Series CA5 Contactors

The complete contactor for heavy industrial applications from 500HP to 900HP

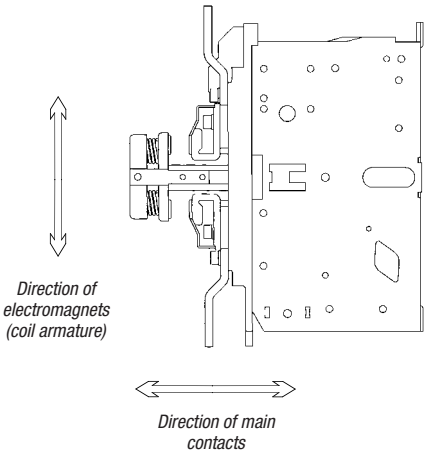
CA5 Series contactors provide large horsepower performance with a design that is up to 40% smaller than traditional contactors of this rating. The entire line is modularly designed for easy inspection, contact replacement and coil changeout. All maintenance can be performed from the front so that mounting can be accomplished with no wasted space on the sides.

The contactor for large horsepower applications

The CA5 series consists of four contactors in two frame sizes covering motors from 500 to 900 HP (at 460V/575V). This line is well suited for heavy industrial applications utilizing large machinery and equipment such as rock quarries and mines, or for any large horsepower application where a rugged and dependable contactor is needed.

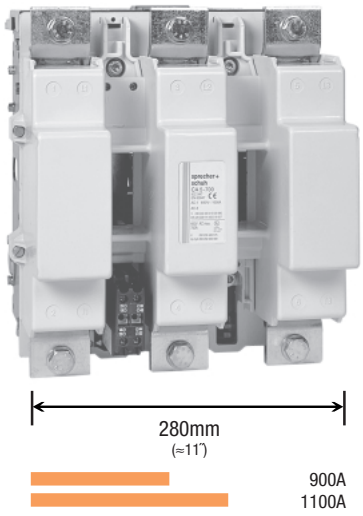
Specially designed shock-free contact system

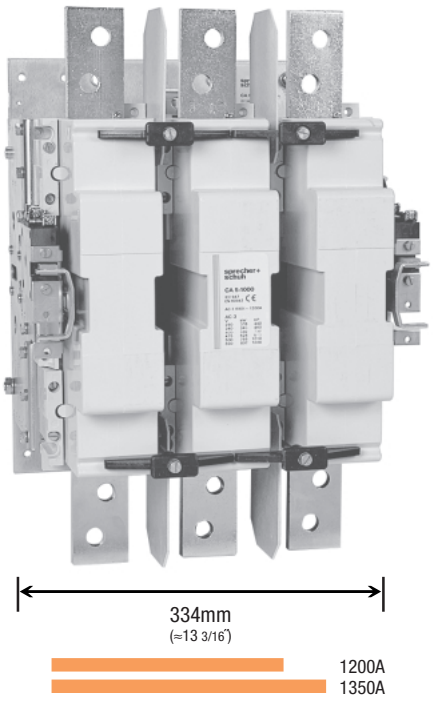
A characteristic of contactors in this size class is to transmit intense impact forces during operation. This is caused by the heavy magnetic armatures of the core, which can cause contact "bounce." CA5 contactors, however, are designed so that the operating planes of the electromagnets and the contacts are opposed to each other by 90°. This results in a bounce-free contact system, increasing the contactor's mechanical life and raising contact reliability.



Rugged and reliable

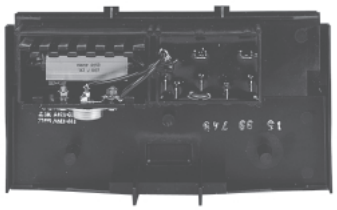
A massive steel framework supporting the magnet system ensures high stability in all applications. Low-wear materials for bearings and sliding surfaces, as well as generously dimensioned magnet-pole faces result in above average mechanical life with a minimum of maintenance. Despite their rugged construction, overall contactor weight has been reduced considerably permitting simpler panel construction and easier assembly.





Unique coil "feeder group" offers many advantages

CA5-700 and 860 contactors are equipped with a special "feeder group" for the coil that accommodates AC control voltages of 50 or 60Hz, and a wide range of DC voltages.



This coil arrangement eliminates noise and provides very low pickup and hold-in current. In addition, the dropout time of the coil can be adjusted within one of three ranges.

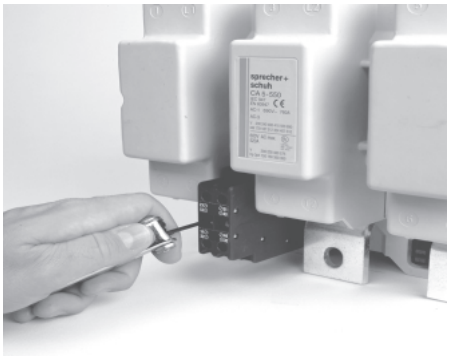
Normal Drop (150 to 200ms): for prompt reaction of contactor to a breaking command (factory setting).

Delayed Drop (0.5 to 1s): where it is necessary for the contactor to be immune to short power supply interruptions or uncertain control devices.

Fast Drop (about 20ms): for safety applications where instant dropout is required.

Adjustable auxiliary contacts

CA5 contactors can be equipped with a maximum of four NO and four NC auxiliary contacts. In addition, the closing time of the auxiliary contacts (on CA5-700 & 860 contactors) can be adjusted to meet individual control requirements.

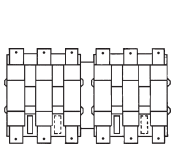


Add-on fourth pole

In many applications, the neutral also needs to be switched. All CA5 contactors can be fitted with a 4th pole on either the left or right side of the contactor. This switched neutral is available as an accessory that can easily be installed in the field.

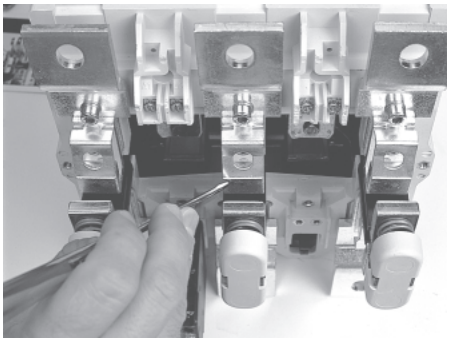
Two choices for interlocking reversing contactors

Unique to the CA5 range is the ability to mechanically interlock reversing contactors in either a horizontal or vertical orientation. This feature allows maximum flexibility when laying out panels.



Horizontal mechanical interlock

Vertical mechanical interlock

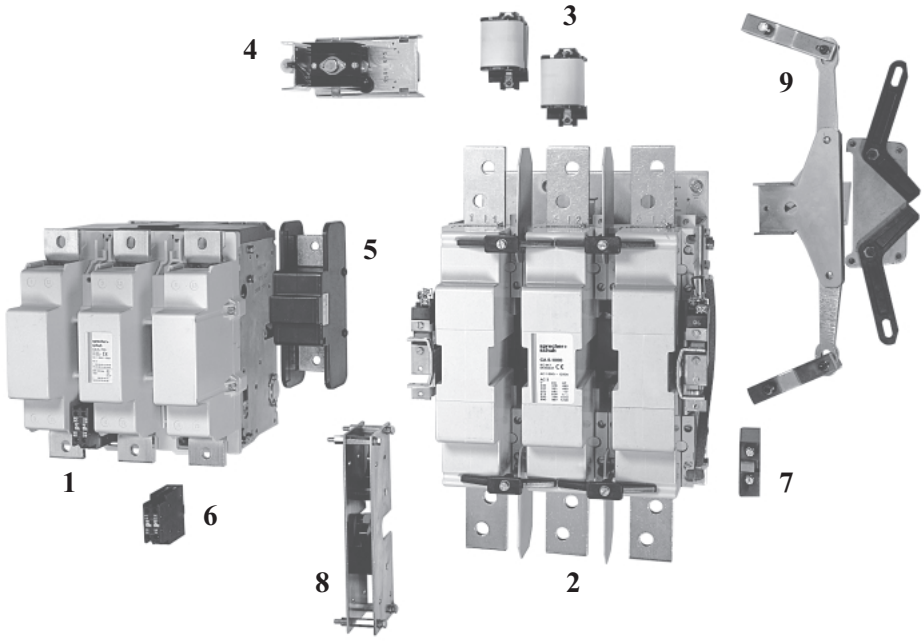


Simple main contact inspection and easy coil change

Modular, convenient design

The CA5 line is modularly designed for easy inspection, coil change and contact replacement. Maintenance can be performed from the front so that mounting requires no additional space. Even with the installation of mechanical interlocks and auxiliary contact blocks, the units can be flush mounted side by side, saving panel space.

1 CA5-700 Contactor
2 CA5-1000 Contactor
3 Coil Pair
4 Feeder Group
5 4th Pole (Neutral Switching)
6 Auxiliary Contact Block
7 Auxiliary Contact Block
8 Mechanical Interlock (horizontal)
9 Mechanical Interlock (vertical)



A full range of CA5 accessories is available, including a unique mechanical interlock that allows vertical mounting of contactors (see explanation above)

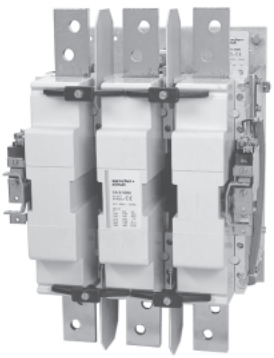
Non-Reversing, Three Pole Contactors With AC or DC Coil, Series CA5 (Open type only) ❶❸❹

I_e [A]		Ratings for Switching AC Motors (AC2 / AC3 / AC4) kW (50 Hz)					UL/CSA HP (60 Hz) ❸ 3 Ø				Auxiliary Contacts per Contactor		Open Type Catalog Number ❶❸	Price
AC-3	AC-1	230V	400V	500V	690V	1000V	200V	230V	460V	575V	NO	NC		
700	1000	220	375	500	600	500	**200**	**250**	**500**	**500**	2	2	**CA5-700-22-✶**	**3250**
860	1100	270	475	600	650	550	**250**	**300**	**600**	**600**	2	2	**CA5-860-22-✶**	**4750**
1000	1200	320	560	720	930	~	**350** ❸	**400** ❸	**800** ❸	**900** ❸	1	2	**CA5-1000-12-✶**	**8250**
1150	1350	375	630	840	1100	~	**450**	**450**	**900**	**900**	1	2	**CA5-1200-12-✶**	**9950**

Note: CA5 open-type contactors include terminal bolts.

See Section C for reversing CA5 contactors.

CA5-700-22 contactor



CA5-1000-12 contactor

Coil Codes ❶❷

CA5-700 / 860			
A.C. & D.C. Coil Code	Voltage Range 50 Hz	60 Hz	VDC
120	110-120V	110-120V	100-110VDC
240	220-240V	220-240V	200-220VDC
380	380-415V	380-415V	345-380VDC
480	440-480V	440-480V	400-440VDC
XXX	Supplied without coil		

CA5-1000 / 1200		
A.C. Coil Code	Voltage Range 50 Hz	60 Hz
110	110V	110V
220	220V	220V
380	380V	380V
440	440V	440V
XXX	Supplied without coil	

Ordering Instructions

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

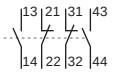
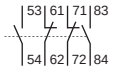
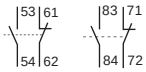
❶ CA5-700 and 860 contactors are equipped with coils that operate with both AC and DC control voltages. CA5-1000 and 1200 contactors operate with AC control voltage input that is rectified for DC coil operation. See page A75. Consult factory for DC control voltage input.

❷ Other voltages available, see page A69. *Non-standard coil voltages not listed here must be ordered and installed separately as renewal parts.*

❸ CA5-1000 horsepower ratings per IEC Utilization category AC-3. See CA5 Technical Data section for additional sizing information. Label does not bear a UL/CSA horsepower rating.

❹ The CA5-550 has been replaced by the CA6-420-EI contactor. CA5-550 contactors are still available by special order if required for their higher AC1 ratings. See ratings in CA5 Technical Section.

Auxiliary Contact Blocks (2 & 4 Pole)

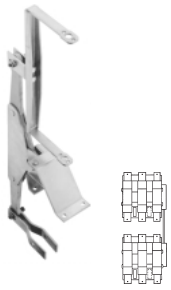
Contact Block	Description	NO	NC	Contact Arrangement	For use with…	Catalog Number	Price
 *4-pole*	• For mounting between T1 & T2 or between T2 & T3 • Adjustable; provides normal, delayed or overlapping contacts ❶ • Maximum two blocks per contactor ❷ • Alternate terminal marking tags included	2	2	 *Standard terminal marking for mounting between T1 & T2*  *Alternate terminal marking for mounting between T2 & T3*	CA5-700 CA5-860	**CA5-EF22** ❷	**270**
 *2-pole*	• For side mounting on either side of the contactor • Maximum four blocks per contactor ❸ • Alternate terminal marking tags included	1	1	 *Standard terminal marking*  *Alternate terminal markings*	CA5-1000 CA5-1200	**CA5-EB11** ❸	**430**

Switched Neutral (4th Pole)

4th Pole	4th Pole Amperes	For use with…	Catalog Number	Price
	500	CA5-700 CA5-860	**CA5-NP500/6**	**630**
		CA5-1000 CA5-1200	**CA5-NP500/7**	**915**
	900	CA5-700 CA5-860	**CA5-NP900/6**	**830**
		CA5-1000 CA5-1200	**CA5-NP900/7**	**1250**

❶ Further information on adjustable contacts can be found under “Auxiliary Contacts” in the CA5 Technical Section.
❷ Contactor comes standard with one 4-pole aux contact block.
❸ In addition to one standard two-pole auxiliary contact block (CA5-EB11), CA5-1000 & 1200 contactors are equipped from the factory with a special two pole auxiliary contact block (CA5-EB11DC). One of the poles is used for operation of the Feeder Group/Coil mechanism, the other NC contact is available for use. Two additional aux contact blocks may be added for a total of four.

Mechanical Interlock Kit ❶

For Horizontal Mounting of Contactors			
Interlock	**For use with…**	**Catalog Number**	**Price**
	CA5-700 CA5-860 CA5-700/CA5-860	**CA5-BM6H**	**450**
	CA5-700/CA5-1000 CA5-700/CA5-1200 CA5-860/CA5-1000 CA5-860/CA5-1200	**CA5-BM67H**	**1365**
	CA5-1000 CA5-1200 CA5-1000/CA5-1200	**CA5-BM7H**	**850**
For Vertical Mounting of Contactors			
	CA5-700 CA5-860 CA5-700/CA5-860	**CA5-BM6V**	**450**
	CA5-700/CA5-1000 CA5-700/CA5-1200 CA5-860/CA5-1000 CA5-860/CA5-1200	**CA5-BM67V**	**1365**
	CA5-1000 CA5-1200 CA5-1000/CA5-1200	**CA5-BM7V**	**850**

❶ Kit includes interlock, mounting pan/rails (if applicable) and all necessary hardware.

All CA5 contactor coils are made up of two parts; the Coil Pair and Feeder Group. When ordering replacement parts, usually assume the Coil Pair must be replaced. If control voltage changes, user must order Coil Pair and matching Feeder Group.

Even though all CA5 coils are designed for AC *input* (DC input also available for CA5-550…860 contactors), they are operated by a DC voltage *supplied* from a "feeder group". Always order by the Coil Code matched to the **actual control voltage available to the contactor.**

Further information on CA5 coil pairs and feeder groups can be found in CA5 Technical Information.

A.C. & D.C. Coil Pairs & Feeder Groups (CA5-550 to CA5-860) ❶❷❸

Voltage Range	COIL ⇓ CODES ⇓	CA5-550 ❶		CA5-700 & CA5-860	
		Coil Pair	Feeder Group	Coil Pair	Feeder Group
110-120V 50/60Hz 100-110VDC	**120**	22.807.301-10	22.807.204-10	22.809.301-10	22.809.204-10
220-240V 50/60Hz 200-220VDC	**240**	22.807.301-13	22.807.204-13	22.809.301-13	22.809.204-13
380-415V 50/60Hz 345-380VDC	**380**	22.807.301-16	22.807.204-16	22.809.301-16	22.809.204-16
440-480V 50/60Hz 400-440VDC	**480**	22.807.301-18	22.807.204-18	22.809.301-18	22.809.204-18
Price		607	658	750	783

A.C. Coil Pairs & Feeder Groups (CA5-1000 & CA5-1200) ❷❸

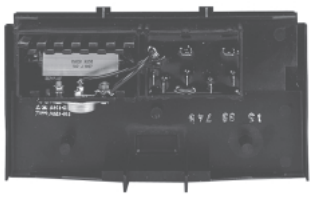
Voltage Range	A.C. COIL ⇓ CODES ⇓	CA5-1000 & CA5-1200	
		Coil Pair	Feeder Group
110 Volts 50/60Hz	**110**	22.811.301-10	22.811.204-10
220 Volts 50/60Hz	**220**	22.811.301-13	22.811.204-13
230 Volts 50/60Hz	230	22.811.301-14	22.811.204-14
380 Volts 50/60Hz	**380**	22.811.301-16	22.811.204-16
400 Volts 50/60Hz	400	22.811.301-31	22.811.204-31
440 Volts 50/60Hz	**440**	22.811.301-18	22.811.204-18
Price		1183	2280

D.C. Coil Pairs & Feeder Groups (CA5-1000 & CA5-1200) ❷❸

Voltage Range	D.C. COIL ⇓ CODES ⇓	CA5-1000 & CA5-1200	
		Coil Pair	Feeder Group
110 Volts D.C.	**110D**	Refer to factory	Refer to factory
220 Volts D.C.	**220D**	Refer to factory	Refer to factory
Price		Refer to factory	Refer to factory

CA5 Coil Pair (typical)

CA5 Feeder Group - front view (typical)



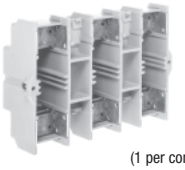
CA5 Feeder Group - rear view (typical)

❶ The CA5-550 has been replaced by the CA6-420-EI contactor. CA5-550 contactors are still available by special order if required for their higher AC1 ratings.
❷ Other voltages available. Please contact factory.
❸ CA5-550, 700 and 860 contactors are equipped with coils that operate with both AC and DC control voltages. For DC coil operation, select A.C. Coil Code for desired DC voltage. CA5-1000 and 1200 contactors operate with AC control voltage input that is rectified for DC coil operation. See page A75. Consult factory for DC control voltage input.

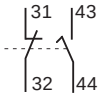
Main Contact - (1 Pole Per Set)

Main Contacts (1 pole) *(typical)*	For use with…	Catalog Number	Price per pole
	CA5-550 ❶	**22.807.202-01**	**650**
	CA5-700	**22.808.202-01**	**850**
	CA5-860	**22.809.202-01**	**1250**
	CA5-1000	**22.810.202-01**	**1925**
	CA5-1200	**22.811.202-01**	**2500**

Arc Chutes

Arc Chutes *(typical)*	For use with…	Catalog Number	Price
 3-pole (1 per contactor)	CA5-550 ❶	**22.807.201-01**	**582**
	CA5-700	**22.808.201-01**	**1100**
	CA5-860	**22.809.201-01**	**1100**
 1-pole (3 per contactor)	CA5-1000	**22.810.201-01**	**500**
	CA5-1200	**22.811.201-01**	**500**

Auxiliary Contact Block (CA5-1000 & CA5-1200)

Contact Block	Description	NO	NC	Contact Arrangement	For use with…	Catalog Number	Price
	• Special two pole design; 1 NO delayed make, 1 NC • NO delayed make contact used for operation of the Feeder Group/Coil mechanism • One supplied standard with contactor	1 *Delayed Make*	1		CA5-1000 CA5-1200	**CA5-EB11DC**	**460**

❶ The CA5-550 has been replaced by the CA6-420-EI contactor. CA5-550 contactors are still available by special order if required for their higher AC1 ratings.

Technical Information

			CA5-550 ❶	CA5-700	CA5-860	CA5-1000	CA5-1200
Rated Insulation Voltage U_i							
to IEC 947-1		[V]	1000V	1000V	1000V	690V	690V
UL/CSA		[V]			600V		
Rated Impulse Voltage U_{imp}							
CA5-550 / 700 / 860		[kV]			3.5		
CA5-1000 / 1200		[kV]			2.5		
Rated Voltage U_e – Main Contacts							
AC 50/60Hz		[V]	220/230, 240, 380/400, 415, 500, 660/690 (1000V - CA5-550 to 860)				
DC		[V]	24, 48, 110, 220, 440V				
Operating Frequency for AC Loads	[Hz]	50/60Hz	180/hr. for 0.25s start time – 42/hr. for 1s start time				

Switching Motor Loads

Standard IEC Ratings							
AC-2, AC-3	230V	[A]	550	700	860	1000	1150
DOL & Reversing	240V	[A]	550	700	860	1000	1150
50Hz/60˚ C	400V	[A]	550	700	860	1000	1150
	415V	[A]	550	700	860	1000	1150
	500V	[A]	550	700	860	1000	1150
	690V	[A]	480	630	690	1000	1150
	1000V	[A]	250	340	380	~	~
	230V	[kW]	160	220	270	320	375
	240V	[kW]	185	240	290	355	400
	400V	[kW]	280	375	475	560	630
	415V	[kW]	315	400	500	600	700
	500V	[kW]	375	500	600	720	840
	690V	[kW]	450	600	650	930	1100
	1000V	[kW]	355	500	550	~	~
UL/CSA	200V	[A]	414	552	692	~	1185
DOL & Reversing	230V	[A]	360	602	722	~	1030
60Hz/60˚C	460 V	[A]	414	590	708	~	1062
3∅	575 V	[A]	336	472	576	~	864
	200 V	[HP]	150	200	250	~	450
	230 V	[HP]	150	250	300	~	450
	460 V	[HP]	350	500	600	~	900
	575 V	[HP]	350	500	600	~	900
AC4 (200,000 Op. Cycles)	230V	[A]	140	180	210	260	300
50Hz	240V	[A]	140	180	210	260	300
	400V	[A]	140	180	210	260	300
	415V	[A]	140	180	210	260	300
	500V	[A]	125	155	190	240	275
	690V	[A]	110	145	165	180	210
	1000V	[A]	95	120	145	~	~
	230V	[kW]	42	55	63	78	90
	240V	[kW]	45	58	68	83	98
	400V	[kW]	75	95	110	140	160
	415V	[kW]	78	100	120	150	175
	500V	[kW]	86	106	132	170	195
	690V	[kW]	100	135	155	165	190
	1000V	[kW]	130	170	205	~	~

❶ The CA5-550 has been replaced by the CA6-420-EI contactor. CA5-550 contactors are still available by special order if required for their higher AC1 ratings.

Electrical Data

			CA5-550 ❶	CA5-700	CA5-860	CA5-1000	CA5-1200
Switching Motor Loads *(continued)*							
Wye-Delta (Star Delta)	230V	[A]	953	1212	1490	1732	1992
50 Hz	240V	[A]	953	1212	1490	1732	1992
	400V	[A]	953	1212	1490	1732	1992
	415V	[A]	953	1212	1490	1732	1992
	500V	[A]	953	1212	1490	1732	1992
	690V	[A]	831	1091	1195	1732	1992
	1000V	[A]	433	589	658	~	~
	230V	[kW]	310	395	485	565	677
	240V	[kW]	424	412	507	589	707
	400V	[kW]	540	717	882	1025	1206
	415V	[kW]	561	745	915	1088	1251
	500V	[kW]	705	897	1102	1309	1505
	690V	[kW]	849	1138	1247	1807	2078
	1000V	[kW]	615	866	970	~	~
60 Hz	230V	[HP]	250	450	500	650	750
	460V	[HP]	600	800	1000	1300	1500
	575V	[HP]	600	800	1000	1500	1500
AC-1 Load, 3∅ Switching	I_{th}	[A]	760	1000	1100	1200	1350
Ambient Temperature 40°C	230V	[kW]	300	398	438	478	538
	240V	[kW]	316	416	457	499	561
	400V	[kW]	526	693	762	831	935
	415V	[kW]	546	719	791	863	970
	500V	[kW]	658	866	953	1039	1169
	690V	[kW]	908	1195	1315	1434	1614
	1000V	[kW]	1316	1732	1905	~	~
Ambient Temperature 60°C	I_{th}	[A]	605	800	870	960	1085
	230V	[kW]	241	319	347	382	432
	240V	[kW]	251	333	362	399	451
	400V	[kW]	419	554	603	665	752
	415V	[kW]	435	575	625	690	780
	500V	[kW]	524	693	753	831	940
	690V	[kW]	723	956	1040	1147	1297
	1000V	[kW]	1048	1386	1507	~	~
Continuous Current (UL/CSA)							
General Purpose Rating (40°C)		[A]	520	700	810	~	1215
Lighting Loads							
Elec.Dischrg.Lamps-AC-5a,	Open	[A]	450	570	700	850	1000
single compensated	Enclosed	[A]	360	460	550	660	800
Incandescent Lamps - AC-5b,							
Electrical endurance ~100,000 operations		[A]	315	440	500	560	630
Switching power transformers AC-6a							
Inrush / Rated transformer currrent = n							
		[A]	259	330	405	470	570
n = 30	400 VAC	[kVA]	248	315	390	450	540
	500 VAC	[kVA]	248	315	390	450	540
	690 VAC	[kVA]	225	284	315	450	540
n = 20		[A]	389	495	608	700	850
n = 15		[A]	517	660	810	945	1130

❶ The CA5-550 has been replaced by the CA6-420-EI contactor. CA5-550 contactors are still available by special order if required for their higher AC1 ratings.

Electrical Data

DC Ratings

				CA5-550 ❶	CA5-700	CA5-860	CA5-1000	CA5-1200
DC-1 Rating at 60°C								
Non-inductive or slightly inductive loads, resistive furnaces	1 pole	24VDC	[A]	645	760	930	1020	1150
		48VDC	[A]	645	760	930	1020	1150
	2 Poles in Series	24VDC	[A]	645	760	930	1020	1150
		48VDC	[A]	645	760	930	1020	1150
		110VDC	[A]	480	560	630	800	900
		220VDC	[A]	315	400	450	500	600
	3 Poles in Series	24VDC	[A]	645	760	930	1020	1150
		48VDC	[A]	645	760	930	1020	1150
		110VDC	[A]	480	560	630	800	900
		220VDC	[A]	315	400	450	500	600
DC-3 Rating at 60°C								
Shunt wound motors - Starting, reverse current breaking, reversing, stepping	3 Poles in Series	24VDC	[A]	645	760	930	1020	1150
		48VDC	[A]	645	760	930	1020	1150
DC-5 Rating at 60°C								
Series wound motors - Starting, reverse current breaking, reversing, stepping	3 Poles in Series	24VDC	[A]	645	760	930	1020	1150
		48VDC	[A]	645	760	930	1020	1150

❶ The CA5-550 has been replaced by the CA6-420-EI contactor. CA5-550 contactors are still available by special order if required for their higher AC1 ratings.

Electrical Data

			CA5-550 ❶	CA5-700	CA5-860	CA5-1000	CA5-1200
Capacitor Ratings							
Capacitor Switching - 50Hz							
Single Capacitor - 40°C	230 V	[kVar]	180	220	250	290	330
	240 V	[kVar]	200	250	300	325	360
	400 V	[kVar]	320	400	450	500	575
	415 V	[kVar]	350	430	500	550	630
	500 V	[kVar]	450	520	600	660	750
	690V	[kVar]	580	700	800	875	1000
	1000V	[kVar]	900	1050	1200	~	~
Single Capacitor - 60°C	230 V	[kVar]	150	180	220	275	325
	240 V	[kVar]	170	200	260	300	350
	400 V	[kVar]	280	330	400	460	550
	415 V	[kVar]	300	360	450	500	600
	500 V	[kVar]	360	420	540	600	720
	690V	[kVar]	500	580	720	800	950
	1000V	[kVar]	700	900	1000	~	~
Capacitor Bank - 40°C	230 V	[kVar]	180	220	250	290	330
	240 V	[kVar]	200	250	300	325	300
	400 V	[kVar]	320	400	450	500	575
	415 V	[kVar]	350	430	500	550	630
	500 V	[kVar]	450	520	600	660	750
	690V	[kVar]	580	700	800	875	1000
	1000 V	[kVar]	900	1050	1200	~	~
Capacitor Bank - 60°C	230 V	[kVar]	150	~	220	275	325
	240 V	[kVar]	170	~	260	300	350
	400 V	[kVar]	280	330	400	460	550
	415 V	[kVar]	300	360	450	500	600
	500 V	[kVar]	360	~	540	600	720
	690V	[kVar]	500	580	720	800	950
	1000 V	[kVar]	700	900	1000	~	~
Short-Circuit Coordination							
Short Time Current Withstand Ratings							
I_{cw} 60° C	1 s	[A]	5500	7000	8000	10000	12000
	4 s	[A]	5500	7000	8000	10000	12000
	10 s	[A]	4400	5600	6900	8000	9600
	15 s	[A]	3800	5000	6000	7400	8500
	60 s	[A]	2300	2800	3400	4000	4800
	240 s	[A]	1300	1650	2000	2300	2700
	900 s	[A]	850	1050	1350	1600	1900
Off Time Between Operations		[Min.]	60	60	60	60	60
Resistance and Watt Loss I_e AC3							
Resistance per power pole		[mΩ]	0.11	0.1	0.08	0.1	0.08
Watt Loss - 3 power poles		[W]	99	147	177	300	318
Coil and 3 power poles	AC	[W]	110	172	202	370	388
(including series resistor)	DC	[W]	109	169	199	360	378

❶ The CA5-550 has been replaced by the CA6-420-EI contactor. CA5-550 contactors are still available by special order if required for their higher AC1 ratings.

Electrical Data

Coil Data

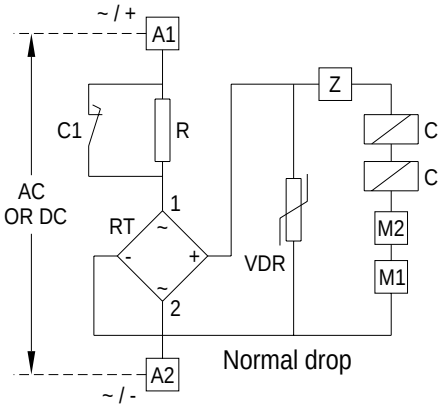
			CA5-550	CA5-700	CA5-860	CA5-1000	CA5-1200
Voltage Range							
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[x U_s]	0.85…1.1	0.85…1.1		0.85…1.1	
	Dropout	[x U_s]	0.2…0.5	0.15…0.5		0.3…0.6	
DC	Pickup	[x U_s]	0.85…1.1	0.85…1.1		0.85…1.1	
	Dropout	[x U_s]	0.2…0.5	0.15…0.5		0.3…0.6	
Coil Consumption							
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[VA]	800…950	1350…1600		2400	
	Hold-in	[VA]	9…11	21…25		70	
DC	Pickup	[W]	700…850	1300…1550		2100	
	Hold-in	[W]	8…10	18…22		60	
Operating Times							
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[ms]	50…100	50…100		25…70	
Normal	Dropout	[ms]	150…200	150…200		35…70	
Delayed	Dropout	[ms]	500…1000	500…1000		~	
Accelerated	Dropout	[ms]	20…50	20…50		~	
DC	Pickup	[ms]	50…100	50…100		25…70	
Normal	Dropout	[ms]	150…200	150…200		35…70	
Delayed	Dropout	[ms]	500…1000	500…1000		~	
Accelerated	Dropout	[ms]	20…50	20…50		~	
Insulation Class			Class “B” to VDE 0660 table 22				

Control and Magnet System for CA5-550…CA5-860 Contactors

Even though the *input* to the magnet system can either be AC or DC, the low pull-in and holding consumption of the magnet system is achieved by DC operating coils *supplied* by a “Feeder Group”. The Feeder Group for these contactors also allows delayed, normal or accelerated dropout times, selectable between 20ms and 1000ms.

Delayed: (500…1000ms)
Normal: (150…200ms)
Accelerated: (20…50ms)

As supplied, the contactors are wired for a normal dropout time. To compensate for wide voltage fluctuations or brief supply voltage interruptions, the dropout time can be delayed by wiring changes made to the Feeder Group at installation.

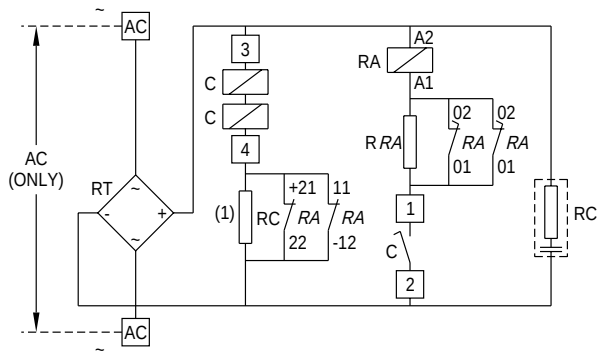


Coil Circuit for CA5-550, 700 & 860
AC or DC supply

Control and Magnet System for CA5-1000…CA5-1200 Contactors

Even though the *input* to the magnet system is only designed for AC voltages, the low pull-in and holding consumption of the magnet system is achieved by DC operating coils *supplied* by a “Feeder Group”. The Feeder Group for these contactors is configured for a dropout time of 35…70ms. Dropout times for these contactors are not selectable.

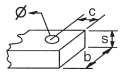
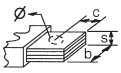
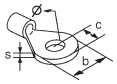
Further information regarding circuit possibilities can be obtained from assembly instructions supplied with each device.



Coil Circuit for CA5-1000 & 1200
AC supply (only)

C: Coil pair
RA: D.C. auxiliary relay coil for economy resistor switching
R, RC, R*RA*: Economy resistor
VDR: Varistor
M1, M2: Terminals for fast-drop connection
Z: Device for dropout operating time variation
(1) For control voltages up to 125V NC contacts 11-12 & 21-22 are connected in parallel; higher voltages are connected in series

Mechanical Data

			CA5-550 ❶	CA5-700	CA5-860	CA5-1000	CA5-1200
Service Life							
Mechanical	AC	[Mil.]	5	5	5	1	1
	DC	[Mil.]	5	5	5	1	1
Electrical	AC-3 (400V)	[Mil.]	0.6	0.6	0.6	0.6	0.6
Shipping Weights							
AC - CA5		[kg]	13.8	26.4	28.4	50.3	53.4
		[Lbs]	30.8	58.9	63.4	112.3	119.2
AC - CAU5		[kg]	28.5	53.9	57.9	102.3	108.5
		[Lbs]	63.6	120.3	129.2	228.3	242.2
Terminations - Power							
Type							
			Hexagonal Bolt				
Direct Connection							
		b max. [mm]	50	60	60	60	60
		c max. [mm]	25	25	25	25	25
		s max. [mm]	2 x 5	2 x 5	2 x 6	2 x 6	2 x 8
		Ø min. [mm]	12.5	13	15	2 x 17	2 x 17
Recommended Torque		[Nm]	50	60	75	90	90
		[Lb-ft]	37	44	55	66	66
Terminations - Control							
Description							
			Combination Screw Head: Cross, Slotted, Pozidrive				
Coils	1 or 2	[mm2]	4				
Wires		[AWG]	25				
Control Modules	1 or 2	[mm2]	4				
Wires		[AWG]	25				
Torque Requirement		[Nm]	1...2.5				
		[Lb-in]	8.9...22				
Degree of Protection - contactor			IP00 (open) per IEC 529 and DIN 40 050				

❶ The CA5-550 has been replaced by the CA6-420-EI contactor. CA5-550 contactors are still available by special order if required for their higher AC1 ratings.

Environmental and General Specifications

	CA5-550 ❶	CA5-700	CA5-860	CA5-1000	CA5-1200
Ambient Temperature					
Storage	-25...+80° C (-13...176° F)				
Operation at rated current	-25...+55° C (-13...131° F)				
Operation at 90% of rated current	-25...+60° C (-13...140° F)				
Operation at 85% of rated current	-25...+65° C (-13...149° F)				
Altitude at installed site	2000 meters above sea level per IEC 947-1				
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 95%, 56 days.				
Operating Position	See next page				
Standards	IEC947-4, CEI 17-3/2, BS 5424, VDE 0660-1, UTE-NFC 63-110, NEMA, ICS				
Approvals	CE, UL, CSA, Lloyd's Register of Shipping (CA5-550 to 860 only)				

❶ The CA5-550 has been replaced by the CA6-420-EI contactor. CA5-550 contactors are still available by special order if required for their higher AC1 ratings.

Auxiliary Contacts

			Auxiliary Contact Block CA5-EF22						Auxiliary Contact Blocks CA5-EB11, CA5-EB11DC					
Switching, AC & DC Loads														
AC-1 I_{th}	at 40°C	[A]	25						30					
	at 60°C	[A]	16						20					
AC-15, switching electromagnetic loads at:		[V]	230	240	400	415	500	690	230	240	400	415	500	690
		[A]	7	6.5	5	4	3	2	12	11	8	7	6	5
DC-13, switching DC electromagnets at:		[V]		24	48	110	220			24	48	110	220	
		[A]		18	15	7	4			20	18	9	4	
Short-Circuit Protection – gG Fuse														
Type 2 Coordination		[A]	25						35					
Terminals														
Terminal Type														
Maximum Wire Size per IEC 947-1			2 x A4						2 x A4					
 Flexible with Wire-End Ferrule	1 Conductor	[mm^2]	1…4						0.5…2.5					
	2 Conductor	[mm^2]	1… 4						0.75…2.5					
 Solid/Stranded-Conductor	1 Conductor	[mm^2]	1.5…6						0.5…2.5					
	2 Conductor	[mm^2]	1.5… 6						0.75…2.5					
Recommended Tightening Torque		[Nm]	1…2.5						1…1.5					
Max. Wire Size per UL/CSA		[AWG]	16…10						18…14					
Recommended Tightening Torque		[lb-in]	8.9…22						8.9…13.3					
Degree of Protection			IP2LX per IEC 529 and DIN 40 050											

Mechanical Latch			CA5-AM5	CA5-AM6	CA5-AM7
Service Life					
Mechanical		[Mil. ops.]	0.5	0.5	0.5
Dropout Delay					
Contactor & latch		[ms]	50…70	50…70	50…70
Trip Coil					
Consumption	AC	[VA]	950	1600	3500
	DC	[W]	500	800	3200
OFF-command (min. impulse duration)		[ms]	200	200	200
Operating Voltage					
Minimum			0.5 U_n	0.5 U_n	0.5 U_n
Maximum			1.1 U_n	1.1 U_n	1.1 U_n

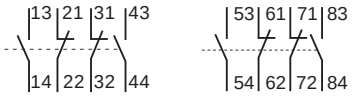
❶ The CA5-550 has been replaced by the CA6-420-EI contactor. CA5-550 contactors are still available by special order if required for their higher AC1 ratings.

Auxiliary Contacts

For CA5-700 & CA5-860 contactors

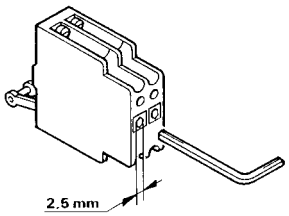
Up to two auxiliary contact blocks can be mounted on each contactor. One four-pole auxiliary contact block (CA5-EF22) is supplied standard and is installed on the contactor between T1 and T2. One additional auxiliary contact block can be installed between T2 and T3.

Each CA5-EF22 contains 2 NO and 2 NC adjustable auxiliary contacts. Standard terminal markings are shown below on the left. If an additional contact block is required, different terminal markings (right) are supplied and may be applied by the user.

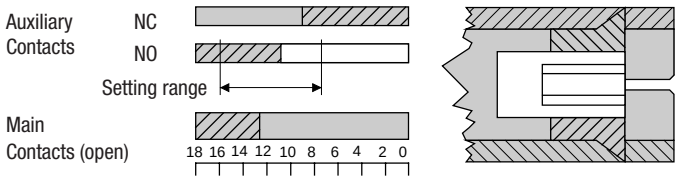


Adjustable Auxiliary Contacts

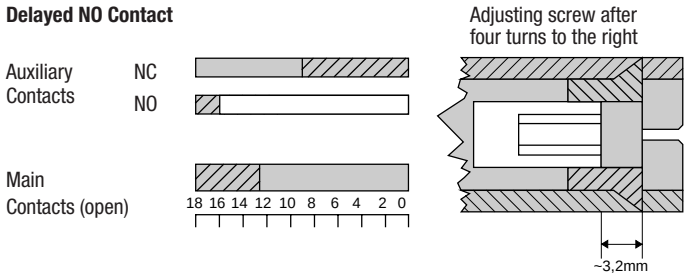
The instant at which the NO contact closes, in relation to the main contacts, can be adjusted from the front of the CA5-EF22 auxiliary contact block by means of an Allen wrench. The following diagrams show the adjustments for Normal, Delayed and Overlapping auxiliary contacts.



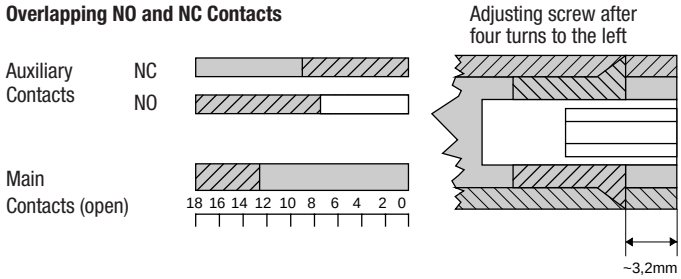
Normal Setting (from factory)



Delayed NO Contact



Overlapping NO and NC Contacts



For CA5-1000 and CA5-1200 contactors

Up to four nonadjustable auxiliary contact blocks can be mounted on each contactor. One CA5-EB11 two pole aux contact and one CA5-EB11DC two pole aux contact come standard. The CA5-EB11DC has 1 NC contact (available) and 1 NO Delayed Make (unavailable) which is used for the operation of the coil feeder group.

CA5-EB11 – 1 NO/1NC
CA5-EB11DC – 1 NO Delayed Make/1 NC

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

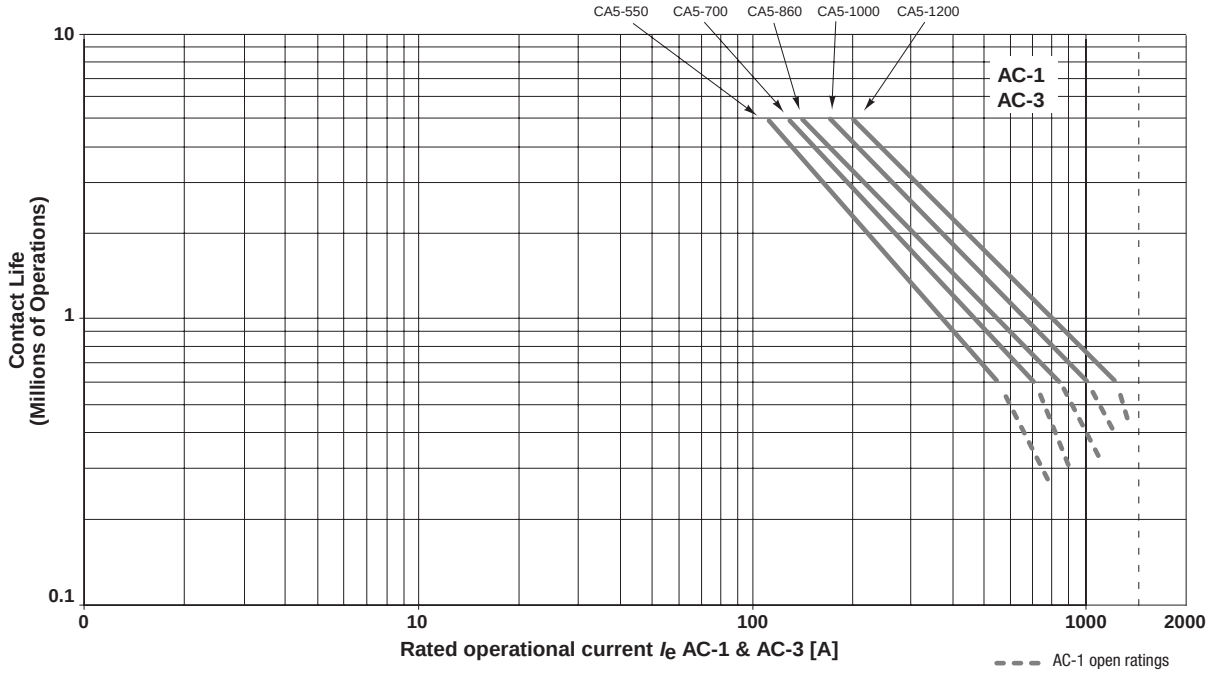
Ue	Rated operational voltage
U	Voltage before make
Ur	Recovery voltage
Ie	Rated operational current
I	Making current
Ic	Breaking current
L	Inductance of test circuit
R	Resistance of test circuit

Life-Load Curves

AC-1

AC-3

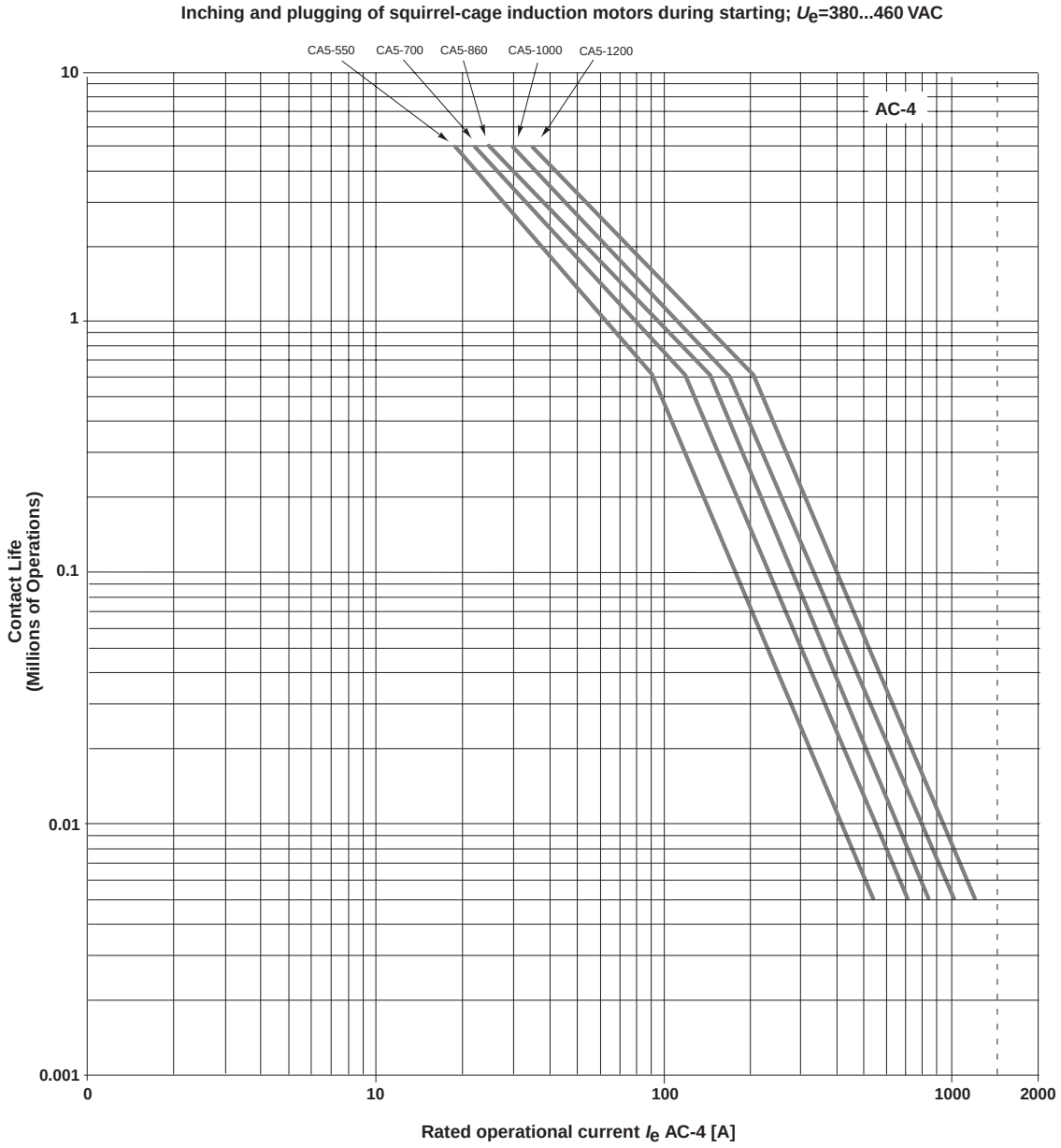
AC-1 - Non or slightly inductive loads, resistive furnaces; U_e=380...460 VAC
AC-3 - Starting and stopping of running squirrel-cage induction motors; U_e=380...460 VAC



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.

Life-Load Curves

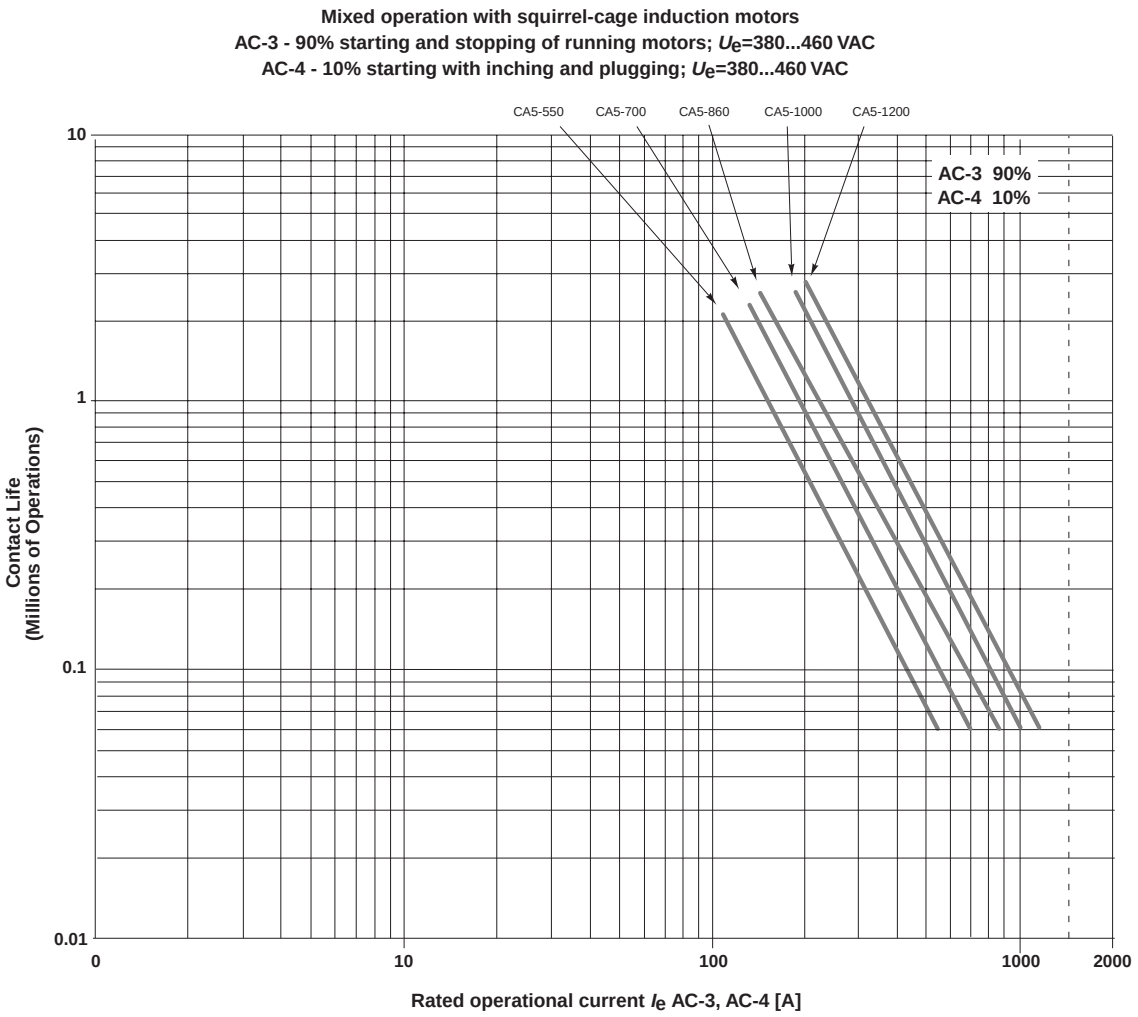
AC-4



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.

Life-Load Curves

**AC-3 (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).

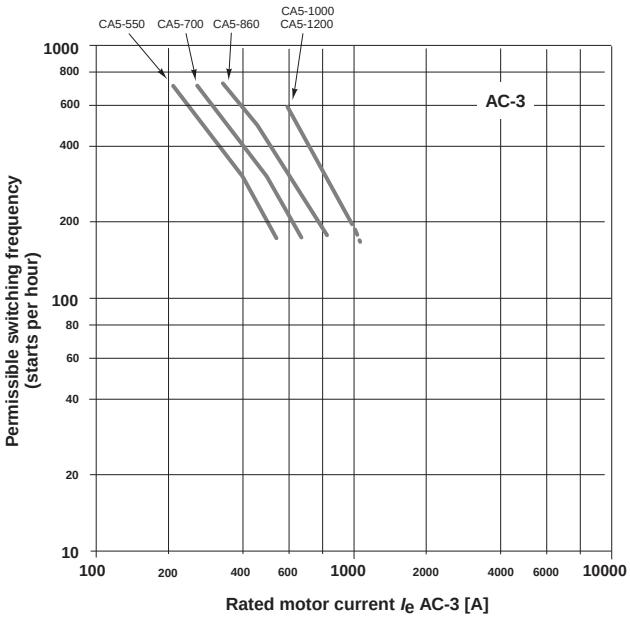
P_{ac4} Percentage of AC-4 operations

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.

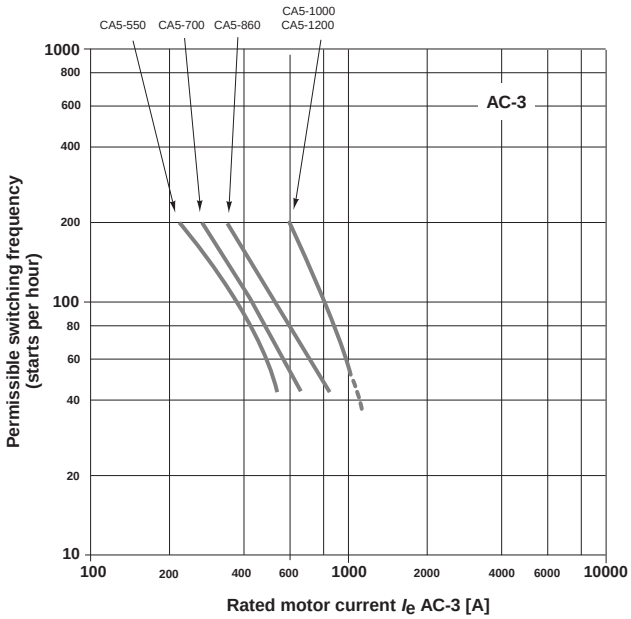
Operating Rate Curves

AC-3

Starting and stopping of running motors
Starting time t_A = 0.25 s
Relative time energized 40%

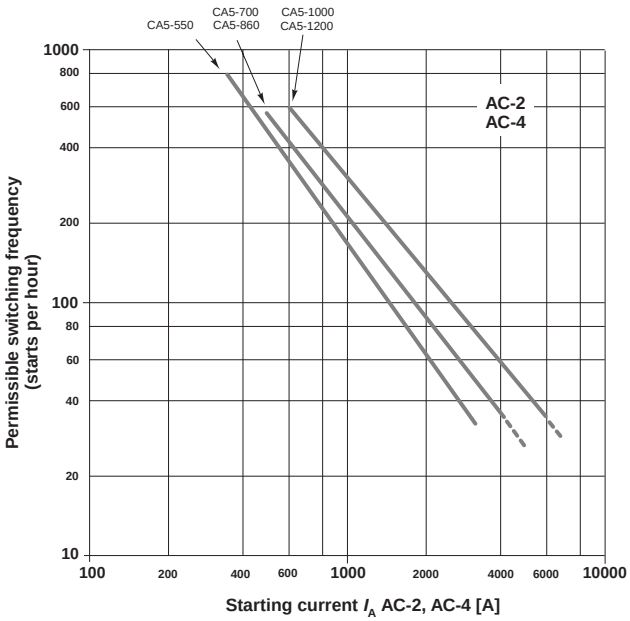


Starting time t_A = 1 s

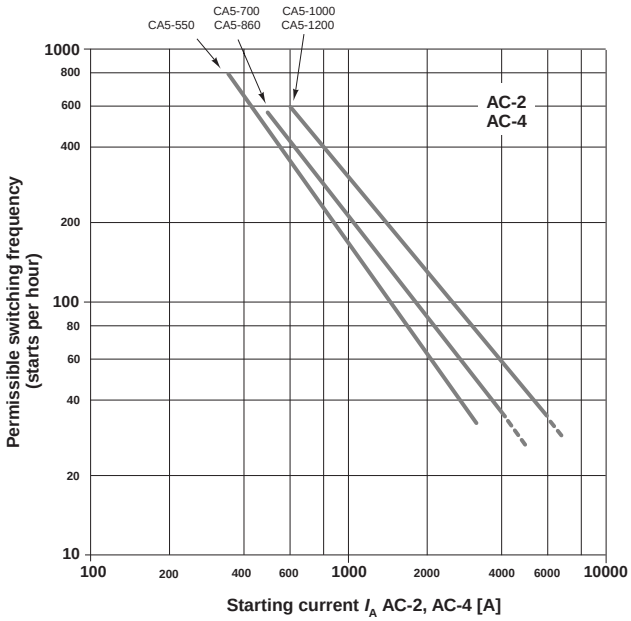


AC-2/AC-4

Switching motors during running (AC2, AC4)
Time energized t_{ED} = 0.25 s ($<t_A$)

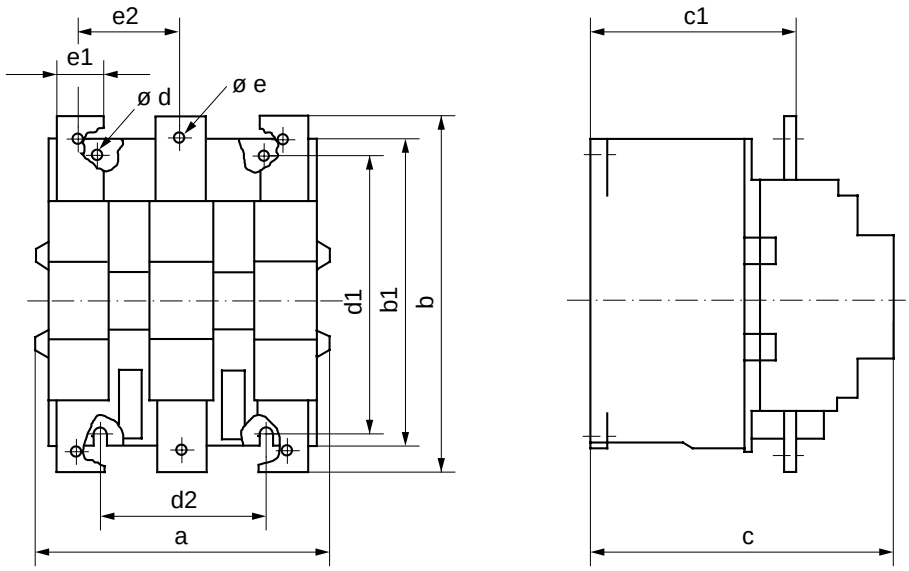


Time energized t_{ED} = 1 s ($<t_A$)



Series CA5 & Series CAU5 (Contactors & Reversing Contactors)

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



Type	a	b	b1	c	c1	ød	d1	d2	øe	e1	e2
CA 5-550 ❶	220 (8-21/32)	258 (10-5/32)	228 (8-31/32)	225 (8-7/8)	164 (6-7/16)	9 (3/8)	220 (8-21/32)	110 (4-5/8)	12.5 (1/2)	40 (1-19/32)	79 (3-1/8)
CA 5-700	280 (11-1/32)	307 (12-3/32)	277 (10-29/32)	291 (11-15/32)	203 (8)	11 (7/16)	280 (11-1/32)	175 (6-7/8)	13 (17/32)	50 (1-31/32)	101 (4)
CA 5-860	280 (11-1/32)	361 (14-7/32)	325 (12-25/32)	291 (11-15/32)	203 (8)	11 (7/16)	280 (11-1/32)	175 (6-7/8)	15 (19/32)	50 (1-31/32)	101 (4)
CA 5-1000	334 (13-5/32)	490 (19-9/32)	440 (17-5/16)	345 (13-9/16)	231 (9-9/32)	13.5 (9/16)	380 (14-31/32)	120 (4-23/32)	2x17 2x(11/16)	50 (1-31/32)	100 (3-31/32)
CA 5-1200	334 (13-5/32)	490 (19-9/32)	440 (17-5/16)	345 (13-9/16)	231 (9-9/32)	13.5 (9/16)	380 (14-31/32)	120 (4-23/32)	2x17 2x(11/16)	60 (2-3/8)	100 (3-31/32)

Reversing Contactors & Accessories

Contactor with…		Dimensions [mm]	Dimensions [inches]
auxiliary contact block		a	a
reversing contactors with mechanical interlock			
next to each other	CA 5-550/CA 5-550	a+42+a	a+1-23/32+a
	CA 5-700, -860/ CA 5-700, -860	a+32+a	a+1-1/4+a
	CA 5-1000,-1200/ CA 5-1000, -1200	a+46+a	a+1-13/16+a
	CA 5-550/CA 5-700, -860	a+37+a	a+1-15/32+a
	CA 5-700, -860/CA 5-1000, -1200	a+73+a	a+2-7/8+a
above each other	CA 5-550/CA 5-550	b+56+b	b+2-3/16+b
	CA 5-700, -860/ CA 5-700, -860	b+100…200+b	b+3-15/16…7-7/8+b
	CA 5-1000,-1200/ CA 5-1000, -1200	b+230…280+b	b+9-1/16…11-1/32+b
	CA 5-550/CA 5-700, -860	b+100…200+b	b+3-15/16…7-7/8+b
	CA 5-700, -860/CA 5-1000, -1200	b+230…280+b	b+9-1/16…11-1/32+b
four main contacts	CA 5-550, -700, -860	a+68	a+2-11/16
	CA 5-1000, -1200	a+76	a+3
latch	CA 5-550	b+47	b+1-7/8
	CA 5-700	b+64	b+2-17/32
	CA 5-860	b+37	b+1-15/32
	CA 5-1000, -1200	a+30	a+1-3/16

Mounting Position