

# Series CA8 Contactors and CAT8 Starters

An ingenious miniature contactor and starter system

Sprecher + Schuh's CA8 Series of miniature contactors and starters provide an extremely compact and reliable method of controlling motors of 7.5 HP or less (@460V). The CA8 is an economical choice for applications where space is limited or where a minimal enclosure is desired.

## Small but rugged

Even though their contacts and coils are not replaceable, Sprecher + Schuh has subjected this series of contactors to monitored endurance tests that demonstrate their ruggedness. At full load, under 3-phase power, the contacts in the CA8 have an electrical life of 700,000 operations, while the AC magnet system has a mechanical life of 15,000,000 operations.



## The CAT8 Starter – Efficient and reliable

This miniature starter features the new CT8 Thermal Overload Relay. A complex current limiting calibration procedure performed after each unit ensures the consistent high quality of Sprecher + Schuh's thermal overload relay. Today's Class 10 T-frame design, like the CT Series, has been recognized by many motor manufacturers as the ideal type to assure optimum motor protection due to less use of copper and iron.



CAT8 starters feature the CT8 thermal overload.

## Accessories require no additional panel space

The entire CA8 System is logically engineered. Modular accessories like auxiliary contact blocks snap-on without increasing the CA8's original width of 45mm. Also, due to its horizontal switching movement, the basic contactor has the same low profile whether an AC or DC operating magnet is used. This permits the use of enclosures with shallow mounting depths. Once the CA8 is installed,



A

Contactors

CA8

all auxiliary contact blocks can be snapped-on or removed without changing any existing power wiring. Other accessories include a snap-on RC Link (surge suppressor), mechanical interlocks and space saving adaptors for connecting auxiliary components.

## Effortless installation

Both the CA8 Contactor and the CAT8 Starter are DIN-rail mountable for instant installation and modification. Fittings are also included on the CA8 for base mounting. All terminals are clearly marked and shipped in the open position for installation with either manual or power screwdrivers.



45mm  
(=1 7/16)

**A** Series CA8 Miniature Contactors, Starters, Overloads & Industrial Relays

Contactors

CA8

- ✓ Rated 690V
- ✓ RoHs Compliant
- ✓ Conforming to U.S., Canadian, and IEC Standards
- ✓ Same Dimensions for AC and DC

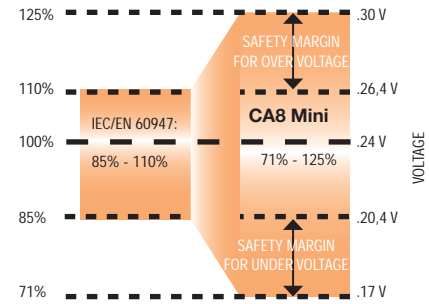
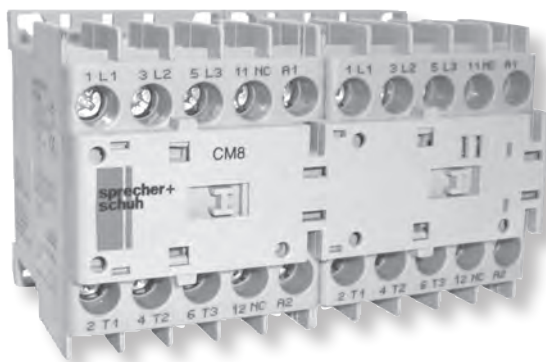


**Pluggable Surge Suppressor Modules**

- Suppressor modules are simply plugged on the front of the contactors, next to the auxiliary contact blocks.
- No wiring required.
- Fast and easy installation.

**Auxiliary Contact Reliability**

- Bifurcated, AgNi (silver/nickel) plated contacts for high contact reliability for 15V/2 mA electronic signals.
- H-shaped self cleaning auxiliary contacts provide a 4-way current path ensure high contact reliability for low energy switching.

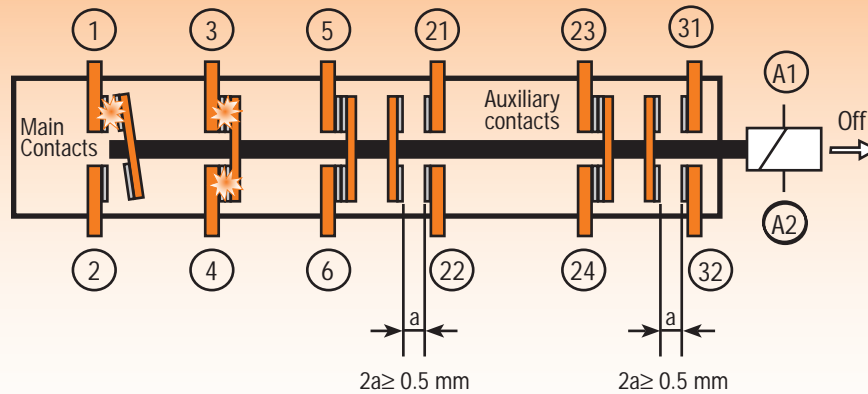


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### High Performance AC & DC Coils

- Wide range DC coils can provide reliability in case of over- and under-voltage, a common issue with battery-fed control power supply systems.
- The low coil consumption allows the contactors to be directly controlled via a PLC.
- Optional, integral factory-installed surge suppressor modules for AC and DC for limiting coil switching transients.

### MIRROR AND MECHANICALLY LINKED DESIGN



### All Around Safety

- CA8: mechanically linked performance between main contacts and internal auxiliary contacts. This feature provides status feedback in the event of a contact weld.
- CA8/Auxiliary contacts: mirror contact between main and auxiliary contacts as per IEC 60947-4-1 prevent any unclear status indications if a N.O. power pole welds.






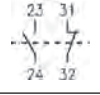


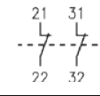

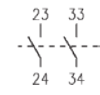


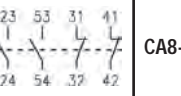

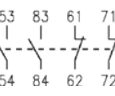
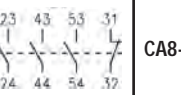
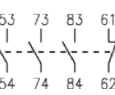
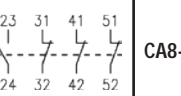
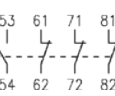
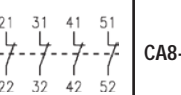
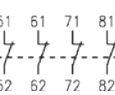
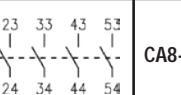
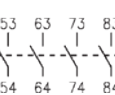








**Auxiliary Contact Blocks (2 & 4 Pole) ①**

Auxiliary Contact Blocks	NO	NC	Contact Arrangement	Catalog No.	Price	Auxiliary Contact Blocks	NO	NC	Contact Arrangement	Catalog No.	Price
 2-Pole	1	1		CA8-P11	27	 2-Pole	1	1		CS8-P11E	27
	0	2		CA8-P02			0	2		CS8-P02E	
	2	0		CA8-P20			2	0		CS8-P20E	
Typical auxiliary contact block   4-Pole	2	2		CA8-P22	54	Typical auxiliary contact block   4-Pole	2	2		CS8-P22Z	54
	3	1		CA8-P31			3	1		CS8-P31Z	
	1	3		CA8-P13			1	3		CS8-P13E	
	0	4		CA8-P04			0	4		CS8-P04E	
	4	0		CA8-P40				CS8-P40E			

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CA8

① Auxiliary contacts mirror contact performance per IEC 60947-4-1. Contacts are bifurcated (H-bridge) with a minimum rating of 2mA @ 15V.



**CAT8 Starters with CT8 Thermal Overload Relay**

For use with contactor....	Amp Range	Overload Relay Code (◆)	Catalog Number (of Overload Relay used)	Price Adder
<b>CT8 Thermal Overload Relay, 1 or 3-Phase, Auto/Manual, Class 10</b>				
CA8-09	0.10...0.16	8A16	CT8-A16	Standard
	0.16...0.25	8A25	CT8-A25	Standard
	0.25...0.4	8A40	CT8-A40	Standard
	0.35...0.5	8A50	CT8-A50	Standard
	0.45...0.63	8A63	CT8-A63	Standard
	0.55...0.8	8A80	CT8-A80	Standard
	0.75...1.0	8B10	CT8-B10	Standard
	0.90...1.3	8B13	CT8-B13	Standard
	1.10...1.6	8B16	CT8-B16	Standard
	1.4...2.0	8B20	CT8-B20	Standard
	1.8...2.5	8B25	CT8-B25	Standard
	2.3...3.2	8B32	CT8-B32	Standard
	2.9...4.0	8B40	CT8-B40	Standard
	3.5...4.8	8B48	CT8-B48	Standard
	4.5...6.3	8B63	CT8-B63	Standard
5.5...7.5	8B75	CT8-B75	Standard	
CA8-09 or 12	7.2...10	8C10	CT8-C10	Standard
CA8-12	9.0...12.5	8C12	CT8-C12	Standard

**Obsolete Contactors Cross Reference, Series CA4 to Series CA8 (Open Type Only)**

I <sub>e</sub> [A]		Ratings for Switching AC Motors (AC2 / AC3 / AC4)									Auxiliary Contacts per Contactor		Series CA4 Obsolete Catalog Number	Series CA8 Replacement Catalog Number
		kW (50 Hz)			UL/CSA HP (60 Hz)									
		230V	400V	500V	1 Ø			3 Ø						
AC-3	AC-1	230V	415V	500V	115V	230V	200V	230V	460V	575V	NO	NC		
9	20	3	4	4	1/2	1-1/2	2	2	5	5	1	0	CA4-9-10	
											0	1	CA4-9-01	
~	20	3	4	4	1/2	1-1/2	2	2	5	5	1	0		CA8-09-10
											0	1		CA8-09-01
12	20	3	5.5	4	1/2	2	3	3	7-1/2	10	1	0	CA4-12-10	
											0	1	CA4-12-01	
~	20	3	5.5	5.5	3/4	2	3	3	7-1/2	7-1/2	1	0		CA8-12-10
											0	1		CA8-12-01



CA4-9-10 Contactor

## Technical Information

CA8 Contactors

			CA8-09	CA8-12				CA8-09	CA8-12			
<b>Rated Insulation Voltage <math>U_i</math></b>	to IEC947-1	[V]	690V		<b>Wye-Delta (Star Delta)</b> 50 Hz	≤230V	[A]	20	20			
	UL/CSA	[V]	600V			≤240V	[A]	20	20			
						400V	[A]	15.5	15.5			
<b>Rated Impulse Voltage Withstand <math>U_{imp}</math></b>		[kV]	6									
<b>Rated Voltage <math>U_e</math>-Main Contacts</b>	AC 50/60Hz	[V]	230, 240, 400, 415, 500, 690									
	DC	[V]	24, 48, 110, 220, 440									
<b>Operating Frequency for AC Loads</b>		[Hz]	50/60Hz									
					400V	[kW]	7.5	10				
<b>Switching Motor Loads</b> Standard IEC Ratings	AC-2, AC-3, AC-4 DOL & Reversing 50Hz@60° C				415V	[kW]	7.5	11				
		230V	[A]	11.3	11.3	500V	[kW]	7.5	7.5			
		240V	[A]	11.3	11.3	690V	[kW]	7.5	7.5			
		400V	[A]	8.5	11.5							
		415V	[A]	8.5	11.5	60 Hz	200V	[Hp]	3	5		
		500V	[A]	6.8	9.2		230V	[Hp]	3	5		
		690V	[A]	4.9	6.7		460V	[Hp]	7.5	10		
		230V	[kW]	3	3	575V	[Hp]	7.5	10			
		240V	[kW]	3	3	<b>AC-1 Load, 3Ø Switching</b>						
		400V	[kW]	4	5.5	Ambient Temperature 40° C	$I_e$	[A]	20	20		
		415V	[kW]	4	5.5	230V	[kW]	8	8			
		500V	[kW]	4	5.5	240V	[kW]	8.3	8.3			
		690V	[kW]	4	5.5	400V	[kW]	14	14			
<b>UL/CSA</b>	DOL & Reversing 60Hz	1Ø	115V	[A]	9.8	415V	[kW]	14	14			
			230V	[A]	10	500V	[kW]	17	17			
			115V	[HP]	0.5	690V	[kW]	24	24			
			230V	[HP]	1.5	2						
			200V	[A]	7.8	11	Ambient Temperature 60° C	$I_e$	[A]	16	16	
			230V	[A]	6.8	9.6	230V	[kW]	6.4	6.4		
			460 V	[A]	7.6	11	240V	[kW]	6.7	6.7		
3Ø			575 V	[A]	6.1	9	400V	[kW]	11	11		
			200 V	[HP]	2	3	415V	[kW]	12	12		
			230 V	[HP]	2	3	500V	[kW]	14	14		
			460 V	[HP]	5	7.5	690V	[kW]	19	19		
			575 V	[HP]	5	7.5	<b>Continuous Current (UL/CSA)</b>					
						General Purpose Rating (40° C)			Open	[A]	12	12
									Enclosed	[A]	15	18
<b>Maximum Operating Rate</b>	AC2	[ops/hour]	300	300	<b>Lighting Loads</b>							
	At 9A for AC3; 20A for AC2/4	[ops/hour]	600	600	Gas Dischrg.Lamps-AC-5a, 220...240VAC (40°C)	Enclosed	[A]	18	18			
	Starting time $t_A = 0.25s$	[ops/hour]	300	300		Open	[A]	15	15			
<b>AC4 (200,000 Op. Cycles)</b> 50Hz	230V	[A]	3.9	3.9	Single compensated	10kA	[µF]	750	750			
	240V	[A]	3.9	3.9	Max. capacitance at prospective short circuit current available at the contactor	20kA	[µF]	400	400			
	400V	[A]	3.6	3.6		50kA	[µF]	~	~			
	415V	[A]	3.6	3.6	<b>Incandescent Lamps</b>							
	500V	[A]	3.2	3.2	- AC-5b							
	230V	[kW]	0.75	0.75	Electrical endurance~100,000 operations 230/240V							
	240V	[kW]	0.75	0.75		[A]		9.0	9.0			
	400V	[kW]	1.5	1.5								
415V	[kW]	1.5	1.5									
500V	[kW]	1.5	1.5									
<b>Max. Operating Rate</b>		[ops/hour]	250	250								

Electrical Data

			CA8-09	CA8-12
<b>Switching power transformers AC-6a (50Hz)</b>				
Inrush				
Rated transformer current	= $\eta$			
$\eta = 30$				
≤230V	[A]		5.4	5.4
≤240V	[A]		5.4	5.4
≤400V	[A]		4.1	5.4
≤415V	[A]		4.1	5.4
≤500V	[A]		3.2	3.2
230VAC	[kVA]		2	2
240VAC	[kVA]		2	2
400VAC	[kVA]		2.8	3.4
415VAC	[kVA]		2.8	3.4
500VAC	[kVA]		2.8	3.4
690VAC	[kVA]		4	5
<b>DC Ratings</b>				
<b>DC-1 Rating at 60°C</b>				
1 Pole	24VDC	[A]	9	9
	48/60VDC	[A]	6/1.5	6/1.5
	110VDC	[A]	1	1
	220VDC	[A]	0.3	0.3
	440VDC	[A]	0.1	0.1
2 Pole in Series	24VDC	[A]	9	9
	48/60VDC	[A]	8	8
	110VDC	[A]	6	6
	220VDC	[A]	1.2	1.2
	440VDC	[A]	0.3	0.3
3 Pole in Series	24VDC	[A]	9	9
	48VDC	[A]	9	9
	110VDC	[A]	9	9
	220VDC	[A]	4	4
	440VDC	[A]	0.6	0.6
<b>Shunt-wound Motors</b>				
Starting, reverse current braking, reversing stepping DC-3, 60°C				
	24V	[A]	9	9
3 Poles in series	48/60V	[A]	6	6
	110V	[A]	3	3
	220V	[A]	1.2	1.2
	440V	[A]	0.2	0.2
<b>Series-wound Motors</b>				
Starting, reverse current braking, reversing stepping DC-5, 60°C				
	24V	[A]	9	9
3 poles in series	48/60V	[A]	3	3
	110V	[A]	1	1
	220V	[A]	0.1	0.1
	440V	[A]	~	~
<b>Short Time Withstand-<math>I_{CW}</math>, 60°C</b>				
	10s	[A]	96	96
<b>Short Circuit Coordination</b> (Max. Fuse or Circuit Breaker Rating)				
50 kA Max. DIN fuse gG per IEC 60947-4-1 (Contactor and Fuse only)				
Available Fault Current				
Type 1 Coordination (690V)	max.	[A]	35	35
Type 2 Coordination (690V)	max.	[A]	20	20
Class K5 and RK5 fuses ❶	max.	[A]	40	40
<b>Resistance and Watt Loss <math>I_e</math> AC3</b>				
Resistance per power pole		[mΩ]	2.2	2.2
Watt Loss - 3 power poles @400V		[W]	0.9	0.9
Coil and AC @400V, warm		[W]	2.7	2.7
3 power poles DC, warm		[W]	3.5	3.5
<b>Coil Data</b>				
			CA8-09	CA8-12
<b>Voltage Range</b>				
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[x $U_s$ ]	0.85...1.1	
	Dropout	[x $U_s$ ]	0.2...0.75	
DC	Pickup	[x $U_s$ ]	0.85...1.1	
	Dropout	[x $U_s$ ]	9, 12, 24, 110V DC: 0.7...1.25	
			0.1...0.75	
<b>Coil Consumption</b>				
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[VA/W]	35/32	
	Hold-in	[VA/W]	5/1.8	
DC	Pickup	[W]	cold 3.0, warm 2.6	
	Hold-in	[W]	cold 3.0, warm 2.6	
<b>Operating Times</b>				
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[ms]	15...40	
	Dropout	[ms]	15...33	
with RC Suppressor	Dropout	[ms]	15...28	
DC	Pickup	[ms]	18...40	
	Dropout	[ms]	6...12	
with Integ. Suppression	Dropout	[ms]	8...12	
with external diode Suppression	Dropout	[ms]	35...50	
Minimal changeover time for reversing		[ms]	>50	

❶ UL listed combination.

#### Mechanical Data

			CA8-09	CA8-12
<b>Service Life</b>				
Mechanical	AC/DC	[Mil.Op.]	15	
Electrical	AC-3(400V)	[Mil.Op.]	0.7	
Reversing combination, mechanical, electrical		[Mil.Op.]	0.7	

#### Shipping Weights

AC-CA8	[kg]	0.16
	[Lbs]	0.35
AC-CAU8	[kg]	0.35
	[Lbs]	0.77
DC-CA8	[kg]	0.20
	[Lbs]	0.44
DC-CAU8	[kg]	0.43
	[Lbs]	0.91

#### Terminations - Screw Type Terminals

Main contacts and Auxiliary contacts



Terminal Type	Combination Screw Head: Cross, Slotted, Pozidrive		
Fine stranded w/ ferrule	1 wire	[mm <sup>2</sup> ]	0.75...2.5
	2 wires	[mm <sup>2</sup> ]	0.75...2.5
Solid or coarse stranded	1 wire	[mm <sup>2</sup> ]	1...4
	2 wires	[mm <sup>2</sup> ]	1...2.5 + 1...4
		[AWG]	18...12
Torque Requirement	[Nm]	1.2	
	[Lb-in]	10.6	

#### Environmental and General Specifications

##### Ambient Temperature

Storage	-55...+80° C (-67...176° F)
Operation	-25...+60° C (-13...140° F)
Conditioned 15% current reduction after AC-1 at >60° C	-25...+70° C (-13...158° F)

**Altitude at installed site** 2000 meters above sea level per IEC 60947-4-1

##### Resistance to Corrosion / Humidity

Damp-alternating climate: cyclic to IEC 68-2, 56 cycles.  
 Dry Heat: IEC 68-2, +100°C (212°F), relative humidity <50%, 7 days.  
 Damp tropical: IEC 68-2, +40°C (104°F), relative humidity <92%, 56 days.

**Shock Resistance** IEC 68-2/EN 60068

**Vibration Resistance** IEC 68-2/EN 60068

**Operating Position** Refer to Dimension Pages

**Standards** IEC/EN 60947-1, -4-1, -5-1, -5-4;  
 UL 508; CSA 22.2. No. 14

##### Approvals



#### High Fault Short Circuit Ratings per UL508 and CSA 22.2 No.14

Overload Cat. No.	Contactor Cat. No.	Max. starter FLC (A)	Fuse Ratings			UL Listed Circuit Breaker Ratings ①			Group Installation ①	
			Max. available fault current (kA)	Max. voltage (V)	UL Class J, CC, CSA HRCI-J fuse max. (A)	Short Circuit Rating (kA)	Max. voltage (V)	Max. CB Rating (A)	Max. CB rating (A)	
CT8	A16...A40	CA8-09	10	50	600	1	5	600	15	30
	A50...A63					2				
	A80...B10					3				
	B13					4				
	B16					5				
	B20					8				
	B25					10				
	B32					12				
	B40...B48					15				
	B63					20				
	B75					25				
	C10	CA8-09...12	13.8	50	35					
C12	CA8-12	50								

Group installation ratings can be applied when used with CA8 Compact Bus Bars (see page A20) in a minimum 1,152 cu. in. enclosure with two latches.

### Auxiliary Contacts

		Built-in Auxiliary Contacts										Add-on Auxiliary Contacts									
<b>Current Switching</b>																					
AC-12 $I_{th}$	at 40°C [A]	10										10									
	at 60°C [A]	6										6									
AC-15, switching electromagnetic loads at:	[V]	24	120	240	400	480	500	600	690			24	120	240	400	480	500	600	690		
	[A]	6	6	3	1.8	1.5	1.4	1.2	1			3	3	2	1.2	1	1	0.6	0.6		
DC-13, switching DC electromagnets at:	[V]	24	48	110	125	220	250	400	440	600		24	48	110	125	220	250	400	440	600	
	[A]	2.8	1.2	0.55	0.55	0.27	0.27	0.15	0.15	0.10		2.3	1	0.55	0.55	0.27	0.27	0.15	0.15	0.10	
DC-12, L/R < 1 ms resistive loads at:	[V]	24	48	110	125	220	250	400	440												
	[A]	6	4	0.6	0.6	0.2	0.2	0.08	0.08												
DC-14, L/R < 15 ms inductive loads with economy resistor in series at:	[V]	24	48	110	125	220	250	400	440												
	[A]	4	2.5	0.4	0.4	0.12	0.12	0.05	0.05												
<b>Low Level Signal Switching</b>																					
Contact design		X-stamped										H-bridge, bi-furcated									
Minimum switching recommendation		17V										15V									
		10mA										2mA									
<b>Short-Circuit Protection - gG Fuse</b>																					
Type 2 Coordination		10										10									
<b>Load carrying capacity per UL/CSA</b>																					
Rated Voltage	AC [V]	600 max.										600 max.									
Continuous Rating	40°C [A]	10 general purpose										10 general purpose									
Switching Capacity	AC	Heavy pilot duty (A600)										Heavy pilot duty (B600)									
Rated Voltage	DC [V]	600 max.										600 max.									
Switching Capacity	DC	Standard pilot duty (Q600)										Standard pilot duty (Q600)									
Mechanically Linked Contacts IEC 60947-5-1, Annex L		Yes										No									
Mirror Contacts IEC 60947-4, Annex F		Yes										Yes									

### Contact Ratings (Per NEMA/UL A600, B600 & Q600)

Standard	Circuit Voltage	Make (Amps/VA)	Break (Amps/VA)	Continuous Amps
A600	120AC	60A/7200VA	60A/720VA	10
	240AC	30A/7200VA	30A/720VA	
	480AC	15A/7200VA	15A/720VA	
	600AC	12A/7200VA	12A/720VA	
B600	120AC	30A/3600VA	3.0A/360VA	10
	240AC	15A/3600VA	1.5A/360VA	
	480AC	7.5A/3600VA	0.75A/360VA	
	600AC	6A/3600VA	0.60A/360VA	
Q600	125DC	0.55/69VA	0.55/69VA	2.5
	250DC	0.27/69VA	0.27/69VA	
	301-600DC	0.1A/69VA	0.1A/69VA	

A

Life-Load Curves

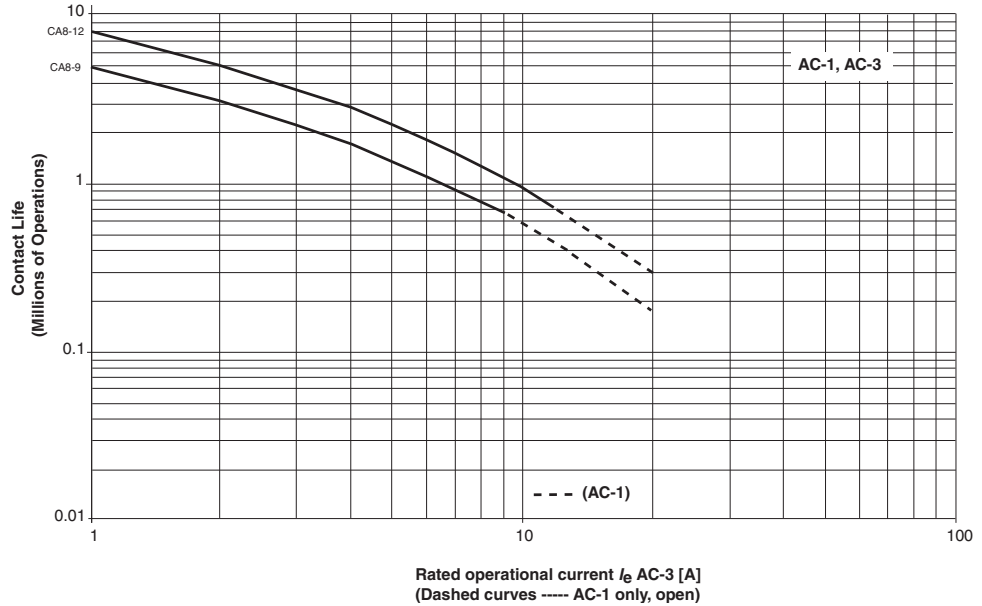
Contactors  
CA8

- Locate the Rated Operational Current ( $I_e$ ) along the bottom of the chart and follow the graph lines up to the intersection of the appropriate contactor's life-load curve.
- Read the estimated contact life along the vertical axis.

**INSTRUCTIONS ON  
"HOW TO READ"  
LIFE CURVES CAN BE  
FOUND ON PAGE A7**

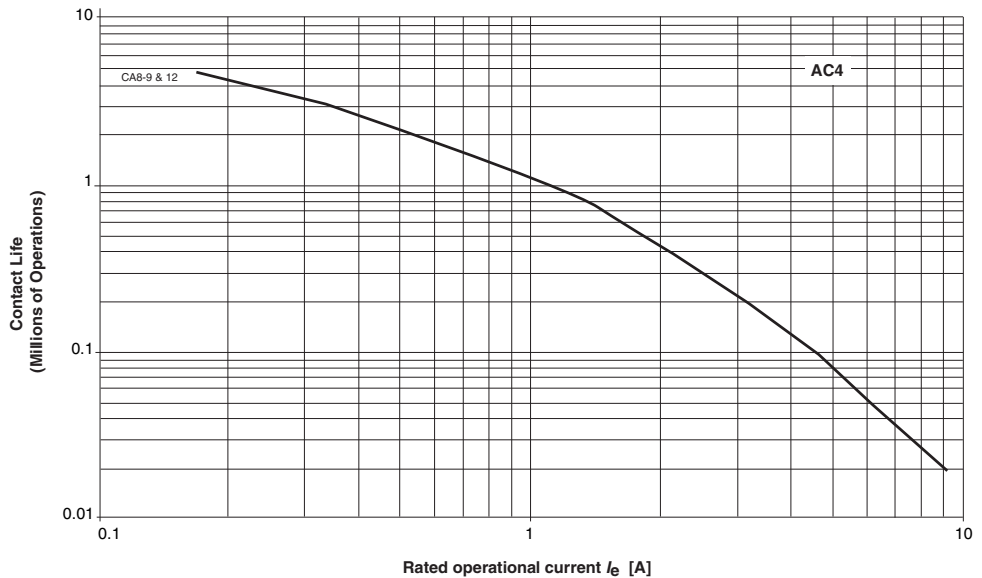
**AC-1, AC3**  
(400...460V AC)

AC-1 Non- or slightly inductive loads, resistance furnaces;  
AC-3 Switching of squirrel-cage motors while starting  
 $U_e = 400...415$  VAC



**AC-4**  
(400...460V AC)

AC-4 Stepping of squirrel-cage motors  
 $U_e = 400...415$  VAC

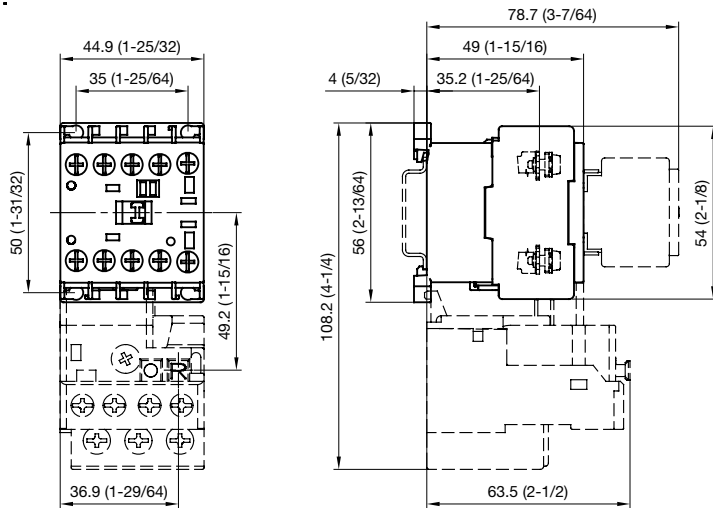


**NOTE:** The life-load curves shown here are based on Sprecher+Schuh tests according to the requirements defined in IEC 60947-4-1. Since contact life in any given application is dependent on environmental conditions and duty cycle, actual application contact life may vary from that indicated by the curves shown here.

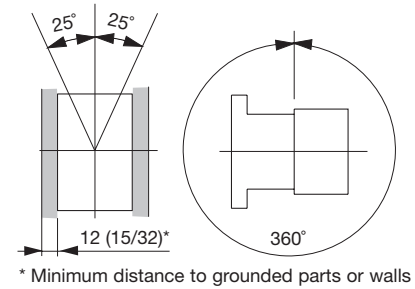


**Series CA8 & Series CAU8 (Contactors & Reversing Contactors)**

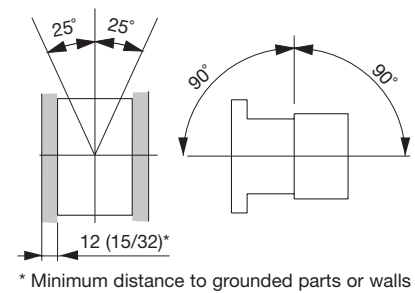
Dimensions are in millimeters (inches). Dimensions not intended for manufacturing purposes.



**Mounting Position without Accessories**



**Mounting Position with Accessories**



**Reversing Contactors & Accessories**

Contactor with...	Dim. [mm]	Dim. [inches]
reversing with mechanical interlock	89.8	3.53
with aux. contact block	78.7	3.1
with timer		
on contactor	81.7	3.25
at side of contactor	66.9	2.63
with neutral terminal		
at side of contactor	64.9	2.56
with protection element		
with nameplate	51	2