

AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

4 to 18.5 kW

AC / DC operated



AF09-30-10K

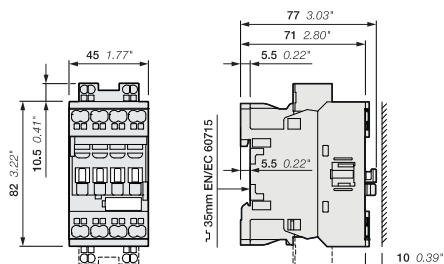


AF26-30-00K

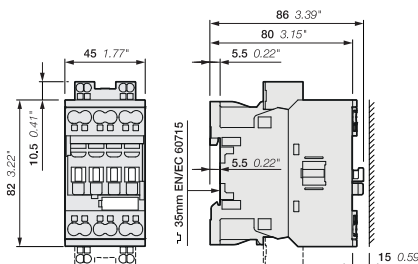
AF09..K ... AF38..K contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC. These contactors are of the block type design with 3 main poles.

- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC), only 4 control voltage ranges covering 24...500 V 50/60 Hz and 20...500 V DC
 - can manage large control voltage variations
 - reduced panel energy consumption
 - 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.

| IEC | UL/CSA | | Rated control circuit voltage | | Auxiliary contacts fitted | Type (1) | Order code | Weight | | | | | |
|---------------|-------------------------|----------------------|-------------------------------|---------------------|---------------------------|----------------|-----------------|-----------------|-------------|-----|----------------|-----------------|-------|
| | Rated operational power | 3-phase motor rating | General use rating | Uc min. ... Uc max. | | | | | Pkg (1 pce) | | | | |
| 400 V AC-3 kW | AC-1 A | 480 V hp | 600 V AC A | V 50/60 Hz V DC | | | | kg | | | | | |
| 4 | 25 | 5 | 25 | 24 ... 60 | 20 ... 60 | 1 0 | AF09-30-10K-11 | 1SBL137005R1110 | 0.285 | | | | |
| | | | | 48 ... 130 | 48 ... 130 | 0 1 | AF09-30-01K-11 | 1SBL137005R1101 | 0.285 | | | | |
| | | | | 100 ... 250 | 100 ... 250 | 1 0 | AF09-30-10K-12 | 1SBL137005R1210 | 0.285 | | | | |
| | | | | 250 ... 500 | 250 ... 500 | 0 1 | AF09-30-01K-12 | 1SBL137005R1201 | 0.285 | | | | |
| | | | | | | 1 0 | AF09-30-10K-13 | 1SBL137005R1310 | 0.285 | | | | |
| | | | | | | 0 1 | AF09-30-01K-13 | 1SBL137005R1301 | 0.285 | | | | |
| | | | | | | 1 0 | AF09-30-10K-14 | 1SBL137005R1410 | 0.325 | | | | |
| | | | | | | 0 1 | AF09-30-01K-14 | 1SBL137005R1401 | 0.325 | | | | |
| | | | | 5.5 | 28 | 7.5 | 28 | 24 ... 60 | 20 ... 60 | 1 0 | AF12-30-10K-11 | 1SBL157005R1110 | 0.285 |
| | | | | | | | | 48 ... 130 | 48 ... 130 | 0 1 | AF12-30-01K-11 | 1SBL157005R1101 | 0.285 |
| 100 ... 250 | 100 ... 250 | 1 0 | AF12-30-10K-12 | | | | | 1SBL157005R1210 | 0.285 | | | | |
| 250 ... 500 | 250 ... 500 | 0 1 | AF12-30-01K-12 | | | | | 1SBL157005R1201 | 0.285 | | | | |
| | | 1 0 | AF12-30-10K-13 | | | | | 1SBL157005R1310 | 0.285 | | | | |
| | | 0 1 | AF12-30-01K-13 | | | | | 1SBL157005R1301 | 0.285 | | | | |
| | | 1 0 | AF12-30-10K-14 | | | | | 1SBL157005R1410 | 0.325 | | | | |
| | | 0 1 | AF12-30-01K-14 | | | | | 1SBL157005R1401 | 0.325 | | | | |
| 7.5 | 30 | 10 | 30 | | | | | 24 ... 60 | 20 ... 60 | 1 0 | AF16-30-10K-11 | 1SBL177005R1110 | 0.285 |
| | | | | | | | | 48 ... 130 | 48 ... 130 | 0 1 | AF16-30-01K-11 | 1SBL177005R1101 | 0.285 |
| | | | | 100 ... 250 | 100 ... 250 | 1 0 | AF16-30-10K-12 | 1SBL177005R1210 | 0.285 | | | | |
| | | | | 250 ... 500 | 250 ... 500 | 0 1 | AF16-30-01K-12 | 1SBL177005R1201 | 0.285 | | | | |
| | | | | | | 1 0 | AF16-30-10K-13 | 1SBL177005R1310 | 0.285 | | | | |
| | | | | | | 0 1 | AF16-30-01K-13 | 1SBL177005R1301 | 0.285 | | | | |
| | | | | | | 1 0 | AF16-30-10K-14 | 1SBL177005R1410 | 0.325 | | | | |
| | | | | | | 0 1 | AF16-30-01K-14 | 1SBL177005R1401 | 0.325 | | | | |
| | | | | 11 | 45 | 15 | 42 | 24 ... 60 | 20 ... 60 | 0 0 | AF26-30-00K-11 | 1SBL237005R1100 | 0.325 |
| | | | | | | | | 48 ... 130 | 48 ... 130 | 0 0 | AF26-30-00K-12 | 1SBL237005R1200 | 0.325 |
| 100 ... 250 | 100 ... 250 | 0 0 | AF26-30-00K-13 | | | | | 1SBL237005R1300 | 0.325 | | | | |
| 250 ... 500 | 250 ... 500 | 0 0 | AF26-30-00K-14 | | | | | 1SBL237005R1400 | 0.365 | | | | |
| 15 | 50 | 20 | 45 | | | | | 24 ... 60 | 20 ... 60 | 0 0 | AF30-30-00K-11 | 1SBL277005R1100 | 0.330 |
| 18.5 | 50 | 25 | 45 | 24 ... 60 | 20 ... 60 | 0 0 | AF30-30-00K-12 | 1SBL277005R1200 | 0.330 | | | | |
| | | | | 48 ... 130 | 48 ... 130 | 0 0 | AF30-30-00K-13 | 1SBL277005R1300 | 0.330 | | | | |
| | | | | 100 ... 250 | 100 ... 250 | 0 0 | AF30-30-00K-14 | 1SBL277005R1400 | 0.370 | | | | |
| | | | | 250 ... 500 | 250 ... 500 | 0 0 | AF38-30-00K-11 | 1SBL297005R1100 | 0.330 | | | | |
| | | | | 48 ... 130 | 48 ... 130 | 0 0 | AF38-30-00K-12 | 1SBL297005R1200 | 0.330 | | | | |
| | | | 100 ... 250 | 100 ... 250 | 0 0 | AF38-30-00K-13 | 1SBL297005R1300 | 0.330 | | | | | |
| | | | 250 ... 500 | 250 ... 500 | 0 0 | AF38-30-00K-14 | 1SBL297005R1400 | 0.370 | | | | | |



AF09..K, AF12..K, AF16..K



AF26..K, AF30..K, AF38..K

Main dimensions mm, inches

AF09Z..K ... AF38Z..K 3-pole contactors - with Push-in Spring terminals

4 to 18.5 kW

AC / DC operated - for specific applications



AF09Z-30-10K



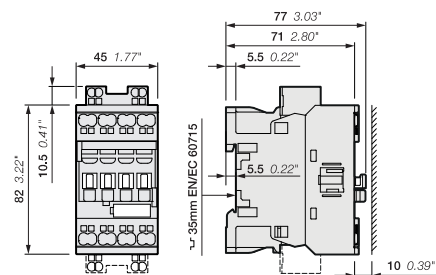
AF26Z-30-00K

AF09Z..K ... AF38Z..K 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.

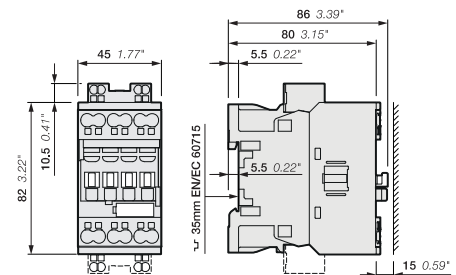
- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC), only 4 control voltage ranges covering 24...250 V 50/60 Hz and 12...250 V DC
 - can manage large control voltage variations
 - allow direct control by PLC-output ≥ 24 V DC 500 mA
 - reduced panel energy consumption
 - very distinct closing and opening
 - can withstand short voltage dips and voltage sags (SEMI F47-0706 conditions of use on request)
- built-in surge suppression
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

| IEC | | UL/CSA | | Rated control circuit voltage | | Auxiliary contacts fitted | Type | Order code | Weight |
|-------------------------|--|----------------------|--------------------|-------------------------------|-----------|---------------------------|-----------------|-----------------|--------|
| Rated operational power | current $\theta \leq 40^\circ\text{C}$ | 3-phase motor rating | General use rating | Uc min. ... Uc max. | | | | | |
| 400 V | AC-3 | 480 V | 600 V AC | V 50/60 Hz | V DC | | | | kg |
| 4 | 25 | 5 | 25 | - | 12 ... 20 | 0 1 | AF09Z-30-10K-20 | 1SBL136005R2010 | 0.315 |
| | | | | | | 0 1 | AF09Z-30-01K-20 | 1SBL136005R2001 | 0.315 |
| | | | | | | 1 0 | AF09Z-30-10K-21 | 1SBL136005R2110 | 0.315 |
| | | | | | | 0 1 | AF09Z-30-01K-21 | 1SBL136005R2101 | 0.315 |
| | | | | | | 1 0 | AF09Z-30-10K-22 | 1SBL136005R2210 | 0.315 |
| | | | | | | 0 1 | AF09Z-30-01K-22 | 1SBL136005R2201 | 0.315 |
| | | | | | | 1 0 | AF09Z-30-10K-23 | 1SBL136005R2310 | 0.315 |
| | | | | | | 0 1 | AF09Z-30-01K-23 | 1SBL136005R2301 | 0.315 |
| | | | | | | 1 0 | AF12Z-30-10K-20 | 1SBL156005R2010 | 0.315 |
| | | | | | | 0 1 | AF12Z-30-01K-20 | 1SBL156005R2001 | 0.315 |
| | | | | | | 1 0 | AF12Z-30-10K-21 | 1SBL156005R2110 | 0.315 |
| | | | | | | 0 1 | AF12Z-30-01K-21 | 1SBL156005R2101 | 0.315 |
| 1 0 | AF12Z-30-10K-22 | 1SBL156005R2210 | 0.315 | | | | | | |
| 0 1 | AF12Z-30-01K-22 | 1SBL156005R2201 | 0.315 | | | | | | |
| 1 0 | AF12Z-30-10K-23 | 1SBL156005R2310 | 0.315 | | | | | | |
| 0 1 | AF12Z-30-01K-23 | 1SBL156005R2301 | 0.315 | | | | | | |
| 1 0 | AF16Z-30-10K-20 | 1SBL176005R2010 | 0.315 | | | | | | |
| 0 1 | AF16Z-30-01K-20 | 1SBL176005R2001 | 0.315 | | | | | | |
| 1 0 | AF16Z-30-10K-21 | 1SBL176005R2110 | 0.315 | | | | | | |
| 0 1 | AF16Z-30-01K-21 | 1SBL176005R2101 | 0.315 | | | | | | |
| 1 0 | AF16Z-30-10K-22 | 1SBL176005R2210 | 0.315 | | | | | | |
| 0 1 | AF16Z-30-01K-22 | 1SBL176005R2201 | 0.315 | | | | | | |
| 1 0 | AF16Z-30-10K-23 | 1SBL176005R2310 | 0.315 | | | | | | |
| 0 1 | AF16Z-30-01K-23 | 1SBL176005R2301 | 0.315 | | | | | | |
| 0 0 | AF26Z-30-00K-20 | 1SBL236005R2000 | 0.355 | | | | | | |
| 0 0 | AF26Z-30-00K-21 | 1SBL236005R2100 | 0.355 | | | | | | |
| 0 0 | AF26Z-30-00K-22 | 1SBL236005R2200 | 0.355 | | | | | | |
| 0 0 | AF26Z-30-00K-23 | 1SBL236005R2300 | 0.355 | | | | | | |
| 0 0 | AF30Z-30-00K-20 | 1SBL276005R2000 | 0.360 | | | | | | |
| 0 0 | AF30Z-30-00K-21 | 1SBL276005R2100 | 0.360 | | | | | | |
| 0 0 | AF30Z-30-00K-22 | 1SBL276005R2200 | 0.360 | | | | | | |
| 0 0 | AF30Z-30-00K-23 | 1SBL276005R2300 | 0.360 | | | | | | |
| 0 0 | AF38Z-30-00K-20 | 1SBL296005R2000 | 0.360 | | | | | | |
| 0 0 | AF38Z-30-00K-21 | 1SBL296005R2100 | 0.360 | | | | | | |
| 0 0 | AF38Z-30-00K-22 | 1SBL296005R2200 | 0.360 | | | | | | |
| 0 0 | AF38Z-30-00K-23 | 1SBL296005R2300 | 0.360 | | | | | | |

Note: Only AF..Z contactors with 12...20 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.



AF09Z..K, AF12Z..K, AF16Z..K



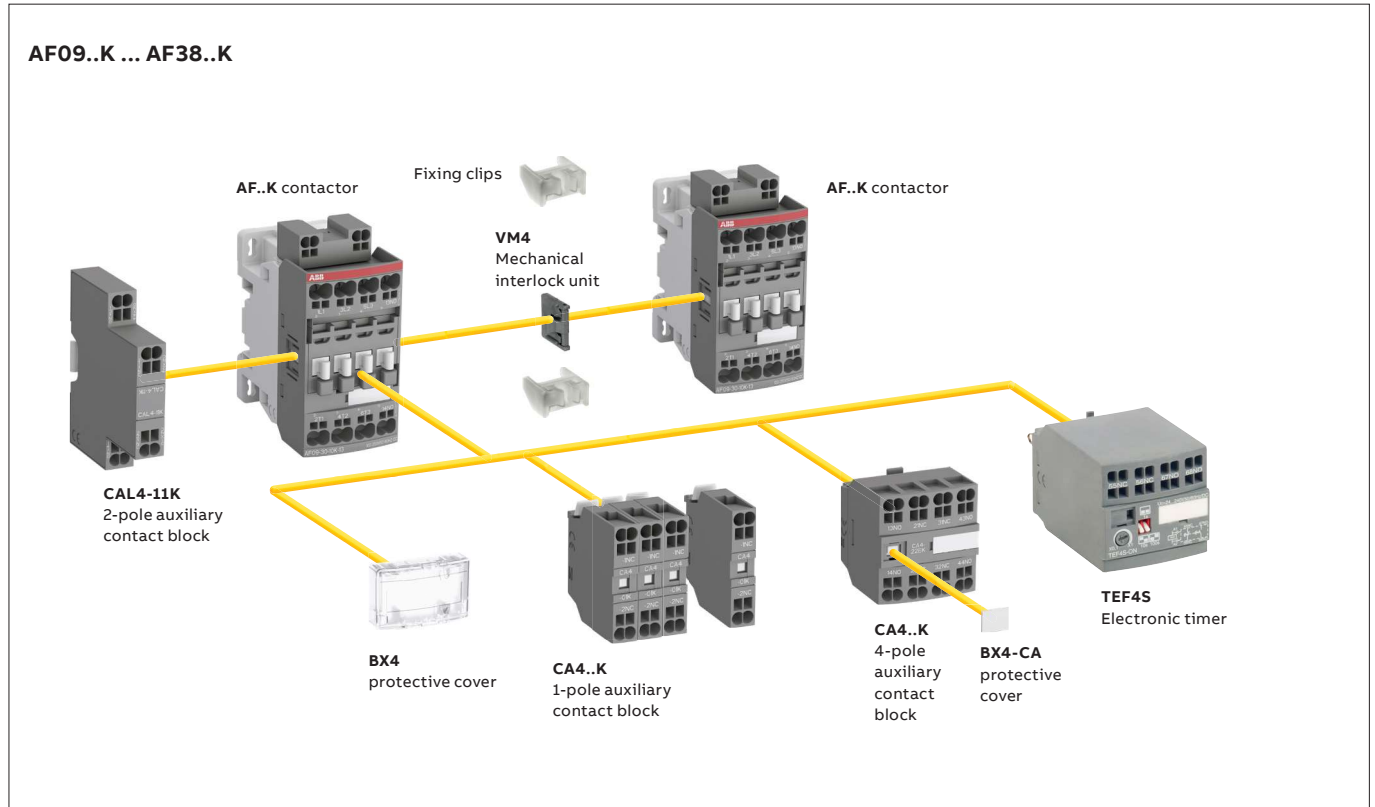
AF26Z..K, AF30Z..K, AF38Z..K

Main dimensions mm, inches

AF09..K ... AF16..K 3-pole contactors - with Push-in Spring terminals

Main accessories

Contactor and main accessories (other accessories available)



Main accessory fitting details - for ordering details, technical data and other accessories: see section accessories

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 interlock unit (between 2 contactors) | Auxiliary contact blocks | |
| | | | 1-pole CA4..K | 4-pole CA4..K | TEF4S | VM4 | Left side | Right side |
| AF09(Z)..K ... AF38(Z)..K (1) | | | | | | | | |
| AF09..K ... AF16..K | 3 0 | 0 1 | 4 max. | or 1 | or 1 | - | + 1 | - |
| AF09..K ... AF16..K | 3 0 | 1 0 | 2 max. | - | or 1 | - | + 1 | + 1 |
| AF26..K ... AF38..K | 3 0 | 0 0 | 4 max. | or 1 | or 1 | + 1 | + 1 | or 1 |
| AF09Z..K ... AF38Z..K 24 V DC designed for PLC - coil 30 (1) | | | | | | | | |
| AF09Z..K ... AF16Z..K | 3 0 | 0 1 | 4 max. | or 1 | or 1 | + 1 | + 1 | + 1 |
| AF09Z..K ... AF16Z..K | 3 0 | 1 0 | 2 max. | - | or 1 | + 1 | + 1 | or 1 |
| AF26Z..K ... AF38Z..K | 3 0 | 0 0 | | | 1 | - | + 1 | + 1 |

(1) Including add-on and built-in contacts: 4 N.C. auxiliary contacts max. on positions 1, 2, 3, 4 and 3 N.C. auxiliary contacts max. on positions 1 ±30°, 5

AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

Main accessories



CA4-10K

1SBCL00080V001.4



CAL4-11K

1SBCL00082V001.4



CA4-22EK

1SBCL00081V001.4



VM4

1SBCL00010W001.4



TEF4S-ON

1SBCL01394F001.4



LDC4K

1SBCL00090V001.4



BX4

1SBCL0021V001.4

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

Front-mounted instantaneous auxiliary contact blocks

| For contactors | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) |
|-------------------------|--------------------|-----------|-----------------|---------|----------------|
| AF09..K ... AF38..K | 1 0 | CA4-10K | 1SBN010160R1010 | 1 | 0.012 |
| | 1 0 | CA4-10K-T | 1SBN010160T1010 | 10 | 0.012 |
| | 0 1 | CA4-01K | 1SBN010160R1001 | 1 | 0.012 |
| | 0 1 | CA4-01K-T | 1SBN010160T1001 | 10 | 0.012 |
| AF26 ... AF16...-40-00K | 2 2 | CA4-22MK | 1SBN010146R1122 | 1 | 0.050 |
| AF26 ... AF38...-40-00K | 2 2 | CA4-22EK | 1SBN010146R1022 | 1 | 0.050 |

Side-mounted instantaneous auxiliary contact blocks

| For contactors | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) |
|---------------------|--------------------|----------|-----------------|---------|----------------|
| AF09..K ... AF38..K | 1 1 | CAL4-11K | 1SBN010134R1011 | 1 | 0.030 |

Mechanical interlock unit

| For contactors | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) |
|---------------------|--------------------|------|-----------------|---------|----------------|
| AF09..K ... AF38..K | | VM4 | 1SBN030105T1000 | 10 | 0.005 |

Note: VM4 includes 2 fixing clips (BB4) to maintain together both contactors.

Fixing clips

| For contactors | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) |
|---------------------|--------------------|------|-----------------|---------|----------------|
| AF09..K ... AF16..K | | BB4 | 1SBN110120W1000 | 50 | 0.002 |

Electronic timers

| For contactors | Time delay range selected by switch | Delay type | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) |
|----------------|-------------------------------------|------------|--------------------|-----------|-----------------|---------|----------------|
| AF09..K ... | 0.1...1 s | ON-delay | 1 1 | TEF4S-ON | 1SBN020113R1000 | 1 | 0.065 |
| AF38..K | 1...10 s | OFF-delay | 1 1 | TEF4S-OFF | 1SBN020115R1000 | 1 | 0.065 |
| | 10...100 s | | | | | | |

Note: Rated control circuit voltage Uc 24 ... 240 V 50/60 Hz or DC. Terminals with spring mode only.

Additional coil terminal block

| For contactors | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) |
|-------------------------|--------------------|-------|-----------------|---------|----------------|
| AF09..K ... AF38..K, NF | | LDC4K | 1SBN070159T1000 | 10 | 0.010 |

Protective covers

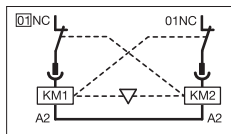
| For contactors | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) |
|--|--------------------|--------|-----------------|---------|----------------|
| AF09..K ... AF38..K 1-stack contactors and NF contactor relays | | BX4 | 1SBN110108T1000 | 10 | 0.006 |
| 4-pole CA4 auxiliary contact blocks and TEF4 electronic timer | | BX4-CA | 1SBN110109W1000 | 50 | 0.001 |

Note: CA4..K and CAL4-11K contact blocks can be used on AF09...AF96 contactors.

Connection accessories for starting solutions- with Push-in Spring terminals



1SBCL00083V0004



VEM4K

| For contactors | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) |
|--|--------------------|-------|-----------------|---------|----------------|
| | | | | | kg |
| Mechanical and electrical interlock set (1) | | | | | |
| AF09..K ... AF16..K | 0 2 | VEM4K | 1SBN030113R1000 | 1 | 0.030 |
| AF26..K ... AF38..K | | | | | |

Note: - VEM4K includes a VM4 mechanical interlock unit with 2 fixing clips (BB4), a VE4K electrical interlock block with A2 - A2 connection.
 - VE4K block must be used with A2-A2 connection to respect the electrical connection diagram.
 - VEM4K not suitable for AF..Z contactors with DC control voltage 12 ... 20 V DC (coil 20 and 24 V DC (coil 30)).
 For product availability, please consult your ABB local sales organization.



1SBCL01673V0004

BEA16-4KF

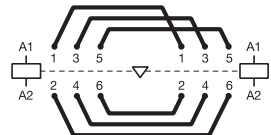
| Connecting links with manual motor starters (1) | | | | | |
|--|-------------------------------|-----------|-----------------|----|-------|
| AF09..K ... AF16..K | with MS132-0.16K... MS132-25K | BEA16-4KF | 1SBN081325T1000 | 10 | 0.052 |
| AF26..K ... AF38..K | with MS132-0.16K... MS132-32K | BEA38-4KF | 1SBN082325T2000 | 10 | 0.057 |

(1) For product availability, please consult your ABB local sales organization.
 Note: BEA not suitable for AF..Z contactors with DC control voltage 24 V DC (coil 30).



1SBCL00128V0004

BER16-4KF



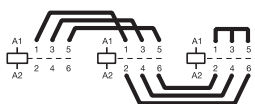
BER
Reversing connections

| Connection sets for reversing contactors | | | | | |
|---|--|-----------|-----------------|---|-------|
| AF09..K ... AF16..K | | BER16-4KF | 1SBN081322R1000 | 1 | 0.050 |
| AF26..K ... AF38..K | | BER38-4KF | 1SBN082322R1000 | 1 | 0.080 |



1SBCL00129V0004

BEY16-4KF



BEY
Line-delta-star connection

| Connection sets for star-delta starter | | | | | |
|---|--|-----------|-----------------|---|-------|
| AF09..K ... AF16..K | | BEY16-4KF | 1SBN081323R2000 | 1 | 0.055 |
| AF26..K ... AF38..K | | BEY38-4KF | 1SBN082323R2000 | 1 | 0.090 |

AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

Technical data

Main pole - Utilization characteristics according to IEC

| Contactor types | AC / DC operated | AF09..K | AF12..K | AF16..K | AF26..K | AF30..K | AF38..K |
|--|--------------------------------|---|-------------------|-------------------|--------------------|--------------------|--------------------|
| 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 ² | 6 mm ² | 6 mm ² | 10 mm ² | 10 mm ² | 10 mm ² |
| AC-1 Utilization category | | | | | | | |
| For air temperature close to contactor | | | | | | | |
| I _e / Rated operational current AC-1 | $\theta \leq 40^\circ\text{C}$ | 25 A | 28 A | 30 A | 45 A | 50 A | 50 A |
| U _e max. $\leq 690\text{ V}$, 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 ² | 6 mm ² | 6 mm ² | 10 mm ² | 10 mm ² | 10 mm ² |
| AC-3, AC-3e Utilization category | | | | | | | |
| For air temperature close to contactor $\theta \leq 60^\circ\text{C}$ | | | | | | | |
| I _e / Max. rated operational current AC-3, AC-3e (1) | | | | | | | |
| | 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 |
| | 1000 V | - | - | - | - | - | - |
| Rated operational power AC-3, AC-3e (1) | | | | | | | |
| | 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 |
| | 1000 V | - | - | - | - | - | - |
| Rated making capacity AC-3, AC-3e | | 10 x I _e AC-3, 12 x I _e AC-3e acc. to IEC 60947-4-1 | | | | | |
| Rated breaking capacity AC-3, AC-3e | | 8 x I _e AC-3, 8.5 x I _e AC-3e acc. to IEC 60947-4-1 | | | | | |
| AC-8a Utilization category (without thermal overload relay U _e 400 V 50/60 Hz $\theta \leq 40^\circ\text{C}$) | | | | | | | |
| I _e / Rated operational current AC-8a | | 12 A | 16 A | 22 A | 30 A | 40 A | 50 A |
| Rated operational power AC-8a | | 5.5 kW | 7.5 kW | 11 kW | 15 kW | 20 kW | 25 kW |
| Short-circuit protection device for contactors without thermal overload relay in free air Motor protection excluded (2) | | | | | | | |
| U _e $\leq 500\text{ V AC}$ - gG type fuse | | 25 A | 32 A | 32 A | 50 A | 63 A | 63 A |
| Rated short-time withstand current I _{cw} at 40 °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 |
| Maximum breaking capacity cos $\phi = 0.45$ | | | | | | | |
| | 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 |
| Power dissipation per pole | | | | | | | |
| | I _e / AC-1 | 1.14 W | 1.43 W | 1.64 W | 2 W | 2.44 W | 2.44 W |
| | I _e / AC-3, AC-3e | 0.15 W | 0.26 W | 0.6 W | 0.66 W | 1 W | 1.41 W |
| Max. electrical switching frequency | | | | | | | |
| | AC-1 | 600 cycles/h | | | | | |
| | AC-3, AC-3e | 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".

AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

Technical data

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

| Contactor types | AC / DC operated | AF09..K | AF12..K | AF16..K | AF26..K | AF30..K | AF38..K |
|---|------------------|---------------------------------------|----------|----------|----------|----------|----------|
| Standards | | UL 60947-4-1, CSA-C22.2 No. 60947-4-1 | | | | | |
| Maximum 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 | 42 A | 45 A | 45 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 | 42 A | 45 A | 45 A |
| 2 poles in serie | 160 V DC | 25 A | 28 A | 30 A | 42 A | 45 A | 45 A |
| 3 poles in serie | 240 V DC | 25 A | 28 A | 30 A | 42 A | 45 A | 45 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 |
| | 550-600 V AC | 9 A | 11 A | 17 A | 22 A | 27 A | 32 A |
| 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 |
| | 550-600 V AC | 7-1/2 hp | 10 hp | 15 hp | 20 hp | 25 hp | 30 hp |
| 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 | | | | | | | |
| Fuse rating | | 30 A | | 60 A | | 100 A | |
| Fuse type, 600 V | | RK5 | | | | | |
| Maximum 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".

AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

Technical data

Main pole - Utilization characteristics - 3 N.O. non reversing contactors

| Contactor types | AC / DC operated | AF09..K | AF12..K | AF16..K | AF26..K | AF30..K | AF38..K |
|---|------------------|----------|----------|----------|----------|----------|----------|
| AC Resistance air heating | | | | | | | |
| Full Load Amps (FLA) | 600 V AC | 20 A | 25 A | 30 A | 42 A | 45 A | 45 A |
| Elevator control, load switching, 500,000 electrical operating cycles acc. to CSA B44.1 / ASME 17.5 paragraph 19.2.1 | | | | | | | |
| 1-phase | | | | | | | |
| Horse power rating | 110-120 V AC | 1/4 hp | 1/3 hp | – | 1-1/2 hp | 2 hp | 2 hp |
| | 220-240 V AC | 1/2 hp | 3/4 hp | – | 3 hp | 3 hp | 5 hp |
| 3-phase | | | | | | | |
| Horse power rating | 200-208 V AC | 1 hp | 2 hp | – | 5 hp | 7-1/2 hp | 7-1/2 hp |
| | 220-240 V AC | 1 hp | 2 hp | – | 5 hp | 7-1/2 hp | 10 hp |
| | 440-480 V AC | 3 hp | 5 hp | – | 15 hp | 20 hp | 20 hp |
| | 550-600 V AC | 3 hp | 5 hp | – | 15 hp | 20 hp | 20 hp |
| Elevator control, 500,000 mechanical operating cycles, 5 electrical operating cycles acc. to CSA B44.1 / ASME 17.5 paragraph 19.2.2 | | | | | | | |
| 1-phase | | | | | | | |
| Horse power rating | 110-120 V AC | 3/4 hp | 1 hp | 1-1/2 hp | 2 hp | 2 hp | 3 hp |
| | 220-240 V AC | 1-1/2 hp | 2 hp | 3 hp | 3 hp | 5 hp | 7-1/2 hp |
| 3-phase | | | | | | | |
| Horse power rating | 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 |
| | 550-600 V AC | 7-1/2 hp | 10 hp | 15 hp | 20 hp | 25 hp | 30 hp |
| Lighting application - UL/CSA | | | | | | | |
| Tungsten lamps | | | | | | | |
| 1-phase per pole | 347 V AC | 20 A | 25 A | 30 A | 42 A | 45 A | 45 A |
| 3-phase break all lines | 600 V AC | 20 A | 25 A | 30 A | 42 A | 45 A | 45 A |
| Electrical discharge lamps (ballast) | | | | | | | |
| 1-phase per pole | 347 V AC | 20 A | 25 A | 30 A | 42 A | 45 A | 45 A |
| 3-phase break all lines | 600 V AC | 20 A | 25 A | 30 A | 42 A | 45 A | 45 A |

AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

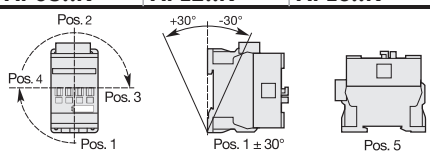
Technical data

General technical data

| Contactor types | AC / DC operated | AF09..K | AF12..K | AF16..K | AF26..K | AF30..K | AF38..K |
|---|------------------|--|---------|---------|---------|---------|---------|
| Rated insulation voltage U_i | | 690 V | | | | | |
| acc. to IEC 60947-4-1 | | 600 V | | | | | |
| acc. to UL / CSA | | 6 kV | | | | | |
| Rated impulse withstand voltage U_{imp} . | | 6 kV | | | | | |
| Electromagnetic compatibility | | Devices complying with IEC 60947-1 / EN 60947-1 - Environment A and B (1) | | | | | |
| Ambient air temperature close to contactor | | -40 ... +70 °C | | | | | |
| Operation Without thermal overload relay | | -60 ... +80 °C | | | | | |
| Storage | | -60 ... +80 °C | | | | | |
| Climatic withstand | | Category B according to IEC 60947-1 Annex Q | | | | | |
| Maximum operating altitude (without derating) | | 3000 m | | | | | |
| Mechanical durability | | 10 million operating cycles | | | | | |
| Number of operating cycles | | 3600 cycles/h | | | | | |
| Maximum switching frequency | | | | | | | |
| Shock withstand | | 1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position | | | | | |
| acc. to IEC 60068-2-27 and EN 60068-2-27 | | | | | | | |
| Mounting position 1 | Shock direction | 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 | | | | | |

(1) AF09 ... AF38...-12 (48...130 V 50/60 Hz-DC) compliant to environment A only. For environment B: select AF09 ... AF38Z...-22.

Mounting characteristics and conditions for use

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

AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

Technical data

Magnet System Characteristics for AF09..K ... AF38..K contactors - AC / DC operated

| Contactor types | AC / DC operated | AF09..K | AF12..K | AF16..K | AF26..K | AF30..K | AF38..K |
|---|-----------------------|--|---------|---------|---------|---------|---------|
| Coil operating limits acc. to IEC 60947-4-1 | AC supply | At $\theta \leq 60^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$. | | | | | |
| | DC supply | At $\theta \leq 60^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$. | | | | | |
| AC control voltage 50/60 Hz | | At $\theta \leq 70^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots U_c \text{ max}$. | | | | | |
| Rated control circuit voltage U_c | | 24 ... 500 V AC | | | | | |
| Coil consumption | Average pull-in value | 50 VA | | | | | |
| | Average holding value | 2.2 VA / 2 W | | | | | |
| DC control voltage | | 20 ... 500 V DC | | | | | |
| Rated control circuit voltage U_c | | 20 ... 500 V DC | | | | | |
| Coil consumption | Average pull-in value | 50 W | | | | | |
| | Average holding value | 2 W | | | | | |
| PLC-output control | | Not suitable for direct control by PLC-output | | | | | |
| Drop-out voltage | | $\leq 60\% U_c \text{ min}$. | | | | | |
| 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 | | | | | |
















Magnet System Characteristics for AF09Z..K ... AF38Z..K contactors - for specific applications - coils 20, 21, 22, 23

| Contactor types | AC / DC operated | AF09Z..K | AF12Z..K | AF16Z..K | AF26Z..K | AF30Z..K | AF38Z..K |
|---|-----------------------|--|----------|----------|----------|----------|----------|
| Coil operating limits acc. to IEC 60947-4-1 | AC supply | At $\theta \leq 60^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$ | | | | | |
| | DC supply | At $\theta \leq 70^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots U_c \text{ max}$ | | | | | |
| AC control voltage 50/60 Hz | | At $\theta \leq 70^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$ | | | | | |
| Rated control circuit voltage U_c | | 24 ... 250 V AC | | | | | |
| Coil consumption | Average pull-in value | 16 VA | | | | | |
| | Average holding value | 1.7 VA / 1.5 W | | | | | |
| DC control voltage | | 12 ... 250 V DC | | | | | |
| Rated control circuit voltage U_c | | 12 ... 250 V DC | | | | | |
| Coil consumption | Average pull-in value | 12 ... 16 W | | | | | |
| | Average holding value | 1.7 W | | | | | |
| PLC-output control | | (AF..Z coil 21) $\geq 500 \text{ mA}$ 24 V DC for PLCs - Not suitable for safety PLCs | | | | | |
| Drop-out voltage | | $\leq 60\%$ of $U_c \text{ min}$. | | | | | |
| Voltage sag immunity acc. to SEMI F47-0706 | | (AF..Z coil 21, 22, 23) conditions of use on request | | | | | |
| Dips withstand $-20^\circ\text{C} \leq \theta \leq +60^\circ\text{C}$ | | (AF..Z coil 21, 22, 23) 20 ms average for $U_c \geq 24 \text{ V}$ 50/60 Hz or $U_c \geq 20 \text{ V}$ DC | | | | | |
| 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 | | | | | |

AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

Technical data

Connecting characteristics

| Contactor types | AC / DC operated | AF09..K | AF12..K | AF16..K | AF26..K | AF30..K | AF38..K |
|---|---|---|--|---------|---------|----------------------------------|---------|
| Main terminals | |  Push-in Spring terminals | | | | | |
| Connection capacity (min. ... max.) | | | | | | | |
| Main conductors (poles) | | | | | | | |
|  | Rigid Solid ($\leq 2.5 \text{ mm}^2$) | 1 x | 1 ... 6 mm ² | | | 1 ... 10 mm ² | |
|  | Stranded ($\geq 4 \text{ mm}^2$) | 2 x | 1 ... 6 mm ² | | | 1 ... 10 mm ² | |
|  | Flexible with non insulated ferrule | 1 x | 1 (push-in) / 0.5 (spring) ... 4 mm ² | | | 1 ... 6 mm ² | |
|  | Flexible with insulated ferrule | 1 x | 1 (push-in) / 0.5 (spring) ... 4 mm ² | | | 1 ... 6 mm ² | |
|  | Flexible without ferrule | 1 x | (spring) 0.5 ... 4 mm ² | | | (spring) 1 ... 6 mm ² | |
|  | Flexible without ferrule | 2 x | (spring) 0.5 ... 4 mm ² | | | (spring) 1 ... 6 mm ² | |
| Connection capacity acc. to UL/CSA (Solid \leq AWG 14) | | 1 or 2 x | AWG 18 ... 10 | | | AWG 18 ... 8 | |
| Stripping length | | | 12 mm | | | 14 mm | |
| Auxiliary conductors (built-in auxiliary terminals + coil terminals) | | | | | | | |
|  | Rigid solid | 1 x | 1 ... 2.5 mm ² | | | | |
|  | Rigid solid | 2 x | 1 ... 2.5 mm ² | | | | |
|  | Flexible with non insulated ferrule | 1 x | 1 (push-in) / 0.5 (spring) ... 2.5 mm ² | | | | |
|  | Flexible with non insulated ferrule | 2 x | 1 (push-in) / 0.5 (spring) ... 2.5 mm ² | | | | |
|  | Flexible with insulated ferrule | 1 x | 1 (push-in) / 0.5 (spring) ... 1.5 mm ² | | | | |
|  | Flexible with insulated ferrule | 2 x | 1 (push-in) / 0.5 (spring) ... 1.5 mm ² | | | | |
|  | Flexible without ferrule | 1 x | (spring) 0.5 ... 2.5 mm ² | | | | |
|  | Flexible without ferrule | 2 x | (spring) 0.5 ... 2.5 mm ² | | | | |
| Connection 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 | | | | | | | |
| Main terminals | | IP20 | | | | | |
| Coil terminals | | IP20 | | | | | |
| Built-in auxiliary terminals | | IP20 | | | | | |
| Screwdriver type | | All terminals | Flat \varnothing 3 mm x 0.5 mm | | | | |

AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

Technical data

Built-in auxiliary contacts according to IEC

| Contactor types | AC / DC operated | AF09..K | AF12..K | AF16..K | AF26..K | AF30..K | AF38..K |
|--|--------------------|---|---------|---------|---------|---------|---------|
| Rated operational voltage Ue max. | | 690 V | | | | | |
| Rated frequency (without derating) | | 50 / 60 Hz | | | | | |
| Conventional free air thermal current Ith - $\theta \leq 40^\circ\text{C}$ | | 16 A | | | | | |
| Ie / Rated operational current AC-15 acc. to IEC 60947-5-1 | | 6 A | | | | | |
| | 24-127 V 50/60 Hz | 4 A | | | | | |
| | 220-240 V 50/60 Hz | 3 A | | | | | |
| | 400-440 V 50/60 Hz | 2 A | | | | | |
| | 500 V 50/60 Hz | 2 A | | | | | |
| | 690 V 50/60 Hz | 2 A | | | | | |
| Making capacity AC-15 | | 10 x Ie AC-15 acc. to IEC 60947-5-1 | | | | | |
| Breaking capacity AC-15 | | 10 x Ie AC-15 acc. to IEC 60947-5-1 | | | | | |
| Ie / Rated operational current DC-13 acc. to IEC 60947-5-1 | | 6 A / 144 W | | | | | |
| | 24 V DC | 2.8 A / 134 W | | | | | |
| | 48 V DC | 1 A / 72 W | | | | | |
| | 72 V DC | 0.55 A / 60 W | | | | | |
| | 110 V DC | 0.55 A / 69 W | | | | | |
| | 125 V DC | 0.27 A / 60 W | | | | | |
| | 220 V DC | 0.27 A / 68 W | | | | | |
| | 250 V DC | 0.15 A / 60 W | | | | | |
| | 400 V DC | 0.13 A / 65 W | | | | | |
| | 500 V DC | 0.1 A / 60 W | | | | | |
| | 600 V DC | | | | | | |
| Short-circuit protection device gG type fuse | | 10 A | | | | | |
| Rated short-time withstand current Icw | for 1.0 s | 100 A | | | | | |
| | for 0.1 s | 140 A | | | | | |
| Minimum switching capacity with failure rate acc. to IEC 60947-5-4 | | 12 V / 3 mA | | | | | |
| Non-overlapping time between N.O. and N.C. contacts | | ≥ 2 ms | | | | | |
| Power dissipation per pole at 6 A | | 0.1 W | | | | | |
| Maximum electrical switching frequency | AC-15 | 1200 cycles/h | | | | | |
| | DC-13 | 900 cycles/h | | | | | |
| Mechanically linked contacts acc. to annex L of IEC 60947-5-1 | | Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts (CA4, CAL4 aux. contact blocks) are mechanically linked contacts. | | | | | |
| Mirror contacts acc. to annex F of IEC 60947-4-1 | | Built-in N.C. auxiliary contacts or additional N.C. auxiliary contacts (CA4, CAL4 aux. contact blocks) are mirror contacts. | | | | | |

Built-in auxiliary contacts according to UL / CSA

| Contactor types | AC / DC operated | AF09..K | AF12..K | AF16..K | AF26..K | AF30..K | AF38..K |
|--|------------------|--------------------|---------|---------|---------|---------|---------|
| Maximum 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..K ... AF38..K 3-pole contactors with Push-in Spring terminals

Electrical durability and utilization categories

General

Utilization categories determine the current making and breaking conditions relating to the characteristics of the loads to be controlled by the contactors. International standard IEC 60947-4-1 and European standard EN 60947-4-1 are the standards to be referred to.

If I_c is the current to be broken by the contactor and I_e the rated operational current normally drawn by the load, then:

- Categories AC-1 and AC-3 $I_c = I_e$
- Category AC-2 $I_c = 2.5 \times I_e$
- Category AC-4 $I_c = 6 \times I_e$

Generally speaking $I_c = m \times I_e$ where m is a multiple of the load operational current.

On next pages, the curves corresponding to categories AC-1, AC-3 and AC-4 represent the electrical durability variation of standard contactors in relation to the breaking current I_c . Electrical durability is expressed in millions of operating cycles.

Curve utilization mode

Electrical durability forecast and contactor selection for categories AC-1, AC-2, AC-3 or AC-4

| Characteristics | Load to be controlled |
|------------------------|---|
| Operational voltage | U_e |
| Current normally drawn | I_e ($U_e / I_e / \text{kW}$ relation for motors, see "Motor rated operational powers and currents") |
| Utilization category | AC-1, AC-2, AC-3 or AC-4 |
| Breaking current | $I_c = I_e$ for AC-1 and for AC-3; $I_c = 2.5 \times I_e$ for AC-2; $I_c = 6 \times I_e$ for AC-4 |

- Define the number of operating cycles N required.
- On the diagram corresponding to the operational category, select the contactor with the curve immediately above the intersection point ($I_c ; N$).

Electrical durability forecast and contactor selection for mixed duty motor control: AC-3 ($I_c = I_e$) type switching off while "motor running" and, occasionally, AC-4 ($I_c = 6 \times I_e$) type switching off while "motor accelerating"

| Characteristics | Load to be controlled |
|--|---|
| Operational voltage | U_e |
| Current normally drawn while "motor running" | I_e ($U_e / I_e / \text{kW}$ relation for motors, see "Motor rated operational powers and currents") |
| Utilization category | AC-1, AC-2, AC-3 or AC-4 |
| Breaking current for AC-3 | $I_c = I_e$ |
| Breaking current for AC-4 while "motor accelerating" | $I_c = 6 \times I_e$ |
| Percentage of AC-4 operating cycles | K (on the basis of the total number of operating cycles) |

- Define the total number of operating cycles N required.
- Note the smallest contactor rating compatible for AC-3 (U_e / I_e) on Main pole utilization characteristic table (see "Technical data").
- For the selected contactor make a note of the following in relation to the voltage using diagram AC-3 in next pages:
 - The number of operating cycles A for $I_c = I_e$ (AC-3)
 - The number of operating cycles B for $I_c = 6 \times I_e$ (AC-4)
- Calculate the estimated number of cycles N' (N' is always below A)

$$N' = \frac{A}{1 + 0.01 K (A/B - 1)}$$

- If N' is too low in relation to the target N , calculate the estimated number of cycles for a higher contactor rating.

Case of uninterrupted duty

For uninterrupted duty, some verifications of preventing maintenance are necessary to check the functionality of the concerned product (consult us).

The combined effect of environmental conditions and the proper temperature of the product may require some disposals. As a matter of fact, for this duty, the use duration prevails over the number of operating cycles.

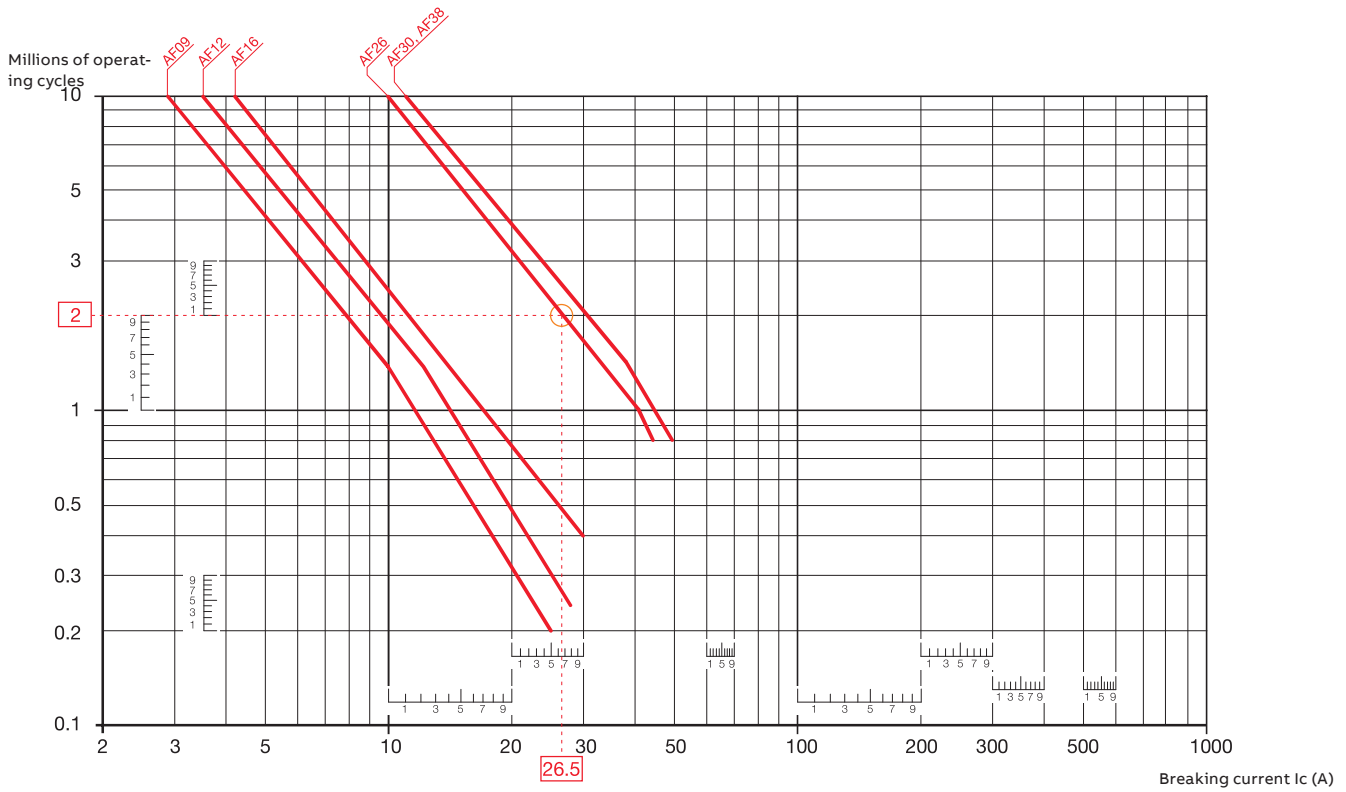
AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

Electrical durability

Electrical Durability for AC-1 Utilization Category - $U_e \leq 690$ V.

Switching non-inductive or slightly inductive loads. The breaking current I_c for AC-1 is equal to the rated operational current of the load.

Ambient temperature and maximum electrical switching frequency: see "Technical Data".



Example:

$I_c / AC-1 = 26.5$ A – Electrical durability required = 2 millions operating cycles.

Using the AC-1 curves above select the AF26 contactor at intersection "O" (26.5 A / 2 millions operating cycles).

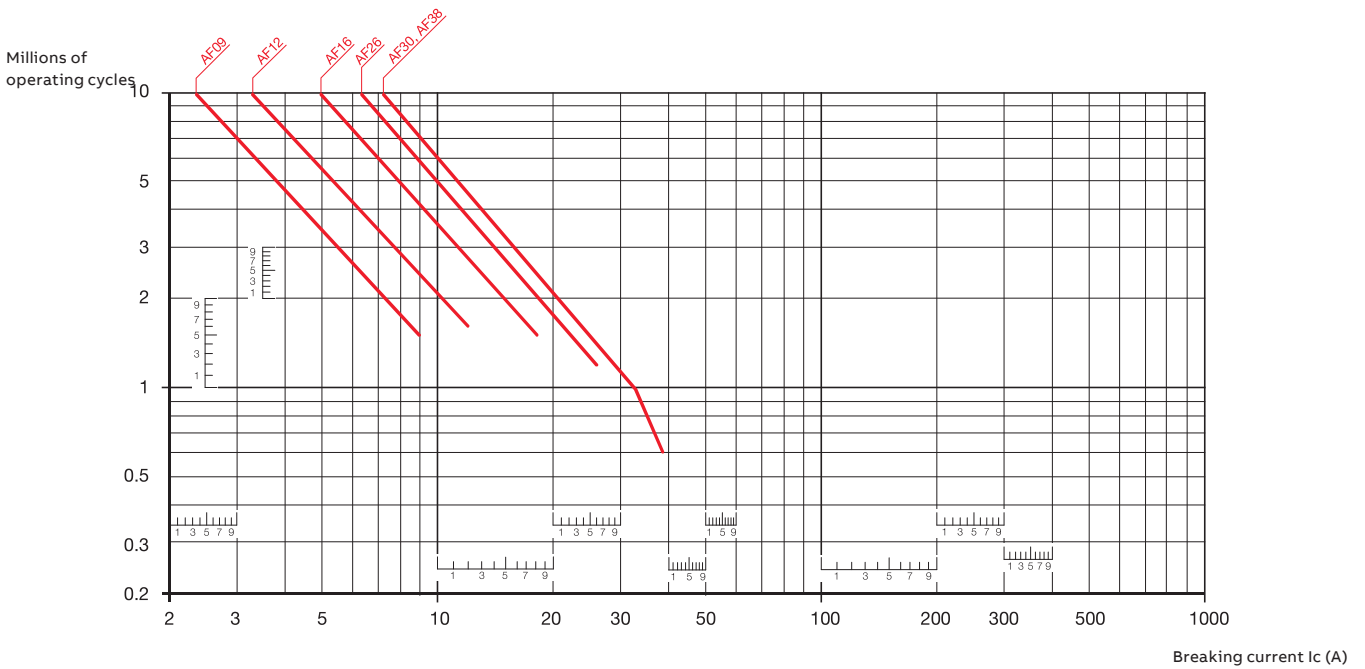
AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

Electrical durability

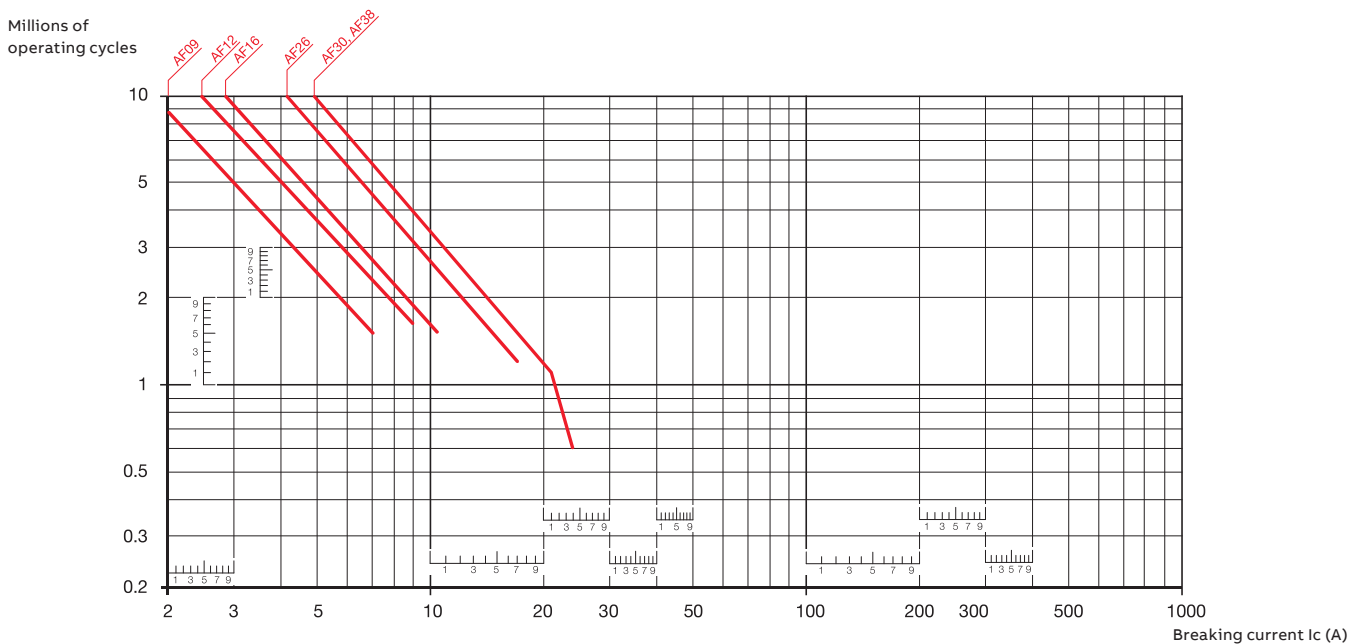
Electrical Durability for AC-3 Utilization Category

Switching cage motors: starting and switching of running motors. The breaking current I_c for AC-3 is equal to the rated operational current I_e (I_e = motor full load current). Ambient temperature and maximum electrical switching frequency: see "Technical Data".

AC-3 - $U_e \leq 440$ V



AC-3 - 440 V < $U_e \leq 690$ V



AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

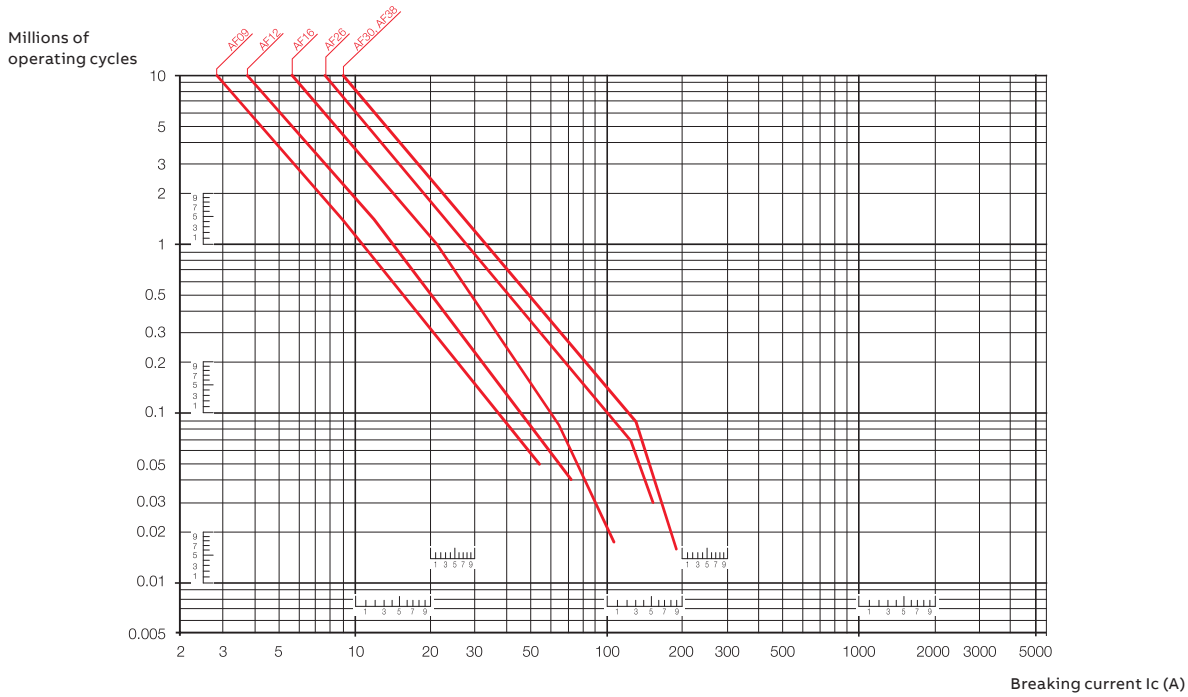
Electrical durability

Electrical Durability for AC-2 or AC-4 Utilization Category

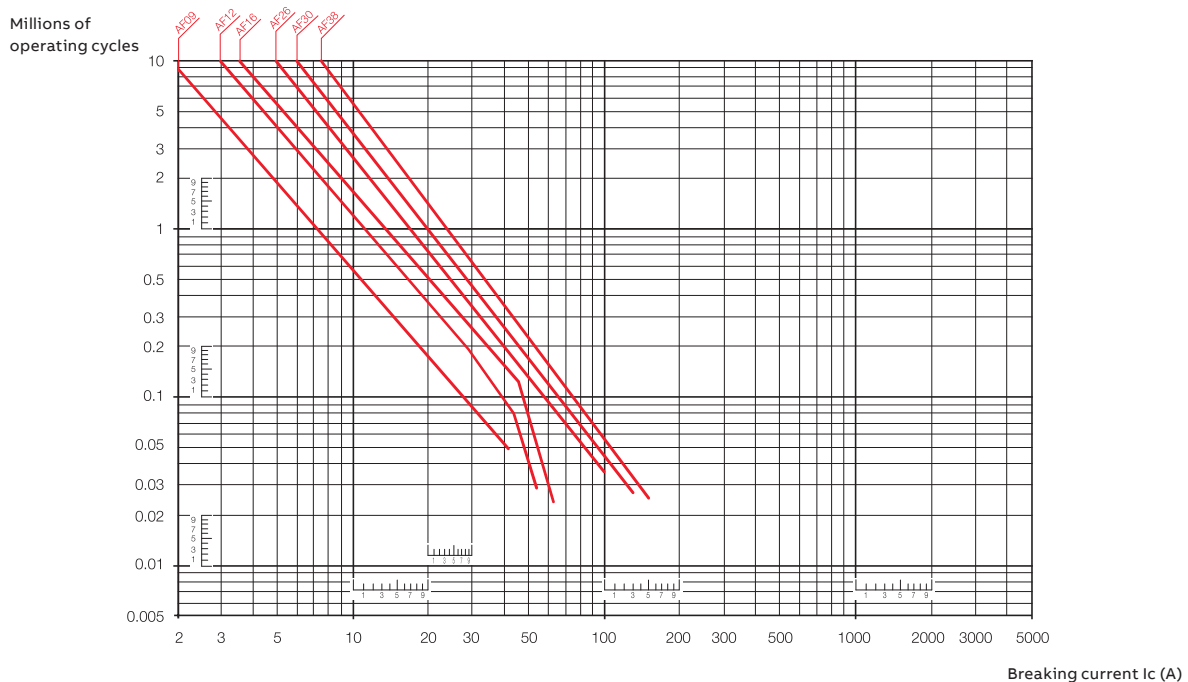
Switching cage motors: starting reverse operation and step-by-step operation. The breaking current I_c is equal to $2.5 \times I_e$ for AC-2 and $6 \times I_e$ for AC-4, keeping in mind that I_e is the motor rated operational current (I_e = motor full load current).

Ambient temperature ≤ 60 °C. Maximum electrical switching frequency: see "Technical Data".

AC-2 or AC-4 - $U_e \leq 440$ V



AC-2 or AC-4 - 440 V $< U_e \leq 690$ V

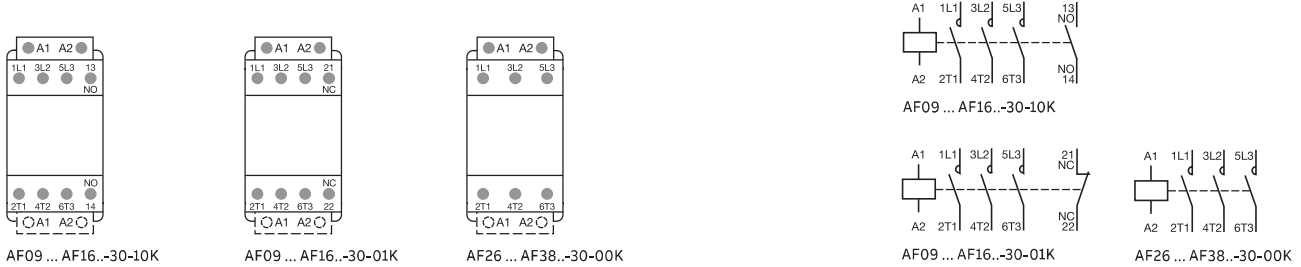


AF09..K ... AF38..K 3-pole contactors - with Push-in Spring terminals

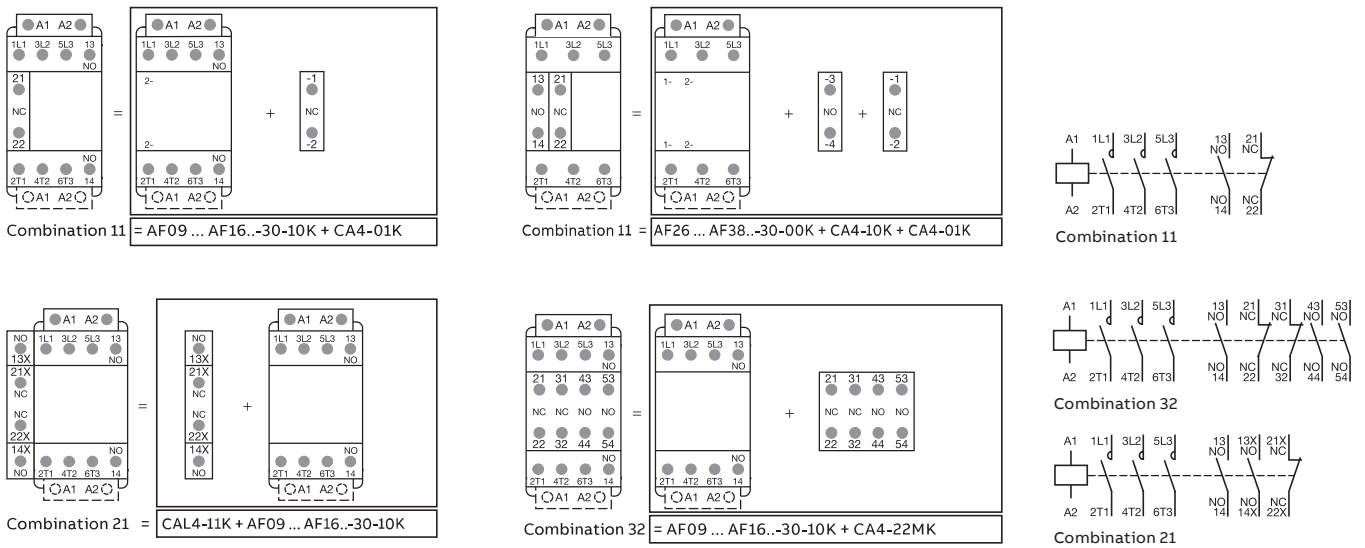
Terminal marking and positioning

AF09..K ... AF38..K contactors - AC / DC operated

Standard devices without addition of auxiliary contacts



Other possible contact combinations with auxiliary contacts added by the user

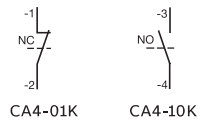


Note: Only AF..Z contactor with DC control voltage 12...20 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole

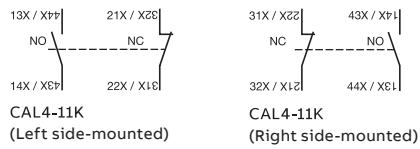
AF09..K ... AF38..K add-on auxiliary contacts - with Push-in Spring terminals

Terminal marking and positioning

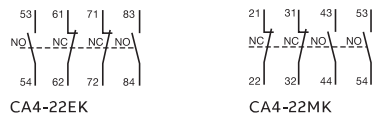
1-pole auxiliary contacts



2-pole auxiliary contacts

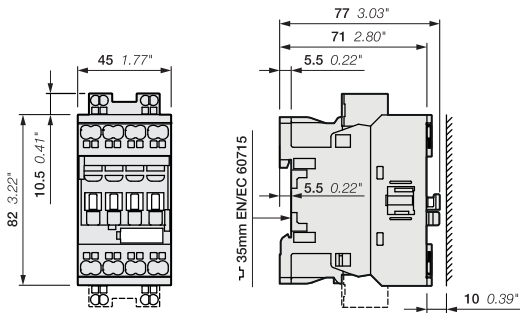


4-pole auxiliary contacts

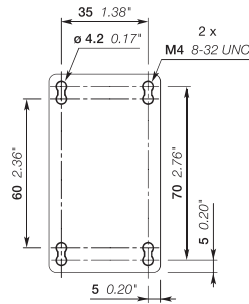


AF09..K, AF16..K 3-pole contactors - with Push-in Spring terminals

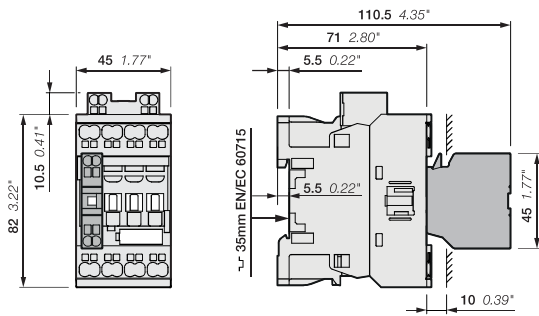
Dimensions



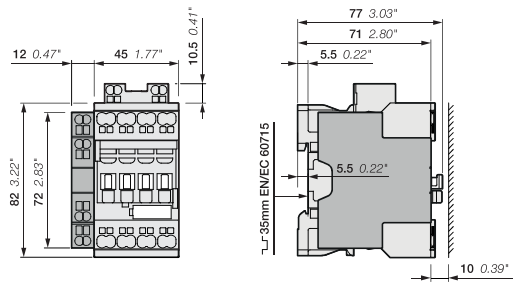
AF09..K, AF12..K, AF16..K



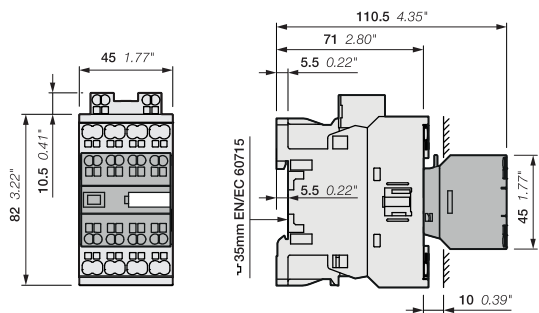
AF09..K, AF12..K, AF16..K



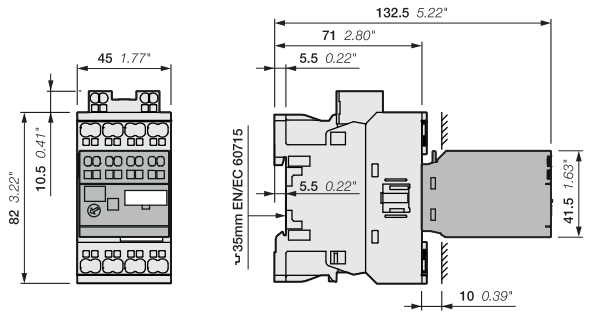
AF09..K, AF12..K, AF16..K
+ CA4..K 1-pole auxiliary contact block



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



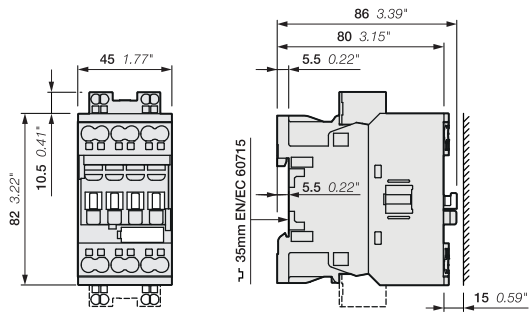
AF09..K, AF16..K
+ CA4..K 4-pole auxiliary contact block



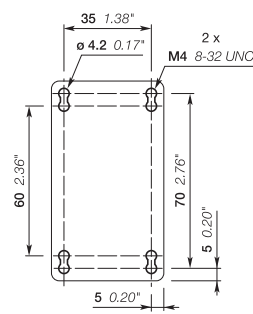
AF09..K, AF16..K
+ TEF45 electronic timer

AF26..K, AF30..K, AF38..K 3-pole contactors - with Push-in Spring terminals

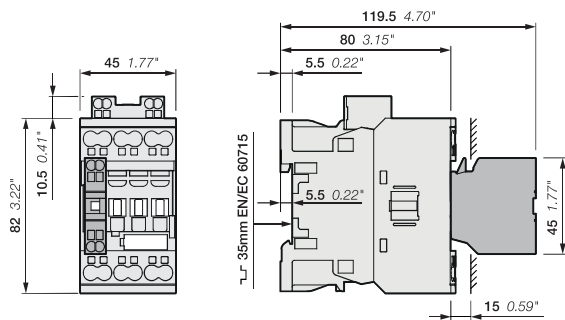
Dimensions



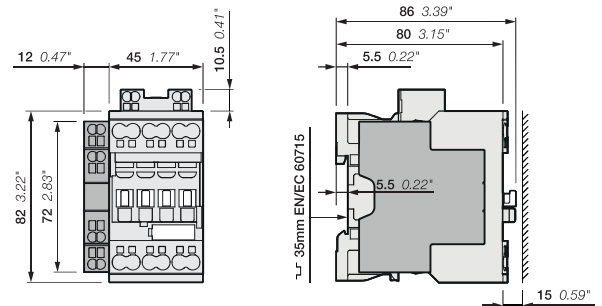
AF26..K, AF30..K, AF38..K



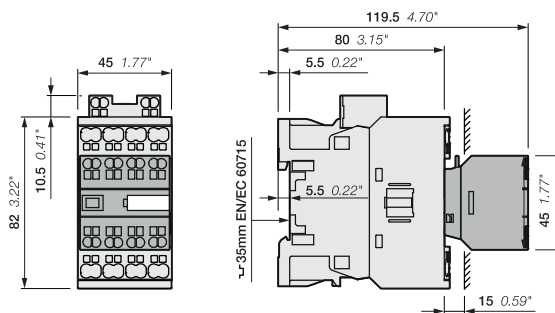
AF26..K, AF30..K, AF38..K



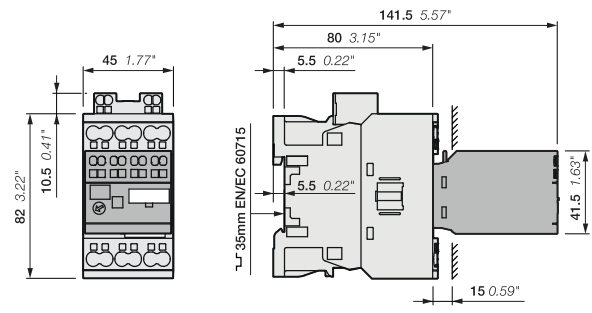
AF26..K, AF30..K, AF38..K
+ CA4..K 1-pole auxiliary contact block



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



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



AF26..K, AF30..K, AF38..K
+ TEF45 electronic timer

Note: For AF26..K ... AF38..K contactors, lateral distance to grounded component 2 mm 0.08" min
24 V DC operated contactor (coil 30) depth + 20 mm (0.79").