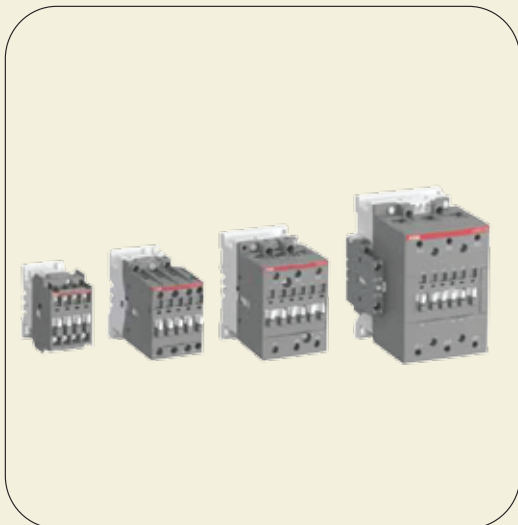




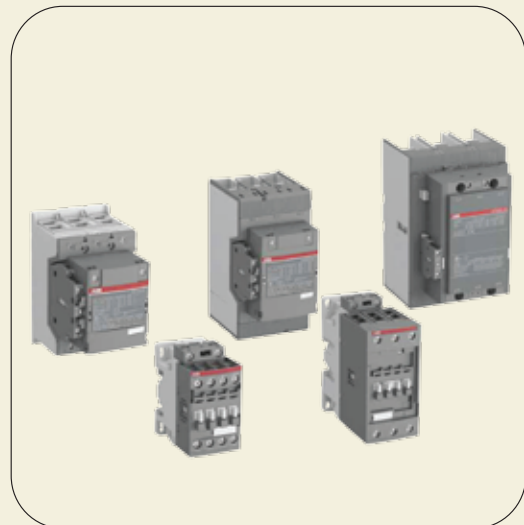
Low Voltage Capacitor



Contactors for capacitor Switching



AX Contactor Range



AF Contactor Range



MULTIPLE TRADING

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Low Voltage Capacitor



- In compliance to IS: 13340/41 & IEC 60831-1&2
- Dry type design
- Dielectric: Polypropylene film
- Extruded cylindrical aluminium can with stud
- Overpressure disconnector
- Elements inside an extruded cylindrical aluminium can, delta connected internally
- Provided with discharge resistor
- Three phase
- Self-healing technology
- Naturally air cooled
- For power factor correction in indoor applications
- Very low losses – Total losses including discharge resistors are less than 0.5 W/kVAR

Range	Cylindrical type	Box-type
Voltage [V]	415/440	
Range [kVar]	1 – 25	
Frequency [Hz]	50	
Connection	3 Phase as standard construction	
Discharge resistor	In-built as part of the capacitor	
Installation	Indoor	
Mounting parts	Threaded stud at bottom of can	Mounting bracket at rear plate
Earth	Extruded stud	Earth connection on the enclosure fixation
Mean life expectancy	100,000 hours (max 5,000 switching / year)	100,000 hours (max 5,000 switching / year)

Contactors for Capacitor Switching

UA..RA 3-pole Contactors for Capacitor Switching Unlimited Peak Current $\hat{I}$



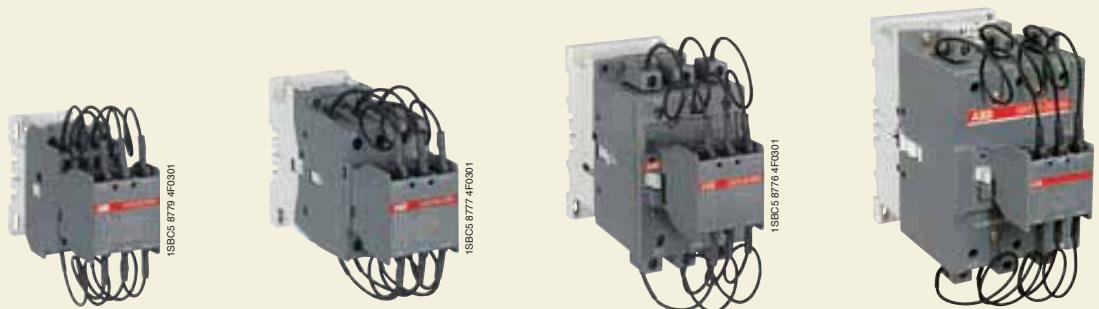
Application

The **UA..RA** contactors can be used in installations in which the peak current far exceeds 100 times nominal rms current. The contactors are delivered complete with their damping resistors and must be used without additional inductances (see table below).

The capacitors must be discharged (maximum residual voltage at terminals ≤ 50 V) before being re-energized when the contactors are making. Their electrical durability is 250 000 operating cycles for $U_e < 500$ V and 100 000 operating cycles for $500 \leq U_e \leq 690$ V.

UA..RA Contactors for Capacitor Switching (UA 16..RA to UA 110..RA) with insertion of damping resistors.

The insertion of damping resistors protects the contactor and the capacitor from the highest inrush currents.



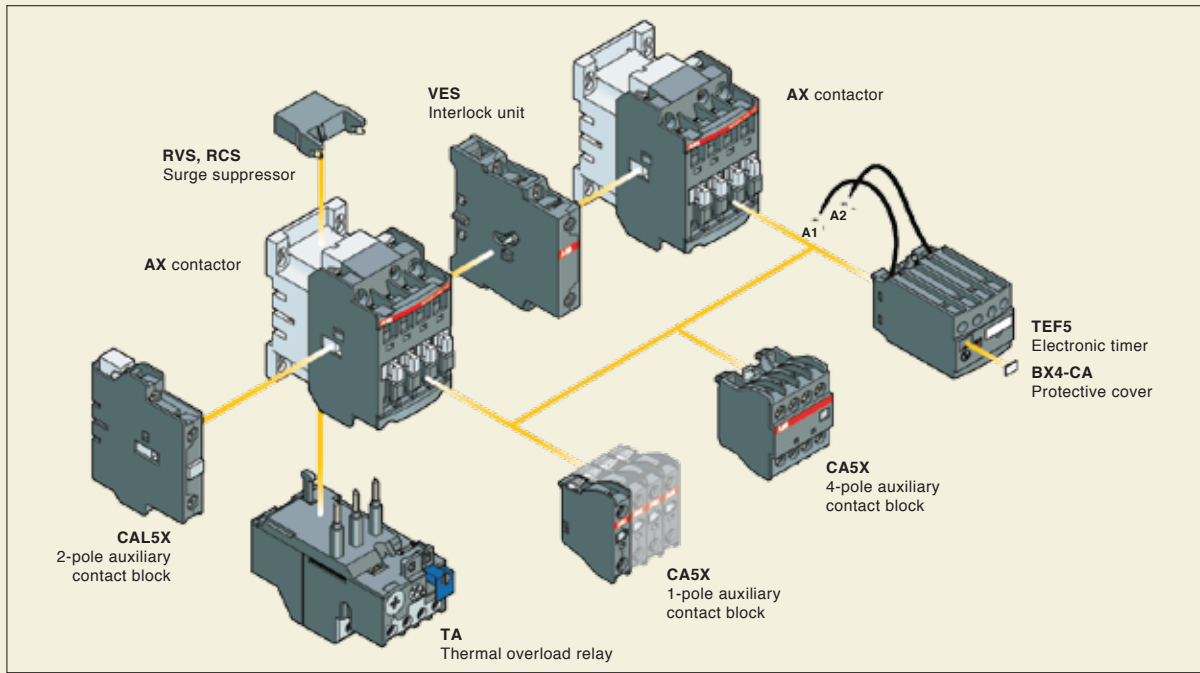
Selection Table according to IEC

Type	Power in kvar – 50/60 Hz (AC-6b)															Max. permissible peak current İ	gG type fuses A max (*)
	230/240 V			400/415 V			440 V			500/550 V			690 V				
	40°C	55°C	70°C	40°C	55°C	70°C	40°C	55°C	70°C	40°C	55°C	70°C	40°C	55°C	70°C		
UA 16-30-10 RA	8	7.5	6	12.5	12.5	10	15	13	11	18	16	12.5	22	21	17	Unlimited	80
UA 26-30-10 RA	12.5	11.5	9	22	20	15.5	24	20	17	30	25	20	35	31	26		125
UA 30-30-10 RA	16	16	11	30	27.5	19.5	32	30	20.5	34	34	25	45	45	32		200
UA 50-30-00 RA	25	24	20	40	40	35	50	43	37	55	50	46	72	65	60		200
UA 63-30-00 RA	30	27	23	50	45	39	55	48	42.5	65	60	50	80	75	65		200
UA 75-30-00 RA	35	30	25	60	50	41	65	53	45	75	65	55	100	80	70		200
UA 95-30-00 RA	40	35	30	70	60	53	75	65	58	85	75	70	120	105	85	Unlimited	250
UA 110-30-00 RA	45	40	35	80	70	60	85	75	70	95	82	78	130	110	100		250

() The fuse ratings given in the column represent the maximum ratings ensuring type 1 coordination according to the definition of standard IEC 60947-4-1.

Main accessories

Contactor and main accessories (other accessories available)



AF96 AF750 3pole Contactors

Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	AC / DC operated	AF96	AF116	AF140	AF146	AF190	AF205	AF265	AF305	AF370	AF400	AF460	AF580	AF750		
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1														
Rated operational voltage Ue max.		690 V														
Rated frequency (without derating)		50 / 60 Hz														
Conventional free-air thermal current Ith acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C		130 A	160 A	200 A	225 A	275 A	350 A	400 A	500 A	600 A	600 A	700 A	800 A	1050 A		
With conductor cross-sectional area		50 mm²	70 mm²	95 mm²	95 mm²	150 mm²	240 mm² (3)	240 mm²	300 mm² (4)	2 x 185 mm²(4)	2x185 mm²	2x240 mm²	2x240 mm²	800 mm² (4)		
AC-1 Utilization category																
For air temperature close to contactor																
le / Rated operational current AC-1																
Ue max. ≤ 690 V, 50/60 Hz																
θ ≤ 40 °C		130 A	160 A	200 A	225 A	275 A	350 A	400 A	500 A	600 A	600 A	700 A	800 A	1050 A		
θ ≤ 60 °C		105 A	145 A	175 A	200 A	250 A	300 A	350 A	400 A	500 A	500 A	600 A	700 A	875 A		
θ ≤ 70 °C		90 A	130 A	160 A	175 A	200 A	240 A	290 A	325 A	400 A	400 A	480 A	580 A	720 A		
With conductor cross-sectional area		50 mm²	—	—	225 A	250 A	275 A	350 A	375 A	400 A	600 A	700 A	800 A	1000 A		
AC-3 Utilization category																
For air temperature close to contactor θ ≤ 60 °C																
le / Max. rated operational current AC-3 (1)																
θ ≤ 60 °C		—	—	200 A	225 A	250 A	300 A	325 A	350 A	500 A	500 A	600 A	700 A	875 A		
θ ≤ 70 °C		—	—	175 A	185 A	200 A	240 A	260 A	290 A	400 A	400 A	480 A	580 A	720 A		
With conductor cross-sectional area		70 mm²	95 mm²	95 mm²	150 mm²	240 mm² (3)	240 mm²	300 mm² (4)	2 x 185 mm²(4)	2x185 mm²	2x240 mm²	2x240 mm²	800 mm² (4)			
220-230-240 V		96 A														
380-400 V		96 A														
415 V		96 A														
440 V		96 A	116 A	140 A	146 A	190 A	205 A	265 A	305 A	370 A	400 A	460 A	580 A	750 A		
500 V		80 A	116 A	140 A	146 A	190 A	205 A	265 A	305 A	370 A	400 A	460 A	580 A	750 A		
690 V		57 A	116 A	140 A	146 A	190 A	205 A	265 A	305 A	370 A	400 A	460 A	580 A	750 A		
1000 V		30 A	116 A	140 A	146 A	190 A	205 A	265 A	305 A	370 A	400 A	460 A	580 A	750 A		
Rated operational power AC-3 (1)																
220-230-240 V		25 kW	65 A	80 A	93 A	135 A	165 A	250 A	290 A	315 A	350 A	400 A	500 A	650 A		
380-400 V		45 kW	—	—	60 A	85 A	100 A	100 A	100 A	100 A	155 A	200 A	250 A	300 A		
415 V		55 kW	—	—	60 A	85 A	100 A	100 A	100 A	100 A	155 A	200 A	250 A	300 A		
440 V		55 kW	30 kW	37 kW	45 kW	55 kW	55 kW	75 kW	90 kW	110 kW	110 kW	132 kW	160 kW	220 kW		
500 V		55 kW	55 kW	75 kW	75 kW	90 kW	110 kW	132 kW	160 kW	200 kW	200 kW	250 kW	315 kW	400 kW		
690 V		55 kW	55 kW	75 kW	75 kW	90 kW	110 kW	132 kW	160 kW	200 kW	220 kW	250 kW	355 kW	425 kW		
1000 V		40 kW	75 kW	90 kW	90 kW	110 kW	132 kW	160 kW	200 kW	250 kW	250 kW	315 kW	400 kW	520 kW		
Rated making capacity AC-3			75 kW	90 kW	90 kW	90 kW	110 kW	200 kW	200 kW	250 kW	250 kW	315 kW	400 kW	520 kW		
Rated breaking capacity AC-3			55 kW	75 kW	90 kW	132 kW	160 kW	200 kW	250 kW	315 kW	315 kW	355 kW	500 kW	600 kW		
AC-8a Utilization category			—	—	75 kW	110 kW	132 kW	132 kW	132 kW	132 kW	220 kW	280 kW	355 kW	400 kW		
(without thermal overload relay - Ue 400V 50/60 Hz - θ ≤ 40 °C)			10 x le AC-3 acc. to IEC 60947-4-1										10 x le AC-3 acc. to IEC 60947-4-1			
le / Rated operational current AC-8a			8 x le AC-3 acc. to IEC 60947-4-1										8 x le AC-3 acc. to IEC 60947-4-1			
Rated operational power AC-8a		120 A														
Short-circuit protection device for contactors without thermal overload relay - Motor protection excluded (2)			250 A	315 A	315 A	355 A	400 A	500 A	500 A	630 A						
Ue ≤ 500 V AC - gG type fuse		200 A	1300 A	1460 A	1460 A	1900 A	2050 A	2650 A	3050 A	3700 A	630 A	800 A	1000 A	1000 A		
Rated short-time withstand current Icw at 40 °C ambient temperature, in free air from a cold state																
1 s		1200 A	928 A	1168 A	1168 A	1520 A	1640 A	2120 A	2440 A	2960 A	4600 A	4600 A	7000 A	7000 A		
10 s		780 A	536 A	674 A	674 A	878 A	947 A	1224 A	1409 A	1709 A	4400 A	4400 A	6400 A	6400 A		
30 s		450 A	379 A	477 A	477 A	621 A	670 A	865 A	996 A	1208 A	3100 A	3100 A	4500 A	4500 A		
1 min		300 A	160 A	200 A	225 A	275 A	350 A	400 A	500 A	600 A	2500 A	2500 A	3500 A	3500 A		
15 min		140 A									840 A	840 A	1300 A	1300 A		
Maximum breaking capacity			2000 A	3000 A	3000 A	3300 A	3500 A	3800 A	4600 A	5000 A	4000 A	5000 A	6000 A	7500 A		
cos φ = 0.45			1000 A	1500 A	1500 A	2200 A	2500 A	3300 A	3800 A	4000 A	3500 A	4500 A	5000 A	7000 A		
Power dissipation per pole																
le / AC-1		8.2 W	6 W	9 W	10 W	7 W	8 W	14 W	19 W	27 W	30 W	42 W	32 W	50 W		
le / AC-3		4.5 W	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	16 W	21 W	17 W	28 W		
Max. electrical switching frequency			AC-1	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h	300 cycles/h		
			AC-3	150 cycles/h	150 cycles/h	150 cycles/h	150 cycles/h	150 cycles/h	150 cycles/h	150 cycles/h	60 cycles/h	60 cycles/h	60 cycles/h	60 cycles/h		
			AC-2, AC-4													

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

(2) For the protection of motor starters against short circuits, see "Coordination with short-circuit protection devices".

AX09 ... AX80 3-pole contactors

Technical data



Main pole - Utilization characteristics according to IEC

Contactor types	AC operated	AX09	AX12	AX18	AX25	AX32	AX40	AX50	AX65	AX80
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1						IEC 60947-1 / 60947-4-1		
Rated operational voltage U _e max.		690 V						690 V		
Rated frequency limits		25 ... 400 Hz						25 ... 400 Hz		
Rated frequency (without derating)		50 / 60 Hz						50 / 60 Hz		
Conventional free-air thermal current I _{th}										
acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$		24 A	26 A	28 A	32 A	65 A	65 A	100 A	125 A	125 A
With conductor cross-sectional area		4 mm ²	4 mm ²	4 mm ²	6 mm ²	16 mm ²	16 mm ²	35 mm ²	50 mm ²	50 mm ²
AC-1 Utilization category										
For air temperature close to contactor										
I _e / Rated operational current AC-1	$\theta \leq 40^\circ\text{C}$	22 A	25 A	27 A	32 A	55 A	60 A	100 A	115 A	125 A
U _e max. $\leq 690\text{ V}$, 50/60 Hz	$\theta \leq 55^\circ\text{C}$	22 A	22 A	25 A	27 A	55 A	60 A	85 A	95 A	105 A
	$\theta \leq 70^\circ\text{C}$	18 A	18 A	20 A	23 A	39 A	42 A	70 A	80 A	85 A
With conductor cross-sectional area		2.5 mm ²	2.5 mm ²	4 mm ²	6 mm ²	10 mm ²	16 mm ²	35 mm ²	50 mm ²	50 mm ²
AC-3 Utilization category										
For air temperature close to contactor $\theta \leq 55^\circ\text{C}$										
I _e / Max. rated operational current AC-3 (1)										
	220-230-240 V	9 A	12 A	18 A	25 A	32 A	40 A	53 A	65 A	80 A
	380-400 V	9 A	12 A	18 A	25 A	32 A	40 A	50 A	65 A	80 A
	415 V	9 A	12 A	18 A	25 A	32 A	40 A	50 A	65 A	80 A
	440 V	9 A	9 A	12 A	16 A	32 A	37 A	45 A	65 A	70 A
	500 V	9 A	9 A	12 A	14 A	28 A	33 A	45 A	55 A	65 A
	690 V	7 A	7 A	9 A	10 A	21 A	25 A	35 A	43 A	46 A
Rated operational power	AC-3 (1)									
	220-230-240 V	2.2 kW	3 kW	4 kW	6.5 kW	9 kW	11 kW	15 kW	18.5 kW	22 kW
	380-400 V	4 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW	22 kW	30 kW	37 kW
	415 V	4 kW	5.5 kW	9 kW	11 kW	15 kW	18.5 kW	25 kW	37 kW	40 kW
	440 V	4 kW	4 kW	5.5 kW	9 kW	18.5 kW	22 kW	25 kW	37 kW	40 kW
	500 V	5.5 kW	5.5 kW	7.5 kW	9 kW	18.5 kW	22 kW	30 kW	37 kW	45 kW
	690 V	5.5 kW	5.5 kW	7.5 kW	9 kW	18.5 kW	22 kW	30 kW	37 kW	40 kW
Rated making capacity AC-3		10 x I _e AC-3 acc. to IEC 60947-4-1						10 x I _e AC-3 acc. to IEC 60947-4-1		
Rated breaking capacity AC-3		8 x I _e AC-3 acc. to IEC 60947-4-1						8 x I _e AC-3 acc. to IEC 60947-4-1		
AC-8a Utilization category										
(without thermal overload relay - U _e 400 V 50/60 Hz - $\theta \leq 40^\circ\text{C}$)										
I _e / Rated operational current AC-8a		12 A	16 A	22 A	30 A	40 A	50 A	63 A	85 A	95 A
Rated operational power AC-8a		5.5 kW	5.5 kW	7.5 kW	11 kW	20 kW	22 kW	30 kW	45 kW	45 kW
Short-circuit protection device for contactors										
without thermal overload relay - Motor protection excluded (2)										
U _e $\leq 500\text{ V}$ AC - gG type fuse		25 A	25 A	32 A	32 A	63 A	63 A	100 A	125 A	160 A
Rated short-time withstand current I _{cw}	1 s	250 A	250 A	280 A	300 A	600 A	600 A	1000 A	1000 A	1000 A
at 40 °C ambient temperature,	10 s	100 A	100 A	120 A	140 A	400 A	400 A	650 A	650 A	650 A
in free air from a cold state	30 s	60 A	60 A	70 A	80 A	225 A	225 A	370 A	370 A	370 A
	1 min	50 A	50 A	55 A	60 A	150 A	150 A	250 A	250 A	250 A
	15 min	26 A	26 A	28 A	30 A	65 A	65 A	110 A	135 A	135 A
Maximum breaking capacity										
cos $\phi = 0.45$										
	at 440 V	250 A	250 A	250 A	250 A	820 A	820 A	1300 A	1300 A	1300 A
	at 690 V	90 A	90 A	90 A	90 A	340 A	340 A	630 A	630 A	630 A
Power dissipation per pole										
I _e / AC-1		0.8 W	0.8 W	1 W	1.2 W	2.5 W	3 W	5 W	6.5 W	7 W
I _e / AC-3		0.1 W	0.1 W	0.2 W	0.35 W	0.9 W	1.3 W	1.3 W	1.5 W	2 W
Electrical durability (1x10 ⁶)	400/415V, AC-3	1.5	1.5	1.5	1.3	1.5	1.5	1.2	1.2	1.1
Max. electrical switching frequency	AC-1	600 cycle/h						600 cycle/h		
	AC-3	1200 cycle/h						600 cycle/h		
Mechanical durability										
Number of operating cycles		10 millions operating cycles						10 millions operating cycles		
Max. switching frequency		3600 cycles/h						3600 cycles/h		

(1) For the corresponding kW/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".
 (2) For the protection of motor starters against short circuits, see "Coordination with short-circuit protection devices".

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