AF09 ... AF80 4-pole contactors
Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	AC / DC operated	AF09	AF16	AF26	AF38	AF40	AF52	AF80
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		35 A	35 A	55 A	55 A	105 A	105 A	125 A
With conductor cross-sectional area		6 mm²	6 mm²	16 mm²	16 mm²	35 mm²	35 mm²	50 mm²
AC-1 Utilization category								
For air temperature close to contactor								
Ie / Rated operational current AC-1	**θ ≤ 40 °C**	25 A	30 A	45 A	55 A	70 A	100 A	125 A
Ue max. ≤ 690 V, 50/60 Hz	**θ ≤ 60 °C**	25 A	30 A	40 A	45 A	60 A	80 A	105 A
	θ ≤ 70 °C	22 A	26 A	32 A	37 A	50 A	70 A	90 A
With conductor cross-sectional area		4 mm²	6 mm²	10 mm²	16 mm²	35 mm²	35 mm²	50 mm²
AC-3 Utilization category								
For air temperature close to contactor θ ≤ 60 °C								
Ie / Max. rated operational current AC-3 (1)								
	220-230-240 V	9 A	18 A	23.2 A	23.2 A	40 A	53 A	80 A
	380-400 V	9 A	18 A	22 A	22 A	40 A	53 A	80 A
M 3~ 3-phase motors	**415 V**	9 A	18 A	21.2 A	21.2 A	40 A	53 A	80 A
	440 V	9 A	18 A	20 A	20 A	40 A	53 A	80 A
	500 V	9.5 A	15 A	17.6 A	17.6 A	35 A	45 A	65 A
	690 V	7 A	10.5 A	10.5 A	10.5 A	25 A	35 A	49 A
Rated operational power AC-3 (1)								
	220-230-240 V	2.2 kW	4 kW	5.5 kW	5.5 kW	11 kW	15 kW	22 kW
	380-400 V	4 kW	7.5 kW	11 kW (3)	11 kW (3)	18.5 kW	22 kW	37 kW
M 3~ 1500 r.p.m. 50 Hz, 1800 r.p.m. 60 Hz, 3-phase motors	**415 V**	4 kW	9 kW	11 kW	11 kW	22 kW	30 kW	45 kW
	440 V	4 kW	9 kW	11 kW	11 kW	22 kW	30 kW	45 kW
	500 V	5.5 kW	9 kW	11 kW	11 kW	22 kW	30 kW	45 kW
	690 V	5.5 kW	9 kW	9 kW	9 kW	22 kW	30 kW	45 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								
Ue ≤ 500 V AC - gG type fuse		25 A	32 A	50 A	63 A	80 A	110 A	160 A
Rated short-time withstand current Icw	**1 s**	300 A	300 A	450 A	450 A	1000 A	1000 A	1200 A
At 40 °C ambient temperature,	**10 s**	150 A	150 A	300 A	300 A	600 A	600 A	780 A
in free air from a cold state	**30 s**	80 A	80 A	225 A	225 A	350 A	350 A	450 A
	1 min	60 A	60 A	150 A	150 A	250 A	250 A	300 A
	15 min	35 A	35 A	55 A	55 A	110 A	110 A	140 A
Maximum breaking capacity N.O. main pole	**at 440 V**	250 A	250 A	-	-	950 A	950 A	1100 A
cos φ = 0.45	**at 690 V**	106 A	106 A	-	-	600 A	600 A	750 A
N.C. Main pole	**at 440 V**	-	-	-	-	600 A	-	900 A
	at 690 V	-	-	-	-	300 A	-	750 A
Power dissipation per pole	**Ie / AC-1**	0.8 W	1.2 W	1.6 W	2.3 W	3 W	6.3 W	8 W
	Ie / AC-3	0.1 W	0.35 W	0.42 W	0.42 W	1 W	1.7 W	3.2 W
Max. electrical switching frequency	**AC-1**	600 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".
(3) 400 V 3-phase motors only.

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AF09 ... AF80 4-pole contactors
Technical data

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

Contactor types	AC / DC operated	AF09	AF16	AF26	AF38	AF40	AF52	AF80
Standards		UL 508, CSA C22.2 N°14				UL 60947-4-1, CSA-C22.2 No. 60947-4-1		
Max. operational voltage		600 V						
UL / CSA general use rating								
	600 V AC	25 A	30 A	45 A	55 A	60 A	80 A	105 A
With conductor cross-sectional area		AWG 10	AWG 10	AWG 8	AWG 6	AWG 6	AWG 4	AWG 2
1 pole	**80 V DC**	25 A (1)	30 A (1)	45 A	55 A	60 A	80 A	105 A
2 poles in serie	**160 V DC**	25 A (1)	30 A (1)	45 A	55 A	60 A	80 A	105 A
3 poles in serie	**240 V DC**	25 A	30 A	45 A	55 A	60 A	80 A	105 A
4 poles in serie	**320 V DC**	25 A	30 A	45 A	55 A	60 A	80 A	105 A
With conductor cross-sectional area		AWG 10	AWG 10	AWG 8	AWG 8	AWG 6	AWG 4	AWG 2
Max. electrical switching frequency								
For general use		600 cycles/h						

Note: 4-pole contactors fitted with 2 N.O. + 2 N.C. main poles, see "General technical data".
(1) 20 A for AF09..-22-00 and AF16..-22-00.

Main pole utilization characteristics - 4 N.O. non-reversing contactors

Contactor types	AC / DC operated	AF09	AF16	AF26	AF38	AF40	AF52	AF80
Lighting application - UL / CSA - breaking all lines								
Electrical discharge lamps (ballast)								
1-phase per pole	**347 V AC**	20 A	30 A	45 A	50 A	-	-	-
3-phase break all lines	**600 V AC**	20 A	30 A	45 A	50 A	-	-	-
Elevator control, load switching, 500 000 electrical operating cycles acc. to CSA B44.1 / ASME 17.5 paragraph 19.2.1								
1-phase								
Horse power rating	**110-120 V AC**	-	1/2 hp	-	-	-	-	-
	220-240 V AC	-	1-1/2 hp	-	-	-	-	-
3-phase								
Horse power rating	**200-208 V AC**	-	3 hp	-	-	-	-	-
	220-240 V AC	-	3 hp	-	-	-	-	-
	440-480 V AC	-	7-1/2 hp	-	-	-	-	-
	550-600 V AC	-	10 hp	-	-	-	-	-

Note: 4-pole contactors fitted with 2 N.O. + 2 N.C. main poles, see "General technical data".

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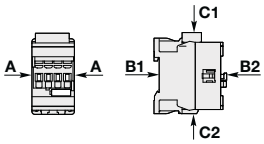
AF09 ... AF80 4-pole contactors
Technical data

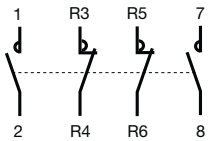
General technical data

Contactor types	AC / DC operated		AF09	AF16	AF26	AF38	AF40	AF52	AF80
Rated insulation voltage Ui									
acc. to IEC 60947-4-1			690 V						1000 V
acc. to UL / CSA			600 V						
Rated impulse withstand voltage Uimp.			6 kV						8 kV
Electromagnetic compatibility			Devices complying with IEC 60947-1 / EN 60947-1 - Environment A and B (1)						
Ambient air temperature close to contactor									
Operation			-40...+70 °C						
Storage			-60...+80 °C						
Climatic withstand			Category B according to IEC 60947-1 Annex Q						
Maximum operating altitude (without derating)			3000 m						
Mechanical durability									
Number of operating cycles			10 millions operating cycles						
Max. switching frequency			3600 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 11 ms: no change in contact position, closed or open position						
	4 N.O. Main poles	**A**	30 g				20 g		
		B1	25 g closed position / 5 g open position				20 g closed position / 5 g open position		
		B2	15 g				10 g		
		C1	25 g				20 g		
		C2	25 g				20 g		
	2 N.O. + 2 N.C. Main poles	**A**	30 g closed position / 25 g open position				20 g		
		B1	25 g closed position / 5 g open position				20 g closed position / 4 g open position		
		B2	15 g closed position / 10 g open position				10 g		
		C1	25 g closed position / 20 g open position				20 g		
		C2	25 g closed position / 20 g open position				20 g		
Vibration withstand			5...300 Hz						
acc. to IEC 60068-2-6			4 g closed position / 2 g open position						



(1) Environment B: all AF09 … AF38 contactors produced since week 08-2013. AF09 … AF38-..-..-12 (48...130 V 50/60 Hz-DC) compliant to environment A only.
For environment B: select AF09 … AF38-..-..-22.

Remark for 4-pole contactors fitted with 2 N.O. + 2 N.C. main poles

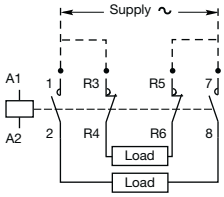


These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising 2 separate loads with a single supply (see diagrams below). When the contactor operates there is no mechanical overlapping between the N.O. poles and the N.C. poles: BREAK before MAKE.

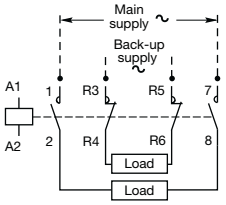
These contactors are not suitable for a reversing starter or for controlling a single load from 2 separate supplies.

Block diagrams

– Single supply and 2 separate loads



– 2 separate supplies and 2 separate loads



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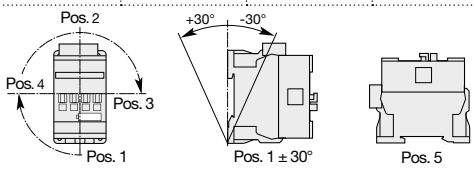
AF09 ... AF80 4-pole contactors
Technical data

Magnet system characteristics

Contactor types	AC / DC operated	AF09	AF16	AF26	AF38	AF40	AF52	AF80
Coil operating limits acc. to IEC 60947-4-1	**AC supply**	At θ ≤ 60 °C 0.85 x Uc min...1.1 x Uc max. At θ ≤ 70 °C 0.85 x Uc min...Uc max.				at θ ≤ 70 °C 0.85 x Uc min ... 1.1 x Uc max		
	DC supply	At θ ≤ 60 °C 0.85 x Uc min...1.1 x Uc max. At θ ≤ 70 °C (AF) 0.85 x Uc min...Uc max. - (AF..Z) 0.85 x Uc min...1.1 x Uc max.				at θ ≤ 70 °C 0.85 x Uc min ... 1.1 x Uc max		
AC control voltage 50/60 Hz								
Rated control circuit voltage Uc		24...500 V AC						
Coil consumption	**Average pull-in value**	(AF) 50 VA - (AF..Z) 16 VA				40 VA		
	Average holding value	(AF) 2.2 VA / 2 W - (AF..Z) 1.7 VA / 1.5 W				4 VA / 2 W		
DC control voltage								
Rated control circuit voltage Uc		12...500 V DC				20...500 V DC		
Coil consumption	**Average pull-in value**	(AF) 50 W - (AF..Z) 12...16 W				40 W		
	Average holding value	(AF) 2 W - (AF..Z) 1.7 W				2 W		
PLC-output control		(AF..Z) ≥ 500 mA 24 V DC				-		
Drop-out voltage		≤ 60 % of Uc min.				≤ 60 % of Uc min.		
Voltage sag immunity acc. to SEMI F47-0706		(AF..Z) conditions of use on request				conditions of use on request		
Dips withstand -20 °C ≤ θ ≤ +60 °C		(AF..Z) 22 ms average for Uc ≥ 24 V 50/60 Hz or Uc ≥ 20 V DC				24 ms average		
Operating time								
Between coil energization and:	**N.O. contact closing**	40...95 ms				48...120 ms		
	N.C. contact opening	38...90 ms				44...115 ms		
Between coil de-energization and:	**N.O. contact opening**	11...95 ms				16...110 ms		
	N.C. contact closing	13...98 ms				18...113 ms		

Mounting characteristics and conditions for use

Contactor types	AF09	AF16	AF26	AF38	AF40	AF52	AF80
Mounting positions							
	Max. add-on N.C. auxiliary contacts: see accessory fitting details for a 4-pole contactor AF09 ... AF80						
Mounting distances	The contactors can be assembled side by side						
Fixing							
On rail according to IEC 60715, EN 60715	35 x 7.5 mm or 35 x 15 mm				35 x 15 mm		
By screws (not supplied)	2 x M4 screws placed diagonally				2 x M4 or 2 x M6 screws placed diagonally		

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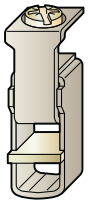
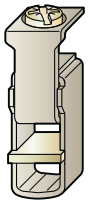
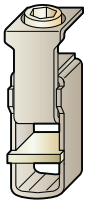
AF09 ... AF80 4-pole contactors
Technical data

Connecting characteristics

Contactor types			AF09 AF16	AF26 AF38	AF40 AF52	AF80
Main terminals			 Screw terminals with cable clamp	 Screw terminals with double connector 2 x (5.5 width x 6.8 depth)	 Screw terminals with double connector 2 x (9.3 width x 7.9/10.3 depth)	 Screw terminals with double connector 2 x (12.4 width x 9.3/11.1 depth)
Connection capacity (min. ... max.)						
Main conductors (poles)						
Rigid	Solid (≤ 4 mm²)	**1 x**	1...6 mm²	1.5...16 mm²	6...35 mm²	6...70 mm²
	Stranded (≥ 6 mm²)	**2 x**	1...6 mm²	1.5...16 mm²	6...35 mm²	6...50 mm²
Flexible with non insulated ferrule		**1 x**	0.75...6 mm²	1.5...16 mm²	4...35 mm²	6...50 mm²
		2 x	0.75...6 mm²	1.5...16 mm²	4...35 mm²	6...50 mm²
Flexible with insulated ferrule		**1 x**	0.75...4 mm²	1.5...16 mm²	4...35 mm²	6...50 mm²
		2 x	0.75...2.5 mm²	1.5...16 mm²	4...35 mm²	6...50 mm²
Bars or lugs		**L <**	9.6 mm	-	9.2 mm	12.2 mm
Connection capacity acc. to UL/CSA		**1 or 2 x**	AWG 16...10	AWG 16...6	AWG 10...2	AWG 6...1
Stripping length			10 mm	12 mm	16 mm	17 mm
Tightening torque			1.5 Nm / 13 lb.in	2.5 Nm / 22 lb.in	4 Nm / 35 lb.in	6 Nm / 53 lb.in
Auxiliary conductors (coil terminals)						
Rigid solid		**1 x**	1...2.5 mm²			
		2 x	1...2.5 mm²			
Flexible with non insulated ferrule		**1 x**	0.75...2.5 mm²			
		2 x	0.75...2.5 mm²			
Flexible with insulated ferrule		**1 x**	0.75...2.5 mm²			
		2 x	0.75...1.5 mm²			
Lugs		**L <**	8 mm			
Connection capacity acc. to UL/CSA		**1 or 2 x**	AWG 18...14			
Stripping length			10 mm			
Tightening torque			1.2 Nm / 11 lb.in			
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529						
Main terminals			IP20		IP10	
Coil terminals			IP20			
Screw terminals			Delivered in open position, screws of unused terminals must be tightened			
Main terminals			M3.5	M4.5	M6	M8
	Screwdriver type		Flat Ø 5.5 / Pozidriv 2		Flat Ø 6.5 / Pozidriv 2	hexagon socket (s = 4 mm)
Coil terminals			M3.5			
	Screwdriver type		Flat Ø 5.5 / Pozidriv 2			

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