

AF09 ... AF38 4-pole Contactors

AC / DC Operated - with Screw Terminals



25 to 55 A



cULus



CE



AF09-40-00



AF09-22-00

Application

AF09 ... AF38 4-pole contactors are used for controlling power circuits up to 600 V AC and 240 V DC. They are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...).

Description

- **AF09 ... AF38** contactors include an electronic coil interface accepting a wide control voltage U_c min. ... U_c max. Only four coils cover control voltages between 24...500 V 50/60 Hz or 20...500 V DC
- **AF** contactors can manage large control voltage variations. One coil (i.e. 100...250 V 50/60 Hz - DC) can be used for different control voltages used worldwide without any coil change
- **AF** contactors have built-in surge protection and do not require additional surge suppressors.

Ordering Details

IEC	UL/CSA	Control voltage		Auxiliary contacts fitted	Catalog number	List price	Weight
AC-1 Rated current	General use rating	U_c min. ... U_c max.					
$\theta \leq 40^\circ\text{C}$	600 V AC	V 50/60 Hz	V DC	 			Pack ^(ing) 1 piece kg/lbs
A	A						

4 N.O. Main Poles

25	25	24...60	20...60	0	0	AF09-40-00-11	0.31/0.68
		48...130	48...130	0	0	AF09-40-00-12	0.27/0.60
		100...250	100...250	0	0	AF09-40-00-13	0.27/0.60
		250...500	250...500	0	0	AF09-40-00-14	0.31/0.68
30	30	24...60	20...60	0	0	AF16-40-00-11	0.31/0.68
		48...130	48...130	0	0	AF16-40-00-12	0.27/0.60
		100...250	100...250	0	0	AF16-40-00-13	0.27/0.60
		250...500	250...500	0	0	AF16-40-00-14	0.31/0.68
45	45	24...60	20...60	0	0	AF26-40-00-11	0.36/0.79
		48...130	48...130	0	0	AF26-40-00-12	0.36/0.79
		100...250	100...250	0	0	AF26-40-00-13	0.36/0.79
		250...500	250...500	0	0	AF26-40-00-14	0.40/0.88
55	55	24...60	20...60	0	0	AF38-40-00-11	0.36/0.79
		48...130	48...130	0	0	AF38-40-00-12	0.36/0.79
		100...250	100...250	0	0	AF38-40-00-13	0.36/0.79
		250...500	250...500	0	0	AF38-40-00-14	0.40/0.88

2 N.O. + 2 N.C. Main Poles

25	25	24...60	20...60	0	0	AF09-22-00-11	0.31/0.68
		48...130	48...130	0	0	AF09-22-00-12	0.27/0.60
		100...250	100...250	0	0	AF09-22-00-13	0.27/0.60
		250...500	250...500	0	0	AF09-22-00-14	0.31/0.68
30	30	24...60	20...60	0	0	AF16-22-00-11	0.31/0.68
		48...130	48...130	0	0	AF16-22-00-12	0.27/0.60
		100...250	100...250	0	0	AF16-22-00-13	0.27/0.60
		250...500	250...500	0	0	AF16-22-00-14	0.31/0.68
45	45	24...60	20...60	0	0	AF26-22-00-11	0.36/0.79
		48...130	48...130	0	0	AF26-22-00-12	0.36/0.79
		100...250	100...250	0	0	AF26-22-00-13	0.36/0.79
		250...500	250...500	0	0	AF26-22-00-14	0.40/0.88
55	55	24...60	20...60	0	0	AF38-22-00-11	0.36/0.79
		48...130	48...130	0	0	AF38-22-00-12	0.36/0.79
		100...250	100...250	0	0	AF38-22-00-13	0.36/0.79
		250...500	250...500	0	0	AF38-22-00-14	0.40/0.88

AF09 ... AF38 4-pole Contactors - AF.Z Additional Coils

AC / DC Operated - with Screw Terminals



25 to 55 A



AF09Z-40-00



AF09Z-22-00

Application

AF09Z ... AF38Z 4-pole contactors are used for controlling power circuits up to 600 V AC and 240 V DC. They are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...).

Description

- **AF09Z ... AF38Z** contactors include an electronic coil interface accepting a wide control voltage U_c min. ... U_c max and managing large control voltage variations.
- **AF.Z** contactors cover control voltages between 24...250 V 50/60 Hz or 12...250 V DC
- **AF.Z** contactors allow direct control by PLC-output ≥ 24 V DC 500 mA and obtain a reduced holding coil consumption.
- **AF.Z** contactors withstand short dips and voltage interruptions (SEMI F47-0706 compliance)
- **AF.Z** contactors have built-in surge protection and do not require additional surge suppressors.

Ordering Details

IEC AC-1 Rated current	UL/CSA General use rating	Control voltage U_c min. ... U_c max.		Auxiliary contacts fitted	Catalog number	List price	Weight Pack ^(ing) 1 piece kg/lbs
$\theta \leq 40^\circ\text{C}$ A	600 V AC A	V 50/60 Hz	V DC	 			

4 N.O. Main Poles

25	25	-	12...20	0 0	AF09Z-40-00-20		0.31/0.68
		24...60	20...60	0 0	AF09Z-40-00-21		0.31/0.68
		48...130	48...130	0 0	AF09Z-40-00-22		0.31/0.68
		100...250	100...250	0 0	AF09Z-40-00-23		0.31/0.68
30	30	-	12...20	0 0	AF16Z-40-00-20		0.31/0.68
		24...60	20...60	0 0	AF16Z-40-00-21		0.31/0.68
		48...130	48...130	0 0	AF16Z-40-00-22		0.31/0.68
		100...250	100...250	0 0	AF16Z-40-00-23		0.31/0.68
45	45	-	12...20	0 0	AF26Z-40-00-20		0.36/0.79
		24...60	20...60	0 0	AF26Z-40-00-21		0.36/0.79
		48...130	48...130	0 0	AF26Z-40-00-22		0.36/0.79
		100...250	100...250	0 0	AF26Z-40-00-23		0.40/0.88
55	55	-	12...20	0 0	AF38Z-40-00-20		0.36/0.79
		24...60	20...60	0 0	AF38Z-40-00-21		0.36/0.79
		48...130	48...130	0 0	AF38Z-40-00-22		0.36/0.79
		100...250	100...250	0 0	AF38Z-40-00-23		0.40/0.88

2 N.O. + 2 N.C. Main Poles

25	25	-	12...20	0 0	AF09Z-22-00-20		0.31/0.68
		24...60	20...60	0 0	AF09Z-22-00-21		0.31/0.68
		48...130	48...130	0 0	AF09Z-22-00-22		0.31/0.68
		100...250	100...250	0 0	AF09Z-22-00-23		0.31/0.68
30	30	-	12...20	0 0	AF16Z-22-00-20		0.31/0.68
		24...60	20...60	0 0	AF16Z-22-00-21		0.31/0.68
		48...130	48...130	0 0	AF16Z-22-00-22		0.31/0.68
		100...250	100...250	0 0	AF16Z-22-00-23		0.31/0.68
45	45	-	12...20	0 0	AF26Z-22-00-20		0.36/0.79
		24...60	20...60	0 0	AF26Z-22-00-21		0.36/0.79
		48...130	48...130	0 0	AF26Z-22-00-22		0.36/0.79
		100...250	100...250	0 0	AF26Z-22-00-23		0.40/0.88
55	55	-	12...20	0 0	AF38Z-22-00-20		0.36/0.79
		24...60	20...60	0 0	AF38Z-22-00-21		0.36/0.79
		48...130	48...130	0 0	AF38Z-22-00-22		0.36/0.79
		100...250	100...250	0 0	AF38Z-22-00-23		0.40/0.88

Note: Only AF.Z contactors with DC control voltage 12...20 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole

AF09 ... AF38 4-pole Contactors

Technical Data



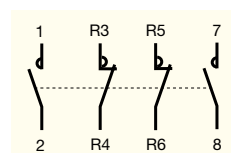
Main Pole - Utilization Characteristics according to UL / CSA

Contactor types	AF09	AF16	AF26	AF38
Standards	UL 508, CSA C22.2 N°14			
Rated operational voltage $U_{g \text{ max.}}$	600 V			
UL General use rating				
600 V AC	25 A	30 A	45 A	55 A
240 V DC - 3-pole for 4 N.O. main poles	25 A	30 A	45 A	55 A
160 V DC - 2-pole for 2 N.O. / 2 N.C. main poles	20 A	20 A	45 A	55 A
Max. conductor cross-sectional area	AWG 10	AWG 10	AWG 8	AWG 6
Max. electrical switching frequency for general use	600 cycles/h			

Main Pole - Utilization Characteristics according to IEC

Contactor types		AF09	AF16	AF26	AF38
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1			
Rated operational voltage $U_{g \text{ max.}}$		690 V			
Rated frequency limits		25 ... 400 Hz			
Conventional free-air thermal current I_{th}					
acc. to IEC 60947-4-1, open contactors, $\leq 40\text{ }^{\circ}\text{C}$		35 A	35 A	55 A	55 A
with conductor cross-sectional area		6 mm ²	6 mm ²	16 mm ²	16 mm ²
AC-1 Utilization category					
for air temperature close to contactor					
I_g / AC-1 rated operational current	$\theta \leq 40\text{ }^{\circ}\text{C}$	25 A	30 A	45 A	55 A
$U_g \text{ max.} \leq 690\text{ V, } 50/60\text{ Hz}$	$\theta \leq 60\text{ }^{\circ}\text{C}$	25 A	30 A	40 A	45 A
	$\theta \leq 70\text{ }^{\circ}\text{C}$	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
Short-circuit protection					
for contactors without thermal O/L relay - Motor protection excluded					
$U_g \leq 500\text{ V AC}$ - gG type fuse		25 A	32 A	50 A	63 A
Rated short-time withstand current I_{cw}	1 s	300 A	300 A	450 A	450 A
at 40 °C ambient temperature, in free air from a cold state	10 s	150 A	150 A	350 A	350 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
Heat dissipation per pole	I_g / AC-1	0.8 W	1.2 W	1.6 W	2.3 W
Max. electrical switching frequency	AC-1	600 cycles/h			

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



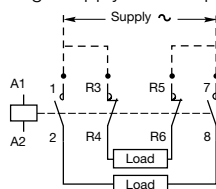
These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising 2 separate loads with a single supply (see diagrams below). When the contactor operates there is no mechanical overlap between the N.O. poles and the N.C. poles: BREAK before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



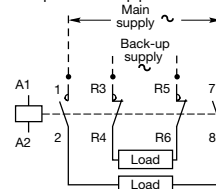
These contactors are not suitable for a reversing starter or for controlling a single load from 2 separate supplies.

Block diagrams

– Single supply and 2 separate loads



– 2 separate supplies and 2 separate loads

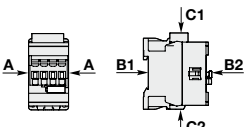


AF09 ... AF38 4-pole Contactors

Technical Data



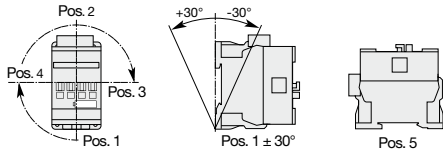
General Technical Data

Contactor types	AF09	AF16	AF26	AF38
Rated insulation voltage U_i acc. to IEC 60947-4-1 acc. to UL	690 V 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 in free air	-40 ... +70 °C			
Storage	-60 ... +80 °C			
Climatic withstand	Category B according to IEC 60947-1 Annex Q			
Operating altitude	≤ 3000 m			
Mechanical durability				
Number of operating cycles	10 millions operating cycles			
Max. switching frequency	3600 cycles/h			
Shock withstand acc. 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	
		A	30 g	30 g Closed position / 25 g Open position
		B1	25 g Closed position / 5 g Open position	25 g Closed position / 5 g Open position
		B2	15 g	15 g Closed position / 10 g Open position
		C1	25 g	25 g Closed position / 20 g Open position
		C2	25 g	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		

Magnet System Characteristics

Contactor types		AF09	AF16	AF26	AF38
Coil operating limits acc. to IEC 60947-4-1		AC supply	at $\theta \leq 60\text{ }^{\circ}\text{C}$ $0.85 \times U_e \text{ min} \dots 1.1 \times U_e \text{ max}$ at $\theta \leq 70\text{ }^{\circ}\text{C}$ $0.85 \times U_e \text{ min} \dots U_e \text{ max}$		
		DC supply	at $\theta \leq 60\text{ }^{\circ}\text{C}$ $0.85 \times U_e \text{ min} \dots 1.1 \times U_e \text{ max}$ at $\theta \leq 70\text{ }^{\circ}\text{C}$ (AF) $0.85 \times U_e \text{ min} \dots U_e \text{ max}$ - (AF..Z) $0.85 \times U_e \text{ min} \dots 1.1 \times U_e \text{ max}$		
AC control voltage	Rated control circuit voltage U_c		24 ... 500 V AC		
50/60 Hz	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	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 in % of $U_e \text{ min}$.			$\leq 60\text{ }\%$ $U_e \text{ min}$		
Voltage sag immunity according to SEMI F47-0706			(AF..Z) conditions of use on request		
Dips withstand (level 0% according to IEC 61000-4-11)			(AF..Z) 22 ms average for $U_e = 24 \dots 250\text{ V}$ 50/60Hz		
-20 °C $\leq \theta \leq$ +60 °C					
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

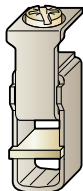
Contactor types	AF09	AF16	AF26	AF38
Mounting positions				
Mounting distances	Max. add-on N.C. auxiliary contacts: see accessory fitting details for a 4-pole contactor AF09 ... AF38			
Fixing	The contactors can be assembled side by side.			
on rail according to IEC 60715, EN 60715	35 x 7.5 mm or 35 x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

AF09 ... AF38 4-pole Contactors

Technical Data



Connecting Characteristics

Contractor types	AF09	AF16	AF26	AF38
Main terminals				
	Screw terminals with cable clamp		Screw terminals with double connector 2x (5.5 width x 6.8 depth)	
Connecting capacity (min. ... max.)				
Main conductors (poles)				
 Rigid solid (≤ 4 mm²)	1 x	1 ... 6 mm²	1.5 ... 16m²	
 Rigid stranded (≥ 6 mm²)	2 x	1 ... 6 mm²	1.5 ... 16m²	
 Flexible with non insulated ferrule	1 x	0.75 ... 6 mm²	1.5 ... 16m²	
 Flexible with insulated ferrule	2 x	0.75 ... 6 mm²	1.5 ... 16m²	
 Flexible with insulated ferrule	1 x	0.75 ... 4 mm²	1.5 ... 16m²	
 Flexible with insulated ferrule	2 x	0.75 ... 2.5 mm²	1.5 ... 16m²	
 Bars or lugs	L <	9.6 mm		
Capacity according to UL/CSA	1 or 2 x	AWG 16 ... 10	AWG 16 ... 6	
Stripping length		10 mm	12 mm	
Auxiliary conductors				
 Rigid solid	1 x	1 ... 2.5 mm²		
 Rigid solid	2 x	1 ... 2.5 mm²		
 Flexible with non insulated ferrule	1 x	0.75 ... 2.5 mm²		
 Flexible with insulated ferrule	2 x	0.75 ... 2.5 mm²		
 Flexible with insulated ferrule	1 x	0.75 ... 2.5 mm²		
 Flexible with insulated ferrule	2 x	0.75 ... 1.5 mm²		
 Bars or lugs	L <	8 mm		
Capacity according to UL/CSA	1 or 2 x	AWG 18 ... 14		
Stripping length		10 mm		
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	
Coil terminals	M3.5			
Screwdriver type	Flat Ø 5.5 / Pozidriv 2			
Tightening torque				
Main pole terminals	1.5 Nm / 13 lb.in		2.5 Nm / 22 lb.in	
Coil terminals	1.2 Nm / 11 lb.in			

AF09 ... AF38 Contactors

DC Circuit Switching

General

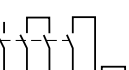
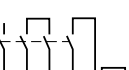
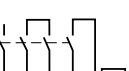
The arc switching on DC is more difficult than on AC.

- 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).

Technical Data

- The tables indicate for the standard contactors the le 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_e and the pole coupling details.
- Ampere values quoted in these tables are valid for a $-25 \dots +70$ °C temperature close to the contactors, as long as these values do not exceed the AC-1 Ampere values for the corresponding ambient temperature.
- Max. switching frequency: 300 cycles/h.

Selection Table

Contactor types	AF09		AF12	AF16	AF26	AF30		AF38	
	3 or 4-pole				3-pole	4-pole	3-pole	3-pole	4-pole
Utilization category DC-1, L/R ≤ 1 ms									
	≤ 72 V	25 A	27 A	30 A	45 A	45 A	50 A	50 A	55 A
	110 V	10 A	15 A	20 A	—	—	—	—	—
	220 V	—	—	—	—	—	—	—	—
	≤ 72 V	25 A	27 A	30 A	45 A	45 A	50 A	50 A	55 A
	110 V	25 A	27 A	30 A	45 A	45 A	50 A	50 A	55 A
	220 V	10 A	15 A	20 A	—	—	—	—	—
	≤ 72 V	25 A	27 A	30 A	45 A	45 A	50 A	50 A	55 A
	110 V	25 A	27 A	30 A	45 A	45 A	50 A	50 A	55 A
	220 V	25 A	27 A	30 A	45 A	45 A	50 A	50 A	55 A
	≤ 72 V	25 A	—	30 A	—	45 A	—	—	55 A
	110 V	25 A	—	30 A	—	45 A	—	—	55 A
	220 V	25 A	—	30 A	—	45 A	—	—	55 A
	440 V	10 A	—	20 A	—	—	—	—	—
Utilization category DC-3, L/R ≤ 2 ms									
	≤ 72 V	25 A	27 A	30 A	45 A	—	50 A	50 A	—
	110 V	6 A	7 A	8 A	—	—	—	—	—
	220 V	—	—	—	—	—	—	—	—
	≤ 72 V	25 A	27 A	30 A	45 A	—	50 A	50 A	—
	110 V	25 A	27 A	30 A	45 A	—	50 A	50 A	—
	220 V	6 A	7 A	8 A	—	—	—	—	—
	≤ 72 V	25 A	27 A	30 A	45 A	—	50 A	50 A	—
	110 V	25 A	27 A	30 A	45 A	—	50 A	50 A	—
	220 V	25 A	27 A	30 A	45 A	—	50 A	50 A	—
	≤ 72 V	25 A	—	30 A	—	—	—	—	—
	110 V	25 A	—	30 A	—	—	—	—	—
	220 V	25 A	—	30 A	—	—	—	—	—
	440 V	6 A	—	8 A	—	—	—	—	—
Utilization category DC-5, L/R ≤ 7.5 ms									
	≤ 72 V	9 A	12 A	16 A	20 A	—	25 A	25 A	—
	110 V	4 A	4 A	4 A	—	—	—	—	—
	220 V	—	—	—	—	—	—	—	—
	≤ 72 V	25 A	27 A	30 A	45 A	—	50 A	50 A	—
	110 V	10 A	15 A	20 A	45 A	—	50 A	50 A	—
	220 V	4 A	4 A	4 A	—	—	—	—	—
	≤ 72 V	25 A	27 A	30 A	45 A	—	50 A	50 A	—
	110 V	25 A	27 A	30 A	45 A	—	50 A	50 A	—
	220 V	9 A	12 A	16 A	20 A	—	25 A	25 A	—
	≤ 72 V	25 A	—	30 A	—	—	—	—	—
	110 V	25 A	—	30 A	—	—	—	—	—
	220 V	10 A	—	20 A	—	—	—	—	—
	440 V	4 A	—	4 A	—	—	—	—	—

Motor Rated Operational Powers and Currents

The currents given below concern standard three-phase four-pole cage motors (1500 r.p.m. at 50 Hz, 1800 r.p.m. at 60 Hz).
These values are given for guidance and may vary according to the motor manufacturer and depending on the number of poles.

IEC	Motor nominal current: standardized values in orange-violet colour (according to IEC 60947-4-1 Annex G)									
Motor power	220 V	230 V	240 V	380V	400 V	415 V	440 V	500 V	660 V	690 V
kW	A	A	A	A	A	A	A	A	A	A
0.06	0.37	0.35	0.34	0.21	0.2	0.19	0.18	0.16	0.13	0.12
0.09	0.54	0.52	0.50	0.32	0.3	0.29	0.26	0.24	0.18	0.17
0.12	0.73	0.7	0.67	0.46	0.44	0.42	0.39	0.32	0.24	0.23
0.18	1	1	1	0.63	0.6	0.58	0.53	0.48	0.37	0.35
0.25	1.6	1.5	1.4	0.9	0.85	0.82	0.74	0.68	0.51	0.49
0.37	2.0	1.9	1.8	1.2	1.1	1.1	1.0	0.88	0.67	0.64
0.55	2.7	2.6	2.5	1.6	1.5	1.4	1.3	1.2	0.91	0.87
0.75	3.5	3.3	3.2	2.0	1.9	1.8	1.7	1.5	1.15	1.1
1.1	4.9	4.7	4.5	2.8	2.7	2.6	2.4	2.2	1.7	1.6
1.5	6.6	6.3	6.0	3.8	3.6	3.5	3.2	2.9	2.2	2.1
2.2	8.9	8.5	8.1	5.2	4.9	4.7	4.3	3.9	2.9	2.8
3	11.8	11.3	10.8	6.8	6.5	6.3	5.7	5.2	4.0	3.8
4	15.7	15	14.4	8.9	8.5	8.2	7.4	6.8	5.1	4.9
5.5	20.9	20	19.2	12.1	11.5	11.1	10.1	9.2	7.0	6.7
7.5	28.2	27	25.9	16.3	15.5	14.9	13.6	12.4	9.3	8.9
11	39.7	38	36.4	23.2	22	21.2	19.3	17.6	13.4	12.8
15	53.3	51	48.9	30.5	29	28.0	25.4	23	17.8	17
18.5	63.8	61	58.5	36.8	35	33.7	30.7	28	22.0	21
22	75.3	72	69	43.2	41	39.5	35.9	33	25.1	24
30	100	96	92	57.9	55	53	48.2	44	33.5	32
37	120	115	110	69	66	64	58	53	40.8	39
45	146	140	134	84	80	77	70	64	49.1	47
55	177	169	162	102	97	93	85	78	59.6	57
75	240	230	220	139	132	127	116	106	81	77
90	291	278	266	168	160	154	140	128	97	93
110	355	340	326	205	195	188	171	156	118	113
132	418	400	383	242	230	222	202	184	140	134
160	509	487	467	295	280	270	245	224	169	162
200	637	609	584	368	350	337	307	280	212	203
250	782	748	717	453	430	414	377	344	261	250
315	983	940	901	568	540	520	473	432	327	313
355	1109	1061	1017	642	610	588	535	488	370	354
400	1255	1200	1150	726	690	665	605	552	418	400
500	1545	1478	1416	895	850	819	745	680	515	493
560	1727	1652	1583	1000	950	916	832	760	576	551
630	1928	1844	1767	1116	1060	1022	929	848	643	615
710	2164	2070	1984	1253	1190	1147	1043	952	721	690
800	2446	2340	2243	1417	1346	1297	1179	1076	815	780
900	2760	2640	2530	1598	1518	1463	1330	1214	920	880
1000	3042	2910	2789	1761	1673	1613	1466	1339	1014	970

UL / CSA	Motor nominal current: standardized values (according to IEC 60947-4-1 Annex G and UL 508)				
Motor power	208 V	220-240 V	380-415 V	440-480 V	550-600 V
hp	A	A	A	A	A
1/2	2.4	2.2	1.3	1.1	0.9
3/4	3.5	3.2	1.8	1.6	1.3
1	4.6	4.2	2.3	2.1	1.7
1-1/2	6.6	6	3.3	3	2.4
2	7.5	6.8	4.3	3.4	2.7
3	10.6	9.6	6.1	4.8	3.9
5	16.7	15.2	9.7	7.6	6.1
7-1/2	24.2	22	14	11	9
10	30.8	28	18	14	11
15	46.2	42	27	21	17
20	59.4	54	34	27	22
25	74.8	68	44	34	27
30	88	80	51	40	32
40	114	104	66	52	41
50	143	130	83	65	52
60	169	154	103	77	62
75	211	192	128	96	77
100	273	248	165	124	99
125	343	312	208	156	125
150	396	360	240	180	144
200	528	480	320	240	192
250	–	604	403	302	242
300	–	722	482	361	289
350	–	828	560	414	336
400	–	954	636	477	382
450	–	1030	–	515	412
500	–	1180	786	590	472

AF09 ... AF38 4-pole Contactors

Contactor Electrical Durability and Utilization Categories

General

Utilization categories determine the current making and breaking conditions relating to the characteristics of the loads to be controlled by the contactors. International standard IEC 60947-4-1 and European standard EN 60947-4-1 are the standards to be referred to.

If I_c is the current to be broken by the contactor and I_e the rated operational current normally drawn by the load, then $I_c = I_e$ for category AC-1. The curve corresponding to category AC-1 represents the electrical durability variation of standard contactors in relation to the breaking current I_c .

Electrical durability is expressed in millions of operating cycles.

Curve Utilization Mode

Electrical durability forecast and contactor selection for category AC-1

- Note the characteristics of the load to be controlled:
 - Operational voltage U_e
 - Current normally drawn I_e
 - Utilization category AC-1
 - Breaking current $I_c = I_e$ for AC-1
- Define the number of operating cycles N required.
- On the diagram corresponding to the operational category, select the contactor with the curve immediately above the intersection point ($I_c ; N$).

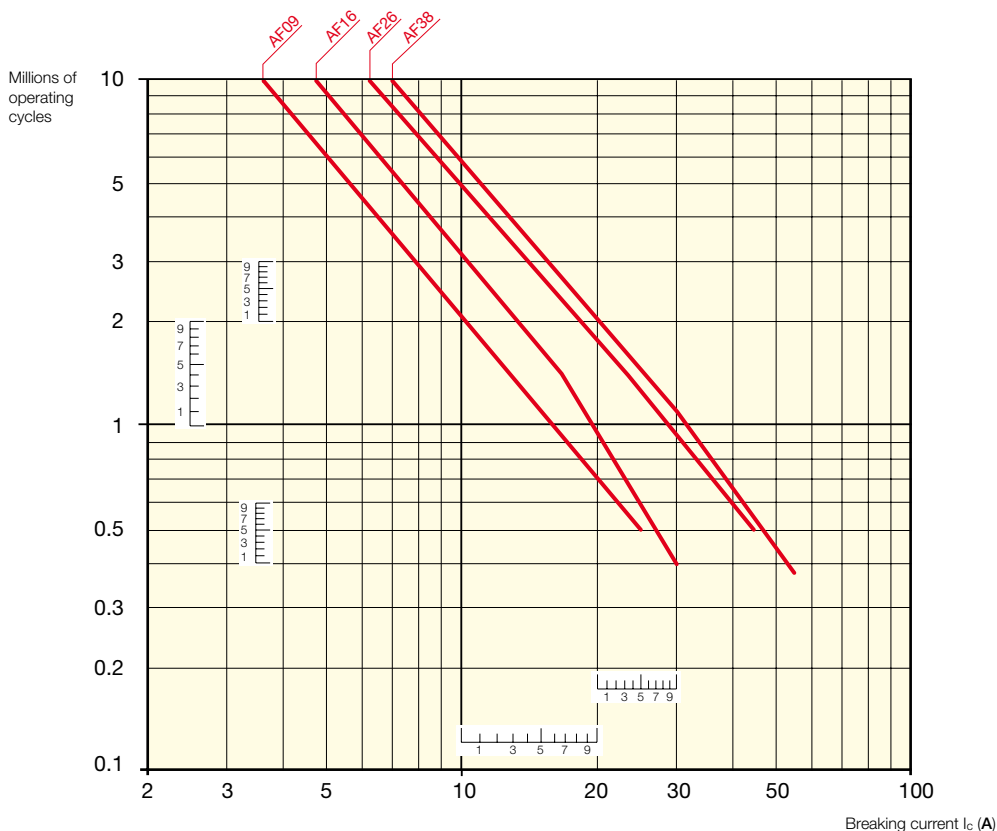
Case of uninterrupted duty

For uninterrupted duty, some verifications of preventing maintenance are necessary to check the functionality of the concerned product (consult us). The combined effect of environmental conditions and the proper temperature of the product may require some disposals. As a matter of fact, for this duty, the use duration prevails over the number of operating cycles.

Electrical Durability for AC-1 Utilization Category - $U_e \leq 690$ V. Ambient Temperature ≤ 60 °C

Switching non-inductive or slightly inductive loads. The breaking current I_c for AC-1 is equal to the rated operational current of the load.

Maximum electrical switching frequency: see "Technical Data".



AF09 ... AF38 4-pole contactors AC-1 electrical durability

AF09 ... AF38 4-pole Contactors

Main Accessories

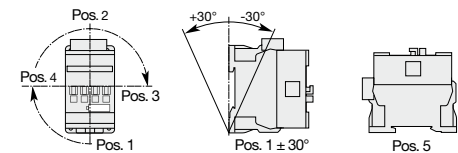


Accessory fitting details for a 4-pole contactor AF09 ... AF38

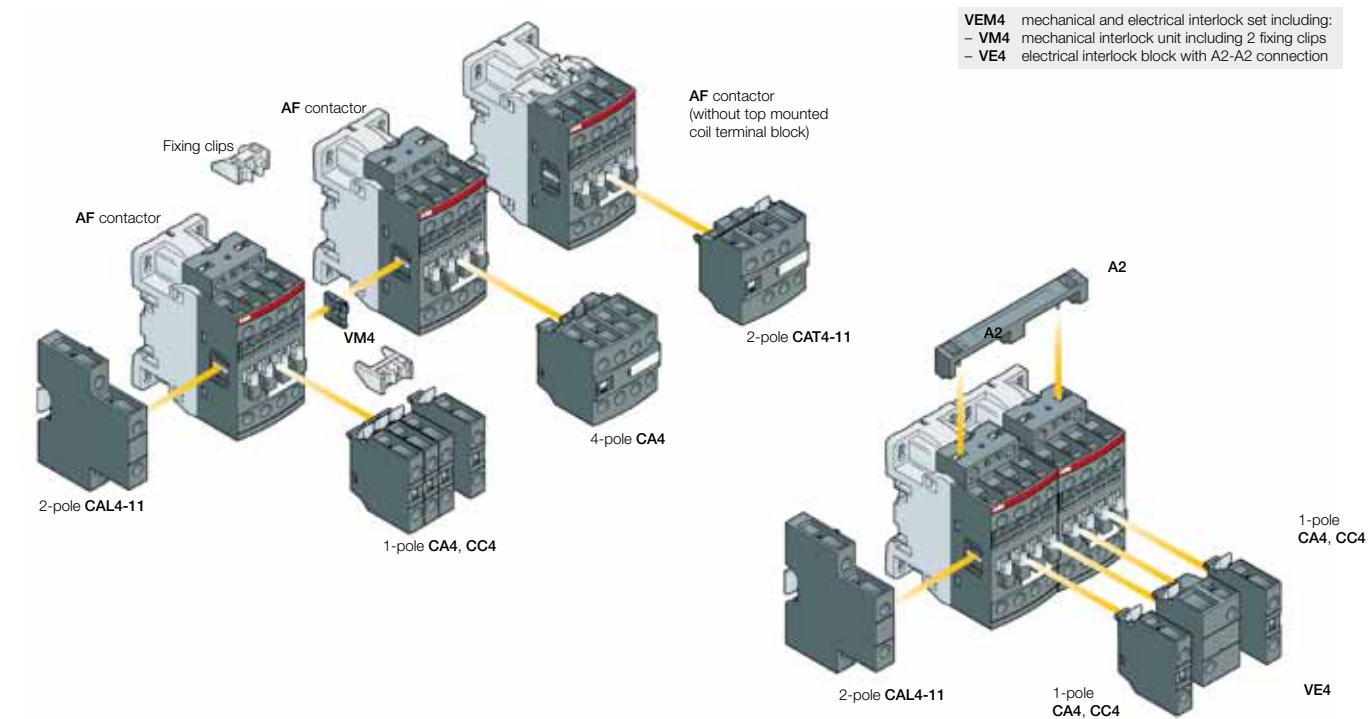
Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

Contactor types	Main poles	Built-in auxiliary contacts	Front-mounted accessories				Side-mounted accessories			
			Auxiliary contact blocks		Electrical and mechanical interlock set (between 2 contactors)		Auxiliary contact blocks			
			1-pole CA4	1-pole CC4	2-pole CAT4-11	4-pole CA4	VEM4	Left side	Right side	
								2-pole CAL4-11		
Max. add-on N.C. auxiliary contacts: 3 N.C. max. on positions 1, 2, 3, 4 and 2 N.C. max. on positions 1 ±30°, 5										
AF09 ... AF38	4	0	0	0	4 max.	or 1	or 1	-	+ 1	-
AF09 ... AF38	4	0	0	0	2 max.	or 1	-	-	+ 1	+ 1
					3 max.	-	-	+ 1	+ 1	-
Max. add-on N.C. auxiliary contacts: 3 N.C. max. on positions 1, 2, 3, 4 and 2 N.C. max. on positions 1 ±30°, 5										
AF09 ... AF16	2	2	0	0	4 max.	or 1	or 1	-	+ 1	-
AF26 ... AF38	2	2	0	0	2 max.	or 1	-	-	+ 1	+ 1

Mounting positions



Contactors and main accessories (other accessories available)



Auxiliary Contact Blocks

Accessories for AF09 ... AF38 4-pole Contactors



CA4-10



CA4-22E



CAL4-11



CAT4-11E

Application

The auxiliary contact blocks are used for the operation of auxiliary circuits and control circuits.

Description

Types of auxiliary contact blocks for standard industrial environments:

- **CA4** 1 or 4-pole block, front-mounted, instantaneous with N.O., N.C. contacts
- **CC4** 1-pole block, front-mounted, with N.O. leading contact or N.C. lagging contact
- **CAT4** 2-pole block, front-mounted, instantaneous N.O. + N.C. contacts with A1 / A2 coil terminal connection on front face
- **CAL4** 2-pole block instantaneous N.O. + N.C. contacts clipped onto the right and/or left side of the contactors.

The auxiliary contact blocks are equipped with screw type connecting terminals delivered open, protected against accidental direct contact and bear the corresponding function marking.

Fitting Details - For each contactor, refer to "Accessory Fitting Details" table.

Ordering Details

For contactors	Auxiliary contacts	Catalog number	List price	Pack ^(ing) pieces	Weight kg/lbs (1 pce)
	 				

Front-mounted instantaneous auxiliary contact blocks

AF09 ... AF38...-40-00	1	0	-	-	CA4-10	1	0.014/0.03
AF09 ... AF38...-22-00	0	1	-	-	CA4-01	1	0.014/0.03
	2	2	-	-	CA4-22E	1	0.055/0.12
	3	1	-	-	CA4-31E	1	0.055/0.12
	4	0	-	-	CA4-40E	1	0.055/0.12
AF09 ... AF38...-40-00	0	4	-	-	CA4-04E	1	0.055/0.12

Front-mounted auxiliary contact blocks with N.O. leading contact and N.C. lagging contact

AF09 ... AF38...-40-00	-	-	1	0	CC4-10	1	0.014/0.03
AF09 ... AF38...-22-00	-	-	0	1	CC4-01	1	0.014/0.03

Side-mounted instantaneous auxiliary contact blocks

AF09 ... AF38...-40-00	1	1	-	-	CAL4-11	1	0.040/0.09
------------------------	---	---	---	---	----------------	---	------------

Front-mounted instantaneous auxiliary contact and A1/A2 coil terminal blocks

AF09 ... AF38...-40-00	1	1	-	-	CAT4-11E	1	0.040/0.09
AF09 ... AF38...-22-00							

Note: CAT4 not fittable on AF..Z contactors with DC control voltage 12...20 V DC.

Auxiliary Contact Blocks

Accessories for AF09 ... AF38 4-pole Contactors



Technical Data

Types	1-pole CA4, 1-pole CC4, 4-pole CA4, 2-pole CAT4, 2-pole CAL4
-------	--

Contact Utilization Characteristics according to IEC

Standards	IEC 60947-5-1 and EN 60947-5-1
Rated insulation voltage U_i acc. to IEC 60947-5-1	690 V
Rated impulse withstand voltage U_{imp}	6 kV
Rated operational voltage U_e max.	24 ... 690 V
Conventional thermal current I_{th} - $\theta \leq 40$ °C	16 A
Rated frequency limits	25 ... 400 Hz
Rated operational current I_e / AC-15	24-127 V 50/60 Hz 6 A
acc. to IEC 60947-5-1	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 acc. to IEC 60947-5-1	10 x I_e AC-15 acc. to IEC 60947-5-1
Breaking capacity acc. to IEC 60947-5-1	10 x I_e AC-15 acc. to IEC 60947-5-1
Rated operational current I_e / DC-13	24 V DC 6 A / 144 W
acc. to IEC 60947-5-1	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 gG type fuse	10 A
Rated short-time withstand current I_{cw}	for 1.0 s 100 A
$\theta = 40$ °C	for 0.1 s 140 A
Minimum switching capacity	12 V / 3 mA
with failure rate acc. to IEC 60947-5-4	10^{-7}
Heat dissipation per pole at 6 A	0.1 W
Mechanical durability	Number of operating cycles 10 million operating cycles
	Max. switching frequency 3600 cycles/h
Max. electrical switching frequency	for AC-15 1200 cycles/h
	for DC-13 900 cycles/h

Contact Utilization Characteristics according to UL/CSA

Standards	UL 508, CSA C22.2 N°14
Rated insulation voltage U_i	600 V
Max. rated 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 maximum volt-ampere breaking	720 VA
DC thermal rated current	2.5 A
DC maximum volt-ampere making-breaking	69 VA

Connecting Characteristics

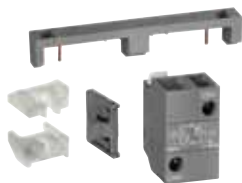
Screw terminals	(delivered in open position, screws of unused terminals must be tightened)
All terminals	M3.5
Connecting capacity (min. ... max.)	
Rigid solid	1 x 1 ... 2.5 mm²
Flexible with non insulated ferrule	2 x 1 ... 2.5 mm²
Flexible with insulated ferrule	1 x 0.75 ... 2.5 mm²
Flexible with insulated ferrule	2 x 0.75 ... 1.5 mm²
Bars or lugs	L < 8 mm
Capacity acc. to UL/CSA	1 or 2 x AWG 18 ... 14
Stripping length	10 mm
Degree of protection	IP20
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529	
Screwdriver type	Flat Ø5.5 / Pozidriv 2
Tightening torque	1.2 Nm / 11 lb.in

Interlocks

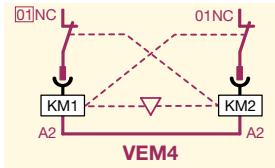
Accessories for AF09 ... AF38 4-pole Contactors



VM4



VEM4



BB4

Mechanical interlock unit

Description

VM4 mechanical interlock unit for the interlocking of two AF contactors.

When mounted between two contactors without additional width, the VM4 mechanical interlock unit prevents one of the contactors from closing as long as the other contactor is closed.

The mechanical interlock unit includes 2 fixing clips (BB4).

Ordering Details

For contactors	Catalog number	List price	Pack ^(ing) pieces	Weight kg/lbs (1 pce)
AF09 ... AF38...-40-00	VM4		10	0.005/0.011

Mechanical and electrical interlock set

Description

VEM4 mechanical and electrical interlock set for the interlocking of two AF contactors.

VEM4 set includes a mechanical interlock unit VM4 with 2 fixing clips (BB4) and a VE4 electrical interlock block with A2-A2 connection.

Fixing the electrical interlock block to the contactor front face connects the 2 built-in N.C. interlocking contacts with the two coils. VE4 block must be used with A2-A2 connection to respect the electrical connection diagram.

Ordering Details

For contactors	Auxiliary contacts	Catalog number	List price	Pack ^(ing) pieces	Weight kg/lbs (1 pce)
AF09 ... AF38...-40-00	1 1	VEM4		1	0.035/0.077

Note: VEM4 not fittable on AF..Z contactors with DC control voltage 12...20 V DC.

Fixing clips

Ordering Details

For contactors	Catalog number	List price	Pack ^(ing) pieces	Weight kg/lbs (1 pce)
AF09 ... AF38...-40-00	BB4		50	0.002/0.004

Interlocks

Accessories for AF09 ... AF38 4-pole Contactors



Technical Data

Interlock types	VM4
Mechanical durability	
Number of operating cycles	5 million operating cycles
Max. switching frequency	1800 cycles/h

Interlock types	VEM4
Contact Utilization Characteristics according to IEC	
Standards	IEC 60947-5-1 and EN 60947-5-1
Rated insulation voltage U_i acc. to IEC 60947-5-1	690 V
Rated impulse withstand voltage U_{imp}	6 kV
Rated control circuit voltage U_c	AC 50/60 Hz control voltage
	DC control voltage
	24 ... 500 V AC
	20 ... 500 V DC
Conventional thermal current I_{th} - $\theta \leq 40^\circ\text{C}$	16 A
Mechanical and electrical durability	
Number of operating cycles	5 million operating cycles
Max. mechanical switching	1800 cycles/h
Max. electrical switching frequency	1200 cycles/h

Contact Utilization Characteristics according to UL / CSA

Standards	UL 508, CSA C22.2 N°14
Max. rated voltage	500 V AC, 500 V DC

Connecting Characteristics

Screw terminals	
All terminals	M3.5
Connecting capacity (min. ... max.)	
 Rigid Solid	1 x 1 ... 2.5 mm ²
 Flexible with non insulated ferrule	2 x 1 ... 2.5 mm ²
 Flexible with insulated ferrule	1 x 0.75 ... 2.5 mm ²
 Flexible with 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
 Bars or lugs	L < 8 mm
Capacity according to UL/CSA	1 or 2 x AWG 18 ... 14
Stripping length	10 mm
Degree of protection	
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529	IP20
Screwdriver type	Flat Ø5.5 / Pozidriv 2
Tightening torque	1.2 Nm / 11 lb.in

Other Accessories

Accessories for AF09 ... AF38 4-pole Contactors



LDC4

Additional coil terminal block

Description

Additional coil terminal block for a bottom access to the coil terminals of contactors or contactor relays.

Ordering Details

For contactors	Catalog number	List price	Pack ^(ing) pieces	Weight kg/lbs (1 pce)
AF09 ... AF38	LDC4		10	0.010/0.02



BX4



BX4-CA

Protective covers

Description

Sealable and transparent protective covers BX4 and non-removable BX4-CA to protect the devices against accidental contact.

Ordering Details

For contactors	Catalog number	List price	Pack ^(ing) pieces	Weight kg/lbs (1 pce)
All 1-stack contactors	BX4		10	0.006/0.013
For 4-pole CA4 and 2-pole CAT4 auxiliary contact blocks	BX4-CA		50	0.001/0.002



BA4

Function markers

Description

Box of 16 blank cards (16 markers per card) printable on HTP500 thermal transfer printer and AMS 500 marking table to identify your contactors, overload relays or manual motor starters.

Marker dimensions: 7 x 20 mm (.276" x .787")

Ordering Details

For contactors	Catalog number	List price	Pack ^(ing) pieces	Weight kg/lbs (1 pce)
Marker card	BA4		16	0.011/0.024
AMS 500 support plate for 8 BA4	XUSP02633		1	0.220/0.48
HTP500 support plate	1SNA235712R2400		1	0.290/0.64

AF09 ... AF38 4-pole Contactors

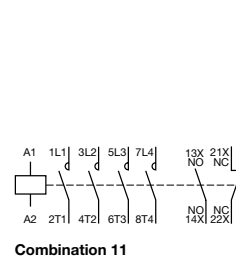
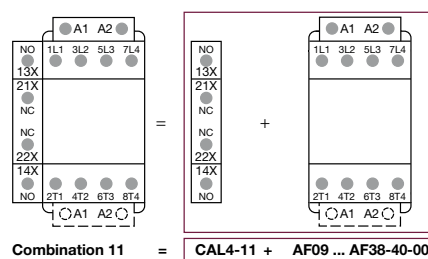
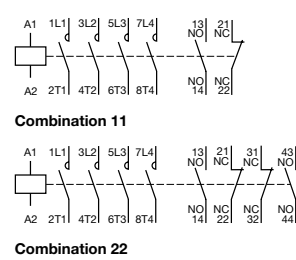
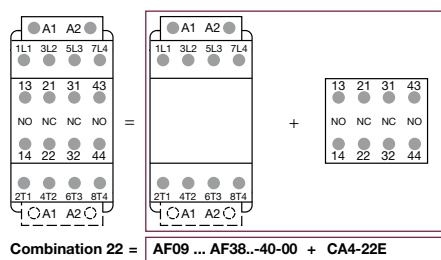
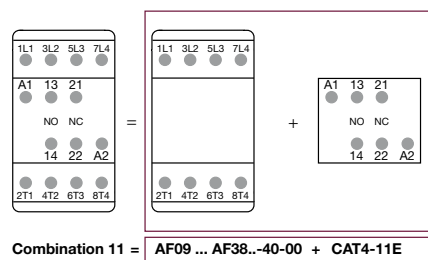
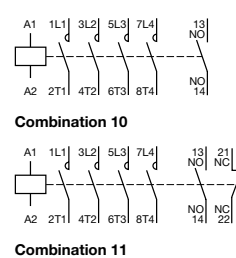
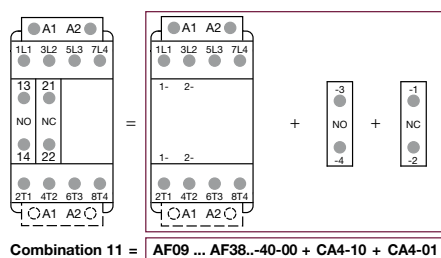
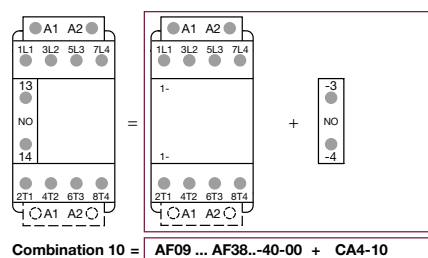
Terminal Marking and Positioning



Standard devices without addition of auxiliary contacts



Other possible contact combinations with auxiliary contacts



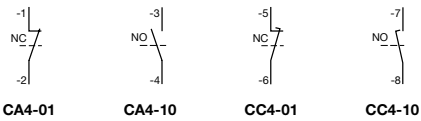
Note: Only AF..Z contactor with DC control voltage 12...20 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole

Add-on Auxiliary Contacts

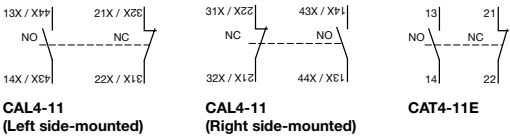
Terminal Marking and Positioning



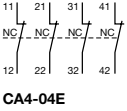
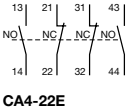
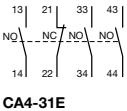
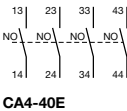
1-pole auxiliary contacts



2-pole auxiliary contacts



4-pole auxiliary contacts

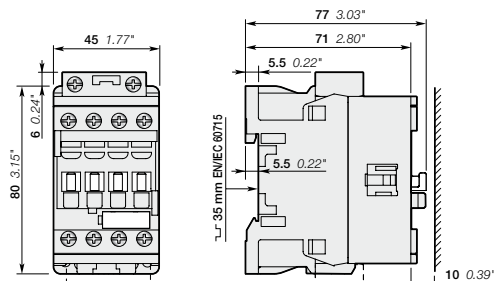


AF09 ... AF38 4-pole Contactors

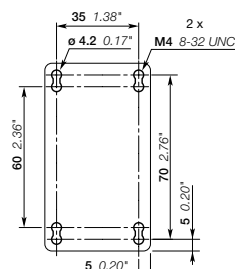
AC / DC Operated - with Screw Terminals



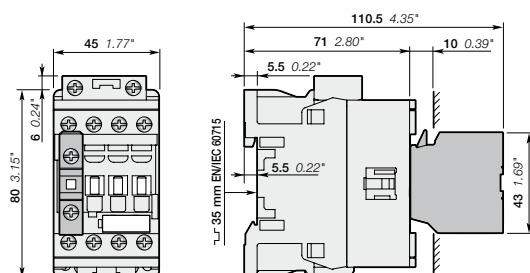
Dimensions mm, inches



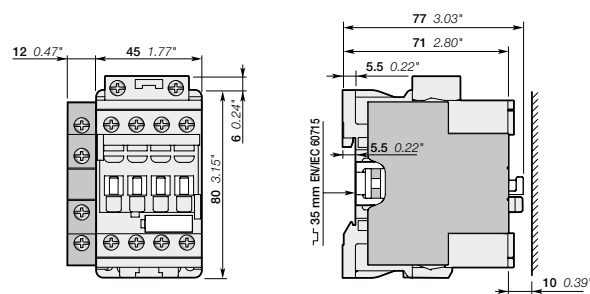
AF09, AF16



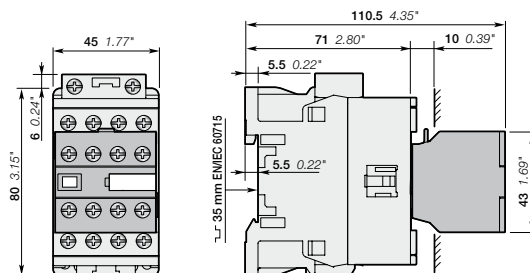
AF09, AF16



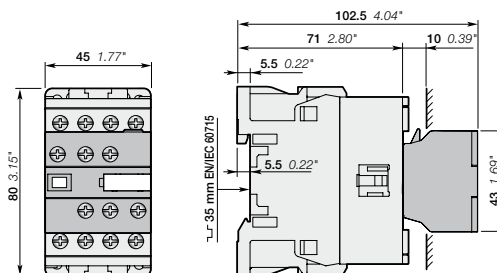
AF09, AF16
+ CA4, CC4 1-pole auxiliary contact block



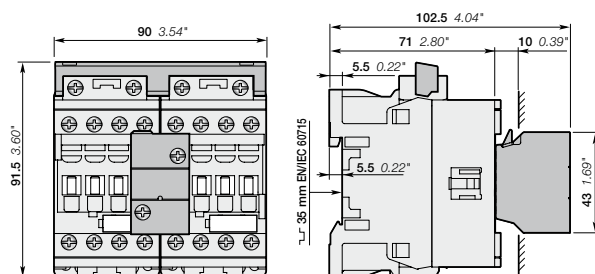
AF09, AF16
+ CAL4-11 2-pole auxiliary contact block



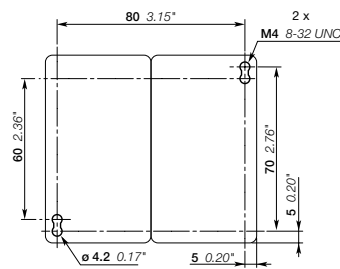
AF09, AF16
+ CA4 4-pole auxiliary contact block



AF09, AF16
+ CAT4 2-pole auxiliary contact and coil terminal block



AF09..-40-00, AF16..-40-00
+ VEM4 mechanical and electrical interlock set



AF09..-40-00, AF16..-40-00
+ VEM4 mechanical and electrical interlock set

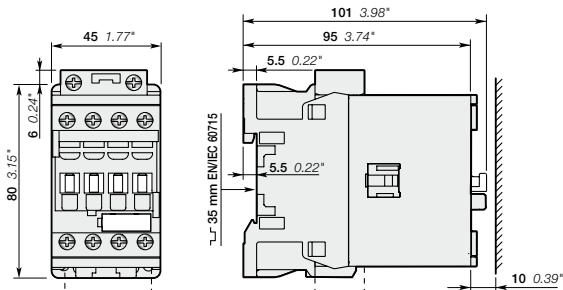
Note: contactor lateral distance to grounded component 2 mm 0.08" min.

AF26, AF38 4-pole Contactors

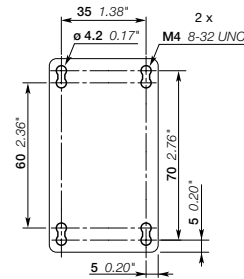
AC / DC Operated - with Screw Terminals



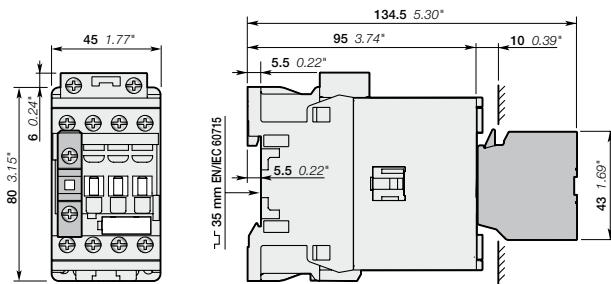
Dimensions mm, inches



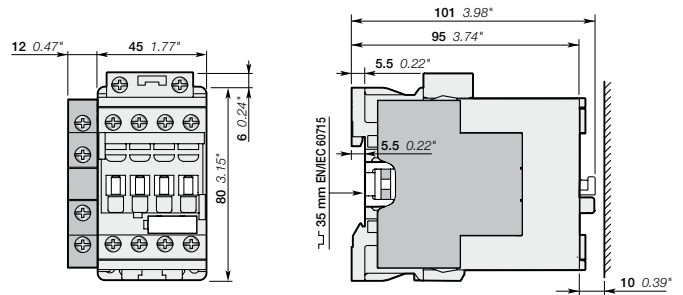
AF26, AF38



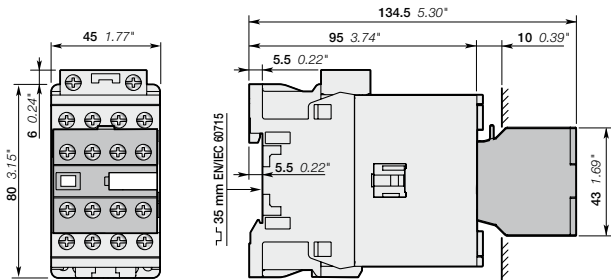
AF26, AF38



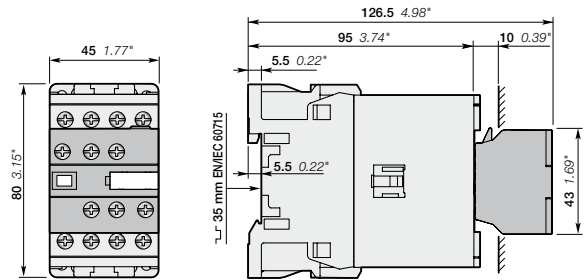
AF26, AF38
+ CA4, CC4 1-pole auxiliary contact block



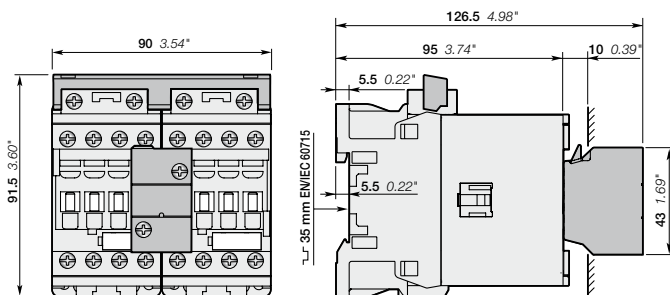
AF26, AF38
+ CAL4-11 2-pole auxiliary contact block



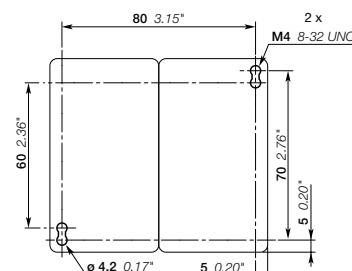
AF26, AF38
+ CA4 4-pole auxiliary contact block



AF26, AF38
+ CAT4 2-pole auxiliary contact and coil terminal block



AF26..-40-00, AF38..-40-00
+ VEM4 mechanical and electrical interlock set



AF26..-40-00, AF38..-40-00
+ VEM4 mechanical and electrical interlock set

Note: contactor lateral distance to grounded component 2 mm 0.08" min.