

## Characteristics

# Control relays

## K mini-control relays

### Environment

<b>Conforming to standards Approvals</b>		IEC/EN 60947-1, 60947-5-1, NF C 63-140, VDE 0660 UL, CSA, DEMKO, NEMKO, SEMKO																																				
<b>Operating position</b>		Without derating Without derating Possible positions for <b>CA2-K</b> only, with derating, call our Customer information centre on 0870 608 8 608.																																				
<b>Connection</b>		<table border="1"> <thead> <tr> <th></th> <th>Min</th> <th>Max</th> <th>Max to IEC/EN 60947</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Screw clamp connections</td> <td>Solid cable</td> <td>1 x 1.5</td> <td>2 x 4</td> <td>1 x 4 + 1 x 2.5</td> </tr> <tr> <td>Flexible cable without cable end</td> <td>1 x 0.75</td> <td>2 x 4</td> <td>2 x 2.5</td> </tr> <tr> <td>Flexible cable with cable end</td> <td>1 x 0.34</td> <td>1 x 1.5 + 1 x 2.5</td> <td>1 x 1.5 + 1 x 2.5</td> </tr> <tr> <td rowspan="2">Spring terminal connections</td> <td>Solid cable</td> <td>1 x 0.75</td> <td>1 x 1.5</td> <td>2 x 1.5</td> </tr> <tr> <td>Flexible cable without cable end</td> <td>1 x 0.75</td> <td>1 x 1.5</td> <td>2 x 1.5</td> </tr> <tr> <td>Faston connectors</td> <td>Clip</td> <td>2 x 2.8 or 1 x 6.35</td> <td></td> <td></td> </tr> <tr> <td>Solder pins for printed circuit board</td> <td>With locating device between power circuit and control circuit</td> <td></td> <td>4 mm x 35 microns</td> <td></td> </tr> </tbody> </table>		Min	Max	Max to IEC/EN 60947	Screw clamp connections	Solid cable	1 x 1.5	2 x 4	1 x 4 + 1 x 2.5	Flexible cable without cable end	1 x 0.75	2 x 4	2 x 2.5	Flexible cable with cable end	1 x 0.34	1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5	Spring terminal connections	Solid cable	1 x 0.75	1 x 1.5	2 x 1.5	Flexible cable without cable end	1 x 0.75	1 x 1.5	2 x 1.5	Faston connectors	Clip	2 x 2.8 or 1 x 6.35			Solder pins for printed circuit board	With locating device between power circuit and control circuit		4 mm x 35 microns	
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Solder pins for printed circuit board	With locating device between power circuit and control circuit		4 mm x 35 microns																																			
<b>Tightening torque</b>	Philips head n° 2 and Ø 6	<b>N.m</b> 0.8...1.3																																				
<b>Terminal referencing</b>	Conforming to standards EN 50005 and EN 50011	Up to 8 contacts																																				
<b>Protective treatment</b>	Conforming to IEC/EN 60068 (DIN 50016)	"TC" (Klimafest, Climateproof)																																				
<b>Degree of protection</b>	Conforming to VDE 0106	Protection against direct finger contact (devices with screw clamp terminals or pins for printed circuit board)																																				
<b>Ambient air temperature around the device</b>	Storage	°C - 50...+ 80																																				
	Operation	°C - 25...+ 50																																				
<b>Maximum operating altitude</b>	Without derating	<b>m</b> 2000																																				
<b>Vibration resistance</b>	Control relay open	2 gn																																				
5...300 Hz	Control relay closed	4 gn																																				
<b>Flame resistance</b>	Conforming to UL 94	Self-extinguishing material V1																																				
	Conforming to NF F 16-101 and 16-102	Conforming to requirement 2																																				
<b>Shock resistance</b>	Control relay open	10 gn																																				
(half sine wave, 11 ms)	Control relay closed	15 gn																																				
<b>Safe circuit separation</b>	Conforming to VDE 0106 and IEC/EN 60536	VLSV (Very Low Safety Voltage), up to 400 V																																				

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### Control circuit characteristics

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Type of control relay		CA2-K	CA3-K	CA4-K
<b>Rated control circuit voltage (Uc)</b>		V ~ 12...690	≡ 12...250	≡ 12...120
<b>Control voltage limits</b> (≤ 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
<b>Mechanical durability</b> at Uc In millions of operating cycles	50/60 Hz coil	10	–	–
	Standard ≡ coil	–	20	–
	Wide range, low consumption ≡ coil	–	–	30
<b>Maximum operating rate</b>	In operating cycles per hour	10,000	10,000	6000
<b>Average consumption</b> at 20 °C and at Uc	Inrush	30 VA	3 W	1.8 W
	Sealed	4.5 VA	3 W	1.8 W
<b>Heat dissipation</b>		<b>W</b> 1.3	3	1.8
<b>Operating time</b> at 20 °C and at Uc	Between coil energisation and - opening of the N/C contacts - closing of the N/O contacts	<b>ms</b> 5...15 <b>ms</b> 10...20	25...35 30...40	25...35 30...40
	Between coil de-energisation and - opening of the N/O contacts - closing of the N/C contacts	<b>ms</b> 10...20 <b>ms</b> 15...25	10 15	10...20 15...25
<b>Maximum immunity to micro breaks</b>		<b>ms</b> 2	2	2

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## Characteristics

# Control relays

## K mini-control relays

### Contact characteristics of mini-control relays and instantaneous contact blocks

<b>Number of contacts</b>	On <b>CA●-K</b>		4
	On <b>LA1-K</b>		2 or 4 for CA2-K and CA3-K: 2 for CA4-K
<b>Rated operational voltage (Ue)</b>	Up to	<b>V</b>	690
<b>Rated insulation voltage (Ui)</b>	Conforming to IEC/EN 60947-1, IEC/EN 60947-5-1	<b>V</b>	690
	Conforming to VDE 0110 group C	<b>V</b>	750
	Conforming to CSA C 22-2 n° 14	<b>V</b>	600
<b>Conventional thermal current (Ith)</b>	For ambient temperature ≤ 50 °C	<b>A</b>	10
<b>Operational current frequency</b>		<b>Hz</b>	Up to 400
<b>Minimum switching capacity</b>	U min (DIN 19 240)	<b>V</b>	17
	I min	<b>mA</b>	5
<b>Short-circuit protection</b>	Conforming to IEC/EN 60947-1 & VDE 0660, gG fuse	<b>A</b>	10
<b>Rated making capacity</b>	Conforming to IEC/EN 60947-1 I rms	<b>A</b>	110
<b>Overload current</b>	Permissible for	1 s	<b>A</b> 80
		500 ms	<b>A</b> 90
		100 ms	<b>A</b> 110
<b>Insulation resistance</b>		<b>MΩ</b>	> 10
<b>Make before break distance</b>	<b>CA●-K and LA1-K</b> : linked contacts as per INRS, BIA and CNA specifications	<b>mm</b>	0.5 (see schemes, page 6/15)

**Operational power of contacts**  
Conforming to IEC/EN 60947-5-1

**a.c. supply, category AC-15**

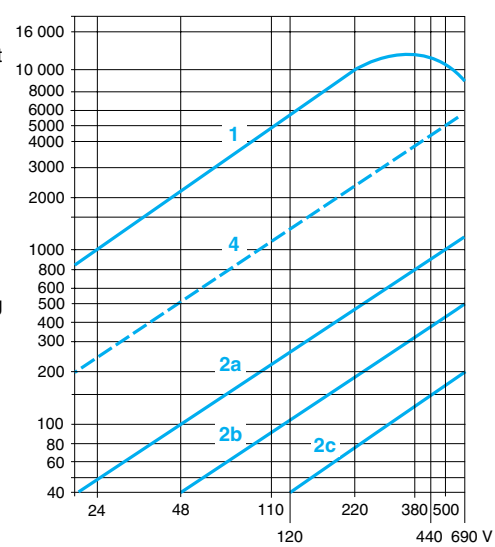
Electrical durability (valid up to 3600 operating cycles per hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times breaking current (cos φ 0.4).

	24	48	110/127	220/230	380/400	440	600/690
<b>V</b>	48	96	240	440	800	880	1200
<b>VA</b>	17	34	86	158	288	317	500
<b>VA</b>	7	14	36	66	120	132	200
<b>VA</b>	1000	2050	5000	10,000	14,000	13,000	9000

1 million operating cycles  
3 million operating cycles  
10 million operating cycles  
Occasional making capacity

- Breaking limit of contacts valid for:
  - maximum of 50 operating cycles at 10 s intervals (breaking current = making current x cos φ 0.7).
- Electrical durability of contacts for:
  - 1 million operating cycles (2a),
  - 3 million operating cycles (2b),
  - 10 million operating cycles (2c).
- 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.
- Thermal limit.

Power broken in VA

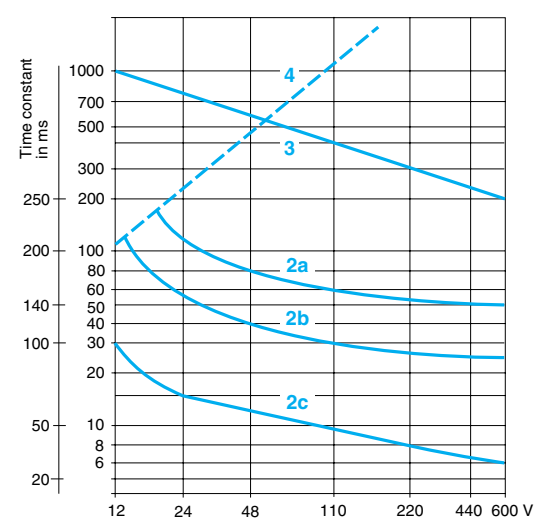


**d.c. supply, category DC-13**

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

	24	48	110	220	440	600
<b>V</b>	120	80	60	52	51	50
<b>W</b>	55	38	30	28	26	25
<b>W</b>	15	11	9	8	7	6
<b>W</b>	720	600	400	300	230	200

Power broken in W



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Schneider Electric

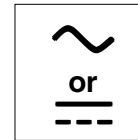
Telemecanique

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## References

## Control relays

K mini-control relays  
For control circuit: a.c. or d.c.



### Mini-control relays for a.c. control circuit



CA2-KN40●●

- Mounted on 35 mm rail or Ø 4 screw fixing.
- Screws in open "ready-to-tighten" position.

Control circuit	Auxiliary contacts	Basic reference. Complete with code indicating control circuit voltage (1)	Weight
			kg

Consumption

#### Screw clamp connections

4.5 VA			
	4	-	CA2-KN40●● 0.180
	3	1	CA2-KN31●● 0.180
	2	2	CA2-KN22●● 0.180

#### Spring terminal connections

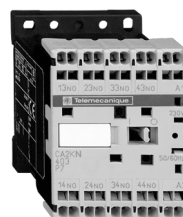
4.5 VA			
	4	-	CA2-KN403●● 0.180
	3	1	CA2-KN313●● 0.180
	2	2	CA2-KN223●● 0.180

#### Faston connectors, 1 x 6.35 or 2 x 2.8

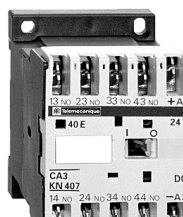
4.5 VA			
	4	-	CA2-KN407●● 0.180
	3	1	CA2-KN317●● 0.180
	2	2	CA2-KN227●● 0.180

#### Solder pins for printed circuit boards

4.5 VA			
	4	-	CA2-KN405●● 0.210
	3	1	CA2-KN315●● 0.210
	2	2	CA2-KN225●● 0.210



CA2-KN403●●



CA3-KN407●●

### Mini-control relays for d.c. control circuit

- Mounted on 35 mm rails or Ø 4 screw connections.
- Screws in open "ready-to-tighten" position.

#### Screw clamp connections

3 W			
	4	-	CA3-KN40●● 0.225
	3	1	CA3-KN31●● 0.225
	2	2	CA3-KN22●● 0.225

#### Spring terminal connections

3 W			
	4	-	CA3-KN403●● 0.225
	3	1	CA3-KN313●● 0.225
	2	2	CA3-KN223●● 0.225

#### Faston connectors, 1 x 6.35 or 2 x 2.8

3 W			
	4	-	CA3-KN407●● 0.225
	3	1	CA3-KN317●● 0.225
	2	2	CA3-KN227●● 0.225

#### Solder pins for printed circuit boards

3 W			
	4	-	CA3-KN405●● 0.255
	3	1	CA3-KN315●● 0.255
	2	2	CA3-KN225●● 0.255

(1) Standard control circuit voltages (for other voltages, please call our Customer information centre on 0870 608 8 608).  
Control relays CA2-K (0.8...1.15 Uc) (0.85...1.1 Uc)

Volts ~	12	20	24(2)	36	42	48	110	115	127	220/	230	230/	380/	400	400/	440	500	660/
50/60 Hz										230		240	400		415			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 (~ control voltage code Z7, --- control circuit voltage code ZD) so as to compensate for the incurred voltage drop.

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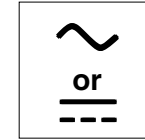
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## References

## Control relays

K mini-control relays  
For control circuit: a.c. or d.c.



CA4-KN40●●●

### Low consumption mini-control relays (a.c. control circuit)

- Mounted on 35 mm rail or Ø 4 screw fixing.
- Screws in open "ready-to-tighten" position.

Control circuit	Auxiliary contacts	Basic reference. Complete with code indicating control circuit voltage (1)	Weight
Consumption			kg
<b>Screw clamp connections</b>			
1.8 W	4 -	CA4-KN40●●	0.235
	3 1	CA4-KN31●●	0.235
	2 2	CA4-KN22●●	0.235
<b>Spring terminal connections</b>			
1.8 W	4 -	CA4-KN403●●	0.235
	3 1	CA4-KN313●●	0.235
	2 2	CA4-KN223●●	0.235
<b>Faston connectors, 1 x 6.35 or 2 x 2.8</b>			
1.8 W	4 -	CA4-KN407●●	0.235
	3 1	CA4-KN317●●	0.235
	2 2	CA4-KN227●●	0.235
<b>Solder pins for printed circuit boards</b>			
1.8 W	4 -	CA4-KN405●●	0.265
	3 1	CA4-KN315●●	0.265
	2 2	CA4-KN225●●	0.265

(1) Standard control circuit voltages (for other voltages, please call our Customer information centre on 0870 608 8 608).

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

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## References

## Control relays

K mini-control relays  
Instantaneous and time delay auxiliary contact blocks



### Instantaneous auxiliary contact blocks

#### Clip-on front mounting, 1 block per control relay

Type of connection	Composition	Reference	Weight
			kg
<b>Screw clamp</b>	2 -	<b>LA1-KN20</b>	0.045
	- 2	<b>LA1-KN02</b>	0.045
	1 1	<b>LA1-KN11</b>	0.045
	4 -	<b>LA1-KN40 (1)</b>	0.045
	3 1	<b>LA1-KN31 (1)</b>	0.045
	2 2	<b>LA1-KN22 (1)</b>	0.045
	1 3	<b>LA1-KN13 (1)</b>	0.045
	- 4	<b>LA1-KN04 (1)</b>	0.045
<b>Spring terminal</b>	2 -	<b>LA1-KN203</b>	0.045
	- 2	<b>LA1-KN023</b>	0.045
	1 1	<b>LA1-KN113</b>	0.045
	4 -	<b>LA1-KN403 (1)</b>	0.045
	3 1	<b>LA1-KN313 (1)</b>	0.045
	2 2	<b>LA1-KN223 (1)</b>	0.045
	1 3	<b>LA1-KN133 (1)</b>	0.045
	- 4	<b>LA1-KN043 (1)</b>	0.045
<b>Faston connectors</b> 1 x 6.35 or 2 x 2.8	2 -	<b>LA1-KN207</b>	0.045
	- 2	<b>LA1-KN027</b>	0.045
	1 1	<b>LA1-KN117</b>	0.045
	4 -	<b>LA1-KN407 (1)</b>	0.045
	3 1	<b>LA1-KN317 (1)</b>	0.045
	2 2	<b>LA1-KN227 (1)</b>	0.045
	1 3	<b>LA1-KN137 (1)</b>	0.045
	- 4	<b>LA1-KN047 (1)</b>	0.045

### Electronic time delay contact blocks

- Relay output with common point changeover contact,  $\sim$  or  $\equiv$  240 V, 2 A maximum
- Control voltage: 0.85...1.1  $U_c$
- 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

#### Clip-on front mounting, 1 block per control relay

Voltage	Type	Timing range	Composition	Reference	Weight
					kg
$\sim$ or $\equiv$ 24...48	On-delay	1...30	1	<b>LA2-KT2E</b>	0.040
$\sim$ 110...240	On-delay	1...30	1	<b>LA2-KT2U</b>	0.040

For other electronic timers type RE7, see pages 6/26 to 6/34.

(1) Block of 4 contacts for use only on CA2-K and CA3-K

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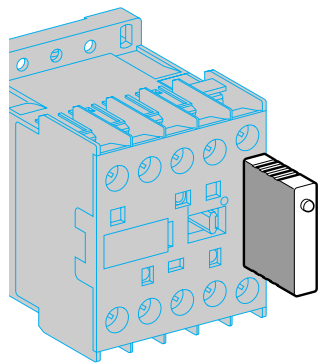
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## References

## Control relays

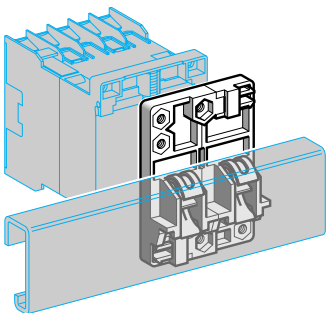
K mini-control relays  
Suppressor modules  
Mounting and marking accessories



LA4-K●●●

### Suppressor modules incorporating LED indicator

Mounting and connection	Type	For voltages	Sold in lots of	Unit reference	Weight kg
Clips onto front of relay with locating device. No tools required for connection.	Varistor (1)	~ and --- 12...24 V	5	LA4-KE1B	0.010
		~ and --- 32...48 V	5	LA4-KE1E	0.010
		~ and --- 50...129 V	5	LA4-KE1FC	0.010
		~ and --- 130...250 V	5	LA4-KE1UG	0.010
	Diode + Zener diode (2)	--- 12...24 V	5	LA4-KC1B	0.010
		--- 32...48 V	5	LA4-KC1E	0.010
	RC (3)	~ 220...250 V	5	LA4-KA1U	0.010



LA9-D973

### Mounting accessories

Description	Application		Sold in lots of	Unit reference	Weight kg
<b>Mounting plates</b>	On 1 rail	Clip-on fixing	1	LA9-D973	0.025
	On 2 rails	110/120 mm fixing centres	10	DX1-AP25	0.065

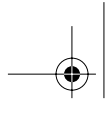
### Marking accessories

Description	Application		Sold in lots of	Unit reference	Weight kg
<b>Marker holder</b>	Clip-on fixing on front face	—	100	LA9-D90	0.001
<b>Clip-in markers</b>	4 maximum per relay	Strips of 10 identical numbers 0 to 9	25	AB1-R● (4)	0.002
		Strips of 10 identical capital letters A to Z	25	AB1-G● (4)	0.002

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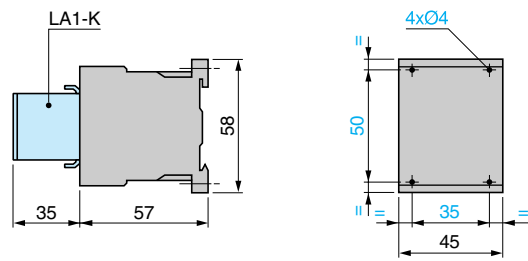
(1) Protection by limitation of the transient voltage to 2 Uc max. Maximum reduction of transient voltage peaks. Slight time delay on drop-out (1.1 to 1.5 times the normal time).  
(2) No overvoltage or oscillation frequency. Polarised component. Slight time delay on drop-out (1.1 to 1.5 times the normal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



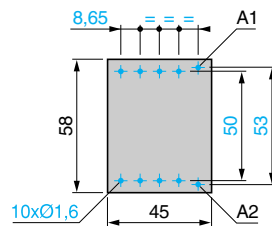
## Dimensions, mounting

## Control relays K mini-control relays

### Mini-control relays CA2-K, CA3-K, CA4-K On panel



### On printed circuit board



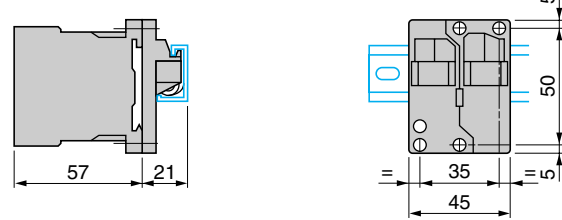
Contactor pins Ø 1.55

### On mounting rail AM1-DP200 or AM1-DE200 (L= 35 mm)

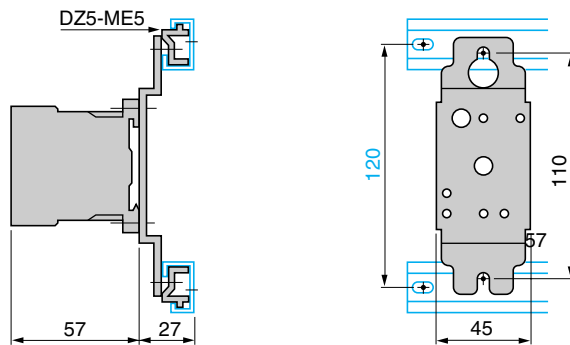


### On asymmetrical rail with clip-on mounting plates LA9-D973

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### DX1-AP25



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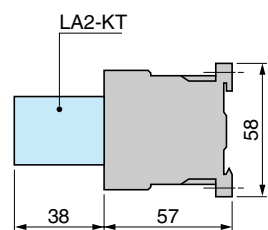
### Electronic time delay contact blocks LA2-KT



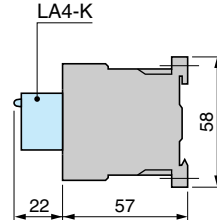
### Suppressor modules LA4-K



### On mini-control relay



### On mini-control relay



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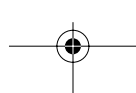
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Schneider Electric



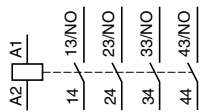
## Schemes

## Control relays

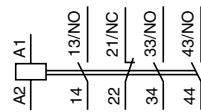
### K mini-control relays

#### Mini-control relays CA2-K, CA3-K, CA4-K

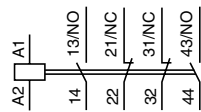
4 N/O



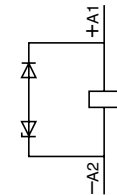
3 N/O + 1 N/C



2 N/O + 2 N/C

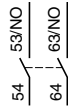


#### With integral suppression device CA4-K



#### Instantaneous auxiliary contact blocks LA1-K for CA2-K, CA3-K, CA4-K

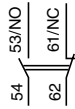
2 N/O  
LA1-KN20  
LA1-KN207



2 N/C  
LA1-KN02  
LA1-KN027



1 N/O + 1 N/C  
LA1-KN11  
LA1-KN117

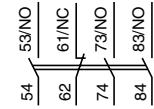


#### for CA2-K, CA3-K

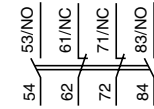
4 N/O  
LA1-KN40  
LA1-KN407



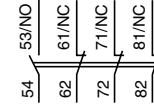
3 N/O + 1 N/C  
LA1-KN31  
LA1-KN317



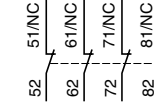
2 N/O + 2 N/C  
LA1-KN22  
LA1-KN227



1 N/O + 3 N/C  
LA1-KN13  
LA1-KN137

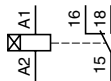


4 N/C  
LA1-KN04  
LA1-KN047

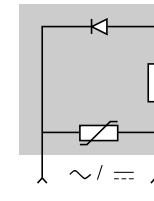
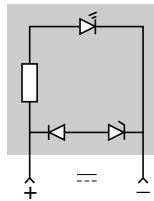


#### Electronic time delay contact blocks LA2-KT for CA2-K, CA3-K, CA4-K

1 C/O  
LA2-KT2



#### Suppressor modules LA4-KC LA4-KE



6

6.2



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