

IEC Technical data

A/F145...AF300, 3-pole

Utilization characteristics

Main pole - Utilization characteristics according to IEC

Contactor types	AC operated	A145	A185	A210	A260	A300
	AC / DC operated	AF145	AF185	AF210	AF260	AF300
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1				
Rated operational voltage Ue max.		1000 V		690 V		
Rated frequency (without derating)		50/60 Hz				
Conventional free-air thermal current Ith						
acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$		250 A	275 A	350 A	400 A	500 A (4)
With conductor cross-sectional area (3)		120 mm ²	150 mm ²	185 mm ²	240 mm ²	300 mm ² (4)
AC-1 Utilization category						
For air temperature close to contactor						
Ie / Rated operational current AC-1	$\theta \leq 40^\circ\text{C}$	250 A	275 A	350 A	400 A	500 A (4)
Ue max. $\leq 690\text{ V}$, 50/60 Hz	$\theta \leq 55^\circ\text{C}$	230 A	250 A	300 A	350 A	400 A (4)
	$\theta \leq 70^\circ\text{C}$	180 A	180 A	240 A	290 A	325 A (4)
Ie / Rated operational current AC-1	$\theta \leq 40^\circ\text{C}$	180 A	200 A	-	-	-
Ue max. $\leq 1000\text{ V}$, 50/60 Hz	$\theta \leq 55^\circ\text{C}$	180 A	200 A	-	-	-
	$\theta \leq 70^\circ\text{C}$	180 A	180 A	-	-	-
With conductor cross-sectional area		120 mm ²	150 mm ²	185 mm ²	240 mm ²	300 mm ² (4)
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	145 A	185 A	210 A	260 A	305 A
	380-400 V	145 A	185 A	210 A	260 A	305 A
	415 V	145 A	185 A	210 A	260 A	300 A
	440 V	145 A	185 A	210 A	240 A	280 A
	500 V	145 A	170 A	210 A	240 A	280 A
	690 V	120 A	170 A	210 A	220 A	280 A
	1000 V	80 A	95 A	-	-	-
Rated operational power AC-3 (1)						
	220-230-240 V	45 kW	55 kW	59 kW	80 kW	90 kW
	380-400 V	75 kW	90 kW	110 kW	140 kW	160 kW
	415 V	75 kW	90 kW	110 kW	140 kW	160 kW
	440 V	75 kW	90 kW	110 kW	140 kW	160 kW
	500 V	90 kW	110 kW	132 kW	180 kW	200 kW
	690 V	110 kW	132 kW	160 kW	200 kW	250 kW
	1000 V	110 kW	132 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		315 A	355 A	400 A	500 A	500 A
Rated short-time withstand current Icw						
at 40 °C ambient temperature,	1 s	1800 A	2000 A	2500 A	3500 A	3500 A
in free air from a cold state	10 s	1200 A	1500 A	1700 A	2400 A	2400 A
	30 s	800 A	1000 A	1200 A	1500 A	1500 A
	1 min	600 A	800 A	1000 A	1100 A	1100 A
	15 min	280 A	320 A	400 A	500 A	500 A
Maximum breaking capacity						
cos $\phi = 0.45$	at 440 V	1500 A	2000 A	2300 A	2600 A	3000 A
(cos $\phi = 0.35$ for Ie > 100 A)	at 690 V	1200 A	1600 A	2000 A	2400 A	2500 A
Power dissipation per pole	Ie / AC-1	13 W	16 W	18 W	25 W	32 W
	Ie / AC-3	5 W	8 W	9 W	14 W	18 W
Max. electrical switching frequency						
	AC-1	300 cycles/h		300 cycles/h		
	AC-3	300 cycles/h		300 cycles/h		
	AC-2, AC-4	150 cycles/h		150 cycles/h		



3-phase motors



1500 r.p.m. 50 Hz
1800 r.p.m. 60 Hz
3-phase motors

(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) Use terminal extension / enlargement pieces (LX 300 / LW 300).

UL/NEMA/CSA Technical data

A/F145...A/F300; A/F145N4...A/F260N5, 3-pole

Utilization characteristics

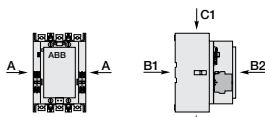
Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types	AC operated	A145	A185	A210	A260	A300
	AC / DC operated	AF145	AF185	AF210	AF260	AF300
Standards		UL 508, CSA C22.2 N°14				
Max. operational voltage		600 V				
NEMA size		4	-	-	5	-
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	40 hp			75 hp	
	230 V AC	50 hp			100 hp	
	460 V AC	100 hp			200 hp	
	575 V AC	200 hp			200 hp	
UL / CSA general use rating						
600 V AC		230 A	250 A	300 A	350 A	400 A
UL / CSA maximum 1-phase motor rating						
Full load current	240 V AC	-	-	-	-	-
Horse power rating	240 V AC	-	-	-	-	-
UL / CSA maximum 3-phase motor rating						
Full load current (1)	200-208 V AC	119.6 A	149.5 A	166.8 A	220.8 A	285.2 A
	220-240 V AC	130 A	145 A	192 A	248 A	248 A
	440-480 V AC	124 A	156 A	180 A	240 A	302 A
	550-600 V AC	125 A	144 A	192 A	242 A	289 A
Horse power rating (1)	200-208 V AC	40 hp	50 hp	60 hp	75 hp	100 hp
	220-240 V AC	50 hp	60 hp	75 hp	100 hp	100 hp
	440-480 V AC	100 hp	125 hp	150 hp	200 hp	250 hp
	550-600 V AC	125 hp	150 hp	200 hp	250 hp	300 hp
Max. electrical switching frequency						
For general use		300 cycles/h				
For motor use		300 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 operated	A145	A185	A210	A260	A300
	AC / DC operated	AF145	AF185	AF210	AF260	AF300
Rated insulation voltage Ui		1000 V				
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 thermal overload relay	-25 to +55 °C				
	Fitted with electronic overload relay	-25 to +70 °C				
	Without electronic overload relay	-40 to +70 °C				
Storage		-40 to +70 °C				
Climatic withstand		acc. to IEC 60068-2-30				
Maximum operating altitude (without derating)		3000 m				
Mechanical durability						
Number of operating cycles		5 millions operating cycles				
Max. switching frequency		3600 cycles/h (300 for AF... contactors)				
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				



General technical data

AF145...AF300, 3-pole

Coil & mounting characteristics

Magnet system characteristics

Contactor types	AC / DC operated	AF145	AF185	AF210	AF260	AF300
Coil operating limits acc. to IEC 60947-4-1	AC or DC supply	At $\theta \leq 70^\circ\text{C}$ $0.85 \times U_c$ min... $1.1 \times U_c$ max. Please also refer to "Mounting characteristics and conditions for use"				
AC control voltage 50/60 Hz	Rated control circuit voltage U_c	48...250 V AC				
	Coil consumption	Average pull-in value 430 VA		470 VA		
		Average holding value 12 VA / 3.5 W		10 VA / 2.5 W		
DC control voltage	Rated control circuit voltage U_c	20...250 V DC				
	Coil consumption	Average pull-in value 500 W		520 W		
		Average holding value 2 W		2 W		
Drop-out voltage		55 % of U_c min.				
Voltage sag immunity acc. to SEMI F47		Conditions of use on request				
Dips withstand		≥ 20 ms				
Operating time						
Between coil energization and:	N.O. contact closing	30...115 ms				
	N.C. contact opening	30...115 ms				
Between coil de-energization and:	N.O. contact opening	25...80 ms				
	N.C. contact closing	25...80 ms				

Mounting characteristics and conditions for use

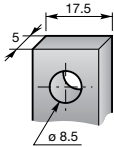
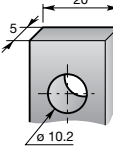









Contactor types	AC / DC operated	AF145	AF185	AF210	AF260	AF300
Mounting positions						
Control voltage / Ambient temperature		Max. add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 3-pole contactor AF145 ... AF2050				
Mounting positions	1, 1±30°, 2, 3, 4, 5 6	at $\theta \leq 70^\circ\text{C}$ $0.85 \times U_c$ min... $1.1 \times U_c$ max. Unauthorized				
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				

General technical data

A/F145...A/F300, 3-pole

Terminal characteristics

Connecting characteristics

Contactor types	AC operated		A145	A185	A210	A260	A300	
	AC / DC operated		AF145	AF185	AF210	AF260	AF300	
Main terminals Flat type								
Connection capacity (min. ... max.)								
Main conductors (poles)								
	Rigid with connector	Single for Cu cable	6...185 mm ²		16...240 mm ²			
		Single for Al/Cu cable	25...150 mm ²		120...240 mm ²			
		Double for Al/Cu cable	-		2 x 95...120 mm ²			
	Bars or lugs		L ≤	24 mm	32 mm			
			Ø >	8 mm	10 mm			
Connection capacity acc. to UL/GSA			6 - 250 MCM x 1		4 - 500 MCM x 1 (1)			
Tightening torque		Recommended	18 Nm / 160 lb.in		28 Nm / 247 lb.in			
		Max.	20 Nm		30 Nm			
Auxiliary conductors (coil terminals)								
	Rigid solid		1 x	1...4 mm ²				
			2 x	1...4 mm ²				
	Flexible with 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 (solid/stranded)			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		M8			M10			
		Screws and bolts						
Coil terminals (delivered in open position)		M3.5						
		Screwdriver type						
		Flat Ø 5.5 mm / Pozidriv 2						

(1) With LW110 enlargement piece: see "Accessories".