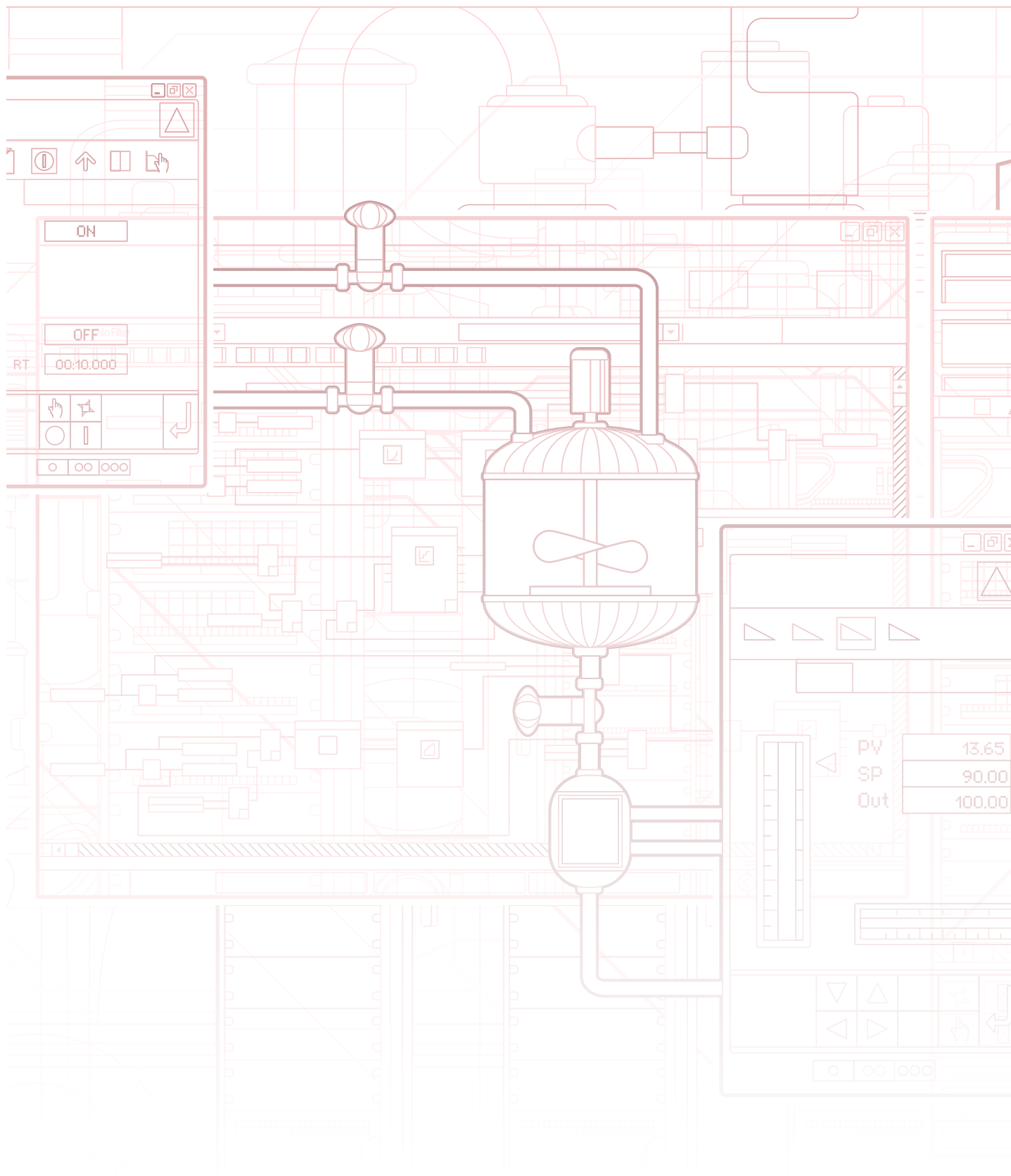
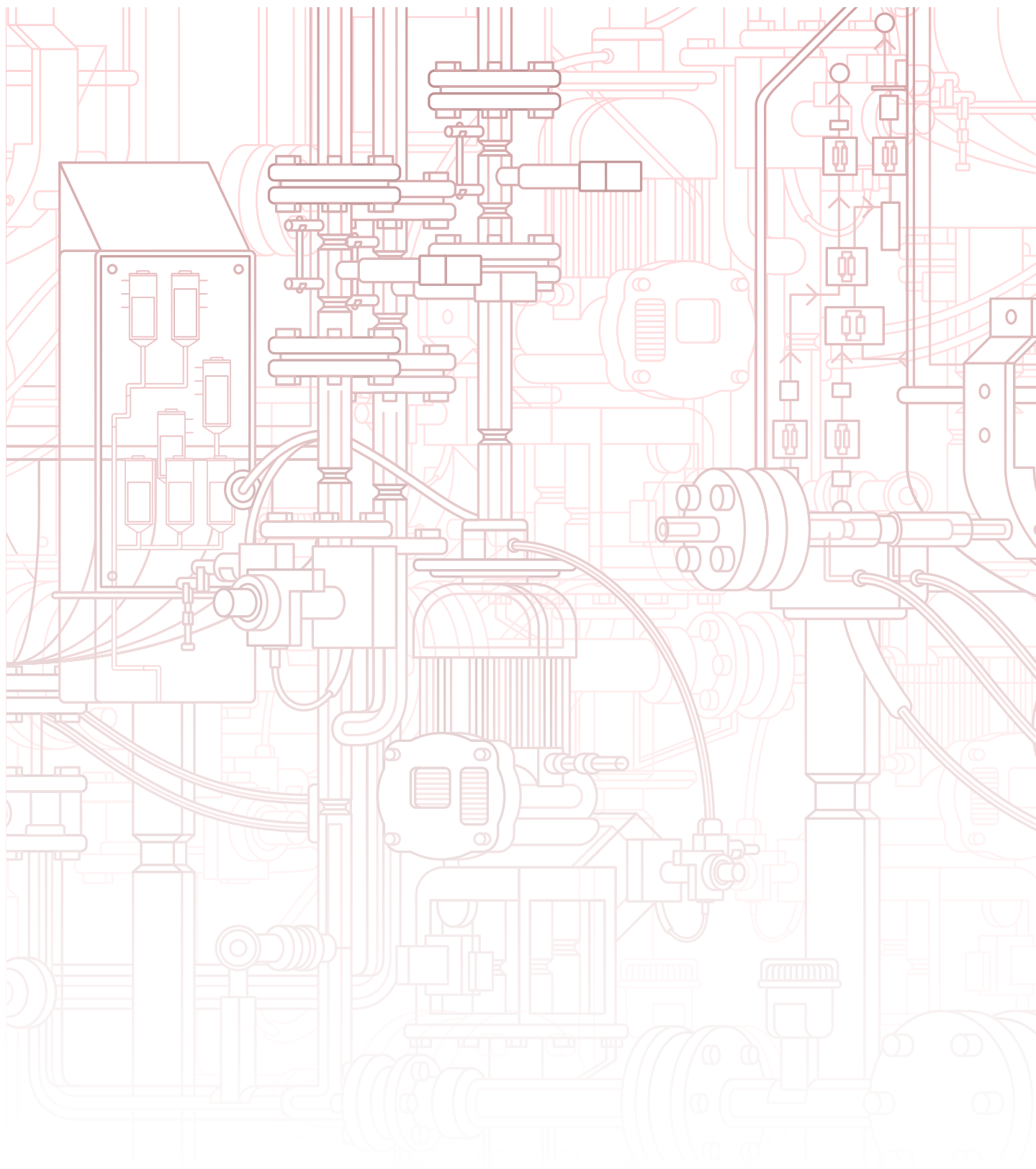




# NF Contactor Relays



|                                                           |           |
|-----------------------------------------------------------|-----------|
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# Contactor Relays



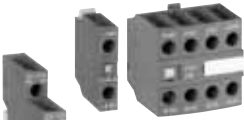
 AC / DC control voltage

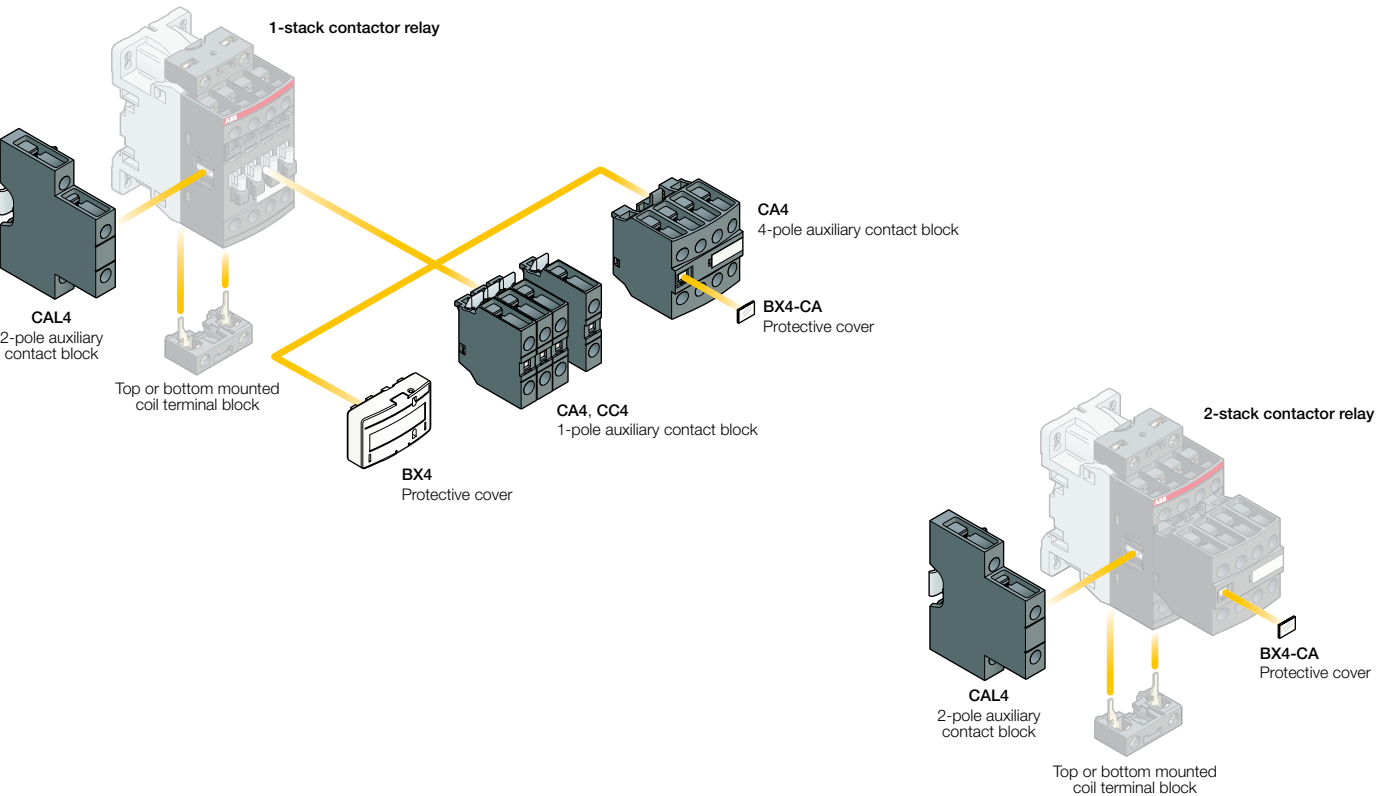
| NF22E           | NF31E           | NF40E  | NF44E           | NF53E           | NF62E           | NF71E           | NF80E  |
|-----------------|-----------------|--------|-----------------|-----------------|-----------------|-----------------|--------|
| 2 N.O. + 2 N.C. | 3 N.O. + 1 N.C. | 4 N.O. | 4 N.O. + 4 N.C. | 5 N.O. + 3 N.C. | 6 N.O. + 2 N.C. | 7 N.O. + 1 N.C. | 8 N.O. |

## Control Circuit Switching

|        |                           |            |               |
|--------|---------------------------|------------|---------------|
| IEC    | Rated operational current |            |               |
|        | AC-15                     | 240 V      | 4 A           |
|        |                           | 400 V      | 3 A           |
|        |                           | 690 V      | 2 A           |
|        | DC-13                     | 24 V       | 6 A / 144 W   |
|        |                           | 400 V      | 0.15 A / 60 W |
| UL/CSA | Pilot Duty                | A600, Q600 |               |

## Main Accessories

|                          |                |                                                                                    |                                                                           |                    |
|--------------------------|----------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------|
| Auxiliary contact blocks | Front mounting |  | 1-pole <b>CA4-10</b> or <b>CA4-01</b> ,<br><b>CC4-10</b> or <b>CC4-01</b> |                    |
|                          |                |                                                                                    | 4-pole <b>CA4</b>                                                         |                    |
|                          | Side mounting  |  |                                                                           | 2-pole <b>CAL4</b> |



# NF Contactor Relays

## AC / DC Operated - with Screw Terminals

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NF22E



NF44E

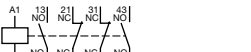
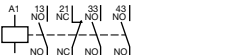
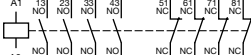
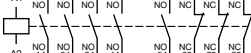
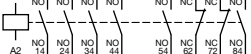
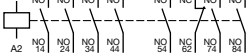
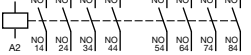
### Application

NF contactor relays are used for switching auxiliary and control circuits.

### Description

- NF contactor relays 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
- NF contactor relays can manage large control voltage variations. One coil (i.e. 100...250 V 50/60 Hz - DC) can be used for different control voltages used worldwide without any coil change
- NFZ contactor relays equipped with a Z coil type allow direct control by 24 V DC 500 mA PLC-output and obtain a reduced holding coil consumption.
- NFZ contactor relays withstand short dips and voltage interruptions (SEMI F47-0706 compliance)
- NF contactor relays have built-in surge protection and do not require additional surge suppressors
- The contactor relays have mechanically-linked auxiliary contacts compliant with Annex L of IEC 60947-5-1 and include the "Mechanically Linked" symbol on their side
- 8-pole contactor relays are mounted with a non-removable auxiliary contact block (2<sup>nd</sup> stack).

### Ordering Details

| Number of contacts                                                                  |                       | Control voltage<br>U <sub>c</sub> min. ... U <sub>c</sub> max. | Type      | Order code | Weight<br><br>Pack <sup>(ing)</sup><br>1 piece<br>kg |       |
|-------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------|-----------|------------|------------------------------------------------------|-------|
| 1 <sup>st</sup> stack                                                               | 2 <sup>nd</sup> stack |                                                                |           |            |                                                      |       |
|                                                                                     |                       | V 50/60 Hz                                                     | V DC      |            |                                                      |       |
|    |                       | 24...60                                                        | 20...60   | NFZ22E-21  | 1SBH 136 001 R2122                                   | 0.310 |
|                                                                                     |                       | 48...130                                                       | 48...130  | NF22E-12   | 1SBH 137 001 R1222                                   | 0.270 |
|                                                                                     |                       | 100...250                                                      | 100...250 | NF22E-13   | 1SBH 137 001 R1322                                   | 0.270 |
|                                                                                     |                       | 250...500                                                      | 250...500 | NF22E-14   | 1SBH 137 001 R1422                                   | 0.310 |
|  |                       | 24...60                                                        | 20...60   | NFZ31E-21  | 1SBH 136 001 R2131                                   | 0.310 |
|                                                                                     |                       | 48...130                                                       | 48...130  | NF31E-12   | 1SBH 137 001 R1231                                   | 0.270 |
|                                                                                     |                       | 100...250                                                      | 100...250 | NF31E-13   | 1SBH 137 001 R1331                                   | 0.270 |
|                                                                                     |                       | 250...500                                                      | 250...500 | NF31E-14   | 1SBH 137 001 R1431                                   | 0.310 |
|  |                       | 24...60                                                        | 20...60   | NFZ40E-21  | 1SBH 136 001 R2140                                   | 0.310 |
|                                                                                     |                       | 48...130                                                       | 48...130  | NF40E-12   | 1SBH 137 001 R1240                                   | 0.270 |
|                                                                                     |                       | 100...250                                                      | 100...250 | NF40E-13   | 1SBH 137 001 R1340                                   | 0.270 |
|                                                                                     |                       | 250...500                                                      | 250...500 | NF40E-14   | 1SBH 137 001 R1440                                   | 0.310 |
|  |                       | 24...60                                                        | 20...60   | NFZ44E-21  | 1SBH 136 001 R2144                                   | 0.360 |
|                                                                                     |                       | 48...130                                                       | 48...130  | NF44E-12   | 1SBH 137 001 R1244                                   | 0.320 |
|                                                                                     |                       | 100...250                                                      | 100...250 | NF44E-13   | 1SBH 137 001 R1344                                   | 0.320 |
|                                                                                     |                       | 250...500                                                      | 250...500 | NF44E-14   | 1SBH 137 001 R1444                                   | 0.360 |
|  |                       | 24...60                                                        | 20...60   | NFZ53E-21  | 1SBH 136 001 R2153                                   | 0.360 |
|                                                                                     |                       | 48...130                                                       | 48...130  | NF53E-12   | 1SBH 137 001 R1253                                   | 0.320 |
|                                                                                     |                       | 100...250                                                      | 100...250 | NF53E-13   | 1SBH 137 001 R1353                                   | 0.320 |
|                                                                                     |                       | 250...500                                                      | 250...500 | NF53E-14   | 1SBH 137 001 R1453                                   | 0.360 |
|  |                       | 24...60                                                        | 20...60   | NFZ62E-21  | 1SBH 136 001 R2162                                   | 0.360 |
|                                                                                     |                       | 48...130                                                       | 48...130  | NF62E-12   | 1SBH 137 001 R1262                                   | 0.320 |
|                                                                                     |                       | 100...250                                                      | 100...250 | NF62E-13   | 1SBH 137 001 R1362                                   | 0.320 |
|                                                                                     |                       | 250...500                                                      | 250...500 | NF62E-14   | 1SBH 137 001 R1462                                   | 0.360 |
|  |                       | 24...60                                                        | 20...60   | NFZ71E-21  | 1SBH 136 001 R2171                                   | 0.360 |
|                                                                                     |                       | 48...130                                                       | 48...130  | NF71E-12   | 1SBH 137 001 R1271                                   | 0.320 |
|                                                                                     |                       | 100...250                                                      | 100...250 | NF71E-13   | 1SBH 137 001 R1371                                   | 0.320 |
|                                                                                     |                       | 250...500                                                      | 250...500 | NF71E-14   | 1SBH 137 001 R1471                                   | 0.360 |
|  |                       | 24...60                                                        | 20...60   | NFZ80E-21  | 1SBH 136 001 R2180                                   | 0.360 |
|                                                                                     |                       | 48...130                                                       | 48...130  | NF80E-12   | 1SBH 137 001 R1280                                   | 0.320 |
|                                                                                     |                       | 100...250                                                      | 100...250 | NF80E-13   | 1SBH 137 001 R1380                                   | 0.320 |
|                                                                                     |                       | 250...500                                                      | 250...500 | NF80E-14   | 1SBH 137 001 R1480                                   | 0.360 |

# NF Contactor Relays - NFZ Additional Coils

## AC / DC Operated - with Screw Terminals

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NFZ22E



NFZ44E

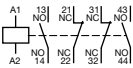
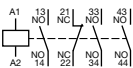
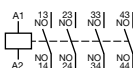
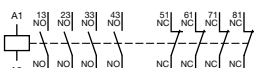
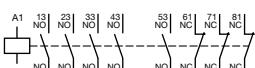
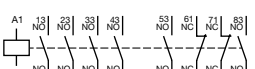
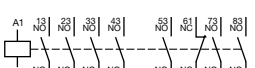
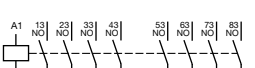
### Application

NFZ contactor relays are used for switching auxiliary and control circuits.

### Description

- NFZ contactor relays include an electronic coil interface accepting a wide control voltage  $U_c$  min. ...  $U_c$  max. and managing large control voltage variations.
- NFZ contactor relays cover control voltages between 24...250 V 50/60 Hz or 12...250 V DC
- NFZ contactor relays allow direct control by PLC-output  $\geq 24$  V DC 500 mA and obtain a reduced holding coil consumption.
- NFZ contactor relays withstand short dips and voltage interruptions (SEMI F47-0706 compliance)
- NFZ contactor relays have built-in surge protection and do not require additional surge suppressors
- The contactor relays have mechanically-linked auxiliary contacts compliant with Annex L of IEC 60947-5-1 and include the "Mechanically Linked" symbol on their side
- 8-pole contactor relays are mounted with a non-removable auxiliary contact block (2<sup>nd</sup> stack).

### Ordering Details

| Number of contacts<br>1 <sup>st</sup> stack      2 <sup>nd</sup> stack              | Control voltage<br>$U_c$ min. ... $U_c$ max. |           | Type      | Order code         | Weight<br><br>Pack <sup>(ing)</sup><br>1 piece<br>kg |
|-------------------------------------------------------------------------------------|----------------------------------------------|-----------|-----------|--------------------|------------------------------------------------------|
|                                                                                     | V 50/60 Hz                                   | V DC      |           |                    |                                                      |
|    | -                                            | 12...20   | NFZ22E-20 | 1SBH 136 001 R2022 | 0.310                                                |
|                                                                                     | 24...60                                      | 20...60   | NFZ22E-21 | 1SBH 136 001 R2122 | 0.310                                                |
|                                                                                     | 48...130                                     | 48...130  | NFZ22E-22 | 1SBH 136 001 R2222 | 0.310                                                |
|                                                                                     | 100...250                                    | 100...250 | NFZ22E-23 | 1SBH 136 001 R2322 | 0.310                                                |
|  | -                                            | 12...20   | NFZ31E-20 | 1SBH 136 001 R2031 | 0.310                                                |
|                                                                                     | 24...60                                      | 20...60   | NFZ31E-21 | 1SBH 136 001 R2131 | 0.310                                                |
|                                                                                     | 48...130                                     | 48...130  | NFZ31E-22 | 1SBH 136 001 R2231 | 0.310                                                |
|                                                                                     | 100...250                                    | 100...250 | NFZ31E-23 | 1SBH 136 001 R2331 | 0.310                                                |
|  | -                                            | 12...20   | NFZ40E-20 | 1SBH 136 001 R2040 | 0.310                                                |
|                                                                                     | 24...60                                      | 20...60   | NFZ40E-21 | 1SBH 136 001 R2140 | 0.310                                                |
|                                                                                     | 48...130                                     | 48...130  | NFZ40E-22 | 1SBH 136 001 R2240 | 0.310                                                |
|                                                                                     | 100...250                                    | 100...250 | NFZ40E-23 | 1SBH 136 001 R2340 | 0.310                                                |
|  | -                                            | 12...20   | NFZ44E-20 | 1SBH 136 001 R2044 | 0.360                                                |
|                                                                                     | 24...60                                      | 20...60   | NFZ44E-21 | 1SBH 136 001 R2144 | 0.360                                                |
|                                                                                     | 48...130                                     | 48...130  | NFZ44E-22 | 1SBH 136 001 R2244 | 0.360                                                |
|                                                                                     | 100...250                                    | 100...250 | NFZ44E-23 | 1SBH 136 001 R2344 | 0.360                                                |
|  | -                                            | 12...20   | NFZ53E-20 | 1SBH 136 001 R2053 | 0.360                                                |
|                                                                                     | 24...60                                      | 20...60   | NFZ53E-21 | 1SBH 136 001 R2153 | 0.360                                                |
|                                                                                     | 48...130                                     | 48...130  | NFZ53E-22 | 1SBH 136 001 R2253 | 0.360                                                |
|                                                                                     | 100...250                                    | 100...250 | NFZ53E-23 | 1SBH 136 001 R2353 | 0.360                                                |
|  | -                                            | 12...20   | NFZ62E-20 | 1SBH 136 001 R2062 | 0.360                                                |
|                                                                                     | 24...60                                      | 20...60   | NFZ62E-21 | 1SBH 136 001 R2162 | 0.360                                                |
|                                                                                     | 48...130                                     | 48...130  | NFZ62E-22 | 1SBH 136 001 R2262 | 0.360                                                |
|                                                                                     | 100...250                                    | 100...250 | NFZ62E-23 | 1SBH 136 001 R2362 | 0.360                                                |
|  | -                                            | 12...20   | NFZ71E-20 | 1SBH 136 001 R2071 | 0.360                                                |
|                                                                                     | 24...60                                      | 20...60   | NFZ71E-21 | 1SBH 136 001 R2171 | 0.360                                                |
|                                                                                     | 48...130                                     | 48...130  | NFZ71E-22 | 1SBH 136 001 R2271 | 0.360                                                |
|                                                                                     | 100...250                                    | 100...250 | NFZ71E-23 | 1SBH 136 001 R2371 | 0.360                                                |
|  | -                                            | 12...20   | NFZ80E-20 | 1SBH 136 001 R2080 | 0.360                                                |
|                                                                                     | 24...60                                      | 20...60   | NFZ80E-21 | 1SBH 136 001 R2180 | 0.360                                                |
|                                                                                     | 48...130                                     | 48...130  | NFZ80E-22 | 1SBH 136 001 R2280 | 0.360                                                |
|                                                                                     | 100...250                                    | 100...250 | NFZ80E-23 | 1SBH 136 001 R2380 | 0.360                                                |

Note: Only NFZ contactor relays 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

# NF Contactor Relays

## Technical Data

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### Contact Utilization Characteristics according to IEC

|                                                                    |                                                    |
|--------------------------------------------------------------------|----------------------------------------------------|
| Contactor relay types                                              | <b>NF</b>                                          |
| Standards                                                          | IEC 60947-1 / 60947-5-1 and EN 60947-1 / 60947-5-1 |
| 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                | $\geq 2$ 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                                       |

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

|                                        |                        |
|----------------------------------------|------------------------|
| Contactor relay types                  | <b>NF</b>              |
| 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                  |

# NF Contactor Relays

## Technical Data

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### General Technical Data

|                                                                           |                                                                 |
|---------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>Contactor relay types</b>                                              | <b>NF</b>                                                       |
| <b>Rated insulation voltage <math>U_i</math></b><br>acc. to IEC 60947-5-1 | 690 V                                                           |
| acc. to UL / CSA                                                          | 600 V                                                           |
| <b>Rated impulse withstand voltage <math>U_{imp}</math></b>               | 6 kV                                                            |
| <b>Electromagnetic compatibility</b>                                      | Devices complying with IEC 60947-1 / EN 60947-1 - Environment A |
| <b>Ambient air temperature</b> close to contactor                         |                                                                 |
| Operation in free air                                                     | -40 ... +70 °C                                                  |
| Storage                                                                   | -60 ... +80 °C                                                  |
| <b>Climatic withstand</b>                                                 | Category B according to IEC 60947-1 Annex Q                     |
| <b>Operating altitude</b>                                                 | ≤ 3000 m                                                        |
| <b>Mechanical durability</b>                                              |                                                                 |
| Number of operating cycles                                                | 20 millions operating cycles                                    |
| Max. switching frequency                                                  | 7200 cycles/h                                                   |
| <b>Shock withstand</b> acc. IEC 60068-2-27 and EN 60068-2-27              |                                                                 |
| Mounting position 1                                                       |                                                                 |
|                                                                           |                                                                 |
| <b>Shock direction</b>                                                    | 1/2 sinusoidal shock for 11 ms: no change in contact position   |
| <b>A</b>                                                                  | 30 g                                                            |
| <b>B1</b>                                                                 | 25 g Closed position / 5 g Open position                        |
| <b>B2</b>                                                                 | 15 g                                                            |
| <b>C1</b>                                                                 | 25 g                                                            |
| <b>C2</b>                                                                 | 25 g                                                            |
| <b>Vibration withstand</b><br>acc. to IEC 60068-2-6                       |                                                                 |
|                                                                           | 5 ... 300 Hz                                                    |
|                                                                           | 4 g Closed position / 2 g Open position                         |

### Magnet System Characteristics

|                                                               |                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Contactor relay types</b>                                  | <b>NF</b>                                                                                                                                                                                                                                                             |
| <b>Coil operating limits</b><br>acc. to IEC 60947-5-1         |                                                                                                                                                                                                                                                                       |
| <b>AC supply</b>                                              | at $\theta \leq 60^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$<br>at $\theta \leq 70^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots U_c \text{ max}$                                                                             |
| <b>DC supply</b>                                              | at $\theta \leq 60^\circ\text{C}$ $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$<br>at $\theta \leq 70^\circ\text{C}$ (NF) $0.85 \times U_c \text{ min} \dots U_c \text{ max}$ - (NFZ) $0.85 \times U_c \text{ min} \dots 1.1 \times U_c \text{ max}$ |
| <b>AC control voltage</b> 50/60 Hz                            | Rated control circuit voltage $U_c$<br>Coil consumption                                                                                                                                                                                                               |
|                                                               | <b>Average pull-in value</b> (NF) 50 VA - (NFZ) 16 VA                                                                                                                                                                                                                 |
|                                                               | <b>Average holding value</b> (NF) 2.2 VA / 2 W - (NFZ) 1.7 VA / 1.5 W                                                                                                                                                                                                 |
| <b>DC control voltage</b>                                     | Rated control circuit voltage $U_c$<br>Coil consumption                                                                                                                                                                                                               |
|                                                               | <b>Average pull-in value</b> (NF) 50 W - (NFZ) 12 ... 16 W                                                                                                                                                                                                            |
|                                                               | <b>Average holding value</b> (NF) 2 W - (NFZ) 1.7 W                                                                                                                                                                                                                   |
| <b>PLC-Output control</b>                                     | (NFZ) $\geq 500 \text{ mA } 24 \text{ V DC}$                                                                                                                                                                                                                          |
| <b>Drop-out voltage in % of <math>U_c \text{ min}</math>.</b> | $\leq 60 \% U_c \text{ min}$                                                                                                                                                                                                                                          |
| <b>Voltage sag immunity</b> according to SEMI F47-0706        | (NFZ) conditions of use on request                                                                                                                                                                                                                                    |
| <b>Dips withstand</b> (level 0% according to IEC 61000-4-11)  | (NFZ) 22 ms average for $U_c = 24 \dots 250 \text{ V } 50/60\text{Hz}$                                                                                                                                                                                                |
| <b>Operating time</b><br>between coil energization and:       | <b>N.O. contact closing</b> 40 ... 95 ms<br><b>N.C. contact opening</b> 38 ... 90 ms                                                                                                                                                                                  |
| between coil de-energization and:                             | <b>N.O. contact opening</b> 11 ... 95 ms<br><b>N.C. contact closing</b> 13 ... 98 ms                                                                                                                                                                                  |

### Mounting Characteristics

|                                          |                                                                                             |
|------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Contactor relay types</b>             | <b>NF</b>                                                                                   |
| <b>Mounting positions</b>                |                                                                                             |
| <b>Mounting distances</b>                | Max. add-on N.C. auxiliary contacts: see accessory fitting details for a NF contactor relay |
| <b>Fixing</b>                            | The contactor relays can be assembled side by side.                                         |
| on rail according to IEC 60715, EN 60715 | 35 x 7.5 mm or 35 x 15 mm                                                                   |
| by screws (not supplied)                 | 2 x M4 screws placed diagonally                                                             |

# NF Contactor Relays

## Technical Data



### Connecting Characteristics

|                                                                                   |                                     |                                                                                   |
|-----------------------------------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------|
| Contactor relay types                                                             |                                     | NF                                                                                |
| Main terminals                                                                    |                                     |  |
|                                                                                   |                                     | Screw terminals with cable clamp                                                  |
| Connecting capacity (min. ... max.)                                               |                                     |                                                                                   |
| Pole and coil terminals                                                           |                                     |                                                                                   |
|  | Rigid                               | 1 x 1 ... 2.5 mm <sup>2</sup>                                                     |
|  |                                     | 2 x 1 ... 2.5 mm <sup>2</sup>                                                     |
|  | Flexible with non insulated ferrule | 1 x 0.75 ... 2.5 mm <sup>2</sup>                                                  |
|  |                                     | 2 x 0.75 ... 2.5 mm <sup>2</sup>                                                  |
|  | Flexible with insulated ferrule     | 1 x 0.75 ... 2.5 mm <sup>2</sup>                                                  |
|  |                                     | 2 x 0.75 ... 1.5 mm <sup>2</sup>                                                  |
|  | Bars or lugs                        | L < 8 mm                                                                          |
| Capacity according to UL/CSA                                                      |                                     | 1 or 2 x AWG 18 ... 14                                                            |
| Stripping length                                                                  |                                     | 10 mm                                                                             |
| Degree of protection                                                              |                                     |                                                                                   |
| acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529                         |                                     |                                                                                   |
| All terminals                                                                     |                                     | IP20                                                                              |
| Screw terminals                                                                   |                                     | (delivered in open position, screws of unused terminals must be tightened)        |
| All terminals                                                                     |                                     | M3.5                                                                              |
| Screwdriver type                                                                  |                                     | Flat Ø5.5 / Pozidriv 2                                                            |
| Tightening torque                                                                 |                                     |                                                                                   |
| Pole terminals                                                                    |                                     | 1.2 Nm / 11 lb.in                                                                 |
| Coil terminals                                                                    |                                     | 1.2 Nm / 11 lb.in                                                                 |

# NF Contactor Relays

## Main Accessories

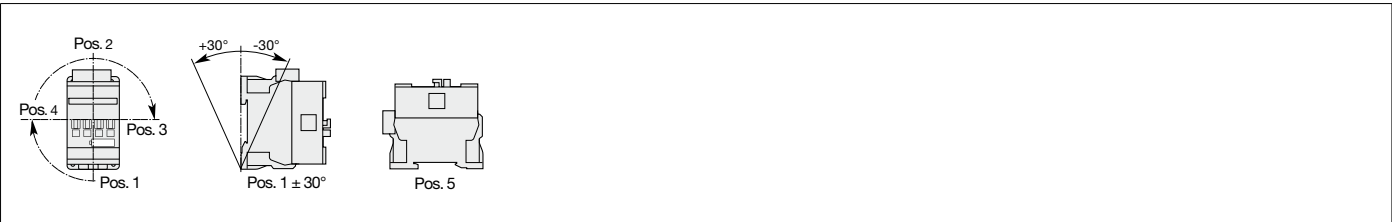


### Accessory fitting details for a NF contactor relay

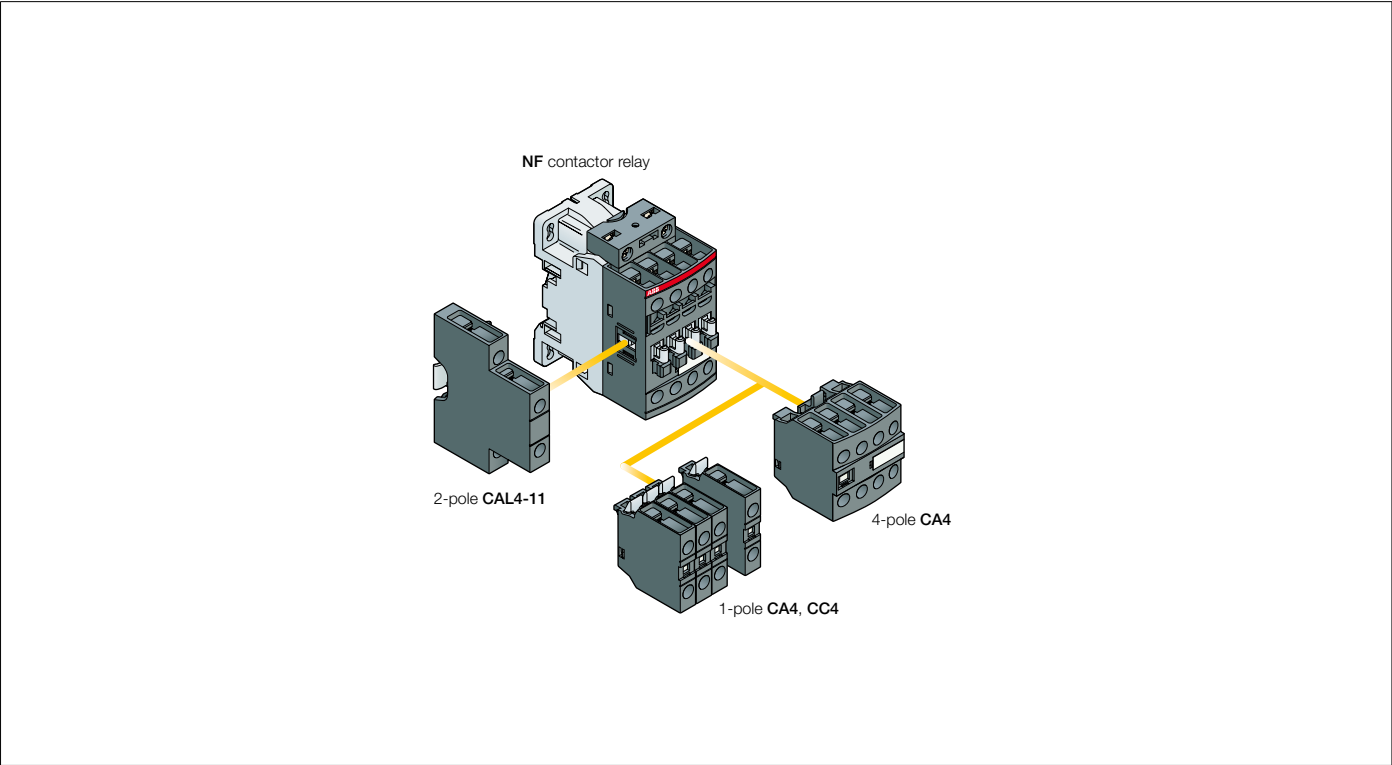
Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

| Contactor relay types                                                                                           | Main poles | Front-mounted accessories |    |            | Side-mounted accessories |            |
|-----------------------------------------------------------------------------------------------------------------|------------|---------------------------|----|------------|--------------------------|------------|
|                                                                                                                 |            | Auxiliary contact blocks  |    |            | Auxiliary contact blocks |            |
|                                                                                                                 |            | 1-pole CA4                |    |            | Left side                | Right side |
|                                                                                                                 |            | 1-pole CC4                |    | 4-pole CA4 | 2-pole CAL4-11           |            |
| 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 |            |                           |    |            |                          |            |
| NF..                                                                                                            | 2 2 E      | 4 max.                    | or | 1          | +                        | 1          |
| NF..                                                                                                            | 3 1 E      | 2 max.                    |    | –          | +                        | 1          |
| Max. 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 |            |                           |    |            |                          |            |
| NF..                                                                                                            | 4 0 E      | 4 max.                    | or | 1          | +                        | 1          |
|                                                                                                                 |            | 2 max.                    |    | –          | +                        | 1          |
| NF..                                                                                                            | 4 4 E      |                           |    |            |                          |            |
| NF..                                                                                                            | 5 3 E      |                           |    |            |                          |            |
| NF..                                                                                                            | 6 2 E      |                           |    |            |                          |            |
| NF..                                                                                                            | 7 1 E      |                           |    |            |                          |            |
| NF..                                                                                                            | 8 0 E      |                           |    |            |                          |            |

### Mounting positions



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



# Auxiliary Contact Blocks

## Accessories for NF Contactor Relays

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CA4-10



CA4-22N



CAL4-11

### 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.
- **CAL4** 2-pole block instantaneous N.O. + N.C. contacts clipped onto the right and/or left side of the contactors.

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 relay type, refer to "Accessory Fitting Details" table.

### Ordering Details

| For contactor relays | Auxiliary contacts                                                                                                                                                  | Type | Order code |  | Pack <sup>(ing)</sup><br>pieces | Weight<br>kg (1 pce) |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------|--|---------------------------------|----------------------|
|                      |   |      |            |  |                                 |                      |

#### Front-mounted instantaneous auxiliary contact blocks

|           |         |          |                    |    |       |
|-----------|---------|----------|--------------------|----|-------|
| 4-pole NF | 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 |
|           | 4 0 - - | CA4-40N  | 1SBN 010 140 R1240 | 1  | 0.055 |
|           | 3 1 - - | CA4-31N  | 1SBN 010 140 R1231 | 1  | 0.055 |
|           | 2 2 - - | CA4-22N  | 1SBN 010 140 R1222 | 1  | 0.055 |
| NF..40E   | 1 3 - - | CA4-13N  | 1SBN 010 140 R1213 | 1  | 0.055 |
|           | 0 4 - - | CA4-04N  | 1SBN 010 140 R1204 | 1  | 0.055 |

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

|           |         |        |                    |   |       |
|-----------|---------|--------|--------------------|---|-------|
| 4-pole NF | - - 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

|    |         |           |                    |    |       |
|----|---------|-----------|--------------------|----|-------|
| NF | 1 1 - - | CAL4-11   | 1SBN 010 120 R1011 | 1  | 0.040 |
|    | 1 1 - - | CAL4-11-T | 1SBN 010 120 T1011 | 10 | 0.040 |

# Auxiliary Contact Blocks

## Accessories for NF Contactor Relays

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### Technical Data

|       |                                                 |
|-------|-------------------------------------------------|
| Types | 1-pole CA4, 1-pole CC4, 4-pole CA4, 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 $U_o$ max.                                   | 24 ... 690 V                                            |
| Conventional thermal current $I_{th}$ - $\theta \leq 40^\circ\text{C}$ | 16 A                                                    |
| Rated frequency limits                                                 | 25 ... 400 Hz                                           |
| Rated operational current $I_o$ / 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 $I_o$ AC-15 acc. to IEC 60947-5-1                  |
| Breaking capacity acc. to IEC 60947-5-1                                | 10 x $I_o$ AC-15 acc. to IEC 60947-5-1                  |
| Rated operational current $I_o$ / 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 $I_{cw}$                            | for 1.0 s 100 A                                         |
| $\theta = 40^\circ\text{C}$                                            | 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                                                          |
| Flexible with non insulated ferrule                       | 2 x 1 ... 2.5 mm²                                                          |
| Flexible with insulated ferrule                           | 1 x 0.75 ... 2.5 mm²                                                       |
| Flexible with insulated ferrule                           | 2 x 0.75 ... 2.5 mm²                                                       |
| Flexible with insulated ferrule                           | 1 x 0.75 ... 2.5 mm²                                                       |
| Flexible with insulated ferrule                           | 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                                      | IP20                                                                       |
| acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 |                                                                            |
| Screwdriver type                                          | Flat Ø5.5 / Pozidriv 2                                                     |
| Tightening torque                                         | 1.2 Nm / 11 lb.in                                                          |

## Accessories for NF Contactor Relays



LDC4

**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 contactor relays | Type | Order code         | Pack <sup>(mg)</sup><br>pieces | Weight<br>kg (1 pce) |
|----------------------|------|--------------------|--------------------------------|----------------------|
| NF                   | LDC4 | 1SBN 070 156 T1000 | 10                             | 0.010                |



BX4



BX4-CA

**Protective covers****Description**

Sealable and transparent protective covers BX4 and non-removable BX4-CA to protect the devices against accidental contact.

**Ordering Details**

| For contactor relays                    | Type   | Order code         | Pack <sup>(mg)</sup><br>pieces | Weight<br>kg (1 pce) |
|-----------------------------------------|--------|--------------------|--------------------------------|----------------------|
| All 1-stack contactor relays            | BX4    | 1SBN 110 108 T1000 | 10                             | 0.006                |
| For 4-pole CA4 auxiliary contact blocks | BX4-CA | 1SBN 110 109 W1000 | 50                             | 0.001                |



BA4

**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 contactor relays            | Type       | Order code         | Pack <sup>(mg)</sup><br>pieces | Weight<br>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                              | 0.290                |
| HTP500 support plate            | HTP500-BA4 | 1SNA 235 712 R2400 | 1                              | 0.220                |

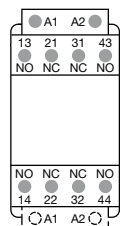
# NF Contactor Relays

## Terminal Marking and Positioning

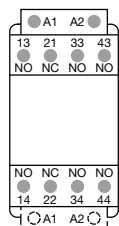
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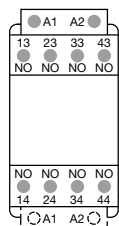
### Standard devices without addition of auxiliary contacts



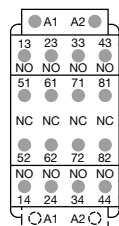
NF..22E



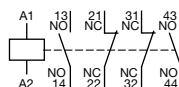
NF..31E



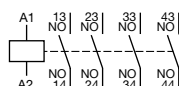
NF..40E



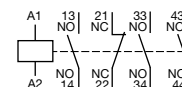
NF..44E



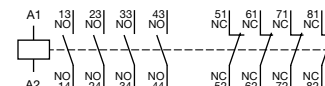
NF..22E



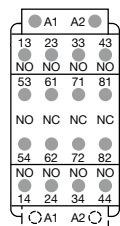
NF..40E



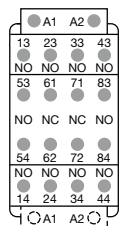
NF..31E



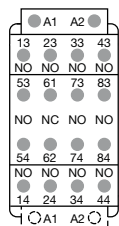
NF..44E



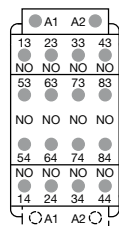
NF..53E



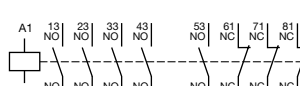
NF..62E



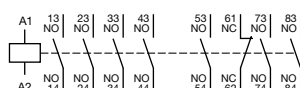
NF..71E



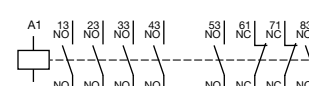
NF..80E



NF..53E



NF..71E

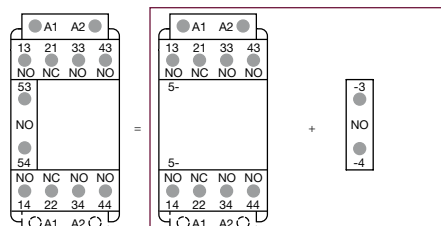


NF..62E

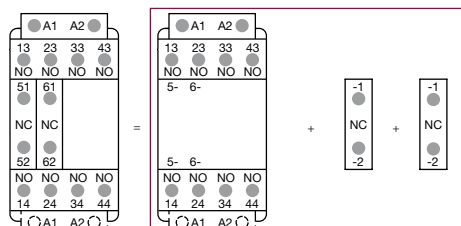


NF..80E

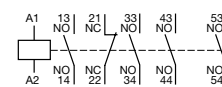
### Other possible contact combinations with auxiliary contacts added by the user



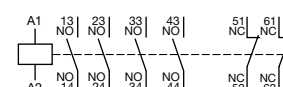
Combination 41 = NF..31E + CA4-10



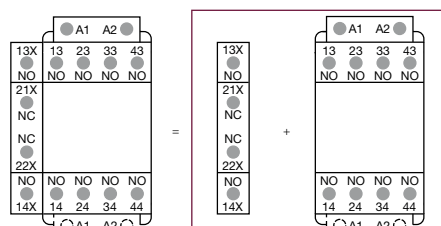
Combination 42 = NF..40E + CA4-01+CA4-01



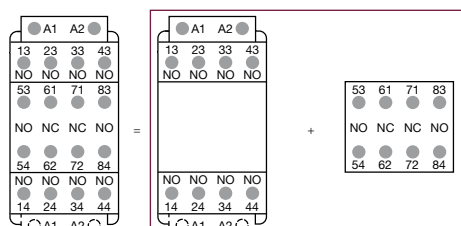
Combination 41 E



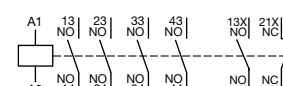
Combination 42 E



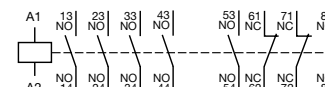
Combination 51 = CAL4-11 + NF..40E



Combination 62 = NF..40E + CA4-22N



Combination 51 E



Combination 62 E

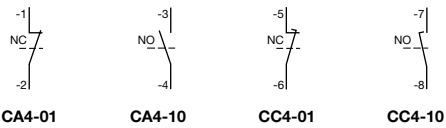
Note: Only NFZ contactor relays with DC control voltage 12...20 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.

# NF Add-on Auxiliary Contacts

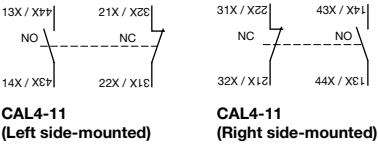
## Terminal Marking and Positioning



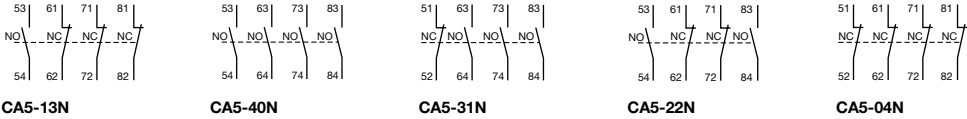
### 1-pole auxiliary contacts



### 2-pole auxiliary contacts



### 4-pole auxiliary contacts



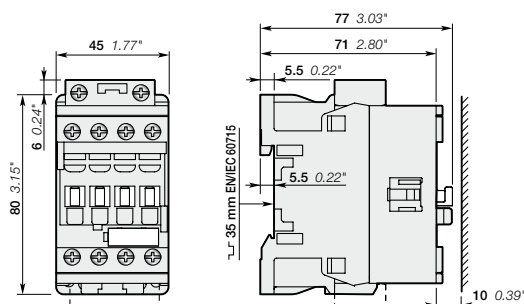
# NF Contactor Relays

## AC / DC Operated - with Screw Terminals

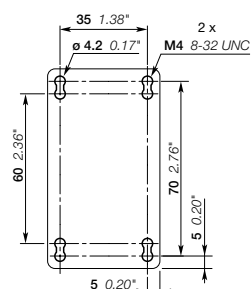
Catalogue Page 1SBC 101 118 S0201



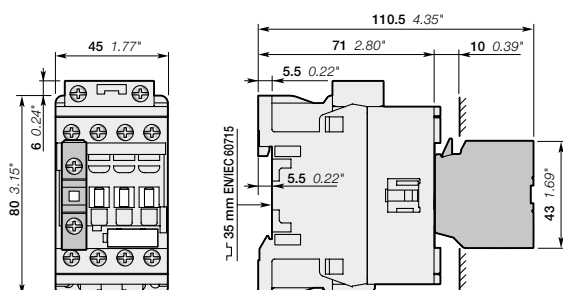
Dimensions mm, inches



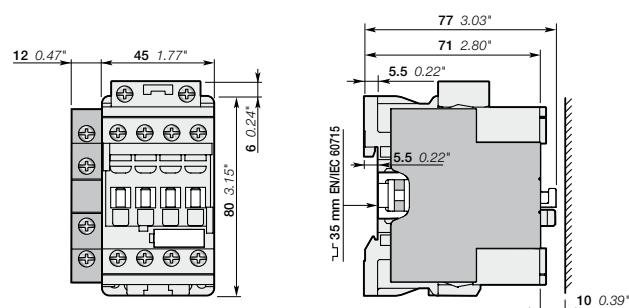
NF..22E, NF..31E, NF..40E



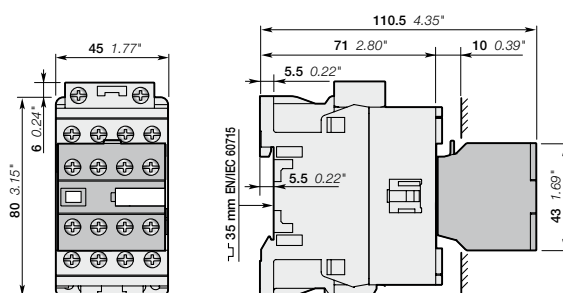
NF



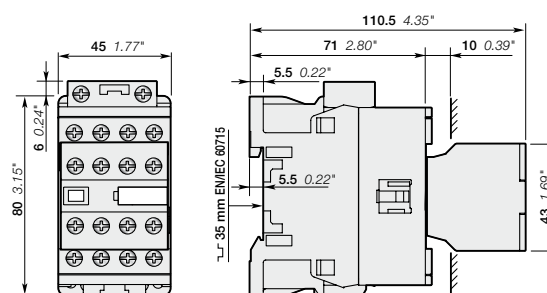
NF..22E, NF..31E, NF..40E  
+ CA4, CC4 1-pole auxiliary contact block



NF..22E, NF..31E, NF..40E  
+ CAL4-11 2-pole auxiliary contact block



NF..22E, NF..31E, NF..40E  
+ CA4 4-pole auxiliary contact block



NF..44E, NF..53E, NF..62E, NF..71E, NF..80E

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

# Contact us

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You can find the address of your local sales organisation  
on the ABB home page

<http://www.abb.com/contacts> -> Low Voltage products

## **Note**

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