

AF16-22-00-.. / AF16Z-22-00-.. 4-pole Contactors AC / DC Operated - with Screw Terminals

AF16(Z) contactors are used for controlling power circuits up to 690 V AC and 440 V DC. They are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...).

- AF..(Z) contactors include an electronic coil interface providing reduced pull-in and holding consumption, particularly for AC control circuits
- Only four coils are needed to cover control voltages between 24...500 V 50/60 Hz or 20...500 V DC.
- AF..(Z) offer extended operating limits and are suitable worldwide for different control voltages. e.g.: the coil 100...250 V 50/60 Hz - DC is suitable for Europe (230 V 50 Hz) and for North America (120 V 60 Hz and 208 V 60 Hz).
- AF..(Z) contactors can manage large control voltage variations.
- AF.Z contactors equipped with a 24...60 V 50/60 Hz - 20...60 V DC coil allow direct control by 24 V DC 500 mA PLC-output
- AF.Z contactors withstand short voltage dips and voltage sags (SEMI F47-0706 compliance)
- AF..(Z) contactors have built-in surge protection and do not require additional surge suppressors.



| | | | |
|--|--|------|--|
| | | 30 A | |
|--|--|------|--|

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

Ordering Details

| IEC | UL/CSA | Control voltage | Auxiliary contacts | Type | Order code | EAN | Weight |
|-------------------------------------|--------------------|---------------------|--------------------|------|------------|-----|--|
| AC-1 Rated current | General use rating | Uc min. ... Uc max. | fitted | | | | |
| $\theta \leq 40^\circ\text{C}$ A | 600 V AC A | V 50/60 Hz ; V DC | | | | | Pack ^(ing) 1 piece kg |

4-pole Contactors 2 N.O. + 2 N.C. Main Poles

| 30 | 30 | 24...60 | 20...60 | 0 0 | AF16-22-00-11 | 1SBL 177 501 R1100 | 3471523116313 | 0.270 |
|----|----|-----------|-----------|-----|---------------|--------------------|---------------|-------|
| | | 48...130 | 48...130 | 0 0 | AF16-22-00-12 | 1SBL 177 501 R1200 | 3471523116320 | 0.270 |
| | | 100...250 | 100...250 | 0 0 | AF16-22-00-13 | 1SBL 177 501 R1300 | 3471523116337 | 0.270 |
| | | 250...500 | 250...500 | 0 0 | AF16-22-00-14 | 1SBL 177 501 R1400 | 3471523116344 | 0.310 |

Note: AF16-22-00-11 not suitable for a direct control by PLC-output. AF16-22-00-11 available in some countries: please consult your ABB representative.

4-pole Contactors 2 N.O. + 2 N.C. Main Poles - Low Consumption

| 30 | 30 | - | 12...20 | 0 0 | AF16Z-22-00-20 | 1SBL 176 501 R2000 | 3471523116702 | 0.310 |
|----|----|-----------|-----------|-----|----------------|--------------------|---------------|-------|
| | | 24...60 | 20...60 | 0 0 | AF16Z-22-00-21 | 1SBL 176 501 R2100 | 3471523116719 | 0.310 |
| | | 48...130 | 48...130 | 0 0 | AF16Z-22-00-22 | 1SBL 176 501 R2200 | 3471523116726 | 0.310 |
| | | 100...250 | 100...250 | 0 0 | AF16Z-22-00-23 | 1SBL 176 501 R2300 | 3471523116733 | 0.310 |

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

Certifications and Approvals

| | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | | | | |
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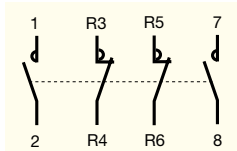
Main Pole - Utilization Characteristics according to IEC

| | | |
|--|--|--------------|
| Standards | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 | |
| Rated operational voltage Ue max. | 690 V | |
| Rated frequency limits | 25 ... 400 Hz | |
| Conventional free-air thermal current Ith | 35 A | |
| acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$ | | |
| with conductor cross-sectional area | 6 mm ² | |
| AC-1 Utilization category | | |
| for air temperature close to contactor | | |
| Ie / AC-1 rated operational current | $\theta \leq 40^\circ\text{C}$ | 30 A |
| Ue max. $\leq 690\text{ V}$, 50/60 Hz | $\theta \leq 60^\circ\text{C}$ | 30 A |
| | $\theta \leq 70^\circ\text{C}$ | 26 A |
| with conductor cross-sectional area | 6 mm ² | |
| Short-circuit protection | | |
| for contactors without thermal O/L relay - Motor protection excluded | | |
| Ue $\leq 500\text{ V AC}$ - gG type fuse | 32 A | |
| Rated short-time withstand current Icw | 1 s | 300 A |
| at 40 °C ambient temperature, in free air from a cold state | 10 s | 150 A |
| | 30 s | 80 A |
| | 1 min | 60 A |
| | 15 min | 35 A |
| Heat dissipation per pole | Ie / AC-1 | 1.2 W |
| Max. electrical switching frequency | AC-1 | 600 cycles/h |

Main Pole - Utilization Characteristics according to UL / CSA

| | | |
|---|------------------------|--|
| Standards | UL 508, CSA C22.2 N°14 | |
| Rated operational voltage Ue max. | 600 V | |
| UL General use rating | | |
| 600 V AC | 30 A | |
| With conductor cross-sectional area | AWG 10 | |
| 80 V DC - 1-pole for 4 N.O. main poles | | |
| With conductor cross-sectional area | | |
| 80 V DC - 1-pole for 2 N.O. / 2 N.C. main poles | 20 A | |
| With conductor cross-sectional area | AWG 12 | |
| Max. electrical switching frequency | | |
| for general use | 600 cycles/h | |

Remark for 4-pole contactors fitted with 2 N.O. + 2 N.C. main poles



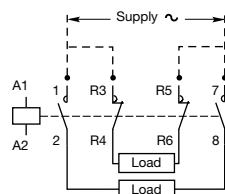
These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising 2 separate loads with a single supply (see diagrams below). When the contactor operates there is no mechanical overlapping between the N.O. poles and the N.C. poles: BREAK before MAKE.



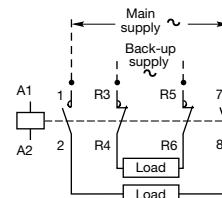
These contactors are not suitable for a reversing starter or for controlling a single load from 2 separate supplies.

Block diagrams

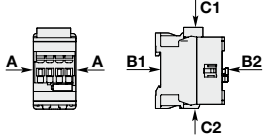
- Single supply and 2 separate loads



- 2 separate supplies and 2 separate loads



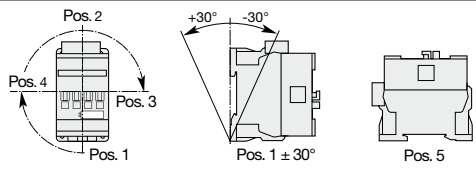
General Technical Data

| | | |
|---|------------------------|---|
| Rated insulation voltage U_i | acc. to IEC 60947-4-1 | 690 V |
| | acc. to UL | 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 in free air | | -40 ... +70 °C |
| Storage | | -60 ... +80 °C |
| Climatic withstand | | Category B according to IEC 60947-1 Annex Q |
| Operating altitude | | ≤ 3000 m |
| Mechanical durability | | |
| Number of operating cycles | | 10 millions operating cycles |
| Max. switching frequency | | 3600 cycles/h |
| Shock withstand acc. IEC 60068-2-27 and EN 60068-2-27 | | |
| Mounting position 1 | | |
|  | 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

| | | | |
|--|-------------------------------------|------------------------------|--|
| Coil operating limits | | AC supply | at $\theta \leq 60$ °C 0.85 x U_c min ... 1.1 x U_c max at $\theta \leq 70$ °C 0.85 x U_c min ... U_c max |
| acc. to IEC 60947-4-1 | | DC supply | at $\theta \leq 60$ °C 0.85 x U_c min ... 1.1 x U_c max at $\theta \leq 70$ °C (AF) 0.85 x U_c min ... U_c max - (AF..Z) 0.85 x U_c min ... 1.1 x U_c max |
| 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 | N.O. contact opening | 11 ... 95 ms |
| | and: | N.C. contact closing | 13 ... 98 ms |

Mounting Characteristics

| | | |
|---------------------------|--|---|
| Mounting positions | |  |
| | | Max. add-on N.C. auxiliary contacts: see accessory fitting details for a 4-pole contactor AF09 ... AF38 |
| Mounting distances | | The contactors can be assembled side by side. |
| Fixing | on rail according to IEC 60715, EN 60715 | 35 x 7.5 mm or 35 x 15 mm |
| | by screws (not supplied) | 2 x M4 screws placed diagonally |















Connecting Characteristics

Main terminals



Screw terminals with cable clamp

Connecting capacity (min. ... max.)

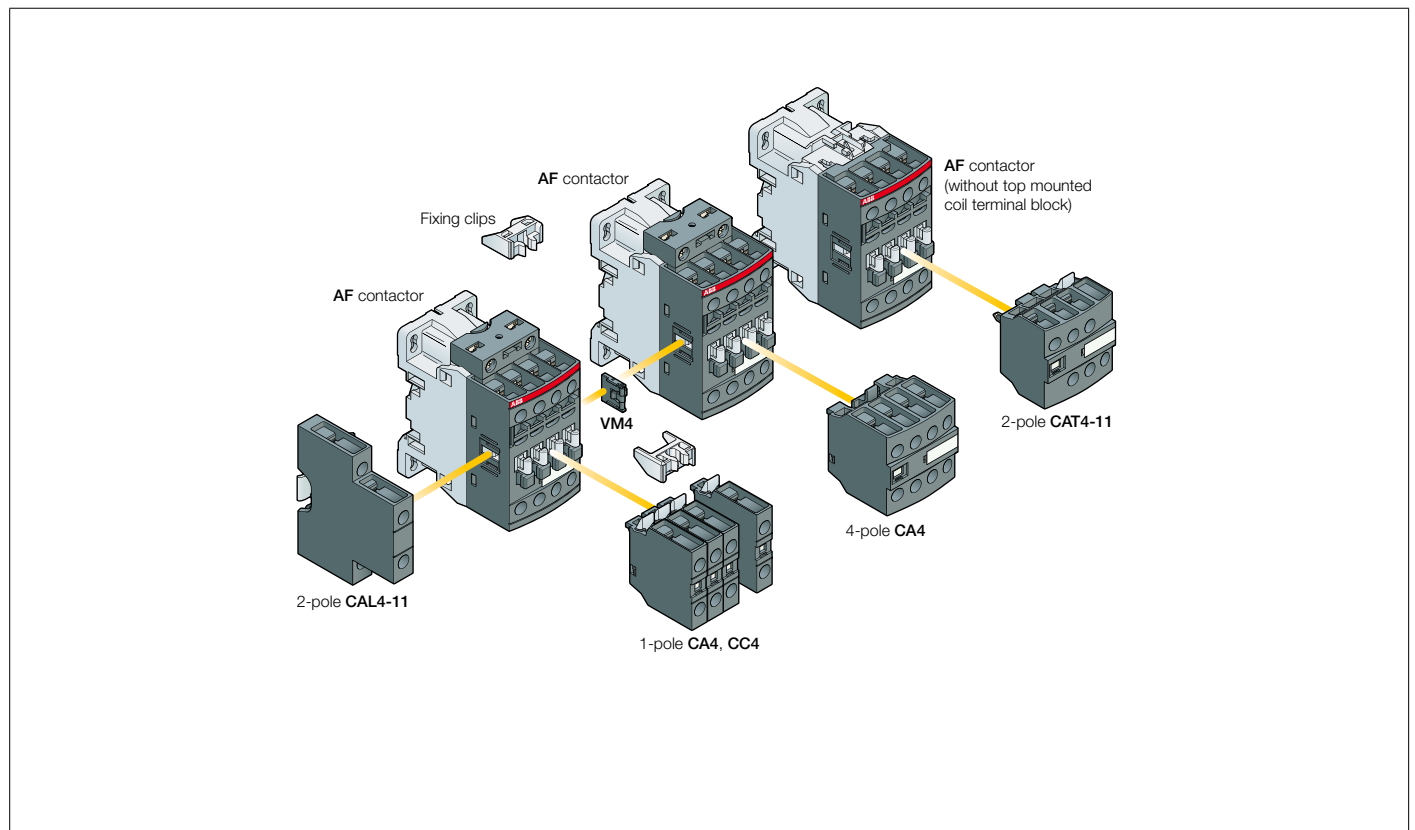
| | | | |
|---|-------------------------------------|------------------------------------|--|
| Main conductors (poles) | | | |
|  | Rigid | solid ($\leq 4 \text{ mm}^2$) | 1 x 1 ... 6 mm ² |
|  | | stranded ($\geq 6 \text{ mm}^2$) | 2 x 1 ... 6 mm ² |
|  | Flexible with non insulated ferrule | | 1 x 0.75 ... 6 mm ² |
|  | | | 2 x 0.75 ... 6 mm ² |
|  | Flexible with insulated ferrule | | 1 x 0.75 ... 4 mm ² |
|  | | | 2 x 0.75 ... 2.5 mm ² |
|  | Bars or lugs | | L < 9.6 mm |
| Capacity according to UL/CSA | | | 1 or 2 x AWG 16 ... 10 |
| Stripping length | | | 10 mm |
| Auxiliary conductors | | | |
|  | Rigid solid | | 1 x 1 ... 2.5 mm ² |
|  | | | 2 x 1 ... 2.5 mm ² |
|  | Flexible with non insulated ferrule | | 1 x 0.75 ... 2.5 mm ² |
|  | | | 2 x 0.75 ... 2.5 mm ² |
|  | Flexible with insulated ferrule | | 1 x 0.75 ... 2.5 mm ² |
|  | | | 2 x 0.75 ... 1.5 mm ² |
|  | Bars or lugs | | L < 8 mm |
| Capacity according to UL/CSA | | | 1 or 2 x AWG 18 ... 14 |
| Stripping length | | | 10 mm |
| Degree of protection | | | |
| acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 | | | |
| Main terminals | | | IP20 |
| Coil terminals | | | IP20 |
| Screw terminals | | | (delivered in open position, screws of unused terminals must be tightened) |
| Main terminals | | | M3.5 |
| Coil terminals | | | M3.5 |
| Screwdriver type | | | Flat Ø 5.5 / Pozidriv 2 |
| Tightening torque | | | |
| Main pole terminals | | | 1.5 Nm / 13 lb.in |
| Coil terminals | | | 1.2 Nm / 11 lb.in |

Accessory Fitting Details for a 4-pole Contactor

Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

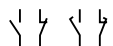
| Main poles | Built-in auxiliary contacts | Front-mounted accessories | | | | Side-mounted accessories | |
|---|-----------------------------|---------------------------|----------------|------------|---|-----------------------------|------------|
| | | Auxiliary contact blocks | | | Electrical and mechanical interlock set (between 2 contactors) | 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. add-on N.C. auxiliary contacts: 3 N.C. max. on positions 1, 2, 3, 4 and 2 N.C. max. on positions 1 ±30°, 5 | | | | | | | |
| 2 | 2 | 0 | 0 | | | | |
| | | 4 max. | or 1 | or 1 | – | + 1 | – |
| | | 2 max. | or 1 | – | – | + 1 | + 1 |

Overview of main accessories (other accessories available)



Main Accessories

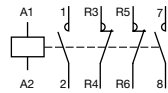
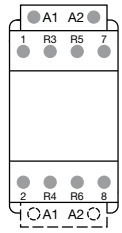
Ordering Details

| Description | Auxiliary contacts  | Type | Order code | EAN | Pack ^(ing) piece | Weight | |
|--|---|----------|--------------------|--------------------|-----------------------------|---------------------------|-------|
| | | | | | | kg <small>(1 pce)</small> | |
| Additional auxiliary contact blocks | Front-mounted instantaneous auxiliary contact blocks | 0 1 - - | CA4-01 | 1SBN 010 110 R1001 | 3471523130029 | 1 | 0.014 |
| | | 1 0 - - | CA4-10 | 1SBN 010 110 R1010 | 3471523130005 | 1 | 0.014 |
| | | 0 1 - - | CA4-01-T | 1SBN 010 110 T1001 | 3471523130395 | 10 | 0.014 |
| | | 1 0 - - | CA4-10-T | 1SBN 010 110 T1010 | 3471523130371 | 10 | 0.014 |
| | Front-mounted auxiliary contact blocks with N.O. leading contact and N.C. lagging contact | - - 0 1 | CC4-01 | 1SBN 010 111 R1001 | 3471523130432 | 1 | 0.014 |
| | | - - 1 0 | CC4-10 | 1SBN 010 111 R1010 | 3471523130425 | 1 | 0.014 |
| | Side-mounted instantaneous auxiliary contact blocks | 1 1 - - | CAL4-11 | 1SBN 010 120 R1011 | 3471523130043 | 1 | 0.040 |
| | | 1 1 - - | CAL4-11-T | 1SBN 010 120 T1011 | 3471523130418 | 10 | 0.040 |
| | Front-mounted instantaneous auxiliary contact blocks | 2 2 - - | CA4-22E | 1SBN 010 140 R1022 | 3471523130128 | 1 | 0.055 |
| | | 3 1 - - | CA4-31E | 1SBN 010 140 R1031 | 3471523130135 | 1 | 0.055 |
| | 4 0 - - | CA4-40E | 1SBN 010 140 R1040 | 3471523130142 | 1 | 0.055 | |
| Front-mounted instantaneous auxiliary contact and A1/A2 coil terminal blocks | 1 1 - - | CAT4-11E | 1SBN 010 151 R1011 | 3471523130067 | 1 | 0.040 | |
| Additional coil terminal block | | LDC4 | 1SBN 070 156 T1000 | 3471523130678 | 10 | 0.010 | |
| Protective covers | Protective covers | | BX4 | 1SBN 110 108 T1000 | 3471523130708 | 10 | 0.006 |
| | | | BX4-CA | 1SBN 110 109 W1000 | 3471523130715 | 50 | 0.001 |
| Function markers | Function markers | | BA4 | 1SNA 235 156 R2700 | 3472592351568 | 16 | 0.011 |
| | | | HTP500-BA4 | 1SNA 235 712 R2400 | 3472592357126 | 1 | 0.220 |
| | | | SPRC 1 | 1SNA 360 010 R1500 | 3472593600108 | 1 | 0.290 |

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

Terminal Marking and Positioning

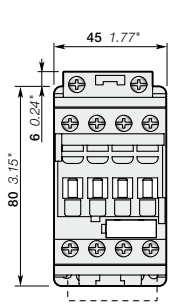
Standard devices without addition of auxiliary contacts



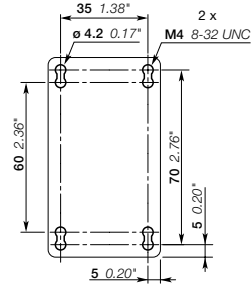
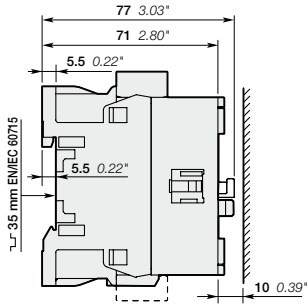
AF16-22-00-.. / AF16Z-22-00-..

AF16-22-00-.. / AF16Z-22-00-..

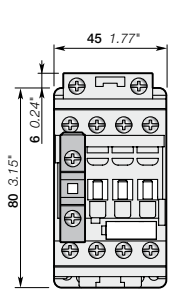
Dimensions mm, inches



AF16

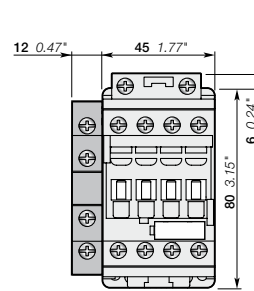
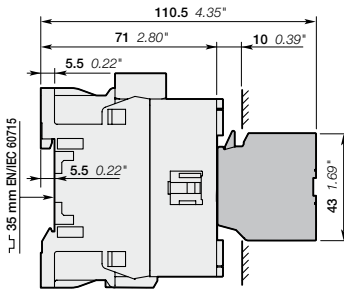


AF16



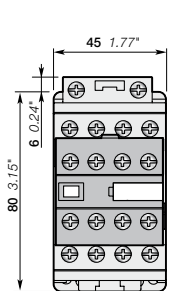
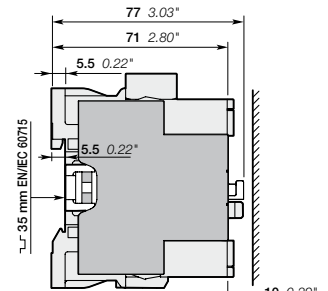
AF16

+ CA4, CC4 1-pole auxiliary contact block



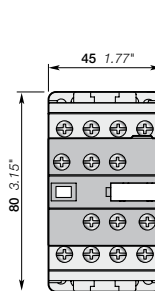
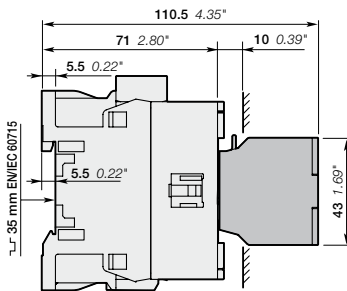
AF16

+ CAL4-11 2-pole auxiliary contact block



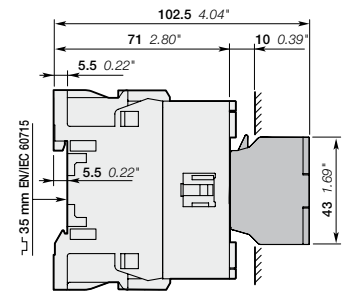
AF16

+ CA4 4-pole auxiliary contact block



AF16

+ CAT4 2-pole auxiliary contact and coil terminal block



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

Contact us

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