Main catalog

# Motor protection and control
# Manual motor starters, A9 ... A300 contactors and overload relays

Power and productivity
for a better world™

# Motor rated operational powers and currents

The currents given below concern standard three-phase four-pole cage motors (1500 r.p.m. at 50 Hz 1800 r.p.m. at 60 Hz). These values are given for guidance and may vary according to the motor manufacturer and depending on the number of poles.

| IEC | Motor nominal current: standardized values in blue colour (according to IEC 60947-4-1 Annex G) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Motor power | 220 V | 230 V | 240 V | 380 V | 400 V | 415 V | 440 V | 500 V | 660 V | 690 V |
| kW | A | A | A | A | A | A | A | A | A | A |
| 0.06 | 0.37 | 0.35 | 0.34 | 0.21 | 0.2 | 0.19 | 0.18 | 0.16 | 0.13 | 0.12 |
| 0.09 | 0.54 | 0.52 | 0.50 | 0.32 | 0.3 | 0.29 | 0.26 | 0.24 | 0.18 | 0.17 |
| 0.12 | 0.73 | 0.7 | 0.67 | 0.46 | 0.44 | 0.42 | 0.39 | 0.32 | 0.24 | 0.23 |
| 0.18 | 1 | 1 | 1 | 0.63 | 0.6 | 0.58 | 0.53 | 0.48 | 0.37 | 0.35 |
| 0.25 | 1.6 | 1.5 | 1.4 | 0.9 | 0.85 | 0.82 | 0.74 | 0.68 | 0.51 | 0.49 |
| 0.37 | 2.0 | 1.9 | 1.8 | 1.2 | 1.1 | 1.1 | 1 | 0.88 | 0.67 | 0.64 |
| 0.55 | 2.7 | 2.6 | 2.5 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 0.91 | 0.87 |
| 0.75 | 3.5 | 3.3 | 3.2 | 2.0 | 1.9 | 1.8 | 1.7 | 1.5 | 1.15 | 1.1 |
| 1.1 | 4.9 | 4.7 | 4.5 | 2.8 | 2.7 | 2.6 | 2.4 | 2.2 | 1.7 | 1.6 |
| 1.5 | 6.6 | 6.3 | 6 | 3.8 | 3.6 | 3.5 | 3.2 | 2.9 | 2.2 | 2.1 |
| 2.2 | 8.9 | 8.5 | 8.1 | 5.2 | 4.9 | 4.7 | 4.3 | 3.9 | 2.9 | 2.8 |
| 3 | 11.8 | 11.3 | 10.8 | 6.8 | 6.5 | 6.3 | 5.7 | 5.2 | 4 | 3.8 |
| 4 | 15.7 | 15 | 14.4 | 8.9 | 8.5 | 8.2 | 7.4 | 6.8 | 5.1 | 4.9 |
| 5.5 | 20.9 | 20 | 19.2 | 12.1 | 11.5 | 11.1 | 10.1 | 9.2 | 7 | 6.7 |
| 7.5 | 28.2 | 27 | 25.9 | 16.3 | 15.5 | 14.9 | 13.6 | 12.4 | 9.3 | 8.9 |
| 11 | 39.7 | 38 | 36.4 | 23.2 | 22 | 21.2 | 19.3 | 17.6 | 13.4 | 12.8 |
| 15 | 53.3 | 51 | 48.9 | 30.5 | 29 | 28 | 25.4 | 23 | 17.8 | 17 |
| 18.5 | 63.8 | 61 | 58.5 | 36.8 | 35 | 33.7 | 30.7 | 28 | 22 | 21 |
| 22 | 75.3 | 72 | 69 | 43.2 | 41 | 39.5 | 35.9 | 33 | 25.1 | 24 |
| 30 | 100 | 96 | 92 | 57.9 | 55 | 53 | 48.2 | 44 | 33.5 | 32 |
| 37 | 120 | 115 | 110 | 69 | 66 | 64 | 58 | 53 | 40.8 | 39 |
| 45 | 146 | 140 | 134 | 84 | 80 | 77 | 70 | 64 | 49.1 | 47 |
| 55 | 177 | 169 | 162 | 102 | 97 | 93 | 85 | 78 | 59.6 | 57 |
| 75 | 240 | 230 | 220 | 139 | 132 | 127 | 116 | 106 | 81 | 77 |
| 90 | 291 | 278 | 266 | 168 | 160 | 154 | 140 | 128 | 97 | 93 |
| 110 | 355 | 340 | 326 | 205 | 195 | 188 | 171 | 156 | 118 | 113 |
| 132 | 418 | 400 | 383 | 242 | 230 | 222 | 202 | 184 | 140 | 134 |
| 160 | 509 | 487 | 467 | 295 | 280 | 270 | 245 | 224 | 169 | 162 |
| 200 | 637 | 609 | 584 | 368 | 350 | 337 | 307 | 280 | 212 | 203 |
| 250 | 782 | 748 | 717 | 453 | 430 | 414 | 377 | 344 | 261 | 250 |
| 315 | 983 | 940 | 901 | 568 | 540 | 520 | 473 | 432 | 327 | 313 |
| 355 | 1109 | 1061 | 1017 | 642 | 610 | 588 | 535 | 488 | 370 | 354 |
| 400 | 1255 | 1200 | 1150 | 726 | 690 | 665 | 605 | 552 | 418 | 400 |
| 500 | 1545 | 1478 | 1416 | 895 | 850 | 819 | 745 | 680 | 515 | 493 |
| 560 | 1727 | 1652 | 1583 | 1000 | 950 | 916 | 832 | 760 | 576 | 551 |
| 630 | 1928 | 1844 | 1767 | 1116 | 1060 | 1022 | 929 | 848 | 643 | 615 |
| 710 | 2164 | 2070 | 1984 | 1253 | 1190 | 1147 | 1043 | 952 | 721 | 690 |
| 800 | 2446 | 2340 | 2243 | 1417 | 1346 | 1297 | 1179 | 1076 | 815 | 780 |
| 900 | 2760 | 2640 | 2530 | 1598 | 1518 | 1463 | 1330 | 1214 | 920 | 880 |
| 1000 | 3042 | 2910 | 2789 | 1761 | 1673 | 1613 | 1466 | 1339 | 1014 | 970 |

| UL / CSA | Motor nominal current: standardized values (according to IEC 60947-4-1 Annex G and UL 508) | | | | |
|---|---|---|---|---|---|
| Motor power | 208 V | 220-240 V | 380-415 V | 440-480 V | 550-600 V |
| hp | A | A | A | A | A |
| 1/2 | 2.4 | 2.2 | 1.3 | 1.1 | 0.9 |
| 3/4 | 3.5 | 3.2 | 1.8 | 1.6 | 1.3 |
| 1 | 4.6 | 4.2 | 2.3 | 2.1 | 1.7 |
| 1-1/2 | 6.6 | 6 | 3.3 | 3 | 2.4 |
| 2 | 7.5 | 6.8 | 4.3 | 3.4 | 2.7 |
| 3 | 10.6 | 9.6 | 6.1 | 4.8 | 3.9 |
| 5 | 16.7 | 15.2 | 9.7 | 7.6 | 6.1 |
| 7-1/2 | 24.2 | 22 | 14 | 11 | 9 |
| 10 | 30.8 | 28 | 18 | 14 | 11 |
| 15 | 46.2 | 42 | 27 | 21 | 17 |
| 20 | 59.4 | 54 | 34 | 27 | 22 |
| 25 | 74.8 | 68 | 44 | 34 | 27 |
| 30 | 88 | 80 | 51 | 40 | 32 |
| 40 | 114 | 104 | 66 | 52 | 41 |
| 50 | 143 | 130 | 83 | 65 | 52 |
| 60 | 169 | 154 | 103 | 77 | 62 |
| 75 | 211 | 192 | 128 | 96 | 77 |
| 100 | 273 | 248 | 165 | 124 | 99 |
| 125 | 343 | 312 | 208 | 156 | 125 |
| 150 | 396 | 360 | 240 | 180 | 144 |
| 200 | 528 | 480 | 320 | 240 | 192 |
| 250 | – | 604 | 403 | 302 | 242 |
| 300 | – | 722 | 482 | 361 | 289 |
| 350 | – | 828 | 560 | 414 | 336 |
| 400 | – | 954 | 636 | 477 | 382 |
| 450 | – | 1030 | – | 515 | 412 |
| 500 | – | 1180 | 786 | 590 | 472 |

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# Motor protection and control
## Manual motor starters, contactors and overload relays


Overview 1

Manual motor starters 2

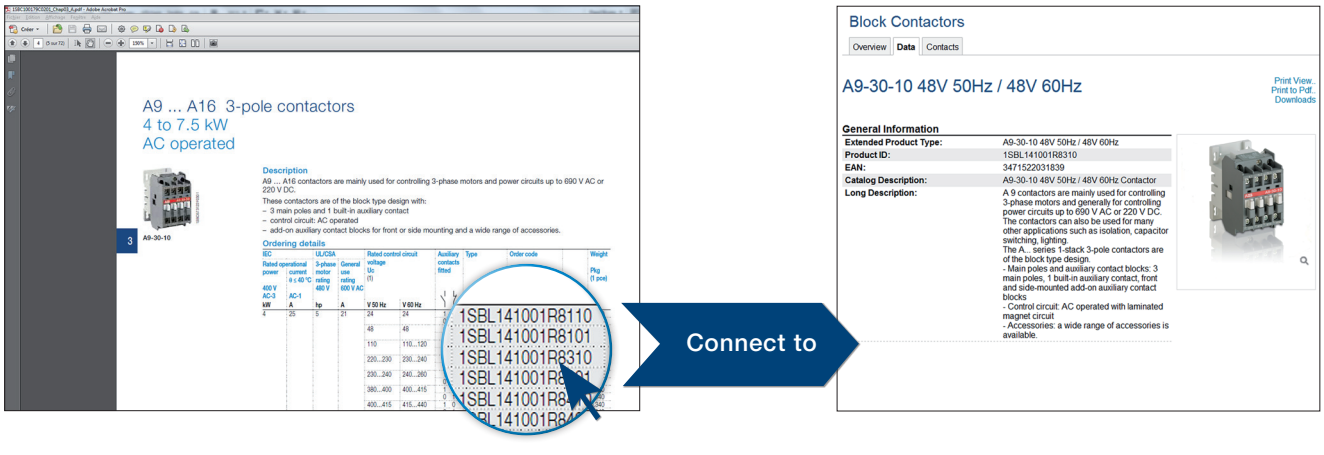
A contactors and N contactor relays 3

Thermal overload relays 4

General technical data 5

Index 6


You can access to more product details, click on the order code



# 3-pole contactors, for motor control and power switching

1



| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **IEC** (1) | **AC-3 Rated operational power** | θ ≤ 55 °C, 400 V | **kW** | **4** | **5.5** | **7.5** | **11** | **15** | **18.5** |
| **UL/CSA** | **3-phase motor rating** | 480 V | **hp** | **5** | **7.5** | **10** | **20** | **25** | **30** |
| **AC Control supply** | | | Type | **A9** | **A12** | **A16** | **A26** | **A30** | **A40** |
| **IEC** | **AC-3 Rated operational current** | θ ≤ 55 °C , 400 V | **A** | **9** | **12** | **17** | **26** | **32** | **37** |
| | **AC-1 Rated operational current** | θ ≤ 40 °C, 690 V | **A** | **25** | **27** | **30** | **45** | **55** | **60** |
| **UL/CSA** | **General use rating** | 600 V | **A** | **21** | **25** | **30** | **40** | **50** | **60** |
| **NEMA** | **NEMA Size** | | | **00** | **0** | — | **1** | **1P** | — |

(1) 1000 V IEC ratings available for A50 ... A300 contactors.

## Main accessories

| | | |
|---|---|---|
| **Auxiliary contact blocks** | Front mounting | **CA5-10** (1 x N.O.)<br>**CA5-01** (1 x N.C.) |
| | Side mounting | **CAL5-11** (1 x N.O. + 1 x N.C.) |
| **Timers** | Electronic | **TEF5-ON**<br>**TEF5-OFF** |
| | | **TE5S** (for star-delta starters - direct timing - separate mounting) |
| **Interlocking units** | Mechanical | **VM5-1** |
| | Mechanical / Electrical | **VE5-1** |
| **Surge suppressors** | Varistor (AC/DC) | **RV5** (24...440 V) |
| | RC Type (AC) | **RC5-1** (24...440 V) |

## Overload relays

**Thermal relays**

| | | |
|---|---|---|
| | Class 10A<br>(Class 10A or 20 for TA80DU)<br>(Class 30 for TA450SU) | **TA25DU-M** (0.10...32 A)<br>**TA42DU-M** (18...42 A) |

## Manual motor starters

| | | |
|---|---|---|
| | Thermal / magnetic protection<br>Class 10 | **MS116** (0.10...32 A)<br>Ics up to 50 kA for class 10 A<br>**MS450** (28...50 A)<br>Ics up to 50 kA |
| | | **MS132** (0.10...32 A)<br>Ics up to 100 kA |
| | | **MS497** (22...100 A)<br>Ics up to 100 kA |
| | Magnetic only types | **MO132** (0.16...32 A)<br>Ics up to 100 kA<br>**MO496** (32...100 A)<br>Ics up to 100 kA |
| | | **MO450** (40...50 A)<br>Ics up to 50 kA |




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 22 | 30 | 37 | 45 | 55 | 75 | 90 | 110 | 140 | 160 |
| | 40 | 60 | 60 | 60 | 75 | 100 | 125 | 150 | 200 | 250 |
| | A50 | A63 | A75 | A95 | A110 | A145 | A185 | A210 | A260 | A300 |
| | 50 | 65 | 75 | 96 | 110 | 145 | 185 | 210 | 260 | 305 |
| | 100 | 115 | 125 | 145 | 160 | 250 | 275 | 350 | 400 | 500 |
| | 80 | 90 | 105 | 125 | 150 | 230 | 250 | 300 | 350 | 400 |
| | 2 | — | 3 | — | — | 4 | — | — | 5 | — |

| | | | | |
|---|---|---|---|---|
| | | | | |
| | | **CAL18-11** (1 x N.O. + 1 x N.C.) | | |
| | | | | |
| | | | **VM300H**<br>**VM300V** | |
| | **VE5-2** | | | |
| | | | | |
| | **RC5-2** (24...440 V) | | **RC5-3** (250...440 V) | |

| | | | | |
|---|---|---|---|---|
| | **TA75DU-M** (18...80 A) | **TA80DU** (29...80 A) | **TA200DU** (66...200 A) | **TA450DU** (130...310 A) |
| | | **TA110DU** (66...110 A) | | **TA450SU** (40...310 A) |

| | | | |
|---|---|---|---|
| | | | |
| | **MS495** (45...100 A)<br>Ics up to 50 kA | | |
| | | | |
| | | **MO495** (63...100 A)<br>Ics up to 50 kA | |

## Short-circuit protection devices

**Tmax** Circuit breaker and accessories

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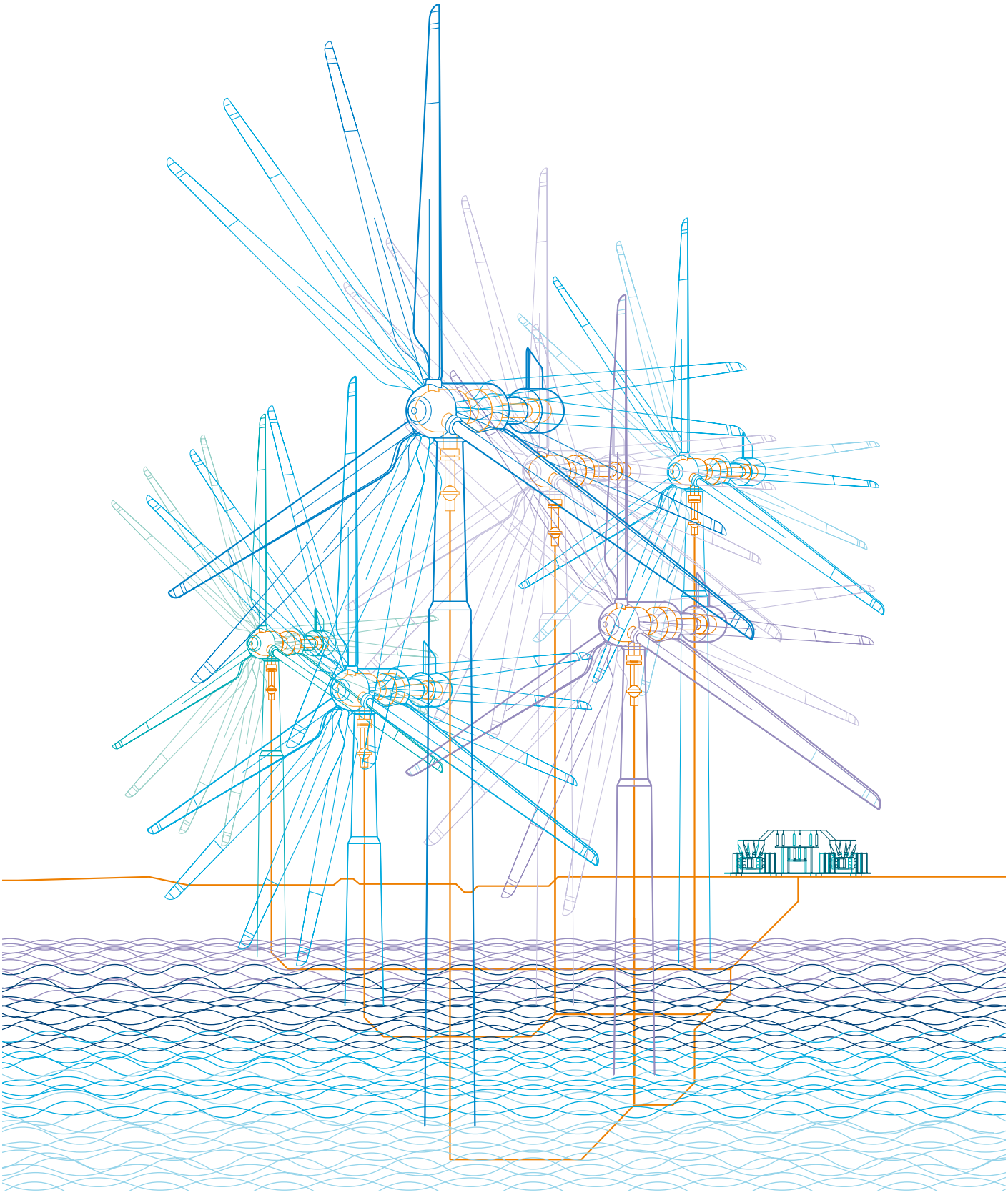

N3

# 4-pole contactors





| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **IEC** | **AC-1 Rated operational current** | θ ≤ 40 °C, 690 V | **A** | **25** | **30** | **45** | **70** | **100** | **125** |
| **UL/CSA** | **General use rating** | 600 V | **A** | **21** | **30** | **40** | **65** | **80** | **105** |
| **AC Control supply** | | ~ | Type | **A9** | **A16** | **A26** | **A45** | **A50** | **A75** |
| **IEC** | **AC-1 Rated operational current** | θ ≤ 40 °C | **A** | **25** | **30** | **45** | **70** | **100** | **125** |
| | | θ ≤ 55 °C | **A** | **22** | **27** | **40** | **60** | **85** | **105** |
| | | θ ≤ 70 °C | **A** | **18** | **23** | **32** | **50** | **70** | **85** |
| | **With conductor cross sectional area** | | **mm²** | **2.5** | **4** | **6** | **25** | **35** | **50** |
| | **Rated operational voltage Ue max.** | | **V** | **690** | **690** | **690** | **1000** | **1000** | **1000** |

## Main accessories

| | | | |
|---|---|---|---|
| **Auxiliary contact blocks** | Front mounting | **CA5-10** (1 x N.O.)<br>**CA5-01** (1 x N.C.) | |
| | Side mounting | **CAL5-11** (1 x N.O. + 1 x N.C.) | |
| **Timers** | Electronic | **TEF5-ON**<br>**TEF5-OFF** | |
| | | **TE5S** (for star-delta starters - direct timing - separate mounting) | |
| **Interlocking units** | Mechanical | **VM5-1** | |
| | Mechanical / Electrical | **VE5-1** | **VE5-2** |
| **Surge suppressors** | Varistor (AC / DC) | **RV5** (24...440 V) | |
| | RC Type (AC) | **RC5-1** (24...440 V) | **RC5-2** (24...440 V) |

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# Manual motor starters


Overview 2/2

2

0.10 to 32 A – with thermal and electromagnetic protection

**Ics up to 50 kA**

MS116 manual motor starters **2**/4

Technical data **2**/5

**Ics up to 100 kA**

MS132 manual motor starters **2**/8

Technical data **2**/9

0.16 to 32 A – with electromagnetic protection

**Ics up to 100 kA**

MO132 manual motor starters **2**/12

Technical data **2**/13

Main accessories for MS116, MS132, MO132 **2**/16

22 to 100 A – with thermal and electromagnetic protection

**Ics up to 50 kA**

MS450, MS495, MS497 manual motor starters **2**/24

Technical data **2**/25

32 to 100 A – with electromagnetic protection

**Ics up to 50 kA**

MO450, MO495, MO496 manual motor starters **2**/28

Technical data **2**/29

Main accessories for MS450, MS495, MS497, MO450, MO495, MO496 **2**/32

General accessories 2/38


Summary_2

# Manual motor starters





| Thermal and electromagnetic protection | Type | MS116 | MS132 | |
|---|---|---|---|---|
| **Electromagnetic protection** | **Type** | **-** | | **MO132** |
| **Phase loss sensitivity** | | Yes | Yes | No |
| **Switch position** | | ON/OFF | ON/OFF/TRIP | |
| **Magnetic trip indication** | | - | Yes | |
| **Lockable handle without accessories** | | - | Yes | |
| **Disconnecting feature** | | Yes | Yes | |
| **Width** | | 45 mm | 45 mm | |
| **Rated operational current Ie** | | 0.16...32 A | 0.16....32 A | 0.16....32 A |
| **Setting range for thermal release** | | 0.10...32 A | 0.10....32 A | - |
| **Rated operational voltage Ue** | | 690 V AC | 690 V AC / 250 V DC | |
| **Rated frequency** | | 50/60 Hz | DC, 50/60 Hz | |
| **Trip class** | | 10A | 10 | |
| **Short-circuit breaking capacity Ics** | **400 V AC** | Up to 50 kA | Up to 100 kA | |
| **Ambient air temperature open compensated** | | -25...+55 °C | -25...+60 °C | |

## Main accessories

| | | | |
|---|---|---|---|
| **Auxiliary contacts** | | | |
| Front mounting |  | HKF1 | |
| Side mounting | | HK1 | |
| **Signalling contacts** | | | |
| Tripped alarm |  | SK1 | |
| Short-circuit alarm | | - | CK1 |
| **Auxiliary trip units** | | | |
| Shunt trip |  | AA1 | |
| Undervoltage release | | UA1 | |
| **Busbar systems** | | | |
| 3-phase busbar |  | PS1 | |
| Feeder terminals |  | S1 | |




| | MS450 | | MS495 | | MS497 | |
|---|---|---|---|---|---|---|
| | | MO450 | | MO495 | | MO496 |
| | Yes | No | Yes | No | Yes | No |
| | ON/OFF/TRIP | | ON/OFF/TRIP | | ON/OFF/TRIP | |
| | - | | - | | - | |
| | Yes | | Yes | | Yes | |
| | Yes | | Yes | | Yes | |
| | 55 mm | | 70 mm | | 70 mm | |
| | 40...50 A | 40...50 A | 63...100 A | 63...100 A | 32...100 A | 32...100 A |
| | 28...50 A | - | 45...100 A | - | 22...100 A | - |
| | 690 V AC / 440 V DC | | 690 V AC / 440 V DC | | 690 V AC / 440 V DC | |
| | DC, 50/60 Hz | | DC, 50/60 Hz | | DC, 50/60 Hz | |
| | 10 | | 10 | | 10 | |
| | Up to 50 kA | | Up to 50 kA | | Up to 100 kA | |
| | -20...+60 °C | | -20...+60 °C | | -20...+60 °C | |

| | | |
|---|---|---|
| | | |
| | HK4 | |
| | HKS4 | |
| | | |
| | SK4 | |
| | SK4 | |
| | | |
| | AA4 | |
| | UA4 | |
| | | |
| | PS4 | - |
| | S4 | - |

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# MS116 manual motor starters
## 0.10 to 32 A – with thermal and electromagnetic protection




2CDC241010F0011

MS116-16


2CDC241001F0011

MS116-25


2CDC241013F0011

MS116-0.16-HKF1-11


2CDC241012F0011

MS116-32-HKF1-11

### Description

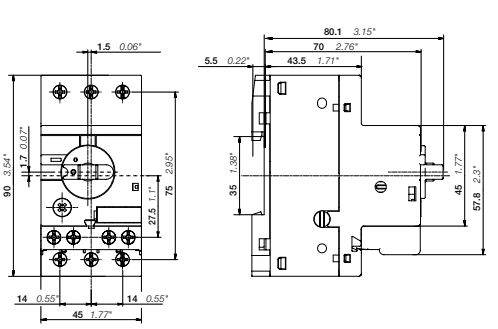
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

MS116 is a compact and economic range for motor protection up to 15.5 kW (400 V) / 32 A in width of 45 mm. Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase bus bars, power in-feed blocks and locking devices for protection against unauthorized changes are available as accessory.

### Ordering details

| Rated operational power 400 V AC-3 | Setting range | Short-circuit breaking capacity Ics at 400 V AC | Rated instantaneous short-circuit current setting Ii | Type | Order code | | Weight (1 pce) |
|---|---|---|---|---|---|---|---|
| kW | A | kA | A | | | | kg |
| 0.03 | 0.10...0.16 | 50 | 1.56 | MS116-0.16 | 1SAM250000R1001 | | 0.225 |
| 0.06 | 0.16...0.25 | 50 | 2.44 | MS116-0.25 | 1SAM250000R1002 | | 0.225 |
| 0.09 | 0.25...0.40 | 50 | 3.90 | MS116-0.4 | 1SAM250000R1003 | | 0.225 |
| 0.12 | 0.40...0.63 | 50 | 6.14 | MS116-0.63 | 1SAM250000R1004 | | 0.225 |
| 0.25 | 0.63...1.00 | 50 | 11.50 | MS116-1.0 | 1SAM250000R1005 | | 0.225 |
| 0.55 | 1.00...1.60 | 50 | 18.40 | MS116-1.6 | 1SAM250000R1006 | | 0.265 |
| 0.75 | 1.60...2.50 | 50 | 28.75 | MS116-2.5 | 1SAM250000R1007 | | 0.265 |
| 1.5 | 2.50...4.00 | 50 | 50.00 | MS116-4.0 | 1SAM250000R1008 | | 0.265 |
| 2.2 | 4.00...6.30 | 50 | 78.75 | MS116-6.3 | 1SAM250000R1009 | | 0.265 |
| 4.0 | 6.30...10.0 | 50 | 150 | MS116-10 | 1SAM250000R1010 | | 0.265 |
| 5.5 | 8.00...12.0 | 25 | 180 | MS116-12 | 1SAM250000R1012 | | 0.265 |
| 7.5 | 10.0...16.0 | 16 | 240 | MS116-16 | 1SAM250000R1011 | | 0.265 |
| 9.0 | 16.0...20.0 | 10 | 300 | MS116-20 | 1SAM250000R1013 | | 0.310 |
| 12.5 | 20.0...25.0 | 10 | 375 | MS116-25 | 1SAM250000R1014 | | 0.310 |
| 15.5 | 25.0...32.0 | 10 | 480 | MS116-32 | 1SAM250000R1015 | | 0.310 |
| **Auxiliary contacts mounted on the front (1 N.O. + 1 N.C.)** | | | | | | | |
| 0.03 | 0.10...0.16 | 50 | 1.56 | MS116-0.16-HKF1-11 | 1SAM250005R1001 | | 0.240 |
| 0.06 | 0.16...0.25 | 50 | 2.44 | MS116-0.25-HKF1-11 | 1SAM250005R1002 | | 0.240 |
| 0.09 | 0.25...0.40 | 50 | 3.90 | MS116-0.4-HKF1-11 | 1SAM250005R1003 | | 0.240 |
| 0.12 | 0.40...0.63 | 50 | 6.14 | MS116-0.63-HKF1-11 | 1SAM250005R1004 | | 0.240 |
| 0.25 | 0.63...1.00 | 50 | 11.50 | MS116-1.0-HKF1-11 | 1SAM250005R1005 | | 0.240 |
| 0.55 | 1.00...1.60 | 50 | 18.40 | MS116-1.6-HKF1-11 | 1SAM250005R1006 | | 0.280 |
| 0.75 | 1.60...2.50 | 50 | 28.75 | MS116-2.5-HKF1-11 | 1SAM250005R1007 | | 0.280 |
| 1.5 | 2.50...4.00 | 50 | 50.00 | MS116-4.0-HKF1-11 | 1SAM250005R1008 | | 0.280 |
| 2.2 | 4.00...6.30 | 50 | 78.75 | MS116-6.3-HKF1-11 | 1SAM250005R1009 | | 0.280 |
| 4.0 | 6.30...10.0 | 50 | 150 | MS116-10.0-HKF1-11 | 1SAM250005R1010 | | 0.280 |
| 5.5 | 8.00...12.0 | 25 | 180 | MS116-12.0-HKF1-11 | 1SAM250005R1012 | | 0.280 |
| 7.5 | 10.0...16.0 | 16 | 240 | MS116-16.0-HKF1-11 | 1SAM250005R1011 | | 0.280 |
| 9.0 | 16.0...20.0 | 10 | 300 | MS116-20-HKF1-11 | 1SAM250005R1013 | | 0.326 |
| 12.5 | 20.0...25.0 | 10 | 375 | MS116-25-HKF1-11 | 1SAM250005R1014 | | 0.326 |
| 15.5 | 25.0...32.0 | 10 | 480 | MS116-32-HKF1-11 | 1SAM250005R1015 | | 0.326 |

### Main dimensions mm, *inches*



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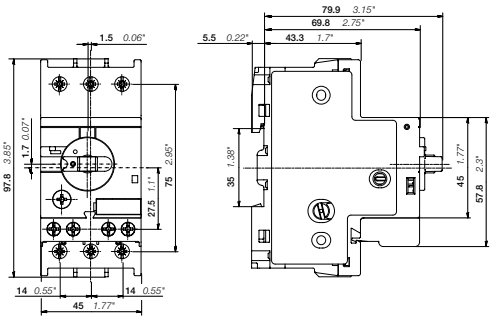
MS116 ≤ 16 A & MS116-HKF1-11 ≤ 16 A



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MS116 ≥ 20 A & MS116-HKF1-11 ≥ 20 A

2CDC131039C0201

# MS116 manual motor starters
# Technical data



## Main circuit – Utilization characteristics according to IEC/EN

| | | |
|---|---|---|
| **Type** | | MS116 |
| **Standards** | | IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1 |
| **Rated operational voltage $U_e$** | | 690 V AC |
| **Rated frequency** | | 50/60 Hz |
| **Trip class** | | 10A |
| **Number of poles** | | 3 |
| **Duty time** | | 100 % |
| **Mechanical durability** | | 100000 cycles |
| **Electrical durability** | **up to 16 A** | 100000 cycles |
| | **20 ... 32 A** | 50000 cycles |
| **Rated impulse withstand voltage $U_{imp}$** | | 6 kV |
| **Rated insulation voltage $U_i$** | | 690 V AC |
| **Rated operational current $I_e$** | | See ordering details |
| **Rated instantaneous short-circuit current setting $I_i$** | | See ordering details |
| **Rated service short-circuit breaking capacity $I_{cs}$** | | See table "Short-circuit breaking capacity and back-up fuses" |
| **Rated ultimate short-circuit breaking capacity $I_{cu}$** | | See table "Short-circuit breaking capacity and back-up fuses" |

## Short-circuit breaking capacity and back-up fuses

$I_{cs}$ Rated service short-circuit breaking capacity

$I_{cu}$ Rated ultimate short-circuit breaking capacity

$I_{cc}$ Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

| Type | 230 V AC | | | 400 V AC | | | 440 V AC | | | 500 V AC | | | 690 V AC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A |
| MS116-0.16 | No back-up fuse required up to $I_{cc}$ = 50 kA | | | | | | | | | No back-up fuse required up to $I_{cc}$ = 30 kA | | | | | |
| MS116-0.25 | | | | | | | | | | | | | | | |
| MS116-0.4 | | | | | | | | | | | | | | | |
| MS116-0.63 | | | | | | | | | | | | | | | |
| MS116-1.0 | | | | | | | | | | | | | | | |
| MS116-1.6 | | | | | | | | | | | | | | | |
| MS116-2.5 | | | | | | | 10 | 10 | 25 | 10 | 10 | 25 | 5 | 5 | 25 |
| MS116-4.0 | | | | | | | 6 | 6 | 25 | 6 | 6 | 25 | 2 | 2 | 25 |
| MS116-6.3 | | | | | | | 6 | 6 | 63 | 6 | 6 | 63 | 2 | 2 | 40 |
| MS116-10 | | | | | | | 6 | 6 | 63 | 6 | 6 | 63 | 2 | 2 | 50 |
| MS116-12 | 25 | 25 | 80 | 25 | 25 | 80 | 6 | 6 | 63 | 6 | 6 | 63 | 2 | 2 | 50 |
| MS116-16 | 16 | 16 | 80 | 16 | 16 | 80 | 6 | 6 | 63 | 4 | 4 | 63 | 2 | 2 | 63 |
| MS116-20 | 10 | 15 | - | 10 | 15 | - | 3 | 6 | - | 3 | 4 | - | 2 | 2 | - |
| MS116-25 | 10 | 15 | - | 10 | 15 | - | 3 | 6 | - | 3 | 4 | - | 2 | 2 | - |
| MS116-32 | 10 | 10 | - | 10 | 10 | - | 3 | 6 | - | 3 | 4 | - | 2 | 2 | - |

MS116-10: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
MS116-16: No need for back-up fuse in networks with a prospective current of up to 16 kA at 400 V.
With an approbiate 80 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.
MS116-32: No need for back-up fuse in networks with a prospective current of up to 10 kA at 400 V.

2CDC131039C0201

# MS116 manual motor starters
## Technical data



### Main circuit – Utilization characteristics according to UL/CSA

| | | |
|---|---|---|
| **Type** | | MS116 |
| **Standards** | | UL 508, CSA 22.2 No. 14 |
| **Maximum operational voltage** | | 600 V AC |
| **Manual motor controller ratings** | | See table "UL 508 – Manual motor controller" |
| **Trip rating** | | 125 % FLA |
| **Motor ratings** | Horse power | See table "Motor rating, three phase" |
| | Full load amps (FLA) | See table "Motor rating, three phase" |
| | Locked rotor amps (LRA) | See table "Motor rating, three phase" |

### Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

| Type | 220-240 V AC | | | 440-480 V AC | | | 500-600 V AC | | |
|---|---|---|---|---|---|---|---|---|---|
| | **hp** | **FLA** | **LRA** | **hp** | **FLA** | **LRA** | **hp** | **FLA** | **LRA** |
| **MS116-0.16** | - | 0.16 | 0.96 | - | 0.16 | 0.96 | - | 0.16 | 0.96 |
| **MS116-0.25** | - | 0.25 | 1.5 | - | 0.25 | 1.5 | - | 0.25 | 1.5 |
| **MS116-0.4** | - | 0.4 | 2.4 | - | 0.4 | 2.4 | - | 0.4 | 2.4 |
| **MS116-0.63** | - | 0.63 | 3.78 | - | 0.63 | 3.78 | - | 0.63 | 3.78 |
| **MS116-1.0** | - | 1.0 | 6.0 | | 1.0 | 6.0 | 1/2 | 0.9 | 8 |
| **MS116-1.6** | - | 1.6 | 9.6 | 3/4 | 1.6 | 12.5 | 3/4 | 1.3 | 10 |
| **MS116-2.5** | 1/2 | 2.2 | 20 | 1 | 2.1 | 15 | 1-1/2 | 2.4 | 16 |
| **MS116-4.0** | 1 | 4.2 | 30 | 2 | 3.4 | 25 | 3 | 3.9 | 25.6 |
| **MS116-6.3** | 1-1/2 | 6.4 | 40 | 3 | 4.8 | 32 | 5 | 6.1 | 36.8 |
| **MS116-10** | 3 | 9.6 | 64 | 5 | 7.6 | 46 | 7-1/2 | 9 | 50.8 |
| **MS116-12** | 3 | 9.6 | 64 | 7-1/2 | 11 | 63.5 | 10 | 11 | 64.8 |
| **MS116-16** | 5 | 15.2 | 92 | 10 | 14 | 81 | 10 | 11 | 64.8 |
| **MS116-20** | 5 | 15.2 | 92 | 10 | 14 | 81 | 15 | 17 | 93 |
| **MS116-25** | 7-1/2 | 22 | 127 | 15 | 21 | 116 | 20 | 22 | 116 |
| **MS116-32** | 10 | 28 | 162 | 20 | 27 | 145 | 25 | 27 | 146 |

### UL 508 – Manual motor controller

| Type | Maximum fuse type K5 o. RK5 per UL/NEC | Maximum short-circuit current for motor disconnect[1] | | for group installation | |
|---|---|---|---|---|---|
| | 480 V / 600 V | 480 V | 600 V | 480 V | 600 V |
| | **A** | **kA** | **kA** | **kA** | **kA** |
| **MS116-0.16** | 100 | 30 | 5 | 30 | 5 |
| **MS116-0.25** | 100 | 30 | 5 | 30 | 5 |
| **MS116-0.4** | 100 | 30 | 5 | 30 | 5 |
| **MS116-0.63** | 100 | 30 | 5 | 30 | 5 |
| **MS116-1.0** | 100 | 30 | 5 | 30 | 5 |
| **MS116-1.6** | 100 | 30 | 5 | 30 | 5 |
| **MS116-2.5** | 100 | 30 | 5 | 30 | 5 |
| **MS116-4.0** | 100 | 18 | 5 | 18 | 5 |
| **MS116-6.3** | 100 | 18 | 5 | 18 | 5 |
| **MS116-10** | 100 | 18 | 5 | 18 | 5 |
| **MS116-12** | 100 | 18 | 5 | 18 | 5 |
| **MS116-16** | 100 | 18 | 5 | 18 | 5 |
| **MS116-20** | 100 | 18 | 5 | 18 | 5 |
| **MS116-25** | 100 | 18 | 5 | 18 | 5 |
| **MS116-32** | 100 | 18 | 5 | 18 | 5 |

[1] Suitable as motor disconnect only when provided with padlock SA1 or SA3...

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# MS116 manual motor starters
# Technical data



## General technical data

| | | |
|---|---|---|
| **Type** | | MS116 |
| **Pollution degree** | | 3 |
| **Phase loss sensitivity** | | Yes |
| **Disconnect function acc. to IEC/EN 60947-2** | | Yes |
| **Ambient air temperature** | | |
| Operation | Open - compensated | -25 ... +55 °C |
| | Open | -25 ... +70 °C |
| | Enclosed (IB132) | 0 ... +40 °C |
| Storage | | -50 ... +80 °C |
| **Ambient air temperature compensation** | | Acc. to IEC/EN60947-4-1 |
| **Maximum operating altitude permissible** | | 2000 m |
| **Resistance to shock acc. to IEC 60068-2-27** | | 25g / 11 ms |
| **Resistance to vibrations acc. to IEC 60068-2-6** | | 5g / 3 ... 150 Hz |
| **Mounting position** | | Position 1-6 (optional for single mounting) |
| **Mounting** | | DIN-rail (EN 60715) |
| **Group mounting** | | On request |
| **Minimum distance to other units same type** | Horizontal | 0 mm |
| | Vertical | 150 mm |
| **Minimum distance to electrical conductive board** | Horizontal, up to 400 V | 0 mm |
| | Horizontal, up to 690 V | > 1.5 mm |
| | Vertical | 75 mm |
| **Degree of protection** | Housing | IP20 |
| | Main circuit terminals | IP20 |

## Connecting characteristics

### Main circuit

| | | | | |
|---|---|---|---|---|
| **Type** | | | MS116 ≤ 16 A | MS116 ≥ 20 A |
| **Connecting capacity** | | | | |
| | Rigid | **1 or 2 x** | 1 ... 4 mm² | 2.5 ... 6 mm² |
| | Flexible with ferrule | **1 or 2 x** | 0.75 ... 2.5 mm² | 1 ... 6 mm² |
| | Flexible with insulated ferrule | **1 or 2 x** | 0.75 ... 2.5 mm² | 1 ... 6 mm² |
| | Flexible | **1 or 2 x** | 0.75 ... 2.5 mm² | 1 ... 6 mm² |
| | Stranded acc. to UL/CSA | **1 or 2 x** | AWG 16-12 | AWG 12-8 |
| | Flexible acc. to UL/CSA | **1 or 2 x** | AWG 16-12 | AWG 12-8 |
| **Stripping length** | | | 9 mm | 10 mm |
| **Tightening torques** | | | 0.8 ... 1.2 Nm / 10 ... 12 lb.in | 2.0 Nm / 18 lb.in |
| **Connection screw** | | | M3.5 (Pozidriv 2 / 5.5 mm) | M4 (Pozidriv 2 / 6.5 mm) |

2CDC131039C0201

# MS132 manual motor starters
## 0.10 to 32 A – with thermal and electromagnetic protection




1SBC101232F0010

MS132-10


2CDC241001F0011

MS132-32


2CDC241014F0011

MS132-0.16-HKF1-11


2CDC241015F0011

MS132-32-HKF1-11

### Description

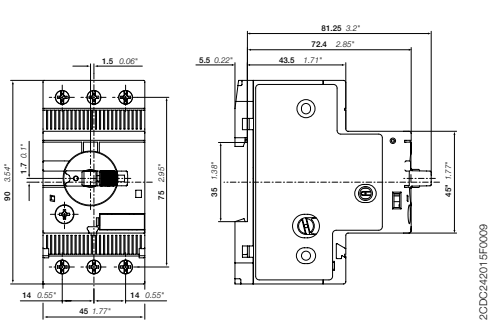
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

MS132 is a compact and powerful range for motor protection up 15.5 kW (400 V) / 32 A in width of 45 mm. Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase bus bars, power in-feed blocks.

### Ordering details

| Rated operational power 400 V AC-3 | Setting range | Short-circuit breaking capacity Ics at 400 V AC | Rated instantaneous short-circuit current setting Ii | Type | Order code | | Weight (1 pce) |
|---|---|---|---|---|---|---|---|
| kW | A | kA | A | | | | kg |
| 0.03 | 0.10...0.16 | 100 | 1.56 | MS132-0.16 | 1SAM350000R1001 | | 0.215 |
| 0.06 | 0.16...0.25 | 100 | 2.44 | MS132-0.25 | 1SAM350000R1002 | | 0.215 |
| 0.09 | 0.25...0.40 | 100 | 3.90 | MS132-0.4 | 1SAM350000R1003 | | 0.215 |
| 0.12 | 0.40...0.63 | 100 | 6.14 | MS132-0.63 | 1SAM350000R1004 | | 0.215 |
| 0.25 | 0.63...1.00 | 100 | 11.50 | MS132-1.0 | 1SAM350000R1005 | | 0.215 |
| 0.55 | 1.00...1.60 | 100 | 18.40 | MS132-1.6 | 1SAM350000R1006 | | 0.265 |
| 0.75 | 1.60...2.50 | 100 | 28.75 | MS132-2.5 | 1SAM350000R1007 | | 0.265 |
| 1.5 | 2.50...4.00 | 100 | 50.00 | MS132-4.0 | 1SAM350000R1008 | | 0.265 |
| 2.2 | 4.00...6.30 | 100 | 78.75 | MS132-6.3 | 1SAM350000R1009 | | 0.265 |
| 4.0 | 6.30...10.0 | 100 | 150 | MS132-10 | 1SAM350000R1010 | | 0.265 |
| 5.5 | 8.00...12.0 | 100 | 180 | MS132-12 | 1SAM350000R1012 | | 0.310 |
| 7.5 | 10.0...16.0 | 100 | 240 | MS132-16 | 1SAM350000R1011 | | 0.310 |
| 9.0 | 16.0...20.0 | 100 | 300 | MS132-20 | 1SAM350000R1013 | | 0.310 |
| 12.5 | 20.0...25.0 | 50 | 375 | MS132-25 | 1SAM350000R1014 | | 0.310 |
| 15.5 | 25.0...32.0 | 25 | 480 | MS132-32 | 1SAM350000R1015 | | 0.310 |
| **Auxiliary contacts mounted on the front (1 N.O. + 1 N.C.)** | | | | | | | |
| 0.03 | 0.10...0.16 | 100 | 1.56 | MS132-0.16-HKF1-11 | 1SAM350005R1001 | | 0.231 |
| 0.06 | 0.16...0.25 | 100 | 2.44 | MS132-0.25-HKF1-11 | 1SAM350005R1002 | | 0.231 |
| 0.09 | 0.25...0.40 | 100 | 3.90 | MS132-0.4-HKF1-11 | 1SAM350005R1003 | | 0.231 |
| 0.12 | 0.40...0.63 | 100 | 6.14 | MS132-0.63-HKF1-11 | 1SAM350005R1004 | | 0.231 |
| 0.25 | 0.63...1.00 | 100 | 11.50 | MS132-1.0-HKF1-11 | 1SAM350005R1005 | | 0.231 |
| 0.55 | 1.00...1.60 | 100 | 18.40 | MS132-1.6-HKF1-11 | 1SAM350005R1006 | | 0.281 |
| 0.75 | 1.60...2.50 | 100 | 28.75 | MS132-2.5-HKF1-11 | 1SAM350005R1007 | | 0.281 |
| 1.5 | 2.50...4.00 | 100 | 50.00 | MS132-4.0-HKF1-11 | 1SAM350005R1008 | | 0.281 |
| 2.2 | 4.00...6.30 | 100 | 78.75 | MS132-6.3-HKF1-11 | 1SAM350005R1009 | | 0.281 |
| 4.0 | 6.30...10.0 | 100 | 150 | MS132-10.0-HKF1-11 | 1SAM350005R1010 | | 0.281 |
| 5.5 | 8.00...12.0 | 100 | 180 | MS132-12.0-HKF1-11 | 1SAM350005R1012 | | 0.326 |
| 7.5 | 10.0...16.0 | 100 | 240 | MS132-16.0-HKF1-11 | 1SAM350005R1011 | | 0.326 |
| 9.0 | 16.0...20.0 | 100 | 300 | MS132-20-HKF1-11 | 1SAM350005R1013 | | 0.326 |
| 12.5 | 20.0...25.0 | 50 | 375 | MS132-25-HKF1-11 | 1SAM350005R1014 | | 0.326 |
| 15.5 | 25.0...32.0 | 25 | 480 | MS132-32-HKF1-11 | 1SAM350005R1015 | | 0.326 |

### Main dimensions mm, *inches*



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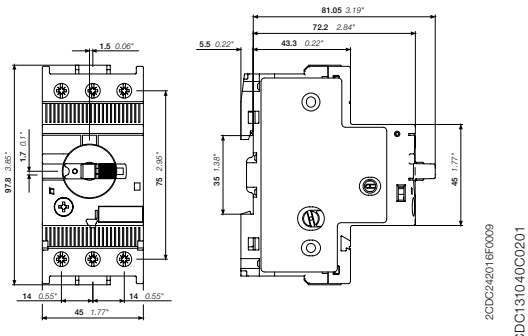
MS132 ≤ 10 A



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MS132 ≥ 12 A

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# MS132 manual motor starters
# Technical data



## Main circuit – Utilization characteristics according to IEC/EN

| Type | MS132 |
|---|---|
| Standards | IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1 |
| Rated operational voltage $U_e$ | 690 V AC / 250 V DC |
| Rated frequency | DC, 50/60 Hz |
| Trip class | 10 (10A for 1SAM350000R1001) |
| Number of poles | 3 |
| Duty time | 100 % |
| Mechanical durability | 100000 cycles |
| Electrical durability | 50000 cycles |
| Rated impulse withstand voltage $U_{imp}$ | 6 kV |
| Rated insulation voltage $U_i$ | 690 V AC |
| Rated operational current $I_e$ | See ordering details |
| Rated oprational current DC-5 $I_e$<br>3 conducting paths in series up to 250 V | See "Rated operational current $I_e$" |
| Rated instantaneous short-circuit current setting $I_i$ | See ordering details |
| Rated service short-circuit breaking capacity $I_{cs}$ | See table "Short-circuit breaking capacity and back-up fuses" |
| Rated ultimate short-circuit breaking capacity $I_{cu}$ | See table "Short-circuit breaking capacity and back-up fuses" |
| Rated service short-circuit breaking capacity DC $I_{cs}$<br>3 conducting paths in series up to 250 V | 10 kA |

## Short-circuit breaking capacity and back-up fuses

$I_{cs}$ Rated service short-circuit breaking capacity

$I_{cu}$ Rated ultimate short-circuit breaking capacity

$I_{cc}$ Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

| Type | 230 V AC | | | 400 V AC | | | 440 V AC | | | 500 V AC | | | 690 V AC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A |
| MS132-0.16 | No back-up fuse required up to $I_{cc}$ = 100 kA | | | | | | | | | | | | | | |
| MS132-0.25 | | | | | | | | | | | | | | | |
| MS132-0.4 | | | | | | | | | | | | | | | |
| MS132-0.63 | | | | | | | | | | | | | | | |
| MS132-1.0 | | | | | | | | | | | | | | | |
| MS132-1.6 | | | | | | | | | | | | | | | |
| MS132-2.5 | | | | | | | | | | | | | | | |
| MS132-4.0 | | | | | | | 20 | 20 | 35 | 20 | 20 | 35 | 3 | 3 | 32 |
| MS132-6.3 | | | | | | | 20 | 20 | 63 | 20 | 20 | 63 | 3 | 3 | 50 |
| MS132-10 | | | | | | | 20 | 20 | 100 | 20 | 20 | 100 | 3 | 3 | 50 |
| MS132-12 | | | | | | | 20 | 20 | 100 | 20 | 20 | 100 | 3 | 3 | 63 |
| MS132-16 | | | | | | | 20 | 20 | 125 | 20 | 20 | 125 | 3 | 3 | 63 |
| MS132-20 | | | | | | | 20 | 20 | 125 | 20 | 20 | 125 | 3 | 3 | 80 |
| MS132-25 | 50 | 50 | 125 | 50 | 50 | 125 | 20 | 20 | 125 | 10 | 10 | 125 | 3 | 3 | 100 |
| MS132-32 | 25 | 50 | 125 | 25 | 50 | 125 | 20 | 20 | 125 | 10 | 10 | 125 | 3 | 3 | 100 |

MS132-16: No need for back-up fuse in networks with a prospective current of up to 100 kA at 400 V.
MS132-32: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 125 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

2CDC131040C0201

# MS132 manual motor starters
# Technical data



## Main circuit – Utilization characteristics according to UL/CSA

| Type | | MS132 |
|---|---|---|
| Standards | | UL 508, CSA 22.2 No. 14 |
| Maximum operational voltage | | 600 V AC |
| Manual motor controller ratings | | See table "UL 508 – Manual motor controller" |
| Trip rating | | 125 % FLA |
| Motor ratings | Horse power | See table "Motor rating, three phase" |
| | Full load amps (FLA) | See table "Motor rating, three phase" |
| | Locked rotor amps (LRA) | See table "Motor rating, three phase" |

## Motor rating, single phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

| Type | 120 V AC | | | 220-240 V AC | | |
|---|---|---|---|---|---|---|
| | hp | FLA | LRA | hp | FLA | LRA |
| MS132-0.16 | - | 0.16 | 0.96 | - | 0.16 | 0.96 |
| MS132-0.25 | - | 0.25 | 1.5 | - | 0.25 | 1.5 |
| MS132-0.4 | - | 0.4 | 2.4 | - | 0.4 | 2.4 |
| MS132-0.63 | - | 0.63 | 3.78 | - | 0.63 | 3.78 |
| MS132-1.0 | - | 1 | 6 | - | 1 | 6 |
| MS132-1.6 | | 1.6 | 9.6 | 1/10 | 1.6 | 9.6 |
| MS132-2.5 | | 2.5 | 15 | 1/6 | 2.5 | 15 |
| MS132-4.0 | 1/8 | 4 | 24 | 1/3 | 4 | 24 |
| MS132-6.3 | 1/4 | 6.3 | 37.8 | 1/2 | 6.3 | 37.8 |
| MS132-10 | 1/2 | 9.8 | 58.8 | 1-1/2 | 10 | 60 |
| MS132-12 | 1/2 | 9.8 | 58.8 | 2 | 12 | 72 |
| MS132-16 | 1 | 16 | 96 | 2 | 12 | 72 |
| MS132-20 | 1-1/2 | 20 | 120 | 3 | 17 | 92 |
| MS132-25 | 2 | 24 | 144 | 3 | 17 | 127 |
| MS132-32 | 2 | 24 | 144 | 5 | 28 | 162 |

## Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

| Type | 220-240 V AC | | | 440-480 V AC | | | 500-600 V AC | | |
|---|---|---|---|---|---|---|---|---|---|
| | hp | FLA | LRA | hp | FLA | LRA | hp | FLA | LRA |
| MS132-0.16 | - | 0.16 | 0.96 | - | 0.16 | 0.96 | - | 0.16 | 0.96 |
| MS132-0.25 | - | 0.25 | 1.5 | - | 0.25 | 1.5 | - | 0.25 | 1.5 |
| MS132-0.4 | - | 0.4 | 2.4 | - | 0.4 | 2.4 | - | 0.4 | 2.4 |
| MS132-0.63 | - | 0.63 | 3.78 | - | 0.63 | 3.78 | - | 0.63 | 3.78 |
| MS132-1.0 | - | 1.0 | 6.0 | - | 1.0 | 6.0 | 1/2 | 1.0 | 6.0 |
| MS132-1.6 | - | 1.6 | 9.6 | 3/4 | 1.6 | 9.6 | 3/4 | 1.6 | 9.6 |
| MS132-2.5 | 1/2 | 2.5 | 15.0 | 1 | 2.5 | 15.0 | 1-1/2 | 2.5 | 15.0 |
| MS132-4.0 | 1 | 4.0 | 24.0 | 2 | 4.0 | 24.0 | 3 | 3.9 | 26.0 |
| MS132-6.3 | 1-1/2 | 6.3 | 37.8 | 3 | 4.8 | 32.0 | 5 | 6.1 | 37.0 |
| MS132-10 | 3 | 9.6 | 64.0 | 5 | 7.6 | 46.0 | 7-1/2 | 9.0 | 51.0 |
| MS132-12 | 3 | 9.6 | 64.0 | 7-1/2 | 11.0 | 64.0 | 10 | 11.0 | 65.0 |
| MS132-16 | 5 | 15.2 | 92.0 | 10 | 14.0 | 81.0 | 10 | 11.0 | 65.0 |
| MS132-20 | 5 | 15.2 | 92.0 | 10 | 14.0 | 81.0 | 15 | 17.0 | 93.0 |
| MS132-25 | 7-1/2 | 22.0 | 127.0 | 15 | 21.0 | 116.0 | 20 | 22.0 | 116.0 |
| MS132-32 | 10 | 28.0 | 162.0 | 20 | 27.0 | 145.0 | 25 | 27.0 | 146.0 |

2CDC131040C0201

# MS132 manual motor starters
## Technical data



### UL 508 – Manual motor controller

| Type | Maximum short-circuit current for motor disconnect | | for group installation | | for self-protected combination motor controller (type E) in combination with feeder block S1-M3-xx | | for tap conductor protection | |
|---|---|---|---|---|---|---|---|---|
| | 480 V kA | 600 V kA | 480 V kA | 600 V kA | 480Y / 277 V kA | 600Y / 347 V kA | 480 V kA | 600 V kA |
| **MS132-0.16** | 65 | 47 | 65 | 47 | 65 | 47 | 65 | 47 |
| **MS132-0.25** | 65 | 47 | 65 | 47 | 65 | 47 | 65 | 47 |
| **MS132-0.4** | 65 | 47 | 65 | 47 | 65 | 47 | 65 | 47 |
| **MS132-0.63** | 65 | 47 | 65 | 47 | 65 | 47 | 65 | 47 |
| **MS132-1.0** | 65 | 47 | 65 | 47 | 65 | 47 | 65 | 47 |
| **MS132-1.6** | 65 | 47 | 65 | 47 | 65 | 47 | 65 | 47 |
| **MS132-2.5** | 65 | 47 | 65 | 47 | 65 | 47 | 65 | 47 |
| **MS132-4.0** | 65 | 18 | 65 | 30 | 65 | 18 | 65 | 18 |
| **MS132-6.3** | 65 | 18 | 65 | 30 | 65 | 18 | 65 | 18 |
| **MS132-10** | 65 | 18 | 65 | 30 | 65 | 18 | 65 | 18 |
| **MS132-12** | 30 | 18 | 30 | 30 | 30 | - | 30 | 18 |
| **MS132-16** | 30 | 18 | 30 | 30 | 30 | - | 30 | 18 |
| **MS132-20** | 30 | 18 | 30 | 30 | 30 | - | 30 | 18 |
| **MS132-25** | 30 | 18 | 30 | 30 | 30 | - | 30 | 18 |
| **MS132-32** | 30 | 18 | 30 | 30 | 30 | - | 30 | 18 |

### General technical data

| | | | |
|---|---|---|---|
| **Type** | | | MS132 |
| **Pollution degree** | | | 3 |
| **Phase loss sensitivity** | | | Yes |
| **Disconnect function acc. to IEC/EN 60947-2** | | | Yes |
| **Ambient air temperature** | | | |
| | Operation | Open - compensated | -25 ... +60 °C |
| | | Open | -25 ... +70 °C |
| | | Enclosed (IB132) | 0 ... +40 °C |
| | Storage | | -50 ... +70 °C |
| **Ambient air temperature compensation** | | | Acc. to IEC/EN60947-4-1 |
| **Maximum operating altitude permissible** | | | 2000 m |
| **Resistance to shock acc. to IEC 60068-2-27** | | | 25g / 11 ms |
| **Resistance to vibrations acc. to IEC 60068-2-6** | | | 5g / 3 ... 150 Hz |
| **Mounting position** | | | Position 1-6 (optional for single mounting) |
| **Mounting** | | | DIN-rail (EN 60715) |
| **Group mounting** | | | On request |
| **Minimum distance to other units same type** | | Horizontal | 0 mm |
| | | Vertical | 150 mm |
| **Minimum distance to electrical conductive board** | | Horizontal, up to 400 V | 0 mm |
| | | Horizontal, up to 690 V | > 1.5 mm |
| | | Vertical | 75 mm |
| **Degree of protection** | | Housing | IP20 |
| | | Main circuit terminals | IP20 |

### Connecting characteristics

Main circuit

| Type | | | MS132-0.16 ... MS132-10 | MS132-12 ... MS132-16 | MS132-20 ... MS132-32 |
|---|---|---|---|---|---|
| **Connecting capacity** | | | | | |
| | Rigid | **1 or 2 x** | 1 ... 4 mm² | 1 ... 4 mm² | 2.5 ... 6 mm² |
| | Flexible with ferrule | **1 or 2 x** | 1 ... 4 mm² | 1 ... 4 mm² | 2.5 ... 6 mm² |
| | Flexible with insulated ferrule | **1 or 2 x** | 1 ... 4 mm² | 1 ... 4 mm² | 2.5 ... 6 mm² |
| | Flexible | **1 or 2 x** | 1 ... 4 mm² | 1 ... 4 mm² | 2.5 ... 6 mm² |
| | Stranded acc. to UL/CSA | **1 or 2 x** | AWG 16-12 | AWG 16-12 | AWG 12-8 |
| | Flexible acc. to UL/CSA | **1 or 2 x** | AWG 16-12 | AWG 16-12 | AWG 12-8 |
| **Stripping length** | | | 9 mm | 10 mm | 10 mm |
| **Tightening torques** | | | 0.8 ... 1.2 Nm / 10 ... 12 lb.in | 1.5 Nm / 14 lb.in | 2.0 Nm / 18 lb.in |
| **Connection screw** | | | M3.5 (Pozidriv 2) | M4 (Pozidriv 2) | M4 (Pozidriv 2) |

2CDC131040C0201

# MO132 manual motor starters magnetic only
# 0.16 to 32 A – with electromagnetic protection




MO132-6.3


MO132-32

## Description

Manual motor starters magnetic only are electromechanical protection devices for the main circuit. They are used mainly to switch motors manually ON/OFF and protect them fuse less against short-circuit.

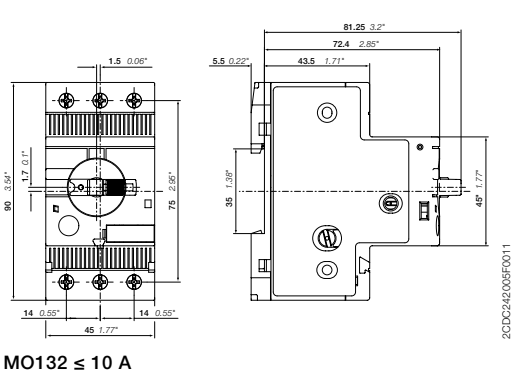
Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds. Fuse less starter combinations are setup together with contactors and overload relays.

## Ordering details

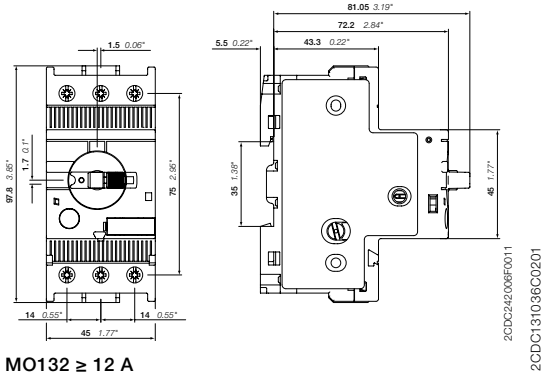
| Rated operational power 400 V AC-3 (1) | Rated operational current | Short-circuit breaking capacity Ics at 400 V AC | Rated instantaneous short-circuit current setting Ii | Type | Order code | | Weight (1 pce) |
|---|---|---|---|---|---|---|---|
| kW | A | kA | A | | | | kg |
| 0.03 | 0.16 | 100 | 1.56 | MO132-0.16 | 1SAM360000R1001 | | 0.215 |
| 0.06 | 0.25 | 100 | 2.44 | MO132-0.25 | 1SAM360000R1002 | | 0.215 |
| 0.09 | 0.40 | 100 | 3.90 | MO132-0.4 | 1SAM360000R1003 | | 0.215 |
| 0.12 | 0.63 | 100 | 6.14 | MO132-0.63 | 1SAM360000R1004 | | 0.215 |
| 0.25 | 1.0 | 100 | 11.50 | MO132-1.0 | 1SAM360000R1005 | | 0.215 |
| 0.55 | 1.6 | 100 | 18.40 | MO132-1.6 | 1SAM360000R1006 | | 0.265 |
| 0.75 | 2.5 | 100 | 28.75 | MO132-2.5 | 1SAM360000R1007 | | 0.265 |
| 1.5 | 4.0 | 50 | 50.00 | MO132-4.0 | 1SAM360000R1008 | | 0.265 |
| 2.2 | 6.3 | 50 | 78.75 | MO132-6.3 | 1SAM360000R1009 | | 0.265 |
| 4.0 | 10 | 50 | 125.00 | MO132-10 | 1SAM360000R1010 | | 0.265 |
| 5.5 | 12 | 50 | 150.00 | MO132-12 | 1SAM360000R1012 | | 0.310 |
| 7.5 | 16 | 50 | 200.00 | MO132-16 | 1SAM360000R1011 | | 0.310 |
| 9.0 | 20 | 50 | 250.00 | MO132-20 | 1SAM360000R1013 | | 0.310 |
| 12.5 | 25 | 50 | 312.50 | MO132-25 | 1SAM360000R1014 | | 0.310 |
| 15.5 | 32 | 25 | 400.00 | MO132-32 | 1SAM360000R1015 | | 0.310 |

(1) For overload protection of motors, an appropriate thermal or electronic overload relay must be used.

## Main dimensions mm, *inches*




MO132 ≤ 10 A




MO132 ≥ 12 A

# MO132 manual motor starters magnetic only
# Technical data



## Main circuit – Utilization characteristics according to IEC/EN

| | |
|---|---|
| **Type** | MO132 |
| **Standards** | IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1 |
| **Rated operational voltage $U_e$** | 690 V AC |
| **Rated frequency** | 50/60 Hz |
| **Number of poles** | 3 |
| **Duty time** | 100 % |
| **Mechanical durability** | 100000 cycles |
| **Electrical durability** | 50000 cycles |
| **Rated impulse withstand voltage $U_{imp}$** | 6 kV |
| **Rated insulation voltage $U_i$** | 690 V AC |
| **Rated operational current $I_e$** | See ordering details |
| **Rated instantaneous short-circuit current setting $I_i$** | See ordering details |
| **Rated service short-circuit breaking capacity $I_{cs}$** | See table "Short-circuit breaking capacity and back-up fuses" |
| **Rated ultimate short-circuit breaking capacity $I_{cu}$** | See table "Short-circuit breaking capacity and back-up fuses" |

## Short-circuit breaking capacity and back-up fuses

$I_{cs}$ Rated service short-circuit breaking capacity

$I_{cu}$ Rated ultimate short-circuit breaking capacity

$I_{cc}$ Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

| Type | 230 V AC | | | 400 V AC | | | 440 V AC | | | 500 V AC | | | 690 V AC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A |
| MO132-0.16 | | | | | | | | | | | | | | | |
| MO132-0.25 | | | | | | | | | | | | | | | |
| MO132-0.4 | | | | | | | | | | | | | | | |
| MO132-0.63 | No back-up fuse required up to $I_{cc}$ = 100 kA | | | | | | | | | | | | | | |
| MO132-1.0 | | | | | | | | | | | | | | | |
| MO132-1.6 | | | | | | | | | | | | | | | |
| MO132-2.5 | | | | | | | | | | | | | | | |
| MO132-4.0 | | | | | | | 20 | 20 | 35 | 20 | 20 | 35 | 3 | 3 | 32 |
| MO132-6.3 | | | | | | | 20 | 20 | 63 | 20 | 20 | 63 | 3 | 3 | 50 |
| MO132-10 | | | | | | | 20 | 20 | 100 | 20 | 20 | 100 | 3 | 3 | 50 |
| MO132-12 | | | | | | | 20 | 20 | 100 | 20 | 20 | 100 | 3 | 3 | 63 |
| MO132-16 | | | | | | | 20 | 20 | 125 | 20 | 20 | 125 | 3 | 3 | 63 |
| MO132-20 | | | | | | | 20 | 20 | 125 | 20 | 20 | 125 | 3 | 3 | 80 |
| MO132-25 | 50 | 50 | 125 | 50 | 50 | 125 | 10 | 10 | 125 | 10 | 10 | 125 | 3 | 3 | 100 |
| MO132-32 | 25 | 50 | 125 | 25 | 50 | 125 | 10 | 10 | 125 | 10 | 10 | 125 | 3 | 3 | 100 |

MO132-20: No need for back-up fuse in networks with a prospective current of up to 100 kA at 400 V.
MO132-32: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 125 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

2CDC131036C0201

# MO132 manual motor starters magnetic only
# Technical data



## Main circuit – Utilization characteristics according to UL/CSA

| | | |
|---|---|---|
| **Type** | | MO132 |
| **Standards** | | UL 508, CSA 22.2 No. 14 |
| **Maximum operational voltage** | | 600 V AC |
| **Manual motor controller ratings** | | See table "UL 508 – Manual motor controller" |
| **Trip rating** | | 125 % FLA |
| **Motor ratings** | Horse power | See table "Motor rating, three phase" |
| | Full load amps (FLA) | See table "Motor rating, three phase" |
| | Locked rotor amps (LRA) | See table "Motor rating, three phase" |

## Motor rating, single phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

| Type | 120 V AC | | | 220 ... 240 V AC | | |
|---|---|---|---|---|---|---|
| | hp | FLA | LRA | hp | FLA | LRA |
| **MO132-0.16** | - | 0.16 | 0.96 | - | 0.16 | 0.96 |
| **MO132-0.25** | - | 0.25 | 1.5 | - | 0.25 | 1.5 |
| **MO132-0.4** | - | 0.4 | 2.4 | - | 0.4 | 2.4 |
| **MO132-0.63** | - | 0.63 | 3.78 | - | 0.63 | 3.78 |
| **MO132-1.0** | - | 1 | 6 | - | 1 | 6 |
| **MO132-1.6** | | 1.6 | 9.6 | 1/10 | 1.6 | 9.6 |
| **MO132-2.5** | | 2.5 | 15 | 1/6 | 2.5 | 15 |
| **MO132-4.0** | 1/8 | 4 | 24 | 1/3 | 4 | 24 |
| **MO132-6.3** | 1/4 | 6.3 | 37.8 | 1/2 | 6.3 | 37.8 |
| **MO132-10** | 1/2 | 9.8 | 58.8 | 1-1/2 | 10 | 60 |
| **MO132-12** | 1/2 | 9.8 | 58.8 | 2 | 12 | 72 |
| **MO132-16** | 1 | 16 | 96 | 2 | 12 | 72 |
| **MO132-20** | 1-1/2 | 20 | 120 | 3 | 17 | 92 |
| **MO132-25** | 2 | 24 | 144 | 3 | 17 | 127 |
| **MO132-32** | 2 | 24 | 144 | 5 | 28 | 162 |

## Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

| Type | 220 ... 240 V AC | | | 440 ... 480 V AC | | | 500 ... 600 V AC | | |
|---|---|---|---|---|---|---|---|---|---|
| | hp | FLA | LRA | hp | FLA | LRA | hp | FLA | LRA |
| **MO132-0.16** | - | 0.16 | 0.96 | - | 0.16 | 0.96 | - | 0.16 | 0.96 |
| **MO132-0.25** | - | 0.25 | 1.5 | - | 0.25 | 1.5 | - | 0.25 | 1.5 |
| **MO132-0.4** | - | 0.4 | 2.4 | - | 0.4 | 2.4 | - | 0.4 | 2.4 |
| **MO132-0.63** | - | 0.63 | 3.78 | - | 0.63 | 3.78 | - | 0.63 | 3.78 |
| **MO132-1.0** | - | 1 | 6 | - | 1 | 6 | 1/2 | 1 | 6 |
| **MO132-1.6** | - | 1.6 | 9.6 | 3/4 | 1.6 | 9.6 | 3/4 | 1.6 | 9.6 |
| **MO132-2.5** | 1/2 | 2.5 | 15 | 1 | 2.5 | 15 | 1-1/2 | 2.5 | 15 |
| **MO132-4.0** | 1 | 4 | 24 | 2 | 4 | 24 | 3 | 3.9 | 26 |
| **MO132-6.3** | 1-1/2 | 6.3 | 37.8 | 3 | 4.8 | 32 | 5 | 6.1 | 37 |
| **MO132-10** | 3 | 9.6 | 64 | 5 | 7.6 | 46 | 7-1/2 | 9 | 51 |
| **MO132-12** | 3 | 9.6 | 64 | 7-1/2 | 11 | 64 | 10 | 11 | 65 |
| **MO132-16** | 5 | 15.2 | 92 | 10 | 14 | 81 | 10 | 11 | 65 |
| **MO132-20** | 5 | 15.2 | 92 | 10 | 14 | 81 | 15 | 17 | 93 |
| **MO132-25** | 7-1/2 | 22 | 127 | 15 | 21 | 116 | 20 | 22 | 116 |
| **MO132-32** | 10 | 28 | 162 | 20 | 27 | 145 | 25 | 27 | 146 |

2CDC131036C0201

# MO132 manual motor starters magnetic only
# Technical data



## UL 508 – Manual motor controller

| Type | Circuit breaker or class R fuse per UL/NEC 480 V / 600 V | Maximum short-circuit current rating | |
|---|---|---|---|
| | | 480 V<br>kA | 600 V<br>kA |
| MO132-0.16 | with minimum interrupting rating of 35,000 rms symmetrical amperes | 30 | 18 |
| MO132-0.25 | | 30 | 18 |
| MO132-0.4 | | 30 | 18 |
| MO132-0.63 | | 30 | 18 |
| MO132-1.0 | | 30 | 18 |
| MO132-1.6 | | 30 | 18 |
| MO132-2.5 | | 30 | 18 |
| MO132-4.0 | | 30 | 18 |
| MO132-6.3 | | 30 | 18 |
| MO132-10 | | 30 | 18 |
| MO132-12 | | 30 | 18 |
| MO132-16 | | 30 | 18 |
| MO132-20 | | 30 | 18 |
| MO132-25 | | 30 | 18 |
| MO132-32 | | 30 | 18 |

## General technical data

| | | |
|---|---|---|
| **Type** | | MO132 |
| **Pollution degree** | | 3 |
| **Phase loss sensitivity** | | No |
| **Disconnect function acc. to IEC/EN 60947-2** | | Yes |
| **Ambient air temperature** | | |
| Operation | Open | -25 ... +60 °C |
| | Enclosed (IB132) | 0 ... +40 °C |
| Storage | | -50 ... +80 °C |
| **Ambient air temperature compensation** | | - |
| **Maximum operating altitude permissible** | | 2000 m |
| **Resistance to shock acc. to IEC 60068-2-27** | | 25g / 11 ms |
| **Resistance to vibrations acc. to IEC 60068-2-6** | | 5g / 3 ... 150 Hz |
| **Mounting position** | | Position 1-6 (optional for single mounting) |
| **Mounting** | | DIN-rail (EN 60715) |
| **Group mounting** | | On request |
| **Minimum distance to other units same type** | Horizontal | 0 mm |
| | Vertical | 150 mm |
| **Minimum distance to electrical conductive board** | Horizontal, up to 400 V | 0 mm |
| | Horizontal, up to 690 V | > 1.5 mm |
| | Vertical | 75 mm |
| **Degree of protection** | Housing | IP20 |
| | Main circuit terminals | IP20 |

## Connecting characteristics

Main circuit

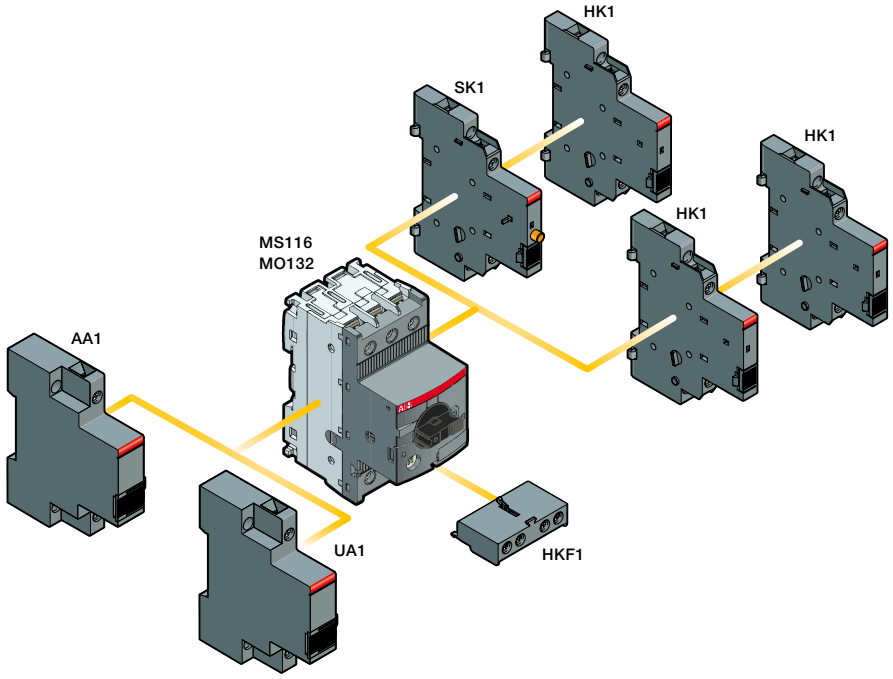
| **Type** | | | MO132-0.16 ... MO132-10 | MO132-12 ... MO132-16 | MO132-20 ... MO132-32 |
|---|---|---|---|---|---|
| **Connecting capacity** | | | | | |
| | Rigid | **1 or 2 x** | 1 ... 4 mm² | 1 ... 4 mm² | 2.5 ... 6 mm² |
| | Flexible with ferrule | **1 or 2 x** | 0.75 ... 2.5 mm² | 0.75 ... 2.5 mm² | 1 ... 6 mm² |
| | Flexible with insulated ferrule | **1 or 2 x** | 0.75 ... 2.5 mm² | 0.75 ... 2.5 mm² | 1 ... 6 mm² |
| | Flexible | **1 or 2 x** | 0.75 ... 2.5 mm² | 0.75 ... 2.5 mm² | 1 ... 6 mm² |
| | Stranded acc. to UL/CSA | **1 or 2 x** | AWG 16-12 | AWG 16-12 | AWG 12-8 |
| | Flexible acc. to UL/CSA | **1 or 2 x** | AWG 16-12 | AWG 16-12 | AWG 12-8 |
| **Stripping length** | | | 9 mm | 10 mm | 10 mm |
| **Tightening torques** | | | 0.8 ... 1.2 Nm / 10 ... 12 lb.in | 1.5 Nm / 14 lb.in | 2.0 Nm / 18 lb.in |
| **Connection screw** | | | M3.5 (Pozidriv 2) | M4 (Pozidriv 2) | M4 (Pozidriv 2) |

2CDC131036C0201

# MS116, MS132, MO132 manual motor starters
## Main accessories

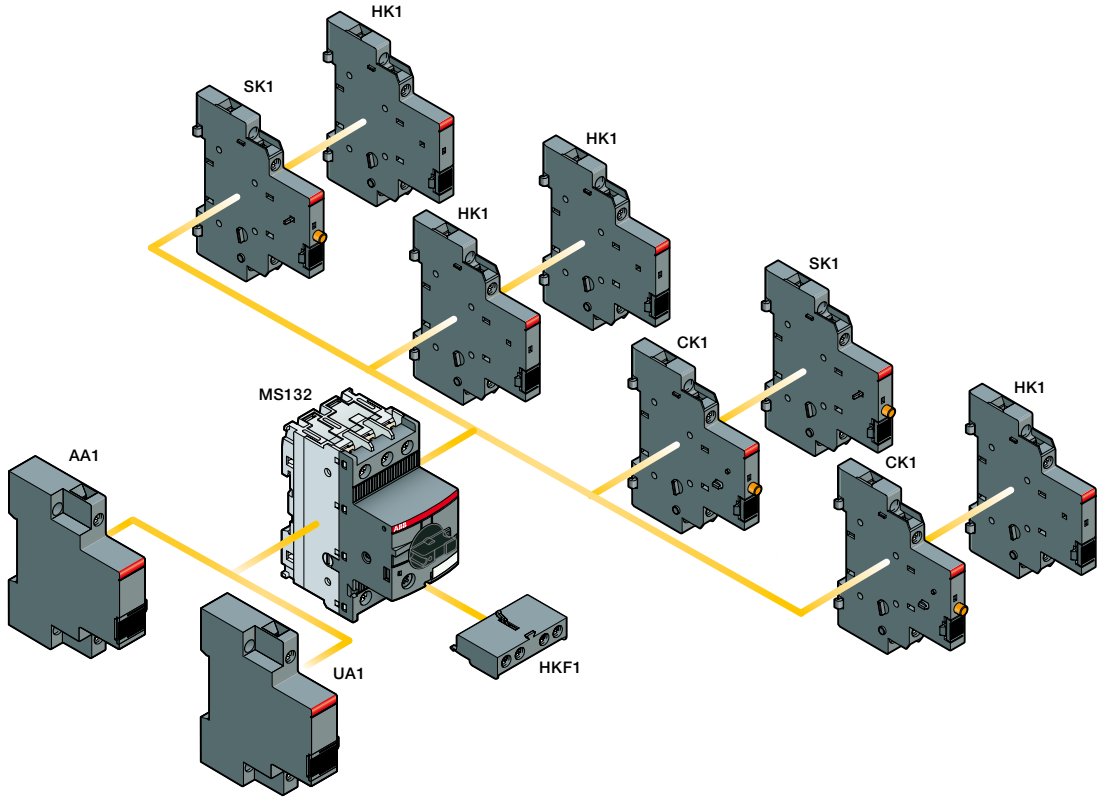


### MS116, MO132 manual motor starters with accessories




2CDC246001F0013

### MS132 manual motor starters with accessories




1SBC500311F0000

2CDC131050C0201

# MS116, MS132, MO132 manual motor starters
## Main accessories




1SBC101208F0014

HKF1-11


1SBC101209F0014

HK1-11


1SBC101210F0014

SK1-11


1SBC101286F0014

CK1-11

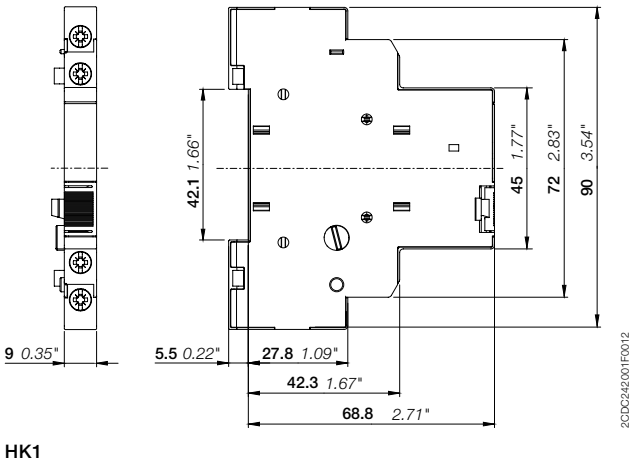
### Description

Manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. Two different signalling contacts are available. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. The signalling contact SK signals tripping regardless if it was caused by short-circuit or overload. The signalling contact CK signals tripping in case it was caused by short-circuit. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

### Ordering details

| Suitable for | Auxiliary contacts N.O. | Auxiliary contacts N.C. | Description | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|---|
| **Auxiliary contacts – mountable on the front** | | | | | | | | |
| MS116, MS132, MO132 | 1 | 1 | | HKF1-11 | 1SAM201901R1001 | | 10 | 0.015 |
| | 2 | 0 | | HKF1-20 | 1SAM201901R1002 | | 10 | 0.015 |
| **Auxiliary contacts – mountable on the right** | | | | | | | | |
| MS116, MS132, MO132 | 1 | 1 | max. 2 pieces | HK1-11 | 1SAM201902R1001 | | 2 | 0.035 |
| | 2 | 0 | max. 2 pieces | HK1-20 | 1SAM201902R1002 | | 2 | 0.035 |
| | 0 | 2 | max. 2 pieces | HK1-02 | 1SAM201902R1003 | | 2 | 0.035 |
| | 2 | 0 | with lead contacts | HK1-20L | 1SAM201902R1004 | | 2 | 0.035 |
| **Signalling contacts – mountable on the right** | | | | | | | | |
| MS116, MS132, MO132 | 1 | 1 | for tripped alarm, max. 2 pieces | SK1-11 | 1SAM201903R1001 | | 2 | 0.035 |
| | 2 | 0 | for tripped alarm, max. 2 pieces | SK1-20 | 1SAM201903R1002 | | 2 | 0.035 |
| | 0 | 2 | for tripped alarm, max. 2 pieces | SK1-02 | 1SAM201903R1003 | | 2 | 0.035 |
| MS132 | 1 | 1 | for short-circuit alarm, max. 2 pieces | CK1-11 | 1SAM301901R1001 | | 2 | 0.035 |
| | 2 | 0 | for short-circuit alarm, max. 2 pieces | CK1-20 | 1SAM301901R1002 | | 2 | 0.035 |
| | 0 | 2 | for short-circuit alarm, max. 2 pieces | CK1-02 | 1SAM301901R1003 | | 2 | 0.035 |

### Main dimensions mm, *inches*




HK1

2CDC131050C0201

# MS116, MS132, MO132 manual motor starters
## Main accessories

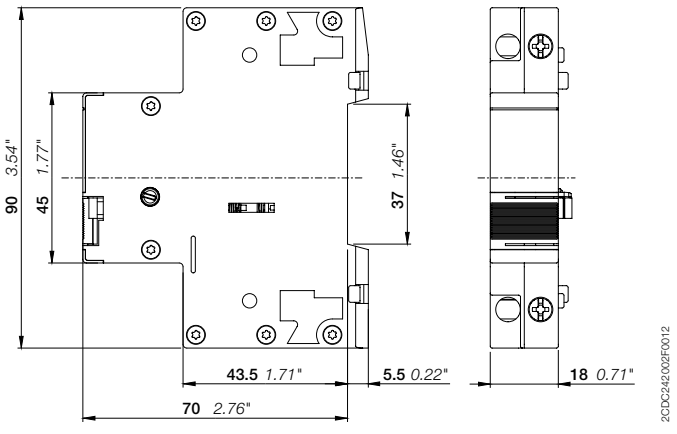

**AA1-24**


**UA1-24**

### Ordering details

| Suitable for | Rated control supply voltage<br>V | Frequency<br>Hz | Type | Order code | | Pkg qty | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|---|
| **Shunt trips – mountable on the left** | | | | | | | |
| MS116, MS132, MO132 | 20...24 | 50/60 | AA1-24 | 1SAM201910R1001 | | 1 | 0.100 |
| | 110 | 50/60 | AA1-110 | 1SAM201910R1002 | | 1 | 0.100 |
| | 200...240 | 50/60 | AA1-230 | 1SAM201910R1003 | | 1 | 0.100 |
| | 350...415 | 50/60 | AA1-400 | 1SAM201910R1004 | | 1 | 0.100 |
| **Undervoltage releases – mountable on the left** | | | | | | | |
| MS116, MS132, MO132 | 24 | 50 | UA1-24 | 1SAM201904R1001 | | 1 | 0.100 |
| | 48 | 50 | UA1-48 | 1SAM201904R1002 | | 1 | 0.100 |
| | 60 | 50 | UA1-60 | 1SAM201904R1003 | | 1 | 0.100 |
| | 110...120 | 50/60 | UA1-110 | 1SAM201904R1004 | | 1 | 0.100 |
| | 208 | 60 | UA1-208 | 1SAM201904R1008 | | 1 | 0.100 |
| | 230...240 | 50/60 | UA1-230 | 1SAM201904R1005 | | 1 | 0.100 |
| | 400 | 50 | UA1-400 | 1SAM201904R1006 | | 1 | 0.100 |
| | 415...480 | 50/60 | UA1-415 | 1SAM201904R1007 | | 1 | 0.100 |

### Main dimensions mm, *inches*




**AA1, UA1**



2CDC131050C0201

# MS116, MS132, MO132 manual motor starters
## Main accessories



### General technical data

| | | | | |
|---|---|---|---|---|
| **Type** | | HK1 | SK1 | HKF1 |
| **Standards** | | IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-1 | | |
| **Rated operational voltage $U_e$** | | 690 V AC / 600 DC | | 250 V AC / 250 V DC |
| **Conventional free-air thermal current $I_{th}$** | | 6 A | | 5 A |
| **Rated frequency** | | 50/60 Hz | | |
| **Rated impulse withstand voltage $U_{imp}$** | | 6 kV | | |
| **Rated insulation voltage $U_i$** | | 690 V AC | | 250 V AC |
| **Pollution degree** | | 3 | | |
| **Ambient air temperature** | Operation | -25 ... +70 °C | | |
| | Storage | -50 ... +80 °C | | |
| **Resistance to shock acc. to IEC 60068-2-27** | | 25g / 11 ms | | |
| **Resistance to vibrations acc. to IEC 60068-2-6** | | 5g / 3 ... 150 Hz | | |
| **$I_e$ / Rated operational current AC-15**<br>acc. to IEC/EN 60947-5-1 for utilization category | | | | |
| | **24 V, 120 V** | 6 A | | 3 A |
| | **240 V** | 4 A | | 1.5 A |
| | **400 V** | 3 A | | - |
| | **440 V, 690 V** | 1 A | | - |
| **$I_e$ / Rated operational current DC-13**<br>acc. to IEC/EN 60947-5-1 for utilization category | | | | |
| | **24 V** | 2 A | | 1 A |
| | **125 V** | 0.55 A | | 0.27 A |
| | **250 V** | 0.27 A | | 0.11 A |
| | **440 V, 600 V** | 0.15 A | | - |
| **Minimum switching capacity** | | 17 V / 5 mA | | |
| **Short-circuit protective device** | **N.C., 95-96** | 10 A Type gG | | |
| | **N.O., 97-98** | 10 A Type gG | | |
| **Duty time** | | 100 % | | |
| **Mounting** | | Right side of MMS | | Front of MMS |
| **Mounting positions** | | 1-6 | | |
| **Mechanical durability** | | 50000 cycles | | - |
| **Electrical durability** | | 50000 cycles | | - |

### Connecting charateristics

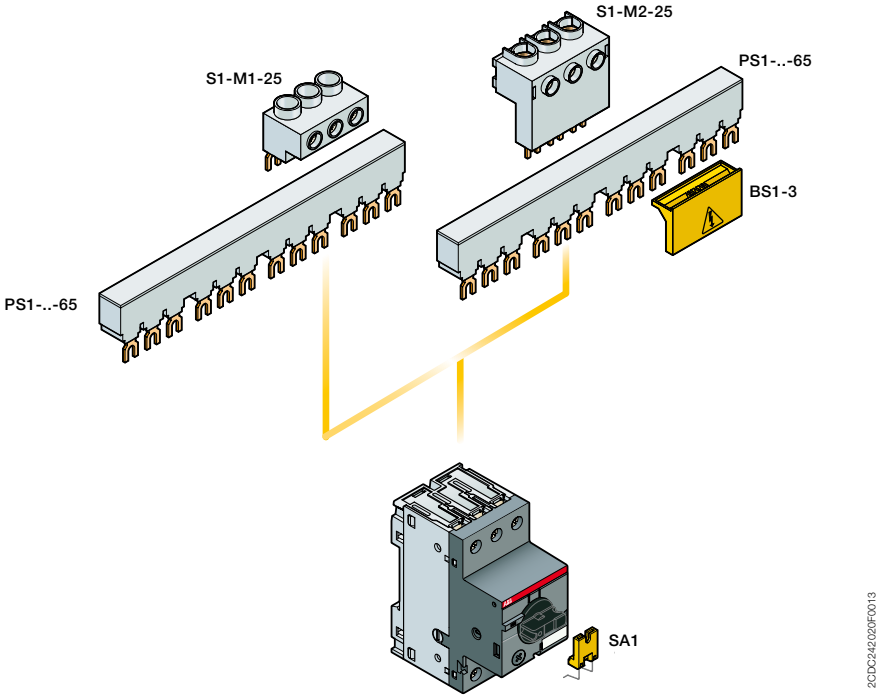
Auxiliary circuit

| | | | | |
|---|---|---|---|---|
| **Type** | | HK1 | SK1 | HKF1 |
| **Connecting capacity** | | | | |
| Rigid | **1 or 2 x** | 1 ... 1.5 mm² | | 1 ... 2.5 mm² |
| Flexible with ferrule | **1 or 2 x** | 0.75 ... 1.5 mm² | | |
| Flexible with insulated ferrule | **1 or 2 x** | 0.75 ... 1.5 mm² | | |
| Flexible | **1 or 2 x** | 0.75 ... 1.5 mm² | | |
| Stranded acc. to UL/CSA | **1 or 2 x** | AWG 16-14 | | |
| Flexible acc. to UL/CSA | **1 or 2 x** | AWG 16-14 | | |
| **Stripping length** | | 8 mm | | |
| **Tightening torques** | | 0.8 ... 1.2 Nm / 7 lb.in | | |
| **Connection screw** | | M3 (Pozidriv 2) | | |

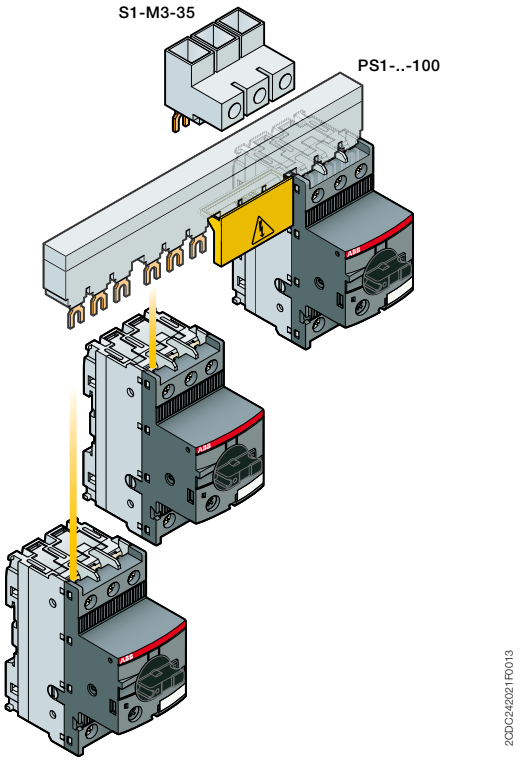
2CDC131050C0201

# MS116, MS132, MO132 manual motor starters
## Main accessories

### Manual motor starter with three-phase busbar systems




Three-phase busbar up to 65 A




Three-phase busbar up to 100 A

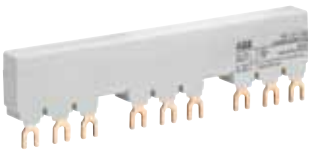
2CDC131050C0201

# MS116, MS132, MO132 manual motor starters
## Main accessories

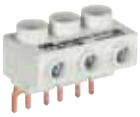



2CDC241017F0010

PS1-2-0-65


2CDC241014F0010

PS1-3-1-100


1SBC101266F0014

S1-M1-25


1SBC101266F0014

S1-M2-25


SK01108B91

SA1


2CDC241023F0013

SA2

### Description

Three-phase busbars ensure a quick and safe connection and are therefore a cost effective solution. A variety of different three-phase busbars up to 100 A are in the assortment. Between 2 and 5 manual motor starters with none, one or two lateral auxiliary contacts can be connected. Different three-phase feeder terminals are available according to the application.

### Ordering details

| Suitable for | Rated operational current<br>A | Number of MMS | Number of lateral aux. | Type | Order code | | Pkg qty | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|---|---|
| **Three-phase busbars** | | | | | | | | |
| MS116, MS132, MO132 | 65 | 2 | 0 | PS1-2-0-65 | 1SAM201906R1102 | | 10 | 0.034 |
| | 65 | 3 | 0 | PS1-3-0-65 | 1SAM201906R1103 | | 10 | 0.055 |
| | 65 | 4 | 0 | PS1-4-0-65 | 1SAM201906R1104 | | 10 | 0.077 |
| | 65 | 5 | 0 | PS1-5-0-65 | 1SAM201906R1105 | | 10 | 0.098 |
| | 65 | 2 | 1 | PS1-2-1-65 | 1SAM201906R1112 | | 10 | 0.036 |
| | 65 | 3 | 1 | PS1-3-1-65 | 1SAM201906R1113 | | 10 | 0.060 |
| | 65 | 4 | 1 | PS1-4-1-65 | 1SAM201906R1114 | | 10 | 0.087 |
| | 65 | 5 | 1 | PS1-5-1-65 | 1SAM201906R1115 | | 10 | 0.108 |
| | 65 | 2 | 2 | PS1-2-2-65 | 1SAM201906R1122 | | 10 | 0.040 |
| | 65 | 3 | 2 | PS1-3-2-65 | 1SAM201906R1123 | | 10 | 0.067 |
| | 65 | 4 | 2 | PS1-4-2-65 | 1SAM201906R1124 | | 10 | 0.095 |
| | 65 | 5 | 2 | PS1-5-2-65 | 1SAM201906R1125 | | 10 | 0.122 |
| MS116, MS132, MO132 | 100 | 3 | 0 | PS1-3-0-100 | 1SAM201916R1103 | | 10 | 0.084 |
| | 100 | 4 | 0 | PS1-4-0-100 | 1SAM201916R1104 | | 10 | 0.117 |
| | 100 | 5 | 0 | PS1-5-0-100 | 1SAM201916R1105 | | 10 | 0.154 |
| | 100 | 3 | 1 | PS1-3-1-100 | 1SAM201916R1113 | | 10 | 0.094 |
| | 100 | 4 | 1 | PS1-4-1-100 | 1SAM201916R1114 | | 10 | 0.134 |
| | 100 | 5 | 1 | PS1-5-1-100 | 1SAM201916R1115 | | 10 | 0.172 |
| | 100 | 3 | 2 | PS1-3-2-100 | 1SAM201916R1123 | | 10 | 0.105 |

| Suitable for | Rated operational current<br>A | Rated cross section<br>mm² | Mounting form | Type | Order code | | Pkg qty | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|---|---|
| **Three-phase feeder terminals** | | | | | | | | |
| MS116, MS132, MO132 | 65 | 25 | Flat | S1-M1-25 | 1SAM201907R1101 | | 10 | 0.038 |
| | 65 | 25 | High | S1-M2-25 | 1SAM201907R1102 | | 10 | 0.051 |
| | 65 | 25 | UL type E and IEC | S1-M3-25 | 1SAM201907R1103 | | 10 | 0.042 |
| | 100 | 35 | UL type E and IEC | S1-M3-35 | 1SAM201913R1103 | | 10 | 0.060 |

| Suitable for | Description | Type | Order code | | Pkg qty | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|
| MS116, MS132, MO132 | Protection cover for busbars | BS1-3 | 1SAM201908R1001 | | 50 | 0.003 |
| | Screw fixing kit | FS116 | 1SAM201909R1001 | | 1 | 0.020 |
| | Padlock + two keys | SA2 | GJF1101903R0002 | | 10 | 0.020 |
| MS116 | Lock handle | SA1 | GJF1101903R0001 | | 10 | 0.003 |
| | Lock handle box SA1/SA2 | SA3 | GJF1101903R0003 | | 10 | 0.050 |

2CDC131050C0201

# MS116, MS132, MO132 manual motor starters
## Main accessories



### General technical data

| Type | | PS1-xxx-65 | PS1-xxx-100 | S1-Mx-25 | S1-Mx-35 |
|---|---|---|---|---|---|
| Standards | | IEC/EN 60947-4-1, IEC/EN 60947-1 | | | |
| Rated operational voltage $U_e$ | | 690 V | | | |
| Rated operational current $I_e$ | | 65 A | 100 A | 65 A | 100 A |
| Rated frequency | | 50/60 Hz | | | |
| Rated impulse withstand voltage $U_{imp}$ | | 6 kV | | | |
| Rated insulation voltage $U_i$ | | 690 V AC | | | |
| Pollution degree | | 3 | | | |
| Cross-section | | 10 mm² | 16 mm² | 25 mm² | 35 mm² |
| Ambient air temperature | Operation | -25 ... +70 °C | | | |
| | Storage | -50 ... +80 °C | | | |
| Resistance to shock acc. to IEC 60068-2-27 | | 25g / 11 ms | | | |
| Resistance to vibrations acc. to IEC 60068-2-6 | | 5g / 3 ... 150 Hz | | | |

### Electrical connection

Main circuit

| Type | | | S1-Mx-25 | S1-Mx-35 |
|---|---|---|---|---|
| Connecting capacity | | | | |
| | Rigid | **1 x** | 6 ... 25 mm² | 10 ... 35 mm² |
| | Flexible with ferrule | **1 x** | 6 ... 16 mm² | 10 ... 35 mm² |
| | Flexible with insulated ferrule | **1 x** | 6 ... 16 mm² | 10 ... 35 mm² |
| | Flexible | **1 x** | 6 ... 16 mm² | 10 ... 35 mm² |
| | Stranded acc. to UL/CSA | **1 x** | AWG 10-4 | AWG 8-2 |
| | Flexible acc. to UL/CSA | **1 x** | AWG 10-6 | AWG 8-2 |
| Stripping length | | | 10 mm | 12 mm |
| Tightening torques | | | 2.5 Nm / 22 lb.in | 4.5 Nm / 40 lb.in |
| Connection screw | | | PZ2 (6 mm) | Hexagon SW4 |

2CDC131050C0201

# MS116, MS132, MO132 manual motor starters
## Main accessories




2CDC241004F0010

IB132-Y


2CDC241003F0010

IB132-G


2CDC241002F0010

DMS132-Y


2CDC241001F0010

DMS132-G

### Description

IB132 are IP65 enclosures for single MMS installation. Additional mounting of auxiliary and signalling contacts, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

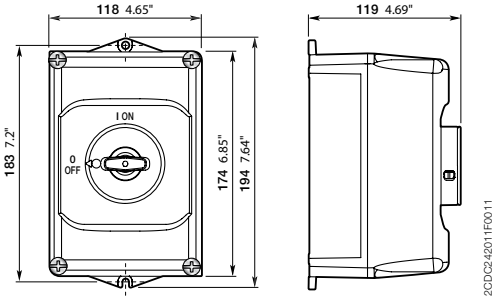
DMS132 are IP65 door mounting kits for MMS installation in any enclosure. Additional mounting of auxiliary, signalling, shunt trips and undervoltage release is possible. The handle is lockable in OFF position. For detailed specification see installation instruction.

### Ordering details

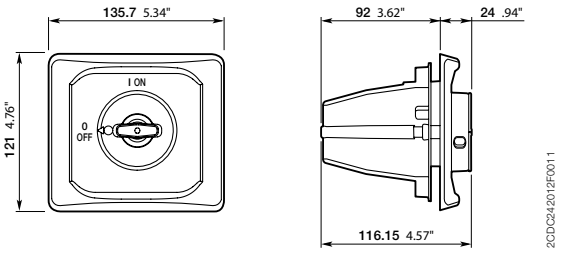
| Suitable for | Description | Color | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| **IP65 enclosures (UL: Type 12)** | | | | | | | |
| MS116, MS132, MO132 | Padlockable max. 3 padlocks with bail diameter 4...6.5 mm | Yellow/red | IB132-Y | 1SAM201911R1011 | | 1 | 0.370 |
| | | Grey/black | IB132-G | 1SAM201911R1010 | | 1 | 0.370 |
| **IP65 door mounting kits (UL: Type 12)** | | | | | | | |
| MS116, MS132, MO132 | Padlockable max. 3 padlocks with bail diameter 4...6.5 mm | Yellow/red | DMS132-Y | 1SAM201912R1011 | | 1 | 0.170 |
| | | Grey/black | DMS132-G | 1SAM201912R1010 | | 1 | 0.170 |

Indication I-O-T and ON-OFF-T.

### Main dimensions mm, *inches*




IB132




DMS132

2CDC131050C0201

# MS450, MS495, MS497 manual motor starters
## 22 to 100 A – with thermal and electromagnetic protection




2CDC241004F0009

MS450-40


1SBC101184F0014

MS495-40


2CDC241020F0011

MS497-100

### Description

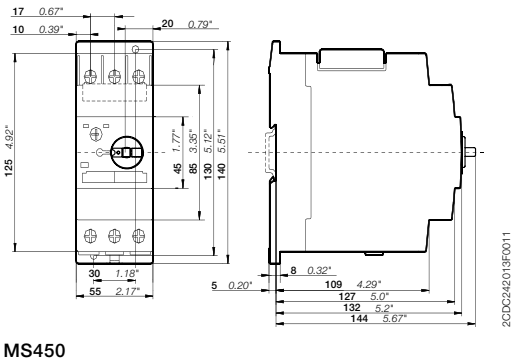
Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse less against short-circuit, overload and phase failures. Fuse less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter is suitable for three- and single-phase applications. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessory.

### Ordering details

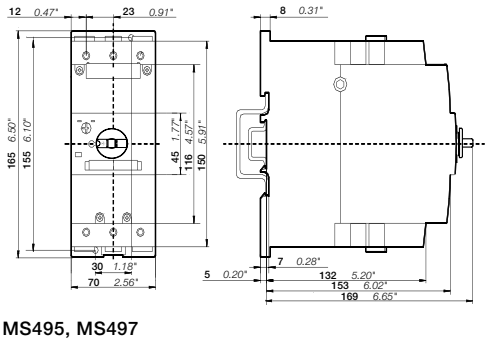
| Rated operational power 400 V AC-3 | Setting range | Short-circuit breaking capacity Ics at 400 V AC | Rated instantaneous short-circuit current setting Ii | Type | Order code | | Weight (1 pce) |
|---|---|---|---|---|---|---|---|
| kW | A | kA | A | | | | kg |
| **MS450 manual motor starters** | | | | | | | |
| 15.8 | 28.0...40.0 | 25 | 520.00 | MS450-40 | 1SAM450000R1005 | | 1.047 |
| 22 | 36.0...45.0 | 25 | 585.00 | MS450-45 | 1SAM450000R1006 | | 1.039 |
| 22 | 40.0...50.0 | 25 | 650.00 | MS450-50 | 1SAM450000R1007 | | 1.027 |
| **MS495 manual motor starters** | | | | | | | |
| 30 | 45.0...63.0 | 25 | 819.00 | MS495-63 | 1SAM550000R1007 | | 2.247 |
| 37 | 57.0...75.0 | 25 | 975.00 | MS495-75 | 1SAM550000R1008 | | 2.253 |
| 45 | 70.0...90.0 | 25 | 1170.00 | MS495-90 | 1SAM550000R1009 | | 2.280 |
| 55 | 80.0...100.0 | 25 | 1235.00 | MS495-100 | 1SAM550000R1010 | | 2.295 |
| **MS497 manual motor starters** | | | | | | | |
| 15 | 22.0...32.0 | 50 | 416.00 | MS497-32 | 1SAM580000R1004 | | 2.222 |
| 18.5 | 28.0...40.0 | 50 | 520.00 | MS497-40 | 1SAM580000R1005 | | 2.203 |
| 22 | 36.0...50.0 | 50 | 650.00 | MS497-50 | 1SAM580000R1006 | | 2.230 |
| 30 | 45.0...63.0 | 50 | 819.00 | MS497-63 | 1SAM580000R1007 | | 2.255 |
| 37 | 57.0...75.0 | 50 | 975.00 | MS497-75 | 1SAM580000R1008 | | 2.266 |
| 45 | 70.0...90.0 | 50 | 1170.00 | MS497-90 | 1SAM580000R1009 | | 2.268 |
| 55 | 80.0...100.0 | 50 | 1235.00 | MS497-100 | 1SAM580000R1010 | | 2.275 |

### Main dimensions mm, *inches*



2CDC242013F0011

MS450



2CDC242014F0011

MS495, MS497

2CDC131042C0201

# MS450, MS495, MS497 manual motor starters
# Technical data



## Main circuit – Utilization characteristics according to IEC/EN

| Type | MS450, MS495, MS497 |
|---|---|
| Standards | IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1 |
| Rated operational voltage $U_e$ | 690 V AC / 450 V DC |
| Rated frequency | 50/60 Hz |
| Trip class | 10 |
| Number of poles | 3 |
| Duty time | 100 % |
| Mechanical durability | 50000 cycles |
| Electrical durability | 25000 cycles |
| Rated impulse withstand voltage $U_{imp}$ | 6 kV |
| Rated insulation voltage $U_i$ | 690 V AC |
| Rated operational current $I_e$ | See ordering details |
| Rated instantaneous short-circuit current setting $I_i$ | See ordering details |
| Rated service short-circuit breaking capacity $I_{cs}$ | See table "Short-circuit breaking capacity and back-up fuses" |
| Rated ultimate short-circuit breaking capacity $I_{cu}$ | See table "Short-circuit breaking capacity and back-up fuses" |

## Short-circuit breaking capacity and back-up fuses

$I_{cs}$ Rated service short-circuit breaking capacity

$I_{cu}$ Rated ultimate short-circuit breaking capacity

$I_{cc}$ Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

| Type | 240 V AC | | | 400 V AC | | | 440 V AC | | | 500 V AC | | | 690 V AC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A |
| **Short-circuit protection MS450** | | | | | | | | | | | | | | | |
| **MS450-40** | No back-up fuse required up to $I_{cc}$ = 100 kA | | | 25 | 50 | 160 | 15 | 50 | 125 | 5 | 10 | 100 | 2 | 4 | 63 |
| **MS450-45** | | | | 25 | 50 | 160 | 15 | 50 | 125 | 5 | 10 | 100 | 2 | 4 | 63 |
| **MS450-50** | | | | 25 | 50 | 160 | 15 | 50 | 125 | 5 | 10 | 100 | 2 | 4 | 80 |

MS450: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Short-circuit protection MS495** | | | | | | | | | | | | | | | |
| **MS495-40** | No back-up fuse required up to $I_{cc}$ = 100 kA | | | 25 | 50 | 125 | 20 | 50 | 125 | 6 | 12 | 125 | 3 | 6 | 63 |
| **MS495-50** | | | | 25 | 50 | 125 | 20 | 50 | 125 | 6 | 12 | 125 | 3 | 6 | 80 |
| **MS495-63** | | | | 25 | 50 | 160 | 20 | 50 | 160 | 6 | 12 | 160 | 3 | 6 | 80 |
| **MS495-75** | | | | 25 | 50 | 160 | 20 | 50 | 160 | 6 | 8 | 160 | 3 | 5 | 100 |
| **MS495-90** | | | | 25 | 50 | 160 | 20 | 50 | 160 | 6 | 8 | 160 | 3 | 5 | 125 |
| **MS495-100** | | | | 25 | 50 | 160 | 20 | 50 | 160 | 6 | 8 | 160 | 3 | 5 | 125 |

MS495-40: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 125 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.
MS495-100: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Short-circuit protection MS497** | | | | | | | | | | | | | | | |
| **MS497-32** | No back-up fuse required up to $I_{cc}$ = 100 kA | | | 50 | 100 | No back-up fuse required up to $I_{cc}$ = 100 kA | 50 | 100 | No back-up fuse required up to $I_{cc}$ = 100 kA | 11 | 22 | 100 | 7 | 12 | 63 |
| **MS497-40** | | | | 50 | 100 | | 50 | 100 | | 9 | 18 | 160 | 6 | 12 | 80 |
| **MS497-50** | | | | 50 | 100 | | 50 | 100 | | 7.5 | 15 | 160 | 5 | 10 | 100 |
| **MS497-63** | | | | 50 | 100 | | 50 | 70 | 200 | 7.5 | 15 | 160 | 4 | 7.5 | 100 |
| **MS497-75** | | | | 50 | 100 | | 50 | 70 | 200 | 5 | 10 | 160 | 3 | 6 | 125 |
| **MS497-90** | | | | 50 | 100 | | 50 | 70 | 200 | 5 | 10 | 160 | 3 | 6 | 160 |
| **MS497-100** | | | | 50 | 100 | | 50 | 70 | 200 | 5 | 10 | 160 | 3 | 6 | 160 |

MS497-32: No need for back-up fuse in networks with a prospective current of up to 100 kA at 440 V.
MS497-90: No need for back-up fuse in networks with a prospective current of up to 70 kA at 440 V.
With an approbiate 200 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

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# MS450, MS495, MS497 manual motor starters
# Technical data



## Main circuit – Utilization characteristics according to UL/CSA

| | | |
|---|---|---|
| **Type** | | MS450, MS495, MS497 |
| **Standards** | | UL 508, CSA 22.2 No. 14 |
| **Maximum operational voltage** | | 600 V AC |
| **Manual motor controller ratings** | | See table "UL 508 – Manual motor controller" |
| **Trip rating** | | 125 % FLA |
| **Motor ratings** | Horse power | See table "Motor rating, three phase" |
| | Full load amps (FLA) | See table "Motor rating, three phase" |
| | Locked rotor amps (LRA) | See table "Motor rating, three phase" |

## Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

| Type | General purpose rating at max. 600 V AC | Full load amps | 200 - 208 V AC | 230 V AC | 460 V AC | 575 V AC |
|---|---|---|---|---|---|---|
| | A | FLA | hp | hp | hp | hp |
| **MS450-40** | 40 | 40 | 10 | 15 | 30 | 40 |
| **MS450-45** | 45 | 45 | 15 | 15 | 30 | 40 |
| **MS450-50** | 50 | 50 | 15 | 20 | 40 | 50 |
| **MS495-63** | 63 | 63 | 20 | 25 | 50 | 60 |
| **MS495-75** | 75 | 75 | 25 | 25 | 60 | 75 |
| **MS495-90** | 90 | 90 | 30 | 30 | 75 | 100 |
| **MS495-100** | 100 | 100 | 40 | 40 | 75 | 100 |
| **MS497-32** | 32 | 32 | 10 | 10 | 25 | 30 |
| **MS497-40** | 40 | 40 | 15 | 15 | 30 | 40 |
| **MS497-50** | 50 | 50 | 15 | 20 | 40 | 50 |
| **MS497-63** | 63 | 63 | 20 | 25 | 50 | 60 |
| **MS497-75** | 75 | 75 | 25 | 25 | 60 | 75 |
| **MS497-90** | 90 | 90 | 30 | 30 | 75 | 100 |
| **MS497-100** | 100 | 100 | 30 | 40 | 75 | 100 |

## UL 508 – Manual motor controller

| Type | Circuit breaker or class R fuse per UL/NEC | Max. circuit breaker or fuse per UL/NEC | Maximum short-circuit current for motor disconnect | | for group installation | | for tap conductor | for protection | UL 508 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Type E * | Type E |
| | 480/600 V | 480/600 V | 480 V | 600 V | 480 V | 600 V | 480Y/277V | 600Y/347V | 480Y/277V | 600Y/347V |
| | A | A | kA | kA | kA | kA | kA | kA | kA | kA |
| **MS450-40** | 150 | 350 | 65 | 25 | 65 | 25 | 65 | 25 | 65 | 25 |
| **MS450-45** | 175 | 350 | 65 | 25 | 65 | 25 | 65 | 25 | 65 | 25 |
| **MS450-50** | 200 | 350 | 65 | 25 | 65 | 25 | 65 | 25 | 65 | 25 |
| **MS495-63** | 250 | 500 | 65 | 30 | 65 | 30 | 65 | 30 | 65 | 30 |
| **MS495-75** | 300 | 500 | 65 | 30 | 65 | 30 | 65 | 30 | 65 | 30 |
| **MS495-90** | 350 | 500 | 65 | 10 | 65 | 10 | 65 | - | 65 | - |
| **MS495-100** | 400 | 500 | 65 | 10 | 65 | 10 | 65 | - | 65 | - |
| **MS497-32** | 120 | 500 | 65 | 30 | 65 | 30 | 65 | 30 | 65 | 30 |
| **MS497-40** | 160 | 500 | 65 | 30 | 65 | 30 | 65 | 30 | 65 | 30 |
| **MS497-50** | 200 | 500 | 65 | 30 | 65 | 30 | 65 | 30 | 65 | 30 |
| **MS497-63** | 250 | 500 | 65 | 30 | 65 | 30 | 65 | 30 | 65 | 30 |
| **MS497-75** | 300 | 500 | 65 | 30 | 65 | 30 | 65 | 30 | 65 | 30 |
| **MS497-90** | 350 | 500 | 65 | 10 | 65 | 10 | - | - | 65 | - |
| **MS497-100** | 400 | 500 | 65 | 10 | 65 | 10 | - | - | 65 | - |

* only with use DX495

2CDC131042C0201

# MS450, MS495, MS497 manual motor starters
# Technical data



## General technical data

| Type | | MS450 | MS495 | MS497 |
|---|---|---|---|---|
| Pollution degree | | 3 | | |
| Phase loss sensitivity | | Yes | | |
| Disconnect function acc. to IEC/EN 60947-2 | | Yes | | |
| Ambient air temperature | | | | |
| Operation | Open - compensated | -20 ... +60 °C | | |
| | Open | -20 ... +70 °C | | |
| | Enclosed | -20 ... +35 °C | | |
| Storage | | -50 ... +80 °C | | |
| Ambient air temperature compensation | | Acc. to IEC/EN60947-4-1 | | |
| Maximum operating altitude permissible | | 2000 m | | |
| Resistance to shock acc. to IEC 60068-2-27 | | 25g / 11 ms | - | |
| Resistance to vibrations acc. to IEC 60068-2-6 | | 2g / 5-150 Hz | | |
| Mounting position | | Position 1-6 (optional for single mounting) | | |
| Mounting | | DIN-rail 35 mm (EN 60715) | DIN-rail 15 mm / 75 mm (EN 60715) | |
| Minimum distance to other units same type | Horizontal | 0 mm | 0 mm | |
| | Vertical - up to 240 V | - | 50 mm | |
| | Vertical - up to 440 V | - | 70 mm | |
| | Vertical - up to 500 V | - | 110 mm | |
| | Vertical - up to 690 V | - | 150 mm | |
| | Vertical | 50 mm | - | |
| Minimum distance to electrical conductive board | Horizontal | 10 mm | - | |
| | Horizontal - up to 500 V | - | 10 mm | |
| | Horizontal - up to 690 V | - | 30 mm | |
| | Vertical - up to 240 V | - | 50 mm | |
| | Vertical - up to 440 V | - | 70 mm | |
| | Vertical - up to 500 V | - | 110 mm | |
| | Vertical - up to 690 V | - | 150 mm | |
| | Vertical | 50 mm | - | |
| Degree of protection | Housing | IP20 | | |
| | Main circuit terminals | IP00 | | |

## Connecting characteristics

### Main circuit

| Type | | | MS450 | MS495 | MS497 |
|---|---|---|---|---|---|
| Connecting capacity | | | | | |
| | Rigid | **1 or 2 x** | 0.75 ... 16 mm² | 2.5 ... 16 mm² | 2.5 ... 16 mm² |
| | Flexible with ferrule | **1 x** | 0.75 ... 35 mm² | 10 ... 70 mm² | 10 ... 70 mm² |
| | | **2 x** | 0.75 ... 25 mm² | 10 ... 50 mm² | 10 ... 50 mm² |
| | Flexible | **1 x** | 0.75 ... 35 mm² | 10 ... 70 mm² | 10 ... 70 mm² |
| | | **2 x** | 0.75 ... 25 mm² | 10 ... 50 mm² | 10 ... 50 mm² |
| | Stranded acc. to UL/CSA | **1 x** | AWG 18-2 | AWG 10-2/0 | AWG 10-2/0 |
| | | **2 x** | AWG 18-2 | AWG 10-1/0 | AWG 10-1/0 |
| | Flexible acc. to UL/CSA | **1 x** | AWG 18-2 | AWG 10-2/0 | AWG 10-2/0 |
| | | **2 x** | AWG 18-2 | AWG 10-1/0 | AWG 10-1/0 |
| Stripping length | | | 13 mm | 17 mm | 17 mm |
| Tightening torques | | | 3 - 4.5 Nm / 27 ... 40 lb.in | 4 - 6 Nm / 35 - 53 lb.in | 4 - 6 Nm / 35 - 53 lb.in |
| Connection screw | | | Pozidriv 2 | Hexagon 4 | Hexagon 4 |

2CDC131042C0201

# MO450, MO495, MO496 manual motor starters magnetic only
## 32 to 100 A – with electromagnetic protection




ST02501

MO450-40


ST02601

MO495-75


2CDC241021F0011

MO496-100

### Description

The manual motor starter magnetic only is used to manually switch on and off motors and to protect them reliably and without the need for a fuse from short-circuits.

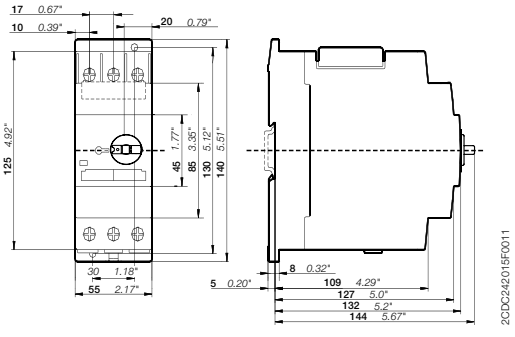
Further features are the build-in disconnect function, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starter magnetic only is suitable for three- and single-phase applications. The handle is lockable to protect against unauthorized changes. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessory.

### Ordering details

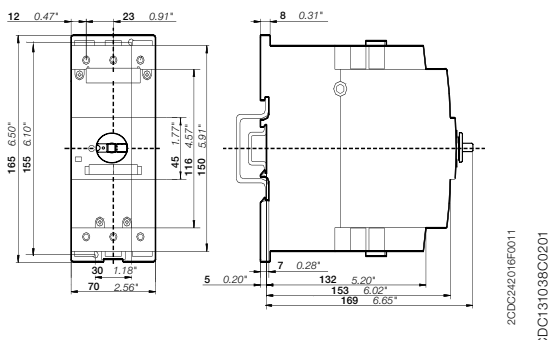
| Rated operational power 400 V AC-3 (1) | Rated operational current | Short-circuit breaking capacity Ics at 400 V AC | Rated instantaneous short-circuit current setting Ii | Type | Order code | | Weight (1 pce) |
|---|---|---|---|---|---|---|---|
| kW | A | kA | A | | | | kg |
| **MO450 manual motor starter magnetic only** | | | | | | | |
| 15.8 | 40 | 25 | 520.00 | MO450-40 | 1SAM460000R1005 | | 1.033 |
| 22 | 45 | 25 | 585.00 | MO450-45 | 1SAM460000R1006 | | 1.040 |
| 22 | 50 | 25 | 650.00 | MO450-50 | 1SAM460000R1007 | | 1.019 |
| **MO495 manual motor starter magnetic only** | | | | | | | |
| 30 | 63 | 25 | 819.00 | MO495-63 | 1SAM560000R1007 | | 2.244 |
| 37 | 75 | 25 | 975.00 | MO495-75 | 1SAM560000R1008 | | 2.247 |
| 45 | 90 | 25 | 1170.00 | MO495-90 | 1SAM560000R1009 | | 2.269 |
| 55 | 100 | 25 | 1235.00 | MO495-100 | 1SAM560000R1010 | | 2.292 |
| **MO496 manual motor starter magnetic only** | | | | | | | |
| 15 | 32 | 50 | 416.00 | MO496-32 | 1SAM590000R1004 | | 2.208 |
| 18.5 | 40 | 50 | 520.00 | MO496-40 | 1SAM590000R1005 | | 2.218 |
| 22 | 50 | 50 | 650.00 | MO496-50 | 1SAM590000R1006 | | 2.218 |
| 30 | 63 | 50 | 819.00 | MO496-63 | 1SAM590000R1007 | | 2.248 |
| 37 | 75 | 50 | 975.00 | MO496-75 | 1SAM590000R1008 | | 2.278 |
| 45 | 90 | 50 | 1170.00 | MO496-90 | 1SAM590000R1009 | | 2.266 |
| 55 | 100 | 50 | 1235.00 | MO496-100 | 1SAM590000R1010 | | 2.293 |

(1) For overload protection of motors, an appropriate thermal or electronic overload relay must be used.

### Main dimensions mm, *inches*




MO450




MO495, MO496

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# MO450, MO495, MO496 manual motor starters magnetic only
# Technical data



## Main circuit – Utilization characteristics according to IEC/EN

| Type | MO450, MO495, MO496 |
|---|---|
| Standards | IEC/EN 60947–2, IEC/EN 60947-4-1, IEC/EN 60947-1 |
| Rated operational voltage $U_e$ | 690 V AC / 450 V DC |
| Rated frequency | 50/60 Hz |
| Number of poles | 3 |
| Duty time | 100 % |
| Mechanical durability | 50000 cycles |
| Electrical durability | 25000 cycles |
| Rated impulse withstand voltage $U_{imp}$ | 6 kV |
| Rated insulation voltage $U_i$ | 690 V AC |
| Rated operational current $I_e$ | See ordering details |
| Rated instantaneous short-circuit current setting $I_i$ | See ordering details |
| Rated service short-circuit breaking capacity $I_{cs}$ | See table "Short-circuit breaking capacity and back-up fuses" |
| Rated ultimate short-circuit breaking capacity $I_{cu}$ | See table "Short-circuit breaking capacity and back-up fuses" |

## Short-circuit breaking capacity and back-up fuses

$I_{cs}$ Rated service short-circuit breaking capacity

$I_{cu}$ Rated ultimate short-circuit breaking capacity

$I_{cc}$ Prospective short-circuit current at installation location

Note: Maximum rated current of the back-up fuses if $I_{cc} > I_{cs}$

| Type | 240 V AC | | | 400 V AC | | | 440 V AC | | | 500 V AC | | | 690 V AC | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A | $I_{cs}$ kA | $I_{cu}$ kA | gG, aM A |
| **Short-circuit protection MO450** | | | | | | | | | | | | | | | |
| MO450-40 | No back-up fuse required up to $I_{cc}$ = 100 kA | | | 25 | 50 | 160 | 15 | 50 | 125 | 5 | 10 | 100 | 2 | 4 | 63 |
| MO450-45 | | | | 25 | 50 | 160 | 15 | 50 | 125 | 5 | 10 | 100 | 2 | 4 | 63 |
| MO450-50 | | | | 25 | 50 | 160 | 15 | 50 | 125 | 5 | 10 | 100 | 2 | 4 | 80 |

MO450: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Short-circuit protection MO495** | | | | | | | | | | | | | | | |
| MO495-63 | No back-up fuse required up to $I_{cc}$ = 100 kA | | | 25 | 50 | 160 | 20 | 50 | 160 | 6 | 12 | 160 | 3 | 6 | 80 |
| MO495-75 | | | | 25 | 50 | 160 | 20 | 50 | 160 | 6 | 8 | 160 | 3 | 5 | 100 |
| MO495-90 | | | | 25 | 50 | 160 | 20 | 50 | 160 | 6 | 8 | 160 | 3 | 5 | 125 |
| MO495-100 | | | | 25 | 50 | 160 | 20 | 50 | 160 | 6 | 8 | 160 | 3 | 5 | 125 |

MO495-100: No need for back-up fuse in networks with a prospective current of up to 50 kA at 400 V.
With an approbiate 160 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Short-circuit protection MO496** | | | | | | | | | | | | | | | |
| MO496-32 | No back-up fuse required up to $I_{cc}$ = 100 kA | | | 50 | 100 | No back-up fuse required up to $I_{cc}$ = 100 kA | 50 | 100 | No back-up fuse required up to $I_{cc}$ = 100 kA | 11 | 22 | 100 | 7 | 12 | 63 |
| MO496-40 | | | | 50 | 100 | | 50 | 100 | | 9 | 18 | 160 | 6 | 12 | 80 |
| MO496-50 | | | | 50 | 100 | | 50 | 100 | | 7.5 | 15 | 160 | 5 | 10 | 100 |
| MO496-63 | | | | 50 | 100 | | 50 | 70 | 200 | 7.5 | 15 | 160 | 4 | 7.5 | 100 |
| MO496-75 | | | | 50 | 100 | | 50 | 70 | 200 | 5 | 10 | 160 | 3 | 6 | 125 |
| MO496-90 | | | | 50 | 100 | | 50 | 70 | 200 | 5 | 10 | 160 | 3 | 6 | 160 |
| MO496-100 | | | | 50 | 100 | | 50 | 70 | 200 | 5 | 10 | 160 | 3 | 6 | 160 |

MO496-32: No need for back-up fuse in networks with a prospective current of up to 100 kA at 440 V.
MO496-90: No need for back-up fuse in networks with a prospective current of up to 70 kA at 440 V.
With an approbiate 200 A type gG fuse the device can be used in a network with a prospective current of up to 100 kA.

2CDC131038C0201

# MO450, MO495, MO496 manual motor starters magnetic only
# Technical data



## Main circuit – Utilization characteristics according to UL/CSA

| | | |
|---|---|---|
| **Type** | | M0450, MO495, MO496 |
| **Standards** | | UL 508, CSA 22.2 No. 14 |
| **Maximum operational voltage** | | 600 V AC |
| **Manual motor controller ratings** | | See table "UL 508 – Manual motor controller" |
| **Trip rating** | | 125 % FLA |
| **Motor ratings** | Horse power | See table "Motor rating, three phase" |
| | Full load amps (FLA) | See table "Motor rating, three phase" |
| | Locked rotor amps (LRA) | See table "Motor rating, three phase" |

## Motor rating, three phase

hp Horse power

FLA Full load amps

LRA Locked rotor amps

| Type | General purpose rating at max. 600 V AC | Full load amps | 200 - 208 V AC | 230 V AC | 460 V AC | 575 V AC |
|---|---|---|---|---|---|---|
| | A | FLA | hp | hp | hp | hp |
| **MO450-40** | 40 | 40 | 10 | 15 | 30 | 40 |
| **MO450-45** | 45 | 45 | 15 | 15 | 30 | 40 |
| **MO450-50** | 50 | 50 | 15 | 20 | 40 | 50 |
| **MO495-63** | 63 | 63 | 20 | 25 | 50 | 60 |
| **MO495-75** | 75 | 75 | 25 | 25 | 60 | 75 |
| **MO495-90** | 90 | 90 | 30 | 30 | 75 | 100 |
| **MO495-100** | 100 | 100 | 40 | 40 | 75 | 100 |
| **MO496-32** | 32 | 32 | 10 | 10 | 25 | 30 |
| **MO496-40** | 40 | 40 | 15 | 15 | 30 | 40 |
| **MO496-50** | 50 | 50 | 15 | 20 | 40 | 50 |
| **MO496-63** | 63 | 63 | 20 | 25 | 50 | 60 |
| **MO496-75** | 75 | 75 | 25 | 25 | 60 | 75 |
| **MO496-90** | 90 | 90 | 30 | 30 | 75 | 100 |
| **MO496-100** | 100 | 100 | 30 | 40 | 75 | 100 |

## UL 508 – Manual motor controller

| Type | Circuit breaker or class R fuse per UL/NEC | Max. circuit breaker or fuse per UL/NEC | Maximum short-circuit current for motor disconnect | | for group installation | |
|---|---|---|---|---|---|---|
| | 480/600 V | 480/600 V | 480 V | 600 V | 480 V | 600 V |
| | A | A | kA | kA | kA | kA |
| **MO450-40** | 150 | - | 65 | 25 | 65 | 25 |
| **MO450-45** | 175 | - | 65 | 25 | 65 | 25 |
| **MO450-50** | 200 | - | 65 | 25 | 65 | 25 |
| **MO495-63** | 60 | 500 | 65 | 30 | 65 | 30 |
| **MO495-75** | 250 | 500 | 65 | 30 | 65 | 30 |
| **MO495-90** | 300 | 500 | 65 | 30 | 65 | 30 |
| **MO495-100** | 350 | 500 | 65 | 10 | 65 | 10 |
| **MO496-32** | 120 | 500 | 65 | 30 | 65 | 30 |
| **MO496-40** | 160 | 500 | 65 | 30 | 65 | 30 |
| **MO496-50** | 200 | 500 | 65 | 30 | 65 | 30 |
| **MO496-63** | 250 | 500 | 65 | 30 | 65 | 30 |
| **MO496-75** | 300 | 500 | 65 | 30 | 65 | 30 |
| **MO496-90** | 350 | 500 | 65 | 10 | 65 | 10 |
| **MO496-100** | 400 | 500 | 65 | 10 | 65 | 10 |

* only with use DX495

2CDC131038C0201

# MO450, MO495, MO496 manual motor starters magnetic only
# Technical data



## General technical data

| Type | | MO450 | MO495 | MO496 |
|---|---|---|---|---|
| Pollution degree | | 3 | | |
| Phase loss sensitivity | | No | | |
| Disconnect function acc. to IEC/EN 60947-2 | | Yes | | |
| Ambient air temperature | | | | |
| Operation | Open - compensated | -20 ... +60 °C | | |
| | Open | -20 ... +70 °C (above 60° C, current derating) | | |
| | Enclosed | -20 ... +35 °C | | |
| Storage | | -50 ... +80 °C | | |
| Ambient air temperature compensation | | - | | |
| Maximum operating altitude permissible | | 2000 m | | |
| Resistance to shock acc. to IEC 60068-2-27 | | 25g / 11 ms | | |
| Resistance to vibrations acc. to IEC 60068-2-6 | | 2g / 5-150 Hz | - | |
| Mounting position | | Position 1-6 (optional for single mounting) | | |
| Mounting | | DIN-rail 35 mm (EN 60715) | DIN-rail 15 mm / 75 mm (EN 60715) | |
| Minimum distance to other units same type | Horizontal | 0 mm | 0 mm | |
| | Vertical - up to 240 V | - | 50 mm | |
| | Vertical - up to 440 V | - | 70 mm | |
| | Vertical - up to 500 V | - | 110 mm | |
| | Vertical - up to 690 V | - | 150 mm | |
| | Vertical | 50 mm | - | |
| Minimum distance to electrical conductive board | Horizontal | 10 mm | - | |
| | Horizontal - up to 500 V | - | 10 mm | |
| | Horizontal - up to 690 V | - | 30 mm | |
| | Vertical - up to 240 V | - | 50 mm | |
| | Vertical - up to 440 V | - | 70 mm | |
| | Vertical - up to 500 V | - | 110 mm | |
| | Vertical - up to 690 V | - | 150 mm | |
| | Vertical | 50 mm | - | |
| Degree of protection | Housing | IP20 | | |
| | Main circuit terminals | IP20 | | |

## Connecting characteristics

### Main circuit

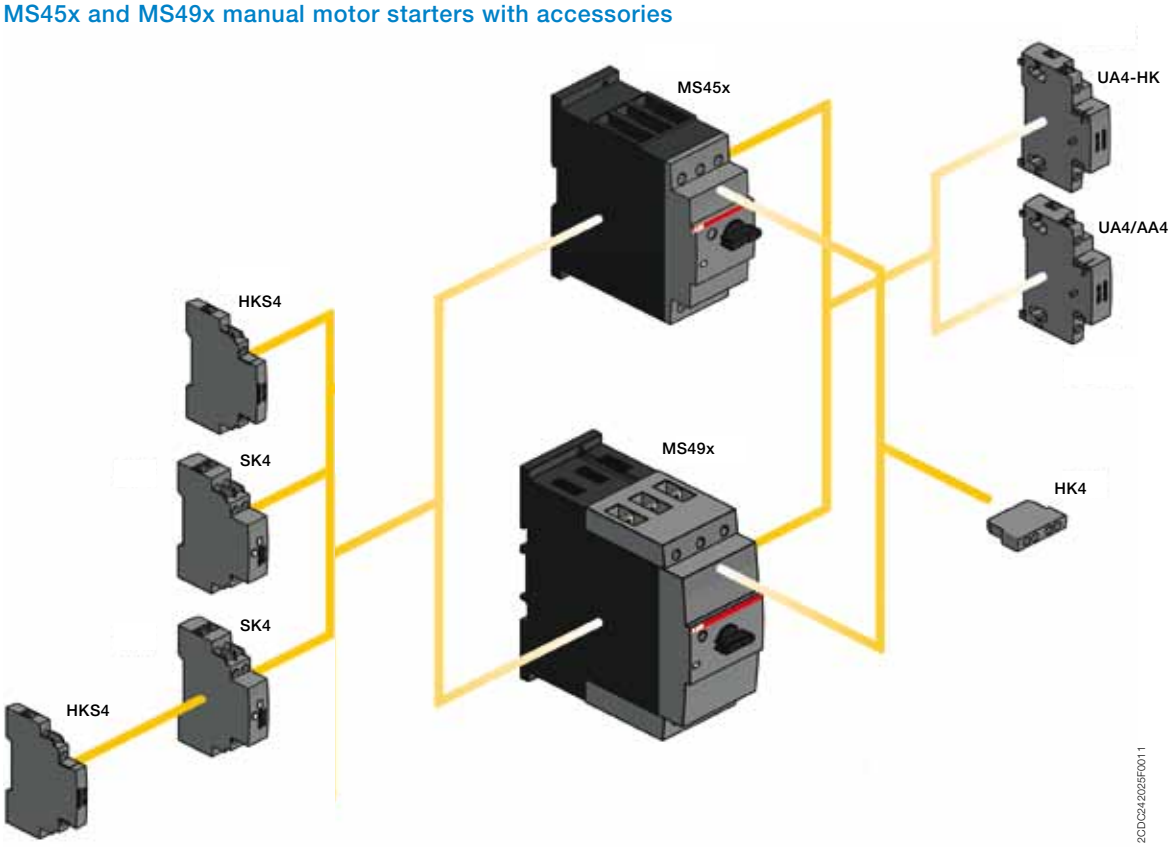
| Type | | | MO450 | MO495 | MO496 |
|---|---|---|---|---|---|
| Connecting capacity | | | | | |
| | Rigid | **1 or 2 x** | 0.75 ... 16 mm² | 2.5 ... 16 mm² | 2.5 ... 16 mm² |
| | Flexible with ferrule | **1 x** | 0.75 ... 35 mm² | 10 ... 70 mm² | 10 ... 70 mm² |
| | | **2 x** | 0.75 ... 25 mm² | 10 ... 50 mm² | 10 ... 50 mm² |
| | Flexible | **1 x** | 0.75 ... 35 mm² | 10 ... 70 mm² | 10 ... 70 mm² |
| | | **2 x** | 0.75 ... 25 mm² | 10 ... 50 mm² | 10 ... 50 mm² |
| | Stranded acc. to UL/CSA | **1 x** | AWG 18-2 | AWG 10-2/0 | AWG 10-2/0 |
| | | **2 x** | AWG 18-2 | AWG 10-1/0 | AWG 10-1/0 |
| | Flexible acc. to UL/CSA | **1 x** | AWG 18-2 | AWG 10-2/0 | AWG 10-2/0 |
| | | **2 x** | AWG 18-2 | AWG 10-1/0 | AWG 10-1/0 |
| Stripping length | | | 13 mm | 17 mm | 17 mm |
| Tightening torques | | | 3 - 4.5 Nm / 27 ... 40 lb.in | 4 - 6 Nm / 35 - 53 lb.in | 4 - 6 Nm / 35 - 53 lb.in |
| Connection screw | | | Pozidriv 2 | Hexagon 4 | Hexagon 4 |

2CDC131038C0201

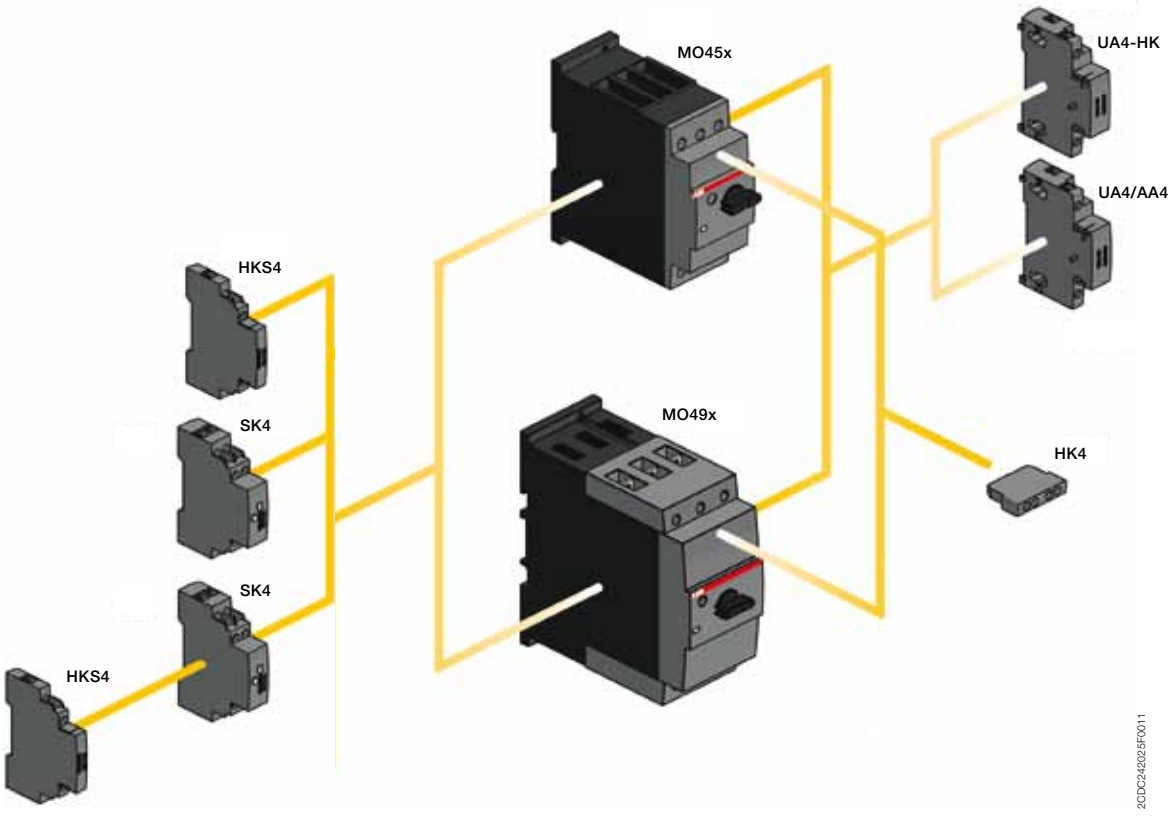
# MS45x, MS49x, MO45x, MO49x manual motor starters
## Main accessories



### MS45x and MS49x manual motor starters with accessories




### MO45x and MO49x manual motor starters with accessories






2CDC131051C0201

# Main accessories


2CDC241026F0011

HK4-11


2CDC241022F0011

HKS4-20


2CDC241024F0011

SK4-11


2CDC241023F0011

AA4-24


2CDC241025F0011

UA4-110

## Description

Manual motor starters can be equipped with auxiliary contacts for lateral/front mounting, signalling contact for lateral mounting, undervoltage release and shunt trips. The accessories can be fitted wiring free and without tools. A variety of combinations is possible as required for the application. The auxiliary contacts change position with the main contacts. Undervoltage release are used for remote tripping of the manual motor starter especially for emergency stop circuits. Shunt trips release the MMS used for remote tripping.

2

## Ordering details

| Suitable for | Auxiliary contacts N.O. | Auxiliary contacts N.C. | Description | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|---|
| **Auxiliary contacts – mountable on the front** | | | | | | | | |
| MS45x, MS49x, MO45x, MO49x | 1 | 1 | Changeover | HK4-11 | 1SAM401901R1001 | | 10 | 0.017 |
| | | | | HK4-W | 1SAM401901R1002 | | 10 | 0.015 |
| **Auxiliary contacts – mountable on the left** | | | | | | | | |
| MS45x, MS49x, MO45x, MO49x | 1 | 1 | Max. 1 piece | HKS4-11 | 1SAM401902R1001 | | 2 | 0.045 |
| | 2 | 0 | Max. 1 piece | HKS4-20 | 1SAM401902R1002 | | 2 | 0.045 |
| | 0 | 2 | Max. 1 piece | HKS4-02 | 1SAM401902R1003 | | 2 | 0.045 |
| **Signalling contacts – mountable on the left** | | | | | | | | |
| MS45x, MS49x, MO45x, MO49x | 2 | 2 | Separate signalling acc. UL508E 1 N.O. + 1 N.C. for short circuit alarm and 1 N.O. + 1 N.C. for tripped alarm, max. 1x SK4-11 + 1 x HKS4-xx | SK4-11 | 1SAM401904R1001 | | 1 | 0.093 |

| Suitable for | Rated control supply voltage V | Frequency Hz | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| **Shunt trip units – mountable on the right** | | | | | | | |
| MS45x, MS49x, MO45x, MO49x | 20...24 | 50/60 | AA4-24 | 1SAM401907R1001 | | 1 | 0.135 |
| | 90...110 | 50/60 | AA4-110 | 1SAM401907R1002 | | 1 | 0.135 |
| | 200...240 | 50/60 | AA4-230 | 1SAM401907R1003 | | 1 | 0.128 |
| | 350...415 | 50/60 | AA4-400 | 1SAM401907R1004 | | 1 | 0.125 |
| **Undervoltage releases – mountable on the right** | | | | | | | |
| MS45x, MS49x, MO45x, MO49x | 24 | 50/60 | UA4-24 | 1SAM401905R1004 | | 1 | 0.134 |
| | 110/120 | 50/60 | UA4-110 | 1SAM401905R1001 | | 1 | 0.134 |
| | 230/240 | 50/60 | UA4-230 | 1SAM401905R1002 | | 1 | 0.131 |
| | 400/440 | 50/60 | UA4-400 | 1SAM401905R1003 | | 1 | 0.129 |
| | 230/240 | 50/60 | UA4-HK-230 | 1SAM401906R1001 | | 1 | 0.140 |
| | 400/440 | 50/60 | UA4-HK-400 | 1SAM401906R1002 | | 1 | 0.137 |

2CDC131051C0201

# MS45x, MS49x, MO45x, MO49x manual motor starters
## Main accessories



### General technical data

| Type | | HK4-11 | HK4-W | HKS4 | SK4 |
|---|---|---|---|---|---|
| Standards | | IEC/EN 60947–1, IEC/EN 60947-5-1, UL 508, CSA22.2 No. 14 | | | |
| Rated operational voltage $U_e$ | | 230 V AC / 220 V DC | 690 V AC / 220 V DC | 690 V AC | 690 V AC |
| Conventional free-air thermal current $I_{th}$ | | 2.5 A | 5 A | 10 A | 10 A |
| Rated frequency | | DC, 50/60 Hz | | | |
| Rated impulse withstand voltage $U_{imp}$ | | 6 kV | | | |
| Rated insulation voltage $U_i$ | | 300 V | 300 V | 690 V | 690 V |
| Pollution degree | | 3 | | | |
| Ambient air temperature | Operation | -20 ... +70 °C | | | |
| | Storage | -50 ... +80 °C | | | |
| Resistance to shock acc. to IEC 60068-2-27 | | 25g / 11 ms | | | |
| Resistance to vibrations acc. to IEC 60068-2-6 | | 2g / 5 ... 150 Hz | | | |
| Number of poles | | 1 N.C. + 1 N.O. | Changeover | 1 N.C. + 1 N.O. / 2 N.O. / 2 N.C. | 2 N.C. + 2 N.O. |
| $I_e$ / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category | | | | | |
| | **24 V** | 2 A | 4 A | 6 A | 6 A |
| | **230 V** | 0.5 A | 3 A | 4 A | 4 A |
| | **400 V** | - | 1.5 A | 3 A | 3 A |
| | **690 V** | - | 0.5 A | 1 A | 1 A |
| $I_e$ / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category | | | | | |
| | **24 V** | 1 A | 1 A | 2 A | 2 A |
| | **48 V** | 0.3 A | - | - | - |
| | **60 V** | 0.15 A | - | - | - |
| | **110 V** | - | 0.22 A | 0.5 A | 0.5 A |
| | **230 V** | - | 0.1 A | 0.25 A | 0.25 A |
| Minimum switching capacity | | 17 V / 1 mA | | - | - |
| Short-circuit protective device | | 10 A Type gG | | | |
| Duty time | | 100 % | | | |
| Mounting | | Front of MMS | Front of MMS | Left side of MMS | Left side of MMS |
| Mounting positions | | 1-6 | | | |
| Mechanical durability | | 100000 cycles | | | |
| Electrical durability | | 100000 cycles | | | |

| Type | | | UA4-xxx | AA4-xxx |
|---|---|---|---|---|
| Power consumption | | | | |
| | Pull-in | **AC** | 20.2/13 VA/W | 20.2/13 VA/W |
| | | **DC** | 20 W | 13 ... 80 W |
| | Holding | **AC** | 7.2/2.4 VA/W | - |
| | | **DC** | 2.1 W | - |
| Operating voltage | | | | |
| | Tripping | | 0.35 ... 0.7 V x $U_s$ | 0.7 ... 1.1 V x $U_s$ |
| | Coil operating voltage | | 0.85 ... 1.1 V x $U_s$ | - |

2CDC131051C0201

# Main accessories

## Connecting characteristics

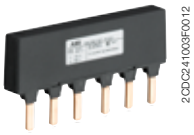
### Auxiliary circuit

| Type | | | HK4-11 | HK4-W | HKS4 | SK4 |
|---|---|---|---|---|---|---|
| **Connecting capacity** | | | | | | |
| | Rigid | **1 x** | 0.5... 2.5 mm² | | | |
| | | **2 x** | 0.5 ... 1.5 mm² or 0.75 ... 2.5 mm | | | |
| | Flexible with ferrule | **1 x** | 0.5 ... 2.5 mm² | | | |
| | | **2 x** | 0.5 ... 1.5 mm² or 0.75 ... 2.5 mm | | | |
| | Flexible | **1 x** | 0.5 ... 2.5 mm² | | | |
| | | **2 x** | 0.5 ... 1.5 mm² or 0.75 ... 2.5 mm | | | |
| | Flexible | **1 x** | 0.5 ... 2.5 mm² | | | |
| | | **2 x** | 0.5 ... 1.5 mm² or 0.75 ... 2.5 mm | | | |
| | Stranded acc. to UL/CSA | **1 or 2 x** | AWG 18-14 | | | |
| | Flexible acc. to UL/CSA | **1 or 2 x** | AWG 18-14 | | | |
| **Stripping length** | | | 10 mm | | | |
| **Tightening torques** | | | 0.8 ... 1.2 Nm / 7 ... 10.3 lb.in | | | |
| **Connection screw** | | | Pozidriv 2 | | | |



2CDC131051C0201

# MS45x, MS49x, MO45x, MO49x manual motor starters
## Main accessories




PS4-2-0


PS4-3-0


PS4-4-0


SA2

### Description

Three-phase busbars ensure a quick and safe connection and are therefor a cost effective solution. A variety of different three-phase busbars up to 108 A are in the assortment. Between 2 and 4 manual motor starter with none or two lateral auxiliary contacts can be connected.

### Ordering details

| Suitable for | Rated operational current<br>A | Number of MMS | Number of lateral aux. | Type | Order code | | Pkg qty | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|---|---|
| **Three-phase busbars** | | | | | | | | |
| MS450, MO450 | 108 A | 2 | 0 | PS4-2-0 | 1SAM401911R1001 | | 5 | 0.134 |
| | 108 A | 3 | 0 | PS4-3-0 | 1SAM401911R1002 | | 5 | 0.206 |
| | 108 A | 4 | 0 | PS4-4-0 | 1SAM401911R1003 | | 5 | 0.280 |
| | 108 A | 2 | 1 | PS4-2-2 | 1SAM401911R1004 | | 5 | 0.148 |
| | 108 A | 3 | 1 | PS4-3-2 | 1SAM401911R1005 | | 5 | 0.250 |
| | 108 A | 4 | 1 | PS4-4-2 | 1SAM401911R1006 | | 5 | 0.362 |

| Suitable for | Rated operational current<br>A | Rated cross section<br>mm² | Mounting form | Type | Order code | | Pkg qty | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|---|---|
| **Three-phase feeder terminals** | | | | | | | | |
| MS450, MO450 | 108 A | 25 | Flat | S4-M1 | 1SAM401911R1007 | | 2 | 0.106 |

| Suitable for | Description | Type | Order code | | Pkg qty | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|
| MS450, MO450 | Protection cover for busbar | BS4-3 | 1SAM401911R1008 | | 10 | 0.001 |
| | Disconnector module | TB450 | 1SAM401910R1001 | | 1 | 0.315 |
| | Terminal shroud | KA450 | 1SAM401908R1001 | | 1 | 0.154 |
| MS495, MS497, MO495, MO496 | Terminal shroud | KA495 | 1SAM501901R1001 | | 10 | 0.018 |
| | Terminal shroud | KA495C (1) | 1SAM501902R1001 | | 10 | 0.038 |
| | Terminal insulation barrier for UL508E | DX495 | 1SAM401912R1001 | | 1 | 0.154 |
| MS450, MS495, MS497, MO450, MO495, MO496 | Padlock + two keys | SA2 | GJF1101903R0002 | | 10 | 0.020 |

(1) Is plugged onto the housing after removing the box terminals, if using cable lugs.

2CDC131051C0201

# MS45x, MS49x, MO45x, MO49x manual motor starters
## Main accessories



### General technical data

| | | | |
|---|---|---|---|
| **Type** | | PS4-xxx | S4-M1 |
| **Standards** | | IEC/EN 60947-1 | |
| **Rated operational voltage $U_e$** | | 690 V AC | |
| **Rated operational current $I_e$** | | 108 A | |
| **Rated frequency** | | 50/60 Hz | |
| **Rated impulse withstand voltage $U_{imp}$** | | 6 kV | |
| **Rated insulation voltage $U_i$** | | 690 V AC | |
| **Pollution degree** | | 3 | |
| **Cross-section** | | 10 mm² | 25 mm² |
| **Ambient air temperature** | Operation | -25 ... +70 °C | |
| | Storage | -50 ... +80 °C | |

### Connecting characteristics

Main circuit

| | | | |
|---|---|---|---|
| **Type** | | | S4-M1 |
| **Connecting capacity** | | | |
| | Rigid | **1 x** | 2.5 ... 50 mm² |
| | Flexible with ferrule | **1 x** | 4 ... 16 mm² |
| | Flexible | **1 x** | 4 ... 16 mm² |
| | Stranded acc. to UL/CSA | **1 x** | AWG 14-4 |
| | Flexible acc. to UL/CSA | **1 x** | AWG 14-4 |
| **Tightening torques** | | | 4 Nm |
| **Connection screw** | | | Pozidriv 2 |

2CDC131051C0201

# MS116, MS132, MO132, MS4xx, MO4xx manual motor starters
## General accessories


2CDC241003F0011

MSHD-LB


2CDC241002S0011

MSHD-LY


2CDC241004F0011

MSMN


2CDC241001F0012

MSH-AR


2CDC241017V0013

MSAH1

### Description

With this solution of door coupling rotary mechanism it is possible to operate a Manual Motor Starter in the back of a switch cabinet from outside. The door coupling mechanism prevents opening of the door of a switch cabinet with the Manual Motor Starter in ON position.

The complete mechanism includes handle, shaft, driver, shaft alignment ring and shaft supporter.

All accessories fit for 6 mm shafts with a maximum length of 180 mm. The degree of protection for handles MSHD is IP64.

### Ordering details

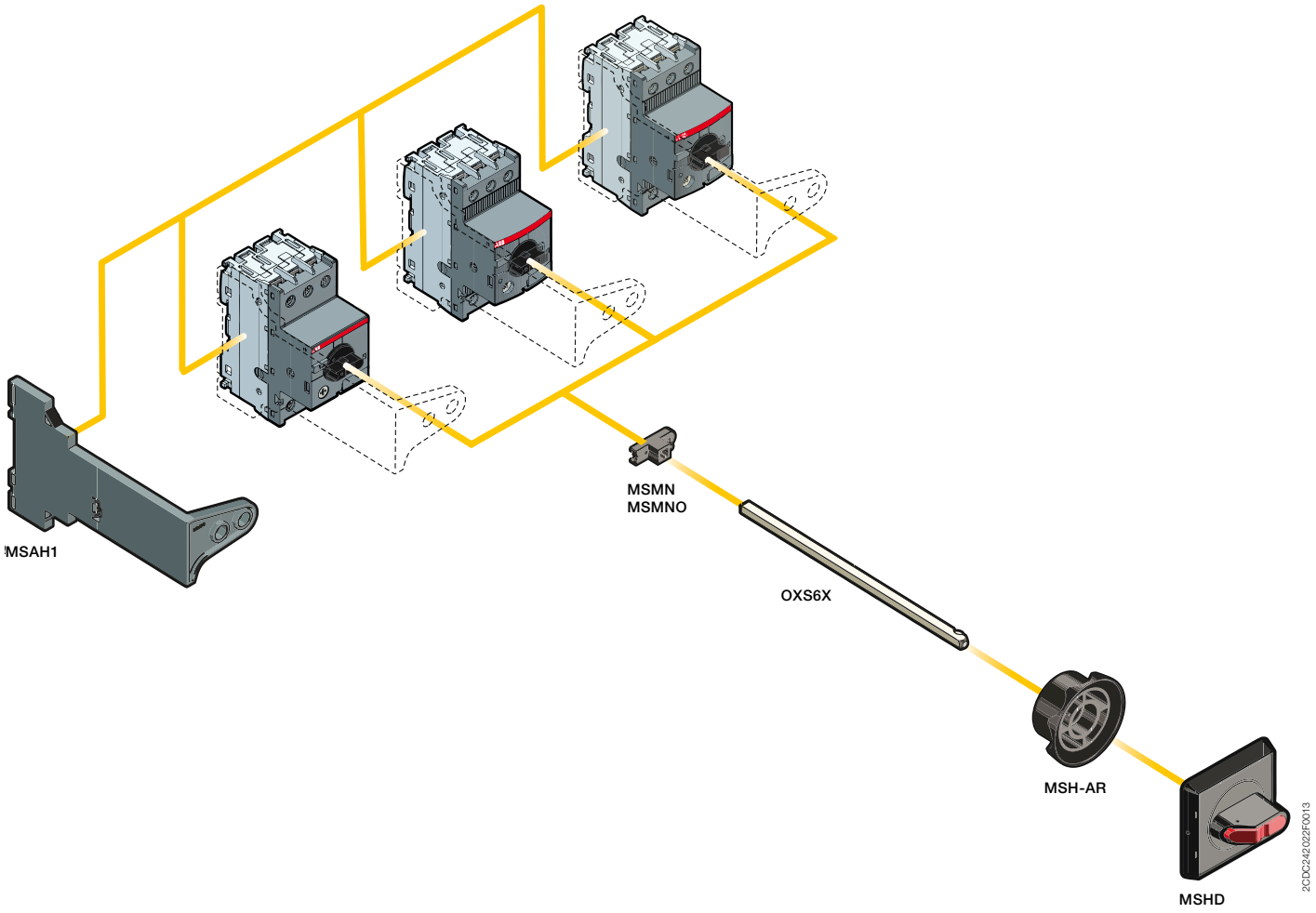
| Suitable for | Description | Shaft length mm | Color | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|---|
| **Shafts** | | | | | | | | |
| MS116, MS132, MO132, MS4xx, MO4xx | For MSHD handles. Shaft diameter 6 mm. Shaft extension for door coupling driver. | 85 | | OXS6X85 | 1SCA101647R1001 | | 1 | 0.020 |
| | | 105 | | OXS6X105 | 1SCA108043R1001 | | 1 | 0.020 |
| | | 130 | | OXS6X130 | 1SCA101655R1001 | | 1 | 0.030 |
| | | 180 | | OXS6X180 | 1SCA101659R1001 | | 1 | 0.040 |
| **IP64 handles (UL: Type 1, 3R, 12)** | | | | | | | | |
| MS116, MS132, MO132, MS4xx, MO4xx | Padlockable max. 3 padlocks with bail diameter 5 ... 8 mm, door interlock in ON position defeatable, for use with 6 mm OXS6...types up to 180 mm or driver shafts MSOX. | | Black | MSHD-LB (1) | 1SAM201920R1001 | | 1 | 0.065 |
| | | | Yellow | MSHD-LY (1) | 1SAM201920R1002 | | 1 | 0.065 |
| | | | Black | MSHD-LTB (2) | 1SAM201920R1011 | | 1 | 0.065 |
| | | | Yellow | MSHD-LTY (2) | 1SAM201920R1012 | | 1 | 0.065 |
| **Driver** | | | | | | | | |
| MS116, MS132, MO132, MS4xx, MO4xx | Coupling driver for use with 6 mm OXS6... types up to 180 mm. | | | MSMN (3) | 1SAM101923R0002 | | 1 | 0.002 |
| | | | | MSMNO (4) | 1SAM101923R0012 | | 1 | 0.002 |
| **Shaft alignment ring** | | | | | | | | |
| MS116, MS132, MO132, MS4xx, MO4xx | The MSH-AR supports the long shafts for alignment to the handle inlet. It makes closing panel doors more easy. Use for OXS6X > 105 mm. | | | MSH-AR | 1SAM201920R1000 | | 1 | 0.010 |
| **Shaft supporter** | | | | | | | | |
| MS116, MS132, MO132 | With the MSAH it is possible to support the shaft in the extension of handle (MSHD). It is mandatory for the usage of shafts >130 mm. | | | MSAH1 | 1SAM201909R1021 | | 1 | 0.035 |

(1) Indication I-O and ON-OFF (recommended for MS116, MS4xx, MO4xx).
(2) Indication I-O and ON-OFF + Trip indication.
(3) Coded - Positioning of ON indication dependent from mounting orientation of the MMS.
(4) Uncoded - Positioning of ON indication independent from mounting orientation of the MMS.

2CDC131053C0201

# General accessories





# A contactors and N contactor relays


## A 3-pole contactors

Overview **3**/2

**4 to 55 kW / 5 to 75 hp**

A9 ... A16 AC operated **3**/4
A26 ... A40 AC operated **3**/5
A50 ... A75 AC operated **3**/6
A95 ... A110 AC operated **3**/7
Main accessories **3**/8

**75 to 160 kW / 100 to 250 hp**

A145 ... A300 AC operated **3**/11
Main accessories **3**/12

Technical data **3**/14
Terminal marking and positioning **3**/27
Star-delta starting of three-phase asynchronous motors **3**/28

## A 4-pole contactors

Overview **3**/30

**25 to 125 A AC-1**

A9 ... A16 AC operated **3**/31
A26 AC operated **3**/32
A45 ... A75 AC operated **3**/33
Main accessories **3**/34
Technical data **3**/36
Terminal marking and positionning **3**/44

## N contactor relays

N AC operated **3**/45
Main accessories **3**/46
Technical data **3**/48
Terminal marking and positioning **3**/50

## Accessories for A contactors and N contactor relays

Auxiliary contact blocks **3**/52
Electronic timers **3**/55
Mechanical and electrical interlock units **3**/58
Electronic timers for star-delta starters **3**/60
Surge suppressors for contactor coils **3**/62
Interface relays **3**/64
Mechanical latching units **3**/66
Function markers - Impulse contact blocks **3**/68
Terminal shrouds, terminal enlargements, terminal extensions, connector terminals **3**/69

**Voltage code table** **3/70**

# 3-pole contactors, for motor control and power switching





| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **IEC** (1) | **AC-3 Rated operational power** | θ ≤ 55 °C, 400 V | **kW** | **4** | **5.5** | **7.5** | **11** | **15** | **18.5** |
| **UL/CSA** | **3-phase motor rating** | 480 V | **hp** | **5** | **7.5** | **10** | **20** | **25** | **30** |
| **AC Control supply** | | | Type | **A9** | **A12** | **A16** | **A26** | **A30** | **A40** |
| **IEC** | **AC-3 Rated operational current** | θ ≤ 55 °C , 400 V | **A** | **9** | **12** | **17** | **26** | **32** | **37** |
| | **AC-1 Rated operational current** | θ ≤ 40 °C, 690 V | **A** | **25** | **27** | **30** | **45** | **55** | **60** |
| **UL/CSA** | **General use rating** | 600 V | **A** | **21** | **25** | **30** | **40** | **50** | **60** |
| **NEMA** | **NEMA Size** | | | **00** | **0** | — | **1** | **1P** | — |

(1) 1000 V IEC ratings available for A50 ... A300 contactors.

## Main accessories

| | | |
|---|---|---|
| **Auxiliary contact blocks** | Front mounting | **CA5-10** (1 x N.O.)<br>**CA5-01** (1 x N.C.) |
| | Side mounting | **CAL5-11** (1 x N.O. + 1 x N.C.) |
| **Timers** | Electronic | **TEF5-ON**<br>**TEF5-OFF** |
| | | **TE5S** (for star-delta starters - direct timing - separate mounting) |
| **Interlocking units** | Mechanical | **VM5-1** |
| | Mechanical / Electrical | **VE5-1** |
| **Surge suppressors** | Varistor (AC/DC) | **RV5** (24...440 V) |
| | RC Type (AC) | **RC5-1** (24...440 V) |

## Overload relays

**Thermal relays**

| | | | |
|---|---|---|---|
| Class 10A<br>(Class 10A or 20 for TA80DU)<br>(Class 30 for TA450SU) | **TA25DU-M** (0.10...32 A) | | |
| | | **TA42DU-M** (18...42 A) | |

## Manual motor starters

| | | | |
|---|---|---|---|
| Thermal / magnetic protection<br>Class 10 | **MS116** (0.10...32 A)<br>Ics up to 50 kA for class 10 A | | **MS450** (28...50 A)<br>Ics up to 50 kA |
| | **MS132** (0.10...32 A)<br>Ics up to 100 kA | | |
| | | | **MS497** (22...100 A)<br>Ics up to 100 kA |
| Magnetic only types | **MO132** (0.16...32 A)<br>Ics up to 100 kA | | **MO496** (32...100 A)<br>Ics up to 100 kA |
| | | | **MO450** (40...50 A)<br>Ics up to 50 kA |




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 22 | 30 | 37 | 45 | 55 | 75 | 90 | 110 | 140 | 160 |
| | 40 | 60 | 60 | 60 | 75 | 100 | 125 | 150 | 200 | 250 |
| | A50 | A63 | A75 | A95 | A110 | A145 | A185 | A210 | A260 | A300 |
| | 50 | 65 | 75 | 96 | 110 | 145 | 185 | 210 | 260 | 305 |
| | 100 | 115 | 125 | 145 | 160 | 250 | 275 | 350 | 400 | 500 |
| | 80 | 90 | 105 | 125 | 150 | 230 | 250 | 300 | 350 | 400 |
| | 2 | — | 3 | — | — | 4 | — | — | 5 | — |

| | | | | |
|---|---|---|---|---|
| | | | | |
| | | **CAL18-11** (1 x N.O. + 1 x N.C.) | | |
| | | | | |
| | | | **VM300H**<br>**VM300V** | |
| | **VE5-2** | | | |
| | | | | |
| | **RC5-2** (24...440 V) | | **RC5-3** (250...440 V) | |

| | | | | |
|---|---|---|---|---|
| | **TA75DU-M** (18...80 A) | **TA80DU** (29...80 A) | **TA200DU** (66...200 A) | **TA450DU** (130...310 A) |
| | | **TA110DU** (66...110 A) | | **TA450SU** (40...310 A) |

## Short-circuit protection devices

**Tmax** Circuit breaker and accessories

| | | |
|---|---|---|
| | | |
| | **MS495** (45...100 A)<br>Ics up to 50 kA | |
| | | |
| | | **MO495** (63...100 A)<br>Ics up to 50 kA |

1SBC101875S0201

# A9 ... A16 3-pole contactors
## 4 to 7.5 kW
## AC operated


A9-30-10

3

### Description

A9 ... A16 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC or 220 V DC.

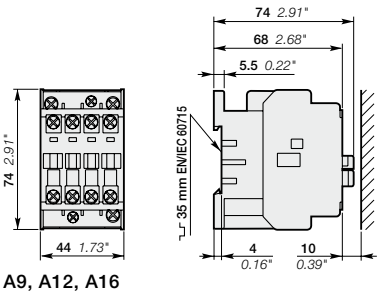
These contactors are of the block type design with:
- 3 main poles and 1 built-in auxiliary contact
- control circuit: AC operated
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

### Ordering details

| IEC | | UL/CSA | | Rated control circuit voltage Uc (1) | | Auxiliary contacts fitted | Type | Order code | | Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| Rated operational power 400 V AC-3 | current θ ≤ 40 °C AC-1 | 3-phase motor rating 480 V | General use rating 600 V AC | | | | | | | Pkg (1 pce) |
| kW | A | hp | A | V 50 Hz | V 60 Hz | | | | | kg |
| 4 | 25 | 5 | 21 | 24 | 24 | 1 0 | A9-30-10 | 1SBL141001R8110 | | 0.340 |
| | | | | | | 0 1 | A9-30-01 | 1SBL141001R8101 | | 0.340 |
| | | | | 48 | 48 | 1 0 | A9-30-10 | 1SBL141001R8310 | | 0.340 |
| | | | | | | 0 1 | A9-30-01 | 1SBL141001R8301 | | 0.340 |
| | | | | 110 | 110...120 | 1 0 | A9-30-10 | 1SBL141001R8410 | | 0.340 |
| | | | | | | 0 1 | A9-30-01 | 1SBL141001R8401 | | 0.340 |
| | | | | 220...230 | 230...240 | 1 0 | A9-30-10 | 1SBL141001R8010 | | 0.340 |
| | | | | | | 0 1 | A9-30-01 | 1SBL141001R8001 | | 0.340 |
| | | | | 230...240 | 240...260 | 1 0 | A9-30-10 | 1SBL141001R8810 | | 0.340 |
| | | | | | | 0 1 | A9-30-01 | 1SBL141001R8801 | | 0.340 |
| | | | | 380...400 | 400...415 | 1 0 | A9-30-10 | 1SBL141001R8510 | | 0.340 |
| | | | | | | 0 1 | A9-30-01 | 1SBL141001R8501 | | 0.340 |
| | | | | 400...415 | 415...440 | 1 0 | A9-30-10 | 1SBL141001R8610 | | 0.340 |
| | | | | | | 0 1 | A9-30-01 | 1SBL141001R8601 | | 0.340 |
| 5.5 | 27 | 7.5 | 25 | 24 | 24 | 1 0 | A12-30-10 | 1SBL161001R8110 | | 0.340 |
| | | | | | | 0 1 | A12-30-01 | 1SBL161001R8101 | | 0.340 |
| | | | | 48 | 48 | 1 0 | A12-30-10 | 1SBL161001R8310 | | 0.340 |
| | | | | | | 0 1 | A12-30-01 | 1SBL161001R8301 | | 0.340 |
| | | | | 110 | 110...120 | 1 0 | A12-30-10 | 1SBL161001R8410 | | 0.340 |
| | | | | | | 0 1 | A12-30-01 | 1SBL161001R8401 | | 0.340 |
| | | | | 220...230 | 230...240 | 1 0 | A12-30-10 | 1SBL161001R8010 | | 0.340 |
| | | | | | | 0 1 | A12-30-01 | 1SBL161001R8001 | | 0.340 |
| | | | | 230...240 | 240...260 | 1 0 | A12-30-10 | 1SBL161001R8810 | | 0.340 |
| | | | | | | 0 1 | A12-30-01 | 1SBL161001R8801 | | 0.340 |
| | | | | 380...400 | 400...415 | 1 0 | A12-30-10 | 1SBL161001R8510 | | 0.340 |
| | | | | | | 0 1 | A12-30-01 | 1SBL161001R8501 | | 0.340 |
| | | | | 400...415 | 415...440 | 1 0 | A12-30-10 | 1SBL161001R8610 | | 0.340 |
| | | | | | | 0 1 | A12-30-01 | 1SBL161001R8601 | | 0.340 |
| 7.5 | 30 | 10 | 30 | 24 | 24 | 1 0 | A16-30-10 | 1SBL181001R8110 | | 0.340 |
| | | | | | | 0 1 | A16-30-01 | 1SBL181001R8101 | | 0.340 |
| | | | | 48 | 48 | 1 0 | A16-30-10 | 1SBL181001R8310 | | 0.340 |
| | | | | | | 0 1 | A16-30-01 | 1SBL181001R8301 | | 0.340 |
| | | | | 110 | 110...120 | 1 0 | A16-30-10 | 1SBL181001R8410 | | 0.340 |
| | | | | | | 0 1 | A16-30-01 | 1SBL181001R8401 | | 0.340 |
| | | | | 220...230 | 230...240 | 1 0 | A16-30-10 | 1SBL181001R8010 | | 0.340 |
| | | | | | | 0 1 | A16-30-01 | 1SBL181001R8001 | | 0.340 |
| | | | | 230...240 | 240...260 | 1 0 | A16-30-10 | 1SBL181001R8810 | | 0.340 |
| | | | | | | 0 1 | A16-30-01 | 1SBL181001R8801 | | 0.340 |
| | | | | 380...400 | 400...415 | 1 0 | A16-30-10 | 1SBL181001R8510 | | 0.340 |
| | | | | | | 0 1 | A16-30-01 | 1SBL181001R8501 | | 0.340 |
| | | | | 400...415 | 415...440 | 1 0 | A16-30-10 | 1SBL181001R8610 | | 0.340 |
| | | | | | | 0 1 | A16-30-01 | 1SBL181001R8601 | | 0.340 |

(1) Other control voltages see voltage code table.

### Main dimensions mm, *inches*




A9, A12, A16

1SBC101855S0201

# A26 ... A40 3-pole contactors
## 11 to 18.5 kW
## AC operated


**A26-30-10**


**A40-30-10**



### Description

A26 ... A40 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC or 220 V DC.

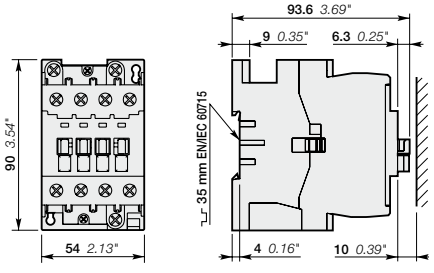
These contactors are of the block type design with:
- 3 main poles and 1 built-in auxiliary contact
- control circuit: AC operated
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

### Ordering details

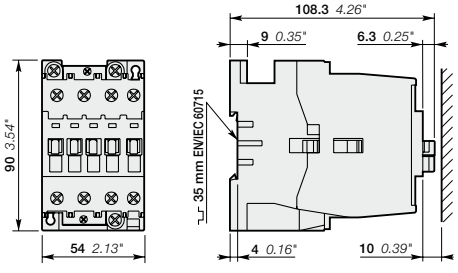
| IEC | | UL/CSA | | Rated control circuit voltage Uc (1) | | Auxiliary contacts fitted | Type | Order code | Weight |
|---|---|---|---|---|---|---|---|---|---|
| Rated operational power 400 V AC-3 | current θ ≤ 40 °C AC-1 | 3-phase motor rating 480 V | General use rating 600 V AC | | | | | | Pkg (1 pce) |
| kW | A | hp | A | V 50 Hz | V 60 Hz | | | | kg |
| 11 | 45 | 20 | 40 | 24 | 24 | 1 0 | A26-30-10 | 1SBL241001R8110 | 0.600 |
| | | | | | | 0 1 | A26-30-01 | 1SBL241001R8101 | 0.600 |
| | | | | 48 | 48 | 1 0 | A26-30-10 | 1SBL241001R8310 | 0.600 |
| | | | | | | 0 1 | A26-30-01 | 1SBL241001R8301 | 0.600 |
| | | | | 110 | 110...120 | 1 0 | A26-30-10 | 1SBL241001R8410 | 0.600 |
| | | | | | | 0 1 | A26-30-01 | 1SBL241001R8401 | 0.600 |
| | | | | 220...230 | 230...240 | 1 0 | A26-30-10 | 1SBL241001R8010 | 0.600 |
| | | | | | | 0 1 | A26-30-01 | 1SBL241001R8001 | 0.600 |
| | | | | 230...240 | 240...260 | 1 0 | A26-30-10 | 1SBL241001R8810 | 0.600 |
| | | | | | | 0 1 | A26-30-01 | 1SBL241001R8801 | 0.600 |
| | | | | 380...400 | 400...415 | 1 0 | A26-30-10 | 1SBL241001R8510 | 0.600 |
| | | | | | | 0 1 | A26-30-01 | 1SBL241001R8501 | 0.600 |
| | | | | 400...415 | 415...440 | 1 0 | A26-30-10 | 1SBL241001R8610 | 0.600 |
| | | | | | | 0 1 | A26-30-01 | 1SBL241001R8601 | 0.600 |
| 15 | 55 | 25 | 50 | 24 | 24 | 1 0 | A30-30-10 | 1SBL281001R8110 | 0.710 |
| | | | | | | 0 1 | A30-30-01 | 1SBL281001R8101 | 0.710 |
| | | | | 48 | 48 | 1 0 | A30-30-10 | 1SBL281001R8310 | 0.710 |
| | | | | | | 0 1 | A30-30-01 | 1SBL281001R8301 | 0.710 |
| | | | | 110 | 110...120 | 1 0 | A30-30-10 | 1SBL281001R8410 | 0.710 |
| | | | | | | 0 1 | A30-30-01 | 1SBL281001R8401 | 0.710 |
| | | | | 220...230 | 230...240 | 1 0 | A30-30-10 | 1SBL281001R8010 | 0.710 |
| | | | | | | 0 1 | A30-30-01 | 1SBL281001R8001 | 0.710 |
| | | | | 230...240 | 240...260 | 1 0 | A30-30-10 | 1SBL281001R8810 | 0.710 |
| | | | | | | 0 1 | A30-30-01 | 1SBL281001R8801 | 0.710 |
| | | | | 380...400 | 400...415 | 1 0 | A30-30-10 | 1SBL281001R8510 | 0.710 |
| | | | | | | 0 1 | A30-30-01 | 1SBL281001R8501 | 0.710 |
| | | | | 400...415 | 415...440 | 1 0 | A30-30-10 | 1SBL281001R8610 | 0.710 |
| | | | | | | 0 1 | A30-30-01 | 1SBL281001R8601 | 0.710 |
| 18.5 | 60 | 30 | 60 | 24 | 24 | 1 0 | A40-30-10 | 1SBL321001R8110 | 0.710 |
| | | | | | | 0 1 | A40-30-01 | 1SBL321001R8101 | 0.710 |
| | | | | 48 | 48 | 1 0 | A40-30-10 | 1SBL321001R8310 | 0.710 |
| | | | | | | 0 1 | A40-30-01 | 1SBL321001R8301 | 0.710 |
| | | | | 110 | 110...120 | 1 0 | A40-30-10 | 1SBL321001R8410 | 0.710 |
| | | | | | | 0 1 | A40-30-01 | 1SBL321001R8401 | 0.710 |
| | | | | 220...230 | 230...240 | 1 0 | A40-30-10 | 1SBL321001R8010 | 0.710 |
| | | | | | | 0 1 | A40-30-01 | 1SBL321001R8001 | 0.710 |
| | | | | 230...240 | 240...260 | 1 0 | A40-30-10 | 1SBL321001R8810 | 0.710 |
| | | | | | | 0 1 | A40-30-01 | 1SBL321001R8801 | 0.710 |
| | | | | 380...400 | 400...415 | 1 0 | A40-30-10 | 1SBL321001R8510 | 0.710 |
| | | | | | | 0 1 | A40-30-01 | 1SBL321001R8501 | 0.710 |
| | | | | 400...415 | 415...440 | 1 0 | A40-30-10 | 1SBL321001R8610 | 0.710 |
| | | | | | | 0 1 | A40-30-01 | 1SBL321001R8601 | 0.710 |

(1) Other control voltages see voltage code table.

### Main dimensions mm, *inches*




**A26**




**A30, A40**

1SBC101856S0201

# A50 ... A75 3-pole contactors
## 22 to 37 kW
## AC operated


A50-30-11

### Description

A50 ... A75 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC / 1000 V AC or 220 V DC.

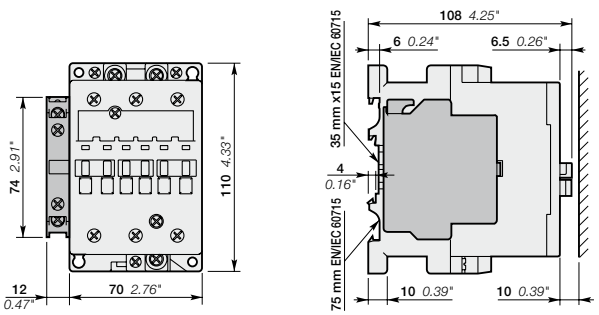
These contactors are of the block type design with:
- 3 main poles
- control circuit: AC operated
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

### Ordering details

| IEC | | UL/CSA | | Rated control circuit voltage Uc (1) | | Auxiliary contacts fitted | Type | Order code | | Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| Rated operational power 400 V AC-3 | current θ ≤ 40 °C AC-1 | 3-phase motor rating 480 V | General use rating 600 V AC | | | | | | | Pkg (1 pce) |
| kW | A | hp | A | V 50 Hz | V 60 Hz | | | | | kg |
| 22 | 100 | 40 | 80 | 24 | 24 | 1 1 | A50-30-11 | 1SBL351001R8111 | | 1.200 |
| | | | | 48 | 48 | 1 1 | A50-30-11 | 1SBL351001R8311 | | 1.200 |
| | | | | 110 | 110…220 | 1 1 | A50-30-11 | 1SBL351001R8411 | | 1.200 |
| | | | | 220…230 | 230…240 | 1 1 | A50-30-11 | 1SBL351001R8011 | | 1.200 |
| | | | | 230…240 | 240…260 | 1 1 | A50-30-11 | 1SBL351001R8811 | | 1.200 |
| | | | | 380…400 | 400…415 | 1 1 | A50-30-11 | 1SBL351001R8511 | | 1.200 |
| | | | | 400…415 | 415…440 | 1 1 | A50-30-11 | 1SBL351001R8611 | | 1.200 |
| 30 | 115 | 60 | 90 | 24 | 24 | 1 1 | A63-30-11 | 1SBL371001R8111 | | 1.200 |
| | | | | 48 | 48 | 1 1 | A63-30-11 | 1SBL371001R8311 | | 1.200 |
| | | | | 110 | 110…220 | 1 1 | A63-30-11 | 1SBL371001R8411 | | 1.200 |
| | | | | 220…230 | 230…240 | 1 1 | A63-30-11 | 1SBL371001R8011 | | 1.200 |
| | | | | 230…240 | 240…260 | 1 1 | A63-30-11 | 1SBL371001R8811 | | 1.200 |
| | | | | 380…400 | 400…415 | 1 1 | A63-30-11 | 1SBL371001R8511 | | 1.200 |
| | | | | 400…415 | 415…440 | 1 1 | A63-30-11 | 1SBL371001R8611 | | 1.200 |
| 37 | 125 | 60 | 105 | 24 | 24 | 1 1 | A75-30-11 | 1SBL411001R8111 | | 1.200 |
| | | | | 48 | 48 | 1 1 | A75-30-11 | 1SBL411001R8311 | | 1.200 |
| | | | | 110 | 110…220 | 1 1 | A75-30-11 | 1SBL411001R8411 | | 1.200 |
| | | | | 220…230 | 230…240 | 1 1 | A75-30-11 | 1SBL411001R8011 | | 1.200 |
| | | | | 230…240 | 240…260 | 1 1 | A75-30-11 | 1SBL411001R8811 | | 1.200 |
| | | | | 380…400 | 400…415 | 1 1 | A75-30-11 | 1SBL411001R8511 | | 1.200 |
| | | | | 400…415 | 415…440 | 1 1 | A75-30-11 | 1SBL411001R8611 | | 1.200 |

(1) Other control voltages see voltage code table.

### Main dimensions mm, *inches*




A50, A63, A75



1SBC101364S0201

# A95 ... A110 3-pole contactors
## 45 to 55 kW
## AC operated


**A95-30-11**

### Description

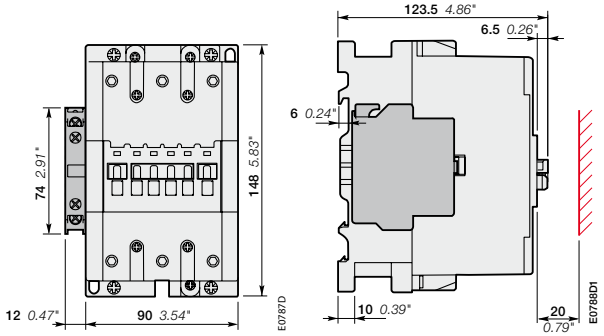
A95 ... A110 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 / 1000 V AC or 220 V DC.
These contactors are of the block type design with:
- 3 main poles
- control circuit: AC operated
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

### Ordering details

| IEC | | UL / CSA | | Rated control circuit voltage Uc (1) | | Auxiliary contacts fitted | | Type | Order code | | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated operational power 400 V AC-3 | current θ ≤ 40 °C AC-1 | 3-phase motor rating 480 V | General use rating 600 V AC | | | | | | | | Pkg (1 pce) |
| kW | A | hp | A | V 50 Hz | V 60 Hz | | | | | | kg |
| 45 | 145 | 60 | 125 | 24 | 24 | 1 | 1 | A95-30-11 | 1SFL431001R8111 | | 2.040 |
| | | | | 48 | 48 | 1 | 1 | A95-30-11 | 1SFL431001R8311 | | 2.040 |
| | | | | 110 | 110...120 | 1 | 1 | A95-30-11 | 1SFL431001R8411 | | 2.040 |
| | | | | 220...230 | 230...240 | 1 | 1 | A95-30-11 | 1SFL431001R8011 | | 2.040 |
| | | | | 230...240 | 240...260 | 1 | 1 | A95-30-11 | 1SFL431001R8811 | | 2.040 |
| | | | | 380...400 | 400...415 | 1 | 1 | A95-30-11 | 1SFL431001R8511 | | 2.040 |
| | | | | 400...415 | 415...440 | 1 | 1 | A95-30-11 | 1SFL431001R8611 | | 2.040 |
| 55 | 160 | 75 | 140 | 24 | 24 | 1 | 1 | A110-30-11 | 1SFL451001R8111 | | 2.040 |
| | | | | 48 | 48 | 1 | 1 | A110-30-11 | 1SFL451001R8311 | | 2.040 |
| | | | | 110 | 110...120 | 1 | 1 | A110-30-11 | 1SFL451001R8411 | | 2.040 |
| | | | | 220...230 | 230...240 | 1 | 1 | A110-30-11 | 1SFL451001R8011 | | 2.040 |
| | | | | 230...240 | 240...260 | 1 | 1 | A110-30-11 | 1SFL451001R8811 | | 2.040 |
| | | | | 380...400 | 400...415 | 1 | 1 | A110-30-11 | 1SFL451001R8511 | | 2.040 |
| | | | | 400...415 | 415...440 | 1 | 1 | A110-30-11 | 1SFL451001R8611 | | 2.040 |

(1) Other control voltages see voltage code table.

### Main dimensions mm, *inches*




**A95, A110**

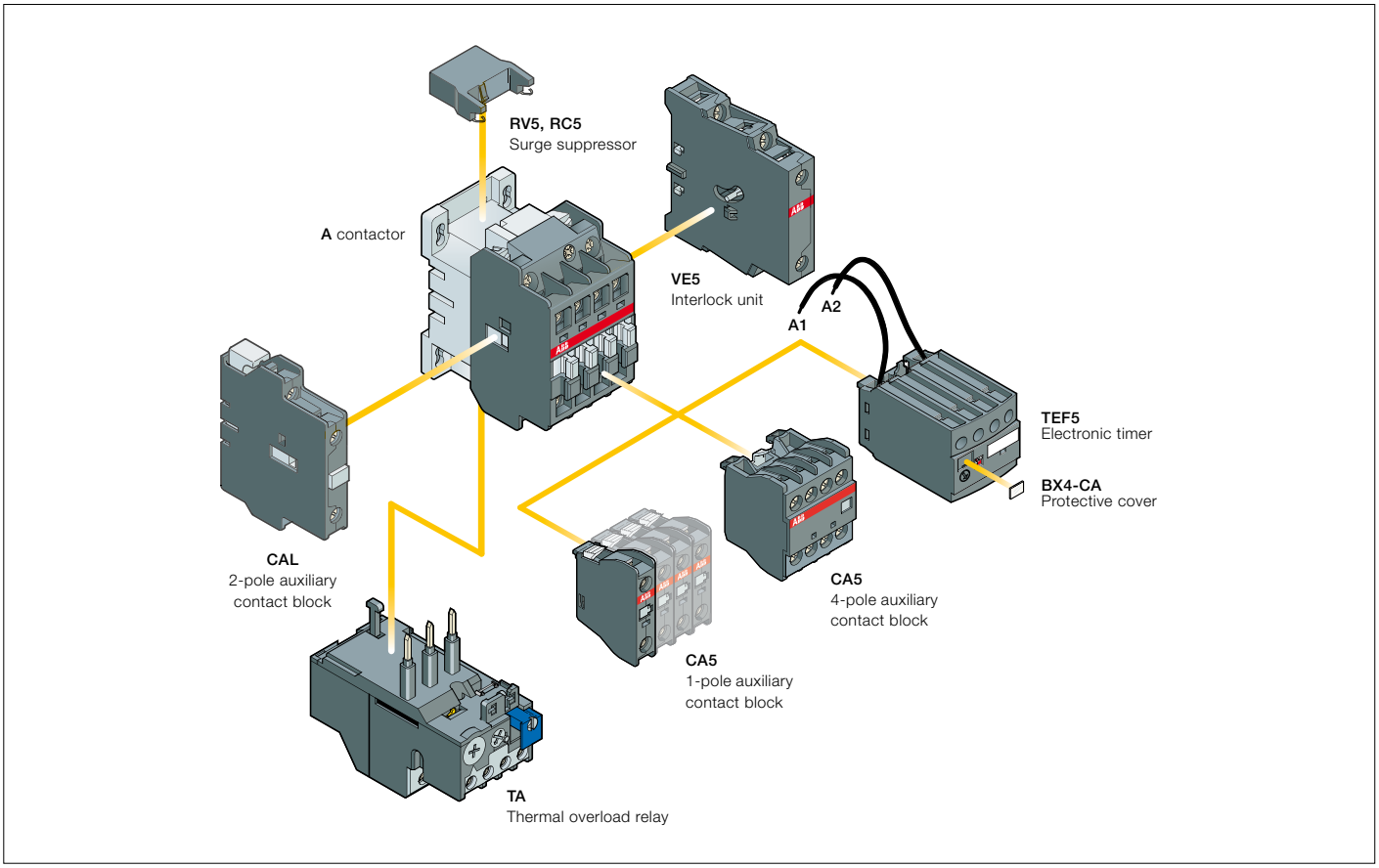


1SFC101146C0201

# A9 ... A110 3-pole contactors
## Main accessories



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




### Main accessory fitting details

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

| Contactor types | Main poles | Built-in auxiliary contacts | Front-mounted accessories: Auxiliary contact blocks | | | | Electronic timer | | Side-mounted accessories: Auxiliary contact blocks | | Interlock unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-pole CA5 | | 4-pole CA5 | | TEF5 | | 2-pole CAL | | VM5 or VE5 |
| A9 ... A26 | 3 0<br>3 0 | 1 0<br>0 1 (1) | 1 to 4 x CA5 | or | 1 x CA5 (4-pole) | or | 1 x TEF5 | + | 1 to 2 x CAL5-11 | or | 1 x VM5-1 or VE5-1<br>+1 x CAL5-11 |
| A30, A40 | 3 0<br>3 0 | 1 0<br>0 1 (1) | 1 to 5 x CA5 | or | 1 x CA5 (4-pole)<br>+ 1 x 1-pole CA5 | or | 1 x TEF5<br>+ 1 x CA5 (1-pole) | + | 1 to 2 x CAL5-11 | or | 1 x VM5-1 or VE5-1<br>+1 x CAL5-11 |
| A50 ... A75 | 3 0 | 1 1 | 1 to 6 x CA5 | or | 1 x CA5 (4-pole)<br>+ 2 x 1-pole CA5 | or | 1 x TEF5<br>+ 2 x CA5 (1-pole) | + | 1 x CAL5-11 | or | 1 x VE5-2 |
| A95, A110 | 3 0 | 1 1 | 1 to 6 x CA5 | or | 1 x CA5 (4-pole)<br>+ 2 x 1-pole CA5 | | – | + | 1 x CAL18-11 | or | 1 x VE5-2 |

(1) 2 N.C. CA5 auxiliary contacts maximum in mounting position 5.

### Overload relays fitting details (2)

| Contactor types | Thermal overload relays |
|---|---|
| A9 ... A26 | TA25DU-M (0.1...0.32 A) |
| A30, A40 | TA25DU-M (0.1...0.32 A) or TA42DU-M (18...42 A) |
| A50 ... A75 | TA75DU-M (18...80 A) |
| A95, A110 | TA80DU (29...80 A) or TA110DU (65...110 A) |

The addition of a thermal overload relay on the contactor does not prevent fitting of many other accessories as shown above.
(2) Direct mounting - No kit required.

1SBC101871S0201

# A9 ... A110 3-pole contactors
## Main accessories


1SBC580992F0301

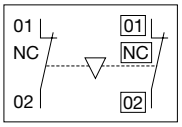
CA5-10


1SBC573752F0301

CAL5-11


1SBC572822F0301

VE5-1




VE5-1, VE5-2
Terminal marking and positioning


1SBC101396F0014

TEF5-OFF


1SBC574001F0301

RV5/50

### Ordering details (1)

| For contactors | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|
| **Front-mounted instantaneous auxiliary contact blocks** | | | | | |
| A9 ... A110 | 1 – | CA5-10 | 1SBN010010R1010 | 10 | 0.014 |
| | – 1 | CA5-01 | 1SBN010010R1001 | 10 | 0.014 |
| A9-30-10 ... A40-30-10 | 2 2 | CA5-22M | 1SBN010040R1122 | 2 | 0.060 |
| A9-30-01 ... A40-30-01 | 2 2 | CA5-22U | 1SBN010040R1322 | 2 | 0.060 |
| A50 ... A110 | 2 2 | CA5-22E | 1SBN010040R1022 | 2 | 0.060 |
| **Side-mounted instantaneous auxiliary contact block** | | | | | |
| A9 ... A75 | 1 1 | CAL5-11 | 1SBN010020R1011 | 2 | 0.050 |
| A95, A110 | 1 1 | CAL18-11 | 1SFN010720R1011 | 2 | 0.050 |

| For contactors | | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|
| **Interlock units** | | | | | | |
| A9 ... A40 | Mechanical | – – | VM5-1 | 1SBN030100R1000 | 1 | 0.066 |
| | Mechanical and electrical | – 2 | VE5-1 | 1SBN030110R1000 | 1 | 0.076 |
| A50 ... A110 | Mechanical and electrical | – 2 | VE5-2 | 1SBN030210R1000 | 1 | 0.146 |

| For contactors | Time delay range selected by switch | Delay type | Auxiliary contacts | Type | Order code | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| **Electronic timers** | | | | | | | |
| A9 ... A75 | 0.1...1 s<br>1...10 s<br>10...100 s | ON-delay | 1 1 | TEF5-ON | 1SBN020312R1000 | 1 | 0.065 |
| | | OFF-delay | 1 1 | TEF5-OFF | 1SBN020314R1000 | 1 | 0.065 |

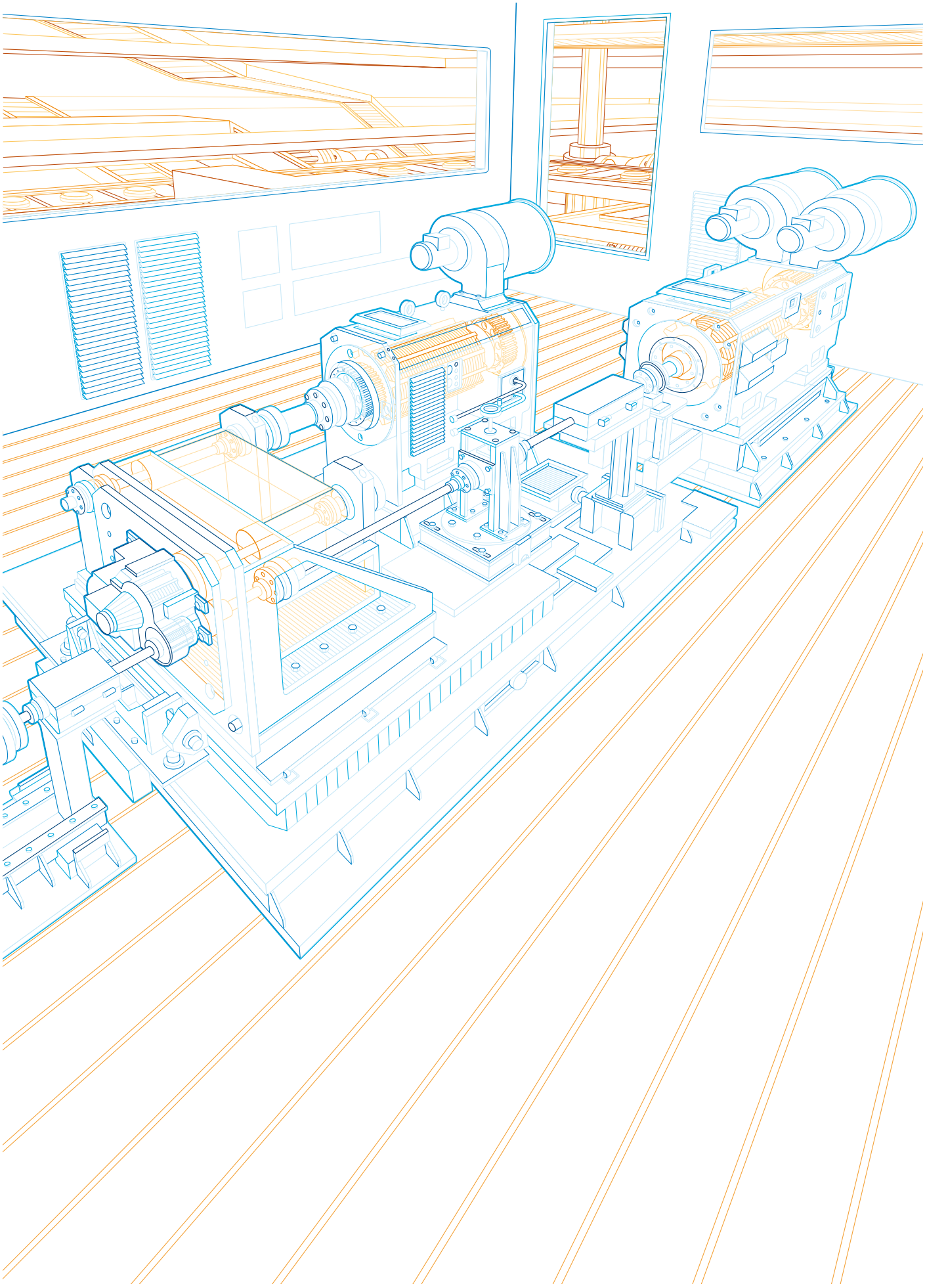
Note: Rated control circuit voltage Uc 24...240 V 50/60 Hz or DC.

| For contactors | Rated control circuit voltage Uc V | AC | DC | Type | Order code | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| **Surge suppressors** | | | | | | | |
| A9 ... A110 | 24...50 | ● | ● | RV5/50 | 1SBN050010R1000 | 2 | 0.015 |
| | 50...133 | ● | ● | RV5/133 | 1SBN050010R1001 | 2 | 0.015 |
| | 110...250 | ● | ● | RV5/250 | 1SBN050010R1002 | 2 | 0.015 |
| | 250...440 | ● | ● | RV5/440 | 1SBN050010R1003 | 2 | 0.015 |
| A9 ... A40 | 24...50 | ● | – | RC5-1/50 | 1SBN050100R1000 | 2 | 0.012 |
| | 50...133 | ● | – | RC5-1/133 | 1SBN050100R1001 | 2 | 0.012 |
| | 110...250 | ● | – | RC5-1/250 | 1SBN050100R1002 | 2 | 0.012 |
| | 250...440 | ● | – | RC5-1/440 | 1SBN050100R1003 | 2 | 0.012 |
| A50 ... A110 | 24...50 | ● | – | RC5-2/50 | 1SBN050200R1000 | 2 | 0.015 |
| | 50...133 | ● | – | RC5-2/133 | 1SBN050200R1001 | 2 | 0.015 |
| | 110...250 | ● | – | RC5-2/250 | 1SBN050200R1002 | 2 | 0.015 |
| | 250...440 | ● | – | RC5-2/440 | 1SBN050200R1003 | 2 | 0.015 |

(1) See "Main accessory fitting details" table.



1SBC101872S0201



N1

# A145 ... A300 3-pole contactors
## 75 to 160 kW
## AC operated


1SFC101029F0201

A185-30-11


1SFC101030F0201

A300-30-11

### Description

A145 ... A300 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 / 1000 V AC (2) or 220 V DC.

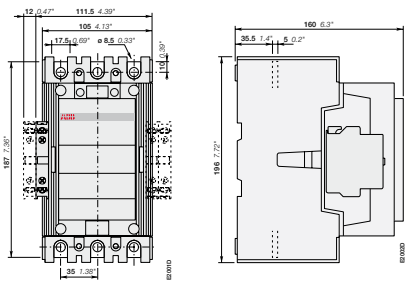
These contactors are of the block type design with:
- 3 main poles
- control circuit: AC operated
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

### Ordering details

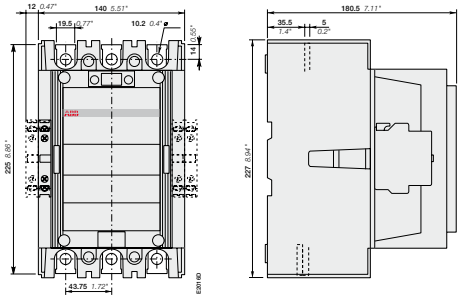
| IEC | | UL / CSA | | Rated control circuit voltage Uc (1) | | Auxiliary contacts fitted | | Type | Order code | | Weight Pkg (1 pce) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated operational power 400 V AC-3 | current θ ≤ 40 °C 690 V AC-1 | 3-phase motor rating 480 V | General use rating 600 V AC | | | | | | | | |
| kW | A | hp | A | V 50 Hz | V 60 Hz | | | | | | kg |
| 75 | 250 | 100 | 230 | 24 | 24 | 1 | 1 | A145-30-11 | 1SFL471001R8111 | | 3.500 |
| | | | | 48 | 48 | 1 | 1 | A145-30-11 | 1SFL471001R8311 | | 3.500 |
| | | | | 110 | 110...120 | 1 | 1 | A145-30-11 | 1SFL471001R8411 | | 3.500 |
| | | | | 220...230 | 230...240 | 1 | 1 | A145-30-11 | 1SFL471001R8011 | | 3.500 |
| | | | | 230...240 | 240...260 | 1 | 1 | A145-30-11 | 1SFL471001R8811 | | 3.500 |
| | | | | 380...400 | 400...415 | 1 | 1 | A145-30-11 | 1SFL471001R8511 | | 3.500 |
| | | | | 400...415 | 415...440 | 1 | 1 | A145-30-11 | 1SFL471001R8611 | | 3.500 |
| 90 | 275 | 125 | 250 | 24 | 24 | 1 | 1 | A185-30-11 | 1SFL491001R8111 | | 3.500 |
| | | | | 48 | 48 | 1 | 1 | A185-30-11 | 1SFL491001R8311 | | 3.500 |
| | | | | 110 | 110...120 | 1 | 1 | A185-30-11 | 1SFL491001R8411 | | 3.500 |
| | | | | 220...230 | 230...240 | 1 | 1 | A185-30-11 | 1SFL491001R8011 | | 3.500 |
| | | | | 230...240 | 240...260 | 1 | 1 | A185-30-11 | 1SFL491001R8811 | | 3.500 |
| | | | | 380...400 | 400...415 | 1 | 1 | A185-30-11 | 1SFL491001R8511 | | 3.500 |
| | | | | 400...415 | 415...440 | 1 | 1 | A185-30-11 | 1SFL491001R8611 | | 3.500 |
| 110 | 350 | 150 | 300 | 24 | 24 | 1 | 1 | A210-30-11 | 1SFL511001R8111 | | 6.100 |
| | | | | 48 | 48 | 1 | 1 | A210-30-11 | 1SFL511001R8311 | | 6.100 |
| | | | | 110 | 110...120 | 1 | 1 | A210-30-11 | 1SFL511001R8411 | | 6.100 |
| | | | | 220...230 | 230...240 | 1 | 1 | A210-30-11 | 1SFL511001R8011 | | 6.100 |
| | | | | 230...240 | 240...260 | 1 | 1 | A210-30-11 | 1SFL511001R8811 | | 6.100 |
| | | | | 380...400 | 400...415 | 1 | 1 | A210-30-11 | 1SFL511001R8511 | | 6.100 |
| | | | | 400...415 | 415...440 | 1 | 1 | A210-30-11 | 1SFL511001R8611 | | 6.100 |
| 140 | 400 | 200 | 350 | 24 | 24 | 1 | 1 | A260-30-11 | 1SFL531001R8111 | | 6.100 |
| | | | | 48 | 48 | 1 | 1 | A260-30-11 | 1SFL531001R8311 | | 6.100 |
| | | | | 110 | 110...120 | 1 | 1 | A260-30-11 | 1SFL531001R8411 | | 6.100 |
| | | | | 220...230 | 230...240 | 1 | 1 | A260-30-11 | 1SFL531001R8011 | | 6.100 |
| | | | | 230...240 | 240...260 | 1 | 1 | A260-30-11 | 1SFL531001R8811 | | 6.100 |
| | | | | 380...400 | 400...415 | 1 | 1 | A260-30-11 | 1SFL531001R8511 | | 6.100 |
| | | | | 400...415 | 415...440 | 1 | 1 | A260-30-11 | 1SFL531001R8611 | | 6.100 |
| 160 | 500 | 250 | 400 | 24 | 24 | 1 | 1 | A300-30-11 | 1SFL551001R8111 | | 6.100 |
| | | | | 48 | 48 | 1 | 1 | A300-30-11 | 1SFL551001R8311 | | 6.100 |
| | | | | 110 | 110...120 | 1 | 1 | A300-30-11 | 1SFL551001R8411 | | 6.100 |
| | | | | 220...230 | 230...240 | 1 | 1 | A300-30-11 | 1SFL551001R8011 | | 6.100 |
| | | | | 230...240 | 240...260 | 1 | 1 | A300-30-11 | 1SFL551001R8811 | | 6.100 |
| | | | | 380...400 | 400...415 | 1 | 1 | A300-30-11 | 1SFL551001R8511 | | 6.100 |
| | | | | 400...415 | 415...440 | 1 | 1 | A300-30-11 | 1SFL551001R8611 | | 6.100 |

(1) Other control voltages see voltage code table.
(2) 690 V AC for A210 ... A300, 1000 V AC for A145, A185.

### Main dimensions mm, *inches*



A145, A185



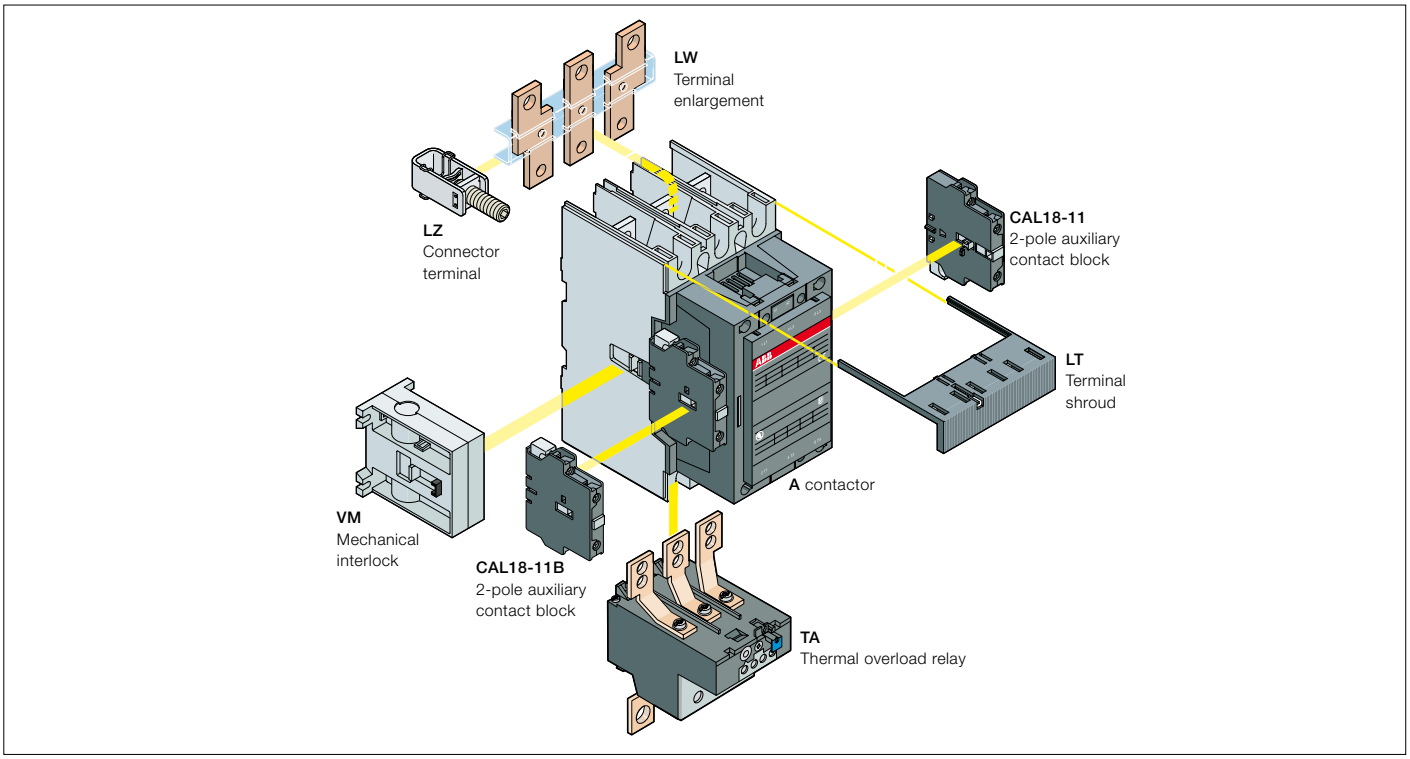
A210, A260, A300

1SFC101147C0201

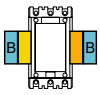
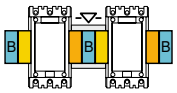
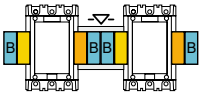
# A145 ... A300 3-pole contactors
## Main accessories



### Main accessories (other accessories available)




### Main accessory fitting details

| Contactor types | Main poles | Available auxiliary contacts | Side-mounted accessories: Add-on auxiliary contact blocks | | | | Mechanical interlock units | Mounting and positioning |
|---|---|---|---|---|---|---|---|---|
| | | | CAL18-11, CAL18-11B | | | | | Factory mounted auxiliary contacts<br>Add-on CAL18-11 auxiliary contacts<br>Add-on CAL18-11B auxiliary contacts |
| **Contactors + auxiliary contact blocks** | | | | | | | | |
| A145 ... A300 | 3 0 | 1 1 | 1 x CAL18-11 | + | 2 x CAL18-11B | | – |  |
| **Contactors with mechanical interlocking + auxiliary contact blocks** | | | | | | | | |
| A145 ... A185 | 3 0 | 1 1 | 2 x CAL18-11 (1) | + | 3 x CAL18-11B (1) | + | VM...H (2) |  |
| A210 ... A300 | 3 0 | 1 1 | 2 x CAL18-11 (1) | + | 4 x CAL18-11B (1) | + | VM...H (2) |  |

(1) Total number of auxiliary contact blocks for the two contactors.
(2) Interlock type, according to the contactor ratings (see "Accessories").

### Overload relays fitting details

| Contactor types | Thermal overload relays |
|---|---|
| A145, A185 | TA200DU (66...200 A) (3) |
| A210, A300 | TA450DU (130...310 A) (3) or TA450SU (40...310 A) (4) |

The addition of a thermal or electronic overload relay on the contactor does not prevent fitting of many other accessories as shown in "Main accessory fitting details" table.
(3) Direct mounting - No kit required.
(4) Mounting kit required.

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# A145 ... A300 3-pole contactors
## Main accessories

CAL18-11

VM300H

LT...AC

LT...AL

LT...AY

LW

LX

LZ

LZ

LZ

## Ordering details (1)

| For contactors | Auxiliary contacts | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|
| **Side-mounted instantaneous auxiliary contact blocks** | | | | | | |
| A145 ... A300 | 1 1 | CAL18-11 | 1SFN010720R1011 | | 2 | 0.050 |
| | 1 1 | CAL18-11B | 1SFN010720R3311 | | 2 | 0.050 |
| **Mechanical interlock unit for two horizontal mounted contactors** | | | | | | |
| A145 ... A300 | | VM300H | 1SFN034700R1000 | | 1 | 0.150 |
| **Terminal shrouds** | | | | | | |
| A145 ... A185 with connectors | | LT185-AC | 1SFN124701R1000 | | 2 | 0.050 |
| A145 ... A185 with lugs | | LT185-AL | 1SFN124703R1000 | | 2 | 0.220 |
| A145 ... A185 with short. bar LY185 or between A145 and TA200DU or between A185 and TA200DU | | LT185-AY | 1SFN124704R1000 | | 1 | 0.050 |
| A210 ... A300 with connectors | | LT300-AC | 1SFN125101R1000 | | 2 | 0.070 |
| A210 ... A300 with lugs | | LT300-AL | 1SFN125103R1000 | | 2 | 0.280 |
| A210 ... A300 with short bar LY300 | | LT300-AY | 1SFN125104R1000 | | 1 | 0.075 |

| For contactors | Dimensions hole Ø mm | bar mm | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| **Terminal enlargements** | | | | | | | |
| A145, A185 | 10.5 | 20 x 5 | LW185 | 1SFN074707R1000 | | 1 | 0.250 |
| A210 ... A300 | 10.5 | 25 x 5 | LW300 | 1SFN075107R1000 | | 1 | 0.450 |
| **Terminal extension** | | | | | | | |
| A145, A185 | 8.5 | 20 x 5 | LX185 | 1SFN074710R1000 | | 1 | 0.250 |
| A210 ... A300 | 10.5 | 20 x 5 | LX300 | 1SFN075110R1000 | | 1 | 0.350 |

| Cables | For contactors | Cable cross section mm² | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| **Connector terminals** | | | | | | | |
| Single Cu | A145, A185 | 6...185 | – | 1SDA023354R0001 | | 3 | 0.200 |
| | A210 ... A300 | 16...240 | – | 1SDA023368R0001 | | 3 | 0.400 |
| Single Al & Cu | A145, A185 | 35...95 | – | 1SDA023356R0001 | | 3 | 0.100 |
| | A145, A185 | 25...150 | – | 1SDA023357R0001 | | 3 | 0.100 |
| | A210 ... A300 | 120...240 | – | 1SDA023370R0001 | | 3 | 0.200 |
| Double Cu | A145, A185 | 2 x (50...120) | LZ185-2C/120 | 1SFN074709R1000 | | 3 | 0.300 |
| Double Al & Cu | A210 ... A300 | 2 x (95...120) | – | 1SDA025766R0001 | | 3 | 0.400 |

(1) For each contactor type, refer to "Main accessory fitting details" table.

| For contactors | Rated control circuit voltage Uc V AC | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|
| A145 ... A300 | 250...440 | RC5-3/440 | 1SFN050300R1003 | | 2 | 0.028 |



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# A9 ... A30 3-pole contactors
# Technical data



## Main pole - Utilization characteristics according to IEC

| Contactor types | AC operated | A9 | A12 | A16 | A26 | A30 |
|---|---|---|---|---|---|---|
| **Standards** | | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 | | | | |
| **Rated operational voltage Ue max.** | | 690 V | | | | |
| **Rated frequency (without derating)** | | 50 / 60 Hz | | | | |
| **Conventional free-air thermal current Ith** | | | | | | |
| acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C | | 26 A | 28 A | 30 A | 45 A | 65 A |
| With conductor cross-sectional area | | 4 mm² | 4 mm² | 4 mm² | 6 mm² | 16 mm² |
| **AC-1 Utilization category** | | | | | | |
| For air temperature close to contactor | | | | | | |
| **Ie / Rated operational current AC-1** | **θ ≤ 40 °C** | 25 A | 27 A | 30 A | 45 A | 55 A |
| Ue max. ≤ 690 V, 50/60 Hz | **θ ≤ 55 °C** | 22 A | 25 A | 27 A | 40 A | 55 A |
| | **θ ≤ 70 °C** | 18 A | 20 A | 23 A | 32 A | 39 A |
| With conductor cross-sectional area | | 2.5 mm² | 4 mm² | 4 mm² | 6 mm² | 10 mm² |
| **AC-3 Utilization category** | | | | | | |
| For air temperature close to contactor θ ≤ 55 °C | | | | | | |
| **Ie / Max. rated operational current AC-3** (1) | | | | | | |
| | **220-230-240 V** | 9 A | 12 A | 17 A | 26 A | 33 A |
|  3-phase motors | **380-400 V** | 9 A | 12 A | 17 A | 26 A | 32 A |
| | **415 V** | 9 A | 12 A | 17 A | 26 A | 32 A |
| | **440 V** | 9 A | 12 A | 16 A | 26 A | 32 A |
| | **500 V** | 9 A | 12 A | 14 A | 22 A | 28 A |
| | **690 V** | 7 A | 9 A | 10 A | 17 A | 21 A |
| **Rated operational power AC-3** (1) | | | | | | |
| | **220-230-240 V** | 2.2 kW | 3 kW | 4 kW | 6.5 kW | 9 kW |
|  1500 r.p.m. 50 Hz<br>1800 r.p.m. 60 Hz<br>3-phase motors | **380-400 V** | 4 kW | 5.5 kW | 7.5 kW | 11 kW | 15 kW |
| | **415 V** | 4 kW | 5.5 kW | 9 kW | 11 kW | 15 kW |
| | **440 V** | 4 kW | 5.5 kW | 9 kW | 15 kW | 18.5 kW |
| | **500 V** | 5.5 kW | 7.5 kW | 9 kW | 15 kW | 18.5 kW |
| | **690 V** | 5.5 kW | 7.5 kW | 9 kW | 15 kW | 18.5 kW |
| **Rated making capacity AC-3** | | 10 x Ie AC-3 acc. to IEC 60947-4-1 | | | | |
| **Rated breaking capacity AC-3** | | 8 x Ie AC-3 acc. to IEC 60947-4-1 | | | | |
| **AC-8a Utilization category** | | | | | | |
| (without thermal overload relay - Ue 400 V 50/60 Hz - θ ≤ 40 °C) | | | | | | |
| **Ie / Rated operational current AC-8a** | | 12 A | 16 A | 22 A | 30 A | 40 A |
| **Rated operational power AC-8a** | | 5.5 kW | 7.5 kW | 11 kW | 15 kW | 20 kW |
| **Short-circuit protection device for contactors** | | | | | | |
| without thermal overload relay - Motor protection excluded (2) | | | | | | |
| Ue ≤ 500 V AC - gG type fuse | | 25 A | 32 A | 32 A | 50 A | 63 A |
| **Rated short-time withstand current Icw** | **1 s** | 250 A | 280 A | 300 A | 400 A | 600 A |
| at 40 °C ambient temperature, | **10 s** | 100 A | 120 A | 140 A | 210 A | 400 A |
| in free air from a cold state | **30 s** | 60 A | 70 A | 80 A | 110 A | 225 A |
| | **1 min** | 50 A | 55 A | 60 A | 90 A | 150 A |
| | **15 min** | 26 A | 28 A | 30 A | 45 A | 65 A |
| **Maximum breaking capacity** | | | | | | |
| cos φ = 0.45 | **at 440 V** | 250 A | | | 420 A | 820 A |
| | **at 690 V** | 90 A | | | 170 A | 340 A |
| **Power dissipation per pole** | **Ie / AC-1** | 0.8 W | 1 W | 1.2 W | 1.8 W | 2.5 W |
| | **Ie / AC-3** | 0.1 W | 0.2 W | 0.35 W | 0.6 W | 0.9 W |
| **Max. electrical switching frequency** | **AC-1** | 600 cycle/h | | | | |
| | **AC-3** | 1200 cycle/h | | | | |
| | **AC-2, AC-4** | 300 cycle/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".

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# A40 ... A110 3-pole contactors
# Technical data



## Main pole - Utilization characteristics according to IEC

| Contactor types | AC operated | A40 | A50 | A63 | A75 | A95 | A110 |
|---|---|---|---|---|---|---|---|
| **Standards** | | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 | | | | | |
| **Rated operational voltage Ue max.** | | 690 V | 1000 V | | | | |
| **Rated frequency (without derating)** | | 50/60 Hz | | | | | |
| **Conventional free-air thermal current Ith** | | | | | | | |
| acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C | | 65 A | 100 A | 125 A | 125 A | 145 A | 160 A |
| With conductor cross-sectional area | | 16 mm² | 35 mm² | 50 mm² | 50 mm² | 50 mm² | 70 mm² |
| **AC-1 Utilization category** | | | | | | | |
| For air temperature close to contactor | | | | | | | |
| **Ie / Rated operational current AC-1** | **θ ≤ 40 °C** | 60 A | 100 A | 115 A | 125 A | 145 A | 160 A |
| Ue max. ≤ 690 V, 50/60 Hz | **θ ≤ 55 °C** | 60 A | 85 A | 95 A | 105 A | 135 A | 145 A |
| | **θ ≤ 70 °C** | 42 A | 70 A | 80 A | 85 A | 115 A | 130 A |
| With conductor cross-sectional area | | 16 mm² | 35 mm² | 50 mm² | 50 mm² | 50 mm² | 70 mm² |
| **AC-3 Utilization category** | | | | | | | |
| For air temperature close to contactor θ ≤ 55 °C | | | | | | | |
| **Ie / Max. rated operational current AC-3** (1) | | | | | | | |
| | **220-230-240 V** | 40 A | 53 A | 65 A | 75 A | 96 A | 110 A |
| | **380-400 V** | 37 A | 50 A | 65 A | 75 A | 96 A | 110 A |
|  3-phase motors | **415 V** | 37 A | 50 A | 65 A | 75 A | 96 A | 110 A |
| | **440 V** | 37 A | 45 A | 65 A | 70 A | 93 A | 100 A |
| | **500 V** | 33 A | 45 A | 55 A | 65 A | 80 A | 100 A |
| | **690 V** | 25 A | 35 A | 43 A | 46 A | 65 A | 82 A |
| | **1000 V** | – | 23 A | 25 A | 28 A | 30 A | 30 A |
| **Rated operational power AC-3** (1) | | | | | | | |
| | **220-230-240 V** | 11 kW | 15 kW | 18.5 kW | 22 kW | 25 kW | 30 kW |
| | **380-400 V** | 18.5 kW | 22 kW | 30 kW | 37 kW | 45 kW | 55 kW |
|  1500 r.p.m. 50 Hz<br>1800 r.p.m. 60 Hz<br>3-phase motors | **415 V** | 18.5 kW | 25 kW | 37 kW | 40 kW | 55 kW | 59 kW |
| | **440 V** | 22 kW | 25 kW | 37 kW | 40 kW | 55 kW | 59 kW |
| | **500 V** | 22 kW | 30 kW | 37 kW | 45 kW | 55 kW | 59 kW |
| | **690 V** | 22 kW | 30 kW | 37 kW | 40 kW | 55 kW | 75 kW |
| | **1000 V** | – | 30 kW | 33 kW | 37 kW | 40 kW | 40 kW |
| **Rated making capacity AC-3** | | 10 x Ie AC-3 acc. to IEC 60947-4-1 | | | | | |
| **Rated breaking capacity AC-3** | | 8 x Ie AC-3 acc. to IEC 60947-4-1 | | | | | |
| **AC-8a Utilization category** | | | | | | | |
| (without thermal overload relay - Ue 400 V 50/60 Hz - θ ≤ 40 °C) | | | | | | | |
| **Ie / Rated operational current AC-8a** | | 50 A | 63 A | 85 A | 95 A | 120 A | 140 A |
| **Rated operational power AC-8a** | | 22 kW | 30 kW | 45 kW | 45 kW | 55 kW | 75 kW |
| **Short-circuit protection device for contactors** | | | | | | | |
| without thermal overload relay - Motor protection excluded (2) | | | | | | | |
| Ue ≤ 500 V AC - gG type fuse | | 63 A | 100 A | 125 A | 160 A | 160 A | 200 A |
| **Rated short-time withstand current Icw** | **1 s** | 600 A | 1000 A | | | 1320 A | |
| at 40 °C ambient temperature, | **10 s** | 400 A | 650 A | | | 800 A | |
| in free air from a cold state | **30 s** | 225 A | 370 A | | | 500 A | |
| | **1 min** | 150 A | 250 A | | | 350 A | |
| | **15 min** | 65 A | 110 A | 135 A | 135 A | 160 A | 175 A |
| **Maximum breaking capacity** | | | | | | | |
| cos φ = 0.45 | **at 440 V** | 820 A | 1300 A | | | 1160 A | |
| | **at 690 V** | 340 A | 630 A | | | 800 A | |
| **Power dissipation per pole** | **Ie / AC-1** | 3 W | 5 W | 6.5 W | 7 W | 6.5 W | 7.5 W |
| | **Ie / AC-3** | 1.3 W | 1.3 W | 1.5 W | 2 W | 2.7 W | 3.6 W |
| **Max. electrical switching frequency** | **AC-1** | 600 cycles/h | | | | 300 cycles/h | |
| | **AC-3** | 1200 cycles/h | 600 cycles/h | | | 300 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".

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# A145 ... A300 3-pole contactors
## Technical data



### Main pole - Utilization characteristics according to IEC

| Contactor types | AC operated | A145 | A185 | A210 | A260 | A300 |
|---|---|---|---|---|---|---|
| **Standards** | | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 | | | | |
| **Rated operational voltage Ue max.** | | 1000 V | | 690 V | | |
| **Rated frequency (without derating)** | | 50/60 Hz | | | | |
| **Conventional free-air thermal current Ith** | | | | | | |
| acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C | | 250 A | 275 A | 350 A | 400 A | 500 A (4) |
| With conductor cross-sectional area (3) | | 120 mm² | 150 mm² | 185 mm² | 240 mm² | 300 mm² (4) |
| **AC-1 Utilization category** | | | | | | |
| For air temperature close to contactor | | | | | | |
| **Ie / Rated operational current AC-1** | **θ ≤ 40 °C** | 250 A | 275 A | 350 A | 400 A | 500 A (4) |
| Ue max. ≤ 690 V, 50/60 Hz | **θ ≤ 55 °C** | 230 A | 250 A | 300 A | 350 A | 400 A (4) |
| | **θ ≤ 70 °C** | 180 A | 180 A | 240 A | 290 A | 325 A (4) |
| **Ie / Rated operational current AC-1** | **θ ≤ 40 °C** | 180 A | 200 A | – | – | – |
| Ue max. ≤ 1000 V, 50/60 Hz | **θ ≤ 55 °C** | 180 A | 200 A | – | – | – |
| | **θ ≤ 70 °C** | 180 A | 180 A | – | – | – |
| With conductor cross-sectional area | | 120 mm² | 150 mm² | 185 mm² | 240 mm² | 300 mm² (4) |
| **AC-3 Utilization category** | | | | | | |
| For air temperature close to contactor θ ≤ 55 °C | | | | | | |
| **Ie / Max. rated operational current AC-3** (1) | | | | | | |
| | **220-230-240 V** | 145 A | 185 A | 210 A | 260 A | 305 A |
| | **380-400 V** | 145 A | 185 A | 210 A | 260 A | 305 A |
|  3-phase motors | **415 V** | 145 A | 185 A | 210 A | 260 A | 300 A |
| | **440 V** | 145 A | 185 A | 210 A | 240 A | 280 A |
| | **500 V** | 145 A | 170 A | 210 A | 240 A | 280 A |
| | **690 V** | 120 A | 170 A | 210 A | 220 A | 280 A |
| | **1000 V** | 80 A | 95 A | – | – | – |
| **Rated operational power AC-3** (1) | | | | | | |
| | **220-230-240 V** | 45 kW | 55 kW | 59 kW | 80 kW | 90 kW |
| | **380-400 V** | 75 kW | 90 kW | 110 kW | 140 kW | 160 kW |
|  1500 r.p.m. 50 Hz<br>1800 r.p.m. 60 Hz<br>3-phase motors | **415 V** | 75 kW | 90 kW | 110 kW | 140 kW | 160 kW |
| | **440 V** | 75 kW | 90 kW | 110 kW | 140 kW | 160 kW |
| | **500 V** | 90 kW | 110 kW | 132 kW | 180 kW | 200 kW |
| | **690 V** | 110 kW | 132 kW | 160 kW | 200 kW | 250 kW |
| | **1000 V** | 110 kW | 132 kW | – | – | – |
| **Rated making capacity AC-3** | | 10 x Ie AC-3 acc. to IEC 60947-4-1 | | | | |
| **Rated breaking capacity AC-3** | | 8 x Ie AC-3 acc. to IEC 60947-4-1 | | | | |
| **Short-circuit protection device for contactors** | | | | | | |
| without thermal overload relay - Motor protection excluded (2) | | | | | | |
| Ue ≤ 500 V AC - gG type fuse | | 315 A | 355 A | 400 A | 500 A | 500 A |
| **Rated short-time withstand current Icw** | **1 s** | 1800 A | 2000 A | 2500 A | 3500 A | 3500 A |
| at 40 °C ambient temperature, | **10 s** | 1200 A | 1500 A | 1700 A | 2400 A | 2400 A |
| in free air from a cold state | **30 s** | 800 A | 1000 A | 1200 A | 1500 A | 1500 A |
| | **1 min** | 600 A | 800 A | 1000 A | 1100 A | 1100 A |
| | **15 min** | 280 A | 320 A | 400 A | 500 A | 500 A |
| **Maximum breaking capacity** | | | | | | |
| cos φ = 0.45 | **at 440 V** | 1500 A | 2000 A | 2300 A | 2600 A | 3000 A |
| (cos φ = 0.35 for Ie > 100 A) | **at 690 V** | 1200 A | 1600 A | 2000 A | 2400 A | 2500 A |
| **Power dissipation per pole** | **Ie / AC-1** | 13 W | 16 W | 18 W | 25 W | 32 W |
| | **Ie / AC-3** | 5 W | 8 W | 9 W | 14 W | 18 W |
| **Max. electrical switching frequency** | **AC-1** | 300 cycles/h | | 300 cycles/h | | |
| | **AC-3** | 300 cycles/h | | 300 cycles/h | | |
| | **AC-2, AC-4** | 150 cycles/h | | 150 cycles/h | | |

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".
(2) For the protection of motor starters against short circuits, see “Coordination with short-circuit protection devices”.
(3) Conductors with preparation.
(4) Use terminal extension / enlargement pieces (LX 300 / LW 300).

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# A9 ... A30 3-pole contactors
# Technical data

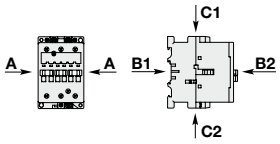


## Main pole - Utilization characteristics according to UL / NEMA / CSA

| Contactor types | AC operated | A9 | A12 | A16 | A26 | A30 |
|---|---|---|---|---|---|---|
| **Standards** | | UL 508, CSA C22.2 N°14 | | | | |
| **Max. operational voltage** | | 600 V | | | | |
| **NEMA size** | | 00 | 0 | – | 1 | 1P |
| **NEMA continuous amp rating** | Thermal current | 9 A | 18 A | – | 27 A | 36 A |
| **NEMA maximum horse power ratings** | | | | | | |
| **1-phase, 60 Hz** | **115 V AC** | 1/3 hp | 1 hp | – | 2 hp | 3 hp |
| | **230 V AC** | 1 hp | 2 hp | – | 3 hp | 5 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** | 1-1/2 hp | 5 hp | – | 10 hp | – |
| | **575 V AC** | 2 hp | 5 hp | – | 10 hp | – |
| **UL / CSA general use rating** | | | | | | |
| 600 V AC | | 21 A | 25 A | 30 A | 40 A | 50 A |
| With conductor cross-sectional area | | AWG 10 | | | AWG 8 | |
| **UL / CSA maximum 1-phase motor rating** | | | | | | |
| Full load current | **120 V AC** | 9.8 A | 13.8 A | 16 A | 28 A | 34 A |
| | **240 V AC** | 12 A | 12 A | 17 A | 24 A | 40 A |
| Horse power rating | **120 V AC** | 1/2 hp | 3/4 hp | 1 hp | 2 hp | 3 hp |
| | **240 V AC** | 2 hp | 2 hp | 3 hp | 5 hp | 7.5 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 |
| | **220-240 V AC** | 6.8 A | 9.6 A | 15.2 A | 28 A | 28 A |
| | **440-480 V AC** | 7.6 A | 11 A | 14 A | 27 A | 34 A |
| | **550-600 V AC** | 9 A | 11 A | 17 A | 27 A | 32 A |
| Horse power rating (1) | **200-208 V AC** | 2 hp | 3 hp | 5 hp | 7.5 hp | 10 hp |
| | **220-240 V AC** | 2 hp | 3 hp | 5 hp | 10 hp | 10 hp |
| | **440-480 V AC** | 5 hp | 7.5 hp | 10 hp | 20 hp | 25 hp |
| | **550-600 V AC** | 7.5 hp | 10 hp | 15 hp | 25 hp | 30 hp |
| **Short-circuit protection device for contactors** | | | | | | |
| without thermal overload relay - Motor protection excluded | | | | | | |
| Fuse rating | | 35 A | 35 A | 60 A | 90 A | 150 A |
| Fuse type, 600 V | | FRS-R | | | | |
| **Max. electrical switching frequency** | | | | | | |
| For general use | | 600 cycles/h | | | | |
| For motor use | | 1200 cycles/h | | | | |

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

## General technical data

| Contactor types | AC operated | A9 | A12 | A16 | A26 | A30 |
|---|---|---|---|---|---|---|
| **Rated insulation voltage Ui** | | | | | | |
| acc. to IEC 60947-4-1 | | 1000 V | | | | |
| acc. to UL / CSA | | 600 V | | | | |
| **Rated impulse withstand voltage Uimp.** | | 8 kV | | | | |
| **Ambient air temperature close to contactor** | | | | | | |
| Operation | Fitted with thermal overload relay | -25...+55 °C | | | | |
| | Without thermal overload relay | -40...+70 °C | | | | |
| Storage | | -60...+80 °C | | | | |
| **Climatic withstand** | | acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II | | | | |
| **Maximum operating altitude (without derating)** | | 3000 m | | | | |
| **Mechanical durability** | | | | | | |
| Number of operating cycles | | 10 millions operating cycles | | | | |
| Max. switching frequency | | 3600 cycles/h | | | | |
| **Shock withstand** | | | | | | |
| acc. to 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, closed or open position | | | | |
| | **A** | 20 g | | | | |
| | **B1** | 10 g closed position / 5 g open position | | | | |
| | **B2** | 15 g | | | | |
| | **C1** | 20 g | | | | |
| | **C2** | 20 g | | | | |



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# A40 ... A110 3-pole contactors
# Technical data

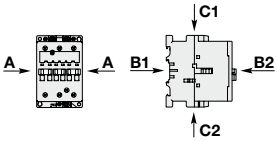


## Main pole - Utilization characteristics according to UL / NEMA / CSA

| Contactor types | AC operated | A40 | A50 | A63 | A75 | A95 | A110 |
|---|---|---|---|---|---|---|---|
| **Standards** | | UL 508, CSA C22.2 N°14 | | | | | |
| **Max. operational voltage** | | 600 V | | | | | |
| **NEMA size** | | – | 2 | – | 3 | – | – |
| **NEMA continuous amp rating** | Thermal current | – | 45 A | – | 90 A | – | – |
| **NEMA maximum horse power ratings** | | | | | | | |
| **1-phase, 60 Hz** | **115 V AC** | – | 3 hp | – | – | – | – |
| | **230 V AC** | – | 7-1/2 | – | – | – | – |
| **NEMA maximum horse power ratings** | | | | | | | |
| **3-phase, 60 Hz** | **200 V AC** | – | 10 hp | – | 25 hp | – | – |
| | **230 V AC** | – | 15 hp | – | 30 hp | – | – |
| | **460 V AC** | – | 25 hp | – | 50 hp | – | – |
| | **575 V AC** | – | 25 hp | – | 50 hp | – | – |
| **UL / CSA general use rating** | | | | | | | |
| 600 V AC | | 60 A | 80 A | 90 A | 105 A | 125 A | 150 A |
| With conductor cross-sectional area | | AWG 6 | AWG 4 | AWG 3 | AWG 2 | AWG 1 | AWG 1/0 |
| **UL / CSA maximum 1-phase motor rating** | | | | | | | |
| Full load current | **120 V AC** | 34 A | 34 A | 56 A | 80 A | 80 A | 100 A |
| | **240 V AC** | 40 A | 40 A | 50 A | 68 A | 88 A | 110 A |
| Horse power rating | **120 V AC** | 3 hp | 3 hp | 5 hp | 7.5 hp | 7.5 hp | 10 hp |
| | **240 V AC** | 7.5 hp | 7.5 hp | 10 hp | 15 hp | 20 hp | 25 hp |
| **UL / CSA maximum 3-phase motor rating** | | | | | | | |
| Full load current (1) | **200-208 V AC** | 32.2 A | 48.3 A | 62.1 A | 78.2 A | 92 A | 92 A |
| | **220-240 V AC** | 42 A | 54 A | 68 A | 80 A | 80 A | 104 A |
| | **440-480 V AC** | 40 A | 52 A | 77 A | 77 A | 77 A | 96 A |
| | **550-600 V AC** | 41 A | 52 A | 77 A | 77 A | 77 A | 99 A |
| Horse power rating (1) | **200-208 V AC** | 10 hp | 15 hp | 20 hp | 25 hp | 30 hp | 30 hp |
| | **220-240 V AC** | 15 hp | 20 hp | 25 hp | 30 hp | 30 hp | 40 hp |
| | **440-480 V AC** | 30 hp | 40 hp | 60 hp | 60 hp | 60 hp | 75 hp |
| | **550-600 V AC** | 40 hp | 50 hp | 75 hp | 75 hp | 75 hp | 100 hp |
| **Short-circuit protection device for contactors** | | | | | | | |
| without thermal overload relay - Motor protection excluded | | | | | | | |
| Fuse rating | | 150 A | 175 A | 200 A | 200 A | 200 A | 200 A |
| Fuse type, 600 V | | FRS-R | | J | | | |
| **Max. electrical switching frequency** | | | | | | | |
| For general use | | 600 cycles/h | | | | 300 cycles/h | |
| For motor use | | 1200 cycles/h | 600 cycles/h | | | 300 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".

## General technical data

| Contactor types | AC operated | A40 | A50 | A63 | A75 | A95 | A110 |
|---|---|---|---|---|---|---|---|
| **Rated insulation voltage Ui** | | | | | | | |
| acc. to IEC 60947-4-1 | | 1000 V | | | | | |
| acc. to UL / CSA | | 600 V | | | | | |
| **Rated impulse withstand voltage Uimp.** | | 8 kV | | | | | |
| **Ambient air temperature close to contactor** | | | | | | | |
| Operation | Fitted with thermal overload relay | -25...+55 °C | | | | | |
| | Without thermal overload relay | -40...+70 °C | | | | | |
| Storage | | -60...+80 °C | | | | -40...+70 °C | |
| **Climatic withstand** | | acc. to IEC 60068-2-30 and 60068-2-11<br>UTE C 63-100 specification II | | | | acc. to IEC 60068-2-30 | |
| **Maximum operating altitude (without derating)** | | 3000 m | | | | | |
| **Mechanical durability** | | | | | | | |
| Number of operating cycles | | 10 millions operating cycles | | | | | |
| Max. switching frequency | | 3600 cycles/h | | | | | |
| **Shock withstand** | | | | | | | |
| acc. to 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, closed or open position (2) | | | | | |
| | **A** | 20 g | | | | | |
| | **B1** | 10 g closed position / 5 g open position | | | | | |
| | **B2** | 15 g | | | | | |
| | **C1** | 20 g | | | | | |
| | **C2** | 20 g | | | | | |

(2) These values are not valid for rail mounting with contactors A95 ... A110.

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# A145 … A300 3-pole contactors
# Technical data



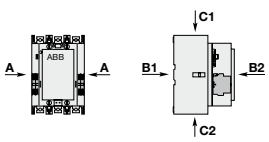
## Main pole - Utilization characteristics according to UL / NEMA / CSA

| Contactor types | AC operated | A145 | A185 | A210 | A260 | A300 |
|---|---|---|---|---|---|---|
| **Standards** | | UL 508, CSA C22.2 N°14 | | | | |
| **Maximum operational voltage** | | 600 V | | | | |
| **NEMA size** | | 4 | – | – | 5 | – |
| **NEMA maximum horse power ratings** | | | | | | |
| **1-phase, 60 Hz** | **115 V AC** | – | – | – | – | – |
| | **230 V AC** | – | – | – | – | – |
| **NEMA maximum horse power ratings** | | | | | | |
| **3-phase, 60 Hz** | **200 V AC** | 40 hp | | | 75 hp | |
| | **230 V AC** | 50 hp | | | 100 hp | |
| | **460 V AC** | 100 hp | | | 200 hp | |
| | **575 V AC** | 200 hp | | | 200 hp | |
| **UL / CSA general use rating** | | | | | | |
| 600 V AC | | 230 A | 250 A | 300 A | 350 A | 400 A |
| **UL / CSA maximum 1-phase motor rating** | | | | | | |
| Full load current | **240 V AC** | – | – | – | – | – |
| Horse power rating | **240 V AC** | – | – | – | – | – |
| **UL / CSA maximum 3-phase motor rating** | | | | | | |
| Full load current (1) | **200-208 V AC** | 119.6 A | 149.5 A | 166.8 A | 220.8 A | 285.2 A |
| | **220-240 V AC** | 130 A | 145 A | 192 A | 248 A | 248 A |
| | **440-480 V AC** | 124 A | 156 A | 180 A | 240 A | 302 A |
| | **550-600 V AC** | 125 A | 144 A | 192 A | 242 A | 289 A |
| Horse power rating (1) | **200-208 V AC** | 40 hp | 50 hp | 60 hp | 75 hp | 100 hp |
| | **220-240 V AC** | 50 hp | 60 hp | 75 hp | 100 hp | 100 hp |
| | **440-480 V AC** | 100 hp | 125 hp | 150 hp | 200 hp | 250 hp |
| | **550-600 V AC** | 125 hp | 150 hp | 200 hp | 250 hp | 300 hp |
| **Short-circuit protection device for contactors** | | | | | | |
| without thermal overload relay - Motor protection excluded | | | | | | |
| Fuse rating | | 300 A | 400 A | 800 A | 800 A | 800 A |
| Fuse type, 600 V | | J/K5 | | | | |
| **Maximum electrical switching frequency** | | | | | | |
| For general use | | 300 cycles/h | | | | |
| For motor use | | 300 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”.

## General technical data

| Contactor types | AC operated | A145 | A185 | A210 | A260 | A300 |
|---|---|---|---|---|---|---|
| **Rated insulation voltage Ui** | | | | | | |
| acc. to IEC 60947-4-1 | | 1000 V | | | | |
| acc. to UL / CSA | | 600 V | | | | |
| **Rated impulse withstand voltage Uimp.** | | 8 kV | | | | |
| **Ambient air temperature close to contactor** | | | | | | |
| Operation | Fitted with thermal overload relay | -25 to +55 °C | | | | |
| Storage | | -40 to +70 °C | | | | |
| **Climatic withstand** | | acc. to IEC 60068-2-30 | | | | |
| **Maximum operating altitude (without derating)** | | 3000 m | | | | |
| **Mechanical durability** | | | | | | |
| Number of operating cycles | | 5 millions operating cycles | | | | |
| Max. switching frequency | | 3600 cycles/h | | | | |
| **Shock withstand** | | | | | | |
| acc. to IEC 60068-2-27 and EN 60068-2-27 | | | | | | |
| Mounting position 1 | | | | | | |
| | **Shock direction** | 1/2 sinusoidal shock for 30 ms: no change in contact position, closed or open position | | | | |
| | **A** | 5 g | | | | |
| | **B1** | 5 g | | | | |
| | **B2** | 5 g | | | | |
| | **C1** | 5 g | | | | |
| | **C2** | 5 g | | | | |

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# A9 ... A30 3-pole contactors
## Technical data

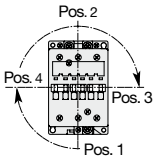
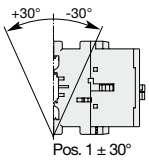
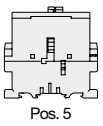
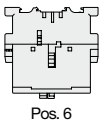


### Magnet system characteristics

| Contactor types | | AC operated | A9 | A12 | A16 | A26 | A30 |
|---|---|---|---|---|---|---|---|
| **Coil operating limits** | | **AC supply** | at θ ≤ 55 °C 0.85...1.1 x Uc<br>Please also refer to "Mounting characteristics and conditions for use" | | | | |
| acc. to IEC 60947-4-1 | | | | | | | |
| **AC control voltage 50/60 Hz** | | | | | | | |
| Rated control circuit voltage Uc | | **at 50 Hz** | 24...690 V | | | | |
| | | **at 60 Hz** | 24...690 V | | | | |
| Coil consumption | **Average pull-in value** | **50 Hz** | 70 VA | | | 120 VA | |
| | | **60 Hz** | 80 VA | | | 140 VA | |
| | | **50/60 Hz** (1) | 74 VA / 70 VA | | | 125 VA / 120 VA | |
| | **Average holding value** | **50 Hz** | 8 VA / 2 W | | | 12 VA / 3 W | |
| | | **60 Hz** | 8 VA / 2 W | | | 12 VA / 3 W | |
| | | **50/60 Hz** (1) | 8 VA / 2 W | | | 12 VA / 3 W | |
| **Drop-out voltage** | | | approx. 40...65 % of Uc | | | | |
| **Operating time** | | | | | | | |
| Between coil energization and: | | **N.O. contact closing** | 10...26 ms | | | 8...21 ms | |
| | | **N.C. contact opening** | 7...21 ms | | | 6...18 ms | |
| Between coil de-energization and: | | **N.O. contact opening** | 4...11 ms | | | 4...11 ms | |
| | | **N.C. contact closing** | 9...16 ms | | | 7...14 ms | |

(1) 50/60 Hz coils: see "Coil voltage code table".

### Mounting characteristics and conditions for use

| Contactor types | | AC operated | A9 | A12 | A16 | A26 | A30 |
|---|---|---|---|---|---|---|---|
| **Mounting positions** | | |     | | | | |
| | | | Max. N.O. or N.C. built-in and add-on N.O. or N.C. auxiliary contacts:<br>see accessory fitting details for 3-pole contactor A9 ... A30 | | | | |
| **Control voltage / Ambient temperature** | | | | | | | |
| Mounting positions | 1, 1±30°, 2, 3, 4, 5 | **at θ ≤ 55 °C** | 0.85...1.1 x Uc | | | | |
| | | **at θ ≤ 70 °C** | Uc | | | | |
| | 6 | **at θ ≤ 55 °C** | 0.95...1.1 x Uc | | | | |
| | | **at θ ≤ 70 °C** | Unauthorized | | | | |
| **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 | | | | |

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# A40 ... A110 3-pole contactors
# Technical data

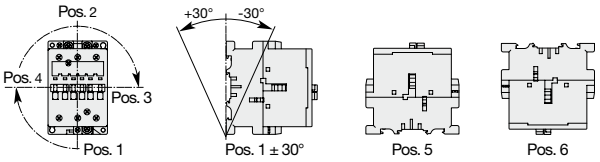


## Magnet system characteristics

| Contactor types | | AC operated | A40 | A50 | A63 | A75 | A95 | A110 |
|---|---|---|---|---|---|---|---|---|
| **Coil operating limits** | | **AC supply** | At θ ≤ 55 °C 0.85...1.1 x Uc | | | | at θ ≤ 70 °C 0.85...1.1 x Uc | |
| acc. to IEC 60947-4-1 | | | Please also refer to "Mounting characteristics and conditions for use" | | | | | |
| **AC control voltage 50/60 Hz** | | | | | | | | |
| Rated control circuit voltage Uc | | **at 50 Hz** | 24…690 V | | | | | |
| | | **at 60 Hz** | 24…690 V | | | | | |
| Coil consumption | **Average pull-in value** | **50 Hz** | 120 VA | 180 VA | | | 350 VA | |
| | | **60 Hz** | 140 VA | 210 VA | | | 450 VA | |
| | | **50/60 Hz** (1) | 125 VA / 120 VA | 190 VA / 180 VA | | | 410 VA / 365 VA | |
| | **Average holding value** | **50 Hz** | 12 VA / 3 W | 18 VA / 5.5 W | | | 22 VA / 6.5 W | |
| | | **60 Hz** | 12 VA / 3 W | 18 VA / 5.5 W | | | 26 VA / 8 W | |
| | | **50/60 Hz** (1) | 12 VA / 3 W | 18 VA / 5.5 W | | | 27 VA / 7.5 W | |
| **Drop-out voltage** | | | Approx. 40...65 % of Uc | | | | | |
| **Operating time** | | | | | | | | |
| Between coil energization and: | | **N.O. contact closing** | 8…21 ms | 8…27 ms | | | 10…25 ms | |
| | | **N.C. contact opening** | 6…18 ms | 7…22 ms | | | 7…22 ms | |
| Between coil de-energization and: | | **N.O. contact opening** | 4…11 ms | 4…11 ms | | | 7…15 ms | |
| | | **N.C. contact closing** | 7…14 ms | 7…14 ms | | | 10…18 ms | |

(1) 50/60 Hz coils: see "Coil voltage code table".

## Mounting characteristics and conditions for use

| Contactor types | | AC operated | A40 | A50 | A63 | A75 | A95 | A110 |
|---|---|---|---|---|---|---|---|---|
| **Mounting positions** | | |  | | | | | |
| | | | Max. built-in and add-on N.O. or N.C. auxiliary contacts:<br>see accessory fitting details for 3-pole contactor A40 ... A110 | | | | | |
| **Control voltage / Ambient temperature** | | | | | | | | |
| Mounting positions | 1, 1±30°, 2, 3, 4, 5 | **at θ ≤ 55 °C** | 0.85...1.1 x Uc | | | | 0.85...1.1 x Uc | |
| | | **at θ ≤ 70 °C** | Uc | | | | 0.85...1.1 x Uc | |
| | 6 | **at θ ≤ 55 °C** | 0.95...1.1 x Uc | | | | Unauthorized | |
| | | **at θ ≤ 70 °C** | Unauthorized | | | | Unauthorized | |
| **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<br>35 x 15 mm | 35 x 15 mm or<br>75 x 25 mm | | | – | |
| By screws (not supplied) | | | 2 x M4 screws<br>placed diagonally | 2 x M6 screws<br>placed diagonally | | | 2 x M6 screws<br>placed diagonally | |

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# A145 … A300 3-pole contactors
## Technical data

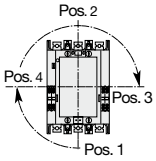
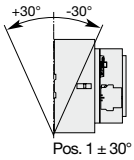
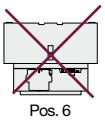


### Magnet system characteristics

| Contactor types | | | AC operated | A145 | A185 | A210 | A260 | A300 |
|---|---|---|---|---|---|---|---|---|
| **Coil operating limits** | | | **AC supply** | At θ ≤ 70 °C 0.85...1.1 x Uc | | | | |
| acc. to IEC 60947-4-1 | | | | Please also refer to "Mounting characteristics and conditions for use" | | | | |
| **AC control voltage** | Rated control circuit voltage Uc | | **at 50 Hz** | 24…690 V | | | | |
| | | | **at 60 Hz** | 24…690 V | | | | |
| | Coil consumption | **Average pull-in value** | **50 Hz** | 550 VA | | 1350 VA | | |
| | | | **60 Hz** | 600 VA | | 1550 VA | | |
| | | | **50/60 Hz** (1) | 700 VA / 650 VA | | 1700 VA / 1550 VA | | |
| | | **Average holding value** | **50 Hz** | 35 VA / 11 W | | 60 VA / 16 W | | |
| | | | **60 Hz** | 40 VA / 12 W | | 65 VA / 19 W | | |
| | | | **50/60 Hz** (1) | 44 VA / 13 W | | 80 VA / 21 W | | |
| **Drop-out voltage** | | | | Approx. 40…65 % of Uc min. | | | | |
| **Operating time** | | | | | | | | |
| | Between coil energization and: | | **N.O. contact closing** | 13…27 ms | | 17…35 ms | | |
| | | | **N.C. contact opening** | 8…22 ms | | 12…30 ms | | |
| | Between coil de-energization and: | | **N.O. contact opening** | 5…10 ms | | 7…13 ms | | |
| | | | **N.C. contact closing** | 9…13 ms | | 10…16 ms | | |

(1) 50/60 Hz coils: see "Voltage code table".

### Mounting characteristics and conditions for use

| Contactor types | | | AC operated | A145 | A185 | A210 | A260 | A300 |
|---|---|---|---|---|---|---|---|---|
| **Mounting positions** | | | |  |  |  |  | |
| | | | | Max. add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for 3-pole contactor A145 ... A300 | | | | |
| **Control voltage / Ambient temperature** | | | | | | | | |
| | Mounting positions | 1, 1±30°, 2, 3, 4, 5 | **at θ ≤ 70 °C** | 0.85 x Uc...1.1 x Uc | | | | |
| | | 6 | | Unauthorized | | | | |
| **Mounting distances** | | | | The contactors can be assembled side by side | | | | |
| **Fixing** | On rail according to IEC 60715, EN 60715 | | | – | | | | |
| | By screws (not supplied) | | | 4 x M5 | | | | |

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# A9 ... A30 3-pole contactors
# Technical data



## Connecting characteristics

| Contactor types | | | AC operated | A9 | A12 | A16 | A26 | A30 |
|---|---|---|---|---|---|---|---|---|
| **Main terminals** | | | |  Screw terminals with cable clamp | | | |  Screw terminals with double connector 2 x (5.6 x 6.5 mm) |
| **Connection capacity** (min. ... max.) | | | | | | | | |
| **Main conductors** (poles) | | | | | | | | |
| Rigid | Solid (≤ 4 mm²) | | **1 x** | 1...4 mm² | | | 1.5...6 mm² | 2.5...16 mm² |
| | Stranded (≥ 6 mm²) | | **2 x** | 1...4 mm² | | | 1.5...6 mm² | 2.5...16 mm² |
| Flexible with ferrule | | | **1 x** | 0.75...2.5 mm² | | | 0.75...4 mm² | 2.5...10 mm² |
| | | | **2 x** | 0.75...2.5 mm² | | | 0.75...4 mm² | 2.5...10 mm² |
| Bars or lugs | | | **L <** | 7.7 mm | | | 10 mm | - |
| | | | **I <** | 3.7 mm | | | 4.2 mm | - |
| Connection capacity acc. to UL / CSA | | | **1 or 2 x** | AWG 18...10 | | | AWG 12...8 | AWG 8...4 |
| Tightening torque | Recommended | | | 1 Nm / 9 lb.in | | | 1.7 Nm / 15 lb.in | 2.3 Nm / 20 lb.in |
| | Max. | | | 1.2 Nm | | | 2.20 Nm | 2.60 Nm |
| **Auxiliary conductors** (built-in auxiliary terminals + coil terminals) | | | | | | | | |
| Rigid solid | | | **1 x** | 1...4 mm² | | | | |
| | | | **2 x** | 1...4 mm² | | | | |
| Flexible with ferrule | | | **1 x** | 0.75...2.5 mm² | | | | |
| | | | **2 x** | 0.75...2.5 mm² | | | | |
| Lugs | | | **L <** | 7.7 mm | | | (1) | 8 mm |
| | | | **I <** | 3.7 mm | | | (1) | 3.7 mm |
| Connection capacity acc. to UL / CSA | | | **1 or 2 x** | AWG 18...14 | | | | |
| Tightening torque | | | | | | | | |
| Coil terminals | Recommended | | | 1 Nm / 9 lb.in | | | | |
| | Max. | | | 1.20 Nm | | | | |
| Built-in auxiliary terminals | Recommended | | | 1 Nm / 9 lb.in | | | 1.7 Nm / 15 lb.in | 1 Nm / 9 lb.in |
| | Max. | | | 1.20 Nm | | | 2.20 Nm | 1.20 Nm |
| **Degree of protection** acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 | | | | | | | | |
| Main terminals | | | | IP20 | | | | |
| Coil terminals | | | | IP20 | | | | |
| Built-in auxiliary terminals | | | | IP20 | | | | |
| **Screw terminals** | | | | Delivered in open position, screws of unused terminals must be tightened | | | | |
| Main terminals | | | | M3.5 | | | M4 | M5 |
| | | **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 | | | | Flat Ø 6.5 / Pozidriv 2 |
| Coil terminals | | | | M3.5 | | | | |
| | | **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 | | | | |
| Built-in auxiliary terminals | | | | M3.5 | | | M4 | M3.5 |
| | | **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 | | | | |

(1) L ≤ 8 and I > 3.7 for coil terminals - L ≤ 10 and I > 4.2 for built-in auxiliary terminals.

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# A40 ... A110 3-pole contactors
## Technical data



### Connecting characteristics

| Contactor types | | | AC operated | A40 | A50 | A63 | A75 | A95 | A110 |
|---|---|---|---|---|---|---|---|---|---|
| **Main terminals** | | | |  Screw terminals with double connector 2 x (5.6 x 6.5 mm) |  Screw terminals with single connector (13 x 10 mm) | | |  Screw terminals with single connector (14 x 14 mm) | |
| **Connection capacity** (min. ... max.) | | | | | | | | | |
| **Main conductors** (poles) | | | | | | | | | |
| Rigid | Solid (≤ 4 mm²) | | **1 x** | 2.5...16 mm² | 6...50 mm² | | | 10...95 mm² | |
| | Stranded (≥ 6 mm²) | | **2 x** | 2.5...16 mm² | 6...25 mm² | | | 6...35 mm² | |
| Flexible with ferrule | | | **1 x** | 2.5...10 mm² | 6...35 mm² | | | 10...70 mm² (1) | |
| | | | **2 x** | 2.5...10 mm² | 6...16 mm² | | | 6...35 mm² (1) | |
| Bars or lugs | | | **L <** | – | – | | | 30 mm (2) | |
| | | | **l <** | – | – | | | 6 mm | |
| Connection capacity acc. to UL / CSA | | | **1 or 2 x** | AWG 8...4 | AWG 8...1 | | | AWG 6...2/0 | |
| Tightening torque | Recommended | | | 2.30 Nm / 20 lb.in | 4.00 Nm / 35 lb.in | | | 8 Nm / 71 lb.in | |
| | Max. | | | 2.60 Nm | 4.50 Nm | | | 9 Nm | |
| **Auxiliary conductors** | | | | | | | | | |
| (built-in auxiliary terminals + coil terminals) | | | | | | | | | |
| Rigid solid | | | **1 x** | 1...4 mm² | | | | 0.75...2.5 mm² | |
| | | | **2 x** | 1...4 mm² | | | | 0.75...2.5 mm² | |
| Flexible with ferrule | | | **1 x** | 0.75...2.5 mm² | 1...2.5 mm² | | | 0.75...2.5 mm² | |
| | | | **2 x** | 0.75...2.5 mm² | | | | | |
| Lugs | | | **L <** | 8 mm | | | | | |
| | | | **l <** | 3.7 mm | | | | | |
| Connection capacity acc. to UL / CSA | | | **1 or 2 x** | AWG 18...14 | | | | | |
| Tightening torque | | | | | | | | | |
| Coil terminals | Recommended | | | 1.00 Nm / 9 lb.in | | | | | |
| | Max. | | | 1.20 Nm | | | | | |
| Built-in auxiliary terminals | Recommended | | | 1.00 Nm / 9 lb.in | – | | | – | |
| | Max. | | | 1.20 Nm | – | | | – | |
| **Degree of protection** | | | | | | | | | |
| acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 | | | | | | | | | |
| Main terminals | | | | IP20 | IP10 | | | | |
| Coil terminals | | | | IP20 | | | | | |
| Built-in auxiliary terminals | | | | IP20 | – | | | – | |
| **Screw terminals** | | | | Delivered in open position, screws of unused terminals must be tightened | | | | | |
| Main terminals | | | | M5 | M6 | | | M8 | |
| | | **Screwdriver type** | | Flat Ø 6.5 / Pozidriv 2 | | | | Hexagon socket (s = 4 mm) | |
| Coil terminals | | | | M3.5 | | | | | |
| | | **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 | | | | | |
| Built-in auxiliary terminals | | | | M3.5 | – | | | | |
| | | **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 | – | | | | |

(1) A95 / A110: use flexible without ferrule.
(2) With LW110 enlargement piece, see "Accessories".

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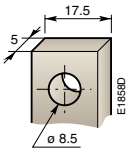
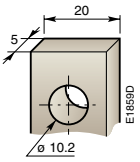
# A145 … A300 3-pole contactors
## Technical data



### Connecting characteristics

| Contactor types | | AC operated | A145 | A185 | A210 | A260 | A300 |
|---|---|---|---|---|---|---|---|
| **Main terminals** Flat type | | |   | |   | | |
| **Connection capacity** (min. ... max.) | | | | | | | |
| **Main conductors** (poles) | | | | | | | |
| Rigid with connector | | Single for Cu cable | 6…185 mm² | | 16…240 mm² | | |
| | | Single for Al/Cu cable | 25…150 mm² | | 120…240 mm² | | |
| | | Double for Al/Cu cable | – | | 2 x 95…120 mm² | | |
| Bars or lugs | | **L ≤** | 24 mm | | 32 mm | | |
| | | **Ø >** | 8 mm | | 10 mm | | |
| Connection capacity acc. to UL / CSA | | **1 or 2 x** | 6 - 250 MCM | | 4 - 500 MCM (1) | | |
| Tightening torque | Recommended | | 18 Nm / 160 lb.in | | 28 Nm / 247 lb.in | | |
| | Max. | | 20 Nm | | 30 Nm | | |
| **Auxiliary conductors** (coil terminals) | | | | | | | |
| Rigid solid | | **1 x** | 1…4 mm² | | | | |
| | | **2 x** | 1…4 mm² | | | | |
| Flexible with ferrule | | **1 x** | 0.75…2.5 mm² | | | | |
| | | **2 x** | 0.75…2.5 mm² | | | | |
| Lugs | | **L ≤** | 8 mm | | | | |
| | | **l >** | 3.7 mm | | | | |
| Connection capacity acc. to UL / CSA | | **1 or 2 x** | AWG 18…14 | | | | |
| Tightening torque | Recommended | | 1.00 Nm / 9 lb.in | | | | |
| | Max. | | 1.20 Nm | | | | |
| **Degree of protection** acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 | | | | | | | |
| Main terminals | | | IP00 | | | | |
| Coil terminals | | | IP20 | | | | |
| **Screw terminals** | | | | | | | |
| Main terminals | | | M8 | | M10 | | |
| | | | Screws and bolts | | | | |
| Coil terminals (delivered in open position) | | | M3.5 | | | | |
| | | **Screwdriver type** | Flat Ø 5.5 mm / Pozidriv 2 | | | | |

(1) With LW110 enlargement piece: see "Accessories".

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# A9 ... A40 3-pole contactors
## Technical data



### Built-in auxiliary contacts according to IEC - Other auxiliary contacts see "Accessories"

| Contactor types | AC operated | A9 | A12 | A16 | A26 | A30 | A40 |
|---|---|---|---|---|---|---|---|
| Rated operational voltage Ue max. | | 690 V | | | | | |
| Rated frequency (without derating) | | 50/60 Hz | | | | | |
| Conventional free air thermal current Ith - θ ≤ 40 °C | | 16 A | | | | | |
| Ie / Rated operational current AC-15 | | | | | | | |
| acc. to IEC 60947-5-1 | 24-127 V 50/60 Hz | 6 A | | | | | |
| | 220-240 V 50/60 Hz | 4 A | | | | | |
| | 380-440 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 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 | 24 V DC | 6 A / 144 W | | | | | |
| | 48 V DC | 2.8 A / 134 W | | | | | |
| | 72 V DC | 2 A / 144 W | | | | | |
| | 110 V DC | 1.1 A / 121 W | | | | | |
| | 125 V DC | 1.1 A / 138 W | | | | | |
| | 220 V DC | 0.55 A / 121 W | | | | | |
| | 250 V DC | 0.55 A / 138 W | | | | | |
| 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 | | 17 V / 5 mA | | | | | |
| with failure rate acc. to IEC 60947-5-4 | | ≤ $10^{-7}$ for AL40 and TAL40 contactors | | | | | |
| Non-overlapping time between N.O. and N.C. contacts | | ≥ 2 ms | | | | | |
| Power dissipation per pole at 6 A | | 0.1 W | | | | | |
| Max. electrical switching frequency | AC-15 | 1200 cycles/h | | | | | |
| | DC-13 | 900 cycles/h | | | | | |
| Mechanically linked contacts 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 of 4-pole CA5 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 (CA5, CAL5-11) are mirror contacts. | | | | | |

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

| Contactor types | AC operated | A9 | A12 | A16 | A26 | A30 | A40 |
|---|---|---|---|---|---|---|---|
| Max. operational voltage | | 600 V AC, 600 V DC | | | | | |
| Pilot duty | | A600, P300 | | | | | |
| AC thermal rated current | | 10 A | | | | | |
| AC maximum volt-ampere making | | 7200 VA | | | | | |
| AC maximum volt-ampere breaking | | 720 VA | | | | | |
| DC thermal rated current | | 5 A | | | | | |
| DC maximum volt-ampere making-breaking | | 138 VA | | | | | |

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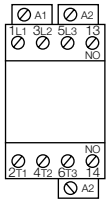
# A9 ... A300 3-pole contactors
## Terminal marking and positioning

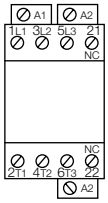


### A9 ... A110 contactors - AC operated

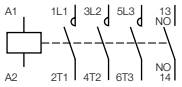
Standard devices without addition of auxiliary contacts



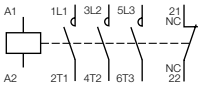

A9 ... A40-30-10




A9 ... A40-30-01

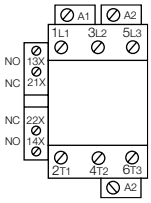



A9 ... A40-30-10

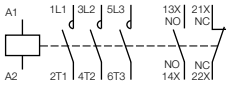



A9 ... A40-30-01

Standard devices with factory mounted auxiliary contacts

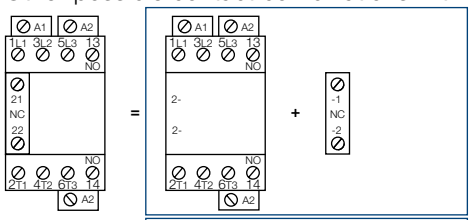



A50 ... A110-30-11

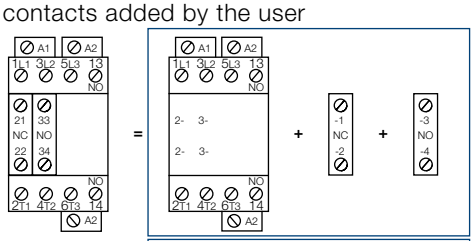



A50 ... A110-30-11

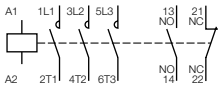
Other possible contact combinations with auxiliary contacts added by the user



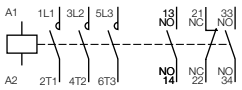

Combination 11 = A9 ... A40-30-10 + CA5-01



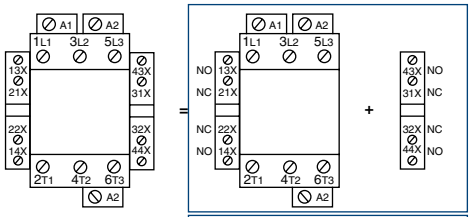

Combination 21 = A9 ... A40-30-10 + CA5-01 + CA5-10




Combination 11



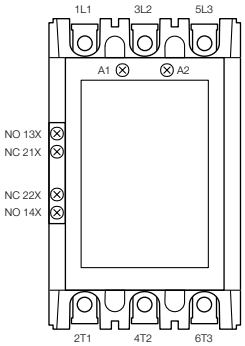

Combination 21



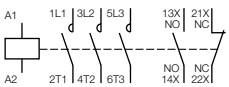

Combination 22 = A50 ... A75-30-11 + CAL5-11

### A145 ... A300 contactors - AC operated

Standard devices with factory mounted auxiliary contacts




A145 ... A300-30-11




A145 ... A300-30-11

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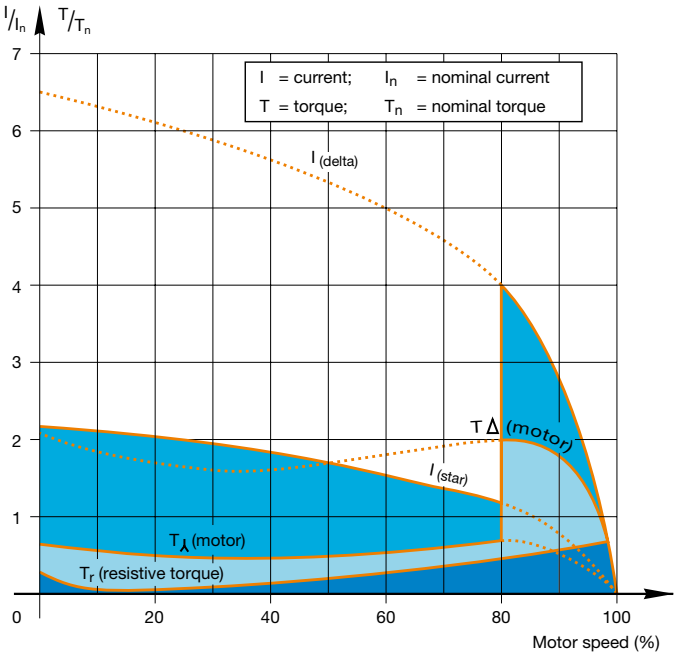
# Star-delta starting of three-phase asynchronous motors
# Contactor selection

## General

Star-delta starting is the most common method to reduce the starting current of a motor. This system can be used on all the squirrel cage motors, which are normally used in delta connection.
In this type of starting, it is recommended to choose motors having high starting torque i.e. much higher than the resistive torque in order to reach sufficient high speed when the motor is connected in star.

3

## Star-delta starting




### Technical Data

When starting:
- inrush current is reduced to a third of direct starting current
- motor torque is reduced to a third or even less of direct starting torque.

Transient current is generated when switching from star to delta connection.

### Utilization

During the initial starting phase ("star" connection), the resistive torque of the driven load must remain, irrespective of speed, less than the "star" motor torque until "star-delta" switching occurs.

This starting mode is therefore ideal for machines having low starting torque such as:
- pumps
- centrifugal compressors
- wood-working machines, etc.

**In order to prevent a high current peak, at least 85 % of nominal speed must be reached before switching from star to delta.**

### Precautions

Motor nominal voltage in delta connection must be equal to that of the mains.

Example:
A motor for 400 V star-delta starting must be designed for 400 V in "delta" connection. Its usual designation is "400 V / 690 V motor". The motor must be constructed with 6 terminal windings.

## Sequence

Starting is a three-stage process:

**1st stage - "Star" connection**

Press the "On" button on the control circuit to close the KM2 "star" contactor. The KM1 "line" contactor then closes and the motor starts. Countdown of programmed starting time (normally 6 to 10 s) then begins.

**2nd stage - "Star" to "Delta" switching**

When the programmed starting time is over, the KM2 "star" contactor opens.

**3rd stage - "Delta" connection**

A transition time (or dwelling time) of 50 ms is fixed between opening of the "star" contactor and closing of the "delta" contactor by the use of TE5S timer. This prevents short circuit between "star" and "delta".

Note: An electrical interlock between star and delta is mandatory such as VE 5 or through auxiliary contacts.
Furthermore, in open transition, the current interruption may reach up to 95 ms: it shall be checked that this duration is compatible with the application i.e. mainly if the decreasing in rotation speed is acceptable during the starting phase.

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# Star-delta starting of three-phase asynchronous motors
## Contactor selection

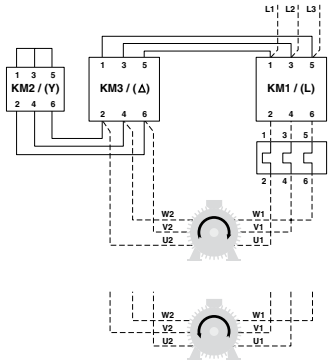
| Rated operational power (1) | | | | | Max. starting time from a cold state (2) | Line contactor KM1 | Delta contactor KM3 | Star contactor KM2 | Overload relay (3) | Timer |
|---|---|---|---|---|---|---|---|---|---|---|
| 230 V AC-3 kW | 400 V AC-3 kW | 415 V AC-3 kW | 500 V AC-3 kW | 690 V AC-3 kW | seconds | Type | Type | Type | Type | Type |
| 4 | 7.5 | 7.5 | 5.5 | 5.5 | 15 | A9 | A9 | A9 | TA25DU-M | TE5S |
| 5.5 | 11 | 11 | 7.5 | 7.5 | 15 | A12 | A12 | A9 | TA25DU-M | TE5S |
| 9 | 15 | 15 | 15 | 11 | 15 | A16 | A16 | A12 | TA25DU-M | TE5S |
| 12.5 | 22 | 22 | 22 | 15 | 15 | A26 | A26 | A16 | TA25DU-M | TE5S |
| 15 | 25 | 25 | 25 | 18.5 | 15 | A30 | A30 | A26 | TA25DU-M | TE5S |
| 18.5 | 37 | 37 | 37 | 37 | 30 | A40 | A40 | A26 | TA42DU-M | TE5S |
| 25 | 45 | 45 | 45 | 45 | 30 | A50 | A50 | A30 | TA75DU-M | TE5S |
| 30 | 55 | 55 | 63 | 59 | 30 | A63 | A63 | A40 | TA75DU-M | TE5S |
| 37 | 63 | 70 | 75 | 63 | 30 | A75 | A75 | A50 | TA75DU-M | TE5S |
| 45 | 75 | 75 | 90 | 90 | 20 | A95 | A95 | A75 | TA110DU | TE5S |
| 55 | 90 | 100 | 110 | 132 | 20 | A110 | A110 | A95 | TA110DU | TE5S |
| 75 | 132 | 132 | 160 | 160 | 20 | A145 | A145 | A110 | TA200DU | TE5S |
| 90 | 160 | 160 | 200 | 250 | 20 | A185 | A185 | A145 | TA200DU | TE5S |
| 110 | 200 | 200 | 250 | 315 | 20 | A210 | A210 | A185 | TA450DU | TE5S |
| 140 | 220 | 250 | 295 | 355 | 20 | A260 | A260 | A210 | TA450DU | TE5S |
| 160 | 250 | 250 | 355 | 450 | 20 | A300 | A300 | A260 | TA450DU | TE5S |

Notes:
(1) Ambient temperature ≤ 55 °C for A9 ... A300
(2) Usual time value = 6...10 s.
(3) The setting current value is: nominal motor current x 0.58.

For motors above 670 kW / 400 V, it is recommended to use Closed Transition Star-Delta starting. Contact your ABB Office for selection.

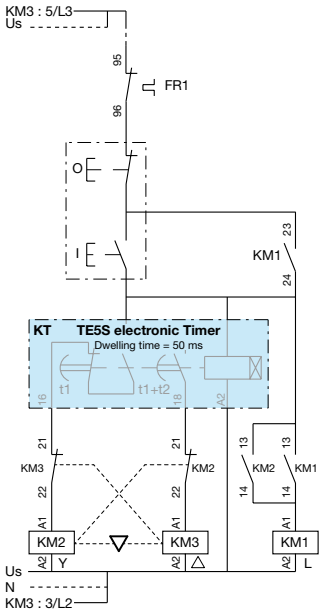
### Power circuit diagram

A9 ... A300 contactors




### Control circuit diagrams - Remote control

A9 ... A300 contactors



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# 4-pole contactors





| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **IEC** | **AC-1 Rated operational current** | θ ≤ 40 °C, 690 V | **A** | **25** | **30** | **45** | **70** | **100** | **125** |
| **UL/CSA** | **General use rating** | 600 V | **A** | **21** | **30** | **40** | **65** | **80** | **105** |
| **AC Control supply** | | ~ | Type | **A9** | **A16** | **A26** | **A45** | **A50** | **A75** |
| **IEC** | **AC-1 Rated operational current** | θ ≤ 40 °C | **A** | **25** | **30** | **45** | **70** | **100** | **125** |
| | | θ ≤ 55 °C | **A** | **22** | **27** | **40** | **60** | **85** | **105** |
| | | θ ≤ 70 °C | **A** | **18** | **23** | **32** | **50** | **70** | **85** |
| | **With conductor cross sectional area** | | **mm²** | **2.5** | **4** | **6** | **25** | **35** | **50** |
| | **Rated operational voltage Ue max.** | | **V** | **690** | **690** | **690** | **1000** | **1000** | **1000** |

## Main accessories

| | | | |
|---|---|---|---|
| **Auxiliary contact blocks** | Front mounting | **CA5-10** (1 x N.O.)<br>**CA5-01** (1 x N.C.) | |
| | Side mounting | **CAL5-11** (1 x N.O. + 1 x N.C.) | |
| **Timers** | Electronic | **TEF5-ON**<br>**TEF5-OFF** | |
| | | **TE5S** (for star-delta starters - direct timing - separate mounting) | |
| **Interlocking units** | Mechanical | **VM5-1** | |
| | Mechanical / Electrical | **VE5-1** | **VE5-2** |
| **Surge suppressors** | Varistor (AC / DC) | **RV5** (24...440 V) | |
| | RC Type (AC) | **RC5-1** (24...440 V) | **RC5-2** (24...440 V) |

1SBC101884S0201

# A9 ... A16 4-pole contactors
## 25 to 30 A AC-1
## AC operated


A9-40-00

### Description

A9 ... A16 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 690 V AC and 440 V DC.

These contactors are of the block type design with:
- 4 main poles
- control circuit: AC operated
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

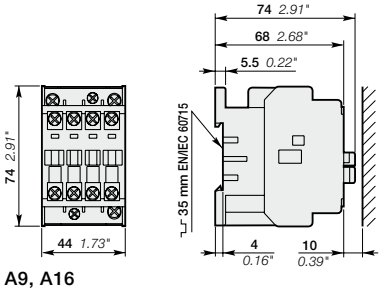


### Ordering details

| IEC<br>Rated operational current<br>θ ≤ 40 °C<br>AC-1 | UL/CSA<br>General use rating<br>600 V AC | Rated control circuit voltage<br>Uc<br>(1) | | Auxiliary contacts fitted | Type | Order code | | Weight<br>Pkg<br>(1 pce) |
|---|---|---|---|---|---|---|---|---|
| A | A | V 50 Hz | V 60 Hz | | | | | kg |
| **4 N.O. main poles** | | | | | | | | |
| 25 | 21 | 24 | 24 | 0 0 | A9-40-00 | 1SBL141201R8100 | | 0.340 |
| | | 48 | 48 | 0 0 | A9-40-00 | 1SBL141201R8300 | | 0.340 |
| | | 110 | 110...120 | 0 0 | A9-40-00 | 1SBL141201R8400 | | 0.340 |
| | | 220...230 | 230...240 | 0 0 | A9-40-00 | 1SBL141201R8000 | | 0.340 |
| | | 230...240 | 240...260 | 0 0 | A9-40-00 | 1SBL141201R8800 | | 0.340 |
| | | 380...400 | 400...415 | 0 0 | A9-40-00 | 1SBL141201R8500 | | 0.340 |
| | | 400...415 | 415...440 | 0 0 | A9-40-00 | 1SBL141201R8600 | | 0.340 |
| 30 | 30 | 24 | 24 | 0 0 | A16-40-00 | 1SBL181201R8100 | | 0.340 |
| | | 48 | 48 | 0 0 | A16-40-00 | 1SBL181201R8300 | | 0.340 |
| | | 110 | 110...120 | 0 0 | A16-40-00 | 1SBL181201R8400 | | 0.340 |
| | | 220...230 | 230...240 | 0 0 | A16-40-00 | 1SBL181201R8000 | | 0.340 |
| | | 230...240 | 240...260 | 0 0 | A16-40-00 | 1SBL181201R8800 | | 0.340 |
| | | 380...400 | 400...415 | 0 0 | A16-40-00 | 1SBL181201R8500 | | 0.340 |
| | | 400...415 | 415...440 | 0 0 | A16-40-00 | 1SBL181201R8600 | | 0.340 |
| **2 N.O. + 2 N.C. main poles** (2) | | | | | | | | |
| 25 | 21 | 24 | 24 | 0 0 | A9-22-00 | 1SBL141501R8100 | | 0.340 |
| | | 48 | 48 | 0 0 | A9-22-00 | 1SBL141501R8300 | | 0.340 |
| | | 110 | 110...120 | 0 0 | A9-22-00 | 1SBL141501R8400 | | 0.340 |
| | | 220...230 | 230...240 | 0 0 | A9-22-00 | 1SBL141501R8000 | | 0.340 |
| | | 230...240 | 240...260 | 0 0 | A9-22-00 | 1SBL141501R8800 | | 0.340 |
| | | 380...400 | 400...415 | 0 0 | A9-22-00 | 1SBL141501R8500 | | 0.340 |
| | | 400...415 | 415...440 | 0 0 | A9-22-00 | 1SBL141501R8600 | | 0.340 |
| 30 | 30 | 24 | 24 | 0 0 | A16-22-00 | 1SBL181501R8100 | | 0.340 |
| | | 48 | 48 | 0 0 | A16-22-00 | 1SBL181501R8300 | | 0.340 |
| | | 110 | 110...120 | 0 0 | A16-22-00 | 1SBL181501R8400 | | 0.340 |
| | | 220...230 | 230...240 | 0 0 | A16-22-00 | 1SBL181501R8000 | | 0.340 |
| | | 230...240 | 240...260 | 0 0 | A16-22-00 | 1SBL181501R8800 | | 0.340 |
| | | 380...400 | 400...415 | 0 0 | A16-22-00 | 1SBL181501R8500 | | 0.340 |
| | | 400...415 | 415...440 | 0 0 | A16-22-00 | 1SBL181501R8600 | | 0.340 |

(1) Other control voltages see voltage code table.
(2) These contactors are not suitable for a reversing starter or star-delta starter or for controlling a single load from 2 separate supplies. Please see technical data.

### Main dimensions mm, *inches*




A9, A16

# A26 4-pole contactors
## 45 A AC-1
## AC operated


A26-40-00

3

### Description

A26 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 690 V AC and 220 V DC.

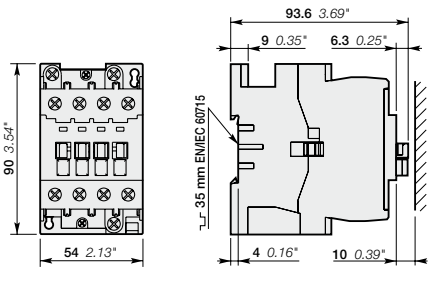
These contactors are of the block type design with:
- 4 main poles
- control circuit: AC operated
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

### Ordering details

| IEC<br>Rated operational current<br>θ ≤ 40 °C<br>AC-1 | UL/CSA<br>General use rating<br>600 V AC | Rated control circuit voltage<br>Uc<br>(1) | | Auxiliary contacts fitted | Type | Order code | | Weight<br>Pkg<br>(1 pce) |
|---|---|---|---|---|---|---|---|---|
| A | A | V 50 Hz | V 60 Hz | | | | | kg |
| **4 N.O. main poles** | | | | | | | | |
| 45 | 40 | 24 | 24 | 0 0 | A26-40-00 | 1SBL241201R8100 | | 0.610 |
| | | 48 | 48 | 0 0 | A26-40-00 | 1SBL241201R8300 | | 0.610 |
| | | 110 | 110...120 | 0 0 | A26-40-00 | 1SBL241201R8400 | | 0.610 |
| | | 220...230 | 230...240 | 0 0 | A26-40-00 | 1SBL241201R8000 | | 0.610 |
| | | 230...240 | 240...260 | 0 0 | A26-40-00 | 1SBL241201R8800 | | 0.610 |
| | | 380...400 | 400...415 | 0 0 | A26-40-00 | 1SBL241201R8500 | | 0.610 |
| | | 400...415 | 415...440 | 0 0 | A26-40-00 | 1SBL241201R8600 | | 0.610 |
| **2 N.O. + 2 N.C. main poles** (2) | | | | | | | | |
| 45 | 40 | 24 | 24 | 0 0 | A26-22-00 | 1SBL241501R8100 | | 0.610 |
| | | 48 | 48 | 0 0 | A26-22-00 | 1SBL241501R8300 | | 0.610 |
| | | 110 | 110...120 | 0 0 | A26-22-00 | 1SBL241501R8400 | | 0.610 |
| | | 220...230 | 230...240 | 0 0 | A26-22-00 | 1SBL241501R8000 | | 0.610 |
| | | 230...240 | 240...260 | 0 0 | A26-22-00 | 1SBL241501R8800 | | 0.610 |
| | | 380...400 | 400...415 | 0 0 | A26-22-00 | 1SBL241501R8500 | | 0.610 |
| | | 400...415 | 415...440 | 0 0 | A26-22-00 | 1SBL241501R8600 | | 0.610 |

(1) Other control voltages see voltage code table.
(2) These contactors are not suitable for a reversing starter or star-delta starter or for controlling a single load from 2 separate supplies. Please see technical data.

### Main dimensions mm, *inches*




A26

1SBC101863S0201

# A45 ... A75 4-pole contactors
## 70 to 125 A AC-1
## AC operated


A45-40-00

### Description

A45 ... A75 4-pole contactors are mainly used for controlling non-inductive or slightly inductive loads (i.e. resistance furnaces...) and generally for controlling power circuits up to 690 V AC and 220 V DC.

These contactors are of the block type design with:
- 4 main poles
- control circuit: AC operated
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

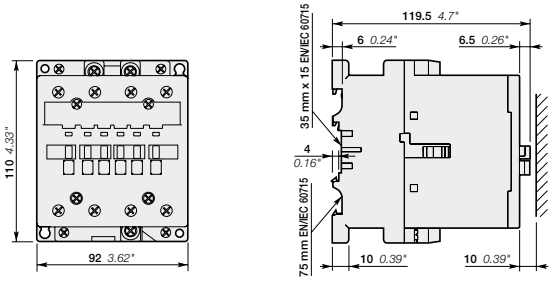


### Ordering details

| IEC<br>Rated operational current<br>θ ≤ 40 °C<br>AC-1<br>A | UL/CSA<br>General use rating<br>600 V AC<br>A | Rated control circuit voltage Uc (1)<br>V 50 Hz | <br>V 60 Hz | Auxiliary contacts fitted<br>  | | Type | Order code | | Weight<br>Pkg (1 pce)<br>kg |
|---|---|---|---|---|---|---|---|---|---|
| **4 N.O. main poles** | | | | | | | | | |
| 70 | 65 | 24 | 24 | 0 | 0 | A45-40-00 | 1SBL331201R8100 | | 1.390 |
| | | 48 | 48 | 0 | 0 | A45-40-00 | 1SBL331201R8300 | | 1.390 |
| | | 110 | 110...120 | 0 | 0 | A45-40-00 | 1SBL331201R8400 | | 1.390 |
| | | 220...230 | 230...240 | 0 | 0 | A45-40-00 | 1SBL331201R8000 | | 1.390 |
| | | 230...240 | 240...260 | 0 | 0 | A45-40-00 | 1SBL331201R8800 | | 1.390 |
| | | 380...400 | 400...415 | 0 | 0 | A45-40-00 | 1SBL331201R8500 | | 1.390 |
| | | 400...415 | 415...440 | 0 | 0 | A45-40-00 | 1SBL331201R8600 | | 1.390 |
| 100 | 80 | 24 | 24 | 0 | 0 | A50-40-00 | 1SBL351201R8100 | | 1.390 |
| | | 48 | 48 | 0 | 0 | A50-40-00 | 1SBL351201R8300 | | 1.390 |
| | | 110 | 110...120 | 0 | 0 | A50-40-00 | 1SBL351201R8400 | | 1.390 |
| | | 220...230 | 230...240 | 0 | 0 | A50-40-00 | 1SBL351201R8000 | | 1.390 |
| | | 230...240 | 240...260 | 0 | 0 | A50-40-00 | 1SBL351201R8800 | | 1.390 |
| | | 380...400 | 400...415 | 0 | 0 | A50-40-00 | 1SBL351201R8500 | | 1.390 |
| | | 400...415 | 415...440 | 0 | 0 | A50-40-00 | 1SBL351201R8600 | | 1.390 |
| 125 | 105 | 24 | 24 | 0 | 0 | A75-40-00 | 1SBL411201R8100 | | 1.390 |
| | | 48 | 48 | 0 | 0 | A75-40-00 | 1SBL411201R8300 | | 1.390 |
| | | 110 | 110...120 | 0 | 0 | A75-40-00 | 1SBL411201R8400 | | 1.390 |
| | | 220...230 | 230...240 | 0 | 0 | A75-40-00 | 1SBL411201R8000 | | 1.390 |
| | | 230...240 | 240...260 | 0 | 0 | A75-40-00 | 1SBL411201R8800 | | 1.390 |
| | | 380...400 | 400...415 | 0 | 0 | A75-40-00 | 1SBL411201R8500 | | 1.390 |
| | | 400...415 | 415...440 | 0 | 0 | A75-40-00 | 1SBL411201R8600 | | 1.390 |
| **2 N.O. + 2 N.C. main poles** (2) | | | | | | | | | |
| 70 | 65 | 24 | 24 | 0 | 0 | A45-22-00 | 1SBL331501R8100 | | 1.400 |
| | | 48 | 48 | 0 | 0 | A45-22-00 | 1SBL331501R8300 | | 1.400 |
| | | 110 | 110...120 | 0 | 0 | A45-22-00 | 1SBL331501R8400 | | 1.400 |
| | | 220...230 | 230...240 | 0 | 0 | A45-22-00 | 1SBL331501R8000 | | 1.400 |
| | | 230...240 | 240...260 | 0 | 0 | A45-22-00 | 1SBL331501R8800 | | 1.400 |
| | | 380...400 | 400...415 | 0 | 0 | A45-22-00 | 1SBL331501R8500 | | 1.400 |
| | | 400...415 | 415...440 | 0 | 0 | A45-22-00 | 1SBL331501R8600 | | 1.400 |
| 125 | 105 | 24 | 24 | 0 | 0 | A75-22-00 | 1SBL411501R8100 | | 1.400 |
| | | 48 | 48 | 0 | 0 | A75-22-00 | 1SBL411501R8300 | | 1.400 |
| | | 110 | 110...120 | 0 | 0 | A75-22-00 | 1SBL411501R8400 | | 1.400 |
| | | 220...230 | 230...240 | 0 | 0 | A75-22-00 | 1SBL411501R8000 | | 1.400 |
| | | 230...240 | 240...260 | 0 | 0 | A75-22-00 | 1SBL411501R8800 | | 1.400 |
| | | 380...400 | 400...415 | 0 | 0 | A75-22-00 | 1SBL411501R8500 | | 1.400 |
| | | 400...415 | 415...440 | 0 | 0 | A75-22-00 | 1SBL411501R8600 | | 1.400 |

(1) Other control voltages see voltage code table.
(2) These contactors are not suitable for a reversing starter or star-delta starter or for controlling a single load from 2 separate supplies. Please see technical data.

### Main dimensions mm, *inches*



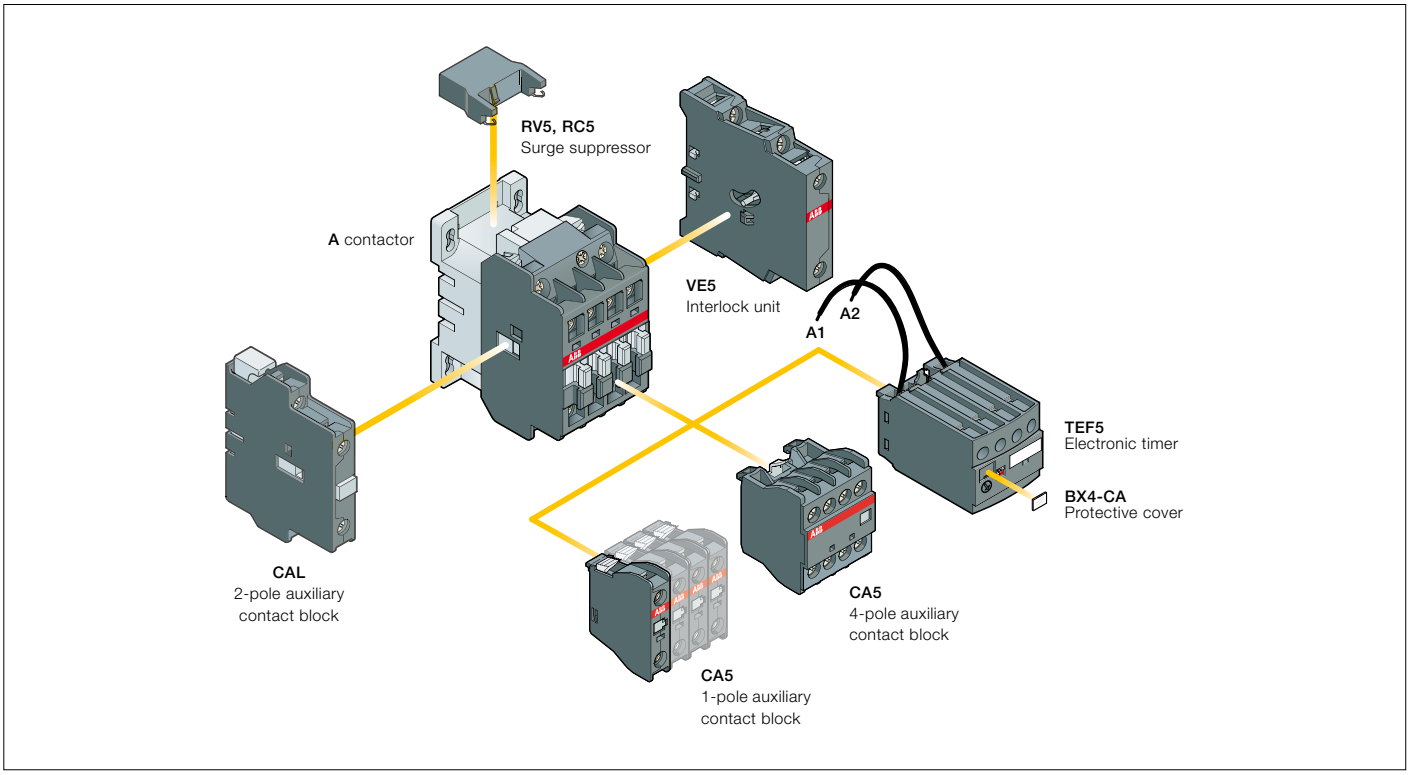

A45, A50, A75

1SBC101377S0201

# A9 … A75 4-pole contactors
## Main accessories



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




### Main accessory fitting details

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

| Contactor types | Main poles | Built-in auxiliary contacts | Front-mounted accessories | | | | | | | Side-mounted accessories | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Auxiliary contact blocks | | | | | Electronic timer | | Auxiliary contact blocks | | Interlock unit |
| | | | 1-pole CA5 | | 4-pole CA5 | | | TEF5 | | 2-pole CAL5-11 | | VM5 or VE5 |
| A9, A16 | 4 0 | 0 0 | 1 to 4 x CA5 | or | 1 x CA5 (4-pole) | or | 1 x TEF5 | + | | 1 to 2 x CAL5-11 | or | 1 x VM5-1 or VE5-1 + 1 x CAL5-11 |
| | 2 2 | 0 0 (1) | 1 to 4 x CA5 | or | 1 x CA5 (4-pole) | or | 1 x TEF5 | + | | 1 to 2 x CAL5-11 | | – |
| A26 | 4 0 | 0 0 | 1 to 4 x CA5 | or | 1 x CA5 (4-pole) | or | 1 x TEF5 | + | | 1 to 2 x CAL5-11 | or | 1 x VM5-1 or VE5-1 + 1 x CAL5-11 |
| | 2 2 | 0 0 (1) | 1 to 4 x CA5 | or | 1 x CA5 (4-pole) | or | 1 x TEF5 | + | | 1 to 2 x CAL5-11 | | – |
| A45 … A75 | 4 0 | 0 0 | 1 to 6 x CA5 | or | 1 x CA5 (4-pole) + 2 x 1-pole CA5 | or | 1 x TEF5 + 2 x CA5 (1-pole) | + | | 1 to 2 x CAL5-11 | or | 1 x VE5-2 + 1 x CAL5-11 |
| | 2 2 | 0 0 (2) | 1 to 6 x CA5 | or | 1 x CA5 (4-pole) + 2 x 1-pole CA5 | or | 1 x TEF5 + 2 x CA5 (1-pole) | + | | 1 to 2 x CAL5-11 | | – |

(1) 2 N.C. CA5 auxiliary contacts maximum in mounting position 5.
(2) 2 N.C. CA5 auxiliary contacts maximum.

1SBC101873S0201

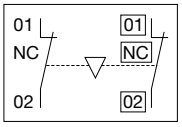
# A9 … A75 4-pole contactors
## Main accessories


1SBC580992F0301

CA5-10


1SBC573752F0301

CAL5-11




VE5-2
Terminal marking and positioning


1SBC101396F0014

TEF5-OFF


1SBC574001F0301

RV5/50

### Ordering details (1)

| For contactors | | Auxiliary contacts | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| **Front-mounted instantaneous auxiliary contact blocks** | | | | | | | |
| A9 ... A75 | | 1 – | CA5-10 | 1SBN010010R1010 | | 10 | 0.014 |
| | | – 1 | CA5-01 | 1SBN010010R1001 | | 10 | 0.014 |
| A9 ... A75 | | 2 2 | CA5-22E | 1SBN010040R1022 | | 2 | 0.060 |
| **Side-mounted instantaneous auxiliary contact block** | | | | | | | |
| A9 ... A75 | | 1 1 | CAL5-11 | 1SBN010020R1011 | | 2 | 0.050 |
| **Interlock units** | | | | | | | |
| A9 ... A26 | Mechanical | – – | VM5-1 | 1SBN030100R1000 | | 1 | 0.066 |
| | Mechanical and electrical | – 2 | VE5-1 | 1SBN030110R1000 | | 1 | 0.076 |
| A45 ... A75 | Mechanical and electrical | – 2 | VE5-2 | 1SBN030210R1000 | | 1 | 0.146 |

| For contactors | Time delay range selected by switch | Delay type | Auxiliary contacts | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|---|
| **Electronic timers** | | | | | | | | |
| A9 ... A75 | 0.1...1 s<br>1...10 s<br>10...100 s | ON-delay | 1 1 | TEF5-ON | 1SBN020312R1000 | | 1 | 0.065 |
| | | OFF-delay | 1 1 | TEF5-OFF | 1SBN020314R1000 | | 1 | 0.065 |

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

| For contactors | Rated control circuit voltage Uc V | AC | DC | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|---|
| **Surge suppressors** | | | | | | | | |
| A9 ... A75 | 24...50 | ● | ● | RV5/50 | 1SBN050010R1000 | | 2 | 0.015 |
| | 50...133 | ● | ● | RV5/133 | 1SBN050010R1001 | | 2 | 0.015 |
| | 110...250 | ● | ● | RV5/250 | 1SBN050010R1002 | | 2 | 0.015 |
| | 250...440 | ● | ● | RV5/440 | 1SBN050010R1003 | | 2 | 0.015 |
| A9 ... A26 | 24...50 | ● | – | RC5-1/50 | 1SBN050100R1000 | | 2 | 0.012 |
| | 50...133 | ● | – | RC5-1/133 | 1SBN050100R1001 | | 2 | 0.012 |
| | 110...250 | ● | – | RC5-1/250 | 1SBN050100R1002 | | 2 | 0.012 |
| | 250...440 | ● | – | RC5-1/440 | 1SBN050100R1003 | | 2 | 0.012 |
| A45 ... A75 | 24...50 | ● | – | RC5-2/50 | 1SBN050200R1000 | | 2 | 0.015 |
| | 50...133 | ● | – | RC5-2/133 | 1SBN050200R1001 | | 2 | 0.015 |
| | 110...250 | ● | – | RC5-2/250 | 1SBN050200R1002 | | 2 | 0.015 |
| | 250...440 | ● | – | RC5-2/440 | 1SBN050200R1003 | | 2 | 0.015 |

(1) See "Main accessory fitting details" table.



1SBC101874S0201

# A9 ... A26 4-pole contactors
## Technical data



### Main pole - Utilization characteristics according to IEC

| Contactor types | AC operated | A9 | A16 | A26 |
|---|---|---|---|---|
| **Standards** | | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 | | |
| **Rated operational voltage Ue max.** | | 690 V | | |
| **Rated frequency (without derating)** | | 50 / 60 Hz | | |
| **Conventional free-air thermal current Ith** | | | | |
| acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C | | 26 A | 30 A | 45 A |
| With conductor cross-sectional area | | 4 mm² | 4 mm² | 6 mm² |
| **AC-1 Utilization category** | | | | |
| For air temperature close to contactor | | | | |
| **Ie / Rated operational current AC-1** | **θ ≤ 40 °C** | 25 A | 30 A | 45 A |
| Ue max. ≤ 690 V, 50/60 Hz | **θ ≤ 55 °C** | 22 A | 27 A | 40 A |
| | **θ ≤ 70 °C** | 18 A | 23 A | 32 A |
| With conductor cross-sectional area | | 2.5 mm² | 4 mm² | 6 mm² |
| **AC-3 Utilization category** | | | | |
| For air temperature close to contactor θ ≤ 55 °C | | | | |
| **Ie / Max. rated operational current AC-3** (1) | | | | |
| | **220-230-240 V** | 9 A | 17 A | 26 A |
| | **380-400 V** | 9 A | 17 A | 26 A |
|  3-phase motors | **415 V** | 9 A | 17 A | 26 A |
| | **440 V** | 9 A | 16 A | 26 A |
| | **500 V** | 9 A | 14 A | 22 A |
| | **690 V** | 7 A | 10 A | 17 A |
| **Rated operational power AC-3** (1) | | | | |
| | **220-230-240 V** | 2.2 kW | 4 kW | 6.5 kW |
| | **380-400 V** | 4 kW | 7.5 kW | 11 kW |
|  1500 r.p.m. 50 Hz<br>1800 r.p.m. 60 Hz<br>3-phase motors | **415 V** | 4 kW | 9 kW | 11 kW |
| | **440 V** | 4 kW | 9 kW | 15 kW |
| | **500 V** | 5.5 kW | 9 kW | 15 kW |
| | **690 V** | 5.5 kW | 9 kW | 15 kW |
| **Rated making capacity AC-3** | | 10 x Ie AC-3 acc. to IEC 60947-4-1 | | |
| **Rated breaking capacity AC-3** | | 8 x Ie AC-3 acc. to IEC 60947-4-1 | | |
| **Short-circuit protection device for contactors** | | | | |
| without thermal overload relay - Motor protection excluded | | | | |
| Ue ≤ 500 V AC - gG type fuse | | 25 A | 32 A | 50 A |
| **Rated short-time withstand current Icw** | **1 s** | 250 A | 300 A | 400 A |
| at 40 °C ambient temperature, | **10 s** | 100 A | 140 A | 210 A |
| in free air from a cold state | **30 s** | 60 A | 80 A | 110 A |
| | **1 min** | 50 A | 60 A | 90 A |
| | **15 min** | 26 A | 30 A | 45 A |
| **Power dissipation per pole** | **Ie / AC-1** | 0.8 W | 1.2 W | 1.8 W |
| | **Ie / AC-3** | 0.1 W | 0.35 W | 0.6 W |
| **Max. electrical switching frequency** | **AC-1** | 600 cycle/h | | |
| | **AC-3** | 1200 cycle/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".

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

| Contactor types | AC operated | A9 | A16 | A26 |
|---|---|---|---|---|
| **Standards** | | UL 508, CSA C22.2 N°14 | | |
| **Max. operational voltage** | | 600 V | | |
| **UL / CSA general use rating** | | | | |
| 600 V AC | | 21 A | 30 A | 40 A |
| With conductor cross-sectional area | | AWG 10 | | AWG 8 |
| **Max. electrical switching frequency** | | | | |
| For general use | | 600 cycles/h | | |

1SBC101864S0201

# A45 ... A75 4-pole contactors
## Technical data

### Main pole - Utilization characteristics according to IEC

| Contactor types | AC operated | A45 | A50 | A75 |
|---|---|---|---|---|
| **Standards** | | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 | | |
| **Rated operational voltage Ue max.** | | 1000 V | | |
| **Rated frequency (without derating)** | | 50 / 60 Hz | | |
| **Conventional free-air thermal current Ith** | | | | |
| acc. to IEC 60947-4-1, open contactors, θ ≤ 40 °C | | 100 A | 100 A | 125 A |
| With conductor cross-sectional area | | 35 mm² | 35 mm² | 50 mm² |
| **AC-1 Utilization category** | | | | |
| For air temperature close to contactor | | | | |
| **Ie / Rated operational current AC-1** | **θ ≤ 40 °C** | 70 A | 100 A | 125 A |
| Ue max. ≤ 690 V, 50/60 Hz | **θ ≤ 55 °C** | 60 A | 85 A | 105 A |
| | **θ ≤ 70 °C** | 50 A | 70 A | 85 A |
| With conductor cross-sectional area | | 25 mm² | 35 mm² | 50 mm² |
| **AC-3 Utilization category** | | | | |
| For air temperature close to contactor θ ≤ 55 °C | | | | |
| **Ie / Max. rated operational current AC-3** (1) | | | | |
| | **220-230-240 V** | 40 A | 53 A | 75 A |
| | **380-400 V** | 37 A | 50 A | 75 A |
|  3-phase motors | **415 V** | 37 A | 50 A | 75 A |
| | **440 V** | 37 A | 45 A | 70 A |
| | **500 V** | 33 A | 45 A | 65 A |
| | **690 V** | 25 A | 35 A | 46 A |
| | **1000 V** | – | 23 A | 28 A |
| **Rated operational power AC-3** (1) | | | | |
| | **220-230-240 V** | 11 kW | 15 kW | 22 kW |
| | **380-400 V** | 18.5 kW | 22 kW | 37 kW |
|  1500 r.p.m. 50 Hz<br>1800 r.p.m. 60 Hz<br>3-phase motors | **415 V** | 18.5 kW | 25 kW | 40 kW |
| | **440 V** | 22 kW | 25 kW | 40 kW |
| | **500 V** | 22 kW | 30 kW | 45 kW |
| | **690 V** | 22 kW | 30 kW | 40 kW |
| | **1000 V** | – | 30 kW | 37 kW |
| **Rated making capacity AC-3** | | 10 x Ie AC-3 acc. to IEC 60947-4-1 | | |
| **Rated breaking capacity AC-3** | | 8 x Ie AC-3 acc. to IEC 60947-4-1 | | |
| **Short-circuit protection device for contactors** | | | | |
| without thermal overload relay - Motor protection excluded | | | | |
| Ue ≤ 500 V AC - gG type fuse | | 80 A | 100 A | 160 A |
| **Rated short-time withstand current Icw** | **1 s** | 1000 A | | |
| at 40 °C ambient temperature, | **10 s** | 650 A | | |
| in free air from a cold state | **30 s** | 370 A | | |
| | **1 min** | 250 A | | |
| | **15 min** | 110 A | 110 A | 135 A |
| **Power dissipation per pole** | **Ie / AC-1** | 2.5 W | 5 W | 7 W |
| | **Ie / AC-3** | 0.65 W | 1.3 W | 2 W |
| **Max. electrical switching frequency** | **AC-1** | 600 cycles/h | | |
| | **AC-3** | 600 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".

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

| Contactor types | AC operated | A45 | A50 | A75 |
|---|---|---|---|---|
| **Standards** | | UL 508, CSA C22.2 N°14 | | |
| **Max. operational voltage** | | 600 V | | |
| **UL / CSA general use rating** | | | | |
| 600 V AC | | 65 A | 80 A | 105 A |
| With conductor cross-sectional area | | AWG 6 | AWG 4 | AWG 2 |
| **Max. electrical switching frequency** | | | | |
| For general use | | 600 cycles/h | | |



1SBC101885S0201

# A9 ... A26 4-pole contactors
# Technical data

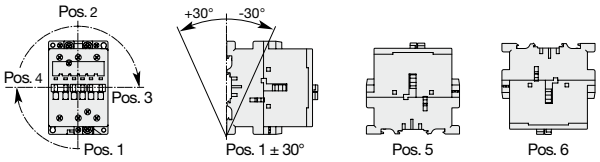


## Magnet system characteristics

| Contactor types | | AC operated | A9 | A16 | A26 |
|---|---|---|---|---|---|
| **Coil operating limits** | | **AC supply** | at θ ≤ 55 °C 0.85...1.1 x Uc<br>Please also refer to "Mounting characteristics and conditions for use" | | |
| acc. to IEC 60947-4-1 | | | | | |
| **AC control voltage 50/60 Hz** | | | | | |
| Rated control circuit voltage Uc | | **at 50 Hz** | 24...690 V | | |
| | | **at 60 Hz** | 24...690 V | | |
| Coil consumption | **Average pull-in value** | **50 Hz** | 70 VA | | 120 VA |
| | | **60 Hz** | 80 VA | | 140 VA |
| | | **50/60 Hz** (1) | 74 VA / 70 VA | | 125 VA / 120 VA |
| | **Average holding value** | **50 Hz** | 8 VA / 2 W | | 12 VA / 3 W |
| | | **60 Hz** | 8 VA / 2 W | | 12 VA / 3 W |
| | | **50/60 Hz** (1) | 8 VA / 2 W | | 12 VA / 3 W |
| **Drop-out voltage** | | | approx. 40...65 % of Uc | | |
| **Operating time** | | | | | |
| Between coil energization and: | | **N.O. contact closing** | 10...26 ms | | 8...21 ms |
| | | **N.C. contact opening** | 7...21 ms | | 6...18 ms |
| Between coil de-energization and: | | **N.O. contact opening** | 4...11 ms | | 4...11 ms |
| | | **N.C. contact closing** | 9...16 ms | | 7...14 ms |

(1) 50/60 Hz coils: see "Coil voltage code table".

## Mounting characteristics and conditions for use

| Contactor types | | AC operated | A9 | A16 | A26 |
|---|---|---|---|---|---|
| **Mounting positions** | | |  | | |
| | | | Max. N.O. or N.C. built-in and add-on N.O. or N.C. auxiliary contacts:<br>see accessory fitting details for 4-pole contactor A9 ... A26 | | |
| **Control voltage / Ambient temperature** | | | | | |
| Mounting positions | 1, 1±30°, 2, 3, 4, 5 | **at θ ≤ 55 °C** | 0.85...1.1 x Uc | | |
| | | **at θ ≤ 70 °C** | Uc | | |
| | 6 | **at θ ≤ 55 °C** | 0.95...1.1 x Uc | | |
| | | **at θ ≤ 70 °C** | unauthorized | | |
| **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 | | |

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# A45 ... A75 4-pole contactors
# Technical data

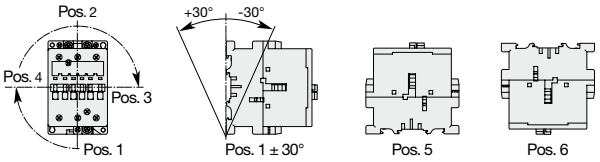


## Magnet system characteristics

| Contactor types | | AC operated | A45 | A50 | A75 |
|---|---|---|---|---|---|
| **Coil operating limits** | | **AC supply** | At θ ≤ 55 °C 0.85...1.1 x Uc | | |
| acc. to IEC 60947-4-1 | | | Please also refer to "Mounting characteristics and conditions for use" | | |
| **AC control voltage** | | | | | |
| Rated control circuit voltage Uc | | **at 50 Hz** | 24…690 V | | |
| | | **at 60 Hz** | 24…690 V | | |
| Coil consumption | **Average pull-in value** | **50 Hz** | 180 VA | | |
| | | **60 Hz** | 210 VA | | |
| | | **50/60 Hz** (1) | 190 VA / 180 VA | | |
| | **Average holding value** | **50 Hz** | 18 VA / 5.5 W | | |
| | | **60 Hz** | 18 VA / 5.5 W | | |
| | | **50/60 Hz** (1) | 18 VA / 5.5 W | | |
| **Drop-out voltage** | | | approx. 40...65 % of Uc | | |
| **Operating time** | | | | | |
| Between coil energization and: | | **N.O. contact closing** | 8…27 ms | | |
| | | **N.C. contact opening** | 7…22 ms | | |
| Between coil de-energization and: | | **N.O. contact opening** | 4…11 ms | | |
| | | **N.C. contact closing** | 7…14 ms | | |

(1) 50/60 Hz coils: see "Coil voltage code table".

## Mounting characteristics and conditions for use

| Contactor types | | AC operated | A45 | A50 | A75 |
|---|---|---|---|---|---|
| **Mounting positions** | | |  | | |
| | | | Pos. 5 unauthorized for A45-22-00, A75-22-00 | | |
| | | | Max. add-on N.O. or N.C. auxiliary contacts:<br>see accessory fitting details for 4-pole contactor A45 ... A75 | | |
| **Control voltage / Ambient temperature** | | | | | |
| Mounting positions (1) | 1, 1±30°, 2, 3, 4, 5 | **at θ ≤ 55 °C** | 0.85…1.1 x Uc | | |
| | | **at θ ≤ 70 °C** | Uc | | |
| | 6 | **at θ ≤ 55 °C** | 0.95…1.1 x Uc | | |
| | | **at θ ≤ 70 °C** | Unauthorized | | |
| **Mounting distances** | | | The contactors can be assembled side by side | | |
| **Fixing** | | | | | |
| On rail according to IEC 60715, EN 60715 | | | 35 x 15 mm or 75 x 25 mm | | |
| By screws (not supplied) | | | 2 x M6 screws placed diagonally | | |

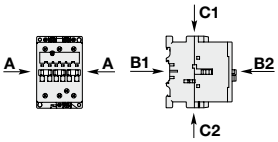
(1) For 60 Hz coil voltage: (only for devices fitted with CA 5-.. and CAL 5-11 auxiliary contacts).
– A45-40-00, A50-40-00 and A75-40-00 contactors.
Mounting positions 1 to 5 and ambient temperature ≤ 55 °C: tolerance reduced to 0.9...1.1 Uc (instead of 0.85...1.1 Uc) for coil voltage codes 70 to 79 and 80 to 89.
– A45-22-00 and A75-22-00 contactors.
Mounting positions 1 to 4 and ambient temperature ≤ 55 °C: tolerance reduced to 0.9...1.1 Uc (instead of 0.85...1.1 Uc) for coil voltage codes 70 to 79 and 80 to 89.
For mounting position 6 or ambient temperature of 55 to 70 °C the information given on this page remains applicable.

1SBC101550S0201 - Rev. B

# A9 ... A26 4-pole contactors
# Technical data

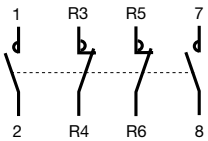


## General technical data

| Contactor types | AC operated | A9 | A16 | A26 |
|---|---|---|---|---|
| **Rated insulation voltage Ui** | | | | |
| acc. to IEC 60947-4-1 | | 1000 V | | |
| acc. to UL / CSA | | 600 V | | |
| **Rated impulse withstand voltage Uimp.** | | 8 kV | | |
| **Ambient air temperature close to contactor** | | | | |
| Operation in free air | | -40...+70 °C | | |
| Storage | | -60...+80 °C | | |
| **Climatic withstand** | | acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II | | |
| **Maximum operating altitude (without derating)** | | 3000 m | | |
| **Mechanical durability** | | | | |
| Number of operating cycles | | 10 millions operating cycles | | |
| Max. switching frequency | | 3600 cycles/h | | |
| **Shock withstand** | | | | |
| acc. to 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, closed or open position | | |
| | **A** | 20 g | | |
| | **B1** | 10 g closed position / 5 g open position | | |
| | **B2** | 15 g | | |
| | **C1** | 20 g | | |
| | **C2** | 20 g | | |



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

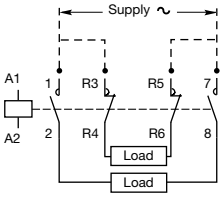



These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising 2 separate loads with a single supply (see diagrams below). When the contactor operates there is no mechanical overlapping between the N.O. poles and the N.C. poles: BREAK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

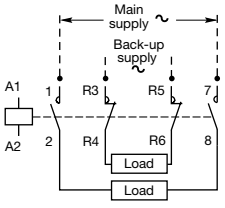
These contactors are not suitable for a reversing starter or for controlling a single load from 2 separate supplies.

**Block diagrams**

– Single supply and 2 separate loads




– 2 separate supplies and 2 separate loads

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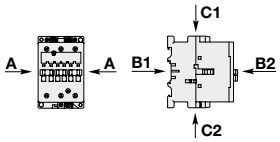
# A45 ... A75 4-pole contactors
# Technical data

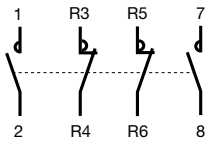


## General technical data

| Contactor types | AC operated | A45 | A50 | A75 |
|---|---|---|---|---|
| **Rated insulation voltage Ui** | | | | |
| acc. to IEC 60947-4-1 | | 1000 V | | |
| acc. to UL / CSA | | 600 V | | |
| **Rated impulse withstand voltage Uimp.** | | 8 kV | | |
| **Ambient air temperature close to contactor** | | | | |
| Operation in free air | | -40...+70 °C | | |
| Storage | | -60...+80 °C | | |
| **Climatic withstand** | | acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II | | |
| **Maximum operating altitude (without derating)** | | 3000 m | | |
| **Mechanical durability** | | | | |
| Number of operating cycles | | 10 millions operating cycles | | |
| Max. switching frequency | | 3600 cycles/h | | |
| **Shock withstand** | | | | |
| acc. to 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, closed or open position | | |
| | **A** | 20 g | | |
| | **B1** | 10 g closed position / 5 g open position | | |
| | **B2** | 15 g | | |
| | **C1** | 20 g | | |
| | **C2** | 20 g | | |



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

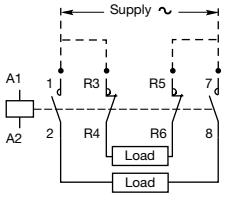



These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising 2 separate loads with a single supply (see diagrams below). When the contactor operates there is no mechanical overlapping between the N.O. poles and the N.C. poles: BREAK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

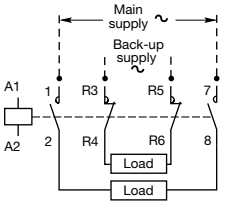
These contactors are not suitable for a reversing starter or for controlling a single load from 2 separate supplies.

**Block diagrams**

– Single supply and 2 separate loads




– 2 separate supplies and 2 separate loads




1SBC101886S0201

# A9 ... A26 4-pole contactors
## Technical data



### Connecting characteristics

| Contactor types | | | AC operated | A9 | A16 | A26 |
|---|---|---|---|---|---|---|
| **Main terminals** | | | |  Screw terminals with cable clamp | | |
| **Connection capacity** (min. ... max.) | | | | | | |
| **Main conductors** (poles) | | | | | | |
| Rigid | Solid (≤ 4 mm²) | | **1 x** | 1...4 mm² | | 1.5...6 mm² |
| | Stranded (≥ 6 mm²) | | **2 x** | 1...4 mm² | | 1.5...6 mm² |
| Flexible with ferrule | | | **1 x** | 0.75...2.5 mm² | | 0.75...4 mm² |
| | | | **2 x** | 0.75...2.5 mm² | | 0.75...4 mm² |
| Bars or lugs | | | **L <** | 7.7 mm | | 10 mm |
| | | | **I <** | 3.7 mm | | 4.2 mm |
| Connection capacity acc. to UL / CSA | | | **1 or 2 x** | AWG 18...10 | | AWG 12...8 |
| Tightening torque | Recommended | | | 1 Nm / 9 lb.in | | 1.7 Nm / 15 lb.in |
| | Max. | | | 1.2 Nm | | 2.2 Nm |
| **Auxiliary conductors** (coil terminals) | | | | | | |
| Rigid solid | | | **1 x** | 1...4 mm² | | |
| | | | **2 x** | 1...4 mm² | | |
| Flexible with ferrule | | | **1 x** | 0.75...2.5 mm² | | |
| | | | **2 x** | 0.75...2.5 mm² | | |
| Lugs | | | **L <** | 7.7 mm | | (1) |
| | | | **I <** | 3.7 mm | | (1) |
| Connection capacity acc. to UL / CSA | | | **1 or 2 x** | AWG 18...14 | | |
| Tightening torque | Recommended | | | 1 Nm / 9 lb.in | | |
| | Max. | | | 1.2 Nm | | |
| **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 | | M4 |
| | | **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 | | |
| Coil terminals | | | | M3.5 | | |
| | | **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 | | |

(1) L ≤ 8 and I > 3.7 for coil terminals - L ≤ 10 and I > 4.2 for built-in auxiliary terminals.

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# A45 ... A75 4-pole contactors
## Technical data

### Connecting characteristics

| Contactor types | | | AC operated | A45 | A50 | A75 |
|---|---|---|---|---|---|---|
| **Main terminals** | | | |  Screw terminals with single connector (13 x 10 mm) | | |
| **Connection capacity** (min. ... max.) | | | | | | |
| **Main conductors** (poles) | | | | | | |
| Rigid | Solid (≤ 4 mm²) | | **1 x** | 6...50 mm² | | |
| | Stranded (≥ 6 mm²) | | **2 x** | 6...25 mm² | | |
| Flexible with ferrule | | | **1 x** | 6...35 mm² | | |
| | | | **2 x** | 6...16 mm² | | |
| Bars or lugs | | | **L <** | – | | |
| | | | **I <** | – | | |
| Connection capacity acc. to UL / CSA | | | **1 or 2 x** | AWG 8...1 | | |
| Tightening torque | Recommended | | | 4.00 Nm / 35 lb.in | | |
| | Max. | | | 4.50 Nm | | |
| **Auxiliary conductors** (coil terminals) | | | | | | |
| Rigid solid | | | **1 x** | 1...4 mm² | | |
| | | | **2 x** | 1...4 mm² | | |
| Flexible with ferrule | | | **1 x** | 1...2.5 mm² | | |
| | | | **2 x** | 0.75...2.5 mm² | | |
| Lugs | | | **L <** | 8 mm | | |
| | | | **I <** | 3.7 mm | | |
| Connection capacity acc. to UL / CSA | | | **1 or 2 x** | AWG 18...14 | | |
| Tightening torque | Recommended | | | 1.00 Nm / 9 lb.in | | |
| | Max. | | | 1.20 Nm | | |
| **Degree of protection** acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 | | | | | | |
| Main terminals | | | | IP10 | | |
| Coil terminals | | | | IP20 | | |
| **Screw terminals** | | | | Delivered in open position, screws of unused terminals must be tightened | | |
| Main terminals | | | | M6 | | |
| | | **Screwdriver type** | | Flat Ø 6.5 / Pozidriv 2 | | |
| Coil terminals | | | | M3.5 | | |
| | | **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 | | |



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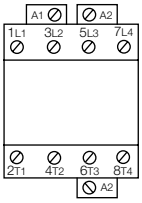
# A9 ... A75  4-pole contactors
## Terminal marking and positioning

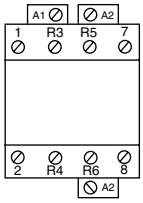
### A9 ... A75 contactors - AC operated

Standard devices without addition of auxiliary contacts

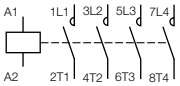




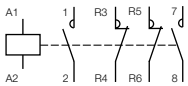

**A9 ... A75-40-00**




**A9 ... A75-22-00**




**A9 ... A75-40-00**




**A9 ... A75-22-00**

1SBC101888S0201

# N 4-pole contactor relays
## AC operated


N40E

### Description

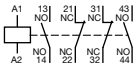
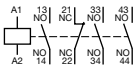
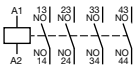
N contactor relays are used for switching auxiliary circuits and control circuits.

These contactor relays are of the block type design with:

– 4 poles. Contactor relays have mechanically linked auxiliary contact elements
– control circuit: AC operated
– add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

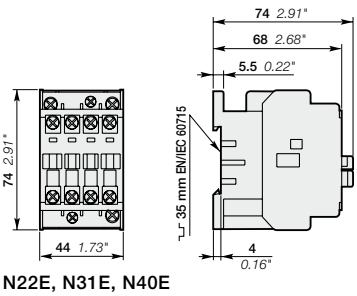
3

### Ordering details

| Number of contacts | Rated control circuit voltage Uc (1) V 50 Hz | V 60 Hz | Type | Order code | | Weight Pkg (1 pce) kg |
|---|---|---|---|---|---|---|
|  | 24 | 24 | N22E | 1SBH141001R8122 | | 0.340 |
| | 48 | 48 | N22E | 1SBH141001R8322 | | 0.340 |
| | 110 | 110...120 | N22E | 1SBH141001R8422 | | 0.340 |
| | 220...230 | 230...240 | N22E | 1SBH141001R8022 | | 0.340 |
| | 230...240 | 240...260 | N22E | 1SBH141001R8822 | | 0.340 |
| | 380...400 | 400...415 | N22E | 1SBH141001R8522 | | 0.340 |
| | 400...415 | 415...440 | N22E | 1SBH141001R8622 | | 0.340 |
|  | 24 | 24 | N31E | 1SBH141001R8131 | | 0.340 |
| | 48 | 48 | N31E | 1SBH141001R8331 | | 0.340 |
| | 110 | 110...120 | N31E | 1SBH141001R8431 | | 0.340 |
| | 220...230 | 230...240 | N31E | 1SBH141001R8031 | | 0.340 |
| | 230...240 | 240...260 | N31E | 1SBH141001R8831 | | 0.340 |
| | 380...400 | 400...415 | N31E | 1SBH141001R8531 | | 0.340 |
| | 400...415 | 415...440 | N31E | 1SBH141001R8631 | | 0.340 |
|  | 24 | 24 | N40E | 1SBH141001R8140 | | 0.340 |
| | 48 | 48 | N40E | 1SBH141001R8340 | | 0.340 |
| | 110 | 110...120 | N40E | 1SBH141001R8440 | | 0.340 |
| | 220...230 | 230...240 | N40E | 1SBH141001R8040 | | 0.340 |
| | 230...240 | 240...260 | N40E | 1SBH141001R8840 | | 0.340 |
| | 380...400 | 400...415 | N40E | 1SBH141001R8540 | | 0.340 |
| | 400...415 | 415...440 | N40E | 1SBH141001R8640 | | 0.340 |

(1) Other control voltages see voltage code table.

### Main dimensions mm, *inches*




N22E, N31E, N40E

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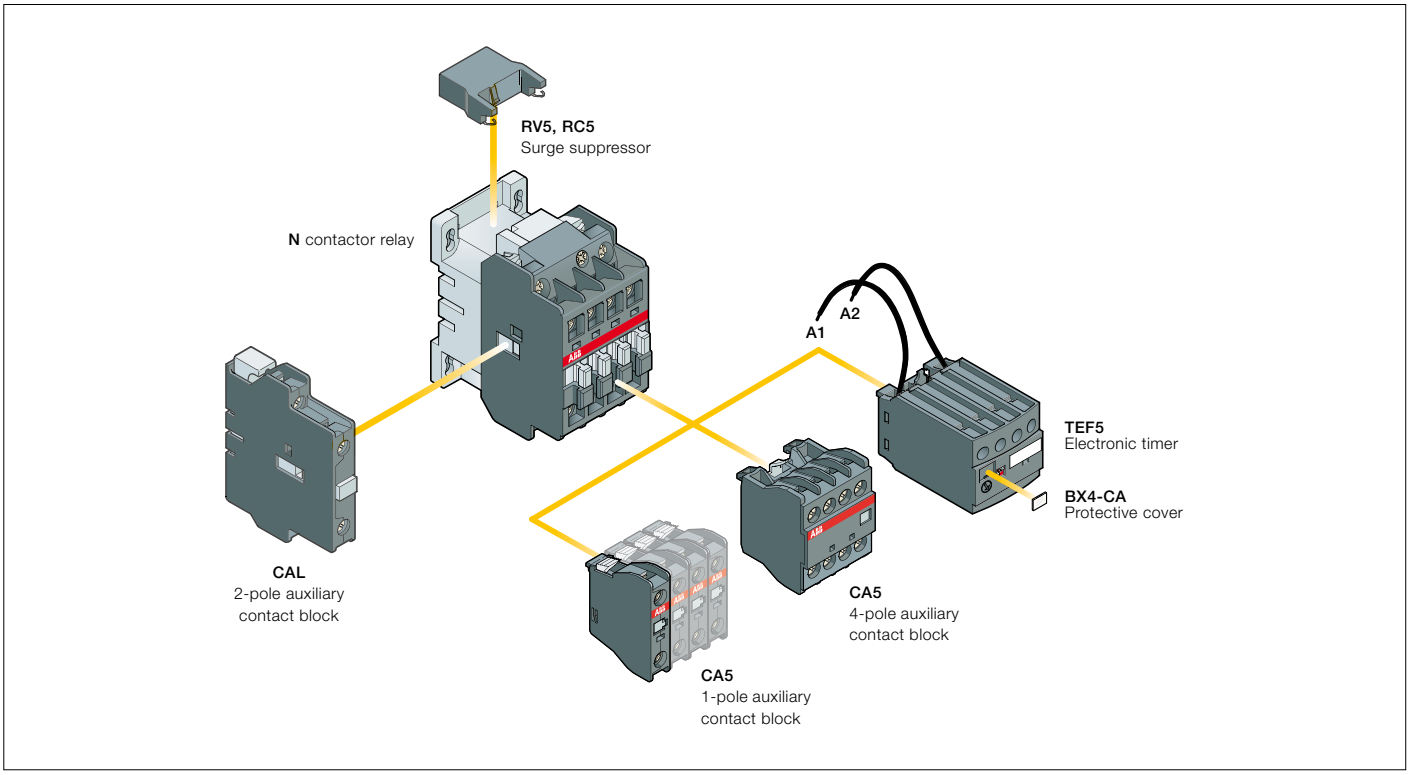
# N 4-pole contactor relays
## Main accessories

3

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




### Main accessory fitting details

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

| Contactor types | Main poles | Front-mounted accessories | | | | | | Side-mounted accessories | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Auxiliary contact blocks | | | | Electronic timer | | Auxiliary contact blocks | | |
| | | 1-pole CA5 | | 4-pole CA5 | | TEF5 | | 2-pole CAL5-11 | | |
| N | 2 2 E (1)<br>3 1 E (1)<br>4 0 E | 1 to 4 x CA5 | or | 1 x CA5 (4-pole) | or | 1 x TEF5 | + | 1 to 2 x CAL5-11 | | |

(1) 2 N.C. front mounted auxiliary contacts maximum in mounting position 5.

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# N 4-pole contactor relays
## Main accessories


1SBC580992F0301

CA5-10


1SBC573752F0301

CAL5-11


1SBC101396F0014

TEF5-OFF


1SBC574001F0301

RV5/50

### Ordering details (1)

| For contactors | Auxiliary contacts | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|
| **Front-mounted instantaneous auxiliary contact blocks** | | | | | | |
| 4-pole N | 1 – | CA5-10 | 1SBN010010R1010 | | 10 | 0.014 |
| | – 1 | CA5-01 | 1SBN010010R1001 | | 10 | 0.014 |
| | 2 2 | CA5-22N | 1SBN010040R1222 | | 2 | 0.060 |
| **Side-mounted instantaneous auxiliary contact block** | | | | | | |
| N | 1 1 | CAL5-11 | 1SBN010020R1011 | | 2 | 0.050 |

| For contactors | Time delay range selected by switch | Delay type | Auxiliary contacts | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|---|
| **Electronic timers** | | | | | | | | |
| 4-pole N | 0.1...1 s<br>1...10 s<br>10...100 s | ON-delay | 1 1 | TEF5-ON | 1SBN020312R1000 | | 1 | 0.065 |
| | | OFF-delay | 1 1 | TEF5-OFF | 1SBN020314R1000 | | 1 | 0.065 |

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

| For contactors | Rated control circuit voltage Uc V | AC | DC | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|---|
| **Surge suppressors** | | | | | | | | |
| N | 24...50 | ● | ● | RV5/50 | 1SBN050010R1000 | | 2 | 0.015 |
| | 50...133 | ● | ● | RV5/133 | 1SBN050010R1001 | | 2 | 0.015 |
| | 110...250 | ● | ● | RV5/250 | 1SBN050010R1002 | | 2 | 0.015 |
| | 250...440 | ● | ● | RV5/440 | 1SBN050010R1003 | | 2 | 0.015 |
| N | 24...50 | ● | – | RC5-1/50 | 1SBN050100R1000 | | 2 | 0.012 |
| | 50...133 | ● | – | RC5-1/133 | 1SBN050100R1001 | | 2 | 0.012 |
| | 110...250 | ● | – | RC5-1/250 | 1SBN050100R1002 | | 2 | 0.012 |
| | 250...440 | ● | – | RC5-1/440 | 1SBN050100R1003 | | 2 | 0.012 |

(1) See "Main accessory fitting details" table.

# N contactor relays
# Technical data



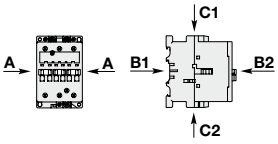
## Contact utilization characteristics according to IEC

| Contactor relay types | AC operated | N |
|---|---|---|
| Standards | | IEC 60947-1 / 60947-5-1 and EN 60947-1 / 60947-5-1 |
| Rated operational voltage Ue max. | | 690 V |
| Rated frequency (without derating) | | 50 / 60 Hz |
| Conventional free-air thermal current Ith $\theta \leq 40$ °C | | 16 A |
| Ie / Rated operational current AC-15 | | |
| acc. to IEC 60947-5-1 | 24-127 V 50/60 Hz | 6 A |
| | 230-240 V 50/60 Hz | 4 A |
| | 400-415 V 50/60 Hz | 3 A |
| | 500 V 50/60 Hz | 2 A |
| | 690 V 50/60 Hz | 2 A |
| Rated making capacity AC-15 | | 10 x Ie AC-15 acc. to IEC 60947-5-1 |
| Rated 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 | 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 | 0.30 A / 66 W |
| | 250 V DC | 0.30 A / 75 W |
| Short-circuit protection device for contactors | | |
| Ue ≤ 500 V AC - gG type fuse | | 10 A |
| Rated short-time withstand current Icw | | |
| at 40 °C ambient temperature, in free air from a cold state | for 1.0 s | 100 A |
| | for 0.1 s | 140 A |
| Minimum switching capacity | | 17 V / 5 mA |
| with failure rate acc. to IEC 60947-5-4 | | $10^{-6}$ |
| Non-overlapping time between N.O. and N.C. contacts | | ≥ 2 ms |
| Power dissipation per pole at 6 A | | 0.1 W |
| Max. electrical switching frequency | AC-15 | 1200 cycles/h |

## Contact utilization characteristics according to UL / CSA

| Contactor relay types | AC operated | N |
|---|---|---|
| Standards | | UL 508, CSA C22.2 N°14 |
| Max. operational voltage | | 600 V AC |
| Pilot duty | | A600, Q300 |

## General technical data

| Contactor relay types | AC operated | N |
|---|---|---|
| Rated insulation voltage Ui | | |
| acc. to IEC 60947-5-1 | | 690 V |
| acc. to UL / CSA | | 600 V |
| Rated impulse withstand voltage Uimp. | | 8 kV |
| Ambient air temperature | | |
| Operation in free air | | -40...+70 °C |
| Storage | | -60...+80 °C |
| Climatic withstand | | acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II |
| Maximum operating altitude (without derating) | | 3000 m |
| Mechanical durability | | |
| Number of operating cycles | | ≥ 20 millions operating cycles |
| Max. switching frequency | | 6000 cycles/h |
| Shock withstand | | |
| acc. to 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, closed or open position |
| | A | 20 g |
| | B1 | 5 g |
| | B2 | 15 g |
| | C1 | 20 g |
| | C2 | 20 g |



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# N contactor relays
# Technical data

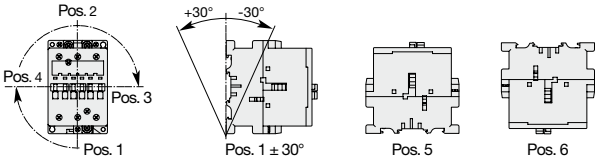


## Magnet system characteristics

| | | | |
|---|---|---|---|
| **Contactor relay types** | | **AC operated** | **N** |
| **Coil operating limits** | | **AC supply** | at θ ≤ 55 °C 0.85...1.1 x Uc |
| acc. to IEC 60947-4-1 | | | Please also refer to "Mounting characteristics and conditions for use" |
| **AC control voltage 50/60 Hz** | | | |
| Rated control circuit voltage Uc | | **at 50 Hz** | 24...690 V |
| | | **at 60 Hz** | 24...690 V |
| Coil consumption | **Average pull-in value** | **50 Hz** | 70 VA |
| | | **60 Hz** | 80 VA |
| | | **50/60 Hz** (1) | 74 VA / 70 VA |
| | **Average holding value** | **50 Hz** | 8 VA / 2 W |
| | | **60 Hz** | 8 VA / 2 W |
| | | **50/60 Hz** (1) | 8 VA / 2 W |
| **Drop-out voltage** | | | approx. 40...65 % of Uc |
| **Operating time** | | | |
| Between coil energization and: | | **N.O. contact closing** | 10...26 ms |
| | | **N.C. contact opening** | 7...21 ms |
| Between coil de-energization and: | | **N.O. contact opening** | 4...11 ms |
| | | **N.C. contact closing** | 9...16 ms |

(1) 50/60 Hz coils: see "Coil voltage code table".

## Mounting characteristics and conditions for use

| | | | |
|---|---|---|---|
| **Contactor relay types** | | **AC operated** | **N** |
| **Mounting positions** | | |  |
| | | | Max. N.O. or N.C. built-in and add-on N.O. or N.C. auxiliary contacts: see accessory fitting details for contactor relays |
| **Control voltage / Ambient temperature** | | | |
| Mounting positions | 1, 1±30°, 2, 3, 4, 5 | **at θ ≤ 55 °C** | 0.85...1.1 x Uc |
| | | **at θ ≤ 70 °C** | Uc |
| | 6 | **at θ ≤ 55 °C** | 0.95...1.1 x Uc |
| | | **> 55 °C** | unauthorized |
| **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

| | | | |
|---|---|---|---|
| **Contactor relay types** | | **AC operated** | **N** |
| **Main terminals** | | |  |
| | | | Screw terminals with cable clamp |
| **Connection capacity** (min. ... max.) | | | |
| **Main conductors** (poles) | | | |
| Rigid | | **1 x** | 1...4 mm² |
| | | **2 x** | 1...4 mm² |
| Flexible with ferrule | | **1 x** | 0.75...2.5 mm² |
| | | **2 x** | 0.75...2.5 mm² |
| Bars or lugs | Pole terminals | **L <** | 7.7 mm |
| | | **I <** | 3.7 mm |
| | Coil terminals | **L <** | 8 mm |
| | | **I <** | 3.7 mm |
| Connection capacity acc. to UL / CSA | | **1 or 2 x** | AWG 18...14 |
| Tightening torque | Recommended | | 1 Nm / 9 lb.in |
| | Max. | | 1.20 Nm |
| **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 Ø 5.5 / Pozidriv 2 |

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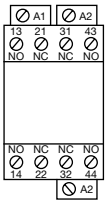
# N 4-pole contactor relays
## Terminal marking and positioning

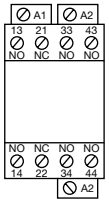


### N contactor relays - AC operated

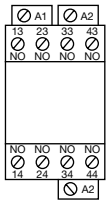
Standard devices without addition of auxiliary contacts



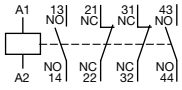

N22E



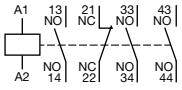

N31E



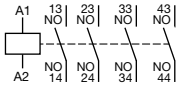

N40E




N22E

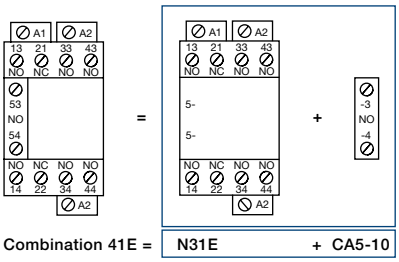



N31E

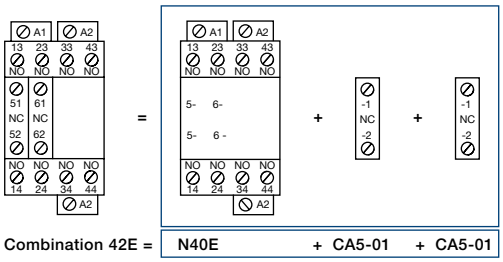



N40E

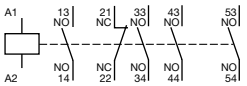
Other possible contact combinations with auxiliary contacts added by the user



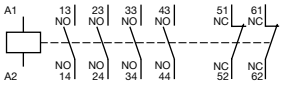

Combination 41E = N31E + CA5-10



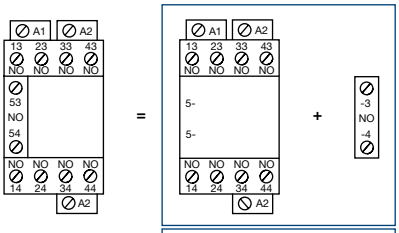

Combination 42E = N40E + CA5-01 + CA5-01



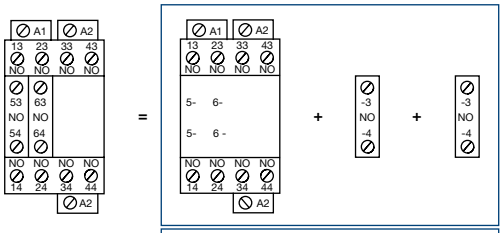

Combination 41E




Combination 42E

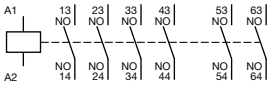



Combination 50E = N40E + CA5-10




Combination 60E = N40E + CA5-10 + CA5-10


Combination 50E




Combination 60E



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# Notes

# Auxiliary contact blocks


CA5-10




CA5-40E


CAL5-11


CAL18-11

## Description

The auxiliary contact blocks are used for the operation of auxiliary circuits and control circuits for standard industrial environments.

Types of auxiliary contact blocks for front mounting:

– CA5 1 or 4-pole block, instantaneous with N.O., N.C. contacts
– CC5 1-pole block, with N.O. leading contact or N.C. lagging contact.

Select the 4-pole auxiliary contact blocks CA5 type, according to the contactor type for compliance with the standard requirements (see "Terminal marking and positioning").

Types of auxiliary contact blocks for side mounting:

– CAL 2-pole block instantaneous N.O. + N.C. contacts.

For clipping onto the right- and/or left-hand side of the contactors.

The CAL18-11B is a second block for mounting in addition to a first CAL18-11 block, right- and/or left-hand of the A145 ... A300 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.

## Ordering details (1)

| For contactors | Auxiliary contacts | | | | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|---|---|
| **Front-mounted instantaneous auxiliary contact blocks, 1-pole** | | | | | | | | | |
| A9 ... A110<br>N 4-pole | 1 | 0 | – | – | CA5-10 | 1SBN010010R1010 | | 10 | 0.014 |
| | 0 | 1 | – | – | CA5-01 | 1SBN010010R1001 | | 10 | 0.014 |
| | – | – | 1 | 0 | CC5-10 | 1SBN010011R1010 | | 10 | 0.014 |
| | – | – | 0 | 1 | CC5-01 | 1SBN010011R1001 | | 10 | 0.014 |
| **Front-mounted instantaneous auxiliary contact blocks, 4-pole** | | | | | | | | | |
| A9 ... A26-40-00<br>A9 ... A26-22-00<br>A45 ... A110 | 2 | 2 | – | – | CA5-22E | 1SBN010040R1022 | | 2 | 0.060 |
| | 3 | 1 | – | – | CA5-31E | 1SBN010040R1031 | | 2 | 0.060 |
| | 4 | 0 | – | – | CA5-40E | 1SBN010040R1040 | | 2 | 0.060 |
| | 0 | 4 | – | – | CA5-04E | 1SBN010040R1004 | | 2 | 0.060 |
| | 1 | 1 | 1 | 1 | CA5-11/11E | 1SBN010040R1018 | | 2 | 0.060 |
| A9 ... A40-30-10 | 2 | 2 | – | – | CA5-22M | 1SBN010040R1122 | | 2 | 0.060 |
| | 3 | 1 | – | – | CA5-31M | 1SBN010040R1131 | | 2 | 0.060 |
| | 1 | 3 | – | – | CA5-13M | 1SBN010040R1113 | | 2 | 0.060 |
| | 0 | 4 | – | – | CA5-04M | 1SBN010040R1104 | | 2 | 0.060 |
| | 1 | 1 | 1 | 1 | CA5-11/11M | 1SBN010040R1118 | | 2 | 0.060 |
| A9 ... A40-30-01 | 2 | 2 | – | – | CA5-22U | 1SBN010040R1322 | | 2 | 0.060 |
| | 3 | 1 | – | – | CA5-31U | 1SBN010040R1331 | | 2 | 0.060 |
| | 4 | 0 | – | – | CA5-40U | 1SBN010040R1340 | | 2 | 0.060 |
| | 0 | 4 | – | – | CA5-04U | 1SBN010040R1304 | | 2 | 0.060 |
| N 4-pole | 2 | 2 | – | – | CA5-22N | 1SBN010040R1222 | | 2 | 0.060 |
| | 3 | 1 | – | – | CA5-31N | 1SBN010040R1231 | | 2 | 0.060 |
| | 1 | 3 | – | – | CA5-13N | 1SBN010040R1213 | | 2 | 0.060 |
| | 0 | 4 | – | – | CA5-04N | 1SBN010040R1204 | | 2 | 0.060 |
| | 4 | 0 | – | – | CA5-40N | 1SBN010040R1240 | | 2 | 0.060 |
| **Side-mounted instantaneous auxiliary contact blocks, 2-pole** | | | | | | | | | |
| A9 ... A75<br>N | 1 | 1 | – | – | CAL5-11 | 1SBN010020R1011 | | 2 | 0.050 |
| A9 ... A16<br>N | – | – | 1 | 1 | CCL5-11 | 1SBN011421R1008 | | 2 | 0.050 |
| A95 ... A300 | 1 | 1 | – | – | CAL18-11 | 1SFN010720R1011 | | 2 | 0.050 |
| A145 ... A300 (2) | 1 | 1 | – | – | CAL18-11B | 1SFN010720R3311 | | 2 | 0.050 |

(1) For each contactor type, refer to "Accessory fitting details" table.
(2) 2 blocks CAL18-11 + 2 blocks CAL18-11B.

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# Auxiliary contact blocks



## Technical data

| Types | | Front mounted<br>1-pole **CA5**, 1-pole **CC5**,<br>4-pole **CA5** | Side mounted<br>**CAL5-11, CCL5-11** | **CAL18-11, CAL18-11B** |
|---|---|---|---|---|

## Contact utilization characteristics according to IEC

| | | | | |
|---|---|---|---|---|
| **Standards** | | IEC 60947-5-1 and EN 60947-5-1 | | |
| **Rated insulation voltage Ui** | | | | |
| acc. to IEC 60947-5-1 | | 690 V | | |
| **Rated operational voltage Ue max.** | | 24...690 V AC | | |
| **Conventional thermal current Ith - θ ≤ 40 °C** | | 16 A | | |
| **Ie / Rated operational current AC-15** | | | | |
| acc. to IEC 60947-5-1 | **24-127 V 50/60 Hz** | 6 A | | |
| | **220-240 V 50/60 Hz** | 4 A | | |
| | **380-440 V 50/60 Hz** | 3 A | | |
| | **500-690 V 50/60 Hz** | 2 A | | |
| **Making capacity** | | 10 x Ie AC-15 acc. to IEC 60947-5-1 | | |
| **Breaking capacity** | | 10 x Ie AC-15 acc. to IEC 60947-5-1 | | |
| **Ie / Rated operational current 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** | 0.3 A / 66 W | | |
| | **250 V DC** | 0.3 A / 75 W | | |
| **Short-circuit protection device gG type fuse** | | 10 A | | |
| **Rated short-time withstand current Icw** | **for 1.0 s** | 100 A | | |
| θ = 40 °C | **for 0.1 s** | 140 A | | |
| **Minimum switching capacity** | | | | |
| A40 ... A75 contactors | | 17 V / 1 mA | | – |
| with failure rate acc. to IEC 60947-5-4 | | ≤ $10^{-7}$ | | – |
| A95 ... A110 contactors | | 24 V / 50 mA | – | 24 V / 50 mA (0.5 million of operating cycles) |
| with failure rate acc. to IEC 60947-5-4 | | – | – | ≤ 10-6 |
| **Power dissipation per pole at 6 A** | | 0.1 W | | 0.15 W |
| **Mechanical durability** | | | | |
| Number of operating cycles | | 10 millions (A9 ... A75)<br>3 millions (A95 ... A110) | 10 millions | 5 millions (A95 ... A185)<br>3 millions (A210 ... A300) |
| Max. switching frequency | | 3600 cycles/h | | |
| **Electrical durability** | | | | |
| Number of operating cycles | | see "Electrical durability" curves | | |
| Max. switching frequency | **AC-15** | 1200 cycles/h | | |
| | **DC-13** | 900 cycles/h | | |

## Contact utilization characteristics according to UL / CSA

| | | | | |
|---|---|---|---|---|
| **Standards** | | UL 508, CSA C22.2 N°14 | | |
| **Max. operational voltage** | | 600 V AC, 250 V DC | | |
| **Pilot duty** | | A600, Q300 | | |
| AC thermal rated current | | 10 A | | |

## Connecting characteristics

| | | | | |
|---|---|---|---|---|
| **Connection capacity** (min. ... max.) | | | | |
| Rigid solid | **1 x** | 1...4 mm² | | |
| | **2 x** | 1...4 mm² | | |
| Flexible with ferrule | **1 x** | 0.75...2.5 mm² | | |
| | **2 x** | 0.75...2.5 mm² | | |
| Lugs | **L ≤** | 7.7 mm | 8 mm | |
| | **I >** | 3.7 mm | 3.7 mm | |
| Connection capacity acc. to UL / CSA | **1 or 2 x** | AWG 18...14 | | |
| Tightening torque | | 1 Nm / 9 lb.in | | |
| **Degree of protection** | **Terminals** | IP20 | | |
| acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 | | | | |
| **Screw terminals** | | Delivered in open position, screws of unused terminals must be tightened | | |
| All terminals | | M3.5 | | |
| **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 | | |

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# Add-on auxiliary contacts
## Terminal marking and positioning



### 1-pole auxiliary contacts

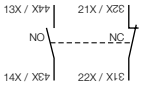

**CA5-01**


**CA5-10**

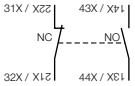

**CC5-01**


**CC5-10**

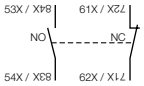
### 2-pole auxiliary contacts



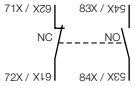

**CAL5-11, CAL18-11**
(L. h. s. mounted)



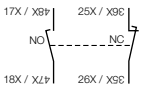

**CAL5-11, CAL18-11**
(R. h. s. mounted)



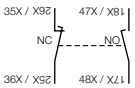

**CAL18-11B**
(L. h. s. mounted)




**CAL18-11B**
(R. h. s. mounted)

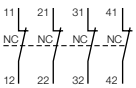



**CCL5-11**
(L. h. s. mounted)

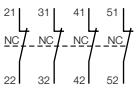



**CCL5-11**
(R. h. s. mounted)

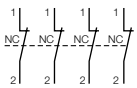
### 4-pole auxiliary contacts



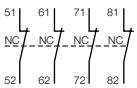

**CA5-04E**



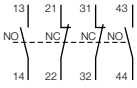

**CA5-04M**



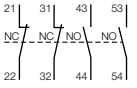

**CA5-04U**



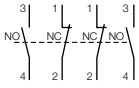

**CA5-04N**



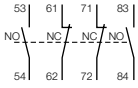

**CA5-22E**



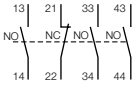

**CA5-22M**



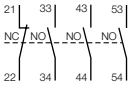

**CA5-22U**



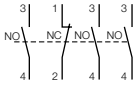

**CA5-22N**



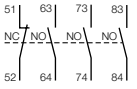

**CA5-31E**



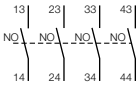

**CA5-31M**



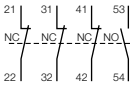

**CA5-31U**



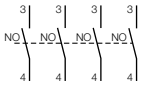

**CA5-31N**



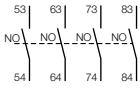

**CA5-40E**



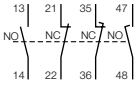

**CA5-13M**



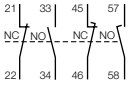

**CA5-40U**



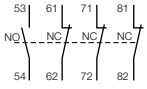

**CA5-40N**




**CA5-11/11E**




**CA5-11/11M**




**CA5-13N**

1SBC101893S0201

# Electronic timers


**TEF5-OFF**

## Description

TEF5 frontal electronic timers are used for realizing timing function and are available in ON-delay and OFF-delay versions.

**Compact solution in cabinet compared to separate timers**

TEF5 electronic timers are front-mounted and locked on A contactors or N contactor relays.
A mechanical indicator allows to show the state of the contactor.

TEF5 electronic timers are supplied by direct wiring to the coil terminals A1 - A2 of the contactor or contactor relay. A varistor is integrated on the timer to offer a built-in protection against surges in the contactor coil.

**Available for a wide control voltage range 24...240 V AC / DC**

TEF5-ON or TEF5-OFF allow time-delayed functions up to 100 s in 3 distinct time ranges, independently of the control system. The time delay ranges are selected by a switch and the time delay can be adjusted by means of a rotary switch. The timing function is activated by closing or opening the device on which the timer is mounted. The OFF-delay version operates without additional control supply.

## Ordering details

| For contactors, contactor relays | Time delay range selected by switch | Delay type | Rated control circuit voltage Uc<br>V 50/60 Hz or DC | Auxiliary contacts | Type | Order code | | Weight<br>Pkg (1 pce)<br>kg |
|---|---|---|---|---|---|---|---|---|
| A9 ... A75<br>N | 0.1...1 s<br>1...10 s<br>10...100 s | ON-delay | 24...240 | 1 1 | TEF5-ON | 1SBN020312R1000 | | 0.065 |
| | | OFF-delay | 24...240 | 1 1 | TEF5-OFF | 1SBN020314R1000 | | 0.065 |



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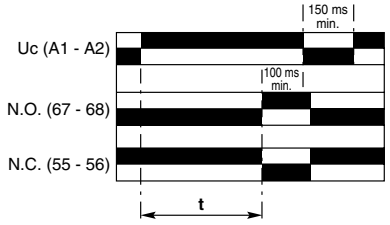
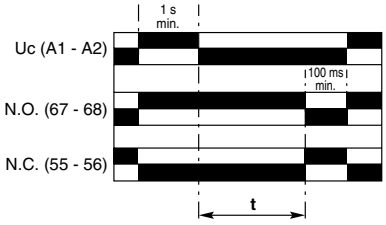
# Electronic timers
# Technical data

## Contact utilization characteristics according to IEC

| Types | | | TEF5-ON | TEF5-OFF |
|---|---|---|---|---|
| **Standards** | | | IEC 60947-5-1 and EN 60947-5-1 | |
| **Rated insulation voltage Ui** | | | | |
| acc. to IEC 60947-5-1 | | | 400 V | |
| **Rated impulse withstand voltage Uimp** | | | 4 kV | |
| **Rated operational voltage Ue max.** | | | 240 V | |
| **Rated frequency (without derating)** | | | 50 / 60 Hz | |
| **Conventional thermal current Ith - θ ≤ 40 °C** | | | 5 A | |
| **Ie / Rated operational current AC-15** | | | | |
| acc. to IEC 60947-5-1 | | **24-127 V 50/60 Hz** | 3 A | |
| | | **220-240 V 50/60 Hz** | 1.5 A | |
| **Making capacity** | | | 10 x Ie AC-15 acc. to IEC 60947-5-1 | |
| **Breaking capacity** | | | 10 x Ie AC-15 acc. to IEC 60947-5-1 | |
| **Ie / Rated operational current DC-13** | | | | |
| acc. to IEC 60947-5-1 | | **24 V DC** | 1 A / 24 W | |
| **Short-circuit protection device gG type fuse** | | | 6 A | |
| **Rated short-time withstand current Icw** | | **for 1.0 s** | 8 A | |
| θ = 40 °C | | **for 0.1 s** | 8 A | |
| **Minimum switching capacity** | | | 12 V / 3 mA | |
| with failure rate acc. to IEC 60947-5-4 | | **24 V DC** | $10^{-7}$ | |
| **Power dissipation per pole at 3 A** | | | 0.1 W | |
| **Function diagram** | | | ON-delay | OFF-delay |
| | | |  |  |
| | | | Bistable relay inside.<br>Before use, once apply Uc then switch it off in order to initialize position of the contacts. | |
| **Control circuit voltage** | | | | |
| **AC control voltage** | Rated control circuit voltage Uc | | 24...240 V AC | |
| 50/60 Hz | Average consumption | | 1.5 mA RMS | 1 mA RMS |
| **DC control voltage** | Rated control circuit voltage Uc | | 24...240 V DC | |
| | Average consumption | | 1.5 mA | 1 mA |
| Rated frequency limits | | | 50 / 60 Hz | |
| Supply voltage range | | | 0.85...1.1 x Uc (at θ ≤ 70 °C) | |
| Overvoltage protection | | | Varistor included | |
| **Time delay range (t) selected by switch** | | **0.1...1 s** |  | |
| | | **1...10 s** |  | |
| | | **10...100 s** |  | |
| On-load reiteration accuracy under constant conditions | | | ≤ 1 % | |
| Minimum ON period | | | 0.1 s | 1 s |
| Recovery time | | | 0.15 s | 0.1 s |
| **Ambient air temperature** | Operation | | -25 °C ... +70 °C | |
| | Storage | | -40 °C ... +80 °C | |
| **Climatic withstand** | | | Category B according to IEC 60947-1 Annex Q | |
| **Maximum operating altitude** | | | 2000 m | |
| **Mounting positions** | | | Acc. to mounting positions permitted on contactors or contactor relays | |
| **Shock withstand** | | | 1/2 sinusoidal shock for 11 ms: no change in contact position | |
| acc. to IEC 60068-2-27 and EN 60068-2-27 | | | Same as contactor or contactor relay | |
| (Mounting position 1) | | | | |
| **Mechanical durability** | | | | |
| | Number of operating cycles | | 5 millions operating cycles | |
| | Max. switching frequency | | 3600 cycles/h | 1800 cycles/h |
| **Max. electrical switching frequency** | | | | |
| | | **AC-15** | 1200 cycles/h | |
| | | **DC-13** | 900 cycles/h | |

1SBC101674S0201

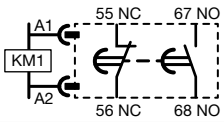
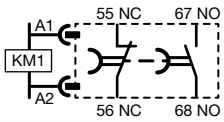
# Electronic timers
## Technical data



### Contact utilization characteristics according to UL / CSA

| Types | TEF5-ON | TEF5-OFF |
|---|---|---|
| **Standards** | UL 508, CSA C22.2 N°14 | |
| **Rated insulation voltage Ui** | | |
| acc. to UL / CSA | 300 V | |
| **Max. operational voltage** | 240 V | |
| **Pilot duty** | B300, R300 | |
| AC thermal rated current | 5 A | |
| AC maximum volt-ampere making | 3600 VA | |
| AC maximum volt-ampere breaking | 360 VA | |
| DC thermal rated current | 1 A | |
| DC maximum volt-ampere making-breaking | 28 VA | |

### Connecting characteristics

| | | |
|---|---|---|
| **Connection capacity** (min. ... max.) | | |
| Rigid solid | **1 x** | 1...2.5 mm² |
| | **2 x** | 1...2.5 mm² |
| Flexible with non insulated ferrule | **1 x** | 0.75...2.5 mm² |
| | **2 x** | 0.75...2.5 mm² |
| Flexible with insulated ferrule | **1 x** | 0.75...2.5 mm² |
| | **2 x** | 0.75...1.5 mm² |
| Lugs | **L ≤** | 8 mm |
| | **I >** | 3.7 mm |
| Connection capacity acc. to UL / CSA | **1 or 2 x** | AWG 18...14 |
| Stripping length | | 10 mm |
| Tightening torque | | 1 N.m / 9 lb.in |
| **Degree of protection** acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 | | IP20 |
| **Screw terminals** | | Delivered in open position, screws of unused terminals should be tightened |
| All terminals | | M3.5 |
| **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 |
| **Terminal Marking** | |   |



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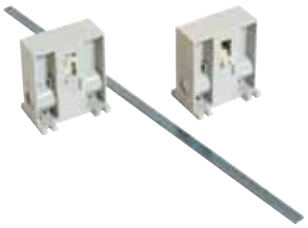
# Mechanical and electrical interlock units




**VM300H**




**VM300V**


**VE5-1**

## Description

When mounted between two contactors, the mechanical interlock unit prevents one of the contactors from closing as long as the other contactor is closed.

– VM interlock units for mechanical interlocking of two horizontal or vertical mounted AC or DC operated contactors
– VE interlock units for mechanical and electrical interlocking of two horizontal mounted AC or DC operated contactors.

## Ordering details (1)

| Left side contactor | Right side contactor | Mounting | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| **Mechanical interlock units for two horizontal mounted contactors** (2) | | | | | | | |
| A9 ... A40 | A9 ... A40 | Rail mounting or mounting plate to be ordered separately (3) | VM5-1 | 1SBN030100R1000 | | 1 | 0.066 |
| A9 ... A40 | A45 ... A110 | See table below with VE5 type | – | – | | – | – |
| A45 ... A75 | A45 ... A110 | | – | – | | – | – |
| A95 ... A185 | A45 ... A110 | | – | – | | – | – |
| A95 ... A185 | A145 ... A300 | Additional plate (not supplied) | VM300H | 1SFN034700R1000 | | 1 | 0.150 |
| A210 ... A300 | A145 ... A300 | | VM300H | 1SFN034700R1000 | | 1 | 0.150 |

| Up contactor | Down contactor | Mounting | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| **Mechanical interlock units for two vertical mounted contactors** (4) | | | | | | | |
| A95 ... A185 | A145 ... A300 | Additional plate (not supplied) | VM300V | 1SFN034701R1000 | | 1 | 0.150 |
| A210 ... A300 | A145 ... A300 | | VM300V | 1SFN034701R1000 | | 1 | 0.150 |

| Left side contactor | Right side contactor | Mounting | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| **Mechanical and electrical interlock units for two horizontal mounted contactors** | | | | | | | |
| A9 ... A40 | A9 ... A40 | Rail mounting or mounting plate to be ordered separately (3) | VE5-1 | 1SBN030110R1000 | | 1 | 0.076 |
| A30 ... A75 | A45 ... A75 | | VE5-2 | 1SBN030210R1000 | | 1 | 0.146 |
| A45 ... A75 | A30 ... A75 | | VE5-2 | 1SBN030210R1000 | | 1 | 0.146 |
| A45 ... A75 | A95 ... A110 | Additional plate (not supplied) | VE5-2 (5) | 1SBN030210R1000 | | 1 | 0.146 |
| A95 ... A110 | A45 ... A75 | | VE5-2 (5) | 1SBN030210R1000 | | 1 | 0.146 |
| A95 ... A110 | A95 ... A110 | | VE5-2 | 1SBN030210R1000 | | 1 | 0.146 |

(1) For each contactor type, refer to "Accessory fitting details".
(2) Mechanical durability: VM5-1 = 5 millions cycles, VM300H = 1 million cycles.
(3) Rail mounting for: 2 x A9 ... A40 contactors only
2 x A30, A40 contactors + MMS.
PM26-23 mounting plate for: 2 x A9 ... A26 contactors + MMS.
(4) Mechanical durability: VM300V = 1 million cycles.
(5) The combination of A45 ... A75 contactors interlocked with A95, A110 contactors cannot be mounted on symmetrical rail (75 mm, IEC/EN 60715).

1SBC101895S0201

# Mechanical and electrical interlock units



## Technical data

| Types | VE5-1 | VE5-2 |
|---|---|---|

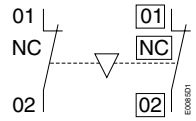
## Contact utilization characteristics according to IEC

| | | |
|---|---|---|
| **Standards** | | IEC 60947-5-1 and EN 60947-5-1 |
| **Rated insulation voltage Ui** | | |
| acc. to IEC 60947-5-1 | | 690 V |
| **Rated operational voltage Ue max.** | | 24...690 V |
| **Conventional thermal current Ith - θ ≤ 40 °C** | | 16 A |
| **Ie / Rated operational current AC-15** | | |
| acc. to IEC 60947-5-1 | **24-127 V 50/60 Hz** | 6 A |
| | **220-240 V 50/60 Hz** | 4 A |
| | **380-440 V 50/60 Hz** | 3 A |
| | **500-690 V 50/60 Hz** | 2 A |
| **Making capacity** | | 10 x Ie AC-15 acc. to IEC 60947-5-1 |
| **Breaking capacity** | | 10 x Ie AC-15 acc. to IEC 60947-5-1 |
| **Ie / Rated operational current DC-13** | | |
| acc. to IEC 60947-5-1 | **24 V DC** | 6 A |
| | **48 V DC** | 2.8 A |
| | **72 V DC** | 1 A |
| | **125 V DC** | 0.55 A |
| | **250 V DC** | 0.3 A |
| **Short-circuit protection device - gG type fuse** | | 10 A |
| **Rated short-time withstand current Icw** | **for 1.0 s** | 100 A |
| θ = 40 °C | **for 0.1 s** | 140 A |
| **Power dissipation per pole at 6 A** | | 0.15 W |
| **Mechanical durability** | | |
| Number of operating cycles | | 5 millions operating cycles |
| **Max. switching frequency** | | 600 cycles/h |

## Utilization characteristics according to UL / CSA

| | |
|---|---|
| **Standards** | UL 508, CSA C22.2 N°14 |
| **Max. operational voltage** | 600 V |

## Connecting characteristics

| | | | |
|---|---|---|---|
| **Connection capacity** (min. ... max.) | | | |
| Rigid solid | | **1 x** | 1...4 mm² |
| | | **2 x** | 1...4 mm² |
| Flexible with ferrule | | **1 x** | 0.75...2.5 mm² |
| | | **2 x** | 0.75...2.5 mm² |
| Lugs | | **L <** | 8 mm |
| | | **l >** | 3.5 mm |
| Tightening torque | Recommended | | 1 Nm |
| | Max. | | 1.2 Nm |
| **Degree of protection** acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 | | | IP20 |
| **Screw terminals** | | | Delivered in open position, screws of unused terminals must be tightened |
| All terminals | | | M3.5 |
| **Screwdriver type** | | | Flat Ø 5.5 / Pozidriv 2 |
| **Terminal marking** | | |  |



Technical note: when, during switching, the arc time is estimated to more than 40 ms, the closing signal of one of the two contactors must be delayed with respect to the opening signal of the other contactor in order to prevent a short-circuit.
Use a TEF5 or TE5S electronic timer according to application use with time lapse for A contators.

1SBC101896S0201

# Electronic timer for star-delta starters




TE5S...

## Description

When used in star-delta starters, the TE5S lags the star connection and provides a lapse of 50 ms before the switch over to delta connection.

According to the type of device chosen, the electronic circuit has a 24 V AC / DC, 110 to 120 V AC, 220 to 240 V AC or 380 to 440 V AC supply. An output relay with reversing contact ensures high current switching. A two-position switch allows selection of one of the two time delay ranges: 0.8 to 8 s or 6 to 60 s. The 0.1 to 1.0 graduated button allows an initial setting without steps within the previously selected range which can then be adjusted using a chronometer.

**Note**: We recommend that you allow for temperature drift for the final adjustment of the time delay setting. Drift: -0.2 % per °C.

For example, a setting made at 20 °C will yield a time delay shorter by 7 % at 55 °C in a cubicle (-0.2 % per °C i.e. -0.2 x 35 = -7 %).

Regardless of these settings the TE5S provides a fixed "lapse" of 50 ms between the opening of contact 15-16 and the closing of contact 15-18. This time delay prevents from arc short-circuit during star to delta switching.

**Operation**

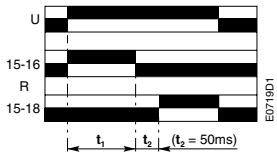
On energization, the green U indicator light (voltage applied) comes on. Contact 15-16 then immediately moves to the closed position.

Count-down of the programmed time immediately commences. When the time delay has elapsed, contact 15-16 opens and at the same time the 50 ms lapse, t2, begins after which contact 15-18 moves to the closed position. The yellow R indicator light comes on.

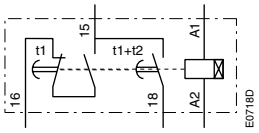
On de-energization, the U and R indicator lights go out and, after the 250 ms resetting time, the device is ready for a new cycle.

**Mounting**

On 35 x 7.5 mm or 35 x 15 mm mounting rail according to IEC/EN 60715.



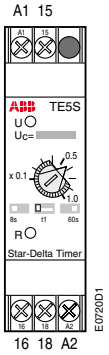

Chart




Equivalent diagram

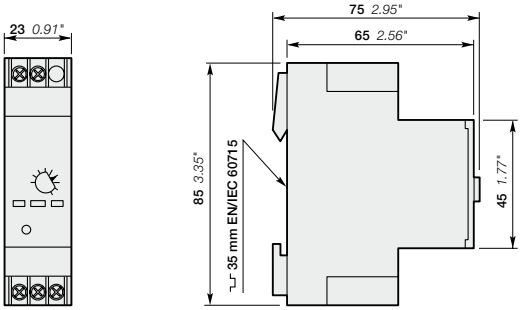
## Ordering details

| For contactors | Rated control circuit voltage Uc | | Type | Order code | | Pkg qty | Weight (1 pce) |
|---|---|---|---|---|---|---|---|
| | V 50/60 Hz | V DC | | | | | kg |
| A9 ... A300 | 24 | 24 | TE5S-24 | 1SBN020010R1001 | | 1 | 0.080 |
| | 110...120 | – | TE5S-120 | 1SBN020010R1002 | | 1 | 0.080 |
| | 220...240 | – | TE5S-240 | 1SBN020010R1003 | | 1 | 0.080 |
| | 380...440 | – | TE5S-440 | 1SBN020010R1004 | | 1 | 0.080 |




Front face

## Main dimensions mm, *inches*

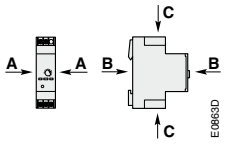





1SBC101523S0201

# Electronic timer for star-delta starters

## Technical data

| Types | | | TE5S-24 | TE5S-120 | TE5S-240 | TE5S-440 |
|---|---|---|---|---|---|---|
| **Utilization characteristics according to IEC** | | | | | | |
| **Standards** | | | IEC 60947-5-1 and EN 60947-5-1 | | | |
| **Rated insulation voltage Ui** | | | | | | |
| acc. to IEC 60947-5-1 | | | 440 V | | | |
| **Rated operational voltage Ue max.** | | | 24 V DC | | | – |
| | | | 24…240 V AC | | | 440 V AC |
| **Conventional free air thermal current Ith** | | | 10 A | | | |
| **Ie / Rated operational current AC-15** | | | | | | |
| acc. to IEC 60947-5-1 | | **24-120 V 50/60 Hz** | 5 A | | | – |
| | | **220-240 V 50/60 Hz** | 4 A | | | – |
| | | **380-440 V 50/60 Hz** | – | | | 3 A |
| **Ie / Rated operational current DC-13** | | | | | | |
| acc. to IEC 60947-5-1 | | **24 V DC** | 4 A | | | – |
| **Short-circuit protection device - gG type fuse** | | | 10 A | | | |
| **Control circuit voltage** | | | | | | |
| **AC control voltage** | Rated supply voltage Uc | | 24 V AC | 110…120 V AC | 220…240 V AC | 380…440 V AC |
| 50/60 Hz | Average consumption | | 1.5 VA | 3.5 VA | 6.5 VA | 12.5 VA |
| **DC control voltage** | Rated supply voltage Uc | | 24 V DC | – | – | – |
| | Average consumption | | 0.7 W | – | – | – |
| Rated frequency limits | | | 48…63 Hz | | | |
| Supply voltage range | | | 0.85…1.1 x Uc | | | |
| Overvoltage protection | | | Built-in varistor | | | |
| Load factor | | | 100 % | | | |
| **Time delay range (t1) selected by switch** | | | 0.8…8 s and 6…60 s | | | |
| Temperature drift | | | -0.2 % per °C | | | |
| Mechanical setting accuracy | | | ±15 % of the setting range | | | |
| On-load reiteration accuracy under constant conditions | | | ±2 % after 1 million operating cycles | | | |
| **Minimum time lapse (t2)** | | | 50 ms | | | |
| Minimum time lapse after 1 million of operating cycles | | | 40 ms | | | |
| **Resetting time** (max.) | | | 250 ms | | | |
| **Front panel display** | | **green indicator light** | Energization | | | |
| | | **yellow indicator light** | Output relay activated | | | |
| **Ambient air temperature** | | | | | | |
| Operation | | | -25…+60 °C | | | |
| Storage | | | -40…+85 °C | | | |
| **Shock withstand** | | | | | | |
| acc. to IEC 60068-2-27 and EN 6006-2-27 | | | | | | |
|   | | **Shock direction** | | | | |
| | | **A** | 20 g / 11 ms | | | |
| | | **B** | 15 g / 11 ms | | | |
| | | **C** | 20 g / 11 ms | | | |
| **Vibration withstand** | | | 10 to 300 Hz in the 3 directions | | | |
| acc. to IEC 60068-2-6 and EN 60068-2-6 | | | 3 g | | | |
| **Mechanical durability** | | | 5 millions operating cycles | | | |
| **Electrical durability** | | | 1 million operating cycles | | | |
| **On-load maximum switching frequency** | | | 720 cycles/h | | | 600 cycles/h |
| **Fixing** | | | | | | |
| On rail according to IEC 60715, EN 60715 | | | 35 x 7.5 mm or 35 x 15 mm | | | |

## Connecting characteristics

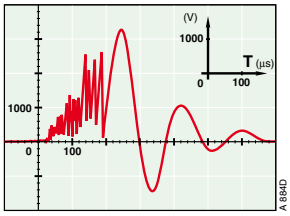
| | | | |
|---|---|---|---|
| **Connection capacity** (min. ... max.) | | | |
| Rigid solid | | **1 x** | 1...2.5 mm² |
| | | **2 x** | 1...2.5 mm² |
| Flexible with ferrule | | **1 x** | 0.75...2.5 mm² |
| | | **2 x** | 0.75...2.5 mm² |
| Tightening torque | Recommended | | 0.6 Nm |
| | Max. | | 0.8 Nm |
| **Degree of protection** | | | |
| acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 | | | IP20 |
| **Screw terminals** | | | Delivered in open position, screws of unused terminals must be tightened |
| All terminals | | | M2.5 |
| **Screwdriver type** | | | Flat Ø 4 / Pozidriv 1 |



1SBC101326S0201 - Rev. A

# Surge suppressors for contactor coils






## Description

The operation of inductive circuits causes overvoltages, in particular on opening of the contactor coil.

The electromagnetic energy stored in the coil during contactor closing is restored on opening in the form of surges, the slope and amplitude of which may rise to several kilovolts. A number of drawbacks are observed ranging from interference on the electronic devices to breakdown of insulators and even destruction of certain sensitive components.
The graph opposite reproduces the oscillogram showing voltage discharges at the terminals of a 42 V / 50 Hz coil without peak clipping. The coil was switched by 8 series-connected poles of a contactor relay.

Following a burst of discharges with a very steep slope a damped oscillation emerges with a peak value of 3500 V.

Overvoltage Factor
The overvoltage factor k is defined as the ratio of the maximum overvoltage peak value Ûs to the peak value Ûc of the coil rated control voltage Uc:

$$k = \frac{\hat{U}s\ max.}{\hat{U}c} \qquad \text{in DC: } k = \frac{\hat{U}s\ max.}{Uc} \qquad \text{or in AC: } k = \frac{\hat{U}s\ max.}{Uc\sqrt{2}}$$

For example the following is obtained for the above graph: $k = \frac{3500}{42\ \sqrt{2}} \approx 60$

To reduce the harmful effects of these overvoltages, ABB has developed a range of surge suppressors designed to reduce the k factor defined above and to limit or even completely eliminate the high pre-damping voltage frequencies.

Each case is different, but the technical data tolerances and the generous sizing of parts have enabled us to reduce the number of variants.

We have chosen the following solutions: transil diodes, varistors and RC blocks.

Note: A varistor is a resistor whose value decreases to a very large extent when a certain voltage is applied at its terminals.


1SBC574001F0301

**RV5/50**


1SBC573891F0301

**RC5-1/50**

## Ordering details

| For contactors | Rated control circuit voltage Uc | | | Type | Order code | | Pkg qty | Weight (1 pce) |
|---|---|---|---|---|---|---|---|---|
| | V | AC | DC | | | | | kg |
| A9 ... A110 | 24...50 | ● | ● | RV5/50 | 1SBN050010R1000 | | 2 | 0.015 |
| | 50...133 | ● | ● | RV5/133 | 1SBN050010R1001 | | 2 | 0.015 |
| | 110...250 | ● | ● | RV5/250 | 1SBN050010R1002 | | 2 | 0.015 |
| | 250...440 | ● | ● | RV5/440 | 1SBN050010R1003 | | 2 | 0.015 |
| A9 ... A40 | 24...50 | ● | – | RC5-1/50 | 1SBN050100R1000 | | 2 | 0.012 |
| | 50...133 | ● | – | RC5-1/133 | 1SBN050100R1001 | | 2 | 0.012 |
| | 110...250 | ● | – | RC5-1/250 | 1SBN050100R1002 | | 2 | 0.012 |
| | 250...440 | ● | – | RC5-1/440 | 1SBN050100R1003 | | 2 | 0.012 |
| A45 ... A110 | 24...50 | ● | – | RC5-2/50 | 1SBN050200R1000 | | 2 | 0.015 |
| | 50...133 | ● | – | RC5-2/133 | 1SBN050200R1001 | | 2 | 0.015 |
| | 110...250 | ● | – | RC5-2/250 | 1SBN050200R1002 | | 2 | 0.015 |
| | 250...440 | ● | – | RC5-2/440 | 1SBN050200R1003 | | 2 | 0.015 |
| A145 ... A300 | 250...440 | ● | – | RC5-3/440 | 1SFN050300R1003 | | 2 | 0.028 |

1SBC101899S0201

# Surge suppressors for contactor coils



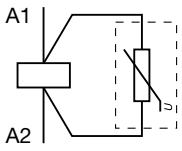
## Technical data

| Varistor | RV5/50 | RV5/133 | RV5/250 | RV5/440 |
|---|---|---|---|---|
| **Rated control circuit voltage Uc** | 24...50 V AC | 50...133 V AC | 110...250 V AC | 250...440 V AC |
| | 24...50 V DC | 50...133 V DC | 110...250 V DC | 250...440 V DC |
| **Residual overvoltage** (clipping voltage) | 132 V AC | 270 V AC | 480 V AC | 825 V AC |
| | 132 V DC | 270 V DC | 480 V DC | 825 V DC |
| **Opening time growth factor** | 1.1...1.5 | | | |
| **Operating temperature** | -20...+70 °C | | | |
| **Connection to the coil terminals** (parallel mounting) | Clip-on for both fixing and connection. | | | |
| **Fixing** | Clipped onto the top part of the contactor base without change in contactor overall dimensions. | | | |
| **Advantages** | High energy absorption: good damping - Unpolarized system. | | | |
| **Drawback** | Clipping as from Uvdr (1), thus voltage front up to this point. | | | |

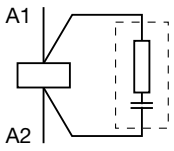
(1) Uvdr = Varistor operating voltage (voltage dependent resistor), tolerance ±10 %.

| RC type | RC5-1/50 | RC5-1/133 | RC5-1/250 | RC5-1/440 |
|---|---|---|---|---|
| | RC5-2/50 | RC5-2/133 | RC5-2/250 | RC5-2/440 |
| | – | – | – | RC5-3/440 |
| **Rated control circuit voltage Uc** | 24...50 V AC | 50...133 V AC | 110...250 V AC | 250...440 V AC |
| **Residual overvoltage** (clipping voltage) | 2 to 3 x Uc max. | | | |
| **Opening time growth factor** | 1.2...1.3 | | | |
| **Operating temperature** | -20...+70 °C | | | |
| **Connection to the coil terminals** (parallel mounting) | Clip-on for both fixing and connection. | | | |
| **Fixing** | Clipped onto the top part of the contactor base without change in contactor overall dimensions. | | | |
| **Advantages** | Very fast clipping - Attenuation of steep fronts and thus of high frequencies. No operating delays. | | | |

## Wiring diagrams

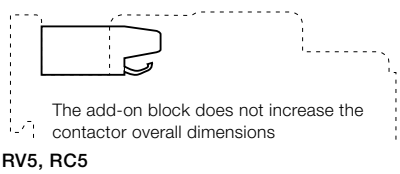



**Varistor**




**RC type**

## Dimensions




**RV5, RC5**

1SBC101900S0201

# Interface relays


RA5-1

3

## Description

RA5-1 interface relay is designed to receive 24 V DC signals delivered by PLC's or other sources with a low output power and to restore them with sufficient power to operate the coils of the relevant A9 ... A110 contactors.

RA5-1 interface relay is made up of a miniature electromechanical relay equipped with a N.O. contact and with a low consumption 24 V DC coil.

The interface relay coil is controlled by the PLC while the N.O. contact ensures switching of the power contactor.

Coil switching gives rise to overvoltages which have adverse effects on the electronic devices, insulators and, more generally, on component lifetime. The RA5-1 is equipped with surge suppressors:

– on the 24 V DC relay coil via a diode,
– on the power contactor coil via a varistor.

Furthermore, the RA5-1 is protected against relay pole reversal by a diode inserted between the E1 and E2 input terminals.

## Ordering details

| For contactors | Coil voltages<br>V 50/60 Hz | Rated control circuit voltage Uc<br>V DC | Type | Order code | | Pkg qty | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|---|
| A9 ... A110 | 24...250 | 24 | RA5-1 | 1SBN060300R1000 | | 1 | 0.050 |
| | | | RA5-1 | 1SBN060300T1000 | | 10 | 0.050 |

1SBC101901S0201

## Technical data

| Type | RA5-1 |
|---|---|

## Utilization characteristics according to IEC

| | | |
|---|---|---|
| **Standards** | | IEC 60255-5 |
| **Rated insulation voltage Ui** | | |
| acc. to IEC 60947-4-1 | | 250 V AC |
| **Ambient air temperature** | | |
| In free air operation | **at Uc = 24 V DC (between E1 and E2)** | -25…+70 °C |
| | **from 0.85 to 1.1 x Uc** | -25…+55 °C |
| Storage | | -40…+70 °C |
| **Climatic withstand** | | Complies with that of associated contactors |
| **Maximum operating altitude** | | 3000 m |
| **Mounting positions** | | No limitation |
| **Fixing** | | Using the contactor A1 and A2 teminal connecting parts |

## Connecting characteristics

| | | |
|---|---|---|
| **Connection capacity** (min. ... max.) | | |
| Rigid solid | **1 x** | 1...4 mm² |
| | **2 x** | 1...4 mm² |
| Flexible with ferrule | **1 x** | 0.75...2.5 mm² |
| | **2 x** | 0.75...2.5 mm² |
| Lugs | **L <** | 8 mm |
| | **I >** | 3.5 mm |
| Tightening torque | Recommended | 1 Nm |
| | Max. | 1.2 Nm |
| **Degree of protection** | | Protection against direct contact in acc. with EN 50274 |
| acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529 | | RA5-1 wired and mounted on the associated contactor |
| **Screw terminals** | | Delivered in open position, screws of unused terminals must be tightened |
| All terminals | | M3.5 |
| **Screwdriver type** | | Flat Ø 5.5 / Pozidriv 2 |

## Working data

| | | |
|---|---|---|
| **Surge suppression** | | |
| For contactor coil | | Varistor |
| For interface relay coil | | Diode |
| **Protection against polarity reversal between terminals E1 and E2** | | Diode |
| **Interface relay operating time** | | Closing and drop-out ≤ 10 ms |
| **Total operating time, interface relay + contactor** | | |
| Between energization and: | **N.O. contact closing** | 20…37 ms |
| | **N.C. contact opening** | 17…32 ms |
| Between de-energization and: | **N.O. contact opening** | 17…25 ms |
| | **N.C. contact closing** | 20…28 ms |

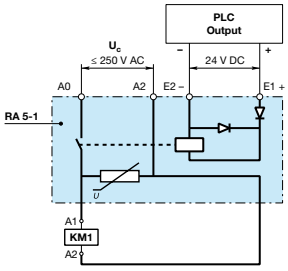
## Electrical input data

| | | |
|---|---|---|
| **Control voltage** (E1 and E2 terminals) **Uc** | | |
| Rated value | | 24 V DC |
| Max. range at ambient temperature 20 °C | | 19...30 V DC |
| **Max. consumption for Uc = 24 V DC, θ = 20 °C** | | 0.3 W |
| **"0" status** (relay open) | **for Uc** | ≤ 2.4 V DC |
| | **for Ic** | < 1 mA |
| **"1" status** (relay closed) | **for Uc** | ≥ 19 V DC |
| **Max. short supply interruption immunity time** | | 2 ms |

## Electrical output data

| | |
|---|---|
| **Switching voltage** (A0 and A2 terminals) | ≤ 250 V AC |
| **Electrical durability** | |
| Number of operating cycles | 2 millions (600 cycles/h) on A9 ... A75 contactors or N contactor relays |
| | 0.5 million (600 cycles/h) on A95 and A110 contactors |

## Connection



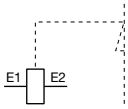

The "E1+" and "E2-" input terminals must be connected, according to their polarity, to the PLC output.
The RA5-1 is equipped with two terminal pads for connection to the A1 and the A2 terminals of the contactor coil.
This coil is supplied between the A0 and the A2 terminals of the RA 5-1.
Mounting: terminals pads clamped inside the contactor coil terminals.

1SBC101902S0201

# Mechanical latching units


WB75-A






Terminal marking

## Description

For converting standard contactors into latched contactors.

The WB75-A block contains a mechanical latching device with electromagnetic impulse unlatching (AC or DC) or manual unlatching.

Captive screw type connecting terminals, built-in cable clamps, M3.5 (+,-) pozidriv 2 screw with screwdriver guidance; delivered untightened and protected against accidental direct contact.

### Operation

After closing, the contactor continues to be held in the closed position by the latching mechanism should the supply voltage fail at the contactor coil terminals.

Contactor opening can be controlled:

– electrically by an impulse (AC or DC) on the WB75-A block coil.
(the coil is not designed to be permanently energized)
– manually by pressing the pushbutton on the front face of the WB75-A block.

### Mounting

The WB75-A block is clipped onto the front face of the 1-stack contactor where it takes up two slots. The two other slots may accept CA5... single pole auxiliary contacts (1 block on each side of the mechanical latch).

## Ordering details

| For contactors | Rated control circuit voltage Uc | | Type | Order code | | Pkg qty | Weight (1 pce) |
|---|---|---|---|---|---|---|---|
| | V 50 Hz or DC | V 60 Hz | | | | | kg |
| A9 ... A75 | 24 | 24...28 | WB75-A | FPTN372726R1001 | | 1 | 0.120 |
| | 42 | 42...48 | WB75-A | FPTN372726R1002 | | 1 | 0.120 |
| | 48 | 48...55 | WB75-A | FPTN372726R1003 | | 1 | 0.120 |
| | 110 | 110...127 | WB75-A | FPTN372726R1004 | | 1 | 0.120 |
| | 220...230 | 220...255 | WB75-A | FPTN372726R1006 | | 1 | 0.120 |
| | 230...240 | 230...277 | WB75-A | FPTN372726R1005 | | 1 | 0.120 |
| | 380...415 | 380...440 | WB75-A | FPTN372726R1007 | | 1 | 0.120 |
| | 415...440 | 440...480 | WB75-A | FPTN372726R1008 | | 1 | 0.120 |

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# Mechanical latching units

## Technical data

| Type | WB75-A |
|---|---|

## Utilization characteristics according to IEC

| | | |
|---|---|---|
| **Rated insulation voltage Ui** acc. to IEC 60947-1 | | 690 V |
| **Max. electrical impulse time** | | |
| On AC coil (with load factor 5 %) | | 20 s |
| On DC coil (with load factor 3 %) | | 8 s |
| **Min. electrical impulse time** | | |
| For latching (energizing of the contactor coil) | **AC** | 50 ms |
| For pull-out (energizing of the WB block coil) | **AC** | 30 ms |
| **Coil operating limits** | **AC or DC supply** | 0.85…1.1 x Uc |
| **AC control voltage** 50/60 Hz | | |
| Rated control circuit voltage Uc | | 24…480 V AC |
| Coil consumption | **Average pull-in value** | 90 VA |
| | **Average holding value** | 60 VA |
| **DC control voltage** | | |
| Rated control circuit voltage Uc | | 24…440 V DC |
| Coil consumption | **Average pull-in value** | 110 W |
| | **Average holding value** | 110 W |
| **Operating time** | | |
| On contactor closing (latching)<br>Between coil energization and: | | |
| | **N.O. contact closing** | No difference with the operation of a contactor without mechanical latching unit |
| | **N.C. contact opening** | No difference with the operation of a contactor without mechanical latching unit |
| On contactor opening (unlatching)<br>Between WB coil energization and: | | |
| | **N.O. contact opening** | 5…25 ms |
| | **N.C. contact closing** | 7…28 ms |
| **Mechanical durability** | | |
| | **Number of operating cycles** | 1 million operating cycles |
| **Max. switching frequency** | | 3600 cycles/h with on-load factor of 8 % |

## Connecting characteristics

| | | | |
|---|---|---|---|
| **Connection capacity** (min. ... max.) | | | |
|  Rigid solid | | **1 x** | 1...4 mm² |
|  | | **2 x** | 1...4 mm² |
|  Flexible with ferrule | | **1 x** | 0.75...2.5 mm² |
|  | | **2 x** | 0.75...2.5 mm² |
|  Lugs | | **L <** | 8 mm |
| | | **I >** | 3.5 mm |
| Tightening torque | Recommended | | 1 Nm |
| | Max. | | 1.2 Nm |
| **Screw terminals** | | | Delivered in open position, screws of unused terminals must be tightened |
| All terminals | | | M3.5 |
| **Screwdriver type** | | | Flat Ø 5.5 / Pozidriv 2 |



1SBC101333S0201 - Rev. A

# Function markers
# Impulse contact blocks




BA5-50

## BA5-50 function markers

### Description

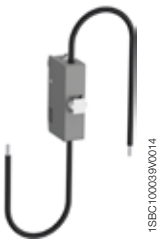
Set of 50 function markers designed to be clipped onto the front face of devices. Details can be added to these markers using a ball point pen, indelible felt-tip pen or pentel white.

Self-adhesive labels (not supplied) can also be added to them.

Marker dimensions: 7 x 19 mm (0.276" x 0.748").

### Ordering details

| For contactors | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|
| Contactors, thermal overload relays and accessories | BA5-50 | 1SBN110000R1000 | | 1 | 0.017 |




CB5

## CB5 impulse contact blocks

### Description

Impulse contact blocks are designed for use in enclosures, in association with an adjustable mechanical pushbutton. Two types are available:

– CB5-10: N.O. contact with a black actuator ("ON" function)
– CB5-01: N.C. contact with a light grey actuator ("OFF" function).

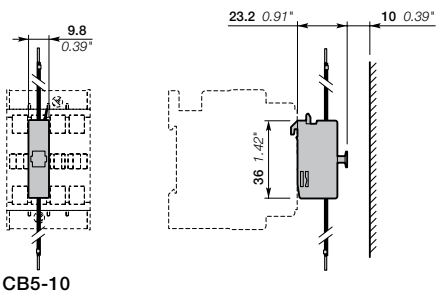
These blocks are equipped with 2 connecting leads 0.5 mm² with end, approximately 18 cm long.

Mounting: Clipped onto the front face of the contactors.

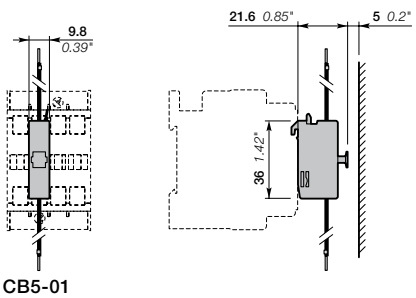
### Ordering details

| For contactors | Contacts | | Type | Order code | | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|---|
| A9 ... A110 | 1 | – | CB5-10 | 1SBN010013R1010 | | 1 | 0.012 |
| | – | 1 | CB5-01 | 1SBN010013R1001 | | 1 | 0.012 |

### Main dimensions mm, *inches*




CB5-10




CB5-01

1SBC101898S0201

# Terminal shrouds, terminal enlargements, terminal extensions Connector terminals




1SFT98099-019C3

LT...-AC


1SFT98099-125

LT...-AL


1SFT98000-014

LT...-AY


1SFT98000-011C3

LW...


1SFT98000-012C3

LX...


1SFT98099-00211C1

LZ...


1SFT98099-095C2

LZ...


1SBC580542R0302

LZ...

## Terminal shrouds

### Description

Main terminal protection for A145 ... A300 contactors.

The auxiliary contact blocks and coils are designed to provide an IP20 degree of protection.

The main terminals, equipped with lugs or connectors, can be protected against accidental direct contact after wiring (EN 50274) by the addition of terminal shrouds (see table below).

### Ordering details

| For contactors | Type | Order code | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|
| A145 ... A185 with connectors | LT185-AC | 1SFN124701R1000 | 2 | 0.050 |
| A145 ... A185 with lugs | LT185-AL | 1SFN124703R1000 | 2 | 0.220 |
| A145 ... A185 with short. bar LY185 or between A145 and TA200DU or between A185 and TA200DU | LT185-AY | 1SFN124704R1000 | 1 | 0.050 |
| A210 ... A300 with connectors | LT300-AC | 1SFN125101R1000 | 2 | 0.070 |
| A210 ... A300 with lugs | LT300-AL | 1SFN125103R1000 | 2 | 0.280 |
| A210 ... A300 with short. bar LY300 | LT300-AY | 1SFN125104R1000 | 1 | 0.075 |

## LW... Terminal enlargements

### Description

Enlargement pieces designed to increase the width of the contactor terminal pads in order to allow larger connections to be mounted.

Sets containing 3 tin plated copper bars fixed by an isolating spacer.

### Ordering details

| For contactors | Dimensions hole Ø mm | Dimensions bar mm | Type | Order code | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|
| A95, A110 | 6.5 | 15 x 3 | LW110 | 1SFN074307R1000 | 1 | 0.100 |
| A145, A185 | 10.5 | 20 x 5 | LW185 | 1SFN074707R1000 | 1 | 0.250 |
| A210 ... A300 | 10.5 | 25 x 5 | LW300 | 1SFN075107R1000 | 1 | 0.450 |

## LX... Terminal extension

### Description

Extension pieces designed to extend the main terminals of contactors for combined mounting of contactors and connection sets.

Sets containing 3 tin plated copper bars fixed by an isolating spacer.

### Ordering details

| For contactors | Dimensions hole Ø mm | Dimensions bar mm | Type | Order code | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|
| A145, A185 | 8.5 | 20 x 5 | LX185 | 1SFN074710R1000 | 1 | 0.250 |
| A210 ... A300 | 10.5 | 20 x 5 | LX300 | 1SFN075110R1000 | 1 | 0.350 |

## Connector terminals

### Description

Connection of copper and aluminium cables to the terminal pads of the poles of A contactors.

### Ordering details

| Cables | For contactors | Cable cross section mm² | Type | Order code | Pkg qty | Weight (1 pce) kg |
|---|---|---|---|---|---|---|
| Single Cu | A145, A185 | 6...185 | – | 1SDA023354R0001 | 3 | 0.200 |
| | A210 ... A300 | 16...240 | – | 1SDA023368R0001 | 3 | 0.400 |
| Single Al & Cu | A145, A185 | 35...95 | – | 1SDA023356R0001 | 3 | 0.100 |
| | A145, A185 | 25...150 | – | 1SDA023357R0001 | 3 | 0.100 |
| | A210 ... A300 | 120...240 | – | 1SDA023370R0001 | 3 | 0.200 |
| Double Cu | A145, A185 | 2 x (50...120) | LZ185-2C/120 | 1SFN074709R1000 | 3 | 0.300 |
| Double Al & Cu | A210 ... A300 | 2 x (95...120) | – | 1SDA025766R0001 | 3 | 0.400 |

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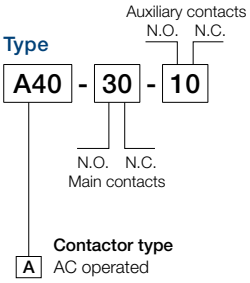
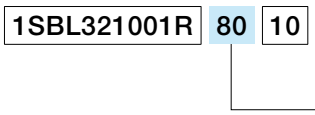
# Voltage code table

The below tables indicate the available coil voltages and corresponding digits for order codes. When placing an order, please give the order code. Select a standard contactor from ordering detail pages. Change the **coil voltage code** in the order code according to the table below. Example: for contactor A50-30-00 and coil 48 V 50/60 Hz, the order code is 1SBL351001R**83**00.

## A contactors



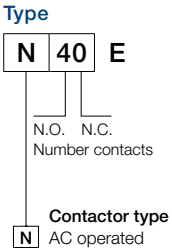



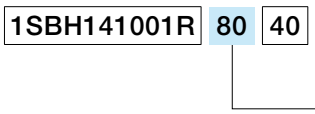

**AC coil code**
**Contactors: A**

| | 50 Hz | 60 Hz |
|---|---|---|
| **81** | **24 V** | **24 V** |
| **82** | **42 V** | **42 V** |
| **83** | **48 V** | **48 V** |
| **84** | **110 V** | **110**...120 V |
| 36 | 190 V | 220 V |
| **80** | 220...**230 V** | **230**...240 V |
| **88** | 230...**240 V** | **240**...260 V |
| **85** | 380...**400 V** | **400**...415 V |
| **86** | 400...**415 V** | **415**...440 V |

Codes in bold for dual frequency coils.

## N contactor relays




**AC coil code**
**Contactors: A**

| | 50 Hz | 60 Hz |
|---|---|---|
| **81** | **24 V** | **24 V** |
| **82** | **42 V** | **42 V** |
| **83** | **48 V** | **48 V** |
| **84** | **110 V** | **110**...120 V |
| 36 | 190 V | 220 V |
| **80** | 220...**230 V** | **230**...240 V |
| **88** | 230...**240 V** | **240**...260 V |
| **85** | 380...**400 V** | **400**...415 V |
| **86** | 400...**415 V** | **415**...440 V |

Codes in bold for dual frequency coils.

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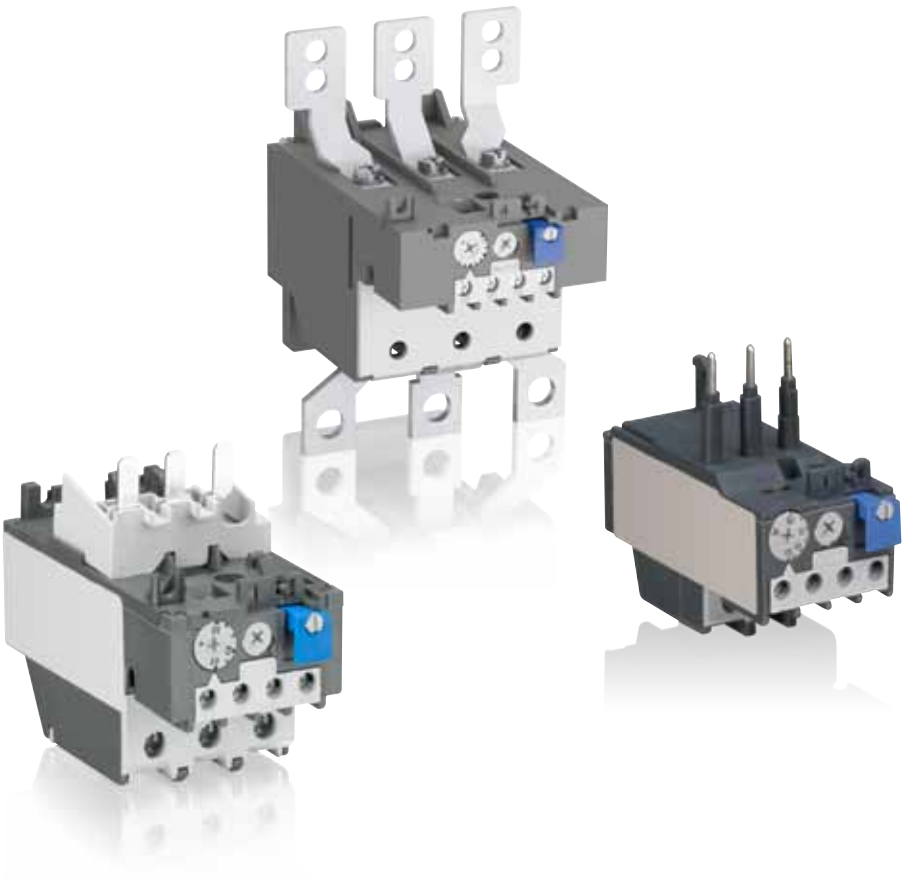
# Notes



# Overload relays


Overview 4/2

Thermal overload relays

**TA25DU-M (0.10 ... 32 A)**

Ordering details **4**/4

Technical data **4**/5

**TA42DU-M (18 ... 42 A)**

Ordering details **4**/8

Technical data **4**/9

**TA75DU-M (18 ... 80 A)**

Ordering details **4**/11

Technical data **4**/12

**TA80DU (29 ... 80 A)**

Ordering details **4**/14

Technical data **4**/15

**TA110DU (66 ... 110 A)**

Ordering details **4**/18

Technical data **4**/19

**TA200DU (66 ... 200 A)**

Ordering details **4**/22

Technical data **4**/23

**TA450DU, TA450SU (40 ... 310 A)**

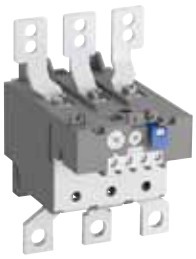
Ordering details **4**/26

Technical data **4**/27

# Thermal overload relays

| Type | TA25DU-M | TA42DU-M | TA75DU-M | |
|---|---|---|---|---|
| **Current range** | 0.10 … 32 A | 18 ... 42 A | 18 ... 80 A | |
| **Trip class** | 10A | 10A | 10A | |
| **Single mounting kit** | - | DB80 | DB80 | |

4



| | TA80DU | TA110DU | TA200DU | TA450DU / TA450SU |
|---|---|---|---|---|
| | 29 ... 80 A | 66 ... 110 A | 66 ... 200 A | 130 ... 310 A / 40 ... 310 A |
| | 10A | 10A | 10A | 10A / 30 |
| | DB80 | DB200 | DB200 | - |



2CDC106070C0201

# TA25DU-M thermal overload relays
## With screw terminals - 0.10 … 32.0 A


TA25DU-19M

4

### Description

The TA25DU-M thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

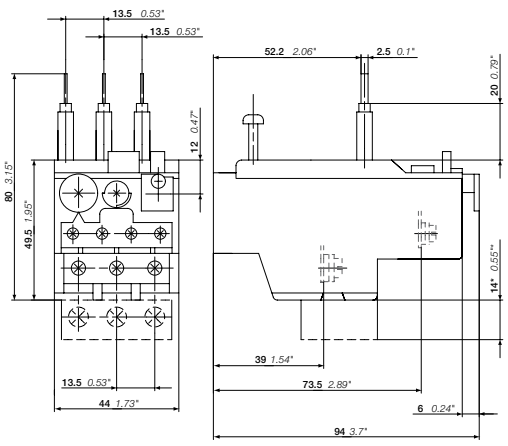
The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

– Manual or automatic reset selectable
– Phase loss sensitive acc. to IEC/EN 60947-4-1
– Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
– TEST and STOP function – Trip indication on the front
– Temperature compensation
– Suitable for three- and single-phase applications

### Ordering details

| Setting range<br>A | Short-circuit protective device | Trip class | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|
| 0.10 ... 0.16 | 0.50 A, Fuse type F | 10A | TA25DU-0.16M | 1SAZ211201R2005 | | 0.150 |
| 0.16 ... 0.25 | 0.63 A, Fuse type F | 10A | TA25DU-0.25M | 1SAZ211201R2009 | | 0.150 |
| 0.25 ... 0.40 | 1.25 A, Fuse type F | 10A | TA25DU-0.4M | 1SAZ211201R2013 | | 0.150 |
| 0.40 ... 0.63 | 2 A, Fuse type gG / - | 10A | TA25DU-0.63M | 1SAZ211201R2017 | | 0.150 |
| 0.63 ... 1.00 | 4 A, Fuse type gG / 2 A aM | 10A | TA25DU-1.0M | 1SAZ211201R2021 | | 0.150 |
| 1.00 ... 1.40 | 6 A, Fuse type gG / 2 A aM | 10A | TA25DU-1.4M | 1SAZ211201R2023 | | 0.150 |
| 1.30 ... 1.80 | 6 A, Fuse type gG / 4 A aM | 10A | TA25DU-1.8M | 1SAZ211201R2025 | | 0.150 |
| 1.70 ... 2.40 | 6 A, Fuse type gG / 4 A aM | 10A | TA25DU-2.4M | 1SAZ211201R2028 | | 0.150 |
| 2.20 ... 3.10 | 10 A, Fuse type gG / 6 A aM | 10A | TA25DU-3.1M | 1SAZ211201R2031 | | 0.150 |
| 2.80 ... 4.00 | 10 A, Fuse type gG / 6 A aM | 10A | TA25DU-4.0M | 1SAZ211201R2033 | | 0.150 |
| 3.50 ... 5.00 | 16 A, Fuse type gG / 10 A aM | 10A | TA25DU-5.0M | 1SAZ211201R2035 | | 0.150 |
| 4.50 ... 6.50 | 20 A, Fuse type gG / 16 A aM | 10A | TA25DU-6.5M | 1SAZ211201R2038 | | 0.150 |
| 6.00 ... 8.50 | 20 A, Fuse type gG / 20 A aM | 10A | TA25DU-8.5M | 1SAZ211201R2040 | | 0.150 |
| 7.50 ... 11.00 | 35 A, Fuse type gG / 25 A aM | 10A | TA25DU-11M | 1SAZ211201R2043 | | 0.150 |
| 10.00 ... 14.00 | 35 A, Fuse type gG / 25 A aM | 10A | TA25DU-14M | 1SAZ211201R2045 | | 0.150 |
| 13.00 ... 19.00 | 50 A, Fuse type gG / 35 A aM | 10A | TA25DU-19M | 1SAZ211201R2047 | | 0.170 |
| 18.00 ... 25.00 | 63 A, Fuse type gG / 50 A aM | 10A | TA25DU-25M | 1SAZ211201R2051 | | 0.170 |
| 24.00 ... 32.00 | 80 A, Fuse type gG / 63 A aM | 10A | TA25DU-32M | 1SAZ211201R2053 | | 0.200 |

### Main dimensions mm, *inches*




TA25DU-M + DX25

2CDC232023F0011

2CDC106056C0201

# TA25DU-M thermal overload relays
# Technical data

## Main circuit – Utilization characteristics according to IEC/EN

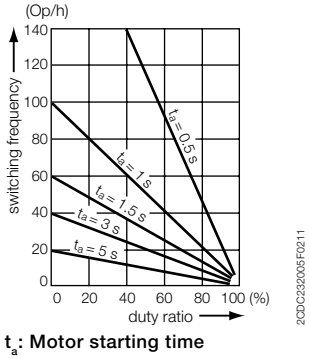
| | |
|---|---|
| **Type** | TA25DU-M |
| **Standards** | IEC/EN 60947–4–1, IEC/EN 60947-5-1, IEC/EN 60947-1 |
| **Rated operational voltage $U_e$** | 690 V AC |
| **Rated frequency** | DC, 50/60 Hz |
| **Frequency range** | 0 ... 400 Hz |
| **Trip class** | 10A |
| **Number of poles** | 3 |
| **Duty time** | 100 % |
| **Operating frequency without early tripping** | Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty" |
| **Rated impulse withstand voltage $U_{imp}$** | 6 kV |
| **Rated insulation voltage $U_i$** | 690 V AC |

4

## Auxiliary circuit according to IEC/EN

| | | |
|---|---|---|
| **Type** | | TA25DU-M |
| **Rated operational voltage $U_e$** | | 500 V AC, 440 V DC |
| **Conventional free air thermal current $I_{th}$** | **N.C., 95-96** | 10 A |
| | **N.O., 97-98** | 6 A |
| **Rated frequency** | | DC, 50/60 Hz |
| **Number of poles** | | 1 N.O. + 1 N.C. |
| **$I_e$ / Rated operational current AC-15** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 110-120 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 220-230-240 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 440 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| 480-500 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| **$I_e$ / Rated operational current DC-13** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 24 V | **N.C., 95-96** | 1.25 A |
| | **N.O., 97-98** | 1.25 A |
| 60 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 110-120-125 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 250 V | **N.C., 95-96** | 0.12 A |
| | **N.O., 97-98** | 0.04 A |
| **Minimum switching capacity** | | 17 V / 3 mA |
| **Short-circuit protective device** | **N.C., 95-96** | 10 A, Fuse type gG |
| | **N.O., 97-98** | 6 A, Fuse type gG |
| **Rated impulse withstand voltage $U_{imp}$** | | 6 kV |
| **Rated insulation voltage $U_i$** | | 690 V |

## Technical diagram – Intermittent periodic duty




$t_a$: Motor starting time

2CDC106056C0201

# TA25DU-M thermal overload relays
# Technical data

## General technical data

| | | |
|---|---|---|
| **Type** | | TA25DU-M |
| **Pollution degree** | | 3 |
| **Phase loss sensitive** | | Yes |
| **Ambient air temperature** | | |
| Operation | Open - compensated | -25 ... +55 °C |
| | Open | -25 ... +55 °C |
| Storage | | -40 ... +70 °C |
| **Ambient air temperature compensation** | | Acc. to IEC/EN60947-4-1 |
| **Maximum operating altitude permissible** | | 2000 m |
| **Resistance to shock acc. to IEC 60068-2-27** | | 12g / 15 ms |
| **Mounting position** | | Position 1-6 |
| **Mounting** | | Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm) |
| **Degree of protection** | Housing | IP20 |
| | Main circuit terminals | IP10 |

## Electrical connection

### Main circuit

| **Type** | | | TA25DU-M (0.16-11 A) | TA25DU-M (14-25 A) | TA25DU-M (32 A) |
|---|---|---|---|---|---|
| **Connecting capacity** | | | | | |
| | Rigid | **1 x** | 0.75 ... 4 mm² | 1.5 ... 6 mm² | 1.5 ... 10 mm² |
| | | **2 x** | 0.75 ... 4 mm² | 1.5 ... 6 mm² | - |
| | Flexible with insulated ferrule | **1 x or 2 x**[1)] | 0.75 ... 4 mm² | 1.5 ... 4 mm² | 1.5 ... 6 mm² |
| **Stripping length** | | | 12 mm | 12 mm | 15 mm |
| **Tightening torques** | | | 1.4 - 2.0 Nm | 1.4 - 2.0 Nm | 2.5 - 3.2 Nm |
| **Connection screw** | | | M4 (Pozidriv 2) | M4 (Pozidriv 2) | M5 (Pozidriv 2) |

[1)] Combination of different wires not possible

### Auxiliary circuit

| **Type** | | | TA25DU-M |
|---|---|---|---|
| **Connecting capacity** | | | |
| | Rigid | **1 x or 2 x** | 0.75 ... 4 mm² |
| | Flexible | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| **Stripping length** | | | 9 mm |
| **Tightening torques** | | | 0.8 ... 1.3 Nm |
| **Connection screw** | | | M3.5 (Pozidriv 2) |



2CDC106056C0201

# TA25DU-M thermal overload relays
## Accessories


SST01494

DX25


2CDC231017F0006

DB25/25A


SST20591

DR25-A-220/380

1SFC151402F0001

KPR-101L

### Description

The single mounting kits offer the possibility to mount the overload relays separately from the contactor. The DS25-A allows electrically remote tripping of TA25DU-M. DR25-A coil for remote reset of TA25DU-M.

### Ordering details

| For thermal overload relays | Description | Type | Order code | | Weight (1 pce) kg |
|---|---|---|---|---|---|
| **Terminal block and mounting kits** | | | | | |
| TA25DU-0.16M; ... 25M / DB25/25 A | Terminal block 10 mm² | DX25 | 1SAZ201307R0002 | | 0.030 |
| TA25DU-0.16M ... 25M | Single mounting kit | DB25/25A | 1SAZ201108R0001 | | 0.055 |
| TA25DU-32M | Single mounting kit | DB25/32A | 1SAZ201108R0002 | | 0.080 |
| **Remote reset coil** | | | | | |
| TA25DU-M | 24 V, 50/60 Hz | DR25-A-24 | 1SAZ201504R0001 | | 0.050 |
| TA25DU-M | 48 V, 50/60 Hz | DR25-A-48 | 1SAZ201504R0002 | | 0.050 |
| TA25DU-M | 110 V, 50/60 Hz | DR25-A-110 | 1SAZ201504R0003 | | 0.050 |
| TA25DU-M | 220/380 V, 50/60 Hz | DR25-A-220/380 | 1SAZ201504R0005 | | 0.050 |
| TA25DU-M | 500 V, 50/60 Hz | DR25-A-500 | 1SAZ201504R0006 | | 0.050 |

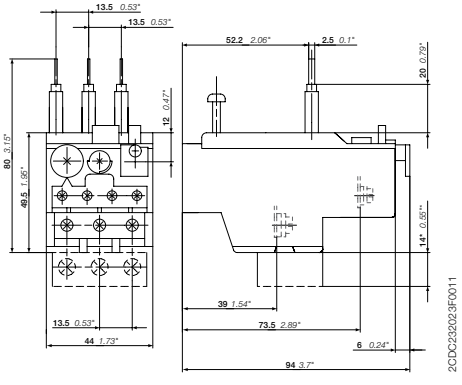
The remote reset coil is to be connected to auxiliary contact 97-98 of TA25DU-M.
The coil is not suitable for Continuous operation. Impulse duration: maximum 0.2 seconds.

**Accessories for reset function**

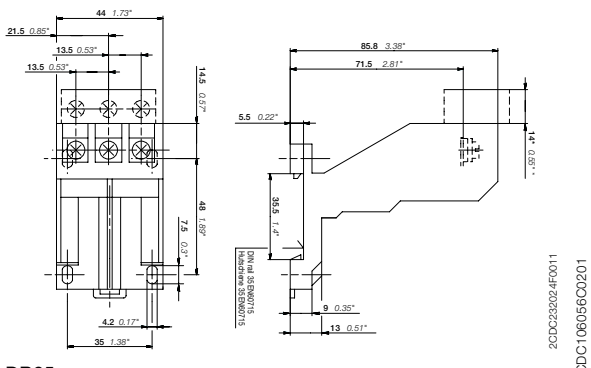
| | | | | | |
|---|---|---|---|---|---|
| TA25DU-M | Reset push button* | KPR-101L | 1SFA616162R1014 | | 0.027 |

*Note: for more information see catalogue 1SFC151004C0201

### Main dimensions mm, *inches*




TA25DU-M + DX25




DB25

# TA42DU-M thermal overload relays
## 18.0 … 42.0 A


**TA42DU-32M**


**DB80**


**KPR-101L**

4

### Description

The TA42DU-M thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

– Manual or automatic reset selectable
– Phase loss sensitive acc. to IEC/EN 60947-4-1
– Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
– TEST and STOP function – Trip indication on the front
– Temperature compensation
– Suitable for three- and single-phase applications

### Ordering details

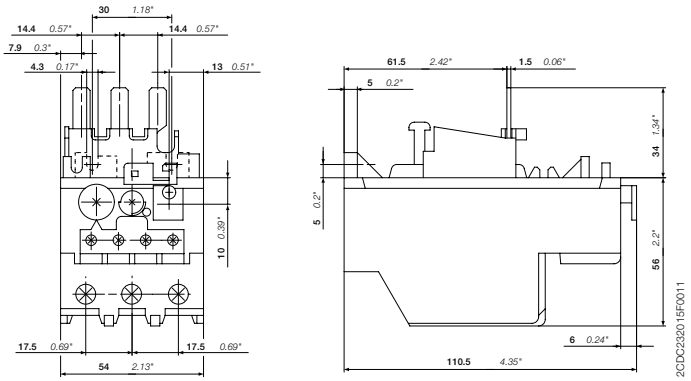
| Setting range<br>A | Short-circuit protective device | Trip class | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|
| 18 ... 25 | 63 A, Fuse type gG / 50 A aM | 10A | TA42DU-25M | 1SAZ311201R2001 | | 0.335 |
| 22 ... 32 | 80 A, Fuse type gG / 63 A aM | 10A | TA42DU-32M | 1SAZ311201R2002 | | 0.335 |
| 29 ... 42 | 100 A, Fuse type gG / 80 A aM | 10A | TA42DU-42M | 1SAZ311201R2003 | | 0.335 |

### Ordering details accessories

| For thermal overload relays<br>A | Description | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|
| TA42DU-M | Single mounting kit | DB80 | 1SAZ301110R0001 | | 0.155 |
| TA42DU-M | Reset push button* | KPR-101L | 1SFA616162R1014 | | 0.027 |

*Note: for more information see catalogue 1SFC151004C0201

### Main dimensions mm, *inches*




**TA42DU-M**



2CDC106057C0201

# TA42DU-M thermal overload relays
# Technical data

## Main circuit – Utilization characteristics according to IEC/EN

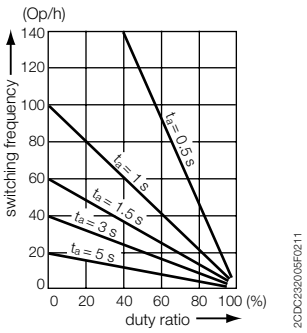
| | |
|---|---|
| **Type** | **TA42DU-M** |
| **Standards** | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 |
| **Rated operational voltage $U_e$** | 690 V AC |
| **Rated frequency** | DC, 50/60 Hz |
| **Trip class** | 10A |
| **Number of poles** | 3 |
| **Duty time** | 100 % |
| **Operating frequency without early tripping** | Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty" |
| **Rated impulse withstand voltage $U_{imp}$** | 6 kV |
| **Rated insulation voltage $U_i$** | 690 V AC |

4

## Auxiliary circuit according to IEC/EN

| | | |
|---|---|---|
| **Type** | | **TA42DU-M** |
| **Rated operational voltage $U_e$** | | 500 V AC, 440 V DC |
| **Conventional free air thermal current $I_{th}$** | **N.C., 95-96** | 10 A |
| | **N.O., 97-98** | 6 A |
| **Rated frequency** | | DC, 50/60 Hz |
| **Number of poles** | | 1 N.O. + 1 N.C. |
| **$I_e$ / Rated operational current AC-15** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 110-120 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 220-230-240 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 440 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| 480-500 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| **$I_e$ / Rated operational current DC-13** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 24 V | **N.C., 95-96** | 1.25 A |
| | **N.O., 97-98** | 1.25 A |
| 60 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 110-120-125 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 250 V | **N.C., 95-96** | 0.12 A |
| | **N.O., 97-98** | 0.04 A |
| **Minimum switching capacity** | | 17 V / 3 mA |
| **Short-circuit protective device** | **N.C., 95-96** | 10 A, Fuse type gG |
| | **N.O., 97-98** | 6 A, Fuse type gG |
| **Rated impulse withstand voltage $U_{imp}$** | | 6 kV |
| **Rated insulation voltage $U_i$** | | 690 V |

## Technical diagram – Intermittent periodic duty




**$t_a$: Motor starting time**

# TA42DU-M thermal overload relays
# Technical data

## General technical data

| | | |
|---|---|---|
| **Type** | | TA42DU-M |
| **Pollution degree** | | 3 |
| **Phase loss sensitive** | | Yes |
| **Ambient air temperature** | | |
| Operation | Open - compensated | -25 ... +55 °C |
| | Open | -25 ... +55 °C |
| Storage | | -40 ... +70 °C |
| **Ambient air temperature compensation** | | Acc. to IEC/EN60947-4-1 |
| **Maximum operating altitude permissible** | | 2000 m |
| **Resistance to shock acc. to IEC 60068-2-27** | | 12g / 15 ms |
| **Mounting position** | | Position 1-6 |
| **Mounting** | | Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm) |
| **Degree of protection** | Housing | IP20 |
| | Main circuit terminals | IP10 |

## Electrical connection

### Main circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA42DU-M |
| **Connecting capacity** | | | |
| | Rigid | **1 x** | 2.5 ... 25 mm² |
| | | **2 x** | 2.5 ... 16 mm² |
| | Flexible with insulated ferrule | **1 x** | 2.5 ... 25 mm² |
| | | **2 x** | 2.5 ... 10 mm² |
| **Stripping length** | | | 14 mm |
| **Tightening torques** | | | 4.5 Nm |
| **Connection screw** | | | M6 (Pozidriv 2) |

### Auxiliary circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA42DU-M |
| **Connecting capacity** | | | |
| | Rigid | **1 x or 2 x** | 0.75 ... 4 mm² |
| | Flexible with ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Flexible with insulated ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Flexible | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| **Stripping length** | | | 9 mm |
| **Tightening torques** | | | 0.8 ... 1.3 Nm |
| **Connection screw** | | | M3.5 (Pozidriv 2) |



2CDC106057C0201

# TA75DU-M thermal overload relays
## 18 ... 80 A


2CDC231022F0013

**TA75DU-63M**


2CDC231007F0010

**DB80**

1SFC151402F0001

**KPR-101L**

### Description

The TA75DU-M thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

– Manual or automatic reset selectable
– Phase loss sensitive acc. to IEC/EN 60947-4-1
– Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
– TEST and STOP function – Trip indication on the front
– Temperature compensation
– Suitable for three- and single-phase applications

4

### Ordering details

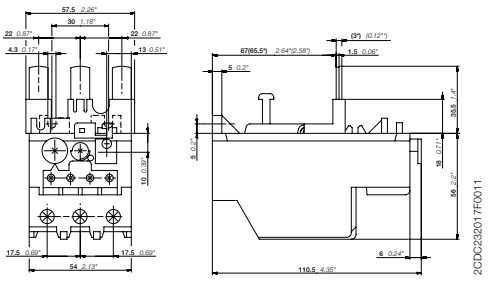
| Setting range A | Short-circuit protective device | Trip class | Type | Order code | | Weight (1 pce) kg |
|---|---|---|---|---|---|---|
| 18 ... 25 | 63 A, Fuse type gG / 50 A aM | 10A | TA75DU-25M | 1SAZ321201R2001 | | 0.335 |
| 22 ... 32 | 80 A, Fuse type gG / 63 A aM | 10A | TA75DU-32M | 1SAZ321201R2002 | | 0.335 |
| 29 ... 42 | 100 A, Fuse type gG / 80 A aM | 10A | TA75DU-42M | 1SAZ321201R2003 | | 0.335 |
| 36 ... 52 | 125 A, Fuse type gG / 100 A aM | 10A | TA75DU-52M | 1SAZ321201R2004 | | 0.335 |
| 45 ... 63 | 160 A, Fuse type gG / 125 A aM | 10A | TA75DU-63M | 1SAZ321201R2005 | | 0.335 |
| 60 ... 80 | 200 A, Fuse type gG / 160 A aM | 10A | TA75DU-80M | 1SAZ321201R2006 | | 0.370 |

### Ordering details accessories

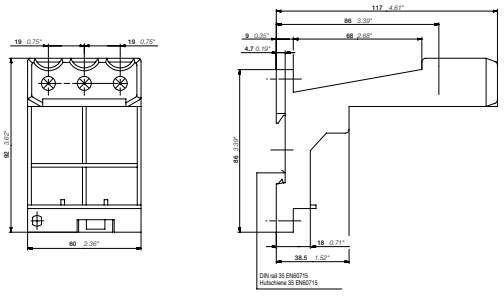
| For thermal overload relays A | Description | Type | Order code | | Weight (1 pce) kg |
|---|---|---|---|---|---|
| TA75DU-M | Single mounting kit | DB80 | 1SAZ301110R0001 | | 0.155 |
| TA75DU-M | Reset push button* | KPR-101L | 1SFA616162R1014 | | 0.027 |

*Note: for more information see catalogue 1SFC151004C0201

### Main dimensions mm, *inches*


2CDC232017F0011

**TA75DU-M**


2CDC232025F0011

**DB80**

2CDC106058C0201

# TA75DU-M thermal overload relays
# Technical data

## Main circuit – Utilization characteristics according to IEC/EN

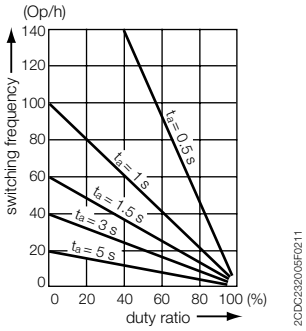
| | |
|---|---|
| **Type** | **TA75DU-M** |
| **Standards** | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 |
| **Rated operational voltage $U_e$** | 690 V AC |
| **Rated frequency** | DC, 50/60 Hz |
| **Trip class** | 10A |
| **Number of poles** | 3 |
| **Duty time** | 100 % |
| **Operating frequency without early tripping** | Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty" |
| **Rated impulse withstand voltage $U_{imp}$** | 6 kV |
| **Rated insulation voltage $U_i$** | 690 V AC |

4

## Auxiliary circuit according to IEC/EN

| | | |
|---|---|---|
| **Type** | | **TA75DU-M** |
| **Rated operational voltage $U_e$** | | 500 V AC, 440 V DC |
| **Conventional free air thermal current $I_{th}$** | **N.C., 95-96** | 10 A |
| | **N.O., 97-98** | 6 A |
| **Rated frequency** | | DC, 50/60 Hz |
| **Number of poles** | | 1 N.O. + 1 N.C. |
| **$I_e$ / Rated operational current AC-15** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 110-120 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 220-230-240 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 440 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| 480-500 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| **$I_e$ / Rated operational current DC-13** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 24 V | **N.C., 95-96** | 1.25 A |
| | **N.O., 97-98** | 1.25 A |
| 60 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 110-120-125 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 250 V | **N.C., 95-96** | 0.12 A |
| | **N.O., 97-98** | 0.04 A |
| **Minimum switching capacity** | | 17 V / 3 mA |
| **Short-circuit protective device** | **N.C., 95-96** | 10 A, Fuse type gG |
| | **N.O., 97-98** | 6 A, Fuse type gG |
| **Rated impulse withstand voltage $U_{imp}$** | | 6 kV |
| **Rated insulation voltage $U_i$** | | 690 V |

## Technical diagram – Intermittent periodic duty




$t_a$: Motor starting time

2CDC106058C0201

# TA75DU-M thermal overload relays
# Technical data

## General technical data

| | | | |
|---|---|---|---|
| **Type** | | | TA75DU-M |
| **Pollution degree** | | | 3 |
| **Phase loss sensitive** | | | Yes |
| **Ambient air temperature** | | | |
| | Operation | Open - compensated | -25 ... +55 °C |
| | | Open | -25 ... +55 °C |
| | Storage | | -40 ... +70 °C |
| **Ambient air temperature compensation** | | | Acc. to IEC/EN60947-4-1 |
| **Maximum operating altitude permissible** | | | 2000 m |
| **Resistance to shock acc. to IEC 60068-2-27** | | | 12g / 15 ms |
| **Mounting position** | | | Position 1-6 |
| **Mounting** | | | Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm) |
| **Degree of protection** | Housing | | IP20 |
| | Main circuit terminals | | IP10 |

## Electrical connection

### Main circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA75DU-M |
| **Connecting capacity** | | | |
| | Rigid | **1 x** | 2.5 ... 25 mm² |
| | | **2 x** | 2.5 ... 16 mm² |
| | Flexible with insulated ferrule | **1 x** | 2.5 ... 25 mm² |
| | | **2 x** | 2.5 ... 10 mm² |
| **Stripping length** | | | 14 mm |
| **Tightening torques** | | | 4.5 Nm |
| **Connection screw** | | | M6 (Pozidriv 2) |

### Auxiliary circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA75DU-M |
| **Connecting capacity** | | | |
| | Rigid | **1 x or 2 x** | 0.75 ... 4 mm² |
| | Flexible with ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Flexible with insulated ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Flexible | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| **Stripping length** | | | 9 mm |
| **Tightening torques** | | | 0.8 ... 1.3 Nm |
| **Connection screw** | | | M3.5 (Pozidriv 2) |



2CDC106058C0201

# TA80DU thermal overload relays
## 29 … 80 A


2CDC231008R0011

TA80DU-80


2CDC231007S0010

DB80


1SFC151402F0001

KPR-101L

### Description

The TA80DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

### Ordering details

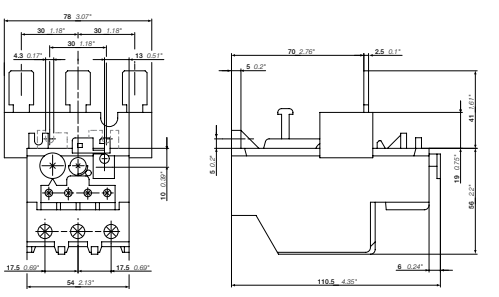
| Setting range<br>A | Short-circuit protective device | Trip class | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|
| 29 ... 42 | 100 A, Fuse type gG / 80 A aM | 10A | TA80DU-42 | 1SAZ331201R1003 | | 0.360 |
| 36 ... 52 | 125 A, Fuse type gG / 100 A aM | 10A | TA80DU-52 | 1SAZ331201R1004 | | 0.365 |
| 45 ... 63 | 160 A, Fuse type gG / 125 A aM | 10A | TA80DU-63 | 1SAZ331201R1005 | | 0.365 |
| 60 ... 80 | 200 A, Fuse type gG / 160 A aM | 10A | TA80DU-80 | 1SAZ331201R1006 | | 0.375 |

### Ordering details accessories

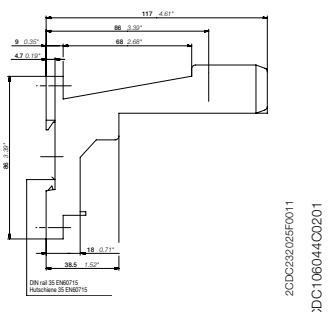
| For thermal overload relay<br>A | Description | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|
| TA80DU | Single mounting kit | DB80 | 1SAZ301110R0001 | | 0.155 |
| TA80DU | Reset push button* | KPR-101L | 1SFA616162R1014 | | 0.027 |

*Note: for more information see catalogue 1SFC151004C0201

### Main dimensions mm, *inches*


2CDC232018F0011

TA80DU


2CDC232025F0011

DB80

2CDC106044C0201

# TA80DU thermal overload relays
# Technical data

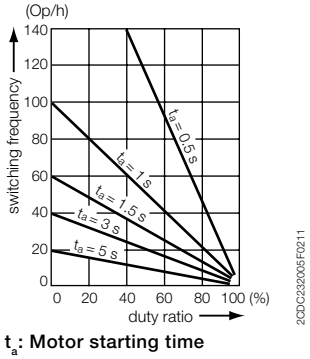
## Main circuit – Utilization characteristics according to IEC/EN

| | |
|---|---|
| **Type** | **TA80DU** |
| **Standards** | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 |
| **Rated operational voltage $U_e$** | 690 V AC |
| **Rated frequency** | DC, 50/60 Hz |
| **Frequency range** | 0 ... 400 Hz |
| **Trip class** | 10A |
| **Number of poles** | 3 |
| **Duty time** | 100 % |
| **Operating frequency without early tripping** | Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty" |
| **Rated impulse withstand voltage $U_{imp}$** | 6 kV |
| **Rated insulation voltage $U_i$** | 690 V AC |

## Auxiliary circuit according to IEC/EN

| | | |
|---|---|---|
| **Type** | | **TA80DU** |
| **Rated operational voltage $U_e$** | | 500 V AC, 440 V DC |
| **Conventional free air thermal current $I_{th}$** | **N.C., 95-96** | 10 A |
| | **N.O., 97-98** | 6 A |
| **Rated frequency** | | DC, 50/60 Hz |
| **Number of poles** | | 1 N.O. + 1 N.C. |
| **$I_e$ / Rated operational current AC-15** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 110-120 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 220-230-240 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 440 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| 480-500 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| **$I_e$ / Rated operational current DC-13** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 24 V | **N.C., 95-96** | 1.25 A |
| | **N.O., 97-98** | 1.25 A |
| 60 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 110-120-125 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 250 V | **N.C., 95-96** | 0.12 A |
| | **N.O., 97-98** | 0.04 A |
| **Minimum switching capacity** | | 17 V / 3 mA |
| **Short-circuit protective device** | **N.C., 95-96** | 10 A, Fuse type gG |
| | **N.O., 97-98** | 6 A, Fuse type gG |
| **Rated impulse withstand voltage $U_{imp}$** | | 6 kV |
| **Rated insulation voltage $U_i$** | | 690 V |

## Technical diagram – Intermittent periodic duty




$t_a$: Motor starting time

# TA80DU thermal overload relays
# Technical data

## Main circuit – Utilization characteristics according to UL/CSA

| Type | TA80DU |
|---|---|
| Standards | UL 508, CSA 22.2 No. 14 |
| Maximum operational voltage | 600 V AC |
| Trip rating | 125 % of FLA |
| Full load amps (FLA) | See table "Full load amps and short-circuit protective device" |
| Short-circuit rating RMS symmetrical | See table "Full load amps and short-circuit protective device" |
| Short-circuit protective device | See table "Full load amps and short-circuit protective device" |

4

## Auxiliary circuit according to UL/CSA

| Type | | TA80DU |
|---|---|---|
| Contact rating | N.C., 95-96 | C600 |
| | N.O., 97-98 | B600 |
| Conventional thermal current | | 5 A |

## Full load amps and short-circuit protective device

| Type | Full load amps (FLA) | Short-circuit protective device 480 / 600 V AC | | |
|---|---|---|---|---|
| | | Short circuit rating RMS symmetrical | Fuse type | Listed circuit breaker |
| TA80DU-42 | 42 A | 5 kA | 150 A, K5 / RK5 | 80 A |
| TA80DU-52 | 52 A | 5 kA | 175 A, K5 / RK5 | 125 A |
| TA80DU-63 | 63 A | 10 kA | 200 A, K5 / RK5 | 125 A |
| TA80DU-80 | 80 A | 10 kA | 250 A, K5 / RK5 | 125 A |

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# TA80DU thermal overload relays
# Technical data

## General technical data

| | | | |
|---|---|---|---|
| **Type** | | | TA80DU |
| **Pollution degree** | | | 3 |
| **Phase loss sensitive** | | | Yes |
| **Ambient air temperature** | | | |
| Operation | Open - compensated | | -25 ... +55 °C |
| | Open | | -25 ... +55 °C |
| Storage | | | -40 ... +70 °C |
| **Ambient air temperature compensation** | | | Acc. to IEC/EN60947-4-1 |
| **Maximum operating altitude permissible** | | | 2000 m |
| **Resistance to shock acc. to IEC 60068-2-27** | | | 12g / 15 ms |
| **Mounting position** | | | Position 1-6 |
| **Mounting** | | | Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit on DIN rail (35 mm) |
| **Degree of protection** | Housing | | IP20 |
| | Main circuit terminals | | IP10 |

## Electrical connection

### Main circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA80DU |
| **Connecting capacity** | | | |
| | Rigid | **1 x** | 2.5 ... 25 mm² |
| | | **2 x** | 2.5 ... 16 mm² |
| | Flexible with insulated ferrule | **1 x** | 2.5 ... 25 mm² |
| | | **2 x** | 2.5 ... 10 mm² |
| | Stranded acc. to UL/CSA | **1 x or 2 x** | AWG 8-1 |
| | Flexible acc. to UL/CSA | **1 x or 2 x** | AWG 8-1 |
| **Stripping length** | | | 14 mm |
| **Tightening torques** | | | 4.5 Nm / 40 lb.in |
| **Connection screw** | | | M6 (Pozidriv 2) |

### Auxiliary circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA80DU |
| **Connecting capacity** | | | |
| | Rigid | **1 x or 2 x** | 0.75 ... 4 mm² |
| | Flexible with ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Flexible with insulated ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Flexible | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Stranded acc. to UL/CSA | **1 x or 2 x** | AWG 18-14 |
| | Flexible acc. to UL/CSA | **1 x or 2 x** | AWG 18-14 |
| **Stripping length** | | | 9 mm |
| **Tightening torques** | | | 0.8 ... 1.3 Nm / 12 lb.in |
| **Connection screw** | | | M3.5 (Pozidriv 2) |



2CDC106044C0201

# TA110DU thermal overload relays
## 66 ... 110 A


**TA110DU-110**


**KPR-101L**

4

### Description

The TA110DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

### Ordering details

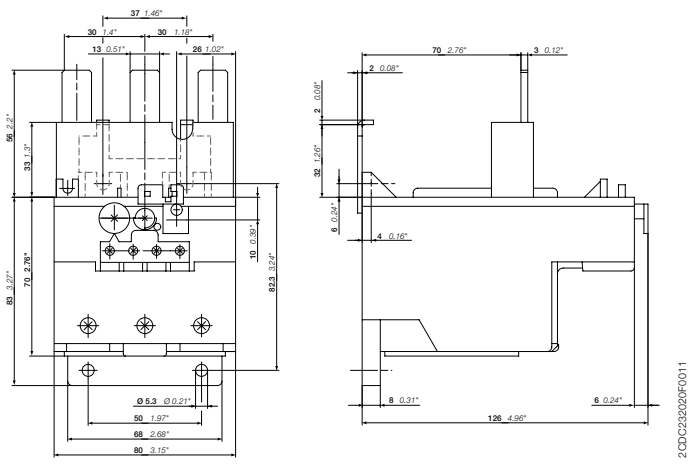
| Setting range<br>A | Short-circuit protective device | Trip class | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|
| 66 ... 90 | 200 A, Fuse type gG / 160 A aM | 10A | TA110DU-90 | 1SAZ411201R1001 | | 0.750 |
| 80 ... 110 | 224 A, Fuse type gG / 200 A aM | 10A | TA110DU-110 | 1SAZ411201R1002 | | 0.755 |

### Ordering details accessories

| For thermal overload relays<br>A | Description | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|
| TA110DU | Single mounting kit | DB200 | 1SAZ401110R0001 | | 0.225 |
| TA110DU | Reset push button* | KPR-101L | 1SFA616162R1014 | | 0.027 |

*Note: for more information see catalogue 1SFC151004C0201

### Main dimensions mm, *inches*




**TA110DU**



2CDC106037C0201

# TA110DU thermal overload relays
# Technical data

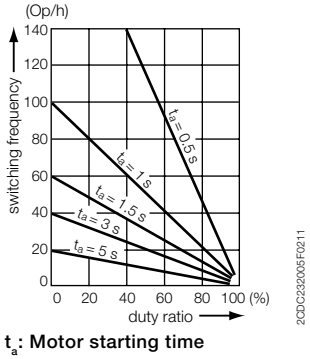
## Main circuit – Utilization characteristics according to IEC/EN

| | |
|---|---|
| **Type** | TA110DU |
| **Standards** | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 |
| **Rated operational voltage $U_e$** | 690 V AC |
| **Rated frequency** | DC, 50/60 Hz |
| **Frequency range** | 0 ... 400 Hz |
| **Trip class** | 10A |
| **Number of poles** | 3 |
| **Duty time** | 100 % |
| **Operating frequency without early tripping** | Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty" |
| **Rated impulse withstand voltage $U_{imp}$** | 6 kV |
| **Rated insulation voltage $U_i$** | 690 V AC |

## Auxiliary circuit according to IEC/EN

| | | |
|---|---|---|
| **Type** | | TA110DU |
| **Rated operational voltage $U_e$** | | 500 V AC, 440 V DC |
| **Conventional free air thermal current $I_{th}$** | **N.C., 95-96** | 10 A |
| | **N.O., 97-98** | 6 A |
| **Rated frequency** | | DC, 50/60 Hz |
| **Number of poles** | | 1 N.O. + 1 N.C. |
| **$I_e$ / Rated operational current AC-15** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 110-120 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 220-230-240 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 440 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| 480-500 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| **$I_e$ / Rated operational current DC-13** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 24 V | **N.C., 95-96** | 1.25 A |
| | **N.O., 97-98** | 1.25 A |
| 60 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 110-120-125 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 250 V | **N.C., 95-96** | 0.12 A |
| | **N.O., 97-98** | 0.04 A |
| **Minimum switching capacity** | | 17 V / 3 mA |
| **Short-circuit protective device** | **N.C., 95-96** | 10 A, Fuse type gG |
| | **N.O., 97-98** | 6 A, Fuse type gG |
| **Rated impulse withstand voltage $U_{imp}$** | | 6 kV |
| **Rated insulation voltage $U_i$** | | 690 V |

## Technical diagram – Intermittent periodic duty




$t_a$: Motor starting time

# TA110DU thermal overload relays
# Technical data

## Main circuit – Utilization characteristics according to UL/CSA

| Type | TA110DU |
|---|---|
| Standards | UL 508, CSA 22.2 No. 14 |
| Maximum operational voltage | 600 V AC |
| Trip rating | 125 % of FLA |
| Full load amps (FLA) | See table "Full load amps and short-circuit protective device" |
| Short-circuit rating RMS symmetrical | See table "Full load amps and short-circuit protective device" |
| Short-circuit protective device | See table "Full load amps and short-circuit protective device" |

4

## Auxiliary circuit according to UL/CSA

| Type | | TA110DU |
|---|---|---|
| Contact rating | N.C., 95-96 | C600 |
| | N.O., 97-98 | B600 |
| Conventional thermal current | | 5 A |

## Full load amps and short-circuit protective device

| Type | Full load amps (FLA) | Short-circuit protective device | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 480 / 600 V AC | | | | | | |
| | | Short circuit rating RMS symmetrical | Fuse type | Listed circuit breaker | Short circuit rating RMS symmetrical | Fuse type | Short circuit rating RMS symmetrical | Listed circuit breaker |
| **TA110DU-90** | 90 A | 10 kA | 250 A, K5 / RK5 | 150 A | 65 kA | 200 A, Class J | 65 / 25 kA | 150 A |
| **TA110DU-110** | 110 A | 10 kA | 250 A, K5 / RK5 | 250 A | 65 kA | 200 A, Class J | 65 / 25 kA | 150 A |

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# TA110DU thermal overload relays
# Technical data

## General technical data

| | | | |
|---|---|---|---|
| **Type** | | | TA110DU |
| **Pollution degree** | | | 3 |
| **Phase loss sensitive** | | | Yes |
| **Ambient air temperature** | | | |
| | Operation | Open - compensated | -25 ... +55 °C |
| | | Open | -25 ... +55 °C |
| | Storage | | -40 ... +70 °C |
| **Ambient air temperature compensation** | | | Acc. to IEC/EN60947-4-1 |
| **Maximum operating altitude permissible** | | | 2000 m |
| **Resistance to shock acc. to IEC 60068-2-27** | | | 12g / 15 ms |
| **Mounting position** | | | Position 1-6 |
| **Mounting** | | | Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit |
| **Degree of protection** | Housing | | IP20 |
| | Main circuit terminals | | IP10 |

## Electrical connection

### Main circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA110DU |
| **Connecting capacity** | | | |
| | Rigid | **1 x** | 16 ... 35 mm² |
| | | **2 x** | - |
| | Flexible | **1 x** | 16 ... 35 mm² |
| | | **2 x** | - |
| | Stranded acc. to UL/CSA | **1 x or 2 x** | AWG 6-2/0 |
| | Flexible acc. to UL/CSA | **1 x or 2 x** | AWG 6-2/0 |
| **Stripping length** | | | 25 mm |
| **Tightening torques** | | | 7.2 ... 9.6 Nm / 40 lb.in |
| **Connection screw** | | | M8 (Hexagon) |

### Auxiliary circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA110DU |
| **Connecting capacity** | | | |
| | Rigid | **1 x or 2 x** | 0.75 ... 4 mm² |
| | Flexible with ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Flexible with insulated ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Flexible | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Stranded acc. to UL/CSA | **1 x or 2 x** | AWG 18-14 |
| | Flexible acc. to UL/CSA | **1 x or 2 x** | AWG 18-14 |
| **Stripping length** | | | 9 mm |
| **Tightening torques** | | | 0.8 ... 1.3 Nm / 12 lb.in |
| **Connection screw** | | | M3.5 (Pozidriv 2) |



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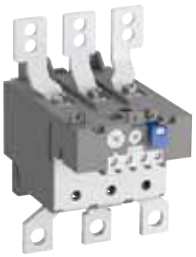
# TA200DU thermal overload relays
## 66 … 200 A


2CDC231016F0013

**TA200DU**


1SFC151402F0001

**KPR-101L**

### Description

The TA200DU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The devices have trip class 10A.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

### Ordering details

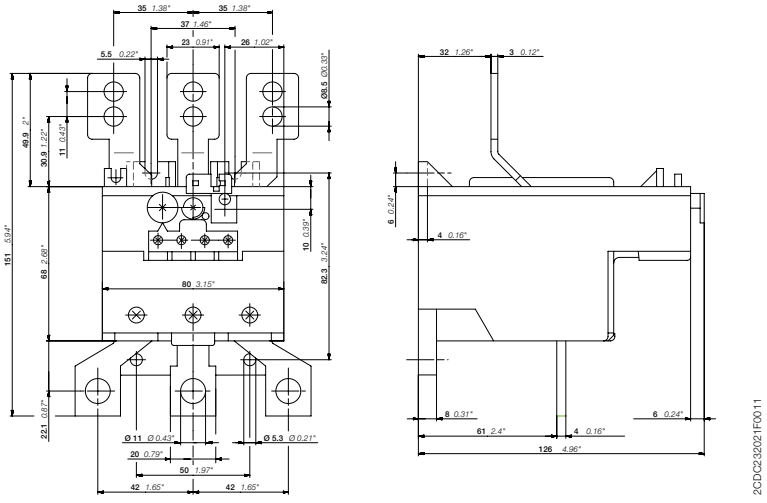
| Setting range<br>A | Short-circuit protective device | Trip class | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|
| 66 ... 90 | 200 A, Fuse type gG / 125 A aM | 10A | TA200DU-90 | 1SAZ421201R1001 | | 0.755 |
| 80 ... 110 | 224 A, Fuse type gG / 160 A aM | 10A | TA200DU-110 | 1SAZ421201R1002 | | 0.760 |
| 100 ... 135 | 224 A, Fuse type gG / 200 A aM | 10A | TA200DU-135 | 1SAZ421201R1003 | | 0.760 |
| 110 ... 150 | 250 A, Fuse type gG / 200 A aM | 10A | TA200DU-150 | 1SAZ421201R1004 | | 0.760 |
| 130 ... 175 | 315 A, Fuse type gG / 250 A aM | 10A | TA200DU-175 | 1SAZ421201R1005 | | 0.770 |
| 150 ... 200 | 315 A, Fuse type gG / 250 A aM | 10A | TA200DU-200 | 1SAZ421201R1006 | | 0.785 |

### Ordering details accessories

| For thermal overload relays<br>A | Description | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|
| TA200DU | Terminal shroud | LT200/A | 1SAZ401901R1001 | | 0.090 |
| TA200DU | Single mounting kit | DB200 | 1SAZ401110R0001 | | 0.225 |
| TA200DU | Reset push button* | KPR-101L | 1SFA616162R1014 | | 0.027 |

*Note: for more information see catalogie 1SFC151004C0201

### Main dimensions mm, *inches*




**TA200DU**

2CDC106038C0201

# TA200DU thermal overload relays
# Technical data

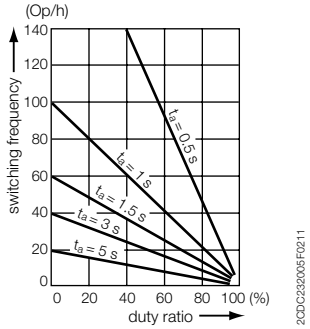
## Main circuit – Utilization characteristics according to IEC/EN

| | |
|---|---|
| **Type** | TA200DU |
| **Standards** | IEC/EN 60947-1, IEC/EN 60947-4-1 |
| **Rated operational voltage $U_e$** | 690 V AC |
| **Rated frequency** | DC, 50/60 Hz |
| **Frequency range** | 0 ... 400 Hz |
| **Trip class** | 10A |
| **Number of poles** | 3 |
| **Duty time** | 100 % |
| **Operating frequency without early tripping** | Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty" |
| **Rated impulse withstand voltage $U_{imp}$** | 6 kV |
| **Rated insulation voltage $U_i$** | 690 V AC |

## Auxiliary circuit according to IEC/EN

| | | |
|---|---|---|
| **Type** | | TA200DU |
| **Rated operational voltage $U_e$** | | 500 V AC, 440 V DC |
| **Conventional free air thermal current $I_{th}$** | **N.C., 95-96** | 10 A |
| | **N.O., 97-98** | 6 A |
| **Rated frequency** | | DC, 50/60 Hz |
| **Number of poles** | | 1 N.O. + 1 N.C. |
| **$I_e$ / Rated operational current AC-15** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 110-120 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 220-230-240 V | **N.C., 95-96** | 3.00 A |
| | **N.O., 97-98** | 1.50 A |
| 440 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| 480-500 V | **N.C., 95-96** | 1.00 A |
| | **N.O., 97-98** | 1.00 A |
| **$I_e$ / Rated operational current DC-13** acc. to IEC/EN 60947-5-1 for utilization category | | |
| 24 V | **N.C., 95-96** | 1.25 A |
| | **N.O., 97-98** | 1.25 A |
| 60 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 110-120-125 V | **N.C., 95-96** | 0.25 A |
| | **N.O., 97-98** | 0.25 A |
| 250 V | **N.C., 95-96** | 0.12 A |
| | **N.O., 97-98** | 0.04 A |
| **Minimum switching capacity** | | 17 V / 3 mA |
| **Short-circuit protective device** | **N.C., 95-96** | 10 A, Fuse type gG |
| | **N.O., 97-98** | 6 A, Fuse type gG |
| **Rated impulse withstand voltage $U_{imp}$** | | 6 kV |
| **Rated insulation voltage $U_i$** | | 690 V |

## Technical diagram – Intermittent periodic duty




$t_a$: Motor starting time

# TA200DU thermal overload relays
# Technical data

## Main circuit – Utilization characteristics according to UL/CSA

| Type | TA200DU |
|---|---|
| Standards | UL 508, CSA 22.2 No. 14 |
| Maximum operational voltage | 600 V AC |
| Trip rating | 125 % of FLA |
| Full load amps (FLA) | See table "Full load amps and short-circuit protective device" |
| Short-circuit rating RMS symmetrical | See table "Full load amps and short-circuit protective device" |
| Short-circuit protective device | See table "Full load amps and short-circuit protective device" |

4

## Auxiliary circuit according to UL/CSA

| Type | | TA200DU |
|---|---|---|
| Contact rating | N.C., 95-96 | C600 |
| | N.O., 97-98 | B600 |
| Conventional thermal current | | 5 A |

## Full load amps and short-circuit protective device

| Type | Full load amps (FLA) | Short-circuit protective device | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 480 / 600 V AC | | | | | | |
| | | Short circuit rating RMS symmetrical | Fuse type | Listed circuit breaker | Short circuit rating RMS symmetrical | Fuse type | Short circuit rating RMS symmetrical | Listed circuit breaker |
| **TA200DU-90** | 90 A | 10 kA | 250 A, K5 / RK5 | 225 A | 100 kA | 250 A, Class J | 100 kA | 250 A |
| **TA200DU-110** | 110 A | 10 kA | 250 A, K5 / RK5 | 225 A | 100 kA | 250 A, Class J | 100 kA | 250 A |
| **TA200DU-135** | 135 A | 10 kA | 300 A, K5 / RK5 | 225 A | 100 kA | 250 A, Class J | 100 kA | 250 A |
| **TA200DU-150** | 150 A | 10 kA | 300 A, K5 / RK5 | 225 A | 100 kA | 250 A, Class J | 100 kA | 250 A |
| **TA200DU-175** | 175 A | 10 kA | 300 A, K5 / RK5 | 225 A | 100 kA | 300 A, Class J | 100 kA | 300 A |
| **TA200DU-200** | 200 A | 10 kA | 400 A, K5 / RK5 | 400 A | 100 kA | 400 A, Class J | 100 kA | 400 A |

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# TA200DU thermal overload relays
# Technical data

## General technical data

| | | | |
|---|---|---|---|
| **Type** | | | TA200DU |
| **Pollution degree** | | | 3 |
| **Phase loss sensitive** | | | Yes |
| **Ambient air temperature** | | | |
| | Operation | Open - compensated | -25 ... +55 °C |
| | | Open | -25 ... +55 °C |
| | Storage | | -40 ... +70 °C |
| **Ambient air temperature compensation** | | | Acc. to IEC/EN60947-4-1 |
| **Maximum operating altitude permissible** | | | 2000 m |
| **Resistance to shock acc. to IEC 60068-2-27** | | | 12g / 15 ms |
| **Mounting position** | | | Position 1-6 |
| **Mounting** | | | Mount on the contactor and tighten the screws of the main circuit terminals or with single mounting kit |
| **Degree of protection** | Housing | | IP20 |
| | Main circuit terminals | | IP00 |

## Electrical connection

### Main circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA200DU |
| **Connecting capacity** | | | |
| | Rigid | **1 x** | 25 ... 120 mm² |
| | Flexible | **1 x** | 25 ... 120 mm² |
| | Stranded acc. to UL/CSA | **1 x** | AWG 4 ... 0000 |
| | Flexible acc. to UL/CSA | **1 x** | AWG 4 ... 0000 |
| | Lugs | | L > 10 mm |
| **Tightening torques** | | | 25 Nm / 220 lb.in |
| **Connection screw** | | | Open bars |

### Auxiliary circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA200DU |
| **Connecting capacity** | | | |
| | Rigid | **1 x or 2 x** | 0.75 ... 4 mm² |
| | Flexible with ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Flexible with insulated ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Flexible | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Stranded acc. to UL/CSA | **1 x or 2 x** | AWG 18 ... 14 |
| | Flexible acc. to UL/CSA | **1 x or 2 x** | AWG 18 ... 14 |
| **Stripping length** | | | 9 mm |
| **Tightening torques** | | | 0.8 ... 1.3 Nm / 12 lb.in |
| **Connection screw** | | | M3.5 (Pozidriv 2) |



2CDC106038C0201

# TA450DU, TA450SU thermal overload relays
## 40 ... 310 A


**TA450DU-310**


**KPR-101L**

4

### Description

The TA450DU, TA450SU thermal overload relays are economic electromechanical protection devices for the main circuit. They offer reliable protection for motors in the event of overload or phase failure. The TA450DU devices have trip class 10A, the TA450SU devices have trip class 30.

The thermal overload relays are three pole relays with bimetal tripping elements. The motor current flows through the bimetal tripping elements and heats them directly and indirectly. In case of an overload (over current), the bimetal elements bent as a result of the heating. This leads to a release of the relay and a change of the contacts switching position (95-96 / 97-98).

- Manual or automatic reset selectable
- Phase loss sensitive acc. to IEC/EN 60947-4-1
- Two electrically isolated auxiliary contacts – 1 N.O. + 1 N.C.
- TEST and STOP function – Trip indication on the front
- Temperature compensation
- Suitable for three- and single-phase applications

### Ordering details

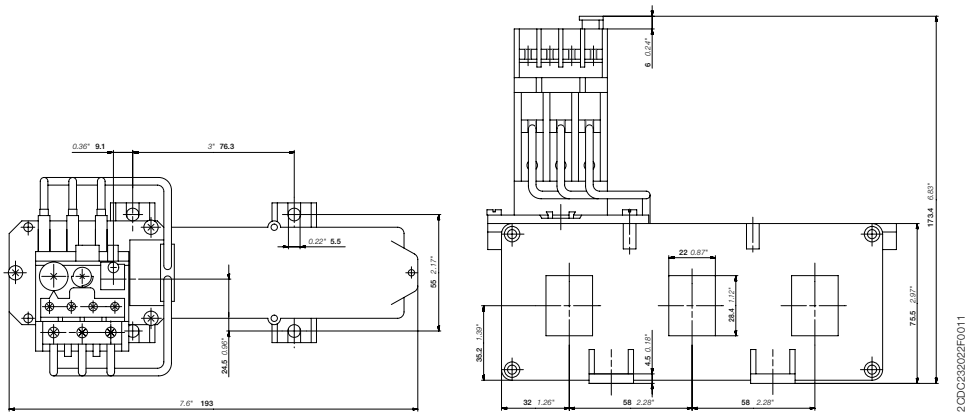
| Setting range<br>A | Short-circuit protective device | Trip class | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|---|
| **Thermal overload relays TA450DU** | | | | | | |
| 130 ... 185 | not applicable | 10A | TA450DU-185 | 1SAZ511201R1001 | | 1.500 |
| 165 ... 235 | not applicable | 10A | TA450DU-235 | 1SAZ511201R1002 | | 1.500 |
| 220 ... 310 | not applicable | 10A | TA450DU-310 | 1SAZ511201R1003 | | 1.500 |
| **Thermal overload relays TA450SU** | | | | | | |
| 40 ... 60 | not applicable | 30 | TA450SU-60 | 1SAZ611201R1005 | | 1.500 |
| 55 ... 80 | not applicable | 30 | TA450SU-80 | 1SAZ611201R1006 | | 1.500 |
| 70 ... 105 | not applicable | 30 | TA450SU-105 | 1SAZ611201R1007 | | 1.500 |
| 95 ... 140 | not applicable | 30 | TA450SU-140 | 1SAZ611201R1008 | | 1.500 |
| 130 ... 185 | not applicable | 30 | TA450SU-185 | 1SAZ611201R1001 | | 1.500 |
| 165 ... 235 | not applicable | 30 | TA450SU-235 | 1SAZ611201R1002 | | 1.500 |
| 220 ... 310 | not applicable | 30 | TA450SU-310 | 1SAZ611201R1003 | | 1.500 |

### Ordering details accessories

| For thermal overload relays<br>A | Description | Type | Order code | | Weight (1 pce)<br>kg |
|---|---|---|---|---|---|
| TA450DU, TA450SU | Terminal shroud | DT450/A185 | 1SAZ501901R1001 | | 1.070 |
| TA450DU, TA450SU | Terminal shroud | DT450/A300 | 1SAZ501902R1001 | | 1.180 |
| TA450DU, TA450SU | Reset push button* | KPR-101L | 1SFA616162R1014 | | 0.027 |

*Note: for more information see catalogue 1SFC151004C0201

### Main dimensions mm, *inches*




**TA450DU, TA450SU**

2CDC106041C0201

# TA450DU, TA450SU thermal overload relays
## Technical data

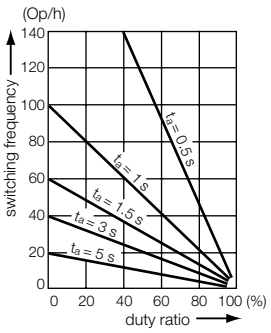
### Main circuit – Utilization characteristics according to IEC/EN

| Type | TA450DU, TA450SU |
|---|---|
| Standards | IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1 |
| Rated operational voltage $U_e$ | 1000 V AC |
| Rated frequency | 50/60 Hz |
| Trip class | 10A / 30 |
| Number of poles | 3 |
| Duty time | 100 % |
| Operating frequency without early tripping | Up to 15 operations/h, see "Technical diagram – Intermittent periodic duty" |
| Rated impulse withstand voltage $U_{imp}$ | 8 kV |
| Rated insulation voltage $U_i$ | 1000 V AC |

### Auxiliary circuit according to IEC/EN

| Type | | TA450DU, TA450SU |
|---|---|---|
| Rated operational voltage $U_e$ | | 500 V AC, 440 V DC |
| Conventional free air thermal current $I_{th}$ | N.C., 95-96 | 10 A |
| | N.O., 97-98 | 6 A |
| Rated frequency | | DC, 50/60 Hz |
| Number of poles | | 1 N.O. + 1 N.C. |
| $I_e$ / Rated operational current AC-15 acc. to IEC/EN 60947-5-1 for utilization category | | |
| 110-120 V | N.C., 95-96 | 3.00 A |
| | N.O., 97-98 | 1.50 A |
| 220-230-240 V | N.C., 95-96 | 3.00 A |
| | N.O., 97-98 | 1.50 A |
| 440 V | N.C., 95-96 | 1.00 A |
| | N.O., 97-98 | 1.00 A |
| 480-500 V | N.C., 95-96 | 1.00 A |
| | N.O., 97-98 | 1.00 A |
| $I_e$ / Rated operational current DC-13 acc. to IEC/EN 60947-5-1 for utilization category | | |
| 24 V | N.C., 95-96 | 1.25 A |
| | N.O., 97-98 | 1.25 A |
| 60 V | N.C., 95-96 | 0.25 A |
| | N.O., 97-98 | 0.25 A |
| 110-120-125 V | N.C., 95-96 | 0.25 A |
| | N.O., 97-98 | 0.25 A |
| 250 V | N.C., 95-96 | 0.12 A |
| | N.O., 97-98 | 0.04 A |
| Minimum switching capacity | | 17 V / 3 mA |
| Short-circuit protective device | N.C., 95-96 | 10 A, Fuse type gG |
| | N.O., 97-98 | 6 A, Fuse type gG |
| Rated impulse withstand voltage $U_{imp}$ | | 6 kV |
| Rated insulation voltage $U_i$ | | 500 V |

### Technical diagram – Intermittent periodic duty

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$t_a$: Motor starting time



2CDC106041C0201

# TA450DU, TA450SU thermal overload relays
# Technical data

## Main circuit – Utilization characteristics according to UL/CSA

| Type | TA450DU, TA450SU |
|---|---|
| Standards | UL 508, CSA 22.2 No. 14 |
| Maximum operational voltage | 600 V AC |
| Trip rating | 125 % of FLA |
| Full load amps (FLA) | See table "Full load amps and short-circuit protective device" |
| Short-circuit rating RMS symmetrical | See table "Full load amps and short-circuit protective device" |
| Short-circuit protective device | See table "Full load amps and short-circuit protective device" |

4

## Auxiliary circuit according to UL/CSA

| Type | | TA450DU, TA450SU |
|---|---|---|
| Contact rating | N.C., 95-96 | C600 |
| | N.O., 97-98 | B600 |
| Conventional thermal current | | 5 A |

## Full load amps and short-circuit protective device

| Type | Full load amps (FLA) | Short-circuit protective device 480 / 600 V AC | | |
|---|---|---|---|---|
| | | Short circuit rating RMS symmetrical | Fuse type | Listed circuit breaker |
| TA450DU-185 | 185 A | 10 kA | na | na |
| TA450DU-235 | 235 A | 10 kA | na | na |
| TA450DU-310 | 310 A | 18 kA | na | na |

2CDC106041C0201

# TA450DU, TA450SU thermal overload relays
# Technical data

## General technical data

| | | | |
|---|---|---|---|
| **Type** | | | TA450DU, TA450SU |
| **Pollution degree** | | | 3 |
| **Phase loss sensitive** | | | Yes |
| **Ambient air temperature** | | | |
| | Operation | Open - compensated | -25 ... +55 °C |
| | | Open | -25 ... +55 °C |
| | Storage | | -40 ... +70 °C |
| **Ambient air temperature compensation** | | | Acc. to IEC/EN60947-4-1 |
| **Maximum operating altitude permissible** | | | 2000 m |
| **Resistance to shock acc. to IEC 60068-2-27** | | | 12g / 15 ms |
| **Mounting position** | | | Position 1-6 |
| **Degree of protection** | | Housing | IP20 |
| | | Main circuit terminals | IP10 |

## Electrical connection

### Main circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA450DU, TA450SU |
| **Connecting capacity** | | | |
| | Bar | | Max. 21 x 28.4 mm |

### Auxiliary circuit

| | | | |
|---|---|---|---|
| **Type** | | | TA450DU, TA450SU |
| **Connecting capacity** | | | |
|  | Rigid | **1 x or 2 x** | 0.75 ... 4 mm² |
|  | Flexible with ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
|  | Flexible with insulated ferrule | **1 x or 2 x** | 0.75 ... 2.5 mm² |
|  | Flexible | **1 x or 2 x** | 0.75 ... 2.5 mm² |
| | Stranded acc. to UL/CSA | **1 x or 2 x** | AWG 18-14 |
| | Flexible acc. to UL/CSA | **1 x or 2 x** | AWG 18-14 |
| **Stripping length** | | | 9 mm |
| **Tightening torques** | | | 0.8 ... 1.3 Nm / 12 lb.in |
| **Connection screw** | | | M3.5 (Pozidriv 2) |



2CDC106041C0201

# Coordination with short-circuit protection devices

In compliance with standards IEC 60947-4-1 and EN 60947-4-1, we define for the contactors and starters the type, rating and characteristics of the short-circuit protection devices SCPD which allow selective protection against overloads and ensure protection against short circuits.

## Basic functions

Any starter is designed to:
– start motors,
– ensure continuous functioning of motors,
– disconnect motors from the supply line,
– guarantee protection of motors against overloads.

The starter is typically made up of a switching device (contactor) and an overload protection device (thermal overload relay or electronic overload relay).

These two devices MUST be coordinated with equipment capable of providing protection against short circuit (SCPD: short circuit protective device): typically a circuit breaker with magnetic release only or a switch fuse. These are not necessarily part of the starter.



## Applicable standards

IEC 60947-4-1 (EN 60947-4-1) precisely defines the different points to be considered in order to carry out correct coordination.

Complete coordination for a combination includes the following points:
– Selectivity test between the overload relay and the short-circuit protection device SCPD.
– Short-circuit condition tests:
  - at prospective "r" currents - These currents depend on the rated operational current of the starter (**Ie** AC-3) and are given by the standard (Table 13). For example:
    r = 1kA for **Ie** AC-3 < 16 A
    r = 3 kA for 16 A < **Ie** AC-3 < 63 A
    r = 5 kA for 63 A < **Ie** AC-3 < 125 A etc.
  - at the rated conditional short-circuit current "**Iq**" - This is the maximum prospective current that the combination can withstand, for example 50 kA.

## Types of coordination

IEC 60947-4-1 (EN 60947-4-1) defines two types of coordination according to the expected level of service continuity. Acceptable extreme damage for the switchgear is divided into two types.

**Type 1:** In short-circuit conditions, the contactor or starter does not endanger persons or installations and will not be able to then operate without being repaired or having parts replaced.

**Type 2:** In short-circuit conditions, the contactor or starter does not endanger persons or installations and will be able to operate afterwards. The risk of contacts light welding is acceptable. In this case, the manufacturer must stipulate the measures to be taken with respect to maintenance of the equipment.

## The complete ABB offer

ABB has acquired years of experience with respect to problems of coordination and is able to make a complete offer based on tests performed in its qualified laboratories. This offer includes 400 V, 500 V, 690 V networks.

**A complete data base of coordination tables,** according to IEC 60947-4-1 (EN 60947-4-1), is available on the ABB Website.

In the coordination tables the following short-circuit protection devices are recommended:
– Moulded case circuit-breakers (MCCBs)
– Miniature circuit-breakers (MCBs)
– Switch-disconnector-fuses (aM, gG and BS)
– Manual Motor Starters (MMS).

## General remarks applicable to all tables

– Each table is defined for a maximum ambient temperature of 40 °C. For higher temperatures, apply a derating factor according to the following rules:
  - Fuses: factor of 0.8 applied to **In** for an ambient temperature of 70 °C
  - MCCBs and MCBs: factor of 0.8 applied to **In** for an ambient temperature of 60 °C
  - The starter derating factor depends on the operating conditions of thermal overload relays:
    Factor of 0.9 applied to **In** for an ambient temperature of 70 °C.
– Each table is defined for motor currents: 3-phase motors, 4-pole
– **Normal starting** means a starting time < 2 s. - **Difficult starting** means an accelerating time 10 s < **ts** < 30 s
  **Tripping classes** of thermal overload relays according to IEC 60947-4-1 (EN 60947-4-1): 10A and 10
  **Tripping classes** of electronic overload relays according to IEC 60947-4-1 (EN 60947-4-1): 10E, 20E, 30E selectable
– In the tables with MCCBs, these are fitted with the magnetic relay alone. Setting is always carried out at > 12.3 **Ie** AC-3 so that the transient current peak occurring during starting does not lead to tripping.

1SBC101590S0201 - Rev. A

# Coordination with short-circuit protection devices

A complete data base of coordination tables, according to **IEC 60947-4-1** (EN 60947-4-1) **or UL 508 / UL 60947-4-1**, is available on the ABB Website: see below.

### Selection

Simple or multiple selections all from the same screen.

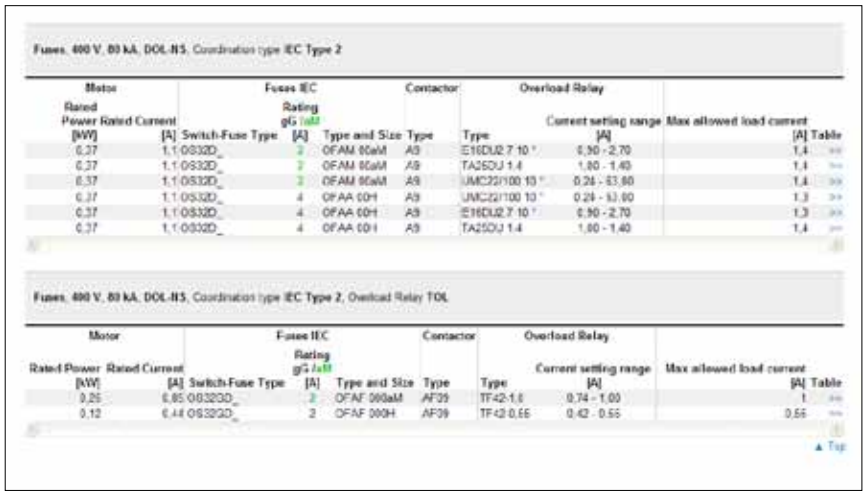

**Short-circuit protection devices**
- Air circuit breakers
- Fuses "gG" or "aM"
- Miniature circuit breaker
- Moulded case circuit breaker
- Manual motor starter

**Starter type**
- Direct-on-line normal start
- Direct-on-line heavy duty
- Star-delta normal start
- Soft starter normal start

**Coordination**
- IEC type 1 or type 2
- UL type A to Type F

### Results

- Search results displayed at the bottom of the selection page.
- Only the most appropriate solutions to your application, will be displayed at the bottom of the page.
  "Enable Smart Current Search" function featured for the short-circuit current where "near to" selected values also are included in the result.
- Possible to print the page to a pdf file or from your printer.
- "Clear selection" function to deselect all selected.




### Access

To find the coordination tables for motor protection, please see:

**www.abb.com/lowvoltage** then go to the right menu: "Support", select: "**Online Product Selection Tools**" then select "**Coordination Tables for motor protection**"



1SBC101591S0201 - Rev. A

# Index

## Order code classification

| Order code | Type | Page |
|---|---|---|
| 1SAM101923R0002 | MSMN | 2/38 |
| 1SAM101923R0012 | MSMNO | 2/38 |
| 1SAM201901R1001 | HKF1-11 | 2/17 |
| 1SAM201901R1002 | HKF1-20 | 2/17 |
| 1SAM201902R1001 | HK1-11 | 2/17 |
| 1SAM201902R1002 | HK1-20 | 2/17 |
| 1SAM201902R1003 | HK1-02 | 2/17 |
| 1SAM201902R1004 | HK1-20L | 2/17 |
| 1SAM201903R1001 | SK1-11 | 2/17 |
| 1SAM201903R1002 | SK1-20 | 2/17 |
| 1SAM201903R1003 | SK1-02 | 2/17 |
| 1SAM201904R1001 | UA1-24 | 2/18 |
| 1SAM201904R1002 | UA1-48 | 2/18 |
| 1SAM201904R1003 | UA1-60 | 2/18 |
| 1SAM201904R1004 | UA1-110 | 2/18 |
| 1SAM201904R1005 | UA1-230 | 2/18 |
| 1SAM201904R1006 | UA1-400 | 2/18 |
| 1SAM201904R1007 | UA1-415 | 2/18 |
| 1SAM201904R1008 | UA1-208 | 2/18 |
| 1SAM201906R1102 | PS1-2-0-65 | 2/21 |
| 1SAM201906R1103 | PS1-3-0-65 | 2/21 |
| 1SAM201906R1104 | PS1-4-0-65 | 2/21 |
| 1SAM201906R1105 | PS1-5-0-65 | 2/21 |
| 1SAM201906R1112 | PS1-2-1-65 | 2/21 |
| 1SAM201906R1113 | PS1-3-1-65 | 2/21 |
| 1SAM201906R1114 | PS1-4-1-65 | 2/21 |
| 1SAM201906R1115 | PS1-5-1-65 | 2/21 |
| 1SAM201906R1122 | PS1-2-2-65 | 2/21 |
| 1SAM201906R1123 | PS1-3-2-65 | 2/21 |
| 1SAM201906R1124 | PS1-4-2-65 | 2/21 |
| 1SAM201906R1125 | PS1-5-2-65 | 2/21 |
| 1SAM201907R1101 | S1-M1-25 | 2/21 |
| 1SAM201907R1102 | S1-M2-25 | 2/21 |
| 1SAM201907R1103 | S1-M3-25 | 2/21 |
| 1SAM201908R1001 | BS1-3 | 2/21 |
| 1SAM201909R1001 | FS116 | 2/21 |
| 1SAM201909R1021 | MSAH1 | 2/38 |
| 1SAM201910R1001 | AA1-24 | 2/18 |
| 1SAM201910R1002 | AA1-110 | 2/18 |
| 1SAM201910R1003 | AA1-230 | 2/18 |
| 1SAM201910R1004 | AA1-400 | 2/18 |
| 1SAM201911R1010 | IB132-G | 2/23 |
| 1SAM201911R1011 | IB132-Y | 2/23 |
| 1SAM201912R1010 | DMS132-G | 2/23 |
| 1SAM201912R1011 | DMS132-Y | 2/23 |
| 1SAM201913R1103 | S1-M3-35 | 2/21 |
| 1SAM201916R1103 | PS1-3-0-100 | 2/21 |
| 1SAM201916R1104 | PS1-4-0-100 | 2/21 |
| 1SAM201916R1105 | PS1-5-0-100 | 2/21 |
| 1SAM201916R1113 | PS1-3-1-100 | 2/21 |
| 1SAM201916R1114 | PS1-4-1-100 | 2/21 |
| 1SAM201916R1115 | PS1-5-1-100 | 2/21 |
| 1SAM201916R1123 | PS1-3-2-100 | 2/21 |
| 1SAM201920R1000 | MSH-AR | 2/38 |
| 1SAM201920R1001 | MSHD-LB | 2/38 |
| 1SAM201920R1002 | MSHD-LY | 2/38 |
| 1SAM201920R1011 | MSHD-LTB | 2/38 |
| 1SAM201920R1012 | MSHD-LTY | 2/38 |
| 1SAM250000R1001 | MS116-0.16 | 2/4 |
| 1SAM250000R1002 | MS116-0.25 | 2/4 |
| 1SAM250000R1003 | MS116-0.4 | 2/4 |
| 1SAM250000R1004 | MS116-0.63 | 2/4 |
| 1SAM250000R1005 | MS116-1.0 | 2/4 |
| 1SAM250000R1006 | MS116-1.6 | 2/4 |
| 1SAM250000R1007 | MS116-2.5 | 2/4 |
| 1SAM250000R1008 | MS116-4.0 | 2/4 |
| 1SAM250000R1009 | MS116-6.3 | 2/4 |
| 1SAM250000R1010 | MS116-10 | 2/4 |
| 1SAM250000R1011 | MS116-16 | 2/4 |
| 1SAM250000R1012 | MS116-12 | 2/4 |
| 1SAM250000R1013 | MS116-20 | 2/4 |
| 1SAM250000R1014 | MS116-25 | 2/4 |
| 1SAM250000R1015 | MS116-32 | 2/4 |
| 1SAM250005R1001 | MS116-0.16-HKF1-11 | 2/4 |
| 1SAM250005R1002 | MS116-0.25-HKF1-11 | 2/4 |
| 1SAM250005R1003 | MS116-0.4-HKF1-11 | 2/4 |
| 1SAM250005R1004 | MS116-0.63-HKF1-11 | 2/4 |
| 1SAM250005R1005 | MS116-1.0-HKF1-11 | 2/4 |
| 1SAM250005R1006 | MS116-1.6-HKF1-11 | 2/4 |
| 1SAM250005R1007 | MS116-2.5-HKF1-11 | 2/4 |
| 1SAM250005R1008 | MS116-4.0-HKF1-11 | 2/4 |
| 1SAM250005R1009 | MS116-6.3-HKF1-11 | 2/4 |
| 1SAM250005R1010 | MS116-10.0-HKF1-11 | 2/4 |
| 1SAM250005R1011 | MS116-16.0-HKF1-11 | 2/4 |
| 1SAM250005R1012 | MS116-12.0-HKF1-11 | 2/4 |
| 1SAM250005R1013 | MS116-20-HKF1-11 | 2/4 |
| 1SAM250005R1014 | MS116-25-HKF1-11 | 2/4 |
| 1SAM250005R1015 | MS116-32-HKF1-11 | 2/4 |
| 1SAM301901R1001 | CK1-11 | 2/17 |
| 1SAM301901R1002 | CK1-20 | 2/17 |
| 1SAM301901R1003 | CK1-02 | 2/17 |
| 1SAM350000R1001 | MS132-0.16 | 2/8 |
| 1SAM350000R1002 | MS132-0.25 | 2/8 |
| 1SAM350000R1003 | MS132-0.4 | 2/8 |
| 1SAM350000R1004 | MS132-0.63 | 2/8 |
| 1SAM350000R1005 | MS132-1.0 | 2/8 |
| 1SAM350000R1006 | MS132-1.6 | 2/8 |
| 1SAM350000R1007 | MS132-2.5 | 2/8 |
| 1SAM350000R1008 | MS132-4.0 | 2/8 |
| 1SAM350000R1009 | MS132-6.3 | 2/8 |
| 1SAM350000R1010 | MS132-10 | 2/8 |
| 1SAM350000R1011 | MS132-16 | 2/8 |
| 1SAM350000R1012 | MS132-12 | 2/8 |
| 1SAM350000R1013 | MS132-20 | 2/8 |
| 1SAM350000R1014 | MS132-25 | 2/8 |
| 1SAM350000R1015 | MS132-32 | 2/8 |
| 1SAM350005R1001 | MS132-0.16-HKF1-11 | 2/8 |
| 1SAM350005R1002 | MS132-0.25-HKF1-11 | 2/8 |
| 1SAM350005R1003 | MS132-0.4-HKF1-11 | 2/8 |
| 1SAM350005R1004 | MS132-0.63-HKF1-11 | 2/8 |
| 1SAM350005R1005 | MS132-1.0-HKF1-11 | 2/8 |
| 1SAM350005R1006 | MS132-1.6-HKF1-11 | 2/8 |
| 1SAM350005R1007 | MS132-2.5-HKF1-11 | 2/8 |
| 1SAM350005R1008 | MS132-4.0-HKF1-11 | 2/8 |
| 1SAM350005R1009 | MS132-6.3-HKF1-11 | 2/8 |
| 1SAM350005R1010 | MS132-10.0-HKF1-11 | 2/8 |
| 1SAM350005R1011 | MS132-16.0-HKF1-11 | 2/8 |
| 1SAM350005R1012 | MS132-12.0-HKF1-11 | 2/8 |
| 1SAM350005R1013 | MS132-20-HKF1-11 | 2/8 |
| 1SAM350005R1014 | MS132-25-HKF1-11 | 2/8 |
| 1SAM350005R1015 | MS132-32-HKF1-11 | 2/8 |
| 1SAM360000R1001 | MO132-0.16 | 2/12 |
| 1SAM360000R1002 | MO132-0.25 | 2/12 |
| 1SAM360000R1003 | MO132-0.4 | 2/12 |
| 1SAM360000R1004 | MO132-0.63 | 2/12 |
| 1SAM360000R1005 | MO132-1.0 | 2/12 |
| 1SAM360000R1006 | MO132-1.6 | 2/12 |
| 1SAM360000R1007 | MO132-2.5 | 2/12 |
| 1SAM360000R1008 | MO132-4.0 | 2/12 |
| 1SAM360000R1009 | MO132-6.3 | 2/12 |
| 1SAM360000R1010 | MO132-10 | 2/12 |
| 1SAM360000R1011 | MO132-16 | 2/12 |
| 1SAM360000R1012 | MO132-12 | 2/12 |
| 1SAM360000R1013 | MO132-20 | 2/12 |
| 1SAM360000R1014 | MO132-25 | 2/12 |
| 1SAM360000R1015 | MO132-32 | 2/12 |
| 1SAM401901R1001 | HK4-11 | 2/33 |
| 1SAM401901R1002 | HK4-W | 2/33 |
| 1SAM401902R1001 | HKS4-11 | 2/33 |
| 1SAM401902R1002 | HKS4-20 | 2/33 |
| 1SAM401902R1003 | HKS4-02 | 2/33 |
| 1SAM401904R1001 | SK4-11 | 2/33 |
| 1SAM401905R1001 | UA4-110 | 2/33 |
| 1SAM401905R1002 | UA4-230 | 2/33 |
| 1SAM401905R1003 | UA4-400 | 2/33 |
| 1SAM401905R1004 | UA4-24 | 2/33 |
| 1SAM401906R1001 | UA4-HK-230 | 2/33 |
| 1SAM401906R1002 | UA4-HK-400 | 2/33 |
| 1SAM401907R1001 | AA4-24 | 2/33 |
| 1SAM401907R1002 | AA4-110 | 2/33 |
| 1SAM401907R1003 | AA4-230 | 2/33 |
| 1SAM401907R1004 | AA4-400 | 2/33 |
| 1SAM401908R1001 | KA450 | 2/36 |
| 1SAM401910R1001 | TB450 | 2/36 |
| 1SAM401911R1001 | PS4-2-0 | 2/36 |
| 1SAM401911R1002 | PS4-3-0 | 2/36 |
| 1SAM401911R1003 | PS4-4-0 | 2/36 |
| 1SAM401911R1004 | PS4-2-2 | 2/36 |
| 1SAM401911R1005 | PS4-3-2 | 2/36 |
| 1SAM401911R1006 | PS4-4-2 | 2/36 |
| 1SAM401911R1007 | S4-M1 | 2/36 |
| 1SAM401911R1008 | BS4-3 | 2/36 |
| 1SAM401912R1001 | DX495 | 2/36 |
| 1SAM450000R1005 | MS450-40 | 2/24 |
| 1SAM450000R1006 | MS450-45 | 2/24 |





1SBC100179C0201_Chap06_Index

# Index

## Order code classification

| Order code | Type | Page |
|---|---|---|
| 1SAM450000R1007 | MS450-50 | 2/24 |
| 1SAM460000R1005 | MO450-40 | 2/28 |
| 1SAM460000R1006 | MO450-45 | 2/28 |
| 1SAM460000R1007 | MO450-50 | 2/28 |
| 1SAM501901R1001 | KA495 | 2/36 |
| 1SAM501902R1001 | KA495C | 2/36 |
| 1SAM550000R1007 | MS495-63 | 2/24 |
| 1SAM550000R1008 | MS495-75 | 2/24 |
| 1SAM550000R1009 | MS495-90 | 2/24 |
| 1SAM550000R1010 | MS495-100 | 2/24 |
| 1SAM560000R1007 | MO495-63 | 2/28 |
| 1SAM560000R1008 | MO495-75 | 2/28 |
| 1SAM560000R1009 | MO495-90 | 2/28 |
| 1SAM560000R1010 | MO495-100 | 2/28 |
| 1SAM580000R1004 | MS497-32 | 2/24 |
| 1SAM580000R1005 | MS497-40 | 2/24 |
| 1SAM580000R1006 | MS497-50 | 2/24 |
| 1SAM580000R1007 | MS497-63 | 2/24 |
| 1SAM580000R1008 | MS497-75 | 2/24 |
| 1SAM580000R1009 | MS497-90 | 2/24 |
| 1SAM580000R1010 | MS497-100 | 2/24 |
| 1SAM590000R1004 | MO496-32 | 2/28 |
| 1SAM590000R1005 | MO496-40 | 2/28 |
| 1SAM590000R1006 | MO496-50 | 2/28 |
| 1SAM590000R1007 | MO496-63 | 2/28 |
| 1SAM590000R1008 | MO496-75 | 2/28 |
| 1SAM590000R1009 | MO496-90 | 2/28 |
| 1SAM590000R1010 | MO496-100 | 2/28 |
| 1SAZ201108R0001 | DB25/25A | 4/7 |
| 1SAZ201108R0002 | DB25/32A | 4/7 |
| 1SAZ201307R0002 | DX25 | 4/7 |
| 1SAZ201504R0001 | DR25-A-24 | 4/7 |
| 1SAZ201504R0002 | DR25-A-48 | 4/7 |
| 1SAZ201504R0003 | DR25-A-110 | 4/7 |
| 1SAZ201504R0005 | DR25-A-220/380 | 4/7 |
| 1SAZ201504R0006 | DR25-A-500 | 4/7 |
| 1SAZ211201R2005 | TA25DU-0.16M | 4/4 |
| 1SAZ211201R2009 | TA25DU-0.25M | 4/4 |
| 1SAZ211201R2013 | TA25DU-0.4M | 4/4 |
| 1SAZ211201R2017 | TA25DU-0.63M | 4/4 |
| 1SAZ211201R2021 | TA25DU-1.0M | 4/4 |
| 1SAZ211201R2023 | TA25DU-1.4M | 4/4 |
| 1SAZ211201R2025 | TA25DU-1.8M | 4/4 |
| 1SAZ211201R2028 | TA25DU-2.4M | 4/4 |
| 1SAZ211201R2031 | TA25DU-3.1M | 4/4 |
| 1SAZ211201R2033 | TA25DU-4.0M | 4/4 |
| 1SAZ211201R2035 | TA25DU-5.0M | 4/4 |
| 1SAZ211201R2038 | TA25DU-6.5M | 4/4 |
| 1SAZ211201R2040 | TA25DU-8.5M | 4/4 |
| 1SAZ211201R2043 | TA25DU-11M | 4/4 |
| 1SAZ211201R2045 | TA25DU-14M | 4/4 |
| 1SAZ211201R2047 | TA25DU-19M | 4/4 |
| 1SAZ211201R2051 | TA25DU-25M | 4/4 |
| 1SAZ211201R2053 | TA25DU-32M | 4/4 |
| 1SAZ301110R0001 | DB80 | 4/8 |
| 1SAZ311201R2001 | TA42DU-25M | 4/8 |
| 1SAZ311201R2002 | TA42DU-32M | 4/8 |
| 1SAZ311201R2003 | TA42DU-42M | 4/8 |
| 1SAZ321201R2001 | TA75DU-25M | 4/11 |
| 1SAZ321201R2002 | TA75DU-32M | 4/11 |
| 1SAZ321201R2003 | TA75DU-42M | 4/11 |
| 1SAZ321201R2004 | TA75DU-52M | 4/11 |
| 1SAZ321201R2005 | TA75DU-63M | 4/11 |
| 1SAZ321201R2006 | TA75DU-80M | 4/11 |
| 1SAZ331201R1003 | TA80DU-42 | 4/14 |
| 1SAZ331201R1004 | TA80DU-52 | 4/14 |
| 1SAZ331201R1005 | TA80DU-63 | 4/14 |
| 1SAZ331201R1006 | TA80DU-80 | 4/14 |
| 1SAZ401110R0001 | DB200 | 4/18 |
| 1SAZ401901R1001 | LT200/A | 4/22 |
| 1SAZ411201R1001 | TA110DU-90 | 4/18 |
| 1SAZ411201R1002 | TA110DU-110 | 4/18 |
| 1SAZ421201R1001 | TA200DU-90 | 4/22 |
| 1SAZ421201R1002 | TA200DU-110 | 4/22 |
| 1SAZ421201R1003 | TA200DU-135 | 4/22 |
| 1SAZ421201R1004 | TA200DU-150 | 4/22 |
| 1SAZ421201R1005 | TA200DU-175 | 4/22 |
| 1SAZ421201R1006 | TA200DU-200 | 4/22 |
| 1SAZ501901R1001 | DT450/A185 | 4/26 |
| 1SAZ501902R1001 | DT450/A300 | 4/26 |
| 1SAZ511201R1001 | TA450DU-185 | 4/26 |
| 1SAZ511201R1002 | TA450DU-235 | 4/26 |
| 1SAZ511201R1003 | TA450DU-310 | 4/26 |
| 1SAZ611201R1001 | TA450SU-185 | 4/26 |
| 1SAZ611201R1002 | TA450SU-235 | 4/26 |
| 1SAZ611201R1003 | TA450SU-310 | 4/26 |
| 1SAZ611201R1005 | TA450SU-60 | 4/26 |
| 1SAZ611201R1006 | TA450SU-80 | 4/26 |
| 1SAZ611201R1007 | TA450SU-105 | 4/26 |
| 1SAZ611201R1008 | TA450SU-140 | 4/26 |
| 1SBH141001R8022 | N22E | 3/45 |
| 1SBH141001R8031 | N31E | 3/45 |
| 1SBH141001R8040 | N40E | 3/45 |
| 1SBH141001R8122 | N22E | 3/45 |
| 1SBH141001R8131 | N31E | 3/45 |
| 1SBH141001R8140 | N40E | 3/45 |
| 1SBH141001R8322 | N22E | 3/45 |
| 1SBH141001R8331 | N31E | 3/45 |
| 1SBH141001R8340 | N40E | 3/45 |
| 1SBH141001R8422 | N22E | 3/45 |
| 1SBH141001R8431 | N31E | 3/45 |
| 1SBH141001R8440 | N40E | 3/45 |
| 1SBH141001R8522 | N22E | 3/45 |
| 1SBH141001R8531 | N31E | 3/45 |
| 1SBH141001R8540 | N40E | 3/45 |
| 1SBH141001R8622 | N22E | 3/45 |
| 1SBH141001R8631 | N31E | 3/45 |
| 1SBH141001R8640 | N40E | 3/45 |
| 1SBH141001R8822 | N22E | 3/45 |
| 1SBH141001R8831 | N31E | 3/45 |
| 1SBH141001R8840 | N40E | 3/45 |
| 1SBL141001R8001 | A9-30-01 | 3/4 |
| 1SBL141001R8010 | A9-30-10 | 3/4 |
| 1SBL141001R8101 | A9-30-01 | 3/4 |
| 1SBL141001R8110 | A9-30-10 | 3/4 |
| 1SBL141001R8301 | A9-30-01 | 3/4 |
| 1SBL141001R8310 | A9-30-10 | 3/4 |
| 1SBL141001R8401 | A9-30-01 | 3/4 |
| 1SBL141001R8410 | A9-30-10 | 3/4 |
| 1SBL141001R8501 | A9-30-01 | 3/4 |
| 1SBL141001R8510 | A9-30-10 | 3/4 |
| 1SBL141001R8601 | A9-30-01 | 3/4 |
| 1SBL141001R8610 | A9-30-10 | 3/4 |
| 1SBL141001R8801 | A9-30-01 | 3/4 |
| 1SBL141001R8810 | A9-30-10 | 3/4 |
| 1SBL141201R8000 | A9-40-00 | 3/31 |
| 1SBL141201R8100 | A9-40-00 | 3/31 |
| 1SBL141201R8300 | A9-40-00 | 3/31 |
| 1SBL141201R8400 | A9-40-00 | 3/31 |
| 1SBL141201R8500 | A9-40-00 | 3/31 |
| 1SBL141201R8600 | A9-40-00 | 3/31 |
| 1SBL141201R8800 | A9-40-00 | 3/31 |
| 1SBL141501R8000 | A9-22-00 | 3/31 |
| 1SBL141501R8100 | A9-22-00 | 3/31 |
| 1SBL141501R8300 | A9-22-00 | 3/31 |
| 1SBL141501R8400 | A9-22-00 | 3/31 |
| 1SBL141501R8500 | A9-22-00 | 3/31 |
| 1SBL141501R8600 | A9-22-00 | 3/31 |
| 1SBL141501R8800 | A9-22-00 | 3/31 |
| 1SBL161001R8001 | A12-30-01 | 3/4 |
| 1SBL161001R8010 | A12-30-10 | 3/4 |
| 1SBL161001R8101 | A12-30-01 | 3/4 |
| 1SBL161001R8110 | A12-30-10 | 3/4 |
| 1SBL161001R8301 | A12-30-01 | 3/4 |
| 1SBL161001R8310 | A12-30-10 | 3/4 |
| 1SBL161001R8401 | A12-30-01 | 3/4 |
| 1SBL161001R8410 | A12-30-10 | 3/4 |
| 1SBL161001R8501 | A12-30-01 | 3/4 |
| 1SBL161001R8510 | A12-30-10 | 3/4 |
| 1SBL161001R8601 | A12-30-01 | 3/4 |
| 1SBL161001R8610 | A12-30-10 | 3/4 |
| 1SBL161001R8801 | A12-30-01 | 3/4 |
| 1SBL161001R8810 | A12-30-10 | 3/4 |
| 1SBL181001R8001 | A16-30-01 | 3/4 |
| 1SBL181001R8010 | A16-30-10 | 3/4 |
| 1SBL181001R8101 | A16-30-01 | 3/4 |
| 1SBL181001R8110 | A16-30-10 | 3/4 |
| 1SBL181001R8301 | A16-30-01 | 3/4 |
| 1SBL181001R8310 | A16-30-10 | 3/4 |
| 1SBL181001R8401 | A16-30-01 | 3/4 |
| 1SBL181001R8410 | A16-30-10 | 3/4 |
| 1SBL181001R8501 | A16-30-01 | 3/4 |
| 1SBL181001R8510 | A16-30-10 | 3/4 |
| 1SBL181001R8601 | A16-30-01 | 3/4 |
| 1SBL181001R8610 | A16-30-10 | 3/4 |

# Index

## Order code classification

| Order code | Type | Page |
|---|---|---|
| 1SBL181001R8801 | A16-30-01 | 3/4 |
| 1SBL181001R8810 | A16-30-10 | 3/4 |
| 1SBL181201R8000 | A16-40-00 | 3/31 |
| 1SBL181201R8100 | A16-40-00 | 3/31 |
| 1SBL181201R8300 | A16-40-00 | 3/31 |
| 1SBL181201R8400 | A16-40-00 | 3/31 |
| 1SBL181201R8500 | A16-40-00 | 3/31 |
| 1SBL181201R8600 | A16-40-00 | 3/31 |
| 1SBL181201R8800 | A16-40-00 | 3/31 |
| 1SBL181501R8000 | A16-22-00 | 3/31 |
| 1SBL181501R8100 | A16-22-00 | 3/31 |
| 1SBL181501R8300 | A16-22-00 | 3/31 |
| 1SBL181501R8400 | A16-22-00 | 3/31 |
| 1SBL181501R8500 | A16-22-00 | 3/31 |
| 1SBL181501R8600 | A16-22-00 | 3/31 |
| 1SBL181501R8800 | A16-22-00 | 3/31 |
| 1SBL241001R8001 | A26-30-01 | 3/5 |
| 1SBL241001R8010 | A26-30-10 | 3/5 |
| 1SBL241001R8101 | A26-30-01 | 3/5 |
| 1SBL241001R8110 | A26-30-10 | 3/5 |
| 1SBL241001R8301 | A26-30-01 | 3/5 |
| 1SBL241001R8310 | A26-30-10 | 3/5 |
| 1SBL241001R8401 | A26-30-01 | 3/5 |
| 1SBL241001R8410 | A26-30-10 | 3/5 |
| 1SBL241001R8501 | A26-30-01 | 3/5 |
| 1SBL241001R8510 | A26-30-10 | 3/5 |
| 1SBL241001R8601 | A26-30-01 | 3/5 |
| 1SBL241001R8610 | A26-30-10 | 3/5 |
| 1SBL241001R8801 | A26-30-01 | 3/5 |
| 1SBL241001R8810 | A26-30-10 | 3/5 |
| 1SBL241201R8000 | A26-40-00 | 3/32 |
| 1SBL241201R8100 | A26-40-00 | 3/32 |
| 1SBL241201R8300 | A26-40-00 | 3/32 |
| 1SBL241201R8400 | A26-40-00 | 3/32 |
| 1SBL241201R8500 | A26-40-00 | 3/32 |
| 1SBL241201R8600 | A26-40-00 | 3/32 |
| 1SBL241201R8800 | A26-40-00 | 3/32 |
| 1SBL241501R8000 | A26-22-00 | 3/32 |
| 1SBL241501R8100 | A26-22-00 | 3/32 |
| 1SBL241501R8300 | A26-22-00 | 3/32 |
| 1SBL241501R8400 | A26-22-00 | 3/32 |
| 1SBL241501R8500 | A26-22-00 | 3/32 |
| 1SBL241501R8600 | A26-22-00 | 3/32 |
| 1SBL241501R8800 | A26-22-00 | 3/32 |
| 1SBL281001R8001 | A30-30-01 | 3/5 |
| 1SBL281001R8010 | A30-30-10 | 3/5 |
| 1SBL281001R8101 | A30-30-01 | 3/5 |
| 1SBL281001R8110 | A30-30-10 | 3/5 |
| 1SBL281001R8301 | A30-30-01 | 3/5 |
| 1SBL281001R8310 | A30-30-10 | 3/5 |
| 1SBL281001R8401 | A30-30-01 | 3/5 |
| 1SBL281001R8410 | A30-30-10 | 3/5 |
| 1SBL281001R8501 | A30-30-01 | 3/5 |
| 1SBL281001R8510 | A30-30-10 | 3/5 |
| 1SBL281001R8601 | A30-30-01 | 3/5 |
| 1SBL281001R8610 | A30-30-10 | 3/5 |
| 1SBL281001R8801 | A30-30-01 | 3/5 |
| 1SBL281001R8810 | A30-30-10 | 3/5 |
| 1SBL321001R8001 | A40-30-01 | 3/5 |
| 1SBL321001R8010 | A40-30-10 | 3/5 |
| 1SBL321001R8101 | A40-30-01 | 3/5 |
| 1SBL321001R8110 | A40-30-10 | 3/5 |
| 1SBL321001R8301 | A40-30-01 | 3/5 |
| 1SBL321001R8310 | A40-30-10 | 3/5 |
| 1SBL321001R8401 | A40-30-01 | 3/5 |
| 1SBL321001R8410 | A40-30-10 | 3/5 |
| 1SBL321001R8501 | A40-30-01 | 3/5 |
| 1SBL321001R8510 | A40-30-10 | 3/5 |
| 1SBL321001R8601 | A40-30-01 | 3/5 |
| 1SBL321001R8610 | A40-30-10 | 3/5 |
| 1SBL321001R8801 | A40-30-01 | 3/5 |
| 1SBL321001R8810 | A40-30-10 | 3/5 |
| 1SBL331201R8000 | A45-40-00 | 3/33 |
| 1SBL331201R8100 | A45-40-00 | 3/33 |
| 1SBL331201R8300 | A45-40-00 | 3/33 |
| 1SBL331201R8400 | A45-40-00 | 3/33 |
| 1SBL331201R8500 | A45-40-00 | 3/33 |
| 1SBL331201R8600 | A45-40-00 | 3/33 |
| 1SBL331201R8800 | A45-40-00 | 3/33 |
| 1SBL331501R8000 | A45-22-00 | 3/33 |
| 1SBL331501R8100 | A45-22-00 | 3/33 |
| 1SBL331501R8300 | A45-22-00 | 3/33 |
| 1SBL331501R8400 | A45-22-00 | 3/33 |
| 1SBL331501R8500 | A45-22-00 | 3/33 |
| 1SBL331501R8600 | A45-22-00 | 3/33 |
| 1SBL331501R8800 | A45-22-00 | 3/33 |
| 1SBL351001R8011 | A50-30-11 | 3/6 |
| 1SBL351001R8111 | A50-30-11 | 3/6 |
| 1SBL351001R8311 | A50-30-11 | 3/6 |
| 1SBL351001R8411 | A50-30-11 | 3/6 |
| 1SBL351001R8511 | A50-30-11 | 3/6 |
| 1SBL351001R8611 | A50-30-11 | 3/6 |
| 1SBL351001R8811 | A50-30-11 | 3/6 |
| 1SBL351201R8000 | A50-40-00 | 3/33 |
| 1SBL351201R8100 | A50-40-00 | 3/33 |
| 1SBL351201R8300 | A50-40-00 | 3/33 |
| 1SBL351201R8400 | A50-40-00 | 3/33 |
| 1SBL351201R8500 | A50-40-00 | 3/33 |
| 1SBL351201R8600 | A50-40-00 | 3/33 |
| 1SBL351201R8800 | A50-40-00 | 3/33 |
| 1SBL371001R8011 | A63-30-11 | 3/6 |
| 1SBL371001R8111 | A63-30-11 | 3/6 |
| 1SBL371001R8311 | A63-30-11 | 3/6 |
| 1SBL371001R8411 | A63-30-11 | 3/6 |
| 1SBL371001R8511 | A63-30-11 | 3/6 |
| 1SBL371001R8611 | A63-30-11 | 3/6 |
| 1SBL371001R8811 | A63-30-11 | 3/6 |
| 1SBL411001R8011 | A75-30-11 | 3/6 |
| 1SBL411001R8111 | A75-30-11 | 3/6 |
| 1SBL411001R8311 | A75-30-11 | 3/6 |
| 1SBL411001R8411 | A75-30-11 | 3/6 |
| 1SBL411001R8511 | A75-30-11 | 3/6 |
| 1SBL411001R8611 | A75-30-11 | 3/6 |
| 1SBL411001R8811 | A75-30-11 | 3/6 |
| 1SBL411201R8000 | A75-40-00 | 3/33 |
| 1SBL411201R8100 | A75-40-00 | 3/33 |
| 1SBL411201R8300 | A75-40-00 | 3/33 |
| 1SBL411201R8400 | A75-40-00 | 3/33 |
| 1SBL411201R8500 | A75-40-00 | 3/33 |
| 1SBL411201R8600 | A75-40-00 | 3/33 |
| 1SBL411201R8800 | A75-40-00 | 3/33 |
| 1SBL411501R8000 | A75-22-00 | 3/33 |
| 1SBL411501R8100 | A75-22-00 | 3/33 |
| 1SBL411501R8300 | A75-22-00 | 3/33 |
| 1SBL411501R8400 | A75-22-00 | 3/33 |
| 1SBL411501R8500 | A75-22-00 | 3/33 |
| 1SBL411501R8600 | A75-22-00 | 3/33 |
| 1SBL411501R8800 | A75-22-00 | 3/33 |
| 1SBN010010R1001 | CA5-01 | 3/9 |
| 1SBN010010R1010 | CA5-10 | 3/9 |
| 1SBN010011R1001 | CC5-01 | 3/52 |
| 1SBN010011R1010 | CC5-10 | 3/52 |
| 1SBN010013R1001 | CB5-01 | 3/68 |
| 1SBN010013R1010 | CB5-10 | 3/68 |
| 1SBN010020R1011 | CAL5-11 | 3/9 |
| 1SBN010040R1004 | CA5-04E | 3/52 |
| 1SBN010040R1018 | CA5-11/11E | 3/52 |
| 1SBN010040R1022 | CA5-22E | 3/9 |
| 1SBN010040R1031 | CA5-31E | 3/52 |
| 1SBN010040R1040 | CA5-40E | 3/52 |
| 1SBN010040R1104 | CA5-04M | 3/52 |
| 1SBN010040R1113 | CA5-13M | 3/52 |
| 1SBN010040R1118 | CA5-11/11M | 3/52 |
| 1SBN010040R1122 | CA5-22M | 3/9 |
| 1SBN010040R1131 | CA5-31M | 3/52 |
| 1SBN010040R1204 | CA5-04N | 3/52 |
| 1SBN010040R1213 | CA5-13N | 3/52 |
| 1SBN010040R1222 | CA5-22N | 3/47 |
| 1SBN010040R1231 | CA5-31N | 3/52 |
| 1SBN010040R1240 | CA5-40N | 3/52 |
| 1SBN010040R1304 | CA5-04U | 3/52 |
| 1SBN010040R1322 | CA5-22U | 3/9 |
| 1SBN010040R1331 | CA5-31U | 3/52 |
| 1SBN010040R1340 | CA5-40U | 3/52 |
| 1SBN011421R1008 | CCL5-11 | 3/52 |
| 1SBN020010R1001 | TE5S-24 | 3/60 |
| 1SBN020010R1002 | TE5S-120 | 3/60 |
| 1SBN020010R1003 | TE5S-240 | 3/60 |
| 1SBN020010R1004 | TE5S-440 | 3/60 |
| 1SBN020312R1000 | TEF5-ON | 3/9 |
| 1SBN020314R1000 | TEF5-OFF | 3/9 |
| 1SBN030100R1000 | VM5-1 | 3/9 |
| 1SBN030110R1000 | VE5-1 | 3/9 |
| 1SBN030210R1000 | VE5-2 | 3/9 |
| 1SBN050010R1000 | RV5/50 | 3/9 |





1SBC100179C0201_Chap06_Index

# Index

## Order code classification


| Order code | Type | Page |
|---|---|---|
| 1SBN050010R1001 | RV5/133 | 3/9 |
| 1SBN050010R1002 | RV5/250 | 3/9 |
| 1SBN050010R1003 | RV5/440 | 3/9 |
| 1SBN050100R1000 | RC5-1/50 | 3/9 |
| 1SBN050100R1001 | RC5-1/133 | 3/9 |
| 1SBN050100R1002 | RC5-1/250 | 3/9 |
| 1SBN050100R1003 | RC5-1/440 | 3/9 |
| 1SBN050200R1000 | RC5-2/50 | 3/9 |
| 1SBN050200R1001 | RC5-2/133 | 3/9 |
| 1SBN050200R1002 | RC5-2/250 | 3/9 |
| 1SBN050200R1003 | RC5-2/440 | 3/9 |
| 1SBN060300R1000 | RA5-1 | 3/64 |
| 1SBN060300T1000 | RA5-1 | 3/64 |
| 1SBN110000R1000 | BA5-50 | 3/68 |
| 1SCA101647R1001 | OXS6X85 | 2/38 |
| 1SCA101655R1001 | OXS6X130 | 2/38 |
| 1SCA101659R1001 | OXS6X180 | 2/38 |
| 1SCA108043R1001 | OXS6X105 | 2/38 |
| 1SDA023354R0001 | - | 3/13 |
| 1SDA023356R0001 | - | 3/13 |
| 1SDA023357R0001 | - | 3/13 |
| 1SDA023368R0001 | - | 3/13 |
| 1SDA023370R0001 | - | 3/13 |
| 1SDA025766R0001 | - | 3/13 |
| 1SFA616162R1014 | KPR-101L | 4/7 |
| 1SFL431001R8011 | A95-30-11 | 3/7 |
| 1SFL431001R8111 | A95-30-11 | 3/7 |
| 1SFL431001R8311 | A95-30-11 | 3/7 |
| 1SFL431001R8411 | A95-30-11 | 3/7 |
| 1SFL431001R8511 | A95-30-11 | 3/7 |
| 1SFL431001R8611 | A95-30-11 | 3/7 |
| 1SFL431001R8811 | A95-30-11 | 3/7 |
| 1SFL451001R8011 | A110-30-11 | 3/7 |
| 1SFL451001R8111 | A110-30-11 | 3/7 |
| 1SFL451001R8311 | A110-30-11 | 3/7 |
| 1SFL451001R8411 | A110-30-11 | 3/7 |
| 1SFL451001R8511 | A110-30-11 | 3/7 |
| 1SFL451001R8611 | A110-30-11 | 3/7 |
| 1SFL451001R8811 | A110-30-11 | 3/7 |
| 1SFL471001R8011 | A145-30-11 | 3/11 |
| 1SFL471001R8111 | A145-30-11 | 3/11 |
| 1SFL471001R8311 | A145-30-11 | 3/11 |
| 1SFL471001R8411 | A145-30-11 | 3/11 |
| 1SFL471001R8511 | A145-30-11 | 3/11 |
| 1SFL471001R8611 | A145-30-11 | 3/11 |
| 1SFL471001R8811 | A145-30-11 | 3/11 |
| 1SFL491001R8011 | A185-30-11 | 3/11 |
| 1SFL491001R8111 | A185-30-11 | 3/11 |
| 1SFL491001R8311 | A185-30-11 | 3/11 |
| 1SFL491001R8411 | A185-30-11 | 3/11 |
| 1SFL491001R8511 | A185-30-11 | 3/11 |
| 1SFL491001R8611 | A185-30-11 | 3/11 |
| 1SFL491001R8811 | A185-30-11 | 3/11 |
| 1SFL511001R8011 | A210-30-11 | 3/11 |
| 1SFL511001R8111 | A210-30-11 | 3/11 |
| 1SFL511001R8311 | A210-30-11 | 3/11 |
| 1SFL511001R8411 | A210-30-11 | 3/11 |
| 1SFL511001R8511 | A210-30-11 | 3/11 |
| 1SFL511001R8611 | A210-30-11 | 3/11 |
| 1SFL511001R8811 | A210-30-11 | 3/11 |
| 1SFL531001R8011 | A260-30-11 | 3/11 |
| 1SFL531001R8111 | A260-30-11 | 3/11 |
| 1SFL531001R8311 | A260-30-11 | 3/11 |
| 1SFL531001R8411 | A260-30-11 | 3/11 |
| 1SFL531001R8511 | A260-30-11 | 3/11 |
| 1SFL531001R8611 | A260-30-11 | 3/11 |
| 1SFL531001R8811 | A260-30-11 | 3/11 |
| 1SFL551001R8011 | A300-30-11 | 3/11 |
| 1SFL551001R8111 | A300-30-11 | 3/11 |
| 1SFL551001R8311 | A300-30-11 | 3/11 |
| 1SFL551001R8411 | A300-30-11 | 3/11 |
| 1SFL551001R8511 | A300-30-11 | 3/11 |
| 1SFL551001R8611 | A300-30-11 | 3/11 |
| 1SFL551001R8811 | A300-30-11 | 3/11 |
| 1SFN010720R1011 | CAL18-11 | 3/9 |
| 1SFN010720R3311 | CAL18-11B | 3/13 |
| 1SFN034700R1000 | VM300H | 3/13 |
| 1SFN034701R1000 | VM300V | 3/58 |
| 1SFN050300R1003 | RC5-3/440 | 3/13 |
| 1SFN074307R1000 | LW110 | 3/69 |
| 1SFN074707R1000 | LW185 | 3/13 |
| 1SFN074709R1000 | LZ185-2C/120 | 3/13 |
| 1SFN074710R1000 | LX185 | 3/13 |
| 1SFN075107R1000 | LW300 | 3/13 |
| 1SFN075110R1000 | LX300 | 3/13 |
| 1SFN124701R1000 | LT185-AC | 3/13 |
| 1SFN124703R1000 | LT185-AL | 3/13 |
| 1SFN124704R1000 | LT185-AY | 3/13 |
| 1SFN125101R1000 | LT300-AC | 3/13 |
| 1SFN125103R1000 | LT300-AL | 3/13 |
| 1SFN125104R1000 | LT300-AY | 3/13 |
| FPTN372726R1001 | WB75-A | 3/66 |
| FPTN372726R1002 | WB75-A | 3/66 |
| FPTN372726R1003 | WB75-A | 3/66 |
| FPTN372726R1004 | WB75-A | 3/66 |
| FPTN372726R1005 | WB75-A | 3/66 |
| FPTN372726R1006 | WB75-A | 3/66 |
| FPTN372726R1007 | WB75-A | 3/66 |
| FPTN372726R1008 | WB75-A | 3/66 |
| GJF1101903R0001 | SA1 | 2/21 |
| GJF1101903R0002 | SA2 | 2/21 |
| GJF1101903R0003 | SA3 | 2/21 |

# Index

## Type classification


| Type | Order code | Page |
|---|---|---|
| A110-30-11 | 1SFL451001R8011 | 3/7 |
| | 1SFL451001R8111 | 3/7 |
| | 1SFL451001R8311 | 3/7 |
| | 1SFL451001R8411 | 3/7 |
| | 1SFL451001R8511 | 3/7 |
| | 1SFL451001R8611 | 3/7 |
| | 1SFL451001R8811 | 3/7 |
| A12-30-01 | 1SBL161001R8001 | 3/4 |
| | 1SBL161001R8101 | 3/4 |
| | 1SBL161001R8301 | 3/4 |
| | 1SBL161001R8401 | 3/4 |
| | 1SBL161001R8501 | 3/4 |
| | 1SBL161001R8601 | 3/4 |
| | 1SBL161001R8801 | 3/4 |
| A12-30-10 | 1SBL161001R8010 | 3/4 |
| | 1SBL161001R8110 | 3/4 |
| | 1SBL161001R8310 | 3/4 |
| | 1SBL161001R8410 | 3/4 |
| | 1SBL161001R8510 | 3/4 |
| | 1SBL161001R8610 | 3/4 |
| | 1SBL161001R8810 | 3/4 |
| A145-30-11 | 1SFL471001R8011 | 3/11 |
| | 1SFL471001R8111 | 3/11 |
| | 1SFL471001R8311 | 3/11 |
| | 1SFL471001R8411 | 3/11 |
| | 1SFL471001R8511 | 3/11 |
| | 1SFL471001R8611 | 3/11 |
| | 1SFL471001R8811 | 3/11 |
| A16-22-00 | 1SBL181501R8000 | 3/31 |
| | 1SBL181501R8100 | 3/31 |
| | 1SBL181501R8300 | 3/31 |
| | 1SBL181501R8400 | 3/31 |
| | 1SBL181501R8500 | 3/31 |
| | 1SBL181501R8600 | 3/31 |
| | 1SBL181501R8800 | 3/31 |
| A16-30-01 | 1SBL181001R8001 | 3/4 |
| | 1SBL181001R8101 | 3/4 |
| | 1SBL181001R8301 | 3/4 |
| | 1SBL181001R8401 | 3/4 |
| | 1SBL181001R8501 | 3/4 |
| | 1SBL181001R8601 | 3/4 |
| | 1SBL181001R8801 | 3/4 |
| A16-30-10 | 1SBL181001R8010 | 3/4 |
| | 1SBL181001R8110 | 3/4 |
| | 1SBL181001R8310 | 3/4 |
| | 1SBL181001R8410 | 3/4 |
| | 1SBL181001R8510 | 3/4 |
| | 1SBL181001R8610 | 3/4 |
| | 1SBL181001R8810 | 3/4 |
| A16-40-00 | 1SBL181201R8000 | 3/31 |
| | 1SBL181201R8100 | 3/31 |
| | 1SBL181201R8300 | 3/31 |
| | 1SBL181201R8400 | 3/31 |
| | 1SBL181201R8500 | 3/31 |
| | 1SBL181201R8600 | 3/31 |
| | 1SBL181201R8800 | 3/31 |
| A185-30-11 | 1SFL491001R8011 | 3/11 |
| | 1SFL491001R8111 | 3/11 |
| | 1SFL491001R8311 | 3/11 |
| | 1SFL491001R8411 | 3/11 |
| | 1SFL491001R8511 | 3/11 |
| | 1SFL491001R8611 | 3/11 |
| | 1SFL491001R8811 | 3/11 |
| A210-30-11 | 1SFL511001R8011 | 3/11 |
| | 1SFL511001R8111 | 3/11 |
| | 1SFL511001R8311 | 3/11 |
| | 1SFL511001R8411 | 3/11 |
| | 1SFL511001R8511 | 3/11 |
| | 1SFL511001R8611 | 3/11 |
| | 1SFL511001R8811 | 3/11 |
| A260-30-11 | 1SFL531001R8011 | 3/11 |
| | 1SFL531001R8111 | 3/11 |
| | 1SFL531001R8311 | 3/11 |
| | 1SFL531001R8411 | 3/11 |
| | 1SFL531001R8511 | 3/11 |
| | 1SFL531001R8611 | 3/11 |
| | 1SFL531001R8811 | 3/11 |
| A26-22-00 | 1SBL241501R8000 | 3/32 |
| | 1SBL241501R8100 | 3/32 |
| | 1SBL241501R8300 | 3/32 |
| | 1SBL241501R8400 | 3/32 |
| | 1SBL241501R8500 | 3/32 |
| | 1SBL241501R8600 | 3/32 |
| | 1SBL241501R8800 | 3/32 |
| A26-30-01 | 1SBL241001R8001 | 3/5 |
| | 1SBL241001R8101 | 3/5 |
| | 1SBL241001R8301 | 3/5 |
| | 1SBL241001R8401 | 3/5 |
| | 1SBL241001R8501 | 3/5 |
| | 1SBL241001R8601 | 3/5 |
| | 1SBL241001R8801 | 3/5 |
| A26-30-10 | 1SBL241001R8010 | 3/5 |
| | 1SBL241001R8110 | 3/5 |
| | 1SBL241001R8310 | 3/5 |
| | 1SBL241001R8410 | 3/5 |
| | 1SBL241001R8510 | 3/5 |
| | 1SBL241001R8610 | 3/5 |
| | 1SBL241001R8810 | 3/5 |
| A26-40-00 | 1SBL241201R8000 | 3/32 |
| | 1SBL241201R8100 | 3/32 |
| | 1SBL241201R8300 | 3/32 |
| | 1SBL241201R8400 | 3/32 |
| | 1SBL241201R8500 | 3/32 |
| | 1SBL241201R8600 | 3/32 |
| | 1SBL241201R8800 | 3/32 |
| A300-30-11 | 1SFL551001R8011 | 3/11 |
| | 1SFL551001R8111 | 3/11 |
| | 1SFL551001R8311 | 3/11 |
| | 1SFL551001R8411 | 3/11 |
| | 1SFL551001R8511 | 3/11 |
| | 1SFL551001R8611 | 3/11 |
| | 1SFL551001R8811 | 3/11 |
| A30-30-01 | 1SBL281001R8001 | 3/5 |
| | 1SBL281001R8101 | 3/5 |
| | 1SBL281001R8301 | 3/5 |
| | 1SBL281001R8401 | 3/5 |
| | 1SBL281001R8501 | 3/5 |
| | 1SBL281001R8601 | 3/5 |
| | 1SBL281001R8801 | 3/5 |
| A30-30-10 | 1SBL281001R8010 | 3/5 |
| | 1SBL281001R8110 | 3/5 |
| | 1SBL281001R8310 | 3/5 |
| | 1SBL281001R8410 | 3/5 |
| | 1SBL281001R8510 | 3/5 |
| | 1SBL281001R8610 | 3/5 |
| | 1SBL281001R8810 | 3/5 |
| A40-30-01 | 1SBL321001R8001 | 3/5 |
| | 1SBL321001R8101 | 3/5 |
| | 1SBL321001R8301 | 3/5 |
| | 1SBL321001R8401 | 3/5 |
| | 1SBL321001R8501 | 3/5 |
| | 1SBL321001R8601 | 3/5 |
| | 1SBL321001R8801 | 3/5 |
| A40-30-10 | 1SBL321001R8010 | 3/5 |
| | 1SBL321001R8110 | 3/5 |
| | 1SBL321001R8310 | 3/5 |
| | 1SBL321001R8410 | 3/5 |
| | 1SBL321001R8510 | 3/5 |
| | 1SBL321001R8610 | 3/5 |
| | 1SBL321001R8810 | 3/5 |
| A45-22-00 | 1SBL331501R8000 | 3/33 |
| | 1SBL331501R8100 | 3/33 |
| | 1SBL331501R8300 | 3/33 |
| | 1SBL331501R8400 | 3/33 |
| | 1SBL331501R8500 | 3/33 |
| | 1SBL331501R8600 | 3/33 |
| | 1SBL331501R8800 | 3/33 |
| A45-40-00 | 1SBL331201R8000 | 3/33 |
| | 1SBL331201R8100 | 3/33 |
| | 1SBL331201R8300 | 3/33 |
| | 1SBL331201R8400 | 3/33 |
| | 1SBL331201R8500 | 3/33 |
| | 1SBL331201R8600 | 3/33 |
| | 1SBL331201R8800 | 3/33 |
| A50-30-11 | 1SBL351001R8011 | 3/6 |
| | 1SBL351001R8111 | 3/6 |
| | 1SBL351001R8311 | 3/6 |
| | 1SBL351001R8411 | 3/6 |
| | 1SBL351001R8511 | 3/6 |
| | 1SBL351001R8611 | 3/6 |
| | 1SBL351001R8811 | 3/6 |
| A50-40-00 | 1SBL351201R8000 | 3/33 |
| | 1SBL351201R8100 | 3/33 |
| | 1SBL351201R8300 | 3/33 |
| | 1SBL351201R8400 | 3/33 |






1SBC100179C0201_Chap06_Index

# Index

## Type classification

| Type | Order code | Page |
|---|---|---|
| | 1SBL351201R8500 | 3/33 |
| | 1SBL351201R8600 | 3/33 |
| | 1SBL351201R8800 | 3/33 |
| A63-30-11 | 1SBL371001R8011 | 3/6 |
| | 1SBL371001R8111 | 3/6 |
| | 1SBL371001R8311 | 3/6 |
| | 1SBL371001R8411 | 3/6 |
| | 1SBL371001R8511 | 3/6 |
| | 1SBL371001R8611 | 3/6 |
| | 1SBL371001R8811 | 3/6 |
| A75-22-00 | 1SBL411501R8000 | 3/33 |
| | 1SBL411501R8100 | 3/33 |
| | 1SBL411501R8300 | 3/33 |
| | 1SBL411501R8400 | 3/33 |
| | 1SBL411501R8500 | 3/33 |
| | 1SBL411501R8600 | 3/33 |
| | 1SBL411501R8800 | 3/33 |
| A75-30-11 | 1SBL411001R8011 | 3/6 |
| | 1SBL411001R8111 | 3/6 |
| | 1SBL411001R8311 | 3/6 |
| | 1SBL411001R8411 | 3/6 |
| | 1SBL411001R8511 | 3/6 |
| | 1SBL411001R8611 | 3/6 |
| | 1SBL411001R8811 | 3/6 |
| A75-40-00 | 1SBL411201R8000 | 3/33 |
| | 1SBL411201R8100 | 3/33 |
| | 1SBL411201R8300 | 3/33 |
| | 1SBL411201R8400 | 3/33 |
| | 1SBL411201R8500 | 3/33 |
| | 1SBL411201R8600 | 3/33 |
| | 1SBL411201R8800 | 3/33 |
| A9-22-00 | 1SBL141501R8000 | 3/31 |
| | 1SBL141501R8100 | 3/31 |
| | 1SBL141501R8300 | 3/31 |
| | 1SBL141501R8400 | 3/31 |
| | 1SBL141501R8500 | 3/31 |
| | 1SBL141501R8600 | 3/31 |
| | 1SBL141501R8800 | 3/31 |
| A9-30-01 | 1SBL141001R8001 | 3/4 |
| | 1SBL141001R8101 | 3/4 |
| | 1SBL141001R8301 | 3/4 |
| | 1SBL141001R8401 | 3/4 |
| | 1SBL141001R8501 | 3/4 |
| | 1SBL141001R8601 | 3/4 |
| | 1SBL141001R8801 | 3/4 |
| A9-30-10 | 1SBL141001R8010 | 3/4 |
| | 1SBL141001R8110 | 3/4 |
| | 1SBL141001R8310 | 3/4 |
| | 1SBL141001R8410 | 3/4 |
| | 1SBL141001R8510 | 3/4 |
| | 1SBL141001R8610 | 3/4 |
| | 1SBL141001R8810 | 3/4 |
| A9-40-00 | 1SBL141201R8000 | 3/31 |
| | 1SBL141201R8100 | 3/31 |
| | 1SBL141201R8300 | 3/31 |
| | 1SBL141201R8400 | 3/31 |
| | 1SBL141201R8500 | 3/31 |
| | 1SBL141201R8600 | 3/31 |
| | 1SBL141201R8800 | 3/31 |
| A95-30-11 | 1SFL431001R8011 | 3/7 |
| | 1SFL431001R8111 | 3/7 |
| | 1SFL431001R8311 | 3/7 |
| | 1SFL431001R8411 | 3/7 |
| | 1SFL431001R8511 | 3/7 |
| | 1SFL431001R8611 | 3/7 |
| | 1SFL431001R8811 | 3/7 |
| AA1-110 | 1SAM201910R1002 | 2/18 |
| AA1-230 | 1SAM201910R1003 | 2/18 |
| AA1-24 | 1SAM201910R1001 | 2/18 |
| AA1-400 | 1SAM201910R1004 | 2/18 |
| AA4-110 | 1SAM401907R1002 | 2/33 |
| AA4-230 | 1SAM401907R1003 | 2/33 |
| AA4-24 | 1SAM401907R1001 | 2/33 |
| AA4-400 | 1SAM401907R1004 | 2/33 |
| BA5-50 | 1SBN110000R1000 | 3/68 |
| BS1-3 | 1SAM201908R1001 | 2/21 |
| BS4-3 | 1SAM401911R1008 | 2/36 |
| CA5-01 | 1SBN010010R1001 | 3/9 |
| CA5-04E | 1SBN010040R1004 | 3/52 |
| CA5-04M | 1SBN010040R1104 | 3/52 |
| CA5-04N | 1SBN010040R1204 | 3/52 |
| CA5-04U | 1SBN010040R1304 | 3/52 |
| CA5-10 | 1SBN010010R1010 | 3/9 |
| CA5-11/11E | 1SBN010040R1018 | 3/52 |
| CA5-11/11M | 1SBN010040R1118 | 3/52 |
| CA5-13M | 1SBN010040R1113 | 3/52 |
| CA5-13N | 1SBN010040R1213 | 3/52 |
| CA5-22E | 1SBN010040R1022 | 3/9 |
| CA5-22M | 1SBN010040R1122 | 3/9 |
| CA5-22N | 1SBN010040R1222 | 3/47 |
| CA5-22U | 1SBN010040R1322 | 3/9 |
| CA5-31E | 1SBN010040R1031 | 3/52 |
| CA5-31M | 1SBN010040R1131 | 3/52 |
| CA5-31N | 1SBN010040R1231 | 3/52 |
| CA5-31U | 1SBN010040R1331 | 3/52 |
| CA5-40E | 1SBN010040R1040 | 3/52 |
| CA5-40N | 1SBN010040R1240 | 3/52 |
| CA5-40U | 1SBN010040R1340 | 3/52 |
| CAL18-11 | 1SFN010720R1011 | 3/9 |
| CAL18-11B | 1SFN010720R3311 | 3/13 |
| CAL5-11 | 1SBN010020R1011 | 3/9 |
| CB5-01 | 1SBN010013R1001 | 3/68 |
| CB5-10 | 1SBN010013R1010 | 3/68 |
| CC5-01 | 1SBN010011R1001 | 3/52 |
| CC5-10 | 1SBN010011R1010 | 3/52 |
| CCL5-11 | 1SBN011421R1008 | 3/52 |
| CK1-02 | 1SAM301901R1003 | 2/17 |
| CK1-11 | 1SAM301901R1001 | 2/17 |
| CK1-20 | 1SAM301901R1002 | 2/17 |
| DB200 | 1SAZ401110R0001 | 4/18 |
| DB25/25A | 1SAZ201108R0001 | 4/7 |
| DB25/32A | 1SAZ201108R0002 | 4/7 |
| DB80 | 1SAZ301110R0001 | 4/8 |
| DMS132-G | 1SAM201912R1010 | 2/23 |
| DMS132-Y | 1SAM201912R1011 | 2/23 |
| DR25-A-110 | 1SAZ201504R0003 | 4/7 |
| DR25-A-220/380 | 1SAZ201504R0005 | 4/7 |
| DR25-A-24 | 1SAZ201504R0001 | 4/7 |
| DR25-A-48 | 1SAZ201504R0002 | 4/7 |
| DR25-A-500 | 1SAZ201504R0006 | 4/7 |
| DT450/A185 | 1SAZ501901R1001 | 4/26 |
| DT450/A300 | 1SAZ501902R1001 | 4/26 |
| DX25 | 1SAZ201307R0002 | 4/7 |
| DX495 | 1SAM401912R1001 | 2/36 |
| FS116 | 1SAM201909R1001 | 2/21 |
| HK1-02 | 1SAM201902R1003 | 2/17 |
| HK1-11 | 1SAM201902R1001 | 2/17 |
| HK1-20 | 1SAM201902R1002 | 2/17 |
| HK1-20L | 1SAM201902R1004 | 2/17 |
| HK4-11 | 1SAM401901R1001 | 2/33 |
| HK4-W | 1SAM401901R1002 | 2/33 |
| HKF1-11 | 1SAM201901R1001 | 2/17 |
| HKF1-20 | 1SAM201901R1002 | 2/17 |
| HKS4-02 | 1SAM401902R1003 | 2/33 |
| HKS4-11 | 1SAM401902R1001 | 2/33 |
| HKS4-20 | 1SAM401902R1002 | 2/33 |
| IB132-G | 1SAM201911R1010 | 2/23 |
| IB132-Y | 1SAM201911R1011 | 2/23 |
| KA450 | 1SAM401908R1001 | 2/36 |
| KA495 | 1SAM501901R1001 | 2/36 |
| KA495C | 1SAM501902R1001 | 2/36 |
| KPR-101L | 1SFA616162R1014 | 4/7 |
| LT185-AC | 1SFN124701R1000 | 3/13 |
| LT185-AL | 1SFN124703R1000 | 3/13 |
| LT185-AY | 1SFN124704R1000 | 3/13 |
| LT200/A | 1SAZ401901R1001 | 4/22 |
| LT300-AC | 1SFN125101R1000 | 3/13 |
| LT300-AL | 1SFN125103R1000 | 3/13 |
| LT300-AY | 1SFN125104R1000 | 3/13 |
| LW110 | 1SFN074307R1000 | 3/69 |
| LW185 | 1SFN074707R1000 | 3/13 |
| LW300 | 1SFN075107R1000 | 3/13 |
| LX185 | 1SFN074710R1000 | 3/13 |
| LX300 | 1SFN075110R1000 | 3/13 |
| LZ185-2C/120 | 1SFN074709R1000 | 3/13 |
| MO132-0.16 | 1SAM360000R1001 | 2/12 |
| MO132-0.25 | 1SAM360000R1002 | 2/12 |
| MO132-0.4 | 1SAM360000R1003 | 2/12 |
| MO132-0.63 | 1SAM360000R1004 | 2/12 |
| MO132-1.0 | 1SAM360000R1005 | 2/12 |
| MO132-1.6 | 1SAM360000R1006 | 2/12 |
| MO132-10 | 1SAM360000R1010 | 2/12 |
| MO132-12 | 1SAM360000R1012 | 2/12 |
| MO132-16 | 1SAM360000R1011 | 2/12 |
| MO132-2.5 | 1SAM360000R1007 | 2/12 |

# Index

## Type classification

| Type | Order code | Page |
|---|---|---|
| MO132-20 | 1SAM360000R1013 | 2/12 |
| MO132-25 | 1SAM360000R1014 | 2/12 |
| MO132-32 | 1SAM360000R1015 | 2/12 |
| MO132-4.0 | 1SAM360000R1008 | 2/12 |
| MO132-6.3 | 1SAM360000R1009 | 2/12 |
| MO450-40 | 1SAM460000R1005 | 2/28 |
| MO450-45 | 1SAM460000R1006 | 2/28 |
| MO450-50 | 1SAM460000R1007 | 2/28 |
| MO495-100 | 1SAM560000R1010 | 2/28 |
| MO495-63 | 1SAM560000R1007 | 2/28 |
| MO495-75 | 1SAM560000R1008 | 2/28 |
| MO495-90 | 1SAM560000R1009 | 2/28 |
| MO496-100 | 1SAM590000R1010 | 2/28 |
| MO496-32 | 1SAM590000R1004 | 2/28 |
| MO496-40 | 1SAM590000R1005 | 2/28 |
| MO496-50 | 1SAM590000R1006 | 2/28 |
| MO496-63 | 1SAM590000R1007 | 2/28 |
| MO496-75 | 1SAM590000R1008 | 2/28 |
| MO496-90 | 1SAM590000R1009 | 2/28 |
| MS116-0.16 | 1SAM250000R1001 | 2/4 |
| MS116-0.16-HKF1-11 | 1SAM250005R1001 | 2/4 |
| MS116-0.25 | 1SAM250000R1002 | 2/4 |
| MS116-0.25-HKF1-11 | 1SAM250005R1002 | 2/4 |
| MS116-0.4 | 1SAM250000R1003 | 2/4 |
| MS116-0.4-HKF1-11 | 1SAM250005R1003 | 2/4 |
| MS116-0.63 | 1SAM250000R1004 | 2/4 |
| MS116-0.63-HKF1-11 | 1SAM250005R1004 | 2/4 |
| MS116-1.0 | 1SAM250000R1005 | 2/4 |
| MS116-1.0-HKF1-11 | 1SAM250005R1005 | 2/4 |
| MS116-1.6 | 1SAM250000R1006 | 2/4 |
| MS116-1.6-HKF1-11 | 1SAM250005R1006 | 2/4 |
| MS116-10 | 1SAM250000R1010 | 2/4 |
| MS116-10.0-HKF1-11 | 1SAM250005R1010 | 2/4 |
| MS116-12 | 1SAM250000R1012 | 2/4 |
| MS116-12.0-HKF1-11 | 1SAM250005R1012 | 2/4 |
| MS116-16 | 1SAM250000R1011 | 2/4 |
| MS116-16.0-HKF1-11 | 1SAM250005R1011 | 2/4 |
| MS116-2.5 | 1SAM250000R1007 | 2/4 |
| MS116-2.5-HKF1-11 | 1SAM250005R1007 | 2/4 |
| MS116-20 | 1SAM250000R1013 | 2/4 |
| MS116-20-HKF1-11 | 1SAM250005R1013 | 2/4 |
| MS116-25 | 1SAM250000R1014 | 2/4 |
| MS116-25-HKF1-11 | 1SAM250005R1014 | 2/4 |
| MS116-32 | 1SAM250000R1015 | 2/4 |
| MS116-32-HKF1-11 | 1SAM250005R1015 | 2/4 |
| MS116-4.0 | 1SAM250000R1008 | 2/4 |
| MS116-4.0-HKF1-11 | 1SAM250005R1008 | 2/4 |
| MS116-6.3 | 1SAM250000R1009 | 2/4 |
| MS116-6.3-HKF1-11 | 1SAM250005R1009 | 2/4 |
| MS132-0.16 | 1SAM350000R1001 | 2/8 |
| MS132-0.16-HKF1-11 | 1SAM350005R1001 | 2/8 |
| MS132-0.25 | 1SAM350000R1002 | 2/8 |
| MS132-0.25-HKF1-11 | 1SAM350005R1002 | 2/8 |
| MS132-0.4 | 1SAM350000R1003 | 2/8 |
| MS132-0.4-HKF1-11 | 1SAM350005R1003 | 2/8 |
| MS132-0.63 | 1SAM350000R1004 | 2/8 |
| MS132-0.63-HKF1-11 | 1SAM350005R1004 | 2/8 |
| MS132-1.0 | 1SAM350000R1005 | 2/8 |
| MS132-1.0-HKF1-11 | 1SAM350005R1005 | 2/8 |
| MS132-1.6 | 1SAM350000R1006 | 2/8 |
| MS132-1.6-HKF1-11 | 1SAM350005R1006 | 2/8 |
| MS132-10 | 1SAM350000R1010 | 2/8 |
| MS132-10.0-HKF1-11 | 1SAM350005R1010 | 2/8 |
| MS132-12 | 1SAM350000R1012 | 2/8 |
| MS132-12.0-HKF1-11 | 1SAM350005R1012 | 2/8 |
| MS132-16 | 1SAM350000R1011 | 2/8 |
| MS132-16.0-HKF1-11 | 1SAM350005R1011 | 2/8 |
| MS132-2.5 | 1SAM350000R1007 | 2/8 |
| MS132-2.5-HKF1-11 | 1SAM350005R1007 | 2/8 |
| MS132-20 | 1SAM350000R1013 | 2/8 |
| MS132-20-HKF1-11 | 1SAM350005R1013 | 2/8 |
| MS132-25 | 1SAM350000R1014 | 2/8 |
| MS132-25-HKF1-11 | 1SAM350005R1014 | 2/8 |
| MS132-32 | 1SAM350000R1015 | 2/8 |
| MS132-32-HKF1-11 | 1SAM350005R1015 | 2/8 |
| MS132-4.0 | 1SAM350000R1008 | 2/8 |
| MS132-4.0-HKF1-11 | 1SAM350005R1008 | 2/8 |
| MS132-6.3 | 1SAM350000R1009 | 2/8 |
| MS132-6.3-HKF1-11 | 1SAM350005R1009 | 2/8 |
| MS450-40 | 1SAM450000R1005 | 2/24 |
| MS450-45 | 1SAM450000R1006 | 2/24 |
| MS450-50 | 1SAM450000R1007 | 2/24 |
| MS495-100 | 1SAM550000R1010 | 2/24 |
| MS495-63 | 1SAM550000R1007 | 2/24 |
| MS495-75 | 1SAM550000R1008 | 2/24 |
| MS495-90 | 1SAM550000R1009 | 2/24 |
| MS497-100 | 1SAM580000R1010 | 2/24 |
| MS497-32 | 1SAM580000R1004 | 2/24 |
| MS497-40 | 1SAM580000R1005 | 2/24 |
| MS497-50 | 1SAM580000R1006 | 2/24 |
| MS497-63 | 1SAM580000R1007 | 2/24 |
| MS497-75 | 1SAM580000R1008 | 2/24 |
| MS497-90 | 1SAM580000R1009 | 2/24 |
| MSAH1 | 1SAM201909R1021 | 2/38 |
| MSH-AR | 1SAM201920R1000 | 2/38 |
| MSHD-LB | 1SAM201920R1001 | 2/38 |
| MSHD-LTB | 1SAM201920R1011 | 2/38 |
| MSHD-LTY | 1SAM201920R1012 | 2/38 |
| MSHD-LY | 1SAM201920R1002 | 2/38 |
| MSMN | 1SAM101923R0002 | 2/38 |
| MSMNO | 1SAM101923R0012 | 2/38 |
| N22E | 1SBH141001R8022 | 3/45 |
| | 1SBH141001R8122 | 3/45 |
| | 1SBH141001R8322 | 3/45 |
| | 1SBH141001R8422 | 3/45 |
| | 1SBH141001R8522 | 3/45 |
| | 1SBH141001R8622 | 3/45 |
| | 1SBH141001R8822 | 3/45 |
| N31E | 1SBH141001R8031 | 3/45 |
| | 1SBH141001R8131 | 3/45 |
| | 1SBH141001R8331 | 3/45 |
| | 1SBH141001R8431 | 3/45 |
| | 1SBH141001R8531 | 3/45 |
| | 1SBH141001R8631 | 3/45 |
| | 1SBH141001R8831 | 3/45 |
| N40E | 1SBH141001R8040 | 3/45 |
| | 1SBH141001R8140 | 3/45 |
| | 1SBH141001R8340 | 3/45 |
| | 1SBH141001R8440 | 3/45 |
| | 1SBH141001R8540 | 3/45 |
| | 1SBH141001R8640 | 3/45 |
| | 1SBH141001R8840 | 3/45 |
| OXS6X105 | 1SCA108043R1001 | 2/38 |
| OXS6X130 | 1SCA101655R1001 | 2/38 |
| OXS6X180 | 1SCA101659R1001 | 2/38 |
| OXS6X85 | 1SCA101647R1001 | 2/38 |
| PS1-2-0-65 | 1SAM201906R1102 | 2/21 |
| PS1-2-1-65 | 1SAM201906R1112 | 2/21 |
| PS1-2-2-65 | 1SAM201906R1122 | 2/21 |
| PS1-3-0-100 | 1SAM201916R1103 | 2/21 |
| PS1-3-0-65 | 1SAM201906R1103 | 2/21 |
| PS1-3-1-100 | 1SAM201916R1113 | 2/21 |
| PS1-3-1-65 | 1SAM201906R1113 | 2/21 |
| PS1-3-2-100 | 1SAM201916R1123 | 2/21 |
| PS1-3-2-65 | 1SAM201906R1123 | 2/21 |
| PS1-4-0-100 | 1SAM201916R1104 | 2/21 |
| PS1-4-0-65 | 1SAM201906R1104 | 2/21 |
| PS1-4-1-100 | 1SAM201916R1114 | 2/21 |
| PS1-4-1-65 | 1SAM201906R1114 | 2/21 |
| PS1-4-2-65 | 1SAM201906R1124 | 2/21 |
| PS1-5-0-100 | 1SAM201916R1105 | 2/21 |
| PS1-5-0-65 | 1SAM201906R1105 | 2/21 |
| PS1-5-1-100 | 1SAM201916R1115 | 2/21 |
| PS1-5-1-65 | 1SAM201906R1115 | 2/21 |
| PS1-5-2-65 | 1SAM201906R1125 | 2/21 |
| PS4-2-0 | 1SAM401911R1001 | 2/36 |
| PS4-2-2 | 1SAM401911R1004 | 2/36 |
| PS4-3-0 | 1SAM401911R1002 | 2/36 |
| PS4-3-2 | 1SAM401911R1005 | 2/36 |
| PS4-4-0 | 1SAM401911R1003 | 2/36 |
| PS4-4-2 | 1SAM401911R1006 | 2/36 |
| RA5-1 | 1SBN060300R1000 | 3/64 |
| | 1SBN060300T1000 | 3/64 |
| RC5-1/133 | 1SBN050100R1001 | 3/9 |
| RC5-1/250 | 1SBN050100R1002 | 3/9 |
| RC5-1/440 | 1SBN050100R1003 | 3/9 |
| RC5-1/50 | 1SBN050100R1000 | 3/9 |
| RC5-2/133 | 1SBN050200R1001 | 3/9 |
| RC5-2/250 | 1SBN050200R1002 | 3/9 |
| RC5-2/440 | 1SBN050200R1003 | 3/9 |
| RC5-2/50 | 1SBN050200R1000 | 3/9 |
| RC5-3/440 | 1SFN050300R1003 | 3/13 |
| RV5/133 | 1SBN050010R1001 | 3/9 |
| RV5/250 | 1SBN050010R1002 | 3/9 |
| RV5/440 | 1SBN050010R1003 | 3/9 |





1SBC100179C0201_Chap06_Index

# Index

## Type classification

| Type | Order code | Page |
|---|---|---|
| RV5/50 | 1SBN050010R1000 | 3/9 |
| S1-M1-25 | 1SAM201907R1101 | 2/21 |
| S1-M2-25 | 1SAM201907R1102 | 2/21 |
| S1-M3-25 | 1SAM201907R1103 | 2/21 |
| S1-M3-35 | 1SAM201913R1103 | 2/21 |
| S4-M1 | 1SAM401911R1007 | 2/36 |
| SA1 | GJF1101903R0001 | 2/21 |
| SA2 | GJF1101903R0002 | 2/21 |
| SA3 | GJF1101903R0003 | 2/21 |
| SK1-02 | 1SAM201903R1003 | 2/17 |
| SK1-11 | 1SAM201903R1001 | 2/17 |
| SK1-20 | 1SAM201903R1002 | 2/17 |
| SK4-11 | 1SAM401904R1001 | 2/33 |
| TA110DU-110 | 1SAZ411201R1002 | 4/18 |
| TA110DU-90 | 1SAZ411201R1001 | 4/18 |
| TA200DU-110 | 1SAZ421201R1002 | 4/22 |
| TA200DU-135 | 1SAZ421201R1003 | 4/22 |
| TA200DU-150 | 1SAZ421201R1004 | 4/22 |
| TA200DU-175 | 1SAZ421201R1005 | 4/22 |
| TA200DU-200 | 1SAZ421201R1006 | 4/22 |
| TA200DU-90 | 1SAZ421201R1001 | 4/22 |
| TA25DU-0.16M | 1SAZ211201R2005 | 4/4 |
| TA25DU-0.25M | 1SAZ211201R2009 | 4/4 |
| TA25DU-0.4M | 1SAZ211201R2013 | 4/4 |
| TA25DU-0.63M | 1SAZ211201R2017 | 4/4 |
| TA25DU-1.0M | 1SAZ211201R2021 | 4/4 |
| TA25DU-1.4M | 1SAZ211201R2023 | 4/4 |
| TA25DU-1.8M | 1SAZ211201R2025 | 4/4 |
| TA25DU-11M | 1SAZ211201R2043 | 4/4 |
| TA25DU-14M | 1SAZ211201R2045 | 4/4 |
| TA25DU-19M | 1SAZ211201R2047 | 4/4 |
| TA25DU-2.4M | 1SAZ211201R2028 | 4/4 |
| TA25DU-25M | 1SAZ211201R2051 | 4/4 |
| TA25DU-3.1M | 1SAZ211201R2031 | 4/4 |
| TA25DU-32M | 1SAZ211201R2053 | 4/4 |
| TA25DU-4.0M | 1SAZ211201R2033 | 4/4 |
| TA25DU-5.0M | 1SAZ211201R2035 | 4/4 |
| TA25DU-6.5M | 1SAZ211201R2038 | 4/4 |
| TA25DU-8.5M | 1SAZ211201R2040 | 4/4 |
| TA42DU-25M | 1SAZ311201R2001 | 4/8 |
| TA42DU-32M | 1SAZ311201R2002 | 4/8 |
| TA42DU-42M | 1SAZ311201R2003 | 4/8 |
| TA450DU-185 | 1SAZ511201R1001 | 4/26 |
| TA450DU-235 | 1SAZ511201R1002 | 4/26 |
| TA450DU-310 | 1SAZ511201R1003 | 4/26 |
| TA450SU-105 | 1SAZ611201R1007 | 4/26 |
| TA450SU-140 | 1SAZ611201R1008 | 4/26 |
| TA450SU-185 | 1SAZ611201R1001 | 4/26 |
| TA450SU-235 | 1SAZ611201R1002 | 4/26 |
| TA450SU-310 | 1SAZ611201R1003 | 4/26 |
| TA450SU-60 | 1SAZ611201R1005 | 4/26 |
| TA450SU-80 | 1SAZ611201R1006 | 4/26 |
| TA75DU-25M | 1SAZ321201R2001 | 4/11 |
| TA75DU-32M | 1SAZ321201R2002 | 4/11 |
| TA75DU-42M | 1SAZ321201R2003 | 4/11 |
| TA75DU-52M | 1SAZ321201R2004 | 4/11 |
| TA75DU-63M | 1SAZ321201R2005 | 4/11 |
| TA75DU-80M | 1SAZ321201R2006 | 4/11 |
| TA80DU-42 | 1SAZ331201R1003 | 4/14 |
| TA80DU-52 | 1SAZ331201R1004 | 4/14 |
| TA80DU-63 | 1SAZ331201R1005 | 4/14 |
| TA80DU-80 | 1SAZ331201R1006 | 4/14 |
| TB450 | 1SAM401910R1001 | 2/36 |
| TE5S-120 | 1SBN020010R1002 | 3/60 |
| TE5S-24 | 1SBN020010R1001 | 3/60 |
| TE5S-240 | 1SBN020010R1003 | 3/60 |
| TE5S-440 | 1SBN020010R1004 | 3/60 |
| TEF5-OFF | 1SBN020314R1000 | 3/9 |
| TEF5-ON | 1SBN020312R1000 | 3/9 |
| UA1-110 | 1SAM201904R1004 | 2/18 |
| UA1-208 | 1SAM201904R1008 | 2/18 |
| UA1-230 | 1SAM201904R1005 | 2/18 |
| UA1-24 | 1SAM201904R1001 | 2/18 |
| UA1-400 | 1SAM201904R1006 | 2/18 |
| UA1-415 | 1SAM201904R1007 | 2/18 |
| UA1-48 | 1SAM201904R1002 | 2/18 |
| UA1-60 | 1SAM201904R1003 | 2/18 |
| UA4-110 | 1SAM401905R1001 | 2/33 |
| UA4-230 | 1SAM401905R1002 | 2/33 |
| UA4-24 | 1SAM401905R1004 | 2/33 |
| UA4-400 | 1SAM401905R1003 | 2/33 |
| UA4-HK-230 | 1SAM401906R1001 | 2/33 |
| UA4-HK-400 | 1SAM401906R1002 | 2/33 |
| VE5-1 | 1SBN030110R1000 | 3/9 |
| VE5-2 | 1SBN030210R1000 | 3/9 |
| VM300H | 1SFN034700R1000 | 3/13 |
| VM300V | 1SFN034701R1000 | 3/58 |
| VM5-1 | 1SBN030100R1000 | 3/9 |
| WB75-A | FPTN372726R1001 | 3/66 |
| | FPTN372726R1002 | 3/66 |
| | FPTN372726R1003 | 3/66 |
| | FPTN372726R1004 | 3/66 |
| | FPTN372726R1005 | 3/66 |
| | FPTN372726R1006 | 3/66 |
| | FPTN372726R1007 | 3/66 |
| | FPTN372726R1008 | 3/66 |

| Type | Order code | Page |
|---|---|---|

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