

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 50Hz/60° C	240V	[A]	550	700	860	1000	1150
	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 60Hz/60°C	230V	[A]	360	602	722	~	1030
	460 V	[A]	414	590	708	~	1062
	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)							
50Hz	230V	[A]	140	180	210	260	300
	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❶ The CA5-550 has been replaced by the CA6-420-EI contactor.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 ①	CA5-700	CA5-860	CA5-1000	CA5-1200
Switching Motor Loads (continued)							
Wye-Delta (Star Delta) 50 Hz	230V	[A]	953	1212	1490	1732	1992
	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, 3Ø Switching							
Ambient Temperature 40°C	I_{th}	[A]	760	1000	1100	1200	1350
	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, single compensated	Open	[A]	450	570	700	850	1000
	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 _____ = n							
Rated transformer current							
n = 30		[A]	259	330	405	470	570
	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

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Electrical Data

				CA5-550 ❶	CA5-700	CA5-860	CA5-1000	CA5-1200
DC Ratings								
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

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Electrical Data

			CA5-550 ①	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_b 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 (including series resistor)	AC	[W]	110	172	202	370	388
	DC	[W]	109	169	199	360	378

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Electrical Data

			CA5-550	CA5-700	CA5-860	CA5-1000	CA5-1200
Coil Data							
Voltage Range							
AC: 50Hz, 60Hz, 50/60 Hz	Pickup	[x U_g]	0.85...1.1	0.85...1.1		0.85...1.1	
	Dropout	[x U_g]	0.2...0.5	0.15...0.5		0.3...0.6	
DC	Pickup	[x U_g]	0.85...1.1	0.85...1.1		0.85...1.1	
	Dropout	[x U_g]	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

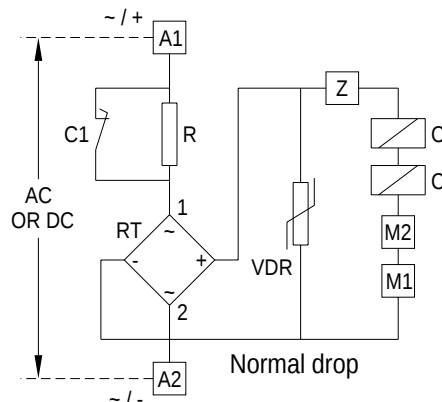
Even though the *input* to the magnet system can either be AC or DC, the low pull-in and holding consumption of the magnet system is achieved by DC operating coils *supplied* by a "Feeder Group". The Feeder Group for these contactors also allows delayed, normal or accelerated dropout times, selectable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

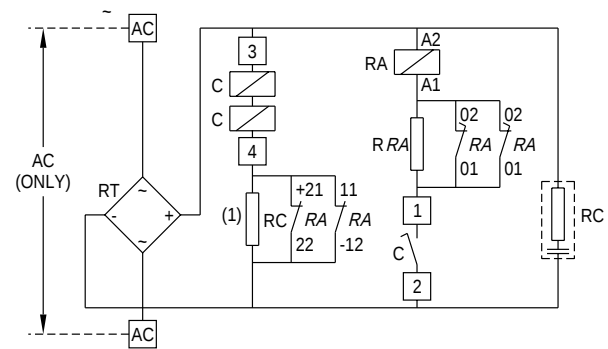


Coil Circuit for CA5-550, 700 & 860
AC or DC supply

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.



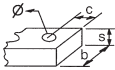
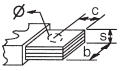
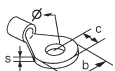
Coil Circuit for CA5-1000 & 1200
AC supply (only)

- C:** Coil pair
- RA:** D.C. auxiliary relay coil for economy resistor switching
- R, RC, RRA:** 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 ①	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	[mm ²]			4		
Wires		[AWG]			25		
Control Modules	1 or 2	[mm ²]			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

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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)			

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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											

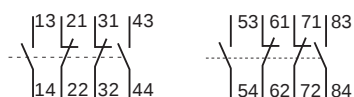
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Auxiliary Contacts

For CA5-700 & CA5-860 contactors

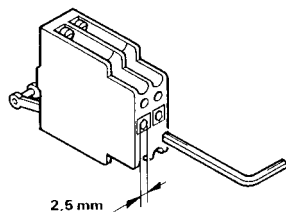
Up to two auxiliary contact blocks can be mounted on each contactor. One four-pole auxiliary contact block (CA5-EF22) is supplied standard and is installed on the contactor between T1 and T2. One additional auxiliary contact block can be installed between T2 and T3.

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.

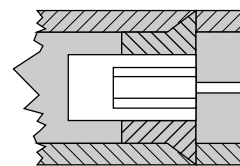
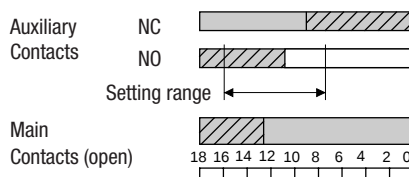


Adjustable Auxiliary Contacts

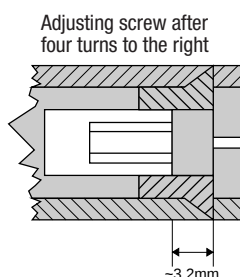
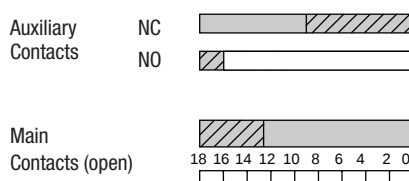
The instant at which the NO contact closes, in relation to the main contacts, can be adjusted from the front of the CA5-EF22 auxiliary contact block by means of an Allen wrench. The following diagrams show the adjustments for Normal, Delayed and Overlapping auxiliary contacts.



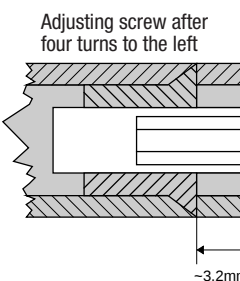
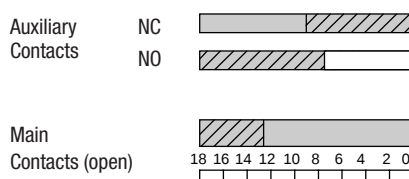
Normal Setting (from factory)



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/I _e	U/U _e	cos	I _c /I _e	U _r /U _e	cos	I/I _e	U/U _e	cos	I _c /I _e	U _r /U _e	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	I _e 17Amp	6	1	0.65	1	0.17	0.65	10	1.1	0.65	8	1.1	0.65
		17Amp < I _e 100Amp	6	1	0.35	1	0.17	0.35	10	1.1	0.35	8	1.1	0.35
		I _e > 100Amp	6	1	0.35	1	0.17	0.35	8Ⓜ	1.1	0.35	6Ⓜ	1.1	0.35
AC-4	Squirrel-cage motors: Starting, plugging, inching Ⓜ	I _e 17Amp	6	1	0.65	6	1	0.65	12	1.1	0.65	10	1.1	0.65
		17Amp < I _e 100Amp	6	1	0.35	6	1	0.35	12	1.1	0.35	10	1.1	0.35
		I _e > 100Amp	6	1	0.35	6	1	0.35	10Ⓜ	1.1	0.35	8Ⓜ	1.1	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/I _e	U/U _e	L/R Ⓜ [ms]	I _c /I _e	U _r /U _e	L/R Ⓜ [ms]	I/I _e	U/U _e	L/R Ⓜ [ms]	I _c /I _e	U _r /U _e	L/R Ⓜ [ms]
DC-1	Non-inductive or slightly inductive loads, resistance furnaces	All values	1	1	1	1	1	1	1.5Ⓜ	1.1Ⓜ	1Ⓜ	1.5Ⓜ	1.1Ⓜ	1Ⓜ
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 PⓂ	1	1	6 x PⓂ	1.1	1.1	6 x PⓂ	1.1	1.1	6 x PⓂ

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.

Ⓜ With a minimum value of 1000A for I or I_c.

Ⓜ With a minimum value of 800A for I_c.

Ⓜ With a minimum value of 1200A for I.

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

Ⓜ $P = U_e \times I_e$ 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.

Ⓜ Only according to VDE.

Ⓜ 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.

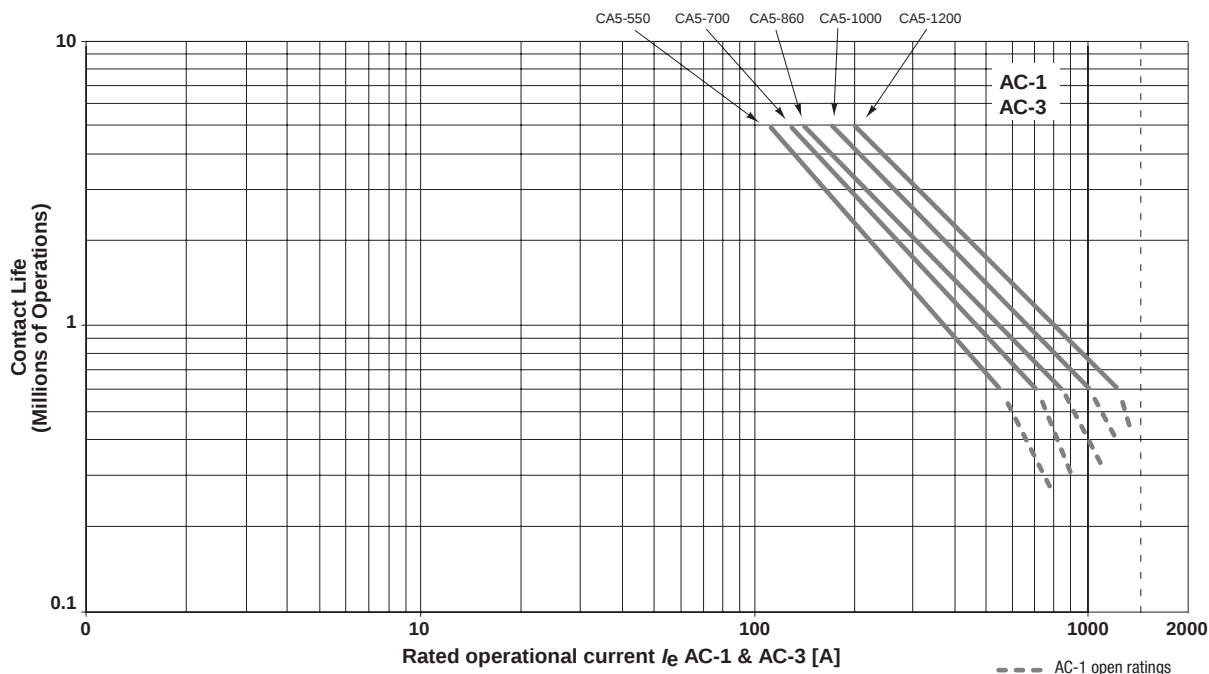
Legend

U_e Rated operational voltage
U Voltage before make
U_r Recovery voltage
I_e Rated operational current
I Making current
I_c Breaking current
L Inductance of test circuit
R Resistance of test circuit

Life-Load Curves

AC-1 - Non or slightly inductive loads, resistive furnaces; $U_e=380\ldots460$ VAC
 AC-3 - Starting and stopping of running squirrel-cage induction motors; $U_e=380\ldots460$ VAC

AC-1
 AC-3



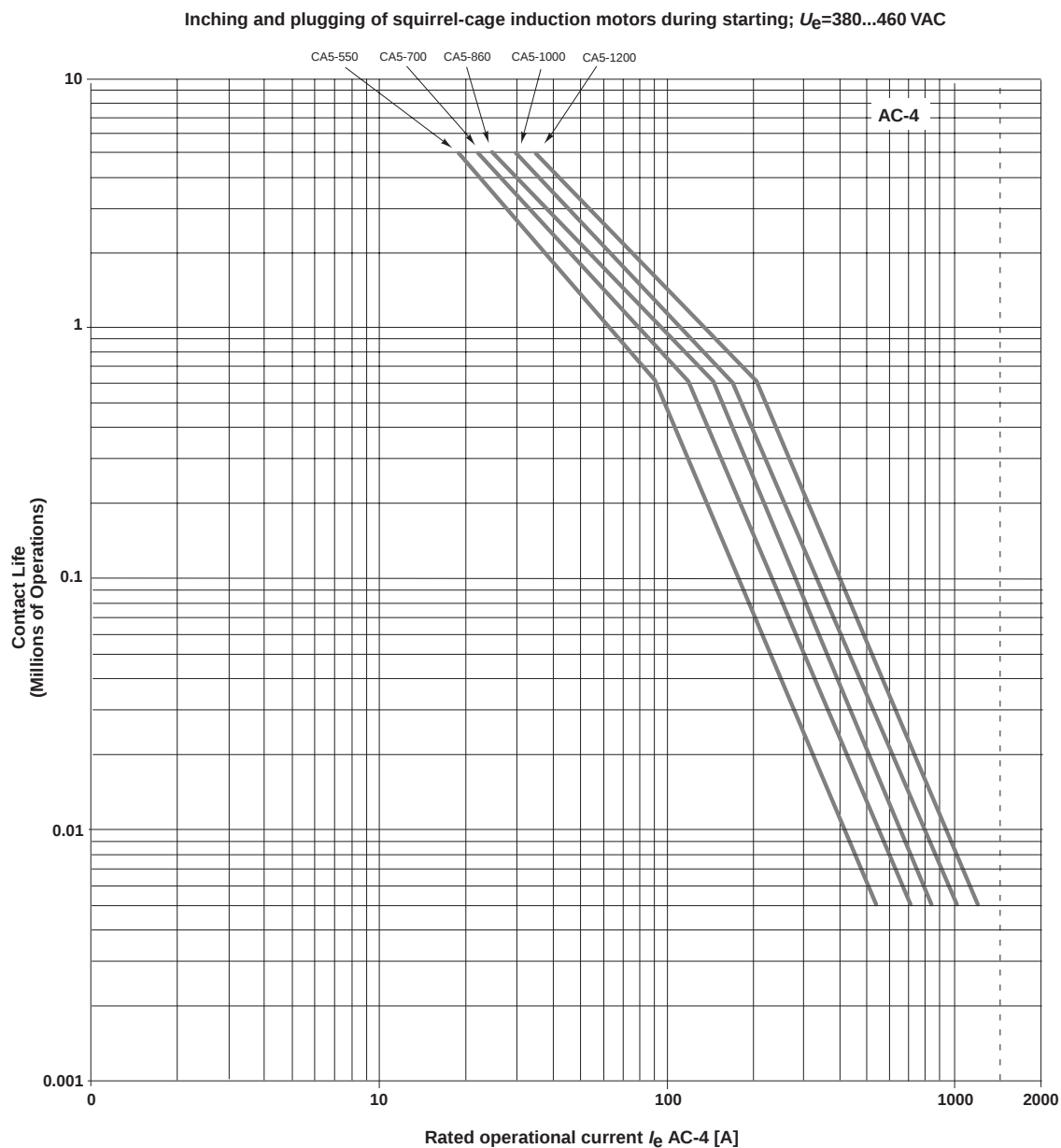
NOTE: The life-load curves shown here are based on Sprecher+Schuh tests according to the requirements defined in IEC 947-4-1. Since contact life in any given application is dependent on environmental conditions and duty cycle, actual application contact life may vary from that indicated by the curves shown here.

A Life-Load Curves

Contactors

AC-4

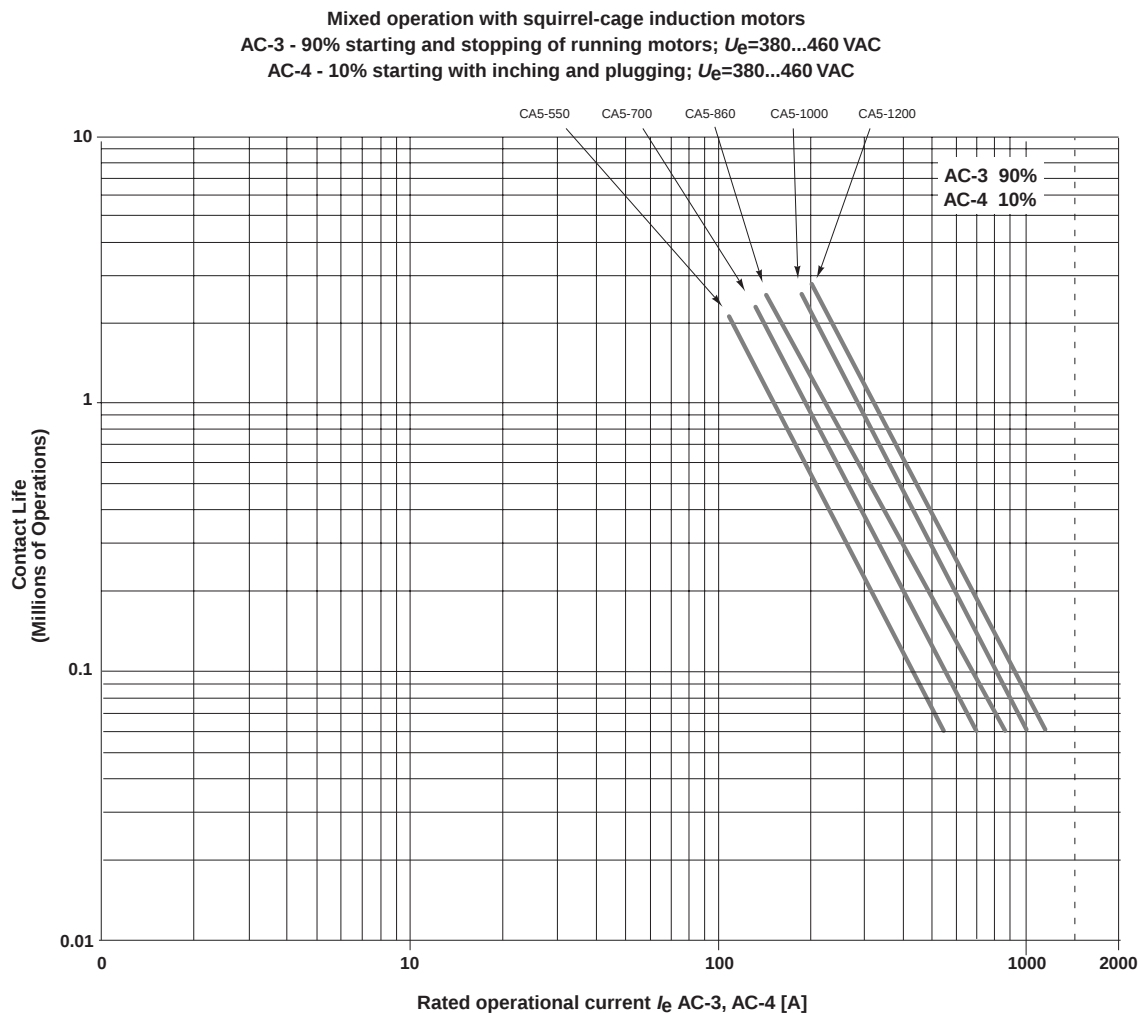
CA5



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:

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

- 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.

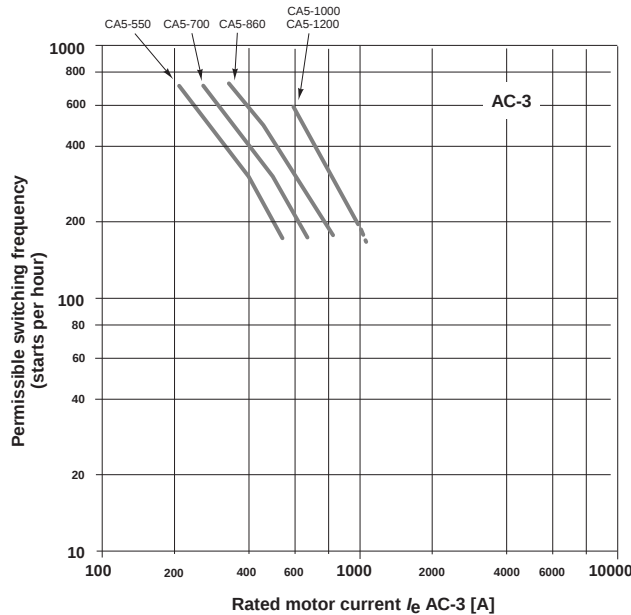
Operating Rate Curves

AC-3

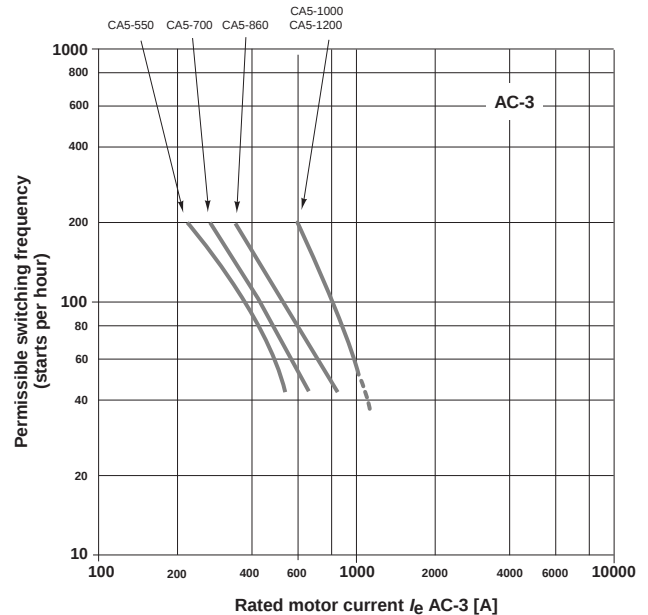
Starting and stopping of running motors

Starting time $t_A = 0.25$ s

Relative time energized 40%



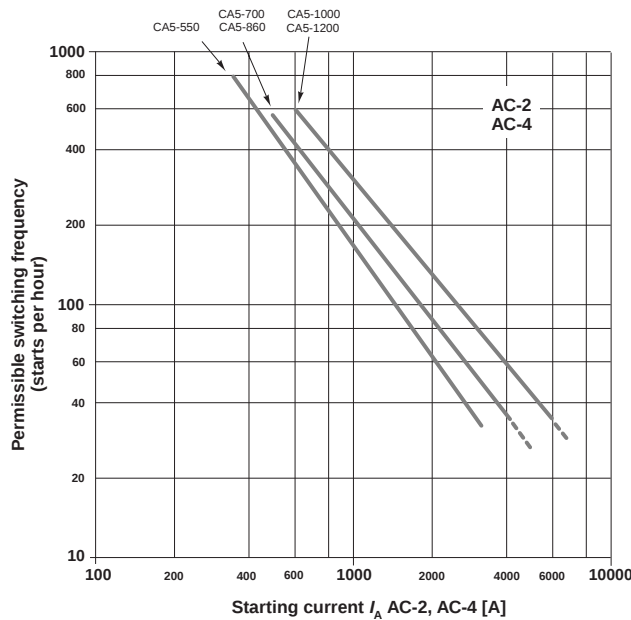
Starting time $t_A = 1$ s



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 ($< t_A$)

