

AF09(Z)B..RT ... AF38(Z)B..RT 3-pole contactors

Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	AF09(Z)B..RT	AF12(Z)B..RT	AF16(Z)B..RT	AF26(Z)B..RT	AF30(Z)B..RT	AF38(Z)B..RT
Standards	IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1					
Fire and smoke	IEC 60077-1, IEC 60077-2, EN 50155 (applicable parts)					
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, $\theta \leq 40^\circ\text{C}$	35 A	35 A	35 A	50 A	50 A	50 A
With conductor cross-sectional area	6 mm ²	6 mm ²	6 mm ²	10 mm ²	10 mm ²	10 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	28 A	30 A	45 A	50 A	50 A
$\theta \leq 60^\circ\text{C}$	25 A	28 A	30 A	40 A	42 A	42 A
$\theta \leq 70^\circ\text{C}$	22 A	24 A	26 A	32 A	37 A	37 A
With conductor cross-sectional area	4 mm ²	6 mm ²	6 mm ²	10 mm ²	10 mm ²	10 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	12 A	18 A	26 A	33 A	40 A
380-400 V	9 A	12 A	18 A	26 A	32 A	38 A
415 V	9 A	12 A	18 A	26 A	32 A	38 A
440 V	9 A	12 A	18 A	26 A	32 A	38 A
500 V	9.5 A	12.5 A	15 A	23 A	28 A	33 A
690 V	7 A	9 A	10.5 A	17 A	21 A	24 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
380-400 V	4 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW
415 V	4 kW	5.5 kW	9 kW	11 kW	15 kW	18.5 kW
440 V	4 kW	5.5 kW	9 kW	15 kW	18.5 kW	22 kW
500 V	5.5 kW	7.5 kW	9 kW	15 kW	18.5 kW	22 kW
690 V	5.5 kW	7.5 kW	9 kW	15 kW	18.5 kW	22 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 (2)						
$U_e \leq 500$ V AC - gG type fuse						
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	300 A	700 A	700 A	700 A
10 s	150 A	150 A	150 A	350 A	350 A	350 A
30 s	80 A	80 A	80 A	225 A	225 A	225 A
1 min	60 A	60 A	60 A	150 A	150 A	150 A
15 min	35 A	35 A	35 A	50 A	50 A	50 A
Maximum breaking capacity $\cos \varphi = 0.45$						
at 440 V	250 A	250 A	250 A	500 A	500 A	500 A
at 690 V	106 A	106 A	106 A	200 A	200 A	200 A
Power dissipation per pole						
I_e / AC-1	0.8 W	1 W	1.2 W	1.8 W	2.4 W	2.4 W
I_e / AC-3	0.1 W	0.2 W	0.35 W	0.6 W	0.9 W	1.3 W
Max. electrical switching frequency						
AC-1	600 cycles/h					
AC-3	1200 cycles/h					
AC-4	300 cycles/h			150 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".

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

Contactor types		AF09(Z)B..RT	AF12(Z)B..RT	AF16(Z)B..RT	AF26(Z)B..RT	AF30(Z)B..RT	AF38(Z)B..RT
Standards		UL 508, CSA C22.2 N°60947-4-1					
Maximum operational voltage		600 V					
NEMA size		00	0	-	1	-	-
NEMA continuous amp rating	Thermal current	9 A	18 A		27 A		
NEMA maximum horse power ratings 1-phase, 60 Hz	115 V AC	1/3 hp	1 hp		2 hp		
	230 V AC	1 hp	2 hp		3 hp		
NEMA maximum horse power ratings 3-phase, 60 Hz	200 V AC	1-1/2 hp	3 hp		7-1/2 hp		
	230 V AC	1-1/2 hp	3 hp		7-1/2 hp		
	460 V AC	2 hp	5 hp		10 hp		
	575 V AC	2 hp	5 hp		10 hp		
UL / CSA general use rating	600 V AC	25 A	28 A	30 A	45 A	50 A	50 A
	With conductor cross-sectional area	AWG 10	AWG 10	AWG 10	AWG 8	AWG 8	AWG 8
UL / CSA maximum 1-phase motor rating Full load current	120 V AC	13.8 A	16 A	20 A	24 A	24 A	24 A
	240 V AC	10 A	12 A	17 A	17 A	28 A	28 A
Horse power rating	120 V AC	3/4 hp	1 hp	1-1/2 hp	2 hp	2 hp	2 hp
	240 V AC	1-1/2 hp	2 hp	3 hp	3 hp	5 hp	5 hp
UL / CSA maximum 3-phase motor rating Full load current (1)	200-208 V AC	7.8 A	11 A	17.5 A	25.3 A	32.2 A	32.2 A
	220-240 V AC	6.8 A	9.6 A	15.2 A	22 A	28 A	28 A
	440-480 V AC	7.6 A	11 A	14 A	21 A	27 A	34 A
	550-600 V AC	9 A	11 A	17 A	22 A	27 A	32 A
	Horse power rating (1)	200-208 V AC	2 hp	3 hp	5 hp	7-1/2 hp	10 hp
	220-240 V AC	2 hp	3 hp	5 hp	7-1/2 hp	10 hp	10 hp
	440-480 V AC	5 hp	7-1/2 hp	10 hp	15 hp	20 hp	25 hp
	550-600 V AC	7-1/2 hp	10 hp	15 hp	20 hp	25 hp	30 hp
Short-circuit protection device for contactors without thermal overload relay - Motor protection excluded							
Fuse rating		30	30	60	60	100	100
Fuse type, 600 V		J					
Maximum electrical switching frequency							
For general use		600					
For motor use		1200					

(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".

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General technical data

Contactor types		AF09(Z)B..RT	AF12(Z)B..RT	AF16(Z)B..RT	AF26(Z)B..RT	AF30(Z)B..RT	AF38(Z)B..RT
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 EN 50121-3-2					
Ambient air temperature close to contactor							
Operation	Fitted with thermal overload relay	-20...+60 °C					
	Without thermal overload relay	-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					
Maximum switching frequency		3600 cycles/h					
Shock and vibration withstand acc. to IEC 61373		Category 1, class B					

Magnet system characteristics

Contactor types		AF09(Z)B..RT	AF12(Z)B..RT	AF16(Z)B..RT	AF26(Z)B..RT	AF30(Z)B..RT	AF38(Z)B..RT
Coil operating limits acc. to IEC 60947-4-1							
		DC supply		(AF..ZB) at $\theta \leq 70$ °C $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$ (AF..B) at $\theta \leq 60$ °C $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$; at $\theta \leq 70$ °C $0.85 \times U_c \text{ min} \dots U_c \text{ max}$			
		AC supply		at $\theta \leq 60$ °C $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$ at $\theta \leq 70$ °C $0.85 \times U_c \text{ min} \dots U_c \text{ max}$			
DC control voltage							
Rated control circuit voltage U_c		20 ... 250 V DC					
Coil consumption		Average pull-in value		(AF..Z) 12 ... 16 W			
		Average holding value		(AF..Z) 1.7 W			
PLC-output control		(AF..Z) ≥ 500 mA 24 V DC					
AC control voltage 50/60 Hz							
Rated control circuit voltage U_c		(AF..ZB) 24 ... 250 V AC - (AF..B) 250 ... 500 V AC					
Coil consumption		Average pull-in value		(AF..ZB) 16 VA - (AF..B) 50 VA			
		Average holding value		(AF..ZB) 1.7 VA / 1.5 W - (AF..B) 2.2 VA / 2 W			
Max. permitted control voltage during voltage fluctuation defined acc. to IEC 60077 / EN 50155		Rated control circuit voltage / Max. permitted control voltage 24 ... 60 V AC 50/60 Hz / 75 V AC 50/60 Hz 48 ... 130 V AC 50/60 Hz / 150 V AC 50/60 Hz 100 ... 250 V AC 50/60 Hz / 275 V AC 50/60 Hz 250 ... 500 V AC 50/60 Hz / 550 V AC 50/60 Hz					
Drop-out voltage		≤ 60 % of $U_c \text{ min}$.					
Operating time							
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					

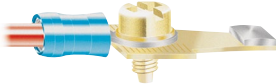
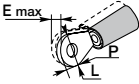
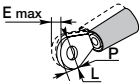
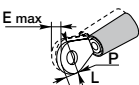
Mounting characteristics and conditions for use

Contactor types		AF09(Z)B..RT	AF12(Z)B..RT	AF16(Z)B..RT	AF26(Z)B..RT	AF30(Z)B..RT	AF38(Z)B..RT
Mounting positions							
		Max. N.C. built-in add add-on N.C. auxiliary contacts : see accessory fitting details for a 3-pole contactor AF09(Z)B ... AF38(Z)B					
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					
By screws (not supplied)		2 x M4 screws placed diagonally					

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Connecting characteristics

Contactor types		AF09(Z)B..RT	AF12(Z)B..RT	AF16(Z)B..RT	AF26(Z)B..RT	AF30(Z)B..RT	AF38(Z)B..RT	
Main terminals								
Connection capacity (min. ... max.)		Conductors with insulated ring tongue ferrule						
Main conductors (poles)								
	Flexible with insulated ferrule	1 or 2 x	0.75...6 mm ²			1.5...10 mm ²		
			Ø mm >	3.5 mm				
			L mm <	9.6 mm			12.8 mm	
			P mm <	5 mm			6.9 mm	
			E mm <	3.6 mm				
Connection capacity acc. to UL/CSA		1 or 2 x	AWG 16...10			AWG 14...8		
Tightening torque			1.5 Nm / 13 lb.in			2.5 Nm / 22 lb.in		
Coil conductors								
	Flexible with insulated ferrule	1 or 2 x	0.75...2.5 mm ²					
			Ø mm >	3.5 mm				
			L mm <	8 mm				
			P mm <	4.7 mm				
			E mm <	2.9 mm				
Connection capacity acc. to UL/CSA		1 or 2 x	AWG 18...14					
Tightening torque			1.2 Nm / 11 lb.in					
Auxiliary conductors								
	Flexible with insulated ferrule	1 or 2 x	0.75...2.5 mm ²			-		
			Ø mm >	3.5 mm			-	
			L mm <	9.6 mm			-	
			P mm <	5 mm			-	
			E mm <	3.6 mm			-	
Connection capacity acc. to UL/CSA		1 or 2 x	AWG 18...14			-		
Tightening torque			1.2 Nm / 11 lb.in			-		
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529								
All terminals		IP10						
Front face		IP20						
Screw terminals		Delivered in open position, screws of unused terminals must be tightened						
Main terminals			M3.5					
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2					
Coil terminals			M3.5					
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2					
Built-in auxiliary terminals			M3.5					
		Screwdriver type	Flat Ø 5.5 / Pozidriv 2					

AF09(Z)B..RT ... AF16(Z)B..RT 3-pole contactors

Technical data

Built-in auxiliary contacts according to IEC

Contactor types	AF09(Z)B..RT	AF12(Z)B..RT	AF16(Z)B..RT
Rated operational voltage U _e max.	690 V		
Rated frequency (without derating)	50 / 60 Hz		
Conventional free air thermal current I _{th} - θ ≤ 40 °C	16 A		
le / Rated operational current AC-15 acc. to IEC 60947-5-1	24-127 V 50/60 Hz	6 A	
	220-240 V 50/60 Hz	4 A	
	400-440 V 50/60 Hz	3 A	
	500 V 50/60 Hz	2 A	
	690 V 50/60 Hz	2 A	
Making capacity AC-15	10 x I _e AC-15 acc. to IEC 60947-5-1		
Breaking capacity AC-15	10 x I _e AC-15 acc. to IEC 60947-5-1		
I _e / Rated operational current DC-13 acc. to IEC 60947-5-1	24 V DC	6 A / 144 W	
	48 V DC	2.8 A / 134 W	
	72 V DC	1 A / 72 W	
	110 V DC	0.55 A / 60 W	
	125 V DC	0.55 A / 69 W	
	220 V DC	0.27 A / 60 W	
	250 V DC	0.27 A / 68 W	
	400 V DC	0.15 A / 60 W	
	500 V DC	0.13 A / 65 W	
	600 V DC	0.1 A / 60 W	
Short-circuit protection device gG type fuse	10 A		
Rated short-time withstand current I _{cw}	for 1.0 s	100 A	
	for 0.1 s	140 A	
Minimum switching capacity with failure rate acc. to IEC 60947-5-4	12 V / 3 mA		
Non-overlapping time between N.O. and N.C. contacts	10 ⁻⁷		
Power dissipation per pole at 6 A	≥ 2 ms		
Maximum electrical switching frequency	0.1 W		
	AC-15	1200 cycles/h	
	DC-13	900 cycles/h	
Mechanically linked contacts acc. to annex L of IEC 60947-5-1	Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts (CA4, CAL4, CAT4 aux. contact blocks) are mechanically linked contacts.		
Mirror contacts acc. to annex F of IEC 60947-4-1	Built-in N.C. auxiliary contacts or additional N.C. auxiliary contacts (CA4, CAL4, CAT4 aux. contact blocks) are mirror contacts.		

Built-in auxiliary contacts according to UL / CSA

Contactor types	AF09(Z)B..RT	AF12(Z)B..RT	AF16(Z)B..RT
Maximum operational voltage	600 V AC, 600 V DC		
Pilot duty	A600, Q600		
AC thermal rated current	10 A		
AC maximum volt-ampere making	7200 VA		
AC w volt-ampere breaking	720 VA		
DC thermal rated current	2.5 A		
DC maximum volt-ampere making-breaking	69 VA		