in mm

Schaltbau GmbH

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

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with compliments:

RoHS 2011/65/EC

Schaltbau GmbH manufactures in compliance with RoHS.

IRIS Certification

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

Schaltbau GmbH ISO 14001 certified since 2002

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

Schaltbau GmbH ISO 9001 certified since 1994

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

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