TeSys

TeSys B - Bar-mounted
variable composition contactors

Catalog 2020

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More than 75% of our product sales offer superior transparency on the material content, regulatory information and environmental impact of our products:

- RoHS compliance
- REACh substance information
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*PEP: Product Environmental Profile (i.e. Environmental Product Declaration)

Tesys

TeSys B - Bar-mounted variable composition Contactors

General contents

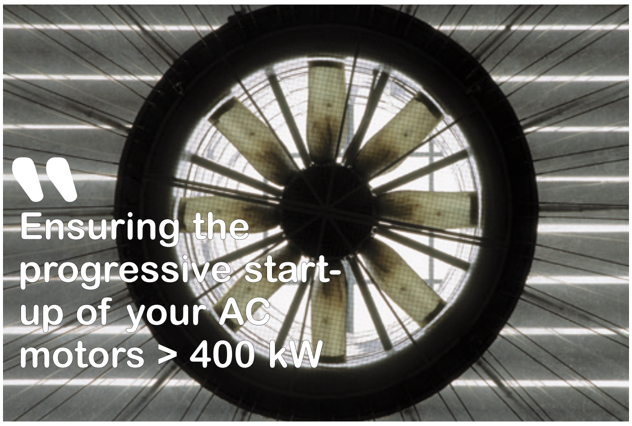
Variable composition contactors,

The use of a variable composition contactor (also called bar-mounted contactor) becomes evident when the specification of the application can no longer be met with a standard contactor.

- High power load: > 400 kW.
- AC main supply from 1000 to 3000 V.
- Very inductive DC load: L/R > 15 ms.
- DC main supply with low current but voltage over 1000 V.
- High operating frequency: up to 1200 op./h.
- High durability: several millions of operations.

Some examples

The fact sheets are available at http://www.se.com/



Application form ref. EDCED110013EN

Application form ref. EDCED110014EN

Application form ref. EDCED110017EN

Application form ref. EDCED110018EN

Videos

Very high power contactors - **TeSys** B - 1 - Discovery

Discover Schneider Electric's TeSys B bar contactors that are designed to cut out considerable electric arcs. See how they are manufactured in the Schneider Electric factory and check out the presentation of the range.

Very high power contactors -**TeSys** B - 2 - Applications

Discover very high-power applications for which Schneider Electric's TeSys B bar contactors offer great advantages.

for very high power applications

Application form ref. EDCED110015EN

Application form ref. EDCED110016EN

Application form ref. EDCED110019EN

Application form ref. EDCED110020EN

Very high power contactors -**TeSys** B - 3 - Technology

Discover how Schneider Electric's TeSys B bar contactors cut out electric arcs of up to several thousand Amps: 'magnetic blowing'.

TeSys
TeSys contactors
Panorama

Applications		Equipment based on standard contactors					Equipment requiring low consumption contactors which can be switched directly from solid state outputs	

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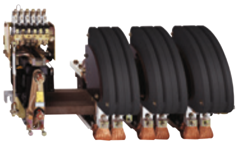
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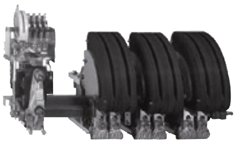
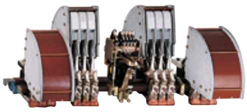
Rated operational current	AC-3	6 A	6...16 A	9…150 A	115…800 A	750…1800 A	6…12 A	9…25 A
	AC-1	12 A	20 A	25…200 A	200…2100 A	800…2750 A	20 A	20…40 A
Max. rated operational voltage		690 V	690 V	690 V	1000 V	1000 V	690 V	690 V
Number of poles		2 or 3	3 or 4	3 or 4	2, 3 or 4	1…4	3 or 4	3
Contactor type references		**LC1SK** **LP1SK**	**LC1K** **LC7K** **LP1K**	**LC1D**	**LC1F**	**LC1B**	**LP4K**	**LC1D**
Pages		Please consult our catalogue “Motor starter solutions. Control and protection components”.				page 7	Please consult our catalogue “Motor starter solutions. Control and protection components”.	

Equipment requiring magnetic latching contactors	Motors, resistive circuits, rotor short-circuiting devices, electro lifting magnets, hoisting, mines, DC motors, high operating rates. Variable composition bar mounted contactors.	Induction heating, heating of metal or of a metal part in a channel or crucible furnace by induction of a.c. currents. Contactors for induction heating applications.	Applications conforming to “NATO” specifications and references. Shockproof contactors
DF533688_1.eps  PB112366.eps 	PB110869.eps 	DF533690.eps 	DF533692_1.eps 
150…1800 A	80...1800 A	–	12…630 A
250…2750 A	80…2750 A	80…2340 A	25…850 A
1000 V	∿ 1000 V ⎓ 440 or 1500 V	3000 V	690 V or 1000 V
1…4	1…6	1…8	3 or 4
CR1F **CR1B**	**CV●**	**CE●** **CS●**	**LC1FG●●●**
CR1F: Please consult our catalogue “Motor starter solutions. Control and protection components”. CR1B: page 113	Pages 6 and 7	Please consult your Regional Sales Office	

TeSys
TeSys B Variable composition contactors
Panorama

Variable composition contactors

Applications	
	■ Motor switching in categories AC-3. ■ Resistive load switching: heating, lighting. ■ Distribution circuit switching: line contactor. ■ Supply changeover switching: circuit coupling. ■ Transformer, capacitor.

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Contactors	Type	**CV1B**					
	Size	**F**	**G** (1)	**H**	**J** (1)	**K**	**L** (1)
Rated operational current	AC-3	80 A		250 A		460 A	
	AC-4/DC-5	72 A/–		205 A/–		380 (2) /630 A (3)	
	AC-1	80 A		300 A		630 A	
Max. rated operational voltage		690 V ∿		690 V ∿		690 V∿ (2) /1000 V ∿ (3)	
Available with configuration type command		A - B - C - D					

Available control circuit configuration	**Type A**	**Type B**
	a.c. supply ∿	d.c. supply ⎓

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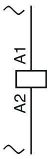

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(1) CV1B legacy size 'G', 'J', 'L' please consult us.
(2) With PN1 type poles.
(3) With PN3 type poles.

Standard and high performance contactors

- Motor switching in categories AC-4, DC-5.
- Inductive circuit switching: crane electromagnets.
- High voltage d.c. switching: railway locomotives.
- Load switching at high operating rates.

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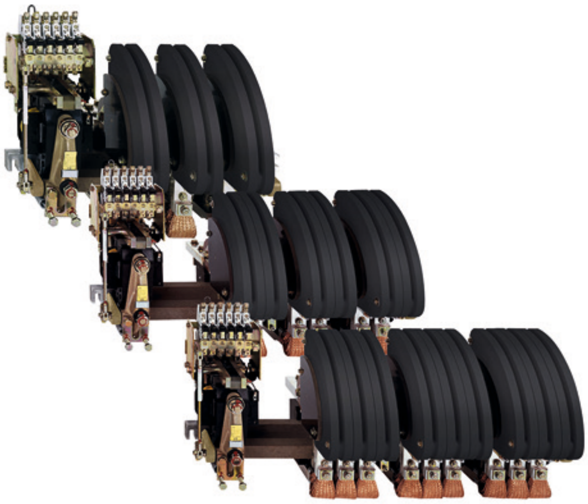

CV3B					CV3B and LC1B			
F	G (1)	H	J (1)	K (1)	L	M	P	R
80 A		250 A			800 A	1000 A	1500 A	1800 A
80/80 A		208/300 A			720/800 A	830/1000 A	1200/1800 A	1500/2500 A
80A		300 A			800 A	1250 A	2000 A	2750 A
1000 V ∿		1000 V ∿			1000 V ∿	1000 V ∿	1000 V ∿	1000 V ∿
A - B - C - D					C - D (B: special conditions - contact us)			

Type C
a.c. supply via economy resistor

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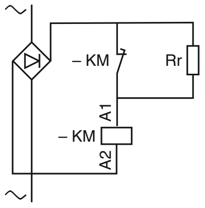

Type D
d.c. supply via economy resistor

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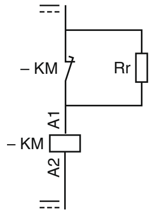

(1) CV3B legacy size 'G', 'J', 'K', please consult us.

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Variable composition contactors

Applications	■ Excitation circuit control of synchronous machine.

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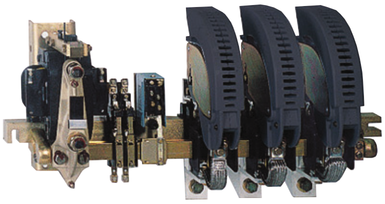

Contactors Type	**CRXB - CVXB contact N/O**								
Size	**F**	**G (1)**	**H**	**J (1)**	**K**	**L**	**M**	**P**	**R**
DC current rating	80 A		300 A		630 A	800 A	1250 A	2000 A	2750 A

Max. rated operational voltage	850 V ⎓
Available with configuration type command	CVXB: C - D CRXB: E - F

Available control circuit configuration	**Type C**	**Type D**
	a.c. supply via economy resistor	d.c. supply via economy resistor

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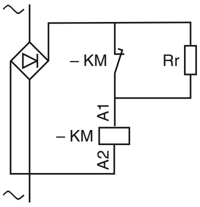

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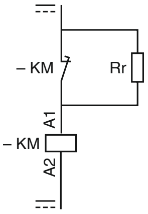

(1) CRXB - CVXB legacy size 'G', 'J', please consult us.

Specific contactors

Applications	
	■ Magnetic latching contactors

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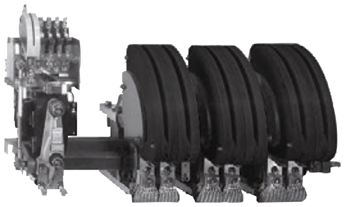

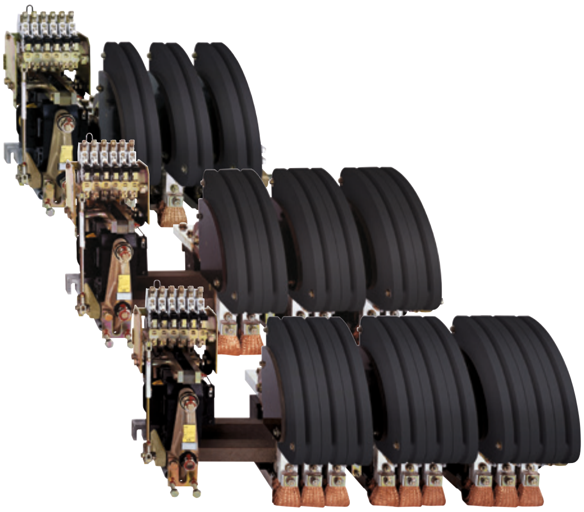

Contactors		CR1B contact N/O								
	Type									
	Size	F	G (1)	H	J	K	L	M	P	R
Rated operational current	AC-3	80 A		250 A		460 A	800 A	1000 A	1500 A	1800 A
	AC-4/DC-5	80/80 A		208/300 A		380/500 A	720/800 A	830/1000 A	1200/1800 A	1500/2500 A
	AC-1	80A		300 A		500 A	800 A	1250 A	2000 A	2750 A
Max. rated operational voltage		690 V ∿		690 V ∿		690 V ∿	1000 V ∿	1000 V ∿	1000 V ∿	1000 V ∿
Available with configuration type command		E - F								

Type E

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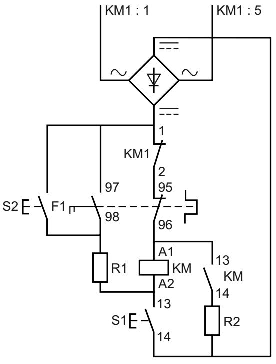
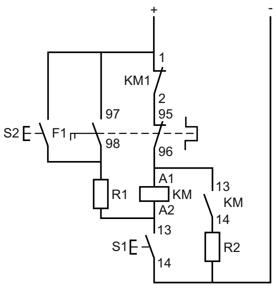


Type F

Control with magnetic locking (d.c. supply)



Not provided:
S1: latching pushbutton.
S2: unlatching pushbutton.

(1) *CR1B legacy size 'G', 'J', please consult us.*

Variable composition contactors (or bar-mounted contactors) - 3 groups

■ **Low power switching contactors:**
□ type CV1B●, 80 to 630 A
□ type CV3B●, 80 to 500 A.
For motor control, the references of the CV1 contactors are given on page 17 and for the CV3 on page 19.
For other applications, the composition of the commercial references is described on Symbol combination table, see pages 37 and 38 or use the configuration software “bar contactor soft-customer.xls” to download on: www.se.com.

■ **Increased power switching contactors:**
□ type LC1B●, 800 to 2750 A. References shown on page 19.

■ **Specific contactors** (large number of main poles, pole arrangement, customised fixing and dimensions, component referencing, etc.) :
□ type CV1●B, 80 to 1000 A
□ type CV3●B, 80 to 2750 A.
To order these contactors, complete the Order form on page 136.

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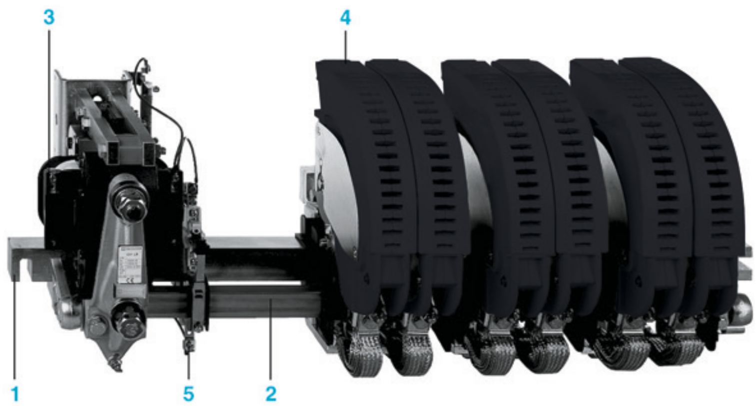


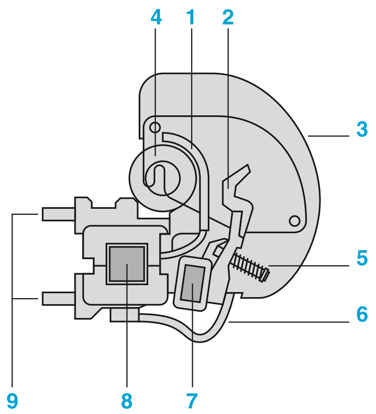
1 Mounting bar
2 Rotating armature shaft
3 Electromagnet
4 Main pole
5 Instantaneous auxiliary contacts

Variable composition contactors are particularly suited for switching a.c. or d.c. motors and other circuits and are capable of providing a high number of operating cycles.
Their variable composition design allows them to be built to customer specification.

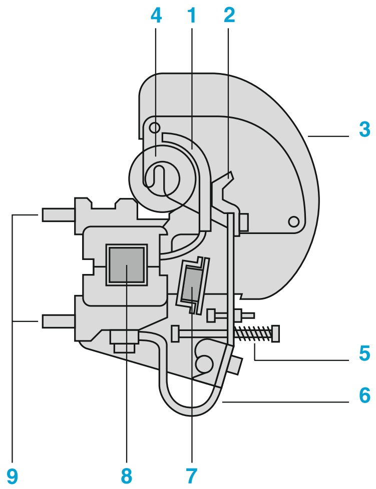
Applications

These variable composition contactors are ideally suited for the most frequently encountered applications:

■ Switching a.c. squirrel cage and slip-ring motors in all utilisation categories (AC-2, AC-3, AC-4).
■ Switching d.c. motors in all utilisation categories (DC-2, DC-3, DC-4, DC-5).
■ Switching a.c. resistive loads (category AC-1) and d.c. resistive loads (category DC-1).
■ Switching distribution circuits (category AC-1).
■ Short-circuiting of rotor resistors.
■ Switching capacitors, power factor correction.
■ Switching transformer primaries.
■ Switching inductive circuits with high time constant (L/R > 15 ms)
Example: alternator excitation circuit.
■ Severe duty requirements and main pole arrangements comprising 1 to 6 N/O and/or N/C poles.



N/O pole 80…2750 A.



N/C pole 80…1000 A.

1 Fixed contact
2 Moving contact
3 Arc chamber
4 Blow-out coil
5 Pole pressure spring
6 Braided conductor
7 Rotating armature shaft (moving contact actuator)
8 Mounting bar
9 Terminal lugs

Power circuit

The principal function of a main pole is to make and break the supply current.
It is designed to continuously carry its nominal operational current.

Making the current

On energisation of the electromagnet coil, the armature shaft rotates and the moving contact makes with the fixed contact. The contact pressure, maintained by the pole pressure spring, is sufficient to overcome the electrodynamic forces of transient current peaks (e.g.: switching a transformer, starting a motor, etc.).

Breaking the current

On de-energisation of the electromagnet coil, the contacts separate and electrical arcing is dissipated by the blow-out coil and arc chamber. To optimise the performance of the magnetic blow-out, the blow-out coil can be selected to suit the operational current, which is particularly important when switching d.c.
The N/C pole operates in a reverse manner to the N/O pole, i.e. the contacts are closed whilst the electromagnet coil is de-energised and open during energisation.

Main pole types

CV1 contactors

■ **690 V ∿, 220 V ⎓ / pole**
□ N/O poles 80…630 A (PN1)
□ N/C poles 80…630 A (PR1).

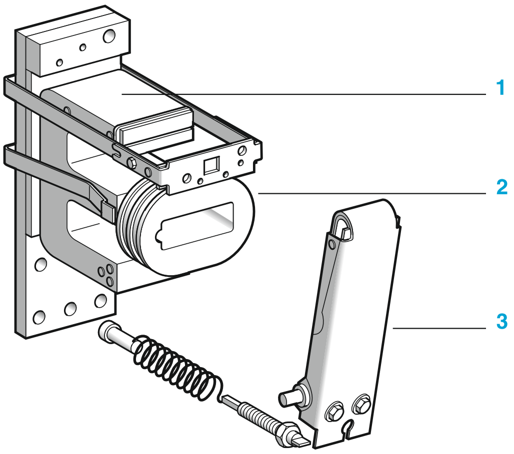
■ **Variants:**
□ no-load breaking poles
- N/O poles 80…630 A (PN5)
- N/C poles 80…630 A (PR5).

□ arc chambers with splitters for dispersing the electric arc: 1000 V ∿ / 440 V ⎓ per pole
- N/O poles 80…630 A (PN3)
- N/C poles 500…630 A (PR3).

CV3 contactors

■ **1000 V ∿, 440 V ⎓ / pole**
□ N/O poles 0…300 A (PA3)
□ N/C poles 80…300 A (PR3)
□ N/O poles 750…2750 A (PA1).

■ **Variants:**
□ high making capacity poles 750…2750 A (PA2)
□ high breaking capacity poles and poles with reduced safety clearances (arc chambers with closed splitters) 750…2750 A (PA1PX8)
□ no-load breaking poles
- N/O poles 750…2750 A (PA5).



Electromagnet EB1
1 Electromagnet core
2 Coil
3 Electromagnet armature

Control circuit

■ 2 types of electromagnet: E shaped core and U shaped core.
■ 2 types of coil: type WB1 and type WB2.

E-shaped electromagnet and coil type WB1 for AC / DC network

■ **Electromagnet with E shaped laminated iron core, type EB** (1)
□ with central air gap machined in armature,
□ with single coil type **WB1** fitted on centre limb of core.
The upper limb incorporates a shading ring, the armature rotates.

■ **Coil - direct a.c. 50 or 60 Hz supply**
□ 20 to 500 V
□ 1200 operations/hour.

At the moment of inrush, with the armature open, the coil impedance is low and power consumption is high.
In the sealed state the armature is closed, the coil impedance increases and power consumption is low.
The inrush current is 6 to 10 times higher than the sealed current.

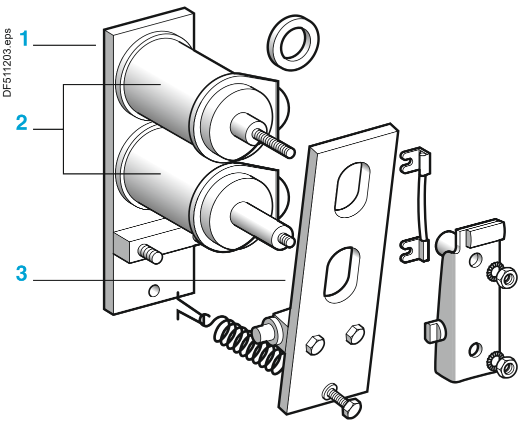
■ **Electromagnet** directly DC powered or via individual rectifier (50-400 Hz):
□ the electromagnet is mounted with the reduction in consumption
□ 12 to 500 V
□ 120 operations/hour.

■ **Electromagnet** powered via individual rectifier (50-400 Hz):
□ the electromagnet is mounted with the reduction in consumption
□ 12 to 500 V
□ 120 operations/hour.

At the moment of inrush, the full actuating voltage is applied to the coil and the inrush current is determined by the coil resistance.
In the sealed state an additional resistor is switched automatically in series with the coil, so as to reduce power consumption.
This economy resistor is switched by a N/C auxiliary contact which is adjusted to open only when the armature is fully closed.
The inrush current is 15 to 40 times higher than the sealed current.

Coils type WB1, used in conjunction with laminated iron cores, have a much higher inrush current than sealed current, whatever the nature of the supply current.

When establishing the current and selecting the supply voltage rating, it is important to take into account the line voltage drop due to the inrush current.



Electromagnet EK
1 Electromagnet core
2 Coil
3 Electromagnet armature

Electromagnet with U shaped core and coil type WB2 for d.c. supply

■ **Electromagnet** with U shaped solid iron core, type **EK:**
□ 2 similar coils type **WB2** connected in series, one coil being fitted to each limb of the core
□ the armature rotates.

■ **Electromagnet** for d.c. supply
□ 12 to 500 V
□ 1200 operations/hour.

The coils for this type of electromagnet have a considerable number of turns so as to obtain sufficient magnetic flux to attract the armature.

Due to its simplicity and relatively slow movements the assembly is very robust and, therefore, has increased mechanical durability.

(1) CRX, CVXB legacy size 'G', 'J'. Please consult us.

Instantaneous and time delay auxiliary contacts

Signalling, electrical interlocking and slave functions can be achieved by using auxiliary contacts.

Instantaneous auxiliary contacts suitable for use with all contactor types:
■ 1 block of 3 instantaneous N/O contacts and 2 N/C instantaneous contacts, reference LA1BN32A.

Delayed auxiliary contacts can be mounted onto contactors CV1 and CV3:
■ On the block LA1BN32A, 1 block of N/O ON-delayed contact + 1 N/C ON-delayed contact , references LADT0 (delay from 0.1 to 3 s), LADT2 (0.1 to 30 s), LADT4 (10 to 180 s)
■ On the block ref. LA1BN32A: 1 block of N/O OFF-delayed contact + 1 N/C OFF-delayed contact, references LADR0 (delay from 0.1 to 3 s), LADR4 (10 to 180 s).

The delayed contacts are established or separate some time after the closing or opening of the contactor which operates them. This time is adjustable.

On the block LA1BN32A all TeSys D contactors additives can be mounted, with the exception of LA6DK, LAD6K, LADN01, LADN10 and LAD8N.

Assembling reversing/changeover contactor pairs

Mounting accessories

For applications involving the switching of reversing motors or changeover circuits, contactors of different ratings can easily be mounted vertically and interlocked. Mechanical interlock kits are available and auxiliary contacts can be used for electrical interlocking.

CV1B, CV3B, LC1B Selection guide

CV1B for control of motors ⩽ 690 V in AC-3

Selection guide for utilisation category AC-3 according to required electrical durability

Rated operational current in A at □ ⩽ 55 °C

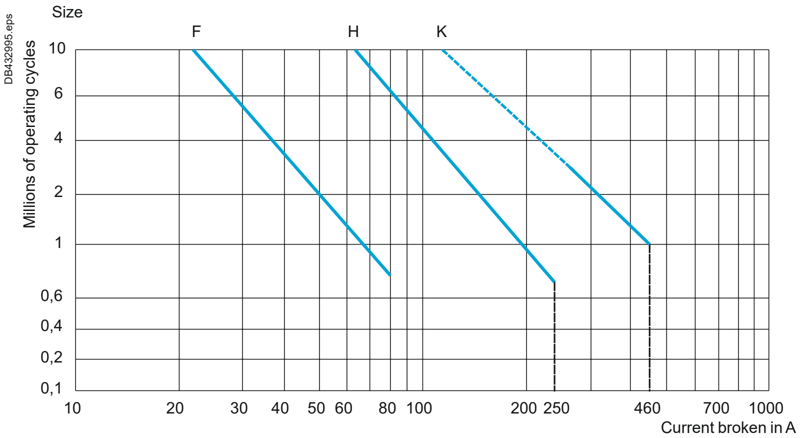
CV1 contactors	Size					
	F	G (1)	H	J (1)	K	L (1)
Maximum operating rate in operating cycles/hour	**1200**		**1200**		**1200**	
⩽ 440 V	80		250		460	
500 V	50		200		450	
690 V	35		150		400	

Nominal operational power at □ ⩽ 55 °C

CV1 contactors	Size					
	F	G (1)	H	J (1)	K	L (1)
Maximum operating rate in operating cycles/hour	**1200**		**1200**		**1200**	
220/230 V	22		75		140	
380/400 V	37		132		250	
415/440 V	37		140		260	
500 V	30		110		315	
660/690 V	22		110		315	

(1) CV1B legacy size 'G', 'J', 'L', please consult us.

Electrical durability (Ue ⩽ 440 V)



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CV1BF●A

CV1B contactors - references according to motor power ratings in category AC-3

References

3-pole contactors for motor control

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3						Maximum rated operational current, category AC-3	Instantaneous auxiliary contacts per contactor		Basic reference, to be completed by adding the voltage code (1) (2)	Frequently used voltage codes	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660/ 690 V						
kW	kW	kW	kW	kW	kW	A					kg
22	37	37	37	30	22	**80**	3	2	**CV1BF3F0Z●●A**	**E5 F5 M5 Q5**	4.000
75	132	140	140	110	110	**250**	3	2	**CV1BH3H0Z●●A**	**E5 F5 M5 Q5**	11.000
140	250	260	260	315	315	**460**	1	1	**CV1BK3K0Z●●11**	**F5 M5 Q5**	40.000

(1) For other compositions, make up the contactor reference as explained on page 36.
(2) Standard control circuit voltages (variable delivery, please contact us):

Volts	48	110	120	127	208	220	230	240	380	400	440
50 Hz	E5	F5	–	G5	–	M5	P5	U5	Q5	V5	R5
60 Hz	E6	–	K6	–	L6	M6	P6	U6	Q6	V6	R6
50/60 Hz	E7	F7	K7	G7	L7	M7	P7	U7	Q7	V7	R7
⎓	ED	FD	KD	GD	–	MD	PD	UD	QD	VD	–
⎓ + *Econ.R.* (3)	ER	FR	KR	GR	–	MR	PR	UR	QR	VR	–

For other voltages: please consult your Regional Sales Office.
(3) Econ.R.: Economy resistor.

CV3B and LC1B for motor control ⩽ 1000 V in AC-3

Selection guide for utilisation category AC-3 according to required electrical durability

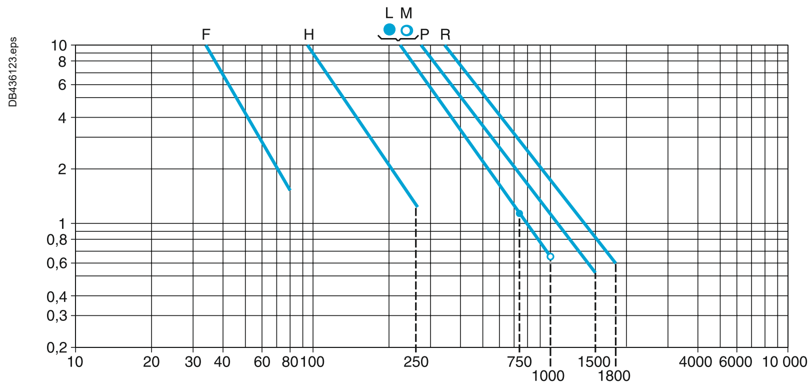
Rated operational current in A at ⩽ 55 °C

Contactors CV3 and LC1B	Size					
	F	H	L	M	P	R
Maximum operating rate in operating cycles/hour	1200	1200	120	120	120	120
⩽ 440 V	80	290	800	1000	1500	1800
500 V	80	250	800	1000	1500	1800
690 V	70	240	750	900	1000	1100
1000 V	70	220	500	500	600	700

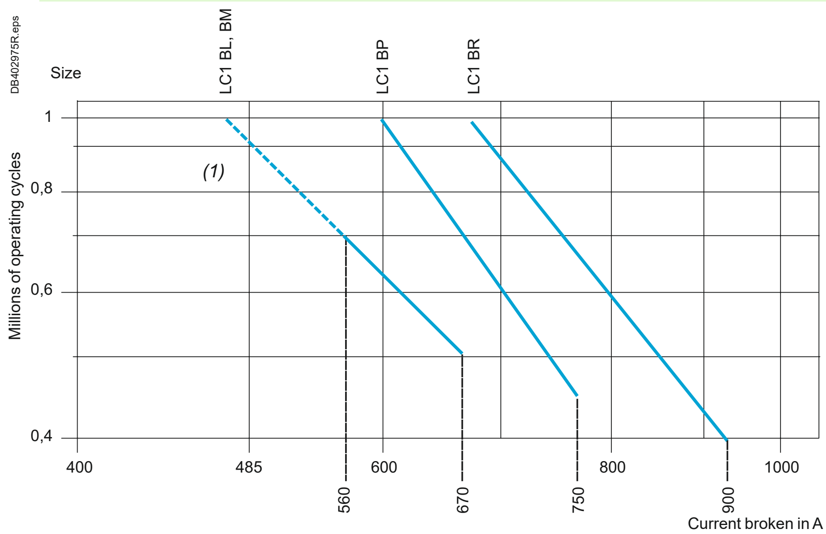
Nominal operational power at ⩽ 55 °C

Contactors CV3 and LC1B	Size					
	F	H	L	M	P	R
Maximum operating rate in operating cycles/hour	1200	1200	120	120	120	120
220/230 V	22	75	220	280	425	500
380/400 V	37	132	400	500	750	900
415 V	37	132	425	530	800	900
440 V	45	132	450	560	800	900
500 V	45	160	500	600	750	900
660/690 V	55	200	560	670	750	900
1000 V	90	250	530	530	670	750

Electrical durability (Ue ⩽ 440 V)



Electrical durability (Ue ⩽ 690 V)



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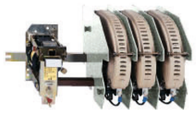

CV3BF

CV3B, LC1B contactor - references according to standard motor power ratings in category AC-3

References

Contactors for motor control in category AC-3, from 80 to 460 A

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 220 V 230 V	380 V 400 V	415 V	440 V	500 V	660/ 690 V	1000 V	Maximum rated opera-tional current, category AC-3	Instan-taneous auxiliary contacts per contactor (NO)	(NC)	Basic reference, to be completed by adding the voltage code (1) (2)	Frequently used voltage codes	Weight
kW	kW	kW	kW	kW	kW	kW	A					kg
22	37	37	45	45	55	90	**80**	3	2	**CV3BF3F0Z●●A**	**E5 F5 M5 Q5**	10.600
75	132	132	132	160	200	250	**285**	3	2	**CV3BH3F0Z●●A**	**E5 F5 M5 Q5**	15.000

(1) For other compositions, make up the contactor reference as explained on page 36.
(2) Standard control circuit voltages (variable delivery, please contact us):

Volts	48	110	120	127	208	220	230	240	380	400	440
50 Hz	E5	F5	–	G5	–	M5	P5	U5	Q5	V5	R5
60 Hz	E6	–	K6	–	L6	M6	P6	U6	Q6	V6	R6
50/60 Hz	E7	F7	K7	G7	L7	M7	P7	U7	Q7	V7	R7
⎓	ED	FD	KD	GD	–	MD	PD	UD	QD	VD	–
⎓ + *Econ.R.* (3)	ER	FR	KR	GR	–	MR	PR	UR	QR	VR	–

For other voltages: please consult your Regional Sales Office.
(3) Econ.R.: Economy resistor.

Contactors for motor control in category AC-3, from 750 to 1800 A (~ or ⎓)

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	1000 V	Maximum rated opera-tional current in AC-3	Instan-taneous auxiliary contacts per contactor (NO)	(NC)	Basic reference, to be completed by adding the voltage code (4)	Frequently used voltage codes			Weight
kW	kW	kW	kW	kW	kW	kW	A							kg
220	400	425	450	500	560	530	**800**	2	2	**LC1BL33●22**	**G**	**P**	**V**	57.000
								3	1	**LC1BL33●31**	**G**	**P**	**V**	57.000
								1	3	**LC1BL33●13**	**G**	**P**	**V**	57.000
								4	–	**LC1BL33●40**	**G**	**P**	**V**	57.000
280	500	530	560	600	670	530	**1000**	2	2	**LC1BM33●22**	**G**	**P**	**V**	60.000
								3	1	**LC1BM33●31**	**G**	**P**	**V**	60.000
								1	3	**LC1BM33●13**	**G**	**P**	**V**	60.000
								4	–	**LC1BM33●40**	**G**	**P**	**V**	60.000
425	750	800	800	700	750	670	**1500**	2	2	**LC1BP33●22**	**G**	**P**	**V**	94.000
								3	1	**LC1BP33●31**	**G**	**P**	**V**	94.000
								1	3	**LC1BP33●13**	**G**	**P**	**V**	94.000
								4	–	**LC1BP33●40**	**G**	**P**	**V**	94.000
500	900	900	900	900	900	750	**1800**	2	2	**LC1BR33●22**	**G**	**P**	**V**	129.000
								3	1	**LC1BR33●31**	**G**	**P**	**V**	129.000
								1	3	**LC1BR33●13**	**G**	**P**	**V**	129.000
								4	–	**LC1BR33●40**	**G**	**P**	**V**	129.000

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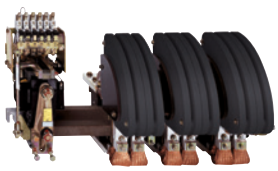

LC1BP

(4) Standard control circuit voltages (variable delivery, please contact us):

Volts	48	110	120	125	127	220	230	240	380	400	415	440	500
~ 50…400 Hz	–	F	K	–	G	M	P	U	Q	V	N	R	S
⎓	ED	FD	–	GD	–	MD	–	UD	–	–	–	RD	SD

For voltages other than those listed above, please consult us.

CV1B for control of resistive circuits ⩽ 690 V in AC-1

Selection guide for utilisation category AC-1 according to required electrical durability

Maximum rated operational current (open-mounted device)

CV1 contactors				**Size**		
				F	**H**	**K**
Maximum operating rate in operating cycles/hour				1200	1200	1200
Connections						
	Cable	C.s.a.	**mm²**	25	185	–
	Bars	Number		–	–	2
		C.s.a.	**mm**	–	–	40 x 5
⩽ 40 °C			**A**	80	300	630
⩽ 55 °C			**A**	80	300	600
⩽ 70 °C			**A**	80	300	550

Increase in operational current by paralleling of poles

Apply the following multiplying factors to the current values given above. The factors take into account the often unbalanced current distribution between poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.

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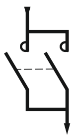

Example: 2 poles in parallel.

Electrical durability (Ue ⩽ 440 V)

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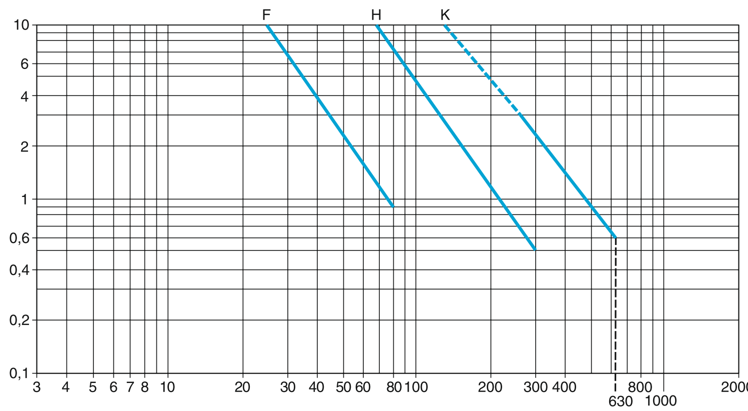

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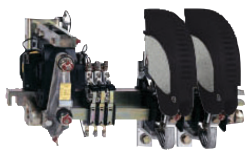

CV1BK

Resistive circuits control ⩽ 690 V in AC-1

Selection of contactor size for utilisation category AC-1

Maximum possibilities of the contactor, new design (size F to H)

N/O poles	N/C poles
0	1
1	0
1	1
2	0
2	1
3	0
4	0

For another combination, please contact us.

Maximum possibilities of the standard contactor (size K)

N/O poles	N/C poles
0	1
1	0
1	1
0	2
2	0
2	1
3	0
4	0

Auxiliaries contacts

■ Size F-H, 5 instantaneous contacts (3N/C + 2N/O) + TeSys D contactor (except for LA6DK, LADN01, LADN10, LAD6K and LAD8N).

■ Size K, up to 5 instantaneous contacts and 1 time delay contact.

Electromagnet and coil(s)

■ For direct a.c. control

■ For direct d.c. control

■ For a.c. or d.c. control via economy resistor

(accessories: economy resistor + contact, rectifier).

Auxiliary contact blocks per contactor

Contact type	Composition		Control circuit			Reference	Weight
			∿ direct	⎓ direct	∿ or ⎓ with economy resistor		kg
Contactor - Size F - H - K							
Instantaneous	3	2	1	1	1	**LA1BN32**	0.060
Time delay							
On-delay	1	1	1	1	1	**LADT●** (1)	0.060
Off-delay	1	1	1	1	1	**LADR●** (1)	0.060

(1) Choose additives LADT● and LADR● from the TeSys D *range.*

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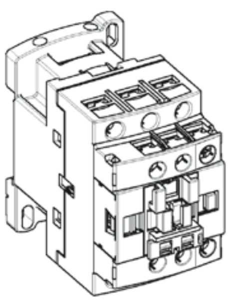

LA1BN32A

CV3B and LC1B for control of resistive circuits ⩽ 1000 V in AC-1

Selection guide for utilisation category AC-1 according to required electrical durability

Maximum rated operational current (open-mounted device)

Contactors CV3 and LC1B			Size F	H	L	M	P	R
Maximum operating rate in operating cycles/hour			1200	1200	120	120	120	120
Connections								
Cable	C.s.a.	mm²	25	120	–	–	–	–
Bars	Number		–	–	2	2	3	3
	C.s.a.	mm	–	–	50 x 5	80 x 5	100 x 5	100 x 10
⩽ 40 °C		A	80	250	800	1250	2000	2750
⩽ 55 °C		A	80	250	700	1100	1750	2400
⩽ 70 °C		A	80	250	600	900	1500	2000

Increase in operational current by paralleling of poles
Apply the following multiplying factors to the current values given above. The factors take into account the often unbalanced current distribution between poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.

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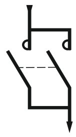

Example: 2 poles in parallel.

Electrical durability (Ue ⩽ 440 V)

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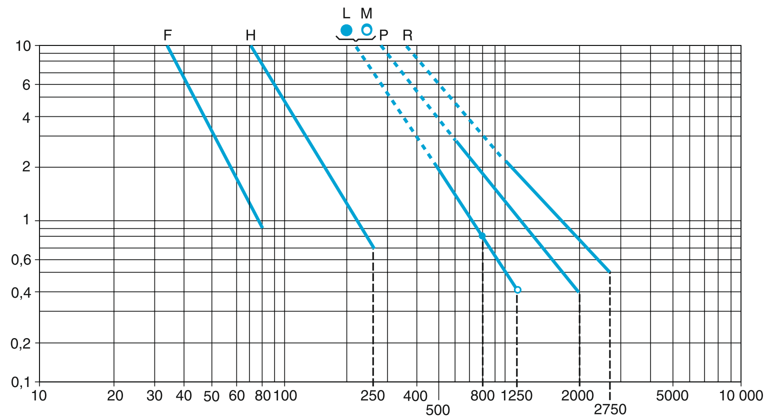

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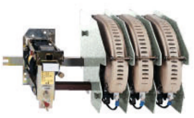

CV3BF

Resistive circuits control ⩽ 1000 V in AC-1

Selection of contactor size for utilisation category AC-1

Maximum possibilities of the contactor

CV3B contactors are characterised by their extensive composition alternatives:

■ Poles [(1)]

Size F - H	
N/O poles	**N/C poles**
0	1
1	0
1	1
2	0
2	1
3	0
4	0

Size L - M - P - R	
N/O poles	**N/C poles**
1	0
2	0
3	0
4	0

Auxiliaries contacts

■ Size F-H, 5 instantaneous contacts (3N/C + 2N/O) + TeSys D contactor (except for LA6DK, LAD6K, LADN01, LADN10 and LAD8N).
■ Size L, up to 5 instantaneous contacts and 1 time delay contact.

Electromagnet and coil(s)

■ For direct a.c. control
■ For direct d.c. control
■ For a.c. or d.c. control via economy resistor
(accessories: economy resistor + contact, rectifier).

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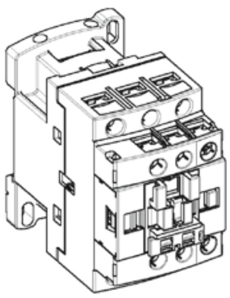

LA1BN32A

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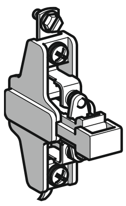


ZC4GM1

Auxiliary contact blocks for contactor - Size F - H							
Contact type	**Composition**		**Control circuit**			**Reference**	**Weight**
			~ direct	**⎓ direct**	**~ or ⎓ with economy resistor**		**kg**
Instantaneous	3	2	1	1	1	**LA1BN32A**	0.060
Time delay							
On-delay	1	1	1	1	1	**LADT●** [(2)]	0.060
Off-delay	1	1	1	1	1	**LADR●** [(2)]	0.060

Auxiliary contact blocks for contactor - Size L - M - P - R						
Contact type	**Composition**		**CV3 contactor size**		**Reference**	**Weight**
			L to R			**kg**
Instantaneous	1	–	4	4	**ZC4GM1**	0.030
	–	1	4	4	**ZC4GM2**	0.030

(1) For possible compositions, see page 36.
(2) Choose additives LADT● and LADR● from the TeSys D range.

TeSys

TeSys CV1B Variable composition contactors - Use in category **AC-2, AC-4**

Selection guide

CV1B for motor control ⩽ 690 V in AC-2 and AC-4

Selection guide for utilisation categories AC-2 and AC-4 according to required electrical durability

Maximum current broken in A

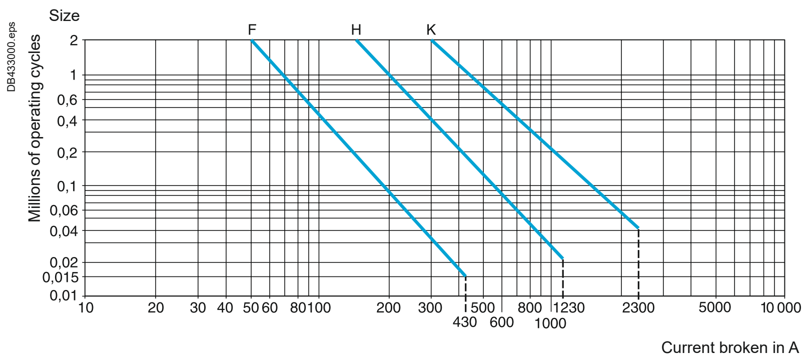
Related to maximum operating rate (operating cycles/hour) and on-load factor

CV1B contactors (1)		**Size**		
		F	**H**	**K**
Operating cycles/hour (2) and on-load factor	Thermal limit zone (3)	Maximum current broken in A		
From 150 and 15 % to 300 and 10 %	**A**	165	520	1300
From 150 and 20 % to 600 and 10 %	**B**	145	460	1150
From 150 and 30 % to 1200 and 10 %	**C**	120	380	950
From 150 and 55 % to 1200 and 20 %	**D**	90	280	700
From 150 and 85 % to 1200 and 35 %	**E**	70	220	550

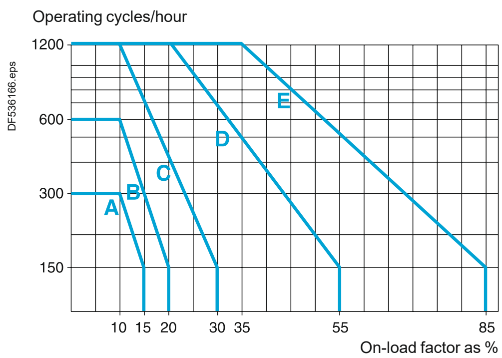
Counter current braking (plugging)

The current varies from the maximum counter current braking value up to the nominal motor current. The current made must be compatible with the making and breaking capacities of the contactor. In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

Electrical durability (Ue ⩽ 440 V)



Example: contactor size selection



For an on-load factor of 17 % at 180 operating cycles per hour, the above curve indicates zone B. If the maximum current broken is 200 A, the table above will lead to the selection of a size H contactor. Referring to the electrical durability curves, it can be seen that the contactor will have a life of 1 million operating cycles. Where a higher value of electrical durability is required, 2 million operating cycles for example, size K would be recommended.

(1) To obtain the complete reference of the contactor see the Symbol combination table on page 37. For customised compositions or dimensional specifications, please use the Order form on page 136 or consult your Regional Sales Office.
(2) Do not exceed the maximum limit for the mechanical operating cycles.
(3) See curve at foot of page for thermal limit zone.

CV3B and LC1B for motor control ⩽ 1000 V in AC-2 and AC-4

Selection guide for utilisation categories AC-2 and AC-4 according to required electrical durability

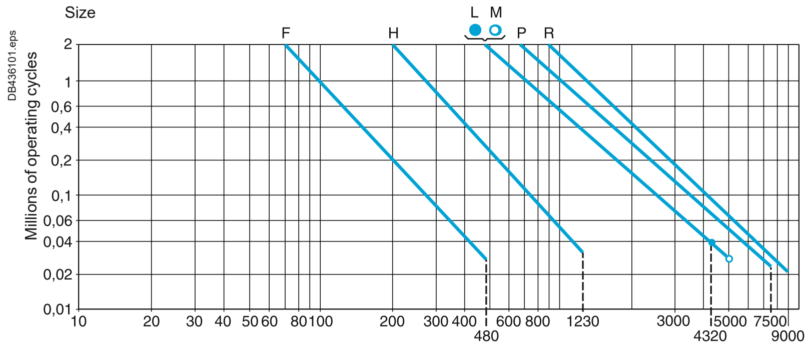
Thermal limits

Related to maximum operating rate (operating cycles/hour) and on-load factor							
Contactors CV3 [(1)] **and LC1B**		**Size**					
		F	**H**	**L**	**M**	**P**	**R**
Operating cycles/hour [(2)] and on-load factor	Thermal limit zone [(3)]	Maximum current broken depending on the duty Thermal limit at ambient temperature ⩽ 55 °C					
From 150 and 15 % to 300 and 10 %	**A**	165	520	2250	3000	4500	5400
From 150 and 20 % to 600 and 10 %	**B**	145	460	2000	2400	3750	5000
From 150 and 30 % to 1200 and 10 %	**C**	120	380	1500	2000	3000	3600
From 150 and 55 % to 1200 and 20 %	**D**	90	280	1000	1500	2000	2500
From 150 and 85 % to 1200 and 35 %	**E**	70	220	750	1000	1500	1800

Counter current braking (plugging)

The current varies from the maximum counter current braking value up to the nominal motor current. The current made must be compatible with the making and breaking capacities of the contactor. In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

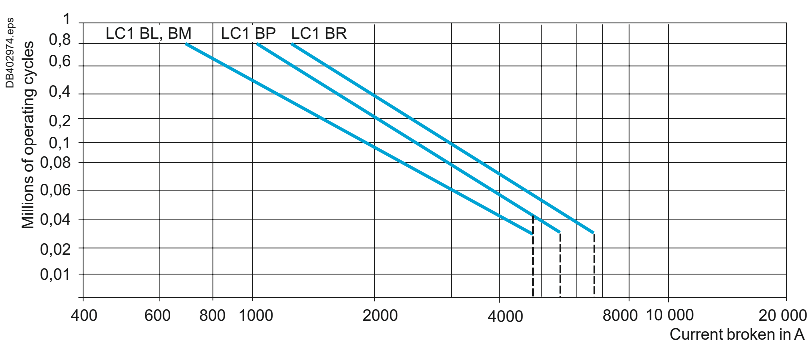
Electrical durability (Ue ⩽ 440 V)



Example:
For an on-load factor of 17 % at 180 operating cycles per hour, the above curve indicates zone B. If the maximum current broken is 90 A, the table above will lead to the selection of a size F contactor. Referring to the electrical durability curves, it can be seen that the contactor will have a life of 1 100 000 operating cycles. Where a higher value of electrical durability is required, 2 million operating cycles for example, size H would be recommended.

Electrical durability (Ue ⩽ 690 V)

Control of 3 phase asynchronous squirrel cage motors with “motor stalled” stop.
The current Ic cut in AC-4 is 6 x Ie. (Ie = rated current drawn by the motor).



(1) To obtain the complete reference of the contactor see the Symbol combination table on page 37. For customised compositions or dimensional specifications, please use the Order form on page 136 or consult your Regional Sales Office.
(2) Do not exceed the maximum limit for the mechanical operating cycles.
(3) See curve at the previous page for thermal limit zone.

CV1B for circuit control ⩽ 1000 V - DC-1 category

Selection guide for utilisation categorie DC-1

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage Ue
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage Ue

This depends on the time constant of the circuit L/R ⩽ 1 ms and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).

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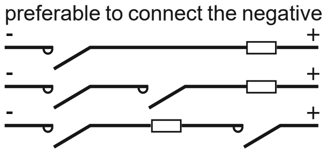

Number of poles to be connected in series according to the operational voltage (time constant of the circuit L/R ⩽ 1 ms)				
CV1B contactors [1]		Size		
		F	H	K
1 pole PN1	V	250	250	250
2 poles PN1 in series	V	500	500	500
1 pole PN3	V	–	–	500
2 poles PN3 in series	V	–	–	1000

Normal operation: Ue ⩾ U supply.

Rated operational current in A at □ ⩽ 40 °C			
CV1B contactors	Size		
	F	H	K
	80	300	630

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to 2 x Ie x 0.8.

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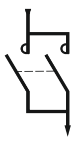

(1) To obtain the complete reference of the contactor refer to page 37.
For customised compositions or dimensional specifications, please use the Order form on page 136 or consult your Regional Sales Office.

CV1B for circuit control ⩽ 1000 V - DC-1 category

Selection guide for utilisation categorie DC-1 according to required electrical durability			
Power broken			
Utilisation categories	**U broken**	**I broken**	**P broken**
DC-1: Non inductive or slightly inductive loads	Ue	Ie	Ue x Ie

Electrical durability (time constant L/R ⩽ 1 ms)

The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:
P broken = U broken x I broken.
The table gives the values of Uc and Ic for the various utilisation categories.

Two-pole switching (time constant L/R ⩽ 1 ms)
The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.

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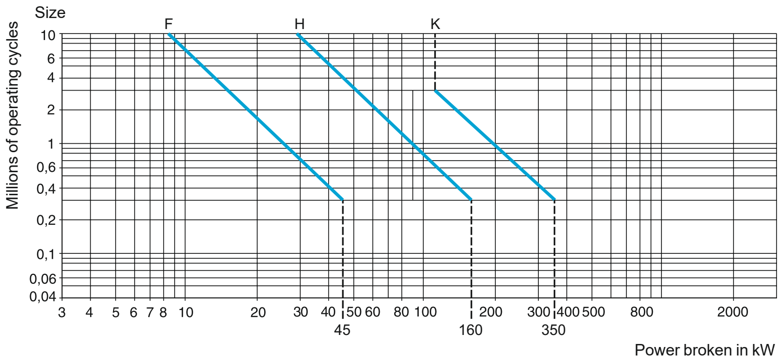

Number of main poles

The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

Thermal limit
The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current Ie.

TeSys CV3B, LC1B Variable composition contactors - Use in category DC-1

Selection guide

CV3B, LC1B for circuit control ⩽ 1500 V - DC-1 category

Selection guide for utilisation categorie DC-1

The selection of the contactor size and number of poles to be connected in series is made according to:
- the maximum operational voltage Ue
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage Ue

This depends on the time constant L/R of the circuit and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).

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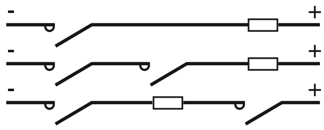


Number of poles to be connected in series according to the operational voltage

Operational voltage	500 V	1
	1000 V	2
	1500 V	Please, consult us

Normal operation: Ue ⩾ U supply.

Rated operational current in A at □ ⩽ 40 °C

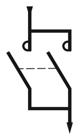
Contactor size CV3B (1)		CV3B and LC1B			
F	**H**	**L**	**M**	**P**	**R**
80	300	800	1000	1800	2500

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to 2 x Ie x 0.8.

DF511252.eps



(1) To obtain the complete reference of the contactor refer on page 37.
For customised compositions or dimensional specifications, please use the Order form on page 136 or consult your Regional Sales Office.

Selection guide for utilisation categorie DC-1 according to required electrical durability

Power broken

Utilisation category	U broken	I broken	P broken
DC-1: Non inductive or slightly inductive loads	Ue	Ie	Ue x Ie

Electrical durability **(time constant L/R ⩽ 1 ms)**

The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:
P broken = U broken x I broken.
The table gives the values of Uc and Ic for the various utilisation categories.

Power broken per pole **(time constant L/R ⩽ 1 ms)**

The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.

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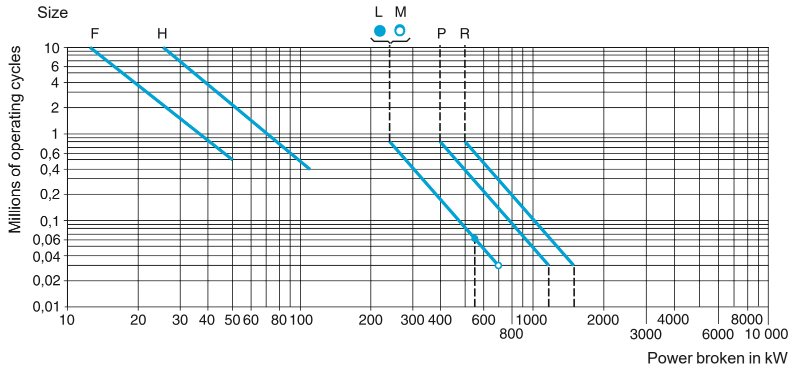

Number of main poles

The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current Ie.

CV1B for circuit control ⩽ 850 V - DC-3, DC-5 category

Selection guide for utilisation categories DC-3 and DC-5

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage Ue
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage Ue

This depends on the time constant of the circuit L/R ⩽ 15 ms and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).

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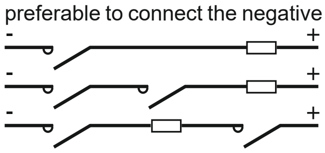

Number of poles to be connected in series according to the operational voltage (time constant of the circuit L/R ⩽ 15 ms)

CV1 B contactors [1]		Size		
		F	H	K
1 pole PN1	V	220	220	220
2 poles PN1 in series	V	440	440	440
1 pole PN3	V	–	–	440
2 poles PN3 in series	V	–	–	850

Normal operation: Ue ⩾ U supply.
With breaking during counter current braking (plugging): Ue ⩾ 1.5 U supply.

Rated operational current in A at □ ⩽ 40 °C

CV1B contactors	Size		
	F	H	K
	80	300	630

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to 2 x Ie x 0.8.

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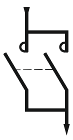

(1) To obtain the complete reference of the contactor refer on page 37.
For customised compositions or dimensional specifications, please use the Order form on page 136 or consult your Regional Sales Office.

Selection guide for utilisation categories DC-3 and DC-5 according to required electrical durability

Power broken

Utilisation categories	U broken	I broken	P broken
DC-3: Shunt motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie
DC-5: Shunt motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie

Electrical durability (time constant L/R ⩽ 15 ms)

The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:
P broken = U broken x I broken.
The table gives the values of Uc and Ic for the various utilisation categories.

Two-pole switching (time constant L/R ⩽ 15 ms)
The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.

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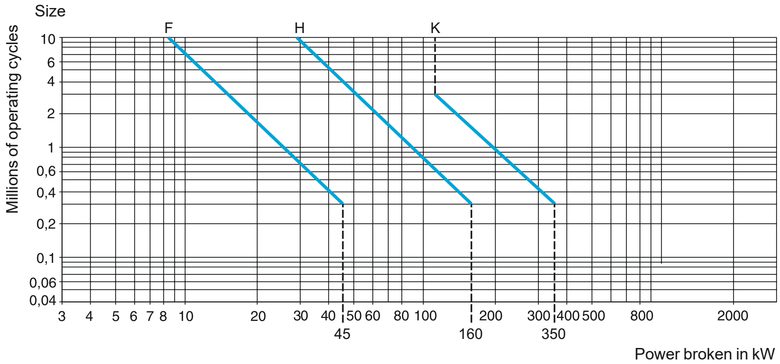

Number of main poles
The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

Thermal limit
The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current Ie.

CV3B, LC1B for circuit control ≤ 1500 V - DC-3, DC-5 category

Selection guide for utilisation categories DC-3 and DC-5

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage Ue
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

Maximum operational voltage Ue

This depends on the time constant L/R of the circuit and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).

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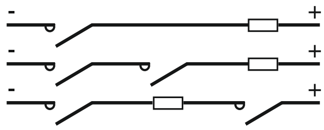

Number of poles to be connected in series according to the operational voltage and time constant L/R (in ms) of the circuit

Time constant in ms		15	30	60	90	120	150
Operational voltage	125 V	1	1	1	2	2	2
	225 V	1	1	2	3	3	4
	330 V	1	2	3	3	4	–
	440 V	1	2	3	4	–	–
	850 V	2	3	4	–	–	–
	1200 V (consult us)	3	4	–	–	–	–
	1500 V (consult us)	4	–	–	–	–	–

Normal operation: Ue ⩾ U supply.
With breaking during counter current braking (plugging): Ue ⩾ 1.5 U supply.

Rated operational current in A at □ ⩽ 40 °C

Contactor size CV3B (1)			CV3B and LC1B			
F	H	H	L	M	P	R
80	300	300	800	1000	1800	2500

Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to 2 x le x 0.8.

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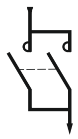


(1) To obtain the complete reference of the contactor refer on page 37.
For customised compositions or dimensional specifications, please use the Order form on page 136 or consult your Regional Sales Office.

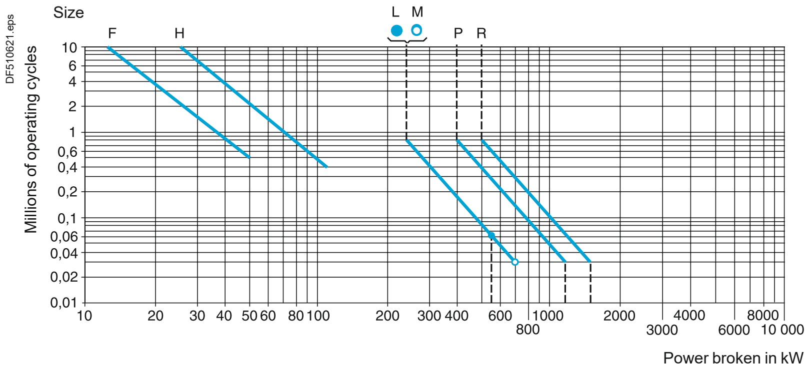
Selection guide for utilisation categories DC-3 and DC-5 according to required electrical durability

Power broken

Utilisation category	U broken	I broken	P broken
DC-3: Shunt motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie
DC-5: Series motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie

Electrical durability **(time constant L/R ⩽ 15 ms)**
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:
P broken = U broken x I broken.
The table gives the values of Uc and Ic for the various utilisation categories.

Power broken per pole **(time constant L/R ⩽ 15 ms)**
The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Example: 30 kW motor, 500 V-70 A in category DC-3: P broken = Ue x 2.5 Ie = 500 x 2.5 x 70 = 86 kW or 43 kW per pole.
For a 2-pole size ***F*** *contactor, the curve gives an electrical durability of 6 x 10^5 operating cycles.*

Electrical durability depending on the time constant

■ According to the time constant L/R.
■ L/R ⩽ 15 ms, read the number of operating cycles directly from the curves.
■ 15 < L/R ⩽ 30 ms, the number of operating cycles is equal to the number read from the curves x $\frac{15}{L/R}$.
■ L/R > 30 ms, please consult your Regional Sales Office.

Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current Ie.

CV1B, CV3B, LC1B for rotor-starting motors

Selection guide for rotor circuits of slip-ring motors

In simple starting systems the contactors which short-circuit the rotor current are subjected to a static voltage, the value of which, decreasing with time, is lower the further away the contactors are located from the rotor terminals. As a result, the operational rotor voltage is deducted from the maximum operational voltage. In this way, it is possible to use contactors with a rated insulation voltage lower than the rotor voltage.

In this application, making and breaking are easy. The selection table below takes into account a ratio of 2 between the maximum rotor operational voltage (Uer) and the stator operational voltage (Ues). This ratio is proposed in starter standard IEC 60947-4.

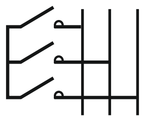
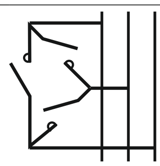
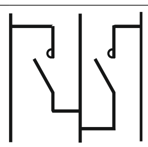
With counter current braking, the rotor operational voltage will be equal to the insulation voltage.

In a system with slowdown or braking, the selection of the contactors concerned should, in addition, take into account the breaking conditions.

The use of magnetic blow-out contactors is recommended in the event of control by a manually operated master controller.

Multiplying factor for rotor voltage and current, depending on type of contactor connection

As far as the current flowing through a rotor circuit contactor is concerned, the short time rating should be taken into account (see pages 40 and 58) according to the starting time. Only the final rotor short-circuit contactor takes account of the continuous current.

Type of connection	Circuit diagram	I rotor / I operational	Maximum 3-phase rotor voltage Ue	3-phase rotor voltage UE with counter-current braking	Contactor type
			V	V	
Star		1	1320	660	**CV1B**
		1	2000	1000	**CV3B LC1B**
Delta		1,4	1100	550	**CV1B**
		1,4	1700	850	**CV3B LC1B**
V		1	1100	550	**CV1B**
		1	1700	850	**CV3B LC1B**

Hoisting applications

For this type of application contactor selection is made according to the duty requirements, required durability, type of connection, etc.
Please consult your Regional Sales Office.

Other versions: For rotor voltage above 3000 V ~, please consult your Regional Sales Office.

Contactors to use with excitation circuit control for synchronous machine (CRXB, CVXB, CWXB)

The proposed contactors are equiped with either latching solenoids (contactor CRXB) or consumption reduction device (contactor CVXB).
Synchronous alternators must have their induction circuit DC powered to generate an output voltage. This power supply is delivered by a bridge rectifier fed itself by the alternator. Synchronous generators are used for the production of energy in power plants.

Magnetic latching contactors, CR1B

These contactors prevent unwanted opening of the poles in the event of a control circuit supply failure.
The holding-in of a contactor is often necessary so as to avoid on-load breaking (for example an excitation circuit).
Furthermore, the fact that no power is consumed by the coil when the contactor is latched leads to energy savings on a separate control circuit supply (particularly useful when using a battery supply). These contactors incorporate an electromagnet with a core made of non-aging magnetic steel and the coil supply can be d.c. or rectified a.c.
The contactor latches in the operated position following energisation of the electromagnetic coil and remains latched when the coil is de-energised, the contactor armature being held closed by remanent magnetism.
The contactor is unlatched by the application of a reversed polarity current, at a value less than the pull-in current, which neutralises the remanent magnetism.
CR1 B contactors are available in all sizes from 80 to 2750 A.
The control supply can be d.c. or rectified a.c.
Please refer to our "Motor starter solutions - Control and protection components" catalogue.

Contactors for furnaces and induction heating applications (CE1 - CS1, CE5 - CE6, CS5 - CS6)

Induction heating covers all applications where metals (or a metal part) are heated in crucible or "channel" furnaces, or in dies, by the induction of a.c. currents at various frequencies.
There are several frequency ranges which, for industrial purposes, can be grouped as follows:

- 50 Hz to 400 Hz:
  - industrial mains power frequencies from 50 to 250 Hz
  - intermediate frequencies of 350 Hz and 400 Hz.
- Maximum operating limits for contactors (single-pole and 6-pole):
  - frequency range up to 500 Hz
  - supply voltage up to 3000 V
  - currents up to 2340 A.

Please refer to our "Contactors for furnaces and induction heating applications" catalogue.

Contactor for the grounding of supply rail tram (CV1BKS)

Designed for networks up to 1000 V DC (high closing capacity up to 43 kA) to ensure the grounding of the rail when it loses power.
But also under fault condition in the event that the rail remains supplied after the passage of the tram.
View the application form CV1BKS on the site: www.se.com.

From assembly definition to contactor ordering

Contactor assembly definition
The criteria required to define the composition of a contactor are:
- the number of N/O and N/C power poles
- the current and power supply voltage
(note: on a d.c. supply, the time constant $\frac{L}{R}$ of the load must be known in order to define the number of poles to be wired in series to break the arc)
- the control circuit voltage
- the number of auxiliary contacts.

Contactor ordering - product reference composition
For all contactors:
- configuration software "bar contactor soft-customer.xls"
Link for download: https://www.se.com/ww/en/product-range-download/667-tesys-b/#/software-firmware-tab
- from order form page 136.

For contactors CV1BF/BH/BK, CV3BF/BH:
- software or selection tables below.

Checking of contactor possible assemblies
CV1B and CV3B have some restrictions:
- in rated operational current (Ie) per power pole
- in number of N/O - N/C power poles
- in number of auxiliary contacts.
Please refer to tables below.

Rated operational current per poles - codes per contactor type

Contactor type		CV1BF CV3BF	CV1BH CV3BH	CV1BK
Rated operational current [1]	11 A	**E**	–	–
	13 A	**M**	–	–
	20 A	**N**	–	–
	40 A	**P**	–	–
	50 A	**Q**	**Q**	–
	80 A	**F**	**F**	–
	125 A	–	**R**	**I**
	200 A	–	**G**	**S**
	250 A	–	–	**H**
	300 A	–	**H**	–
	320 A	–	–	–
	400 A	–	–	**U**
	470 A	–	–	–
	500 A	–	–	**V**
	630 A	–	–	**K**
	1000 A	–	–	–
	0 no magnetic blowing	**Z**	**Z**	**Z**

(1) Other rating: contact us.

CV1B contactors: maximum number of power poles

Contactor type	CV1BF		CV1BH		CV1BK	
Pole type	**N/O**	**N/C**	**N/O**	**N/C**	**N/O**	**N/C**
Number of poles	5	0	4	0	4	0
	0	2	0	2	0	2
	2	1	2	1	2	1

CV3B contactors: maximum number of power poles

Contactor type	CV3BF		CV3BH	
Pole type	**N/O**	**N/C**	**N/O**	**N/C**
Number of poles	5	0	4	0
	0	2	0	2
	1	2	–	–
	3	1	2	1

CV1B/CV3B contactors: maximum number of auxiliary contacts

Contactor type	CV1B		CV3B	
Pole type	**N/O**	**N/C**	**N/O**	**N/C**
	4 + 1 time delay if necessary			

Examples
- Switching of single-phase capacitor: 400 V - 80 A - 1 N/O main pole. 220 V / 50 Hz.
control circuit voltage, 3 N/O and 2 N/C auxiliary contacts. Reference: **CV1BF1F0ZM5A**.
- Switching of d.c. heating circuits: 800 V - 250 A - 2 N/O main poles - 48 V ⎓.
control circuit, instantaneous auxiliary contact 1 N/O + 1 on-delay. Reference: **CV3BH2H0ZEDA + LADT0, 2 or 4**.

Other versions
To obtain a composition with more main poles or with more than 4 auxiliary contacts, please use **order form CF 452,** on page 136.

Product reference coding table

				Serie	Size	Number of N/O poles	Op. current in N/O pole	Number of N/C poles	Op. current in N/C pole	Control voltage	Control frequency	Aux. contacts
Type of contactor related to application												
~ 690 V, ⎓ 220 V/pole				**CV1B**								
~ 1000 V, ⎓ 440 V/pole				**CV3B**								
Contactor size AC-1/AC-3												
CV1: 80/80 A		CV3: 80/80 A			**F** *							
CV1: 300/250 A		CV3: 300/285 A			**H** *							
Number of poles												
N/O poles		0 N/O				**0**						
		1 N/O				**1**						
		2 N/O				**2**						
		3 N/O				**3**						
		4 N/O				**4**						
N/C poles		0 N/C						**0**				
		1 N/C						**1**				
Operational current (determines the blow-out coil size)												
CV1BF/CV3BF		CV1BH/CV3BH										
AC	DC	AC	DC									
0 A breaking		0 A breaking					**Z**		**Z**			
0.9 A	1 A	0.7 A	1.05 A				**A**		**A**			
1.75 A	1.9 A	1.25 A	1.95 A				**B**		**B**			
3.6 A	4 A	2.5 A	3.85 A				**C**		**C**			
6.8 A	7.6 A	4.7 A	7.5 A				**D**		**D**			
11 A	12 A	8 A	12 A				**E**		**E**			
13 A	14.5 A	10 A	15 A				**M**		**M**			
20 A	22 A	17 A	24 A				**N**		**N**			
40 A	45 A						**P**		**P**			
50 A	55 A	60 A	90 A				**Q**		**Q**			
80 A	80 A	80 A	120 A				**F**		**F**			
125 A		130 A	190 A				**R**		**R**			
200 A		200 A	200 A				**G**		**G**			
300 A		300 A	300 A				**H**		**H**			
Control circuit voltage												
24 V										**B**		
48 V										**E**		
110 V										**F**		
120 V										**K**		
127 V										**G**		
208 V										**L**		
220 V										**M**		
230 V										**P**		
240 V										**U**		
380 V										**Q**		
400 V										**V**		
Operating frequency												
50 Hz											**5**	
60 Hz											**6**	
50/60 Hz (with rectifier + economy resistor)											**7**	
⎓											**D**	
⎓ with economy resistor											**R**	
Auxiliary contacts (LA1BN32 + additives (fitted as standard))												
Instantaneous		3 N/O + 2 N/C										**A**

To check whether the symbol combinations are possible, refer to the selection information and guide on page 36.
If in doubt, fill out order form CF 452, on page 136.

* *Can use any additives in the range of contactors* TeSys D *except LA6DK, and LAD6K LAD8N.*

Important information for use by Schneider Electric
To place an order in SAP GRC switch-LOGOS
Example: Order the contactor CV1BH2HCZM5A
- enter in the Reference product "CV1BH"
- in the field "Technical text", specify "CV1BH2H02M5A".

Product reference coding table

		Serie	Size	Number of N/O poles	Op. current in N/O pole	Number of N/C poles	Op. current in N/C pole	Pole type	Control voltage	Control frequency	Aux. contacts
Type of contactor related to application											
~ 690 V, ⎓ 220 V/pole		CV1B									
~ 1000 V, ⎓ 440 V/pole											
Contactor size AC-1/AC-3											
CV1: 630/460 A			K								
Number of poles											
N/O poles	0 N/O			0							
	1 N/O			1							
	2 N/O			2							
zzzzzzzzzz	3 N/O			3							
	4 N/O			4							
N/C poles	0 N/C					0					
	1 N/C					1					
	2 N/C					2					
Type of poles											
~ 690 V, ⎓ 220 V/pole	Type 1 pole (PN1)							1			
~ 1000 V, ⎓ 440 V/pole	Type 3 pole (PN3)							3			
Operational current (determines the blow-out coil size)											
0 A breaking					Z		Z				
150 A					I		I				
250 A					S		S				
300 A					H		H				
400 A					U		U				
500 A					V		V				
630 A					K		K				
Control circuit voltage											
24 V									B		
48 V									E		
110 V									F		
120 V									K		
127 V									G		
208 V									L		
220 V									M		
230 V									P		
240 V									U		
380 V									Q		
400 V									V		
415 V									N		
440 V									R		
480 V									T		
500 V									S		
600 V									X		
Operating frequency											
50 Hz										5	
60 Hz										6	
50/60 Hz (with rectifier + economy resistor)										7	
⎓										D	
⎓ with economy resistor										R	
Auxiliary contacts (LA1BN32 auxiliary contact block)											
3 N/O - instantaneous	1 aux. contact block										A
2 N/C - instantaneous	2 aux. contact blocks										B

To check whether the symbol combinations are possible, refer to the selection information and guide on page 36.
If in doubt, fill out order form CF 452, on page 136.

CV1B, CV3B, LC1B Characteristics

TeSys CV1B

TeSys CV3B, LC1B

CV1B with a.c. or d.c control circuit (envir. & pole characteristics)

Characteristics				
CV1B contactor size				**F**
Environment				
Rated insulation voltage (Ui)	Conforming to IEC 60947-4		**V**	690
Conforming to standards				IEC 60947-4
Product certifications				Bureau veritas, Register of shipping (CEI), CSA
Degree of protection	Conforming to IEC 60529			IP00
Protective treatment				TC
Ambient air temperature around the device	Storage		**° C**	-60…+80
	Operation		**° C**	-5…+55 (0.85…1.10 Un)
	Permissible for operation		**° C**	-30…+70 at Uc
Maximum operating altitude			**m**	2000
Operating positions				± 23° possible, in relation to normal vertical mounting plane
Shock and vibration resistance				4 gn for frequencies y 30 Hz, 2 gn for frequencies > 30 Hz
Pole characteristics in AC				
Rated operational current (Ie)	In AC-3, Ue ≤ 440 V, □ ≤ 55 °C		**A**	80
	In AC-1, Ue ≤ 440 V, □ ≤ 40 °C		**A**	80
Rated operational voltage (Ue)	Up to		**V**	690
Frequency limits of the operational current	Without derating		**Hz**	50/60
	Derating coefficient		**Hz**	100 Hz: 0.9 - 150 Hz: 0.8 - 250 Hz: 0.7 - 400 Hz: 0.5
Rated making capacity	cos □ = 0.35		**A**	1000
Rated breaking capacity	cos □ = 0.35	220/400 V	**A**	900
		415/440 V	**A**	800
		500 V	**A**	800
		660/690 V	**A**	320
		1000 V	**A**	-
Power dissipated per pole for the above operational currents	AC-3		**W**	7.6
	AC-1		**W**	9.6
Pole characteristics in DC				
Rated operational current (Ie)	DC-1, Ue ≤ 250 V, □ ≤ 40 °C		**A**	80
	DC-1, Ue ≤ 500 V, □ ≤ 40 °C		**A**	-
	DC-3, DC-5, Ue ≤ 220 V, □ ≤ 40 °C		**A**	80
	DC-3, DC-5, Ue ≤ 440 V, □ ≤ 40 °C		**A**	-
Rated operational voltage (Ue)	(L/R ≤ 1 ms)		**A**	250
	(L/R ≤ 15 ms)		**A**	220
Rated making capacity	(L/R ≤ 15 ms)		**A**	1600
Rated breaking capacity	(L/R ≤ 1 ms)	Single-pole 250 V	**A**	320
		2-pole 250 V	**A**	320
		2-pole 500 V	**A**	240
	(L/R ≤ 15 ms)	Single-pole 220 V	**A**	320
		2-pole 220 V	**A**	320
		2-pole 440 V	**A**	240
	(L/R ≤ 1 ms)	Single-pole 500 V	**A**	-
		2-pole 500 V	**A**	-
		2-pole 1000 V	**A**	-
	(L/R ≤ 15 ms)	Single-pole 440 V	**A**	-
		2-pole 440 V	**A**	-
		2-pole 850 V	**A**	-
Power dissipated per pole for the above operational currents	DC-1		**W**	9.6
	DC-3, DC-5		**W**	9.6
General pole characteristics				
Number of poles				1…4
Conventional thermal current	□ ≤ 40 °C		**A**	80
Short time rating From cold state, with no current flowing for previous 60 minutes at θ ≤ 40 °C	For 5 s		**A**	640
	For 10 s		**A**	640
	For 30 s		**A**	380
	For 1 min		**A**	320
	For 3 min		**A**	200
	For 10 min		**A**	130
Short-circuit protection by fuses	Ue ≤ 440 V	Type aM / type g1	**A**	80/125
Average impedance per pole	At Ith and 50 Hz		**m□**	1.5
Cabling Bar			**mm x mm**	-
Cable with lug			**nb x mm²**	1 x 25
Cable with connector			**nb x mm²**	2 x 16
Bolt diameter			**mm**	Ø 6
Tightening torque	Power circuit connections		**N.m**	9

	H	K PN1 PR1	K PN3 PR3
	1000	1000	1000
	250	460	460
	300	630	630
	690	609	1000
	2500	4600	4600
	2400	4200	4200
	2200	4100	4100
	2000	3800	4100
	1800	3200	3800
	-	-	3200
	35	55	55
	51	103	103
	300	630	630
	-	-	630
	300	630	630
	-	-	630
	250	250	500
	220	220	440
	4000	6500	6500
	1200	2500	2500
	1200	2520	2520
	900	1500	1500
	1200	2500	2500
	1200	2520	2520
	900	1500	1500
	-	-	2500
	-	-	2520
	-	-	2500
	-	-	2500
	-	-	2520
	-	-	2500
	51	103	103
	51	103	103
	300	630	
	2400	5000	
	2000	3600	
	1200	2260	
	1000	1900	
	600	1280	
	410	880	
	315/400	630/800	
	0.57	0.26	
	-	63 x 6	
	1 x 185	2 x 185	
	1 x 185	-	
	Ø 10	Ø 12	
	35	58	

TeSys CV1B, CV3B with a.c. control circuit

Control circuit characteristics

CV1B, CV3B with a.c. control circuit

Characteristics

Control circuit characteristics

CV1B contactor size				F	G (1)	H	J (1)	K	L (1)
Rated control circuit voltage (Uc)	Direct a.c.		V	22...500 (50 Hz) 28...500 (60 Hz)		22...500 (50 Hz) 28...500 (60 Hz)		110....500 (50-60 Hz)	
	a.c. with economy resistor		V	24…500		24…500		36…500 (50/400 Hz)	
Control voltage limits (θ ⩽ 55 °C)									
Operation			V	0.85…1.1 Uc		0.85…1.1 Uc		0.85…1.1 Uc	
Drop-out	Direct a.c.		V	0.5…0.7 Uc		0.5…0.7 Uc		0.5…0.7 Uc	
	a.c. with economy resistor		V	0.2…0.5 Uc		0.2…0.5 Uc		0.2…0.5 Uc	
Average consumption at 20 °C and at Uc									
Direct a.c. 50 Hz	Inrush		VA	270		570		2300	
	Sealed		VA	45		80		210	
60 Hz	Inrush		VA	300		600		2650	
	Sealed		VA	45		85		260	
a.c. with economy resistor	Inrush		VA	155		320		420	
	Sealed		VA	9.5		14.5		9	
Heat dissipation	50 Hz		W	16		26		65	
	60 Hz		W	16		30		90	
Average operating time (2)									
Direct a.c.	Closing “N/O”		ms	40		35		75	
	Opening “N/C”		ms	15		14		15	
a.c. (with economy resistor) breaking on rectified side	Closing “N/O”		ms	40		35		75	
	Opening “N/C”		ms	12		14		15	
Durabilité mécanique	In operating cycles	* New design		5 x 10^6		5 x 10^6		-	
Direct a.c.		Old design		10 x 10^6		10 x 10^6		3 x 10^6	
a.c. with economy resistor	In operating cycles			1.2 x 10^6		1.2 x 10^6		1.2 x 10^6	
Cadence maximale (□ ⩽ 55 °C)									
Direct a.c.	In operating cycles/hour			1200		1200		1200	
a.c. with economy resistor	In operating cycles/hour			120		120		120	

Note: coperating characteristics stated are for an inductive circuit, such as the coil of the contactor electromagnet. Cos □ inrush and sealed = 0.3.

(1) Please consult us.
(2) The closing time “N/O” or opening time “N/C” are measured from the moment the coil supply is switched on or off, to initial contact or separation of the main poles.

Characteristics

Auxiliary contact characteristics

Type of contacts				Auxiliary contact LA1BN32A (size F to H)
Rated operational voltage (Ue)	Up to		V	690
Conventional thermal current (Ith)	For ambient temperature ⩽ 60 °C		A	10
Short-circuit protection	Conforming to IEC 60947-5-1			gG fuse: 10 A
Rated making capacity	Conforming to IEC 60947-5-1	I rms	A	∿ : 140, ⎓ : 250
Tightening torque	Philips head n° 2 and Ø 6		N.m	1.2
Screw clamp connections	Flexible conductor without cable end	1 conductor	mm^2	1…4
		2 conductors	mm^2	1…4
	Flexible conductor with cable end	1 conductor	mm^2	1…4
		2 conductors	mm^2	1…2.5
	Solid conductor without cable end	1 conductor	mm^2	1…4
		2 conductors	mm^2	1…4
	Tightening torque		N.m	1.7
Mechanical durability In millions of operating cycles				1

Rated operational power of contacts in AC (conforming to IEC 60947-5-1)

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet:
making current (cos □ 0.7) = 10 times the power broken (cos □ 0.4).

	V	24	48	115	230	400	440	600
1 million operating cycles	VA	60	120	280	560	960	1050	1440
3 million operating cycles	VA	16	32	80	160	280	300	420
10 million operating cycles	VA	4	8	20	40	70	80	100

Rated operational power of contacts in DC (conforming to IEC 60947-5-1)

d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the power.

	V	24	48	125	250	440
1 million operating cycles	VA	120	90	75	68	61
3 million operating cycles	VA	70	50	38	33	28
10 million operating cycles	VA	25	18	14	12	10

CV1B, CV3B with d.c control circuit

Characteristics

Control circuit characteristics

CV1B contactor size				F	H	K
Rated control circuit voltage (Uc)	Direct d.c.		V	12…500		
	d.c. with economy resistor		V	24…500		
Control voltage limits (θ ≤ 55 °C and at Uc)						
Operation			V	0.85…1.1 Uc		
Drop-out	Direct d.c.		V	0.1…0.65 Uc		
	d.c. with economy resistor		V	0.2…0.5 Uc		
Coil consumption						
Direct d.c.	Inrush and sealed		W	20…27	42…52	80…105
d.c. with economy resistor	Inrush		W	95	200	300
	Sealed		W	6	13	6
Average operating time [(1)]						
Direct d.c.	Closing “N/O”		ms	130	160	250
	Opening “N/C”		ms	30	32	130
d.c. with economy resistor	Closing “N/O”		ms	40	35	75
	Opening “N/C”		ms	12	14	15
Mechanical durability at Uc	In operating cycles	* New design		5 x 10^6	5 x 10^6	-
Direct d.c. supply		Old design		10 x 10^6	20 x 10^6	10 x 10^6
d.c. with economy resistor	In operating cycles			1.2 x 10^6	1.2 x 10^6	1.2 x 10^6
Maximum operating rate (θ ≤ 55 °C)						
Direct d.c.	In operating cycles/hour			1200	1200	1200
d.c. with economy resistor	In operating cycles/hour			120	120	120

(1) The closing time “N/O” or opening time “N/C” are measured from the moment the coil supply is switched on or off, to initial contact or separation of the main poles.

Characteristics

Auxiliary contact characteristics (cont.)

Type of contacts				Auxiliary contact LA1BN32A (size F to H)
Rated operational voltage (Ue)	Up to		V	690
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C		A	10
Short-circuit protection	Conforming to IEC 60947-5-1			gG fuse: 10 A
Rated making capacity	Conforming to IEC 60947-5-1	I rms	A	∿: 140, ⎓: 250
Tightening torque	Philips head n° 2 and Ø 6		N.m	1.2
Screw clamp connections	Flexible conductor without cable end	1 conductor	mm²	1…4
		2 conductors	mm²	1…4
	Flexible conductor with cable end	1 conductor	mm²	1…4
		2 conductors	mm²	1…2.5
	Solid conductor without cable end	1 conductor	mm²	1…4
		2 conductors	mm²	1…4
	Tightening torque		N.m	1.7
Mechanical durability In millions of operating cycles				1

Rated operational power of contacts in AC (conforming to IEC 60947-5-1)

a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet:
making current (cos □ 0.7) = 10 times the power broken (cos □ 0.4).

	V	24	48	115	230	400	440	600
1 million operating cycles	VA	60	120	280	560	960	1050	1440
3 million operating cycles	VA	16	32	80	160	280	300	420
10 million operating cycles	VA	4	8	20	40	70	80	100

Rated operational power of contacts in DC (conforming to IEC 60947-5-1)

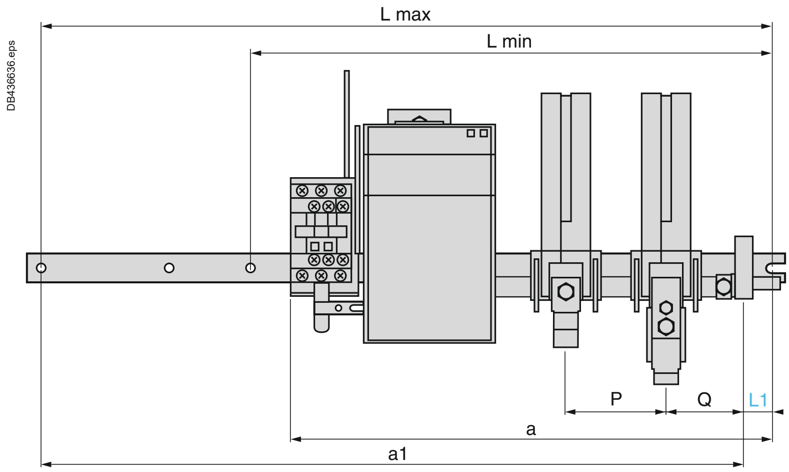
d.c. supply, category DC-13

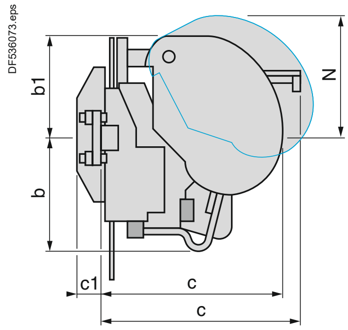
Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the power.

	V	24	48	125	250	440
1 million operating cycles	VA	120	90	75	68	61
3 million operating cycles	VA	70	50	38	33	28
10 million operating cycles	VA	25	18	14	12	10

CV1B size F to H for direct a.c.

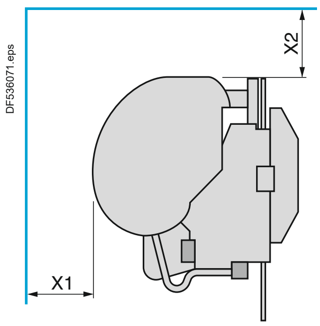
Dimensions





Dimension a: position of electromagnet according to the number of N/O or N/C main poles.

CV1B contactor size	Number of N/O poles	Number of N/C poles	Dimensions L [1] min	max	a	a1
F	0	1	225	445	-	210
	1	0	225	445	-	210
	1	1	285	445	-	270
	2	0	285	445	-	270
	2	1	345	445	-	330
	3	0	345	445	-	330
	4	0	345	445	-	330
H	0	1	345	540	286	-
	1	0	345	540	286	-
	1	1	385	540	355	-
	2	0	385	540	355	-
	2	1	445	540	430	-
	3	0	445	540	430	-
	4	0	540	540	505	-



X1, X2: minimum electrical clearance according to operational voltage and breaking capacity

CV1 B	380 V		500 V		600 V	
	X1	X2	X1	X2	X1	X2
F	50	80	60	100	80	120
H	70	100	80	120	100	150

Rating of contactor CV1 B	Ø	b [2] [3]	b1 [2]	c [2]	c1	L1	N	P [4]	Q
F	M6	76	71	112	17	15	97	40	20
H	M6	55	128	140	47	20	164	50	57

(1) Bar pre-drilled at 225 - 285 - 345 - 385 - 445.
*(2) Where 2 dimensions are given, the first is for a contactor fitted with an **EB1** electromagnet and the second, for a contactor fitted with an **EC1** electromagnet.*
*(3) With N/C main pole: size **F** and **H**, b = 95 mm - size **L**, b = 141 mm.*
(4) + 20 mm if intermediate bearing fitted.

CV1B size K, for direct a.c.

Dimensions

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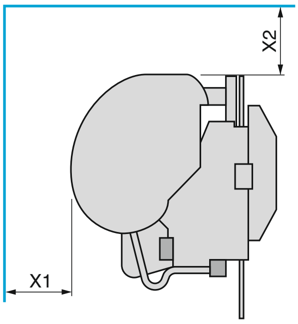

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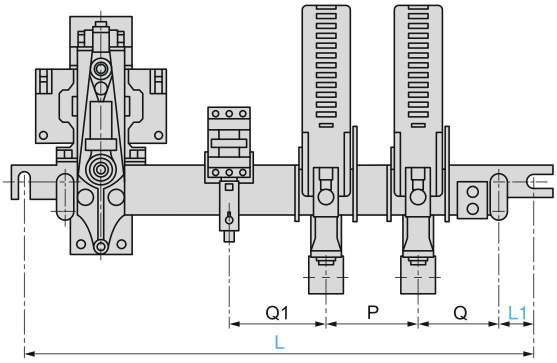

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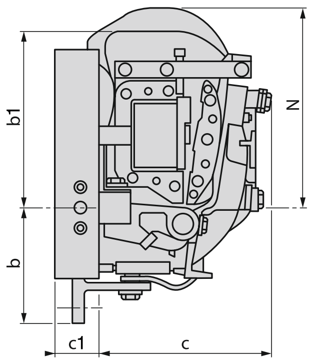


Dimension a: position of electromagnet according to the number of N/O or N/C main poles, with or without magnetic blow-out, and the number of ZC4GM auxiliary contact blocks in addition to the maintaining contact.

CV1B contactor size	Ø	b (1) (2)	b1 (1)	c (1)	c1	L1	N	P (3)	Q	Q1 (3)
K	M12	141	214	215	45	30	237	100	71	74

X1, X2: minimum electrical clearance according to operational voltage and breaking capacity

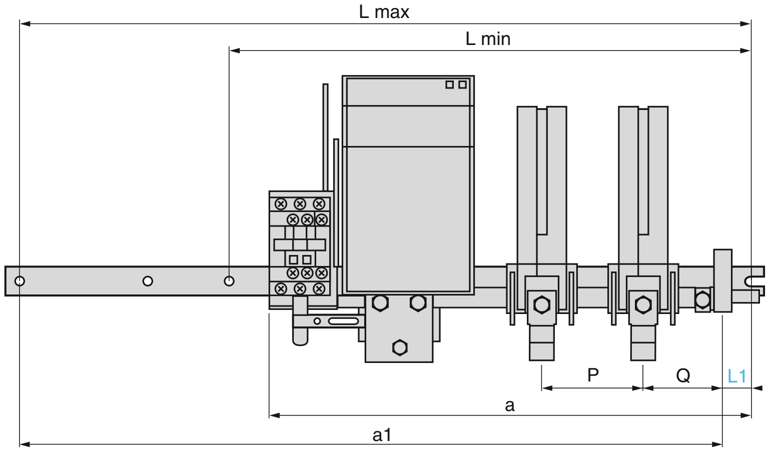
CV1B	380 V		500 V		600 V	
	X1	X2	X1	X2	X1	X2
K PN1 pole	90	90	120	120	160	160
K PN3 pole	40	40	60	60	80	80

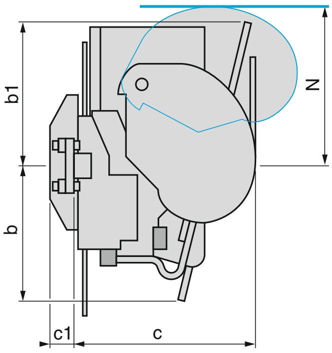
CV1B contactor size	Number of poles (4)	Dimensions	Number of LA1BN32 auxilliary contact module 0	1	2
K	1 N/O	L	345	385	445
		a	335	375	435
	2 N/O	L	445	540	540
		a	435	531	531
	3 N/O	L	540	635	635
		a	531	625	625
	4 N/O	L	635	760	760
		a	625	750	750
	1 N/C	L	345	385	445
		a	335	375	435
	2 N/C	L	445	540	540
		a	435	531	531

(1) Where 2 dimensions are given, the first is for a contactor fitted with an ***EB1*** *electromagnet and the second, for a contactor fitted with an* ***EC1*** *electromagnet.*
(2) With N/C main pole: size ***F*** *and* ***H****, b = 95 mm - size* ***G****, b = 84 mm - size* ***L****, b = 141 mm.*
(3) + 20 mm if intermediate bearing fitted.
(4) N/O poles (Normally Open), N/C poles (Normally Closed).

CV1B size F to H, for direct d.c.

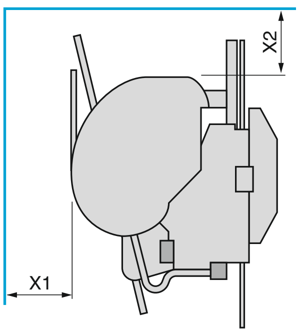
Dimensions





Dimension a: position of electromagnet according to the number of N/O or N/C main poles.

CV1B contactor size	Number of N/O poles	Number of N/C poles	Dimensions L (1) min	Dimensions L (1) max	a	a1
F	0	1	225	445	-	210
	1	0	225	445	-	210
	1	1	285	445	-	270
	2	0	285	445	-	270
	2	1	345	445	-	330
	3	0	345	445	-	330
	4	0	345	445	-	330
H	0	1	345	540	281	-
	1	0	345	540	281	-
	1	1	385	540	350	-
	2	0	385	540	350	-
	2	1	445	540	425	-
	3	0	445	540	425	-
	4	0	540	540	500	-



X1, X2: minimum electrical clearance according to operational voltage and breaking capacity

CV1B	380 V X1	380 V X2	500 V X1	500 V X2	600 V X1	600 V X2
F	50	80	60	100	80	120
H	70	100	80	120	100	150

CV1B contactor size	Ø	b (2)	b1	c	c1	L1	N	P (3)	Q
F	M6	78	92	142	17	20	97	40	40
H	M6	56	154	140	47	20	164	75	57

(1) Bar pre-drilled at 225 - 285 - 345 - 385 - 445.
*(2) With N/C main pole: size **F** and **H**, b = 95 mm .*
(3) + 20 mm if intermediate bearing fitted.

CV1B size K, for direct d.c.

Dimensions

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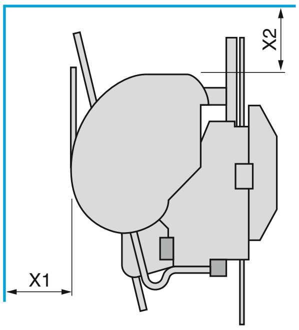

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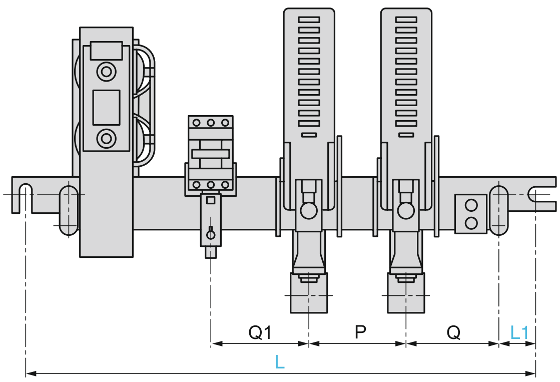

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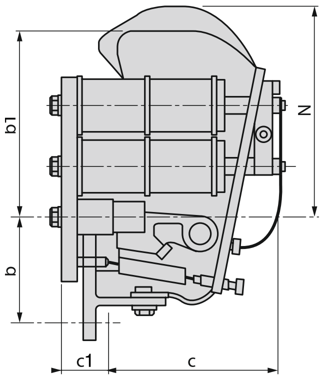


CV1B contactor size	Ø	b (1)	b1	c	c1	L1	N	P (2)	Q	Q1 (2)
K	M12	141	214	215	45	30	237	100	71	74

X1, X2: minimum electrical clearance according to operational voltage and breaking capacity

CV1B	380 V		500 V		600 V	
	X1	X2	X1	X2	X1	X2
K PN1 pole	90	90	120	120	160	160
K PN3 pole	40	40	60	60	80	80

CV1B contactor size	Number of poles (3)	Dimensions	Number of LA1BN32 auxilliary contact module		
			0	1	2
K	1 N/O	L	345	385	385
		a	321	361	361
	2 N/O	L	445	540	540
		a	421	517	517
	3 N/O	L	540	635	635
		a	517	611	611
	4 N/O	L	635	760	760
		a	611	736	736
	1 N/C	L	345	385	385
		a	321	361	361
	2 N/C	L	445	540	540
		a	421	517	517

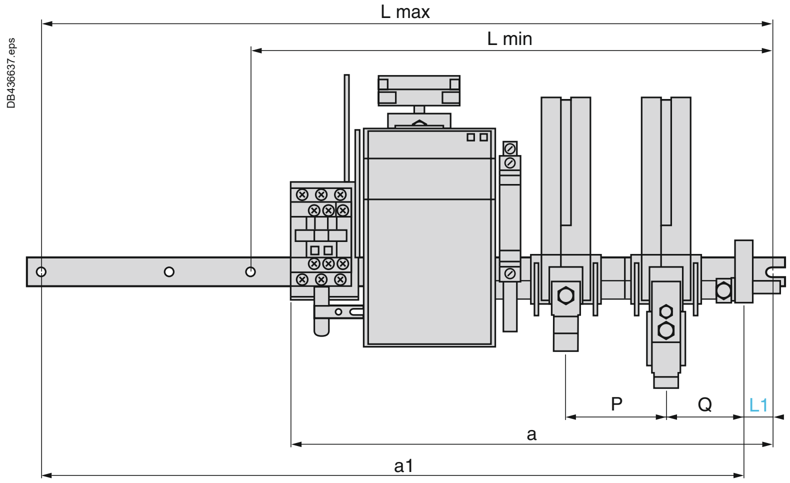
*(1) With N/C main pole: size **F** and **H**, b = 95 mm - size **G**, b = 84 mm - size **L**, b = 141 mm.*
(2) + 20 mm if intermediate bearing fitted.
(3) N/O poles (Normally Open), N/C poles (Normally Closed).

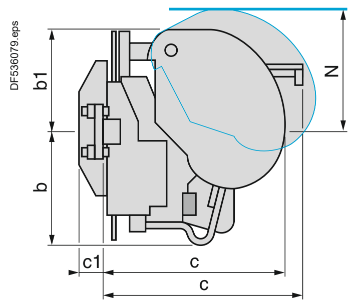
TeSys CV1B, size F, H, for rectified a.c. with economy resistor, d.c. with economy resistor

Dimensions

CV1B, size F, H, for rectified a.c. with economy resistor, d.c. with economy resistor

Dimensions

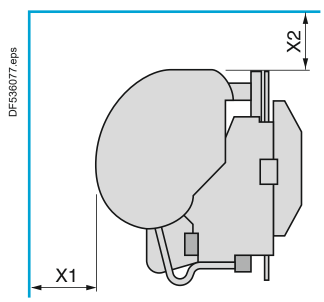




Dimension a: position of electromagnet according to the number of N/O or N/C main poles.

No maintaining contact for this version.
The economy resistor and N/C contact (included in the dimensions) are mounted on the contactor and wired in parallel.

CV1B contactor size	Number of N/O poles	Number of N/C poles	Dimensions L (1) min	L (1) max	a	a1
F	0	1	285	445	-	270
	1	0	285	445	-	270
	1	1	285	445	-	270
	2	0	285	445	-	270
	2	1	345	445	-	330
	3	0	345	445	-	330
	4	0	385	445	-	370
H	0	1	345	540	286	-
	1	0	345	540	286	-
	1	1	385	540	355	-
	2	0	385	540	355	-
	2	1	445	540	430	-
	3	0	445	540	430	-
	4	0	540	540	505	-



X1, X2: minimum electrical clearance according to operational voltage and breaking capacity

CV1 B	380 V X1	380 V X2	500 V X1	500 V X2	600 V X1	600 V X2
F	50	80	60	100	80	120
H	70	100	80	120	100	150

CV1B contactor size	Ø	b (2)	b1	c	c1	L1	N	P (3)	Q
F	M6	76	72	112	17	15	97	40	20
H	M6	65	128	140	47	20	164	75	57

(1) Bar pre-drilled at 225 - 285 - 345 - 385 - 445.
*(2) With N/C main pole: size **F** and **H**, b = 95 mm - size **L**, b = 141 mm.*
(3) + 20 mm if intermediate bearing fitted.

CV1B, size J to L, for rectified a.c. with economy resistor, d.c. with economy resistor

Dimensions

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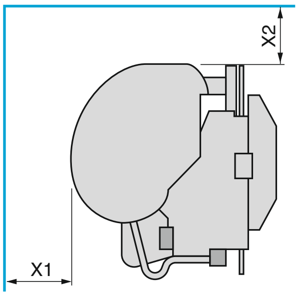

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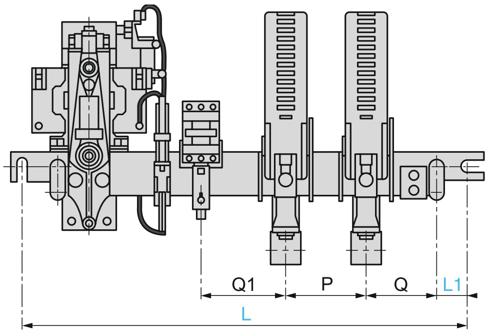

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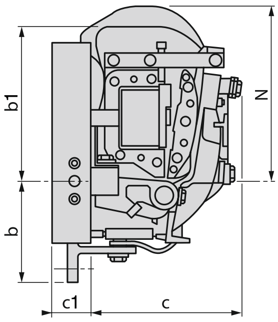


CV1B contactor size	Ø	b (1)	b1	c	c1	L1	N	P (2)	Q	Q1 (2)
K	M12	141	214	215	45	30	237	100	71	74

X1, X2: minimum electrical clearance according to operational voltage and breaking capacity

CV1B	380 V		500 V		600 V	
	X1	X2	X1	X2	X1	X2
K PN1 pole	90	90	120	120	160	160
K PN3 pole	40	40	60	60	80	80

CV1B contactor size	Number of poles (3)	Dimensions	Number of LA1BN32 auxilliary contact module		
			0	1	2
K	1 N/O	L	345	385	445
		a	335	375	435
	2 N/O	L	445	540	540
		a	435	531	531
	3 N/O	L	540	635	635
		a	531	625	625
	4 N/O	L	635	760	760
		a	625	750	750
	1 N/C	L	345	385	445
		a	335	375	435
	2 N/C	L	445	540	540
		a	435	531	531

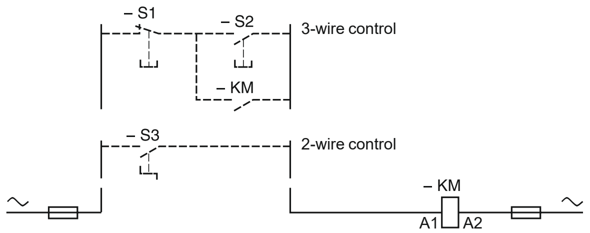
*(1) With N/C main pole: size **F** and **H**, b = 95 mm - size **G**, b = 84 mm - size **L**, b = 141 mm.*
(2) + 20 mm if intermediate bearing fitted.
(3) N/O poles (Normally Open), N/C poles (Normally Closed).

TeSys
TeSys CV1B for rectified a.c. with economy resistor, d.c. with economy resistor
Schemes

Schemes

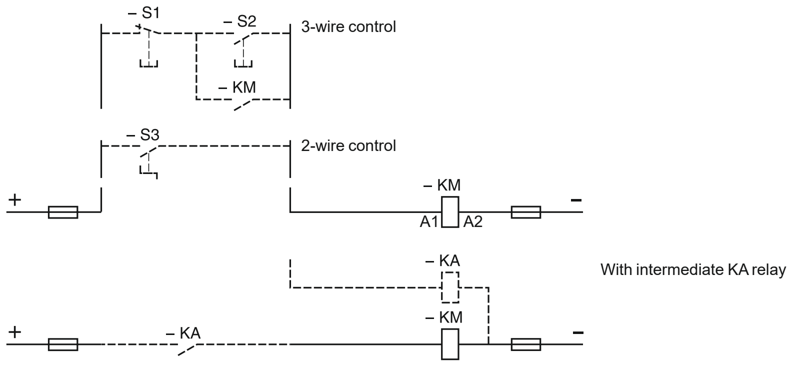
Direct a.c. control circuit supply (scheme a)

DF536105.eps



Direct d.c. control circuit supply (scheme b)

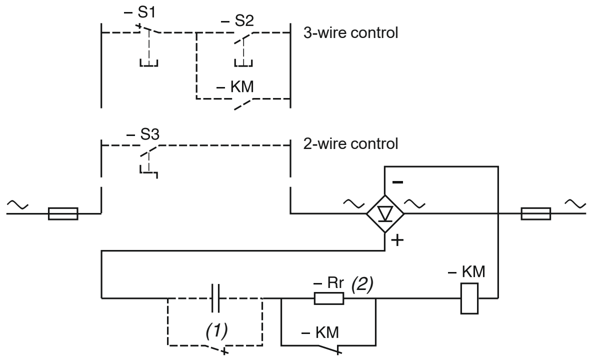
DF536106.eps



Dotted lines show optional wiring and external items required.

a.c. control circuit supply via rectifier and economy resistor

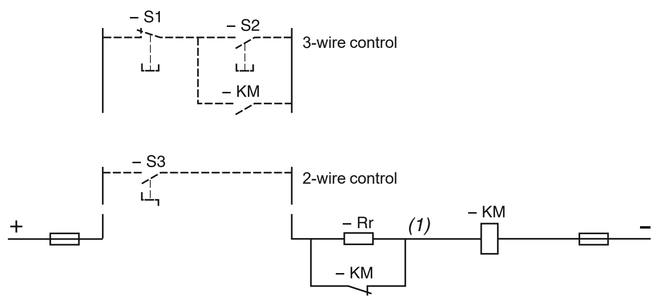
DF536528.eps



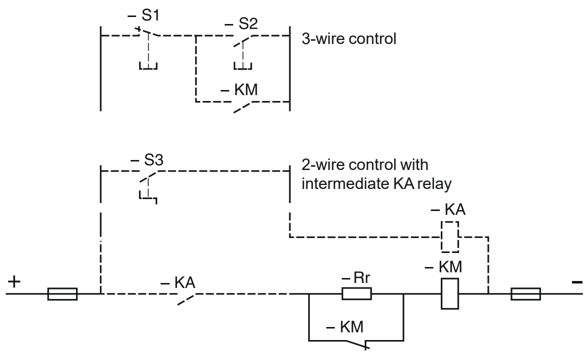
(1) Optional protection relay. Must be latching type for 2-wire control.
(2) Rr: economy resistor.

d.c. control circuit supply via rectifier and economy resistor

DF536529.eps



DF536530R.eps



It is essential to check that the control circuit contacts have ratings compatible with the voltage and power consumption of the operating coil of the contactor. If not, an intermediate "KA" auxiliary relay must be fitted and wired as shown.
(1) Rr: economy resistor.

Installation and maintenance of CV1B contactors

Fixing
In general, bar mounted contactors are fixed on 2 vertical uprights.

The fixing dimensions of the support bars are standardised as is the diameter of the fixing holes.

At each end of each bar there is a cut-out with notches, one vertical, the other horizontal.

For contactors:
■ CV1BK.
The use of LA9B103 bar mounting brackets is recommended, see page 74.

Tightening
In order to obtain good mechanical resistance to vibration, we recommend that the bar be fixed directly to the 2 uprights using screws of diameter recommended for the contactor size.

Maintenance

Bar mounted contactors require no special mechanical maintenance.

We recommend a periodic check of the main contacts.

Contacts which have performed numerous breaks may look as if they are worn. It is only by checking the compression gap that the degree of wear can be evaluated.

Never make adjustments to the compression gap before the contacts are replaced.

When the compression gap has reduced to 20-50 % of its initial value, replace all of the contactor’s contacts.

After each change of contacts:
■ Align the contacts to the initial compression dimension.
■ Check the contact pressure of each contact (contactor closed electrically or wedged mechanically).
■ Clean the inner side walls of the arc chambers by scraping.
■ Check tightness of the adjustment screws and nuts.

Note: ⚠ *the contacts must never be filed, cleaned or greased.*

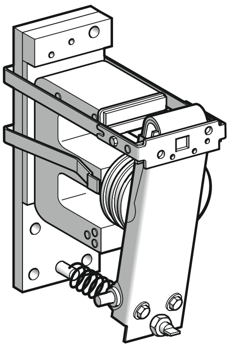
Replacement parts
■ Please see pages 76 to 101.

Setting characteristics
■ Please see page 54.

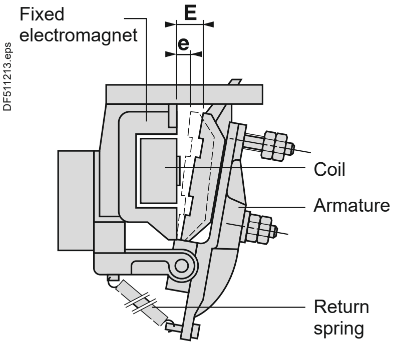
Setting characteristics of contactors CV1B, sizes F to L

Electromagnet for a.c. supply

Electromagnet EB1 or EC1

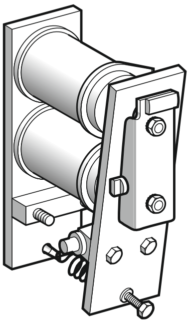


Setting closing travel (E) and compression gap (e)

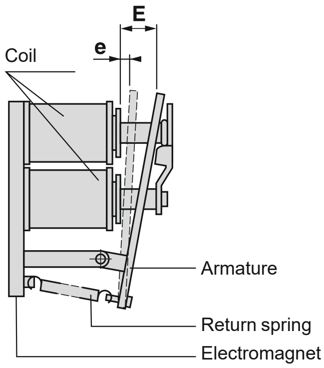


Electromagnet for d.c. supply

Electromagnet EK1

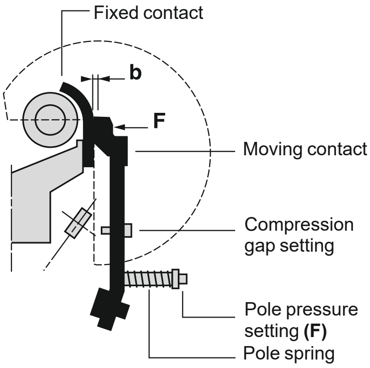


Setting closing travel (E) and compression gap (e)

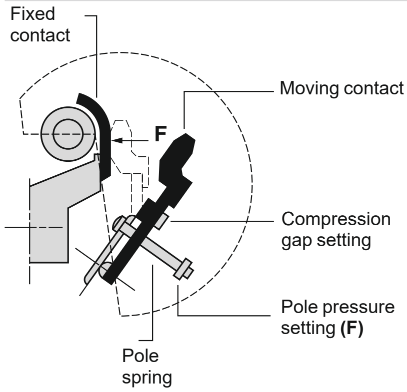


Poles

N/C poles



N/O poles



Setting characteristics of N/C poles

These characteristics apply to all forms of electromagnet power supply.

CV1 contactor size		F	G	H	J	K	L
Opening stroke (b)	**mm**	4	6	6	7.5	7.5	7.5
Contact pressure force (F)	**daN**	0.6	0.7	1	1.6	4	8

The operating force for a N/C pole is approximately equal to the force of 2 N/O poles.

Setting characteristics of contactors CV1B, sizes F to L on a.c. supply

Direct a.c. 50/60 Hz supply with standard power electromagnet EB1

CV1B contactor size				F	G	H	J	K	L
Electromagnet				EB1EA40	EB1GA40	EB1HA40	EB1JB40	EB1KB40	EB1KB40
	Armature closing travel (E)		mm	15 ±1	16 ±1	21 ±1	21/24	28/33	28/33
	Compression travel (e)		mm	5/5.5	5.5/6	6.5/7	6/7	8/9	8.5/9
Coil				WB1EA●●●	WB1GA●●●	WB1HA●●●	WB1JB●●●	WB1KB●●●	WB1KB●●●
	Pull-in voltage		V	0.8 Uc					
	Drop-out voltage		V	0.5…0.7 Uc					
N/O poles Contact pressure setting (F) per pole according to the contactor composition		1 pole	daN	3	4.5	7	10.5	20	20 (1)
		2 poles	daN	1.5	2.2	3.5	5.2	10	10 (1)
		3 poles	daN	1	1.5	2.3	3.5	6.6	–
		4 poles	daN	0.75	1.1	1.7	2.6	5	–

Direct a.c. 50/60 Hz supply with increased power electromagnet EC1

CV1B contactor size				F	G	H	J	K	L
Electromagnet				EC1EA40	EC1GA40	EC1HA40	EC1JB40	–	–
	Armature closing travel (E)		mm	16 ±1	21 ±1	21/24	28/33	–	–
	Compression travel (e)		mm	5.5/6	6.5/7	6/7	8/9	–	–
Coil				WB1GA●●●	WB1HA●●●	WB1JB●●●	WB1KB●●●	–	–
	Pull-in voltage		V	0.8 Uc				–	–
	Drop-out voltage		V	0.5…0.7 Uc				–	–
N/O poles Contact pressure setting (F) per pole according to the contactor composition		1 pole	daN	2.2	3	–	–	–	–
		2 poles	daN	1.5	2	–	–	–	–
		3 poles	daN	1	1.5	2.6	5	–	–
		4 poles	daN	0.8	1.2	2.1	4	–	–

a.c. 40/400 Hz supply via individual rectifier and economy resistor

CV1B contactor size				F	G	H	J	K	L
Electromagnet				EB1EA40	EB1GA40	EB1HA40	EB5JB40	EB5KB40	EB5KB40
	Armature closing travel (E)		mm	15 ±1	16 ±1	21 ±1	21/24	28/33	28/33
	Compression travel (e)		mm	5/5.5	5.5/6	6.5/7	6/7	8/9	8/9
Coil				WB1 EA●●●	WB1GA●●●	WB1HA●●●	WB1JB●●●	WB1KB●●●	WB1KB●●●
	Pull-in voltage		V	0.73 ±0.02 Uc					
	Drop-out voltage		V	0.2…0.52 Uc					
N/O poles Contact pressure setting (F) per pole according to the contactor composition		1 pole	daN	3	4.5	7	10.5	20	20 (1)
		2 poles	daN	1.5	2.2	3.5	5.2	10	10 (1)
		3 poles	daN	1	1.5	2.3	3.5	6.6	13 (1)
		4 poles	daN	0.75	1.1	1.7	2.6	5	10 (1)
		5 poles	daN	0.75	1	–	–	–	–

(1) Each pole has 2 contacts; the force must be applied evenly to each of these contacts.

Setting characteristics of contactors CV1B, sizes F to L on d.c. supply

d.c. supply with economy resistor

CV1B contactor size			F	G	H	J	K	L
Electromagnet			EB1EA40	EB1GA40	EB1HA40	EB5JB40	EB5KB40	EB5KB40
	Armature closing travel (E)	mm	15 ±1	16 ±1	21 ±1	21/24	28/33	28/33
	Compression travel (e)	mm	5/5.5	5.5/6	6.5/7	6/7	8/9	8/9
Coil			WB1EA●●●	WB1GA●●●	WB1HA●●●	WB1JB●●●	WB1KB●●●	WB1KB●●●
	Pull-in voltage	V	0.73 ±0.02 Uc					
	Drop-out voltage	V	0.2…0.52 Uc			0.2…0.50 Uc		
N/O poles Contact pressure setting (F) per pole according to the contactor composition	1 pole	daN	3	4.5	7	10.5	20	20 (1)
	2 poles	daN	1.5	2.2	3.5	5.2	10	10 (1)
	3 poles	daN	1	1.5	2.3	3.5	6.6	13 (1)
	4 poles	daN	0.75	1.1	1.7	2.6	5	10 (1)
	5 poles	daN	0.75	1	–	–	–	–

Direct d.c. supply

CV1B contactor size			F		G		H	J	K	L
Electromagnet			EK1EA40		EK1GA40		EK1HA40	EK1JA40	EK1KA40	EK1KA40
	Armature closing travel (E)	mm	22 ±1		22 ±1		26.5 ±1	26.5 ±1	38 ±2	38 ±2
	Compression travel (e)	mm	6,5/7		6,5/7		8/8,5	7 ± 0,5	10 ±0,5	10 ±0,5
Coil			WB2EA●●●		WB2EA●●●		WB2HA●●●	WB2HA●●●	WB2KA●●●	WB2KA●●●
	Power consumption of the 2 coils	W	20…26	30…40	20…26	30..40	42…52	42…52	80…105	80…105
	Pull-in current If (2)	A	0.64	0.61	0.64	0.61	0.61	0.61	0.61	0.61
	Drop-out voltage	V	0.05…0.65 Uc							
N/O poles Contact pressure setting (F) per pole according to the contactor composition	1 pole	daN	3	–	2.6	–	7	8.8	14	20 (1)
	2 poles	daN	1.5	–	1.3	–	3.5	4.4	10	10 (1)
	3 poles	daN	0.9	–	–	1.5	2.3	2.9	6.6	–
	4 poles	daN	–	1.1	–	1.1	1.7	2.2	5	–
	5 poles	daN	–	0.9	–	–	–	–	–	–

(1) Each pole has 2 contacts; the force must be applied evenly to each of these contacts.
(2) If = current flowing through the 2 coils, at ambient temperature, after switch-on at Uc.

TeSys CV3B, LC1B with a.c. or d.c control circuit

Envir. & pole characteristics

CV3B, LC1B with a.c. or d.c control circuit

Characteristics

Contactor	Type / Size		Unit	CV3B F	CV3B H
Environment					
Rated insulation voltage (Ui)	Conforming to IEC 60947-4	∿	V	1000	1000
		⎓	V	1000	1000
Conforming to standards				IEC 60947-4	
Product certifications				Bureau veritas, CSA	
Degree of protection	Conforming to IEC 60529			IP00	
Protective treatment				TC	
Ambient air temperature around the device	Storage		° C	-60…+80	
	Operation		° C	-5…+55 (0.85…1.1 Un)	
	Permissible for operation at Uc		° C	-30…+70 at Uc	
Maximum operating altitude			m	2000	
Operating positions					± 23° possible, in relation to normal vertical mounting plane
Pole characteristics in AC				**Pole PA3**	
Rated operational current (Ie)	AC-3, Ue ⩽ 440 V, □ ⩽ 55 °C		A	80	250
	AC-1, Ue ⩽ 440 V, □ ⩽ 40 °C		A	80	300
Rated operational voltage (Ue)	Up to		V	1000	1000
Frequency limits of the operational current	Without derating		Hz	50/60	
	Derating coefficient		Hz	100 Hz: 0.9 - 150 Hz: 0.8 - 250 Hz: 0.7 - 400 Hz: 0.5	
Rated making capacity	cos □ = 0.35		A	1000	2500
Rated breaking capacity on ∿ supply (cos □ = 0.35) I rms conforming to IEC 60947-4-1	cos □ = 0.35	up to 440 V	A	900	2200
		500 V	A	900	2200
		660/ 690 V	A	800	2100
		1000 V	A	700	2000
Power dissipation per pole for the above operational currents	AC-3		W	9.6	35
	AC-1		W	9.6	51
Pole characteristics in DC				**Pole PA3**	
Rated operational current (Ie)	DC-1, Ue ⩽ 500 V, □ ⩽ 40 °C		A	80	300
	DC-3 to DC-5, Ue ⩽ 440 V, T □ ⩽ 40 °C		A	80	300
Rated operational voltage (Ue)	L/R ⩽ 1 ms			500	500
	L/R ⩽ 15 ms			440	440
Rated making capacity	L/R ⩽ 15 ms		A	1400	3500
Rated breaking capacity	L/R ⩽ 1 ms	Single-pole - 500 V	A	1000	3000
		2-pole - 500 V	A	1000	3000
		2-pole - 1000 V	A	1000	3000
	L/R ⩽ 15 ms	Single-pole - 440 V	A	1000	3000
		2-pole - 440 V	A	1000	3000
		2-pole - 850 V	A	1000	3000
Power dissipation per pole for the above operational currents	In DC-1		W	9.6	35
	From DC-3 to DC-5		W	9.6	35
General pole characteristics				**Pole PA3**	
Number of poles				1…4	
Conventional thermal current	□ ⩽ 40 °C		A	80	300
Short time rating From cold state, with no current flowing for previous 60 minutes at □ ⩽ 40 °C	For 1 s		A	800	2400
	For 5 s		A	640	2300
	For 10 s		A	640	2280
	For 30 s		A	380	1300
	For 1 min		A	320	1100
	For 3 min		A	200	680
	For 10 min		A	130	440
Short-circuit protection by fuse	Ue ⩽ 440 V	Type aM / type g1	A	80/125	250/315
Average impedance per pole	At Ith and 50 Hz		m□	1.5	0.57
Cabling		Number of bars or conductor		1	1
	Bar		mm	–	32 x 4
	Cable with lug		mm²	25	120
	Cable with connector		mm²	–	–
	Bolt diameter		mm	Ø 6	Ø 10
Tightening torque	Power circuit connections		N.m	9	35

TeSys CV3B, LC1B with a.c. or d.c control circuit

Envir. & pole characteristics

CV3B and LC1B			
L	M	P	R
1000			
1500			
Bureau veritas, Register of shipping (CEI), German Lloyd			
Pole PA2			
800	1000	1500	1800
800	1250	2000	2750
1000	1000	1000	1000
10 000	10 000	15 000	18 000
8000	9000	12 000	16 000
7000	8000	12 000	14 000
6000	7000	9000	11 000
4000	4000	5000	6000
115	180	290	360
115	280	520	680
Pole PA2			
800	1250	2000	2750
800	1000	1800	2500
500	500	500	500
440	440	440	440
10 000	10 000	15 000	18 000
3200	4400	7200	10 000
3200	4400	7200	10 000
3200	4400	7200	10 000
3200	4400	7200	10 000
3200	4400	7200	10 000
3200	4400	7200	10 000
115	280	520	680
115	180	420	560
Pole PA2			
800	1250	2000	2750
9600	9600	12 000	15 000
9600	9600	12 000	15 000
7000	8000	9600	12 000
4800	5200	6400	8000
3500	3800	5200	6300
2100	2400	3600	4400
1200	1800	2800	3600
800/1000	1200/1500	2 x 800/2 x 1000	2 x 1000/2 x 1250
0.18	0.18	0.13	0.09
2	2	3	4
50 x 5	80 x 5	100 x 5	100 x 5
–	–	–	–
–	–	–	–
4 x Ø 8	4 x Ø 10	4 x Ø 10	4 x Ø 10
18	35	35	35

TeSys CV3B, LC1B size L to R with a.c. or d.c control circuit with economy resistor

Control circuit characteristics

CV3B L to R, LC1B with a.c. or d.c control circuit (with economy resistor)

Characteristics

CV3B and LC1B contactors sizes				L	M	P	R
Control circuit characteristics							
Rated control circuit voltage (Uc)	d.c. with economy resistor		V	48…500 on 3-pole contactor 60…500 on 4-pole contactor			
	a.c. with economy resistor		V	110…500			
Control voltage limits (□ ≤ 55 °C and at Uc)	Operation		V	0.85…1.1 Uc			
	Drop-out		V	0.3…0.5 Uc		0.35…0.5 Uc	0.4…0.5 Uc
Maximum consumption (coil + economy resistor)							
d.c. with economy resistor (1)	Composition	1 pole	W	Inrush: 520 - Sealed: 10			
		2 poles	W	Inrush: 800 - Sealed: 20			
		3 poles	W	Inrush: 1100 - Sealed: 31			
		4 poles	W	Inrush: 1400 - Sealed: 47			
a.c. with economy resistor	Composition	1 pole	VA	Inrush: 620 - Sealed: 10			
		2 poles	VA	Inrush: 1000 - Sealed: 20			
		3 poles	VA	Inrush: 1100 - Sealed: 31			
		4 poles	VA	Inrush: 1600 - Sealed: 47			
Average operating time at Uc (1)	Closing "N/O"		ms	100…150			
	Opening "N/C"		ms	20…40			
Mechanical durability at Uc	In operating cycles			1,2 x 10^6			
Maximum operating rate (□ ≤ 55 °C)	In operating cycles/hour			120			

Auxiliary contact characteristics

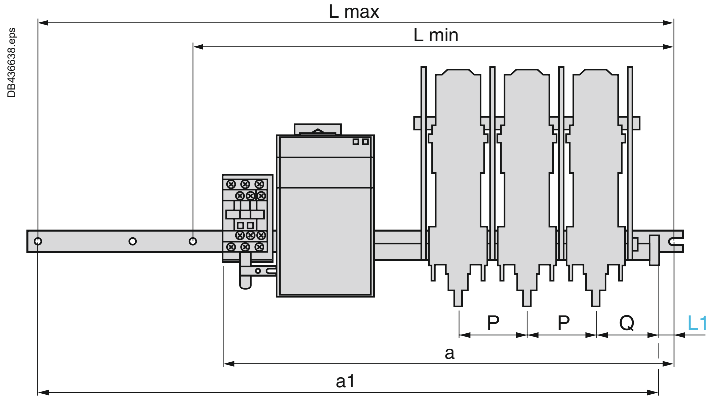
Type of contacts			Instantaneous ZC4GM					
Rated thermal current (Ith)		A	20					
Operational power a.c.		V	48	110/127	220/240	380/415	440/500	
	1 x 10^6 operating cycles	W	900	2200	4000	4000	4000	
	3 x 10^6 operating cycles	W	800	1300	1500	1500	1500	
	10 x 10^6 operating cycles	W	450	500	500	500	500	
Occasional making and breaking capacity a.c.		W	5000	14000	23000	35000	45000	
Operational power d.c.		V	24	48	110	220	440	600
	1 x 10^6 operating cycles	W	300	280	250	250	230	100
	3 x 10^6 operating cycles	W	115	105	95	90	85	50
	10 x 10^6 operating cycles	W	45	40	35	33	30	20
Occasional making and breaking capacity d.c.		W	5000	6000	1600	800	400	240
Cabling	With cable end	mm^2	1 or 2 x 4 mm^2 conductors					
	Without cable end	mm^2	1 or 2 x 6 mm^2 conductors					
Tightening torque		N.m	1.2					

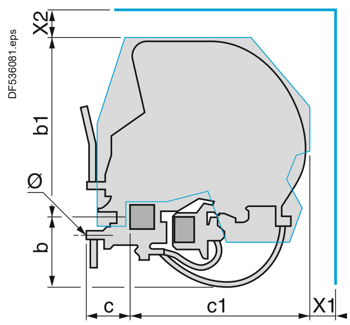
(1) The closing time "N/O" or opening time "N/C" are measured from the moment the coil supply is switched on or off, to initial contact or separation of the main poles.

CV3B size F, H, for direct a.c.

Dimensions

Sizes F, H





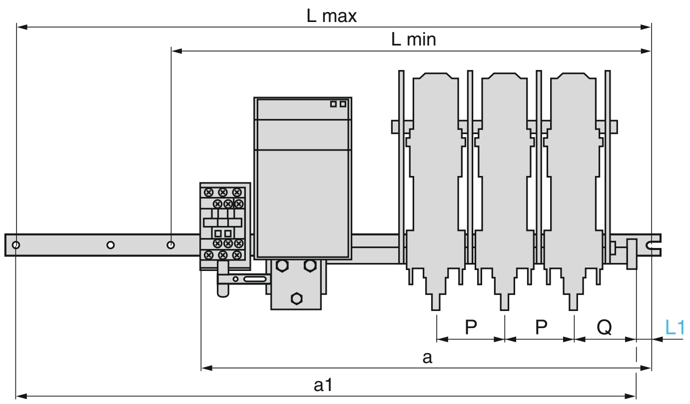
Dimension L: fixing centres depending on the number of N/O or N/C main poles.

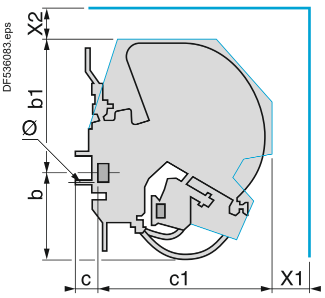
CV3B contactor size	Number of N/O poles	Number of N/C poles	Dimensions L min	L max	a	a1
F	0	1	285	445	-	270
	1	0	285	445	-	270
	1	1	345	445	-	330
	2	0	345	445	-	330
	2	1	385	445	-	370
	3	0	385	445	-	370
	4	0	445	445	-	430
H	0	1	345	540	286	-
	1	0	345	540	286	-
	1	1	385	540	355	-
	2	0	385	540	355	-
	2	1	445	540	430	-
	3	0	445	540	430	-
	4	0	540	540	505	-

CV3B contactor size									Minimum electrical clearance	
	Ø	b	b1	c	c1	L1	P	Q	X1	X2
F	M6	76	120	15	157	15	50	46	25	15
H	M6	62	188	52	176	20	60	57	60	55

CV3B size F, H, for direct d.c.

Dimensions





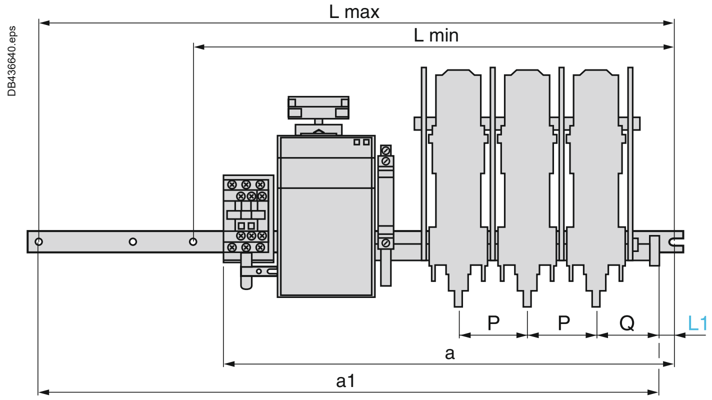
Dimension L: fixing centres depending on the number of N/O or N/C main poles.

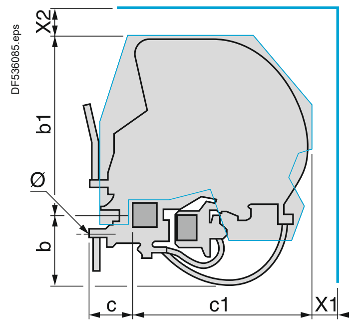
CV3B contactor size	Number of N/O poles	Number of N/C poles	Dimensions L min	Dimensions L max	a	a1
F	0	1	285	445	-	270
	1	0	285	445	-	270
	1	1	345	445	-	330
	2	0	345	445	-	330
	2	1	385	445	-	370
	3	0	385	445	-	370
	4	0	445	445	-	430
H	0	1	345	540	284	-
	1	0	345	540	284	-
	1	1	385	540	353	-
	2	0	385	540	353	-
	2	1	445	540	428	-
	3	0	445	540	428	-
	4	0	540	540	503	-

CV3B contactor size	Ø	b	b1	c	c1	L1	P	Q	Minimum electrical clearance X1	Minimum electrical clearance X2
F	M6	78	120	15	157	20	50	48	25	15
H	M6	62	188	52	176	20	60	57	60	55

CV3B size F, H, for rectified a.c. with economy resistor, d.c. with economy resistor

Dimensions





Dimension L: fixing centres depending on the number of N/O or N/C main poles, with or without magnetic blow-out, and the number of ***ZC4 GM*** *auxiliary contact blocks in addition to the maintaining contact.*

CV3B contactor size	Number of N/O poles	Number of N/C poles	Dimensions L min	L max	a	a1
F	0	1	285	445	-	270
	1	0	285	445	-	270
	1	1	345	445	-	330
	2	0	345	445	-	330
	2	1	385	445	-	370
	3	0	385	445	-	370
	4	0	445	445	-	430
H	0	1	345	540	286	-
	1	0	345	540	286	-
	1	1	385	540	355	-
	2	0	385	540	355	-
	2	1	445	540	430	-
	3	0	445	540	430	-
	4	0	540	540	505	-

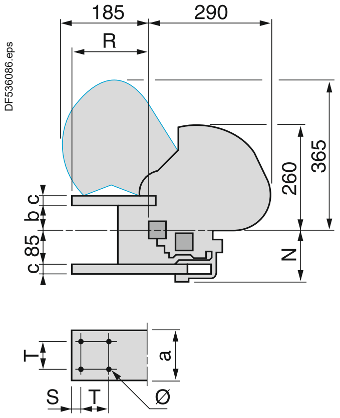
CV3B contactor size									Minimum electrical clearance	
	Ø	b	b1	c	c1	L1	P	Q	X1	X2
F	M6	75	120	17	149	15	50	48	25	153
H	M10	62	188	52	176	20	60	57	60	55

TeSys
TeSys CV3B size L to R, LC1B
Dimensions

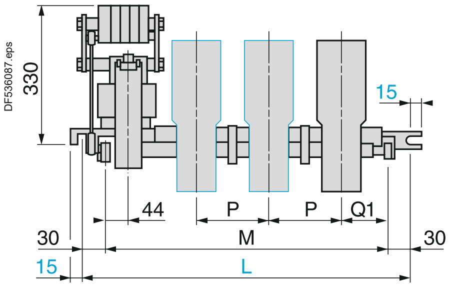
CV3B size L to R, LC1B

Dimensions

Common side view

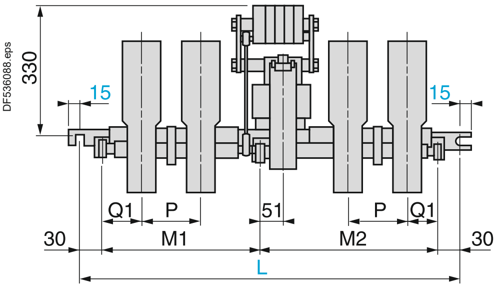


Contactors CV3B and LC1B, single-pole, 2-pole or 3-pole



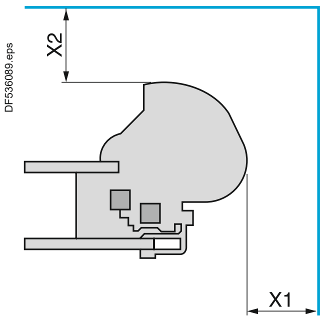
Fixing screws: Ø 8 for CV3 and LC1 B size L,
Ø 10 for all other contactor sizes.

Contactors type CV3B and LC1B, 4-pole



CV3B and LC1B contactor size	L				M				P				R			
Number of poles (1)	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
a	50	50	50	50	63	63	63	63	100	100	100	100	125	125	125	125
b	59	59	59	59	55	55	55	55	55	55	55	55	50	50	50	50
c	16	16	16	16	20	20	20	20	20	20	20	20	25	25	25	25
L	345	445	540	760	345	445	540	760	385	540	760	1065	445	635	885	1065
M	285	385	480	–	285	385	480	–	325	480	700	–	385	575	825	–
M1	–	–	–	308	–	–	–	308	–	–	–	455	–	–	–	455
M2	–	–	–	392	–	–	–	392	–	–	–	550	–	–	–	550
N	121	121	121	121	125	125	125	125	125	125	125	125	130	130	130	130
P	100	100	100	100	100	100	100	100	150	150	150	150	195	195	195	195
Q1	100	100	100	100	100	100	100	100	110	110	110	110	130	130	130	123
R	122	122	122	122	157	157	157	157	173	173	173	173	173	173	173	173
S	10	10	10	10	17	17	17	17	20	20	20	20	20	20	20	20
T	30	30	30	30	30	30	30	30	60	60	60	60	60	60	60	60
Ø	9	9	9	9	11	11	11	11	11	11	11	11	11	11	11	11

(1) N/O poles (Normally Open).



Minimum electrical clearance

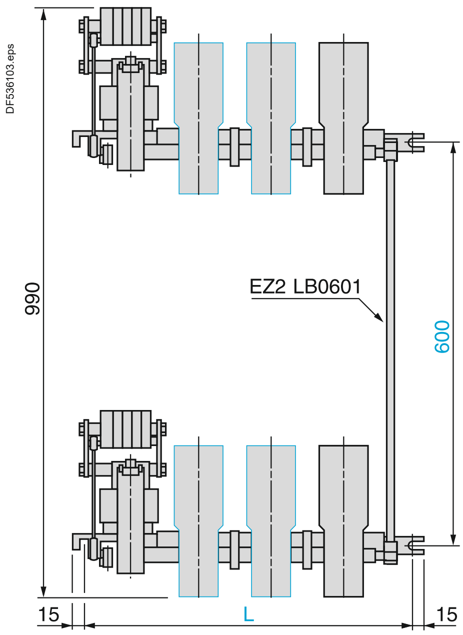
Values X1 and X2 are given for a breaking capacity of 10 In (3-phase ∿ current).

CV3B and LC1B contactor size		L	M	P	R
3-phase ∿ voltage					
380/440 V	**X1**	100	100	150	200
	X2	150	150	200	250
500 V	**X1**	100	100	150	200
	X2	150	150	220	250
660/690 V	**X1**	150	150	200	200
	X2	200	200	250	250
1000 V	**X1**	200	200	200	250
	X2	250	250	250	300

Mechanical interlocking

Mounting

Reversing contactor pairs LC1B and CV3B, Sizes L, M, P, R (for assembly by the user)



L : see dimensions.

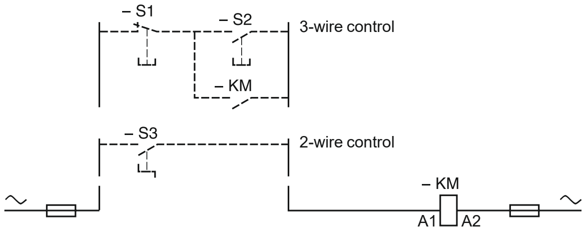
Contactor rating	Electromagnet	Supply voltage (in V)	Interaxis (in mm) CV1B (⩽ 690 V)
F	EB1∼	-	180
	EC1∼	-	200
	EK1⎓	-	180
H	-	⩽ 440	220
		⩾ 440	260
K	-	⩽ 440	400
		⩾ 440	500
M	-	-	-
P	-	-	-
R	-	-	-

Contactor rating	Electromagnet	Interaxis (in mm)	
		CV3B (⩽ 1000 V)	LC1B (⩽ 1000 V)
F	EB1∼	240	-
	EC1∼	240	-
	EK1⎓	240	-
H	-	320	-
L	-	600	-
M	-	600	600
P	-	600	600
R	-	600	600

Schemes

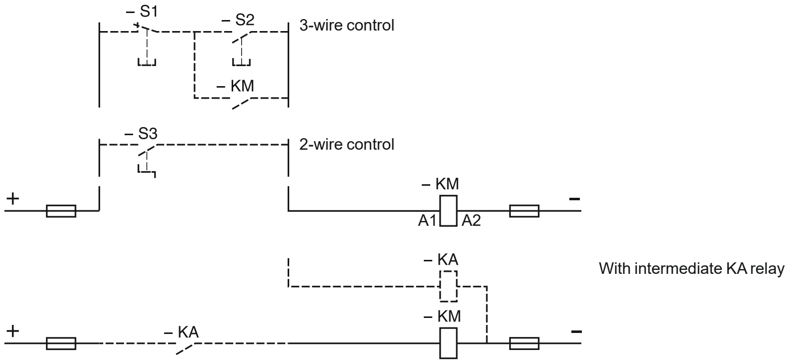
Direct a.c. control circuit supply (scheme a)

DF536105.eps



Direct d.c. control circuit supply (scheme b)

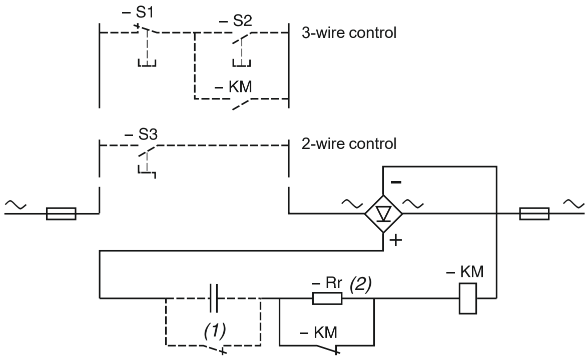
DF536106.eps



Dotted lines show optional wiring and external items required.

a.c. control circuit supply via rectifier and economy resistor

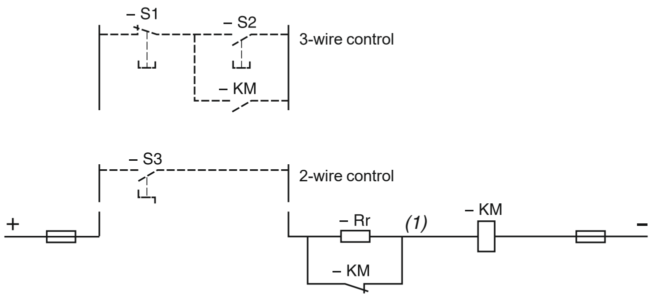
DF536528.eps



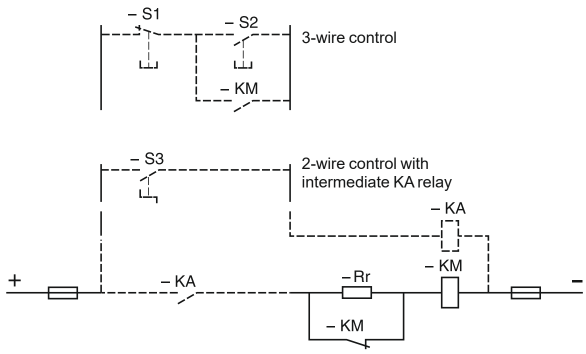
(1) Optional protection relay. Must be latching type for 2-wire control.
(2) Rr: economy resistor.

d.c. control circuit supply via rectifier and economy resistor

DF536529.eps



DF536530R.eps



It is essential to check that the control circuit contacts have ratings compatible with the voltage and power consumption of the operating coil of the contactor.
If not, an intermediate “KA” auxiliary relay must be fitted and wired as shown.
(1) Rr: economy resistor.

Installation and maintenance of CV3B and LC1B contactors

Fixing
In general, bar mounted contactors are fixed on 2 vertical uprights.

The fixing dimensions of the support bars are standardised as is the diameter of the fixing holes.

At each end of each bar there is a cut-out with notches, one vertical, the other horizontal.

For contactors:
■ CV3B, sizes L to R
■ LC1B
The use of LA9B103 bar mounting brackets is recommended, see page 74.

Tightening
In order to obtain good mechanical resistance to vibration, we recommend that the bar be fixed directly to the 2 uprights using screws of diameter recommended for the contactor size.

Maintenance
Bar mounted contactors require no special mechanical maintenance.

We recommend a periodic check of the main contacts.

Contacts which have performed numerous breaks may look as if they are worn. It is only by checking the compression gap that the degree of wear can be evaluated.

Never make adjustments to the compression gap before the contacts are replaced.

When the compression gap has reduced to 20-50 % of its initial value, replace all of the contactor's contacts.

After each change of contacts:
■ Align the contacts to the initial compression dimension.
■ Check the contact pressure of each contact (contactor closed electrically or wedged mechanically).
■ Clean the inner side walls of the arc chambers by scraping.
■ Check tightness of the adjustment screws and nuts.

Note: ⚠ *the contacts must never be filed, cleaned or greased.*

Replacement parts
■ Please see pages 76 to 101.

Setting characteristics
■ Please see page 68.

TeSys

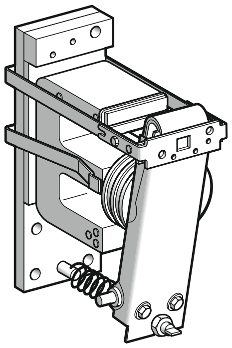
TeSys CV3B, LC1B installation, maintenance, setting

Setting

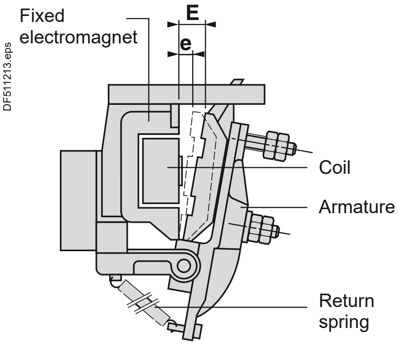
Setting characteristics of contactors CV3B, sizes F to K

Electromagnet for a.c. supply

Electromagnet EB1

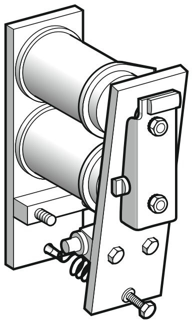


Setting closing travel (E) and compression gap (e)

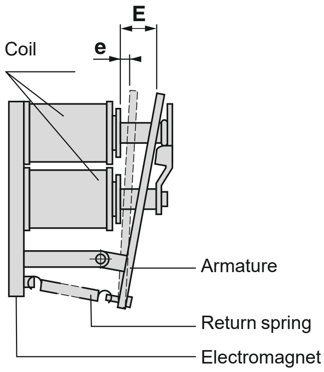


Electromagnet for d.c. supply

Electromagnet EK1

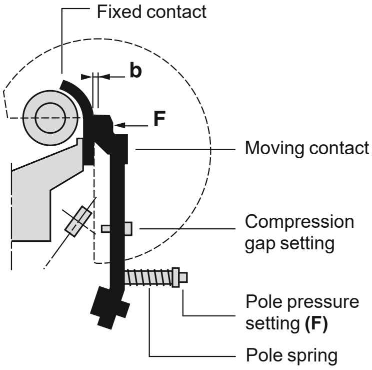


Setting closing travel (E) and compression gap (e)

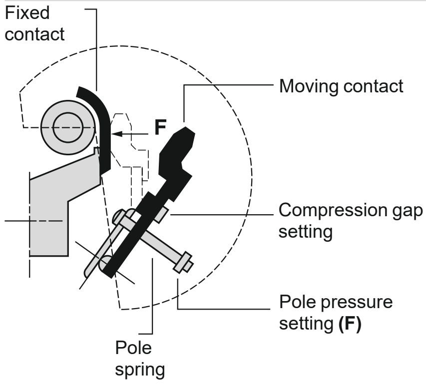


Poles

N/C pole



N/O pole



Setting characteristics of N/C poles

These characteristics apply to all forms of electromagnet power supply.

CV3 B contactor size		F	G	H	J - K
Opening stroke (b)	**mm**	4	6	6	No pole
Contact pressure force (F)	**daN**	0.6	0.7	1	Switch as standard (consult us)

The operating force for a N/C pole is approximately equal to the force of 2 N/O poles.

Setting characteristics of contactors CV3B, sizes F to K on a.c. supply

Direct a.c. 50/60 Hz supply with standard power electromagnet EB1

CV3B contactor size			F	G	H	J	K
Electromagnet			EB1EA40	EB1GA40	EB1HA40	EB1GA40	EB1KA40
	Armature closing travel (E)	mm	15 ±1	16 ±1	21 ±1	16 ±1	21 ±2
	Compression travel (e)	mm	5/5.5	5.5/6	6.5/7	5.5/6	6.5/7
Coil			WB1EA●●●	WB1GA●●●	WB1HA●●●	WB1GA●●●	WB1HA●●●
	Pull-in voltage	V	0.8 Uc				
	Drop-out voltage	V	0.4…0.7 Uc				
N/O poles Contact pressure setting (F) per pole according to the contactor composition	1 pole	daN	3	4.5	7	4.4 (1)	7 (1)
	2 poles	daN	1.5	2.2	3.5	2.2 (1)	3.4 (1)
	3 poles	daN	1	1.5	2.3	–	–
	4 poles	daN	–	1.1	1.7	–	–

Direct a.c. 50/60 Hz supply with increased power electromagnet EC1

CV3B contactor size			F	G	H	J	K
Electromagnet			EC1EA40	EC1GA40	EC1HA40	EC1GA40	EC1HB40
	Armature closing travel (E)	mm	16 ±1	21 ±1	23 ±1	21 ±1	23 ±1
	Compression travel (e)	mm	5.5/6	6.5/7	7 ±0.3	6.5/7	7 ±0.3
Coil			WB1GA●●●	WB1HA●●●	WB1JB●●●	WB1HA●●●	WB1JB●●●
	Pull-in voltage	V	0.8 Uc				
	Drop-out voltage	V	0.25…0.7 Uc				
N/O poles Contact pressure setting (F) per pole according to the contactor composition	1 pole	daN	–	–	–	3 (1)	5.2 (1)
	2 poles	daN	1.4	2	–	2.2 (1)	3.5 (1)
	3 poles	daN	1.1	1.5	2.6	–	–
	4 poles	daN	0.85	1.2	2.1	–	–

a.c. 50/400 Hz supply via individual rectifier and economy resistor

CV3 B contactor size			F	G	H	J	K
Electromagnet			EB1EA40	EB1GA40	EB1HA40	EB1GA40	EB1HA40
	Armature closing travel (E)	mm	15 ±1	16 ±1	21 ±1	16 ±1	21 ±1
	Compression travel (e)	mm	5/5.5	5.5/6	6.5/7	5.5/6	6.5/7
Coil			WB1EA●●●	WB1GA●●●	WB1HA●●●	WB1GA●●●	WB1HA●●●
	Pull-in voltage	V	0.73 ±0.02 Uc				
	Drop-out voltage	V	0.20…0.52 Uc				
N/O poles Contact pressure setting (F) per pole according to the contactor composition	1 pole	daN	3	4.5	7	4.4 (1)	7 (1)
	2 poles	daN	1.5	2.2	3.5	2.2 (1)	3.4 (1)
	3 poles	daN	1	1.5	2.3	–	–
	4 poles	daN	0.75	1.1	1.7	–	–
	5 poles	daN	0.75	1	–	–	–

(1) Each pole has 2 contacts; the force must be applied evenly to each of these contacts.

Setting characteristics of contactors CV3 B sizes F to K on d.c. supply

d.c. supply with economy resistor

CV3 B contactor size			F	G	H	J (1)	K (1)
Electromagnet			EB1EA40	EB1GA40	EB1HA40	EB1GA40	EB1HA40
	Armature closing travel (E)	mm	15 ±1	16 ±1	21 ±1	16 ±1	21 ±1
	Compression travel (e)	mm	5/5.5	5.5/6	6.5/7	5.5/6	6.5/7
Coil			WB1EA●●●	WB1GA●●●	WB1HA●●●	WB1GA●●●	WB1HA●●●
	Pull-in voltage	V	0.73 ±0.02 Uc				
	Drop-out voltage	V	0.20…0.52 Uc				
N/O poles	1 pole	daN	3	4.5	7	4.4 (2)	7 (2)
Contact pressure setting (F)	2 poles	daN	1.5	2.2	3.5	2.2 (2)	3.4 (2)
per pole according to the	3 poles	daN	1	1.5	2.3	–	–
contactor composition	4 poles	daN	0.75	1.1	1.7	–	–
	5 poles	daN	0.75	1	–	–	–

Direct d.c. supply

CV3 B contactor size			F		G		H	J	K
Electromagnet			EK1EA40		EK1GA40		EK1HA40	EK1GA40	EK1HA40
	Armature closing travel (E)	mm	22 ±1		22 ±1		26.5 ±1	22 ±1	26.5 ±1
	Compression travel (e)	mm	6.5/7		6.5/7		8.5/9	6.5/7	8/8.5
Coil			WB2EA●●●		WB2EA●●●		WB2HA●●●	WB2EA●●●	WB2HA●●●
	Power consumption of the 2 coils	W	20…26	30…40	20…26	30…40	42…52	26…37	42…52
	Pull-in current If (3)	A	0.64	0.61	0.64	0.61	0.61	0.61	0.61
	Drop-out voltage	V	0.05…0.65 Uc						
N/O poles	1 pole	daN	3	–	2.6	–	7	3.7 (2)	7 (2)
Contact pressure setting (F)	2 poles	daN	1.5	–	–	1.3	3.5	2.2 (2)	3.4 (2)
per pole according to the	3 poles	daN	0.9	1.5	–	1.5	2.3	–	–
contactor composition	4 poles	daN	–	1.1	–	1.1	1.7	–	–
	5 poles	daN	–	0.9	–	–	–	–	–

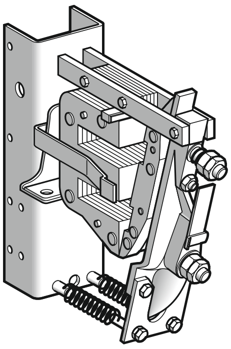
(1) 2 x GB poles in parallel for size J and 2 x HB poles in parallel for size K.
(2) Each pole has 2 contacts; the force must be applied evenly to each of these contacts.
(3) If = current flowing through the 2 coils. at ambient temperature. after switch-on at Uc.

Setting characteristics of contactors CV3B, sizes L to R, and LC1B

Electromagnet

Electromagnet EB5KB50

DF511218.eps



Setting closing travel (E) and compression gap (e)

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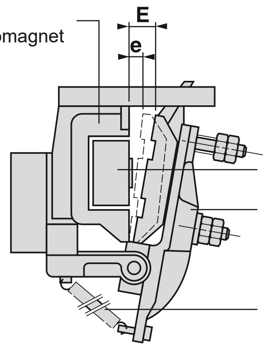

Poles

Complete pole

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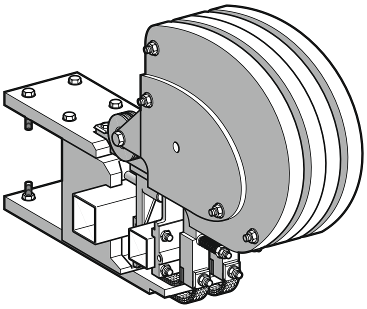

N/O pole

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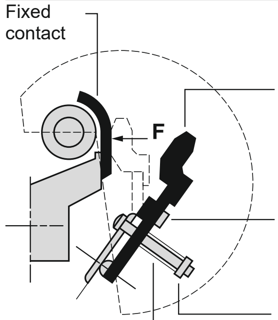
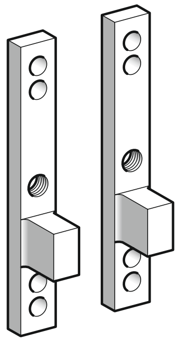


Setting characteristics on ⎓ or ∼ supply with economy resistor (and rectifier ∼)

CV3B or LC1B contactor size				L	M	P	R
Electromagnet				EB5KB50	EB5KB50	EB5KB50	EB5KB50
	Armature closing travel (E)		mm	30 ±2	30 ±2	30 ±2	30 ±2
	Compression travel (e)		mm	10 ±0.5	10 ±0.5	10 ±0.5	10 ±0.5
Coil				WB1KB●●●	WB1KB●●●	WB1KB●●●	WB1KB●●●
	Pull-in voltage		V	0.73 ±0.02 Uc	0.73 ±0.02 Uc	0.73 ±0.02 Uc	0.73 ±0.02 Uc
	Drop-out voltage		V	0.25…0.5 Uc	0.25…0.5 Uc	0.25…0.5 Uc	0.25…0.5 Uc
N/O poles Contact pressure setting (F) per pole according to the contactor composition		1 pole	daN	30 ±3	30 ±3	30 ±3 (1)	30 ±3 (2)
		2 poles	daN	30 ±3	30 ±3	30 ±3 (1)	30 ±3 (2)
		3 poles	daN	30 ±3	30 ±3	30 ±3 (1)	30 ±3 (2)
		4 poles	daN	30 ±3	30 ±3	30 ±3 (1)	30 ±3 (2)

(1) Each pole has 2 contacts; the force must be applied evenly to each of these contacts.
(2) Each pole has 3 contacts; the force must be applied evenly to each of these contacts.

CV1B, CV3B, LC1B
Accessories - Spare parts



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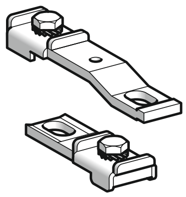
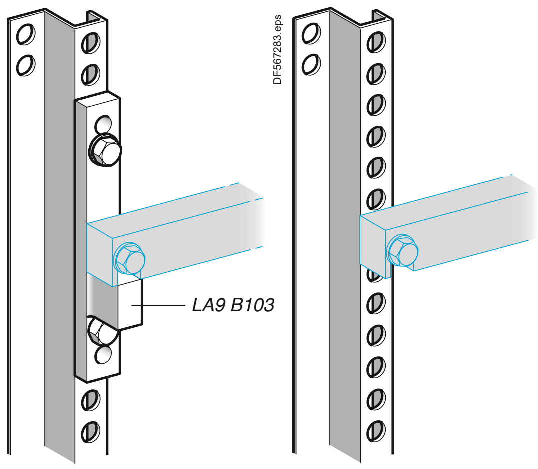


PN1GB81 - PN1GB82



DZ6MZ●

Mounting accessories for CV1B, CV3B, LC1B

References

Mounting and cabling accessories

Description		Contactors Type	Size	Reference	Weight kg
Mounting plates with bar support block, 36 mm fixing centres 120 or 150 mm		LC1B and CV3B	**L** to **R**	**LA9B103**	1.650
Pole connecting links for cabling from the front	Top connection	CV1B and CV3 B	**G**	**PN1GB81**	0.130
		CV1B and CV3B	**H**	**PN1HB81**	0.160
		CV1B	**J**	**PN1JB81**	0.250
		CV1B	**K**	**PN1KB81**	0.500
	Bottom connection	CV1B and CV3B	**G**	**PN1GB82**	0.100
		CV1B and CV3B	**H**	**PN1HB82**	0.110

Description	Specification	Length mm	Sold in lots of	Unit reference	Weight kg
Pre-drilled, "Z" profile uprights suitable for building chassis for variable composition contactors	–	1020	–	**DZ6MZ121**	2.590
		1320	–	**DZ6MZ151**	3.350
		1420		**DZ6MZ161**	3.600
		1620		**DZ6MZ181**	4.110
		1820		**DZ6MZ200**	4.620
		1920	–	**DZ6MZ211**	4.870
Notched clamp nuts for fixing on pre-drilled "Z" profile uprights	M6	–	100	**DZ5MF6**	–
	M8	–	100	**DZ5MF8**	–
Square nuts for fixing on pre-drilled Z" profile uprights	M10	–	10	**DZ6MZ904**	–

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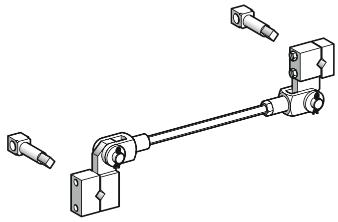

EZ2GA0602●

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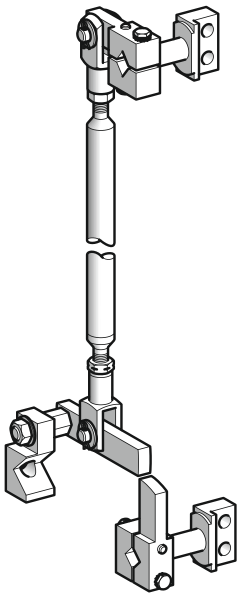

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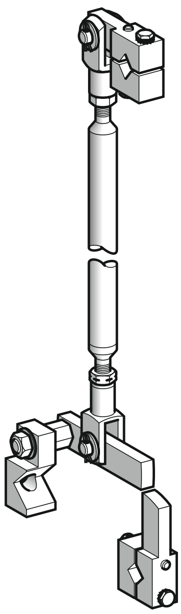

EZ2LB0601

Mechanical interlock for assembly of vertically mounted reversing CV1B, CV3B, LC1B contactor pairs

References

For contactors CV1B [1] (Building reversing contactor pairs using contactors of identical size) [*]

CV1B contactor size	Electro-magnet	Supply voltage	Fixing centres	Reference	Weight
			mm		kg
F [4]	EB1∼	–	180	**EZ2EA0301** [2]	0.030
	EC1∼	–	200	**EZ2EA0302** [2]	0.050
	EK1⎓	–	180	**EZ2EA032** [2]	0.110
G [5]	–	< 440 V	200	**EZ2GA0602200** [3]	0.285
		⩾ 440 V	240	**EZ2GA0602240**	0.310
H [5]	–	< 440 V	220	**EZ2HA0602220** [3]	0.315
		⩾ 440 V	260	**EZ2HA0602260**	0.370
J [5]	–	< 440 V	320	**EZ2JA0602320** [3]	0.750
		⩾ 440 V	400	**EZ2JA0602400**	0.780
K and L [5]	–	< 440 V	400	**EZ2KA0602400** [3]	1.260
		⩾ 440 V	500	**EZ2KA0602500**	1.700

For contactors CV3 B [1] (Building reversing contactor pairs using contactors of identical size) [*]

CV3 B contactor size	Electro-magnet	Fixing centres	Reference	Weight
		mm		kg
F [4]	EB1 ∼	240	**EZ2EA033** [2]	0.030
	EC1 ∼	240	**EZ2EA031** [2]	0.220
	EK1 ⎓	240	**EZ2EA0602240**	0.310
G [5]	–	260	**EZ2GA0602260** [3]	0.310
H [5]	–	320	**EZ2HA0602320** [3]	0.370
J [5]	–	280	**EZ2JA0602280** [3]	0.750
K [5]	–	340	**EZ2HA0602360** [3]	1.260
L to R [5] [6]	–	600	**EZ2LB0602**	1.560

For contactors LC1B

Specifications

■ Positive mechanical interlock between two vertically mounted contactors of the same or different size.

■ Connecting rod with cranks mounted on the right-hand, pole side [2].

Description	Fixing centres	Reference	Weight
	mm		kg
Mechanical interlock and locking device components	600	**EZ2LB0601**	1.280

(*) For the interlocking of two contactors of different ratings or the triple interlocking: contact us.

(1) The mechanical interlock must be adjusted so that when one of the contactors is closed, the other contactor has approximately 1 to 2 mm of free play at its stop.

(2) This assembly is mounted on the electromagnets, which must be aligned.

(3) Kit comprising: 1 rod, 1 upper crank with threaded clevis, 1 lower crank with plain clevis, 2 right-hand side mounting bearings.

(4) Left mounting.

(5) Right mounting.

(6) Dimensions see page 64.

TeSys CV3B, LC1B Variable composition contactors

Accessories - Spare parts

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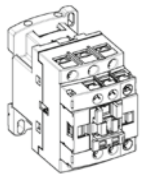
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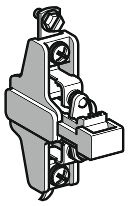
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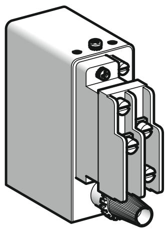
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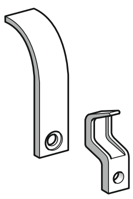
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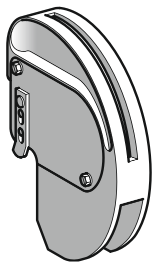
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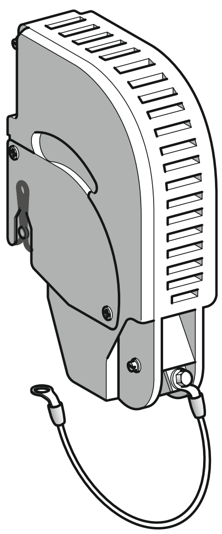
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CV3B, LC1B - Spare parts

References

Spare parts

Description		Composition	Contactors		Reference	Weight
			Type	Size		kg
Instantaneous auxiliary contacts		3 “N/O” + 2 “N/C”	CV1B	F to H	**LA1BN32A**	0.060
Time delay auxiliary contacts (*)						
	On-delay 1 C/O	1 “N/O” + 1 “N/C”			**LADT●**	0.060
	Off-delay 1 C/O	1 “N/O” + 1 “N/C”			**LADR●**	0.060

Spare parts

Description	Composition	Reference	Weight kg
Instantaneous auxiliary contacts	1 “N/O”	**ZC4GM1**	0.030
	1 “N/C”	**ZC4GM2**	0.030
Time delay auxiliary contacts	1 “N/C” + 1 “N/O” on-delay	**ZC2GG1**	0.455
	1 “N/C” + 1 “N/O” off-delay	**ZC2GG5**	0.455

Spare parts

Sets of contacts

Description	Number of sets required per contactor pole	CV1B contactors size	Reference	Weight kg
1 fixed contact + 1 moving contact	1	F	**PN1FB80**	0.035
	1	G	**PN1GB80**	0.060
	1	H	**PN1HB80**	0.115
	1	J	**PN1JB80**	0.195
	1	K	**PN1KB80**	0.345
	2	L	**PN1KB80**	0.790

Arc chamber only

Description	Type of poles	CV1B contactors size	Reference	Weight kg
Standard type arc chamber	PN1 or PR1	F	**PN1FB50**	0.220
		G	**PN1GB50**	0.360
		H	**PN1HB50**	0.580
		J	**PN1JB50**	1.380
		K	**PN1KB50**	1.880
		L	**PN1LB50**	4.380
Arc chamber with splitters	PN3 or PR3	J	**PN3JB50**	1.860
		K	**PN3KB50**	2.390
		L	**PN3LB50**	4.780
Coils	See pages 84 to 101.			

(*) Choose additives LADT● and LADR● from the TeSys D *range.*

TeSys CV3B, LC1B Variable composition contactors

Accessories - Spare parts

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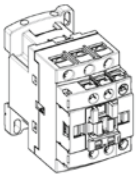
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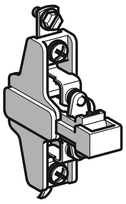
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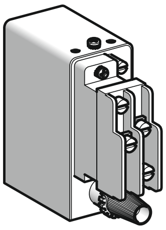
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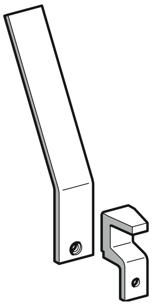
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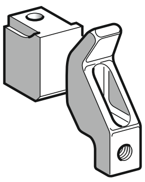
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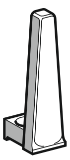
PA1LB89

CV3B, LC1B - Spare parts

References

Spare parts

Description		Composition	Contactors Type	Size	Reference	Weight kg
Instantaneous auxiliary contact		3 "N/O" + 2 "N/C"	CV3B	F to H	**LA1BN32A**	0.060
Time delay auxiliary contacts (*)						
	on-delay	1 "N/O" + 1 "N/C"			**LADT●**	0.060
	off-delay	1 "N/O" + 1 "N/C"			**LADR●**	0.060

Spare parts

Description	Composition	Contactors Type	Size	Reference	Weight kg
Instantaneous auxiliary contact	1 "N/O"	CV3B and LC1B	All	**ZC4GM1**	0.030
	1 "N/C"	CV3B and LC1B	All	**ZC4GM2**	0.030
Time delay auxiliary contacts	1 "N/C" + 1 "N/O" on-delay	CV3B	F to K	**ZC2GG1**	0.455
	1 "N/C" + 1 "N/O" off-delay	CV3B	F to K	**ZC2GG5**	0.455

Spare parts

Sets of contacts

Description	Number of sets required per contactor pole	Contactors Type	Size	Reference	Weight kg
1 fixed contact + 1 moving contact	1	CV3B	F	**PA2FB80**	0.070
	1	CV3B	G	**PA2GB80**	0.160
	1	CV3B	H	**PA2HB80**	0.220
	2	CV3B	J	**PA2GB80**	0.320
	2	CV3B	K	**PA2HB80**	0.440
	1	CV3B and LC1B	L	**PA1LB80**	0.420
	1	CV3B and LC1B	M	**PA1LB80**	0.420
	2	CV3B and LC1B	P	**PA1LB80**	0.840
	3	CV3B and LC1B	R	**PA1LB80**	1.260
Moving contact only (1 finger)	1	CV3B and LC1B	L to R	**PA1LB75**	0.220
Fixed contact only (1 finger)	1	CV3B and LC1B	L to R	**PA1LB76**	0.200
Blow-out horn (1 finger)	1	CV3B and LC1B	L to R	**PA1LB89**	0.120
Coils	See pages 84 to 101.				

(*) Choose additives LADT● and LADR● from the TeSys D *range.*

TeSys

TeSys CV1B Variable composition contactors

Accessories - Spare parts

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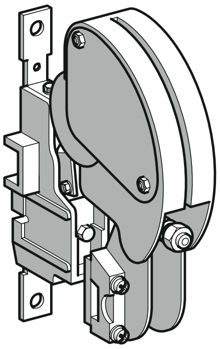

PN1FB00●

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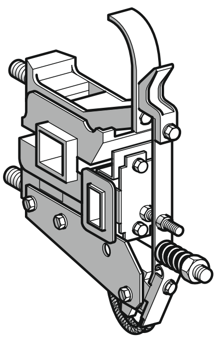

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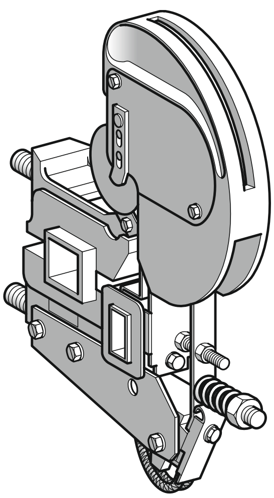

PR1GB00●

CV1B - Complete pre-assembled poles

Complete pre-assembled poles
Blow-out coils only, with housing and core

Size (1)	Maximum current for continuous duty		Complete poles		Blow-out coils	
	~	⎓	N/O	N/C	PN1 and PR1	Economy resistor
	A	A				□
For contactors CV1BF						
	0.35	0.4	PN1FB0003	PR1FB0003	PN1FA5103	19
	0.6	0.7	PN1FB0004	PR1FB0004	PN1FA5104	6.1
A	**0.9**	**1**	PN1FB0005	PR1FB0005	PN1FA5105	2.5
	1.3	1.45	PN1FB0006	PR1FB0006	PN1FA5106	1.335
B	**1.75**	**1.9**	PN1FB0007	PR1FB0007	PN1FA5107	0.747
	2.2	2.45	PN1FB0008	PR1FB0008	PN1FA5108	0.425
	2.6	3	PN1FB0009	PR1FB0009	PN1FA5109	0.272
C	**3.6**	**4**	PN1FB0010	PR1FB0010	PN1FA5110	0.1655
	4.3	4.8	PN1 FB0011	PR1 FB0011	PN1 FA5111	0.1135
	4.85	5.4	PN1 FB0012	PR1 FB0012	PN1 FA5112	0.0854
D	**6.8**	**7.6**	PN1FB0014	PR1FB0014	PN1FA5114	0.052
	7.4	8.2	PN1FB0015	PR1FB0015	PN1FA5115	0.045
	9.7	11	PN1FB0016	PR1FB0016	PN1FA5116	0.019
E	**11**	**12**	PN1FB0018	PR1FB0018	PN1FA5118	0.017
M	**13**	**14.5**	PN1FB0020	PR1FB0020	PN1FA5120	0.0125
N	**20**	**22**	PN1FB0025	PR1FB0025	PN1FA5125	0.0043
P	**40**	**45**	PN1FB009	PR1FB009	PN1FA519	Bar
Q	**50**	**55**	PN1FB007	PR1FB007	PN1FA517	Bar
F	**80**	**80**	PN1FB004	PR1FB004	PN1FB514	Bar
Y	Without arc chamber or blow-out		PN5FB00	PR5FB00	–	–
For contactors CV1BG						
	0.25	0.38	PN1GB0003	PR1GB0003	PN1GA5103	28
	0.45	0.67	PN1GB0004	PR1GB0004	PN1GA5104	9
	0.7	1.05	PN1GB0005	PR1GB0005	PN1GA5105	3.77
	1	1.45	PN1GB0006	PR1GB0006	PN1GA5106	1.8
	1.25	1.95	PN1GB0007	PR1GB0007	PN1GA5107	1.02
	1.6	2.55	PN1GB0008	PR1GB0008	PN1GA5108	0.6
	2.1	3.3	PN1GB0009	PR1GB0009	PN1GA5109	0.38
	2.5	3.85	PN1GB0010	PR1GB0010	PN1GA5110	0.27
	3	4.8	PN1GB0011	PR1GB0011	PN1GA5111	0.175
	3.5	5.5	PN1GB0012	PR1GB0012	PN1GA5112	0.123
	4.7	7.5	PN1GB0014	PR1GB0014	PN1GA5114	0.07
	5.5	8.85	PN1GB0015	PR1GB0015	PN1GA5115	0.051
	6.2	10	PN1GB0016	PR1GB0016	PN1GA5116	0.041
	8	12	PN1GB0018	PR1GB0018	PN1GA5118	0.026
	10	15	PN1GB0020	PR1GB0020	PN1GA5120	0.017
	12	19	PN1GB0022	PR1GB0022	PN1GA5122	0.011
	17	24	PN1GB0025	PR1GB0025	PN1GA5125	0.0068
	40	55	PN1GB009	PR1GB009	PN1GA519	Bar
Q	**55**	**80**	PN1GB007	PR1GB007	PN1GA517	Bar
R	**125**	**125**	PN1GB003	PR1GB003	PN1GA513	Bar
G	**200**	**200**	PN1GB002	PR1GB002	PN1GB512	Bar
Y	Without arc chamber or blow-out		PN5GB00	PR5GB00	–	–

(1) For devices with symbol combinations, the figures corresponding to the current are in bold.

CV1B - Complete pre-assembled poles

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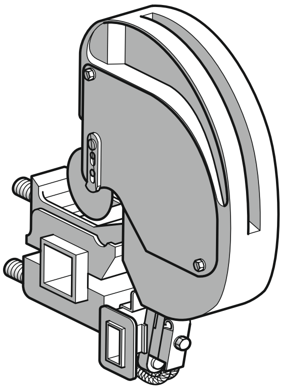

PN1HB00●

Size (1)	Maximum current for continuous duty		Complete poles		Blow-out coils	
	~	⎓	N/O	N/C	PN1 and PR1	Economy resistor
	A	A				Ω
For contactors CV1BH						
	0.25	0.38	PN1HB0003	PR1HB0003	PN1HA5103	36.5
	0.45	0.67	PN1HB0004	PR1HB0004	PN1HA5104	12.25
	0.7	1.05	PN1HB0005	PR1HB0005	PN1HA5105	5.1
	1	1.45	PN1HB0006	PR1HB0006	PN1HA5106	2.66
	1.25	1.95	PN1HB0007	PR1HB0007	PN1HA5107	1.39
	1.6	2.55	PN1HB0008	PR1HB0008	PN1HA5108	0.828
	2.1	3.3	PN1HB0009	PR1HB0009	PN1HA5109	0.512
	2.5	3.85	PN1HB0010	PR1HB0010	PN1HA5110	0.345
	3	4.8	PN1HB0011	PR1HB0011	PN1HA5111	0.237
	3.5	5.5	PN1HB0012	PR1HB0012	PN1HA5112	0.1755
	4.7	7.5	PN1HB0014	PR1HB0014	PN1HA5114	0.094
	5.5	8.85	PN1HB0015	PR1HB0015	PN1HA5115	0.0716
	6.2	10	PN1HB0016	PR1HB0016	PN1HA5116	0.0525
	8	12	PN1HB0018	PR1HB0018	PN1HA5118	0.0355
	10	15	PN1HB0020	PR1HB0020	PN1HA5120	0.022
	13	19	PN1HB0022	PR1HB0022	PN1HA5122	0.0152
	17	24	PN1HB0025	PR1HB0025	PN1HA5125	0.0096
	60	90	PN1HB007	PR1HB007	PN1HA517	Bar
	80	120	PN1HB005	PR1HB005	PN1HA515	Bar
R	**130**	**190**	PN1HB003	PR1HB003	PN1HA513	Bar
G	**200**	**200**	PN1HB002	PR1HB002	PN1HA512	Bar
H	**300**	**300**	PN1HB001	PR1HB001	PN1HB511	Bar
Y	Without arc chamber or blow-out		PN5HB00	PR5HB00	–	–

Table title: **Complete pre-assembled poles — Blow-out coils only, with housing and core**

(1) For devices with symbol combinations, the figures corresponding to the current are in bold.

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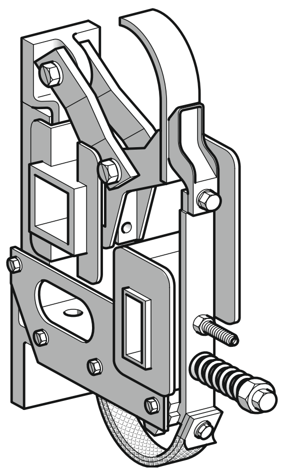

PR5JB00●

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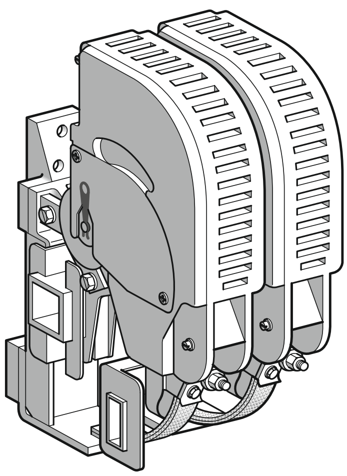

PN1LB00●

Complete pre-assembled poles
Blow-out coils only, with housing and core

Size (1)	Maximum current for continuous duty ∿ / ⎓	Complete poles Standard N/O	Complete poles Standard N/C	Complete poles Arc chamber with splitters N/O	Complete poles Arc chamber with splitters N/C	Blow-out coils PN1 and PR1
	A					
For contactors CV1BJ						
	110	PN1JB009	PR1JB009	PN3JB009	PR3JB009	PN1JB5139
	150	PN1JB007	PR1JB007	PN3JB007	PR3JB007	PN1JB5137
	185	PN1JB004	PR1JB004	PN3JB004	PR3JB004	PN1JB5134
S	**250**	PN1JB003	PR1JB003	PN3JB003	PR3JB003	PN1JB5133
T	**320**	PN1JB002	PR1JB002	PN3JB002	PR3JB002	PN1JB5132
J	**470**	PN1JB001	PR1JB001	PN3JB001	PR3JB001	PN1JB5131
Y	Without arc chamber or blow-out	PN5JB00	PR5JB00	–	–	–
For contactors CV1BK						
	150	PN1KB009	PR1KB009	PN3KB009	PR3KB009	PN1KB5159
	235	PN1KB006	PR1KB006	PN3KB006	PR3KB006	PN1KB5156
	290	PN1KB004	PR1KB004	PN3KB004	PR3KB004	PN1KB5154
U	**400**	PN1KB003	PR1KB003	PN3KB003	PR3KB003	PN1KB5153
V	**500**	PN1KB002	PR1KB002	PN3KB002	PR3KB002	PN1KB5152
K	**630**	PN1KB001	PR1KB001	PN3KB001	PR3KB001	PN1KB5151
Y	Without arc chamber or blow-out	PN5KB00	PR5KB00	–	–	–
For contactors CV1BL						
	240	PN1LB009	PR1LB009	PN3LB009	PR3LB009	PN1LB5189
	375	PN1LB006	PR1LB006	PN3LB006	PR3LB006	PN1LB5186
	460	PN1LB004	PR1LB004	PN3LB004	PR3LB004	PN1LB5184
K	**640**	PN1LB003	PR1LB003	PN3LB003	PR3LB003	PN1LB5183
	800	PN1LB002	PR1LB002	PN3LB002	PR3LB002	PN1LB5182
L	**1000**	PN1LB001	PR1LB001	PN3LB001	PR3LB001	PN1LB5181
Y	Without arc chamber or blow-out	PN5LB00	PR5LB00	–	–	–

(1) For devices with symbol combinations, the figures corresponding to the current are in bold.

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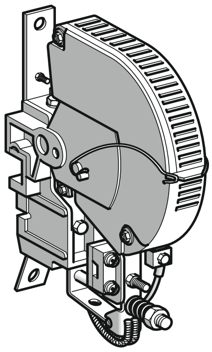

PR3FB00●

Complete pre-assembled poles
Blow-out coils only, with housing and core

Size (1)	Maximum current for continuous duty		Complete poles		Blow-out coils	
	~	⎓	N/O	N/C	PA3 and PR3	Economy resistor
	A	A				□
For contactors CV3BF						
	0.35	0.4	PA3FB0003	PR3FB0003	PA1FA5103	19
	0.6	0.7	PA3FB0004	PR3FB0004	PA1FA5104	6.1
A	**0.9**	**1**	PA3FB0005	PR3FB0005	PA1FA5105	2.5
	1.3	1.45	PA3FB0006	PR3FB0006	PA1FA5106	1.335
B	**1.75**	**1.9**	PA3FB0007	PR3FB0007	PA1FA5107	0.747
	2.2	2.45	PA3FB0008	PR3FB0008	PA1FA5108	0.425
	2.6	3	PA3FB0009	PR3FB0009	PA1FA5109	0.272
C	**3.6**	**4**	PA3FB0010	PR3FB0010	PA1FA5110	0.1655
	4.3	4.8	PA3FB0011	PR3FB0011	PA1FA5111	0.1135
	4.85	5.4	PA3FB0012	PR3FB0012	PA1FA5112	0.0854
D	**6.8**	**7.6**	PA3FB0014	PR3 FB0014	PA1FA5114	0.052
	7.4	8.2	PA3FB0015	PR3FB0015	PA1FA5115	0.045
	9.7	11	PA3FB0016	PR3FB0016	PA1FA5116	0.019
E	**11**	**12**	PA3FB0018	PR3FB0018	PA1FA5118	0.017
M	**13**	**14.5**	PA3FB0020	PR3FB0020	PA1FA5120	0.0125
N	**20**	**22**	PA3FB0025	PR3FB0025	PA1FA5125	0.0043
P	**40**	**45**	PA3FB009	PR3 FB009	PA1FA519	Bar
Q	**50**	**55**	PA3FB007	PR3FB007	PA1FA517	Bar
F	**80**	**80**	PA3FB004	PR3FB004	PA1FB514	Bar
For contactors CV3BG						
	0.25	0.38	PA3GB0003	PR3GB0003	PA1GA5103	28
	0.45	0.67	PA3GB0004	PR3GB0004	PA1GA5104	9
	0.7	1.05	PA3GB0005	PR3GB0005	PA1GA5105	3.77
	1	1.45	PA3GB0006	PR3GB0006	PA1GA5106	1.8
	1.25	1.95	PA3GB0007	PR3GB0007	PA1GA5107	1.02
	1.6	2.55	PA3GB0008	PR3GB0008	PA1GA5108	0.6
	2.1	3.3	PA3GB0009	PR3GB0009	PA1GA5109	0.38
	2.5	3.85	PA3GB0010	PR3GB0010	PA1GA5110	0.27
	3	4.8	PA3GB0011	PR3GB0011	PA1GA5111	0.175
	3.5	5.5	PA3GB0012	PR3GB0012	PA1GA5112	0.123
	4.7	7.5	PA3GB0014	PR3GB0014	PA1GA5114	0.07
	5.5	8.85	PA3GB0015	PR3GB0015	PA1GA5115	0.051
	6.2	10	PA3GB0016	PR3GB0016	PA1GA5116	0.041
	8	12	PA3GB0018	PR3GB0018	PA1GA5118	0.026
	10	15	PA3GB0020	PR3GB0020	PA1GA5120	0.017
	12	19	PA3GB0022	PR3GB0022	PA1GA5122	0.011
	17	24	PA3GB0025	PR3GB0025	PA1GA5125	0.0068
	40	55	PA3GB009	PR3GB009	PA1GA519	Bar
Q	**55**	**80**	PA3GB007	PR3GB007	PA1GA517	Bar
R	**125**	**125**	PA3GB003	PR3GB003	PA1GA513	Bar
G	**200**	**200**	PA3GB002	PR3GB002	PA1GB512	Bar

(1) For devices with symbol combinations, the figures corresponding to the current are in bold.

Complete pre-assembled poles
Blow-out coils only, with housing and core

Size (1)	Maximum current for continuous duty		Complete poles		Blow-out coils	
	~	⎓	N/O	N/C	PA3 and PR3	Economy resistor
	A	A				Ω
For contactors CV3BH						
	0.25	0.38	PA3HB0003	PR3HB0003	PA1HA5103	36.5
	0.45	0.67	PA3HB0004	PR3HB0004	PA1HA5104	12.25
	0.7	1.05	PA3HB0005	PR3HB0005	PA1HA5105	5.1
	1	1.45	PA3HB0006	PR3HB0006	PA1HA5106	2.66
	1.25	1.95	PA3HB0007	PR3HB0007	PA1HA5107	1.39
	1.6	2.55	PA3HB0008	PR3HB0008	PA1HA5108	0.828
	2.1	3.3	PA3HB0009	PR3HB0009	PA1HA5109	0.512
	2.5	3.85	PA3HB0010	PR3HB0010	PA1HA5110	0.345
	3	4.8	PA3HB0011	PR3HB0011	PA1HA5111	0.237
	3.5	5.5	PA3HB0012	PR3HB0012	PA1HA5112	0.1755
	4.7	7.5	PA3HB0014	PR3HB0014	PA1HA5114	0.094
	5.5	8.85	PA3HB0015	PR3HB0015	PA1HA5115	0.0716
	6.2	10	PA3HB0016	PR3HB0016	PA1HA5116	0.0525
	8	12	PA3HB0018	PR3HB0018	PA1HA5118	0.0355
	10	15	PA3HB0020	PR3HB0020	PA1HA5120	0.022
	12	19	PA3HB0022	PR3HB0022	PA1HA5122	0.0152
	17	24	PA3HB0025	PR3HB0025	PA1HA5125	0.0096
	60	90	PA3HB007	PR3HB007	PA1HA517	Bar
	80	120	PA3HB005	PR3HB005	PA1HA515	Bar
R	**130**	**190**	PA3HB003	PR3HB003	PA1HA513	Bar
G	**200**	**200**	PA3HB002	PR3HB002	PA1HA512	Bar
H	**300**	**300**	PA3HB001	PR3HB001	PA1HB511	Bar

Size (1)	Maximum current for continuous duty		Complete poles (No N/C poles)		Blow-out coils
	~	⎓	N/O	–	PA3
	A	A			
For contactors CV3BJ					
	80	110	PA3JB009		2 x PA1GA519
	110	160	PA3JB007		2 x PA1GA517
S	**250**	**250**	PA3JB003		2 x PA1GA513
T	**320**	**320**	PA3JB002		2 x PA1GB512
For contactors CV3BK					
	120	180	PA3KB007		2 x PA1HA517
	160	240	PA3KB005		2 x PA1HA515
U	**260**	**380**	PA3KB003		2 x PA1HA513
V	**400**	**400**	PA3KB002		2 x PA1HA512
K	**500**	**500**	PA3KB001		2 x PA1HB511

Size	Maximum current for continuous duty	Complete poles		Blow-out coils	Arc chamber
	~ / ⎓	Standard	With magnetic compensator		
	A				
For contactors CV3BL, M, P, R					
-	800	PA1LB00	PA2LB00	PA1LB51	PA1LB50
	1250	PA1MB00	PA2MB00	PA1LB51	PA1LB50
	2000	PA1PB00	PA2PB00	PA1PB51	PA1PB50
	2750	PA1RB00	PA2RB00	PA1RB51	PA1RB50

(1) *For devices with symbol combinations, the figures corresponding to the current are in bold.*

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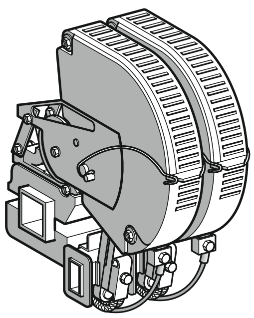

PA3KB00●

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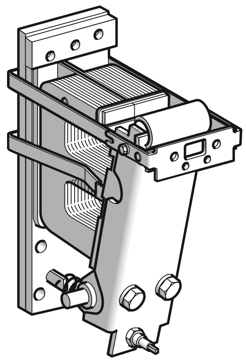

EB1GA40

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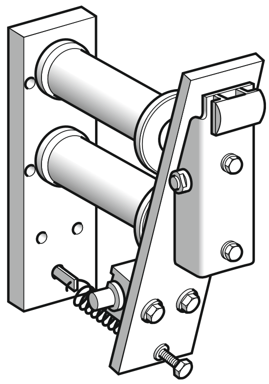

EK1GA40

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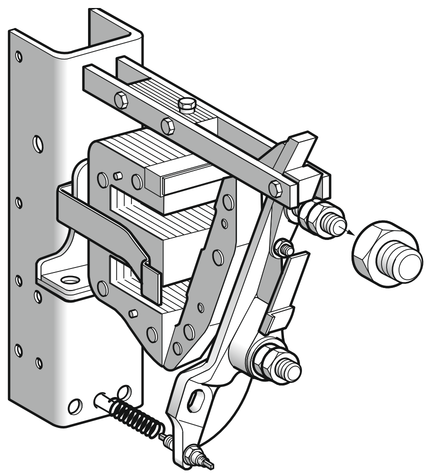

EB5KB40

CV1B, CV3B, LC1B - Complete pre-assembled electromagnets (without coil)

Electromagnets

Supply	Type	Reference	Weight kg
For contactors CV1BF and CV3BF			
direct ∼	1	**EB1EA40**	1.020
	1	**EC1EA40**	1.650
∼ or ⎓ with	1	**EB1EA40**	1.020
direct ⎓	2	**EK1EA40**	1.760
For contactors CV1BG, CV3BG and CV3BJ			
direct ∼	1	**EB1GA40**	1.720
	1	**EC1GA40**	2.880
∼ or ⎓ with	1	**EB1GA40**	1.720
direct ⎓	2	**EK1GA40**	1.950
For contactors CV1BH, CV3BH and CV3BK			
direct ∼	1	**EB1HA40**	2.810
	3	**EC1HB40**	4.590
∼ or ⎓ with	1	**EB1HA40**	2.810
direct ⎓	2	**EK1HA40**	3.740
For contactors CV1BJ			
direct ∼	3	**EB1JB40**	4.030
	3	**EC1JB40**	11.430
∼ or ⎓ with	3	**EB5JB40**	4.190
direct ⎓	2	**EK1JA40**	3.740
For contactors CV1BK and CV1BL			
direct ∼	3	**EB1KB40**	9.830
∼ or ⎓ with	3	**EB5KB40**	10.490
direct ⎓	2	**EK1KA40**	13.200
For contactors CV3B and LC1BL, M, P and R			
∼ or ⎓ with	3	**EB5KB50**	10.600
direct ⎓	2	**EK1KA50**	13.900

CV1B, CV3B - Electromagnets and direct a.c. coils

References

For contactors (1)

Contactor	Type	CV1B	CV3B
	Size	F	F
Associated electromagnet		**EB1EA40**	**EB1EA40**

(1) The contactor electromagnet will be defined at the manufacturing stage, according to its utilisation category and composition.

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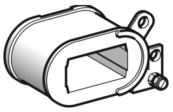

WB1EA●

Coils

Voltage	50 Hz Reference	Coil R	L	60 Hz Reference	Coil R	L
V		□	H		□	H
24	**WB1EA024**	0.50	0.038	**WB1EA022**	0.45	0.032
48	**WB1EA048**	2.22	0.15	**WB1EA043**	1.80	0.12
110	**WB1EA110**	12.54	0.80	**WB1EA100**	10.1	0.66
127	**WB1EA127**	14.83	1.07	**WB1EA127**	14.83	1.07
220	**WB1EA220**	50.4	3.2	**WB1EA200**	41.5	2.6
240	**WB1EA240**	62.7	3.8	**WB1EA220**	50.4	3.2
380	**WB1EA380**	156.2	9.6	**WB1EA365**	148.6	8.8
400	**WB1EA400**	182	10	**WB1EA380**	156.2	9.6
440	**WB1EA455**	233	14	**WB1EA400**	182	10
450	**WB1EA455**	233	14	**WB1EA432**	199.1	12
500	**WB1EA500**	284	16	**WB1EA455**	233	14
550	**WB1EA550**	347	20	**WB1EA500**	284	16
600	**-**	-	-	**-**	-	-

L: inductance closed circuit at Un max.
R: resistance at 20 °C ±10 %.

Specifications

- Operating range: 0.85 to 1.1 Uc.
- Coil supply transformer power: 100 VA.
- Coil weight, all voltages : 180 grams.

Average consumption

	50 Hz Un min. VA	W	Un max. VA	W	60 Hz Un min. VA	W	Un max. VA	W
Inrush	220	90	270	110	225	75	275	95
Sealed	35	13	55	19	35	13	55	10

Power factor cos □

	50 Hz	60 Hz
	0.40	0.34
	0.35	0.37

TeSys CV1B, CV3B Variable composition contactors

Accessories - Spare parts

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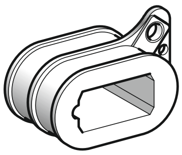


WB1GA●

References

For contactors [(1)]

Contactor	Type	CV1B		CV3B		
	Size	F	G	F	G	J (2 poles)
Associated electromagnet		**EC1EA40**	**EB1GA40**	**EC1EA40**	**EB1GA40**	**EB1GA40**

(1) The contactor electromagnet will be defined at the manufacturing stage, according to its utilisation category and composition.

Coil

Voltage	50 Hz			60 Hz		
	Reference	Coil		Reference	Coil	
		R	L		R	L
V		Ω	H		Ω	H
24	**WB1GA024**	0.40	0.026	**WB1GA021**	0.28	0.020
48	**WB1GA048**	1.32	0.10	**WB1GA044**	1.19	0.088
110	**WB1GA110**	7.66	0.55	**WB1GA095**	5.29	0.41
127	**WB1GA130**	11.09	0.66	**WB1GA110**	7.66	0.55
220	**WB1GA220**	33.74	2.2	**WB1GA200**	27.38	1.8
240	**WB1GA250**	47.33	2.8	**WB1GA220**	33.74	2.2
380	**WB1GA380**	85.48	6	**WB1GA345**	77.56	5.4
400	**WB1GA400**	110.71	7.3	**WB1GA345**	77.56	5.4
440	**WB1GA440**	123.32	8.9	**WB1GA400**	110.71	7.3
450	**WB1GA480**	136.22	10.6	**WB1GA400**	110.71	7.3
500	**WB1GA500**	143.98	11.5	**WB1GA440**	123.32	8.9
550	**WB1GA550**	212.39	14	**WB1GA500**	143.98	11.5
600	**WB1GA600**	259.73	16	**-**	-	-

L: inductance closed circuit at Un max.
R: resistance at 20 °C ±10 %.

Specifications

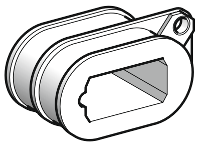
- Operating range: 0.85 to 1.1 Uc.
- Coil supply transformer power: 160 VA.
- Coil weight, all voltages : 220 grams.

Average consumption

	50 Hz				60 Hz			
	Un min.		Un max.		Un min.		Un max.	
	VA	W	VA	W	VA	W	VA	W
Inrush	345	130	415	160	370	130	475	165
Sealed	45	16	65	25	50	19	75	30

Power factor cos φ

	50 Hz	60 Hz
	0.38	0.35
	0.35	0.37



WB1HA●

References

For contactors [1]

Contactor	Type	CV1B		CV3B		
	Size	G	H	G, J	H	K (2 poles)
Associated electromagnet		**EC1GA40**	**EB1 HA40**	**EC1GA40**	**EB1 HA40**	**EB1HA40**

(1) The contactor electromagnet will be defined at the manufacturing stage, according to its utilisation category and composition.

Coil

Voltage	50 Hz			60 Hz		
	Reference	Coil		Reference	Coil	
		R	L		R	L
V		□	H		□	H
24	**WB1HA024**	0.26	0.021	**WB1HA022**	0.21	0.018
48	**WB1HA048**	0.94	0.085	**WB1HA044**	0.77	0.071
110	**WB1HA110**	4.84	0.44	**WB1HA097**	3.46	0.34
127	**WB1HA130**	7.27	0.62	**WB1HA120**	5.35	0.53
220	**WB1HA220**	17.55	1.8	**WB1HA200**	15.77	1.5
240	**WB1HA250**	24.93	2.3	**WB1HA220**	17.55	1.8
380	**WB1HA380**	54.52	5.3	**WB1HA345**	48.94	4.4
400	**WB1HA400**	64.52	5.9	**WB1HA365**	51.68	4.9
440	**WB1HA440**	78.1	7.1	**WB1HA400**	64.52	5.9
450	**WB1HA480**	86.03	8.5	**WB1HA400**	64.52	5.9
500	**WB1HA500**	101.9	9.2	**WB1HA440**	78.1	7.1
550	**WB1HA550**	113.3	11.1	**WB1HA500**	101.9	9.2
600	**WB1HA600**	153.8	13.2	**WB1HA550**	113.3	11.1

L: inductance closed circuit at Un max.
R: resistance at 20 °C ±10 %.

Specifications

- Operating range: 0.85 to 1.1 Uc.
- Coil supply transformer power: 250 VA.
- Coil weight, all voltages : 280 grams.

Average consumption

	50 Hz				60 Hz			
	Un min.		Un max.		Un min.		Un max.	
	VA	W	VA	W	VA	W	VA	W
Inrush	500	155	615	190	560	170	675	200
Sealed	60	22	85	35	65	25	95	40

Power factor cos □

	50 Hz	60 Hz
	0.31	0.30
	0.38	0.39

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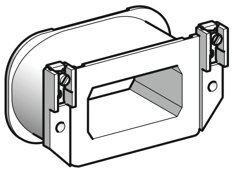

WB1JB●

References

For contactors [(1)]

Contactor	Type	CV1B		CV3B	
	Size	H	J	H	K
Associated electromagnet		**EC1HB40**	**EB1JB40**	**EC1HB40**	**EC1HB40**

(1) The contactor electromagnet will be defined at the manufacturing stage, according to its utilisation category and composition.

Coil

Voltage	50 Hz			60 Hz		
	Reference	Coil		Reference	Coil	
		R	L		R	L
V		□	H		□	H
48	**WB1JB317**	0.30	0.065	**WB1JB315**	0.21	0.043
110	**WB1JB326**	1.56	0.34	**WB1JB323**	1.19	0.25
127	**WB1JB328**	2.26	0.408	**WB1JB326**	1.56	0.34
220	**WB1JB335**	6.29	1.37	**WB1JB332**	4.84	1.02
240	**WB1JB337**	7.99	1.77	**WB1JB334**	5.15	1.14
380	**WB1JB342**	19.37	4.10	**WB1JB340**	15	3.09
400	**WB1JB343**	22.76	4.54	**WB1JB340**	15	3.09
440	**WB1JB344**	27.65	5.50	**WB1JB342**	19.37	4.10
450	**WB1JB345**	30.60	6.54	**WB1JB342**	19.37	4.10
500	**WB1JB346**	35.13	7.10	**WB1JB344**	27.65	5.50
550	**WB1JB347**	43.18	8.59	**WB1JB345**	30.60	6.54
600	**WB1JB348**	53.04	10.2	**WB1JB346**	35.13	7.10

L: inductance closed circuit at Un max.
R: resistance at 20 °C ±10 %.

Specifications

- Operating range: 0.85 to 1.1 Uc.
- Coil supply transformer power: 400 VA.
- Coil weight, all voltages : 560 grams.

Average consumption

	50 Hz				60 Hz			
	Un min.		Un max.		Un min.		Un max.	
	VA	W	VA	W	VA	W	VA	W
Inrush	700	120	840	145	915	140	1100	165
Sealed	80	28	110	45	115	41	170	65

Power factor cos □

	50 Hz	60 Hz
	0.17	0.15
	0.38	0.38

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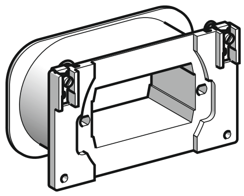


WB1KB●

CV1B - Electromagnets and direct a.c. coils

References

For contactors (1)

Contactor	**Type**	**CV1B**	
	Size	**J**	**L** (2 poles)
Associated electromagnet		**EC1JB40**	**EB1KB40**

(1) The contactor electromagnet will be defined at the manufacturing stage, according to its utilisation category and composition.

Coil

Voltage	**50 Hz**			**60 Hz**		
	Reference	**Coil**		**Reference**	**Coil**	
		R	**L**		**R**	**L**
V		□	**H**		□	**H**
110	**WB1KB151**	0.46	0.175	-	-	-
127	**WB1KB166**	0.59	0.228	**WB1KB151**	0.46	0.175
220	**WB1KB154**	1.87	0.700	**WB1KB163**	1.14	0.487
240	**WB1KB154**	1.87	0.700	**WB1KB162**	1.37	0.580
380	**WB1KB155**	5.06	2.10	**WB1KB141**	3.30	1.35
400	**WB1KB132**	5.95	2.32	**WB1KB142**	4.11	1.70
440	**WB1KB123**	7.35	2.80	**WB1KB155**	5.06	2.10
450	**WB1KB123**	7.35	2.80	**WB1KB155**	5.06	2.10
500	**WB1KB133**	9.54	3.63	**WB1KB132**	5.95	2.32
550	**WB1KB121**	11.66	4.40	**WB1KB123**	7.35	2.80
600	**WB1KB121**	11.66	4.40	**WB1KB133**	9.54	3.63

L: inductance closed circuit at Un max.
R: resistance at 20 °C ±10 %.

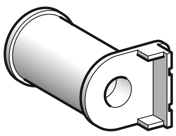
Specifications

- Operating range: 0.85 to 1.1 Uc.
- Coil supply transformer power: 800 VA.
- Coil weight, all voltages : 1.120 kilograms.

Average consumption

	50 Hz				**60 Hz**			
	Un min.		**Un max.**		**Un min.**		**Un max.**	
	VA	**W**	**VA**	**W**	**VA**	**W**	**VA**	**W**
Inrush	2300	320	3060	430	2350	280	2750	330
Sealed	205	65	385	140	205	70	330	120

Power factor cos □		
	50 Hz	**60 Hz**
	0.14	0.12
	0.36	0.36



WB2EA●

CV1B, CV3B - Electromagnets and direct d.c. coils

References

For contactors

Contactor	Type	CV1B		CV3B		
	Size	F	G	F	G	J (2 poles)
Associated electromagnet		**EK1EA40**	**EK1GA40**	**EK1EA40**	**EK1GA40**	**EK1GA40**

Coils

Voltage		Coil (unit characteristics) (1)		
Coils 20 to 26 W (2)	Coils 26 to 37 W (2)	Resistance at 20 °C ±10 %	Reference	Weight
V	V	□	50 Hz - 60 Hz	kg
-	24	8.4	**WB2EA600**	0.400
24	-	13.5	**WB2EA530**	0.400
-	48	40	**WB2EA400**	0.400
48	-	52	**WB2EA375**	0.400
-	110	202	**WB2EA265**	0.400
110	127	247	**WB2EA250**	0.400
127	-	394	**WB2EA224**	0.400
-	220	740	**WB2EA190**	0.400
-	240	900	**WB2EA180**	0.400
220 - 240	-	1140	**WB2EA170**	0.400
-	380	1865	**WB2EA150**	0.400
-	400	2415	**WB2EA140**	0.400
380	440 - 450	3075	**WB2EA132**	0.400
400 - 440	500	3800	**WB2EA125**	0.400
450	550 - 600	4850	**WB2EA118**	0.400
500 - 550	-	5850	**WB2EA112**	0.400
600	-	7200	**WB2EA106**	0.400

Specifications

Operating range: 0,85 to 1,1 Uc (IEC 60947-4).

Average consumption of the 2 coils (inrush and sealed)	CV1 and CV3	F	Standard power Increased power	20 to 26 W 26 to 37 W
	CV1 and CV3	G J	26-37 W	
Time constant when sealed	CV1 and CV3	F	75 ms	
	CV1 and CV3	G J	100 ms	
Duty			100 %	

(1) The EK1 electromagnet always has two identical coils connected in series.
(2) For contactors CV1F and CV3F the selection of 20-26 W or 26-37 W coils depends on the composition of the contactor: i.e. number of poles and auxiliary contacts.

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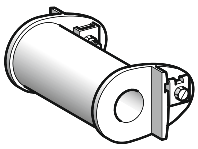

WB2HA●

CV1B, CV3B - Electromagnets and direct d.c. coils

References

For contactors

Contactor	Type	CV1B		CV3B	
	Size	H	J	H	K
Associated electromagnet		**EK1HA40**	**EK1JA40**	**EK1HA40**	**EK1HA40**

Coils

Voltage		Coil (unit characteristics) (1)		
100 % duty (2)	**50 % duty (2)**	**Resistance at 20 °C ±10 %**	**Unit reference**	**Weight**
V	**V**	□		**kg**
-	24	2.63	**WB2HA900**	0.675
24	-	6.78	**WB2HA710**	0.675
-	48	10.6	**WB2HA630**	0.675
48	-	27.1	**WB2HA500**	0.675
-	110	54.3	**WB2HA425**	0.675
-	127	70.5	**WB2HA400**	0.675
-	-	86.8	**WB2HA375**	0.675
-	-	112	**WB2HA355**	0.675
110	-	141	**WB2HA335**	0.675
127	-	172	**WB2HA315**	0.675
-	220	228	**WB2HA300**	0.675
-	240	283	**WB2HA280**	0.675
220 - 240	-	552	**WB2HA236**	0.675
-	380 - 400	692	**WB2HA224**	0.675
-	440 - 450	875	**WB2HA212**	0.675
-	500	1066	**WB2HA200**	0.675
-	550	1336	**WB2HA190**	0.675
380 - 400	600	1683	**WB2HA180**	0.675
440 - 450	-	2161	**WB2HA170**	0.675
500	-	2786	**WB2HA160**	0.675
550 - 600	-	3697	**WB2HA150**	0.675

Specifications

■ Operating range: 0,85 to 1,1 Uc.

Power consumption of both coils (inrush and sealed)	CV1 and CV3	H	100 % duty	42 to 52 W
	CV1	J		
	CV3	K		
	CV3	K	50 % duty	93 to 116 W
Time constant when sealed	–	K	150 ms	

(1) The EK1 electromagnet always has two identical coils connected in series.
(2) Coil selection depends on the composition of the contactor.
50 % duty implies an energised time less than or equal to 2 minutes and a de-energised time longer than or equal to the energised time.

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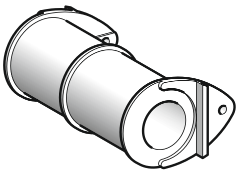

WB2KA●

CV1B - Electromagnets and direct d.c. coils

References

For contactors

Contactor			
	Type	CV1B	
	Size	**K**	**L**
Associated electromagnet		**EK1KA40**	**EK1KA40**

Coils

Operating range	Coil (unit characteristics) (1)		
	Resistance at 20 °C ±10 %	Unit reference	Weight
V	□		kg
24	3	**WB2KA1120**	1.710
48	11.9	**WB2KA800**	1.710
110	60	**WB2KA530**	1.710
127	92	**WB2KA475**	1.710
220	238	**WB2KA375**	1.710
240	302	**WB2KA355**	1.710
380	766	**WB2KA280**	1.710
400	964	**WB2KA265**	1.710
440	1218	**WB2KA250**	1.710
450	1218	**WB2KA250**	1.710
500 - 550	1490	**WB2KA236**	1.710
600	1877	**WB2KA224**	1.710

Specifications

- Operating range: 0.85 to 1.1 Uc.
- Average consumption of the 2 coils (inrush and sealed): 80 to 105 W.
- Time constant when sealed: 180 ms.
- Duty: 100 %.

(1) The EK1 electromagnet always has two identical coils connected in series.

TeSys CV1B, CV3B Variable composition contactors

Accessories - Spare parts

CV1B, CV3B - Electromagnets and d.c. coils with economy resistor - rectified a.c. coils with economy resistor

References

For contactors

Contactor	Type	CV1B	CV3B
	Size	F	F
Associated electromagnet		**EB1EA40**	**EB1EA40**

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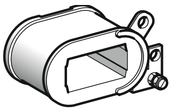

WB1EA●

Coils

Voltage d.c.	Voltage a.c. (1)	Coil Resist. at 20 °C ± 10 %	Coil I inrush ± 10 % at Un max	With economy resistor: Resistor Unit reference	With economy resistor: Resistor Total resistance	With economy resistor: Number of contacts ZC4 GM2	Rectifier Reference DR5 TE1● (2)	Coil Reference	Weight
V	V	□	A		□				kg
-	24	3.3	5.66	**DR2SC0047**	47	1	**U**	**WB1EA058**	0.180
24	-	7	3.72	**DR2SC0100**	100	1	**U**	**WB1EA085**	0.180
48	48	24.6	1.98	**DR2SC0330**	330	1	**U**	**WB1EA163**	0.180
-	110	104	0.980	**DR2SC1500**	1500	1	**U**	**WB1EA315**	0.180
110	-	127.9	0.906	**DR2SC1800**	1800	1	**U**	**WB1EA345**	0.180
-	127	156.3	0.793	**DR2SC2200**	2200	1	**U**	**WB1EA380**	0.180
127	-	199.2	0.697	**DR2SC2700**	2700	1	**U**	**WB1EA432**	0.180
220	220 - 240	418.2	0.526	**DR2SC6800**	6800	1	**U**	**WB1EA595**	0.180
240	-	581.7	0.433	**DR2SC8200**	8200	1	**S**	**WB1EA720**	0.180
380	380 - 400	1425.5	0.322	**DR2SC2201**	22 000	1	**S**	**WB1EA1175**	0.180
400	500	1374.5	0.267	**DR2SC1001**	10 000 + 10 000	2	**S**	**WB1EA970**	0.180
450 - 500	-	2355.1	0.219	**DR2SC1801**	18 000 + 18 000	2	**S**	**WB1EA1430**	0.180

Specifications

- Operating range: 0.85 to 1.1 Uc.
- Time constant when sealed: 9 ms.
- Maximum operating rate: 120 operating cycles/hour (□ ≤ 55 °C).

Average consumption	d.c. operation Un min.	d.c. operation Un max.	a.c. (with rectifier) Un min.	a.c. (with rectifier) Un max.	a.c. (with rectifier) Un min.	a.c. (with rectifier) Un max.
	W	W	VA	W	VA	W
Inrush	70	150	85	–	180	–
Sealed (coil)	0.25	0.7	–	0.3	–	0.75
Economy resistor	10	11	–	4.5	–	11

(1) a.c. (50-400 Hz) with individual rectifier and economy resistor, see scheme on page 52.
*(2) Complete the silicon rectifier reference **DR5TE1U** or **DR5TE1S**.*

CV1B, CV3B - Electromagnets and d.c. coils with economy resistor - rectified a.c. coils with economy resistor

References

For contactors

Contactor	Type	CV1B	CV3B	
	Size	G	G	J (2 poles)
Associated electromagnet		EB1GA40	EB1GA40	EB1GA40

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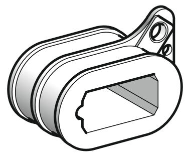

WB1GA●

Coils

Voltage		Coil		With economy resistor			Rectifier	Coil	
d.c.	a.c. (1)	Resist. at 20 °C ± 10 %	I inrush ± 10 % at Un max	Resistor Unit reference	Total resistance	Number of contacts ZC4GM2	Reference DR5TE1● (2)	Reference	Weight
V	V	□	A		□				kg
-	24	1.87	11.1	**DR2SC0039**	39	1	**U**	**WB1GA054**	0.220
24	-	4.17	6	**DR2SC0082**	82	1	**U**	**WB1GA085**	0.220
-	48	7.26	5.36	**DR2SC0150**	150	1	**U**	**WB1GA105**	0.220
48	-	11.09	4.43	**DR2SC0220**	220	1	**U**	**WB1GA130**	0.220
-	110	47.33	2.23	**DR2SC1000**	1000	1	**U**	**WB1GA250**	0.220
110 - 127	127	85.48	1.53	**DR2SC1500**	1500	1	**U**	**WB1GA380**	0.220
-	220	212.39	0.95	**DR2SC3900**	3900	1	**U**	**WB1GA550**	0.220
220 - 240	240	259.73	0.96	**DR2SC4700**	4700	1	**S**	**WB1GA600**	0.220
-	380 - 400	609.71	0.60	**DR2SC1201**	12 000	1	**S**	**WB1GA905**	0.220
380 - 400	440 - 450	604.08	0.46	**DR2SC1001** **DR2SC8200**	10000 + 8200	1	**S**	**WB1GA1160**	0.220
440 - 450	500	1029.53	0.47	**DR2SC1001**	10 000 + 10 000	2	**S**	**WB1GA1170**	0.220
500 - 550	-	1495.16	0.39	**DR2SC1501**	15 000 + 15 000	2	**–**	**WB1GA1480**	0.220

Specifications

- Operating range: 0,85 to 1,1 Uc.
- Time constant when sealed: 11 ms.
- Maximum operating rate: 120 operating cycles/hour (□ ≤ 55 °C).

Average consumption	d.c. operation		a.c. (with rectifier)			
	Un min.	Un max.	Un min.	Un max.	Un min.	Un max.
	W	W	VA	W	VA	W
Inrush	130	250	160	–	300	–
Sealed (coil)	0.35	0.5	–	0.4	–	0.65
Economy resistor	6.5	11	–	7	–	12

(1) a.c. (50-400 Hz) with individual rectifier and economy resistor, see scheme on page 52.
*(2) Complete the silicon rectifier reference **DR5TE1U** or **DR5TE1S**.*

CV1B, CV3B - Electromagnets and d.c. coils with economy resistor - rectified a.c. coils with economy resistor

References

For contactors

Contactor	Type	CV1B	CV3B	
	Size	H	H	**K** (2 poles)
Associated electromagnet		**EB1HA40**	**EB1HA40**	**EB1HA40**

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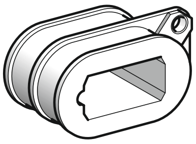

WB1HA●

Coils

Voltage		Coil		With economy resistor			Rectifier	Coil	
d.c.	a.c. (1)	Resist. at 20 °C ± 10 %	I inrush ± 10 % at Un max.	Resistor Unit reference	Total resis-tance	Number of contacts ZC4GM2	Reference DR5TE1● (2)	Reference	Weight
V	V	□	A		□				kg
-	24	1.34	12	**DR2SC0027**	27	1	**U**	**WB1HA060**	0.280
24	-	2.61	9	**DR2SC0047**	47	1	**U**	**WB1HA082**	0.280
48	48	10.24	4.8	**DR2SC0180**	180	1	**U**	**WB1HA160**	0.280
-	110	54.52	1.9	**DR2SC0820**	820	1	**U**	**WB1HA380**	0.280
110	-	64.52	1.85	**DR2SC1200**	1200	1	**U**	**WB1HA400**	0.280
127	127	78.10	1.66	**DR2SC1500**	1500	1	**U**	**WB1HA440**	0.280
-	220 - 240	221.80	0.97	**DR2SC3900**	3900	1	**U**	**WB1HA765**	0.280
220 - 240	-	228.20	1.07	**DR2SC3900**	3900	1	**S**	**WB1HA660**	0.280
380	380 - 400	729.20	0.52	**DR2SC1201**	12 000	1	**S**	**WB1HA1500**	0.280
400 - 450	450 - 500	704.40	0.64	**DR2SC1201**	12 000	2	**S**	**WB1HA1150**	0.280

Specifications

- Operating range: 0.85 to 1.1 Uc.
- Time constant when sealed: 12 ms.
- Maximum operating rate: 120 operating cycles/hour (□ ≤ 55 °C).

Average consumption	d.c. operation		a.c. (with rectifier)			
	Un min.	Un max.	Un min.	Un max.	Un min.	Un max.
	W	W	VA	W	VA	W
Inrush	150	280	180	–	340	–
Sealed (coil)	0.4	0.75	–	0.4	–	0.8
Economy resistor	7.5	14	–	8	–	15

(1) a.c. (50-400 Hz) with individual rectifier and economy resistor, see scheme on page 52.
*(2) Complete the silicon rectifier reference **DR5TE1U** or **DR5TE1S**.*

CV1B, CV3B - Electromagnets and d.c. coils with economy resistor - rectified a.c. coils with economy resistor

References

For contactors

Contactor	Type	CV1B	CV3B
	Size	J	K (3 and 4 poles)
Associated electromagnet		**EB1JB40 (d.c.)**	**EC1HA40**
		EB5JB40 (rectified)	**EC1HA40**

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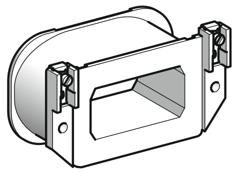


WB1JB●

Coils

Voltage d.c.	a.c.[1]	Coil Resist. at 20 °C ± 10 %	I inrush ± 10 % at Un max	With economy resistor: Resistor Unit reference	Total resist.	Number of contacts ZC4GM2	Rectifier Reference DR5TE1● [2]	Coil Reference	Weight
V	V	□	A		□				kg
-	24	2.26	8.52	**DR2SC0047**	47	1	**U**	**WB1JB328**	0.560
24	-	3.90	6.33	**DR2SC0082**	82	1	**U**	**WB1JB331**	0.560
-	48	11.95	3.70	**DR2SC0220**	220	1	**U**	**WB1JB339**	0.560
48	-	15.79	3.13	**DR2SC0330**	330	1	**U**	**WB1JB341**	0.560
-	110	53.04	1.90	**DR2SC1000**	1000	1	**U**	**WB1JB348**	0.560
110	127	76.59	1.47	**DR2SC1500**	1500	1	**U**	**WB1JB428**	0.560
127	-	95.85	1.32	**DR2SC1800**	1800	1	**U**	**WB1JB429**	0.560
220	220 - 240	242	0.93	**DR2SC4700**	4700	1	**U**	**WB1JB432**	0.560
240	-	371.30	0.76	**DR2SC6800**	6800	1	**S**	**WB1JB433**	0.560
-	380	565.60	0.63	**DR2SC1001**	10 000	1	**S**	**WB1JB434**	0.560
380 - 400	400 - 450	881.90	0.50	**DR2SC1001 + DR2SC8200**	10 000 + 8200	1	**S**	**WB1JB435**	0.560
440 - 500	500	1328.10	0.38	**DR2SC1501 + DR2SC1201**	15 000 + 12 000	2	**S**	**WB1JB436**	0.560

Specifications

- Operating range: 0,85 to 1,1 Uc.
- Time constant when sealed: 25 ms.
- Maximum operating rate: 120 operating cycles/hour (□ ≤ 55 °C).

Average consumption	d.c. operation Un min.	Un max.	a.c. (with rectifier) Un min.	Un max.	Un min.	Un max.
	W	W	VA	W	VA	W
Inrush	130	220	160	–	270	–
Sealed (coil)	0.35	0.7	–	0.4	–	0.765
Economy resistor	6.5	13	–	7	–	13

(1) a.c. (50-400 Hz) with individual rectifier and economy resistor, see scheme on page 52.
*(2) Complete the silicon rectifier reference **DR5TE1U** or **DR5TE1S**.*

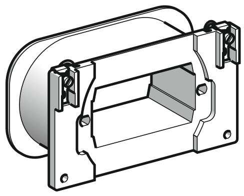
TeSys
TeSys CV1B, CV3B Variable composition contactors
Accessories - Spare parts

CV1B, CV3B - Electromagnets and d.c. coils with economy resistor - rectified a.c. coils with economy resistor

References

For contactors

Contactor	Type	CV1B	CV3B
	Size	K	L (2 poles)
Associated electromagnet		**EB5KB40**	**EB5KB40**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WB1KB●

Coils

Voltage		Coil		With economy resistor			Rectifier	Coil	
d.c. min.	a.c. [(1)] min.	Resist. at 20 °C ± 10 %	I inrush ± 10 % at Un max.	Resistor Unit reference	Resistor Total resist.	Number of contacts ZC4GM2	Reference DR5TE1● [(2)]	Reference	Weight
V	V	□	A		□				kg
24	-	1.9	13	**DR2SC0100**	100	1	**–**	**WB1KB154**	1.120
-	48	5.9	6.8	**DR2SC0270**	270	1	**U**	**WB1KB132**	1.120
48	-	9.5	5.3	**DR2SC0470**	470	1	**U**	**WB1KB133**	1.120
-	110	33.1	3.2	**DR2SC1500**	1500	1	**U**	**WB1KB124**	1.120
110	127	50.9	2.3	**DR2SC2200**	2200	1	**U**	**WB1KB122**	1.120
127	-	61.3	2.1	**DR2SC2700**	2700	1	**U**	**WB1KB135**	1.120
-	220	159.9	1.3	**DR2SC8200**	8200	1	**U**	**WB1KB137**	1.120
220 - 240	240	199.6	1.2	**DR2SC1001**	10 000	1	**S**	**WB1KB126**	1.120
-	380	382	0.82	**DR2SC1801**	18 000	1	**S**	**WB1KB127**	1.120
380 - 400	400 - 450	507	0.84	**DR2SC1201**	12 000 + 12 000	1	**S**	**WB1KB128**	1.120
440 - 500	500	770	0.64	**DR2SC1801**	18 000 + 18 000	2	**S**	**WB1KB129**	1.120

Specifications

- Operating range: 0.85 to 1.1 Uc.
- Time constant when sealed: 45 ms.
- Maximum operating rate: 120 operating cycles/hour (□ ≤ 55 °C).

Average consumption	d.c. operation		a.c. (with rectifier)			
	Un min.	Un max.	Un min.	Un max.	Un min.	Un max.
	W	W	VA	W	VA	W
Inrush	215	380	260	–	460	–
Sealed (coil)	0.1	0.2	–	0.1	–	0.2
Economy resistor	4.5	8	–	5	–	9

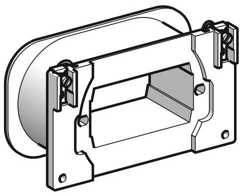
(1) a.c. (50-400 Hz) with individual rectifier and economy resistor, see scheme on page 52.
*(2) Complete the silicon rectifier reference **DR5TE1U** or **DR5TE1S**.*

CV1B - Electromagnets and d.c. coils with economy resistor - rectified a.c. coils with economy resistor

References

For contactors

Contactor	**Type**	**CV1B**
	Size	**L** (3 and 4 poles)
Associated electromagnet		**EB5KB40**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WB1KB●

Coils

Voltage d.c.	Voltage a.c. (1)	Coil Resist. at 20 °C ± 10 %	Coil I inrush ± 10 % at Un max.	With economy resistor: Resistor Unit reference	Resistor Total resist.	Number of contacts ZC4GM2	Rectifier Reference DR5TE1● (2)	Coil Reference	Weight
V	V	Ω	A		Ω				kg
24	-	1.85	14	**DR2SC0068**	68	1	**–**	**WB1KB154**	1.120
-	48	5.86	7.2	**DR2SC0220**	220	1	**U**	**WB1KB132**	1.120
48	-	7.2	6.8	**DR2SC0270**	270	1	**U**	**WB1KB123**	1.120
-	110	32.5	3.3	**DR2SC1200**	1200	1	**U**	**WB1KB124**	1.120
110	127	49.7	2.4	**DR2SC1800**	1800	1	**U**	**WB1KB122**	1.120
127	-	61	2.2	**DR2SC2200**	2200	1	**U**	**WB1KB135**	1.120
-	220	128	1.5	**DR2SC4700**	4700	1	**U**	**WB1KB125**	1.120
-	240	160	1.4	**DR2SC5600**	5600	1	**U**	**WB1KB137**	1.120
220 - 240	-	197	1.3	**DR2SC6800**	6800	1	**S**	**WB1KB126**	1.120
-	380	408	0.86	**DR2SC1501**	15 000	1	**S**	**WB1KB127**	1.120
380 - 450	450 - 500	507	0.89	**DR2SC1001**	10 000 + 8200	2	**S**	**WB1KB128**	1.120
500	-	785	0.63	**DR2SC1501**	15 000 + 15 000	2	**–**	**WB1KB129**	1.120

Specifications

- Operating range: 0.85 to 1.1 Uc.
- Time constant when sealed: 45 ms.
- Maximum operating rate: 120 operating cycles/hour (θ ≤ 55 °C).

Average consumption	d.c. operation Un min.	d.c. operation Un max.	a.c. (with rectifier) Un min.	a.c. (with rectifier) Un max.	Un min.	Un max.
	W	W	VA	W	VA	W
Inrush	240	420	290	–	515	–
Sealed (coil)	0.2	0.3	–	0.2	–	0.3
Economy resistor	7	11	–	7.5	–	12

(1) a.c. (50-400 Hz) with individual rectifier and economy resistor, see scheme on page 52.
*(2) Complete the silicon rectifier reference **DR5TE1U** or **DR5TE1S**.*

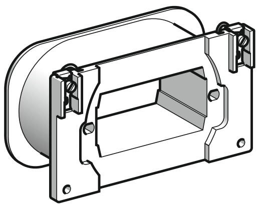
LC1B - Single pole - d.c. coils with economy resistor - rectified a.c. coils with economy resistor

References

The same coils are used for ⎓ or ∿ contactor control supply.

■ For d.c. operation, the following must be associated with the coil:
- 1 economy resistor arrangement (resistors + 1 or 2 auxiliary contact(s) or 1 contactor).

■ For 50 to 400 Hz a.c. operation, the following must be associated with the coil:
- 1 individual rectifier (to be wired)
- 1 economy resistor arrangement (resistors + auxiliary contact(s) or 1 contactor) wired into the rectified current side.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Operating range min-max (1)		Coil		Economy resistor				Rectifier (for ∿ only)	Coil	Weight
d.c.	a.c.	Resist. at 20 °C ± 10 %	I inrush ± 10 % at Un max	Resistor Unit reference	Resistor Total resist.	Contact Qty	Contact Reference	Reference	Reference	
V	V	Ω	A		Ω					kg
48	-	5.1	10.3	**DR2SC0270**	270	1	**ZC4GM2**	-	**WB1KB155**	1.120
-	110	25.5	4.3	**DR2SC1200**	1200	1	**ZC4GM2**	**DR5TE1U**	**WB1KB134**	1.120
110-127	127	33.1	4.2	**DR2SC1800**	1800	1	**ZC4GM2**	**DR5TE1U**	**WB1KB124**	1.120
220	220-240	94.8	2.3	**DR2SC4700**	4700	2	**ZC4GM2**	**DR5TE1U**	**WB1KB139**	1.120
240	-	123.9	1.9	**DR2SC6800**	6800	1	**LC1DT20LDS135**	**DR5TE1U**	**WB1KB125**	1.120
380- 400	380-450	247.4	1.6	**DR2SC1201**	6800 + 5600	1	**LC1DT20TDS135**	**DR5TE1S**	**WB1KB138**	1.120
440	500	382	1.1 (2)	**DR2SC1001**	20 000	1	**LC1DT20VDS135**	**DR5TE1S**	**WB1KB127**	1.120
450-500	-	506.7	1 (3)	**DR2SC1201**	24 000	1	**LC1DT20RDS135**	–	**WB1KB128**	1.120

Specifications

■ Average coil consumption (low sealed consumption):
- d.c.: inrush 380…520 W, sealed 0.15…0.20 W
- a.c. (with rectifier): inrush 450…620 VA, sealed 0.15…0.20 VA.

■ Time constant when sealed 25 ms.
■ Economy resistor consumption: 7…10 W.
■ Operating cycles/hour at θ ≤ 55 °C: ≤ 120.
■ Mechanical durability at Uc: 1.2 million operating cycles.
■ With a.c. operation: good resistance to voltage drop on inrush, non susceptibility to micro-breaks, mains harmonics: level ≤ 7.

(1) For supply voltages of less than 110 V, beware of voltage drops caused by the inrush current.
(2) 2 resistors in series: 2 x 10000 Ω.
(3) 2 resistors in series: 2 x 12000 Ω.

LC1B - 2-pole - d.c. coils with economy resistor - rectified a.c. coils with economy resistor

References

The same coils are used for ⎓ or ∿ contactor control supply.

■ For d.c. operation, the following must be associated with the coil:
- 1 economy resistor arrangement (resistors + 1 or 2 auxiliary contact(s) or 1 contactor).

■ For 50 to 400 Hz a.c. operation, the following must be associated with the coil:
- 1 individual rectifier (to be wired)
- 1 economy resistor arrangement (resistors + auxiliary contact(s) or 1 contactor) wired into the rectified current side.

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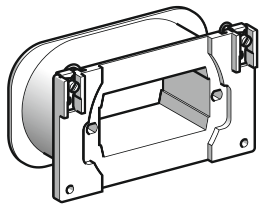

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Operating range min-max (1)		Coil		Economy resistor				Rectifier (for ∿ only)	Coil	Weight
d.c.	a.c.	Resist. at 20 °C ± 10 %	I inrush ± 10 % at Un max	Resistors (2 in series) Unit reference	Total resist.	Contact Qty	Reference	Reference	Reference	
V	V	□	A		□					kg
48	–	3.22	15.8	**DR2SC0068**	2x68	1	**ZC4GM2**	–	**WB1KB141**	1.120
-	110	11.4	8.6	**DR2SC0220** **DR2SC0270**	220 + 270	1	**ZC4GM2**	–	**WB1KB121**	1.120
110	127	19.7	6	**DR2SC0390**	2x390	1	**ZC4GM2**	**DR5TE1U**	**WB1KB140**	1.120
127	-	25.2	5.4	**DR2SC0470**	2x470	2	**ZC4GM2**	**DR5TE1U**	**WB1KB134**	1.120
-	220	61	3.4	**DR2SC1200**	2x1200	2	**ZC4GM2**	**DR5TE1U**	**WB1KB135**	1.120
220	240	77.2	3	**DR2SC1500** **DR2SC1800**	1500 + 1800	2	**ZC4GM2**	**DR5TE1U**	**WB1KB136**	1.120
240	-	94	3	**DR2SC1800** **DR2SC2200**	1800 + 2200	1	**LP1DT20LDS135**	**DR5TE1S**	**WB1KB139**	1.120
-	380	160	2.1	**DR2SC3300**	2x3300	1	**LP1DT20TDS135**	**DR5TE1S**	**WB1KB137**	1.120
380	400-450	197	2	**DR2SC3900**	2x3900	1	**LP1DT20TDS135**	**DR5TE1S**	**WB1KB126**	1.120
400-500	500	257	1.9	**DR2SC4700** **DR2SC5600**	4700 + 5600	1	**LP1DT20VDS135**	**DR5TE1S**	**WB1KB138**	1.120

Specifications

■ Average coil consumption (low sealed consumption):
- d.c.: inrush 600…800 W, sealed 0.35…0.5 W
- a.c. (with rectifier): inrush 720…1000 VA, sealed 0.35…0.5 VA.

■ Time constant when sealed 25 ms.
■ Economy resistor consumption: 15…20 W.
■ Operating cycles/hour at □ ⩽ 55 °C: ⩽ 120.
■ Mechanical durability at Uc: 1.2 million operating cycles.
■ With a.c. operation: good resistance to voltage drop on inrush, non susceptibility to micro-breaks, mains harmonics: level ⩽ 7.

(1) For supply voltages of less than 110 V, beware of voltage drops caused by the inrush current.

LC1B - 3-pole - d.c. coils with economy resistor - rectified a.c. coils with economy resistor

References

The same coils are used for ⎓ or ∼ contactor control supply.

■ For d.c. operation, the following must be associated with the coil:
- 1 economy resistor arrangement (resistors + 1 or 2 auxiliary contact(s) or 1 contactor).

■ For 50 to 400 Hz a.c. operation, the following must be associated with the coil:
- 1 individual rectifier (to be wired),
- 1 economy resistor arrangement (resistors + auxiliary contact(s) or 1 contactor) wired into the rectified current side.

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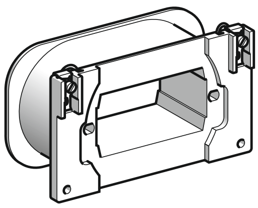

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Operating range min-max (1)		Coil		Economy resistor				Rectifier (for ∼ only)	Coil	Weight
d.c.	a.c.	Resist. at 20 °C ± 10 %	I inrush ± 10 % at Un max	Resistors (2 in parallel or in series) Unit reference	Total resist.	Contact Qty	Reference	Reference	Reference	
V	V	Ω	A		Ω					kg
47-50	–	1.85	27	**DR2SC0150**	2x150//		**ZC4GM2**		**WB1KB154**	1.120
51-55	–	2.35	23.5	**DR2SC0180**	2x180//	1	**ZC4GM2**	–	**WB1KB153**	1.120
56-60	–	3.22	18.5	**DR2SC0220**	2x220//	1	**ZC4GM2**	–	**WB1KB141**	1.120
61-66	–	4.04	16	**DR2SC0270**	2X270//	1	**ZC4GM2**	–	**WB1KB142**	1.120
67-72	–	4.96	14.5	**DR2SC0330**	2x330//	1	**ZC4GM2**	–	**WB1KB155**	1.120
73-79	–	5.86	13.5	**DR2SC0100**	2x100	1	**ZC4GM2**	–	**WB1KB132**	1.120
80-92	–	7.2	12.8	**DR2SC0120**	2x120	1	**ZC4GM2**	–	**WB1KB123**	1.120
93-98	108-113	9.6	10.2	**DR2SC0150** **DR2SC0180**	150 + 180	1	**ZC4GM2**	**DR5TE1U**	**WB1KB133**	1.120
99-114	114-132	11.4	10	**DR2SC0180** **DR2SC0220**	180 + 220	1	**ZC4GM2**	**DR5TE1U**	**WB1KB121**	1.120
115-126	133-145	16.3	7.7	**DR2SC0270**	2x270	2	**ZC4GM2**	**DR5TE1U**	**WB1KB130**	1.120
127-139	146-160	11.7	7	**DR2SC0330**	2x330	2	**ZC4GM2**	**DR5TE1U**	**WB1KB140**	1.120
140-159	161-181	25.2	6.3	**DR2SC0390** **DR2SC0470**	390 + 470	2	**ZC4GM2**	**DR5TE1U**	**WB1KB134**	1.120
160-201	182-228	32.2	6.2	**DR2SC0560**	2x560	2	**ZC4GM2**	**DR5TE1U**	**WB1KB124**	1.120
202-222	229-255	49.7	4.5	**DR2SC0820**	2x820	2	**ZC4GM2**	**DR5TE1U**	**WB1KB122**	1.120
223-246	256-282	61	4	**DR2SC1000**	2x1000	1	**LC1DT20LDS135**	**DR5TE1S**	**WB1KB135**	1.120
247-277	283-316	77.2	3.6	**DR2SC1200**	2x1200	1	**LC1DT20LDS135**	**DR5TE1S**	**WB1KB136**	1.120
278-327	317-372	94	3.5	**DR2SC1500**	2x1500	1	**LC1DT20UDS135**	**DR5TE1S**	**WB1KB139**	1.120
328-360	373-408	128	2.8	**DR2SC1500**	3x1500	1	**LC1DT20TDS135**	**DR5TE1S**	**WB1KB125**	1.120
361-399	409-452	160	2.5	**DR2SC1800**	3x1800	1	**LC1DT20VDS135**	**DR5TE1S**	**WB1KB137**	1.120
400-469	453-500	197	2.4	**DR2SC2200**	3x2200	1	**LC1DT20VDS135**	**DR5TE1S**	**WB1KB126**	1.120
470-500	–	257	1.9	**DR2SC2700**	3x2700	1	**LC1DT20RDS135**	–	**WB1KB138**	1.120

Specifications

■ Average coil consumption (low sealed consumption):
- d.c.: inrush 900…1100 W, sealed 0.7…1 W
- a.c. (with rectifier): inrush 1100…1300 VA, sealed 0.7…1 VA

■ Time constant when sealed 25 ms
■ Economy resistor consumption: 24…30 W
■ Operating cycles/hour at θ ⩽ 55 °C: ⩽ 120
■ Mechanical durability at Uc: 1.2 million operating cycles
■ With a.c. operation: good resistance to voltage drop on inrush, non susceptibility to micro-breaks, mains harmonics: level ⩽ 7.

(1) For supply voltages of less than 110 V, beware of voltage drops caused by the inrush current.

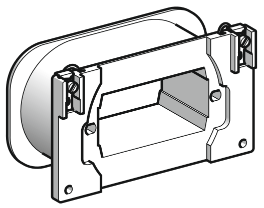
LC1B - 4-pole - d.c. coils with economy resistor - rectified a.c. coils with economy resistor

References

The same coils are used for ⎓ or ∿ contactor control supply.

■ For d.c. operation, the following must be associated with the coil:
- 1 economy resistor arrangement (resistors + 1 or 2 auxiliary contact(s) or 1 contactor).

■ For 50 to 400 Hz a.c. operation, the following must be associated with the coil:
- 1 individual rectifier (to be wired),
- 1 economy resistor arrangement (resistors + auxiliary contact(s) or 1 contactor) wired into the rectified current side.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Operating range min-max [1]		**Coil**		**Economy resistor**				**Rectifier** (for ∿ only)	**Coil**	**Weight**
d.c.	**a.c.**	**Resist. at 20 °C ± 10 %**	**I inrush ± 10 % at Un max**	**Resistors** (3 in series) **Unit reference**	**Total resist.**	**Contact Qty**	**Reference**	**Reference**	**Reference**	
V	**V**	**Ω**	**A**		**Ω**					**kg**
57-61	–	2.35	26	**DR2SC0027**	3x27	1	**ZC4GM2**	–	**WB1KB153**	1.120
62-67	–	3.22	21	**DR2SC0033**	3x33	1	**ZC4GM2**	–	**WB1KB141**	1.120
68-73	–	4.04	18	**DR2SC0039**	3x39	1	**ZC4GM2**	–	**WB1KB142**	1.120
74-81	–	4.96	16.3	**DR2SC0047**	3x47	1	**ZC4GM2**	–	**WB1KB155**	1.120
82-89	–	5.86	15	**DR2SC0056**	3x56	1	**ZC4GM2**	–	**WB1KB132**	1.120
90-102	105-119	7.2	14	**DR2SC0068**	3x68	1	**ZC4GM2**	**DR5TE1U**	**WB1KB123**	1.120
103-111	120-128	9.6	11.5	**DR2SC0100**	3x100	2	**ZC4GM2**	**DR5TE1U**	**WB1KB133**	1.120
112-129	129-148	11.4	11.3	**DR2SC0100**	3x100	2	**ZC4GM2**	**DR5TE1U**	**WB1KB121**	1.120
130-143	149-163	16.3	8.7	**DR2SC0150**	3x150	2	**ZC4GM2**	**DR5TE1U**	**WB1KB130**	1.120
144-157	164-179	19.7	8	**DR2SC0180**	3x180	2	**ZC4GM2**	**DR5TE1U**	**WB1KB140**	1.120
158-180	180-204	25.2	7.1	**DR2SC0220**	3x220	2	**ZC4GM2**	**DR5TE1U**	**WB1KB134**	1.120
181-226	205-259	32.5	6.9	**DR2SC0330**	3x330	2	**ZC4GM2**	**DR5TE1U**	**WB1KB124**	1.120
227-251	260-288	49.7	5	**DR2SC0470**	3x470	1	**LC1DT20LDS135**	**DR5TE1S**	**WB1KB122**	1.120
252-278	289-317	61	4.5	**DR2SC0560**	3x560	1	**LC1DT20UDS135**	**DR5TE1S**	**WB1KB135**	1.120
279-313	318-356	77.2	4	**DR2SC0680**	3x680	1	**LC1DT20UDS135**	**DR5TE1S**	**WB1KB136**	1.120
314-368	357-418	94	3.9	**DR2SC0820**	3x820	1	**LC1DT20TDS135**	**DR5TE1S**	**WB1KB139**	1.120
369-408	419-462	128	3.2	**DR2SC1200**	3x1200	1	**LC1DT20VDS135**	**DR5TE1S**	**WB1KB125**	1.120
409-448	463-500	160	2.8	**DR2SC1500**	3x1500	1	**LC1DT20VDS135**	**DR5TE1S**	**WB1KB137**	1.120
449-500	–	197	2.5	**DR2SC1800**	3x1800	1	**LC1DT20RDS135**	–	**WB1KB126**	1.120

Specifications

■ Average coil consumption (low sealed consumption):
- d.c.: inrush 1100…1400 W, sealed 1.2…1.6 W
- a.c. (with rectifier): inrush 1300…1600 VA, sealed 1.2…1.6 VA

■ Time constant when sealed 25 ms
■ Economy resistor consumption: 35…45 W
■ Operating cycles/hour at θ ≤ 55 °C: ≤ 120
■ Mechanical durability at Uc: 1.2 million operating cycles
■ With a.c. operation: good resistance to voltage drop on inrush, non susceptibility to micro-breaks, mains harmonics: level ≤ 7.

(1) For supply voltages of less than 110 V, beware of voltage drops caused by the inrush current.

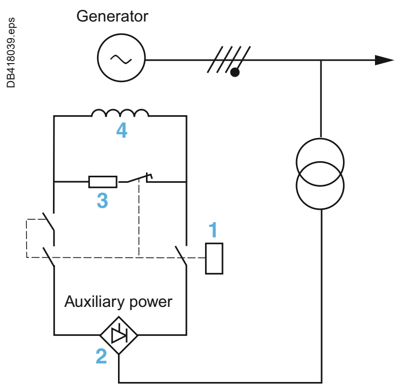
CVEB, CWEB, CRXB, CVXB, CWXB Predefined composition contactor

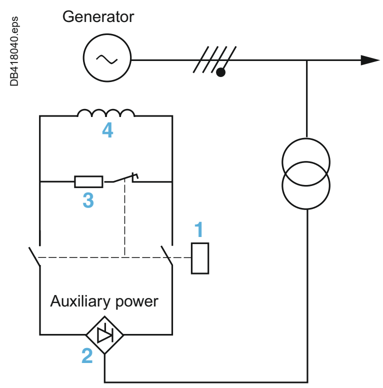
CVEB, CWEB, CRXB, CVXB, CWXB Predefined composition contactors for synchronous motor excitation circuit

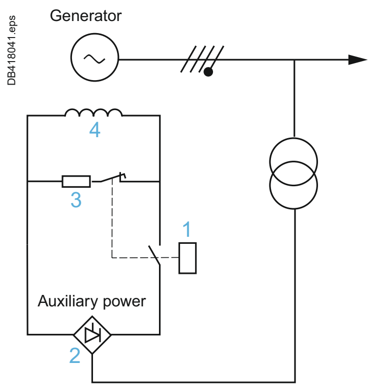
Introduction

Variable composition contactors CVE, CWE, CRXB, CVXB, CWXB are designed for switching the excitation circuits of synchronous machines, in particular electrical power station generators, for operational currents from 80 to 2750 A.
Example: Static excitation generator.

Basic scheme







1 Excitation contactor
2 Thyristor bridge
3 Discharge resistor Rd
4 Excitation winding

Operating principle
The voltage delivered by the generator is related to the current flowing through the excitation winding 4.

Start-up phase
■ The contactor 1 closes, off load.
■ An adjustable auxiliary power supply generates current in the excitation winding 4 to allow power-up of the generator.
■ When the voltage delivered by the generator is sufficient to supply the excitation winding 4 via a thyristor bridge 2, the auxiliary supply is switched off.

Stop phase
When a stop instruction is received, the thyristor bridge 2 operates for a few seconds as an inverter, then the excitation contactor 1 opens.
The function of the N/C pole is to discharge residual electromagnetic energy from the excitation winding 4 via the discharge resistor Rd 3.

Under normal operating conditions, breaking is therefore easy, especially as the N/O poles and the N/C pole are make before break.
However, in the event of a problem, the contactor must be able to break.

Contactor selection
Selection is done according to the nominal operating voltage of the machine and the necessity or not to fully isolate the thyristor bridge coil of the power supply (1, 2, or 3 N/O poles).

***Note:** The N/C pole, which is used for machine de-excitation, has no arc chambers.*
Its breaking capacity is nil. Re-energisation of the contactor must therefore be avoided during the de-excitation phase.
If there is any risk of this happening, it is advisable to add an off-delay function that prevents pick-up of the contactor for the 10 seconds following drop-out.

CVEB and CWEB contactors composition:

■ 2 or N/O poles with magnetic blow-out (80…300 A)
■ 1 N/C pole without blow-out, overlapping contacts (possible mounting of a blow-out device)
■ 1 electromagnet with d.c. supply
□ either mechanical latching (CWEB)
□ or with economy resistor (CVEB).
■ 1 ZC4GM auxiliary contact or 1 or 2 instantaneous auxiliary contact heads (3 to 6 N/O contacts + 2 to 4 N/C contacts).
■ 1 mounting bar, 1 rotary drive shaft.

The following can be added:
■ 1 or 2 blocks of 4 instantaneous auxiliary contacts LADN●●, without increasing the overall size of the contactor
■ or 1 time delay block LADT● or LADR●.

Note: *it is not possible to fit a mechanical latch block type LA6DK●● on these contactors.*

Characteristics

CVEB, CWEB contactor sizes			F		H	
N/O pole			**1 pole**	**2 poles**	**1 pole**	**2 poles**
Rated current	θ ⩽ 40°C	**A**	80	80	300	300
Maximum operating voltage	d.c	**V**	220	440	220	440
Rated insulation voltage According to IEC 60664-1	d.c	**V**	690	690	690	690
Making capacity	d.c	**A**	1600	1600	4000	4000
Breaking capacity	d.c L/R = 15 ms	**A**	240	240	900	900
Overlap time with the N/C pole		**ms**	2	2	2	2
N/C pole						
Rated current	θ ⩽ 40°C	**A**	80	80	300	300
Making capacity	d.c	**A**	1600	1600	4000	4000
Breaking capacity	d.c L/R = 15 ms	**A**	0	0	0	0
Permissible current	For 10 s	**A**	480	480	1400	1400

TeSys

TeSys CRXB, CVXB, CWXB Predifined composition contactors

Description/characteristics

CRXB, CVXB and CWXB contactors composition:

■ 1 to 3 N/O poles with magnetic blow-out (80…2750 A)
■ 1 N/C pole without blow-out, overlapping contacts (possible mounting of a blow-out device)
■ 1 electromagnet with d.c supply
□ or with economy resistor (CVXB)
□ either with magnetic latching (CRXB)
□ either with mechanical latching (CWXB)
■ 1 ZC4GM auxiliary contact or 1 or 2 instantaneous auxiliary contacts (3 to 6 N/O contacts + 2 to 4 N/C contacts)
■ 1 mounting bar, 1 rotary drive shaft.

The following can be added:
■ 1 or 2 blocks of 4 instantaneous auxiliary contacts type LADN●●, without increasing the overall size of the contactor.
■ or 1 time delay block type LADT● or LADR●.

***Note:** it is not possible to fit a mechanical latch block type LA6DK●● on these contactors.*

Characteristics

Size of contactors C●XB (1)			F			H		
N/O pole			**1 pole**	**2 poles**	**3 poles**	**1 pole**	**2 poles**	**3 poles**
Rated current	θ ≤ 40°C	A	80	80	80	300	300	300
Maximum operating voltage		V DC	440	850	1000	440	850	1000
Rated insulation voltage		V DC	1000	1000	1000	1000	1000	1000
Making capacity		A	1400	1400	1400	3500	3500	3500
Breaking capacity	For U max	A	500	500	500	1200	1200	1200
Overlap time with the N/C pole		ms	2	2	2	2	2	2
N/C pole								
Rated current	θ ≤ 40°C	A	80	80	80	300	300	300
Making capacity		A	1600	1600	1600	4000	4000	4000
Breaking capacity		A	0	0	0	0	0	0
Permissible current	For 10s	A	480	480	480	1400	1400	1400

Characteristics

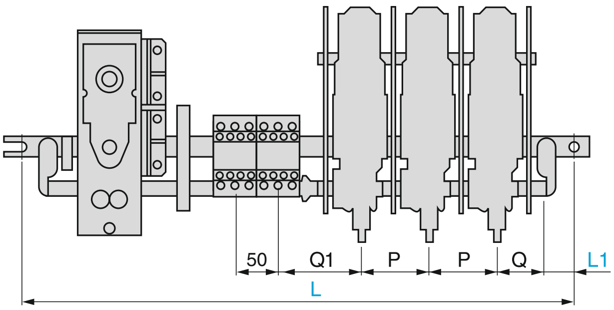
Size of contactors C●XB			K			L		
N/O pole			**1 pole**	**2 pole**	**3 poles**	**1 pole**	**2 pole**	**3 poles**
Rated current	θ ≤ 40°C	A	630	630	630	800	800	800
Maximum operating voltage		V DC	440	850	1000	440	850	1200
Rated insulation voltage		V DC	1000	1000	1000	1500	1500	1500
Making capacity		A	6500	6500	6500	14000	14000	14000
Breaking capacity	For U max	A	2500	2500	2500	3200	3200	3200
Overlap time with the N/C pole		ms	2	2	2	2	2	2
N/C pole								
Rated current	θ ≤ 40°C	A	630	630	630	630	630	630
Making capacity		A	6500	6500	6500	6500	6500	6500
Breaking capacity		A	0	0	0	0	0	0
Permissible current	For 10s	A	3600	3600	3600	3600	3600	3600

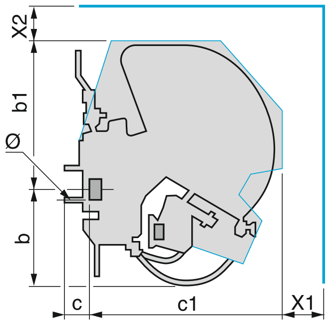
Characteristics

Size of contactors C●XB			M			P			R		
N/O pole			**1 pole**	**2 poles**	**3 poles**	**1 pole**	**2 poles**	**3 poles**	**1 pole**	**2 poles**	**3 poles**
Rated current	θ ≤ 40°C	A	1250	1250	1250	2000	2000	2000	2750	2750	2750
Maximum operating voltage		V DC	440	850	1200	440	850	1200	440	850	1200
Rated insulation voltage		V DC	1500	1500	1500	1500	1500	1500	1500	1500	1500
Making capacity		A	14000	14000	14000	21000	21000	21000	25000	25000	25000
Breaking capacity	For U max	A	4400	4400	4400	7200	7200	7200	10000	10000	10000
Overlap time with the N/C pole		ms	2	2	2	2	2	2	2	2	2
N/C pole											
Rated current	θ ≤ 40°C	A	630	630	630	630	630	630	630	630	630
Making capacity		A	6500	6500	6500	6500	6500	6500	6500	6500	6500
Breaking capacity		A	0	0	0	0	0	0	0	0	0
Permissible current	For 10s	A	3600	3600	3600	3600	3600	3600	3600	3600	3600

(1) CRX, CVXB legacy size 'G', 'J'. Please consult us.

Contactors CRXB and CVXB, sizes F to K

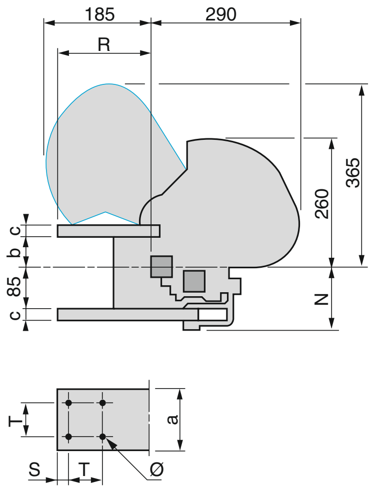


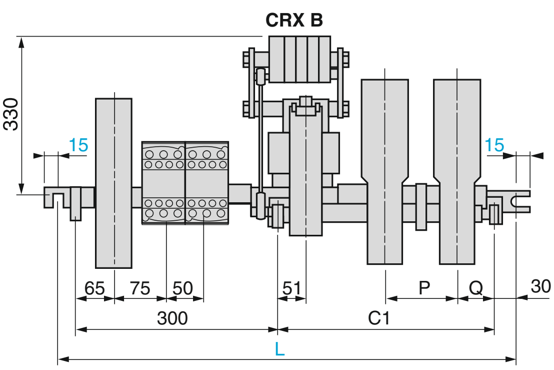


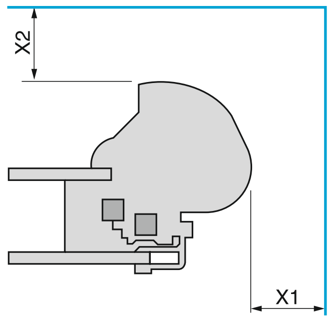
Dimension L: fixing centres depending on the number of N/O or N/C main poles, with or without magnetic blow-out, and the number of ZC4GM auxiliary contact blocks in addition to the maintaining contact.

C•XB contactor size											Minimum electrical clearance	
	Ø	**b**	**b1**	**c**	**c1**	**L**	**L1**	**P**	**Q**	**Q1**	**X1**	**X2**
F	M6	75	120	17	149	445	15	50	20	52	25	15
H	M10	62	188	52	176	540	20	60	57	57	60	55
K	M12	141	214	45	215	760	37	100	64	75	80	80

Contactors CRXB and CVXB, sizes L to R







Dimension L: fixing centres depending on the number of N/O or N/C main poles, with or without magnetic blow-out, and the number of ***ZC4GM*** *auxiliary contact blocks in addition to the maintaining contact.*

C•XB contactor size										Minimum electrical clearance	
	Ø	**b**	**c**	**C1**	**L**	**N**	**P**	**Q**	**R**	**X1**	**X2**
L	M8	59	16	392	760	121	100	100	122	200	250
M	M10	55	20	392	760	125	100	100	157	200	250
P	M10	55	20	487	885	125	150	110	173	200	250
R	M10	50	25	582	950	130	195	130	173	250	300

TeSys CVEB, CWEB, CRXB, CVXB, CWXB Predefined composition contactors

Product references - coding principle

Decoding a product reference (example)

C	V	E	B	G	2	G	1	Y	G	D	1
1	2	3	4	5	6	7	8	7(1)	9		10

(1) Standard construction without blow-out: code Y.

1 - Contactor

2 - Type of control circuit of the contactor
- V = Electromagnet with economy resistor
- R = Electromagnet with magnetic latching
- W = Electromagnet with mechanical latching

3 - Type of N/O poles
- E = PN1
- X= PA3 (FB to HB), PN3 (KB) and PA1 (LB to RB)

4 - Evolution

5 - Size of the contactor (in A)

F	H	K	L	M	P	R
80	300	630	800	1250	2000	2750

6 - Number of N/O poles

1, 2 or 3 according to the scheme used by the customer

7 - Operating current (Ie)

Code	Contactor BF Ie	BF Rep* blow-out	BH Ie	BH Rep* blow-out	BK Ie	BK Rep* blow-out
A	1	05				
B	1.9	07				
C	4	10				
D	7,6	14				
E	12	18				
M	12	20				
N	22	25				
P	45	9				
Q	55	7				
F	80	4				
R						
G			200	2		
H			300	1		
T						
U					400	53
J						
V					500	52
K					630	51
Y	Only for CV1 with pole type PN5 ou PR5 without blow-out					

8 - 1 N/C pole

10 - Block of auxiliary contacts
- 1 = 1 ZC4GM1
- A = 1 block type LA1BN32
- B = 2 blocks type LA1BN32 (standard configuration)

9 - Control voltage

Code	BD	ED	FD	GD	MD			UD
Uc (V DC)	24	48	110	125	220			250
Code	**B7**	**E7**	**F7**	**G7**	**M7**	**P7**	**U7**	
Uc (V AC)	24	48	110	127	220	230	240	

Performance label for the excitation contactors

	CVEB, CREB, CWEB BF 1P	BF 2P	BH 1P	BH 2P	CRXB, CVXB, CWXB BF 1P	BF 2P	BF 3P	BH 1P	BH 2P	BH 3P
Ue (V DC)	200	440	200	440	440	850	1000	440	850	1000
In (A)	80		300		80			300		
Ie	See table 7									
Uc	See table 9									

	CRXB, CVXB, CWXB BK 1P	BK 2P	BK 3P	BL 1P	BL 2P	BL 3P	BM 1P	BM 2P	BM 3P	BP 1P	BP 2P	BP 3P	BR 1P	BR 2P	BR 3P
Ue (V DC)	440	850	1000	440	850	1000	440	850	1000	440	850	1000	440	850	1000
In (A)	630			800			1250			2000			2750		
Ie	See table 7														
Uc	See table 9														

CVEB, CWEB contactors equipped with type 1 (PN1) N/O poles

Control circuit						With economy resistor	With mechanical latching	
Operational voltage	Number of poles N/O	Number of poles N/C	Instantaneous auxiliary contacts (2)		Rated operational current	Basic reference to be completed by adding the code of the blow-out coils (1), of the control voltage (2) and of the aux. contacts (3)	Basic reference to be completed by adding the code of the blow-out coils (1), of the control voltage (2) and of the aux. contacts (3)	Scheme
V					A			
220V DC	1	1	1, 3 or 6	1, 2 or 4	80	CVEBF1•1••••	CWEBF1•1••••	1
					300	CVEBH1•1••••	CWEBH1•1••••	1
440V DC	2	1	1, 3 or 6	1, 2 or 4	80	CVEBF2•1••••	CWEBF2•1••••	2
					300	CVEBH2•1••••	CWEBH2•1••••	2

CRXB, CVXB and CWXB contactors equipped with N/O poles type PA3 (F to H), PN3 (J and K) or PA1 (L to R)

Control circuit						Economy resistor	Mechanical latching	Magnetic latching	
Operational voltage	Number of poles N/O	Number of poles N/C	Instantaneous auxiliary contacts (2)		Rated operational current	Basic reference to be completed by adding the code of the blow-out coils (1), of the control voltage (2) and of the aux. contacts (3)	Basic reference to be completed by adding the code of the blow-out coils (1), of the control voltage (2) and of the aux. contacts (3)	Basic reference to be completed by adding the code of the blow-out coils (1), of the control voltage (2) and of the aux. contacts (3)	Scheme
V					A				
440V DC	1	1	1, 3 or 6	1, 2 or 4	80	CVXBF1•1••••	CWXBF1•1••••	CRXBF1•1••••	1
					300	CVXBH1•1••••	CWXBH1•1••••	CRXBH1•1••••	1
					630	CVXBK1•1••••	CWXBK1•1••••	CRXBK1•1••••	1
					800	CVXBL1•1••••	CWXBL1•1••••	CRXBL1•1••••	1
					1250	CVXBM1•1••••	CWXBM1•1••••	CRXBM1•1••••	1
					2000	CVXBP1•1••••	CWXBP1•1••••	CRXBP1•1••••	1
					2750	CVXBR1•1••••	CWXBR1•1••••	CRXBR1•1••••	1
850V DC	2	1	1, 3 or 6	1, 2 or 4	80	CVXBF2•1••••	CWXBF2•1••••	CRXBF2•1••••	2
					300	CVXBH2•1••••	CWXBH2•1••••	CRXBH2•1••••	2
					630	CVXBK2•1••••	CWXBK2•1••••	CRXBK2•1••••	2
					800	CVXBL2•1••••	CWXBL2•1••••	CRXBL2•1••••	2
					1250	CVXBM2•1••••	CWXBM2•1••••	CRXBM2•1••••	2
					2000	CVXBP2•1••••	CWXBP2•1••••	CRXBP2•1••••	2
					2750	CVXBR2•1••••	CWXBR2•1••••	CRXBR2•1••••	2
1000V DC	3	1	1, 3 or 6	1, 2 or 4	80	CVXBF3•1••••	CWXBF3•1••••	CRXBF3•1••••	3
					300	CVXBH3•1••••	CWXBH3•1••••	CRXBH3•1••••	3
					630	CVXBK3•1••••	CWXBK3•1••••	CRXBK3•1••••	3
1200V DC	3	1	1, 3 or 6	1, 2 or 4	800	CVXBL3•1••••	CWXBL3•1••••	CRXBL3•1••••	3
					1250	CVXBM3•1••••	CWXBM3•1••••	CRXBM3•1••••	3
					2000	CVXBP3•1••••	CWXBP3•1••••	CRXBP3•1••••	3
					2750	CVXBR3•1••••	CWXBR3•1••••	CRXBR3•1••••	3

(1) For the codes of the blow-out coils, please refer page 108.
(2) Existing control voltages (other voltages, please consult us).

Volts	24	48	110	125	220	230	240	250
DC	BD *	ED *	FD	GD	MD	PD	-	UD
AC	B7 *	E7 *	F7	G7	M7	P7	U7	-

** K to R rating: please consult us.*

(3) 1 auxiliary contact type ZC4GM1 (code 1) or 1 auxiliary contact type ZC4GM2 (code 2)
or 1 auxiliary contacts block type LA1BN32 (3 N/O contacts + 2 N/C contacts) (code A)
or 2 auxiliary contacts blocks type LA1BN32 (6 N/O contacts + 4 N/C contacts) (code B).

Coils

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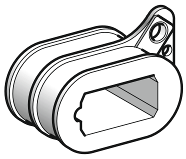

WB1GA●

Coils and associated components

Contactors	Usual voltage ⎓	Coil Reference	R at 20 °C	Additional resistors R1	Reference	R2	Reference	Automatic coil cut-out contact No.	Reference
	V		W	W		W			
CRXBF21FD	110	**WB1EA200**	44	100	**DR2SC0100**	82	**DR2SC0082**	2	**ZC4GM2**
CRXBF21GD	125	**WB1EA220**	53	120	**DR2SC0120**	100	**DR2SC0100**	2	**ZC4GM2**
CRXBF21UD	250	**WB1EA432**	208	470	**DR2SC0470**	470	**DR2SC0470**	2	**ZC4GM2**
CRXBG21FD	110	**WB1GA230**	33	68	**DR2SC0068**	47	**DR2SC0047**	2	**ZC4GM2**
CRXBG21GD	125	**WB1GA300**	59	120	**DR2SC0120**	56	**DR2SC0056**	2	**ZC4GM2**
CRXBG21UD	250	**WB1GA550**	203	390	**DR2SC0390**	270	**DR2SC0270**	2	**ZC4GM2**
CRXBH21FD	110	**WB1HA340**	45	68	**DR2SC0068**	68	**DR2SC0068**	2	**ZC4GM2**
CRXBH21GD	125	**WB1HA380**	51	120	**DR2SC0120**	82	**DR2SC0082**	2	**ZC4GM2**
CRXBH21UD	250	**WB1HA600**	158	270	**DR2SC0270**	220	**DR2SC0220**	2	**ZC4GM2**
CRXBJ21FD	110	**WB1JB348**	55	120	**DR2SC0120**	100	**DR2SC0100**	2	**ZC4GM2**
CRXBJ21GD	125	**WB1JB428**	76.3	180	**DR2SC0180**	100	**DR2SC0100**	2	**ZC4GM2**
CRXBJ21UD	250	**WB1JB432**	244	680	**DR2SC0680**	330	**DR2SC0330**	2	**ZC4GM2**
CRXBK21FD	110	**WB1KB124**	32.5	100	**DR2SC0100**	68	**DR2SC0068**	2	**ZC4GM2**
CRXBK21GD	125	**WB1KB124**	32.5	100	**DR2SC0100**	68	**DR2SC0068**	2	**ZC4GM2**
CRXBK21UD	250	**WB1KB137**	160	390	**DR2SC0390**	390	**DR2SC0390**	2	**ZC4GM2**
CRXBL/M/P/21FD	110	**WB1KB121**	11.4	47	**DR2SC0047**	39	**DR2SC0039**	1	**PR4FB0010**
CRXBL/M/P/21GD	125	**WB1KB140**	19.7	100	**DR2SC0100**	47	**DR2SC0047**	1	**PR4FB0009**
CRXBL/M/P/21UD	250	**WB1KB136**	77.2	330	**DR2SC0330**	220	**DR2SC0220**	1	**PR4FB0006**
CRXBR21FD	110	**WB1KB133**	9.6	47	**DR2SC0047**	39	**DR2SC0039**	1	**PR4FB0011**
CRXBR21GD	125	**WB1KB121**	11.4	56	**DR2SC0056**	47	**DR2SC0047**	1	**PR4FB0010**
CRXBR21UD	250	**WB1KB135**	61	270	**DR2SC0270**	270	**DR2SC0270**	1	**PR4FB0006**

Contactors	Usual voltage ⎓	Coil Reference	R at 20 °C	Economy resistor Reference	Total resistance	Economy resistor contact No.	Reference
	V		W		W		
CVXBF21FD	110	**WB1EA290**	88	**DR2SC1500**	1500	1	**ZC4GM2**
CVXBF21GD	125	**WB1EA315**	110	**DR2SC1800**	1800	1	**ZC4GM2**
CVXBF21UD	250	**WB1EA550**	367	**DR2SC6800**	6800	1	**ZC4GM2**
CVXBG21FD	110	**WB1GA380**	88	**DR2SC1500**	1500	1	**ZC4GM2**
CVXBG21GD	125	**WB1GA380**	88	**DR2SC1500**	1500	1	**ZC4GM2**
CVXBG21UD	250	**WB1GA600**	257	**DR2SC5600**	5600	1	**ZC4GM2**
CVXBH21FD	110	**WB1HA400**	62	**DR2SC1200**	1200	1	**ZC4GM2**
CVXBH21GD	125	**WB1HA440**	79	**DR2SC1500**	1500	1	**ZC4GM2**
CVXBH21UD	250	**WB1HA750**	303	**DR2SC5600**	5600	1	**ZC4GM2**
CVXBJ21FD	110	**WB1JB428**	76.3	**DR2SC1200**	1200	1	**ZC4GM2**
CVXBJ21GD	125	**WB1JB429**	97.5	**DR2SC1500**	1500	1	**ZC4GM2**
CVXBJ21UD	250	**WB1JB433**	388	**DR2SC6800**	6800	1	**ZC4GM2**
CVXBK21FD	110	**WB1KB122**	49.7	**DR2SC2200**	2200	1	**ZC4GM2**
CVXBK21GD	125	**WB1KB135**	61	**DR2SC2700**	2700	1	**ZC4GM2**
CVXBK21UD	250	**WB1KB138**	257	**DR2SC1201**	12 000	1	**ZC4GM2**
CVXBL/M/P/21FD	110	**WB1KB140**	19.7	**2 x DR2SC0330**	660	1	**ZC4GM2**
CVXBL/M/P/21GD	125	**WB1KB134**	25.2	**2 x DR2SC0470**	940	2	**ZC4GM2**
CVXBL/M/P/21UD	250	**WB1KB139**	94	**DR2SC1800 + DR2SC2200**	4000	1	**LP1D12004UD**
CVXBR21FD	110	**WB1KB121**	11.4	**DR2SC0180 + DR2SC0220**	400	1	**ZC4GM2**
CVXBR21GD	125	**WB1KB130**	16.3	**2 x DR2SC0270**	540	2	**ZC4GM2**
CVXBR21UD	250	**WB1KB136**	77.2	**2 x DR2SC1200**	2400	1	**ZC4GM2 LP1D12004UD**

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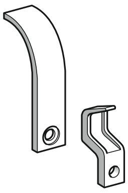

PN1JB80

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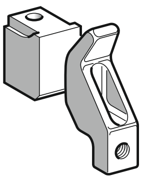

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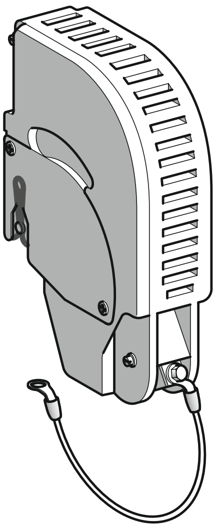

PN3KB50

Spare parts

Sets of contacts for CRXB, CVXB contactors

Description	Number of sets required per contactor pole	CRXB and CVXB contactor sizes	Reference	Weight kg
1 fixed contact + 1 moving contact	1	F	**PA2FB80**	0.070
	1	G	**PA2GB80**	0.160
	1	H	**PA2HB80**	0.220
	1	J	**PN1JB80**	0.320
	1	K	**PN1KB80**	0.440
	1	L	**PA1LB80**	0.420
	1	M	**PA1LB80**	0.420
	2	P	**PA1LB80**	0.420
	3	R	**PA1LB80**	0.420

Arc chamber only

Description	Number of sets required per contactor pole	CRXB and CVXB contactor sizes	Reference	Weight kg
Arc chamber	1	F	**PA2FB50**	0.070
		G	**PA2GB50**	0.160
		H	**PA2HB50**	0.220
		J	**PN3JB50**	0.320
		K	**PN3KB50**	0.440
		L	**PA1LB50**	0.420
		M	**PA1LB50**	0.420
		P	**PA1PB52**	0.840
		R	**PA1RB52**	1.260

CR1B Magnetic latching contactors

Magnetic latching contactors

The magnetic latching contactors are equipped with a specific electromagnet allowing them to maintain position “ON” although the coil is fed by any current.

Use

The specific properties of magnetic latching contactors make them suitable for many uses:

Properties	Use
Memory retention of the sequence in automatic equipment, in the event of loss of the control voltage.	Refineries, power plants, excitation circuits.
Energy saving, as no current is drained when the contactor is activated.	Contactor staying activated for long periods. Examples: refineries, alimentation energy, ST distribution.
Change of state “Work” / “Rest” by current pulse sent to the coil.	Selective opening control.
Insensitivity to main perturbations.	No unexpected opening or closing of power poles
Use of contactors beyond breaking capacity as they are activated off-load.	Passer diverter, for use with 1000 V
Silent contactor when locked in ON position	

Electro-magnet operation of the CR1B contactors

The CR1B magnetic latching contactors are equipped with a single coil, supplied with direct current or alternating current through a rectifier.
The latching is obtained by direct feeding of the coil with a current in a given direction.
The unlatching is produced by a current of opposite direction, adjusted by resistors.

Range

- The magnetic latching contactors are available from 80 to 630 A (Size F to K).
- The characteristics of N/O and N/C poles are identical to those of CV1 and CV3B (Size F to K).
- For other characteristics and mounting dimensions, please contact us.
- For ratings of 800 to 2750 A, see next page.

CR1B contactors for direct starting of squirrel cage motors

In continuous or intermittent service up to 30 operating cycles per hour.

CR1B contactor, thermal relay product reference - selection according to motor power

Motor [(1)] 220 / 230 V		380 / 400 V		415 V		440 V		3-poles contactor CR1B	Differential thermal relay 3-poles		3 type fuses aM	BS-88
P	In	P	In	P	In	P	In	Ref. [(2)]	Ref.	Adjustment range	Rating	
kW	A	kW	A	kW	A	kW	A			A	A	A
220	700	355	635	400	650	425	650	CR1BL33	LR1F800	500 - 800	800	1000
-	-	375	670	425	690	445	680	CR1BL33	LR1F800	500 - 800	800	1000
-	-	400	710	445	730	450	690	CR1BL33	LR1F800	500 - 800	800	1000
-	-	-	-	450	740	475	730	CR1BL33	LR1F800	500 - 800	800	1000
250	800	425	760	475	780	500	780	CR1BM33	LR1F800	500 - 800	800	1000
257	826	445	790	500	820	530	825	CR1BM33	LR1F1000	630 - 1000	1000	1250
280	900	450	800	530	870	560	870	CR1BM33	LR1F1000	630 - 1000	1000	1250
295	948	475	850	560	920	600	920	CR1BM33	LR1F1000	630 - 1000	1000	1250
300	980	500	900	600	978	630	965	CR1BM33	LR1F1000	630 - 1000	1000	1250
315	990	530	950	-	-	-	-	CR1BM33	LR1F1000	630 - 1000	1000	1250

(1) The ratings are for standard 220/230 V, 380/400 V, 415 or 440 V motors. The overload relays should preferably be set to the motor full-load current shown on the motor rating plate. For other power ratings, select the overload relay with the appropriate range; the associated contactor and fuses must have ratings equal to or immediately greater than In.
(2) Reference to be completed on page 117 .

CR1B rating - selection according to operational current - category AC-3

CR1B contactor rating		L	M	P	R
Rated operational current (□ ≤ 55 °C)					
440 V	A	750	1000	1500	1800
500 V	A	750	900	1200	1500
660 V	A	700	800	900	1100
1000 V	A	400	400	500	600
Operational power (□ ≤ 55 °C) (normalized motor power)					
220 / 230 V	kW	220	280	425	500
380 / 400 V	kW	400	500	750	900
415 V	kW	425	530	800	900
440 V	kW	450	560	800	900
500 V	kW	500	600	750	900
660 V	kW	560	670	750	900
1000 V	kW	530	530	670	750

Maximum operating rate of 120 operating cycles/hour, at rated operational power with an on-load factor ≤ 85 %.

CR1B rating selection according to electrical durability in category AC-3 (Ue ≤ 440 V)

For 660 V, multiply the number of operating cycles by 0.8.

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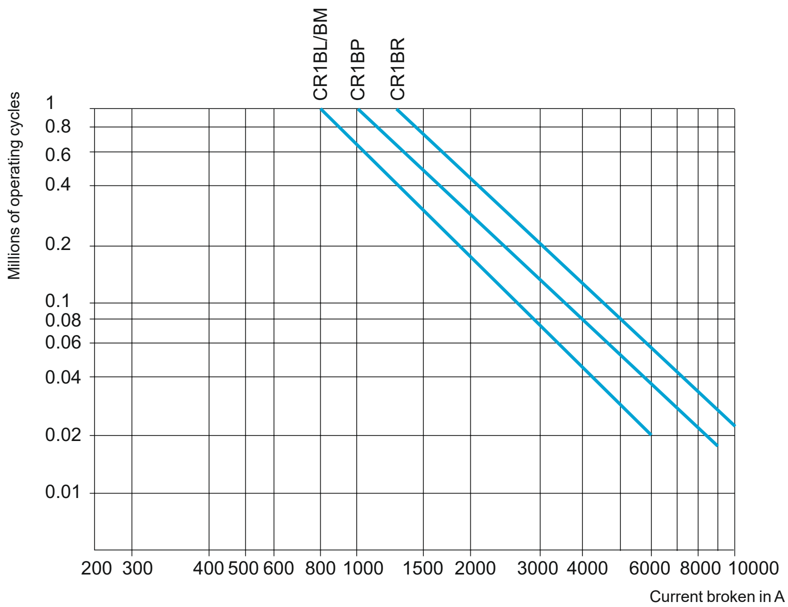


CR1B contactors for control of resistive circuits - power factor ≥ 0.95.

CR1B rating - selection according to operational current - category AC-1

CR1B contactor rating			L	M	P	R
Maximum operational current (□ ≤ 55 °C)						
Number of bars			2	2	3	4
Cabling c.s.a.		mm²	50 x 5	80 x 5	100 x 5	100 x 5
Rated operationnal current in category AC-1 at ambient air temperature	≤ 40 °C	A	800	1250	3000	2750
	≤ 55 °C	A	700	1100	1750	2400
	≤ 70 °C	A	600	900	1500	2000

Increase in rated operational current by paralleling of poles

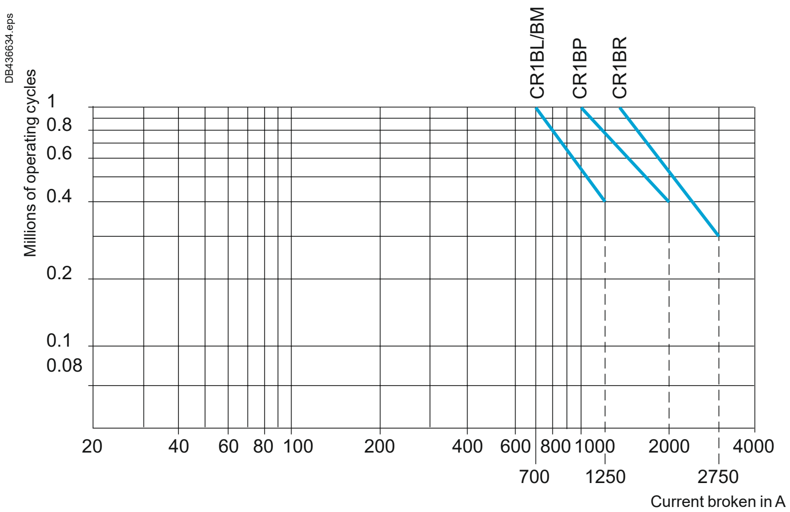
Apply the following coefficients to the above currents:
- 2 poles in parallel: K = 1.60
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.

these coefficients take into account an often unbalanced distribution of current between the poles

Maximum operating rate in operating cycles 120/hour.

CR1B rating - selection according to electrical durability in category AC-1 (Ue ≤ 440 V)

For 660 V, multiply the number of operating cycles by 0.8.



CR1B contactors for switching the primaries of 3-phase transformers

Conditions of use

- Maximum operational voltage: 1000 V 50/60 Hz.
- Maximum ambient temperature: 55 °C.

At power up, there is usually a suden inrush current. It reaches almost instantly its peak value and then decreases so approximately exponentially to its rapid steady state value.
The value depends on:
- characteristics of the magnetic circuit and the windings (section of kernel design field,number of turns, dimensions of the coils...)
- characteristics of magnetic metal sheets used (residual induction and saturation induction)
- of the magnetic state of the circuit and the instantaneous value of the alternating voltage of the network at the time of activation.

When a transformer is switched on, there is generally an initial current surge which can reach 20 to 40 times the rated current for the power ratings shown below.

This current reaches its peak value almost instantaneously and then decreases in a largely exponential manner, quickly dropping back down to its steady state value.

CR1B contactor ratings			L	M	P	R
Prospective peak current at switch-on		A	18000	18000	24000	30000
Maximum operational power [(1)]	220 / 230 V	kVA	230	230	300	380
	380 400 V	kVA	400	400	530	660
	415 / 440 V	kVA	450	450	560	700
	500 V	kVA	480	480	600	750
	660 V	kVA	600	600	800	950
	1000 V	kVA	700	700	1000	1200

(1) Maximum operational power corresponding to a current peak at switch-on of 30 In.

TeSys CR1B Magnetic latching contactors

Product references

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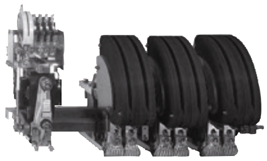


CR1BL33

CR1B Magnetic latching contactors - Product references

Maximum thermal current in category AC-1	Rated operational current in category AC-3	Composition	Number of Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code [1]	Weight
A	A		N/C	N/O		kg
800	750	1 pole	2	1	**CR1BL31●21** [2]	32.000
		2 poles	2	1	**CR1BL32●21** [2]	45.000
		3 poles	2	1	**CR1BL33●21** [2]	58.000
		4 poles	2	1	**CR1BL34●21** [2]	72.000
1250	1000	1 pole	2	1	**CR1BM31●21** [2]	31.000
		2 poles	2	1	**CR1BM32●21** [2]	44.000
		3 poles	2	1	**CR1BM33●21** [2]	57.000
		4 poles	2	1	**CR1BM34●21** [2]	71.000
2000	1500	1 pole	2	1	**CR1BP31●21** [2]	41.000
		2 poles	2	1	**CR1BP32●21** [2]	65.000
		3 poles	2	1	**CR1BP33●21** [2]	94.000
		4 poles	2	1	**CR1BP34●21** [2]	120.000
2750	1800	1 pole	2	1	**CR1BR31●21** [2]	52.000
		2 poles	2	1	**CR1BR32●21** [2]	85.000
		3 poles	2	1	**CR1BR33●21** [2]	129.000
		4 poles	2	1	**CR1BR34●21** [2]	160.000

(1) Standard control circuit voltages:

Volts	110	125	127	200	220	240	250	380	412	440	500
∿ 50-400 Hz	F	-	G	L	M	U	-	Q	N	R	S
⎓	FD	GD	-	-	MD	UD	UCD	-	-	RD	SD

For other voltages, see tables of references coils page 123 or consult us.

(2) Other configurations, see below.

Other configurations for CR1B

For other configurations of auxiliary contacts, replace the number 21 (2 “N/O” + 1 “N/C”) by the reference of the chosen configuration.
Example: LC1BP33●30.

1 “N/O” + 2 “N/C”	→	**12**
3 “N/O”	→	**30**

Spare parts see page 122.

Note: *the protection coil control circuit against short circuits must be performed by a fuse coordinated with the cable section used: 1.5 mm² for copper: 12 A fuse maximum (BS88 or g1).*

Characteristics according to ratings

CR1B contactor rating				L	M	P	R
Number of poles				1, 2, 3 or 4			
Rated operational voltage			V	1000			
Environment							
Terminal protection cover against accidental contact				Without			
Protective treatment				TC			
Ambient air temperature		storage	°C	-60 ... +80			
		operation	°C	-15 ... +60			
Maximum operating altitude			m	3000			
Maximum inclination				± 30° occasional, in relation to normal vertical mounting plane			
Pole characteristics							
Rated operational voltage conforming to		BS 775 and IEC 158-1	V	1000			
		VDE 0110 grC	V	1500			
Frequency limits by operational current			Hz	50-60			
Operational current	Distribution (□ ≤ 40 °C)	AC-1	A	800	1250	2000	2750
	Motor	AC-3	A	750	1000	1500	1800
	(□ ≤ 40 °C, U ≤ 440 V)	AC-4	A	750	1000	1500	1800
Rated making capacity I rms conforming to IEC 158-1			A	10000	10000	15000	18000
Rated breaking capacity conforming to IEC 158-1		220 - 380 - 415 - 440 V	A	10000	10000	15000	18000
		500 V	A	9000	9000	12000	15000
		660 V	A	8000	8000	9000	11000
		1000 V	A	4000	4000	5000	6000
Permissible short time rating From cold state, with no current flowing for previous 60 minutes at □ ≤ 40 °C		for 1 s	A	9600	9600	12000	15000
		for 5 s	A	9600	9600	12000	15000
		for 10 s	A	7000	8000	9600	12000
		for 30 s	A	4800	5200	6400	8000
		for 1 min	A	3500	3800	5200	6300
		for 3 min	A	2100	2400	3600	4400
		for 10 min	A	1200	1800	2800	3600
Short-circuit protection by fuses (max. rating)	Distribution	type g1 - BS 88	A	800	1200	1000 x 2 (1)	1200 x 2 (1)
	Motor circuit	type aM	A	800	1200	800 x 2 (1)	1000 x 2 (1)
	With thermal overload relay	type g1 - BS 88	A	1000	1500	1000 x 2 (1)	1200 x 2 (1)
Average impedance per pole			mΩ	0.18	0.18	0.13	0.09
Power dissipated per pole		AC-1	W	115	280	520	680
		AC-3	W	88	180	290	360
Number of bars				2	2	3	4
Bar			mm	50 x 5	80 x 5	100 x 5	100 x 10
Control circuit characteristics							
Rated control voltage		50/60 Hz	V	110 to 500			
		400 Hz and ⎓	V	110 to 500			
Voltage limits ∿ and ⎓		latching	Un	0.85 to 1.1			
		unlatching	Un	0.85 to 1.1			
Maximum operating rate in mechanical operating cycles (at □ ≤ 40 °C)			man./h	120			
Mechanical durability			man.	1 million			
Average consumption at 50/60 Hz	Latching	1 pole	VA	650	650	650	650
		2 poles	VA	1100	1100	1100	1100
		3 poles	VA	1650	1650	1650	1650
		4 poles	VA	1850	1850	1850	1850
	Unlatching	1 pole	VA	110	110	110	110
		2 poles	VA	125	125	125	125
		3 poles	VA	165	165	165	165
		4 poles	VA	175	175	175	175
Average consumption at 400 Hz and ⎓	Latching	1 pole	VA	600	600	600	600
		2 poles	VA	1000	1000	1000	1000
		3 poles	VA	1500	1500	1500	1500
		4 poles	VA	1700	1700	1700	1700
	Unlatching	1 pole	VA	100	100	100	100
		2 poles	VA	115	115	115	115
		3 poles	VA	150	150	150	150
		4 poles	VA	160	160	160	160
Average operating time at nominal voltage				The closing time “C” is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time “O” is measured from the moment the coil supply is switched off to the moment the main poles separate.			
Operating in a.c. or d.c.		Latching	ms	100 - 150	100 - 150	100 - 150	100 - 150
		Unlatching	ms	20 - 40	20 - 40	20 - 40	20 - 40
				Note: *the arcing time depends on the circuit switched by the main poles. For 3-phase applications the arcing time is usually less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.*			
Characteristics of instantaneous auxiliary contacts (type ZC4GM for CR1B contactors)							
Rated thermal current			A	20			
Rated insulation voltage conforming to		IEC 337-1		660			
		VDE 0110 grC		750			
Cabling		Number of bars		2			
		Bar c.s.a.	mm²	4			

(1) Parallel cabling must be done only according the instructions of the fuses manufacturer.

Characteristics

Characteristics of instantaneous auxiliary contacts (type ZC4GM for CR1B contactors)

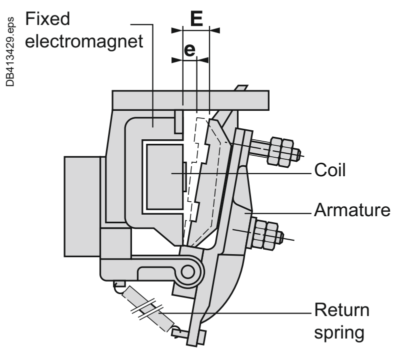
Operational power	in a.c.	**V**	110/127	220	380	415/440	500
	1 million operating cycles	**VA**	2000	4000	4000	4000	3500
	occasional making capacity	**VA**	14000	23000	35000	45000	35000
			Electrical durability (valid for up to 2400 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos □ 0.7) = 10 times the power broken (cos □ 0.4).				
Operational power	in d.c.	**V**	110	220	440	500	
	1 million operating cycles	**VA**	250	250	230	200	
	occasional making capacity	**VA**	1600	800	400	360	
			Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.				

Setting characteristics for control circuit

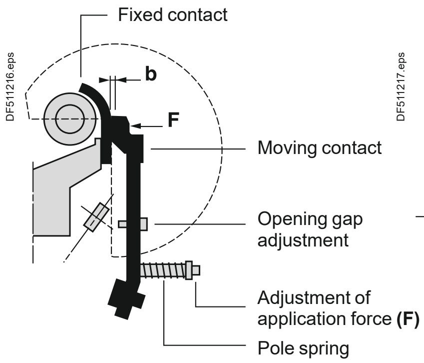
CR1B contactor rating			**L**	**M**	**P**	**R**
Electromagnet		**Ref.**	ET1-KB50			
Air gap of the magnetic circuit		**mm**	5/100			
Pick-up travel (E)		**mm**	30			
Pull-in travel (e)		**mm**	10			
N° of the return spring of the moving part			1 x 292 (1 pole contactors) 2 x 292 (2 poles, 3 poles, 4 poles contactors)			
Type of coil			WB1-KB			
Pull-in cold voltage (□ = 20 °C)		**Un**	0.75			
Drop-out voltage		**Un**	0.30 to 0.50			
Adjustment of application force (F) on the contact per pole	according to contactor composition					
Number of springs	1 pole		201	201	201	155
	2 poles		201	201	201	155
	3 poles		201	201	201	155
	4 poles		201	201	201	155
Application force (F) to contact per pole	1 pole	**daN**	30	30	30 (1)	30 (2)
	2 poles	**daN**	30	30	30 (1)	30 (2)
	3 poles	**daN**	30	30	30 (1)	30 (2)
	4 poles	**daN**	30	30	30 (1)	30 (2)
Switch pole setting	Opening gap (b.), electro-magnet closed	**mm**	2 ±0.5			
	Beginning of opening, during closing action (F)	**mm**	12 to 14			
	Application force (F)	**daN**	0.900			

(1) Each pole has 2 contacts: the force must be applied evenly to each of these contacts.
(2) Each pole has 3 contacts: the force must be applied evenly to each of these contacts.

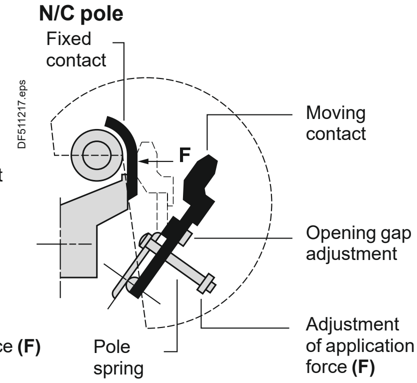
Electromagnet ET1-KB50



N/O pole



N/C pole

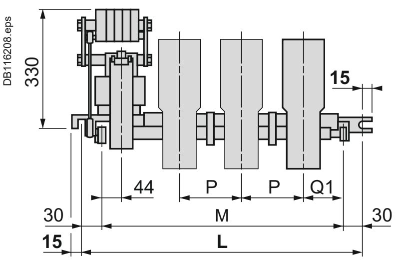


TeSys CR1B Magnetic latching contactors

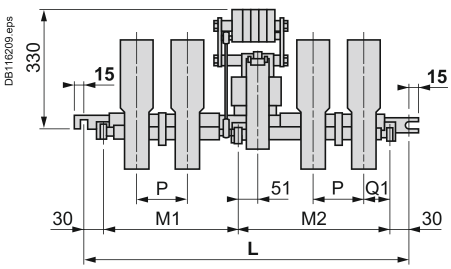
Dimensions

Front face view

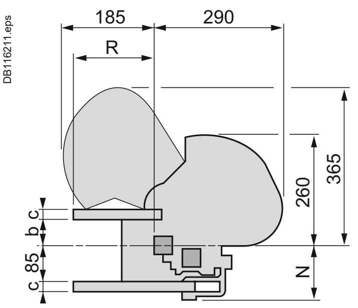
Single, 2 or 3-pole contactors



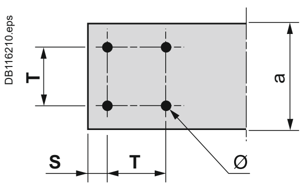
4-pole contactors



Common side view

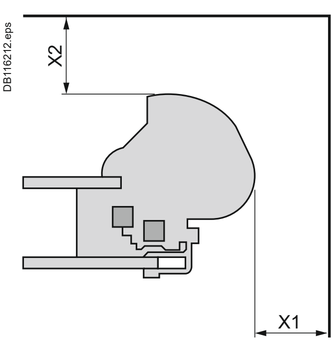


Drilling plan of busbars connections



Diameter of screw: 12 mm.

Type	Rating (A)	Number of poles	L	M	M1	M2	b	c	ø	a	T	S	R	N	P	Q1
CR1BL	800	1	345	285	-	-	59	16	9	50	30	10	122	121	100	100
		2	445	385	-	-	59	16	9	50	30	10	122	121	100	100
		3	540	480	-	-	59	16	9	50	30	10	122	121	100	100
		4	760	-	308	392	59	16	9	50	30	10	122	121	100	100
CR1BM	1250	1	345	285	-	-	55	20	11	63	30	17	157	125	100	100
		2	445	385	-	-	55	20	11	63	30	17	157	125	100	100
		3	540	480	-	-	55	20	11	63	30	17	157	125	100	100
		4	760	-	308	392	55	20	11	63	30	17	157	125	100	100
CR1BP	2000	1	385	325	-	-	55	20	11	100	60	20	173	125	150	110
		2	540	480	-	-	55	20	11	100	60	20	173	125	150	110
		3	760	700	-	-	55	20	11	100	60	20	173	125	150	110
		4	1065	-	455	550	55	20	11	100	60	20	173	125	150	110
CR1BR	2750	1	445	385	-	-	55	20	11	125	60	20	173	130	195	123
		2	635	575	-	-	55	20	11	125	60	20	173	130	195	123
		3	885	825	-	-	55	20	11	125	60	20	173	130	195	123
		4	1065	-	455	550	55	20	11	125	60	20	173	130	195	123



Minimum electrical clearance

Values X1 and X2 are given for a breaking capacity of 10 In (a 3-phase supply).

Rating of contactor CR1B		L	M	P	R
∿ 3-phase voltage					
380/440 V	X1	100	100	150	200
	X2	150	150	200	250
500 V	X1	100	100	150	200
	X2	150	150	220	250
660 V	X1	150	150	200	200
	X2	200	200	250	250
1000 V	X1	200	200	200	250
	X2	250	250	250	300

Contactor CR1B with overload relay

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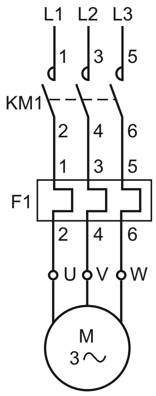

Contactor CR1B

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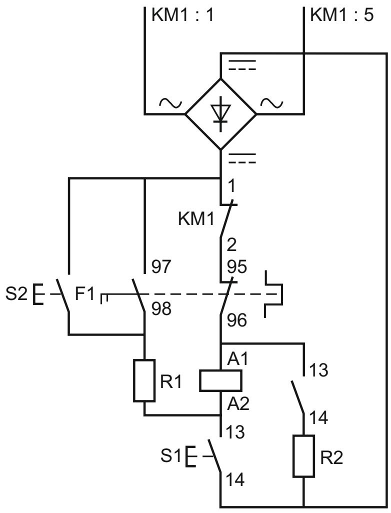
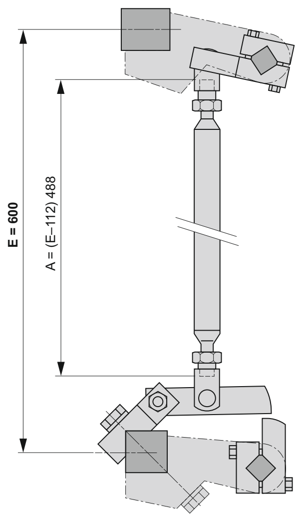
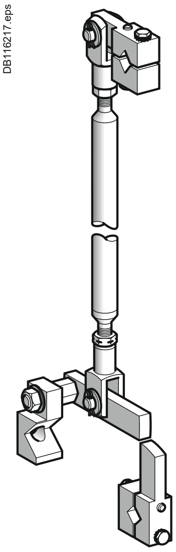


S1: latching pushbutton.
S2: unlatching pushbutton.



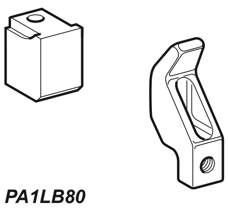


EZ2LB0601

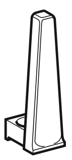
Accessories for CR1B contactors

Description	Application	Reference	Weight kg
Mechanical interlock (3) with mounting accessories	For vertical assembly of reversing contactors and CR1 B changeover contactor pairs	**EZ2LB0601**	1.560
Kit containing 2 bar mounting brackets		**LA9B103**	1.620

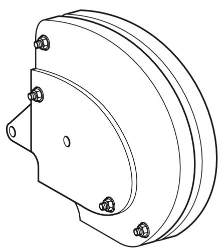
(3) Positive mechanical interlocking between 2 vertically mounted contactors of identical or different ratings. Connecting rods and cranks assembled on right-hand sides, crank pins on the pole side.
Vertical fixing centre distance between the two contactors: 600 mm.



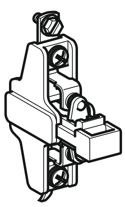
PA1LB80
(PA1LB76 + PA1LB75)



PA1LB89



PA1LB50



ZC4GM1

Spare parts for CR1B contactors

Description	For contactors	Number of sets required per pole	Reference	Weight kg
Sets of contacts (1 moving contact, 1 fixed contact)	**CR1BL**	1	**PA1LB80**	0.420
	CR1BM	1	**PA1LB80**	0.420
	CR1BP	2	**PA1LB80**	0.420
	CR1BR	3	**PA1LB80**	0.420
Description	**For contactors**	**Composition**	**Reference**	**Weight kg**
Moving contact only (for one finger)	**CR1B**		**PA1LB75**	0.220
Fixed contact only (for one finger)	**CR1B**		**PA1LB76**	0.200
Blow-out horn only (for 1 finger)	**CR1B**		**PA1LB89**	0.120
Arc chambers (for a single pole)	**CR1BL**		**PA1LB50**	3.700
	CR1BM		**PA1LB50**	3.700
	CR1BP		**PA1PB50**	6.200
	CR1BR		**PA1RB50**	8.500
Auxiliary contact blocks	**CR1B**	1 contact N/C	**ZC4GM1**	0.030
	CR1B	1 contact N/O	**ZC4GM2**	0.030
	CR1B	1 contact N/C	**ZC4GM9**	0.030
	CR1B	1 contact N/O	**ZC4GM8**	0.030
Switch pole for automatic cut-out coil	**CR1B**		**PR4FB00●●** (1)	0.600
Set of moving and fixed contacts for switch pole	**CR1B**		**PV1FA80**	0.035
Arc chamber for switch pole	**CR1B**		**PN1FB50**	0.220

(1) Reference to be completed, see page 117.

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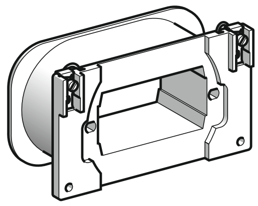


WB1KB●

Coils for CR1B contactors

Usual voltage		Coils		Spare parts				
⎓	~ 50 - 400 Hz	Resistance (□ = 20 °C)	Reference	Additional resistors [1] R1	R2	Cut-out contact Number	Type	Rectifier for ~
V	V	Ω		Ω	Ω			
For CR1B●31		**1 pole**						
-	110/120	19.7	**WB1KB140**	68	47	2	**ZC4GM2** or **ZC4GM8**	**DR5TE1U**
110 / 125	-	25.2	**WB1KB134**	68	68	2	**ZC4GM2** or **ZC4GM8**	-
-	220/240	77.2	**WB1KB136**	220	180	2	**ZC4GM2** or **ZC4GM8**	**DR5TE1U**
220	-	94	**WB1KB139**	270	220	2	**ZC4GM2** or **ZC4GM8**	-
250	-	128	**WB1KB125**	330	270	3	**ZC4GM2** or **ZC4GM8**	-
-	380/400	197	**WB1KB126**	470	470	3	**ZC4GM2** or **ZC4GM8**	**DR5TE1S**
-	415/440	257	**WB1KB138**	1000	470	3	**ZC4GM2** or **ZC4GM8**	**DR5TE1S**
For CR1B●32		**2 poles**						
-	110	9.6	**WB1KB133**	10	33	1	**PR4FB0011**	**DR5TE1U**
110	120/127	11.4	**WB1KB121**	47	39	1	**PR4FB0010**	**DR5TE1U**
125	-	19.7	**WB1KB140**	100	47	1	**PR4FB0009**	-
-	220	32.5	**WB1KB124**	120	120	1	**PR4FB0007**	**DR5TE1U**
220	240	49.7	**WB1KB122**	220	150	1	**PR4FB0007**	**DR5TE1U**
250	-	77.2	**WB1KB136**	330	220	1	**PR4FB0006**	-
-	380/400	128	**WB1KB125**	470	470	1	**PR4FB0005**	**DR5TE1S**
-	415/440	160	**WB1KB137**	680	560	1	**PR4FB0004**	**DR5TE1S**
For CR1B●33		**3 poles**						
-	110	7.2	**WB1KB123**	39	27	1	**PR4FB0012**	**DR5TE1U**
110	120/127	9.6	**WB1KB133**	47	39	1	**PR4FB0011**	**DR5TE1U**
125	-	11.4	**WB1KB121**	56	47	1	**PR4FB0010**	-
220	240	32.5	**WB1KB124**	180	120	1	**PR4FB0008**	**DR5TE1U**
250	-	61	**WB1KB135**	270	270	1	**PR4FB0006**	-
-	380/400	94	**WB1KB139**	470	390	1	**PR4FB0005**	**DR5TE1S**
-	415/440	128	**WB1KB125**	680	470	1	**PR4FB0004**	**DR5TE1S**
For CR1B●34		**4 poles**						
-	110	5.8	**WB1KB132**	33	27	1	**PR4FB0014**	**DR5TE1U**
110	120/127	7.2	**WB1KB123**	47	33	1	**PR4FB0012**	**DR5TE1U**
125	-	11.4	**WB1KB121**	56	45	1	**PR4FB0010**	-
-	220	25.2	**WB1KB134**	150	120	1	**PR4FB0008**	**DR5TE1U**
-	240	32.5	**WB1KB124**	180	150	1	**PR4FB0007**	**DR5TE1U**
250	-	49.7	**WB1KB122**	270	220	1	**PR4FB0007**	-
-	380	77.2	**WB1KB136**	390	390	1	**PR4FB0006**	**DR5TE1S**
-	400/440	94	**WB1KB139**	560	470	1	**PR4 FB0005**	**DR5TE1S**

(1) For hot and humid conditions "TH treatment", the references of the coils are supplemented by the letters "TH".
*Example: **WB1KB135TH**.*
*Reference of resistance : **DR2SC0010** for 10 ohms and*
***DR2SC0470** for 470 ohms.*

Weight of the various elements:
- *coil WB1KB●●● 1.120 kg*
- *contact ZC4GM● 0.030 kg*
- *switch PR4FB00●● 0.600 kg*
- *rectifier DRSTEl● 0.100 kg*
- *resistance DR2SC0●●● 0.030 kg*

Standards and tests description

Characteristics with their description

Altitude

The rarefied atmosphere at high altitude reduces the dielectric strength of the air and hence the rated operational voltage of the contactor. It also reduces the cooling effect of the air and hence the rated operational current of the contactor (unless the temperature drops at the same time).

No derating is necessary up to 3000 m.

Derating factors to be applied above this altitude for main pole operational voltage and current (a.c. supply) are as follows.

Altitude	3500 m	4000 m	4500 m	5000 m
Rated operetional voltage	0.90	0.80	0.70	0.60
Rated operational current	0.92	0.90	0.88	0.86

Ambient air temperature

The temperature of the air surrounding the device, measured near to the device.
The operating characteristics are given :
- with no restriction for temperatures between -5 and +55 °C,
- with restrictions, if necessary, for temperatures between -50 and +70 °C.

Rated operational current (Ie)

This is defined taking into account the rated operational voltage, operating rate and duty, utilisation category and ambient temperature around the device.

Rated conventional thermal current (Ith) (1)

The current which a closed contactor can sustain for a minimum of 8 hours without its temperature rise exceeding the limits given in the standards.

Permissible short time rating

The current which a closed contactor can sustain for a short time after a period of no load, without dangerous overheating.

Rated operational voltage (Ue)

This is the voltage value which, in conjunction with the rated operational current, determines the use of the contactor or starter, and on which the corresponding tests and the utilisation category are based. For 3-phase circuits it is expressed as the voltage between phases.
Apart from exceptional cases such as rotor short-circuiting, the rated operational voltage Ue is less than or equal to the rated insulation voltage Ui.

Rated control circuit voltage (Uc)

The rated value of the control circuit voltage, on which the operating characteristics are based. For a.c. applications, the values are given for a near sinusoidal wave form (less than 5% total harmonic distortion).

Rated insulation voltage (Ui)

This is the voltage value used to define the insulation characteristics of a device and referred to in dielectric tests determining leakage paths and creepage distances. As the specifications are not identical for all standards, the rated value given for each of them is not necessarily the same.

Rated impulse withstand voltage (Uimp)

The peak value of a voltage surge which the device is able to withstand without breaking down.

Rated operational power (expressed in kW)

The rated power of the standard motor which can be switched by the contactor, at the stated operational voltage.

Rated breaking capacity (2)

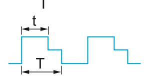
This is the current value which the contactor can break in accordance with the breaking conditions specified in the IEC standard.

Rated making capacity (2)

This is the current value which the contactor can make in accordance with the making conditions specified in the IEC standard.

On-load factor (m)

$m = \frac{t}{T}$



This is the ratio between the time the current flows (t) and the duration of the cycle (T)
Cycle duration: duration of current flow + time at zero current

Pole impedance

The impedance of one pole is the sum of the impedance of all the circuit components between the input terminal and the output terminal.
The impedance comprises a resistive component (R) and an inductive component (X = L□).
The total impedance therefore depends on the frequency and is normally given for 50 Hz.
This average value is given for the pole at its rated operational current.

Electrical durability

This is the average number of on-load operating cycles which the main pole contacts can perform without maintenance. The electrical durability depends on the utilisation category, the rated operational current and the rated operational voltage.

Mechanical durability

This is the average number of no-load operating cycles (i.e. with zero current flow through the main poles) which the contactor can perform without mechanical failure.

(1) Conventional thermal current, in free air, conforming to IEC standards.
(2) For a.c. applications, the breaking and making capacities are expressed by the rms value of the symmetrical component of the short-circuit current. Taking into account the maximum asymmetry which may exist in the circuit, the contacts therefore have to withstand a peak asymmetrical current which may be twice the rms symmetrical component.
***Note:** these definitions are extracted from standard IEC 60947-1.*

Contactor utilization categories conforming to IEC 60947-4

The standard utilisation categories define the current values which the contactor must be able to make or break.

These values depend on:
■ the type of load being switched : squirrel cage or slip ring motor, resistors,
■ the conditions under which making or breaking takes place: motor stalled, starting or running, reversing, plugging.

a.c. applications

Category AC-1

This category applies to all types of a.c. load with a power factor equal to or greater than 0.95 ($\cos\varphi \geq 0.95$).

Application examples: heating, distribution.

Category AC-2

This category applies to starting, plugging and inching of slip ring motors.
■ On closing, the contactor makes the starting current, which is about 2.5 times the rated current of the motor.
■ On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage.

Category AC-3

This category applies to squirrel cage motors with breaking during normal running of the motor.
■ On closing, the contactor makes the starting current, which is about 5 to 7 times the rated current of the motor.
■ On opening, it breaks the rated current drawn by the motor; at this point, the voltage at the contactor terminals is about 20 % of the mains supply voltage. Breaking is light.
Application examples: all standard squirrel cage motors: lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc.

Category AC-4

This category covers applications with plugging and inching of squirrel cage and slip ring motors. The contactor closes at a current peak which may be as high as 5 or 7 times the rated motor current. On opening it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe
Application examples: printing machines, wire drawing machines, cranes and hoists, metallurgy industry.

d.c. applications

Category DC-1

This category applies to all types of d.c. load with a time constant (L/R) of less than or equal to 1 ms.

Category DC-3

This category applies to starting, counter-current braking and inching of shunt motors.
Time constant ⩽ 2 ms.
■ On closing, the contactor makes the starting current, which is about 2.5 times the rated motor current.
■ On opening, the contactor must be able to break 2.5 times the starting current at a voltage which is less than or equal to the mains voltage. The slower the motor speed, and therefore the lower its back e.m.f., the higher this voltage.
Breaking is difficult.

Category DC-5

This category applies to starting, counter-current braking and inching of series wound motors.
Time constant ⩽ 7.5 ms.
On closing, the contactor makes a starting current peak which may be as high as 2.5 times the rated motor current. On opening, the contactor breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage.
Breaking is severe.

Utilization categories for auxiliary contacts & control relays conforming to IEC 60947-5

a.c. applications

Category AC-14 (1)

This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is less than 72 VA.

Application example: switching the operating coil of contactors and relays.

Category AC-15 (1)

This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is more than 72 VA.

Application example: switching the operating coil of contactors.

d.c. applications

Category DC-13 (2)

This category applies to the switching of electromagnetic loads for which the time taken to reach 95 % of the steady state current (T = 0.95) is equal to 6 times the power P drawn by the load (with P ⩽ 50 W).

Application example: switching the operating coil of contactors without economy resistor.

(1) Replaces category AC-11.
(2) Replaces category DC-13.

Standardization

Conformity to standards

Schneider Electric products satisfy, in the majority of cases, national (for example: BS in Great Britain, NF in France, DIN in Germany), European (for example: CENELEC) or international (IEC) standards. These product standards precisely define the performance of the designated products (such as IEC 60947 for low voltage equipment).
When used correctly, as designated by the manufacturer and in accordance with regulations and correct practices, these products will allow users to build equipment, machine systems or installations that conform to their appropriate standards (for example: IEC 60204-1, relating to electrical equipment used on industrial machines).
Schneider Electric is able to provide proof of conformity of its production to the standards it has chosen to comply with, through its quality assurance system.
On request, and depending on the situation, Schneider Electric can provide the following:

- a declaration of conformity,
- a certificate of conformity (ASEFA/LOVAG),
- a homologation certificate or approval, in the countries where this procedure is required or for particular specifications, such as those existing in the merchant navy.

Code	Certification authority		Country
	Name	Abbreviation	
ANSI	American National Standards Institute	ANSI	USA
BS	British Standards Institution	BSI	Great Britain
CEI	Comitato Elettrotecnico Italiano	CEI	Italy
DIN/VDE	Verband Deutscher Electrotechniker	VDE	Germany
EN	Comité Européen de Normalisation Electrotechnique	CENELEC	Europe
GOST	Gosudarstvenne Komitet Standartov	GOST	Russia
IEC	International Electrotechnical Commission	IEC	Worldwide
JIS	Japanese Industrial Standards Committee	JISC	Japan
NBN	Institut Belge de Normalisation	IBN	Belgium
NEN	Nederlands Normalisatie Institut	NNI	Netherlands
NF	Union Technique de l'Electricité	UTE	France
SAA	Standards Association of Australia	SAA	Australia
UNE	Asociacion Española de Normalizacion y Certificacion	AENOR	Spain

European EN standards

These are technical specifications established in conjunction with, and with approval of, the relative bodies within the various CENELEC member countries (European Union, European Free Trade Association and many central and eastern European countries having "member" or "affiliated" status). Prepared in accordance with the principle of consensus, the European standards are the result of a weighted majority vote. Such adopted standards are then integrated into the national collection of standards, and contradictory national standards are withdrawn.
European standards incorporated within the French collection of standards carry the prefix NF EN. At the 'Union Technique de l'Electricité' *(Technical Union of Electricity)* (UTE), the French version of a corresponding European standard carries a dual number: European reference (NF EN …) and classification index (C …).
Therefore, the standard NF EN 60947-4-1 relating to motor contactors and starters, effectively constitutes the French version of the European standard EN 60947-4-1 and carries the UTE classification C 63-110.
This standard is identical to the British standard BS EN 60947-4-1 or the German standard DIN EN 60947-4-1.
Whenever reasonably practical, European standards reflect the international standards (IEC).
With regard to automation system components and distribution equipment, in addition to complying with the requirements of French NF standards, Schneider Electric brand components conform to the standards of all other major industrial countries.

Regulations

European Directives

Opening up of European markets assumes harmonisation of the regulations pertaining to each of the member countries of the European Union.
The purpose of the European Directive is to eliminate obstacles hindering the free circulation of goods within the European Union, and it must be applied in all member countries. Member countries are obliged to transcribe each Directive into their national legislation and to simultaneously withdraw any contradictory regulations. The Directives, in particular those of a technical nature which concern us, only establish the objectives to be achieved, referred to as "essential requirements".
The manufacturer must take all the necessary measures to ensure that his products conform to the requirements of each Directive applicable to his production.
As a general rule, the manufacturer certifies conformity to the essential requirements of the Directive(s) for his product by affixing the CE mark.
The CE mark is affixed to Schneider Electric brand products concerned, in order to comply with French and European regulations.

Significance of the CE mark

- The CE mark affixed to a product signifies that the manufacturer certifies that the product conforms to the relevant European Directive(s) which concern it; this condition must be met to allow free distribution and circulation within the countries of the European Union of any product subject to one or more of the E.U. Directives.
- The CE mark is intended solely for national market control authorities.
- The CE mark must not be confused with a conformity marking.

Standardization

European Directives (continued)

For electrical equipment, only conformity to standards signifies that the product is suitable for its designated function, and only the guarantee of an established manufacturer can provide a high level of quality assurance.
For Schneider Electric brand products, one or several Directives are likely to be applicable, depending on the product, and in particular:

- the Low Voltage Directive 2006/95/EC: the CE mark relating to this Directive has been compulsory since 16th January 2007.
- the Electromagnetic Compatibility Directive 89/336/EEC, amended by Directives 92/31/EEC and 93/68/EEC: the CE mark on products covered by this Directive has been compulsory since 1st January 1996.

ASEFA-LOVAG certification

The function of ASEFA *(Association of French Testing Stations for Low Voltage Industrial Electrical Equipment)* is to carry out tests of conformity to standards and to issue certificates of conformity and test reports. ASEFA laboratories are authorised by the French authorisation committee (COFRAC).
ASEFA is now a member of the European agreement group LOVAG (Low Voltage Agreement Group). This means that any certificates issued by LOVAG/ASEFA are recognised by all the authorities which are members of the group and carry the same validity as those issued by any of the member authorities.

Quality labels

When components can be used in domestic and similar applications, it is sometimes recommended that a “Quality label” be obtained, which is a form of certification of conformity.

Code	Quality label	Country
CEBEC	Comité Electrotechnique Belge	Belgium
KEMA-KEUR	Keuring van Electrotechnische Materialen	Netherlands
NF	Union Technique de l’Electricité	France
ÖVE	Österreichischer Verband für Electrotechnik	Austria
SEMKO	Svenska Electriska Materiel Kontrollanatalten	Sweden

Product certifications

In some countries, the certification of certain electrical components is a legal requirement. In this case, a certificate of conformity to the standard is issued by the official test authority.
Each certified device must bear the relevant certification symbols when these are mandatory:

Code	Certification authority	Country
CSA	Canadian Standards Association	Canada
UL	Underwriters Laboratories	USA
CCC	China Compulsory Certification	China

Note on certifications issued by the Underwriters Laboratories (UL). There are two levels of approval:

“Recognized” (RU) The component is fully approved for inclusion in equipment built in a workshop, where the operating limits are known by the equipment manufacturer and where its use within such limits is acceptable by the Underwriters Laboratories.
The component is not approved as a “Product for general use” because its manufacturing characteristics are incomplete or its application possibilities are limited.
A “Recognized” component does not necessarily carry the certification symbol.

“Listed” (UL) The component conforms to all the requirements of the classification applicable to it and may therefore be used both as a “Product for general use” and as a component in assembled equipment. A “Listed” component must carry the certification symbol.

Marine classification societies

Prior approval (= certification) by certain marine classification societies is generally required for electrical equipment which is intended for use on board merchant vessels.

Code	Classification authority	Country
BV	Bureau Veritas	France
DNV	Det Norske Veritas	Norway
GL	Germanischer Lloyd	Germany
LR	Lloyd’s Register	Great Britain
NKK	Nippon Kaiji Kyokaï	Japan
RINA	Registro Italiano Navale	Italy
RRS	Register of Shipping	Russia

Note

For further details on a specific product, please refer to the “Characteristics” pages in this catalogue or consult your Regional Sales Office.

Tests of contactors (conforming to IEC 60947-4-1)

		Electrical durability: making and breaking conditions						Occasional duty: making and breaking conditions					
a.c. supply													
Typical applications	**Utilisation category**	**Making**			**Breaking**			**Making**			**Breaking**		
		I	**U**	**cos φ**	**I**	**U**	**cos φ**	**I**	**U**	**cos φ**	**I**	**U**	**cos φ**
Resistors, non inductive or slightly inductive loads	**AC-1**	Ie	Ue	0.95	Ie	Ue	0.95	1.5 Ie	1.05 Ue	0.8	1.5 Ie	1.05 Ue	0.8
Motors													
Slip ring motors: starting, breaking.	**AC-2**	2.5 Ie	Ue	0.65	2.5 Ie	Ue	0.65	4 Ie	1.05 Ue	0.65	4 Ie	1.05 Ue	0.65
Squirrel cage motors: starting, breaking whilst motor running.	**AC-3**												
	Ie ⩽ (1)	6 Ie	Ue	0.65	1 Ie	0.17 Ue	0.65	10 Ie	1.05 Ue	0.45	8 Ie	1.05 Ue	0.45
	Ie > (2)	6 Ie	Ue	0.35	1 Ie	0.17 Ue	0.35	10 Ie	1.05 Ue	0.35	8 Ie	1.05 Ue	0.35
Squirrel cage motors: starting, reversing, inching	**AC-4**												
	Ie ⩽ (1)	6 Ie	Ue	0.65	6 Ie	Ue	0.65	12 Ie	1.05 Ue	0.45	10 Ie	1.05 Ue	0.45
	Ie > (2)	6 Ie	Ue	0.35	6 Ie	Ue	0.35	12 Ie	1.05 Ue	0.35	10 Ie	1.05 Ue	0.35

d.c. supply													
Typical applications	**Utilisation category**	**Making**			**Breaking**			**Making**			**Breaking**		
		I	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)
Resistors, non inductive or slightly inductive loads	**DC-1**	Ie	Ue	1	Ie	Ue	1	1.5 Ie	1.05 Ue	1	1.5 Ie	1.05 Ue	1
Shunt wound motors: starting, reversing, inching	**DC-3**	2.5 Ie	Ue	2	2.5 Ie	Ue	2	4 Ie	1.05 Ue	2.5	4 Ie	1.05 Ue	2.5
Series wound motors: starting, reversing, inching	**DC-5**	2.5 Ie	Ue	7.5	2.5 Ie	Ue	7.5	4 Ie	1.05 Ue	15	4 Ie	1.05 Ue	15

Tests of control relays and auxiliary contacts (conforming to IEC 60947-4-1)

		Electrical durability: making and breaking conditions						Occasional duty: making and breaking conditions					
a.c. supply													
Typical applications	**Utilisation category**	**Making**			**Breaking**			**Making**			**Breaking**		
		I	**U**	**cos φ**	**I**	**U**	**cos φ**	**I**	**U**	**cos φ**	**I**	**U**	**cos φ**
Electromagnets													
⩽ 72 VA	**AC-14**	–	–	–	–	–	–	6 Ie	1.1 Ue	0.7	6 Ie	1.1 Ue	0.7
> 72 VA	**AC-15**	10 Ie	Ue	0.7	Ie	Ue	0.4	10 Ie	1.1 Ue	0.3	10 Ie	1.1 Ue	0.3

d.c. supply													
Typical applications	**Utilisation category**	**Making**			**Breaking**			**Making**			**Breaking**		
		I	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)	**I**	**U**	**L/R** (ms)
Electromagnets	**DC-13**	Ie	Ue	6 P (3)	Ie	Ue	6 P (3)	1.1 Ie	1.1 Ue	6 P (3)	1.1 Ie	1.1 Ue	6 P (3)

(1) Ie ⩽ 17 A for electrical durability, Ie ⩽ 100 A for occasional duty.
(2) Ie > 17 A for electrical durability, Ie > 100 A for occasional duty.
(3) The value 6 P (in watts) is based on practical observations and is considered to represent the majority of d.c. magnetic loads up to the maximum limit of P = 50 W i.e. 6 P = 300 ms = L/R.
Above this, the loads are made up of smaller loads in parallel. The value 300 ms is therefore a maximum limit whatever the value of current drawn.

Current of asynchronous squirrel cage motors at nominal load - Common values

3-phase 4-pole motors

Current values for power in kW

Rated operational power (1)	Indicative rated operational current values at: 230 V	400 V	500 V	690 V
kW	A	A	A	A
0.06	0.35	0.2	0.16	0.12
0.09	0.52	0.3	0.24	0.17
0.12	0.7	0.44	0.32	0.23
0.18	1	0.6	0.48	0.35
0.25	1.5	0.85	0.68	0.49
0.37	1.9	1.1	0.88	0.64
0.55	2.6	1.5	1.2	0.87
0.75	3.3	1.9	1.5	1.1
1.1	4.7	2.7	2.2	1.6
1.5	6.3	3.6	2.9	2.1
2.2	8.5	4.9	3.9	2.8
3	11.3	6.5	5.2	3.8
4	15	8.5	6.8	4.9
5.5	20	11.5	9.2	6.7
7.5	27	15.5	12.4	8.9
11	38	22	17.6	12.8
15	51	29	23	17
18.5	61	35	28	21
22	72	41	33	24
30	96	55	44	32
37	115	66	53	39
45	140	80	64	47
55	169	97	78	57
75	230	132	106	77
90	278	160	128	93
110	340	195	156	113
132	400	230	184	134
160	487	280	224	162
200	609	350	280	203
250	748	430	344	250
315	940	540	432	313
355	1061	610	488	354
400	1200	690	552	400
500	1478	850	680	493
560	1652	950	760	551
630	1844	1060	848	615
710	2070	1190	952	690
800	2340	1346	1076	780
900	2640	1518	1214	880
1000	2910	1673	1339	970

Current values for power in hp

Rated operational power (2)	Indicative rated operational current values at: 110 - 120 V	200 V	208 V	220 - 240 V	380 - 415 V	440 - 480 V	550 - 600 V
hp	A	A	A	A	A	A	A
1/2	4.4	2.5	2.4	2.2	1.3	1.1	0.9
3/4	6.4	3.7	3.5	3.2	1.8	1.6	1.3
1	8.4	4.8	4.6	4.2	2.3	2.1	1.7
1 1/2	12	6.9	6.6	6	3.3	3	2.4
2	13.6	7.8	7.5	6.8	4.3	3.4	2.7
3	19.2	11	10.6	9.6	6.1	4.8	3.9
5	30.4	17.5	16.7	15.2	9.7	7.6	6.1
7 1/2	44	25.3	24.2	22	14	11	9
10	56	32.2	30.8	28	18	14	11
15	84	48.3	46.2	42	27	21	17
20	108	62.1	59.4	54	34	27	22
25	136	78.2	74.8	68	44	34	27
30	160	92	88	80	51	40	32
40	208	120	114	104	66	52	41
50	260	150	143	130	83	65	52
60	–	177	169	154	103	77	62
75	–	221	211	192	128	96	77
100	–	285	273	248	165	124	99
125	–	359	343	312	208	156	125
150	–	414	396	360	240	180	144
200	–	552	528	480	320	240	192
250	–	–	–	604	403	302	242
300	–	–	–	722	482	361	289
350	–	–	–	828	560	414	336
400	–	–	–	954	636	477	382
450	–	–	–	1030	–	515	412
500	–	–	–	1180	786	590	472

(1) Values conforming to standard IEC 60072-1 (at 50 Hz).
(2) Values conforming to standard UL 508 (at 60 Hz).

***Note:** These values are given as a guide. They may vary depending on the type of motor, its polarity and the manufacturer.*

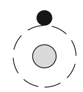
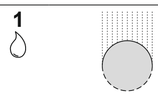
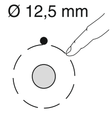
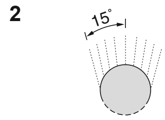
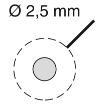
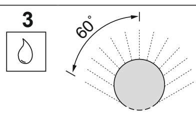
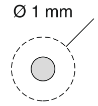
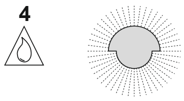
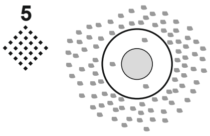
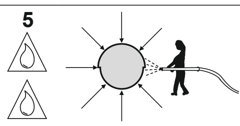
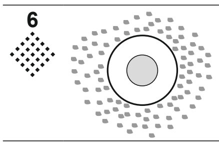
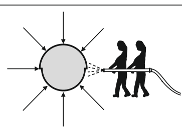
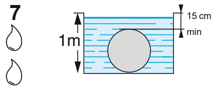
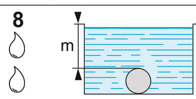
Degrees of protection provided by enclosures: IP Code

Degrees of protection against the penetration of solid bodies, water and personnel access to live parts

The European standard EN 60529 dated October 1991, IEC publication 529 (2nd edition - November 1989), defines a coding system (IP code) for indicating the degree of protection provided by electrical equipment enclosures against accidental direct contact with live parts and against the ingress of solid foreign objects or water. This standard does not apply to protection against the risk of explosion or conditions such as humidity, corrosive gasses, fungi or vermin.
Certain equipment is designed to be mounted on an enclosure which will contribute towards achieving the required degree of protection (example : control devices mounted on an enclosure).
Different parts of an equipment can have different degrees of protection (example : enclosure with an opening in the base).
Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.
Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

IP ●●● code

The IP code comprises **2 characteristic numerals** (e.g. **IP 55**) and may include **an additional letter** when the actual protection of personnel against direct contact with live parts is better than that indicated by the first numeral (e.g. IP 20C).
Any characteristic numeral which is unspecified is replaced by an X (e.g. IP XXB).

1st characteristic numeral:				2nd characteristic numeral:			Additional letter:	
corresponds to protection of the equipment against penetration of solid objects and protection of personnel against direct contact with live parts.				corresponds to protection of the equipment against penetration of water with harmful effects.			corresponds to protection of personnel against direct contact with live parts.	
Protection of the equipment against penetration of solid objects			**Protection of personnel**	**Protection of the equipment against penetration of water**			**Protection of personnel against direct contact with live parts**	
0	Non-protected		Non-protected	0	Non-protected		A	With the back of the hand.
1	Ø 50 mm 	Protected against the penetration of solid objects having a diameter greater than or equal to 50 mm	Protected against direct contact with the back of the hand (accidental contacts).	1		Protected against vertical dripping water, (condensation).	B	With the finger.
2	Ø 12,5 mm 	Protected against the penetration of solid objects having a diameter greater than or equal to 12.5 mm.	Protected against direct finger contact.	2		Protected against dripping water at an angle of up to 15°.	C	With a Ø 2.5 mm tool.
3	Ø 2,5 mm 	Protected against the penetration of solid objects having a diameter greater than or equal to 2.5 mm.	Protected against direct contact with a Ø 2.5 mm tool.	3		Protected against rain at an angle of up to 60°.	D	With a Ø 1 mm wire.
4	Ø 1 mm 	Protected against the penetration of solid objects having a diameter greater than or equal to 1 mm.	Protected against direct contact with a Ø 1 mm wire.	4		Protected against splashing water in all directions.		
5		Dust protected (no harmful deposits).	Protected against direct contact with a Ø 1 mm wire.	5		Protected against water jets in all directions.		
6		Dust tight.	Protected against direct contact with a Ø 1 mm wire.	6		Protected against powerful jets of water and waves.		
				7		Protected against the effects of temporary immersion.		
				8		Protected against the effects of prolonged immersion under specified conditions.		

Degrees of protection provided by enclosures: IK code

Degrees of protection against mechanical impact

The European standard EN 50102 dated March 1995 defines a coding system (IK code) for indicating the degree of protection provided by electrical equipment enclosures against external mechanical impact.

Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.

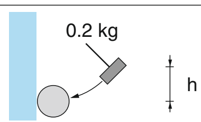
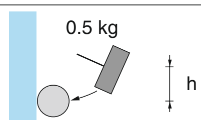
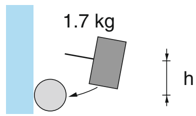
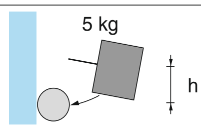
Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

IK●● code

The IK code comprises **2 characteristic numerals** (e.g. **IK 05**).

2 characteristic numerals:

corresponding to a value of impact energy.

Degrees of protection against mechanical impact		h (cm)	Energy (J)
00	Non-protected		
01		7.5	0.15
02		10	0.2
03		17.5	0.35
04		25	0.5
05		35	0.7
06		20	1
07		40	2
08		30	5
09		20	10
10		40	20

Protective treatment of equiment according to climatic environment

Depending on the climatic and environmental conditions in which the equipment is placed, Schneider Electric can offer specially adapted products to meet your requirements.

In order to make the correct choice of protective finish, two points should be remembered:
- the prevailing climate of the country is never the only criterion
- only the atmosphere in the immediate vicinity of the equipment need be considered.

All climates treatment “TC”

This is the standard treatment for Schneider-electric brand equipment and is suitable for the vast majority of applications. It is the equivalent of treatments described as “Klimafest”, “Climateproof”.
In particular, it meets the requirements specified in the following publications:
- Publication UTE C 63-100 (method I), successive cycles of humid heat at: + 40 °C and 95 % relative humidity.
- DIN 50016 - Variations of ambient conditions within a climatic chamber: + 23 °C and 83 % relative humidity + 40 °C and 92 % relative humidity.

It also meets the requirements of the following marine classification societies: BV-LR-GL-DNV-RINA.

Characteristics

- Steel components are usually treated with zinc. When they have a mechanical function, they may also be painted.
- Insulating materials are selected for their high electrical, dielectric and mechanical characteristics.
- Metal enclosures have a stoved paint finish, applied over a primary phosphate protective coat, or are galvanised (e.g. some prefabricated busbar trunking components).

Limits for use of “TC” (All climates) treatment

- “TC” treatment is suitable for the following temperatures and humidity:

Temperature (°C)	**Relative humidity** (%)
20	95
40	80
50	50

“TC” treatment is therefore suitable for all latitudes and in particular tropical and equatorial regions where the equipment is mounted in normally ventilated industrial premises. Being sheltered from external climatic conditions, temperature variations are small, the risk of condensation is minimised and the risk of dripping water is virtually non-existent.

Extension of use of “TC” (All climates) treatment

In cases where the humidity around the equipment exceeds the conditions described above, or in equatorial regions if the equipment is mounted outdoors, or if it is placed in a very humid location (laundries, sugar refineries, steam rooms, etc.), “TC” treatment can still be used if the following precautions are taken:
- The enclosure in which the equipment is mounted must be protected with a “TH” finish (see next page) and must be well ventilated to avoid condensation and dripping water (e.g. enclosure base plate mounted on spacers).
- Components mounted inside the enclosure must have a “TC” finish.
- If the equipment is to be switched off for long periods, a heater must be provided (0.2 to 0.5 kW per square decimetre of enclosure), that switches on automatically when the equipment is turned off. This heater keeps the inside of the enclosure at a temperature slightly higher than the outside surrounding temperature, thereby avoiding any risk of condensation and dripping water (the heat produced by the equipment itself during normal running is sufficient to provide this temperature difference).
- Special considerations for “Operator dialog” and “Detection” products: for certain pilot devices, the use of “TC” treatment can be extended to outdoor use provided their enclosure is made of light alloys, zinc alloys or plastic material. In this case, it is also essential to ensure that the degree of protection against penetration of liquids and solid objects is suitable for the applications involved.

"TH" treatment for hot and humid environments

This treatment is suitable for hot and humid atmospheres where installations are regularly subject to condensation, dripping water and the risk of fungi.

In addition, plastic insulating components are resistant to attacks from insects such as termites and cockroaches. These properties have often led to this treatment being described as "Tropical Finish", but this does not mean that all equipment installed in tropical and equatorial regions must systematically have undergone "TH" treatment. On the other hand, certain operating conditions in temperate climates may well require the use of "TH" treated equipment (see limitations for use of "TC" treatment).

Special characteristics of "TH" treatment

■ All insulating components are made of materials which are either resistant to fungi or treated with a fungicide, and which have increased resistance to creepage (Standards IEC 60112, NF C 26-220, DIN 5348).
■ Metal enclosures receive a top-coat of stoved, fungicidal paint, applied over a rust inhibiting undercoat. Components with "TH" treatment may be subject to a surcharge [1]. Please consult your Regional Sales Office.

Protective treatment selection guide

Surrounding environment	Duty cycle	Internal heating of enclosure when not in use	Type of climate	Protective treatment of equipment	Protective treatment of enclosure
Indoors					
No dripping water or condensation	Unimportant	Not necessary	Unimportant	"TC"	"TC"
Presence of dripping water or condensation	Frequent switching off for periods of more than 1 day	No	Temperate	"TC"	"TH"
			Equatorial	"TH"	"TH"
		Yes	Unimportant	"TC"	"TH"
	Continuous	Not necessary	Unimportant	"TC"	"TH"
Outdoors (sheltered)					
No dripping water or dew	Unimportant	Not necessary	Temperate	"TC"	"TC"
			Equatorial	"TH"	"TH"
Exposed outdoors or near the sea					
Frequent and regular presence of dripping water or dew	Frequent switching off for periods of more than 1 day	No	Temperate	"TC"	"TH"
			Equatorial	"TH"	"TH"
		Yes	Unimportant	"TC"	"TH"
	Continuous	Not necessary	Unimportant	"TC"	"TH"

These treatments cover, in particular, the applications defined by methods I and II of guide UTE C 63-100.

Special precautions for electronic equipment

Electronic products always meet the requirements of "TC" treatment. A number of them are "TH" treated as standard.

Some electronic products (for example: programmable controllers, flush mountable controllers CCX and flush mountable operator terminals XBT) require the use of an enclosure providing a degree of protection to at least IP 54, as defined by standards IEC 60664 and NF C 20 040, for use in industrial applications or in environmental conditions requiring "TH" treatment.

These electronic products, including flush mountable products, must have a degree of protection to at least IP 20 (provided either by their own enclosure or by their installation method) for restricted access locations where the degree of pollution does not exceed 2 (a test booth not containing machinery or other dust producing activities, for example).

Special treatments

For particularly harsh industrial environments, Schneider Electric is able to offer special protective treatments. Please consult your Regional Sales Office.

(1) A large number of the Schneider Electric brand products are "TH" treated as standard and are, therefore, not subject to a surcharge.

TeSys B Variable composition contactors

CF 452 - Customer requirements specification form

Download the configuration software "bar contactor soft-customer.xls" on:
https://www.se.com/ww/en/product-range-download/667-tesys-b/#/software-firmware-tab

Date of order	Editor	Geog. area	Order n°	Required delivery (1)	Job n°
				/ /	

Company: .... Customer Order N°: ....

Activity sector: .... Application: ....

Number of contactors: .... Type - size or symbol combination: ....

For devices with symbol combination: Do not fill out the form below

For use by Schneider Electric

POWER CIRCUIT

Voltage: .... V **AC** ☐ **...... Hz** **DC** ☐

Number of N/O main poles: Rated current: .... Amp

Number of N/C main poles: Rated current: .... Amp

Any special details: ....

....

Poles

Ref:

Ref:

CONTROL CIRCUIT

Voltage: .... V **AC** ☐ **...... Hz** **DC** ☐

Economy resistor: ☐ Yes ☐ No

(unless specified, an economy resistor will only be included if necessary)

For alternative control, in direct latching contact: ☐ Yes ☐ No

Customer marking: ....

Electromag:

Coil:

Coil maint. cont:

Rectifier:

Econ. resist. contact:

Econ. Resist.:

AUXILIARY CONTACTS AVAILABLE

Instantaneous contacts: **Number of N/O** **Number of N/C**

If a specific type or block of contacts is required, please indicate below.

Number	GM1:	GM2:	GP4:	GP5:	GP6:	LA1:

Note : For mechanical interlocking, a N/C contact must be specified for the interlocking function.

Time delay contacts N/C + N/O : **On delay** ☐ **or** **Off delay** ☐

Note: If LA1 is used, a build specification is required.

No. ZC4GM1 : (N/O)
No. ZC4GM2 : (N/C)
No. ZC1GP4 : (N/C)
No. ZC1GP5 : (N/C+N/O)
No. ZC1GP6 : (N/O+N/O)
No. ZC2GG1 : (ON-Del)
No. ZC2GG5 : (OFF-Del)

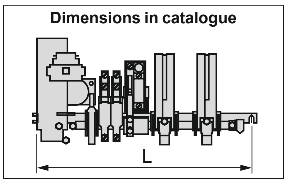
No. LA1BN●31 :
No. LA1DN●● :
No. LA●DT● :
If CV1, specif. n°:

MOUNTING

Fixing centres L: Standard ☐ Specified ☐ With L = ...

Mechanical interlock "MI":

Yes ☐ No ☐



Vertically mounted reversers fixing centres "E" =.......... mm

Upper position contactor: .... Lower position contactor:

If mechanical interlock specified : Ref: ....

Supply linking components for the 2 contactors (Rod, clevis, cranks, lock, etc...) : Yes ☐ No ☐

Note : "MI" components that are part of the contactor such as the bearing, clevis or lock support are factory fitted.

Shaft: C or E =

Code.:

Bar: L = :

Code.:

Build see drwg.

N° :

"MI" bearing

W1

"MI" ref

ANY SPECIAL DETAILS

(Comments / Specific requirements / Special "MI" / Accessories / Etc...)

Launch date

Delivery date

Contactor reference*

....

* 3 possibilities

1) Device with symbol combination (see drwg 1492177)

2) Device n° defined on the basis of this form

Type/size/order n°/year. E.g.: CV1GB000599

3) Reference defined to "specification"

(1) Standard delivery time: 3 weeks, from receipt of order. For faster delivery, please consult your Regional Sales Office.

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