

# MINI-CONTACTORS K1

Data according to IEC / EN60947-4-1, VDE 0660

Type K1-09D.. K1-09F.. K1-09L.. K1-12D..

## Main Contacts <sup>1) 2) 3)</sup>

Rated insulation voltage $U_i$		V~	690 <sup>1)</sup>	690 <sup>1)</sup>	690 <sup>2)</sup>	690 <sup>1)</sup>
Making capacity $I_{eff}$	at $U_e = 690V\sim$	A	165	165	165	165
Breaking capacity $I_{eff}$	400V~	A	100	100	100	100
$\cos\varphi = 0,65$	500V~	A	90	90	90	90
	690V~	A	80	80	80	80

## Utilization category AC1 Switching of resistive load

Rated operational current $I_e (=I_{th})$	open	at 40°C		20	16	16	20
		Rated operational power of three-phase resistive loads	230V	kW	7,9	6	6
50-60Hz, $\cos\varphi = 1$	enclosed	at 60°C		16	12	12	16
		230V	kW	6,3	4,5	4,5	6,3
		240V	kW	6,7	5	5	6,7
Rated operational power of three-phase resistive loads	enclosed	400V	kW	13,8	11	11	13,8
		415V	kW	14,3	11,5	11,5	14,3
		230V	kW	6,3	4,5	4,5	6,3
50-60Hz, $\cos\varphi = 1$	enclosed	240V	kW	6,7	5	5	6,7
		400V	kW	11	8	8	11
		415V	kW	11,5	8,5	8,5	11,5
Minimum cross-section of conductor at load with $I_e (=I_{th})$		mm <sup>2</sup>	2,5	2,5	-	2,5	

## Utilization category AC2 and AC3 Switching of three-phase motors

Rated operational current $I_e$	open and enclosed	220V		12	12	12	15
		230V	A	11,5	11,5	11,5	14,5
Rated operational power of three-phase motors	50-60Hz	240V	A	11	11	11	14
		380-400V	A	9	9	9	12
		415-440V	A	8	8	8	11
		500V	A	7	7	7	9
		660-690V	A	5	5	5	6,5
Rated operational power of three-phase motors	50-60Hz	220-240V	kW	3	3	3	4
		380-440V	kW	4	4	4	5,5
		500-690V	kW	4	4	4	5,5

## Utilization category DC1

Switching of resistive load	1pole	24V	A	20	16	16	20
Time constant $L/R \leq 1ms$		60V	A	20	16	16	20
Rated operational current $I_e$		110V	A	5	5	5	5
		220V	A	0,6	0,6	0,6	0,6

## Power consumption of coils

AC operated	inrush sealed	VA		25	25	25	25
		W	1,2	1,2	1,2	1,2	
DC operated and VM...	inrush sealed	W		2,5	2,5	2,5	2,5
		W	2,5	2,5	2,5	2,5	

## Operation range of coils

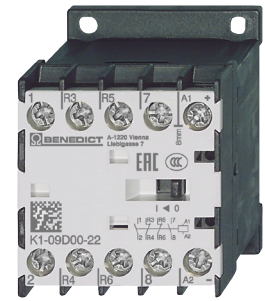
in multiple of control voltage $U_s$ AC operated	0,85-1,1
$U_s$ DC operated	0,8-1,1

## Maximum ambient temperature

Operation	open	°C	-40 bis +60 (+90) <sup>3)</sup>
	enclosed	°C	-40 bis +40
with thermal overload relay	open	°C	-25 bis +60
	enclosed	°C	-25 bis +40
Storage		°C	-50 bis +90

## Short circuit protection contactors without thermal overload relay

Coordination-type "1" acc. IEC 947-4-1,	gL (gG)	A	20	20	20	20
Contact welding without hazard of persons max. fuse size						



Symbol

## Wiring diagram

K1-09D10 K1-09F10 K1-09L10 K1-12D10	
K1-09D01 K1-09F01 K1-09L01 K1-12D01	
K1-09D00-40 K1-09F00-40 K1-09L00-40 K1-12D00-40	
K1-09D00-22 K1-09F00-22 K1-09L00-22 K1-12D00-22	

## Voltage information AC

K1-... 24	24V 50/60Hz
K1-... 230	220-230V 50Hz, 230-250V 60Hz

## Voltage information DC

K1-...= 24	24V = DC
K1-...= 42	42V = DC
K1-...= 220VS	over voltage protection (Transil)

Technical changes reserved

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### Switching time at control voltage $U_c \pm 10\%$ <sup>4) 5)</sup>

AC operated	make time	ms	15-19	15-19	15-19	15-19
	release time	ms	8-25	8-25	8-25	8-25
DC operated	make time	ms	15-50	15-50	15-50	15-50
	release time	ms	8-25	8-25	8-25	8-25
AC + DC operated	arc duration	ms	10-15	10-15	10-15	10-15

### Cable cross-sections

main connector	solid or stranded	mm <sup>2</sup>	0,5-2,5	Fast on connector	Solder connector	0,5-2,5	
	flexible	mm <sup>2</sup>	0,5-2,5			1x6,3x0,8	0,5-2,5
	flexible with multicore cable end	mm <sup>2</sup>	0,5-1,5			or 2x2,8x0,8	Ø 1,15

### Anschlußklemmen

Connecting screws	Pozidrive		M3,5	-	-	M3,5
Screwdriver			Pz2	-	-	Pz2
Tightening torque	Nm		0,8-1,4	-	-	0,8-1,4
Number of clampable conductors per terminal	solid or stranded	AWG	2	-	-	2
			18-14	-	-	18-14

### Auxiliary Contacts

Rated insulation voltage $U_i$		V $\sim$	690 <sup>1)</sup>	690 <sup>1)</sup>	690 <sup>2)</sup>	690 <sup>1)</sup>
Thermal rated current $I_{th}$ bis 690V						
Ambient temperature	40°C	A	10	10	10	10
	60°C	A	6	6	6	6

### Utilization category AC15

Rated operational current $I_e$	220-240V	A	3	3	3	3
	380-415V	A	2	2	2	2
	440V	A	1,6	1,6	1,6	1,6
	500V	A	1,2	1,2	1,2	1,2
	660-690V	A	0,6	0,6	0,6	0,6

### Utilization category DC13

Rated operational current $I_e$	60V	A	2	2	2	2
	110V	A	0,4	0,4	0,4	0,4
	220V	A	0,1	0,1	0,1	0,1

### Short circuit protection max. fuse size

short-circuit current 1kA, contact welding not accepted	gL (gG)	A	20	20	20	20
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## Technical Data to UL508

Type K1-09D.. K1-09F.. K1-09L.. K1-12D..

### Main contacts (cULus)

Rated operational current "General Use"	A	15	15	20	20
Rated operational power of three-phase motors at 60Hz (3ph)	110-120V	hp	1½	1½	2
	200-208V	hp	3	3	3
	220-240V	hp	3	3	3
	440-480V	hp	5	5	7½
	550-600V	hp	7½	7½	10
Rated operational power of AC motors at 60Hz (1ph)	110-120V	hp	½	½	¾
	200-208V	hp	1	1	1½
	220-240V	hp	1½	1½	2
Fuse / Sort-circuit current	A/kA	30/5	30/5	30/5	30/5
Rated voltage	V $\sim$	600	600	600 <sup>3)</sup>	600

### Auxiliary Contacts (cULus)

heavy pilot duty	AC	A600	A600	A600	A600
standard pilot duty	DC	Q600	Q600	Q600	Q600

1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .  
Data for other conditions on request.

2) Suitable at 690V for pollution degree 2,  $U_{imp} = 6kV$ .

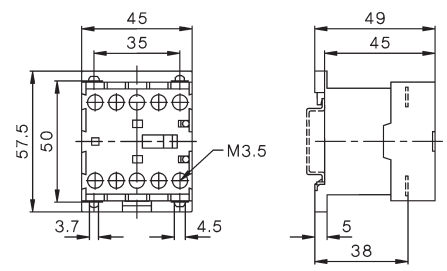
Pollution degree 3  $U_i$   
= 690V non-tracking of the printed circuit CTI  $\geq 600$   
Pollution degree 3  $U_i$   
= 500V non-tracking of the printed circuit CTI  $\geq 400$   
Pollution degree 3  $U_i$   
= 400V non-tracking of the printed circuit CTI  $\geq 100$

3) With reduced control voltage range 0,9 up to 1,0 x  $U_s$  and with reduced thermal rated current  $I_{th}$  to  $I_e$  /AC15

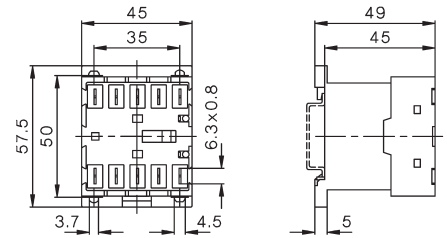
4) Summary switching time = release time + arc duration

5) Release time of NC make time of NO increase when suppressor units for voltage peak protection are used (Varistor, RC-units, Diode units).

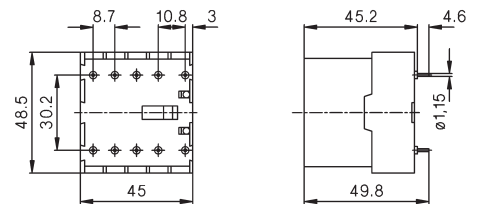
### Dimensions K1-09D.., K1-12D..



### Dimensions K1-09F..



### Dimensions K1-09L..



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