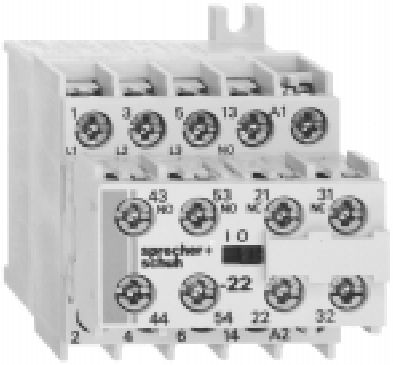
Series CA4 Contactors & CAT4 Starters

An ingenious miniature contactor and starter system

Sprecher + Schuh's CA4 Series of miniature contactors and starters provide an extremely compact and reliable method of controlling motors of 5 HP or less (@460V). The CA4 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 CA4 have an electrical life of 700,000 operations, while the AC magnet system has a mechanical life of 10,000,000 operations.

Also, due to its sideways 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 CA4 is installed, 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.

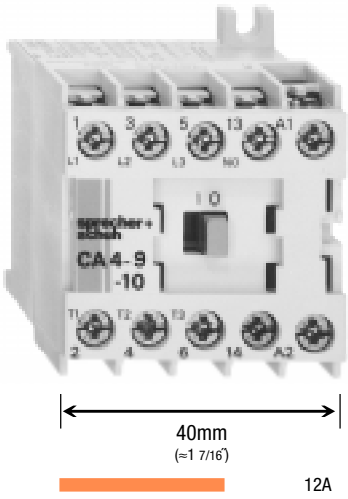
The CAT4 Starter – Efficient and reliable

This miniature starter features the new CEP7 Solid State Overload Relay, known for its superb protection, accuracy and low energy use. Rather than simulate the heat build-up in the motor by passing current through an electromechanical mechanism, CEP7 overload relays measure current directly through the use of current transformers. Their solid state design significantly reduces heat and ensures a precise and reliable tripping response even after many years of operation. For a complete description of Sprecher + Schuh Solid State Overload Relays, see page B2 in this catalog.

Effortless installation

Both the CA4 Contactor and the CAT4 Starter are DIN-rail mountable for instant installation and modification. Fittings are also included on the CA4 for base mounting. All terminals are clearly marked and shipped in the open position for installation with either manual or power screwdrivers.

CAT4 starters feature the new CEP7 solid state overload relay…more accurate, wider current adjustment range and less heat generated



Accessories require no additional panel space

The entire CA4 System is logically engineered. Modular accessories like auxiliary contact blocks and timing elements snap-on without increasing the CA4's original width of 45mm.

Non-Reversing, Three Pole Contactors With AC Coil, Series CA4 (Open type only) ❶

I_e [A]		Ratings for Switching AC Motors (AC2 / AC3 / AC4)										Auxiliary Contacts per Contactor		Open Type	
		kW (50 Hz)				UL/CSA HP (60 Hz)									
						1 Ø		3 Ø							
AC-3	AC-1	230V	415V 400V	500V	690V	115V	230V	200V	230V	460V	575V	NO	NC	Catalog Number	Price
9	20	12	9	7	~	.75	1.5	3	3	5	5	1	0	CA4-9-10-✶	52
												0	1	CA4-9-01-✶	52

CA4-9-01 contactor

Non-Reversing, Three Pole Contactors With DC Coil, Series CA4 (Open type only) ❶❷

I_e [A]		Ratings for Switching AC Motors (AC2 / AC3 / AC4)										Auxiliary Contacts per Contactor		Open Type	
		kW (50 Hz)				UL/CSA HP (60 Hz)									
						1 Ø		3 Ø							
AC-3	AC-1	230V	415V 400V	500V	690V	115V	230V	200V	230V	460V	575V	NO	NC	Catalog Number	Price
9	20	12	9	7	~	.75	1.5	3	3	5	5	1	0	CA4-9C-10-✶	72
												0	1	CA4-9C-01-✶	72

CA4-9C-10 contactor

Reversing, Three Pole Contactors With AC Coil, Series CAU4 (Open type only) ❶

I_e [A]		Ratings for Switching AC Motors (AC2 / AC3 / AC4)										Auxiliary Contacts per Contactor		Open Type	
		kW (50 Hz)				UL/CSA HP (60 Hz)									
						1 Ø		3 Ø							
AC-3	AC-1	230V	415V 400V	500V	690V	115V	230V	200V	230V	460V	575V	NO	NC ❸	Catalog Number	Price
9	20	12	9	7	~	.75	1.5	3	3	5	5	0	1	CAU4-9-02-✶-LW	125
												2	1	CAU4-9-42-✶-PW	165

Note: Reversing CA4 contactors with DC coils will not accept a mechanical interlock and are not available.

CAU4…LW Includes:
- Mechanical interlock

CAU4…PW Includes:
- Mechanical and electrical interlock ❸
- Reversing power and control wiring (using Wiring Kit Cat.# KCR4)
- Top mount auxiliary contact block (Cat.# CS4-P20)

CAU4-9-42-✶-PW reversing contactor

A.C. Coil Codes ❶

A.C. Coil Code	Voltage Range 50 Hz	60 Hz
24	24V	24V
120	110V	110V-120V
240	220V-230V	230V-240V
277	240V	277V
380	400V-415V	380V-400V

D.C. Coil Codes ❶

D.C. Coil Codes	Voltage
24D	24V
48D	48V
110D	110V
220D	220V

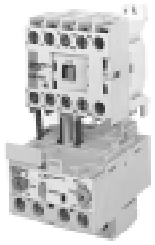
Ordering Instructions

- Specify Catalog Number
- Replace (✶) With Coil Code — **See Coil Code table on this page for codes**

❶ CA4 not available without coil. Coils and contacts not replaceable.
❷ Select Coil Code from D.C. Coil Code table only.
❸ NC contacts on each contactor are used for electrical interlocking.

Non-Reversing, Three Pole Starters With AC Coil, Series CAT4 (Open type only) ❶

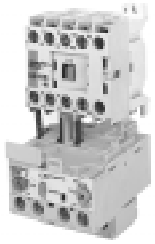
I_e [A]		Ratings for Switching AC Motors (AC2 / AC3 / AC4)										Auxiliary Contacts per Contactor		Open Type	
		kW (50 Hz)				UL/CSA HP (60 Hz)									
						1 Ø		3 Ø							
AC-3	AC-1	230V	415V 400V	500V	690V	115V	230V	200V	230V	460V	575V	NO	NC	Catalog Number	Price
9	20	12	9	7	~	.75	1.5	3	3	5	5	1	0	**CAT4-9-10-✶-◆**	**94**
												0	1	**CAT4-9-01-✶-◆**	**94**



CAT4-9-10… starter

Non-Reversing, Three Pole Starters With DC Coil, Series CAT4 (Open type only) ❶❷

I_e [A]		Ratings for Switching AC Motors (AC2 / AC3 / AC4)										Auxiliary Contacts per Contactor		Open Type	
		kW (50 Hz)				UL/CSA HP (60 Hz)									
						1 Ø		3 Ø							
AC-3	AC-1	230V	415V 400V	500V	690V	115V	230V	200V	230V	460V	575V	NO	NC	Catalog Number	Price
9	20	12	9	7	~	.75	1.5	3	3	5	5	1	0	**CAT4-9C-10-✶-◆**	**114**
												0	1	**CAT4-9C-01-✶-◆**	**114**



CAT4-9C-10… starter

Reversing, Three Pole Starters With AC Coil, Series CAUT4 (Open type only) ❶❸❹

I_e [A]		Ratings for Switching AC Motors (AC2 / AC3 / AC4)										Auxiliary Contacts per Contactor		Open Type	
		kW (50 Hz)				UL/CSA HP (60 Hz)									
						1 Ø		3 Ø							
AC-3	AC-1	230V	415V 400V	500V	690V	115V	230V	200V	230V	460V	575V	NO	NC ❸	Catalog Number	Price
9	20	12	9	7	~	.75	1.5	3	3	5	5	0	1	**CAUT4-9-02-✶-◆-LW**	**167**
												2	1	**CAUT4-9-42-✶-◆-PW**	**207**

CAUT4…LW Includes:

- Mechanical interlock
- Select either solid state or electromechanical Overload Relay Code from Section C

CAUT4…PW Includes:

- Mechanical and electrical interlock ❸
- Reversing power and control wiring (using Wiring Kit Cat.# KCR4)
- Top mount auxiliary contact block (Cat.# CS4-P20)
- Select *only* solid state Overload Relay Code from Section C ❹

Note: Reversing CA4 starters with DC coils will not accept a mechanical interlock and are not available.

CAUT4-9-42…PW reversing starter

A.C. Coil Codes ❶

A.C. Coil Code	Voltage Range 50 Hz	60 Hz
24	24V	24V
120	110V	110V-120V
240	220V-230V	230V-240V
277	240V	277V
380	400V-415V	380V-400V

D.C. Coil Codes ❶

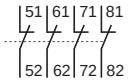
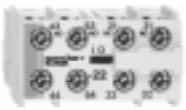
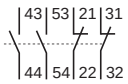
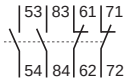
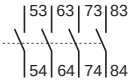
D.C. Coil Codes	Voltage
24D	24V
48D	48V
110D	110V
220D	220V

Ordering Instructions

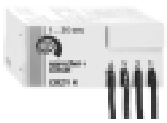
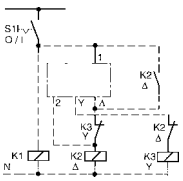
- Specify Catalog Number
- Replace (✶) With Coil Code — **Coil Codes on this page**
- Replace (◆) With O/L Relay Code ❹ — **O/L Relay Code on A93**

❶ CA4 not available without coil. Coils and contacts not replaceable.
❷ Select Coil Code from D.C. Coil Code table only.
❸ NC contacts on each contactor are used for electrical interlocking.
❹ If selecting CAUT4-9-42-✶-◆-PW reversing starter, only use Overload Relay Code for a CEP7 solid state overload relay. CT4 Thermal Overload Relay is not compatible with power wiring kit.

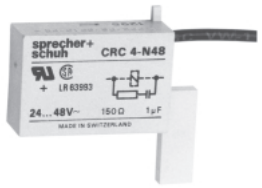
Auxiliary Contact Blocks (2 & 4 Pole)

Auxiliary Contact Blocks	NO	NC	Contact Arrangement	Catalog Number	Price
 *Contact blocks snap on without tools*	0	2		**CA4-P02**	**13**
	0	2		**CS4-P02**	**13**
	1	1		**CA4-P11**	**13**
	1	1		**CS4-P11**	**13**
 *2-pole auxiliary contact block (typical)*	2	0		**CS4-P20**	**13**
	0	4		**CS4-P04**	**23**
 *4-pole auxiliary contact block (typical)*	2	2		**CA4-P22**	**23**
	2	2		**CS4-P22**	**23**
	4	0		**CS4-P40**	**23**

Control Modules

Module	Description	For use with…	Connection Diagrams	Function	Catalog Number	Price
	**Electronic Timing Module – ON-Delay** The contactor is energized at the end of the delay time.	CA4 all		110…250V 50/60Hz 0.1…3 sec. 1…30 sec.	**CRZE4-3S** **CRZE4-30S**	**60** **60**
	**Electronic Timing Module – Wye-Delta Transition Timer** After the set time has elapsed, the contactor K3 (Y) is de-energized, and then after 90ms nominal (±30ms), the contactor K2 (D) is energized.	CA4 all		110…120V 50/60Hz 1…30 sec. 220…250V 50/60Hz 1…30 sec.	**CRZY4-30S-120V** **CRZY4-30S-250V**	**68** **68**

Miscellaneous Accessories

Accessory	Description	Catalog Number	Price
	**Surge Suppressor CRC4 -** Limits voltage spikes when switching off coil. Attaches to all CA4 contactors, CT4 overload relays and auxililary contact blocks. Coil itself provides sufficient limitation at voltages over 240V. RC Link (Type CRC4…) 24-48VAC 110-280VAC 380-480VAC Diode Link (Type CRD4…) 12-250VDC	 **25.950.121-01** **25.950.121-02** **25.950.121-03** **25.950.123-02**	**20**
	Varistor Link (Type CRV4…) 12-55VAC/12-77VDC 56-136VAC/78-180VDC 137-277VAC/181-350VDC	 **25.950.122-01** **25.950.122-02** **25.950.122-03**	**13**
	**Mechanical Interlock Kit -** For CA4 contactors with AC coil.	**25.951.301-01**	**10**
	**Wiring Kit -** For connecting line, load and control wiring of a CAU4 reversing contactor. May not be used with CT4 Thermal Overload relay. May be used with CEP7 Solid State O/L if CEP7 adaptor bracket is removed.	**KCR4**	**10**
	**Adaptor -** For mounting CRZE4 and CRZY4 Electronic Timers to DIN-rails.	**25.950.207-01**	**3**
	**Neutral Terminal -** With insulated part for sliding onto contactor. 10mm^2 16mm^2	 **25.945.105-01** **25.945.105-04**	 **11** **12**

Marking Systems

Component	Description	Pkg. Qty.	Catalog Number	Price Each
	**Label Sheet –** 1 sheet with 105 self-adhesive paper labels each, 6 x 17mm	1	**CA7-FMS**	**1**
	**Marking Tag Sheet -** 1 sheet with 160 perforated paper labels each, 6 x 17mm. To be used with transparent cover.	1	**CA7-FMP**	**1**
	Transparent Cover - To be used with Marking Tag Sheets.	100 ❶	**CA7-FMC**	**.10**
	**Tag Carrier -** For marking with Clip-on Tags. See Terminals Section for complete listing of Clip-on Tags.	100 ❶	**CA7-FMA1**	**.10**

❶ Minimum order quantity is one package of 100. Price each x 100 = total price.

Miscellaneous Accessories

Accessory	Description	Catalog Number	Price
	**Steel DIN-rail –** Top Hat (2 types) and G-rail – 6 ft. lengths	**See Section G**	~
	**Device Supports –** For mounting CA4 contactors or CAU4 reversing contactors to a KTA3 Motor Circuit Controller. Device supports are DIN-rail mounted or base mounted using three screws. Lower device support rail is adjustable.	**See Section G**	~
	**Connecting Module –** Provides a solid "wireless" connection between a KTA3 Motor Circuit Controller and a CA4 contactor.	**See Section G**	~

CA4 Series Starters with CEP7 Solid State Overload Relay ❶

For use with contactor…	Amp Range	Overload Relay Code (▲)	Catalog Number (of Overload Relay used)	Price Adder
CEP7 Solid State Overload Relay, 3-Phase, Manual Reset, Class 10				
CA4-9	0.1…0.32	MA	CEP7-M32-0.32-10	Standard
	0.32…1.0	MB	CEP7-M32-1.0-10	Standard
	1.0…2.9	MC	CEP7-M32-2.9-10	Standard
	1.6…5.0	MD	CEP7-M32-5-10	Standard
	3.7…12	ME	CEP7-M32-12-10	Standard
CEP7 Solid State Overload Relay, 3-Phase, Manual Reset, Class 20				
CA4-9	0.1…0.32	M2A	CEP7-M32-0.32-20	N/C
	0.32…1.0	M2B	CEP7-M32-1.0-20	N/C
	1.0…2.9	M2C	CEP7-M32-2.9-20	N/C
	1.6…5.0	M2D	CEP7-M32-5-20	N/C
	3.7…12	M2E	CEP7-M32-12-20	N/C
CEP7 Solid State O/L Relay, 3-Phase, Auto/Manual Reset, Class 10				
CA4-9	0.1…0.32	AA	CEP7-A32-0.32-10	3
	0.32…1.0	AB	CEP7-A32-1.0-10	3
	1.0…2.9	AC	CEP7-A32-2.9-10	3
	1.6…5.0	AD	CEP7-A32-5-10	3
	3.7…12	AE	CEP7-A32-12-10	3
CEP7 Solid State O/L Relay, 3-Phase, Auto/Manual Reset, Class 20				
CA4-9	0.1…0.32	A2A	CEP7-A32-0.32-20	3
	0.32…1.0	A2B	CEP7-A32-1.0-20	3
	1.0…2.9	A2C	CEP7-A32-2.9-20	3
	1.6…5.0	A2D	CEP7-A32-5-20	3
	3.7…12	A2E	CEP7-A32-12-20	3
CEP7 Solid State Overload Relay, 1-Phase, Manual Reset, Class 10				
CA4-9	2…7	MSD	CEP7S-M32-7-10	Standard
	5…15	MSE	CEP7S-M32-15-10	Standard
CEP7 Solid State Overload Relay, 1-Phase, Manual Reset, Class 20				
CA4-9	2…7	MS2D	CEP7S-M32-7-20	N/C
	5…15	MS2E	CEP7S-M32-15-20	N/C
CEP7 Solid State O/L Relay, 1-Phase, Auto/Manual Reset, Class 10				
CA4-9	2…7	ASD	CEP7S-A32-7-10	3
	5…15	ASE	CEP7S-A32-15-10	3
CEP7 Solid State O/L Relay, 1-Phase, Auto/Manual Reset, Class 10				
CA4-9	2…7	AS2D	CEP7S-A32-7-20	3
	5…15	AS2E	CEP7S-A32-15-20	3

❶ 3-phase CEP7 units are only designed for 3∅ applications. Single phase CEP7 units are only designed for 1∅ applications.

CA4 Series Starters with CT4 Thermal Overload Relay

For use with contactor…	Amp Range	Overload Relay Code (▲)	Catalog Number (of Overload Relay used)	Price Adder
CT4 Thermal Overload Relay, 1 or 3-Phase, Auto/Manual, Class 10				
CA4-9	0.10…0.15	0.15	CT4-0.15	3
	0.15…0.23	0.23	CT4-0.23	3
	0.23…0.35	0.35	CT4-0.35	3
	0.35…0.55	0.55	CT4-0.55	3
	0.55…0.80	0.80	CT4-0.80	3
	0.80…1.2	1.2	CT4-1.2	3
	1.2…1.8	1.8	CT4-1.8	3
	1.8…2.7	2.7	CT4-2.7	3
	2.7…4.0	4.0	CT4-4.0	3
	4.0…6.0	6.0	CT4-6.0	3
	6.0…7.7	7.7	CT4-7.7	3
	7.5…9.0	9.0	CT4-9.0	3

Technical Information

Rated Insulation Voltage U_i			
to IEC 947-1		[V]	500V
UL/CSA		[V]	600V
Rated Impulse Voltage U_{imp}		[kV]	8
Rated Voltage U_e – Main Contacts			
AC 50/60Hz		[V]	230, 240, 400, 415, 500
DC		[V]	24, 48, 110, 220, 440
Operating Frequency for AC Loads		[Hz]	50/60Hz

Switching Motor Loads

Standard IEC Ratings				
AC-2, AC-3, AC-4		230V	[A]	12
DOL & Reversing		240V	[A]	12
50Hz/60˚ C		400V	[A]	9
		415V	[A]	9
		500V	[A]	7
		230V	[kW]	1.7
		240V	[kW]	1.8
		400V	[kW]	2.5
		415V	[kW]	2.6
		500V	[kW]	2.3
UL/CSA		115V	[A]	13.8
DOL & Reversing	1∅	230V	[A]	10
60Hz/60˚C		115V	[HP]	0.75
		230V	[HP]	1.5
		200V	[A]	11
		230V	[A]	9.6
		460 V	[A]	7.6
	3∅	575 V	[A]	6.1
		200 V	[HP]	3
		230 V	[HP]	3
		460 V	[HP]	5
		575 V	[HP]	5
Maximum Operating Rate		AC2	[ops/hr]	300
At 9A for AC3; 20A for AC2/4		AC3	[ops/hr]	600
Starting time t_A = 0.25s		AC4	[ops/hr]	300
AC4 (200,000 Op. Cycles)		230V	[A]	3.9
50Hz		240V	[A]	3.9
		400V	[A]	3.3
		415V	[A]	3.3
		230V	[kW]	0.92
		240V	[kW]	0.96
		400V	[kW]	1.5
		415V	[kW]	1.6
Max. Operating Rate			[ops/hour]	250

Wye-Delta (Star Delta)		230V	[A]	21
50 Hz		240V	[A]	21
		400V	[A]	16
		415V	[A]	16
		500V	[A]	12
		230V	[kW]	5.8
		240V	[kW]	6.3
		400V	[kW]	7.9
		415V	[kW]	8.2
		500V	[kW]	7.7
AC-1 Load, 3∅ Switching		I_e	[A]	20
Ambient Temperature 40°C		230V	[kW]	8
		240V	[kW]	8.3
		400V	[kW]	14
		415V	[kW]	14
		500V	[kW]	17
Ambient Temperature 60°C		I_e	[A]	16
		230V	[kW]	6.4
		240V	[kW]	6.7
		400V	[kW]	11
		415V	[kW]	12
		500V	[kW]	14
Continuous Current (UL/CSA)				
General Purpose Rating (40°C)		Open	[A]	12
		Enclosed	[A]	12

Lighting Loads

Elec.Dischrg.Lamps-AC-5a,	Open	[A]	18
single compensated	Enclosed	[A]	18
Max. capacitance at	10kA	[µF]	750
prospective short circuit	20kA	[µF]	400
current available at the	50kA	[µF]	~
contactor.			
Incandescent Lamps - AC-5b,			
Electrical endurance ~100,000 operations		[A]	9.3

Electrical Data

Switching power transformers AC-6a

Inrush / Rated transformer currrent	= n		
	230V	[A]	5.4
	240V	[A]	5.4
	400V	[A]	4.1
	415V	[A]	4.1
	500V	[A]	~
	230 VAC	[kVA]	2.2
	240 VAC	[kVA]	2.2
	400 VAC	[kVA]	2.8
	415 VAC	[kVA]	2.9
	500 VAC	[kVA]	2.7

DC Ratings

DC-1 Rating at 60°C		[kW]	x
1 Pole	24VDC	[A]	9
	48VDC	[A]	6
	110VDC	[A]	1
	220VDC	[A]	0.3
	440VDC	[A]	0.1
2 Pole in Series	24VDC	[A]	9
	48VDC	[A]	8
	110VDC	[A]	6
	220VDC	[A]	1.2
	440VDC	[A]	0.3
3 Pole in Series	24VDC	[A]	9
	48VDC	[A]	9
	110VDC	[A]	9
	220VDC	[A]	4
	440VDC	[A]	0.6

Short Time Current Withstand Ratings

I_{cw} 60° C	1 s	[A]	110
	4 s	[A]	85
	10 s	[A]	60
	15 s	[A]	50
	60 s	[A]	30
	240 s	[A]	20
	900 s	[A]	20
Off Time Between Operations		[Min.]	3

Resistance and Watt Loss I_e AC3			
Resistance per power pole		[mΩ]	5.5
Watt Loss - 3 power poles		[W]	1.3
Coil and 3 power poles	AC	[W]	2.7
	DC	[W]	3.8

Coil Data

Voltage Range			
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	`[x U_s]	0.85…1.1
	Dropout	[x U_s]	0.3…0.65
DC	Pickup	[x U_s]	0.85…1.1
	Dropout	[x U_s]	0.1…0.25
Coil Consumption			
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[VA/W]	22/20
	Hold-in	[VA/W]	4/1.4
DC	Pickup	[W]	2.5
	Hold-in	[W]	2.5
Operating Times			
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[ms]	15…40
	Dropout	[ms]	15…25
with RC Suppressor	Dropout	[ms]	15…25
DC	Pickup	[ms]	18…40
	Dropout	[ms]	6…12
with Integ. Suppression	Dropout	[ms]	8…12
with Diode Suppression	Dropout	[ms]	35…50

Mechanical Data

Service Life			
Mechanical	AC	[Mil.]	10
	DC	[Mil.]	20
Electrical	AC-3 (400V)	[Mil.]	0.7
Shipping Weights			
AC - CA4		[kg]	0.16
		[Lbs]	0.35
AC - CAU4		[kg]	0.35
		[Lbs]	0.77
DC - CA4		[kg]	0.16
		[Lbs]	0.35
DC - CAU4		[kg]	0.35
		[Lbs]	0.77
Terminations - Power			
Terminal Type			
			Combination Screw Head: Cross, Slotted, Posidrive
	1 Wire	[mm^2]	0.75...2.5
	2 Wires	[mm^2]	0.75...2.5
	1 Wire	[mm^2]	0.75...2.5
	2 Wires	[mm^2]	0.75...2.5
	1 Wire	[AWG]	18...14
	2 Wires	[AWG]	18...14
Torque Requirement		[Nm]	1...1.5
		[Lb-in]	7...15
Terminations - Control			
Terminal Type			
			Combination Screw Head: Cross, Slotted, Pozidrive
Coils	1 or 2	[mm^2]	0.75...2.5
Wires		[AWG]	18...14
Control Modules	1 or 2	[mm^2]	0.75...2.5
Wires		[AWG]	18...14
Torque Requirement		[Nm]	1...1.5
		[Lb-in]	7...15
Degree of Protection - contactor	IP 2LX per IEC 529 and DIN 40 050 (with wires installed)		
Protection Against Accidental Contact	Safe from touch by fingers and back-of-hand per VDE 0106; Part 100		

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 947-4
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: Half sinusoidal shock 11ms, 30g (in all three directions)
Vibration Resistance	IEC 68-2: Static >2g, in normal position no malfunction <5g
Operating Position	Refer to Dimension Pages
Standards	IEC947-1/4, EN 60947; UL 508; CSA 22.2, No. 14, SEV1025
Approvals	CE, UL, CSA, SEV, SUVA, Lloyd's Registry of Shipping, Bureau Veritas, Maritime Register of Shipping, Elektrizitats-Inspektorat Finland

Auxiliary Contacts

			Built-in Auxiliary Contacts	Auxiliary Contact Blocks
Current Switching				
AC-1 Ith	at 40°C	[A]	10	16
	at 60°C	[A]	6	12
AC-15, switching electromagnetic loads at:		[V]	230 240 400 415 500	230 240 400 415 500
		[A]	2 2 1 1 0.6	6 5 2.5 2 1.25
DC-13, switching DC electromagnets at:		[V]	24 48 110 220 440	24 48 110 220 440
		[A]	2 0.6 0.45 0.1 0.04	5 0.6 0.45 0.25 0.04
Short-Circuit Protection - gG Fuse				
Type 2 Coordination		[A]	10	16
Load carrying capacity per UL/CSA				
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 (A600)
Rated Voltage	DC	[V]	600 max.	600 max.
Switching Capacity	DC		Standard pilot duty (Q600)	Standard pilot duty (Q600)
Terminals				
Terminal Type				
Maximum Wire Size per IEC 947-1				
 Flexible with Wire-End Ferrule	1 Conductor	[mm²]	0.75…2.5	0.75…2.5
	2 Conductor	[mm²]	0.75…2.5	0.75…2.5
 Solid/Stranded-Conductor	1 Conductor	[mm²]	0.75…2.5	0.75…2.5
	2 Conductor	[mm²]	0.75…2.5	0.75…2.5
Recommended Tightening Torque		[Nm]	1…1.5	1…1.5
Max. Wire Size per UL/CSA		[AWG]	18…14	18…14
Recommended Tightening Torque		[lb-in]	7…15	7…15

CRZE4/CRZY4 Electronic Timers

Permissible voltage	
CRZE4 (AC or DC)	110V (-23%) - 250V (+10%)
CRZY4 (AC only)	110V (-23%) - 120V (+10%)
	220V (-20%) - 250V (+10%)
Voltage drop	5V max
Load current for reliable operation	10mA min
Load current	
20°C	600mA
40°C	440mA
55°C	320mA
Leakage current at 220V	
CRZE4	5mA
CRZY4	"Y" 17mA, "D" 6mA
Reset time	200ms
Voltage failure duration having no influence on timing sequence	
CRZE4	15ms
CRZY4	20ms
Repeat accuracy	±5%
Time interval for start commands	
CRZE4	1.4 x set time
CRZY4	2 x set time
Ambient temperature	
Storage	-40°C to +80°C
Operation	-20°C to +55°C

Determining Contact Life

To determine the contactor's estimated electrical life, follow these guidelines:

1. Identify the appropriate Utilization Category from Table A.
2. On the following pages, choose the graph for the Utilization Category selected.
3. 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.
4. Read the estimated contact life along the vertical axis.

Table A – IEC Special Utilization Categories *(Number of operations under load)* ❶

Category	Typical Applications	Rated Current	Conditions for testing electrical life						Conditions for testing making and breaking capacity					
			Make			Break			Make			Break		
			I/Ie	*U/Ue*	cos	*Ic/Ie*	*Ur/Ue*	cos	*I/Ie*	*U/Ue*	cos	*Ic/Ie*	*Ur/Ue*	cos
AC-1	Non-inductive or slightly inductive loads, resistance furnaces	All values	1	1	0.95	1	1	0.95	1.5	1.05	0.8	1.5	1.05	0.8
AC-2	Slip-ring motors: Starting, plugging	All values	2	1.05	0.65	2	1.05	0.65	4	1.05	0.65	4	1.05	0.65
AC-3	Squirrel-cage motors: Starting, switching off motors during running	*Ie* 17Amp 17Amp < *Ie* 100Amp *Ie* > 100Amp	6 6 6	1 1 1	0.65 0.35 0.35	1 1 1	0.17 0.17 0.17	0.65 0.35 0.35	10 10 8❸	1.1 1.1 1.1	0.65 0.35 0.35	8 8 6❹	1.1 1.1 1.1	0.65 0.35 0.35
AC-4	Squirrel-cage motors: Starting, plugging, inching ❾	*Ie* 17Amp 17Amp < *Ie* 100Amp *Ie* > 100Amp	6 6 6	1 1 1	0.65 0.35 0.35	6 6 6	1 1 1	0.65 0.35 0.35	12 12 10❺	1.1 1.1 1.1	0.65 0.35 0.35	10 10 8❸	1.1 1.1 1.1	0.65 0.35 0.35
AC-5a	Switching of electric discharge lamp control		2	1.05	0.45	2	1.05	0.45	3	1.05	0.45	3	1.05	0.45
AC-5b	Switching of incandescent lamps		1	1.05		1	1.05		1.5	1.05		1.5	1.05	
AC-13	Control of solid state loads with transformer isolation		2	1	0.65	1	1	0.65	10	1.1	0.65	1.1	1.1	0.65
AC-15	Electromagnets for contactors, valves, solenoid actuators		10	1	0.3	1	1	0.3	10	1.1	0.3	10	1.1	0.3
			Make			Break			Make			Break		
			I/Ie	*U/Ue*	L/R ❻ [ms]	*Ic/Ie*	*Ur/Ue*	L/R❻ [ms]	*I/Ie*	*U/Ue*	L/R❻ [ms]	*Ic/Ie*	*Ur/Ue*	L/R❻ [ms]
DC-1	Non-inductive or slightly inductive loads, resistance furnaces	All values	1	1	1	1	1	1	1.5❽	1.1❽	1❽	1.5❽	1.1❽	1❽
DC-2	Shunt-motors: Starting, switching off motors during running	All values	2.5	1	2	1	0.1	7.5	4	1.1	2.5	4	1.1	2.5
DC-3	Shunt-motors: Starting, plugging, inching	All values	2.5	1	2	2.5	1	2	4	1.1	2.5	4	1.1	2.5
DC-4	Series-motors: Starting, switching off motors during running	All values	2.5	1	7.5	1	0.3	10	4	1.1	15	4	1.1	15
DC-5	Series-motors: Starting, plugging, inching	All values	2.5	1	7.5	2.5	1	7.5	4	1.1	15	4	1.1	15
DC-15	Electromagnets for contactors, valves, solenoid actuators		1	1	6 x P❼	1	1	6 x P❼	1.1	1.1	6 x P❼	1.1	1.1	6 x P❼

❶ Utilization categories and test conditions for AC & DC. For contactors according to IEC 158-1, starters according to IEC 292-1 ... 4 and control switches according to IEC 337-1 and IEC 337-1A.

❸ With a minimum value of 1000A for *I* or *Ic*.

❹ With a minimum value of 800A for *Ic*.

❺ With a minimum value of 1200A for *I*.

❻ $T_{0.95}$ for DC-15: Time in milliseconds for reaching 95% of steady-state current *Ie* x $T_{0.95}$ is 300% of the time constant $T = L/R$ of the circuit.

❼ $P = Ue \times Ie$ rated power [W]. The value "6 x P" has been derived from an empiric relationship which covers most magnetic loads for DC up to an upper limit of P = 50W.

❽ Only according to VDE.

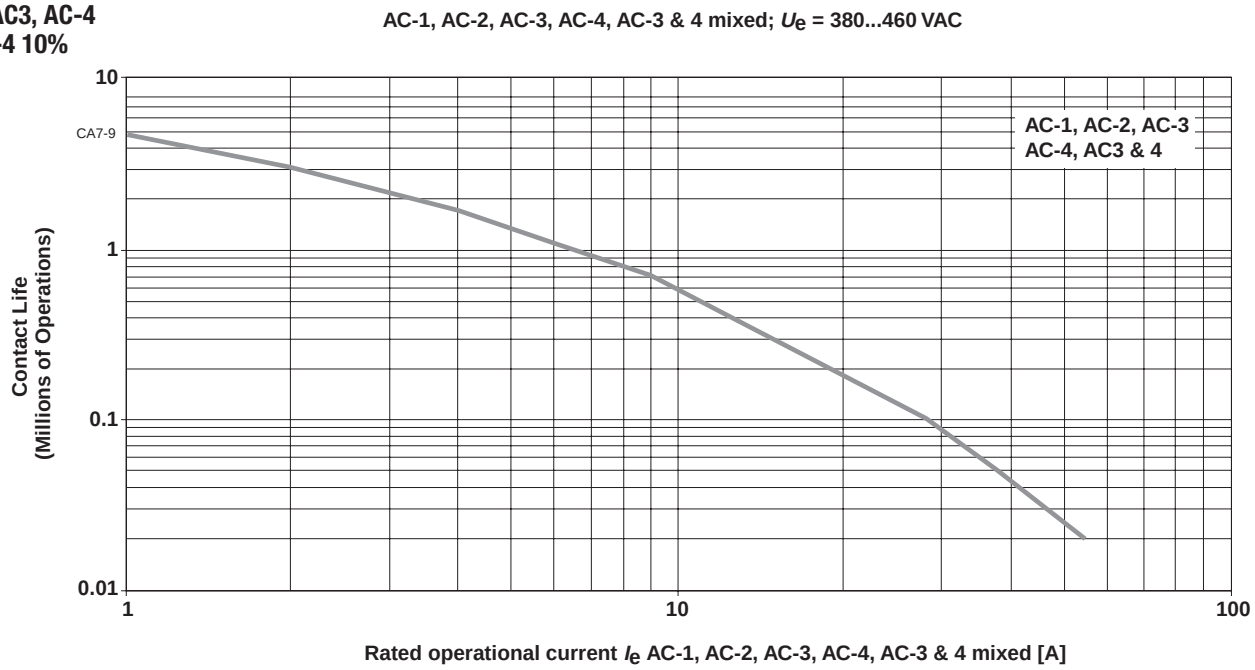
❾ Plugging is understood as stopping or reversing the motor rapidly by reversing the motor primary connections while the motor is running. Inching [or jogging] is understood as energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

Legend

Ue	Rated operational voltage
U	Voltage before make
Ur	Recovery voltage
Ie	Rated operational current
I	Making current
Ic	Breaking current
L	Inductance of test circuit
R	Resistance of test circuit

Life-Load Curves

AC-1, AC-2, AC3, AC-4
AC3 90%/AC-4 10%



Contact Life for Mixed Utilization Categories AC-3 and AC-4

In many applications, the utilization category cannot be defined as either purely AC-3 or AC-4. In those applications, the electrical life of the contactor can be estimated with the following equation:

$$L_{mixed} = L_{ac3} / [1+P_{ac4} \times (L_{ac3}/L_{ac4}-1)]$$, where:

L_{mixed} Approximate contact life in operations for a mixed AC-3/AC-4 utilization category application.

L_{ac3} Approximate contact life in operations for a pure AC-3 utilization category (from the AC-3 life-load curve).

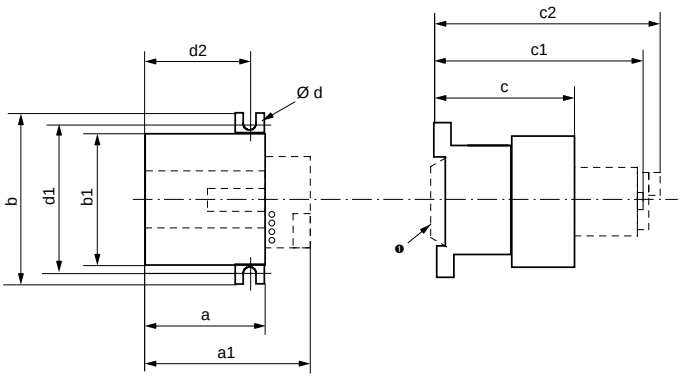
L_{ac4} Approximate contact life in operations for a pure AC-4 utilization category (from the AC-4 life-load curve).

P_{ac4} Percentage of AC-4 operations

NOTE: The life-load curves shown here are based on Sprecher+Schuh tests according to the requirements defined in IEC 947-4-1. 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 CA4-9 & Series CAU4-9 (Contactors & Reversing Contactors)

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

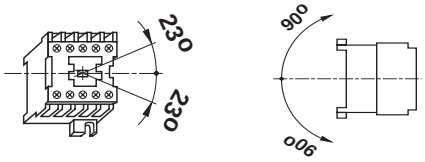


Type	a	a1	b	b1	c	c1	c2	ød	d1	d2
CA4-9	45 (1-25/32)	67 (2-21/32)	56 (2-3/16)	47 (1-14/16)	48 (1-29/32)	74 (2-15/16)	77 (3-1/16)	4.2 (11/64)	50 (1-31/32)	40 (1-9/16)

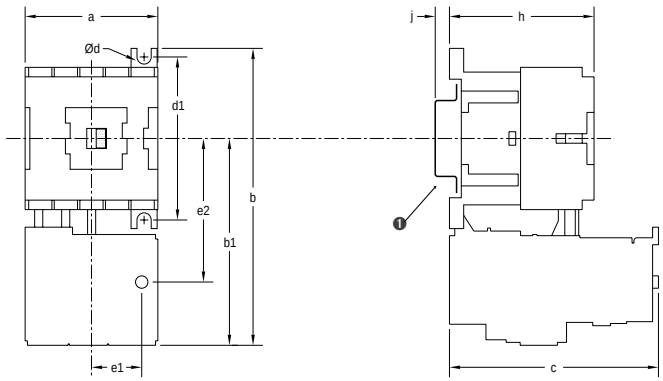
Reversing Contactors & Accessories

Contactor with…		Dim. [mm]	Dim. [inches]
reversing wirh mechanical interlock		a+a	a+a
with aux. contact block		c1	c1
with timer	on contactor	c2	c2
	at side of contactor	a1	a1
with neutral terminal	at side of contactor	a+20	a + 1-25/32
with protection element		c2	c2
with nameplate		c..+5	c..+ 3/16

Mounting Position



Series CAT4-9 & Series CAUT4-9 (Starters & Reversing Starters)



Type	a	b	b1	c	e2	d1	h	j	ød
CA4-9 + CEP7-A/M/S	45 (1-25/32)	107 (4-7/32)	83 (3-9/32)	66.6 (2-5/8)	50 (1-31/32)	50 (1-31/32)	48.2 (1-29/32)	2 (3/32)	Two ∅ 4.2 (Two 11/64 ∅)
CA4-9 + CT4	45 (1-25/32)	98 (3-7/8)	70 (2-3/4)	86 (3-13/32)	40 (1-19/32)	50 (1-31/32)	48.2 (1-29/32)	2 (3/32)	Two ∅ 4.2 (Two 11/64 ∅)

Reversing Starters

Contactor	Dim. [mm]	Dim. [inches]
reversing with mechanical interlock	a+a	a+a

❶ Provision for mounting on a top hat rail (EN 50 022). Top hat and G-rail mounting not possible when using mechanical interlock.