AF09 ... AF38 3-pole Contactors up to 18.5 kW / 20 hp



Overview 2

Ordering Details
– AF09 ... AF38 3-pole Contactors 4
– AF..Z Additional Coils 5

Technical Data 6

Main Accessory Fitting Details 11

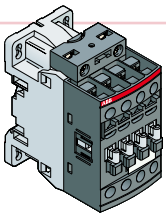
Accessory Ordering Details and Technical Data 12

Terminal Marking and Positioning 18

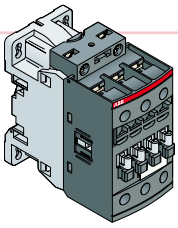
Dimensions 20

1SBC 101 134 S0201

Main Accessories

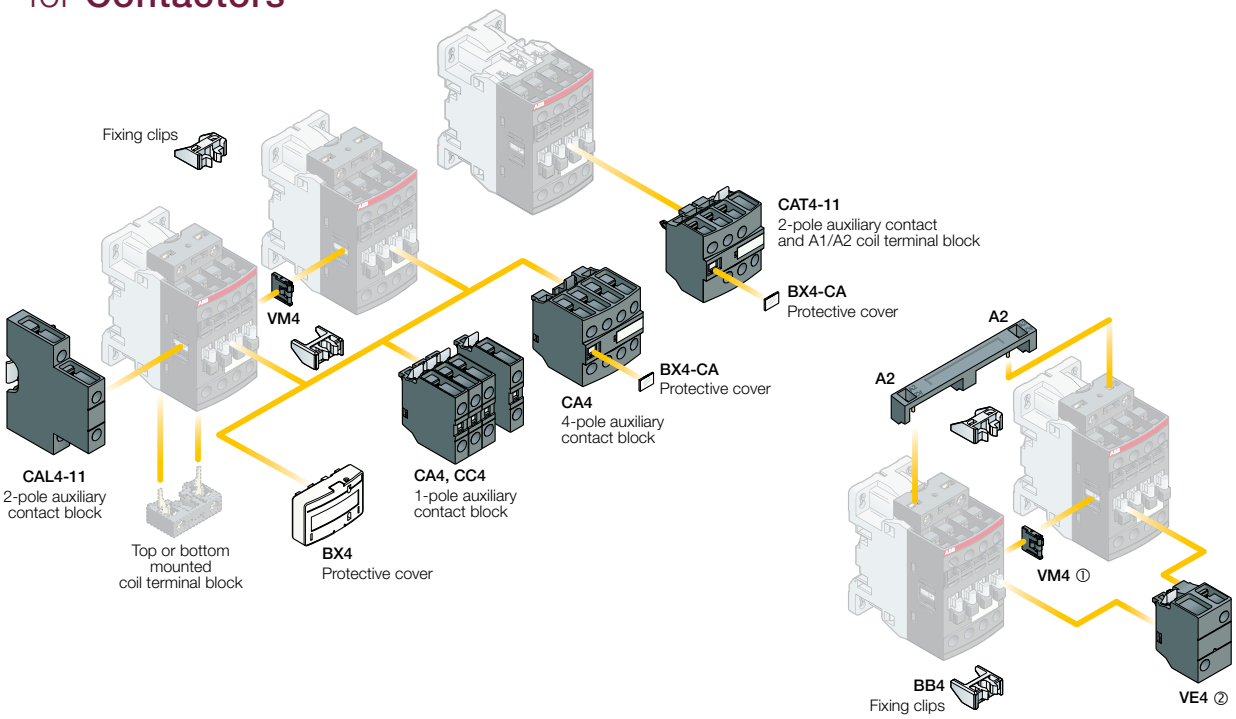


AF09 ... AF16
3-pole contactors



AF26 ... AF38
3-pole contactors

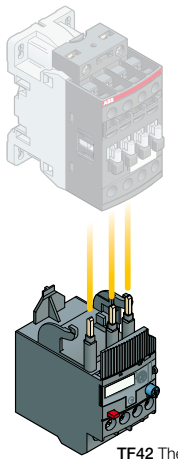
for **Contactors**



VEM4 mechanical and electrical interlock set including:
① **VM4** mechanical interlock unit including 2 fixing clips (BB4)
② **VE4** electrical interlock block with A2-A2 connection

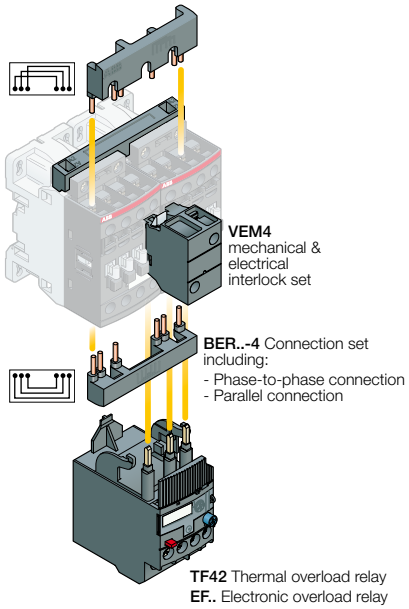
for **Starting Solutions**

Direct-On-Line Starter



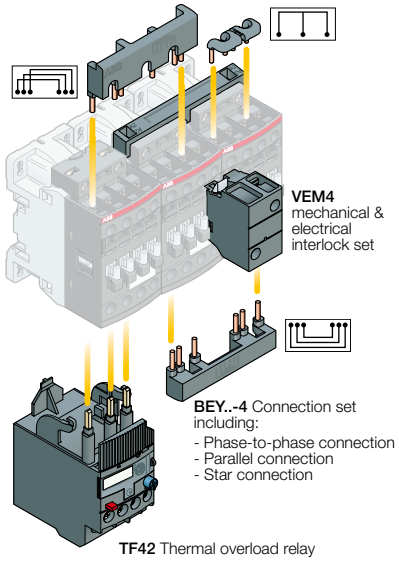
TF42 Thermal overload relay
EF.. Electronic overload relay

Reversing Starter



TF42 Thermal overload relay
EF.. Electronic overload relay

Star-Delta Starter



TF42 Thermal overload relay
EF.. Electronic overload relay

1SBC 101 090 S0201

3-pole Contactors





AC / DC control voltage

					AF09	AF12	AF16	AF26	AF30	AF38
					AF09-30-10	AF12-30-10	AF16-30-10	AF26-30-00	AF30-30-00	AF38-30-00
					AF09-30-01	AF12-30-01	AF16-30-01			

Switching of 3-phase Cage Motors

						4 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW
IEC	AC-3	Rated power			400 V						
		Rated operational current	θ ≤ 60 °C		400 V	9 A	12 A	18 A	26 A	32 A	38 A
			θ ≤ 60 °C		415 V	9 A	12 A	18 A	26 A	32 A	38 A
			θ ≤ 60 °C		690 V	7 A	9 A	10.5 A	17 A	21 A	24 A
UL/CSA	**Motor rating**				480 V	**5 hp**	**7.5 hp**	**10 hp**	**15 hp**	**20 hp**	**20 hp**
	Nema size					00	0	-	1	-	-

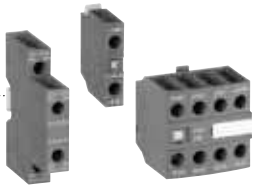
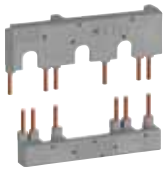
Protection of 3-phase motors

Thermal overload relays	**TF42...**
Electronic overload relays	**EF19...** setting range in **A**: 0.10 ... **0.32** / 0.30 ... **1.0** / 0.80 ... **2.7** / 1.90 ... **6.3** / 5.7 ... **18.9**; **EF45...** setting range in **A**: 9.0 ... **30** / 15 ... **45**

Switching of Resistive Circuits

						25 A	28 A	30 A	45 A	50 A	50 A
IEC	AC-1	Rated operational current	θ ≤ 40 °C		690 V						
			θ ≤ 60 °C		690 V	25 A	28 A	30 A	40 A	42 A	42 A
			θ ≤ 70 °C		690 V	22 A	24 A	26 A	32 A	37 A	37 A
	With conductor cross-sectional area					4 mm²	6 mm²	6 mm²	10 mm²	10 mm²	10 mm²
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

Main Accessories

Auxiliary contact blocks	Front mounting		1-pole **CA4-10** or **CA4-01**, **CC4-10** or **CC4-01** 4-pole **CA4** 2-pole **CAT4-11** (with coil front connection)
	Side mounting		2-pole **CAL4-11**
Interlocks	Mechanical / electrical		**VEM4** including VM4 mechanical interlock unit and VE4 electrical interlock block with A2-A2 connection
	Mechanical		**VM4** including 2 fixing clips
Connection sets	Reversing Starters		**BER16-4** / **BER38-4**
	Star-Delta Starters		**BEY16-4** / **BEY38-4**

1SBC 101 090 S2201

AF09 ... AF38 3-pole Contactors
AC / DC Operated - with Screw Terminals


4 to 18.5 kW
5 to 20 hp

cULus CE


AF09-30-10


AF26-30-00

Application

AF09 ... AF38 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.

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 (e.g. 100...250 V 50/60 Hz - DC) can be used for different control voltages used worldwide without any coil change
- **AF..Z** contactors equipped with a **Z** coil type allow direct control by 24 V DC 500 mA PLC-output and obtain a reduced holding coil consumption.
  AF..Z contactors withstand short dips and voltage interruptions (SEMI F47-0706 compliance)
- **AF** contactors have built-in surge protection and do not require additional surge suppressors
- The built-in N.C. auxiliary contact is a mirror contact in compliance with annex F of IEC 60947-4-1.

Ordering Details

IEC	UL/CSA	Control voltage		Auxiliary contacts fitted		Type	Order code		Weight
Rated power 400 V AC-3	3-phase motor rating 480 V	U_c min. ... U_c max.							Pack[ing] 1 piece
kW	hp	V 50/60 Hz	V DC						kg
4	5	24...60	20...60	1	0	AF09Z-30-10-21	1SBL 136 001 R2110		0.310
		24...60	20...60	0	1	AF09Z-30-01-21	1SBL 136 001 R2101		0.310
		48...130	48...130	1	0	AF09-30-10-12	1SBL 137 001 R1210		0.270
		48...130	48...130	0	1	AF09-30-01-12	1SBL 137 001 R1201		0.270
		100...250	100...250	1	0	AF09-30-10-13	1SBL 137 001 R1310		0.270
		100...250	100...250	0	1	AF09-30-01-13	1SBL 137 001 R1301		0.270
		250...500	250...500	1	0	AF09-30-10-14	1SBL 137 001 R1410		0.310
		250...500	250...500	0	1	AF09-30-01-14	1SBL 137 001 R1401		0.310
5.5	7.5	24...60	20...60	1	0	AF12Z-30-10-21	1SBL 156 001 R2110		0.310
		24...60	20...60	0	1	AF12Z-30-01-21	1SBL 156 001 R2101		0.310
		48...130	48...130	1	0	AF12-30-10-12	1SBL 157 001 R1210		0.270
		48...130	48...130	0	1	AF12-30-01-12	1SBL 157 001 R1201		0.270
		100...250	100...250	1	0	AF12-30-10-13	1SBL 157 001 R1310		0.270
		100...250	100...250	0	1	AF12-30-01-13	1SBL 157 001 R1301		0.270
		250...500	250...500	1	0	AF12-30-10-14	1SBL 157 001 R1410		0.310
		250...500	250...500	0	1	AF12-30-01-14	1SBL 157 001 R1401		0.310
7.5	10	24...60	20...60	1	0	AF16Z-30-10-21	1SBL 176 001 R2110		0.310
		24...60	20...60	0	1	AF16Z-30-01-21	1SBL 176 001 R2101		0.310
		48...130	48...130	1	0	AF16-30-10-12	1SBL 177 001 R1210		0.270
		48...130	48...130	0	1	AF16-30-01-12	1SBL 177 001 R1201		0.270
		100...250	100...250	1	0	AF16-30-10-13	1SBL 177 001 R1310		0.270
		100...250	100...250	0	1	AF16-30-01-13	1SBL 177 001 R1301		0.270
		250...500	250...500	1	0	AF16-30-10-14	1SBL 177 001 R1410		0.310
		250...500	250...500	0	1	AF16-30-01-14	1SBL 177 001 R1401		0.310
11	15	24...60	20...60	0	0	AF26Z-30-00-21	1SBL 236 001 R2100		0.350
		48...130	48...130	0	0	AF26-30-00-12	1SBL 237 001 R1200		0.310
		100...250	100...250	0	0	AF26-30-00-13	1SBL 237 001 R1300		0.310
		250...500	250...500	0	0	AF26-30-00-14	1SBL 237 001 R1400		0.350
15	20	24...60	20...60	0	0	AF30Z-30-00-21	1SBL 276 001 R2100		0.350
		48...130	48...130	0	0	AF30-30-00-12	1SBL 277 001 R1200		0.310
		100...250	100...250	0	0	AF30-30-00-13	1SBL 277 001 R1300		0.310
		250...500	250...500	0	0	AF30-30-00-14	1SBL 277 001 R1400		0.350
18.5	20	24...60	20...60	0	0	AF38Z-30-00-21	1SBL 296 001 R2100		0.350
		48...130	48...130	0	0	AF38-30-00-12	1SBL 297 001 R1200		0.310
		100...250	100...250	0	0	AF38-30-00-13	1SBL 297 001 R1300		0.310
		250...500	250...500	0	0	AF38-30-00-14	1SBL 297 001 R1400		0.350

AF09 ... AF38 3-pole Contactors - **AF..Z** Additional Coils
AC / DC Operated - with Screw Terminals

4 to 18.5 kW
5 to 20 hp

cULus CE



AF09Z-30-10



AF26Z-30-00

Application

AF09Z ... AF38Z 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.

Description

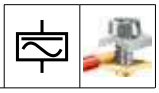
- **AF09Z ... AF38Z** contactors include an electronic coil interface accepting a wide control voltage **U_c** min. ... **U_c** max and managing large control voltage variations.
- **AF..Z** contactors cover control voltages comprised between 24...250 V 50/60 Hz or 12...250 V DC
- **AF..Z** contactors 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
- The built-in N.C. auxiliary contact is a mirror contact in compliance with annex F of IEC 60947-4-1.

Ordering Details

IEC	UL/CSA	Control voltage		Auxiliary contacts fitted		Type	Order code		Weight
Rated power 400 V AC-3	3-phase motor rating 480 V	U_c min. ... U_c max.							Pack(ing) 1 piece
kW	hp	V 50/60 Hz	V DC						kg
4	5	-	12...20	1	0	AF09Z-30-10-20	1SBL 136 001 R2010		0.310
		-	12...20	0	1	AF09Z-30-01-20	1SBL 136 001 R2001		0.310
		24...60	20...60	1	0	AF09Z-30-10-21	1SBL 136 001 R2110		0.310
		24...60	20...60	0	1	AF09Z-30-01-21	1SBL 136 001 R2101		0.310
		48...130	48...130	1	0	AF09Z-30-10-22	1SBL 136 001 R2210		0.310
		48...130	48...130	0	1	AF09Z-30-01-22	1SBL 136 001 R2201		0.310
		100...250	100...250	1	0	AF09Z-30-10-23	1SBL 136 001 R2310		0.310
		100...250	100...250	0	1	AF09Z-30-01-23	1SBL 136 001 R2301		0.310
5.5	7.5	-	12...20	1	0	AF12Z-30-10-20	1SBL 156 001 R2010		0.310
		-	12...20	0	1	AF12Z-30-01-20	1SBL 156 001 R2001		0.310
		24...60	20...60	1	0	AF12Z-30-10-21	1SBL 156 001 R2110		0.310
		24...60	20...60	0	1	AF12Z-30-01-21	1SBL 156 001 R2101		0.310
		48...130	48...130	1	0	AF12Z-30-10-22	1SBL 156 001 R2210		0.310
		48...130	48...130	0	1	AF12Z-30-01-22	1SBL 156 001 R2201		0.310
		100...250	100...250	1	0	AF12Z-30-10-23	1SBL 156 001 R2310		0.310
		100...250	100...250	0	1	AF12Z-30-01-23	1SBL 156 001 R2301		0.310
7.5	10	-	12...20	1	0	AF16Z-30-10-20	1SBL 176 001 R2010		0.310
		-	12...20	0	1	AF16Z-30-01-20	1SBL 176 001 R2001		0.310
		24...60	20...60	1	0	AF16Z-30-10-21	1SBL 176 001 R2110		0.310
		24...60	20...60	0	1	AF16Z-30-01-21	1SBL 176 001 R2101		0.310
		48...130	48...130	1	0	AF16Z-30-10-22	1SBL 176 001 R2210		0.310
		48...130	48...130	0	1	AF16Z-30-01-22	1SBL 176 001 R2201		0.310
		100...250	100...250	1	0	AF16Z-30-10-23	1SBL 176 001 R2310		0.310
		100...250	100...250	0	1	AF16Z-30-01-23	1SBL 176 001 R2301		0.310
11	15	-	12...20	0	0	AF26Z-30-00-20	1SBL 236 001 R2000		0.350
		24...60	20...60	0	0	AF26Z-30-00-21	1SBL 236 001 R2100		0.350
		48...130	48...130	0	0	AF26Z-30-00-22	1SBL 236 001 R2200		0.350
		100...250	100...250	0	0	AF26Z-30-00-23	1SBL 236 001 R2300		0.350
15	20	-	12...20	0	0	AF30Z-30-00-20	1SBL 276 001 R2000		0.350
		24...60	20...60	0	0	AF30Z-30-00-21	1SBL 276 001 R2100		0.350
		48...130	48...130	0	0	AF30Z-30-00-22	1SBL 276 001 R2200		0.350
		100...250	100...250	0	0	AF30Z-30-00-23	1SBL 276 001 R2300		0.350
18.5	20	-	12...20	0	0	AF38Z-30-00-20	1SBL 296 001 R2000		0.350
		24...60	20...60	0	0	AF38Z-30-00-21	1SBL 296 001 R2100		0.350
		48...130	48...130	0	0	AF38Z-30-00-22	1SBL 296 001 R2200		0.350
		100...250	100...250	0	0	AF38Z-30-00-23	1SBL 296 001 R2300		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

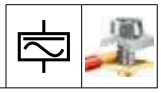
AF09 ... AF38 3-pole Contactors
Technical Data



Main Pole - Utilization Characteristics according to IEC

Contactor types		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 limits		25 ... 400 Hz					
Conventional free-air thermal current I_{th}							
acc. to IEC 60947-4-1, open contactors, $\theta \le 40$ °C		35 A	35 A	35 A	50 A	50 A	50 A
with conductor cross-sectional area		6 mm²	6 mm²	6 mm²	10 mm²	10 mm²	10 mm²
AC-1 Utilization category							
for air temperature close to contactor							
I_e / AC-1 rated operational current	**$\theta \le 40$ °C**	25 A	28 A	30 A	45 A	50 A	50 A
U_e max. ≤ 690 V, 50/60 Hz	**$\theta \le 60$ °C**	25 A	28 A	30 A	40 A	42 A	42 A
	$\theta \le 70$ °C	22 A	24 A	26 A	32 A	37 A	37 A
with conductor cross-sectional area		4 mm²	6 mm²	6 mm²	10 mm²	10 mm²	10 mm²
AC-3 Utilization category							
for air temperature close to contactor $\theta \le 60$ °C							
(for 1500 r.p.m., 50 Hz or 1800 r.p.m., 60 Hz, 3-phase motors)							
I_e / AC-3 max. rated operational current	**220-230-240 V**	9 A	12 A	18 A	26 A	33 A	40 A
3-phase motors	**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
AC-3 rated operational power	**220-230-240 V**	2.2 kW	3 kW	4 kW	6.5 kW	9 kW	11 kW
1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors	**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
Rated making capacity AC-3		10 x I_e AC-3 acc. to IEC 60947-4-1					
Rated breaking capacity AC-3		8 x I_e AC-3 acc. to IEC 60947-4-1					
AC-8a Utilization category							
(without thermal overload relay - U_e 400 V - $\theta \le 40$ °C)							
I_e / AC-8a rated operational current		12 A	16 A	22 A	30 A	40 A	50 A
AC-8a rated operational power		5.5 kW	7.5 kW	11 kW	15 kW	20 kW	25 kW
Short-circuit protection for contactors							
without thermal O/L relay - Motor protection excluded							
$U_e \le 500$ V AC - gG type fuse		25 A	32 A	32 A	50 A	63 A	63 A
Rated short-time withstand current Icw	**1 s**	300 A	300 A	300 A	700 A	700 A	700 A
at 40 °C ambient temperature, in free air from a cold state	**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
Maximum breaking capacity	**at 440 V**	250 A	250 A	250 A	500 A	500 A	500 A
cos φ = 0.45	**at 690 V**	106 A	106 A	106 A	200 A	200 A	200 A
Heat dissipation per pole	**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
Max. electrical switching frequency	**AC-1**	600 cycles/h					
	AC-3	1200 cycles/h					
	AC-2, AC-4	300 cycles/h			150 cycles/h		

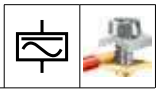
AF09 ... AF38 3-pole Contactors
Technical Data



Built-in Auxiliary Contacts according to IEC

Contactor types		AF09	AF12	AF16	AF26	AF30	AF38
Rated operational voltage U_e max.		690 V					
Conventional free air thermal current I_{th} - $\theta \leq 40$ °C		16 A					
Rated frequency limits		25 ... 400 Hz					
Rated operational current I_e / AC-15							
acc. to IEC 60947-5-1	**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_e AC-15 acc. to IEC 60947-5-1					
Breaking capacity AC-15		10 x I_e AC-15 acc. to IEC 60947-5-1					
Rated operational current I_e / DC-13							
acc. to IEC 60947-5-1	**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 gG type fuse		10 A					
Rated short-time withstand current I_{cw}	**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^{-7}					
Non-overlapping time between N.O. and N.C. contacts		≥ 2 ms					
Heat dissipation per pole at 6 A		0.1 W					
Max. electrical switching frequency	**AC-15**	1200 cycles/h					
	DC-13	900 cycles/h					

AF09 ... AF38 3-pole Contactors
Technical Data



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

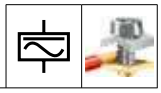
Contactor types		AF09	AF12	AF16	AF26	AF30	AF38
Standards		UL 508, CSA C22.2 N°14					
Rated operational voltage U_e max.		600 V					
NEMA size		00	0	-	1	-	-
NEMA continuous amp rating	**thermal current**	9 A	18 A		27 A		
NEMA maximum H.P. ratings 1-phase, 60 Hz	**115 V AC**	1/3 hp	1 hp		2 hp		
	230 V AC	1 hp	2 hp		3 hp		
NEMA maximum H.P. 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 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
80 V DC - 1-pole		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 maximum 1-phase motor rating							
Amp-rating	**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
Motor power	**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 maximum 3-phase motor rating							
Amp-rating	**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	27 A
	550-600 V AC	9 A	11 A	17 A	22 A	(1)	(1)
Motor power	**200-208 V AC**	2 hp	3 hp	5 hp	7.5 hp	10 hp	10 hp
(for 1500 r.p.m., 50 Hz or 1800 r.p.m., 60 Hz 3-phase motors)	**220-240 V AC**	2 hp	3 hp	5 hp	7.5 hp	10 hp	10 hp
	440-480 V AC	5 hp	7.5 hp	10 hp	15 hp	20 hp	20 hp
	550-600 V AC	7.5 hp	10 hp	15 hp	20 hp	(1)	(1)
Short-circuit protection							
for contactors without thermal O/L relay - Motor protection excluded							
Fuse rating		60 A	60 A	60 A	150 A	150 A	150 A
Fuse type, 600 V		NTD					
Max. electrical switching frequency							
for general use		600 cycles/h					
for motor use		1200 cycles/h					
Mechanical durability							
Number of operating cycles		10 millions operating cycles					
Max. switching frequency		3600 cycles/h					

(1) On request

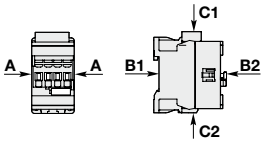
Built-in Auxiliary Contacts according to UL / CSA

Contactor types	AF09	AF12	AF16	AF26	AF30	AF38
Max. rated operational voltage U_e max.	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 ... AF38 3-pole Contactors
Technical Data



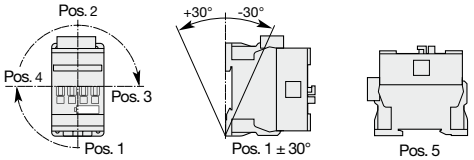
General Technical Data

Contactor types			AF09	AF12	AF16	AF26	AF30	AF38
Rated insulation voltage U_i								
acc. to IEC 60947-4-1			690 V					
acc. to UL / CSA			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	fitted with thermal overload relay		-					
	without thermal overload relay		-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					
		A	30 g					
		B1	25 g Closed position / 5 g Open position					
		B2	15 g					
		C1	25 g					
		C2	25 g					
Vibration withstand			5 ... 300 Hz					
acc. to IEC 60068-2-6			4 g Closed position / 2 g Open position					

Magnet System Characteristics

Contactor types			AF09	AF12	AF16	AF26	AF30	AF38
Coil operating limits		**AC supply**	at θ ≤ 60 °C 0.85 x **U_c** min ... 1.1 x **U_c** max at θ ≤ 70 °C 0.85 x **U_c** min ... **U_c** max					
acc. to IEC 60947-4-1		**DC supply**	at θ ≤ 60 °C 0.85 x **U_c** min ... 1.1 x **U_c** max at θ ≤ 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					
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) ≥ 500 mA 24 V DC					
Drop-out voltage in % of U_c min.			≤ 60 % **U_c** 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_c** = 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

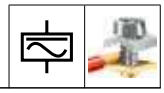
Contactor types	AF09	AF12	AF16	AF26	AF30	AF38
Mounting positions						
	Max. N.C. built-in and add-on N.C. auxiliary contacts: see accessory fitting details for a 3-pole contactor AF09 ... AF38					
Mounting distances	The contactors can be assembled side by side.					
Fixing						
on rail according to IEC 60715, EN 60715	35 x 7.5 mm or 35 x 15 mm					
by screws (not supplied)	2 x M4 screws placed diagonally					

AF09 ... AF38 3-pole Contactors
Technical Data

Connecting Characteristics

Contactor types				AF09	AF12	AF16	AF26	AF30	AF38
Main terminals				 Screw terminals with cable clamp					
Connecting capacity (min. ... max.)									
Main conductors (poles)									
Rigid	solid (≤ 4 mm²)		**1 x**	1 ... 6 mm²			2.5 ... 10 mm²		
	stranded (≥ 6 mm²)		**2 x**	1 ... 6 mm²			2.5 ... 10 mm²		
Flexible with non insulated ferrule			**1 x**	0.75 ... 6 mm²			1.5 ... 10 mm²		
			2 x	0.75 ... 6 mm²			1.5 ... 10 mm²		
Flexible with insulated ferrule			**1 x**	0.75 ... 4 mm²			1.5 ... 10 mm²		
			2 x	0.75 ... 2.5 mm²			1.5 ... 4 mm²		
Bars or lugs			**L <**	9.6 mm			12.5 mm		
Capacity according to UL/CSA			**1 or 2 x**	AWG 16 ... 10			AWG 14 ... 8		
Stripping length				10 mm			14 mm		
Auxiliary conductors									
(built-in auxiliary terminals + coil terminals)									
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					
Built-in auxiliary terminals				IP20					
Screw terminals				(delivered in open position, screws of unused terminals must be tightened)					
Main terminals				M3.5			M4		
Coil terminals				M3.5					
Built-in auxiliary terminals				M3.5					
Screwdriver type				Flat Ø5.5 / 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					
Built-in auxiliary terminals				1.2 Nm / 11 lb.in					

AF09 ... AF38 3-pole Contactors
Main Accessories

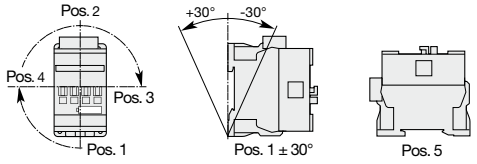


Accessory fitting details for a 3-pole contactor AF09 ... AF38

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: Auxiliary contact blocks						Electrical and mechanical interlock set (between 2 contactors)		Side-mounted accessories: Auxiliary contact blocks		
			1-pole **CA4** / 1-pole **CC4**		2-pole **CAT4-11**		4-pole **CA4**		**VEM4**		Left side / 2-pole **CAL4-11**		Right side
			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		–	+	1		–
			2 max.		–		–		–	+	1	+	1
			3 max.		–		–	+	1	+	1	or	1
AF09 ... AF16	3 0	1 0	4 max.	or	1	or	1		–	+	1		–
AF26 ... AF38	3 0	0 0	2 max.	or	1		–		–	+	1	+	1
			3 max.		–		–	+	1	+	1	or	1

Mounting positions

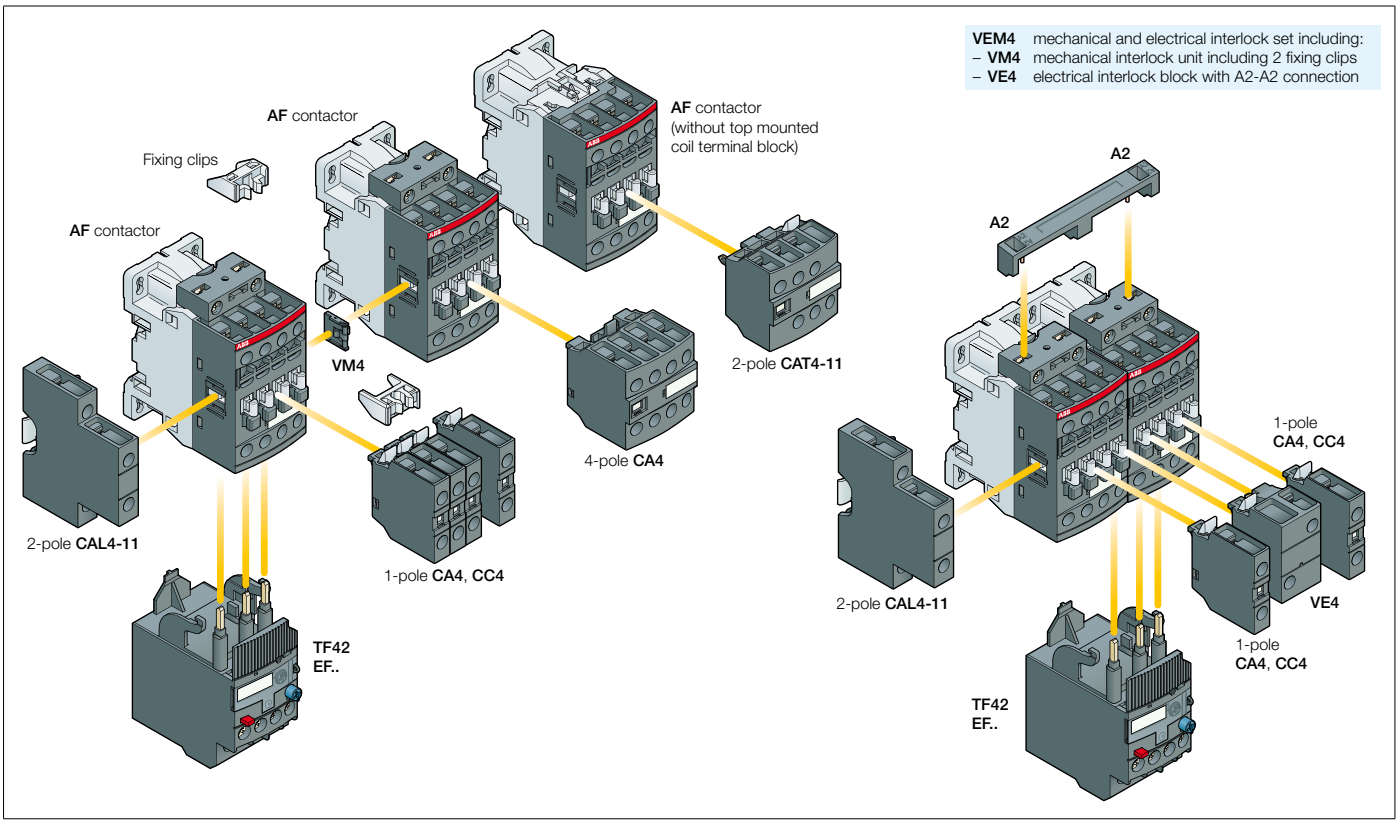


Protection against overloads with thermal or electronic overload relays

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

Contactor types	Overload relays - direct mounting - no kit required
AF09 ... AF38	TF42 thermal overload relay
AF09 ... AF38	EF19 electronic overload relay
AF26 ... AF38	EF45 electronic overload relay

Contactors and main accessories (other accessories available)



Auxiliary Contact Blocks
Accessories for AF09 ... AF38 3-pole Contactors




CA4-10


CA4-22M


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.

Select the type of 2 or 4-pole auxiliary contact blocks CAT4 or CA4-..E, CA 4-..M or CA 4-..U, according to the contactor type for compliance with the standard requirements (see terminal and marking positioning).
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	Type	Order code		Pack(ing) pieces	Weight kg (1 pce)
Front-mounted instantaneous auxiliary contact blocks						
AF09 ... AF38	1 0 - -	**CA4-10**	**1SBN 010 110 R1010**		1	0.014
	1 0 - -	**CA4-10-T**	**1SBN 010 110 T1010**		10	0.014
	0 1 - -	**CA4-01**	**1SBN 010 110 R1001**		1	0.014
	0 1 - -	**CA4-01-T**	**1SBN 010 110 T1001**		10	0.014
AF09 ... AF16..-30-10	2 2 - -	**CA4-22M**	**1SBN 010 140 R1122**		1	0.055
	3 1 - -	**CA4-31M**	**1SBN 010 140 R1131**		1	0.055
	1 3 - -	**CA4-13M**	**1SBN 010 140 R1113**		1	0.055
	0 4 - -	**CA4-04M**	**1SBN 010 140 R1104**		1	0.055
AF26 ... AF38..-30-00	2 2 - -	**CA4-22E**	**1SBN 010 140 R1022**		1	0.055
	3 1 - -	**CA4-31E**	**1SBN 010 140 R1031**		1	0.055
	4 0 - -	**CA4-40E**	**1SBN 010 140 R1040**		1	0.055
	0 4 - -	**CA4-04E**	**1SBN 010 140 R1004**		1	0.055
AF09 ... AF16..-30-01	2 2 - -	**CA4-22U**	**1SBN 010 140 R1322**		1	0.055
	3 1 - -	**CA4-31U**	**1SBN 010 140 R1331**		1	0.055
	4 0 - -	**CA4-40U**	**1SBN 010 140 R1340**		1	0.055
Front-mounted auxiliary contact blocks with N.O. leading contact and N.C. lagging contact						
AF09 ... AF38	- - 1 0	**CC4-10**	**1SBN 010 111 R1010**		1	0.014
	- - 0 1	**CC4-01**	**1SBN 010 111 R1001**		1	0.014
Side-mounted instantaneous auxiliary contact blocks						
AF09 ... AF38	1 1 - -	**CAL4-11**	**1SBN 010 120 R1011**		1	0.040
	1 1 - -	**CAL4-11-T**	**1SBN 010 120 T1011**		10	0.040
Front-mounted instantaneous auxiliary contact and A1/A2 coil terminal blocks						
AF09 ... AF16..-30-10	1 1 - -	**CAT4-11M**	**1SBN 010 151 R1111**		1	0.040
AF26 ... AF38..-30-00	1 1 - -	**CAT4-11E**	**1SBN 010 151 R1011**		1	0.040
AF09 ... AF16..-30-01	1 1 - -	**CAT4-11U**	**1SBN 010 151 R1311**		1	0.040

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

Auxiliary Contact Blocks
Accessories for AF09 ... AF38 3-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} - θ ≤ 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 Icw	**for 1.0 s**	100 A
θ = 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 millions 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
	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 acc. 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


BEA16-4

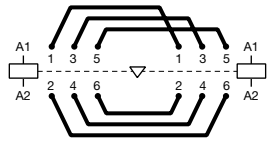
Connecting links with manual motor starters

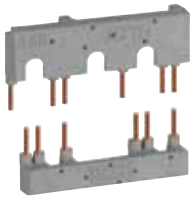
Description

The **BEA..-4** connecting links are used to connect AF09 ... AF38 contactors with the MS116 or MS132 manual motor starters.
The **BEA..-4** insulated 3-pole connecting links ensure the electrical and mechanical connection between the contactor and the associated manual motor starter.

Ordering Details

For contactors	Type	Order code		Pack(ing) pieces	Weight kg (1 pce)
AF09 ... AF16 with MS116 and MS132	**BEA16-4**	**1SBN 081 306 T1000**		10	0.025
AF26 ... AF38 with MS132-12 ... MS132-32	**BEA38-4**	**1SBN 082 306 T2000**		10	0.030




BER16-4

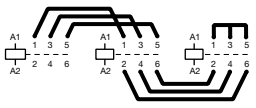
Connection sets for reversing contactors

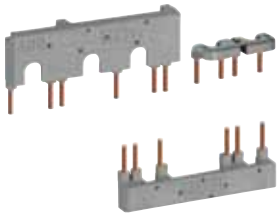
Description

BER16-4 and **BER38-4** connection sets between the main poles of two 3-pole contactors mounted side by side.
The connection sets are made up of 1 upstream and 1 downstream connections: insulated, solid copper bars.

Ordering Details

For contactors	Type	Order code		Pack(ing) pieces	Weight kg (1 pce)
AF09 ... AF16	**BER16-4**	**1SBN 081 311 R1000**		1	0.045
AF26 ... AF38	**BER38-4**	**1SBN 082 311 R1000**		1	0.100




BEY16-4

Connection sets for Star-Delta starting

Description

BEY16-4 and **BEY38-4** connection sets between the main poles of the Line, Delta and Star contactors of a Star-Delta starter.
The connection sets are made up of:
— Line contactor / Delta contactor: upstream phase-to-phase connection
— Delta contactor / Star contactor: downstream connection in parallel
— Star contactor: Star point upstream.

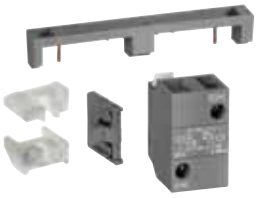
Ordering Details

For Line, Delta and Star contactors	Interlock unit between Delta & Star contactors	Type	Order code		Pack(ing) pieces	Weight kg (1 pce)
AF09 ... AF16	With or without VM4 or VEM4	**BEY16-4**	**1SBN 081 313 R2000**		1	0.050
AF26 ... AF38		**BEY38-4**	**1SBN 082 713 R2000**		1	0.110

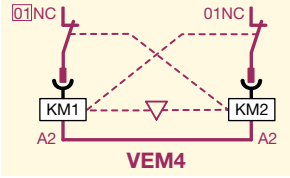




VM4



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	Type	Order code		Pack(ing) pieces	Weight kg (1 pce)
AF09 ... AF38	**VM4**	**1SBN 030 105 T1000**		10	0.005

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	Type	Order code		Pack(ing) pieces	Weight kg (1 pce)
AF09 .. AF16 AF26 .. AF38	1 1	**VEM4**	**1SBN 030 111 R1000**		1	0.035

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

Fixing clips

Ordering Details

For contactors	Type	Order code		Pack(ing) pieces	Weight kg (1 pce)
AF09 ... AF38	**BB4**	**1SBN 110 120 W1000**		50	0.002



Technical Data

Interlock types	VM4
Mechanical durability	
Number of operating cycles	5 millions 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**	24 ... 500 V AC
DC control voltage	20 ... 500 V DC
Conventional thermal current I_{th} - $\theta \leq 40$ °C	16 A
Mechanical and electrical durability	
Number of operating cycles	5 millions operating cycles
Max. mechanical switching frequency	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 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	IP20
Screwdriver type	Flat Ø5.5 / Pozidriv 2
Tightening torque	1.2 Nm / 11 lb.in




LDC4


BX4

BX4-CA


BA4

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	Type	Order code		Pack(ing) pieces	Weight kg (1 pce)
AF09 ... AF38	**LDC4**	**1SBN 070 156 T1000**		10	0.010

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	Type	Order code		Pack(ing) pieces	Weight kg (1 pce)
All 1-stack contactors	**BX4**	**1SBN 110 108 T1000**		10	0.006
For 4-pole CA4 and 2-pole CAT4 auxiliary contact blocks	**BX4-CA**	**1SBN 110 109 W1000**		50	0.001

Function markers

Description

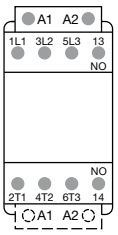
Box of 16 blank cards (16 markers by card) printable on HTP500 thermal transfer printer and AMS 500 marking table to identify your contactors, overload relays or manual motor starters.
Marker dimensions: 7 x 20 mm *(.276" x .787")*

Ordering Details

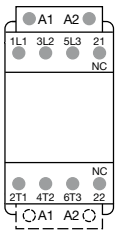
For contactors	Type	Order code		Pack(ing) pieces	Weight kg (1 pce)
Marker card	**BA4**	**1SNA 235 156 R2700**		16	0.011
AMS 500 support plate for 8 BA4	**SPRC 1**	**1SNA 360 010 R1500**		1	0.220
HTP500 support plate	**HTP500-BA4**	**1SNA 235 712 R2400**		1	0.290

AF09 ... AF38 3-pole Contactors
Terminal Marking and Positioning

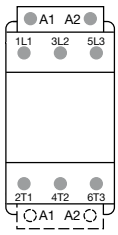
Standard devices without addition of auxiliary contacts



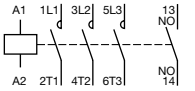
AF09...AF16..-30-10



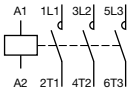
AF09...AF16..-30-01



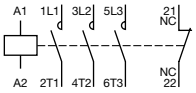
AF26...AF38..-30-00



AF09...AF16..-30-10

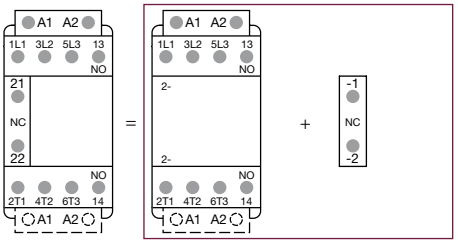


AF26...AF38..-30-00

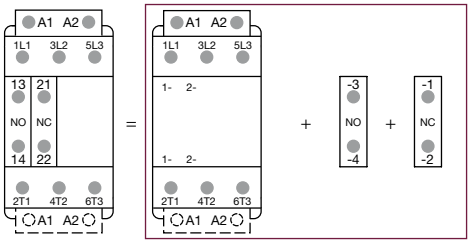


AF09...AF16..-30-01

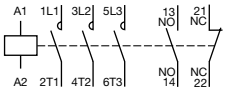
Other possible contact combinations with auxiliary contacts added by the user



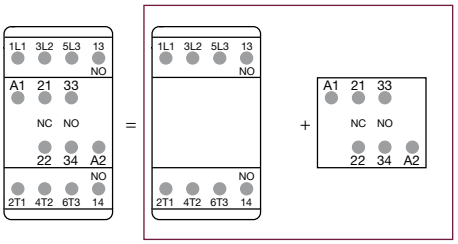
Combination 11 = AF09...AF16..-30-10 + CA4-01



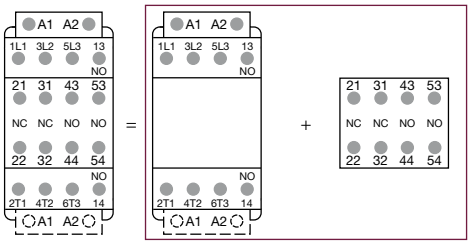
Combination 11 = AF26...AF38..-30-00 + CA4-10 + CA4-01



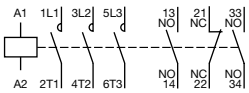
Combination 11



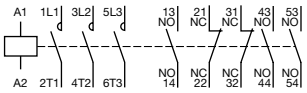
Combination 21 = AF09...AF16..-30-10 + CAT4-11M



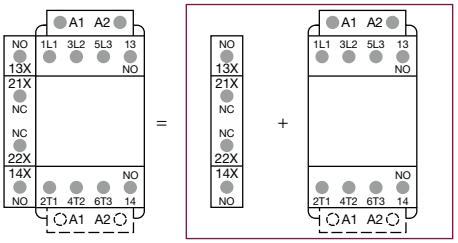
Combination 32 = AF09...AF16..-30-10 + CA4-22M



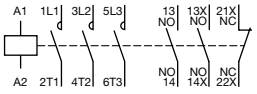
Combination 21



Combination 32



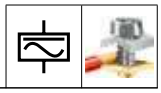
Combination 21 = CAL4-11 + AF09...AF16..-30-10



Combination 21

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



CA4-01



CA4-10

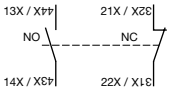


CC4-01

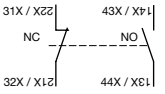


CC4-10

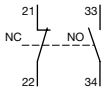
2-pole auxiliary contacts



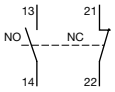
CAL4-11
(Left side-mounted)



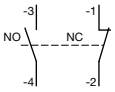
CAL4-11
(Right side-mounted)



CAT4-11M

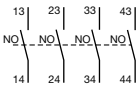


CAT4-11E

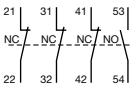


CAT4-11U

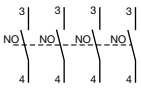
4-pole auxiliary contacts



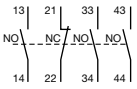
CA4-40E



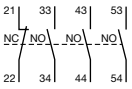
CA4-13M



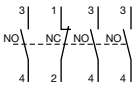
CA4-40U



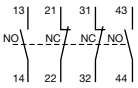
CA4-31E



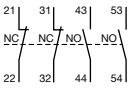
CA4-31M



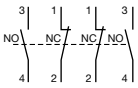
CA4-31U



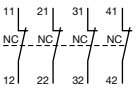
CA4-22E



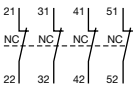
CA4-22M



CA4-22U

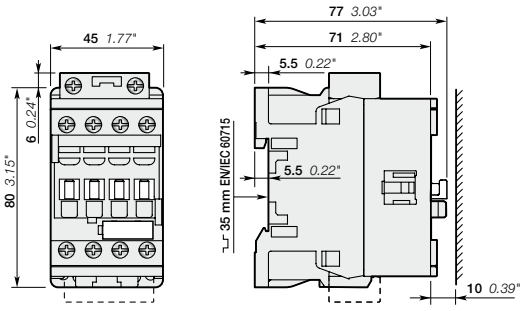


CA4-04E

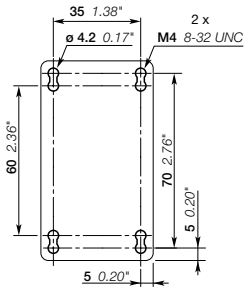


CA4-04M

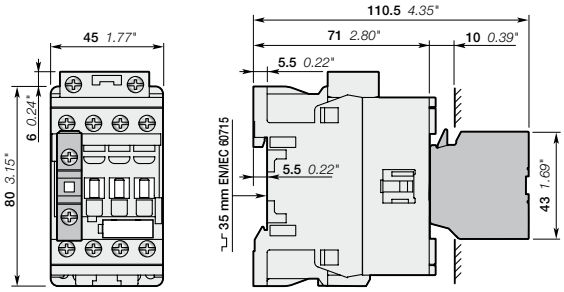
Dimensions mm, *inches*



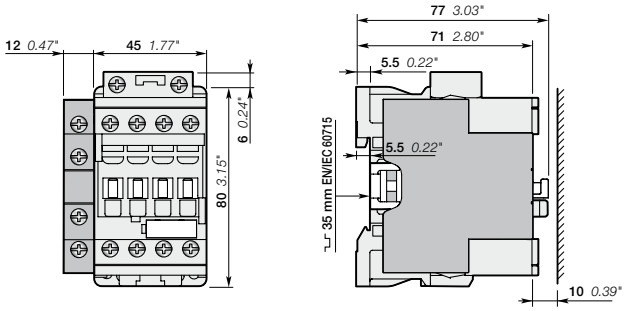
AF09, AF12, AF16



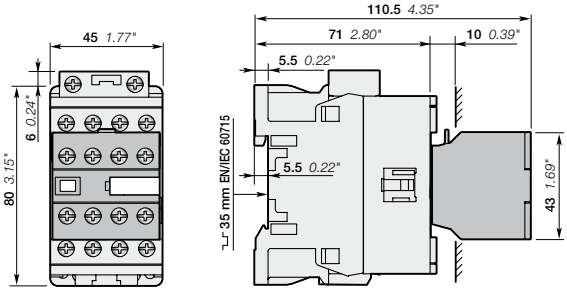
AF09, AF12, AF16



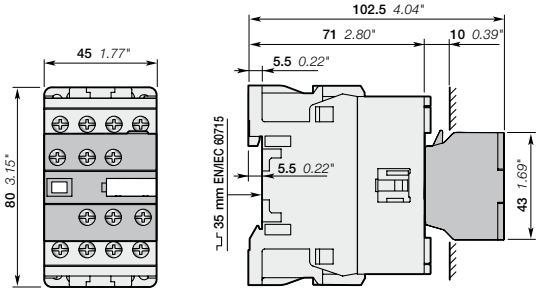
AF09, AF12, AF16
+ CA4, CC4 1-pole auxiliary contact block



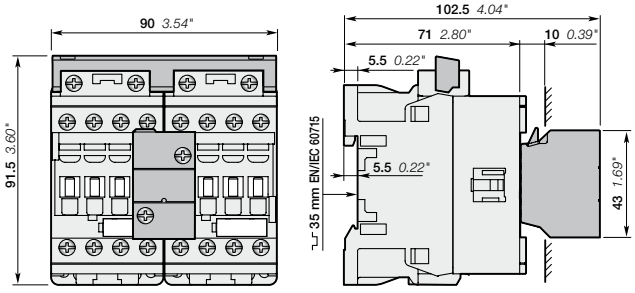
AF09, AF12, AF16
+ CAL4-11 2-pole auxiliary contact block



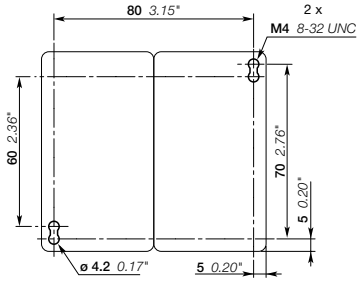
AF09, AF12, AF16
+ CA4 4-pole auxiliary contact block



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



AF09, AF12, AF16
+ VEM4 mechanical and electrical interlock set

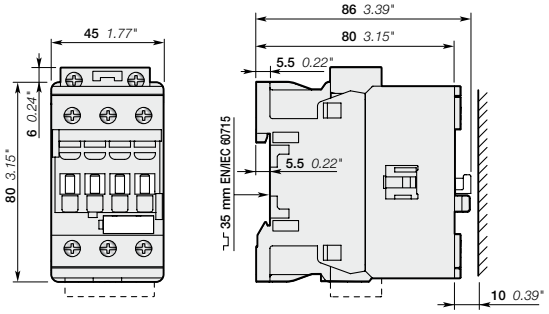


AF09, AF12, AF16
+ VEM4 mechanical and electrical interlock set

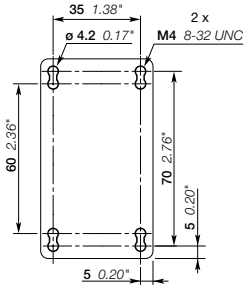
Note: contactor lateral distance to grounded component 2 mm *0.08*" min.

AF26 ... AF38 3-pole Contactors
AC / DC Operated - with Screw Terminals

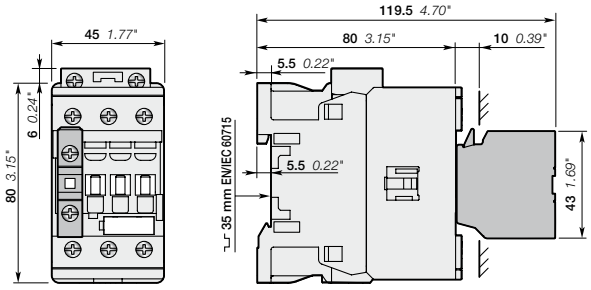
Dimensions mm, *inches*



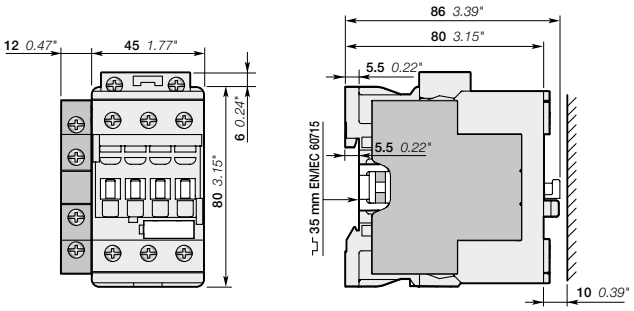
AF26, AF30, AF38



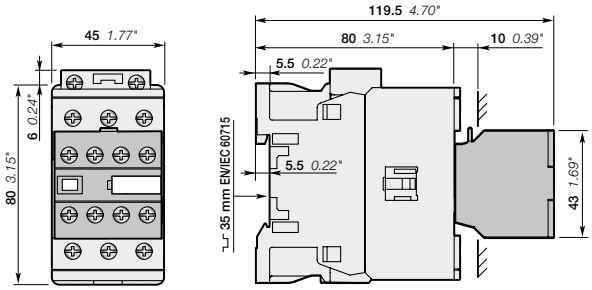
AF26, AF30, AF38



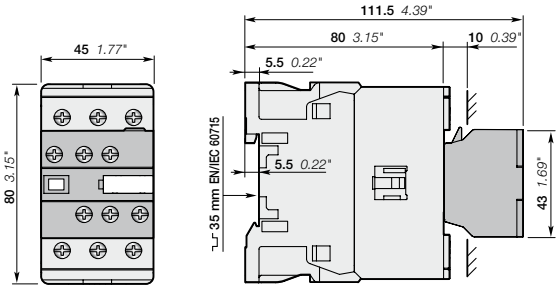
AF26, AF30, AF38
+ CA4, CC4 1-pole auxiliary contact block



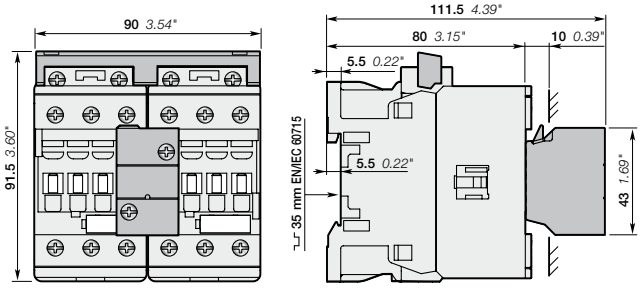
AF26, AF30, AF38
+ CAL4-11 2-pole auxiliary contact block



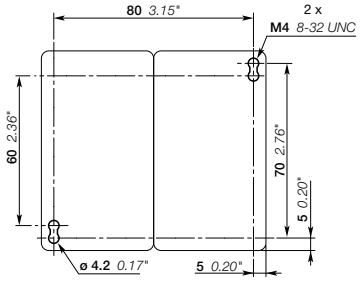
AF26, AF30, AF38
+ CA4 4-pole auxiliary contact block



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



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



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

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