

IEC Contactors



Bulletin No.	100-K/104-K	100-E/104-E	100-C/104-C
Screw Terminals	(5...12 A)	(9...96 A), Thru-hole (116...2650 A)	(9...97 A)
Spring Terminals	(5...9 A)	—	(9...16 A)
Max. Current I_e	12 A	2650 A	97 A
Current Rating	5...12 A	9...2650 A	9...97 A
Mounting	Panel mounting or mounting on 35 mm DIN Rail		
Materials	Made of environmentally friendly materials		
Features	<ul style="list-style-type: none"> AC or DC coil control Mini contactors Uniform panel mounting dimensions 	<ul style="list-style-type: none"> AC/DC electronic coil with built-in surge suppression E09...E370: optional PLC interface on E116...E370 E400...E2650: PLC interface 	<ul style="list-style-type: none"> AC or DC coil control Reversible coil terminals (line or load side) Common accessories
Contacts	<ul style="list-style-type: none"> 3 power poles with internal N.O. or N.C. auxiliary contact, or 4 power poles Optional front-mounted 2- or 4-pole external auxiliary contact block 	<ul style="list-style-type: none"> 3 main poles with 2 auxiliary contacts (1 N.O. and 1 N.C.) on E116...E2650 Optional front- or side-mounted external auxiliary contact block 	<ul style="list-style-type: none"> 3 power poles with internal N.O. or N.C. auxiliary contact or 4 power poles (9...23 A) Optional front- or side-mounted 1-, 2- or 4-pole external auxiliary contact block
Coil Voltages	24...600V AC, 50/60Hz 12...250V DC	20...500V, 50/60 Hz/DC	12...480V AC, 50/60Hz 9...250V DC
Optional Overload Relays	Electronic or bimetallic	Electronic	Electronic or bimetallic
Optional Accessories	<ul style="list-style-type: none"> Front-mount auxiliary contacts Electronic timers Mechanical interlocks Surge suppressors 	<ul style="list-style-type: none"> Side- or front-mount auxiliary contacts Electronic timers (9...96 A) Mechanical interlocks Mechanical latches (9...96 A) Terminal lugs Terminal shields Connecting bars 	<ul style="list-style-type: none"> Front or side-mount auxiliary contacts Electronic or pneumatic timers Mechanical interlocks Mechanical latches Surge suppressors
Standards/Certifications	<ul style="list-style-type: none"> UL CSA IEC CE Marked CCC 	<ul style="list-style-type: none"> EN/IEC CE Marked cULus CCC EAC C-tick KC 	<ul style="list-style-type: none"> UL CSA IEC CE Marked CCC

Product Selection

- 3-pole AC- and DC-operated contactors
- Compact size
- Same dimensions for AC and DC
- Full-voltage non-reversing and reversing contactors
- 5 A, 9 A, and 12 A contactors rated at 690V
- IP2X finger protection
- Optional integrated surge suppressor
- Compatible with Bulletin 193-K bimetallic overload relay
- Mirror contacts per IEC 60947-4-1 and mechanically linked contacts per IEC 60947-5-1 on main unit



100-K Miniature Contactor



104-K Reversing Miniature Contactor

Bulletin 100-K miniature contactors are designed for commercial and light industrial applications where panel space is at a premium. These miniature devices, while 45 mm wide, are shallower and have less panel depth requirements than standard IEC contactors.

The miniature contactors have been designed with flexibility in mind. They are available with AC or DC operating coils, several contact ratings, and optional 2-pole or 4-pole adder decks in a variety of auxiliary contact configurations.



The ⊗ symbol represents the coil voltage code — see [Coil Voltage Codes on page 6](#).

3-Pole AC- and DC-Operated Contactors

Rated Operational Current I_e [A] 40 °C (104 °F)		Ratings for Switching AC Motors: AC-2, AC-3, AC-4										Auxiliary Contacts		Package Quantity ⁽¹⁾	Cat. No.	
		3-phase kW (50 Hz) [V]				Hp (60 Hz)						N.O.	N.C.			
						1-Phase [V]		3-Phase [V]								
AC-3	AC-1	230	400/415	500	690	115	230	200	230	460	575	N.O.	N.C.			
Screw Terminals																
5	20	1.5	2.2	2.2	2.2	1/2	1	1-1/2	1-1/2	3	3	1	0	1	100-K05⊗10	
												0	1			100-K05⊗01
9	20	3	4	4	4	1/2	1-1/2	2	2	5	5	1	0			100-K09⊗10
												0	1			100-K09⊗01
12	20	3	5.5	5.5	5.5	3/4	2	3	3	7-1/2	7-1/2	1	0		100-K12⊗10	
												0	1		100-K12⊗01	
Spring Clamp Terminals																
5	10	1.5	2.2	2.2	2.2	1/3	3/4	1-1/2	1-1/2	3	3	1	0	1	100-KR05⊗10	
												0	1			100-KR05⊗01
9	10	2.2	4	4	4	1/3	1	2	2	5	5	1	0			100-KR09⊗10
												0	1			100-KR09⊗01

(1) To order the product in package quantities of 20, add letter M to the end of the Cat. No. For example: 100-K09ZJ10M.

Specifications

Table 1 - Main Circuits

Description		Cat. No. 100-KR		Cat. No. 100/104-K			
		05	09	05	09	12	
AC-1 Active Power Load (50 Hz); Ambient Temperature 40 °C (104 °F)							
Rated Operational Current, I_e	≤ 500V	[A]	10	10	20	20	20
	690V						
Rated Operational Power, P_e	230V	[kW]	4	4	8	8	8
	240V		4	4	8.3	8.3	8.3
	400V		6.9	6.9	14	14	14
	415V		7	7	14	14	14
	500V		8.7	8.7	17	17	17
	690V		12	12	24	24	24
AC-1 Active Power Load (50 Hz); Ambient Temperature 60 °C (140 °F)							
Rated Operational Current, I_e	≤ 500V	[A]	10	10	16	16	16
	690V						
Rated Operational Power, P_e	230V	[kW]	4	4	6.4	6.4	6.4
	240V		4	4	6.7	6.7	6.7
	400V		6.9	6.9	11	11	11
	415V		7	7	12	12	12
	500V		8.7	8.7	14	14	14
	690V		12	12	19	19	19
Switching of 3-phase Motors, (50 Hz); Ambient Temperature 60 °C (140 °F), AC-2, AC-3							
Rated Operational Current, I_e	230V	[A]	6.3	8.5	6.3	11.3	11.3
	240V						
	400V		4.9	8.5	4.9	8.5	11.5
	415V						
	500V		3.9	6.8	3.9	6.8	9.2
	690V		2.8	4.9	2.8	4.9	6.7
Rated Operational Power, P_e	230V	[kW]	1.5	2.2	1.5	3	3
	240V						
	400V		2.2	4	2.2	4	5.5
	415V						
	500V						
	690V						
Load Carrying Capacity per UL/CSA							
General Purpose Current (enclosed)		[A]	9	9	12	15	18
Rated current (enclosed), 1-phase	115V	[A]	7.2	7.2	9.8	9.8	13.8
	230V		6.9	8	8	10	12
Rated power (enclosed), 1-phase	115V	[Hp]	1/3	1/3	0.5	0.5	0.75
	230V		3/4	1	1	1.5	2
Rated current (enclosed), 3-phase	200V	[A]	6.9	7.8	6.9	7.8	11
	230V		6	6.8	6	6.8	9.6
	460V		4.8	7.6	4.8	7.6	11
	575V		3.9	6.1	3.9	6.1	9
Rated power (enclosed), 3-phase	200V	[Hp]	1.5	2	1.5	2	3
	230V						
	460V		3	5	3	5	7.5
	575V						

Table 2 - Main Circuits

Description		Cat. No. 100/104-K			
		05	09	12	
Switching of 3-phase Motors, (50 Hz); Ambient Temperature 60 °C (140 °F), AC-4					
Rated Operational Current, I_e	230V	[A]	6.3	11.3	11.3
	240V				
	400V		4.9	8.5	11.5
	415V				
	500V		3.9	6.8	9.2
	690V		2.8	4.9	6.7
Rated Operational Power, P_e	230V	[Hp]	1.5	3	3
	240V				
	400V		2.2	4	5.5
	415V				
	500V				
	690V				
AC-4 at Approximately 200,000 Operations					
Rated Operational Current, I_e	230V	[A]	2.3	3.9	3.9
	240V				
	400/415V		2	3.6	3.6
	500V		1.9	3.2	3.2
Rated Operational Power, P_e	230V ⁽¹⁾	[Hp]	0.37	0.75	0.75
	240V ⁽¹⁾				
	400V ⁽¹⁾		0.75	1.5	1.5
	415V ⁽¹⁾				
	500V ⁽¹⁾				
Max. switching frequency		Ops/hour	250	250	250
Wye-Delta (60 Hz)					
Rated Operational Power, P_e	200V	[Hp]	2.2	3	5
	230V				
	460V		5	7.5	10
	575V				
Star-Delta Starting (50 Hz)					
Rated Operational Current, I_e	≤ 230V	[A]	11.3	20	20
	≤ 240V				
	400V		8.5	15.5	15.5
	415V				
	500V		6.8	12.4	12.4
	690V		4.9	8.9	8.9
Rated Operational Power, P_e	230V ⁽¹⁾	[kW]	3	5.5	5.5
	240V ⁽¹⁾				
	400V ⁽¹⁾		4	7.5	7.5
	415V ⁽¹⁾				
	500V ⁽¹⁾				
	690V ⁽¹⁾				

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



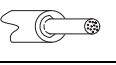
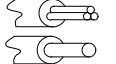
Table 3 - Main Circuits

Description		Cat. No. 100/104-K			
		05	09	12	
Switching of Power Transformers, AC-6a (50 Hz)					
		$\frac{\text{Inrush Current}}{\text{Rated Transformer Current}} = n$			
n= 30	≤ 230V	[A]	2.9	5.4	5.4
	≤ 240V				
	≤ 400V		2.4	4.1	5.4
	≤ 415V				
	≤ 500V		1.8	3.2	3.2
Apparent Power	230V	[kVA]	1.2	2	2
	240V				
	400V		1.7	2.8	3.4
	415V				
	500V		2	4	5
690V					
Switching of Lamps					
Gas Discharge Lamps AC-5a, 40 °C (104 °F)	Open	[A]	18	18	18
	Enclosed		14.5	14.5	14.5
Individually Compensated:					
Max. Capacitance at Expected					
Short-circuit current of:	10 kA	[μF]	750	750	750
	20 kA		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				
Switching of Motor Load for Home Appliances (50 Hz)					
AC-7b	230V	[A]	6	11	11
	400V				
Switching of Hermetically Sealed Cooling Compressor Motors – Manual Reset of Overload Release (50 Hz)					
AC-8a	400V	[A]	11	18	18
	500V		10	15	15
Switching of DC Loads					
Non-inductive, slightly inductive loads, or resistance furnaces DC-1, 60 °C (140 °F)					
1 pole	24V	[A]	6	9	9
	48/60V		4/1	6/1.5	6/1.5
	110V		0.6	1	1
	220V		0.2	0.3	0.3
	440V		0.08	0.1	0.1
2 poles in series	24V	[A]	6	9	9
	48/60V		6	8	8
	110V		4	6	6
	220V		0.8	1.2	1.2
	440V		0.2	0.3	0.3
3 poles in series	24V	[A]	6	9	9
	48/60V				
	110V		3	4	4
	220V		0.4	0.6	0.6
	440V				

Table 3 - Main Circuits (Continued)

Description	Cat. No. 100/104-K				
	05	09	12		
Shunt-wound Motors Starting, Reverse Current Braking, Reversing, Stepping DC-3, 60 °C (140 °F)					
3 Poles in Series	24V	[A]	5	9	9
	48/60V		4	6	6
	110V		2	3	3
	220V		0.8	1.2	1.2
	440V		0.15	0.2	0.2
Series-wound Motors Starting, Reverse Current Braking, Reversing, Stepping DC-5, 60 °C (140 °F)					
3 Poles in Series	24V	[A]	5	9	9
	48/60V		2	3	3
	110V		0.6	1	1
	220V		0.1	0.1	0.1
Short Time Withstand I_{CW} , 60 °C (140 °F)	10 s		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		2.9	3.5	3.5
Lifespan					
Mechanical AC control	[Million Operations]	15	15	15	
Mechanical DC control					
Electrical AC-3 (400 V)		0.7	0.7	0.7	
Weight					
AC	Non-Rev.	[kg (lbs.)]	0.16 (0.35)		
	Rev.		0.4 (0.88)		
DC	Non-Rev.	[kg (lbs.)]	0.2 (0.44)		
	Rev.		0.48 (1.06)		

Table 4 - Conductors

Description	Cat. No. 100-KR		Cat. No. 100/104-K		
	05	09	05	09	12
Conductor Cross Sections – Main Contacts Terminal type			 (1)		
 1 conductor 2 conductors	[mm ²]	0.50...2.5		0.75...2.5	
		0.75...2.5 (2)		1...4	
 1 conductor 2 conductors	[mm ²]	0.75...2.5 (2)		1...2.5+1...4	
		Recommended Torque [N•m]		1.2	
Cross Section per UL/CSA	[AWG]	18...14 (2)		18...12	
Recommended Torque	[lb•in]	–		10.6	

(1) Pozidriv No. 2 / Blade No. 3 screw
 (2) Fine- or coarse-stranded only

Table 5 - Short-circuit Coordination Data ⁽¹⁾

Description	Cat. No. 100/104-K		
	05	09	12
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
Type "2" (400V)		16	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
UL Class CC and CSA HRCI-MISC Fuses		50 kA Available Fault Current	
UL Listed Combination (600V)	[A]	30	30
UL Class J and CSA HRCI-J Fuses		50 kA Available Fault Current	
UL Listed Combination (600V)	[A]	30	30

(1) See the Rockwell Automation Global SCCR Tool at rok.auto/sccr for complete short-circuit current ratings.

Table 6 - Coil Data

Description	Cat. No. 100/104-K		
	05	09	12
Operating Limits			
50 Hz, 60 Hz, 50/60 Hz	pick-up	[x U _s]	0.85...1.1
	dropout		0.2...0.75
DC (conventional)	pick-up		0.8...1.1
	dropout		0.7...1.25 ⁽¹⁾
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		
Operating Times			
AC	closing delay	[ms]	15...40
	opening delay		15...33
With RC module	closing delay		15...28
	opening delay		18...40
DC (conventional)	closing delay		6...12
	opening delay		8...12
With external diode	opening delay	35...50	

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

Table 7 - Auxiliary Contacts and Auxiliary Contact Blocks



Conventional Coils		Internal	Front Mounted
Switching of AC Loads			
AC-12 I _{th}	at 40 °C (104 °F)	[A]	10
	at 60 °C (140 °F)		6
AC-15 at Rated Voltage of:	24V	[A]	10
	42/48V		6
	120V		3
	230V		1.8
	240V		1.4
	400V		1.0
	415V		0.6
	500V		0.6
Switching of DC Loads			
DC-12 L/R < 1 ms resistive loads at:	24V DC	[A]	6
	48V DC		4
	110V DC		0.6
	220V DC		0.2
	440V DC		0.08
DC-14L/R < 15 ms inductive loads with economy resistor in series at:	24V DC	[A]	4
	48V DC		2.5
	110V DC		0.4
	220V DC		0.12
	440V DC		0.05
DC-13 switching electromagnets at:	24V DC	[A]	2.8
	48V DC		1.2
	110V DC		0.55
	220V DC		0.27
	440V DC		0.15
Fuse gG		[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	at 40 °C (104 °F)	[A]	10
Switching Capacity	AC	[A]	A600
Rated Voltage	DC	[V]	max. 600
Switching Capacity	DC	[A]	Q600

Table 8 - General

Attribute		Value
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 (°F)]	-55...+80 (-67...176)
Operation at Rated Voltage	[°C (°F)]	-25...+60 (-13...140)
at 70 °C (158 °F)		15% current reduction against 60 °C (140 °F) 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, Annex L		100-K... (on main device)
Mirror Contacts IEC60947-4 Annex F		100-K...+100-KF...

Table 9 - Standards Compliance and Certification

Standards Compliance	Certifications
<ul style="list-style-type: none"> IEC/EN 60947-1,-4-1,-5-1,-5-4 UL 508 CSA 22.2. No. 14 NF F 62-000 	<ul style="list-style-type: none"> CE Marked CCC cULus Listed (File No. E41850, Guide NLDX, NLDX7)
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

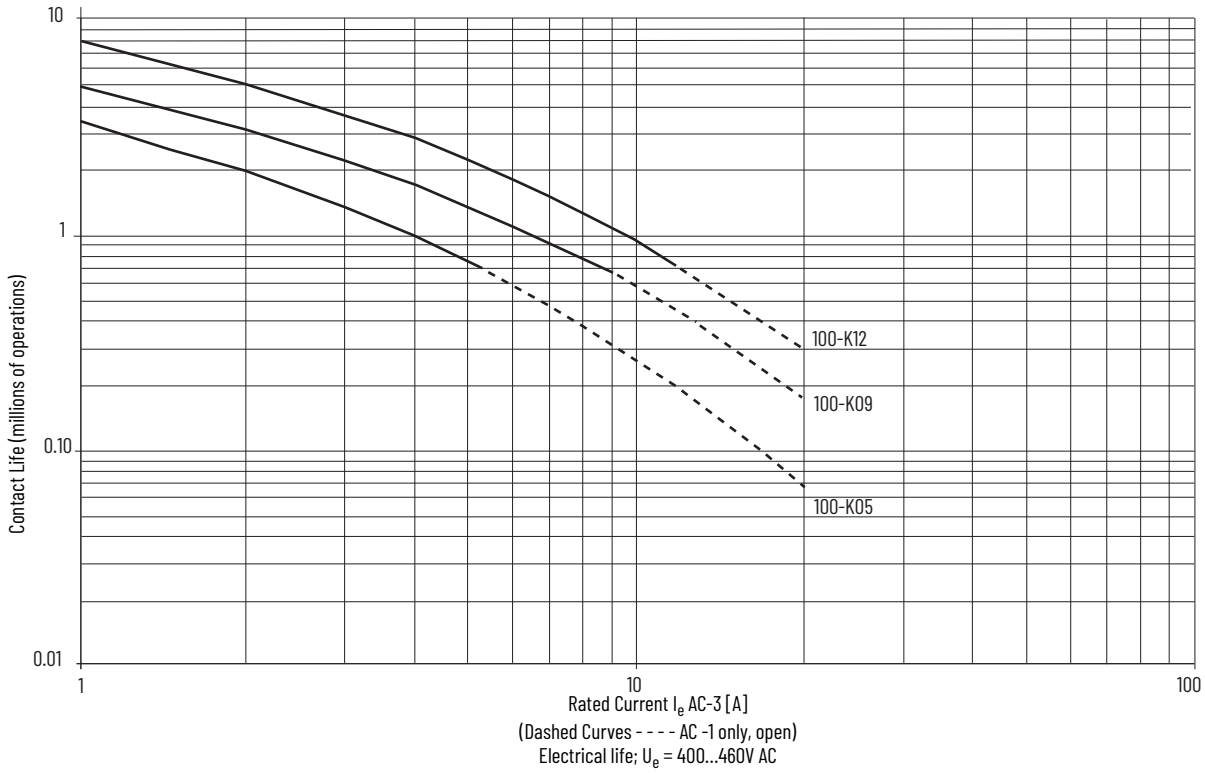
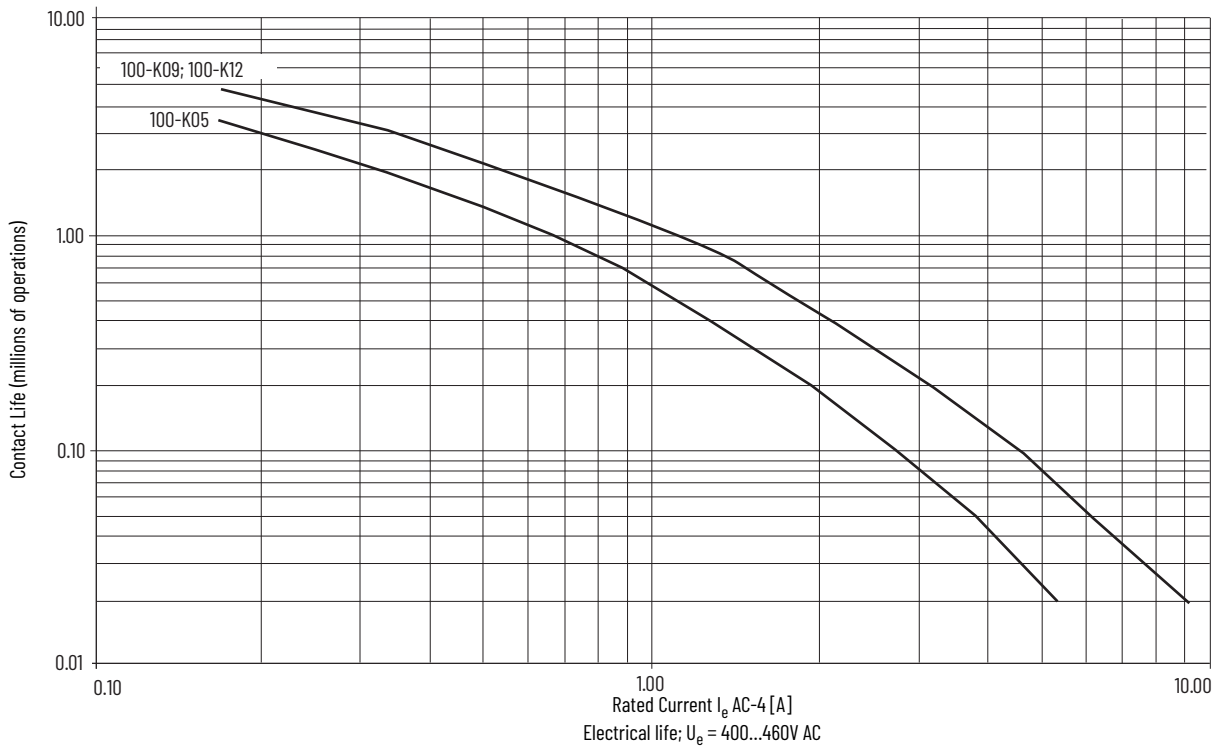


Figure 2 - AC-4, Stepping of Squirrel-Cage motors



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

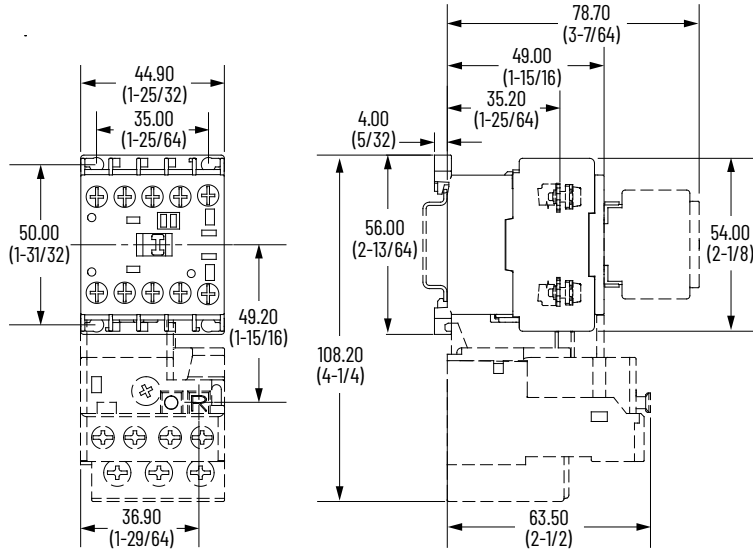
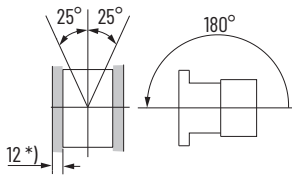


Figure 4 - Mounting Position



*) = minimum distance to grounded parts or walls