AF16-40-00-.. / AF16Z-40-00-.. 4-pole Contactors AC / DC Operated - with Screw Terminals

AF16(Z) contactors are used for controlling power circuits up to 690 V AC and 440 V DC.
They are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...).

- AF..(Z) contactors include an electronic coil interface providing reduced pull-in and holding consumption, particularly for AC control circuits
- Only four coils are needed to cover control voltages between 24...500 V 50/60 Hz or 20...500 V DC.
  AF..(Z) offer extended operating limits and are suitable worldwide for different control voltages. e.g.: the coil 100...250 V 50/60 Hz - DC is suitable for Europe (230 V 50 Hz) and for North America (120 V 60 Hz and 208 V 60 Hz).
  AF..(Z) contactors can manage large control voltage variations.
- AF..Z contactors equipped with a 24...60 V 50/60 Hz - 20...60 V DC coil allow direct control by 24 V DC 500 mA PLC-output
- AF..Z contactors withstand short voltage dips and voltage sags (SEMI F47-0706 compliance)
- AF..(Z) contactors have built-in surge protection and do not require additional surge suppressors.




30 A

3D CAD outline drawings available on «Control Product 3D» portal

Ordering Details

IEC AC-1 Rated current θ ≤ 40 °C A	UL/CSA General use rating 600 V AC A	Control voltage Uc min. ... Uc max. V 50/60 Hz	 V DC	Auxiliary contacts fitted	Type	Order code	EAN		Weight Pack(ing) 1 piece kg
4-pole Contactors 4 N.O. Main Poles									
30	30	24...60	20...60	0 0	**AF16-40-00-11**	**1SBL 177 201 R1100**	3471523115118		0.270
		48...130	48...130	0 0	**AF16-40-00-12**	**1SBL 177 201 R1200**	3471523115125		0.270
		100...250	100...250	0 0	**AF16-40-00-13**	**1SBL 177 201 R1300**	3471523115132		0.270
		250...500	250...500	0 0	**AF16-40-00-14**	**1SBL 177 201 R1400**	3471523115149		0.310

Note: AF16-40-00-11 not suitable for a direct control by PLC-output. AF16-40-00-11 available in some countries: please consult your ABB representative.

4-pole Contactors 4 N.O. Main Poles - Low Consumption									
30	30	-	12...20	0 0	**AF16Z-40-00-20**	**1SBL 176 201 R2000**	3471523115903		0.310
		24...60	20...60	0 0	**AF16Z-40-00-21**	**1SBL 176 201 R2100**	3471523115910		0.310
		48...130	48...130	0 0	**AF16Z-40-00-22**	**1SBL 176 201 R2200**	3471523115927		0.310
		100...250	100...250	0 0	**AF16Z-40-00-23**	**1SBL 176 201 R2300**	3471523115934		0.310

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

Certifications and Approvals

CE cULus CCC GOST C-Tick

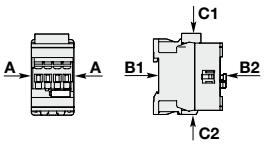
Main Pole - Utilization Characteristics according to IEC

Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1
Rated operational voltage Ue max.		690 V
Rated frequency limits		25 ... 400 Hz
Conventional free-air thermal current Ith		
acc. to IEC 60947-4-1, open contactors, $\theta \leq 40$ °C		35 A
with conductor cross-sectional area		6 mm²
AC-1 Utilization category		
for air temperature close to contactor		
Ie / AC-1 rated operational current	$\theta \leq$ **40 °C**	30 A
Ue max. ≤ 690 V, 50/60 Hz	$\theta \leq$ **60 °C**	30 A
	$\theta \leq$ **70 °C**	26 A
with conductor cross-sectional area		6 mm²
Short-circuit protection		
for contactors without thermal O/L relay - Motor protection excluded		
Ue ≤ 500 V AC - gG type fuse		32 A
Rated short-time withstand current Icw	**1 s**	300 A
at 40 °C ambient temperature, in free air from a cold state	**10 s**	150 A
	30 s	80 A
	1 min	60 A
	15 min	35 A
Heat dissipation per pole	**Ie / AC-1**	1.2 W
Max. electrical switching frequency	**AC-1**	600 cycles/h

Main Pole - Utilization Characteristics according to UL / CSA

Standards	UL 508, CSA C22.2 N°14
Rated operational voltage Ue max.	600 V
UL General use rating	
600 V AC	30 A
With conductor cross-sectional area	AWG 10
80 V DC - 1-pole for 4 N.O. main poles	30 A
With conductor cross-sectional area	AWG 10
80 V DC - 1-pole for 2 N.O. / 2 N.C. main poles	
With conductor cross-sectional area	
Max. electrical switching frequency	
for general use	600 cycles/h

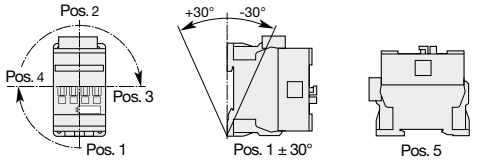
General Technical Data

Rated insulation voltage Ui			
acc. to IEC 60947-4-1			690 V
acc. to UL			600 V
Rated impulse withstand voltage Uimp			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			
	Closed or open position	**Shock direction**	1/2 sinusoidal shock for 11 ms: no change in contact position
	Main poles	**A**	30 g
		B1	25 g Closed position / 5 g Open position
		B2	15 g
		C1	25 g
		C2	25 g
Vibration withstand acc. to IEC 60068-2-6			5 ... 300 Hz 4 g Closed position / 2 g Open position

Magnet System Characteristics

Coil operating limits acc. to IEC 60947-4-1		**AC supply**	at θ ≤ 60 °C 0.85 x Uc min ... 1.1 x Uc max at θ ≤ 70 °C 0.85 x Uc min ... Uc max
		DC supply	at θ ≤ 60 °C 0.85 x Uc min ... 1.1 x Uc max at θ ≤ 70 °C (AF) 0.85 x Uc min ... Uc max - (AF..Z) 0.85 x Uc min ... 1.1 x Uc max
AC control voltage	Rated control circuit voltage Uc		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 Uc		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) ≥ 500 mA 24 V DC
Drop-out voltage in % of Uc min.			≤ 60 % Uc 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 Uc = 24 ... 250 V 50/60Hz
-20 °C ≤ θ ≤ +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

Mounting positions	 Max. add-on N.C. auxiliary contacts: see accessory fitting details for a 4-pole contactor AF09 ... AF38
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

Connecting Characteristics

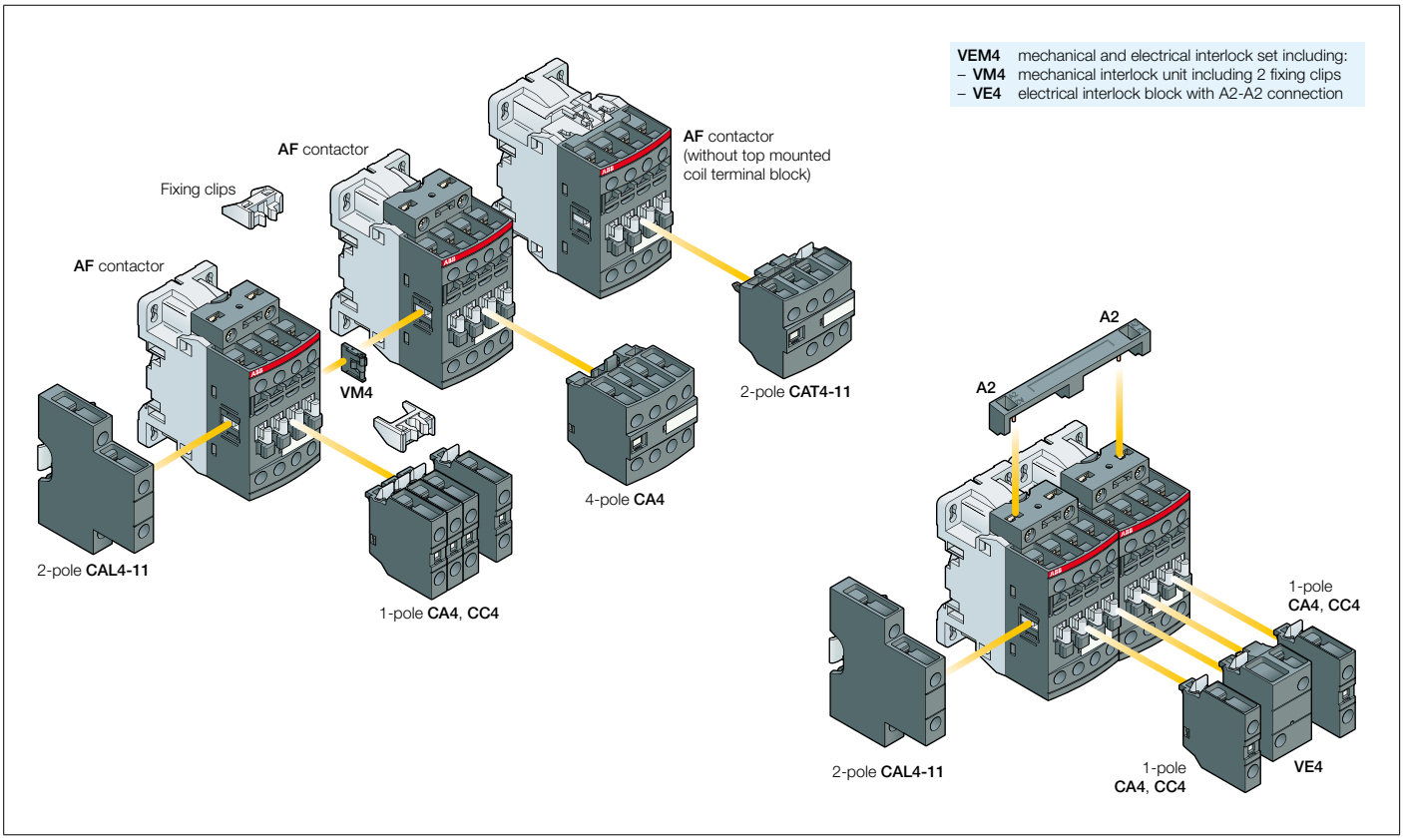
Main terminals				 Screw terminals with cable clamp
Connecting capacity (min. ... max.)				
Main conductors (poles)				
Rigid	solid (≤ 4 mm²)		**1 x**	1 ... 6 mm²
	stranded (≥ 6 mm²)		**2 x**	1 ... 6 mm²
Flexible with non insulated ferrule			**1 x**	0.75 ... 6 mm²
			2 x	0.75 ... 6 mm²
Flexible with insulated ferrule			**1 x**	0.75 ... 4 mm²
			2 x	0.75 ... 2.5 mm²
Bars or lugs			**L <**	9.6 mm
Capacity according to UL/CSA			**1 or 2 x**	AWG 16 ... 10
Stripping length				10 mm
Auxiliary conductors				
Rigid solid			**1 x**	1 ... 2.5 mm²
			2 x	1 ... 2.5 mm²
Flexible with non insulated ferrule			**1 x**	0.75 ... 2.5 mm²
			2 x	0.75 ... 2.5 mm²
Flexible with insulated ferrule			**1 x**	0.75 ... 2.5 mm²
			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
Coil terminals				M3.5
Screwdriver type				Flat Ø 5.5 / Pozidriv 2
Tightening torque				
Main pole terminals				1.5 Nm / 13 lb.in
Coil terminals				1.2 Nm / 11 lb.in

Accessory Fitting Details for a 4-pole Contactor

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

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

Overview of main accessories (other accessories available)



Main Accessories

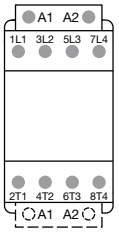
Ordering Details

Description		Auxiliary contacts	Type	Order code	EAN	Pack(ing) piece	Weight kg (1 pce)
Additional auxiliary contact blocks	Front-mounted instantaneous auxiliary contact blocks	0 1 - -	**CA4-01**	**1SBN 010 110 R1001**	3471523130029	1	0.014
		1 0 - -	**CA4-10**	**1SBN 010 110 R1010**	3471523130005	1	0.014
		0 1 - -	**CA4-01-T**	**1SBN 010 110 T1001**	3471523130395	10	0.014
		1 0 - -	**CA4-10-T**	**1SBN 010 110 T1010**	3471523130371	10	0.014
	Front-mounted auxiliary contact blocks with N.O. leading contact and N.C. lagging contact	- - 0 1	**CC4-01**	**1SBN 010 111 R1001**	3471523130432	1	0.014
		- - 1 0	**CC4-10**	**1SBN 010 111 R1010**	3471523130425	1	0.014
	Side-mounted instantaneous auxiliary contact blocks	1 1 - -	**CAL4-11**	**1SBN 010 120 R1011**	3471523130043	1	0.040
		1 1 - -	**CAL4-11-T**	**1SBN 010 120 T1011**	3471523130418	10	0.040
	Front-mounted instantaneous auxiliary contact blocks	0 4 - -	**CA4-04E**	**1SBN 010 140 R1004**	3471523130159	1	0.055
		2 2 - -	**CA4-22E**	**1SBN 010 140 R1022**	3471523130128	1	0.055
		3 1 - -	**CA4-31E**	**1SBN 010 140 R1031**	3471523130135	1	0.055
		4 0 - -	**CA4-40E**	**1SBN 010 140 R1040**	3471523130142	1	0.055
	Front-mounted instantaneous auxiliary contact and A1/A2 coil terminal blocks	1 1 - -	**CAT4-11E**	**1SBN 010 151 R1011**	3471523130067	1	0.040
Interlocks	Mechanical interlock unit		**VM4**	**1SBN 030 105 T1000**	3471523130609	10	0.005
	Mechanical and electrical interlock set	1 1 - -	**VEM4**	**1SBN 030 111 R1000**	3471523130616	1	0.035
	Fixing clips		**BB4**	**1SBN 110 120 W1000**	3471523130722	50	0.002
Additional coil terminal block	Additional coil terminal block		**LDC4**	**1SBN 070 156 T1000**	3471523130678	10	0.010
Protective covers	Protective covers		**BX4**	**1SBN 110 108 T1000**	3471523130708	10	0.006
			BX4-CA	**1SBN 110 109 W1000**	3471523130715	50	0.001
Function markers	Function markers		**BA4**	**1SNA 235 156 R2700**	3472592351568	16	0.011
			HTP500-BA4	**1SNA 235 712 R2400**	3472592357126	1	0.220
			SPRC 1	**1SNA 360 010 R1500**	3472593600108	1	0.290

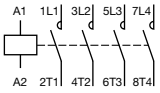
Note:
- CAT4: not fittable on AF..Z contactors with DC control voltage 12...20VDC.
- VM4: includes 2 fixing clips (BB4) to maintain together both contactors.
- VEM4: includes a VM4 mechanical interlock unit with 2 fixing clips (BB4), a VE4 electrical interlock block and A2-A2 connection.
VE4 block must be used with its A2-A2 connection to respect the electrical connection diagram.
VEM4 not fittable on AF..Z contactors with DC control voltage 12...20 V DC.

Terminal Marking and Positioning

Standard devices without addition of auxiliary contacts

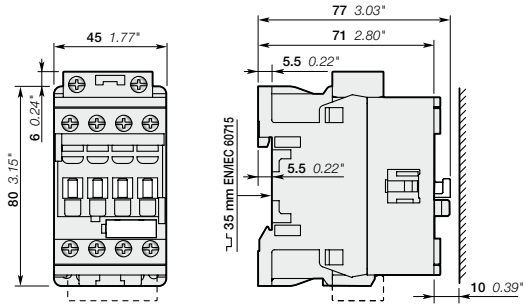


AF16-40-00-.. / AF16Z-40-00-..

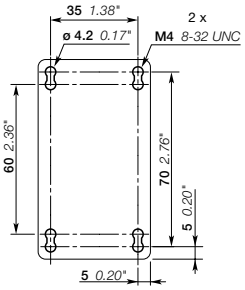


AF16-40-00-.. / AF16Z-40-00-..

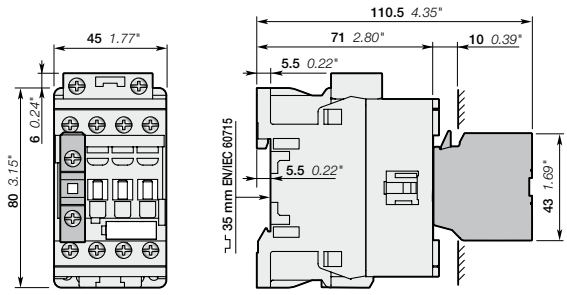
Dimensions mm, inches



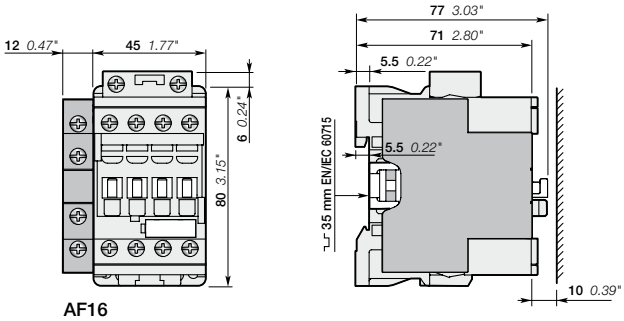
AF16



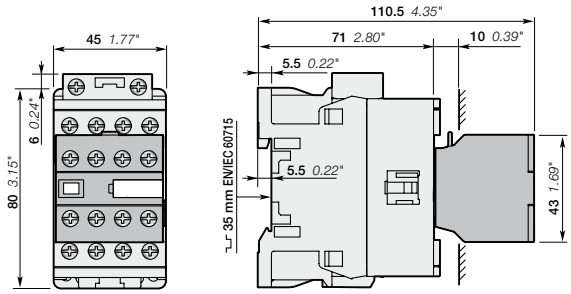
AF16



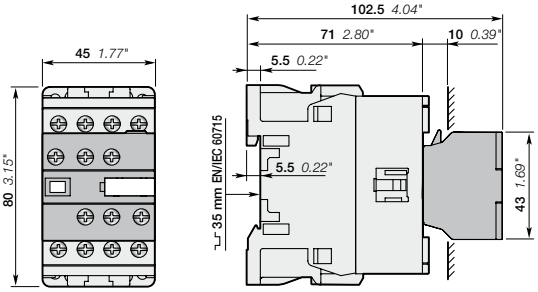
AF16
+ CA4, CC4 1-pole auxiliary contact block



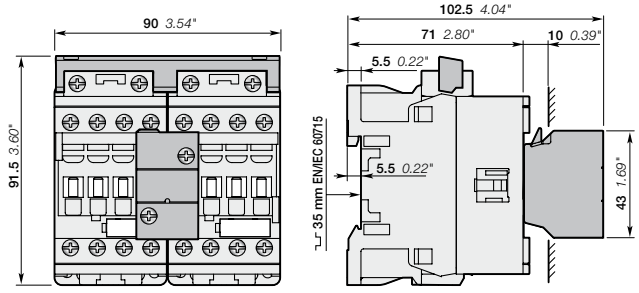
AF16
+ CAL4-11 2-pole auxiliary contact block



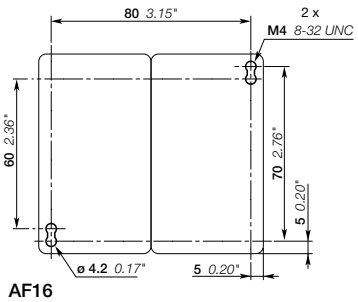
AF16
+ CA4 4-pole auxiliary contact block



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



AF16
+ VEM4 mechanical and electrical interlock set



AF16
+ VEM4 mechanical and electrical interlock set

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

Contact us

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You can find the address of your local sales organisation on the ABB home page
http://www.abb.com/contacts -> Low Voltage products

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