

IEC Technical data

A/E/L40, A/E/F50...A/F110, 3-pole

Utilization characteristics

Main pole - Utilization characteristics according to IEC

Contactor types		AC operated	A40	A50	A63	A75	A95	A110	
		DC operated	AL40	AE50	AE63	AE75	–	–	
			TAL40	TAE50	–	TAE75	–	–	
		AC / DC operated	–	AF50	AF63	AF75	AF95	AF110	
Standards			IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1						
Rated operational voltage U _e max.			690 V		1000 V (690 V for AF.. contactors)		1000 V		
Rated frequency (without derating)			50/60 Hz						
Conventional free-air thermal current I _{th}									
acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C			65 A		100 A	125 A	125 A	145 A	160 A
With conductor cross-sectional area			16 mm ²		35 mm ²	50 mm ²	50 mm ²	50 mm ²	70 mm ²
AC-1 Utilization category									
For air temperature close to contactor									
I _e / Rated operational current AC-1			θ ≤ 40 °C	60 A	100 A	115 A	125 A	145 A	160 A
U _e max. ≤ 690 V, 50/60 Hz			θ ≤ 55 °C	60 A	85 A	95 A	105 A	135 A	145 A
			θ ≤ 70 °C (3)	42 A	70 A	80 A	85 A	115 A	130 A
With conductor cross-sectional area			16 mm ²		35 mm ²	50 mm ²	50 mm ²	50 mm ²	70 mm ²
AC-3 Utilization category									
For air temperature close to contactor θ ≤ 55 °C									
I _e / Max. rated operational current AC-3 (1)									
			220-230-240 V	40 A	53 A	65 A	75 A	96 A	110 A
			380-400 V	37 A	50 A	65 A	75 A	96 A	110 A
			415 V	37 A	50 A	65 A	75 A	96 A	110 A
			440 V	37 A	45 A	65 A	70 A	93 A	100 A
			500 V	33 A	45 A	55 A	65 A	80 A	100 A
			690 V	25 A (4)	35 A	43 A	46 A	65 A	82 A
			1000 V	–	23 A (6)	25 A (6)	28 A (6)	30 A	30 A
Rated operational power AC-3 (1)									
			220-230-240 V	11 kW	15 kW	18.5 kW	22 kW	25 kW	30 kW
			380-400 V	18.5 kW	22 kW	30 kW	37 kW	45 kW	55 kW
			415 V	18.5 kW	25 kW	37 kW	40 kW	55 kW	59 kW
			440 V	22 kW	25 kW	37 kW	40 kW	55 kW	59 kW
			500 V	22 kW	30 kW	37 kW	45 kW	55 kW	59 kW
			690 V	22 kW (4)	30 kW	37 kW	40 kW	55 kW	75 kW
			1000 V	–	30 kW (6)	33 kW (6)	37 kW (6)	40 kW	40 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						
AC-8a Utilization category (without thermal overload relay - U _e 400 V 50/60 Hz - θ ≤ 40 °C)									
I _e / Rated operational current AC-8a			50 A		63 A	85 A	95 A	120 A	140 A
Rated operational power AC-8a			22 kW		30 kW	45 kW	45 kW	55 kW	75 kW
Short-circuit protection device for contactors									
without thermal overload relay - Motor protection excluded (2)									
U _e ≤ 500 V AC - gG type fuse			63 A		100 A	125 A	160 A	160 A	200 A
Rated short-time withstand current I _{cw}			1 s	600 A	1000 A			1320 A	
at 40 °C ambient temperature,			10 s	400 A	650 A			800 A	
in free air from a cold state			30 s	225 A	370 A			500 A	
			1 min	150 A	250 A			350 A	
			15 min	65 A	110 A	135 A	135 A	160 A	175 A
Maximum breaking capacity									
cos φ = 0.45			at 440 V	820 A (5)	1300 A			1160 A	
(cos φ = 0.35 for I _e > 100 A)			at 690 V	340 A (5)	630 A			800 A	
Power dissipation per pole			I _e / AC-1	3 W	5 W	6.5 W	7 W	6.5 W	7.5 W
			I _e / AC-3	1.3 W	1.3 W	1.5 W	2 W	2.7 W	3.6 W
Max. electrical switching frequency			AC-1	600 cycles/h	600 cycles/h (300 for AF., AE., TAE.)			300 cycles/h	
			AC-3	1200 cycles/h	600 cycles/h (300 for AF., AE., TAE.)			300 cycles/h	
			AC-2, 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".

(3) Unauthorized for TAL.., TAE.. contactors.

(4) AC-3, 690 V values for AL40 and TAL40 contactors: 18.5 kW, I_e = 21 A.

(5) Max. breaking capacity for AL40 and TAL40 contactors: 470 A at 440 V, 175 A at 690 V.

(6) AF contactors excluded.

UL/NEMA/CSA Technical data

A/E/L40; A/E/F50...A/F110, A/E/F50N2...A/E/F75N3, 3-pole Utilization characteristics

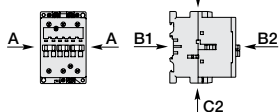
Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types	AC operated	A40	A50	A63	A75	A95	A110
	DC operated	AL40, TAL40	AE50, TAE50	AE63	AE75, TAE75	–	–
	AC / DC operated	–	AF50	AF63	AF75	AF95	AF110
Standards	UL 508, CSA C22.2 N°14						
Max. operational voltage	600 V						
NEMA size		–	2	–	3	–	–
NEMA continuous amp rating	Thermal current	–	45 A	–	90 A	–	–
NEMA maximum horse power ratings 1-phase, 60 Hz							
	115 V AC	–	3 hp	–	–	–	–
	230 V AC	–	7-1/2	–	–	–	–
NEMA maximum horse power ratings 3-phase, 60 Hz							
	200 V AC	–	10 hp	–	25 hp	–	–
	230 V AC	–	15 hp	–	30 hp	–	–
	460 V AC	–	25 hp	–	50 hp	–	–
	575 V AC	–	25 hp	–	50 hp	–	–
UL / CSA general use rating							
600 V AC		60 A	80 A	90 A	105 A	125 A	150 A
With conductor cross-sectional area		AWG 6	AWG 4	AWG 3	AWG 2	AWG 1	AWG 1/0
UL / CSA maximum 1-phase motor rating							
Full load current	120 V AC	34 A	34 A	56 A	80 A	80 A	100 A
	240 V AC	40 A	40 A	50 A	68 A	88 A	110 A
Horse power rating	120 V AC	3 hp	3 hp	5 hp	7.5 hp	7.5 hp	10 hp
	240 V AC	7.5 hp	7.5 hp	10 hp	15 hp	20 hp	25 hp
UL / CSA maximum 3-phase motor rating							
Full load current (1)	200-208 V AC	32.2 A	48.3 A	62.1 A	78.2 A	92 A	92 A
	220-240 V AC	42 A	54 A	68 A	80 A	80 A	104 A
	440-480 V AC	40 A	52 A	77 A	77 A	77 A	96 A
	550-600 V AC	41 A	52 A	77 A	77 A	77 A	99 A
Horse power rating (1)	200-208 V AC	10 hp	15 hp	20 hp	25 hp	30 hp	30 hp
	220-240 V AC	15 hp	20 hp	25 hp	30 hp	30 hp	40 hp
	440-480 V AC	30 hp	40 hp	60 hp	60 hp	60 hp	75 hp
	550-600 V AC	40 hp	50 hp	75 hp	75 hp	75 hp	100 hp
Max. electrical switching frequency							
For general use		600 cycles/h	600 cycles/h (300 for AF.., AE..)			300 cycles/h	–
For motor use		1200 cycles/h	600 cycles/h (300 for AF.., AE..)			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	A40	A50	A63	A75	A95	A110
	DC operated	AL40, TAL40	AE50, TAE50	AE63	AE75, TAE75	–	–
	AC / DC operated	–	AF50	AF63	AF75	AF95	AF110
Rated insulation voltage Ui		1000 V					
acc. to IEC 60947-4-1		600 V					
acc. to UL		8 kV					
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...+55 °C					
	Without thermal overload relay	-40...+70 °C (55 °C max. for TAL... and TAE... contactor)					
Storage		-60...+80 °C					
Climatic withstand		acc. to IEC 60068-2-30 and 60068-2-11 UTE C 63-100 specification II					
Maximum operating altitude (without derating)		3000 m					
Mechanical durability							
Number of operating cycles		10 millions operating cycles (5 millions for AE.. and TAE..)					
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 11 ms: no change in contact position, closed or open position (2)					
	A	20 g					
	B1	10 g closed position / 5 g open position					
	B2	15 g					
	C1	20 g					
	C2	20 g					



For AL40, TAL40
A : 20 g closed position / 10 g open position
B1 : 15 g closed position / 5 g open position
B2 : 10 g closed position / 10 g open position
C1 : 20 g closed position / 8 g open position
C2 : 14 g closed position / 8 g open position

(2) These values are not valid for rail mounting with contactors A95 ... A110 and AF95 ... AF110.

General technical data

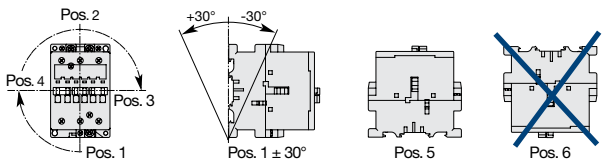
AF50...AF110, 3-pole

Coil & mounting characteristics

Magnet system characteristics

Contactor types	AC / DC operated	AF50	AF63	AF75	AF95	AF110
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 Coil consumption	48...250 V 50/60 Hz				
	Average pull-in value	210 VA				
	Average holding value	7 VA / 2.8 W				
DC control voltage	Rated control circuit voltage U_c Coil consumption	20...250 V DC				
	Average pull-in value	190 W				
	Average holding value	2.8 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...100 ms				
	N.C. contact opening	27...95 ms				
Between coil de-energization and:	N.O. contact opening	30...110 ms				
	N.C. contact closing	35...115 ms				

Mounting characteristics and conditions for use

Contactor types	AC / DC operated	AF50	AF63	AF75	AF95	AF110
Mounting positions						
Control voltage / Ambient temperature		Max. built-in and add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 3-pole contactor AF50 ... AF110				
Mounting positions	1, $1 \pm 30^\circ$, 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)	35 x 15 mm or 75 x 25 mm 2 x M6 screws placed diagonally				

General technical data

A/E/L40, A/E/F50...A/F110, 3-pole

Terminal characteristics

Across the line 1

Connecting characteristics

Contactor types	AC operated		A40	A50	A63	A75	A95	A110
	DC operated		AL40	AE50	AE63	AE75	–	–
			TAL40	TAE50	–	TAE75	–	–
	AC / DC operated		–	AF50	AF63	AF75	AF95	AF110
Main terminals			 Screw terminals with double connector 2 x (5.6 x 6.5 mm)	 Screw terminals with single connector (13 x 10 mm)		 Screw terminals with single connector (14 x 14 mm)		
Connection capacity (min. ... max.)								
Main conductors (poles)								
 Rigid	Solid ($\leq 4 \text{ mm}^2$)	} 1 x	2.5...16 mm ²	6...50 mm ²		10...95 mm ²		
 Stranded ($\geq 6 \text{ mm}^2$)			2 x	2.5...16 mm ²	6...25 mm ²		6...35 mm ²	
 Flexible with ferrule		1 x	2.5...10 mm ²	6...35 mm ²		10...70 mm ² (1)		
 Flexible with ferrule		2 x	2.5...10 mm ²	6...16 mm ²		6...35 mm ² (1)		
 Bars or lugs	L $\leq$	–	–		30 mm (2)			
	L $>$	–	–		6 mm			
Connection capacity acc. to UL/CSA (solid/stranded)		1 or 2 x	AWG 8...4	AWG 8...1		AWG 6...2/0		
Tightening torque		Recommended	2.30 Nm / 20 lb.in		4.00 Nm / 35 lb.in		8 Nm / 71 lb.in	
		Max.	2.60 Nm		4.50 Nm		9 Nm	
Auxiliary conductors								
(built-in auxiliary terminals + coil terminals)								
 Rigid solid		1 x	1...4 mm ²			0.75...2.5 mm ²		
 Rigid solid		2 x	1...4 mm ²			0.75...2.5 mm ²		
 Flexible with ferrule		1 x	0.75...2.5 mm ²	1...2.5 mm ²		0.75...2.5 mm ²		
 Flexible with ferrule		2 x	0.75...2.5 mm ²					
 Lugs	L $\leq$	8 mm						
	L $>$	3.7 mm						
Connection capacity acc. to UL/CSA (solid/stranded)		1 or 2 x	AWG 18...14					
Tightening torque								
Coil terminals		Recommended	1.00 Nm / 9 lb.in					
		Max.	1.20 Nm					
Built-in auxiliary terminals		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			IP20		IP10			
Coil terminals			IP20					
Built-in auxiliary terminals			IP20		–		–	
Screw terminals			Delivered in open position, screws of unused terminals must be tightened					
Main terminals			M5		M6		M8	
Screwdriver type			Flat Ø 6.5 / Pozidriv 2		Hexagon socket (s = 4 mm)			
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		–		–	

(1) A(F)95 / A(F)110: use flexible without ferrule.

(2) With LW110 enlargement piece, see "Accessories".

IEC/UL/CSA Technical data

A/E/F45...A/E/F75, 4-pole

Utilization characteristics

Main pole - Utilization characteristics according to IEC

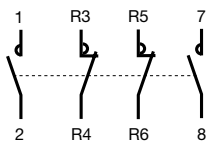
Contactor types	AC operated	A45	A50	A75
	DC operated	AE45	AE50	AE75
		TAE45	TAE50	TAE75
	AC / DC operated	AF45	AF50	AF75
Standards	IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1			
Rated operational voltage U _e max.	1000 V (690 V for AF.. contactors)			
Rated frequency (without derating)	50 / 60 Hz			
Conventional free-air thermal current I _{th}				
acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$	100 A	100 A	125 A	
With conductor cross-sectional area	35 mm ²	35 mm ²	50 mm ²	
AC-1 Utilization category				
For air temperature close to contactor				
I _e / Rated operational current AC-1	$\theta \leq 40^\circ\text{C}$	70 A	100 A	125 A
U _e max. $\leq 690\text{ V}$, 50/60 Hz	$\theta \leq 55^\circ\text{C}$	60 A	85 A	105 A
	$\theta \leq 70^\circ\text{C}$ (1)	50 A	70 A	85 A
With conductor cross-sectional area		25 mm ²	35 mm ²	50 mm ²
Short-circuit protection device for contactors				
without thermal overload relay - Motor protection excluded				
U _e $\leq 500\text{ V}$ AC - gG type fuse		80 A	100 A	160 A
Rated short-time withstand current I _{cw}	1 s	1000 A		
At 40 °C ambient temperature,	10 s	650 A		
in free air from a cold state	30 s	370 A		
	1 min	250 A		
	15 min	110 A	110 A	135 A
Power dissipation per pole	I _e / AC-1	2.5 W	5 W	7 W
Max. electrical switching frequency	AC-1	600 cycles/h (300 for AF.., AE.., TAE..)		

(1) Unauthorized for TAE.. contactors

Main pole - Utilization characteristics according to UL / CSA

Contactor types	AC operated	A45	A50	A75
	DC operated	AE45	AE50	AE75
		TAE45	TAE50	TAE75
	AC / DC operated	AF45	AF50	AF75
Standards	UL 508, CSA C22.2 N°14			
Max. operational voltage	600 V			
UL / CSA general use rating				
600 V AC	65 A	80 A	105 A	
With conductor cross-sectional area	AWG 6	AWG 4	AWG 2	
Max. electrical switching frequency				
For general use	600 cycles/h (300 for AF.., AE.., TAE..)			

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



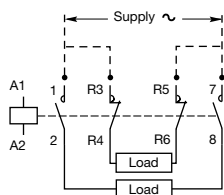
These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising 2 separate loads with a single supply (see diagrams below). When the contactor operates there is no mechanical overlapping between the N.O. poles and the N.C. poles: BREAK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



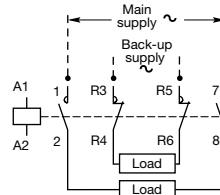
These contactors are not suitable for a reversing starter or for controlling a single load from 2 separate supplies.

Block diagrams

– Single supply and 2 separate loads



– 2 separate supplies and 2 separate loads



General technical data

AF45...AF75

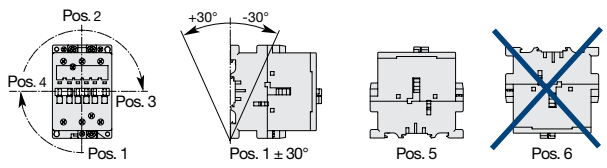
Coil & mounting characteristics

Across the line
Contactors

Magnet system characteristics

Contactor types	AC / DC operated	AF45	AF50	AF75
Coil operating limits acc. to IEC 60947-4-1	AC or DC supply	At $\theta \leq 70^\circ\text{C}$ $0.85 \times U_c \text{ min...} 1.1 \times U_c \text{ max.}$ 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		
	Coil consumption	210 VA		
	Average pull-in value	7 VA / 2.8 W		
DC control voltage	Rated control circuit voltage U_c	20...250 V DC		
	Coil consumption	190 W		
	Average pull-in value	2.8 W		
Drop-out voltage		55 % of $U_c \text{ min.}$		
Voltage sag immunity acc. to SEMI F47		Conditions of use on request		
Dips withstand		$\geq 20 \text{ ms}$		
Operating time				
Between coil energization and:	N.O. contact closing	30...100 ms		
	N.C. contact opening	27...95 ms		
Between coil de-energization and:	N.O. contact opening	30...110 ms		
	N.C. contact closing	35...115 ms		

Mounting characteristics and conditions for use

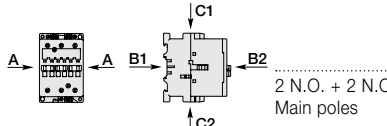
Contactor types	AC / DC operated	AF45	AF50	AF75
Mounting positions				
Control voltage / Ambient temperature		Pos. 5 unauthorized for AF45-22-00, AF75-22-00 contactors		
Mounting positions 1, $1 \pm 30^\circ$, 2, 3, 4, 5		Max. and add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 4-pole contactor AF45 ... AF110		
positions 6		at $\theta \leq 70^\circ\text{C}$ $0.85 \times U_c \text{ min...} 1.1 \times U_c \text{ max.}$		
Mounting distances		Unauthorized		
Fixing	On rail according to IEC 60715, EN 60715	The contactors can be assembled side by side		
	By screws (not supplied)	35 x 15 mm or 75 x 25 mm		
		2 x M6 screws placed diagonally		

General technical data

A/E/F45...A/E/F75, 4-pole

General technical data

Contactor types

	AC operated	A45	A50	A75
	DC operated	AE45	AE50	AE75
		TAE45	TAE50	TAE75
	AC / DC operated	AF45	AF50	AF75
Rated insulation voltage U_i				
acc. to IEC 60947-4-1		1000 V		
acc. to UL / CSA		600 V		
Rated impulse withstand voltage U_{imp}		8 kV		
Electromagnetic compatibility		AF contactors complying with IEC 60947-1 / EN 60947-1 - Environment A		
Ambient air temperature close to contactor				
Operation		-40...+70 °C (1)		
Storage		-60...+80 °C		
Climatic withstand		acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II		
Maximum operating altitude (without derating)		3000 m		
Mechanical durability				
Number of operating cycles		10 millions operating cycles (5 millions for AE... and TAE... contactors)		
Max. switching frequency		3600 cycles/h (300 for AF..)		
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 2 N.O. + 2 N.C. Main poles		A	20 g	
		B1	10 g closed position / 5 g open position	
		B2	15 g	
		C1	20 g	
		C2	20 g	
		A	20 g	
		B1	10 g closed position / 5 g open position (2)	
		B2	15 g (3)	
		C1	20 g	
		C2	20 g	

(1) 55 °C max. for TAE... contactors.

(2) 3 g in open position for AF 45-22, AE 45-22, AF 75-22 and AE 75-22.

(3) 10 g for AF 45-22, AE 45-22, AF 75-22 and AE 75-22.

General technical data

A/E/F45...A/E/F75

Terminal characteristics

Across the line
Contactors

Connecting characteristics

Contactor types	AC operated	A45	A50	A75
	DC operated	AE45	AE50	AE75
		TAE45	TAE50	TAE75
	AC / DC operated	AF45	AF50	AF75
Main terminals		 Screw terminals with single connector (13 x 10 mm)		
Connection capacity (min. ... max.)				
Main conductors (poles)				
	Rigid	Solid ($\leq 4 \text{ mm}^2$)	1 x	6...50 mm ²
		Stranded ($\geq 6 \text{ mm}^2$)	2 x	6...25 mm ²
	Flexible with ferrule		1 x	6...35 mm ²
			2 x	6...16 mm ²
	Bars or lugs		L $\leq$	-
			L $>$	-
Connection capacity acc. to UL/CSA (Sol/Str)		1 or 2 x	AWG 8...1	
Tightening torque		Recommended	4.00 Nm / 35 lb.in	
		Max.	4.50 Nm	
Auxiliary conductors				
(built-in auxiliary terminals + coil terminals)				
	Rigid solid		1 x	1...4 mm ²
			2 x	1...4 mm ²
	Flexible with ferrule		1 x	1...2.5 mm ²
			2 x	0.75...2.5 mm ²
	Lugs		L $\leq$	8 mm
			L $>$	3.7 mm
Connection capacity acc. to UL/CSA (Sol/Str)		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		IP10		
Coil terminals		IP20		
Screw terminals		Delivered in open position, screws of unused terminals must be tightened		
Main terminals		Screwdriver type	M6	
			Flat Ø 6.5 / Pozidriv 2	
Coil terminals		Screwdriver type	M3.5	
			Flat Ø 5.5 / Pozidriv 2	

IEC technical data

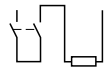
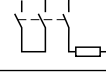
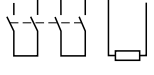
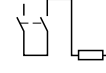
A/E/L9...A/E/F75, GA/E75, 3 & 4-pole

DC Circuit switching

General

The arc switching on d.c. is more difficult than on a.c.

- For selecting a contactor it is essential to determine the current, the voltage and the L/R time constant of the controlled load.
- For information, typical time constant values are quoted hereafter: non-inductive loads such as resistance furnaces ($L/R \approx 1$ ms), inductive loads such as shunt motors ($L/R \approx 2$ ms) or series motors ($L/R \approx 7.5$ ms).
- The addition of a resistor in parallel with an inductive winding helps in the elimination of the arcs.
- All the poles required for breaking must be connected in series between the load and the source polarity not linked to earth (or chassis).

a.c. operated contactors a.c. / d.c. operated (electronic coil interface) d.c. operated contactors		A9 – AE9	A12 – AE12	A16 – AE16	A26 – AE26	A30 – AE30	A40 – AE40	A45 AF45 AE45	A50 AF50 AE50	A63 AF63 AE63	A75 AF75 AE75	GA75 – GAE75
Utilization category DC-1, $L/R \leq 1$ ms												
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120
	110 V	A	10	15	20	–	–	–	–	–	–	120
	220 V	A	–	–	–	–	–	–	–	–	–	120
	440 V	A	–	–	–	–	–	–	–	–	–	100
	600 V	A	–	–	–	–	–	–	–	–	–	75
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120
	110 V	A	25	27	30	45	55	60	70	100	110	120
	220 V	A	10	15	20	–	–	–	–	–	–	–
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120
	110 V	A	25	27	30	45	55	60	70	100	110	120
	220 V	A	25	27	30	45	55	60	70	100	110	120
	≤ 72 V	A	25	27	30	45	–	–	70	100	–	120
	110 V	A	25	27	30	45	–	–	70	100	–	120
	220 V	A	25	27	30	45	–	–	70	100	–	120
	440 V	A	10	15	20	–	–	–	–	–	–	–
Utilization category DC-3, $L/R \leq 2$ ms												
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120
	110 V	A	6	7	8	–	–	–	–	–	–	120
	220 V	A	–	–	–	–	–	–	–	–	–	100
	440 V	A	–	–	–	–	–	–	–	–	–	85
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120
	110 V	A	25	27	30	45	55	60	70	100	110	120
	220 V	A	6	7	8	–	–	–	–	–	–	–
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120
	110 V	A	25	27	30	45	55	60	70	100	110	120
	220 V	A	25	27	30	45	55	60	70	100	110	120
	≤ 72 V	A	25	27	30	45	–	–	70	100	–	120
	110 V	A	25	27	30	45	–	–	70	100	–	120
	220 V	A	25	27	30	45	–	–	70	100	–	120
	440 V	A	6	7	8	–	–	–	–	–	–	–
Utilization category DC-5, $L/R \leq 7.5$ ms												
	≤ 72 V	A	9	12	16	25	30	40	50	50	63	75
	110 V	A	4	4	4	–	–	–	–	–	–	85
	220 V	A	–	–	–	–	–	–	–	–	–	85
	440 V	A	–	–	–	–	–	–	–	–	–	35
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120
	110 V	A	10	15	20	30	45	50	70	80	90	100
	220 V	A	4	4	4	–	–	–	–	–	–	–
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120
	110 V	A	25	27	30	45	55	60	70	100	110	120
	220 V	A	9	12	16	25	30	40	50	50	63	75
	≤ 72 V	A	25	27	30	45	–	–	70	100	–	120
	110 V	A	25	27	30	45	–	–	70	100	–	120
	220 V	A	10	15	20	30	–	–	70	70	–	100
	440 V	A	4	4	4	–	–	–	–	–	–	–

IEC Technical data

A/F95...AF750, B/C6...B/C7, 3-pole

DC circuit switching

Technical Data

- The tables indicate for the standard contactors the I_n max. operating currents depending on: the utilization category (i.e. L/R) DC-1, DC-3, DC-5 as defined in the IEC 60947-4-1 publication, the operating voltage U_o and the pole coupling details. See page 1.81.
Ampere values quoted in the tables below are valid for a -25 ... +70 °C temperature close to the contactors, as long as the AC-1 Ampere values (see pages 1.45 - 146) for the corresponding ambient temperature are not exceeded.
- Max. switching frequency: 300 ops/h.
- For switching higher d.c. ratings, we recommend the use of bar mounted contactors, R series (63 ... 2000 A).

The selection table for AE 50 ... AE 110 contactors can be used for the TAE 50 ... TAE 110 types.

a.c. operated contactors a.c. / d.c. operated (electronic coil interface) d.c. operated contactors			A95 AF95	A110 AF110	A145 AF145	A185 AF185	A210 AF210	A260 AF260	A300 AF300	- AF400	- AF460	- AF580	- AF750
Utilization category DC-1, L/R ≤ 1 ms													
	≤110 V	A	-	-	-	-	-	-	-	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	-	-	-	-	-	-	-	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	145	160	250	275	350	400	450	600	700	800	1050
	440 V	A	-	-	-	-	-	-	-	600	700	800	1050
	600 V	A	-	-	-	-	-	-	-	600	700	800	1050
Utilization category DC-3, L/R ≤ 2.5 ms													
	≤110 V	A	-	-	-	-	-	-	-	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	-	-	-	-	-	-	-	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	145	160	250	275	350	400	450	600	700	800	1050
	440 V	A	-	-	-	-	-	-	-	600	700	800	1050
	600 V	A	-	-	-	-	-	-	-	600	700	800	1050
Utilization category DC-5, L/R ≤ 15 ms													
	≤110 V	A	-	-	-	-	-	-	-	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	-	-	-	-	-	-	-	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	145	160	250	275	350	400	450	600	700	800	1050
	440 V	A	-	-	-	-	-	-	-	600	700	800	1050
	600 V	A	-	-	-	-	-	-	-	600	700	800	1050

D.C. Power circuit switching

Utilization category			DC-1 L/R ≤ 1 ms	DC-3 L/R ≤ 2 ms	DC-5 L/R ≤ 7.5 ms
24 V	A		16.0	16.0	16.0
48 V	A		16.0	8.0	2.0
60 V	A		16.0	4.0	1.25
110 V	A		7.0	1.5	0.4
220 V	A		0.8	0.25	0.2
24 V	A		16.0	16.0	16.0
48 V	A		16.0	16.0	16.0
60 V	A		16.0	15.0	12.0
110 V	A		16.0	7.0	2.0
220 V	A		5.0	1.5	0.5
24 V	A		16.0	16.0	16.0
48 V	A		16.0	16.0	16.0
60 V	A		16.0	16.0	16.0
110 V	A		16.0	15.0	8.0
220 V	A		14.0	4.0	2.0