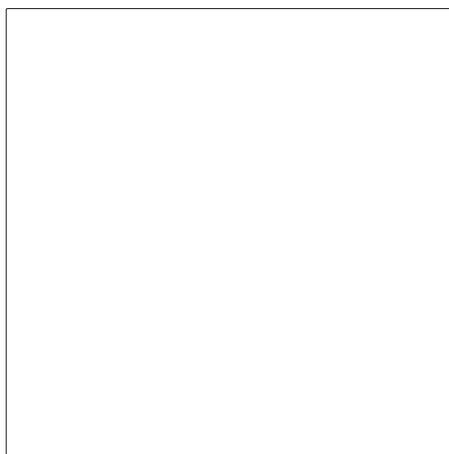
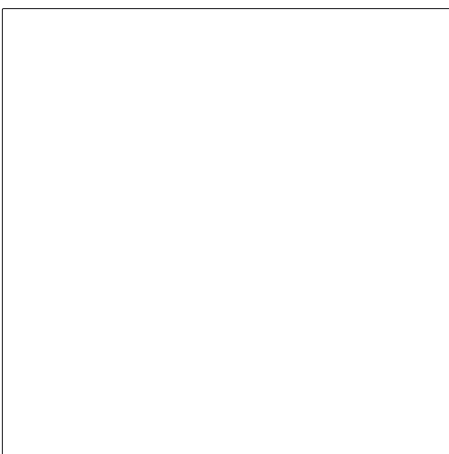
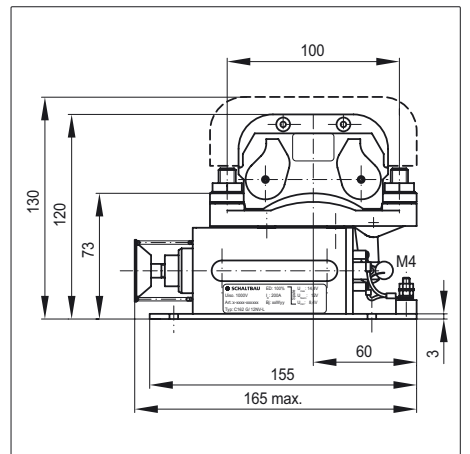
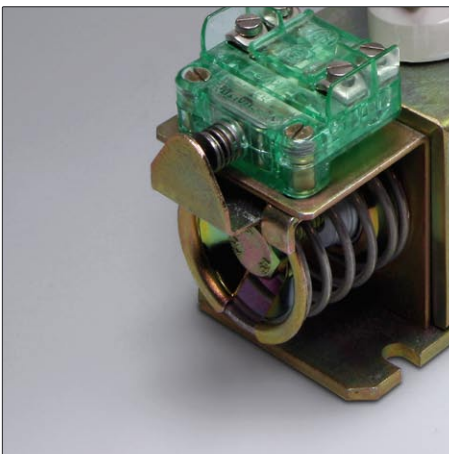
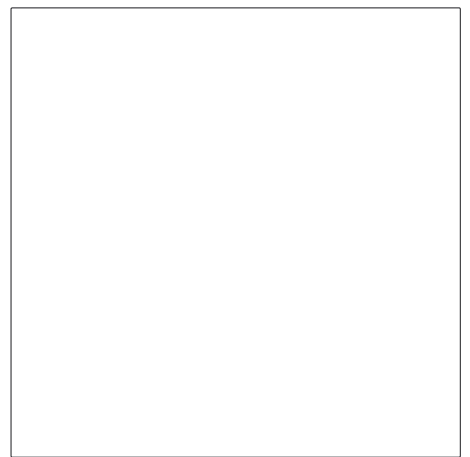


**Single pole
cam contactors
for DC and AC
applications
C160, C162 Series**



Single pole C160/C162 Series cam contactors for DC and AC operation

Schaltbau C160 and C162 Series cam contactors are supplied as single pole NO contactors. Cam switch elements are used as main contacts for DC and AC operation together with magnetic blowout for DC applications and auxiliary contacts.

The contactors are of compact design, feature double-break main contacts, and are known for their reliability. Schaltbau cam contactors are used in large numbers in industrial and railway applications.

Ordering code

C160, C162 Series

C160, C162 Series

Example: **C160 C/ 24EV-H1-L**

Series + Version

C160 K/	C160; cam switch element S306 K $I_{th} = 160 \text{ A}$, no blowout *1
C160 M/	C160; cam switch element S306 M $I_{th} = 160 \text{ A}$, with blowout *1
C160 A/	C160; cam switch element S306 A $I_{th} = 200 \text{ A}$, no blowout *1
C160 C/	C160; cam switch element S306 C $I_{th} = 200 \text{ A}$, with blowout *1
C162 E/	C162; cam switch element S307 E $I_{th} = 250 \text{ A}$, no blowout *1
C162 G/	C162; cam switch element S307 G $I_{th} = 250 \text{ A}$, with blowout *1
C162 N/	C162; cam switch element S307 G/N $I_{th} = 250 \text{ A}$, $U_n = 400 \text{ V}$, with blowout *2

Coil voltage

12/24/36/48/60/80/96/110 Coil voltage in V DC

Tolerance

E	+25% ... -30% at $T_a = 70^\circ\text{C}$ (special coil)
N	+20% ... -30% at $T_a = 50^\circ\text{C}$

Suppression

V	Varistor
X	none

Aux. contacts (Number of, Configuration)

H1	1 SPDT, S804 b Series (single auxiliary contact)
P1	1 SPDT, S826 b Series (single auxiliary contact)
B02	2 SPST-NC (auxiliary switch block)
B20	2 SPST-NO (auxiliary switch block)
C22	2 SPST-NO, 2 SPST-NC (auxiliary switch block)
C40	4 SPST-NO (auxiliary switch block)
D24	2 SPST-NO, 4 SPST-NC (auxiliary switch block)
D42	4 SPST-NO, 2 SPST-NC (auxiliary switch block)

Arc chamber/chute

L	Arc chamber for S306
M	Arc chamber for S307
N	Arc chamber for S307, with mounting screw
P	Arc chute for S307 G/N

Note:

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

Special variant

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

Cam switch elements

C160 Series

Identification	Cam switch element	Conv. thermal current I_{th}	Magnetic blowout
K	S306 K	160 A	none
M	S306 M	160 A	existent
A	S306 A	200 A	none
C	S306 C	200 A	existent

C162 Series

Identification	Cam switch element	Conv. thermal current I_{th}	Magnetic blowout
E	S307 E	250 A	none
G	S307 G	250 A	existent
N	S307 G/N	250 A	existent

Arc chamber

C160, C162 Series

Identification	used for cam switch element	Mounting
LK-S306	S306 A, S306 C, S306 M, S306 K	slip on
LK-S307	S307 E, S307 G	slip on
LK-S309	S307 E, S307 G	slip on/screw on

Arc chute

C162 Series

Identification	used for cam switch element	Mounting
LK-S307-DC	S307 G/N	slip on/screw on

Auxiliary contacts

Auxiliary switch blocks for C160, C162 (see page 6)

Unlike single auxiliary contacts, auxiliary switch blocks cannot be retrofitted. You must, therefore, order the corresponding version designed for use with auxiliary switch blocks beforehand, see ordering code.

Single auxiliary contacts for C160, C162 (see page 7)

Identification	Ordering code Single aux. contact	Auxiliary switch
H1	HK-C160/C162-H1	1 SPDT, S804 b
P1	HK-C160/C162-P1	1 SPDT, S826 b

*1 Arc chamber, detachable, see also table Cam switch elements

*2 Arc chute slip-on/screw-on, see also table Cam switch elements

Standards

Contactors meet requirements for industrial applications to:

IEC 60947-1 Low-voltage switchgear and controlgear - Part 1: General rules

IEC 60947-4-1 Low-voltage switchgear and controlgear - Part 4-1: Contactors and motor starters - Electro-mechanical contactors and motor starters.

Contactors meet requirements for railway applications to:

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.

Specifications

C160, C162 Series

Series	C160	C162
Type of voltage	DC, AC	DC, AC
Main contacts, Number of, Configuration	1x SPST-NO	1x SPST-NO
Nominal voltage U_n	450 V / 750 V *1	450 V / 750 V *1
Rated insulation voltage U_i to IEC 60947-1	630 V / 1,000 V *1	630 V / 1,000 V *1
Pollution degree Overvoltage category	PD3 OV3	PD3 OV3
Conventional thermal current I_{th} Cam switch elements *2	S306 K, S306 M S306 A, S306 C S307 E, S307 G, S307 G/N 160 A 200 A ---	--- --- 250 A
Making capacity, resistive, T = 0 ms Cam switch elements *2	S306 K, S306 M S306 A, S306 C S307 E, S307 G, S307 G/N 600 A 800 A ---	--- --- 1,000 A
Maximum breaking capacity	see diagram, page 5	see diagram, page 5
Short-circuit current	900 A	1,400 A
Switching off, no motor reversing circuits (only DC)	only in one direction	only in one direction
Arc chute for DC operation	---	• (LK-S307-DC for S307 G/N)
Blowout, magnetic (only DC)	•	•
Arc chamber	•	•
Main contacts: Material Main terminals	AgSnO ₂ M8, tightening torque 6 Nm	AgSnO ₂ M10, tightening torque 10 Nm
Auxiliary contacts: Number of, Configuration Conv. thermal current I_{th} Rated insulation voltage U_i Terminals	Single aux. contact or assembly with 2, 4 or 6 aux. contacts *3 Single aux. contact 10 A, aux. contact assembly 6 A 400 V Screw-type with washer disc, or quick-connect 6.3 x 0.8 mm	
Magnetic drive: Rated control supply voltage U_s Operating range of U_s Coil power dissipation ($T_a = 20^\circ\text{C} / U_s$) Coil temperature Suppression Terminals	12 / 24 / 48 / 60 / 80 / 96 / 110 V DC -30 % ... +20 % at $T_a = 50^\circ\text{C}$ *4 max. approx. 18 W 155° C at $T_{a,max}$ and $U_{s,max}$ Varistor Screw-type M4	
Degree of protection (IEC 60529)	IP00	
Mechanical endurance	5 million operating cycles	
Duty cycle	100 %	
Mounting position	preferably suspended upright	
Temperature Operating temperature Storage temperature	-25° C ... +50° C -40° C ... +80° C	
Weight	2.0 kg	2.0 kg

*1 Special design

*2 See catalogue B40.en

*3 See also Auxiliary contacts, page 6f.

*4 Others on request

Mode of operation, Maximum breaking capacity

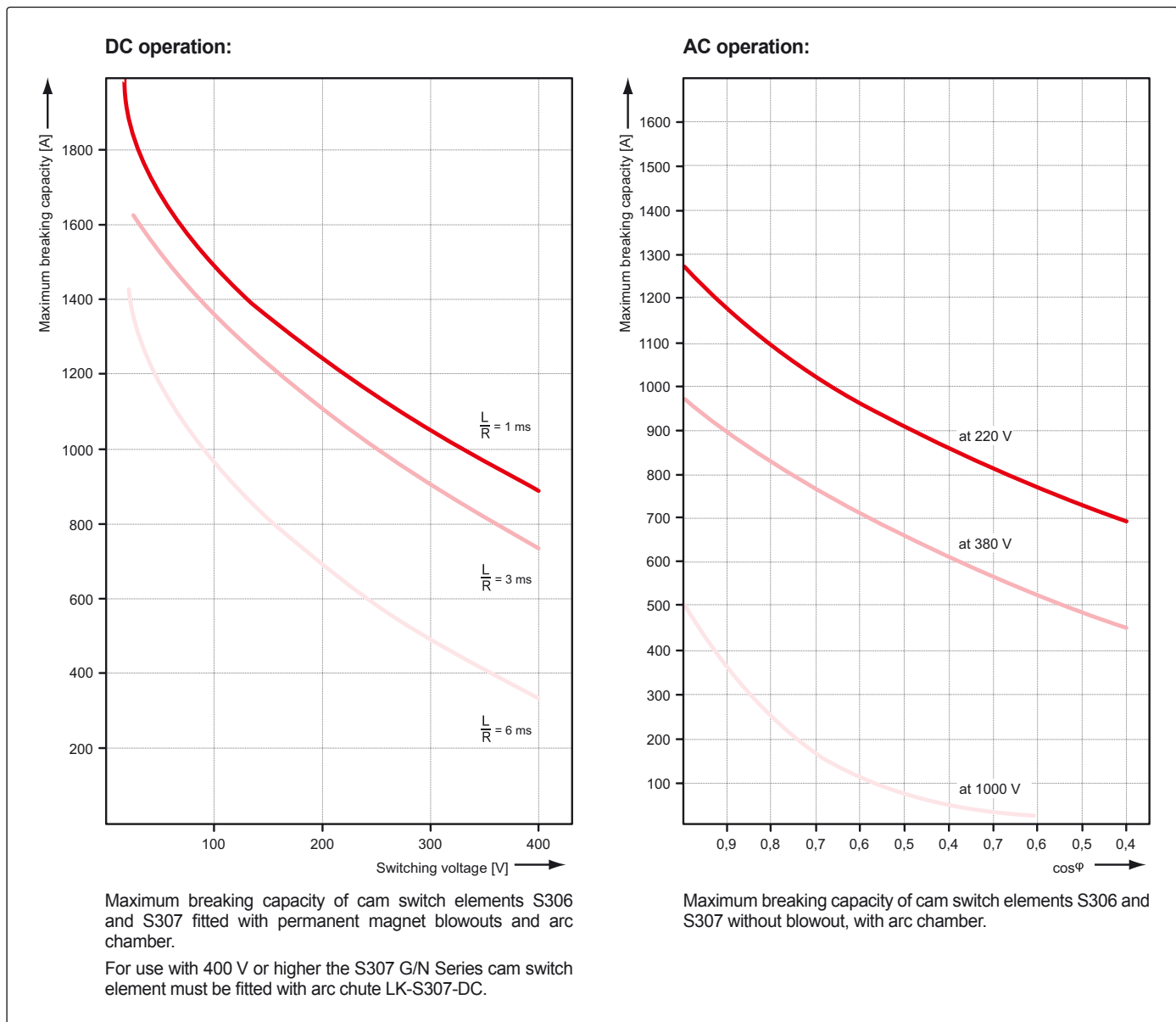
C160, C162 Series

DC operation: For voltages below 24 V or small loads at higher voltages cam switch elements without arc chamber and blowout are used. For voltages up to 40 V and corresponding high breaking capacity a cam switch element with magnetic blowout but without arc chamber is required. For voltages over 40 V an arc chamber should be used along with the cam switch element fitted with magnetic blowout. For use with 400 V or higher the S307 G/N Series cam switch element must be fitted with arc chute LK-S307-DC.

Maximum breaking capacity: The breaking capacity of a switching element is a relative value which is influenced by a number of interactive factors like the kind of current (AC or DC), voltage, amperage, switching speed, frequency of operating cycles and design life. So if the maximum is required for one of those conditions, it means that all other conditions must be reduced correspondingly. The exact values can only be determined in several test series. As a guideline for choosing the right type of switching element that suits your application the below diagrams show the maximum breaking capacity of the switching element.

AC operation: Depending on the required breaking capacity cam switch elements can be used with arc chambers or do without. Principally no magnetic blowouts are used with AC operation. A similar effect have the alternate current loops that form between the S-shaped stationary contacts and the movable contact bridge. For detailed information on the cam switch elements used in Schaltbau cam contactors refer to catalogue B40.en.

For use under normal operating conditions these values are to be reduced for reasons of safety and in order to enhance the electrical endurance of the switching element. Based on our experience, it is, therefore, recommendable to limit the actual breaking capacity to 20% up to 60% of the maximum breaking capacity as shown in the diagrams. The value of the maximum breaking capacity reflects the capacity at which the arc is still being extinguished. The making capacity depends on both the welding strength of the contact material and the speed of actuation (bouncing).

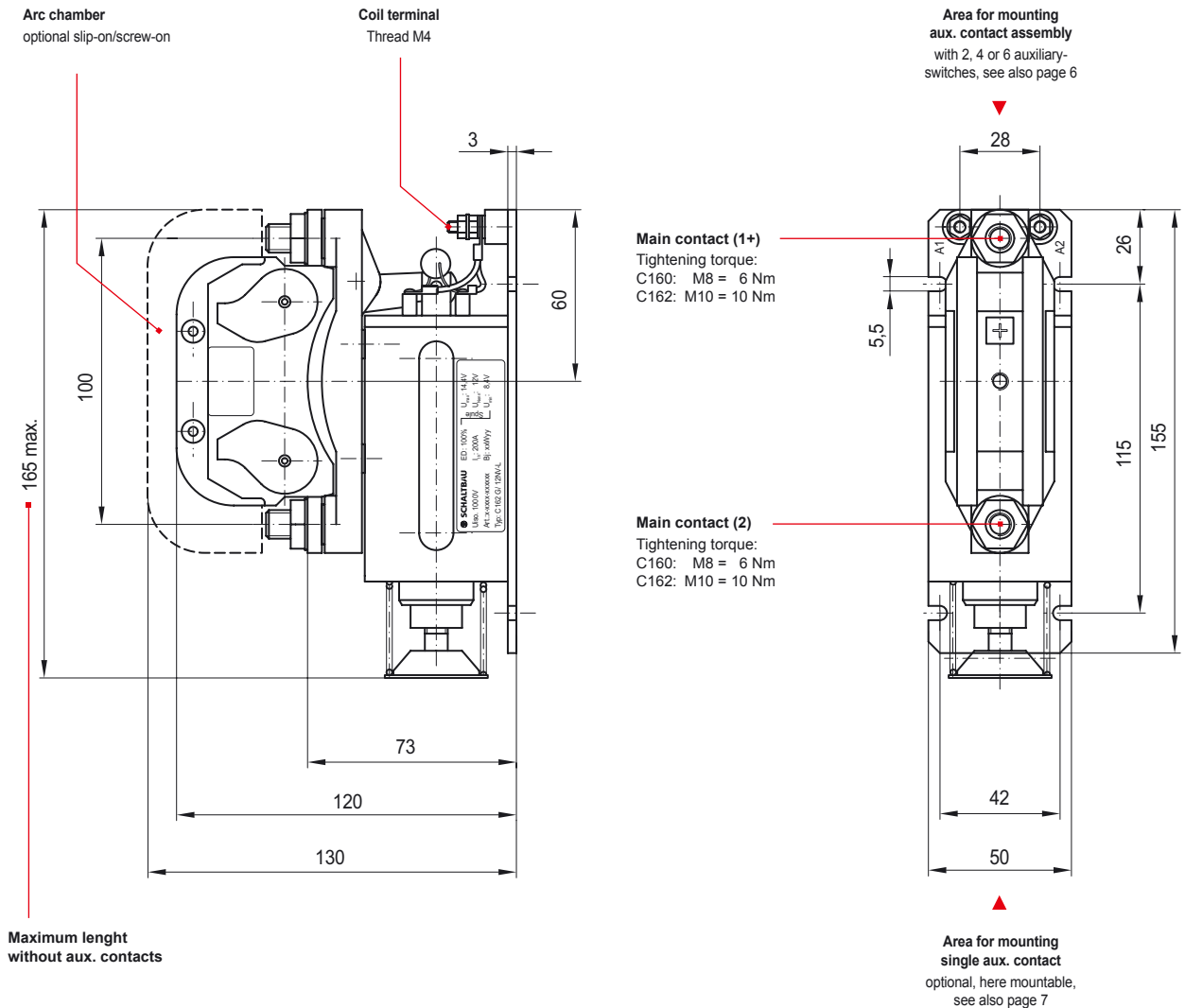


Maximum breaking capacity: In order to make choosing the right cam switch element easier the diagrams also show values which exceed the maximum breaking capacity.

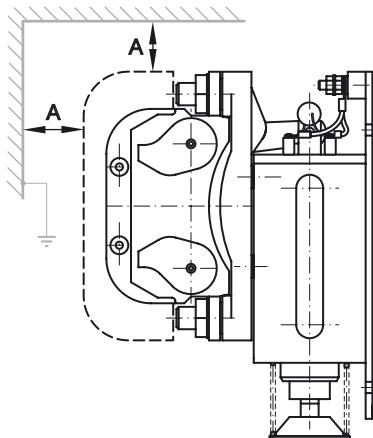
Dimension diagram, Circuit diagram

C160, C162 Series

- C160 and C162 (without auxiliary contact):

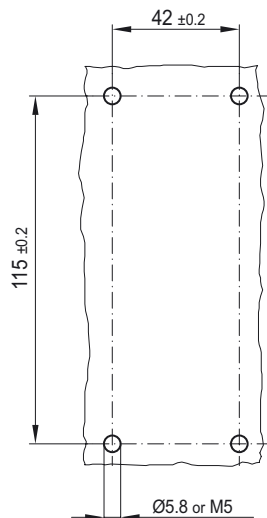


- Clearance towards live or earthed parts



Clearance towards plasma exit	A
P < rated power	70 mm
P ≥ rated power	100 mm

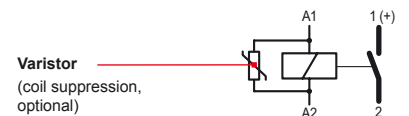
- Mounting borings:



Mounting position:

Any, preferably upright with return spring pointing downwards.

- Circuit diagram:



- Safety instructions:

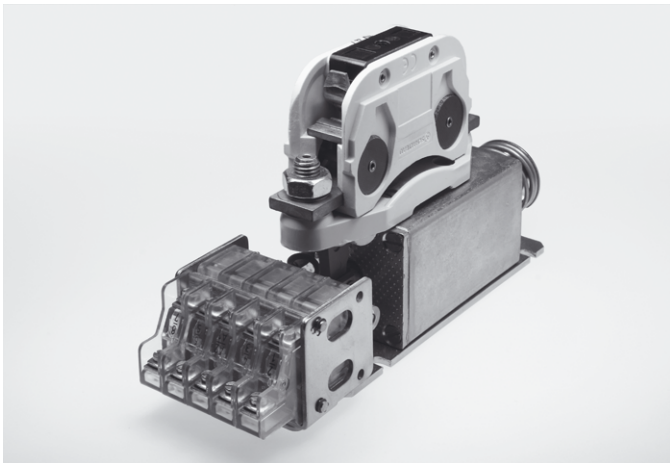
The user has to see to it that there are no exposed electrical parts of the contactor when live or under load.

The way you mount the contactor has no less an impact on the rise of temperature and the insulation of the switching device. So please observe the clearance between live or earthed parts and comply with the safety regulations of the applicable standards.

No liability will be accepted by Schaltbau in any circumstances for indirect damage resulting from clearances not being observed, devices not mounted properly, or products tampered with in any way.

Auxiliary switch block fitted with 2, 4 or 6 switching elements

C160, C162 Series



C160, C162 contactor with mounted auxiliary switch block C22 (comprising 2 SPST-NC and 2 SPST-NO contacts).

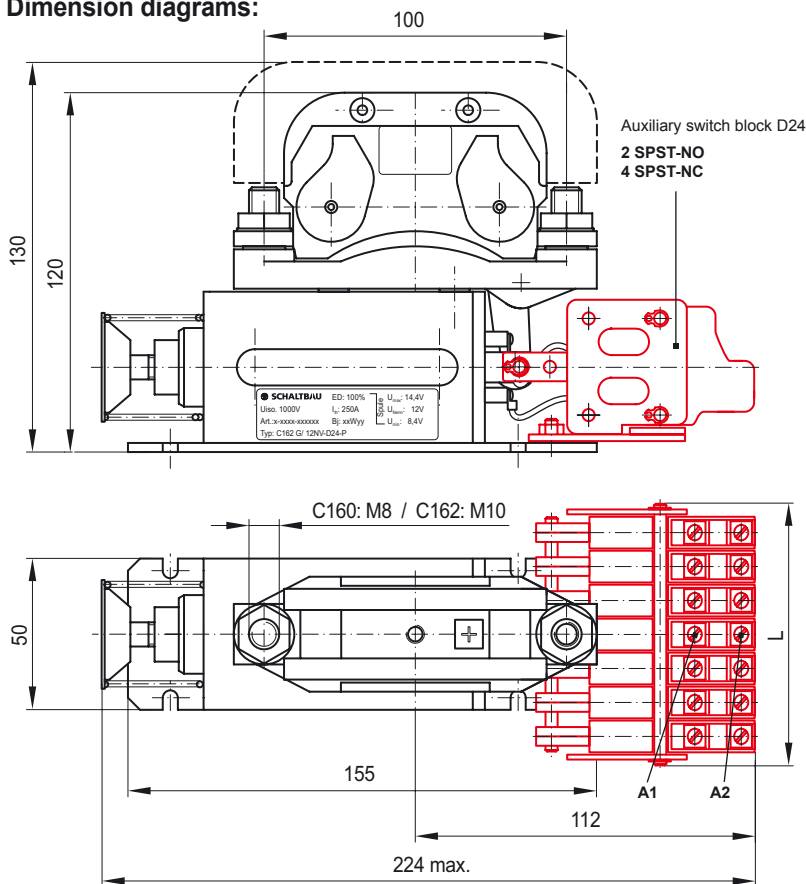
For carrying out additional control and interlocking functions switch blocks are available fitted with two, four or six auxiliary contacts.

How to order: Auxiliary switch blocks are pre-assembled at the factory and mounted to the contactor. That is why a certain switch block must be ordered together with the contactor and, unlike a single auxiliary contact, cannot be retrofitted at a later time. For exact ordering information please refer to Ordering code on page 3.

Specifications of auxiliary switch block	
Auxiliary switch	Momentary contact (SPST-NC or SPST-NO)
Number of contacts, Material	1 ... 6, hard silver (AgCu3)
Conv. thermal current I_{th}	6 A
Rated insulation voltage U_i	400 V
Terminal Wire cross-section	M3 for 1 ... 2 wires 1.0 mm ² ... 2.5 mm ²

Dimension and circuit diagrams Auxiliary switch blocks for C160, C162 Series

Dimension diagrams:



Circuit diagrams:

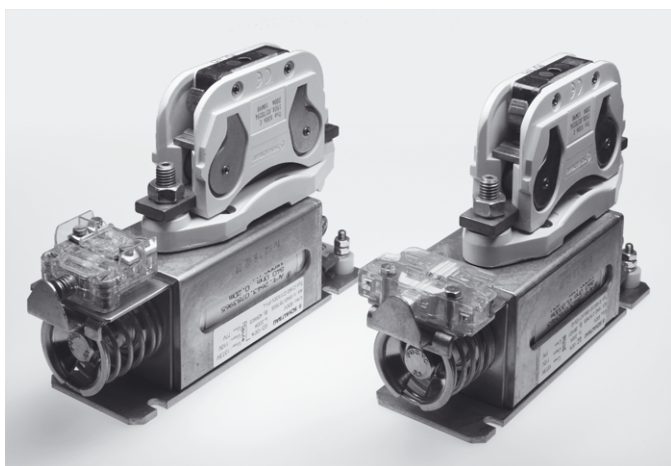
Aux. contacts Length	Circuit diagrams
Identification B02 SPST-NO A1 A2 SPST-NO L=41	
Identification B20 SPST-NC A1 A2 SPST-NC L=41	
Identification C22 SPST-NC SPST-NO A1 A2 SPST-NO SPST-NC L=63	
Identification C40 SPST-NO SPST-NO A1 A2 SPST-NO SPST-NO L=63	
Identification D24 SPST-NC SPST-NC SPST-NO A1 A2 SPST-NO SPST-NC SPST-NC L=85	
Identification D42 SPST-NC SPST-NO SPST-NO A1 A2 SPST-NO SPST-NO SPST-NC L=85	

Note:

1. With the auxiliary switch block mounted, the coil terminal of the contactor is shifted to the dummy switch in the middle of the switch block marked A1 A2 in the circuit diagram.
2. The individual switches as shown in the circuit diagrams are pre-assembled as an auxiliary switch block at the factory and mounted to the contactor. Other switch block versions are not possible in order to maintain the symmetry of power of the assembly.

Auxiliary contacts Single auxiliary contacts

C160, C162 Series



C160, C162 Series contactors with mounted snap-action switches as single auxiliary contact (left S804, right S826 Series).

For carrying out additional control and interlocking functions an auxiliary contact will normally do. For this purpose our single auxiliary contact which can also be retrofitted is suited best.

Features:

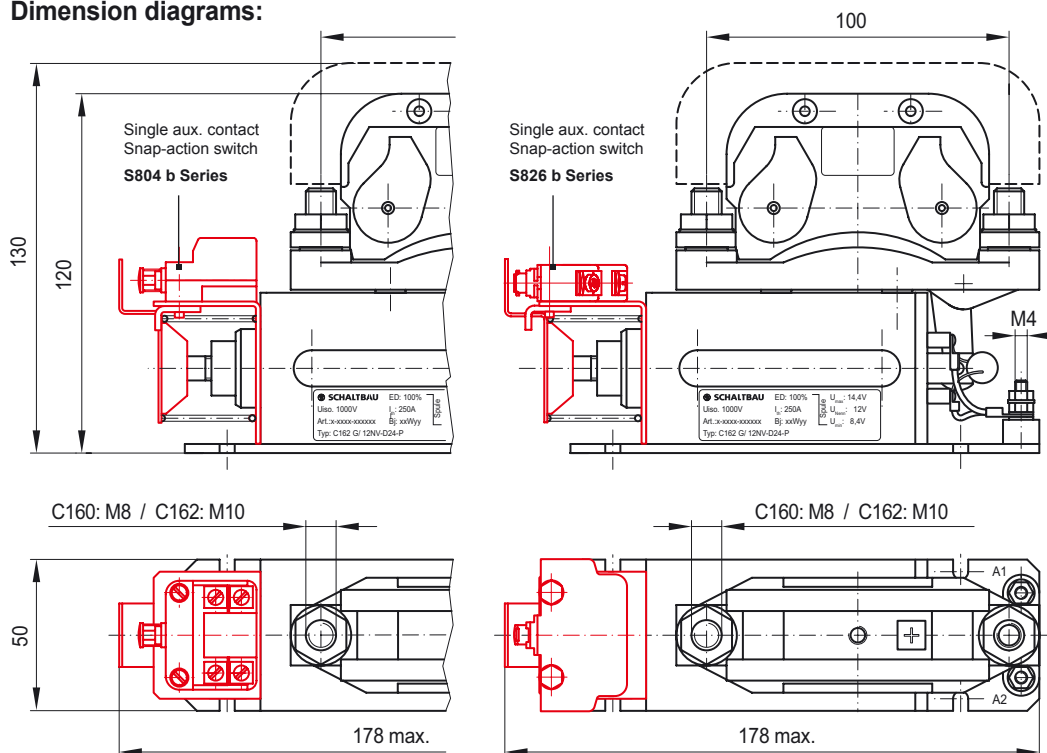
- Form Z circuitry SPDT with double-break contacts
- Snap-action switch with positive opening operation
- Solid contact bridge
- Wiping, self-cleaning contacts (only S826)

Specifications of single auxiliary contact

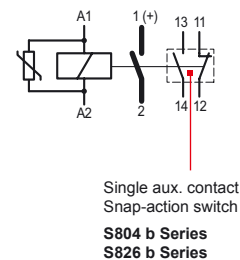
Auxiliary contact	Snap-action switch S804 (see cat. D20e) Snap-action switch S826 (see cat. D26e)
Number of contacts, Material	1, hard silver (AgCu3)
Conventional thermal current I_{th}	10 A
Rated insulation voltage U_i	400 V
Terminal Wire cross-section	M3 for 1 ... 2 wires 0.75 mm ² ... 2.5 mm ²

Dimension and circuit diagrams Single auxiliary contact for C160, C162 Series

Dimension diagrams:



Circuit diagram:



Scope of delivery:

Single auxiliary contact comprising supporting bracket and snap-action switch together with spring plate (spring Ø: 30 mm) for retrofitting. See Ordering code, page 2.

Mounting Single auxiliary contacts

Mounting is easy and when done properly there is no need of adjusting the contactor anew.

Pull off the existent slotted spring plate and remove the return spring. Push the supporting bracket together with the switching element over the cylinder of the magnetic drive and replace the return spring. While pretensioning the return

spring a little, fit in the new spring plate together with the actuator angle. The operating position of the auxiliary switch can be adjusted either by moving the switch on its supporting bracket or by slightly bending of the actuator angle.

For the exact ordering code of single auxiliary contacts refer to page 2.



Schaltbau GmbH manufactures in compliance with RoHS.



Schaltbau GmbH has an environment management system that has been certified since 2002.



Schaltbau GmbH has a quality management system that has been certified since 1994.

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 stop 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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