Control relays
TeSys SK, K, D

Relays – TeSys SK, K - For control of TeSys K contactor coils and other devices

Relays – TeSys D - For control of TeSys D contactor coils and other devices

Control relays
Mini-control relays
TeSys CA2 SK and CA3 SK
Mini-control relay TeSys CA2 SKE with alternating contacts

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CA2 SK20●●

Mini-control relays

- Width of mini-control relays 27 mm.
- Mounting on 35 mm ⎓ rail.
- Connection by connectors.

Control circuit supply	Auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)
a.c. supply	2	–	**CA2SK20●●**
	1	1	**CA2SK11●●**
d.c. supply	2	–	**CA3SK20●●**
	1	1	**CA3SK11●●**

PF526255.tif

CA2 SKE20●●

Mini-control relay with alternating contacts

This mini-control relay with alternating contacts (see function diagram page B7/17) makes it possible to automatically split the operating time between 2 circuits of a redundant system.
By regularly energising the “safety circuits”, this device makes it possible to ensure that they are operating correctly.

- Width of mini-control relay 45 mm.
- Fixing by Ø4 screws.
- Connection by connectors.
- Cannot be fitted with front-mounted auxiliary contact block.
- Cannot be fitted with coil suppressor module.

Control circuit supply	Auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)
a.c. supply	2	–	**CA2SKE20●●**

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Mini-control relays CA2 SK and CA2 SKE									
Volts ∿ 50/60 Hz	**24**	**48**	**110**	**120**	**220**	**230**	**240**	**380**	**400**
Code	B7	E7	F7	G7	M7	P7	U7	Q7	V7
Mini-control relays CA3 SK									
Volts ⎓	**12**	**24**	**36**	**48**	**72**				
Code	JD	BD	CD	ED	SD				

Characteristics: pages B7/14 and B7/15
Dimensions: page B7/16
Schemes: page B7/17

Control relays
Mini-control relays
TeSys CA2 SK and CA3 SK
Instantaneous auxiliary contacts and coil suppressor modules

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LA1 SK11

Instantaneous auxiliary contact blocks

Clip-on front mounting

For use on control relays	Maximum number of blocks per contactor	Composition		Reference
				
CA2SK20	1	2	–	**LA1SK20**
		–	2	**LA1SK02**
		1	1	**LA1SK11**

PF526257.tif

LA4 SK●1●

Suppressor modules

Connection without need for tools by clipping onto right-hand side of contactor

For use on control relays	Type	For voltages	Sold in lots of	Unit reference
CA2SK and **CA3SK**	Varistor (1)	∿ and ⎓ 24 V…48 V	10	**LA4SKE1E**
		∿ and ⎓ 110 V…250 V	10	**LA4SKE1U**
	Diode (2)	⎓ 24 V…250 V	10	**LA4SKC1U**

(1) Protection provided by limiting the transient voltage to 2 Uc max.
Maximum reduction of transient voltage peaks.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
(2) No overvoltage or oscillating frequency.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).

Characteristics: pages B7/14 and B7/15
Dimensions: page B7/16
Schemes: page B7/17

Control relays

TeSys K control relays

For a.c. or d.c. control circuit

PF526247.tif

CA2 KN40●●

PF526248.tif

CA2 KN403●●

PF526249.tif

CA3 KN407●●

Control relays for a.c. control circuit

- Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

Control circuit Consumption	Auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)
Screw clamp connections			
4.5 VA	4	–	**CA2KN40●●**
	3	1	**CA2KN31●●**
	2	2	**CA2KN22●●**
Spring terminal connections			
4.5 VA	4	–	**CA2KN403●●**
	3	1	**CA2KN313●●**
	2	2	**CA2KN223●●**
Faston connectors, 1 x 6.35 or 2 x 2.8			
4.5 VA	4	–	**CA2KN407●●**
	3	1	**CA2KN317●●**
	2	2	**CA2KN227●●**
Solder pins for printed circuit boards			
4.5 VA	4	–	**CA2KN405●●**
	3	1	**CA2KN315●●**
	2	2	**CA2KN225●●**

Control relays for d.c. control circuit

- Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

Screw clamp connections			
3 W	4	–	**CA3KN40●●**
	3	1	**CA3KN31●●**
	2	2	**CA3KN22●●**
Spring terminal connections			
3 W	4	–	**CA3KN403●●**
	3	1	**CA3KN313●●**
	2	2	**CA3KN223●●**
Faston connectors, 1 x 6.35 or 2 x 2.8			
3 W	4	–	**CA3KN407●●**
	3	1	**CA3KN317●●**
	2	2	**CA3KN227●●**
Solder pins for printed circuit boards			
3 W	4	–	**CA3KN405●●**
	3	1	**CA3KN315●●**
	2	2	**CA3KN225●●**

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):
Control relays CA2 K (0.8...1.15 Uc) *(0.85...1.1 Uc)*

Volts ∼ 50/60 Hz	**12**	**20**	**24(2)**	**36**	**42**	**48**	**110**	**115**	**127**	**220/230**	**230**	**230/240**	**380/400**	**400**	**400/415**	**440**	**500**	**660/690**
Code	J7	Z7	B7	C7	D7	E7	F7	FE7	FC7	M7	P7	U7	Q7	V7	N7	R7	S7	Y7

Up to and including 240 V, coil with integral suppression device available: add **2** to the code required. Example: **J72**
Control relays CA3 K (0.8...1.15 Uc)

Volts ⎓	**12**	**20**	**24(2)**	**36**	**48**	**60**	**72**	**100**	**110**	**125**	**200**	**220**	**230**	**240**	**250**
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	LD	MD	MPD	MUD	UD

Coil with integral suppression device available: add **3** to the code required. Example: **JD3**.

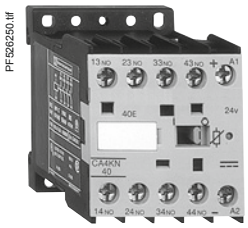
(2) When connecting an electronic sensor or timer in series with the coil of the control relay, select a 20 V coil (∼ code Z7, ⎓ code ZD) so as to compensate for the incurred voltage drop.

Characteristics: pages B7/18 and B7/19
Dimensions: page B7/20
Schemes: page B7/21

Control relays

TeSys K control relays

For d.c. control circuit



CA4 KN40●●●

Low consumption control relays (d.c. control circuit)

- Mounting on 35 mm ⎓ rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

Control circuit Consumption	Auxiliary contacts		Basic reference, to be completed by adding the voltage code (1)
Screw clamp connections			
1.8 W	4	–	**CA4KN40●●**
	3	1	**CA4KN31●●**
	2	2	**CA4KN22●●**
Spring terminal connections			
1.8 W	4	–	**CA4KN403●●**
	3	1	**CA4KN313●●**
	2	2	**CA4KN223●●**
Faston connectors, 1 x 6.35 or 2 x 2.8			
1.8 W	4	–	**CA4KN407●●**
	3	1	**CA4KN317●●**
	2	2	**CA4KN227●●**
Solder pins for printed circuit boards			
1.8 W	4	–	**CA4KN405●●**
	3	1	**CA4KN315●●**
	2	2	**CA4KN225●●**

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):
Control relays CA4 K (Wide range coil: 0.7...1.3 Uc)

Volts ⎓	**12**	**20**	**24**	**48**	**72**	**110**	**120**
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

Characteristics: pages B7/18 and B7/19
Dimensions: page B7/20
Schemes: page B7/21

Control relays

TeSys K control relays

Instantaneous and time delay auxiliary contact blocks

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LA1 KN20

PB111966.eps

LA1 K●●●

Instantaneous auxiliary contact blocks

Clip-on front mounting, 1 per control relay

Connection	Composition		Reference
Screw clamp terminals	2	–	**LA1KN20**
	–	2	**LA1KN02**
	1	1	**LA1KN11**
	4	–	**LA1KN40** (1)
	3	1	**LA1KN31** (1)
	2	2	**LA1KN22** (1)
	1	3	**LA1KN13** (1)
	–	4	**LA1KN04** (1)
Spring terminals	2	–	**LA1KN203**
	–	2	**LA1KN023**
	1	1	**LA1KN113**
	4	–	**LA1KN403** (1)
	3	1	**LA1KN313** (1)
	2	2	**LA1KN223** (1)
	1	3	**LA1KN133** (1)
	–	4	**LA1KN043** (1)
Faston connectors 1 x 6.35 or 2 x 2.8	2	–	**LA1KN207**
	–	2	**LA1KN027**
	1	1	**LA1KN117**
	4	–	**LA1KN407** (1)
	3	1	**LA1KN317** (1)
	2	2	**LA1KN227** (1)
	1	3	**LA1KN137** (1)
	–	4	**LA1KN047** (1)

Electronic time delay contact blocks

- Relay output with common point changeover contact, ∼ or ⎓ 240 V, 2 A maximum
- Control voltage 0.85...1.1 Uc
- Maximum switching capacity 250 VA or 150 W
- Operating temperature -10...+ 60 °C
- Reset time: 1.5 s during the time delay period 0.5 s after the time delay period

PF526253.tif

LA2 KT2●

Clip-on front mounting, 1 per control relay

Voltage	Type	Timing range	Composition	Reference
V		s		
∼ or ⎓ 24...48	On-delay	1...30	1	**LA2KT2E**
∼ 110...240	On-delay	1...30	1	**LA2KT2U**

Other versions

Electronic timers type RE4.
Please consult your Regional Sales Office.

*(1) Block of 4 contacts for use on **CA2 K** and **CA3 K**.*

Characteristics : page B7/19
Dimensions : page B7/20
Schemes : page B7/21

Control relays

TeSys K control relays

Mounting and marking accessories

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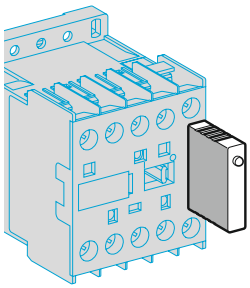

LA4 K●●●

Suppressor modules incorporating LED indicator

Mounting and connection	Type	For voltages	Sold in lots of	Unit reference
Clips onto front of relay with locating device. No tools required.	Varistor (1)	∿ and ⎓ 12...24 V	5	**LA4KE1B**
		∿ and ⎓ 32...48 V	5	**LA4KE1E**
		∿ and ⎓ 50...129 V	5	**LA4KE1FC**
		∿ and ⎓ 130...250 V	5	**LA4KE1UG**
	Diode + Zener diode (2)	⎓ 12...24 V	5	**LA4KC1B**
		⎓ 32...48 V	5	**LA4KC1E**
	RC (3)	∿ 220...250 V	5	**LA4KA1U**

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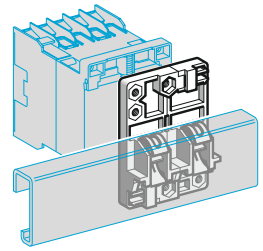

LA9 D973

Mounting accessories

Description	Application		Sold in lots of	Unit reference
Mounting plates	On 1 ⊏⊐ rail	Clip-on	1	**LA9D973**
	On 2 ⊏⊐ rails	110/120 mm fixing centres	10	**DX1AP25**

Marking accessories

Description	Application		Sold in lots of	Unit reference
Marker holder	Clip-on fixing on front face	–	100	**LA9D90**
Clip-in markers	4 maximum per relay	Strips of 10 identical numbers 0 to 9	25	**AB1R●** (4)
		Strips of 10 identical capital letters A to Z	25	**AB1G●** (4)

(1) Protection provided by limiting the transient voltage to 2 Uc max.
Maximum reduction of transient voltage peaks.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
(2) No overvoltage or oscillating frequency.
Polarised component.
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
(3) Protection by limiting the transient voltage to 3 Uc max. and limitation of the oscillating frequency.
Slight increase in drop-out time (1.2 to 2 times the normal time).
(4) Complete the reference by replacing the dot with the required character.

Control relays

Dimensions : page B7/20

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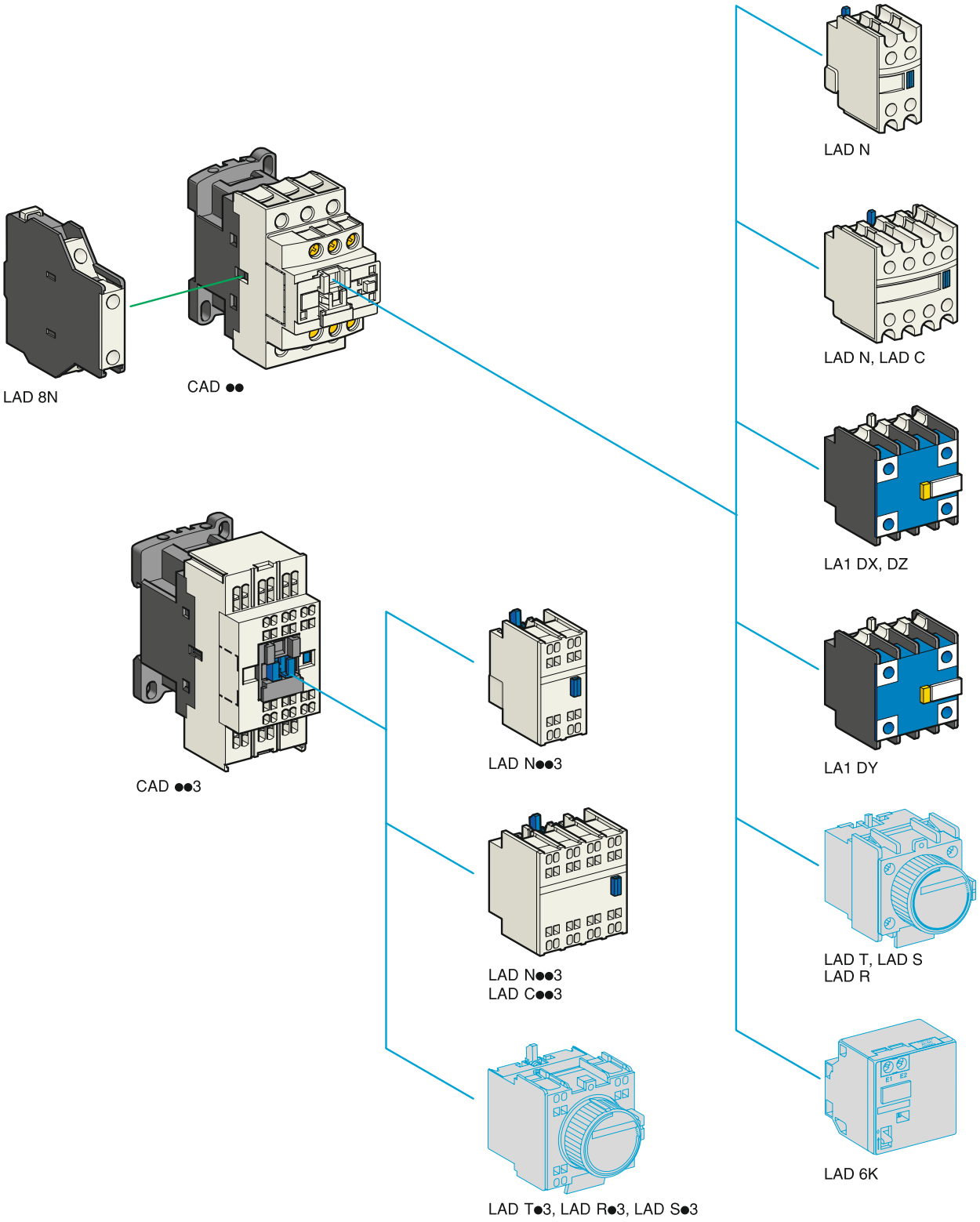

See page opposite for mounting possibilities according to control relay type and rating

TeSys control relays

TeSys D control relays and add-on blocks

Control circuit: a.c., d.c. or low consumption

TeSys D

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CAD 50●●

PF526457.tif

CAD 32●●

PF526458.tif

CAD 503●●

PF526460.tif

CAD 323●●

Control relays for connection by screw clamp terminals

Type	Number of contacts	Composition		Basic reference, to be completed by adding the control voltage code (1)
Instantaneous	5	5	–	**CAD50●●** (3)
		3	2	**CAD32●●** (3)

Control relays for connection by spring terminals

Instantaneous	5	5	–	**CAD503●●**
		3	2	**CAD323●●**

Instantaneous auxiliary contact blocks for connection by screw clamp terminals

For use in normal operating environments

Number of contacts	Maximum number per relay, Clip-on mounting: front	Maximum number per relay, Clip-on mounting: side	Composition		Reference	
2	1	–	1	1	**LADN11**	
	–	1 on LH side	1	1	**LAD8N11** (6)	
	1	–	2	–	**LADN20**	
	–	1 on LH side	2	–	**LAD8N20** (6)	
	1	–	–	2	**LADN02**	
	–	1 on LH side	–	2	**LAD8N02** (6)	
4 (4)	1	–	2	2	**LADN22**	**LADN22S** (7)
			1	3	**LADN13**	
			4	–	**LADN40**	
			–	4	**LADN04**	
			3	1	**LADN31**	
4 (4)	1	–	2	2	**LADC22**	

Including 1 N/O and 1 N/C make before break.

With dust and damp protected contacts, for use in particularly harsh industrial environments

Number of contacts	Maximum number per relay, Front mounting	Composition: protected (5)			Composition: not protected		Reference
2	1	2	–	–	–	–	**LA1DX20**
		–	2	–	–	–	**LA1DX02**
		2	–	2	–	–	**LA1DY20**
4 (4)	1	2	–	–	2	–	**LA1DZ40**
		2	–	–	1	1	**LA1DZ31**

Instantaneous auxiliary contact blocks for connection by spring terminals

This type of connection is not possible for contact blocks LAD 8 and blocks with dust and damp protected contacts.
For all other instantaneous auxiliary contact blocks, add the digit **3** to the end of the references selected above.
Example: **LAD N11** becomes **LAD N113**.

(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office).

a.c. supply												
Volts ∿	**24**	**42**	**48**	**110**	**115**	**220**	**230**	**240**	**380**	**400**	**415**	**440**
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7

d.c. supply (coils with integral suppression device fitted as standard)											
Volts ⎓	**12**	**24**	**36**	**48**	**60**	**72**	**110**	**125**	**220**	**250**	**440**
U from 0.7 to 1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD

Low consumption (coils with integral suppression device fitted as standard)								
Volts ⎓	**5**	**12**	**20**	**24**	**48**	**110**	**220**	**250**
Code	AL	JL	ZL	BL	EL	FL	ML	UL

(2) LC: low consumption.
*(3) To order control relays with connection by lugs, add the digit **6** to the end of the selected reference.*
Example: CAD50●● becomes CAD506●●.
(4) Blocks with 4 auxiliary contacts cannot be used on low consumption control relays.
(5) Product fitted with 4 earth screen continuity terminals.
(6) These contact blocks cannot be used on low consumption control relays.
(7) With red front face - for safety chain indication.

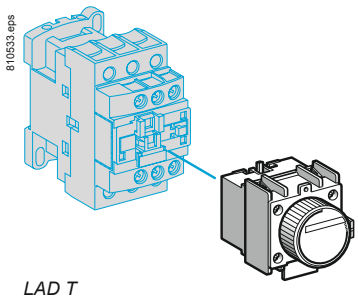
Characteristics: pages B7/22 and B7/25
Dimensions: page B7/26
Schemes: page B7/27

TeSys control relays

TeSys D control relays

Add-on blocks

TeSys D



LAD T

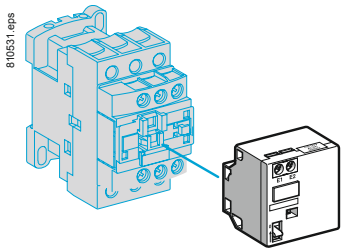
Time delay auxiliary contact blocks for connection by screw clamp terminals (1)

Number and type of contacts	Maximum number per relay	Time delay		Reference
	Front mounting	Type	Range	
1 N/C and 1 N/O	1	On-delay	0.1…3 s (2)	**LADT0**
			0.1…30 s	**LADT2**
			10…180 s	**LADT4**
			1…30 s (3)	**LADS2**
		Off-delay	0.1…3 s (2)	**LADR0**
			0.1…30 s	**LADR2**
			10…180 s	**LADR4**

(Sealing cover: see page B8/21)

Time delay auxiliary contact blocks for connection by spring terminals

Add the digit **3** to the references selected above. Example: **LAD T0** becomes **LAD T03**.



LAD 6K10

Mechanical latch blocks (4)

Unlatching control	Maximum number per relay	Basic reference to be completed (5)
	Front mounting	
Manual or electric	1	**LAD6K10●**

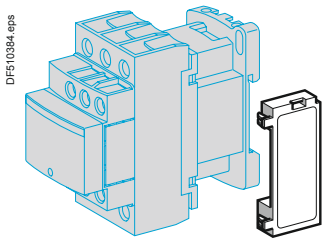
Suppressor modules

These modules clip onto the top of the control relay and the electrical connection is instantly made. Fitting of an input module is still possible.

RC circuits (Resistor-Capacitor)

- Effective protection for circuits highly sensitive to “high frequency” interference.
- Voltage limited to 3 Uc maximum and oscillating frequency limited to 400 Hz maximum.
- Slight time delay on drop-out (1.2 to 2 times the normal time).

For mounting on	Operational voltage	Reference
CAD ∿	∿ 24…48 V	**LAD4RCE**
	∿ 110…240 V	**LAD4RCU**



LAD 4●●

Varistors (peak limiting)

- Protection provided by limiting the transient voltage value to 2Uc maximum.
- Maximum reduction of transient voltage peaks.
- Slight time delay on drop-out (1.1 to 1.5 times the normal time).

CAD ∿	∿ 24…48 V	**LAD4VE**
	∿ 50…127 V	**LAD4VG**
	∿ 110…250 V	**LAD4VU**

Freewheel diode

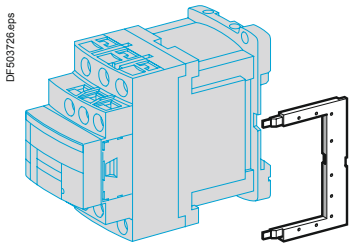
- No overvoltage or oscillating frequency.
- Increase in drop-out time (6 to 10 times the normal time).
- Polarised component.

CAD ⎓	⎓ 24…250 V	**LAD4DDL**

Bidirectional peak limiting diode (6)

- Protection provided by limiting the transient overvoltage value to 2Uc maximum.
- Maximum reduction of transient voltage peaks.

CAD ∿	∿ 24 V	**LAD4TB**
	∿ 72 V	**LAD4TS**
CAD ⎓	⎓ 24 V	**LAD4TBDL**
	⎓ 72 V	**LAD4TSDL**
	⎓ 125 V	**LAD4TGDL**
	⎓ 250 V	**LAD4TUDL**
	⎓ 600 V	**LAD4TXDL**



LAD 4●●

(1) These contact blocks cannot be used on low consumption control relays.
(2) With extended scale from 0.1 to 0.6 s.
(3) With switching time of 40 ms ±15 ms between opening of the N/C contact and closing of the N/O contact.
(4) Power should not be simultaneously applied or maintained to the mechanical latching block of the CAD N. The duration of the control signal to the mechanical latching block and the CAD N should be ⩾ 100 ms.
(5) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

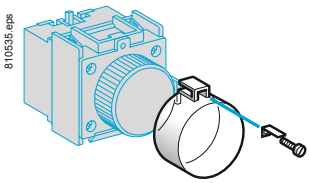
Volts ∿ and ⎓	24	32/36	42/48	60/72	100	110/127	220/240	256/277	380/415
Code	B	C	E	EN	K	F	M	U	Q

*(6) **CAD ●● ⎓** and low consumption control relays are fitted with a built-in bi-directional peak limiting diode suppressor as standard. On control relays produced after 15th July 2004, this diode is removable. It can therefore be replaced by the user (see references **LAD4T●●●** above). It can also be replaced by a freewheel diode **LAD 4DDL** . If a d.c. or low consumption control replay is used without suppression, the standard suppressor should be replaced with a blanking plug **LAD9DL**.*

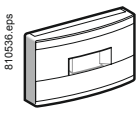
Characteristics: pages B7/22 and B7/25 | Illustrations: page B7/8 | Dimensions: page B7/26 | Schemes: page B7/27

TeSys control relays
TeSys D control relays
Accessories and spare parts

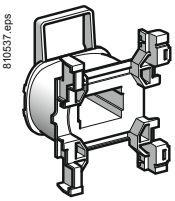
TeSys D



LA9 D901



LAD 9ET1



LXD 1

Accessories (to be ordered separately)

Description	For mounting on	Sold in lots of	Unit reference
For marking			
Sheet of 64 blank legends, self-adhesive, 8 x 33 mm	CAD, LAD (4 contacts)	10	**LAD21**
Sheet of 112 blank legends, self-adhesive, 8 x 12 mm	LAD (2 contacts), LAD T		**LAD22**
Strips of blank, self-adhesive legends for printing by plotter (4 sets of 5 strips)	All products	35	**LAD24**
"SIS Label" labelling software for legends LAD 21 and LAD 22, supplied on CD-Rom	Multi-language version: English, French, German, Italian, Spanish	1	**XBY2U**
Legend holder, snap-in, 8 x 18 mm	LC1 D09...38 LC1DT20...40 LADN (4 contacts) LAD T, LAD R	100	**LAD90**
For protection			
Sealing cover	LAD T, LAD R	1	**LA9D901**
Safety cover preventing access to the moving contact carrier	CAD	1	**LAD9ET1**
Red cover (for safety chain indication)	CAD	1	**LAD9ET1S**

Spare parts: coils

Specifications

- Average consumption at 20 °C:
  - inrush (cos φ = 0.75) 50/60 Hz: 70 VA at 50 Hz,
  - sealed (cos φ = 0.3) 50/60 Hz: 8 VA at 60 Hz,
- Operating range (θ < 60 °C): 0.85 to 1.1 Uc

Control circuit voltage Uc	Average resistance at 20 °C ±10 %	Inductance of closed circuit	Reference (1) 50/60 Hz
V	V	H	
12	6.3	0.26	**LXD1J7**
21 (2)	5.6	0.24	**LXD1Z7**
24	6.19	0.26	**LXD1B7**
32	12.3	0.48	**LXD1C7**
36	–	–	**LXD1CC7**
42	19.15	0.77	**LXD1D7**
48	25	1	**LXD1E7**
60	–	–	**LXD1EE7**
100	–	–	**LXD1K7**
110	130	5.5	**LXD1F7**
115	–	–	**LXD1FE7**
120	159	6.7	**LXD1G7**
127	192.5	7.5	**LXD1FC7**
200	–	–	**LXD1L7**
208	417	16	**LXD1LE7**
220/230	539	22	**LXD1M7** (3)
230	595	21	**LXD1P7**
230/240	645	25	**LXD1U7** (4)
277	781	30	**LXD1W7**
380/400	1580	60	**LXD1Q7**
400	1810	64	**LXD1V7**
415	1938	74	**LXD1N7**
440	2242	79	**LXD1R7**
480	2300	85	**LXD1T7**
500	2499	–	**LXD1S7**
575	3294	–	**LXD1SC7**
600	3600	135	**LXD1X7**
690	5600	190	**LXD1Y7**

(1) The last 2 digits in the reference represent the voltage code.
(2) Voltage for special coils fitted in control relays with serial timer module with 24 V supply.
(3) This coil can be used on 240 V at 60 Hz.
(4) This coil can be used on 230/240 V at 50 Hz and on 240 V only at 60 Hz.

Characteristics: pages B7/22 and B7/25
Dimensions: page B7/26
Schemes: page B7/27

TeSys SK, K, D

Technical Data for Designers

Contents

Control relays

Mini-control relays TeSys CA● SK and CA2 SKE

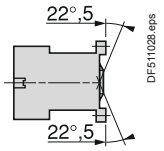
TeSys SK

Environment

Rated insulation voltage (Ui)	Conforming to IEC 60947, VDE 0110 gr C, BS 5424, CSA 22-2 n° 14, UL 508	**V**	690
Conforming to standards			IEC 60947, NF C 63-110, VDE 0660, BS 5424
Product certifications			UL, CSA
Protective treatment	Conforming to IEC 60068 (DIN 50015)		"TC" (Klimafest, Climateproof)
Degree of protection	Conforming to VDE 0106		Protection against direct finger contact
Ambient air temperature around the device	Storage	**°C**	-50…+70
	Operation	**°C**	-20…+50
Maximum operating altitude	Without derating	**m**	2000

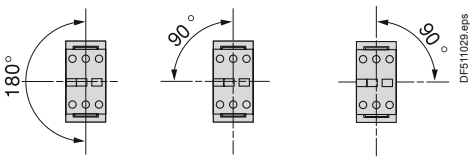
Operating position

Vertical axis



Without derating

Horizontal axis



Without derating

			Min.	Max.
Connection by connectors	Solid cable	**mm²**	1 x 1.5 or 2 x 1.5	1 x 6 or 2 x 4
	Flexible cable without cable end	**mm²**	1 x 0.5 or 2 x 0.35	1 x 6 or 2 x 2.5
	Flexible cable with cable end	**mm²**	1 x 0.35 or 2 x 0.35	1 x 6 or 2 x 1.5
Tightening torque	Pozidriv n° 1 head	**N.m**	0.8	
Terminal referencing	Conforming to standards EN 50005 and EN 50011		Up to 4 contacts	

Control circuit characteristics

Control relay			**CA2 SK**	**CA2 SKE**	**CA3 SK**
Rated control circuit voltage (Uc)		**V**	∿ 24…400		⎓ 12…72
Control voltage limits (≤ 50 °C)	For operation		0.85…1.1 Uc		0.85…1.1 Uc
	For drop-out		≤ 0.20 Uc		≤ 0.10 Uc
Average consumption at 20 °C and at Uc	Inrush		16 VA	23 VA	2.2 W
	Sealed		4.2 VA	4.9 VA	2.2 W
Heat dissipation		**W**	1.4	1.5	2.2
Operating time at 20 °C and at Uc	Between coil energisation and opening of the N/C contacts	**ms**	8…16		10…18
	Between coil energisation and closing of the N/O contacts	**ms**	7…14		8…12
	Between coil de-energisation and opening of the N/O contacts	**ms**	6…8		4…6
	Between coil de-energisation and closing of the N/C contacts	**ms**	8…10		6…8
Maximum operating rate	In operating cycles per hour		1200		1200
Mechanical durability at Uc in millions of operating cycles	50/60 Hz coil		10		–
	Standard ⎓ coil		–		10

References: pages B7/2 and B7/3
Dimensions: page B7/16
Schemes: page B7/17

Control relays

Mini-control relays TeSys CA● SK and CA2 SKE

TeSys SK

Auxiliary contact characteristics of mini-control relays and instantaneous contact blocks

Rated operational voltage (Ue)		**V**	Up to 690
Rated insulation voltage (Ui)	Conforming to IEC 96047, BS 5424, VDE 0110 group C, CSA C 22-2 n° 14	**V**	690
Conventional rated thermal current (Ith)	For ambient temperature ≤ 55 °C	**A**	10
Frequency of the operational current		**Hz**	Up to 400
Short-circuit protection	Conforming to IEC 60947 and VDE 0660, gl fuse	**A**	10

Operational power of contacts conforming to IEC 60947

a.c. supply, category 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 φ 0.7) = 10 times the power broken (cos φ 0.4).

	V	24	48	110/127	220/230	380/400	440
1 million operating cycles	**VA**	48	96	240	440	800	880
3 million operating cycles	**VA**	17	34	86	158	288	317
10 million operating cycles	**VA**	7	14	36	66	120	132
Occasional making capacity	**VA**	1000	2050	5000	10000	14000	13 000

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 load.

	V	24	48	110	220	440
1 million operating cycles	**W**	120	80	60	52	51
3 million operating cycles	**W**	55	38	30	28	26
10 million operating cycles	**W**	15	11	9	8	7
Occasional making capacity	**W**	720	600	400	300	230

Control relays

References: pages B7/2 and B7/3
Dimensions: page B7/16
Schemes: page B7/17

Control relays

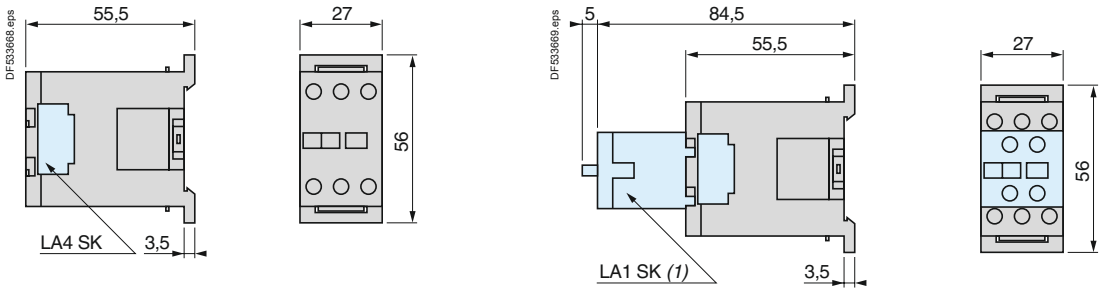
Mini-control relays TeSys CA● SK and CA2 SKE

TeSys SK

Dimensions

Mini-control relays

CA2 SK and CA3 SK



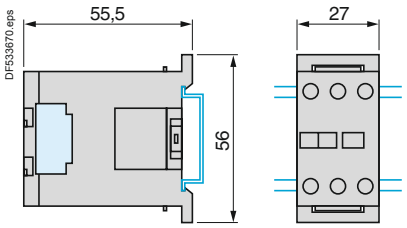
(1) Only on CA2 SK20.

Mounting

Mini-control relays

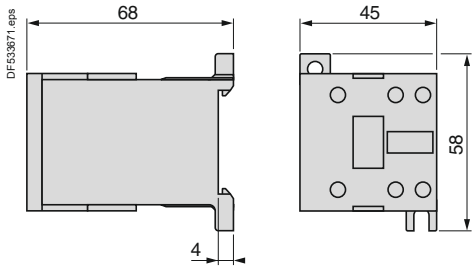
CA2 SK and CA3 SK

On mounting rail AM1 DP200 or AM1 DE200 (╍ 35 mm)



Dimensions

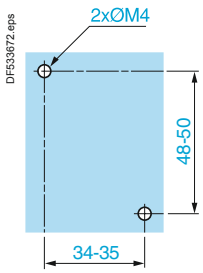
CA2 SKE



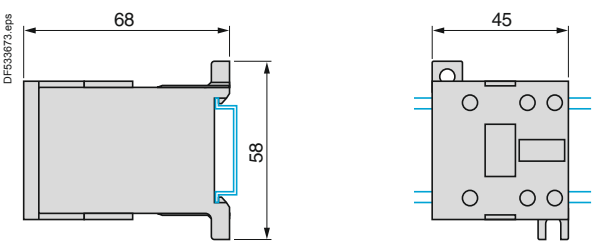
Mounting

CA2 SKE

On panel



On mounting rail AM1 DP200 or AM1 DE200 (╍ 35 mm)



References:
pages B7/2 and B7/3

Characteristics:
pages B7/14 and B7/15

Schemes:
page B7/17

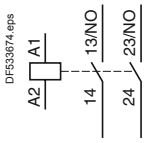
Control relays

Mini-control relays TeSys CA● SK and CA2 SKE

Schemes

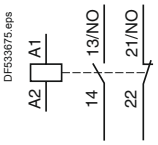
CA2 SK20, CA3 SK20

2 N/O



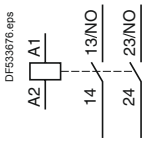
CA2 SK11, CA3 SK11

1 N/O + 1 N/C



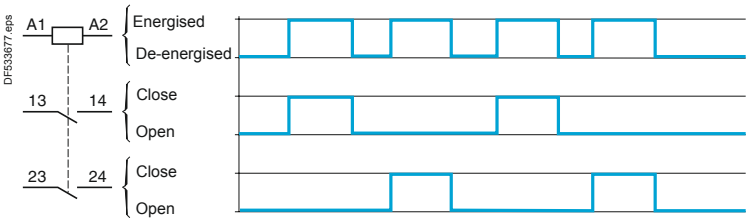
CA2 SKE

2 N/O



CA2 SKE

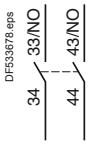
Function diagram



Instantaneous auxiliary contacts

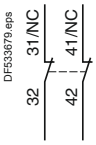
2 N/O

LA1 SK20



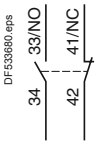
2 N/C

LA1 SK02



1 N/O + 1 N/C

LA1 SK11

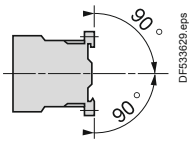
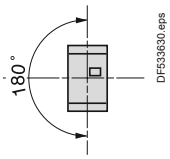
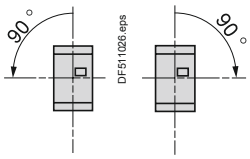


Control relays

Control relays
TeSys K control relays

TeSys K

Environment

Conforming to standards			IEC 60947, NF C 63-140, VDE 0660, BS 5424		
Product certifications			UL, CSA		
Operating positions			**Vertical axis**  Without derating	**Horizontal axis**  Without derating	 Possible positions for **CA2 K** only, with derating, please consult your Regional Sales Office.
Connection			**Min.**	**Max.**	**Max. to IEC 60947**
Screw clamp connections	Solid cable	**mm²**	1 x 1.5	2 x 4	1 x 4 + 1 x 2.5
	Flexible cable without cable end	**mm²**	1 x 0.75	2 x 4	2 x 2.5
	Flexible cable with cable end	**mm²**	1 x 0.34	1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5
Spring terminals	Solid cable	**mm²**	1 x 0.75	1 x 1.5	2 x 1.5
	Flexible cable without cable end	**mm²**	1 x 0.75	1 x 1.5	2 x 1.5
Faston connectors	Clip	**mm**	2 x 2.8 or 1 x 6.35		
Solder pins for printed circuit board	With locating device between power and control circuits		4 mm x 35 microns		
Tightening torque	Philips head n° 2 and Ø6	**N.m**	0.8…1.3		
Terminal referencing	Conforming to standards EN 50005 and EN 50011		Up to 8 contacts		
Protective treatment	Conf. to IEC 60068 (DIN 50016)		"TC" (Klimafest, Climateproof)		
Degree of protection	Conforming to VDE 0106		Protection against direct finger contact (devices with screw clamp terminals or pins for printed circuit board)		
Ambient air temperature around the device	Storage	**°C**	-50...+80		
	Operation	**°C**	-25...+50		
Maximum operating altitude	Without derating	**m**	2000		
Vibration resistance	Control relay open		2 gn		
5...300 Hz	Control relay closed		4 gn		
Flame resistance	Conforming to UL 94		Self-extinguishing material V1		
	Conforming to NF F 16-101 and 16-102		Conforming to requirement 2		
Shock resistance (1/2 sine wave, 11 ms)	Control relay open		10 gn		
	Control relay closed		15 gn		
Safety separation of circuits	Conforming to VDE 0106 and IEC 60536		SELV (Safety Extra Low Voltage), up to 400 V		

Control circuit characteristics

Control relay type			**CA2 K**	**CA3 K**	**CA4 K**
Rated control circuit voltage (Uc)		**V**	∿ 12...690	⎓ 12...250	⎓ 12...120
Control voltage limits (y 50 °C) single voltage coil	For operation		0.8...1.15 Uc	0.8...1.15 Uc	0.7...1.3 Uc
	For drop-out		≤ 0.2 Uc	≤ 0.1 Uc	≤ 0.1 Uc
Mechanical durability at Uc In millions of operating cycles	50/60 Hz coil		10	–	–
	Standard ⎓ coil		–	20	–
	Wide range, low consumption ⎓ coil		–	–	30
Maximum operating rate	In operating cycles per hour		10 000	10 000	6000
Average consumption at 20 °C and at Uc	Inrush		30 VA	3 W	1.8 W
	Sealed		4.5 VA	3 W	1.8 W
Heat dissipation		**W**	1.3	3	1.8
Operating time at 20 °C and at Uc	Between coil energisation and opening of the N/C contacts	**ms**	5...15	25...35	25...35
	closing of the N/O contacts	**ms**	10...20	30...40	30...40
	Between coil de-energisation and opening of the N/O contacts	**ms**	10...20	10	10...20
	closing of the N/C contacts	**ms**	15...25	15	15...25
Maximum immunity to microbreaks		**ms**	2	2	2

References: pages B7/4 to B7/7
Dimensions: page B7/20
Schemes: page B7/21

Control relays
TeSys K control relays

TeSys K

Contact characteristics of control relays and instantaneous contact blocks

Number of auxiliary contacts	On **CA● K**		4
	On **LA1 K**		2 or 4 for **CA2 K** and **CA3 K**, 2 for **CA4 K**
Rated operational voltage (Ue)	Up to	**V**	690
Rated insulation voltage (Ui)	Conforming to BS 5424	**V**	690
	Conforming to IEC 60947	**V**	690
	Conforming to VDE 0110 group C	**V**	750
	Conforming to CSA C 22-2 n° 14	**V**	600
Conventional thermal current (Ith)	For ambient temperature ≤ 50 °C	**A**	10
Frequency of the operational current		**Hz**	Up to 400
Minimum switching capacity	U min (DIN 19 240)	**V**	17
	I min	**mA**	5
Short-circuit protection	Conforming to IEC 60947 and VDE 0660, gG fuse	**A**	10
Rated making capacity	Conforming to IEC 60947		
	I rms	**A**	110
Short-time rating	Permissible for		
	1 s	**A**	80
	500 ms	**A**	90
	100 ms	**A**	110
Insulation resistance		**MΩ**	> 10
Non-overlap distance	CA● K and LA1 K: linked contacts conforming to INRS, BIA and CNA specifications	**mm**	0.5 (see schemes page B7/21)

Operational power of contacts conforming to IEC 60947

a.c. supply, category 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 φ 0.7) = 10 times the power broken (cos φ 0.4)

	V	24	48	110/127	220/230	380/400	440	600/690
1 million operating cycles	**VA**	48	96	240	440	800	880	1200
3 million operating cycles	**VA**	17	34	86	158	288	317	500
10 million operating cycles	**VA**	7	14	36	66	120	132	200
Occasional making capacity	**VA**	1000	2050	5000	10000	14000	13000	9000

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 load.

	V	24	48	110	220	440	600
1 million operating cycles	**W**	120	80	60	52	51	50
3 million operating cycles	**W**	55	38	30	28	26	25
10 million operating cycles	**W**	15	11	9	8	7	6
Occasional making capacity	**W**	720	600	400	300	230	200

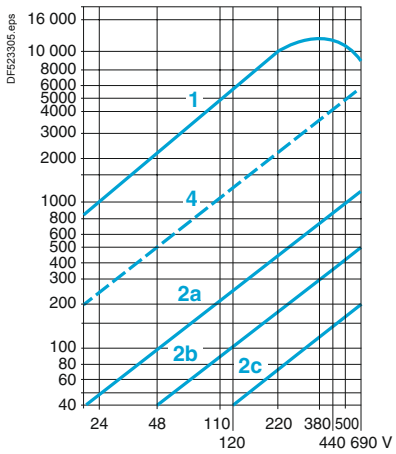
1 Breaking limit of contacts valid for:
■ maximum of 50 operating cycles at 10 s intervals (power broken = making current x cos φ 0.7).

2 Electrical durability of contacts for:
■ 1 million operating cycles (2a)
■ 3 million operating cycles (2b)
■ 10 million operating cycles (2c).

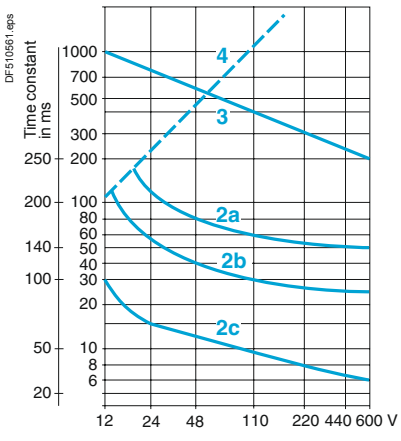
3 Breaking limit of contacts valid for:
■ maximum of 20 operating cycles at 10 s intervals with current passing for 0.5 s per operating cycle.

4 Thermal limit

Power broken in VA



Power broken in W



References:
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Dimensions:
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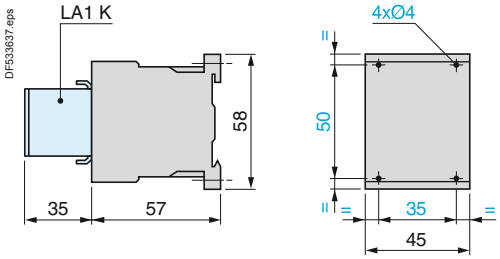
Schemes:
page B7/21

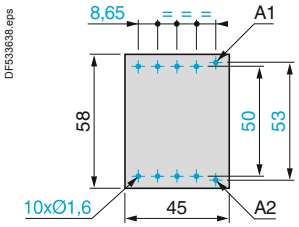
Control relays
TeSys K control relays

TeSys K

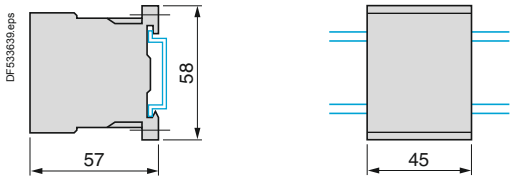
Control relays
CA2 K, CA3 K, CA4 K
On panel



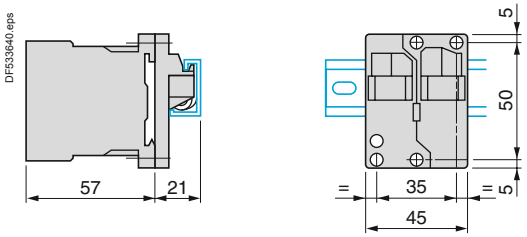
On printed circuit board



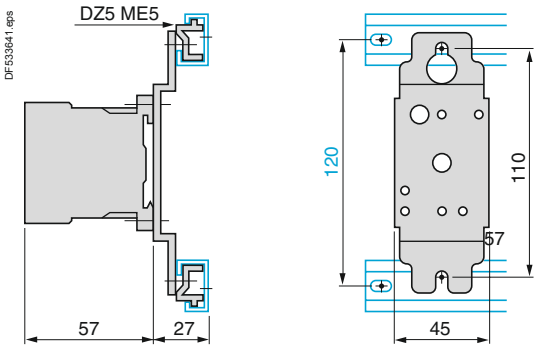
On mounting rail AM1 DP200 or AM1 DE200 (, 35 mm)



LA9 D973
On asymmetrical rail with clip-on mounting plates

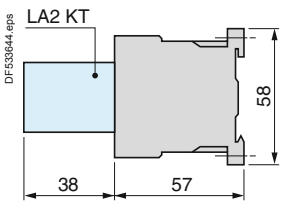


DX1 AP25
On asymmetrical rail with clip-on mounting plates

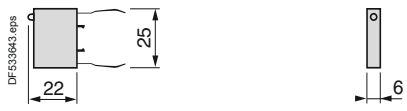


Electronic time delay contact blocks
LA2 KT

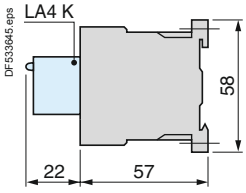
On control relay



Suppressor modules
LA4 K



On control relay



References:
pages B7/4 to B7/7

Characteristics:
pages B7/18 and B7/19

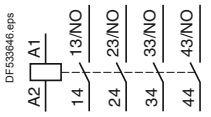
Schemes:
page B7/21

Control relays
TeSys K control relays

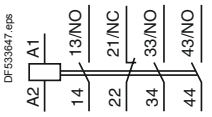
TeSys K

Control relays
CA2 K, CA3 K, CA4 K

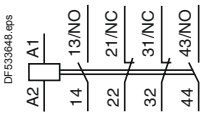
4 N/O



3 N/O + 1 N/C

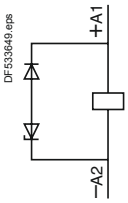


2 N/O + 2 N/C

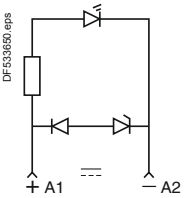


With integral suppression device

CA3 K



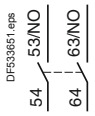
CA4 K



Instantaneous auxiliary contact blocks LA1 K
For CA2 K, CA3 K, CA4 K

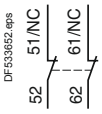
2 N/O

LA1 KN20, LA1 KN207



2 N/C

LA1 KN02, LA1 KN027



1 N/O + 1 N/C

LA1 KN11, LA1 KN117

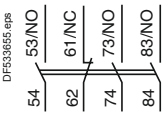
For CA2 K, CA3 K

4 N/O

LA1 KN40, LA1 KN407

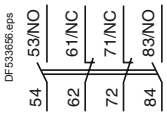
3 N/O + 1 N/C

LA1 KN31, LA1 KN317



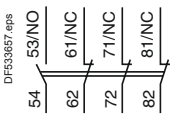
2 N/O + 2 N/C

LA1 KN22, LA1 KN227



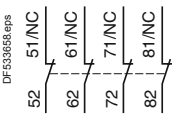
1 N/O + 3 N/C

LA1 KN13, LA1 KN137



4 N/C

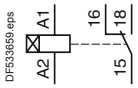
LA1 KN04, LA1 KN047



Electronic time delay contact blocks LA2 KT
For CA2 K, CA3 K, CA4 K

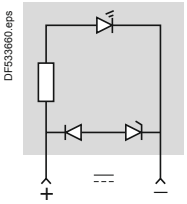
1 C/O

LA2 KT2

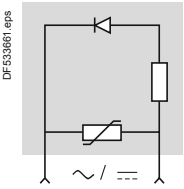


Suppressor modules

LA4 KC



LA4 KE



References:
pages B7/4 to B7/7

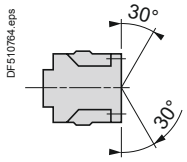
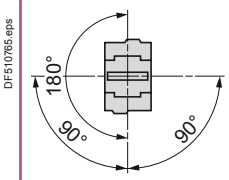
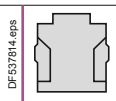
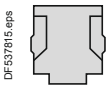
Characteristics:
pages B7/18 and B7/19

Dimensions:
page B7/20

TeSys control relays
TeSys D control relays

TeSys D

Environment

Control relay type				CAD ~	CAD ⎓	CAD ⎓ low consumption
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1 Overvoltage category III and degree of pollution 3		**V**	690	690	690
	Conforming to UL, CSA		**V**	600	600	600
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947		**kV**	6	6	6
Separation of electrical circuits	Conforming to IEC 60536 and VDE 0106			Reinforced insulation up to 400 V		
Conforming to standards				IEC 60947-5-1, N-F C 63-140, VDE 0660, BS 4794, EN 60947-5		
Product certifications				UL, CSA		
Protective treatment	Conforming to IEC 60068			"TH"		
Degree of protection	Conforming to VDE 0106			Front face protected against direct finger contact IP 2X		Protection against direct finger contact
Ambient air temperature around the device	Storage		**°C**	-60…+80	-60…+80	-60…+80
	Operation, conforming to IEC 60255 (0.8…1.1 UC)		**°C**	-5…+60	-5…+60	-5…+60
	For operation at Uc		**°C**	-40…+70	-40…+70	-40…+70
Maximum operating altitude	Without derating		**m**	3000	3000	3000
Operating positions	Without derating in the following positions			 		
	Positions that are not allowed				 	
Shock resistance (1) half sine wave for 11ms	Control relay open			10 gn	10 gn	10 gn
	Control relay closed			15 gn	15 gn	15 gn
Vibration resistance (1) 5…300 Hz	Control relay open			2 gn	2 gn	2 gn
	Control relay closed			4 gn	4 gn	4 gn
Screw clamp connections	Flexible conductor without cable end	1 conductor	**mm²**	1…4	1…4	1…4
		2 conductors	**mm²**	1…4	1…4	1…4
	Flexible conductor with cable end	1 conductor	**mm²**	1…4	1…4	1…4
		2 conductors	**mm²**	1…2.5	1…2.5	1…2.5
	Solid conductor without cable end	1 conductor	**mm²**	1…4	1…4	1…4
		2 conductors	**mm²**	1…4	1…4	1…4
	Tightening torque		**N.m**	1.7	1.7	1.7
Spring terminal connections	1 or 2 flexible or rigid conductors without cable end		**mm²**	1…2.5	1…2.5	1…2.5

(1) In the least favourable direction, without change of contact state, with coil supplied at Uc.

References: pages B7/9 to B7/11
Dimensions: page B7/26
Schemes: page B7/27

TeSys control relays
TeSys D control relays

TeSys D

Control circuit characteristics

Control relay type			CAD ~	CAD ⎓	CAD low consumption
Rated control circuit voltage (Uc)		**V**	12…690	12…440	⎓ 5…72
Control voltage limits					
Operation	With coil 50/60 Hz		0.8…1.1 Uc at 50 Hz	–	–
			0.85…1.1 Uc at 60 Hz	–	–
	With standard coil, wide range		–	0.7…1.25 Uc	0.7…1.25 Uc
Drop-out			0.3…0.6 Uc	0.1…0.25 Uc	0.1…0.25 Uc
Average consumption at 20 °C and at Uc	~ 50/60 Hz (at 50 Hz)	**VA**	Inrush: 70	–	–
			sealed: 8	–	–
	With standard coil	**W**	–	Inrush or sealed: 5.4	Inrush or sealed: 2.4
Operating time (at rated control circuit voltage and at 20 °C)	Between coil energisation and - opening of the N/C contacts	**ms**	4…19	55 ± 15 %	67 ± 15 %
	- closing of the N/O contacts	**ms**	12…22	63 ± 15 %	77 ± 15 %
	Between coil de-energisation and - opening of the N/O contacts	**ms**	4…12	20 ± 20 %	27 ± 20 %
	- closing of the N/C contacts	**ms**	6…17	25 ± 20 %	35 ± 20 %
Short supply failure	Maximum duration without affecting hold-in of the device	**ms**	2	2	2
Maximum operating rate	In operating cycles per second		3	3	3
Mechanical durability In millions of operating cycles	With coil 50/60 Hz (at 50 Hz)		30	–	–
	With standard coil ⎓ wide range		–	30	30
Time constant L/R		**ms**	–	28	40

References: pages B7/9 to B7/11
Dimensions: page B7/26
Schemes: page B7/27

TeSys control relays
TeSys D control relays

TeSys D

Characteristics of instantaneous contacts incorporated in the control relay

Number of contacts				5
Rated operational voltage (Ue)	Up to		**V**	690
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1		**V**	690
	Conforming to UL, CSA		**V**	600
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C		**A**	10
Frequency of the operational current			**Hz**	25...400
Minimum switching capacity	U min		**V**	17
	I min		**mA**	5
Short-circuit protection	Conforming to IEC 60947-5-1			gG fuse: 10 A
Rated making capacity	Conforming to IEC 60947-5-1	I rms		∼ 140, ⎓ 250
Short-time rating	Permissible for	1 s	**A**	100
		500 ms	**A**	120
		100 ms	**A**	140
Insulation resistance			**MΩ**	> 10
Non-overlap time	Guaranteed between N/C and N/O contacts		**ms**	1.5 (on energisation and on de-energisation)
Tightening torque	Philips head n° 2 and Ø6		**N.m**	1.2
Non-overlap distance				Linked contacts in association with auxiliary contacts LAD N
Mechanically linked contacts	Conforming to IEC 60947-5-1			The 3 N/O contacts and the 2 N/C contacts of CAD N32 are linked mechanically by one mobile contact carrier.

References:
pages B7/9 to B7/11

Dimensions:
page B7/26

Schemes:
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TeSys control relays
TeSys D control relays

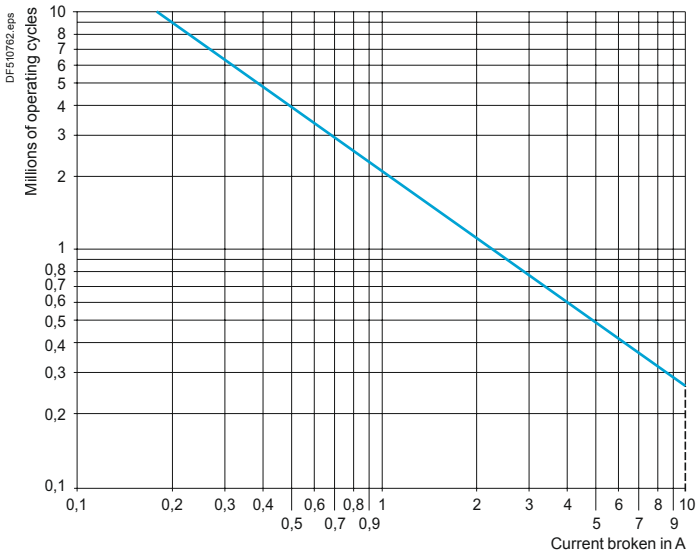
TeSys D

Rated operational power of contacts (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 φ 0.7) = 10 times the power broken (cos φ 0.4).

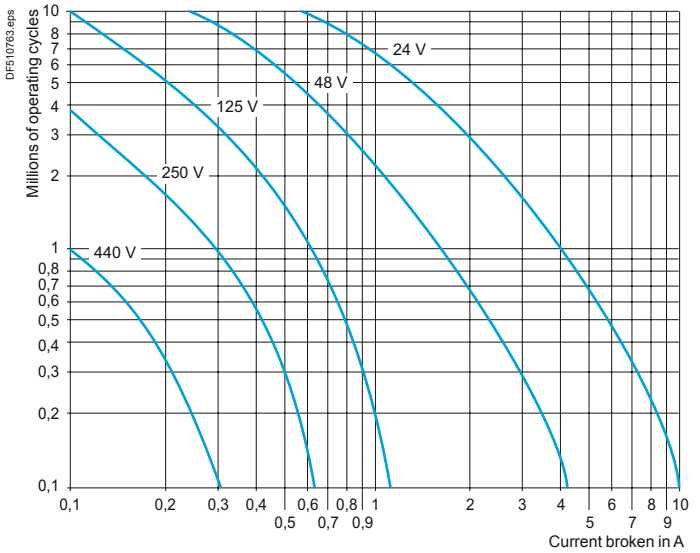
	V	24	48	115	230	400	440	600
1 million operating cycles	VA	60	120	280	560	960	1050	1440
3 million operating cycles	VA	16	32	80	160	280	300	420
10 million operating cycles	VA	4	8	20	40	70	80	100



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	W	120	90	75	68	61
3 million operating cycles	W	70	50	38	33	28
10 million operating cycles	W	25	18	14	12	10

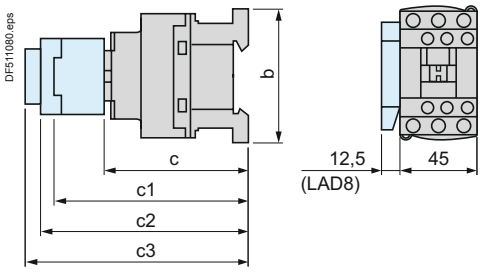


Control relays

TeSys D

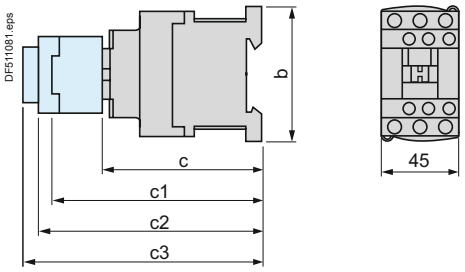
Dimensions

CAD ∼



CAD		32 50	323 503
b		77	99
c	without cover or add-on blocks	84	84
	with cover, without add-on blocks	86	86
c1	with LAD N or C (2 or 4 contacts)	117	117
c2	with LAD 6K10	129	129
c3	with LAD T, R, S	137	137
	with LAD T, R, S and sealing cover	141	141

CAD ⎓ or LC (low consumption)

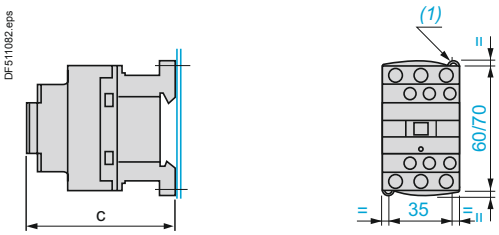


CAD		32 50	323 503
b		77	99
c	without cover or add-on blocks	93	93
	with cover, without add-on blocks	95	95
c1	with LAD N or C (2 or 4 contacts)	126	126
c2	with LAD 6K10	138	138
c3	with LAD T, R, S	146	146
	with LAD T, R, S and sealing cover	150	150

Mounting

CAD

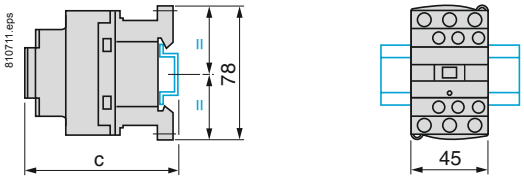
Panel mounted



		CAD ∼	CAD ⎓ or LC
c	with cover	86	95

(1) 2 elongated holes 4.5 x 9.

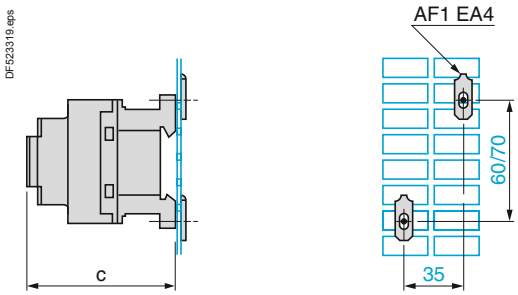
Mounted on rail AM1 DP200 or DE200



		CAD ∼	CAD ⎓ or LC
c	(AM1 DP200) (2)	88	97
c	(AM1 DP200) (2)	96	105

(2) With cover.

Mounted on plate AM1 P



		CAD ∼	CAD ⎓ or LC
c	with cover	86	95

References:
pages B7/9 to B7/11

Illustration:
page B7/8

Characteristics:
pages B7/22 and B7/25

Schemes:
page B7/27

TeSys control relays

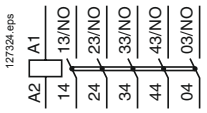
TeSys D control relays and add-on blocks

TeSys D

Instantaneous auxiliary contacts

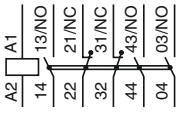
5 N/O

CAD 50



3 N/O + 2 N/C

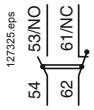
CAD 32



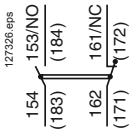
Instantaneous auxiliary contact blocks

1 N/O + 1 N/C

LAD N11

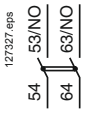


LAD 8N11 (1)

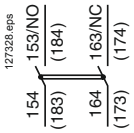


2 N/O

LAD N20

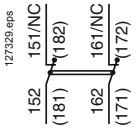


LAD 8N20 (1)

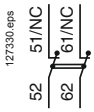


2 N/C

LAD 8N02



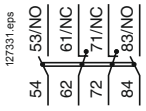
LAD N02



(1) The figures in brackets are for the device mounted on the RH side of the control relay.

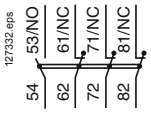
2 N/O + 2F N/C

LAD N22



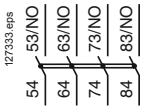
1 N/O + 3 N/C

LAD N13



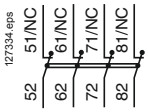
4 N/O

LAD N40



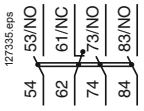
4 N/C

LAD N04



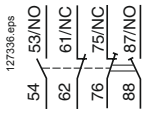
3 N/O + 1 N/C

LAD N31



2 N/O + 2 N/C including 1 N/O + 1 N/C make before break

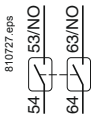
LAD C22



With dust and damp protected contacts

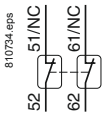
2 N/O protected

LA1 DX20



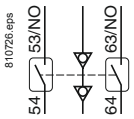
2 N/C protected

LA1 DX02



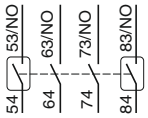
2 N/O protected (2)

LA1 DY20



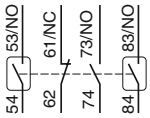
2 N/O protected + 2 N/O non protected

LA1 DZ40



2 N/O protected + 1 N/O + 1 N/C non protected

LA1 DZ31

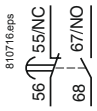


(2) Product fitted with 4 earth screen continuity terminals.

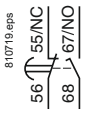
Time delay auxiliary contact blocks

On-delay 1 N/O + 1 N/C

LAD T

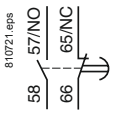


LAD S



Off-delay 1 N/O + 1 N/C

LAD R



Mechanical latch blocks

LAD 6K10