

AF400 ... AF2650 3-pole contactors

Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050	AF2650	
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1									
Rated operational voltage Ue max.		1000 V									
Rated frequency (without derating)		50/60 Hz									
Conventional free-air thermal current Ith		acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$									
	With conductor cross-sectional area (3)	600 A	700 A	800 A	1050 A	1260 A	1350 A	1650 A	2050 A	2650 A	
		2x185 mm ²	2x240 mm ²	2x240 mm ²	800 mm ² (4)	1000 mm ² (4)	1000 mm ² (5)	1500 mm ² (5)	2000 mm ² (5)	3000 mm ² (5)	
AC-1 Utilization category		For air temperature close to contactor									
	Ie / Rated operational current AC-1	$\theta \leq 40^\circ\text{C}$									
	Ue max. $\leq 690\text{ V}$, 50/60 Hz	$\theta \leq 55^\circ\text{C}$	500 A	600 A	700 A	875 A	1040 A	1150 A	1450 A	1750 A	2350 A
		$\theta \leq 70^\circ\text{C}$	400 A	480 A	580 A	720 A	875 A	1000 A	1270 A	1500 A	2120 A
	Ie / Rated operational current AC-1	$\theta \leq 40^\circ\text{C}$	600 A	700 A	800 A	1000 A	1260 A	1350 A	1650 A	2050 A	2650 A
	Ue max. $\leq 1000\text{ V}$, 50/60 Hz	$\theta \leq 55^\circ\text{C}$	500 A	600 A	700 A	875 A	1040 A	1150 A	1450 A	1750 A	2350 A
		$\theta \leq 70^\circ\text{C}$	400 A	480 A	580 A	720 A	875 A	1000 A	1270 A	1500 A	2120 A
	With conductor cross-sectional area		2x185 mm ²	2x240 mm ²	2x240 mm ²	800 mm ² (4)	1000 mm ² (4)	1000 mm ² (5)	1500 mm ² (5)	2000 mm ² (5)	3000 mm ² (5)
AC-3 Utilization category		For air temperature close to contactor $\theta \leq 55^\circ\text{C}$									
	Ie / Max. rated operational current AC-3 (1)										
	220-230-240 V	400 A	460 A	580 A	750 A	-	860 A	1050 A	-	-	
	380-400 V	400 A	460 A	580 A	750 A	-	860 A	1050 A	-	-	
	415 V	400 A	460 A	580 A	750 A	-	860 A	1050 A	-	-	
	440 V	400 A	460 A	580 A	750 A	-	860 A	1050 A	-	-	
	500 V	400 A	460 A	580 A	750 A	-	800 A	950 A	-	-	
	690 V	350 A	400 A	500 A	650 A	-	800 A	950 A	-	-	
	1000 V	155 A	200 A	250 A	300 A	-	-	-	-	-	
	Rated operational power AC-3 (1)										
	220-230-240 V	110 kW	132 kW	160 kW	220 kW	-	257 kW	315 kW	-	-	
	380-400 V	200 kW	250 kW	315 kW	400 kW	-	475 kW	560 kW	-	-	
	415 V	220 kW	250 kW	355 kW	425 kW	-	500 kW	600 kW	-	-	
	440 V	220 kW	250 kW	355 kW	450 kW	-	560 kW	670 kW	-	-	
	500 V	250 kW	315 kW	400 kW	520 kW	-	560 kW	700 kW	-	-	
	690 V	315 kW	355 kW	500 kW	600 kW	-	750 kW	900 kW	-	-	
	1000 V	220 kW	280 kW	355 kW	400 kW	-	-	-	-	-	
	Rated making capacity AC-3	10 x Ie AC-3 acc. to IEC 60947-4-1									
	Rated breaking capacity AC-3	8 x Ie AC-3 acc. to IEC 60947-4-1									
Short-circuit protection device for contactors		without thermal overload relay									
	Motor protection excluded (2)										
	Ue $\leq 500\text{ V AC}$ - gG type fuse	630 A	800 A	1000 A	1000 A	Please consult us for coordination with circuit-breaker					
Rated short-time withstand current Icw		at 40 °C ambient temperature, in free air from a cold state									
	1 s	4600 A	4600 A	7000 A	7000 A	8000 A	10000 A	12000 A	12000 A	12000 A	
	10 s	4400 A	4400 A	6400 A	6400 A	7200 A	8000 A	10000 A	10000 A	10000 A	
	30 s	3100 A	3100 A	4500 A	4500 A	5200 A	6000 A	7500 A	7500 A	7500 A	
	1 min	2500 A	2500 A	3500 A	3500 A	4000 A	4500 A	5500 A	5500 A	5500 A	
	15 min	840 A	840 A	1300 A	1300 A	1500 A	1600 A	2200 A	2200 A	2800 A	
Maximum breaking capacity		cos $\varphi = 0.45$									
	at 440 V	4000 A	5000 A	6000 A	7500 A	10000 A					
	at 690 V	3500 A	4500 A	5000 A	7000 A	-					
	(cos $\varphi = 0.35$ for Ie > 100 A)										
Power dissipation per pole		Ie / AC-1									
		30 W	42 W	32 W	50 W	80 W	80 W	80 W	125 W	200 W	
	Ie / AC-3	16 W	21 W	17 W	28 W	-	50 W	50 W	-	-	
Max. electrical switching frequency		AC-1									
		300 cycles/h			300 cycles/h			300 cycles/h		60 cycles/h	
	AC-3	300 cycles/h			300 cycles/h			-		60 cycles/h	
	AC-2, AC-4	60 cycles/h			60 cycles/h			-		-	

(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".

(3) Conductors with preparation.

(4) Max. connection bar width 50 mm.

(5) Max. connection bar width 100 mm.

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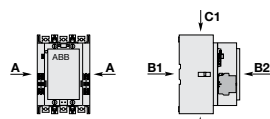
Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types	AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050	AF2650
Standards		UL 60947-1 / 60947-4-1A and CSA 60947-1 / 60947-4-1A								
Maximum operational voltage		600 V								
NEMA size		-	6	-	7	-	-	8	-	-
NEMA maximum horse power ratings										
1-phase, 60 Hz	115 V AC	-	-	-	-	-	-	-	-	-
	230 V AC	-	-	-	-	-	-	-	-	-
NEMA maximum horse power ratings										
3-phase, 60 Hz	200 V AC	-	150 hp	-	-	-	-	-	-	-
	230 V AC	-	200 hp	-	300 hp	-	-	450 hp	-	-
	460 V AC	-	400 hp	-	600 hp	-	-	900 hp	-	-
	575 V AC	-	400 hp	-	600 hp	-	-	900 hp	-	-
UL / CSA general use rating										
600 V AC		550 A	650 A	750 A	900 A	1210 A	1350 A	1650 A	2100 A	2700 A
UL / CSA maximum 1-phase motor rating										
Full load current	120 V AC	-	-	-	-	-	-	-	-	-
	240 V AC	-	-	-	-	-	-	-	-	-
Horse power rating	120 V AC	-	-	-	-	-	-	-	-	-
	240 V AC	-	-	-	-	-	-	-	-	-
UL / CSA maximum 3-phase motor rating										
Full load current (1)	200-208 V AC	358.8 A	414 A	552 A	692.3 A	-	954 A	1030 A	-	-
	220-240 V AC	360 A	480 A	604 A	722 A	-	954 A	1030 A	-	-
	440-480 V AC	414 A	477 A	590 A	722 A	-	954 A	1030 A	-	-
	550-600 V AC	382 A	472 A	578 A	672 A	-	944 A	1050 A	-	-
Horse power rating (1)	200-208 V AC	125 hp	150 hp	200 hp	250 hp	-	-	-	-	-
	220-240 V AC	150 hp	200 hp	250 hp	300 hp	-	400 hp	450 hp	-	-
	440-480 V AC	350 hp	400 hp	500 hp	600 hp	-	800 hp	900 hp	-	-
	550-600 V AC	400 hp	500 hp	600 hp	700 hp	-	1000 hp	1150 hp	-	-
Short-circuit protection device for contactors										
without thermal overload relay - Motor protection excluded										
Fuse rating		1000 A		1200 A		Please consult us for coordination with circuit-breaker				
Fuse type, 600 V		L								
Maximum electrical switching frequency										
For general use		300 cycles/h				60 cycles/h			15 cycles/h	
For motor use		300 cycles/h				60 cycles/h			-	

(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".

General technical data

Contactor types	AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050	AF2650
Rated insulation voltage Ui										
acc. to IEC 60947-4-1		1000 V								
acc. to UL		600 V								
Rated impulse withstand voltage Uimp.		8 kV								
Electromagnetic compatibility		AF contactors complying with IEC 60947-1 / EN 60947-1 - Environment A								
Ambient air temperature close to contactor										
Operation	Fitted with electronic overload relay	-25 to +70 °C								
	Without electronic overload relay	-40 to +70 °C								
Storage		-40 to +70 °C								
Maximum operating altitude (without derating)		3000 m								
Mechanical durability										
Number of operating cycles		3 millions operating cycles				0.5 million operating cycles			0.3 million operating cycles	
Max. switching frequency		300 cycles/h				60 cycles/h				
Shock withstand										
acc. to IEC 60068-2-27 and EN 60068-2-27										
Mounting position 1										
Shock direction		1/2 sinusoidal shock for 30 ms: no change in contact position, closed or open position								
A		5 g								
B1		5 g								
B2		5 g								
C1		5 g								
C2		5 g								



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Magnet system characteristics

Contactor types	AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050	AF2650	
Coil operating limits	AC supply	At $\theta \leq 70^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$									
acc. to IEC 60947-4-1	DC supply	At $\theta \leq 70^\circ\text{C}$ $0.80 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$									
Rated control circuit voltage U_c											
Coil consumption											
AC control voltage 50/60 Hz											
24...60 V AC	Average pull-in value	900 VA		780 VA		-					
	Average holding value	12 VA		12 VA		-					
48...130 V AC	Average pull-in value	1215 VA		1100 VA		-					
	Average holding value	12 VA		12 VA		-					
100...250 V AC	Average pull-in value	955 VA		880 VA		2450 VA		-			
	Average holding value	12 VA		12 VA		48 VA		-			
250 ... 500 V AC	Average pull-in value	950 VA		985 VA		-					
	Average holding value	12 VA		12 VA		-					
DC control voltage											
20...60 V DC	Average pull-in value	900 VA		785 VA		-					
	Average holding value	5 VA		5.5 VA		-					
48...130 V DC	Average pull-in value	1150 VA		1020 VA		-					
	Average holding value	5 VA		5 VA		-					
100...250 V DC	Average pull-in value	895 VA		880 VA		2290 VA		-			
	Average holding value	5 VA		5 VA		20.5 VA		-			
250 ... 500 V AC	Average pull-in value	885 VA		910 VA		-					
	Average holding value	7.5 VA		7.5 VA		-					
Drop-out voltage	55 % of $U_c \text{ min.}$										
Voltage sag immunity	Conditions of use on request										
acc. to SEMI F47											
Dips withstand	$\geq 20 \text{ ms}$										
Operating time											
Coil supply between A1 - A2											
Between coil energization and:	Main contact closing	50...120 ms				50...80 ms		-			
Between coil de-energization and:	Main contact opening	33...70 ms				35...55 ms		-			
Control input for PLC's											
Between coil energization and:	Main contact closing	40...60 ms		40...90 ms		40...65 ms		-			
Between coil de-energization and:	Main contact opening	10...30 ms				10...30 ms		-			

Mounting characteristics and conditions for use

Contactor types	AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050	AF2650
Mounting positions										
Max. add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 3-pole contactor AF400 ... AF2650										
Mounting distances										
The contactors can be assembled side by side										
Fixing										
On rail according to IEC 60715, EN 60715										
By screws (not supplied)										
		4 x M5		4 x M6		4 x M8		-		

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Connecting characteristics

Contactor types	AC / DC operated	AF400	AF460	AF580	AF750	AF1250	AF1350	AF1650	AF2050	AF2650
Main terminals										
Flat type										
Connection capacity (min. ... max.)										
Main conductors (poles)										
	Cu cable - Stranded	2 x	240 mm ²		-					
	Clamp type		1SDA013922R1		-					
	Tightening torque		35 Nm		-					
	Cu cable - Stranded	3 x	-	185 mm ²		-				
	Clamp type		-	1SDA013956R1		-				
	Tightening torque		35 Nm	45 Nm		-				
	Al cable - Stranded	2 x	240 mm ²		-					
	Clamp type		1SDA013922R1		-					
	Tightening torque		35 Nm		-					
		3 x	-	185 mm ²		-				
	Clamp type		-	1SDA013956R1		-				
	Tightening torque		35 Nm	45 Nm		-				
	Lugs	W ≤	47 mm		50 mm		100 mm			
		Ø >	10 mm		12 mm					
	Tightening torque		35 Nm / 310 lb.in		45 Nm / 398 lb.in					
Connection capacity acc. to UL / CSA										
		2 x	250-500 MCM alt. 2/0 AWG-400 MCM		-		2// 3 x 0.25 in		4/0 AWG - 500 MCM 4//4 x 0.25 in	
	Clamp type		K6TH alt. ATK580		-		bars, use LW1250		K7TK K7TK bars	
	Tightening torque		275 lb.in		-		375 lb.in		-	
Connection capacity acc. to UL / CSA										
		3 x	2/0 AWG-400 MCM		2/0 AWG-500 MCM		1/0-750 MCM		-	
	Clamp type		K6TJ		ATK750/3		K8TL, K8TM, ATK1650/4		K8TL, K8TM, ATK1650/4, ATK1650/6	
	Tightening torque		275 lb.in		375 lb.in		500 lb.in		-	
Auxiliary conductors (coil terminals)										
	Solid / stranded	1 x	1...4 mm ²							
		2 x	1...4 mm ²							
	Flexible	1 x	0.75...2.5 mm ²							
		2 x	0.75...2.5 mm ²							
	Flexible with non insulated ferrule	1 x	0.75...2.5 mm ²							
		2 x	0.75...2.5 mm ²							
	Flexible with insulated ferrule	1 x	0.75...2.5 mm ²							
		2 x	0.75...2.5 mm ²							
	Lugs	L ≤	8 mm							
		L >	3.7 mm							
Connection capacity acc. to UL / CSA										
		1 or 2 x	AWG 18...14							
	Tightening torque	Recommended	1.00 Nm / 9 lb.in							
		Max.	1.20 Nm							
Degree of protection										
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529										
	Main terminals			IP00						
	Coil terminals			IP20						
Screw terminals										
	Main terminals			M10		M12				
	Coil terminals (delivered in open position)			Screws and bolts						
				M3.5						
	Screwdriver type			Flat Ø 5.5 mm / Pozidriv 2						

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