

# AF09Z ... AF38Z 3-pole contactors

## 4 to 18.5 kW

### 24 V DC operated - low consumption



AF09Z-30-10

1SBC101525V0014



AF26Z-30-00

1SBC101525V0014

#### Description

AF09Z ... AF38Z contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC. These contactors are of the block type design with 3 main poles.

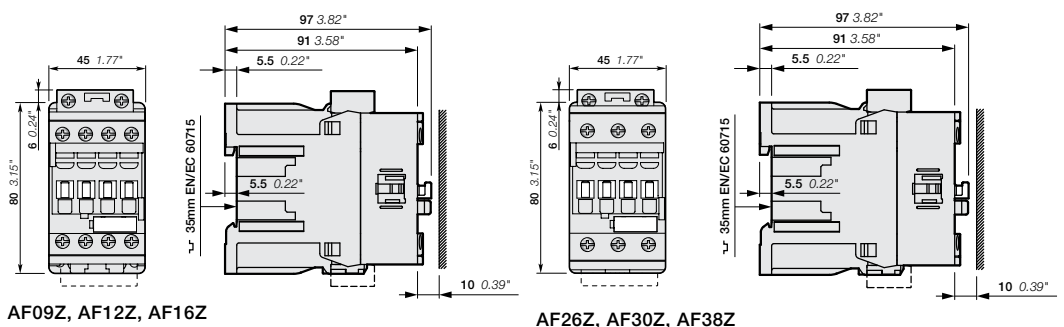
- control circuit: DC operated with electronic coil interface allowing low holding consumption up to 1.7 W and reduced panel energy consumption
- allow direct control by PLC-output  $\geq 250$  mA 24 V DC
- very distinct closing and opening
- built-in surge suppression
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

#### Ordering details

IEC		UL/CSA		Rated control circuit voltage Uc	Auxiliary contacts fitted	Type	Order code	Weight
Rated operational power	current $\theta \leq 40$ °C	3-phase motor rating 480 V	General use rating 600 V AC					
400 V AC-3 kW	AC-1 A	hp	A	V DC				kg
4	25	5	25	24	1 0	AF09Z-30-10-30	1SBL136001R3010	0.430
					0 1	AF09Z-30-01-30	1SBL136001R3001	0.430
5.5	28	7.5	28	24	1 0	AF12Z-30-10-30	1SBL156001R3010	0.430
					0 1	AF12Z-30-01-30	1SBL156001R3001	0.430
7.5	30	10	30	24	1 0	AF16Z-30-10-30	1SBL176001R3010	0.430
					0 1	AF16Z-30-01-30	1SBL176001R3001	0.430
11	45	15	45	24	0 0	AF26Z-30-00-30	1SBL236001R3000	0.480
15	50	20	50	24	0 0	AF30Z-30-00-30	1SBL276001R3000	0.480
18.5	50	25	50	24	0 0	AF38Z-30-00-30	1SBL296001R3000	0.480

AF, Z contactors with 24 V DC control voltage need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.

#### Main dimensions mm, inches

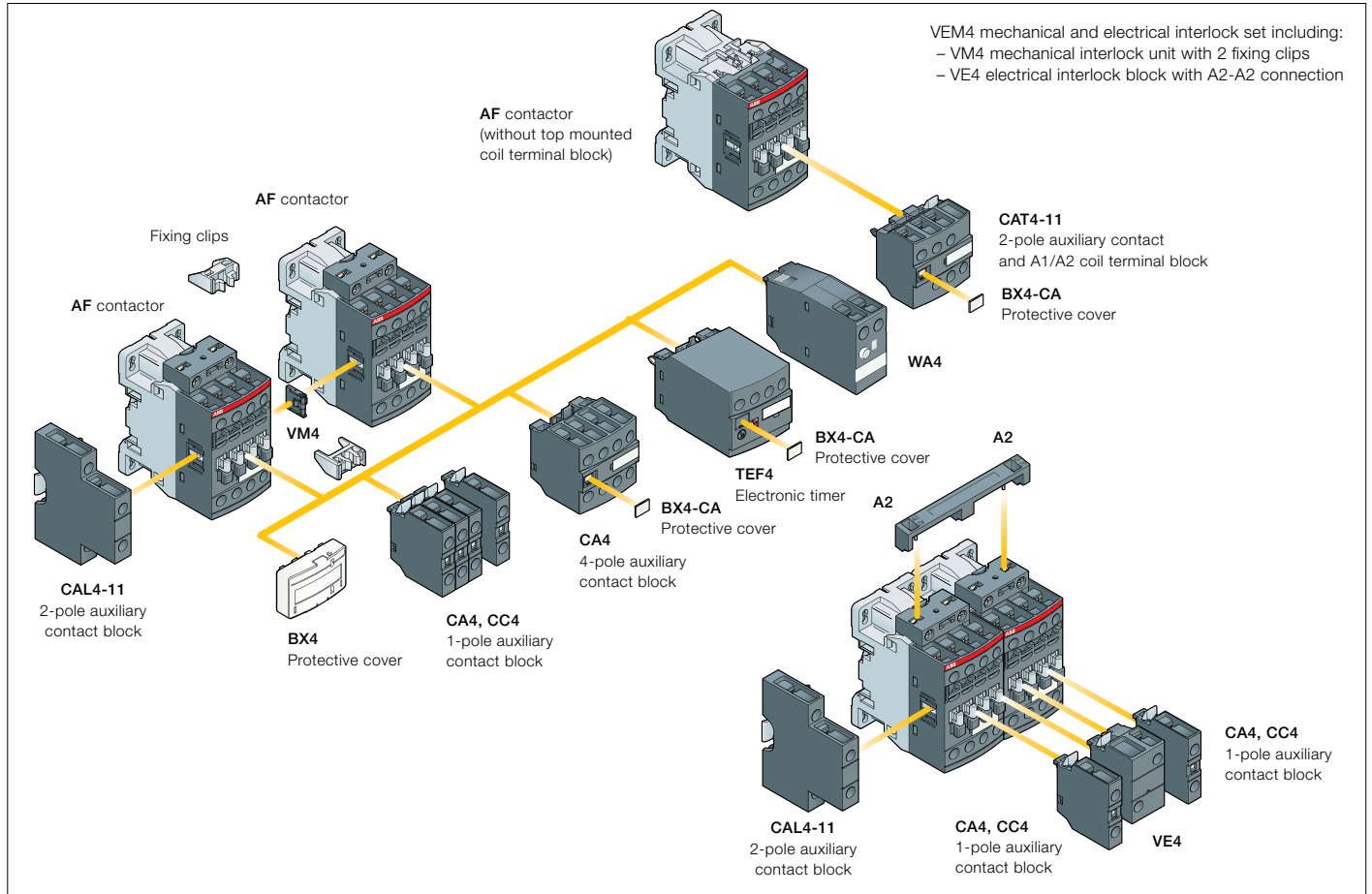


1SBC100328S0201

# AF09 ... AF96 3-pole contactors

## Main accessories

### Contactor and main accessories (other accessories available)



### Main accessory fitting details

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			Electronic timer	Mechanical latching unit	Electrical and mechanical interlock set (between 2 contactors)	Auxiliary contact blocks	
			1-pole CA4	2-pole CAT4-11	4-pole CA4	TEF4 (3)	WA4 (1) (3)	VEM4	Left side	Right side
			1-pole CC4 (3)						2-pole CAL4-11	
Max. N.C. built-in and 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										
AF09 ... AF16	3 0	0 1	4 max.	or 1	or 1	or 1	or 1	-	+ 1	-
AF09 ... AF16	3 0	1 0	2 max.	or 1	-	or 1	or 1	-	+ 1	+ 1
AF26 ... AF38	3 0	0 0	3 max.	-	-	-	-	+ 1	+ 1	or 1
Max. add-on N.C. auxiliary contacts: 6 N.C. max. on positions 1, 1 ±30°, 2, 3, 4, 5										
AF40 ... AF65	3 0	0 0	4 max.	or 1	or 1	or 1	or 1	-	+ 1	+ 1
AF80, AF96	3 0	0 0	4 max.	-	or 1	or 1	or 1	-	+ 1	+ 1
AF09Z ... AF38Z 24 V DC (coil 30) Max. N.C. built-in and 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										
AF09Z ... AF16Z	3 0	0 1	4 max.	-	or 1	-	-	-	or 1	+ 1
AF09Z ... AF16Z	3 0	1 0	2 max.	-	-	-	-	-	+ 1	+ 1
AF26Z ... AF38Z	3 0	0 0								

### Overload relays fitting details (2)

Contactor types	Thermal overload relays	Electronic overload relays
AF09 ... AF38	TF42 (0.10...38 A)	EF19 (0.10...19 A)
AF26 ... AF38	TF42 (0.10...38 A)	EF45 (9...45 A)
AF40 ... AF65	TF65 (22...67 A)	EF65 (20...70 A)
AF80, AF96	TF96 (40...96 A)	EF96 (36...100 A)

The addition of an overload relay on the contactor does not prevent fitting of many other accessories as shown above.

(1) accept 1-pole CA4 auxiliary contacts (1 block on each side of the mechanical latch) in respect to the total number of built-in or additional N.C. auxiliary contacts

(2) Direct mounting - No kit required.

(3) For CC4, CE5, WA4, TEF4 accessory use with contactors coil 30, please consult your ABB local sales organization.

# AF09 ... AF96 3-pole contactors

## Main accessories



CA4-10



CAL4-11



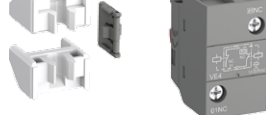
CA4-22E



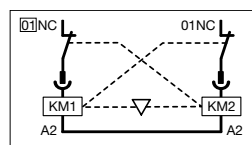
CAT4-11E



VM4



VE4



TEF4-ON



WA4-13

### Ordering details (1)

For contactors	Auxiliary contacts	Type	Order code	Pkg qty	Weight (1 pce)
					kg

#### Front-mounted instantaneous auxiliary contact blocks

AF09 ... AF96	1 0	- -	CA4-10	1SBN010110R1010	1	0.014
	1 0	- -	CA4-10-T	1SBN010110T1010	10	0.014
	0 1	- -	CA4-01	1SBN010110R1001	1	0.014
	0 1	- -	CA4-01-T	1SBN010110T1001	10	0.014
AF09 ... AF16...-30-10	2 2	- -	CA4-22M	1SBN010140R1122	1	0.055
AF26 ... AF96...-30-00	2 2	- -	CA4-22E	1SBN010140R1022	1	0.055
AF09 ... AF16...-30-01	2 2	- -	CA4-22U	1SBN010140R1322	1	0.055

#### Front-mounted auxiliary contact blocks with N.O. leading contact and N.C. lagging contact (2)

AF09 ... AF96	- -	1 0	CC4-10	1SBN010111R1010	1	0.014
	- -	0 1	CC4-01	1SBN010111R1001	1	0.014

#### Side-mounted instantaneous auxiliary contact blocks

AF09 ... AF96	1 1	- -	CAL4-11	1SBN010120R1011	1	0.040
	1 1	- -	CAL4-11-T	1SBN010120T1011	10	0.040

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

AF09 ... AF16...-30-10	1 1	- -	CAT4-11M	1SBN010151R1111	1	0.040
AF26 ... AF65...-30-00	1 1	- -	CAT4-11E	1SBN010151R1011	1	0.040
AF09 ... AF16...-30-01	1 1	- -	CAT4-11U	1SBN010151R1311	1	0.040

Note: CAT4 not suitable for AF..Z contactors with DC control voltages 12...20 V DC (coil 20) and 24 V DC (coil 30).

#### Mechanical interlock unit

AF09 ... AF38			VM4	1SBN030105T1000	10	0.005
AF40 ... AF96			VM96-4	1SBN033405T1000	10	0.006

Note: VM4 and VM96-4 include 2 fixing clips (BB4) to maintain together both contactors.

#### Mechanical and electrical interlock set

AF09 ... AF16	0 2	- -	VE4	1SBN030111R1000	1	0.035
AF26 ... AF38						

Note: - VE4 includes a VM4 mechanical interlock unit with 2 fixing clips (BB4), a VE4 electrical interlock block. VE4 block must be used with A2-A2 connection to respect the electrical connection diagram.  
- VE4 not suitable for AF..Z contactors with DC control voltages 12...20 V DC (coil 20) and 24 V DC (coil 30).

For contactors	Time delay range selected by switch	Delay type	Auxiliary contacts	Type	Order code	Pkg qty	Weight (1 pce)
							kg

#### Electronic timers (2)

AF09 ... AF96	0.1...1 s	ON-delay	1 1	TEF4-ON	1SBN020112R1000	1	0.065
	1...10 s						
	10...100 s	OFF-delay	1 1	TEF4-OFF	1SBN020114R1000	1	0.065

Note: Rated control circuit voltage Uc 24...240 V 50/60 Hz or DC.

#### Mechanical latching unit (2)

AF09 ... AF65			WA4-13	1SBN040100R1013	1	0.080
AF80, AF96			WA4-96-13	1SBN040200R1013	1	0.080

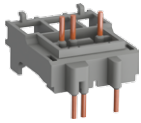
Note: coil 13 for Uc 100...250 V 50/60 Hz or DC. For other rated control circuit voltages between 24...500 V 50/60 Hz / DC or 24 V DC - 500 mA PLC control, refer to main catalog "Accessories" section.

(1) For more information, refer to main catalog "Accessories" section.

(2) For CC4, CE5, WA4, TEF4 accessory use with contactors coil 30, please consult your ABB local sales organization.

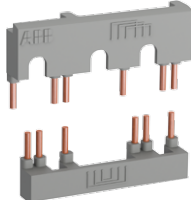
# AF09 ... AF96 3-pole contactors

## Main accessories



BEA16-4

1SBC100014V0014



BER16-4

1SBC100016V0014

### Ordering details (1)

For contactors	Type	Order code	Pkg qty	Weight (1 pce)
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#### Connecting links with manual motor starters

AF09 ... AF16	with MS116-0.16 ... MS116-25 MS132-0.16 ... MS132-25	BEA16-4	1SBN081306T1000	10	0.025
AF26 ... AF38	with MS116-0.16 ... MS116-16 MS132-0.16 ... MS132-10	BEA26-4	1SBN082306T1000	10	0.025
	with MS116-20 ... MS116-32 MS132-12 ... MS132-32	BEA38-4	1SBN082306T2000	10	0.030
AF40 ... AF65	with MS165-16 ... MS165-65	BEA65-4	1SBN083406R1000	1	0.090
	MS165-16 ... MS165-65 (1)	BPR65-4	1SBN113405R1000	1	0.014

Note: (1) Applicable for MS165 manufactured after week 31, 2016 (date code > 16214). Use one BPR65-4 for each contactor AF40 ... AF65.

#### Connection sets for reversing contactors

AF09 ... AF16	BER16-4	1SBN081311R1000	1	0.045
AF26 ... AF38	BER38-4	1SBN082311R1000	1	0.100
AF40 ... AF65	BER65-4	1SBN083411R1000	1	0.175
AF80 ... AF96	BER96-4	1SBN083911R1000	1	0.250

#### Connection sets for star-delta starting

AF09 ... AF16	With or without VM4	BEY16-4	1SBN081313R2000	1	0.050
AF26 ... AF38	With or without VM4	BEY38-4	1SBN082713R2000	1	0.110
AF40 ... AF65	With or without VM96-4	BEY65-4	1SBN083413R2000	1	0.200
AF80 ... AF96	With or without VM96-4	BEY96-4	1SBN083913R2000	1	0.250

# AF09 ... AF38 3-pole contactors

## Technical data

### Main pole - Utilization characteristics according to IEC

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1					
Rated operational voltage $U_e$ max.		690 V					
Rated frequency (without derating)		50 / 60 Hz					
Conventional free-air thermal current $I_{th}$							
acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$		35 A	35 A	35 A	50 A	50 A	50 A
With conductor cross-sectional area		6 mm <sup>2</sup>	6 mm <sup>2</sup>	6 mm <sup>2</sup>	10 mm <sup>2</sup>	10 mm <sup>2</sup>	10 mm <sup>2</sup>
<b>AC-1 Utilization category</b>							
For air temperature close to contactor							
<b><math>I_e</math> / Rated operational current AC-1</b>	$\theta \leq 40^\circ\text{C}$	25 A	28 A	30 A	45 A	50 A	50 A
$U_e$ max. $\leq 690$ V, 50/60 Hz	$\theta \leq 60^\circ\text{C}$	25 A	28 A	30 A	40 A	42 A	42 A
	$\theta \leq 70^\circ\text{C}$	22 A	24 A	26 A	32 A	37 A	37 A
With conductor cross-sectional area		4 mm <sup>2</sup>	6 mm <sup>2</sup>	6 mm <sup>2</sup>	10 mm <sup>2</sup>	10 mm <sup>2</sup>	10 mm <sup>2</sup>
<b>AC-3 Utilization category</b>							
For air temperature close to contactor $\theta \leq 60^\circ\text{C}$							
<b><math>I_e</math> / Max. rated operational current AC-3 (1)</b>							
	220-230-240 V	9 A	12 A	18 A	26 A	33 A	40 A
	380-400 V	9 A	12 A	18 A	26 A	32 A	38 A
	415 V	9 A	12 A	18 A	26 A	32 A	38 A
	440 V	9 A	12 A	18 A	26 A	32 A	38 A
	500 V	9.5 A	12.5 A	15 A	23 A	28 A	33 A
	690 V	7 A	9 A	10.5 A	17 A	21 A	24 A
<b>Rated operational power AC-3 (1)</b>							
	220-230-240 V	2.2 kW	3 kW	4 kW	6.5 kW	9 kW	11 kW
	380-400 V	4 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW
	415 V	4 kW	5.5 kW	9 kW	11 kW	15 kW	18.5 kW
	440 V	4 kW	5.5 kW	9 kW	15 kW	18.5 kW	22 kW
	500 V	5.5 kW	7.5 kW	9 kW	15 kW	18.5 kW	22 kW
	690 V	5.5 kW	7.5 kW	9 kW	15 kW	18.5 kW	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 V 50/60 Hz - $\theta \leq 40^\circ\text{C}$ )							
<b><math>I_e</math> / Rated operational current AC-8a</b>		12 A	16 A	22 A	30 A	40 A	50 A
<b>Rated operational power AC-8a</b>		5.5 kW	7.5 kW	11 kW	15 kW	20 kW	25 kW
<b>Short-circuit protection device for contactors</b>							
without thermal overload relay - Motor protection excluded (2)							
$U_e \leq 500$ V AC - gG type fuse		25 A	32 A	32 A	50 A	63 A	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							
	1 s	300 A	300 A	300 A	700 A	700 A	700 A
	10 s	150 A	150 A	150 A	350 A	350 A	350 A
	30 s	80 A	80 A	80 A	225 A	225 A	225 A
	1 min	60 A	60 A	60 A	150 A	150 A	150 A
	15 min	35 A	35 A	35 A	50 A	50 A	50 A
<b>Maximum breaking capacity</b>							
$\cos \varphi = 0.45$							
	at 440 V	250 A	250 A	250 A	500 A	500 A	500 A
	at 690 V	106 A	106 A	106 A	200 A	200 A	200 A
<b>Power dissipation per pole</b>							
	$I_e$ / AC-1	0.8 W	1 W	1.2 W	1.8 W	2.4 W	2.4 W
	$I_e$ / AC-3	0.1 W	0.2 W	0.35 W	0.6 W	0.9 W	1.3 W
<b>Max. electrical switching frequency</b>							
	AC-1	600 cycles/h					
	AC-3	1200 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-phase motors



1500 r.p.m. 50 Hz  
1800 r.p.m. 60 Hz  
3-phase motors

# AF09 ... AF38 3-pole contactors

## Technical data

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

Contactors types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Standards		UL 508, CSA C22.2 N°60947-4-1					
Max. operational voltage		600 V					
NEMA size		00	0	-	1	-	-
NEMA continuous amp rating	Thermal current	9 A	18 A		27 A		
NEMA maximum horse power ratings							
1-phase, 60 Hz	115 V AC	1/3 hp	1 hp		2 hp		
	230 V AC	1 hp	2 hp		3 hp		
NEMA maximum horse power ratings							
3-phase, 60 Hz	200 V AC	1-1/2 hp	3 hp		7-1/2 hp		
	230 V AC	1-1/2 hp	3 hp		7-1/2 hp		
	460 V AC	2 hp	5 hp		10 hp		
	575 V AC	2 hp	5 hp		10 hp		
UL / CSA general use rating							
	600 V AC	25 A	28 A	30 A	45 A	50 A	50 A
With conductor cross-sectional area		AWG 10	AWG 10	AWG 10	AWG 8	AWG 8	AWG 8
1 pole	80 V DC	25 A	28 A	30 A	45 A	50 A	50 A
2 poles in serie	160 V DC	25 A	28 A	30 A	45 A	50 A	50 A
3 poles in serie	240 V DC	25 A	28 A	30 A	45 A	50 A	50 A
With conductor cross-sectional area		AWG 10	AWG 10	AWG 10	AWG 8	AWG 8	AWG 8
UL / CSA maximum 1-phase motor rating							
Full load current	120 V AC	13.8 A	16 A	20 A	24 A	24 A	24 A
	240 V AC	10 A	12 A	17 A	17 A	28 A	28 A
Horse power rating	120 V AC	3/4 hp	1 hp	1-1/2 hp	2 hp	2 hp	2 hp
	240 V AC	1-1/2 hp	2 hp	3 hp	3 hp	5 hp	5 hp
UL / CSA maximum 3-phase motor rating							
Full load current (1)	200-208 V AC	7.8 A	11 A	17.5 A	25.3 A	32.2 A	32.2 A
	220-240 V AC	6.8 A	9.6 A	15.2 A	22 A	28 A	28 A
	440-480 V AC	7.6 A	11 A	14 A	21 A	27 A	34 A (3)
	550-600 V AC	9 A	11 A	17 A	22 A	27 A (2)	32 A (3)
Horse power rating (1)	200-208 V AC	2 hp	3 hp	5 hp	7-1/2 hp	10 hp	10 hp
	220-240 V AC	2 hp	3 hp	5 hp	7-1/2 hp	10 hp	10 hp
	440-480 V AC	5 hp	7-1/2 hp	10 hp	15 hp	20 hp	25 hp (3)
	550-600 V AC	7-1/2 hp	10 hp	15 hp	20 hp	25 hp (2)	30 hp (3)
UL / CSA - DC motor starting - 3 poles in series							
Full Load Amps (FLA)	125 V DC	9.5 A	13.2 A	17 A	25 A	25 A	25 A
	250 V DC	8.5 A	12.2 A	12.2 A	20 A	29 A	29 A
Horse power rating	125 V DC	1 hp	1-1/2 hp	2 hp	3 hp	3 hp	3 hp
	250 V DC	2 hp	3 hp	3 hp	5 hp	7-1/2 hp	7-1/2 hp
Short-circuit protection device for contactors							
without thermal overload relay - Motor protection excluded							
High fault current		100 kA					
Fuse rating		30 A	30 A	60 A	60 A	100 A	100 A
Fuse type, 600 V		J					
Max. electrical switching frequency							
For general use		600 cycles/h					
For motor use		1200 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 contactors produced since week 49-2011.

(3) For contactors produced since week 36-2014.

# AF09 ... AF96 3-pole contactors

## Technical data

### Main pole utilization characteristics - 3 N.O. non-reversing contactors

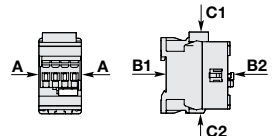
Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38	AF40	AF52	AF65	AF80	AF96
<b>HVAC application - UL / CSA</b>												
<b>Definite purpose heating rating - 3-phase</b>												
Full Load Amps (FLA)		20 A	25 A	30 A	45 A	50 A	50 A	60 A	80 A	90 A	105 A	115 A
Locked Rotor Amps (LRA)	<b>200-208 V AC</b>	120 A	150 A	180 A	270 A	300 A	300 A	360 A	480 A	540 A	630 A	690 A
	<b>220-240 V AC</b>	120 A	150 A	180 A	270 A	300 A	300 A	360 A	480 A	540 A	630 A	690 A
	<b>440-480 V AC</b>	120 A	150 A	180 A	270 A	300 A	300 A	360 A	480 A	540 A	630 A	690 A
	<b>550-600 V AC</b>	80 A	100 A	120 A	180 A	200 A	200 A	240 A	320 A	360 A	420 A	460 A
<b>Definite purpose air conditioning rating - 3-phase</b>												
Full Load Amps (FLA)		20 A	25 A	30 A	45 A	50 A	50 A	60 A	80 A	90 A	105 A	115 A
Locked Rotor Amps (LRA)	<b>200-208 V AC</b>	120 A	150 A	180 A	270 A	300 A	300 A	360 A	480 A	540 A	630 A	690 A
	<b>220-240 V AC</b>	120 A	150 A	180 A	270 A	300 A	300 A	360 A	480 A	540 A	630 A	690 A
	<b>440-480 V AC</b>	120 A	150 A	180 A	270 A	300 A	300 A	360 A	480 A	540 A	630 A	690 A
	<b>550-600 V AC</b>	80 A	100 A	120 A	180 A	200 A	200 A	240 A	320 A	360 A	420 A	460 A
<b>AC Resistance air heating</b>												
Full Load Amps (FLA)	<b>600 V AC</b>	20 A	25 A	30 A	45 A	50 A	50 A	65 A	80 A	90 A	105 A	115 A
<b>Elevator control, load switching, 500 000 electrical operating cycles</b>												
acc. to CSA B44.1 / ASME 17.5 paragraph 19.2.1												
<b>1-phase</b>												
Horse power rating	<b>110-120 V AC</b>	1/4 hp	1/3 hp	(1)	1-1/2 hp	2 hp	2 hp	3 hp	3 hp	3 hp	5 hp	5 hp
	<b>220-240 V AC</b>	1/2 hp	3/4 hp	(1)	3 hp	3 hp	5 hp	5 hp	7-1/2 hp	10 hp	10 hp	10 hp
<b>3-phase</b>												
Horse power rating	<b>200-208 V AC</b>	1 hp	2 hp	(1)	5 hp	7-1/2 hp	7-1/2 hp	10 hp	10 hp	15 hp	15 hp	15 hp
	<b>220-240 V AC</b>	1 hp	2 hp	(1)	5 hp	7-1/2 hp	10 hp	10 hp	15 hp	20 hp	20 hp	20 hp
	<b>440-480 V AC</b>	3 hp	5 hp	(1)	15 hp	20 hp	20 hp	25 hp	30 hp	40 hp	40 hp	40 hp
	<b>550-600 V AC</b>	3 hp	5 hp	(1)	15 hp	20 hp	20 hp	30 hp	40 hp	40 hp	50 hp	50 hp
<b>Elevator control, 500 000 mechanical operating cycles, 5 electrical operating cycles</b>												
acc. to CSA B44.1 / ASME 17.5 paragraph 19.2.2												
<b>1-phase</b>												
Horse power rating	<b>110-120 V AC</b>	3/4 hp	1 hp	1-1/2 hp	2 hp	2 hp	3 hp	3 hp	3 hp	5 hp	7-1/2 hp	7-1/2 hp
	<b>220-240 V AC</b>	1-1/2 hp	2 hp	3 hp	3 hp	5 hp	7.5 hp	7-1/2 hp	7-1/2 hp	10 hp	15 hp	20 hp
<b>3-phase</b>												
Horse power rating	<b>200-208 V AC</b>	2 hp	3 hp	5 hp	7-1/2 hp	10 hp	10 hp	10 hp	15 hp	20 hp	25 hp	30 hp
	<b>220-240 V AC</b>	2 hp	3 hp	5 hp	7-1/2 hp	10 hp	10 hp	15 hp	20 hp	25 hp	30 hp	30 hp
	<b>440-480 V AC</b>	5 hp	7-1/2 hp	10 hp	15 hp	20 hp	25 hp	30 hp	40 hp	50 hp	60 hp	60 hp
	<b>550-600 V AC</b>	7-1/2 hp	10 hp	15 hp	20 hp	25 hp	30 hp	40 hp	50 hp	60 hp	75 hp	75 hp
<b>Lighting application - UL / CSA</b>												
<b>Tungsten lamps</b>												
1-phase per pole	<b>347 V AC</b>	20 A	25 A	30 A	45 A	50 A	50 A	65 A	80 A	90 A	105 A	115 A
3-phase break all lines	<b>600 V AC</b>	20 A	25 A	30 A	45 A	50 A	50 A	65 A	80 A	90 A	105 A	115 A
<b>Electrical discharge lamps (ballast)</b>												
1-phase per pole	<b>347 V AC</b>	20 A	25 A	30 A	45 A	50 A	50 A	65 A	80 A	90 A	105 A	115 A
3-phase break all lines	<b>600 V AC</b>	20 A	25 A	30 A	45 A	50 A	50 A	65 A	80 A	90 A	105 A	115 A

(1) 3-pole AF16 cannot be used. Select 4-pole non-reversing contactor AF16.-40.-.

# AF09 ... AF96 3-pole contactors

## Technical data

### General technical data

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
<b>Rated insulation voltage Ui</b> acc. to IEC 60947-4-1 acc. to UL / CSA		690 V 600 V					
<b>Rated impulse withstand voltage Uimp.</b>		6 kV					
<b>Electromagnetic compatibility</b>		Devices complying with IEC 60947-1 / EN 60947-1 - Environment A and B (1)					
<b>Ambient air temperature close to contactor</b>							
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>Maximum operating altitude (without derating)</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. to 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, closed or open 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> acc. to IEC 60068-2-6		5...300 Hz					
		4 g closed position / 2 g open position					

(1) Environment B: all AF09 ... AF38 contactors produced since week 08-2013. AF09 ... AF38-...-12 (48...130 V 50/60 Hz-DC) compliant to environment A only.  
For environment B: select AF09 ... AF38-...-22.

### Magnet system characteristics

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
<b>Coil operating limits</b> acc. to IEC 60947-4-1	<b>AC supply</b>	At $\theta \leq 60$ °C $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$ . At $\theta \leq 70$ °C $0.85 \times U_c \text{ min} \dots U_c \text{ max}$ .					
	<b>DC supply</b>	At $\theta \leq 60$ °C $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$ . - (AF..Z coil 30) $0.85 \dots 1.1 U_c$ At $\theta \leq 70$ °C (AF) $0.85 \times U_c \text{ min} \dots U_c \text{ max}$ . - (AF..Z coil 20, 21 22, 23) $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$ . (AF..Z coil 30) $U_c$					
<b>AC control voltage 50/60 Hz</b>		24...500 V AC					
Rated control circuit voltage $U_c$	<b>Average pull-in value</b>	(AF) 50 VA - (AF..Z coil 21, 22, 23) 16 VA					
Coil consumption	<b>Average holding value</b>	(AF) 2.2 VA / 2 W - (AF..Z coil 21, 22, 23) 1.7 VA / 1.5 W					
<b>DC control voltage</b>		12...500 V DC					
Rated control circuit voltage $U_c$	<b>Average pull-in value</b>	(AF) 50 W - (AF..Z coil 20, 21, 22, 23) 12...16 W - (AF..Z coil 30) 6 W					
Coil consumption	<b>Average holding value</b>	(AF) 2 W - (AF..Z) 1.7 W					
<b>PLC-output control</b>		(AF..Z coil 30) $\geq 250$ mA 24 V DC for PLCs and safety PLCs using broken wire detection (AF..Z coil 21) $\geq 500$ mA 24 V DC for PLCs					
<b>Drop-out voltage</b>		$\leq 60$ % of $U_c \text{ min}$ .					
<b>Voltage sag immunity</b> acc. to SEMI F47-0706		(AF..Z coil 21, 22, 23) conditions of use on request					
<b>Dips withstand</b> $-20$ °C $\leq \theta \leq +60$ °C		(AF..Z coil 21, 22, 23) 22 ms average for $U_c \geq 24$ V 50/60 Hz or $U_c \geq 20$ V DC					
<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					
<b>Operating time AF..Z coil 30 - 24 V DC</b>							
Between coil energization and:	<b>N.O. contact closing</b>	27 ... 53 ms					
	<b>N.C. contact opening</b>	20 ... 35 ms					
Between coil de-energization and:	<b>N.O. contact opening</b>	17 ... 29 ms					
	<b>N.C. contact closing</b>	22 ... 57 ms					



# AF09 ... AF38 3-pole contactors

## Technical data

### Mounting characteristics and conditions for use

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Mounting positions							
Mounting distances		Max. N.C. built-in and add-on N.C. auxiliary contacts: see accessory fitting details for a 3-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					

5

### Connecting characteristics

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38
Main terminals		<p>Screw terminals with cable clamp</p>					
Connection capacity (min. ... max.)							
<b>Main conductors (poles)</b>							
Rigid Solid ( $\leq 4 \text{ mm}^2$ )	} 1 x	1..6 mm <sup>2</sup>				2.5...10 mm <sup>2</sup>	
Stranded ( $\geq 6 \text{ mm}^2$ )		2 x 1..6 mm <sup>2</sup>				2.5...10 mm <sup>2</sup>	
Flexible with non insulated ferrule	1 x	0.75...6 mm <sup>2</sup>				1.5...10 mm <sup>2</sup>	
Flexible with insulated ferrule	2 x	0.75...6 mm <sup>2</sup>				1.5...10 mm <sup>2</sup>	
Flexible with insulated ferrule	1 x	0.75...4 mm <sup>2</sup>				1.5...10 mm <sup>2</sup>	
Flexible with insulated ferrule	2 x	0.75...2.5 mm <sup>2</sup>				1.5...4 mm <sup>2</sup>	
Bars or lugs	L <	9.6 mm				12.5 mm	
Connection capacity acc. to UL/CSA	1 or 2 x	AWG 16...10				AWG 14...8	
Stripping length		10 mm				14 mm	
Tightening torque		1.5 Nm / 13 lb.in				2.5 Nm / 22 lb.in	
<b>Auxiliary conductors</b>							
(built-in auxiliary terminals + coil terminals)							
Rigid solid	} 1 x	1...2.5 mm <sup>2</sup>					
Rigid solid		2 x 1...2.5 mm <sup>2</sup>					
Flexible with non insulated ferrule	1 x	0.75...2.5 mm <sup>2</sup>					
Flexible with non insulated ferrule	2 x	0.75...2.5 mm <sup>2</sup>					
Flexible with insulated ferrule	1 x	0.75...2.5 mm <sup>2</sup>					
Flexible with insulated ferrule	2 x	0.75...1.5 mm <sup>2</sup>					
Lugs	L <	8 mm					
Connection capacity acc. to UL/CSA	1 or 2 x	AWG 18...14					
Stripping length		10 mm					
Tightening torque							
Coil terminals		1.2 Nm / 11 lb.in					
Built-in auxiliary terminals		1.2 Nm / 11 lb.in					
<b>Degree of protection</b>		acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529					
Main terminals		IP20					
Coil terminals		IP20					
Built-in auxiliary terminals		IP20					
<b>Screw terminals</b>		Delivered in open position, screws of unused terminals must be tightened					
Main terminals		M3.5				M4	
	Screwdriver type	Flat Ø 5.5 / Pozidriv 2				Flat Ø 6.5 / Pozidriv 2	
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					

# AF09 ... AF96 3-pole contactors

## Technical data

### Built-in auxiliary contacts according to IEC

Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38	AF40	AF52	AF65	AF80	AF96
Rated operational voltage U <sub>e</sub> max.		690 V										
Rated frequency (without derating)		50 / 60 Hz										
Conventional free air thermal current I <sub>th</sub> - θ ≤ 40 °C		16 A										
le / Rated operational current AC-15		16 A										
acc. to IEC 60947-5-1		16 A										
	24-127 V 50/60 Hz	6 A										
	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 AC-15		10 x I <sub>e</sub> AC-15 acc. to IEC 60947-5-1										
Breaking capacity AC-15		10 x I <sub>e</sub> AC-15 acc. to IEC 60947-5-1										
le / Rated operational current DC-13		16 A										
acc. to IEC 60947-5-1		16 A										
	24 V DC	6 A / 144 W										
	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 device gG type fuse		10 A										
Rated short-time withstand current I <sub>cw</sub>	for 1.0 s	100 A										
	for 0.1 s	140 A										
Minimum switching capacity		12 V / 3 mA										
with failure rate acc. to IEC 60947-5-4		10 <sup>-7</sup>										
Non-overlapping time between N.O. and N.C. contacts		≥ 2 ms										
Power dissipation per pole at 6 A		0.1 W										
Max. electrical switching frequency	AC-15	1200 cycles/h										
	DC-13	900 cycles/h										
Mechanically linked contacts		Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts (CA4, CAL4, CAT4 aux. contact blocks) are mechanically linked contacts.										
acc. to annex L of IEC 60947-5-1												
Mirror contacts		Built-in N.C. auxiliary contacts or additional N.C. auxiliary contacts (CA4, CAL4, CAT4 aux. contact blocks) are mirror contacts.										
acc. to annex F of IEC 60947-4-1												

### Built-in auxiliary contacts according to UL / CSA

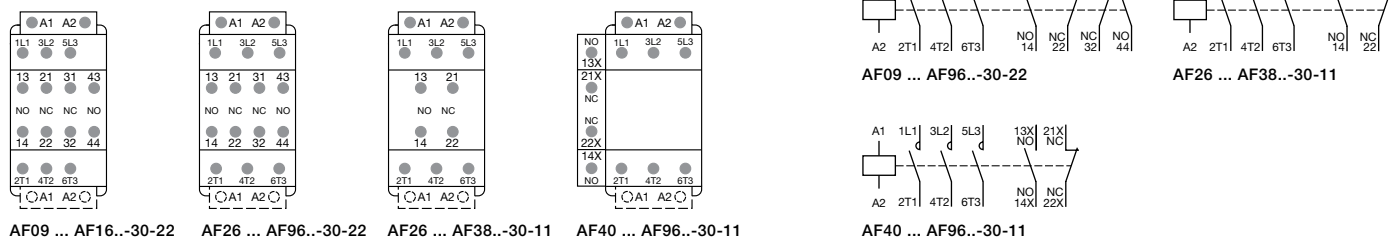
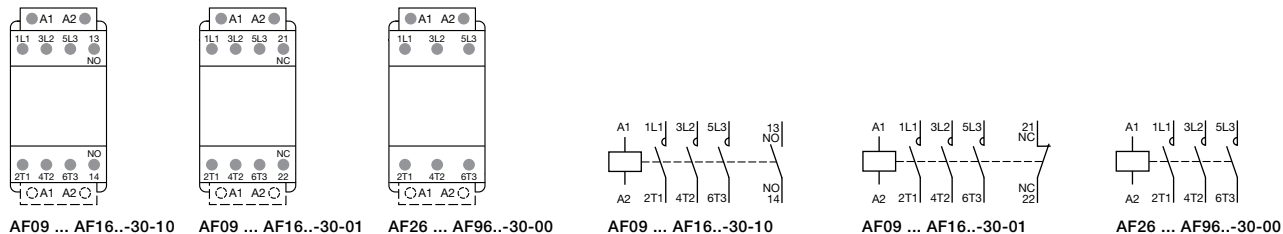
Contactor types	AC / DC operated	AF09	AF12	AF16	AF26	AF30	AF38	AF40	AF52	AF65	AF80	AF96
Max. operational voltage		600 V AC, 600 V DC										
Pilot duty		A600, Q600										
AC thermal rated current		10 A										
AC maximum volt-ampere making		7200 VA										
AC maximum volt-ampere breaking		720 VA										
DC thermal rated current		2.5 A										
DC maximum volt-ampere making-breaking		69 VA										

# AF09 ... AF96 3-pole contactors

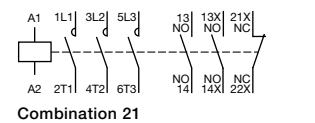
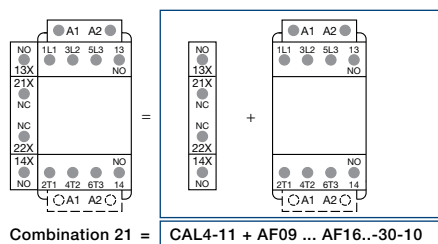
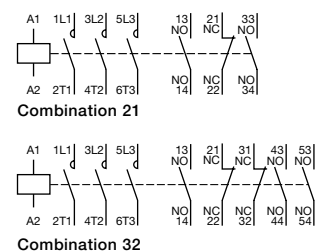
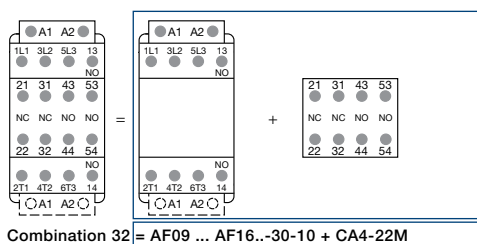
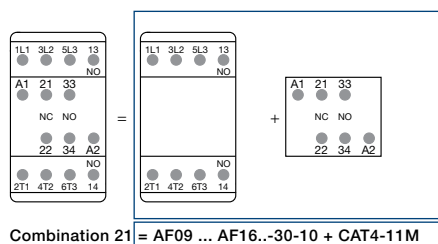
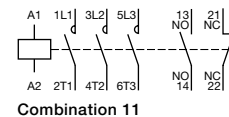
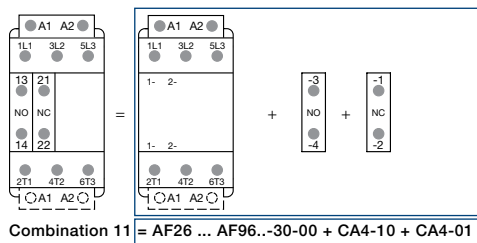
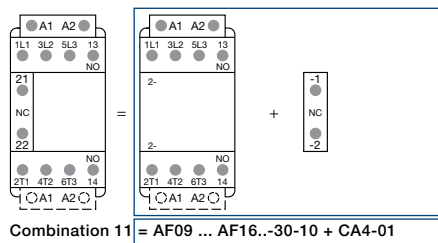
## Terminal marking and positioning

### AF09 ... AF96 contactors - AC / DC operated

Standard devices without addition of auxiliary contacts



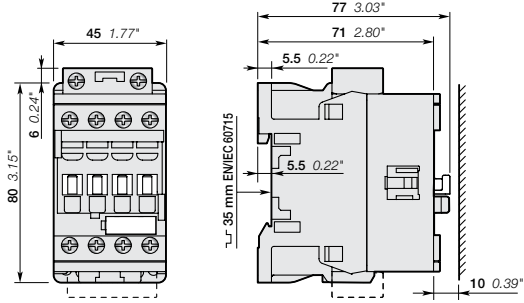
Other possible contact combinations with auxiliary contacts added by the user



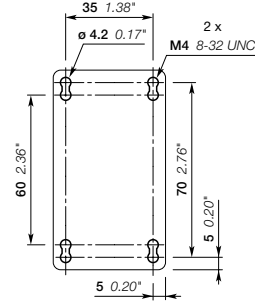
Note: only AF.Z contactor with DC control voltages 12...20 V DC (coil 20) and 24 V DC (coil 30) need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.

# AF09, AF12, AF16 3-pole contactors

## Main dimensions mm, inches

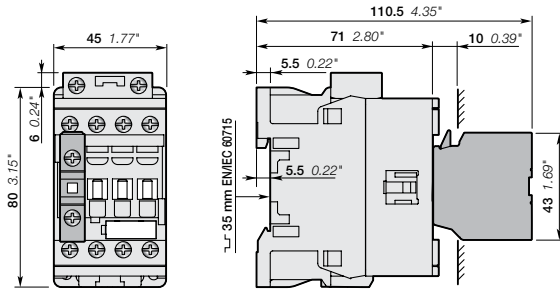


AF09, AF12, AF16

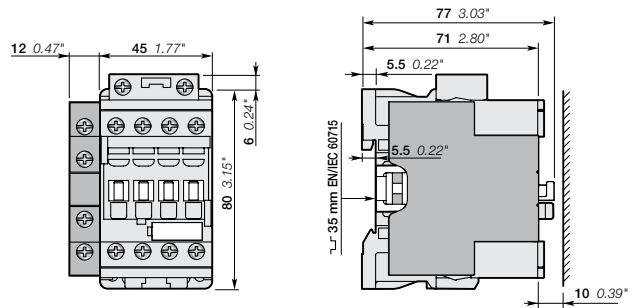


AF09, AF12, AF16

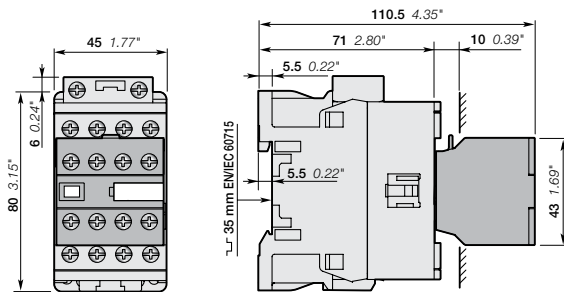
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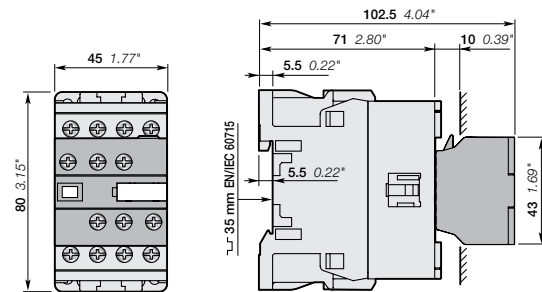
AF09, AF12, AF16  
+ CA4, CC4 1-pole auxiliary contact block



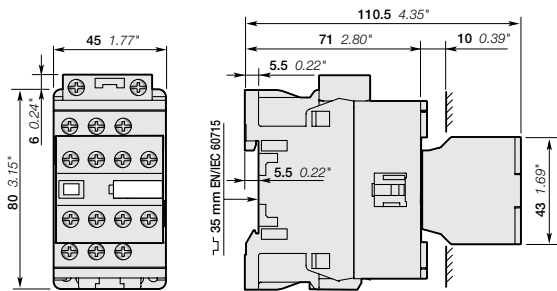
AF09, AF12, AF16  
+ CAL4-11 2-pole auxiliary contact block



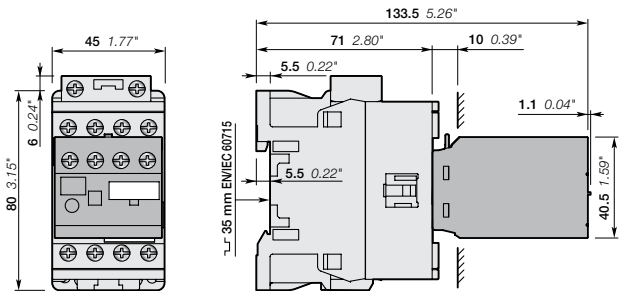
AF09, AF12, AF16  
+ CA4 4-pole auxiliary contact block



AF09, AF12, AF16  
+ CAT4 2-pole auxiliary contact and coil terminal block



AF09, AF12, AF16...-30-22

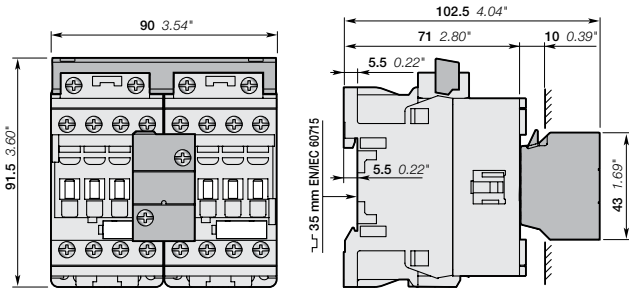


AF09, AF12, AF16  
+ TEF4 electronic timer

Note: contactor lateral distance to grounded component 2 mm 0.08" min.  
24 V DC operated contactor (coil 30) depth + 20 mm + 0.79".

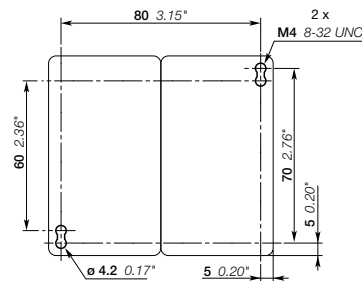
# AF09, AF12, AF16 3-pole contactors

## Main dimensions mm, inches



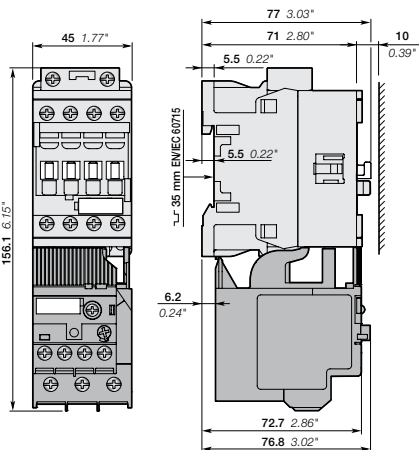
AF09, AF12, AF16

+ VEM4 mechanical and electrical interlock set



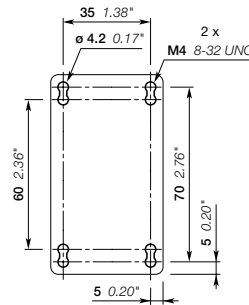
AF09, AF12, AF16

+ VEM4 mechanical and electrical interlock set



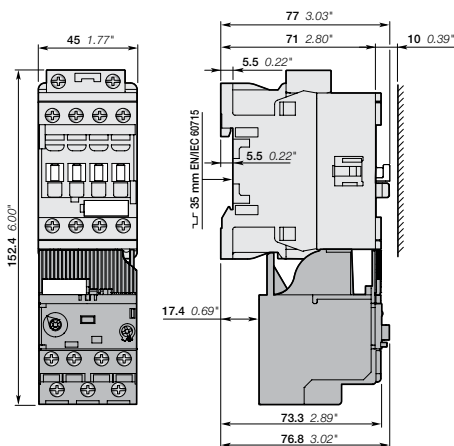
AF09, AF12, AF16

+ TF42 thermal overload relay



AF09, AF12, AF16

+ TF42, EF19



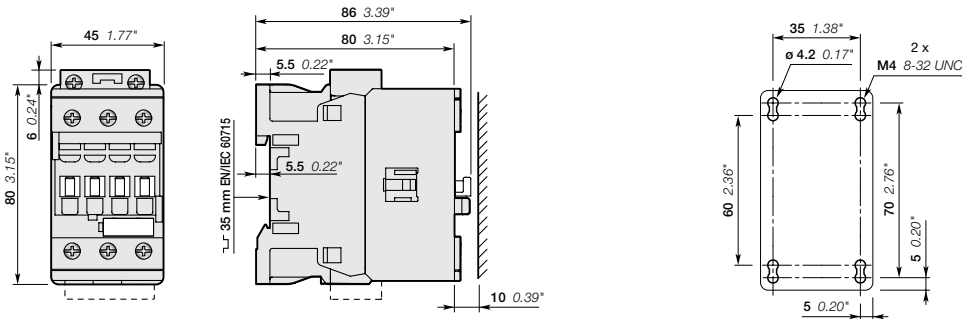
AF09, AF12, AF16 3-pole contactors

+ EF19 electronic overload relay

Note: contactor lateral distance to grounded component 2 mm 0.08" min.  
24 V DC operated contactor (coil 30) depth + 20 mm + 0.79".

# AF26, AF30, AF38 3-pole contactors

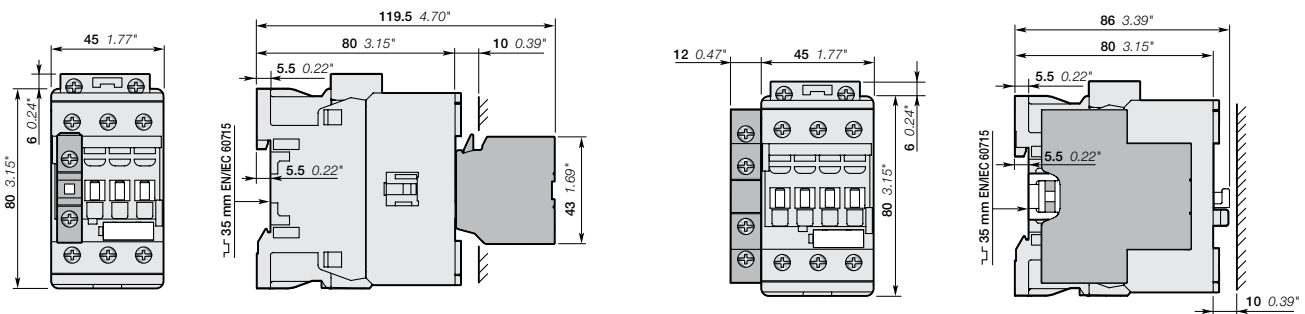
## Main dimensions mm, inches



AF26, AF30, AF38

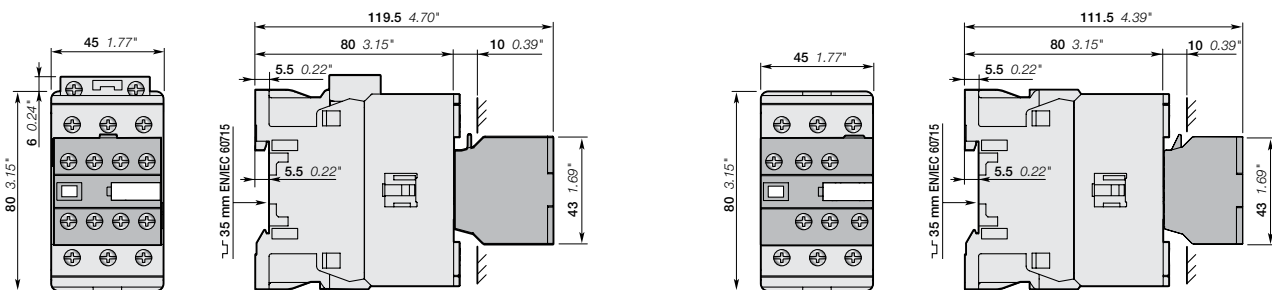
AF26, AF30, AF38

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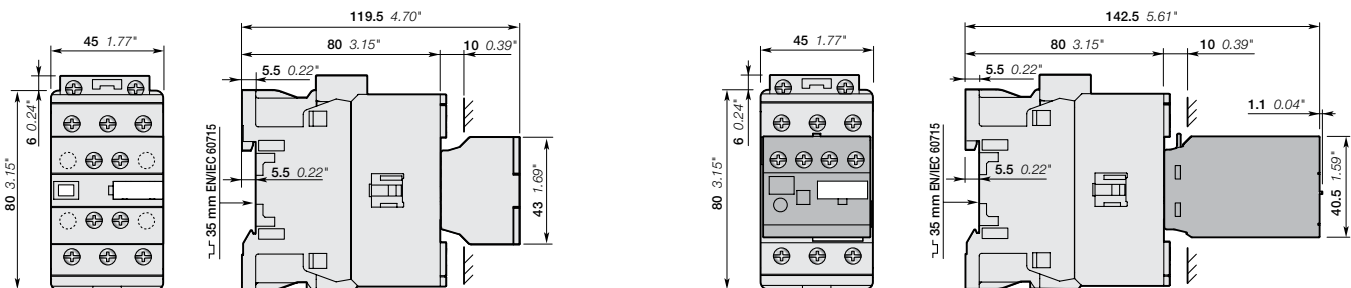
AF26, AF30, AF38  
+ CA4, CC4 1-pole auxiliary contact block

AF26, AF30, AF38  
+ CAL4-11 2-pole auxiliary contact block



AF26, AF30, AF38  
+ CA4 4-pole auxiliary contact block

AF26, AF30, AF38  
+ CAT4 2-pole auxiliary contact and coil terminal block



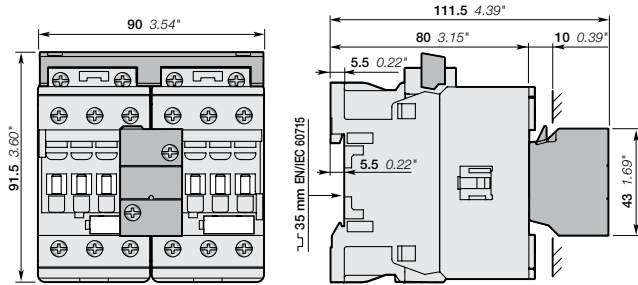
AF26, AF30, AF38..-30-11  
AF26, AF30, AF38..-30-22

AF26, AF30, AF38  
+ TEF4 electronic timer

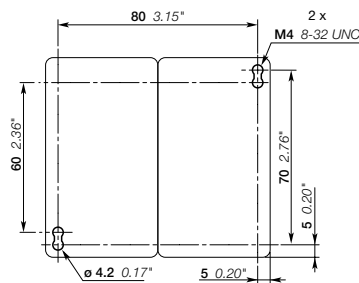
Note: contactor lateral distance to grounded component 2 mm (0.08") min.  
24 V DC operated contactor (coil 30) depth + 20 mm (+ 0.79").

# AF26, AF30, AF38 3-pole contactors

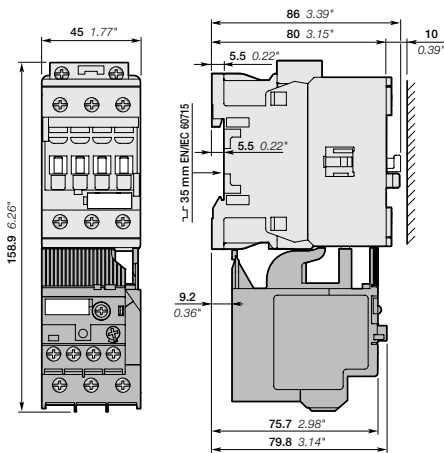
## Main dimensions mm, inches



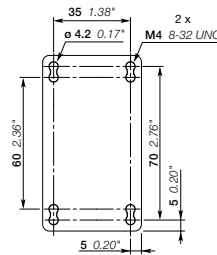
AF26, AF30, AF38  
+ VEM4 mechanical and electrical interlock set



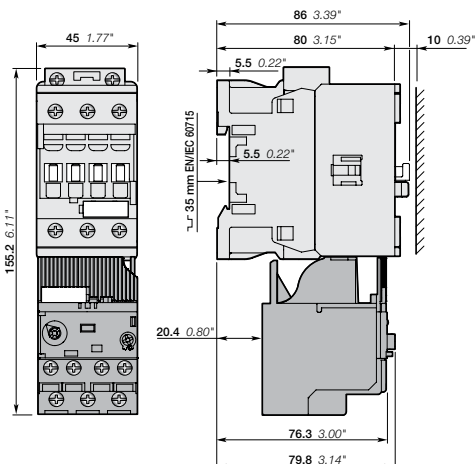
AF26, AF30, AF38  
+ VEM4 mechanical and electrical interlock set



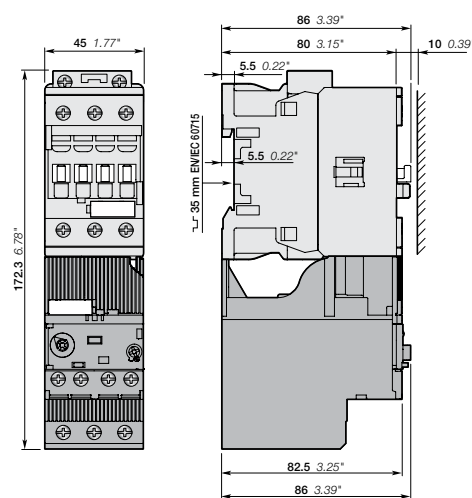
AF26, AF30, AF38  
+ TF42 thermal overload relay



AF26, AF30, AF38  
+ TF42, EF19, EF45



AF26 3-pole contactors  
+ EF19 electronic overload relay



AF26, AF30, AF38 3-pole contactors  
+ EF45 electronic overload relay

Note: contactor lateral distance to grounded component 2 mm (0.08") min.  
24 V DC operated contactor (coil 30) depth + 20 mm (+ 0.79").