

# 100-K/104-K Miniature Contactors

## Coil Voltage Codes

### ⊗ Coil Voltage Code for screw type terminal versions

The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No. Example: 120V, 60 Hz: Cat. No. 100-K09⊗10 becomes Cat. No.100-K09D10.

AC Voltages [V]	24	110	120	230	240	400	480	600
50 Hz	—	D	—	—	—	—	—	—
60 Hz	—	—	D	—	—	—	B	VC
50/60 Hz	KJ	—	—	KF	KA	KN	—	—

DC Voltages [V]	12	24	110	125	220	250
Standard	ZQ	ZJ	ZD	ZS	ZA	ZT
with Integrated Diode	—	DJ	—	—	—	—

### ⊗ Coil Voltage Code for spring clamp type terminal versions

The Cat. No. as listed is incomplete. Select a coil voltage code from the table below to complete the Cat. No. Example: 120V, 60 Hz: Cat. No. 100-KR09⊗10 becomes Cat. No.100-KR09D10.

AC Voltages [V]	24	110	120	230
50 Hz	—	D	—	—
60 Hz	—	—	D	—
50/60 Hz	KJ	—	—	KF


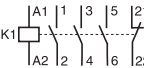
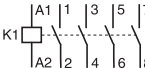
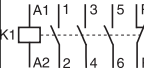

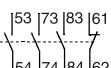
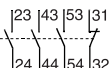
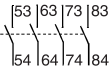
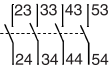
DC Voltages [V]	24	110
Standard	ZJ	ZD
with Integrated Diode	DJ	—

# Assignment of Contacts

## Device Combinations in Accordance with IEC 60947-1 / -4-1

Table valid for : AC / DC = 0.85...1.1 x U<sub>s</sub>, T<sub>amb</sub> = -25 °C...+60 °C, normal position (horizontal rail mounting)

Auxiliary Contact Blocks <sup>(1)</sup>		100-K Miniature Contactors (AC and DC Control)					
	Circuit Diagram	Control	100-K05⊗10 100-K09⊗10 100-K12⊗10	100-K05⊗01 100-K09⊗01 100-K12⊗01	100-K05⊗400 100-K09⊗400 100-K12⊗400	100-K05⊗300 100-K09⊗300 100-K12⊗300	100-K05⊗200 100-K09⊗200 100-K12⊗200
Front Mounting							
100-KFA02E		AC/DC	(2)	01 + 02 = 03 <sup>(3)</sup>	(2)	(2)(3)	—
100-KFC02		AC/DC	10 + 02 = 12	—	00 + 02 = 02	00 + 02 = 02 <sup>(3)</sup>	—
100-KFA11E		AC/DC	(2)	01 + 11 = 12	(2)	(2)	(2)
100-KFB11		AC/DC	10 + 11 = 21	—	00 + 11 = 11	00 + 11 = 11	00 + 11 = 11
100-KFC11		AC/DC	10 + 11 = 21	(2)	00 + 11 = 11	00 + 11 = 11	00 + 11 = 11
100-KFA20E		AC/DC	(2)	01 + 20 = 21	(2)	(2)	(2)
100-KFC20		AC/DC	10 + 20 = 30	(2)	00 + 20 = 20	00 + 20 = 20	00 + 20 = 20
100-KFA04E		AC/DC	(2)(3)	—	(2)(3)	—	—
100-KFC04		AC/DC	10 + 04 = 14 <sup>(3)</sup>	—	00 + 04 = 04 <sup>(3)</sup>	—	—
100-KFA13E		AC/DC	(2)	01 + 13 = 14 <sup>(3)</sup>	(2)	(2)(3)	—
100-KFC13		AC/DC	10 + 13 = 23	(2)(3)	00 + 13 = 13	00 + 13 = 13 <sup>(3)</sup>	—
100-KFA22Z		AC/DC	(2)	01 + 22 = 23 <sup>(3)</sup>	(2)	(2)(3)	—
100-KFB22		AC/DC	10 + 22 = 32	—	00 + 22 = 22	00 + 22 = 22 <sup>(3)</sup>	—
100-KFC22		AC/DC	10 + 22 = 32	(2)(3)	00 + 22 = 22	00 + 22 = 22 <sup>(3)</sup>	—

Auxiliary Contact Blocks <sup>(1)</sup>		100-K Miniature Contactors (AC and DC Control)					
	Circuit Diagram	Control	100-K05⊗10 100-K09⊗10 100-K12⊗10	100-K05⊗01 100-K09⊗01 100-K12⊗01	100-K05⊗400 100-K09⊗400 100-K12⊗400	100-K05⊗300 100-K09⊗300 100-K12⊗300	100-K05⊗200 100-K09⊗200 100-K12⊗200
							
100-KFA31Z		AC/DC	(2)	—	(2)(4)	—	—
100-KFC31		AC/DC	10 + 31 = 41 <sup>(4)</sup>	—	00 + 31 = 31 <sup>(4)</sup>	—	—
100-KFA40E		AC/DC	(2)	—	(2)	(2)	(2)
100-KFC40		AC/DC	10 + 40 = 50	(2)	00 + 40 = 40	00 + 40 = 40	00 + 40 = 40

(1) For other operating limits, please contact your local Rockwell Automation sales office or Allen-Bradley distributor

(2) Combination possible but not recommended, due to repeating or not consecutive sequence numbering

(3) T<sub>amb</sub> max. +40 °C

(4) T<sub>amb</sub> max. +40 °C and only allowed for coil voltage 24V DC or 230V AC

# Specifications





			100-KR		100/104-K		
			05	09	05	09	12
Coil Type:	Conventional		X	X	X	X	X
AC-1 Active Power Load (50 Hz); Ambient temperature 40 °C							
Rated Operational Current, $I_e$	≤500V	[A]	10	10	20	20	20
	690V	[A]	10	10	20	20	20
	230V	[kW]	4	4	8	8	8
	240V	[kW]	4	4	8.3	8.3	8.3
	400V	[kW]	6.9	6.9	14	14	14
	415V	[kW]	7	7	14	14	14
	500V	[kW]	8.7	8.7	17	17	17
	690V	[kW]	12	12	24	24	24
AC-1 Active Power Load (50 Hz); Ambient temperature 60 °C							
Rated Operational Current, $I_e$	≤500V	[A]	10	10	16	16	16
	690V	[A]	10	10	16	16	16
	230V	[kW]	4	4	6.4	6.4	6.4
	240V	[kW]	4	4	6.7	6.7	6.7
	400V	[kW]	6.9	6.9	11	11	11
	415V	[kW]	7	7	12	12	12
	500V	[kW]	8.7	8.7	14	14	14
	690V	[kW]	12	12	19	19	19
Switching of 3-phase Motors; (50 Hz) Ambient temperature 60 °C, AC-2, AC-3							
Rated Operational Current, $I_e$	230V	[A]	6.3	8.5	6.3	11.3	11.3
	240V	[A]	6.3	8.5	6.3	11.3	11.3
	400V	[A]	4.9	8.5	4.9	8.5	11.5
	415V	[A]	4.9	8.5	4.9	8.5	11.5
	500V	[A]	3.9	6.8	3.9	6.8	9.2
	690V	[A]	2.8	4.9	2.8	4.9	6.7
	230V	[kW]	1.5	2.2	1.5	3	3
	240V	[kW]	1.5	2.2	1.5	3	3
	400V	[kW]	2.2	4	2.2	4	5.5
	415V	[kW]	2.2	4	2.2	4	5.5
	500V	[kW]	2.2	4	2.2	4	5.5
	690V	[kW]	2.2	4	2.2	4	5.5
Load Carrying Capacity per UL/CSA							
General Purpose Current (enclosed)		[A]	9	9	12	15	18
Rated power (enclosed) 1-phase	115V	[A]	7.2	7.2	9.8	9.8	13.8
	230V	[A]	6.9	8	8	10	12
	115V	[Hp]	1/3	1/3	0.5	0.5	0.75
	230V	[Hp]	3/4	1	1	1.5	2
	200V	[A]	6.9	7.8	6.9	7.8	11
Rated power (enclosed) 3-phase	230V	[A]	6	6.8	6	6.8	9.6
	460V	[A]	4.8	7.6	4.8	7.6	11
	575V	[A]	3.9	6.1	3.9	6.1	9
	200V	[Hp]	1.5	2	1.5	2	3
	230V	[Hp]	1.5	2	1.5	2	3
	460V	[Hp]	3	5	3	5	7.5
	575V	[Hp]	3	5	3	5	7.5

			100/104-K		
			05	09	12
Coil Type:	Conventional		X	X	X
Switching of 3-phase Motors, (50 Hz); Ambient temperature 60 °C, AC-4					
	230V	[A]	6.3	11.3	11.3
	240V	[A]	6.3	11.3	11.3
	400V	[A]	4.9	8.5	11.5
	415V	[A]	4.9	8.5	11.5
	500V	[A]	3.9	6.8	9.2
	690V	[A]	2.8	4.9	6.7
	230V	[Hp]	1.5	3	3
	240V	[Hp]	1.5	3	3
	400V	[Hp]	2.2	4	5.5
	415V	[Hp]	2.2	4	5.5
	500V	[Hp]	2.2	4	5.5
	690V	[Hp]	2.2	4	5.5
AC-4 at approximately 200,000 operations					
	230V	[A]	2.3	3.9	3.9
	240V	[A]	2.3	3.9	3.9
	400/415V	[A]	2	3.6	3.6
	500V	[A]	1.9	3.2	3.2
	230V <sup>(1)</sup>	[Hp]	0.37	0.75	0.75
	240V <sup>(1)</sup>	[Hp]	0.37	0.75	0.75
	400V <sup>(1)</sup>	[Hp]	0.75	1.5	1.5
	415V <sup>(1)</sup>	[Hp]	0.75	1.5	1.5
	500V <sup>(1)</sup>	[Hp]	0.75	1.5	1.5
	Max. switching frequency	Ops/hour	250	250	250
Wye-Delta (60 Hz)					
	200V	[Hp]	2.2	3	5
	230V	[Hp]	2.2	3	5
	460V	[Hp]	5	7.5	10
	575V	[Hp]	5	7.5	10
Star-Delta Starting (50 Hz)					
	≤ 230V	[A]	11.3	20	20
	≤ 240V	[A]	11.3	20	20
	400V	[A]	8.5	15.5	15.5
	415V	[A]	8.5	15.5	15.5
	500V	[A]	6.8	12.4	12.4
	690V	[A]	4.9	8.9	8.9
	230V <sup>(1)</sup>	[kW]	3	5.5	5.5
	240V <sup>(1)</sup>	[kW]	3	5.5	5.5
	400V <sup>(1)</sup>	[kW]	3	5.5	5.5
	415V <sup>(1)</sup>	[kW]	4	7.5	10
	500V <sup>(1)</sup>	[kW]	4	7.5	11
	690V <sup>(1)</sup>	[kW]	4	7.5	7.5

(1) Power ratings at 50 Hz: Preferred values according to IEC 60072-1

		100/104-K			
		05	09	12	
Coil Type:	Conventional	X	X	X	
Switching of Power Transformers, AC-6a (50 Hz)					
Inrush Current	=n				
Rated transformer current					
n= 30	≤ 230V	[A]	2.9	5.4	5.4
	≤ 240V	[A]	2.9	5.4	5.4
	≤ 400V	[A]	2.4	4.1	5.4
	≤ 415V	[A]	2.4	4.1	5.4
	≤ 500V	[A]	1.8	3.2	3.2
	230V	[kVA]	1.2	2	2
	240V	[kVA]	1.2	2	2
	400V	[kVA]	1.7	2.8	3.4
	415V	[kVA]	1.7	2.8	3.4
	500V	[kVA]	1.7	2.8	3.4
Switching of Lamps					
Gas discharge lamps AC-5a, 40 °C					
open	[A]	18	18	18	
enclosed	[A]	14.5	14.5	14.5	
Individually compensated:					
Max. capacitance at expected					
Short-circuit current of	10 kA	[μF]	750	750	750
	20 kA	[μF]	400	400	400
Filament AC-5b	230/240V	[A]	5	9	9
Switching of Low Inductive Loads in Home Appliances and Similar Applications per IEC 61095 (50 Hz)					
AC-7a	230V	[A]	20	20	20
	400V	[A]	20	20	20
Switching of Motor Load for Home Appliances (50 Hz)					
AC-7b	230V	[A]	6	11	11
	400V	[A]	6	11	11
Switching of Hermetically Sealed Cooling Compressor Motors - manual reset of overload release (50 Hz)					
AC-8a	400V	[A]	11	18	18
	500V	[A]	10	15	15
Switching of DC Loads					
Non-inductive or slightly inductive loads or resistance furnaces DC-1, 60 °C					
1 pole	24V	[A]	6	9	9
	48/60V	[A]	4/1	6/1.5	6/1.5
	110V	[A]	0.6	1	1
	220V	[A]	0.2	0.3	0.3
	440V	[A]	0.08	0.1	0.1
2 poles in series	24V	[A]	6	9	9
	48/60V	[A]	6	8	8
	110V	[A]	4	6	6
	220V	[A]	0.8	1.2	1.2
	440V	[A]	0.2	0.3	0.3

			100/104-K			
			05	09	12	
Coil Type:	Conventional		X	X	X	
3 poles in series	24V	[A]	6	9	9	
	48/60V	[A]	6	9	9	
	110V	[A]	6	9	9	
	220V	[A]	3	4	4	
	440V	[A]	0.4	0.6	0.6	
Shunt-wound Motors						
Starting, reverse current braking, reversing, stepping DC-3, 60 °C						
3 poles in series	24V	[A]	5	9	9	
	48/60V	[A]	4	6	6	
	110V	[A]	2	3	3	
	220V	[A]	0.8	1.2	1.2	
	440V	[A]	0.15	0.2	0.2	
Series-wound Motors						
Starting, reverse current braking, reversing, stepping DC-5, 60 °C						
3 poles in series	24V	[A]	5	9	9	
	48/60V	[A]	2	3	3	
	110V	[A]	0.6	1	1	
	220V	[A]	0.1	0.1	0.1	
Short Time Withstand $I_{CW}$ 60 °C		10 s	[A]	60	96	96
Resistance and Power Dissipation						
Main current circuit resistance		[mΩ]	2.2	2.2	2.2	
Power dissipation by all circuits at $I_e$ AC-3/400V		[W]	0.3	0.9	0.9	
Total power dissipation						
At $I_e$ AC-3/400V	AC control	[W]	2.1	2.7	2.7	
	DC control (electronic)	[W]	2.9	3.5	3.5	
Lifespan						
Mechanical AC control		[Mil. operationss]	15	15	15	
Mechanical DC control		[Mil. operationss]	15	15	15	
Electrical AC-3 (400 V)		[Mil. operationss]	0.7	0.7	0.7	
Weight						
AC	Non-Rev.	kg (lbs.)	0.16 (0.35)			
	Rev.	kg (lbs.)	0.4 (0.88)			
DC	Non-Rev.	kg (lbs.)	0.2 (0.44)			
	Rev.	kg (lbs.)	0.48 (1.06)			

			100-KR		100/104-K		
			05	09	05	09	12
Coil Type:	Conventional		X	X	X	X	X
Conductor Cross Sections - Main Contacts Terminal type					 (2)		
	1 conductor	[mm <sup>2</sup> ]	0.50...2.5		0.75...2.5		
	2 conductors	[mm <sup>2</sup> ]	0.50...2.5		0.75...2.5		
	1 conductor	[mm <sup>2</sup> ]	0.75...2.5 (1)		1...4		
	2 conductors	[mm <sup>2</sup> ]	0.75...2.5 (1)		1...2.5+1...4		
Recommended torque		[N•m]	—		1.2		
Cross section per UL/CSA		[AWG]	18...14 (1)		18...12		
Recommended torque		[lb-in]	—		10.6		

(1) Fine- or coarse-stranded only

(2) Pozidriv No. 2 / Blade No. 3 screw

## Short-Circuit Coordination Data

See [www.ab.com/certifications/ul508a](http://www.ab.com/certifications/ul508a) for complete short-circuit current ratings.



		100/104-K		
		05	09	12
Coil Type:	Conventional	X	X	X
Short Circuit Coordination (Max. Fuse or Circuit Breaker Rating) Per IEC 60947-4-1 (contactor and fuses only)				
DIN Fuses- gG, gL		50 kA Available Fault Current		
Type "1" (690V)	[A]	35	35	35
Type "2" (400V)	[A]	16	20	20
Per UL 508 and CSA 22.2 No. 14 (contactor and fuses or circuit breaker only)				
UL Class K5 and RK5 Fuses		5 kA Available Fault Current		
UL Listed Combination (600V)	[A]	40	40	40
UL Class CC and CSA HRCI-MISC Fuses				
UL Listed Combination (600V)	[A]	30	30	30
UL Class J and CSA HRCI-J Fuses		50 kA Available Fault Current		
UL Listed Combination (600V)	[A]	30	30	30

## Coil Data

		100/104-K		
		05	09	12
Coil Type:	Conventional	X	X	X
Operating Limits				
50 Hz, 60 Hz, 50/60 Hz	pick-up	[x U <sub>s</sub> ]	0.85...1.1	
	dropout	[x U <sub>s</sub> ]	0.2...0.75	
DC (conventional)	pick-up	[x U <sub>s</sub> ]	0.8...1.1 0.7...1.25 <sup>(1)</sup>	
	dropout	[x U <sub>s</sub> ]	0.1...0.75	
Coil Consumption				
50 Hz, 60 Hz, 50/60 Hz	pick-up	[VA]	35	
	hold-in	[VA/W]	5/1.8	
DC (conventional)	pick-up	[W]	cold 3.0, warm 2.6	
	hold-in	[W]	cold 3.0, warm 2.6	
Operating Times				
AC	closing delay	[ms]	15...40	
	opening delay	[ms]	15...33	
With RC module	closing delay	[ms]	15...28	
DC (conventional)	opening delay	[ms]	18...40	
	closing delay	[ms]	6...12	
With integrated diode	opening delay	[ms]	8...12	
With external diode	opening delay	[ms]	35...50	

(1) For 9, 12, 24, and 110V DC coils

## Auxiliary Contacts, Auxiliary Contact Blocks, and Pneumatic Timers

			Internal	Front mounted
Switching of AC Loads				
AC-12 $I_{th}$	at 40 °C	[A]	10	10
	at 60 °C	[A]	6	6
AC-15 at rated voltage of	24V	[A]	6	3
	42/48V	[A]	6	3
	120V	[A]	6	3
	230V	[A]	3	2
	240V	[A]	3	2
	400V	[A]	1.8	1.2
	415V	[A]	1.8	1.2
	500V	[A]	1.4	1.0
690V	[A]	1.0	0.6	
Switching of DC Loads				
DC-12 L/R < 1 ms resistive loads at	24V DC	[A]	6	—
	48V DC	[A]	4	—
	110V DC	[A]	0.6	—
	220V DC	[A]	0.2	—
	440V DC	[A]	0.08	—
DC-14L/R < 15 ms inductive loads with economy resistor in series at	24V DC	[A]	4	—
	48V DC	[A]	2.5	—
	110V DC	[A]	0.4	—
	220V DC	[A]	0.12	—
	440V DC	[A]	0.05	—
DC-13 switching electromagnets at	24V DC	[A]	2.8	2.3
	48V DC	[A]	1.2	1
	110V DC	[A]	0.55	0.55
	220V DC	[A]	0.27	0.27
	440V DC	[A]	0.15	0.15
Fuse gG				
		[A]	10	10
		[A]	10	10
Min. switching capacity according to IEC 60947-5-4			15V/ 10 mA	15V/ 2 mA
Load Carrying Capacity per UL/CSA				
Rated voltage	AC	[V]	max.600	
Continuous rating	40 °C	[A]	10	
Switching capacity	AC	[A]	A600	B600
Rated voltage	DC	[V]	max.600	
Switching capacity	DC	[A]	Q600	

## General

Rated Isolation Voltage $U_i$		
IEC	[V]	690
UL, CSA	[V]	600
Rated Impulse Voltage Withstand $U_{imp}$	[kV]	6
Rated Voltage $U_e$		
AC 50/60 Hz	[V]	230, 240, 400, 415, 460, 500, 575, 690
DC	[V]	24, 48, 110, 220, 440
Insulation Class of the Coil		Class F per IEC 60085 Class 105 insulation system per UL 508
Rated coil frequency		AC 50/60 Hz, DC
Ambient Temperature		
Storage	[°C]	-55...+80
Operation at rated voltage	[°C]	-25...+60
at 70 °C		15% current reduction against 60 °C values
Climatic Withstand		IEC60068-2-30
Max. Altitude of Installation Site	[m]	2000 NN, per IEC60947-4
Protection Class		IP2X
Single contactor cover		—
Contactor with frame terminal block		—
Auxiliary contact		IP2X
Protection against Accidental Contact		—
Resistance to Shock		IEC60068-2
Resistance to Vibration		IEC60068-2
Mechanically Linked Contacts IEC60947-5-1,AnnexL		100-K... (on main device)
Mirror Contacts IEC60947-4 Annex F		100-K...+100-KF...

## Standards Compliance and Certifications

Standards Compliance	Certifications
IEC/EN 60947-1,-4-1,-5-1,-5-4	CE Marked
UL 508	CCC
CSA 22.2. No. 14	cULus Listed (File No. E41850, Guide NLDX, NLDX7)
NF F 62-000	
Meets the material restrictions for European Directive 2002/95/IEC-EU-RoHS	

# Life-Load Curves

Figure 1 - AC-3, Switching of squirrel-cage motors while starting /AC-1, Non- or slightly inductive loads, resistance furnaces

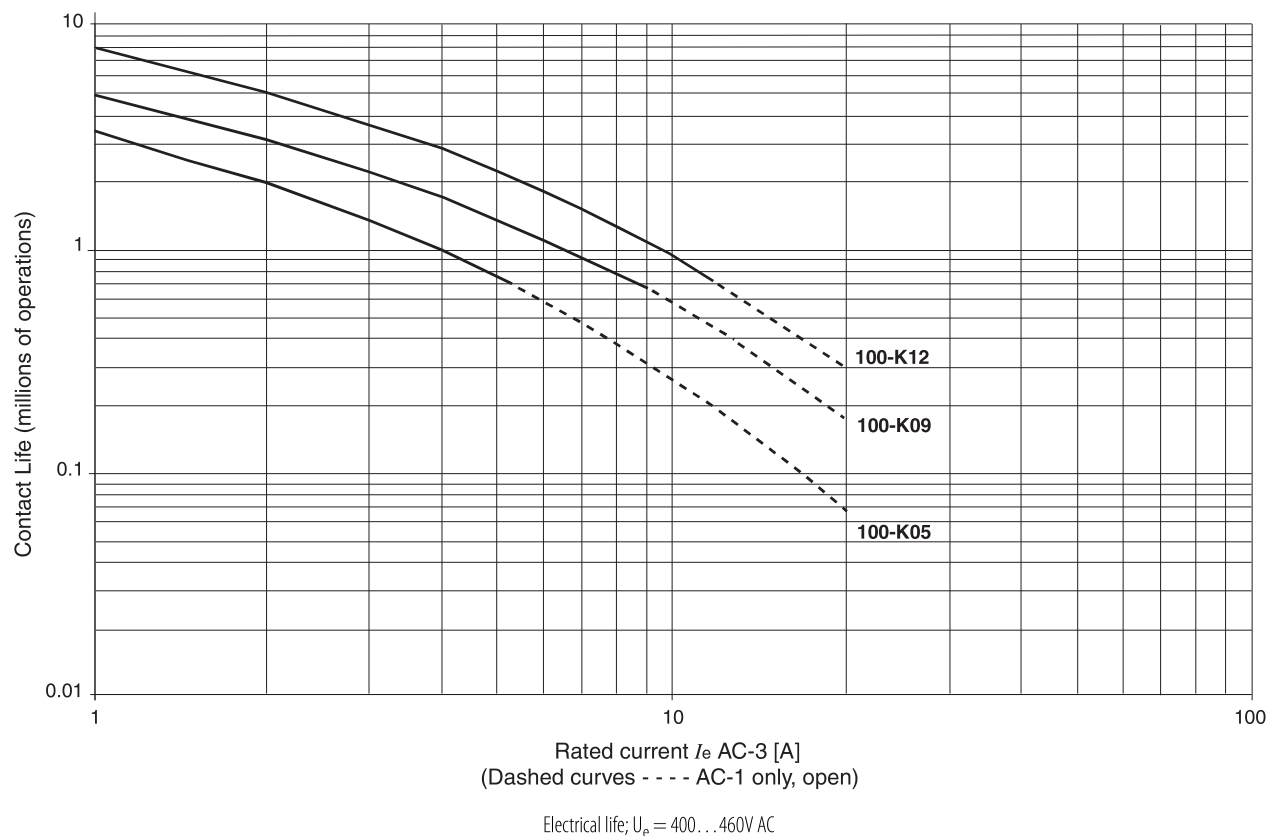
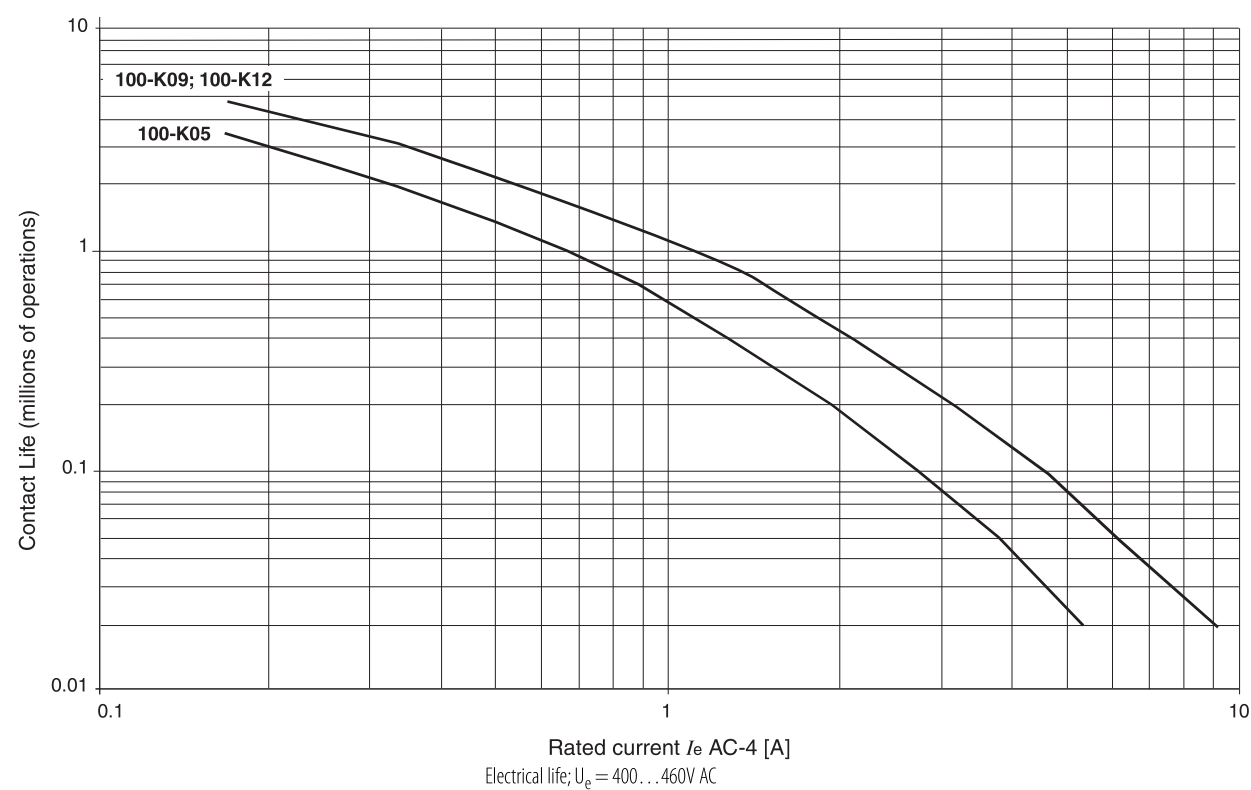




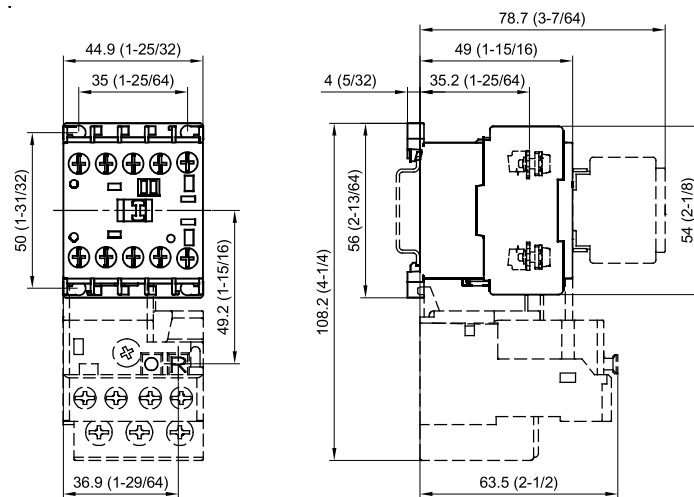
Figure 2 - AC-4, Stepping of squirrel-cage motors



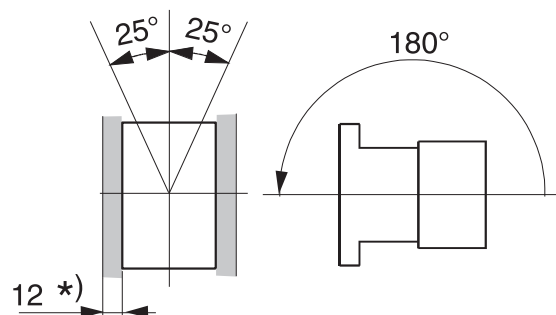
## Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

**Figure 3 - 100-K Miniature Contactor with 193-K Overload Relay**



**Figure 4 - Mounting Position**



\*-) -Minimum distance to grounded parts or walls