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

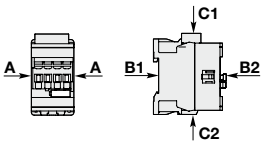
Main Pole - Utilization Characteristics according to IEC

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

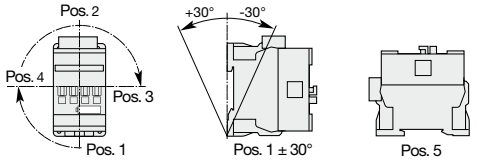
General Technical Data

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

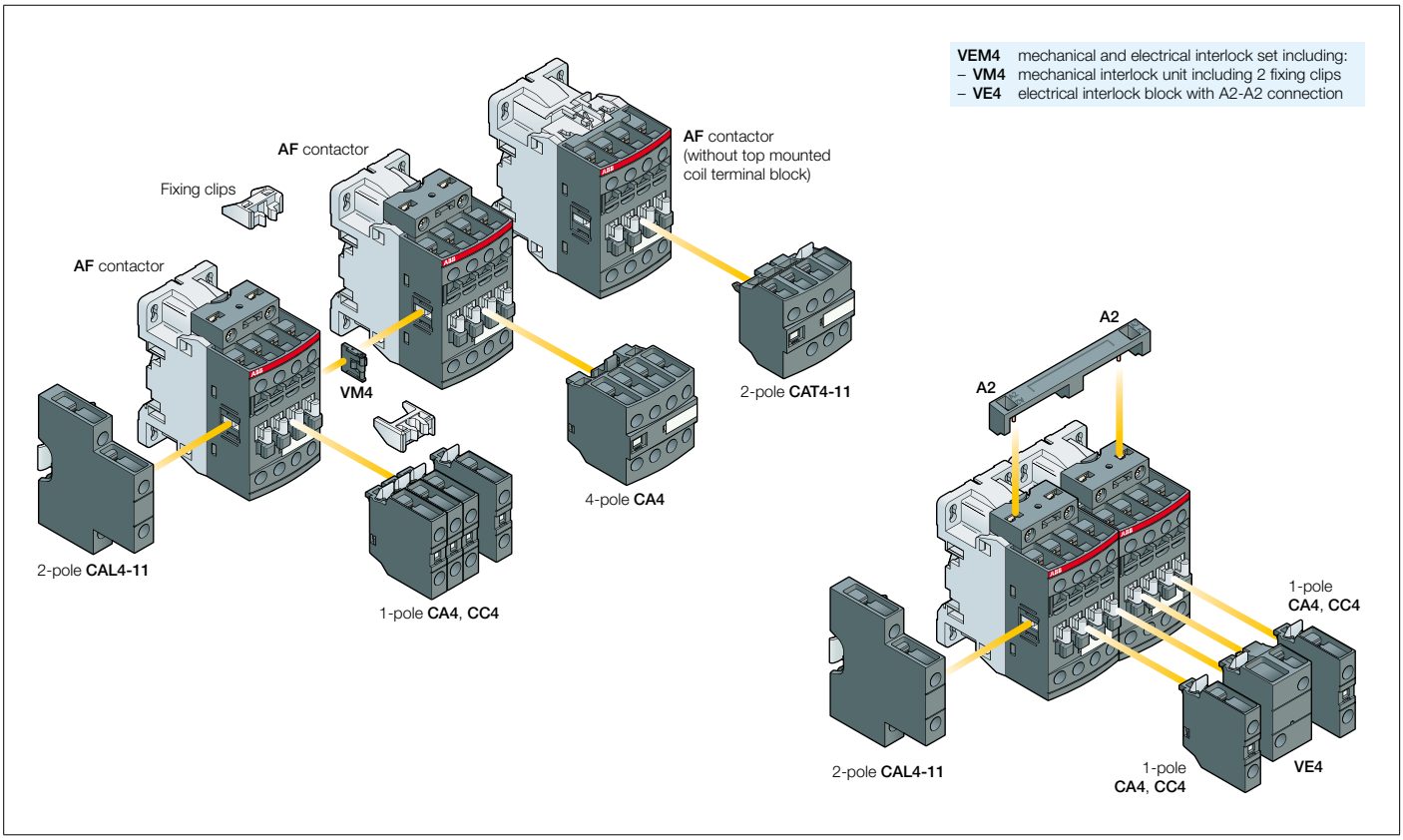
Main terminals				 Screw terminals with cable clamp
Connecting capacity (min. ... max.)				
Main conductors (poles)				
Rigid	solid (≤ 4 mm²)		**1 x**	1 ... 6 mm²
	stranded (≥ 6 mm²)		**2 x**	1 ... 6 mm²
Flexible with non insulated ferrule			**1 x**	0.75 ... 6 mm²
			2 x	0.75 ... 6 mm²
Flexible with 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

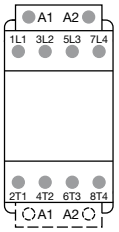
Ordering Details

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

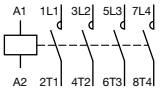
Note:
- CAT4: not fittable on AF..Z contactors with DC control voltage 12...20VDC.
- VM4: includes 2 fixing clips (BB4) to maintain together both contactors.
- VEM4: includes a VM4 mechanical interlock unit with 2 fixing clips (BB4), a VE4 electrical interlock block and A2-A2 connection.
VE4 block must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

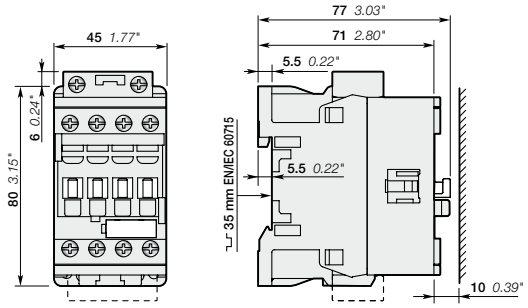


AF16-40-00-.. / AF16Z-40-00-..

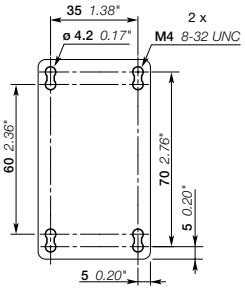


AF16-40-00-.. / AF16Z-40-00-..

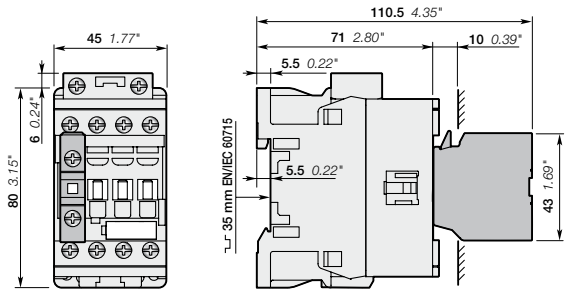
Dimensions mm, inches



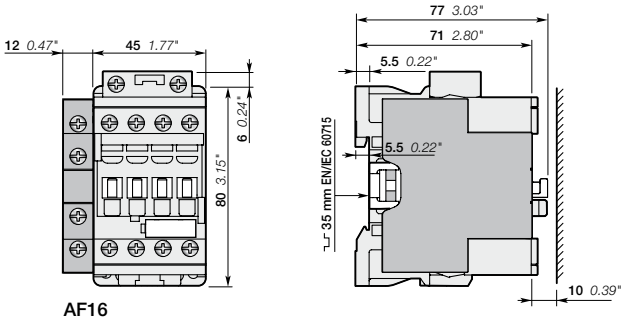
AF16



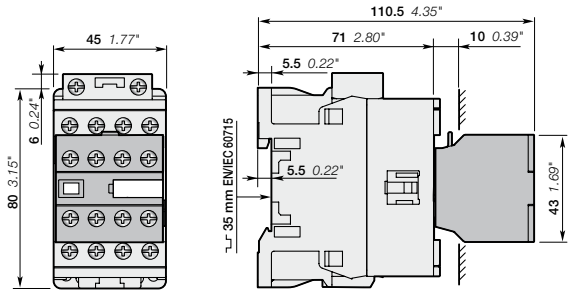
AF16



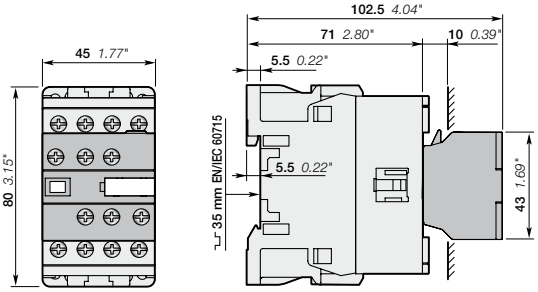
AF16
+ CA4, CC4 1-pole auxiliary contact block



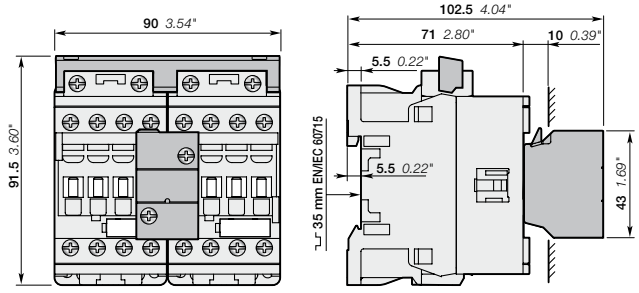
AF16
+ CAL4-11 2-pole auxiliary contact block



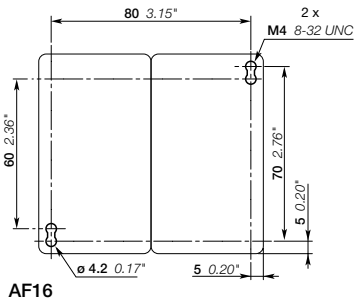
AF16
+ CA4 4-pole auxiliary contact block



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

ABB France
Low Voltage Products Division
10, rue Ampère Z.I. - B.P. 114
F-69685 Chassieu cedex / France

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

Note
We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

Technical Datasheet 1SBC101420D0201 (06/04/11)