



AF09 ... AF38 4-pole contactors

Technical data

Main pole - Utilization characteristics according to IEC

Contactors types	AC / DC operated	AF09	AF16	AF26	AF38
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1			
Rated operational voltage U_e max.		690 V			
Rated frequency (without derating)		50 / 60 Hz			
Conventional free-air thermal current I_{th} acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$ With conductor cross-sectional area		35 A	35 A	55 A	55 A
		6 mm ²	6 mm ²	16 mm ²	16 mm ²
AC-1 Utilization category					
For air temperature close to contactor					
I_e / Rated operational current AC-1 U_e max. ≤ 690 V, 50/60 Hz	$\theta \leq 40^\circ\text{C}$	25 A	30 A	45 A	55 A
	$\theta \leq 60^\circ\text{C}$	25 A	30 A	40 A	45 A
	$\theta \leq 70^\circ\text{C}$	22 A	26 A	32 A	37 A
With conductor cross-sectional area		4 mm ²	6 mm ²	10 mm ²	16 mm ²
AC-3 Utilization category					
For air temperature close to contactor $\theta \leq 60^\circ\text{C}$					
I_e / Max. rated operational current AC-3 (1)					
	220-230-240 V	9 A	18 A	23.2 A	23.2 A
 3-phase motors	380-400 V	9 A	18 A	22 A	22 A
	415 V	9 A	18 A	21.2 A	21.2 A
	440 V	9 A	18 A	20 A	20 A
	500 V	9.5 A	15 A	17.6 A	17.6 A
	690 V	7 A	10.5 A	10.5 A	10.5 A
Rated operational power AC-3 (1)					
	220-230-240 V	2.2 kW	4 kW	5.5 kW	5.5 kW
 1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors	380-400 V	4 kW	7.5 kW	11 kW (2)	11 kW (2)
	415 V	4 kW	9 kW	11 kW	11 kW
	440 V	4 kW	9 kW	11 kW	11 kW
	500 V	5.5 kW	9 kW	11 kW	11 kW
	690 V	5.5 kW	9 kW	9 kW	9 kW
Rated making capacity AC-3		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			
Short-circuit protection device for contactors					
Without thermal overload relay - Motor protection excluded					
$U_e \leq 500$ V AC - gG type fuse		25 A	32 A	50 A	63 A
Rated short-time withstand current I_{cw} At 40 °C ambient temperature, in free air from a cold state	1 s	300 A	300 A	450 A	450 A
	10 s	150 A	150 A	300 A	300 A
	30 s	80 A	80 A	225 A	225 A
	1 min	60 A	60 A	150 A	150 A
	15 min	35 A	35 A	55 A	55 A
Power dissipation per pole	I_e / AC-1	0.8 W	1.2 W	1.6 W	2.3 W
	I_e / AC-3	0.1 W	0.35 W	0.42 W	0.42 W
Max. electrical switching frequency	AC-1	600 cycles/h			
	AC-3	600 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) 400V 3-phase motor only.

Main pole - Utilization characteristics according to UL / CSA

Contactors types	AC / DC operated	AF09	AF16	AF26	AF38
Standards		UL 60947-1 / 60947-4-1A and CSA 60947-1 / 60947-4-1A			
Max. operational voltage		600 V			
UL / CSA general use rating	600 V AC	25 A	30 A	45 A	55 A
	With conductor cross-sectional area	AWG 10	AWG 10	AWG 8	AWG 6
Max. electrical switching frequency		600 cycles/h			
	For general use	600 cycles/h			

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

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Magnet system characteristics

Contactor types	AC / DC operated	AF09	AF16	AF26	AF38
Coil operating limits acc. to IEC 60947-4-1	AC supply	At $\theta \leq 60^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$. At $\theta \leq 70^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots U_c \text{ max}$.			
	DC supply	At $\theta \leq 60^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$. At $\theta \leq 70^\circ\text{C}$ (AF) $0.85 \times U_c \text{ min} \dots U_c \text{ max}$. - (AF..Z) $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$.			
AC control voltage 50/60 Hz		24...500 V AC			
Rated control circuit voltage U_c		24...500 V AC			
Coil consumption	Average pull-in value	(AF) 50 VA - (AF..Z) 16 VA			
	Average holding value	(AF) 2.2 VA / 2 W - (AF..Z) 1.7 VA / 1.5 W			
DC control voltage		12...500 V DC			
Rated control circuit voltage U_c		12...500 V DC			
Coil consumption	Average pull-in value	(AF) 50 W - (AF..Z) 12...16 W			
	Average holding value	(AF) 2 W - (AF..Z) 1.7 W			
PLC-output control		(AF..Z) $\geq 500 \text{ mA}$ 24 V DC			
Drop-out voltage		$\leq 60\%$ of $U_c \text{ min}$.			
Voltage sag immunity acc. to SEMI F47-0706		(AF..Z) conditions of use on request			
Dips withstand $-20^\circ\text{C} \leq \dots \leq +60^\circ\text{C}$		(AF..Z) 22 ms average for $U_c \geq 24 \text{ V}$ 50/60 Hz or $U_c \geq 20 \text{ V}$ DC			
Operating time		40...95 ms			
Between coil energization and:	N.O. contact closing	40...95 ms			
	N.C. contact opening	38...90 ms			
Between coil de-energization and:	N.O. contact opening	11...95 ms			
	N.C. contact closing	13...98 ms			

Mounting characteristics and conditions for use

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

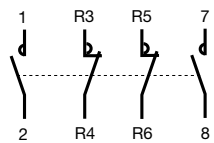
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Technical data

General technical data

Contactor types	AC / DC operated	AF09	AF16	AF26	AF38
Rated insulation voltage U_i					
acc. to IEC 60947-4-1		690 V			
acc. to UL / CSA		600 V			
Rated impulse withstand voltage U_{imp}		6 kV			
Electromagnetic compatibility		Devices complying with IEC 60947-1 / EN 60947-1 - Environment A			
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		
		B1	25 g closed position / 5 g open position		
		B2	15 g		
		C1	25 g		
		C2	25 g		
	2 N.O. + 2 N.C. Main poles	A	30 g closed position / 25 g open position		
		B1	25 g closed position / 5 g open position		
		B2	15 g closed position / 10 g open position		
		C1	25 g closed position / 20 g open position		
		C2	25 g closed position / 20 g open position		
Vibration withstand					
acc. to IEC 60068-2-6		5...300 Hz			
		4 g closed position / 2 g open position			

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



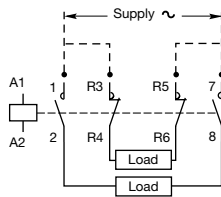
These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising 2 separate loads with a single supply (see diagrams below). When the contactor operates there is no mechanical overlapping between the N.O. poles and the N.C. poles: BREAK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



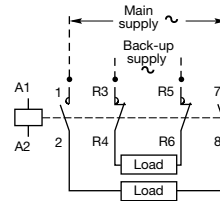
These contactors are not suitable for a reversing starter or for controlling a single load from 2 separate supplies.

Block diagrams

– Single supply and 2 separate loads




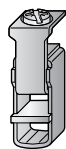














– 2 separate supplies and 2 separate loads



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Connecting characteristics

Contactor types	AF09	AF16	AF26	AF38
Main terminals				
	Screw terminals with cable clamp		Screw terminals with double connector 2 x (5.5 width x 6.8 depth)	
Connection capacity (min. ... max.)				
Main conductors (poles)				
 Rigid	Solid ($\leq 4 \text{ mm}^2$)	} 1 x	1...6 mm ²	1.5...16 mm ²
 Stranded ($\geq 6 \text{ mm}^2$)			2 x	1...6 mm ²
 Flexible with non insulated ferrule		1 x	0.75...6 mm ²	1.5...16 mm ²
 Flexible with non insulated ferrule		2 x	0.75...6 mm ²	1.5...16 mm ²
 Flexible with insulated ferrule		1 x	0.75...4 mm ²	1.5...16 mm ²
 Flexible with insulated ferrule		2 x	0.75...2.5 mm ²	1.5...16 mm ²
 Bars or lugs		L <	9.6 mm	-
Connection capacity acc. to UL/CSA	1 or 2 x		AWG 16...10	AWG 16...6
Stripping length			10 mm	12 mm
Tightening torque			1.5 Nm / 13 lb.in	2.5 Nm / 22 lb.in
Auxiliary conductors (coil terminals)				
 Rigid solid		1 x	1...2.5 mm ²	
 Rigid solid		2 x	1...2.5 mm ²	
 Flexible with non insulated ferrule		1 x	0.75...2.5 mm ²	
 Flexible with non insulated ferrule		2 x	0.75...2.5 mm ²	
 Flexible with insulated ferrule		1 x	0.75...2.5 mm ²	
 Flexible with insulated ferrule		2 x	0.75...1.5 mm ²	
 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			
Coil terminals	IP20			
Screw terminals	Delivered in open position, screws of unused terminals must be tightened			
Main terminals			M3.5	M4.5
	Screwdriver type	Flat Ø 5.5 / Pozidriv 2		
Coil terminals			M3.5	
	Screwdriver type	Flat Ø 5.5 / Pozidriv 2		