

# AF38-30-00-.. / AF38Z-30-00-.. 3-pole Contactors AC / DC Operated - with Screw Terminals

AF38(Z) contactors are used for controlling power circuits up to 690 V AC and 220 V DC. They are mainly used for controlling 3-phase motors, non-inductive or slightly inductive loads.

- 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.



		18.5 kW	
		20 hp	

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

### Ordering Details

IEC	UL/CSA	Control voltage		Main contacts	Auxiliary contacts fitted	Type	Order code	EAN	Weight
Rated power	3-phase motor rating	Uc min. ... Uc max.							Pack <sup>(ing)</sup>
400 V	480 V	V 50/60 Hz	V DC						1 piece
kW	hp								kg

### 3-pole Contactors

18.5	20	24...60	20...60	3	0	0	0	AF38-30-00-11	1SBL 297 001 R1100	3471523111516	0.310
		48...130	48...130	3	0	0	0	AF38-30-00-12	1SBL 297 001 R1200	3471523111523	0.310
		100...250	100...250	3	0	0	0	AF38-30-00-13	1SBL 297 001 R1300	3471523111530	0.310
		250...500	250...500	3	0	0	0	AF38-30-00-14	1SBL 297 001 R1400	3471523111547	0.350

Note: AF38-30-00-11 not suitable for a direct control by PLC-output. AF38-30-00-11 available in some countries: please consult your ABB representative.

### 3-pole Contactors - Low Consumption



18.5	20	-	12...20	3	0	0	0	AF38Z-30-00-20	1SBL 296 001 R2000	3471523114708	0.350
		24...60	20...60	3	0	0	0	AF38Z-30-00-21	1SBL 296 001 R2100	3471523114715	0.350
		48...130	48...130	3	0	0	0	AF38Z-30-00-22	1SBL 296 001 R2200	3471523114722	0.350
		100...250	100...250	3	0	0	0	AF38Z-30-00-23	1SBL 296 001 R2300	3471523114739	0.350

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	PG	C-Tick							

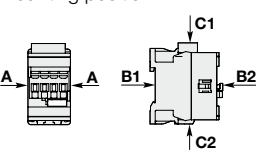
## Main Pole - Utilization Characteristics according to IEC

<b>Standards</b>	IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1	
<b>Rated operational voltage <math>U_e</math> max.</b>	690 V	
<b>Rated frequency limits</b>	25 ... 400 Hz	
<b>Conventional free-air thermal current <math>I_{th}</math></b> acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$	50 A	
with conductor cross-sectional area	10 mm <sup>2</sup>	
<b>AC-1 Utilization category</b> for air temperature close to contactor		
<b><math>I_e</math> / AC-1 rated operational current</b>	$\theta \leq 40^\circ\text{C}$	50 A
$U_e$ max. $\leq 690\text{ V}$ , 50/60 Hz	$\theta \leq 60^\circ\text{C}$	42 A
	$\theta \leq 70^\circ\text{C}$	37 A
with conductor cross-sectional area	10 mm <sup>2</sup>	
<b>AC-3 Utilization category</b> for air temperature close to contactor $\theta \leq 60^\circ\text{C}$ (for 1500 r.p.m., 50 Hz or 1800 r.p.m., 60 Hz, 3-phase motors)		
<b><math>I_e</math> / AC-3 max. rated operational current</b>	<b>220-230-240 V</b>	40 A
 3-phase motors	<b>380-400 V</b>	38 A
	<b>415 V</b>	38 A
	<b>440 V</b>	38 A
	<b>500 V</b>	33 A
	<b>690 V</b>	24 A
	<b>AC-3 rated operational power</b>	<b>220-230-240 V</b>
 1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors	<b>380-400 V</b>	18.5 kW
	<b>415 V</b>	18.5 kW
	<b>440 V</b>	22 kW
	<b>500 V</b>	22 kW
	<b>690 V</b>	22 kW
	<b>Rated making capacity AC-3</b>	10 x $I_e$ AC-3 acc. to IEC 60947-4-1
<b>Rated breaking capacity AC-3</b>	8 x $I_e$ AC-3 acc. to IEC 60947-4-1	
<b>AC-8a Utilization category</b> (without thermal overload relay - $U_e 400\text{ V}$ - $\theta \leq 40^\circ\text{C}$ )		
<b><math>I_e</math> / AC-8a rated operational current</b>	50 A	
<b>AC-8a rated operational power</b>	25 kW	
<b>Short-circuit protection for contactors</b> without thermal O/L relay - Motor protection excluded $U_e \leq 500\text{ V AC}$ - gG type fuse	63 A	
<b>Rated short-time withstand current <math>I_{cw}</math></b> at $40^\circ\text{C}$ ambient temperature, in free air from a cold state	<b>1 s</b>	700 A
	<b>10 s</b>	350 A
	<b>30 s</b>	225 A
	<b>1 min</b>	150 A
	<b>15 min</b>	50 A
<b>Maximum breaking capacity</b>	<b>at 440 V</b>	500 A
$\cos \phi = 0.45$	<b>at 690 V</b>	200 A
<b>Heat dissipation per pole</b>	<b><math>I_e</math> / AC-1</b>	2.4 W
	<b><math>I_e</math> / AC-3</b>	1.3 W
<b>Max. electrical switching frequency</b>	<b>AC-1</b>	600 cycles/h
	<b>AC-3</b>	1200 cycles/h
	<b>AC-2, AC-4</b>	150 cycles/h

## Main Pole - Utilization Characteristics according to UL / NEMA / CSA

<b>Standards</b>	UL 508, CSA C22.2 N°14	
<b>Rated operational voltage Ue max.</b>	600 V	
<b>NEMA size</b>	-	
<b>NEMA continuous amp rating</b>	<b>thermal current</b>	
<b>NEMA maximum H.P. ratings 1-phase, 60 Hz</b>	115 V AC	
	230 V AC	
<b>NEMA maximum H.P. ratings 3-phase, 60 Hz</b>	200 V AC	
	230 V AC	
	460 V AC	
	575 V AC	
<b>UL General use rating</b>		
600 V AC	50 A	
With conductor cross-sectional area	AWG 8	
80 V DC - 1-pole	50 A	
With conductor cross-sectional area	AWG 8	
<b>UL maximum 1-phase motor rating</b>		
Amp-rating	120 V AC	24 A
	240 V AC	28 A
Motor power	120 V AC	2 hp
	240 V AC	5 hp
<b>UL maximum 3-phase motor rating</b>		
Amp-rating	200-208 V AC	32.2 A
	220-240 V AC	28 A
	440-480 V AC	27 A
	550-600 V AC	On request
	Motor power	200-208 V AC
(for 1500 r.p.m., 50 Hz or 1800 r.p.m., 60 Hz 3-phase motors)	220-240 V AC	10 hp
	440-480 V AC	20 hp
	550-600 V AC	On request
<b>Short-circuit protection</b>		
for contactors without thermal O/L relay - Motor protection excluded		
Fuse rating	150 A	
Fuse type, 600 V	NTD	
<b>Max. electrical switching frequency</b>		
for general use	600 cycles/h	
for motor use	1200 cycles/h	

## General Technical Data

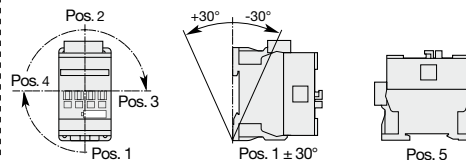
<b>Rated insulation voltage <math>U_i</math></b>		
acc. to IEC 60947-4-1		690 V
acc. to UL /CSA		600 V
<b>Rated impulse withstand voltage <math>U_{imp}</math></b>		6 kV
<b>Electromagnetic compatibility</b>		Devices complying with IEC 60947-1 / EN 60947-1 - Environment A
<b>Ambient air temperature</b> close to contactor		
Operation	fitted with thermal overload relay	-25 ... +60 °C
	without thermal overload relay	-40 ... +70 °C
Storage		-60 ... +80 °C
<b>Climatic withstand</b>		Category B according to IEC 60947-1 Annex Q
<b>Operating altitude</b>		≤ 3000 m
<b>Mechanical durability</b>		
Number of operating cycles		10 millions operating cycles
Max. switching frequency		3600 cycles/h
<b>Shock withstand</b>		
acc. IEC 60068-2-27 and EN 60068-2-27		
Mounting position 1		
		<b>Shock direction</b> 1/2 sinusoidal shock for 11 ms: no change in contact position <b>A</b> 30 g <b>B1</b> 25 g Closed position / 5 g Open position <b>B2</b> 15 g <b>C1</b> 25 g <b>C2</b> 25 g
<b>Vibration withstand</b>		5 ... 300 Hz
acc. to IEC 60068-2-6		4 g Closed position / 2 g Open position

## Magnet System Characteristics

<b>Coil operating limits</b>		<b>AC supply</b>	at $\theta \leq 60$ °C 0.85 x $U_c$ min ... 1.1 x $U_c$ max at $\theta \leq 70$ °C 0.85 x $U_c$ min ... $U_c$ max
acc. to IEC 60947-4-1		<b>DC supply</b>	at $\theta \leq 60$ °C 0.85 x $U_c$ min ... 1.1 x $U_c$ max at $\theta \leq 70$ °C (AF) 0.85 x $U_c$ min ... $U_c$ max - (AF.Z) 0.85 x $U_c$ min ... 1.1 x $U_c$ max
<b>AC control voltage</b> 50/60 Hz	Rated control circuit voltage $U_c$		24 ... 500 V AC
	Coil consumption	<b>Average pull-in value</b>	(AF) 50 VA - (AF.Z) 16 VA
		<b>Average holding value</b>	(AF) 2.2 VA / 2 W - (AF.Z) 1.7 VA / 1.5 W
<b>DC control voltage</b>	Rated control circuit voltage $U_c$		12 ... 500 V DC
	Coil consumption	<b>Average pull-in value</b>	(AF) 50 W - (AF.Z) 12 ... 16 W
		<b>Average holding value</b>	(AF) 2 W - (AF.Z) 1.7 W
<b>PLC-Output control</b>			(AF.Z) ≥ 500 mA 24 V DC
<b>Drop-out voltage in % of <math>U_c</math> min.</b>			≤ 60 % $U_c$ min
<b>Voltage sag immunity</b> according to SEMI F47-0706			(AF.Z) conditions of use on request
<b>Dips withstand</b> (level 0% according to IEC 61000-4-11) -20 °C ≤ $\theta$ ≤ +60 °C			(AF.Z) 22 ms average for $U_c = 24$ ... 250 V 50/60Hz
<b>Operating time</b>			
between coil energization and:	<b>N.O. contact closing</b>		40 ... 95 ms
	<b>N.C. contact opening</b>		38 ... 90 ms
between coil de-energization and:	<b>N.O. contact opening</b>		11 ... 95 ms
	<b>N.C. contact closing</b>		13 ... 98 ms

## Mounting Characteristics

### Mounting positions



Max. N.C. built-in and add-on N.C. auxiliary contacts: see accessory fitting details for a 3-pole contactor AF09 ... AF38

### 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 7.5 mm or 35 x 15 mm  
2 x M4 screws placed diagonally

## Connecting Characteristics

### Main terminals



Screw terminals with cable clamp

### Connecting capacity (min. ... max.)

#### Main conductors (poles)

	Rigid	solid ( $\leq 4 \text{ mm}^2$ )	1 x	2.5 ... 10 mm <sup>2</sup>
		stranded ( $\geq 6 \text{ mm}^2$ )	2 x	2.5 ... 10 mm <sup>2</sup>
	Flexible with non insulated ferrule		1 x	1.5 ... 10 mm <sup>2</sup>
			2 x	1.5 ... 10 mm <sup>2</sup>
	Flexible with insulated ferrule		1 x	1.5 ... 10 mm <sup>2</sup>
			2 x	1.5 ... 4 mm <sup>2</sup>
	Bars or lugs		L <	12.5 mm

Capacity according to UL/CSA 1 or 2 x AWG 14 ... 8

Stripping length 14 mm

#### Auxiliary conductors

(built-in auxiliary terminals + coil terminals)

	Rigid solid		1 x	1 ... 2.5 mm <sup>2</sup>
			2 x	1 ... 2.5 mm <sup>2</sup>
	Flexible with non insulated ferrule		1 x	0.75 ... 2.5 mm <sup>2</sup>
			2 x	0.75 ... 2.5 mm <sup>2</sup>
	Flexible with insulated ferrule		1 x	0.75 ... 2.5 mm <sup>2</sup>
			2 x	0.75 ... 1.5 mm <sup>2</sup>
	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

Built-in auxiliary terminals

### Screw terminals

(delivered in open position, screws of unused terminals must be tightened)

Main terminals M4

Coil terminals M3.5

Built-in auxiliary terminals

### Screwdriver type

Flat  $\varnothing 5.5$  / Pozidriv 2

### Tightening torque

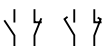
Main pole terminals 2.5 Nm / 22 lb.in

Coil terminals 1.2 Nm / 11 lb.in

Built-in auxiliary terminals

## Main Accessories

### Ordering Details

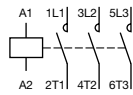
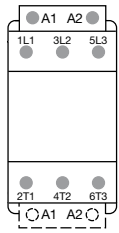
Description	Auxiliary contacts 	Type	Order code	EAN	Pack <sup>(ing)</sup> piece	Weight	
						kg (1 pce)	
<b>Additional auxiliary contact blocks</b>	Front-mounted instantaneous auxiliary contact blocks	0 1 - -	CA4-01	1SBN 010 110 R1001	3471523130029	1	0.014
		1 0 - -	CA4-10	1SBN 010 110 R1010	3471523130005	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	
<b>Interlocks</b>	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
<b>Connection accessories for starting</b>	Connecting links with manual motor starters		BEA26-4	1SBN 082 306 T1000	3471523130746	10	0.025
			BEA38-4	1SBN 082 306 T2000	3471523130753	10	0.030
	Connection sets for reversing contactors		BER38-4	1SBN 082 311 R1000	3471523130784	1	0.100
<b>Additional coil terminal block</b>	Additional coil terminal block		LDC4	1SBN 070 156 T1000	3471523130678	10	0.010
<b>Protective covers</b>	Protective covers		BX4	1SBN 110 108 T1000	3471523130708	10	0.006
			BX4-CA	1SBN 110 109 W1000	3471523130715	50	0.001
<b>Function markers</b>	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.
- 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

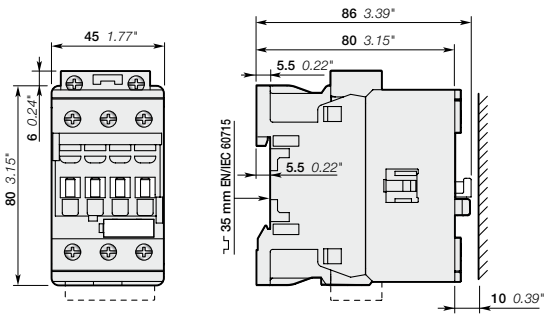
Standard devices without addition of auxiliary contacts



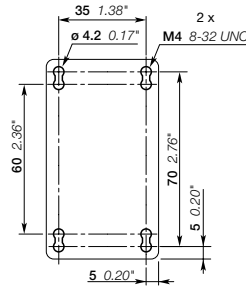
AF38-30-00.. / AF38Z-30-00..

AF38-30-00.. / AF38Z-30-00..

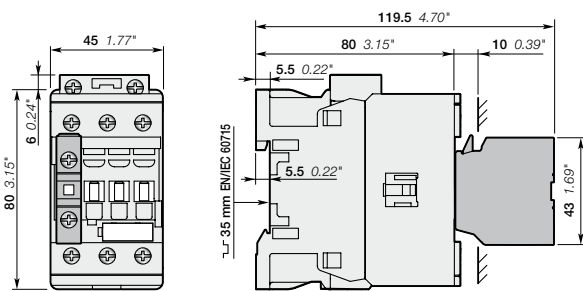
## Dimensions mm, inches



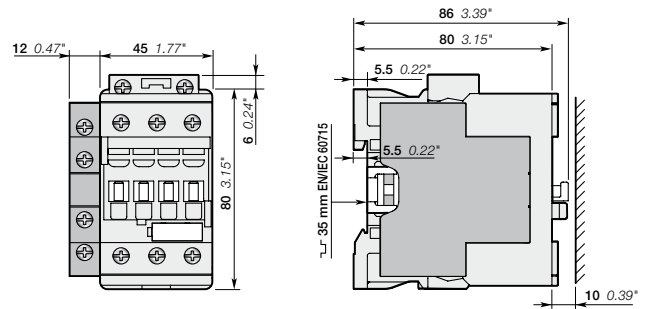
AF38



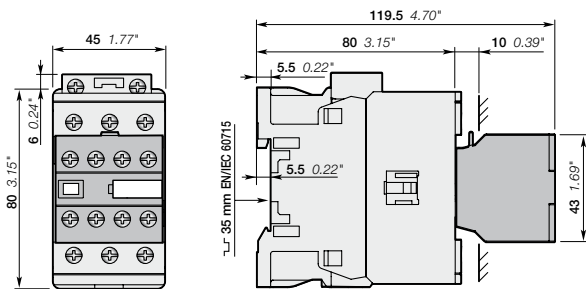
AF38



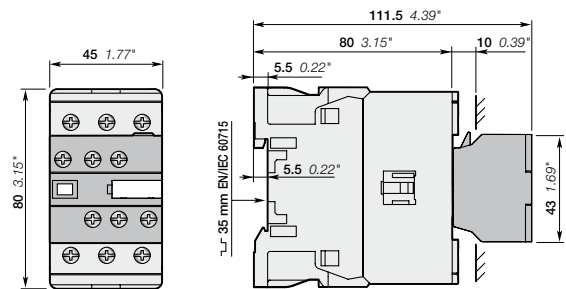
AF38  
+ CA4, CC4 1-pole auxiliary contact block



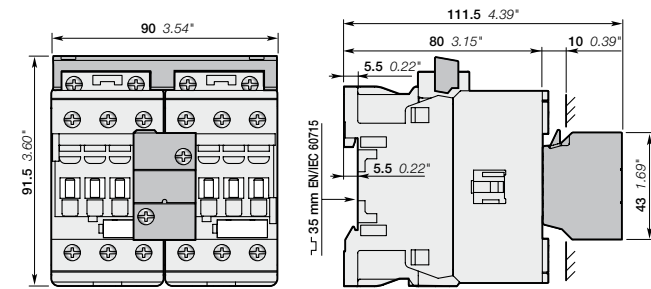
AF38  
+ CAL4-11 2-pole auxiliary contact block



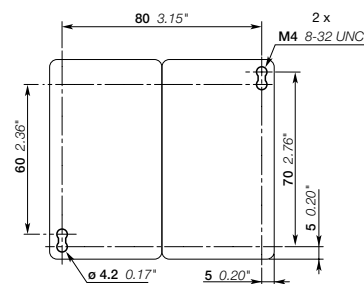
AF38  
+ CA4 4-pole auxiliary contact block



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



AF38  
+ VEM4 mechanical and electrical interlock set



AF38  
+ 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**

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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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