

# Low Voltage Switch Gear

|                 |                                         |      |
|-----------------|-----------------------------------------|------|
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| J7KNA           | Mini Motor Contactor                    | H-15 |
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## Low Voltage Switch Gear

| Classification                     | Mini Contactor Relays                                                                                                                             |        | Mini Motor Contactors                                                              |                                                                                     |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Model                              | J7KNA - AR                                                                                                                                        | J7KNA  | J7KNA-4                                                                            |                                                                                     |
|                                    | 4-pole                                                                                                                                            | 3-pole | 4-pole                                                                             |                                                                                     |
| Appearance                         |                                                                  |        |  |  |
| Remarks                            | AC and DC operated<br>4-, 6- and 8-contacts in different configurations<br>Positively guided contacts<br>Screw fixing and snap fitting (DIN rail) |        | AC and DC operated<br>3 main poles<br>1 auxiliary contact integrated (1NO or 1NC)  | AC operated<br>4 main poles                                                         |
| Accessoires                        | Auxiliar contact modules                                                                                                                          |        | Auxiliar contact modules<br>Suppressors<br>Link module MPCB - contactor            | Auxiliar contact modules<br>Suppressors<br>Link module MPCB - contactor             |
| Maximum power (AC3-380/415V)       | No                                                                                                                                                |        | 4 kW; 5,5 kW                                                                       | 4 kW                                                                                |
| Rated current (AC3-380/415V)       | 10 A (I th2)                                                                                                                                      |        | 9/12 A                                                                             | 9 A                                                                                 |
| AC operated                        | Yes                                                                                                                                               |        | Yes                                                                                | Yes                                                                                 |
| DC operated                        | Yes                                                                                                                                               |        | Yes                                                                                | No                                                                                  |
| 4 - pole version                   | Yes                                                                                                                                               |        | No                                                                                 | Yes                                                                                 |
| Auxiliary contacts included        | No                                                                                                                                                |        | 1NO or 1NC                                                                         | No                                                                                  |
| Auxiliary contacts front mounting  | 1NO/1NC<br>0NO/2NC<br>2NO/2NC<br>4NO/0NC                                                                                                          |        | 1NO/1NC<br>0NO/2NC<br>2NO/2NC                                                      | 1NO/1NC<br>0NO/2NC<br>2NO/2NC                                                       |
| Auxiliary contacts side mounting   | No                                                                                                                                                |        | No                                                                                 | No                                                                                  |
| Mechanical life span (AC operated) | 5 Mio.                                                                                                                                            |        | 5 Mio.                                                                             | 5 Mio.                                                                              |
| Mechanical life span (DC operated) | 15 Mio.                                                                                                                                           |        | 15 Mio.                                                                            | 15 Mio.                                                                             |
| Setting range (in A)               | No                                                                                                                                                |        | No                                                                                 | No                                                                                  |
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| Motor Contactors                                                                                                           |                                                                                                                               |                                                                                                                               |                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| J7KN 10..KN 22                                                                                                             | J7KN 24..KN 40                                                                                                                | J7KN 50..KN 74                                                                                                                | J7KN 85..KN 110                                                                     |
| 3-pole                                                                                                                     | 3-pole                                                                                                                        | 3-pole                                                                                                                        | 3-pole                                                                              |
|                                           |                                              |                                             |  |
| AC and DC operate<br>3 main poles<br>1 auxiliary contact integrated (1NO or 1NC)<br>max 4 auxiliary contacts front mounted | AC and DC operate<br>3 main poles<br>max 4 auxiliary contacts front mounted<br>2 auxiliary contacts side mounted (1NO or 1NC) | AC and DC operate<br>3 main poles<br>max 4 auxiliary contacts front mounted<br>2 auxiliary contacts side mounted (1NO or 1NC) | AC and DC operate<br>3 main poles<br>4 auxiliary contacts integrated (1NO/1NC)      |
| Auxiliar contact modules<br>Mechanical interlock<br>Suppressors<br>Link module MPCB-contactor<br>Pneumatic timers          | Auxiliar contact modules<br>Mechanical interlock<br>Suppressors<br>Link module MPCB-contactor<br>Pneumatic timers             | Auxiliar contact modules<br>Mechanical interlock<br>Suppressors<br>Pneumatic timers                                           | Mechanical interlock<br>Suppressors                                                 |
| 4 kW; 5,5 kW; 7,5 kW; 11 kW                                                                                                | 11 kW; 15 kW; 18,5 kW                                                                                                         | 22 kW; 30kW; 37 kW                                                                                                            | 45 kW; 55 kW                                                                        |
| 10/14/18/22 A                                                                                                              | 24/32/40 A                                                                                                                    | 50/62/74 A                                                                                                                    | 85/110 A                                                                            |
| Yes                                                                                                                        | Yes                                                                                                                           | Yes                                                                                                                           | Yes                                                                                 |
| Yes                                                                                                                        | Yes                                                                                                                           | Yes                                                                                                                           | Yes                                                                                 |
| No                                                                                                                         | No                                                                                                                            | No                                                                                                                            | No                                                                                  |
| 1NO or 1NC                                                                                                                 | No                                                                                                                            | No                                                                                                                            | 2NO + 2NC                                                                           |
| max 4<br>NO/NC                                                                                                             | max 4<br>NO/NC                                                                                                                | max 4<br>NO/NC                                                                                                                | No                                                                                  |
| No                                                                                                                         | 1NO + 1NC                                                                                                                     | 1NO + 1NC                                                                                                                     | 1NO + 1NC                                                                           |
| 10 Mio.                                                                                                                    | 10 Mio.                                                                                                                       | 10 Mio.                                                                                                                       | 5 Mio.                                                                              |
| 10 Mio.                                                                                                                    | 10 Mio.                                                                                                                       | 10 Mio.                                                                                                                       | 5 Mio.                                                                              |
| No                                                                                                                         | No                                                                                                                            | No                                                                                                                            | No                                                                                  |
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## Low Voltage Switch Gear

| Classification                     | Motor Contactors                                                                   |                                                                                    | Thermal Overload Relays                                                             |
|------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Model                              | J7KN 150..KN 175                                                                   | J7KN 200                                                                           | J7TKN-A                                                                             |
|                                    | 3-pole                                                                             | 3-pole                                                                             |                                                                                     |
| Appearance                         |   |  |  |
| Remarks                            | AC and DC operate<br>3 main poles<br>2 auxiliary contacts integrated (1NO/<br>1NC) | AC and DC operate<br>3 main poles<br>4 auxiliary contacts integrated (1NO/<br>1NC) | Direct mounting<br>1 auxiliary contact (change over)                                |
| Accessoires                        | No                                                                                 | No                                                                                 | No                                                                                  |
| Maximum power (AC3-380/415V)       | 75 kW; 90 kW                                                                       | 110 kW                                                                             |                                                                                     |
| Rated current (AC3-380/415V)       | 150/175 A                                                                          | 210 A                                                                              |                                                                                     |
| AC operated                        | Yes                                                                                | Yes                                                                                |                                                                                     |
| DC operated                        | No                                                                                 | No                                                                                 |                                                                                     |
| 4 - pole version                   | No                                                                                 | No                                                                                 |                                                                                     |
| Auxiliary contacts included        | 1NO + 1NC                                                                          | 2NO + 2NC                                                                          | 1NO + 1NC                                                                           |
| Auxiliary contacts front mounting  | No                                                                                 | No                                                                                 |                                                                                     |
| Auxiliary contacts side mounting   | 1NO + 1NC                                                                          | 2NO + 2NC                                                                          |                                                                                     |
| Mechanical life span (AC operated) | 10 Mio.                                                                            | 10 Mio.                                                                            |                                                                                     |
| Mechanical life span (DC operated) | 10 Mio.                                                                            | 10 Mio.                                                                            |                                                                                     |
| Setting range (in A)               | No                                                                                 | No                                                                                 | 0,12..30 A                                                                          |
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| Thermal Overload Relays                                                           |                                                                                   | Motor Protection Circuit Breakers (MPCB)                                                                               |                                                                                                                        |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| J7TKN-B..TKN-D                                                                    | J7TKN-E..TKN-F                                                                    | J7MN12                                                                                                                 | J7MN25                                                                                                                 |
|  |  |                                      |                                     |
| Direct mounting<br>Auto, -manual, -reset button<br>2 auxiliary contacts (1NO/1NC) | Separate mounting<br>2 auxiliary contacts (1NO/1NC)                               | Rocker operating switch<br>Short circuit release<br>Over load release<br>I cu = 100 kA (0,16..6,3 A)                   | Rotary operating switch<br>Short circuit release<br>Over load release<br>I cu = 100 kA (0,16..12,5 A)                  |
| Sets for single mounting<br>Busbar sets                                           | Sets for single mounting<br>Busbar sets                                           | Trip indicating contact<br>Plastic enclosures<br>2 contacts side mounted<br>2 contacts front mounted<br>Bus bar system | Trip indicating contact<br>Plastic enclosures<br>3 contacts side mounted<br>2 contacts front mounted<br>Bus bar system |
|                                                                                   |                                                                                   |                                                                                                                        |                                                                                                                        |
|                                                                                   |                                                                                   |                                                                                                                        |                                                                                                                        |
|                                                                                   |                                                                                   |                                                                                                                        |                                                                                                                        |
|                                                                                   |                                                                                   |                                                                                                                        |                                                                                                                        |
|                                                                                   |                                                                                   |                                                                                                                        |                                                                                                                        |
| 1NO + 1NC                                                                         | 1NO + 1NC                                                                         | 1NO + 1NC                                                                                                              | 1NO + 1NC                                                                                                              |
|                                                                                   |                                                                                   |                                                                                                                        |                                                                                                                        |
|                                                                                   |                                                                                   | 1NO + 1NC                                                                                                              | 1NO + 1NC                                                                                                              |
|                                                                                   |                                                                                   | 100000                                                                                                                 | 100000                                                                                                                 |
|                                                                                   |                                                                                   |                                                                                                                        |                                                                                                                        |
| 0,12..74 A                                                                        | 60..220 A                                                                         | 0,11..12 A                                                                                                             | 0,11..25 A                                                                                                             |
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## Low Voltage Switch Gear

| Classification                     | Motor Protection Circuit Breakers (MPCB)                                                                               |                                                                                                                        |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Model                              | J7MN50                                                                                                                 | J7MN100                                                                                                                |
| Appearance                         |                                       |                                      |
| Remarks                            | Rotary operating switch<br>Short circuit release<br>Over load release<br>I cu = 50 kA                                  | Rotary operating switch<br>Short circuit release<br>Over load release<br>I cu = 50 kA                                  |
| Accessoires                        | Trip indicating contact<br>Plastic enclosures<br>2 contacts side mounted<br>3 contacts front mounted<br>Bus bar system | Trip indicating contact<br>Plastic enclosures<br>2 contacts side mounted<br>3 contacts front mounted<br>Bus bar system |
| Maximum power (AC3-380/415V)       |                                                                                                                        |                                                                                                                        |
| Rated current (AC3-380/415V)       |                                                                                                                        |                                                                                                                        |
| AC operated                        |                                                                                                                        |                                                                                                                        |
| DC operated                        |                                                                                                                        |                                                                                                                        |
| 4 - pole version                   |                                                                                                                        |                                                                                                                        |
| Auxiliary contacts included        |                                                                                                                        |                                                                                                                        |
| Auxiliary contacts front mounting  | 1NO + 1NC                                                                                                              | 1NO + 1NC                                                                                                              |
| Auxiliary contacts side mounting   | 1NO + 1NC                                                                                                              | 1NO + 1NC                                                                                                              |
| Mechanical life span (AC operated) | 50000                                                                                                                  | 50000                                                                                                                  |
| Mechanical life span (DC operated) |                                                                                                                        |                                                                                                                        |
| Setting range (in A)               | 22..50 A                                                                                                               | 45..100 A                                                                                                              |
| Page No.                           | H-69                                                                                                                   | H-69                                                                                                                   |

Mini Contactor Relays 4-pole

J7KNA-AR

Main contactor

- AC & DC operated
- 4-, 6- and 8-pole versions in different configurations
- Positively guided contacts
- Screw fixing and snap fitting (35 mm DIN rail)
- Rated current = 10A ( $I_{th}$ )
- Suitable for electronic devices (DIN 19240)
- Finger proof (VBG 4)

Accessories

- 2- and 4-pole additional auxiliary contacts in different configurations



Approved Standards

| Standard     | Guide No (US,C) |
|--------------|-----------------|
| UL           | NKCR, NKCR7     |
| ICE 947-5-1  |                 |
| VDE 0660     |                 |
| EN 60947-5-1 |                 |

Ordering Information

■ Model Number Legend

1. Mini Contactor Relays

7KNA-□□-□□-□□□□  
1 2 3 4

- 1)

Mini Contactor
- 2)

AR: Contactor Relay
- 3)

Combination of NO / NC contacts

22: 2 NO 2 NC

31: 3 NO 1 NC

40: 4 NO 0 NC
- 4)

Coil voltage (AC operated)

24: AC24V 50/60Hz

48: AC48V 50Hz

110: AC110-115V 50Hz,AC120-125V 60Hz

230: AC220-230V 50Hz,AC240V 60Hz

240: AC230V-240V 50Hz

400: AC380-400V 50Hz,AC440V 60Hz

415: AC400-415V 50Hz

550: AC525-550V 50Hz,AC600V 60Hz

- Coil voltage (DC operated)
- 24D: DC24V
- 48D: DC48V
- 60D: DC60V
- 110D: DC110V
- 125D: DC125V
- 24VS: DC24V with diode
- 48VS: DC48V with diode
- 110VS: DC110V with diode

2. Aux. Contact Modules for Mini Contactor Relays

73KN-□□-□□-□□  
1 2 3 4

- 1)

Auxiliary Contact Modules
- 2)

A: for mini contactor relay
- 3)

Combination of NO/NC contacts

11: 1 NO 1 NC

02: 0 NO 2 NC

22: 2 NO 2 NC

40: 4 NO 0 NC

# System overview

## Mini Contactor Relays 4-pole

### AC Operated

|                                                                                   | Contacts                                                                          |                                                                                   | Distinc.<br>Number<br>acc. to<br>DIN EN<br>50011 | Ratings           |           | Thermal<br>Rated<br>Current<br><br>$I_{th}$<br>A | Type<br><br><br>Coil voltage <sup>1)</sup><br><br>24 24V 50/60Hz<br>230 220-230V 50Hz | Pack<br><br><br>pcs. | Weight<br><br><br>kg/pc. |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------|-------------------|-----------|--------------------------------------------------|---------------------------------------------------------------------------------------|----------------------|--------------------------|
|                                                                                   |  |  |                                                  | AC15<br>230V<br>A | 400V<br>A |                                                  |                                                                                       |                      |                          |
|                                                                                   | NO                                                                                | NC                                                                                |                                                  |                   |           |                                                  |                                                                                       |                      |                          |
|  | 4-pole, With Screw Terminals                                                      |                                                                                   |                                                  |                   |           |                                                  |                                                                                       |                      |                          |
|                                                                                   | 4                                                                                 | -                                                                                 | 40E                                              | 3                 | 2         | 10                                               | J7KNA-AR-40 24                                                                        | 10                   | 0,16                     |
|                                                                                   |                                                                                   |                                                                                   |                                                  |                   |           |                                                  | J7KNA-AR-40 230                                                                       |                      |                          |
|                                                                                   |                                                                                   |                                                                                   |                                                  |                   |           |                                                  |                                                                                       |                      |                          |
|                                                                                   |                                                                                   |                                                                                   |                                                  |                   |           |                                                  |                                                                                       |                      |                          |
|                                                                                   | 3                                                                                 | 1                                                                                 | 31E                                              | 3                 | 2         | 10                                               | J7KNA-AR-31 24                                                                        | 10                   | 0,16                     |
|                                                                                   |                                                                                   |                                                                                   |                                                  |                   |           |                                                  | J7KNA-AR-31 230                                                                       |                      |                          |
|                                                                                   |                                                                                   |                                                                                   |                                                  |                   |           |                                                  |                                                                                       |                      |                          |
|                                                                                   |                                                                                   |                                                                                   |                                                  |                   |           |                                                  |                                                                                       |                      |                          |
|                                                                                   | 2                                                                                 | 2                                                                                 | 22E                                              | 3                 | 2         | 10                                               | J7KNA-AR-22 24                                                                        | 10                   | 0,16                     |
|                                                                                   |                                                                                   |                                                                                   |                                                  |                   |           |                                                  | J7KNA-AR-22 230                                                                       |                      |                          |
|                                                                                   |                                                                                   |                                                                                   |                                                  |                   |           |                                                  |                                                                                       |                      |                          |

1) Other coil voltages see page 10

### DC Solenoid Operated

|                                                                                     | Contacts                     |    | Distinc.<br>Number<br>acc. to<br>DIN EN<br>50011 | Ratings           |           | Thermal<br>Rated<br>Current<br><br>$I_m$<br>A | Type                                | Pack | Weight |
|-------------------------------------------------------------------------------------|------------------------------|----|--------------------------------------------------|-------------------|-----------|-----------------------------------------------|-------------------------------------|------|--------|
|                                                                                     | NO                           | NC |                                                  | AC15<br>230V<br>A | 400V<br>A |                                               |                                     |      |        |
|  | 4-pole, With Screw Terminals |    |                                                  |                   |           |                                               |                                     |      |        |
|                                                                                     | 4                            | -  | 40E                                              | 3                 | 2         | 10                                            | J7KNA-AR-40 24D (-VS) <sup>1)</sup> | 10   | 0,19   |
|                                                                                     |                              |    |                                                  |                   |           |                                               |                                     |      |        |
|                                                                                     |                              |    |                                                  |                   |           |                                               |                                     |      |        |
|                                                                                     | 3                            | 1  | 31E                                              | 3                 | 2         | 10                                            | J7KNA-AR-31 24D (-VS) <sup>1)</sup> | 10   | 0,19   |
|                                                                                     |                              |    |                                                  |                   |           |                                               |                                     |      |        |
|                                                                                     |                              |    |                                                  |                   |           |                                               |                                     |      |        |
|                                                                                     | 2                            | 2  | 22E                                              | 3                 | 2         | 10                                            | J7KNA-AR-22 24D (-VS) <sup>1)</sup> | 10   | 0,19   |
|                                                                                     |                              |    |                                                  |                   |           |                                               |                                     |      |        |
|                                                                                     |                              |    |                                                  |                   |           |                                               |                                     |      |        |
|                                                                                     |                              |    |                                                  |                   |           |                                               |                                     |      |        |
|                                                                                     |                              |    |                                                  |                   |           |                                               |                                     |      |        |

1) VS = with diode

### Auxiliary Contact Blocks for Contactor Relays J7KNA-AR

|                                                                                     | Contacts |    | Ratings | Thermal Rated Current<br>$I_{th}$<br>A | Type | Pack       | Weight |
|-------------------------------------------------------------------------------------|----------|----|---------|----------------------------------------|------|------------|--------|
|                                                                                     | NO       | NC |         |                                        |      |            |        |
|  | 1        | 1  | 3       | 2                                      | 10   | J73KN-A-11 | 0,04   |
|                                                                                     | -        | 2  | 3       | 2                                      | 10   | J73KN-A-02 | 0,04   |
|                                                                                     | 4        | -  | 3       | 2                                      | 10   | J73KN-A-40 | 0,04   |
|                                                                                     | 2        | 2  | 3       | 2                                      | 10   | J73KN-A-22 | 0,04   |

# System overview

## Mini Contactor Relays 4-pole

### AC Operated

| Wiring Diagrams              | Distinc. Number acc. to DIN EN 50011 | Auxiliary Contact Blocks | Contactor Relay with Auxiliary Contact |    | Block Distinc. Number according to DIN EN 50011 |   | Contacts suitable for Electronic Circuits according to DIN 19240 for rated voltage 24V DC (test ratings 17V DC, 5mA) Positively guided contacts |                                                                               |
|------------------------------|--------------------------------------|--------------------------|----------------------------------------|----|-------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
|                              |                                      | Type                     | NO                                     | NC |                                                 |   | NO                                                                                                                                              | NC                                                                            |
| 4-pole, With Screw Terminals |                                      |                          |                                        |    |                                                 |   |                                                                                                                                                 |                                                                               |
|                              | 40E                                  | J73KN-A-11               | 1                                      | 1  | 51E                                             | 5 | 1                                                                                                                                               | Preferable combinations with distinctive letter „E“ according to DIN EN 50011 |
|                              |                                      | J73KN-A-02               | 0                                      | 2  | 42E                                             | 4 | 2                                                                                                                                               |                                                                               |
|                              |                                      | J73KN-A-40               | 4                                      | 0  | 80E                                             | 8 | 0                                                                                                                                               |                                                                               |
|                              |                                      | J73KN-A-22               | 2                                      | 2  | 62E                                             | 6 | 2                                                                                                                                               |                                                                               |
|                              | 31E                                  | J73KN-A-11               | 1                                      | 1  | 42Y                                             | 4 | 2                                                                                                                                               |                                                                               |
|                              |                                      | J73KN-A-02               | 0                                      | 2  | 33Y                                             | 3 | 3                                                                                                                                               |                                                                               |
|                              |                                      | J73KN-A-40               | 4                                      | 0  | 71Y                                             | 7 | 1                                                                                                                                               |                                                                               |
|                              |                                      | J73KN-A-22               | 2                                      | 2  | 53Y                                             | 5 | 3                                                                                                                                               |                                                                               |
|                              | 22E                                  | J73KN-A-11               | 1                                      | 1  | 33Y                                             | 3 | 3                                                                                                                                               |                                                                               |
|                              |                                      | J73KN-A-02               | 0                                      | 2  | 24Y                                             | 2 | 4                                                                                                                                               |                                                                               |
|                              |                                      | J73KN-A-40               | 4                                      | 0  | 62Y                                             | 6 | 2                                                                                                                                               |                                                                               |
|                              |                                      | J73KN-A-22               | 2                                      | 2  | 44Y                                             | 4 | 4                                                                                                                                               |                                                                               |

### DC Solenoid Operated

| Wiring Diagrams              | Distinc. Number acc. to DIN EN 50011 | Auxiliary Contact Blocks | Contactor Relay with Auxiliary Contact |    | Block Distinc. Number according to DIN EN 50011 |   |    |                                                                               |
|------------------------------|--------------------------------------|--------------------------|----------------------------------------|----|-------------------------------------------------|---|----|-------------------------------------------------------------------------------|
|                              |                                      | Type                     | NO                                     | NC |                                                 |   | NO | NC                                                                            |
| 4-pole, With Screw Terminals |                                      |                          |                                        |    |                                                 |   |    |                                                                               |
|                              | 40E                                  | J73KN-A-11               | 1                                      | 1  | 51E                                             | 5 | 1  | Preferable combinations with distinctive letter „E“ according to DIN EN 50011 |
|                              |                                      | J73KN-A-02               | 0                                      | 2  | 42E                                             | 4 | 2  |                                                                               |
|                              |                                      | J73KN-A-40               | 4                                      | 0  | 80E                                             | 8 | 0  |                                                                               |
|                              |                                      | J73KN-A-22               | 2                                      | 2  | 62E                                             | 6 | 2  |                                                                               |
|                              | 31E                                  | J73KN-A-11               | 1                                      | 1  | 42Y                                             | 4 | 2  |                                                                               |
|                              |                                      | J73KN-A-02               | 0                                      | 2  | 33Y                                             | 3 | 3  |                                                                               |
|                              |                                      | J73KN-A-40               | 4                                      | 0  | 71Y                                             | 7 | 1  |                                                                               |
|                              |                                      | J73KN-A-22               | 2                                      | 2  | 53Y                                             | 5 | 3  |                                                                               |
|                              | 22E                                  | J73KN-A-11               | 1                                      | 1  | 33Y                                             | 3 | 3  |                                                                               |
|                              |                                      | J73KN-A-02               | 0                                      | 2  | 24Y                                             | 2 | 4  |                                                                               |
|                              |                                      | J73KN-A-40               | 4                                      | 0  | 62Y                                             | 6 | 2  |                                                                               |
|                              |                                      | J73KN-A-22               | 2                                      | 2  | 44Y                                             | 4 | 4  |                                                                               |

## Auxiliary Contact Blocks for Contactor Relays J7KNA-AR

| Wiring diagrams |            |            |            | Contacts suitable for Electronic Circuits according to DIN 19240 for rated voltage 24V DC (test ratings 17V DC, 5mA) Positively guided contacts |
|-----------------|------------|------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| J73KN-A-11      | J73KN-A-02 | J73KN-A-40 | J73KN-A-22 |                                                                                                                                                 |
|                 |            |            |            |                                                                                                                                                 |

# Specifications

## ■ Coil Voltages

| Suffix<br>to contactor type<br>e.g.<br><b>J7KNA-09-10-24</b> | Voltage Marking<br>at the coil |               | Rated Control Voltage $U_s$<br>range for |                   |                   |                   |
|--------------------------------------------------------------|--------------------------------|---------------|------------------------------------------|-------------------|-------------------|-------------------|
|                                                              | for 50Hz<br>V                  | for 60Hz<br>V | 50Hz<br>min<br>V.                        | 50Hz<br>max<br>V. | 60Hz<br>min<br>V. | 60Hz<br>max<br>V. |
| 12                                                           | 12                             | 12            | 11                                       | 12                | 12                | 12                |
| <b>24</b>                                                    | <b>24</b>                      | <b>24</b>     | <b>22</b>                                | <b>24</b>         | <b>24</b>         | <b>24</b>         |
| 42                                                           | 42                             | 42            | 38.5                                     | 42                | 42                | 42                |
| 48                                                           | 48-50                          | 48            | 48                                       | 50                | 48                | 50                |
| 60                                                           | 60                             | 60            | 52                                       | 66                | 54                | 60                |
| 90                                                           | 90-95                          | 100-105       | 90                                       | 95                | 100               | 105               |
| 95                                                           | 95-100                         | 105-110       | 95                                       | 100               | 105               | 110               |
| 100                                                          | 100                            | 110-115       | 100                                      | 105               | 110               | 115               |
| 105                                                          | 105-110                        | 115-120       | 105                                      | 110               | 115               | 120               |
| 110                                                          | 110-115                        | 120-125       | 110                                      | 115               | 120               | 125               |
| 200                                                          | 200                            | 210-220       | 195                                      | 205               | 210               | 220               |

| Suffix<br>to contactor type<br>e.g.<br><b>J7KNA-09-10- 230</b> | Voltage Marking<br>at the coil |               | Rated Control Voltage $U_s$<br>range for |                   |                   |                   |
|----------------------------------------------------------------|--------------------------------|---------------|------------------------------------------|-------------------|-------------------|-------------------|
|                                                                | for 50Hz<br>V                  | for 60Hz<br>V | 50Hz<br>min<br>V.                        | 50Hz<br>max<br>V. | 60Hz<br>min<br>V. | 60Hz<br>max<br>V. |
| 210                                                            | 205-215                        | 220-230       | 205                                      | 215               | 220               | 230               |
| 220                                                            | 210-220                        | 230-240       | 210                                      | 220               | 230               | 240               |
| <b>230</b>                                                     | <b>220-230</b>                 | <b>240</b>    | <b>220</b>                               | <b>230</b>        | <b>240</b>        | <b>250</b>        |
| 240                                                            | 230-240                        |               | 230                                      | 240               | 250               | 260               |
| 400                                                            | 380-400                        | 440           | 380                                      | 400               | 415               | 440               |
| 500                                                            | 475-500                        | 520-545       | 475                                      | 500               | 520               | 545               |
| 550                                                            | 525-550                        | 600           | 525                                      | 550               | 570               | 600               |

Standard voltages in bold type letters. Coil not exchangeable

## Engineering data and Characteristics

### Mini Contactor Relays

Data according to IEC 947-5-1, VDE 0660, EN 60947-5-1

| Auxiliary Contacts                                                   |              | Type | J7KNA-AR...                    | J7KNA-AR...D      | J7KNA-AR...VS     | J73KN-A...        |
|----------------------------------------------------------------------|--------------|------|--------------------------------|-------------------|-------------------|-------------------|
| Rated insulation voltage $U_i$                                       |              | V AC | 690 <sup>*1</sup>              | 690 <sup>*1</sup> | 690 <sup>*1</sup> | 690 <sup>*1</sup> |
| Thermal rated current $I_{th}$ to 690V                               |              |      |                                |                   |                   |                   |
| Ambient temperature                                                  | 40°C         | A    | 10                             | 10                | 10                | 10                |
|                                                                      | 60°C         | A    | 6                              | 6                 | 6                 | 6                 |
| Power loss per pole                                                  | at $I_{th}$  | W    | 0.5                            | 0.5               | 0.5               | 0.5               |
| Utilization category AC15                                            |              |      |                                |                   |                   |                   |
| Rated operational current $I_e$                                      | 220-240V     | A    | 3                              | 3                 | 3                 | 3                 |
|                                                                      | 380-415V     | A    | 2                              | 2                 | 2                 | 2                 |
|                                                                      | 440V         | A    | 1.6                            | 1.6               | 1.6               | 1.6               |
|                                                                      | 500V         | A    | 1.2                            | 1.2               | 1.2               | 1.2               |
|                                                                      | 660-690V     | A    | 0.6                            | 0.6               | 0.6               | 0.6               |
| Utilization category DC13                                            |              |      |                                |                   |                   |                   |
| Rated operational current $I_e$                                      | 60V          | A    | 2                              | 2                 | 2                 | 2                 |
|                                                                      | 110V         | A    | 0.4                            | 0.4               | 0.4               | 0.4               |
|                                                                      | 220V         | A    | 0.1                            | 0.1               | 0.1               | 0.1               |
| Maximum ambient temperature                                          |              |      |                                |                   |                   |                   |
| Operation                                                            | open         | °C   | -40 to +60 (+90) <sup>*2</sup> |                   |                   |                   |
|                                                                      | enclosed     | °C   |                                |                   |                   |                   |
| Storage                                                              |              | °C   | -40 to +40                     |                   |                   |                   |
| Short circuit protection                                             |              |      |                                |                   |                   |                   |
| short-circuit current 1kA,<br>contact welding not accepted           |              |      |                                |                   |                   |                   |
| max. fuse size                                                       | gL (gG)      | A    | 20                             | 20                | 20                | 20                |
| Power consumption of coils                                           |              |      |                                |                   |                   |                   |
| AC operated                                                          | inrush       | VA   | 25                             | -                 | -                 | -                 |
|                                                                      | sealed       | VA   | 4 - 5                          | -                 | -                 | -                 |
|                                                                      |              | W    | 1.2                            | -                 | -                 | -                 |
| DC operated                                                          | inrush       | W    | -                              | 2.5               | 2.5               | -                 |
|                                                                      | sealed       | W    | -                              | 2.5               | 2.5               | -                 |
| Operation range of coils                                             |              |      |                                |                   |                   |                   |
| in multiples of control voltage $U_s$                                |              |      | 0.85 - 1.1                     | 0.8 - 1.1         | 0.8 - 1.1         | -                 |
| Switching time at control voltage $U_s$ $\pm 10\%$ <sup>*3, *4</sup> |              |      |                                |                   |                   |                   |
| AC operated                                                          | make time    | ms   | 15 - 25                        | -                 | -                 | -                 |
|                                                                      | release time | ms   | 8 - 25                         | -                 | -                 | -                 |
|                                                                      | arc duration | ms   | 10 - 15                        | -                 | -                 | -                 |
| DC operated                                                          | make time    | ms   | -                              | 15 - 19           | -                 | -                 |
|                                                                      | release time | ms   | -                              | 8 - 25            | -                 | -                 |
|                                                                      | arc duration | ms   | -                              | 10 - 15           | -                 | -                 |

## Mini Contactor Relays

Data according to IEC 947-5-1, VDE 0660, EN 60947-5-1

| Auxiliary Contacts         |                                   | Type            | J7KNA-AR... | J7KNA-AR...D | J7KNA-AR...VS | J73KN-A... |
|----------------------------|-----------------------------------|-----------------|-------------|--------------|---------------|------------|
| <b>Cable cross-section</b> |                                   |                 |             |              |               |            |
| all connectors             | solid                             | mm <sup>2</sup> | 0.75 - 2.5  | 0.75 - 2.5   | 0.75 - 2.5    | 0.75 - 2.5 |
|                            | flexible                          | mm <sup>2</sup> | 0.75 - 2.5  | 0.75 - 2.5   | 0.75 - 2.5    | 0.75 - 2.5 |
|                            | flexible with multicore cable end | mm <sup>2</sup> | 0.5 - 1.5   | 0.5 - 1.5    | 0.5 - 1.5     | 0.5 - 2.5  |
| Clamps per pole            |                                   |                 | 2           | 2            | 2             | 2          |
| solid or stranded          |                                   | AWG             | 18 - 14     | 18 - 14      | 18 - 14       | 18 - 14    |

\*1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .  
Data for other conditions on request.

\*2) With reduced control voltage range 0.9 up to  $1.0 \times U_s$  and with reduced thermal rated current  $I_{th}$  to  $I_e/AC15$

\*3) Summary switching time = release time + arc duration

\*4) Release time of NC make time of NO increase when suppressor units for voltage peak protection are used (Varistor, RC-units, Diode units).

## Mini Contactor Relays for North America

Data according to UL508

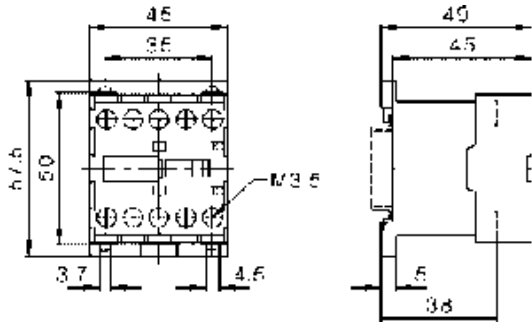
| Main Contacts (cULus)                                            |      | Type | J7KNA-AR... | J73KN-A... |
|------------------------------------------------------------------|------|------|-------------|------------|
| Rated operational current "General Use"                          |      | A    | 10          | 10         |
| Rated operational power of three-phase motors at 60Hz (3ph)      | 115V | hp   | -           | -          |
|                                                                  | 200V | hp   | -           | -          |
|                                                                  | 230V | hp   | -           | -          |
|                                                                  | 460V | hp   | -           | -          |
|                                                                  | 575V | hp   | -           | -          |
| Rated operational power of AC motors at 60Hz (1ph)               | 115V | hp   | -           | -          |
|                                                                  | 200V | hp   | -           | -          |
|                                                                  | 230V | hp   | -           | -          |
| Fuses                                                            |      | A    | -           | -          |
| Suitable for use on a capability of delivering not more than rms |      | A    | -           | -          |
|                                                                  |      | V    | -           | -          |
| Rated voltage                                                    |      | V AC | 600         | 600        |
| <b>Auxiliary Contacts (cULus)</b>                                |      |      |             |            |
| heavy pilot duty                                                 |      | AC   | A600        | A600       |
| standard pilot duty                                              |      | DC   | Q600        | Q600       |

■ Dimensions

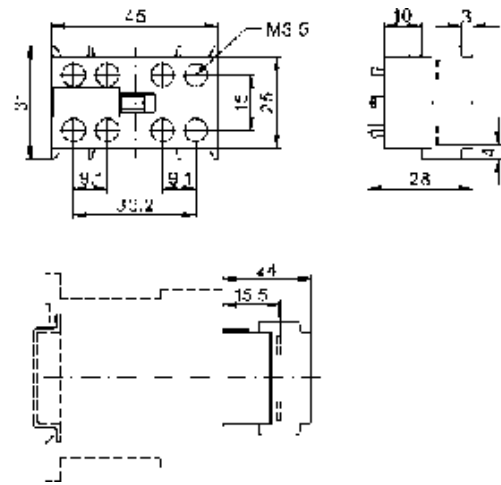
AC and DC operated  
with screw terminals

Auxiliary Contact Blocks

J7KNA-AR...



J73KN-A...



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

Cat. No. J507-E2-02

In the interest of product improvement, specifications are subject to change without notice.

Mini Motor Contactor

J7KNA

Main contactor

- AC & DC operated
- Integrated auxiliary contacts
- Screw fixing and snap fitting (35 mm DIN rail)
- Range from 4 to 5.5 kW (AC 3, 380/415V)
- 4 -main pole version (4 kW AC and DC coil)
- Auxiliary contacts suitable for electronic devices (DIN 19240)
- Finger proof (VBG 4)

Accessories

- 2 and 4 pole additional auxiliary contacts in different configurations
- Mechanical interlock (in reversing contactor combination only)
- RC Suppressors



Approved Standards

| Standard     | Guide No (US,C) |
|--------------|-----------------|
| UL           | NLDX, NLDX7     |
| ICE 947-5-1  |                 |
| VDE 0660     |                 |
| EN 60947-5-1 |                 |

Ordering Information

Model Number Legend

1. Mini Motor Contactors

J7KNA-□□-□□-□□□□□□

1 2 3 4 5

- 1) Mini Contactor
- 2) Rated Motor Current (AC3 400V)  
09: 9A  
12: 12A
- 3) Integrated auxiliary contact  
10: 1 NO 0 NC  
01: 0 NO 1 NC  
4: 4 main pole type (no aux contact)
- 4) W: Reversing Contactor
- 5) Coil voltage (AC operated)<sup>1)</sup>  
24: AC24V 50/60Hz  
48: AC48V 50Hz  
60: AC60V 50Hz  
110: AC110-115V 50Hz, AC120-125V 60Hz  
230: AC220-230V 50Hz, AC240V 60Hz  
240: AC230V-240V 50Hz

<sup>1)</sup> RC-suppressor unit go to page H-29, section 6 or page H-35, suppressor units

- 400: AC380-400V 50Hz, AC440V 60Hz  
415: AC400-415V 50Hz

Coil voltage (DC operated)

- 24D: DC24V  
48D: DC48V  
60D: DC60V  
110D: DC110V  
24VS: DC24V with diode  
48VS: DC48V with diode  
110VS: DC110V with diode

2. Aux. Contact Modules for Mini Motor Contactors

J73KN-□□-□□-□□

1 2 3 4

- 1) Auxiliary Contact Modules
- 2) AM: for mini motor contactor
- 3) Combination of NO/NC contacts  
11: 1 NO 1 NC  
02: 0 NO 2 NC  
22: 2 NO 2 NC  
40: 4 NO 0 NC
- 4) for Reversing Contactors  
v: left side  
x: right side

## ■ System overview

### Mini Motor Contactors AC Operated

|                                                                                   | Ratings                                |            |                    | Rated Current    |                  | Aux. Contacts                                                                     |                                                                                   | Type                                         | Pack                                           | Weight         |
|-----------------------------------------------------------------------------------|----------------------------------------|------------|--------------------|------------------|------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------|----------------|
|                                                                                   | AC2, AC3<br>380V<br>400V<br>415V<br>kW | 500V<br>kW | 660V<br>690V<br>kW | AC3<br>400V<br>A | AC1<br>690V<br>A | NO                                                                                | NC                                                                                |                                              |                                                |                |
|                                                                                   |                                        |            |                    |                  |                  |  |  | Accept<br>Overload<br>Relay see<br>page H-58 | Coil Voltage*1<br>24V 50/60Hz<br>220-230V 50Hz | pcs.<br>kg/pc. |
|  | <b>3-pole, With Screw Terminals</b>    |            |                    |                  |                  |                                                                                   |                                                                                   |                                              |                                                |                |
|                                                                                   | 4                                      | 4          | 4                  | 9                | 20               | 1                                                                                 | -                                                                                 | J7TKN-A                                      | J7KNA-09-10-□□□□□                              | 10 0.16        |
|                                                                                   | 5.5                                    | 5.5        | 5.5                | 12               | 20               | 1                                                                                 | -                                                                                 | J7TKN-A                                      | J7KNA-12-10-□□□□□                              | 10 0.16        |
|                                                                                   |                                        |            |                    |                  |                  |                                                                                   |                                                                                   |                                              |                                                |                |
|                                                                                   | 4                                      | 4          | 4                  | 9                | 20               | -                                                                                 | 1                                                                                 | J7TKN-A                                      | J7KNA-09-01-□□□□□                              | 10 0.16        |
|                                                                                   | 5.5                                    | 5.5        | 5.5                | 12               | 20               | -                                                                                 | 1                                                                                 | J7TKN-A                                      | J7KNA-12-01-□□□□□                              | 10 0.16        |
|                                                                                   |                                        |            |                    |                  |                  |                                                                                   |                                                                                   |                                              |                                                |                |
|                                                                                   |                                        |            |                    |                  |                  |                                                                                   |                                                                                   |                                              |                                                |                |
|                                                                                   | <b>4-pole, With Screw Terminals</b>    |            |                    |                  |                  |                                                                                   |                                                                                   |                                              |                                                |                |
|                                                                                   | 4                                      | 4          | 4                  | 9                | 20               | -                                                                                 | -                                                                                 | J7TKN-A                                      | J7KNA-09-4-□□□□□                               | 10 0.19        |
|                                                                                   |                                        |            |                    |                  |                  |                                                                                   |                                                                                   |                                              |                                                |                |
|                                                                                   |                                        |            |                    |                  |                  |                                                                                   |                                                                                   |                                              |                                                |                |
|                                                                                   |                                        |            |                    |                  |                  |                                                                                   |                                                                                   |                                              |                                                |                |

\*1) Other coil voltages see page H-20

### DC Solenoid Operated

|                                                                                     | Ratings                                |            |                    | Rated Current    |                  | Aux. Contacts                                                                       |                                                                                     | Type                                         | Pack                                                     | Weight         |
|-------------------------------------------------------------------------------------|----------------------------------------|------------|--------------------|------------------|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------|----------------|
|                                                                                     | AC2, AC3<br>380V<br>400V<br>415V<br>kW | 500V<br>kW | 660V<br>690V<br>kW | AC3<br>400V<br>A | AC1<br>690V<br>A | NO                                                                                  | NC                                                                                  |                                              |                                                          |                |
|                                                                                     |                                        |            |                    |                  |                  |  |  | Accept<br>Overload<br>Relay see<br>page H-58 | DC Coil Voltage<br>24V 50/60Hz<br>24V 50/60Hz w. diode*1 | pcs.<br>kg/pc. |
|  | <b>3-pole, With Screw Terminals</b>    |            |                    |                  |                  |                                                                                     |                                                                                     |                                              |                                                          |                |
|                                                                                     | 4                                      | 4          | 4                  | 9                | 20               | 1                                                                                   | -                                                                                   | J7TKN-A                                      | J7KNA-09-10-□□□□D(-VS)                                   | 10 0.19        |
|                                                                                     | 5.5                                    | 5.5        | 5.5                | 12               | 20               | 1                                                                                   | -                                                                                   | J7TKN-A                                      | J7KNA-12-10-□□□□D(-VS)                                   | 10 0.19        |
|                                                                                     |                                        |            |                    |                  |                  |                                                                                     |                                                                                     |                                              |                                                          |                |
|                                                                                     | 4                                      | 4          | 4                  | 9                | 20               | -                                                                                   | 1                                                                                   | J7TKN-A                                      | J7KNA-09-01-□□□□D(-VS)                                   | 10 0.19        |
|                                                                                     | 5.5                                    | 5.5        | 5.5                | 12               | 20               | -                                                                                   | 1                                                                                   | J7TKN-A                                      | J7KNA-12-01-□□□□D(-VS)                                   | 10 0.19        |
|                                                                                     |                                        |            |                    |                  |                  |                                                                                     |                                                                                     |                                              |                                                          |                |
|                                                                                     |                                        |            |                    |                  |                  |                                                                                     |                                                                                     |                                              |                                                          |                |

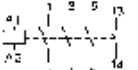
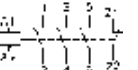
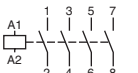
\*1) with built-in coil suppressor (zener diode)

### Auxiliary contact blocks with screw terminals for contactors J7KNA-09... and J7KNA-12...

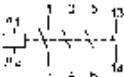
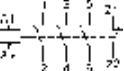
|                                                                                     | Contacts                                                                            |                                                                                     | Rated Current     |           | Thermal Rated Current | Type        | Pack | Weight |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------|-----------|-----------------------|-------------|------|--------|
|                                                                                     |  |  | AC15<br>230V<br>A | 400V<br>A |                       |             |      |        |
|  | 1                                                                                   | 1                                                                                   | 3                 | 2         | 10                    | J73KN-AM-11 | 10   | 0.04   |
|                                                                                     | -                                                                                   | 2                                                                                   | 3                 | 2         | 10                    | J73KN-AM-02 | 10   | 0.04   |
|                                                                                     | 2                                                                                   | 2                                                                                   | 3                 | 2         | 10                    | J73KN-AM-22 | 10   | 0.04   |

# ■ System overview

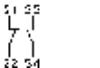
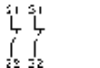
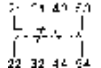
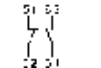
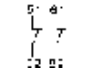
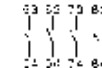
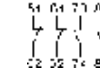
## Mini Motor Contactors AC Operated

| Wiring Diagrams                                                                   |                                           | Auxiliary Contact Blocks |                                                                                      |                                                                                      | Contactor with Auxiliary Contact Block    |                                                                                        |                                                                                        | Contacts suitable for Electronic Circuits according to DIN 19240 for rated voltage 24V DC (test ratings 17V DC, 5mA) Positively guided contacts |
|-----------------------------------------------------------------------------------|-------------------------------------------|--------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   | Distinc. Number according to DIN EN 50012 | Type                     |  NO |  NC | Distinc. Number according to DIN EN 50012 |  NO |  NC |                                                                                                                                                 |
| <b>3-pole, With Screw Terminals</b>                                               |                                           |                          |                                                                                      |                                                                                      |                                           |                                                                                        |                                                                                        |                                                                                                                                                 |
|  | 10                                        | J73KN-AM-11              | 1                                                                                    | 1                                                                                    | 21                                        | 2                                                                                      | 1                                                                                      | Preferred combinations according to DIN EN 50012                                                                                                |
|                                                                                   |                                           | J73KN-AM-02              | 0                                                                                    | 2                                                                                    | 12                                        | 1                                                                                      | 2                                                                                      |                                                                                                                                                 |
|                                                                                   |                                           | J73KN-AM-22              | 2                                                                                    | 2                                                                                    | 32                                        | 3                                                                                      | 2                                                                                      |                                                                                                                                                 |
|  | 01                                        | J73KN-A-11               | 1                                                                                    | 1                                                                                    | -                                         | 1                                                                                      | 2                                                                                      | Contacts according to DIN EN 50005                                                                                                              |
|                                                                                   |                                           | J73KN-A-02               | 0                                                                                    | 2                                                                                    | -                                         | 0                                                                                      | 3                                                                                      |                                                                                                                                                 |
|                                                                                   |                                           | J73KN-A-40               | 4                                                                                    | 0                                                                                    | -                                         | 4                                                                                      | 1                                                                                      |                                                                                                                                                 |
|                                                                                   |                                           | J73KN-A-22               | 2                                                                                    | 2                                                                                    | -                                         | 2                                                                                      | 3                                                                                      |                                                                                                                                                 |
| <b>4-pole, With Screw Terminals</b>                                               |                                           |                          |                                                                                      |                                                                                      |                                           |                                                                                        |                                                                                        |                                                                                                                                                 |
|  | 00                                        | J73KN-A-11               | 1                                                                                    | 1                                                                                    | -                                         | 1                                                                                      | 1                                                                                      | Contacts according to DIN EN 50005                                                                                                              |
|                                                                                   |                                           | J73KN-A-02               | 0                                                                                    | 2                                                                                    | -                                         | 0                                                                                      | 2                                                                                      |                                                                                                                                                 |
|                                                                                   |                                           | J73KN-A-40               | 4                                                                                    | 0                                                                                    | -                                         | 4                                                                                      | 0                                                                                      |                                                                                                                                                 |
|                                                                                   |                                           | J73KN-A-22               | 2                                                                                    | 2                                                                                    | -                                         | 2                                                                                      | 2                                                                                      |                                                                                                                                                 |

## DC Solenoid Operated

| Wiring Diagrams                                                                     | Distinc. Number according to DIN EN 50012 | Auxiliary Contact Blocks |    |    | Contactor with Auxiliary Contact Block    |    |    | Contacts suitable for Electronic Circuits according to DIN 19240 for rated voltage 24V DC (test ratings 17V DC, 5mA) Positively guided contacts |
|-------------------------------------------------------------------------------------|-------------------------------------------|--------------------------|----|----|-------------------------------------------|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                     |                                           | Type                     | NO | NC | Distinc. Number according to DIN EN 50012 | NO | NC |                                                                                                                                                 |
| 3-pole, With Screw Terminals                                                        |                                           |                          |    |    |                                           |    |    |                                                                                                                                                 |
|  | 10                                        | J73KN-AM-11              | 1  | 1  | 21                                        | 2  | 1  | Preferred combinations according to DIN EN 50012                                                                                                |
|                                                                                     |                                           | J73KN-AM-02              | 0  | 2  | 12                                        | 1  | 2  |                                                                                                                                                 |
|                                                                                     |                                           | J73KN-AM-22              | 2  | 2  | 32                                        | 3  | 2  |                                                                                                                                                 |
|  | 01                                        | J73KN-A-11               | 1  | 1  | -                                         | 1  | 2  | Contacts according to DIN EN 50005                                                                                                              |
|                                                                                     |                                           | J73KN-A-02               | 0  | 2  | -                                         | 0  | 3  |                                                                                                                                                 |
|                                                                                     |                                           | J73KN-A-40               | 4  | 0  | -                                         | 4  | 1  |                                                                                                                                                 |
|                                                                                     |                                           | J73KN-A-22               | 2  | 2  | -                                         | 2  | 3  |                                                                                                                                                 |

## Auxiliary contact blocks with screw terminals for contactors J7KNA-09... and J7KNA-12...

| Wiring Diagrams                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       | Contacts suitable for Electronic Circuits according to DIN 19240 for rated voltage 24V DC (test ratings 17V DC, 5mA) Positively guided contacts |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| J73KN-AM-11                                                                         | J73KN-AM-02                                                                         | J73KN-AM-22                                                                         | J73KN-A-11                                                                          | J73KN-A-02                                                                          | J73KN-A-40                                                                          | J73KN-A-22                                                                            |                                                                                                                                                 |
|  |  |  |  |  |  |  |                                                                                                                                                 |

## ■ System overview

### Mini Reversing Contactors, Mechanical Interlocked AC Operated

|                                                                                  | Ratings                      |            |                    | Rated Current |           | Aux. Contacts                                                                     |                                                                                   | Type                                         | Pack                                           | Weight |        |
|----------------------------------------------------------------------------------|------------------------------|------------|--------------------|---------------|-----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------|--------|--------|
|                                                                                  | AC2, AC3                     |            |                    | AC3           | AC1       |                                                                                   |                                                                                   |                                              |                                                |        |        |
|                                                                                  | 380V<br>400V<br>415V<br>kW   | 500V<br>kW | 660V<br>690V<br>kW | 400V<br>A     | 690V<br>A |  |  | Accept<br>Overload<br>Relay see<br>page H-58 | Coil Voltage*1<br>24V 50/60Hz<br>220-230V 50Hz | pcs.   | kg/pc. |
|  | 3-pole, With Screw Terminals |            |                    |               |           |                                                                                   |                                                                                   |                                              |                                                |        |        |
|                                                                                  | 4                            | 4          | 4                  | 9             | 20        | -                                                                                 | 1                                                                                 | J7TKN-A                                      | J7KNA-09-01-W-□□□□□                            | 1      | 0.32   |
|                                                                                  | 5.5                          | 5.5        | 5.5                | 12            | 20        | -                                                                                 | 1                                                                                 | J7TKN-A                                      | J7KNA-12-01-W-□□□□□                            | 1      | 0.32   |
|                                                                                  |                              |            |                    |               |           |                                                                                   |                                                                                   |                                              |                                                |        |        |
|                                                                                  |                              |            |                    |               |           |                                                                                   |                                                                                   |                                              |                                                |        |        |

\*1) Other coil voltages see page H-20

### DC Solenoid Operated

|                                                                                   |                              |            |                    |               |           |                                                                                      |                                                                                      |                                              |                    |                                                          |      |        |
|-----------------------------------------------------------------------------------|------------------------------|------------|--------------------|---------------|-----------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------|--------------------|----------------------------------------------------------|------|--------|
|                                                                                   | Ratings                      |            |                    | Rated Current |           | Aux. Contacts                                                                        |                                                                                      | Type                                         | Pack               | Weight                                                   |      |        |
|                                                                                   | AC2, AC3                     |            |                    | AC3           | AC1       |                                                                                      |                                                                                      |                                              |                    |                                                          |      |        |
|                                                                                   | 380V<br>400V<br>415V<br>kW   | 500V<br>kW | 660V<br>690V<br>kW | 400V<br>A     | 690V<br>A |  NO |  NC | Accept<br>Overload<br>Relay see<br>page H-58 | 24D<br>24VS        | DC Coil Voltage<br>24V 50/60Hz<br>24V 50/60Hz w. diode*1 | pcs. | kg/pc. |
|  | 3-pole, With Screw Terminals |            |                    |               |           |                                                                                      |                                                                                      |                                              |                    |                                                          |      |        |
|                                                                                   | 4                            | 4          | 4                  | 9             | 20        | -                                                                                    | 1                                                                                    | J7TKN-A                                      | J7KNA-09-01-W-□□□D | 1                                                        | 0.38 |        |
|                                                                                   | 5.5                          | 5.5        | 5.5                | 12            | 20        | -                                                                                    | 1                                                                                    | J7TKN-A                                      | J7KNA-12-01-W-□□□D | 1                                                        | 0.38 |        |
|                                                                                   |                              |            |                    |               |           |                                                                                      |                                                                                      |                                              |                    |                                                          |      |        |
|                                                                                   |                              |            |                    |               |           |                                                                                      |                                                                                      |                                              |                    |                                                          |      |        |
|                                                                                   |                              |            |                    |               |           |                                                                                      |                                                                                      |                                              |                    |                                                          |      |        |

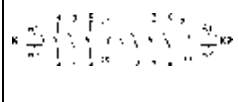
\*1) with built-in coil suppressor (zener diode)

### Auxiliary contact blocks with screw terminals for contactors J7KNA-09-01-W...(D) and J7KNA-12-01-W...(D)

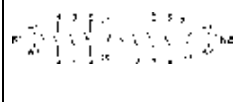
|                                                                                     | Contacts |    | Rated Current     |           | Thermal Rated Current | Type         | Pack | Weight |
|-------------------------------------------------------------------------------------|----------|----|-------------------|-----------|-----------------------|--------------|------|--------|
|                                                                                     | NO       | NC | AC15<br>230V<br>A | 400V<br>A |                       |              |      |        |
|  | 1        | 1  | 3                 | 2         | 10                    | J73KN-AM-11V | 10   | 0.04   |
|                                                                                     | 1        | 1  | 3                 | 2         | 10                    | J73KN-AM-11X | 10   | 0.04   |
|                                                                                     |          |    |                   |           |                       |              |      |        |

■ System overview

Mini Motor Contactors  
AC Operated

|                                                                                   |    |                                            |                                                                                   |                                                                                   |                                             |                                                                                     |                                                                                     |                                                                                                                                                 |
|-----------------------------------------------------------------------------------|----|--------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Wiring Diagrams                                                                   |    | Auxiliary Contact Blocks suitable for      |                                                                                   |                                                                                   |                                             |                                                                                     |                                                                                     | Contacts suitable for Electronic Circuits according to DIN 19240 for rated voltage 24V DC (test ratings 17V DC, 5mA) Positively guided contacts |
|                                                                                   |    | left hand side<br>Contactor K1<br><br>Type |  |  | right hand side<br>Contactor K2<br><br>Type |  |  |                                                                                                                                                 |
| 3-pole, With Screw Terminals                                                      |    |                                            |                                                                                   |                                                                                   |                                             |                                                                                     |                                                                                     |                                                                                                                                                 |
|  | 01 | J73KN-AM-11V                               | 1                                                                                 | 1                                                                                 | J73KN-AM-11X                                | 1                                                                                   | 1                                                                                   |                                                                                                                                                 |
|                                                                                   |    |                                            |                                                                                   |                                                                                   |                                             |                                                                                     |                                                                                     |                                                                                                                                                 |
|                                                                                   |    |                                            |                                                                                   |                                                                                   |                                             |                                                                                     |                                                                                     |                                                                                                                                                 |
|                                                                                   |    |                                            |                                                                                   |                                                                                   |                                             |                                                                                     |                                                                                     |                                                                                                                                                 |
|                                                                                   |    |                                            |                                                                                   |                                                                                   |                                             |                                                                                     |                                                                                     |                                                                                                                                                 |

DC Solenoid Operated

|                                                                                     |                                           |                                       |                                                                                   |                                                                                   |                 |                                                                                     |                                                                                     |                                                                                                                                                 |
|-------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Wiring Diagrams                                                                     | Distinc. Number according to DIN EN 50012 | Auxiliary Contact Blocks suitable for |                                                                                   |                                                                                   |                 |                                                                                     |                                                                                     | Contacts suitable for Electronic Circuits according to DIN 19240 for rated voltage 24V DC (test ratings 17V DC, 5mA) Positively guided contacts |
|                                                                                     |                                           | left hand side                        |                                                                                   |                                                                                   | right hand side |                                                                                     |                                                                                     |                                                                                                                                                 |
|                                                                                     |                                           | Contactor K1                          |  |  | Contactor K2    |  |  |                                                                                                                                                 |
|                                                                                     |                                           | Type                                  | NO                                                                                | NC                                                                                | Type            | NO                                                                                  | NC                                                                                  |                                                                                                                                                 |
| 3-pole, With Screw Terminals                                                        |                                           |                                       |                                                                                   |                                                                                   |                 |                                                                                     |                                                                                     |                                                                                                                                                 |
|  | 01                                        | J73KN-AM-11V                          | 1                                                                                 | 1                                                                                 | J73KN-AM-11X    | 1                                                                                   | 1                                                                                   |                                                                                                                                                 |
|                                                                                     |                                           |                                       |                                                                                   |                                                                                   |                 |                                                                                     |                                                                                     |                                                                                                                                                 |
|                                                                                     |                                           |                                       |                                                                                   |                                                                                   |                 |                                                                                     |                                                                                     |                                                                                                                                                 |
|                                                                                     |                                           |                                       |                                                                                   |                                                                                   |                 |                                                                                     |                                                                                     |                                                                                                                                                 |
|                                                                                     |                                           |                                       |                                                                                   |                                                                                   |                 |                                                                                     |                                                                                     |                                                                                                                                                 |

Auxiliary contact blocks with screw terminals for contactors J7KNA-09-01-W...(D) and J7KNA-12-01-W...(D)

|                                                                                     |                                                                                     |  |  |  |  |                                                                                                                                                 |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|--|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Wiring Diagrams                                                                     |                                                                                     |  |  |  |  | Contacts suitable for Electronic Circuits according to DIN 19240 for rated voltage 24V DC (test ratings 17V DC, 5mA) Positively guided contacts |
| J73KN-AM-11V                                                                        | J73KN-AM-11X                                                                        |  |  |  |  |                                                                                                                                                 |
|  |  |  |  |  |  |                                                                                                                                                 |

# Specifications

## ■ Coil Voltages

| Suffix<br>to contactor type<br>e.g.<br><b>J7KNA-09-10-24</b> | Voltage Marking<br>at the coil |               | Rated Control Voltage $U_s$<br>range for |                   |                   |                   |
|--------------------------------------------------------------|--------------------------------|---------------|------------------------------------------|-------------------|-------------------|-------------------|
|                                                              | for 50Hz<br>V                  | for 60Hz<br>V | 50Hz<br>min<br>V.                        | 50Hz<br>max<br>V. | 60Hz<br>min<br>V. | 60Hz<br>max<br>V. |
| 12                                                           | 12                             | 12            | 11                                       | 12                | 12                | 12                |
| <b>24</b>                                                    | <b>24</b>                      | <b>24</b>     | <b>22</b>                                | <b>24</b>         | <b>24</b>         | <b>24</b>         |
| 48                                                           | 48-50                          | 48            | 48                                       | 50                | 48                | 50                |
| 60                                                           | 60                             | 60            | 52                                       | 66                | 54                | 60                |
| 90                                                           | 90-95                          | 100-105       | 90                                       | 95                | 100               | 105               |
| 95                                                           | 95-100                         | 105-110       | 95                                       | 100               | 105               | 110               |
| 100                                                          | 100                            | 110-115       | 100                                      | 105               | 110               | 115               |
| 105                                                          | 105-110                        | 115-120       | 105                                      | 110               | 115               | 120               |
| 110                                                          | 110-115                        | 120-125       | 110                                      | 115               | 120               | 125               |
| 200                                                          | 200                            | 210-220       | 195                                      | 205               | 210               | 220               |

| Suffix<br>to contactor type<br>e.g.<br><b>J7KNA-09-10-230</b> | Voltage Marking<br>at the coil |               | Rated Control Voltage $U_s$<br>range for |                   |                   |                   |
|---------------------------------------------------------------|--------------------------------|---------------|------------------------------------------|-------------------|-------------------|-------------------|
|                                                               | for 50Hz<br>V                  | for 60Hz<br>V | 50Hz<br>min<br>V.                        | 50Hz<br>max<br>V. | 60Hz<br>min<br>V. | 60Hz<br>max<br>V. |
| 210                                                           | 205-215                        | 220-230       | 205                                      | 215               | 220               | 230               |
| 220                                                           | 210-220                        | 230-240       | 210                                      | 220               | 230               | 240               |
| <b>230</b>                                                    | <b>220-230</b>                 | <b>240</b>    | <b>220</b>                               | <b>230</b>        | <b>240</b>        | <b>250</b>        |
| 240                                                           | 230-240                        |               | 230                                      | 240               | 250               | 260               |
| 400                                                           | 380-400                        | 440           | 380                                      | 400               | 415               | 440               |
| 500                                                           | 475-500                        | 520-545       | 475                                      | 500               | 520               | 545               |
| 550                                                           | 525-550                        | 600           | 525                                      | 550               | 570               | 600               |

Standard voltages in bold type letters. Coil not exchangeable

## ■ Engineering data and Characteristics

### Mini Motor Contactors

Data according to IEC 947-4-1, VDE 0660, EN 60947-4-1

| Main Contacts                                                                             | Type            | J7KNA-09-...       | J7KNA-12-...       |
|-------------------------------------------------------------------------------------------|-----------------|--------------------|--------------------|
| <b>Rated insulation voltage <math>U_i</math></b>                                          | V AC            | 690 <sup>(1)</sup> | 690 <sup>(1)</sup> |
| <b>Making capacity <math>I_{eff}</math></b> at $U_e = 690V$ AC                            | A               | 165                | 165                |
| <b>Breaking capacity <math>I_{eff}</math></b> 400V AC                                     | A               | 100                | 100                |
| $\cos\varphi = 0,65$ 500V AC                                                              | A               | 90                 | 90                 |
| 690V AC                                                                                   | A               | 80                 | 80                 |
| <b>Utilization category AC1</b>                                                           |                 |                    |                    |
| <b>Switching of resistive load</b>                                                        |                 |                    |                    |
| Rated operational current $I_e (=I_{th})$ at 40°C, open                                   | A               | 20                 | 20                 |
| Rated operational power of three-phase resistive loads 230V<br>50-60Hz, $\cos\varphi = 1$ | kW              | 7.9                | 7.9                |
|                                                                                           | 240V kW         | 8.3                | 8.3                |
|                                                                                           | 400V kW         | 13.8               | 13.8               |
|                                                                                           | 415V kW         | 14.3               | 14.3               |
| Rated operational current $I_e (=I_{the})$ at 60°C, enclosed                              | A               | 16                 | 16                 |
| Rated operational power of three-phase resistive loads 230V<br>50-60Hz, $\cos\varphi = 1$ | kW              | 6.3                | 6.3                |
|                                                                                           | 240V kW         | 6.7                | 6.7                |
|                                                                                           | 400V kW         | 11                 | 11                 |
|                                                                                           | 415V kW         | 11.5               | 11.5               |
| Minimum cross-section of conductor at load with $I_e (=I_{th})$                           | mm <sup>2</sup> | 2.5                | 2.5                |
| <b>Utilization category AC2 and AC3</b>                                                   |                 |                    |                    |
| <b>Switching of three-phase motors</b>                                                    |                 |                    |                    |
| Rated operational current $I_e$<br>open and enclosed                                      | 220V A          | 12                 | 15                 |
|                                                                                           | 230V A          | 11.5               | 14.5               |
|                                                                                           | 240V A          | 11                 | 14                 |
|                                                                                           | 380-400V A      | 9                  | 12                 |
|                                                                                           | 415-440V A      | 8                  | 11                 |
|                                                                                           | 500V A          | 7                  | 9                  |
|                                                                                           | 660-690V A      | 5                  | 6.5                |
| Rated operational power of three-phase motors 220-240V<br>50-60Hz                         | kW              | 3                  | 4                  |
|                                                                                           | 380-440V kW     | 4                  | 5.5                |
|                                                                                           | 500-690V kW     | 4                  | 5.5                |
| <b>Utilization category AC4</b>                                                           |                 |                    |                    |
| <b>Switching of squirrel cage motors, inching</b>                                         |                 |                    |                    |
| Rated operational current $I_e$<br>open and enclosed                                      | 220V A          | 12                 | 15                 |
|                                                                                           | 230V A          | 11.5               | 14.5               |
|                                                                                           | 240V A          | 11                 | 14                 |
|                                                                                           | 380-400V A      | 9                  | 12                 |
|                                                                                           | 415-440V A      | 8                  | 11                 |
|                                                                                           | 500V A          | 7                  | 9                  |
|                                                                                           | 660-690V A      | 5                  | 6.5                |
| Rated operational power of three-phase motors 220-240V<br>50-60Hz                         | kW              | 3                  | 4                  |
|                                                                                           | 380-440V kW     | 4                  | 5.5                |
|                                                                                           | 500-690V kW     | 4                  | 5.5                |

## Mini Motor Contactors

Data according to IEC 947-4-1, VDE 0660, EN 60947-4-1

| Main Contacts                                  |                                                                                                                                                               |      | Type                           | J7KNA-09-... | J7KNA-12-... |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------|--------------|--------------|
| Utilization category DC1                       |                                                                                                                                                               |      |                                |              |              |
| Switching of resistive load                    | 1 pole                                                                                                                                                        | 24V  | A                              | 20           | 20           |
| Time constant L/R ≤ 1ms                        |                                                                                                                                                               | 60V  | A                              | 20           | 20           |
| Rated operational current I <sub>e</sub>       |                                                                                                                                                               | 110V | A                              | 5            | 5            |
|                                                |                                                                                                                                                               | 220V | A                              | 0.6          | 0.6          |
| 3 poles in series                              | 24V                                                                                                                                                           | A    | 20                             | 20           |              |
|                                                | 60V                                                                                                                                                           | A    | 20                             | 20           |              |
|                                                | 110V                                                                                                                                                          | A    | 20                             | 20           |              |
|                                                | 220V                                                                                                                                                          | A    | 16                             | 16           |              |
| Utilization category DC3 and DC5               |                                                                                                                                                               |      |                                |              |              |
| Switching of shunt motors                      | 1 pole                                                                                                                                                        | 24V  | A                              | 20           | 20           |
| and series motors                              |                                                                                                                                                               | 60V  | A                              | 5            | 5            |
| Time constant L/R ≤ 15ms                       |                                                                                                                                                               | 110V | A                              | 1            | 1            |
| Rated operational current I <sub>e</sub>       |                                                                                                                                                               | 220V | A                              | 0.15         | 0.15         |
| 3 poles in series                              | 24V                                                                                                                                                           | A    | 20                             | 20           |              |
|                                                | 60V                                                                                                                                                           | A    | 20                             | 20           |              |
|                                                | 110V                                                                                                                                                          | A    | 20                             | 20           |              |
|                                                | 220V                                                                                                                                                          | A    | 2                              | 2            |              |
| Maximum ambient temperature                    |                                                                                                                                                               |      |                                |              |              |
| Operation                                      | open                                                                                                                                                          | °C   | -40 to +60 (+90) <sup>*2</sup> |              |              |
|                                                | enclosed                                                                                                                                                      | °C   | -40 to +40                     |              |              |
| with thermal overload relay                    | open                                                                                                                                                          | °C   | -25 to +60                     |              |              |
|                                                | enclosed                                                                                                                                                      | °C   | -25 to +40                     |              |              |
| Storage                                        |                                                                                                                                                               | °C   | -50 to +90                     |              |              |
| Short circuit protection                       |                                                                                                                                                               |      |                                |              |              |
| for contactors without thermal overload relay  |                                                                                                                                                               |      |                                |              |              |
| Coordination-type "1" according to IEC 947-4-1 |                                                                                                                                                               |      |                                |              |              |
| Contact welding without hazard of persons      | gL (gG)                                                                                                                                                       | A    | 40                             | 40           |              |
| max. fuse size                                 |                                                                                                                                                               |      |                                |              |              |
| Coordination-type "2" according to IEC 947-4-1 | gL (gG)                                                                                                                                                       | A    | 25                             | 25           |              |
| Light contact welding accepted                 |                                                                                                                                                               |      |                                |              |              |
| max. fuse size                                 | gL (gG)                                                                                                                                                       | A    | 10                             | 10           |              |
| Contact welding not accepted                   |                                                                                                                                                               |      |                                |              |              |
| max. fuse size                                 | For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size. |      |                                |              |              |
| Cable cross-sections                           |                                                                                                                                                               |      |                                |              |              |
| for contactors without thermal overload relay  |                                                                                                                                                               |      |                                |              |              |
| main connector                                 | solid or stranded                                                                                                                                             | mm²  | 0.5 - 2.5                      | 0.5 - 2.5    |              |
|                                                | flexible                                                                                                                                                      | mm²  | 0.5 - 2.5                      | 0.5 - 2.5    |              |
|                                                | flexible with multicore cable end                                                                                                                             | mm²  | 0.5 - 1.5                      | 0.5 - 1.5    |              |
| Cables per clamp                               |                                                                                                                                                               |      | 2                              | 2            |              |
|                                                | solid or stranded                                                                                                                                             | AWG  | 18 - 14                        | 18 - 14      |              |

# Mini Motor Contactors

Data according to IEC 947-4-1, VDE 0660, EN 60947-4-1

| Main Contacts                                       |                             | Type            | J7KNA-09-... | J7KNA-12-... |
|-----------------------------------------------------|-----------------------------|-----------------|--------------|--------------|
| <b>Frequency of operations z</b>                    | without load                | 1/h             | 10000        | 10000        |
| Contactors without thermal overload relay           | AC3, I <sub>e</sub>         | 1/h             | 600          | 700          |
|                                                     | AC4, I <sub>e</sub>         | 1/h             | 120          | 150          |
|                                                     | DC3, I <sub>e</sub>         | 1/h             | 600          | 700          |
|                                                     |                             |                 |              |              |
| <b>Mechanical life</b> AC operated                  | S x                         | 10 <sup>6</sup> | 5            | 5            |
| DC operated                                         | S x                         | 10 <sup>6</sup> | 15           | 15           |
| <b>Short time current</b>                           | 10s-current                 | A               | 96           | 120          |
| <b>Power loss</b> per pole                          | at I <sub>e</sub> /AC3 400V | W               | 0.15         | 0.25         |
| <b>Resistance to shock according to IEC 68-2-27</b> |                             |                 |              |              |
| Shock time 20ms sine-wave                           |                             |                 |              |              |
| AC operated                                         | NO                          | g               | 5            | 5            |
|                                                     | NC                          | g               | 5            | 5            |
| DC operated                                         | NO                          | g               | 8            | 8            |
|                                                     | NC                          | g               | 6            | 6            |

\*1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV.  
Data for other conditions on request.

\*2) With reduced control voltage range 0.9 up to 1.0 x U<sub>s</sub> and with reduced rated current I<sub>e</sub>/AC1 according to I<sub>e</sub>/AC3

## Mini Motor Contactors

Data according to IEC 947-5-1, VDE 0660, EN 60947-5-1

| Auxiliary Contacts                                                                                                                                             |              | Type | J7KNA-09...<br>J7KNA-12...     | J7KNA-09...D(VS)<br>J7KNA-12...D(VS) | J73KN-A...        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------|--------------------------------|--------------------------------------|-------------------|
| Rated insulation voltage $U_i$                                                                                                                                 |              | V AC | 690 <sup>*1</sup>              | 690 <sup>*1</sup>                    | 690 <sup>*1</sup> |
| <b>Thermal rated current <math>I_{th}</math> to 690V</b>                                                                                                       |              |      |                                |                                      |                   |
| Ambient temperature                                                                                                                                            | 40°C         | A    | 10                             | 10                                   | 10                |
|                                                                                                                                                                | 60°C         | A    | 6                              | 6                                    | 6                 |
| <b>Power loss</b> per pole                                                                                                                                     | at $I_{th}$  | W    | 0.5                            | 0.5                                  | 0.5               |
| <b>Utilization category AC15</b>                                                                                                                               |              |      |                                |                                      |                   |
| Rated operational current $I_o$                                                                                                                                | 220-240V     | A    | 3                              | 3                                    | 3                 |
|                                                                                                                                                                | 380-415V     | A    | 2                              | 2                                    | 2                 |
|                                                                                                                                                                | 440V         | A    | 1.6                            | 1.6                                  | 1.6               |
|                                                                                                                                                                | 500V         | A    | 1.2                            | 1.2                                  | 1.2               |
|                                                                                                                                                                | 660-690V     | A    | 0.6                            | 0.6                                  | 0.6               |
| <b>Utilization category DC13</b>                                                                                                                               |              |      |                                |                                      |                   |
| Rated operational current $I_o$                                                                                                                                | 60V          | A    | 2                              | 2                                    | 2                 |
|                                                                                                                                                                | 110V         | A    | 0.4                            | 0.4                                  | 0.4               |
|                                                                                                                                                                | 220V         | A    | 0.1                            | 0.1                                  | 0.1               |
| <b>Maximum ambient temperature</b>                                                                                                                             |              |      |                                |                                      |                   |
| Operation                                                                                                                                                      | open         | °C   | -40 to +60 (+90) <sup>*2</sup> |                                      |                   |
|                                                                                                                                                                | enclosed     | °C   |                                |                                      |                   |
| Storage                                                                                                                                                        |              | °C   | -40 to +40<br>-40 to +90       |                                      |                   |
| <b>Short circuit protection</b><br>short-circuit current 1kA,<br>contact welding not accepted                                                                  |              |      |                                |                                      |                   |
| max. fuse size                                                                                                                                                 | gL (gG)      | A    | 20                             | 20                                   | 20                |
| For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse size. |              |      |                                |                                      |                   |
| <b>Power consumption of coils</b>                                                                                                                              |              |      |                                |                                      |                   |
| AC operated                                                                                                                                                    | inrush       | VA   | 25                             | -                                    | -                 |
|                                                                                                                                                                | sealed       | VA   | 4 - 5                          | -                                    | -                 |
|                                                                                                                                                                |              | W    | 1.2                            | -                                    | -                 |
| DC operated                                                                                                                                                    | inrush       | W    | -                              | 2.5                                  | -                 |
|                                                                                                                                                                | sealed       | W    | -                              | 2.5                                  | -                 |
| <b>Operation range of coils</b><br>in multiples of control voltage $U_s$                                                                                       |              |      | 19 - 30V DC                    |                                      |                   |
|                                                                                                                                                                |              |      | 0.85 - 1.1                     | 0.8 - 1.1                            | -                 |
| <b>Switching time</b> at control voltage $U_i \pm 10\%$ <sup>*3, *4</sup>                                                                                      |              |      |                                |                                      |                   |
| AC operated                                                                                                                                                    | make time    | ms   | 15 - 25                        | -                                    | -                 |
|                                                                                                                                                                | release time | ms   | 8 - 25                         | -                                    | -                 |
|                                                                                                                                                                | arc duration | ms   | 10 - 15                        | -                                    | -                 |
| DC operated                                                                                                                                                    | make time    | ms   | -                              | 15 - 19                              | -                 |
|                                                                                                                                                                | release time | ms   | -                              | 8 - 25                               | -                 |
|                                                                                                                                                                | arc duration | ms   | -                              | 10 - 15                              | -                 |

## Mini Motor Contactors

Data according to IEC 947-5-1, VDE 0660, EN 60947-5-1

| Auxiliary Contacts         | Type                              | J7KNA-09...<br>J7KNA-12... | J7KNA-09...D(VS)<br>J7KNA-12...D(VS) | J73KN-A... |
|----------------------------|-----------------------------------|----------------------------|--------------------------------------|------------|
| <b>Cable cross-section</b> |                                   |                            |                                      |            |
| all connectors             | solid                             | mm <sup>2</sup>            | 0.75 - 2.5                           | 0.75 - 2.5 |
|                            | flexible                          | mm <sup>2</sup>            | 0.75 - 2.5                           | 0.75 - 2.5 |
|                            | flexible with multicore cable end | mm <sup>2</sup>            | 0.5 - 1.5                            | 0.5 - 2.5  |
| Clamps per pole            |                                   |                            | 2                                    | 2          |
|                            | solid or stranded                 | AWG                        | 18 - 14                              | 18 - 14    |

\*1) Suitable at 690V for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ .  
Data for other conditions on request.

\*2) With reduced control voltage range 0.9 up to  $1.0 \times U_s$  and with reduced thermal rated current  $I_{th}$  to  $I_e/AC15$

\*3) Summary switching time = release time + arc duration

\*4) Release time of NC make time of NO increase when suppressor units for voltage peak protection are used (Varistor, RC-units, Diode units).

## Mini Contactors for North America

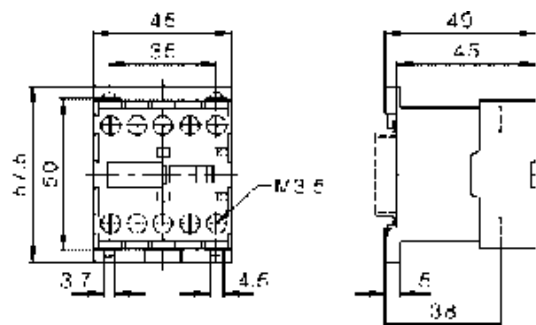
Data according to UL508

| Main Contacts (cULus)                                            | Type    | J7KNA-09... | J7KNA-12... | J73KN-A... |
|------------------------------------------------------------------|---------|-------------|-------------|------------|
| Rated operational current "General Use"                          | A       | 15          | 20          | 10         |
| Rated operational power of three-phase motors<br>at 60Hz (3ph)   | 115V hp | 1½          | 2           | -          |
|                                                                  | 200V hp | 3           | 3           | -          |
|                                                                  | 230V hp | 3           | 3           | -          |
|                                                                  | 460V hp | 5           | 7½          | -          |
|                                                                  | 575V hp | 7½          | 10          | -          |
| Rated operational power of AC motors<br>at 60Hz (1ph)            | 115V hp | ½           | ¾           | -          |
|                                                                  | 200V hp | 1           | 1½          | -          |
|                                                                  | 230V hp | 1½          | 2           | -          |
| Fuses                                                            | A       | 30          | 30          | -          |
| Suitable for use on a capability of delivering not more than rms | A       | 5000        | 5000        | -          |
|                                                                  | V       | 600         | 600         | -          |
| Rated voltage                                                    | V AC    | 600         | 600         | 600        |
| <b>Auxiliary Contacts (cULus)</b>                                |         |             |             |            |
| heavy pilot duty                                                 | AC      | A600        | A600        | A600       |
| standard pilot duty                                              | DC      | Q600        | Q600        | Q600       |

# Dimensions

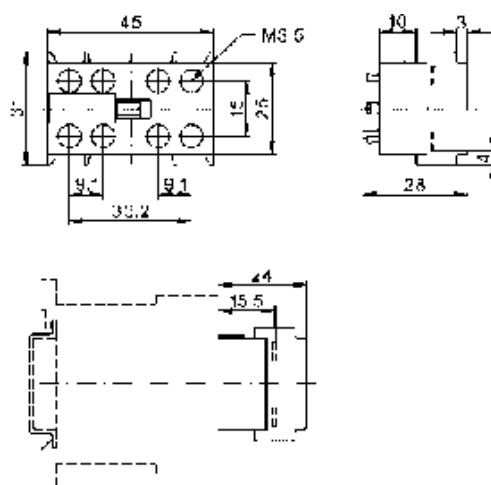
AC and DC operated  
with screw terminals

J7KNA-09...  
J7KNA-12...



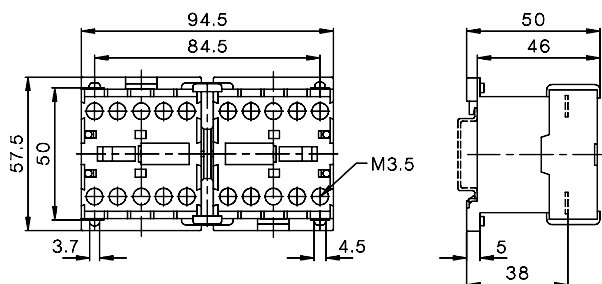
Auxiliary Contact Blocks

J73KN-A...

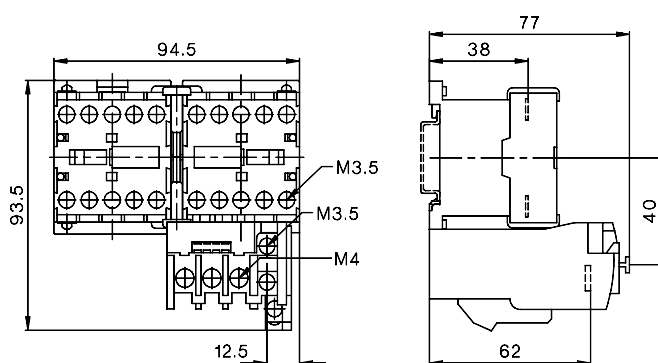


Reversing Contactors

J7KNA-09-01-W...  
J7KNA-12-01-W...



J7KNA-09-01-W... + J7TKN-A  
J7KNA-12-01-W... + J7TKN-A



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

Cat. No. J506-E2-02

In the interest of product improvement, specifications are subject to change without notice.

# Motor Contactor J7KN

## Main contactor

- AC & DC operated
- Integrated auxiliary contacts
- Screw fixing and snap fitting (35 mm DIN rail) up to 45 kW
- Range from 4 to 110 kW (AC 3, 380/415V)
- Finger proof (VBG 4)

## Accessories

- front mounted single pole additional auxiliary contacts (1 NO or 1 NC)
- Side mounted additional auxiliary contacts (1 NO/1 NC)
- Mechanical interlock
- Suppressors (RC and varistor)
- Pneumatic timer modules
- Link modules MPCB - Motor contactor



## Approved Standards

| Standard     | Guide No (US,C) |
|--------------|-----------------|
| UL           | NLDX, NLDX7     |
| ICE 947-4-1  |                 |
| VDE 0660     |                 |
| EN 60947-4-1 |                 |



# Ordering Information

## ■ Model Number Legend

### 1. Motor Contactors

J7KN-□□□□□□□□  
1 2 3 4

- 1) Motor Contactor
  - 2) Rated Motor Current (AC3 400V)
    - 10: 10A
    - 14: 14A
    - 18: 18A
    - 22: 22A
    - 24: 24A
    - 32: 32A
    - 40: 40A
    - 50: 50A
    - 62: 62A
    - 74: 74A
    - 85: 85A
    - 110: 110A
    - 150: 150A
    - 175: 175A
    - 200: 200A
  - 3) Integrated auxiliary contact
    - 10: 1NO 0NC
    - 01: 0NO 1NC
    - 21: 2NO 1NC
    - 22: 2NO 2NC
    - : 0NO 0NC
  - 4) Coil voltage (AC operated)
    - 24: AC24V 50/60Hz
    - 48: AC48V 50Hz
    - 110: AC110V 50Hz, AC110-120V 60Hz
    - 180: AC180-210V 50Hz, AC200-240V 60Hz
    - 230: AC220-240V 50Hz, AC240V 60Hz
    - 400: AC380-415V 50Hz, AC415-440V 60Hz
    - 500: AC500-550V 50Hz, AC550-600V 60Hz
- Coil voltage(DC operated)
- 24D: DC24V
  - 48D: DC48V
  - 110D: DC110V
  - 125D: DC125V

### 2. Aux. Contact Modules for Motor Contactors

J73KN-□□□□□□  
1 2 3 4

- 1) Auxiliary Contact Modules
- 2) B: for motor contactor (4-37kW)  
C: for motor contactor (11-37kW)
- 3) Combination of NO/NC contacts
  - 10: 1NO 0NC
  - 01: 0NO 1NC
  - 11: 1NO 1NC
- 4) S: side mounting  
: front mounting

### 3. Accessories for Motor Contactors (Link Modules MPCB - Motor Contactor)

J74KN-□□□□□□  
1 2 3

- 1) Accessories for Motor Contactors
- 2) VD: Link module type  
HU: DIN-rail adapter type
- 3) 12: for motor contactor (4 - 7.5kW)  
25: for motor contactor (11 - 15kW)

### 4. Accessories for Motor Contactors (Pneumatic Timers)

J74KN-□□□□□□  
1 2 3 4 5

- 1) Accessories for Motor Contactors
- 2) B: Motor Contactor (4-11kW)
- 3) TP: Pneumatic Timer
- 4) 40: 40 sec  
180: 180 sec
- 5) DA: ON-delayed  
IA: OFF-delayed

### 5. Accessories for Motor Contactors (Mechanical Interlock)

J74KN-□□□□□□  
1 2 3

- 1) Accessories for Motor Contactors
- 2) B: Motor Contactor (4-18.5kW)  
C: Motor Contactor (11-37kW)  
D: Motor Contactor (45-55kW)
- 3) ML: Mechanical Interlock

### 6. Accessories for Motor Contactors (RC Suppressor units)

J74KN-□□□□□□  
1 2 3 4

- 1) Accessories for Motor Contactors
- 2) A: for Mini Motor Contactor and Motor Contactor (4-18.5kW)  
(between DIN-rail and Contactor)  
B: for Mini Motor Contactor and Motor Contactor (4-55kW)  
C: for Motor Contactor (4-37kW) to snap on the contactor
- 3) RC: RC-surge suppressors
- 4) 48: 24 - 48 VAC/DC (A+B type)  
230: 110 - 230 VAC/DC (A+B type)  
400: 250 - 415 VAC/DC (A+B type)  
24: 12 - 48 VAC/DC (C type)  
110: 48 - 127 VAC/DC (C type)  
230: 110 - 250 VAC/DC (C type)

### 7. Accessories for Motor Contactors (Varistor units)

J74KN-□□□□□□  
1 2 3 4

- 1) Accessories for Motor Contactors
- 2) A: for Motor Contactor (4-11kW) to snap on to coil terminals  
B: for Motor Contactor (4-37kW) to snap on to contactor
- 3) VG: Varistor Suppressors
- 4) 230: 110-230VAC/DC  
400: 250-415VAC/DC

## List of Models

### Contactors 3-pole

- Up to 210A AC3
- Up to 350A AC1
- DIN-rail mounting up to AC3 74A
- International Approvals
- Data according to IEC 947 / EN 60947



| Ratings                                                                        |              |                 |                                                                                                                                                                         |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
|--------------------------------------------------------------------------------|--------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|---------|---------|
| AC3                                                                            | 400V Motor   | 10A             | 14A                                                                                                                                                                     | 18A        | 22A        | 24A                                                                                                                               | 32A                                                                                                                                                        | 40A     | 50A                                                                                   | 62A     | 74A     |
|                                                                                | 380-400V     | 4kW             | 5,5kW                                                                                                                                                                   | 7,5kW      | 11kW       | 11kW                                                                                                                              | 15kW                                                                                                                                                       | 18,5kW  | 22kW                                                                                  | 30kW    | 37kW    |
|                                                                                | 660-690V     | 5,5kW           | 7,5kW                                                                                                                                                                   | 10kW       | 10kW       | 15kW                                                                                                                              | 18,5kW                                                                                                                                                     | 18,5kW  | 30kW                                                                                  | 37kW    | 45kW    |
|                                                                                | 690V at 40°C | 25A             | 25A                                                                                                                                                                     | 32A        | 32A        | 50A                                                                                                                               | 65A                                                                                                                                                        | 80A     | 110A                                                                                  | 120A    | 130A    |
| AC1                                                                            |              |                 |                                                                                                                                                                         |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
| Type                                                                           |              | J7KN-10-10      | J7KN-14-10                                                                                                                                                              | J7KN-18-10 | J7KN-22-10 | J7KN-24                                                                                                                           | J7KN-32                                                                                                                                                    | J7KN-40 | J7KN-50                                                                               | J7KN-62 | J7KN-74 |
| Auxiliary contacts                                                             |              | 1NO             | 1NO                                                                                                                                                                     | 1NO        | 1NO        | -                                                                                                                                 | -                                                                                                                                                          | -       | -                                                                                     | -       | -       |
| Type                                                                           |              | J7KN-10-01      | J7KN-14-01                                                                                                                                                              | J7KN-18-01 | J7KN-22-01 | -                                                                                                                                 | -                                                                                                                                                          | -       | -                                                                                     | -       | -       |
| Auxiliary contacts                                                             |              | 1NC             | 1NC                                                                                                                                                                     | 1NC        | 1NC        | -                                                                                                                                 | -                                                                                                                                                          | -       | -                                                                                     | -       | -       |
| Cable cross-section                                                            |              |                 |                                                                                                                                                                         |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
| Solid                                                                          |              | mm <sup>2</sup> | 0,75 - 6                                                                                                                                                                |            |            | 1,5 - 25                                                                                                                          |                                                                                                                                                            |         | 4 - 50                                                                                |         |         |
| Flexible                                                                       |              | mm <sup>2</sup> | 1 - 4                                                                                                                                                                   |            |            | 2,5 - 16                                                                                                                          |                                                                                                                                                            |         | 10 - 35                                                                               |         |         |
| Cables per clamp                                                               |              |                 | 2                                                                                                                                                                       |            |            | 1 + 1                                                                                                                             |                                                                                                                                                            |         | 1 + 1                                                                                 |         |         |
| Auxiliary contact                                                              |              |                 |                                                                                                                                                                         |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
| I <sub>th</sub>                                                                |              | 40°C            | A                                                                                                                                                                       | 16         |            |                                                                                                                                   | -                                                                                                                                                          |         |                                                                                       | -       |         |
| AC15                                                                           |              | 230V            | A                                                                                                                                                                       | 12         |            |                                                                                                                                   | -                                                                                                                                                          |         |                                                                                       | -       |         |
|                                                                                |              | 400V            | A                                                                                                                                                                       | 4          |            |                                                                                                                                   | -                                                                                                                                                          |         |                                                                                       | -       |         |
| Power consumption of coils                                                     |              |                 |                                                                                                                                                                         |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
| Inrush VA                                                                      |              |                 | 33 - 45                                                                                                                                                                 |            |            | 90 - 115                                                                                                                          |                                                                                                                                                            |         | 140 - 165                                                                             |         |         |
| Hold VA                                                                        |              |                 | 7 - 10                                                                                                                                                                  |            |            | 9 - 13                                                                                                                            |                                                                                                                                                            |         | 13 - 18                                                                               |         |         |
| Operation range of coils                                                       |              |                 | 0,85 - 1,1                                                                                                                                                              |            |            | 0,85 - 1,1                                                                                                                        |                                                                                                                                                            |         | 0,85 - 1,1                                                                            |         |         |
| Mounting                                                                       |              |                 | 35mm DIN-rail or base                                                                                                                                                   |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
| Additional aux. contact blocks                                                 |              |                 |                                                                                                                                                                         |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
| Front mounting contacts                                                        |              | Type            |  J73KN-B-10<br>1NO<br>f. low level switching                                         |            |            |  J73KN-B-01<br>1NC<br>f. low level switching |                                                                                                                                                            |         |                                                                                       |         |         |
|                                                                                |              |                 | maximal 4 J73KN-B..                                                                                                                                                     |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
| Additional aux. contact blocks                                                 |              |                 |                                                                                                                                                                         |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
| Side mounting contacts                                                         |              | Type            | -                                                                                                                                                                       | -          | -          | -                                                                                                                                 |  J73KN-C-11S<br>1NO+1NC<br>f. low level switching<br>max. 2 J73KN-C-11S |         |                                                                                       |         |         |
| Overload Relay (thermal)                                                       |              |                 |                                                                                                                                                                         |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
| Single phase protection<br>Temperature compensation<br>Trip and alarm contacts |              |                 |   |            |            |                                               |                                                                                                                                                            |         |  |         |         |
| Type                                                                           |              | J7TKN-B         | J7TKN-A                                                                                                                                                                 |            |            | J7TKN-C                                                                                                                           |                                                                                                                                                            |         | J7TKN-D                                                                               |         |         |
|                                                                                |              | Setting Ranges  |                                                                                                                                                                         |            |            | Setting Ranges                                                                                                                    |                                                                                                                                                            |         | Setting Ranges                                                                        |         |         |
|                                                                                |              | 0,12 - 0,18A    | 1,8 - 2,7A                                                                                                                                                              |            |            | 28 - 42A                                                                                                                          |                                                                                                                                                            |         | 20 - 28A                                                                              |         |         |
|                                                                                |              | 0,18 - 0,27A    | 2,7 - 4A                                                                                                                                                                |            |            |                                                                                                                                   |                                                                                                                                                            |         | 28 - 42A                                                                              |         |         |
|                                                                                |              | 0,27 - 0,4A     | 4 - 6A                                                                                                                                                                  |            |            |                                                                                                                                   |                                                                                                                                                            |         | 40 - 52A                                                                              |         |         |
|                                                                                |              | 0,4 - 0,6A      | 6 - 9A                                                                                                                                                                  |            |            |                                                                                                                                   |                                                                                                                                                            |         | 52 - 65A                                                                              |         |         |
|                                                                                |              | 0,6 - 0,9A      | 8 - 11A                                                                                                                                                                 |            |            |                                                                                                                                   |                                                                                                                                                            |         | 60 - 74A                                                                              |         |         |
|                                                                                |              | 0,8 - 1,2A      | 10 - 14A                                                                                                                                                                |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
|                                                                                |              | 1,2 - 1,8A      | 13 - 18A                                                                                                                                                                |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
|                                                                                |              |                 |                                                                                                                                                                         |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |
|                                                                                |              | 17 - (23)24A    | (22)23 - (30)32A                                                                                                                                                        |            |            |                                                                                                                                   |                                                                                                                                                            |         |                                                                                       |         |         |



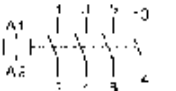
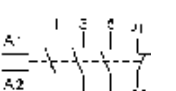
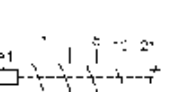
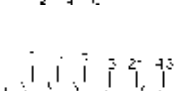
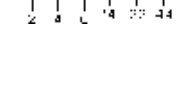
| Ratings                        |              |                                                                                     |             |                                                                                     |             |             |
|--------------------------------|--------------|-------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------|-------------|-------------|
| AC3                            | 400V Motor   | 85A                                                                                 | 110A        | 150A                                                                                | 175A        | 210A        |
|                                | 380-400V     | 45kW                                                                                | 55kW        | 75kW                                                                                | 90kW        | 110kW       |
|                                | 660-690V     | 55kW                                                                                | 55kW        | 75kW                                                                                | 110kW       | 132kW       |
| AC1                            | 690V at 40°C | 150A                                                                                | 170A        | 200A                                                                                | 250A        | 350A        |
| Type                           |              | J7KN-85-22                                                                          | J7KN-110-22 | J7KN-150-11                                                                         | J7KN-175-11 | J7KN-200-22 |
| Auxiliary contacts             |              | 2NO+2NC                                                                             | 2NO+2NC     | 1NO+1NC                                                                             | 1NO+1NC     | 2NO+2NC     |
| Type                           |              | -                                                                                   | -           | -                                                                                   | -           | -           |
| Auxiliary contacts             |              | -                                                                                   | -           | -                                                                                   | -           | -           |
| Cable cross-section            |              |                                                                                     |             |                                                                                     |             |             |
| Solid                          | mm²          | 10 - 70                                                                             | 10 - 70     | busbar                                                                              | busbar      | busbar      |
| Flexible                       | mm²          | 16 - 50                                                                             | 16 - 50     | 18x5                                                                                | 18x5        | 22x4        |
| Cables per clamp               |              | 1                                                                                   | 1           | 1                                                                                   | 1           | 1           |
| Auxiliary contact              |              |                                                                                     |             |                                                                                     |             |             |
| I <sub>th</sub>                | 40°C         | A 16                                                                                |             | 10                                                                                  |             |             |
| AC15                           | 230V         | A 12                                                                                |             | 3                                                                                   |             |             |
|                                | 400V         | A 6                                                                                 |             | 2                                                                                   |             |             |
| Power consumption of coils     |              |                                                                                     |             |                                                                                     |             |             |
| Inrush VA                      |              | 350 - 420                                                                           |             | 550                                                                                 | 550         | 1100        |
| hold VA                        |              | 23 - 29                                                                             |             | 130                                                                                 | 130         | 66          |
| Operation range of coils       |              | 0,85 - 1,1                                                                          |             | 0,85 - 1,1                                                                          |             |             |
| Mounting                       |              | base                                                                                |             |                                                                                     |             |             |
| Additional aux. contact blocks |              |                                                                                     |             |                                                                                     |             |             |
| Front mounting                 | Type         |                                                                                     |             |                                                                                     |             |             |
| contacts                       |              |                                                                                     |             |                                                                                     |             |             |
| Additional aux. contact blocks |              |                                                                                     |             |                                                                                     |             |             |
| Side mounting                  | Type         | -                                                                                   | -           | -                                                                                   | -           | -           |
| contacts                       |              |                                                                                     |             |                                                                                     |             |             |
| Overload Relay (thermal)       |              |                                                                                     |             |                                                                                     |             |             |
| Single phase protection        |              |  |             |  |             |             |
| Temperature compensation       |              |                                                                                     |             |                                                                                     |             |             |
| Trip and alarm contacts        |              |                                                                                     |             |                                                                                     |             |             |
| Type                           |              | J7TKN-E                                                                             |             | J7TKN-F                                                                             |             |             |
|                                |              | Setting Ranges                                                                      |             | Setting Ranges                                                                      |             |             |
|                                |              | 60 - 90A                                                                            |             | 100 - 150A                                                                          |             |             |
|                                |              | 80 - 120A                                                                           |             | 140 - 220A                                                                          |             |             |
|                                |              |                                                                                     |             |                                                                                     |             |             |
|                                |              |                                                                                     |             | Busbar Sets                                                                         |             |             |
|                                |              |                                                                                     |             | J74TK-SU-175, J74TK-SU-200                                                          |             |             |
|                                |              |                                                                                     |             |                                                                                     |             |             |
|                                |              |                                                                                     |             |                                                                                     |             |             |

**Contactors 3-pole**  
**AC Operated**

|                                                                                     | Ratings                    |                |                        | Rated Current<br>AC1<br>690V<br>A | Aux. Contacts |    |                                          | Type<br><br>Coil Voltage*1<br>24V 50/60Hz<br>110V 50Hz<br>220-240V 50Hz | Pack<br><br>pcs. | Weight<br><br>kg/pc. |
|-------------------------------------------------------------------------------------|----------------------------|----------------|------------------------|-----------------------------------|---------------|----|------------------------------------------|-------------------------------------------------------------------------|------------------|----------------------|
|                                                                                     | AC2, AC3                   |                |                        |                                   | Built-in      |    | Additional<br>see<br>page 34<br><br>Type |                                                                         |                  |                      |
|                                                                                     | 380V<br>400V<br>415V<br>kW | 500V<br><br>kW | 660V<br>690V<br><br>kW |                                   | NO            | NC |                                          |                                                                         |                  |                      |
|                                                                                     |                            |                |                        |                                   |               |    |                                          |                                                                         |                  |                      |
|    | 4                          | 5.5            | 5.5                    | 25                                | 1             | -  | max. 4<br>J73KN-B                        | J7KN-10-10□□□□                                                          | 1                | 0.23                 |
|                                                                                     | 4                          | 5.5            | 5.5                    | 25                                | -             | 1  |                                          | J7KN-10-01□□□□                                                          | 1                | 0.23                 |
|                                                                                     | 5.5                        | 7.5            | 7.5                    | 25                                | 1             | -  |                                          | J7KN-14-10□□□□                                                          | 1                | 0.23                 |
|                                                                                     | 5.5                        | 7.5            | 7.5                    | 25                                | -             | 1  |                                          | J7KN-14-01□□□□                                                          | 1                | 0.23                 |
|                                                                                     | 7.5                        | 10             | 10                     | 32                                | 1             | -  |                                          | J7KN-18-10□□□□                                                          | 1                | 0.23                 |
|                                                                                     | 7.5                        | 10             | 10                     | 32                                | -             | 1  |                                          | J7KN-18-01□□□□                                                          | 1                | 0.23                 |
|                                                                                     | 11                         | 10             | 10                     | 32                                | 1             | -  |                                          | J7KN-22-10□□□□                                                          | 1                | 0.23                 |
|                                                                                     | 11                         | 10             | 10                     | 32                                | -             | 1  |                                          | J7KN-22-01□□□□                                                          | 1                | 0.23                 |
|    | 11                         | 15             | 15                     | 50                                | -             | -  | max. 4<br>J73KN-B +<br>2 J73KN-<br>C-11S | J7KN-24□□□□                                                             | 1                | 0.48                 |
|                                                                                     | 15                         | 18.5           | 18.5                   | 65                                | -             | -  |                                          | J7KN-32□□□□                                                             | 1                | 0.48                 |
|                                                                                     | 18.5                       | 18.5           | 18.5                   | 80                                | -             | -  |                                          | J7KN-40□□□□                                                             | 1                | 0.48                 |
|   | 22                         | 30             | 30                     | 110                               | -             | -  | max. 4<br>J73KN-B +<br>2 J73KN-<br>C11S  | J7KN-50□□□□                                                             | 1                | 0.85                 |
|                                                                                     | 30                         | 37             | 37                     | 120                               | -             | -  |                                          | J7KN-62□□□□                                                             | 1                | 0.85                 |
|                                                                                     | 37                         | 45             | 45                     | 130                               | -             | -  |                                          | J7KN-74□□□□                                                             | 1                | 0.85                 |
|                                                                                     | Ratings                    |                |                        | Rated Current                     | Aux. Contacts |    |                                          | Type                                                                    | Pack             | Weight               |
|                                                                                     | AC2, AC3                   |                |                        | AC1                               | Built-in      |    |                                          |                                                                         |                  |                      |
|                                                                                     | 380V<br>415V<br>kW         | 500V<br>kW     | 660V<br>690V<br>kW     | 690V<br>A                         | NO            | NC |                                          | Coil Voltage*1<br>220-230V 50Hz<br>380-400V 50Hz                        | pcs.             | kg/pc.               |
|  | 45                         | 55             | 55                     | 150                               | 2             | 2  |                                          | J7KN-85-22□□□□                                                          | 1                | 1.8                  |
|                                                                                     | 55                         | 75             | 55                     | 170                               | 2             | 2  |                                          | J7KN-110-22□□□□                                                         | 1                | 1.9                  |
|  | 75                         | 75             | 75                     | 200                               | 1             | 1  |                                          | J7KN-150-11□□□□                                                         | 1                | 5                    |
|                                                                                     | 90                         | 90             | 90                     | 250                               | 1             | 1  |                                          | J7KN-175-11□□□□                                                         | 1                | 5                    |
|                                                                                     | 110                        | 132            | 132                    | 350                               | 2             | 2  |                                          | J7KN-200-22□□□□                                                         | 1                | 7.3                  |

\*1) Coil voltage range and other coil voltages see page 37

# **Contactors 3-pole** **DC Operated**

| Type             | Coil voltage |         | Aux. Contacts                                                                     |                                                                                   | Weight          | Accept Overload Relay<br>page 57   | Busbar Set for Overload Relay<br>page 59   | Wiring Diagram                                                                      |
|------------------|--------------|---------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------|------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------|
|                  | 24           | 24V DC  | Built-in                                                                          | Additional <sup>(*)</sup>                                                         |                 |                                    |                                            |                                                                                     |
|                  | 60           | 60V DC  |  |  | Type            | Type                               | Type                                       | Coil Circuits see page 36                                                           |
|                  | 110          | 110V DC | NO                                                                                | NC                                                                                | kg/pc.          | Type                               | Type                                       | Terminal Markings                                                                   |
|                  | 220          | 220V DC |                                                                                   |                                                                                   |                 |                                    |                                            |                                                                                     |
| J7KN-10-10□□□□D  |              |         | 1                                                                                 | -                                                                                 | max. 3          | J7TKN-B                            | -                                          |  |
| J7KN-10-01□□□□D  |              |         | -                                                                                 | 1                                                                                 | J73KN-B         | J7TKN-A                            | -                                          |                                                                                     |
| J7KN-14-10□□□□D  |              |         | 1                                                                                 | -                                                                                 |                 |                                    | -                                          |                                                                                     |
| J7KN-14-01□□□□D  |              |         | -                                                                                 | 1                                                                                 |                 |                                    | -                                          |                                                                                     |
| J7KN-18-10□□□□D  |              |         | 1                                                                                 | -                                                                                 |                 |                                    | -                                          |                                                                                     |
| J7KN-18-01□□□□D  |              |         | -                                                                                 | 1                                                                                 |                 |                                    | -                                          |                                                                                     |
| J7KN-22-10□□□□D  |              |         | 1                                                                                 | -                                                                                 |                 |                                    | -                                          |                                                                                     |
| J7KN-22-01□□□□D  |              |         | -                                                                                 | 1                                                                                 |                 |                                    | -                                          |                                                                                     |
| J7KN-24□□□□D     |              |         | -                                                                                 | -                                                                                 | max. 3          | J7TKN-B                            | -                                          |  |
| J7KN-32□□□□D     |              |         | -                                                                                 | -                                                                                 | J73KN-B         | J7TKN-C                            | -                                          |                                                                                     |
|                  |              |         | -                                                                                 | -                                                                                 | + 2 J73KN-C-11S |                                    | -                                          |                                                                                     |
| J7KN-40□□□□D     |              |         | -                                                                                 | -                                                                                 |                 |                                    | -                                          |                                                                                     |
| J7KN-50□□□□D     |              |         | -                                                                                 | -                                                                                 | max. 3          | J7TKN-D                            |                                            |  |
| J7KN-62□□□□D     |              |         | -                                                                                 | -                                                                                 | J73KN-B         |                                    |                                            |                                                                                     |
| J7KN-74□□□□D     |              |         | 2                                                                                 | 1                                                                                 | + 2 J73KN-C-11S |                                    |                                            |                                                                                     |
|                  |              |         |                                                                                   |                                                                                   |                 |                                    |                                            |                                                                                     |
| Type             | Coil voltage |         | Aux. Contacts                                                                     |                                                                                   | Weight          | Accept Overload Relay<br>page H-59 | Busbar Set for Overload Relay<br>page H-59 | Wiring Diagram                                                                      |
|                  | 110          | 110V DC | Built-in                                                                          |                                                                                   |                 |                                    |                                            |                                                                                     |
|                  | 220          | 220V DC | NO                                                                                | NC                                                                                | kg/pc.          | Type                               | Type                                       |                                                                                     |
| J7KN-85-21□□□□D  |              |         | 2                                                                                 | 1                                                                                 | -               | J7TKN-E                            |                                            |  |
| J7KN-110-21□□□□D |              |         | 2                                                                                 | 1                                                                                 | -               |                                    |                                            |                                                                                     |
|                  |              |         |                                                                                   |                                                                                   |                 |                                    |                                            |                                                                                     |
|                  |              |         |                                                                                   |                                                                                   |                 |                                    |                                            |                                                                                     |
|                  |              |         |                                                                                   |                                                                                   |                 |                                    | J73TK-SU-175                               |  |
|                  |              |         |                                                                                   |                                                                                   |                 | J7TKN-F                            | J73TK-SU-200                               |                                                                                     |

<sup>(\*)</sup> Only 3 additional Aux. Contacts are possible! (See also the wiring diagrams coil circuit DC operated page 36)

# Contactors 4-pole AC Operated

|                                                                                   | Ratings                                   |                       | Rated Current        | Aux. Contacts                                                                     |                                                                                   | Type                                                        | Pack          | Weight |                                        |
|-----------------------------------------------------------------------------------|-------------------------------------------|-----------------------|----------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------|---------------|--------|----------------------------------------|
|                                                                                   | AC2,<br>AC3<br>380V<br>400V<br>415V<br>kW | AC1<br>400V<br><br>kW | AC1<br>690V<br><br>A | Built-in                                                                          |                                                                                   | Coil Voltage*1<br>24V 50/60Hz<br>110V 50Hz<br>220-240V 50Hz | pcs.          | kg/pc. |                                        |
|                                                                                   |                                           |                       |                      |  |  |                                                             |               |        | Additional<br>see<br>below<br><br>Type |
|  | 4                                         | 17.5                  | 25                   | -                                                                                 | -                                                                                 | max. 4<br>J73KN-B                                           | J7KN-10-4□□□□ | 1      | 0.22                                   |

\*1) Coil voltage range and other coil voltages see page 37

## Auxiliary Contact Blocks for contactors J7KN-10... to -74... type J73KN for low level switching\*1

| Front mounting                                                                     | Rated Operational Current |                   |                  | Contacts |    |    |    | Type       | Pack | Weight |
|------------------------------------------------------------------------------------|---------------------------|-------------------|------------------|----------|----|----|----|------------|------|--------|
|                                                                                    | AC15<br>230V<br>A         | AC15<br>400V<br>A | AC1<br>690V<br>A | NO       | NC | EM | LB |            | pcs. | kg/pc. |
|  | 3                         | 2                 | 10               | 1        | -  | -  | -  | J73KN-B-10 | 10   | 0.02   |
|                                                                                    | 3                         | 2                 | 10               | -        | 1  | -  | -  | J73KN-B-01 | 10   | 0.02   |

## Auxiliary Contact Blocks for contactors J7KN-24... to -74... type J73KN for low level switching\*1

| Side mounting                                                                       | Rated Operational Current |                   |                  |        | Contacts |    | Type        | Pack | Weight |
|-------------------------------------------------------------------------------------|---------------------------|-------------------|------------------|--------|----------|----|-------------|------|--------|
|                                                                                     | AC15<br>230V<br>A         | AC15<br>400V<br>A | AC1<br>690V<br>A |        | NO       | NC |             | pcs. | kg/pc. |
|  | 3                         | 2                 | 10               | max. 2 | 1        | 1  | J73KN-C-11S | 10   | 0.02   |

## Pneumatic Timer for contactors J7KN-10... to -22...

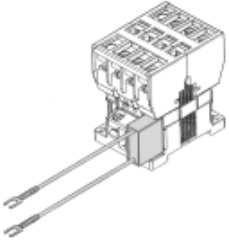
|                                                                                     | Function  | Time range<br>s | Contacts |    |    |    | Type            | Pack<br>pcs. | Weight<br>kg/pc. |
|-------------------------------------------------------------------------------------|-----------|-----------------|----------|----|----|----|-----------------|--------------|------------------|
|                                                                                     |           |                 | NO       | NC | NO | NC |                 |              |                  |
|  | On-delay  | 0.1 - 40        | 1        | 1  | -  | -  | J74KN-B-TP40DA  | 1            | 0.09             |
|                                                                                     | On-delay  | 10 - 180        | 1        | 1  | -  | -  | J74KN-B-TP180DA | 1            | 0.09             |
|                                                                                     | Off-delay | 0.1 - 40        | -        | -  | 1  | 1  | J74KN-B-TP40IA  | 1            | 0.09             |
|                                                                                     | Off-delay | 10 - 180        | -        | -  | 1  | 1  | J74KN-B-TP180IA | 1            | 0.09             |

1. suitable according to DIN 19240 (test ratings 17V DC, 5mA)  
Technical data see page 51

## Mechanical Interlocks

|                                                                                   | Interlocks contactor with contactor |                    | Mounting   | Type       | Pack pcs. | Weight kg/pc. |
|-----------------------------------------------------------------------------------|-------------------------------------|--------------------|------------|------------|-----------|---------------|
|                                                                                   | Type                                | + Type             |            |            |           |               |
|  | J7KN10 - J7KN40                     | + J7KN10 - J7KN40  | horizontal | J74KN-B-ML | 1         | 0.006         |
|                                                                                   | J7KN24 - J7KN74                     | + J7KN24 - J7KN74  | horizontal | J74KN-C-ML | 1         | 0.010         |
|                                                                                   | J7KN85 - J7KN110                    | + J7KN85 - J7KN110 | horizontal | J74KN-D-ML | 1         | 0.076         |

## Suppressor Units

|                                                                                    | Voltage Range V                                         | Mounting                                | Type          | Pack pcs. | Weight kg/pc. |
|------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------|---------------|-----------|---------------|
|   | <b>Varistor</b> for contactors J7KN-10 to J7KN-22       |                                         |               |           |               |
|                                                                                    | 110 - 230V AC/DC                                        | to snap on to coil terminals            | J74KN-A-VG230 | 10        | 0.01          |
|                                                                                    | 250 - 415V AC/DC                                        | to snap on to coil terminals            | J74KN-A-VG400 | 10        | 0.01          |
|                                                                                    | <b>Varistor</b> for contactors J7KN-10 to J7KN-74       |                                         |               |           |               |
|                                                                                    | 110 - 230V AC/DC                                        | to snap on the contactor                | J74KN-B-VG230 | 10        | 0.02          |
|                                                                                    | 250 - 415V AC/DC                                        | to snap on the contactor                | J74KN-B-VG400 | 10        | 0.02          |
|   | <b>RC-unit</b> for contactors J7KN-10 to J7KN-40, J7KNA |                                         |               |           |               |
|                                                                                    | 110 - 230V AC/DC                                        | between DIN-rail and contactor          | J74KN-A-RC230 | 1         | 0.036         |
|                                                                                    | <b>RC-units</b> for contactors J7KN-10 to J7KN-110      |                                         |               |           |               |
|                                                                                    | 24 - 48V AC/DC                                          | universal (fixing band, adhesive strip) | J74KN-B-RC48  | 5         | 0.02          |
|                                                                                    | 110 - 230V AC/DC                                        | universal (fixing band, adhesive strip) | J74KN-B-RC230 | 5         | 0.02          |
|                                                                                    | 250 - 415V AC                                           | universal (fixing band, adhesive strip) | J74KN-B-RC400 | 5         | 0.02          |
|  | <b>RC-units</b> for contactors J7KN-10 to J7KN-74       |                                         |               |           |               |
|                                                                                    | 12 - 48V AC (50/60Hz) & DC                              | to snap on the contactor                | J74KN-C-RC24  | 10        | 0.02          |
|                                                                                    | 48 - 127V AC (50/60Hz) & DC                             | to snap on the contactor                | J74KN-C-RC110 | 10        | 0.036         |
|                                                                                    | 110 - 250V AC (50/60Hz) & DC                            | to snap on the contactor                | J74KN-C-RC230 | 10        | 0.036         |

# Wiring Diagrams Coil Circuit

| AC operated                     | DC operated<br>with double winding coil*1 |
|---------------------------------|-------------------------------------------|
| J7KN-10...<br>to<br>J7KN-175... | J7KN-10...D<br>to<br>J7KN-22...D          |
| J7KN-200...                     | J7KN-24...D<br>to<br>J7KN-74...D          |
|                                 | J7KN-85...D<br>to<br>J7KN-110...D         |

\*1) Only 3 additional Aux. Contacts are possible! (See also page 33)

# Specifications

## ■ Coil Voltages

Type-suffix for contactor types J7KN-10... to J7KN-74...

| Suffix<br>to contactor<br>type e.g.<br><b>J7KN-10-10-24</b> | Voltage Marking<br>at the coil |                | Rated Control Voltage U <sub>s</sub><br>range for |            |            |            |
|-------------------------------------------------------------|--------------------------------|----------------|---------------------------------------------------|------------|------------|------------|
|                                                             | for 50Hz<br>V                  | for 60Hz<br>V  | 50Hz                                              |            | 60Hz       |            |
|                                                             |                                |                | min<br>V.                                         | max<br>V.  | min<br>V.  | max<br>V.  |
| <b>24</b>                                                   | <b>24</b>                      | <b>24</b>      | <b>22</b>                                         | <b>24</b>  | <b>24</b>  | <b>27</b>  |
| 48                                                          | 48                             |                | 47                                                | 52         | 52         | 58         |
| <b>110</b>                                                  | <b>110</b>                     | <b>110-120</b> | <b>100</b>                                        | <b>110</b> | <b>110</b> | <b>122</b> |
| 180                                                         | 180-210                        | 200-240        | 180                                               | 210        | 200        | 240        |
| <b>230</b>                                                  | <b>220-240</b>                 | <b>240</b>     | <b>220</b>                                        | <b>240</b> | <b>240</b> | <b>264</b> |
| <b>400</b>                                                  | <b>380-415</b>                 | <b>415-440</b> | <b>380</b>                                        | <b>415</b> | <b>415</b> | <b>460</b> |
| 500                                                         | 500-550                        | 550-600        | 500                                               | 550        | 550        | 600        |

Standard voltages in bold type letter

Type-suffix for contactor types J7KN-85... to J7KN-110...

| Suffix<br>to contactor<br>type e.g.<br><b>J7KN-85-22-24</b> | Voltage Marking<br>at the coil |                | Rated Control Voltage U <sub>s</sub><br>range for |            |            |            |
|-------------------------------------------------------------|--------------------------------|----------------|---------------------------------------------------|------------|------------|------------|
|                                                             | for 50Hz<br>V                  | for 60Hz<br>V  | 50Hz                                              |            | 60Hz       |            |
|                                                             |                                |                | min<br>V.                                         | max<br>V.  | min<br>V.  | max<br>V.  |
| <b>24</b>                                                   | <b>24</b>                      |                | <b>24</b>                                         | <b>27</b>  | <b>29</b>  | <b>32</b>  |
| 48                                                          | 48                             | 60             | 47                                                | 52         | 56         | 62         |
| <b>110</b>                                                  | <b>110-120</b>                 |                | <b>110</b>                                        | <b>122</b> | <b>132</b> | <b>146</b> |
| 180                                                         | 180-200                        | 208-240        | 180                                               | 200        | 208        | 240        |
| <b>230</b>                                                  | <b>220-240</b>                 | <b>277</b>     | <b>220</b>                                        | <b>240</b> | <b>264</b> | <b>288</b> |
| <b>400</b>                                                  | <b>380-415</b>                 | <b>460-480</b> | <b>380</b>                                        | <b>415</b> | <b>455</b> | <b>498</b> |
| 500                                                         | 500-550                        | 600-660        | 500                                               | 550        | 600        | 660        |

Standard voltages in bold type letter

Type-suffix for contactor types J7KN-150... to J7KN-200...

| Suffix<br>to contactor<br>type e.g.<br><b>J7KN-150-110</b> | Voltage Marking<br>at the coil |               | Rated Control Voltage U <sub>s</sub><br>range for |            |            |            |
|------------------------------------------------------------|--------------------------------|---------------|---------------------------------------------------|------------|------------|------------|
|                                                            | for 50Hz<br>V                  | for 60Hz<br>V | 50Hz                                              |            | 60Hz       |            |
|                                                            |                                |               | min<br>V.                                         | max<br>V.  | min<br>V.  | max<br>V.  |
| 24                                                         | 24                             |               | 24                                                | 24         | -          | -          |
| 48                                                         | 48                             |               | 48                                                | 48         | -          | -          |
| 110                                                        | 110                            | 110           | 110                                               | 110        | 110        | 110        |
| 180                                                        | 180                            | 220           | 180                                               | 180        | 220        | 220        |
| <b>230</b>                                                 | <b>220-230</b>                 | <b>220</b>    | <b>220</b>                                        | <b>230</b> | <b>220</b> | <b>220</b> |
| 240                                                        | 240                            | 240           | 240                                               | 240        | 240        | 240        |
| <b>400</b>                                                 | <b>380-400</b>                 |               | <b>380</b>                                        | <b>400</b> | -          | -          |
| 440                                                        |                                | 440           | -                                                 | -          | 440        | 440        |

Standard voltages in bold type letter

## ■ Engineering data and characteristics

### Approximate Values for three-phase Motors

#### Motor Full Load Currents

Approximate values of motor F.L.C. and minimum „slow blow“ respectively „gL“ short-circuit fuse

| Motor rating<br>Range according to BS for 415V |       |     |      |    | 220-230V Motor<br>Value of fusing at<br>motor start |             |         | 240V Motor<br>Value of fusing at<br>motor start |             |         | 380-400V Motor<br>Value of fusing at<br>motor start |             |         | 415V Motor<br>Value of fusing at<br>motor start |             |         | 500V Motor<br>Value of fusing at<br>motor start |             |         | 660-690V Motor<br>Value of fusing at<br>motor start |             |         |
|------------------------------------------------|-------|-----|------|----|-----------------------------------------------------|-------------|---------|-------------------------------------------------|-------------|---------|-----------------------------------------------------|-------------|---------|-------------------------------------------------|-------------|---------|-------------------------------------------------|-------------|---------|-----------------------------------------------------|-------------|---------|
| kW                                             | PS-hp | hp  | cosφ | %  | F.L.C.<br>A                                         | D.O.L.<br>A | YD<br>A | F.L.C.<br>A                                     | D.O.L.<br>A | YD<br>A | F.L.C.<br>A                                         | D.O.L.<br>A | YD<br>A | F.L.C.<br>A                                     | D.O.L.<br>A | YD<br>A | F.L.C.<br>A                                     | D.O.L.<br>A | YD<br>A | F.L.C.<br>A                                         | D.O.L.<br>A | YD<br>A |
| 0.06                                           | 0.08  | -   | 0.7  | 59 | 0.38                                                | 1           | 1       | 0.35                                            | 1           | 1       | 0.22                                                | 1           | 1       | -                                               | -           | -       | 0.16                                            | 1           | 1       | -                                                   | -           | -       |
| 0.09                                           | 0.12  | -   | 0.7  | 60 | 0.55                                                | 2           | 2       | 0.5                                             | 2           | 2       | 0.33                                                | 1           | 1       | -                                               | -           | -       | 0.24                                            | 1           | 1       | -                                                   | -           | -       |
| 0.12                                           | 0.16  | -   | 0.7  | 61 | 0.76                                                | 2           | 2       | 0.68                                            | 2           | 2       | 0.42                                                | 2           | 2       | -                                               | -           | -       | 0.33                                            | 1           | 1       | -                                                   | -           | -       |
| 0.18                                           | 0.24  | -   | 0.7  | 61 | 1.1                                                 | 2           | 2       | 1                                               | 2           | 2       | 0.64                                                | 2           | 2       | -                                               | -           | -       | 0.46                                            | 1           | 1       | -                                                   | -           | -       |
| 0.25                                           | 0.34  | -   | 0.7  | 62 | 1.4                                                 | 4           | 2       | 1.38                                            | 4           | 2       | 0.88                                                | 2           | 2       | -                                               | -           | -       | 0.59                                            | 2           | 2       | -                                                   | -           | -       |
| 0.37                                           | 0.5   | -   | 0.72 | 64 | 2.1                                                 | 4           | 4       | 1.93                                            | 4           | 4       | 1.22                                                | 4           | 2       | -                                               | -           | -       | 0.85                                            | 2           | 2       | 0.7                                                 | 2           | 2       |
| 0.55                                           | 0.75  | -   | 0.75 | 69 | 2.7                                                 | 4           | 4       | 2.3                                             | 4           | 4       | 1.5                                                 | 4           | 2       | -                                               | -           | -       | 1.2                                             | 4           | 2       | 0.9                                                 | 2           | 2       |
| 0.75                                           | 1     | 1   | 0.8  | 74 | 3.3                                                 | 6           | 4       | 3.1                                             | 6           | 4       | 2                                                   | 4           | 4       | 2                                               | 4           | 4       | 1.48                                            | 4           | 2       | 1.1                                                 | 2           | 2       |
| 1.1                                            | 1.5   | 1.5 | 0.83 | 77 | 4.9                                                 | 10          | 6       | 4.1                                             | 6           | 6       | 2.6                                                 | 4           | 4       | 2.5                                             | 4           | 4       | 2.1                                             | 4           | 4       | 1.5                                                 | 4           | 2       |
| 1.5                                            | 2     | 2   | 0.83 | 78 | 6.2                                                 | 10          | 10      | 5.6                                             | 10          | 10      | 3.5                                                 | 6           | 4       | 3.5                                             | 6           | 4       | 2.6                                             | 4           | 4       | 2                                                   | 4           | 4       |
| 2.2                                            | 3     | 3   | 0.83 | 81 | 8.7                                                 | 16          | 10      | 7.9                                             | 16          | 10      | 5                                                   | 10          | 6       | 5                                               | 10          | 6       | 3.8                                             | 6           | 6       | 2.9                                                 | 6           | 4       |
| 2.5                                            | 3.4   | -   | 0.83 | 81 | 9.8                                                 | 16          | 16      | 8.9                                             | 16          | 10      | 5.7                                                 | 10          | 10      | -                                               | -           | -       | 4.3                                             | 6           | 6       | -                                                   | -           | -       |
| 3                                              | 4     | 4   | 0.84 | 81 | 11.6                                                | 20          | 16      | 10.6                                            | 20          | 16      | 6.6                                                 | 16          | 10      | 6.5                                             | 16          | 10      | 5.1                                             | 10          | 10      | 3.5                                                 | 6           | 4       |
| 3.7                                            | 5     | 5   | 0.84 | 82 | 14.2                                                | 25          | 20      | 13                                              | 25          | 16      | 8.2                                                 | 16          | 10      | 7.5                                             | 16          | 10      | 6.2                                             | 16          | 10      | -                                                   | -           | -       |
| 4                                              | 5.5   | -   | 0.84 | 82 | 15.3                                                | 25          | 20      | 14                                              | 25          | 20      | 8.5                                                 | 16          | 10      | -                                               | -           | -       | 6.5                                             | 16          | 10      | 4.9                                                 | 10          | 6       |
| 5.5                                            | 7.5   | 7.5 | 0.85 | 83 | 20.6                                                | 35          | 25      | 18.9                                            | 35          | 25      | 11.5                                                | 20          | 16      | 11                                              | 20          | 16      | 8.9                                             | 16          | 10      | 6.7                                                 | 16          | 10      |
| 7.5                                            | 10    | 10  | 0.86 | 85 | 27.4                                                | 35          | 35      | 24.8                                            | 35          | 35      | 15.5                                                | 25          | 20      | 14                                              | 25          | 16      | 11.9                                            | 20          | 16      | 9                                                   | 16          | 10      |
| 8                                              | 11    | -   | 0.86 | 85 | 28.8                                                | 50          | 35      | 26.4                                            | 35          | 35      | 16.7                                                | 25          | 20      | -                                               | -           | -       | 12.7                                            | 20          | 16      | -                                                   | -           | -       |
| 11                                             | 15    | 15  | 0.86 | 87 | 39.2                                                | 63          | 50      | 35.3                                            | 50          | 50      | 22                                                  | 35          | 25      | 21                                              | 35          | 25      | 16.7                                            | 25          | 20      | 13                                                  | 25          | 16      |
| 12.5                                           | 17    | -   | 0.86 | 87 | 43.8                                                | 63          | 50      | 40.2                                            | 63          | 50      | 25                                                  | 35          | 35      | -                                               | -           | -       | 19                                              | 35          | 25      | -                                                   | -           | -       |
| 15                                             | 20    | 20  | 0.86 | 87 | 52.6                                                | 80          | 63      | 48.2                                            | 80          | 63      | 30                                                  | 50          | 35      | 28                                              | 35          | 35      | 22.5                                            | 35          | 25      | 17.5                                                | 25          | 20      |
| 18.5                                           | 25    | 25  | 0.86 | 88 | 64.9                                                | 100         | 80      | 58.7                                            | 80          | 63      | 37                                                  | 63          | 50      | 35                                              | 50          | 50      | 28.5                                            | 50          | 35      | 21                                                  | 35          | 25      |
| 20                                             | 27    | -   | 0.86 | 88 | 69.3                                                | 100         | 80      | 63.4                                            | 80          | 80      | 40                                                  | 63          | 50      | -                                               | -           | -       | 30.6                                            | 50          | 35      | -                                                   | -           | -       |
| 22                                             | 30    | 30  | 0.87 | 89 | 75.2                                                | 100         | 80      | 68                                              | 100         | 80      | 44                                                  | 63          | 50      | 40                                              | 63          | 50      | 33                                              | 50          | 50      | 25                                                  | 35          | 35      |
| 25                                             | 34    | -   | 0.87 | 89 | 84.4                                                | 125         | 100     | 77.2                                            | 100         | 100     | 50                                                  | 80          | 63      | -                                               | -           | -       | 38                                              | 63          | 50      | -                                                   | -           | -       |
| 30                                             | 40    | 40  | 0.87 | 90 | 101                                                 | 125         | 125     | 92.7                                            | 125         | 100     | 60                                                  | 80          | 63      | 55                                              | 80          | 63      | 44                                              | 63          | 50      | 33                                                  | 50          | 35      |
| 37                                             | 50    | 50  | 0.87 | 90 | 124                                                 | 160         | 160     | 114                                             | 160         | 125     | 72                                                  | 100         | 80      | 66                                              | 100         | 80      | 54                                              | 80          | 63      | 42                                                  | 63          | 50      |
| 40                                             | 54    | -   | 0.87 | 90 | 134                                                 | 160         | 160     | 123                                             | 160         | 160     | 79                                                  | 100         | 100     | -                                               | -           | -       | 60                                              | 80          | 63      | -                                                   | -           | -       |
| 45                                             | 60    | 60  | 0.88 | 91 | 150                                                 | 200         | 160     | 136                                             | 200         | 160     | 85                                                  | 125         | 100     | 80                                              | 100         | 100     | 64.5                                            | 100         | 80      | 49                                                  | 63          | 63      |
| 51                                             | 70    | -   | 0.88 | 91 | 168                                                 | 200         | 200     | 154                                             | 200         | 200     | 97                                                  | 125         | 100     | -                                               | -           | -       | 73.7                                            | 100         | 80      | -                                                   | -           | -       |
| 55                                             | 75    | -   | 0.88 | 91 | 181                                                 | 250         | 200     | 166                                             | 200         | 200     | 105                                                 | 160         | 125     | -                                               | -           | -       | 79                                              | 125         | 100     | 60                                                  | 80          | 63      |
| 59                                             | 80    | 80  | 0.88 | 91 | 194                                                 | 250         | 250     | 178                                             | 250         | 200     | 112                                                 | 160         | 125     | 105                                             | 160         | 125     | 85.3                                            | 125         | 100     | -                                                   | -           | -       |
| 75                                             | 100   | 100 | 0.88 | 91 | 245                                                 | 315         | 250     | 226                                             | 315         | 250     | 140                                                 | 200         | 160     | 135                                             | 200         | 160     | 106                                             | 160         | 125     | 82                                                  | 125         | 100     |
| 90                                             | 125   | 125 | 0.88 | 92 | 292                                                 | 400         | 315     | 268                                             | 315         | 315     | 170                                                 | 250         | 200     | 165                                             | 200         | 200     | 128                                             | 160         | 160     | 98                                                  | 125         | 125     |
| 110                                            | 150   | 150 | 0.88 | 92 | 358                                                 | 500         | 400     | 327                                             | 400         | 400     | 205                                                 | 250         | 250     | 200                                             | 250         | 250     | 156                                             | 200         | 200     | 118                                                 | 160         | 125     |
| 129                                            | 175   | 175 | 0.88 | 92 | 420                                                 | 500         | 500     | 384                                             | 500         | 400     | 242                                                 | 315         | 250     | 230                                             | 315         | 250     | 184                                             | 250         | 200     | -                                                   | -           | -       |
| 132                                            | 180   | -   | 0.88 | 92 | 425                                                 | 500         | 500     | 393                                             | 500         | 500     | 245                                                 | 315         | 250     | -                                               | -           | -       | 186                                             | 250         | 200     | 140                                                 | 200         | 160     |
| 147                                            | 200   | 200 | 0.88 | 93 | 472                                                 | 630         | 630     | 432                                             | 630         | 500     | 273                                                 | 315         | 315     | 260                                             | 315         | 315     | 207                                             | 250         | 250     | -                                                   | -           | -       |
| 160                                            | 220   | -   | 0.88 | 93 | 502                                                 | 630         | 630     | 471                                             | 630         | 630     | 295                                                 | 400         | 315     | -                                               | -           | -       | 220                                             | 315         | 250     | 170                                                 | 200         | 200     |
| 184                                            | 250   | 250 | 0.88 | 93 | 590                                                 | 800         | 630     | 541                                             | 630         | 630     | 340                                                 | 400         | 400     | 325                                             | 400         | 400     | 259                                             | 315         | 315     | -                                                   | -           | -       |
| 200                                            | 270   | -   | 0.88 | 93 | 626                                                 | 800         | 800     | 589                                             | 800         | 630     | 370                                                 | 500         | 400     | -                                               | -           | -       | 278                                             | 315         | 315     | 215                                                 | 250         | 250     |
| 220                                            | 300   | 300 | 0.88 | 93 | 700                                                 | 1000        | 800     | 647                                             | 800         | 800     | 408                                                 | 500         | 500     | 385                                             | 500         | 400     | 310                                             | 400         | 400     | -                                                   | -           | -       |
| 250                                            | 340   | -   | 0.88 | 93 | 803                                                 | 1000        | 1000    | 736                                             | 1000        | 800     | 460                                                 | 630         | 500     | -                                               | -           | -       | 353                                             | 500         | 400     | 268                                                 | 315         | 315     |
| 257                                            | 350   | 350 | 0.88 | 93 | 826                                                 | 1000        | 1000    | 756                                             | 1000        | 800     | 475                                                 | 630         | 630     | 450                                             | 630         | 500     | 363                                             | 500         | 400     | -                                                   | -           | -       |
| 295                                            | 400   | 400 | 0.88 | 93 | 948                                                 | 1250        | 1000    | 868                                             | 1000        | 1000    | 546                                                 | 800         | 630     | 500                                             | 630         | 630     | 416                                             | 500         | 500     | -                                                   | -           | -       |
| 315                                            | 430   | -   | 0.88 | 93 | 990                                                 | 1250        | 1250    | 927                                             | 1250        | 1000    | 580                                                 | 800         | 630     | -                                               | -           | -       | 445                                             | 630         | 500     | 337                                                 | 400         | 400     |
| 355                                            | 483   | -   | 0.89 | 95 | -                                                   | -           | -       | -                                               | -           | -       | 636                                                 | 800         | 800     | -                                               | -           | -       | 483                                             | 630         | 630     | 366                                                 | 500         | 400     |
| 400                                            | 545   | -   | 0.89 | 96 | -                                                   | -           | -       | -                                               | -           | -       | 710                                                 | 1000        | 800     | -                                               | -           | -       | 538                                             | 630         | 630     | 410                                                 | 500         | 500     |

The motor F.L.C. be valid for standard internal and surface cooled three-pole motors with 1500 min<sup>-1</sup>. The fuses values be valid for the motor F.L.C. shown in the table and D.O.L.-start: starting current max. 6x motor F.L.C., starting time max. 5s; star-delta-start: starting current max. 2x motor F.L.C., starting time max. 15s. For motors with higher F.L.C., higher starting current and / or longer starting time, larger short-circuit fuses are required.

The maximum admissible value is dependent on the switchgear respectively thermal overload relay.

Approximate values of motor F.L.C. according to CSA and UL

| Motor rating<br>hp | Motor F.L.C. at 110-120V |              |              | Motor F.L.C. at 220-240V*1 |              |              | Motor F.L.C. at 440-480V |              |              | Motor F.L.C. at 550-600V |              |              |
|--------------------|--------------------------|--------------|--------------|----------------------------|--------------|--------------|--------------------------|--------------|--------------|--------------------------|--------------|--------------|
|                    | 1-phase<br>A             | 2-phase<br>A | 3-phase<br>A | 1-phase<br>A               | 2-phase<br>A | 3-phase<br>A | 1-phase<br>A             | 2-phase<br>A | 3-phase<br>A | 1-phase<br>A             | 2-phase<br>A | 3-phase<br>A |
| 1/2                | 9.8                      | 4.0          | 4.4          | 4.9                        | 2.0          | 2.2          | 2.5                      | 1.0          | 1.1          | 2.0                      | 0.8          | 0.9          |
| 3/4                | 13.8                     | 4.8          | 6.4          | 6.9                        | 2.4          | 3.2          | 3.5                      | 1.2          | 1.6          | 2.8                      | 1.0          | 1.3          |
| 1                  | 16.0                     | 6.4          | 8.4          | 8.0                        | 3.2          | 4.2          | 4.0                      | 1.6          | 2.1          | 3.2                      | 1.3          | 1.7          |
| 1 1/2              | 20.0                     | 9.0          | 12.0         | 10.0                       | 4.5          | 6.0          | 5.0                      | 2.3          | 3.0          | 4.0                      | 1.8          | 2.4          |
| 2                  | 24.0                     | 11.8         | 13.6         | 12.0                       | 5.9          | 6.8          | 6.0                      | 3.0          | 3.4          | 4.8                      | 2.4          | 2.7          |
| 3                  | 34.0                     | 16.6         | 19.2         | 17.0                       | 8.3          | 9.6          | 8.5                      | 4.2          | 4.8          | 6.8                      | 3.3          | 3.9          |
| 5                  | 56.0                     | 26.4         | 30.4         | 28.0                       | 13.2         | 15.2         | 14.0                     | 6.6          | 7.6          | 11.2                     | 5.3          | 6.1          |
| 7 1/2              | 80.0                     | 38.0         | 44.0         | 40.0                       | 19.0         | 22.0         | 21.0                     | 9.0          | 11.0         | 16.0                     | 8.0          | 9.0          |
| 10                 | 100.0                    | 48.0         | 56.0         | 50.0                       | 24.0         | 28.0         | 26.0                     | 12.0         | 14.0         | 20.0                     | 10.0         | 11.0         |
| 15                 | 135.0                    | 72.0         | 84.0         | 68.0                       | 36.0         | 42.0         | 34.0                     | 18.0         | 21.0         | 27.0                     | 14.0         | 17.0         |
| 20                 | -                        | 94.0         | 108.0        | 88.0                       | 47.0         | 54.0         | 44.0                     | 23.0         | 27.0         | 35.0                     | 19.0         | 22.0         |
| 25                 | -                        | 118.0        | 136.0        | 110.0                      | 59.0         | 68.0         | 55.0                     | 29.0         | 34.0         | 44.0                     | 24.0         | 27.0         |
| 30                 | -                        | 138.0        | 160.0        | 136.0                      | 69.0         | 80.0         | 68.0                     | 35.0         | 40.0         | 54.0                     | 28.0         | 32.0         |
| 40                 | -                        | 180.0        | 208.0        | 176.0                      | 90.0         | 104.0        | 88.0                     | 45.0         | 52.0         | 70.0                     | 36.0         | 41.0         |
| 50                 | -                        | 226.0        | 260.0        | 216.0                      | 113.0        | 130.0        | 108.0                    | 56.0         | 65.0         | 86.0                     | 45.0         | 52.0         |
| 60                 | -                        | -            | -            | -                          | 133.0        | 145.0        | -                        | 67.0         | 77.0         | -                        | 53.0         | 62.0         |
| 75                 | -                        | -            | -            | -                          | 166.0        | 192.0        | -                        | 83.0         | 96.0         | -                        | 66.0         | 77.0         |
| 100                | -                        | -            | -            | -                          | 218.0        | 248.0        | -                        | 109.0        | 124.0        | -                        | 87.0         | 99.0         |
| 125                | -                        | -            | -            | -                          | -            | 312.0        | -                        | 135.0        | 156.0        | -                        | 108.0        | 125.0        |
| 150                | -                        | -            | -            | -                          | -            | 360.0        | -                        | 156.0        | 180.0        | -                        | 125.0        | 144.0        |
| 200                | -                        | -            | -            | -                          | -            | 480.0        | -                        | 208.0        | 240.0        | -                        | 167.0        | 192.0        |
| 250                | -                        | -            | -            | -                          | -            | 602.0        | -                        | -            | 302.0        | -                        | -            | 242.0        |
| 300                | -                        | -            | -            | -                          | -            | -            | -                        | -            | 361.0        | -                        | -            | 289.0        |
| 350                | -                        | -            | -            | -                          | -            | -            | -                        | -            | 414.0        | -                        | -            | 336.0        |
| 400                | -                        | -            | -            | -                          | -            | -            | -                        | -            | 477.0        | -                        | -            | 382.0        |
| 500                | -                        | -            | -            | -                          | -            | -            | -                        | -            | 590.0        | -                        | -            | 472.0        |

\*1) Determine the motor current for 200V and 208V by increasing the values for 220-240V at 200V about 15% and for 208V about 10%.

# Contactors

## Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Main Contacts                                                   | Type                 | J7KN-10   | J7KN-14    | J7KN-18    | J7KN-22   | J7KN-24   | J7KN-32   | J7KN-40     | J7KN-50   | J7KN-62   | J7KN-74   |
|-----------------------------------------------------------------|----------------------|-----------|------------|------------|-----------|-----------|-----------|-------------|-----------|-----------|-----------|
| Rated insulation voltage $U_i^{1)}$                             | V AC                 | 690       | 690        | 690        | 690       | 690       | 690       | 690         | 690       | 690       | 690       |
| Making capacity $I_m$                                           | at $U_n = 690V$ AC A | 200       | 200        | 200        | 200       | 400       | 500       | 500         | 700       | 900       | 900       |
| Breaking capacity $I_n$                                         | 400V AC A            | 180       | 180        | 200        | 200       | 380       | 400       | 400         | 600       | 800       | 800       |
| J7KN-10 to J7KN-22 $\cos\phi = 0,65$                            | 500V AC A            | 150       | 150        | 180        | 180       | 300       | 370       | 370         | 500       | 700       | 700       |
| J7KN-24 to J7KN-72 $\cos\phi = 0,35$                            | 690V AC A            | 100       | 100        | 150        | 150       | 260       | 340       | 340         | 400       | 500       | 500       |
|                                                                 | 1000V AC A           | -         | -          | -          | -         | -         | -         | -           | -         | -         | -         |
| <b>Utilization category AC1</b>                                 |                      |           |            |            |           |           |           |             |           |           |           |
| <b>Switching of resistive load</b>                              |                      |           |            |            |           |           |           |             |           |           |           |
| Rated operational current $I_n (=I_{n0})$ at 40°C, open         | A                    | 25        | 25         | 32         | 32        | 50        | 65        | 80          | 110       | 120       | 130       |
| Rated operational power                                         | 220V kW              | 9,5       | 9,5        | 12,2       | 12,2      | 19,0      | 24,7      | 30,4        | 41,9      | 45,7      | 49,5      |
| of three-phase resistive loads                                  | 230V kW              | 9,9       | 9,9        | 12,7       | 12,7      | 19,9      | 25,9      | 31,8        | 43,8      | 47,7      | 51,7      |
| 50-60Hz, $\cos\phi = 1$                                         | 240V kW              | 10,4      | 10,4       | 13,3       | 13,3      | 20,8      | 27,0      | 33,2        | 45,7      | 49,8      | 54,0      |
|                                                                 | 380V kW              | 16,4      | 16,4       | 21,0       | 21,0      | 32,9      | 42,7      | 52,6        | 72,3      | 78,9      | 85,5      |
|                                                                 | 400V kW              | 17,3      | 17,3       | 22,1       | 22,1      | 34,6      | 45,0      | 55,4        | 76,1      | 83,0      | 90,0      |
|                                                                 | 415V kW              | 17,9      | 17,9       | 23,0       | 23,0      | 35,9      | 46,7      | 57,4        | 79,0      | 86,2      | 93,3      |
|                                                                 | 440V kW              | 19,0      | 19,0       | 24,4       | 24,4      | 38,1      | 49,5      | 60,9        | 83,7      | 91,3      | 99,0      |
|                                                                 | 500V kW              | 21,6      | 21,6       | 27,7       | 27,7      | 43,3      | 56,2      | 69,2        | 95,2      | 103,8     | 112,5     |
|                                                                 | 660V kW              | 28,5      | 28,5       | 36,5       | 36,5      | 57,1      | 74,2      | 91,3        | 125,6     | 137,0     | 148,4     |
|                                                                 | 690V kW              | 29,8      | 29,8       | 38,2       | 38,2      | 59,7      | 77,6      | 95,5        | 131,3     | 143,2     | 155,2     |
|                                                                 | 1000V kW             | -         | -          | -          | -         | -         | -         | -           | -         | -         | -         |
| Rated operational current $I_n (=I_{n0})$ at 60°C, enclosed     | A                    | 25        | 25         | 32         | 32        | 40        | 55        | 65          | 90        | 100       | 110       |
| Rated operational power                                         | 220V kW              | 9,5       | 9,5        | 12,2       | 12,2      | 15,2      | 20,9      | 24,7        | 34,3      | 38,1      | 41,9      |
| of three-phase resistive loads                                  | 230V kW              | 9,9       | 9,9        | 12,7       | 12,7      | 15,9      | 21,9      | 25,9        | 35,8      | 39,8      | 43,8      |
| 50-60Hz, $\cos\phi = 1$                                         | 240V kW              | 10,4      | 10,4       | 13,3       | 13,3      | 16,6      | 22,8      | 27,0        | 37,4      | 41,5      | 45,7      |
|                                                                 | 380V kW              | 16,4      | 16,4       | 21,0       | 21,0      | 26,3      | 36,2      | 42,7        | 59,2      | 65,7      | 72,3      |
|                                                                 | 400V kW              | 17,3      | 17,3       | 22,1       | 22,1      | 27,7      | 38,1      | 45,0        | 62,3      | 69,2      | 76,1      |
|                                                                 | 415V kW              | 17,9      | 17,9       | 23,0       | 23,0      | 28,7      | 39,5      | 46,7        | 64,6      | 71,8      | 79,0      |
|                                                                 | 440V kW              | 19,0      | 19,0       | 24,4       | 24,4      | 30,4      | 41,9      | 49,5        | 68,5      | 76,1      | 83,7      |
|                                                                 | 500V kW              | 21,6      | 21,6       | 27,7       | 27,7      | 34,6      | 47,6      | 56,2        | 77,9      | 86,5      | 95,2      |
|                                                                 | 660V kW              | 28,5      | 28,5       | 36,5       | 36,5      | 45,7      | 62,8      | 74,2        | 102,8     | 114,2     | 125,6     |
|                                                                 | 690V kW              | 29,8      | 29,8       | 38,2       | 38,2      | 47,7      | 65,7      | 77,6        | 107,4     | 119,4     | 131,3     |
|                                                                 | 1000V kW             | -         | -          | -          | -         | -         | -         | -           | -         | -         | -         |
| Minimum cross-section of conductor at load with $I_n (=I_{n0})$ | mm²                  | 4         | 4          | 6          | 6         | 10        | 16        | 25          | 35        | 50        | 50        |
| <b>Utilization category AC2 and AC3</b>                         |                      |           |            |            |           |           |           |             |           |           |           |
| <b>Switching of three-phase motors</b>                          |                      |           |            |            |           |           |           |             |           |           |           |
| Rated operational current $I_n$ open and enclosed               | 220V A               | 12        | 15         | 18         | 22        | 24        | 30        | 40          | 50        | 63        | 74        |
|                                                                 | 230V A               | 11,5      | 14,5       | 18         | 22        | 24        | 30        | 40          | 50        | 62        | 74        |
|                                                                 | 240V A               | 11        | 14         | 18         | 22        | 24        | 32        | 40          | 50        | 62        | 74        |
|                                                                 | <b>380-400V A</b>    | <b>10</b> | <b>14</b>  | <b>18</b>  | <b>22</b> | <b>24</b> | <b>32</b> | <b>40</b>   | <b>50</b> | <b>62</b> | <b>74</b> |
|                                                                 | 415V A               | 9         | 14         | 18         | 22        | 23        | 30        | 40          | 50        | 62        | 74        |
|                                                                 | 440V A               | 9         | 14         | 18         | 22        | 23        | 30        | 40          | 50        | 62        | 74        |
|                                                                 | 500V A               | 7         | 9          | 9          | 9         | 17,5      | 21        | 21          | 33        | 42        | 42        |
|                                                                 | 660-690V A           | 6,5       | 8,5        | 8,5        | 8,5       | 17        | 20        | 20          | 31        | 40        | 40        |
|                                                                 | 1000V A              | -         | -          | -          | -         | -         | -         | -           | -         | -         | -         |
| Rated operational power of three-phase motors 50-60Hz           | 220-230V kW          | 3         | 4          | 5          | 6         | 6         | 8,5       | 11          | 12,5      | 18,5      | 22        |
|                                                                 | 240V kW              | 3         | 4          | 5          | 7         | 7         | 9         | 11,5        | 13,5      | 19        | 23        |
|                                                                 | <b>380-400V kW</b>   | <b>4</b>  | <b>5,5</b> | <b>7,5</b> | <b>11</b> | <b>11</b> | <b>15</b> | <b>18,5</b> | <b>22</b> | <b>30</b> | <b>37</b> |
|                                                                 | 415V kW              | 4,5       | 6          | 8,5        | 12        | 12        | 16        | 20          | 24        | 33        | 40        |
|                                                                 | 440V kW              | 4,5       | 6          | 8,5        | 12        | 12        | 16        | 20          | 24        | 33        | 40        |
|                                                                 | 500V kW              | 5,5       | 7,5        | 10         | 10        | 15        | 18,5      | 18,5        | 30        | 37        | 45        |
|                                                                 | 660-690V kW          | 5,5       | 7,5        | 10         | 10        | 15        | 18,5      | 18,5        | 30        | 37        | 45        |
|                                                                 | 1000V kW             | -         | -          | -          | -         | -         | -         | -           | -         | -         | -         |
| <b>Utilization category AC4</b>                                 |                      |           |            |            |           |           |           |             |           |           |           |
| <b>Switching of squirrel cage motors, inching</b>               |                      |           |            |            |           |           |           |             |           |           |           |
| Rated operational current $I_n (=I_{n0})$ open and enclosed     | 220V A               | 12        | 15         | 18         | 18        | 24        | 30        | 40          | 50        | 63        | 63        |
|                                                                 | 230V A               | 11,5      | 14,5       | 18         | 18        | 24        | 30        | 40          | 50        | 62        | 62        |
|                                                                 | 240V A               | 11        | 14         | 18         | 18        | 24        | 32        | 40          | 50        | 62        | 62        |
|                                                                 | <b>380-400V A</b>    | <b>10</b> | <b>14</b>  | <b>18</b>  | <b>18</b> | <b>24</b> | <b>32</b> | <b>40</b>   | <b>50</b> | <b>62</b> | <b>62</b> |
|                                                                 | 415V A               | 9         | 14         | 18         | 18        | 23        | 30        | 37          | 45        | 60        | 60        |
|                                                                 | 440V A               | 9         | 14         | 18         | 18        | 23        | 30        | 37          | 45        | 55        | 55        |
|                                                                 | 500V A               | 9         | 12         | 16         | 16        | 17,5      | 21        | 21          | 33        | 42        | 42        |
|                                                                 | 660V A               | 7         | 9          | 9          | 9         | 17        | 20        | 20          | 31        | 40        | 40        |
|                                                                 | 690V A               | 6,5       | 8,5        | 8,5        | 8,5       | 17        | 20        | 20          | 31        | 40        | 40        |
|                                                                 | 1000V A              | -         | -          | -          | -         | -         | -         | -           | -         | -         | -         |

| Main Contacts                                                                    |                         | Type      | J7KN-10  | J7KN-14    | J7KN-18    | J7KN-22    | J7KN-24   | J7KN-32   | J7KN-40     | J7KN-50   | J7KN-62           | J7KN-74   |
|----------------------------------------------------------------------------------|-------------------------|-----------|----------|------------|------------|------------|-----------|-----------|-------------|-----------|-------------------|-----------|
| Rated operational power of three-phase motors 50-60Hz                            | 220-230V                | kW        | 3        | 4          | 5          | 5          | 6         | 8,5       | 11          | 12,5      | 18,5              | 18,5      |
|                                                                                  | 240V                    | kW        | 3        | 4          | 5          | 5          | 7         | 9         | 11,5        | 13,5      | 19                | 19        |
|                                                                                  | <b>380-400V</b>         | <b>kW</b> | <b>4</b> | <b>5,5</b> | <b>7,5</b> | <b>7,5</b> | <b>11</b> | <b>15</b> | <b>18,5</b> | <b>22</b> | <b>30</b>         | <b>30</b> |
|                                                                                  | 415V                    | kW        | 4,5      | 6          | 8,5        | 8,5        | 12        | 16        | 20          | 24        | 33                | 33        |
|                                                                                  | 440V                    | kW        | 4,5      | 6          | 8,5        | 8,5        | 12        | 16        | 20          | 24        | 33                | 33        |
|                                                                                  | 500V                    | kW        | 5,5      | 7,5        | 10         | 10         | 15        | 18,5      | 18,5        | 30        | 37                | 37        |
|                                                                                  | 660-690V                | kW        | 5,5      | 7,5        | 10         | 10         | 15        | 18,5      | 18,5        | 30        | 37                | 37        |
|                                                                                  | 1000V                   | kW        | -        | -          | -          | -          | -         | -         | -           | -         | -                 | -         |
| <b>Utilization category AC 5a</b>                                                |                         |           |          |            |            |            |           |           |             |           |                   |           |
| <b>Switching of gas discharge lamps</b>                                          |                         |           |          |            |            |            |           |           |             |           |                   |           |
| Rated operational current I <sub>n</sub> per pole at 220/230V                    |                         |           |          |            |            |            |           |           |             |           |                   |           |
| Fluorescent lamps,                                                               |                         |           |          |            |            |            |           |           |             |           |                   |           |
| uncompensated and serial compensated                                             | A                       | 20        | 20       | 25         | 25         | 40         | 52        | 64        | 88          | 96        | 104               |           |
| parallel compensated                                                             | A                       | 7         | 9        | 9          | 9          | 18         | 22        | 22        | 30          | 40        | 45                |           |
| dual-connection                                                                  | A                       | 22,5      | 22,5     | 28         | 28         | 45         | 58        | 72        | 98          | 108       | 117               |           |
| Metal halide lamps <sup>2</sup> ,                                                |                         |           |          |            |            |            |           |           |             |           |                   |           |
| uncompensated                                                                    | A                       | 12        | 15       | 19         | 19         | 30         | 39        | 48        | 66          | 72        | 78                |           |
| parallel compensated                                                             | A                       | 7         | 9        | 9          | 9          | 18         | 22        | 22        | 30          | 40        | 45                |           |
| Mercury-vapour lamps <sup>3</sup> ,                                              |                         |           |          |            |            |            |           |           |             |           |                   |           |
| uncompensated                                                                    | A                       | 22,5      | 25       | 28         | 28         | 45         | 58        | 72        | 99          | 108       | 117               |           |
| parallel compensated                                                             | A                       | 7         | 9        | 9          | 9          | 18         | 22        | 22        | 30          | 40        | 45                |           |
| Mixed light lamps <sup>4</sup>                                                   |                         |           |          |            |            |            |           |           |             |           |                   |           |
|                                                                                  | A                       | 20        | 20       | 25         | 25         | 40         | 52        | 64        | 88          | 96        | 104               |           |
| <b>Utilization category AC5b</b>                                                 |                         |           |          |            |            |            |           |           |             |           |                   |           |
| <b>Switching of incandescent lamps<sup>5</sup></b>                               |                         |           |          |            |            |            |           |           |             |           |                   |           |
| Rated operational current I <sub>n</sub> per pole at 220/230V                    | A                       | 12,5      | 12,5     | 12,5       | 12,5       | 25         | 31        | 31        | 43          | 56        | 56                |           |
| <b>Utilization category AC6a</b>                                                 |                         |           |          |            |            |            |           |           |             |           |                   |           |
| <b>Transformer primary switching</b>                                             |                         |           |          |            |            |            |           |           |             |           |                   |           |
| at inrush                                                                        | n                       | 30        | 30       | 30         | 30         | 30         | 30        | 30        | 30          | 30        | 30                |           |
| Rated operational current I <sub>n</sub>                                         | 400V A                  | 4,5       | 5,5      | 7,5        | 7,5        | 10,5       | 13,5      | 13,5      | 20          | 27        | 33                |           |
| Rated operational power dependent on inrush n                                    | 220-230V                | kVA       | 1,8      | 2,2        | 3          | 4,2        | 5,4       | 5,4       | 8           | 10,7      | 13                |           |
|                                                                                  | 240V                    | kVA       | 1,9      | 2,3        | 3,1        | 3,1        | 4,3       | 5,6       | 8,3         | 11,2      | 13,5              |           |
|                                                                                  | 380-400V                | kVA       | 3,1      | 3,8        | 5,2        | 5,2        | 7,3       | 9,3       | 13,5        | 18,5      | 22,5              |           |
|                                                                                  | 415-440V                | kVA       | 3,4      | 4,2        | 5,7        | 5,7        | 8         | 10,2      | 15          | 20,5      | 25                |           |
| For different inrush-factors x use the following formula: Px=Pn*(n/x)            |                         |           |          |            |            |            |           |           |             |           |                   |           |
|                                                                                  | 500V                    | kVA       | 3,9      | 4,8        | 6,5        | 6,5        | 9         | 11,5      | 17          | 23        | 28                |           |
|                                                                                  | 660-690V                | kVA       | 5,4      | 6,5        | 9          | 9          | 12,5      | 16        | 24          | 32        | 39                |           |
| <b>Utilization category AC6b</b>                                                 |                         |           |          |            |            |            |           |           |             |           |                   |           |
| <b>Switching of three-phase capacitor banks</b>                                  |                         |           |          |            |            |            |           |           |             |           |                   |           |
| Maximum inrush current (peak value) as multiple k of the capacitor rated current | k                       | 35        | 25       | 20         | 20         | 25         | 25        | 25        | 25          | 25        | 20                |           |
| Rated operational current I <sub>n</sub>                                         | 500V A                  | 8         | 12       | 15,5       | 15,5       | 23         | 32        | 32        | 45          | 60        | 70                |           |
| Rated operational power (sinφ→1)                                                 | 220-230V                | kVar      | 3        | 4,5        | 6          | 6          | 8,5       | 12        | 17          | 24        | 28                |           |
|                                                                                  | 240V                    | kVar      | 3,5      | 5          | 6,5        | 6,5        | 9,5       | 13        | 18,5        | 25        | 29                |           |
|                                                                                  | 380-400V                | kVar      | 5        | 7,5        | 10         | 10         | 15        | 20        | 29          | 39        | 46                |           |
|                                                                                  | 415-440V                | kVar      | 5,5      | 8          | 11         | 11         | 16        | 22        | 32          | 43        | 50                |           |
| For different multiples x use the following formula: Px=Pk*(k/x)                 |                         |           |          |            |            |            |           |           |             |           |                   |           |
|                                                                                  | 500V                    | kVar      | 7        | 10         | 13         | 13         | 20        | 26        | 39          | 50        | 58                |           |
|                                                                                  | 660-690V                | kVar      | 7        | 10         | 13         | 13         | 20        | 26        | 40          | 50        | 58                |           |
| <b>Switching of detuned capacitors</b>                                           |                         |           |          |            |            |            |           |           |             |           |                   |           |
| Rated operational current I <sub>n</sub>                                         | 690V A                  | 8         | 13       | 18         | 20         | 28         | 36        | 42        | 48          | 72        | 105 <sup>1)</sup> |           |
| Rated operational power                                                          | 220-230V                | kVar      | 2,9      | 5          | 7          | 7,5        | 11        | 14        | 16          | 28        | 33                |           |
|                                                                                  | 240V                    | kVar      | 3,1      | 5,4        | 7          | 8          | 11        | 14        | 17          | 28        | 36                |           |
|                                                                                  | 380-400V                | kVar      | 5        | 9          | 12,5       | 13         | 20        | 25        | 27,5        | 50        | 75 <sup>1)</sup>  |           |
|                                                                                  | 415-440V                | kVar      | 5,5      | 9,5        | 13         | 14         | 22        | 30        | 36          | 53        | 75 <sup>1)</sup>  |           |
|                                                                                  | 500V                    | kVar      | 6        | 11         | 15         | 17         | 25        | 30        | 40          | 60        | 75                |           |
|                                                                                  | 660-690V                | kVar      | 8        | 15         | 20         | 22         | 33        | 41        | 48          | 82        | 100               |           |
| <b>Utilization category DC1</b>                                                  |                         |           |          |            |            |            |           |           |             |           |                   |           |
| <b>Switching of resistive load</b>                                               |                         |           |          |            |            |            |           |           |             |           |                   |           |
| Time constant L/R ≤1ms                                                           |                         |           |          |            |            |            |           |           |             |           |                   |           |
| Rated operational current I <sub>n</sub>                                         | 1 pole24V A             | 20        | 25       | 32         | 32         | 50         | 65        | 80        | 110         | 120       | 130               |           |
|                                                                                  | 60V A                   | 20        | 25       | 32         | 32         | 50         | 65        | 80        | 110         | 120       | 130               |           |
|                                                                                  | 110V A                  | 6         | 6        | 6          | 6          | 10         | 10        | 10        | 12          | 12        | 12                |           |
|                                                                                  | 220V A                  | 0,8       | 0,8      | 0,8        | 0,8        | 1,4        | 1,4       | 1,4       | 1,4         | 1,4       | 1,4               |           |
|                                                                                  | 3 poles in series 24V A | 20        | 25       | 32         | 32         | 50         | 65        | 80        | 110         | 120       | 130               |           |
|                                                                                  | 60V A                   | 20        | 25       | 32         | 32         | 50         | 65        | 80        | 110         | 120       | 130               |           |
|                                                                                  | 110V A                  | 20        | 25       | 32         | 32         | 50         | 65        | 80        | 110         | 120       | 130               |           |
|                                                                                  | 220V A                  | 16        | 20       | 20         | 20         | 30         | 35        | 35        | 63          | 80        | 80                |           |

| Main Contacts                                                                                                                                                 |                                       | Type                            | J7KN-10 | J7KN-14 | J7KN-18 | J7KN-22                 | J7KN-24 | J7KN-32 | J7KN-40                 | J7KN-50 | J7KN-62 | J7KN-74 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------|---------|---------|---------|-------------------------|---------|---------|-------------------------|---------|---------|---------|
| Utilization category DC3 and DC5                                                                                                                              |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| Switching of shunt motors and series motors                                                                                                                   |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| Time constant L/R ≤15ms                                                                                                                                       |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| Rated operational current I <sub>o</sub>                                                                                                                      | 1 pole24V A                           | 20                              | 25      | 32      | 32      | 50                      | 65      | 80      | 110                     | 120     | 130     |         |
|                                                                                                                                                               | 60V A                                 | 6                               | 6       | 6       | 6       | 30                      | 30      | 30      | 60                      | 60      | 60      |         |
|                                                                                                                                                               | 110V A                                | 1,2                             | 1,2     | 1,2     | 1,2     | 1,8                     | 1,8     | 1,8     | 1,8                     | 1,8     | 1,8     |         |
|                                                                                                                                                               | 220V A                                | 0,2                             | 0,2     | 0,2     | 0,2     | 0,2                     | 0,2     | 0,2     | 0,25                    | 0,25    | 0,25    |         |
|                                                                                                                                                               | 3 poles in series 24V A               | 20                              | 25      | 32      | 32      | 50                      | 65      | 80      | 110                     | 120     | 130     |         |
|                                                                                                                                                               | 60V A                                 | 20                              | 25      | 32      | 32      | 40                      | 40      | 40      | 80                      | 80      | 80      |         |
|                                                                                                                                                               | 110V A                                | 20                              | 20      | 20      | 20      | 40                      | 40      | 40      | 80                      | 80      | 80      |         |
|                                                                                                                                                               | 220V A                                | 2,5                             | 2,5     | 2,5     | 2,5     | 4                       | 4       | 4       | 5                       | 5       | 5       |         |
| Maximum ambient temperature                                                                                                                                   |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| Operation                                                                                                                                                     | open °C                               | -40 to +60 (+90)*6              |         |         |         |                         |         |         |                         |         |         |         |
|                                                                                                                                                               | enclosed °C                           | -40 to +40                      |         |         |         |                         |         |         |                         |         |         |         |
| with thermal overload relay                                                                                                                                   | open °C                               | -25 to +60                      |         |         |         |                         |         |         |                         |         |         |         |
| enclosed                                                                                                                                                      | °C                                    | -25 to +40                      |         |         |         |                         |         |         |                         |         |         |         |
| Storage                                                                                                                                                       | °C                                    | -50 to +90                      |         |         |         |                         |         |         |                         |         |         |         |
| Short circuit protection                                                                                                                                      |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| for contactors without thermal overload relay                                                                                                                 |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| Coordination-type "1" according to IEC 947-4-1                                                                                                                |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| Contact welding without hazard of persons                                                                                                                     |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| max. fuse size                                                                                                                                                | gL (gG) A                             | 63                              | 63      | 63      | 63      | 80                      | 80      | 80      | 160                     | 160     | 160     |         |
| Coordination-type "2" according to IEC 947-4-1                                                                                                                |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| Light contact welding accepted                                                                                                                                |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| max. fuse size                                                                                                                                                | gL (gG) A                             | 25                              | 35      | 35      | 35      | 50                      | 50      | 50      | 100                     | 125     | 125     |         |
| Contact welding not accepted                                                                                                                                  |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| max. fuse size                                                                                                                                                | gL (gG) A                             | 16                              | 16      | 16      | 16      | 25                      | 35      | 35      | 50                      | 63      | 63      |         |
| For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size. |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| Cable cross-sections                                                                                                                                          |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| for contactors without thermal overload relay                                                                                                                 |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| main connector                                                                                                                                                | solid or stranded mm²                 | 0,75 - 6                        |         |         |         | 1,5 - 25                |         |         | 4 - 50                  |         |         |         |
|                                                                                                                                                               | flexible mm²                          | 1 - 4                           |         |         |         | 2,5 - 16                |         |         | 10 - 35                 |         |         |         |
|                                                                                                                                                               | flexible with multicore cable end mm² | 0,75 - 4                        |         |         |         | 1,5 - 16                |         |         | 6 - 35                  |         |         |         |
| Cables per clamp                                                                                                                                              |                                       | 2                               |         |         |         | 1                       |         |         | 1                       |         |         |         |
|                                                                                                                                                               | solid or stranded mm²                 | 6+(1-6) / 4+(0,75-4)            |         |         |         | 16+(2,5-6) / 10+(4-10)  |         |         | 50+4 / 35+6 / 25+(6-16) |         |         |         |
|                                                                                                                                                               |                                       | 2,5+(0,75-2,5) / 1,5+(0,75-1,5) |         |         |         | 6+(4-6) / 4+(2,5-4)     |         |         | 16+(6-16) / 10+(6-16)   |         |         |         |
|                                                                                                                                                               | flexible mm²                          | 6+(1,5-6) / 4+(1-4)             |         |         |         | 16+(2,5-6) / 10+(4-10)  |         |         | 50+(4-10) / 35+(4-16)   |         |         |         |
|                                                                                                                                                               |                                       | 2,5+(0,75-2,5) / 1,5+(0,75-1,5) |         |         |         | 6+(4-6) / 4+(2,5-4)     |         |         | 25+(4-25) / 16+(4-16)   |         |         |         |
| Cables per clamp                                                                                                                                              |                                       | 2                               |         |         |         | 2                       |         |         | 2                       |         |         |         |
| main connector                                                                                                                                                | solid AWG                             | 18 - 10                         |         |         |         | 16 - 10                 |         |         | 12 - 10                 |         |         |         |
|                                                                                                                                                               | flexible AWG                          | 18 - 10                         |         |         |         | 14 - 4                  |         |         | 10 - 0                  |         |         |         |
| Cables per clamp                                                                                                                                              |                                       | 2                               |         |         |         | 1                       |         |         | 1                       |         |         |         |
|                                                                                                                                                               | solid AWG                             | 10+(16-10) / 12+(18-12)         |         |         |         | 10+(16-10) / 12+(18-12) |         |         | 10+(12-10) / 12+12      |         |         |         |
|                                                                                                                                                               |                                       | 14+(18-14) / 16+(18-16)         |         |         |         | 14+(18-14) / 16+(18-16) |         |         |                         |         |         |         |
|                                                                                                                                                               | flexible AWG                          | 10+(14-10) / 12+(18-12)         |         |         |         | 4+(18-12) / 6+(18-8)    |         |         | 1+(12-10) / 2+(8-12)    |         |         |         |
|                                                                                                                                                               |                                       | 14+(18-14) / 16+(18-16)         |         |         |         | 8+(18-8) / 10+(18-12)   |         |         | 3+(12-8) / 4+(10-6)     |         |         |         |
| Cables per clamp                                                                                                                                              |                                       | 2                               |         |         |         | 2                       |         |         | 2                       |         |         |         |
| Frequency of operations z                                                                                                                                     |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| Contactors without thermal overload relay                                                                                                                     |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
|                                                                                                                                                               | without load 1/h                      | 10000                           | 10000   | 10000   | 10000   | 7000                    | 7000    | 7000    | 7000                    | 7000    | 7000    |         |
|                                                                                                                                                               | AC3, I <sub>o</sub> 1/h               | 600                             | 600     | 600     | 600     | 600                     | 600     | 600     | 400                     | 400     | 400     |         |
|                                                                                                                                                               | AC4, I <sub>o</sub> 1/h               | 120                             | 120     | 120     | 120     | 120                     | 120     | 120     | 120                     | 120     | 120     |         |
|                                                                                                                                                               | DC3, I <sub>o</sub> 1/h               | 600                             | 600     | 600     | 600     | 600                     | 600     | 600     | 400                     | 400     | 400     |         |
| Mechanical life                                                                                                                                               |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| AC operated                                                                                                                                                   | S x 10 <sup>6</sup>                   | 10                              | 10      | 10      | 10      | 10                      | 10      | 10      | 10                      | 10      | 10      |         |
| DC operated                                                                                                                                                   | S x 10 <sup>6</sup>                   | 10                              | 10      | 10      | 10      | 10                      | 10      | 10      | 10                      | 10      | 10      |         |
| Short time current                                                                                                                                            | 10s-current A                         | 96                              | 120     | 144     | 176     | 184                     | 240     | 296     | 360                     | 504     | 592     |         |
| Power loss per pole                                                                                                                                           | at I <sub>o</sub> /AC3 400V W         | 0,21                            | 0,35    | 0,5     | 0,75    | 0,7                     | 1,3     | 2       | 2,2                     | 3,9     | 5,5     |         |
| Resistance to shock acc. to IEC 68-2-27                                                                                                                       |                                       |                                 |         |         |         |                         |         |         |                         |         |         |         |
| Shock time 20ms sine-wave                                                                                                                                     | NO g                                  | 10                              | 10      | 10      | 10      | 8                       | 8       | 8       | 8                       | 8       | 8       |         |
|                                                                                                                                                               | NC g                                  | 6                               | 6       | 6       | 6       | -                       | -       | -       | -                       | -       | -       |         |

\*1) Suitable at 690V for: earthed-neutral systems, overvoltage I to IV, pollution degree 3 (standard-industry): U<sub>imp</sub> = 8kV.

Data for other conditions on request.

\*2) Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps)

\*3) High-pressure lamps

\*4) Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a fluorescent glass bulb (daylight lamps)

\*5) Current inrush approx. 16 x I<sub>o</sub>

\*6) With reduced control voltage range 0,9 up to 1,0 x U<sub>s</sub> and with reduced rated current I<sub>o</sub>/AC1 according to I<sub>o</sub>/AC3

| Main Contacts                                                                  |             | Type                 | J7KN-85 | J7KN-110 | J7KN-150 | J7KN-175 | J7KN-200 |
|--------------------------------------------------------------------------------|-------------|----------------------|---------|----------|----------|----------|----------|
| Rated insulation voltage $U_i$ <sup>1)</sup>                                   |             | V AC                 | 750     | 750      | 690      | 690      | 690      |
| Making capacity $I_m$                                                          |             | at $U_s = 690V$ AC A | 1100    | 1200     | 1500     | 1800     | 1700     |
| Breaking capacity $I_{bn}$                                                     |             | 400V AC A            | 950     | 1100     | 1200     | 1400     | 1600     |
| J7KN-10 to J7KN-22 $\cos\phi = 0,65$                                           |             | 500V AC A            | 850     | 1000     | 1200     | 1400     | 1600     |
| J7KN-24 to J7KN-72 $\cos\phi = 0,35$                                           |             | 690V AC A            | 600     | 600      | 700      | 800      | 1200     |
|                                                                                |             | 1000V AC A           | -       | -        | -        | -        | -        |
| <b>Utilization category AC1</b>                                                |             |                      |         |          |          |          |          |
| <b>Switching of resistive load</b>                                             |             |                      |         |          |          |          |          |
| Rated operational current $I_n (=I_{n0})$ at 40°C, open                        |             | A                    | 150     | 170      | 200      | 250      | 350      |
| Rated operational power of three-phase resistive loads 50-60Hz, $\cos\phi = 1$ | 220V kW     |                      | 57      | 64       | 72       | 90       | 125      |
|                                                                                | 230V kW     |                      | 59      | 67       | 72       | 90       | 125      |
|                                                                                | 240V kW     |                      | 62      | 70       | 75       | 94       | 130      |
|                                                                                | 380V kW     |                      | 98      | 111      | 125      | 156      | 218      |
|                                                                                | 400V kW     |                      | 103     | 117      | 125      | 156      | 218      |
|                                                                                | 415V kW     |                      | 107     | 122      | 130      | 160      | 225      |
|                                                                                | 440V kW     |                      | 114     | 129      | 144      | 180      | 250      |
|                                                                                | 500V kW     |                      | 130     | 147      | 164      | 205      | 285      |
|                                                                                | 660V kW     |                      | 171     | 194      | 216      | 270      | 380      |
|                                                                                | 690V kW     |                      | 179     | 203      | 216      | 270      | 380      |
|                                                                                | 1000V kW    |                      | -       | -        | -        | -        | -        |
| Rated operational current $I_n (=I_{n0})$ at 60°C, enclosed                    |             | A                    | 100     | 125      | 160      | 200      | 280      |
| Rated operational power of three-phase resistive loads 50-60Hz, $\cos\phi = 1$ | 220V kW     |                      | 38      | 47       | 60       | 76       | 106      |
|                                                                                | 230V kW     |                      | 40      | 49       | 63       | 79       | 111      |
|                                                                                | 240V kW     |                      | 41      | 52       | 66       | 83       | 116      |
|                                                                                | 380V kW     |                      | 65      | 82       | 105      | 131      | 184      |
|                                                                                | 400V kW     |                      | 69      | 86       | 110      | 138      | 193      |
|                                                                                | 415V kW     |                      | 71      | 89       | 115      | 143      | 201      |
|                                                                                | 440V kW     |                      | 71      | 95       | 121      | 152      | 213      |
|                                                                                | 500V kW     |                      | 86      | 108      | 138      | 173      | 242      |
|                                                                                | 660V kW     |                      | 114     | 142      | 182      | 228      | 320      |
|                                                                                | 690V kW     |                      | 119     | 149      | 191      | 239      | 334      |
|                                                                                | 1000V kW    |                      | -       | -        | -        | -        | -        |
| Minimum cross-section of conductor at load with $I_n (=I_{n0})$                |             | mm <sup>2</sup>      | 50      | 70       | 95       | 120      | 185      |
| <b>Utilization category AC2 and AC3</b>                                        |             |                      |         |          |          |          |          |
| <b>Switching of three-phase motors</b>                                         |             |                      |         |          |          |          |          |
| Rated operational current $I_n$ open and enclosed                              | 220V A      |                      | 85      | 110      | 150      | 175      | 210      |
|                                                                                | 230V A      |                      | 85      | 110      | 150      | 175      | 210      |
|                                                                                | 240V A      |                      | 85      | 110      | 150      | 175      | 210      |
|                                                                                | 380-400V A  |                      | 85      | 110      | 150      | 175      | 210      |
|                                                                                | 415V A      |                      | 85      | 110      | 150      | 175      | 210      |
|                                                                                | 440V A      |                      | 85      | 110      | -        | -        | -        |
|                                                                                | 500V A      |                      | 60      | 60       | -        | -        | -        |
|                                                                                | 660-690V A  |                      | 57,5    | 57,5     | -        | -        | -        |
|                                                                                | 1000V A     |                      | -       | -        | -        | -        | -        |
|                                                                                |             |                      |         |          |          |          |          |
| Rated operational power of three-phase motors 50-60Hz                          | 220-230V kW |                      | 25      | 33       | 40       | 50       | 60       |
|                                                                                | 240V kW     |                      | 27      | 35       | 45       | 55       | 65       |
|                                                                                | 380-400V kW |                      | 45      | 55       | 75       | 90       | 110      |
|                                                                                | 415V kW     |                      | 49      | 63       | 80       | 95       | 115      |
|                                                                                | 440V kW     |                      | 49      | 63       | 85       | 100      | 125      |
|                                                                                | 500V kW     |                      | 55      | 75       | 75       | 100      | 132      |
|                                                                                | 660-690V kW |                      | 55      | 55       | 75       | 110      | 132      |
|                                                                                | 1000V kW    |                      | -       | -        | -        | -        | -        |
| <b>Utilization category AC4</b>                                                |             |                      |         |          |          |          |          |
| <b>Switching of squirrel cage motors, inching</b>                              |             |                      |         |          |          |          |          |
| Rated operational current $I_n (=I_{n0})$ open and enclosed                    | 220V A      |                      | 85      | 98       | 55       | 63       | 85       |
|                                                                                | 230V A      |                      | 85      | 98       | 55       | 63       | 85       |
|                                                                                | 240V A      |                      | 85      | 98       | 55       | 63       | 85       |
|                                                                                | 380-400V A  |                      | 85      | 85       | 55       | 63       | 85       |
|                                                                                | 415V A      |                      | 85      | 85       | -        | -        | -        |
|                                                                                | 440V A      |                      | 85      | 85       | -        | -        | -        |
|                                                                                | 500V A      |                      | 85      | 85       | -        | -        | -        |
|                                                                                | 660V A      |                      | 60      | 60       | -        | -        | -        |
|                                                                                | 690V A      |                      | 57,5    | 57,5     | -        | -        | -        |
|                                                                                | 1000V A     |                      | -       | -        | -        | -        | -        |

| Main Contacts                                                                    |                   | Type   | J7KN-85 | J7KN-110 | J7KN-150 | J7KN-175 | J7KN-200 |
|----------------------------------------------------------------------------------|-------------------|--------|---------|----------|----------|----------|----------|
| Rated operational power of three-phase motors 50-60Hz                            | 220-230V          | kW     | 25      | 30       | 15       | 18,5     | 25       |
|                                                                                  | 240V              | kW     | 27      | 32       | 15,5     | 19       | 26       |
|                                                                                  | 380-400V          | kW     | 45      | 45       | 25       | 30       | 45       |
|                                                                                  | 415V              | kW     | 49      | 49       | 25       | 33       | 45       |
|                                                                                  | 440V              | kW     | 49      | 49       | 30       | 34       | 48       |
|                                                                                  | 500V              | kW     | 55      | 55       | 25       | 30       | 55       |
|                                                                                  | 660-690V          | kW     | 55      | 55       | 25       | 30       | 55       |
| 1000V                                                                            | kW                | -      | -       | -        | -        | -        |          |
| Utilization category AC 5a<br>Switching of gas discharge lamps                   |                   |        |         |          |          |          |          |
| Rated operational current I <sub>o</sub> per pole at 220/230V                    |                   |        |         |          |          |          |          |
| Fluorescent lamps,                                                               |                   |        |         |          |          |          |          |
| uncompensated and serial compensated                                             | A                 | 100    | 120     | 120      | 140      | 180      |          |
| parallel compensated                                                             | A                 | 55     | 70      | 85       | 100      | 120      |          |
| dual-connection                                                                  | A                 | 112    | 144     | 120      | 140      | 180      |          |
| Metal halide lamps <sup>2</sup> ,                                                |                   |        |         |          |          |          |          |
| uncompensated                                                                    | A                 | 85     | 90      | 95       | 110      | 140      |          |
| parallel compensated                                                             | A                 | 55     | 70      | 75       | 85       | 110      |          |
| Mercury-vapour lamps <sup>3</sup> ,                                              |                   |        |         |          |          |          |          |
| uncompensated                                                                    | A                 | 112    | 144     | 120      | 140      | 180      |          |
| parallel compensated                                                             | A                 | 55     | 70      | 75       | 85       | 110      |          |
| Mixed light lamps <sup>4</sup>                                                   | A                 | 100    | 120     | 100      | 120      | 160      |          |
| Utilization category AC5b<br>Switching of incandescent lamps <sup>5</sup>        |                   |        |         |          |          |          |          |
| Rated operational current I <sub>o</sub> per pole at 220/230V                    | A                 | 69     | 75      | 100      | 120      | 160      |          |
| Utilization category AC6a<br>Transformer primary switching                       |                   |        |         |          |          |          |          |
| at inrush                                                                        |                   | n      | 30      | 30       | 30       | 30       | 30       |
| Rated operational current I <sub>o</sub>                                         | 400V              | A      | 38      | 50       | 65       | 80       | 90       |
| Rated operational power dependent on inrush n                                    | 220-230V          | kVA    | 15      | 20       | 25       | 30       | 34       |
|                                                                                  | 240V              | kVA    | 15,5    | 20,5     | 27       | 33       | 37       |
|                                                                                  | 380-400V          | kVA    | 26      | 34       | 45       | 55       | 60       |
| For different inrush-factors x use the following formula: Px=Pn*(n/x)            | 415-440V          | kVA    | 29      | 38       | 46       | 57       | 63       |
|                                                                                  | 500V              | kVA    | 33      | 43       | 55       | 69       | 75       |
|                                                                                  | 660-690V          | kVA    | 45      | 60       | 56       | 69       | 100      |
| Utilization category AC6b<br>Switching of three-phase capacitor banks            |                   |        |         |          |          |          |          |
| Maximum inrush current (peak value) as multiple k of the capacitor rated current |                   | k      | 20      | 20       | 20       | 20       | 15       |
| Rated operational current I <sub>o</sub>                                         | 500V              | A      | 87      | 100      | 120      | 155      | 195      |
| Rated operational power (sinφ→1)                                                 | 220-230V          | kVAr   | 33      | 38       | 45       | 60       | 75       |
|                                                                                  | 240V              | kVAr   | 36      | 42       | 52       | 62       | 78       |
|                                                                                  | 380-400V          | kVAr   | 57      | 65       | 80       | 100      | 130      |
| For different multiples x use the following formula: Px=Pk*(k/x)                 | 415-440V          | kVAr   | 60      | 70       | 95       | 110      | 135      |
|                                                                                  | 500V              | kVAr   | 70      | 80       | 100      | 130      | 170      |
|                                                                                  | 660-690V          | kVAr   | 70      | 80       | 100      | 130      | 170      |
| Switching of detuned capacitors                                                  |                   |        |         |          |          |          |          |
| Rated operational current I <sub>o</sub>                                         | 690V              | A      | 98      | 105      | 115      | 140      | 200      |
| Rated operational power                                                          | 220-230V          | kVAr   | 35      | 40       | 43       | 53       | 76       |
|                                                                                  | 240V              | kVAr   | 39      | 43       | 45       | 55       | 80       |
|                                                                                  | 380-400V          | kVAr   | 68      | 75       | 75       | 90       | 130      |
|                                                                                  | 415-440V          | kVAr   | 71      | 77       | 80       | 100      | 140      |
|                                                                                  | 500V              | kVAr   | 85      | 90       | 95       | 120      | 170      |
|                                                                                  | 660-690V          | kVAr   | 110     | 120      | 125      | 150      | 200      |
| Utilization category DC1<br>Switching of resistive load                          |                   |        |         |          |          |          |          |
| Time constant L/R ≤1ms                                                           |                   |        |         |          |          |          |          |
| Rated operational current I <sub>o</sub>                                         | 1 pole            | 24V A  | 150     | 170      | -        | -        | -        |
|                                                                                  |                   | 60V A  | 150     | 170      | -        | -        | -        |
|                                                                                  |                   | 110V A | 20      | 25       | -        | -        | -        |
|                                                                                  |                   | 220V A | 2       | 2,5      | -        | -        | -        |
|                                                                                  | 3 poles in series | 24V A  | 150     | 170      | 200      | 250      | 350      |
|                                                                                  |                   | 60V A  | 150     | 170      | 200      | 250      | 350      |
|                                                                                  |                   | 110V A | 150     | 170      | 150      | 170      | 250      |
|                                                                                  |                   | 220V A | 100     | 160      | 80       | 100      | 150      |

| Main Contacts                                                                                                                                                 |                                                   | Type                           | J7KN-85               | J7KN-110 | J7KN-150                       | J7KN-175 | J7KN-200 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------|-----------------------|----------|--------------------------------|----------|----------|
| Utilization category DC3 and DC5                                                                                                                              |                                                   |                                |                       |          |                                |          |          |
| Switching of shunt motors and series motors                                                                                                                   |                                                   |                                |                       |          |                                |          |          |
| Time constant L/R ≤15ms                                                                                                                                       |                                                   |                                |                       |          |                                |          |          |
| Rated operational current I <sub>o</sub>                                                                                                                      | 1 pole 24V A                                      |                                | 150                   | 170      | -                              | -        | -        |
|                                                                                                                                                               |                                                   | 60V A                          | 85                    | 110      | -                              | -        | -        |
|                                                                                                                                                               |                                                   | 110V A                         | 2                     | 2,5      | -                              | -        | -        |
|                                                                                                                                                               |                                                   | 220V A                         | 0,5                   | 0,5      | -                              | -        | -        |
|                                                                                                                                                               | 3 poles in series 24V A                           |                                | 150                   | 170      | -                              | -        | -        |
|                                                                                                                                                               |                                                   | 60V A                          | 100                   | 110      | -                              | -        | -        |
|                                                                                                                                                               |                                                   | 110V A                         | 100                   | 110      | -                              | -        | -        |
|                                                                                                                                                               |                                                   | 220V A                         | 7                     | 8        | -                              | -        | -        |
| Maximum ambient temperature                                                                                                                                   |                                                   |                                |                       |          |                                |          |          |
| Operation                                                                                                                                                     | open °C                                           | -40 to +60 (+90) <sup>16</sup> |                       |          | -25 to +55 (+70) <sup>17</sup> |          |          |
|                                                                                                                                                               | enclosed °C                                       | -40 to +40                     |                       |          | -25 to +40                     |          |          |
| with thermal overload relay                                                                                                                                   | open °C                                           | -25 to +60                     |                       |          | -25 to +55                     |          |          |
| enclosed                                                                                                                                                      | °C                                                | -25 to +40                     |                       |          | -25 to +40                     |          |          |
| Storage                                                                                                                                                       | °C                                                | -50 to +90                     |                       |          | -55 to +80                     |          |          |
| Short circuit protection                                                                                                                                      |                                                   |                                |                       |          |                                |          |          |
| for contactors without thermal overload relay                                                                                                                 |                                                   |                                |                       |          |                                |          |          |
| Coordination-type "1" according to IEC 947-4-1                                                                                                                |                                                   |                                |                       |          |                                |          |          |
| Contact welding without hazard of persons                                                                                                                     |                                                   |                                |                       |          |                                |          |          |
| max. fuse size                                                                                                                                                | gL (gG) A                                         |                                | 250                   | 250      | 250                            | 315      | 400      |
| Coordination-type "2" according to IEC 947-4-1                                                                                                                |                                                   |                                |                       |          |                                |          |          |
| Light contact welding accepted                                                                                                                                |                                                   |                                |                       |          |                                |          |          |
| max. fuse size                                                                                                                                                | gL (gG) A                                         |                                | 160                   | 200      | 200                            | 250      | 315      |
| Contact welding not accepted                                                                                                                                  |                                                   |                                |                       |          |                                |          |          |
| max. fuse size                                                                                                                                                | gL (gG) A                                         |                                | 100                   | 125      | 160                            | 200      | 250      |
| For contactors with thermal overload relay the device with the smaller admissible backup fuse (contactor or thermal overload relay) determines the fuse size. |                                                   |                                |                       |          |                                |          |          |
| Cable cross-sections                                                                                                                                          |                                                   |                                |                       |          |                                |          |          |
| for contactors without thermal overload relay                                                                                                                 |                                                   |                                |                       |          |                                |          |          |
| main connector                                                                                                                                                | solid or stranded mm <sup>2</sup>                 | 10 - 70 <sup>18</sup>          | 10 - 70 <sup>18</sup> | 95       | 120                            | 185      |          |
|                                                                                                                                                               | flexible mm <sup>2</sup>                          | 6 - 50 <sup>18</sup>           | 16 - 50 <sup>18</sup> | screw    | screw                          | screw    |          |
|                                                                                                                                                               | flexible with multicore cable end mm <sup>2</sup> | 10 - 35                        | 10 - 35               | M8       | M8                             | M8       |          |
| Cables per clamp                                                                                                                                              |                                                   |                                |                       |          |                                |          |          |
|                                                                                                                                                               | solid or stranded mm <sup>2</sup>                 |                                |                       |          |                                |          |          |
|                                                                                                                                                               | flexible mm <sup>2</sup>                          |                                |                       |          |                                |          |          |
| Cables per clamp                                                                                                                                              |                                                   |                                |                       |          |                                |          |          |
| main connector                                                                                                                                                | solid AWG                                         | 10                             | 10                    |          |                                |          |          |
|                                                                                                                                                               | flexible AWG                                      | 6 - 0                          | 6 - 0                 |          |                                |          |          |
| Cables per clamp                                                                                                                                              |                                                   | 1                              | 1                     |          |                                |          |          |
|                                                                                                                                                               | solid AWG                                         |                                |                       |          |                                |          |          |
|                                                                                                                                                               | flexible AWG                                      |                                |                       |          |                                |          |          |
| Cables per clamp                                                                                                                                              |                                                   |                                |                       |          |                                |          |          |
| Frequency of operations z                                                                                                                                     |                                                   |                                |                       |          |                                |          |          |
| Contactors without thermal overload relay                                                                                                                     |                                                   |                                |                       |          |                                |          |          |
|                                                                                                                                                               | without load 1/h                                  | 3000                           | 3000                  | 1200     | 1200                           | 1200     |          |
|                                                                                                                                                               | AC3, I <sub>n</sub> 1/h                           | 300                            | 300                   | -        | -                              | -        |          |
|                                                                                                                                                               | AC4, I <sub>n</sub> 1/h                           | 120                            | 120                   | -        | -                              | -        |          |
|                                                                                                                                                               | DC3, I <sub>n</sub> 1/h                           | 300                            | 300                   | -        | -                              | -        |          |
| Mechanical life                                                                                                                                               |                                                   |                                |                       |          |                                |          |          |
| AC operated                                                                                                                                                   | S x 10 <sup>6</sup>                               | 5                              | 5                     | 10       | 10                             | 8        |          |
| DC operated                                                                                                                                                   | S x 10 <sup>6</sup>                               | 5                              | 5                     | 10       | 10                             | 8        |          |
| Short time current                                                                                                                                            |                                                   |                                |                       |          |                                |          |          |
|                                                                                                                                                               | 10s-current A                                     | 680                            | 880                   | 1200     | 1400                           | 1800     |          |
| Power loss per pole                                                                                                                                           |                                                   |                                |                       |          |                                |          |          |
|                                                                                                                                                               | at I <sub>o</sub> /AC3 400V W                     | 4,3                            | 6,0                   | 8        | 11                             | 8        |          |
| Resistance to shock acc. to IEC 68-2-27                                                                                                                       |                                                   |                                |                       |          |                                |          |          |
| Shock time 20ms sine-wave                                                                                                                                     | NO g                                              | 7                              | 7                     | -        | -                              | -        |          |
|                                                                                                                                                               | NC g                                              | 5                              | 5                     | -        | -                              | -        |          |

\*1) Suitable at 690V for: earthed-neutral systems, overvoltage I to IV, pollution degree 3 (standard-industry):

U<sub>imp</sub> = 8kV. Data for other conditions on request.

\*2) Metal halide lamps and sodium-vapour lamps (high- and low-pressure lamps)

\*3) High-pressure lamps

\*4) Blended lamps, containing a mercury high-pressure unit and a tungsten helix in a fluorescent glass bulb (daylight lamps)

\*5) Current inrush approx. 16 x I<sub>o</sub>

\*6) With reduced control voltage range 0,9 up to 1,0 x U<sub>s</sub> and with reduced rated current I<sub>o</sub>/AC1 according to I<sub>o</sub>/AC3

\*7) With reduced control voltage range 1,0 x U<sub>s</sub> and with reduced rated current I<sub>o</sub>/AC1 according to I<sub>o</sub>/AC3

\*8) Maximum cable cross-section with prepared conductor

## Contactors

### Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

| Auxiliary Contacts                                                                                                                                        |                                       | Type     | J7KN-10 | J7KN-14 | J7KN-18 | J7KN-22  | J7KN-24 | J7KN-32 | J7KN-40  | J7KN-50 | J7KN-62 | J7KN-74 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|----------|---------|---------|---------|----------|---------|---------|----------|---------|---------|---------|
| Rated insulation voltage U <sub>i</sub> <sup>1</sup>                                                                                                      |                                       | V~       | 690     | 690     | 690     | 690      | -       | -       | -        | -       | -       | -       |
| Thermal rated current I <sub>n</sub> to 690V                                                                                                              |                                       |          |         |         |         |          |         |         |          |         |         |         |
| Ambient temperature                                                                                                                                       | 40°C A                                | 16       | 16      | 16      | 16      | -        | -       | -       | -        | -       | -       | -       |
|                                                                                                                                                           | 60°C A                                | 12       | 12      | 12      | 12      | -        | -       | -       | -        | -       | -       | -       |
| Utilization category AC15                                                                                                                                 |                                       |          |         |         |         |          |         |         |          |         |         |         |
| Rated operational current I <sub>L</sub>                                                                                                                  | 220-240V A                            | 12       | 12      | 12      | 12      | -        | -       | -       | -        | -       | -       | -       |
|                                                                                                                                                           | 380-415V A                            | 4        | 4       | 4       | 4       | -        | -       | -       | -        | -       | -       | -       |
|                                                                                                                                                           | 440V A                                | 4        | 4       | 4       | 4       | -        | -       | -       | -        | -       | -       | -       |
|                                                                                                                                                           | 500V A                                | 3        | 3       | 3       | 3       | -        | -       | -       | -        | -       | -       | -       |
|                                                                                                                                                           | 660-690V A                            | 1        | 1       | 1       | 1       | -        | -       | -       | -        | -       | -       | -       |
| Utilization category DC13                                                                                                                                 |                                       |          |         |         |         |          |         |         |          |         |         |         |
| Rated operational current I <sub>L</sub>                                                                                                                  | 60V A                                 | 8        | 8       | 8       | 8       | -        | -       | -       | -        | -       | -       | -       |
|                                                                                                                                                           | 110V A                                | 1        | 1       | 1       | 1       | -        | -       | -       | -        | -       | -       | -       |
|                                                                                                                                                           | 220V A                                | 0,1      | 0,1     | 0,1     | 0,1     | -        | -       | -       | -        | -       | -       | -       |
| Short circuit protection                                                                                                                                  |                                       |          |         |         |         |          |         |         |          |         |         |         |
| short-circuit current 1kA, contact welding not accepted                                                                                                   |                                       |          |         |         |         |          |         |         |          |         |         |         |
| max. fuse size                                                                                                                                            | gL (gG) A                             | 25       | 25      | 25      | 25      | -        | -       | -       | -        | -       | -       | -       |
| For contactors with thermal overload relay the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse. |                                       |          |         |         |         |          |         |         |          |         |         |         |
| Control Circuit                                                                                                                                           |                                       |          |         |         |         |          |         |         |          |         |         |         |
| Power consumption of coils                                                                                                                                |                                       |          |         |         |         |          |         |         |          |         |         |         |
| AC operated                                                                                                                                               | inrush VA                             | 33-45    |         |         |         | 90-115   |         |         | 140-165  |         |         |         |
|                                                                                                                                                           | sealed VA                             | 7-10     |         |         |         | 9-13     |         |         | 13-18    |         |         |         |
|                                                                                                                                                           | W                                     | 2,6-3    |         |         |         | 2,7-4    |         |         | 5,4-7    |         |         |         |
| DC operated                                                                                                                                               | inrush W                              | 75       |         |         |         | 140      |         |         | 200      |         |         |         |
|                                                                                                                                                           | sealed W                              | 2        |         |         |         | 2        |         |         | 6        |         |         |         |
| Operation range of coils                                                                                                                                  |                                       |          |         |         |         |          |         |         |          |         |         |         |
| in multiples of control voltage U <sub>c</sub>                                                                                                            | AC operated                           | 0,85-1,1 |         |         |         | 0,85-1,1 |         |         | 0,85-1,1 |         |         |         |
|                                                                                                                                                           | DC operated                           | 0,8-1,1  |         |         |         | 0,8-1,1  |         |         | 0,8-1,1  |         |         |         |
| Switching time at control voltage U <sub>c</sub> ±10% <sup>2,3</sup>                                                                                      |                                       |          |         |         |         |          |         |         |          |         |         |         |
| AC operated                                                                                                                                               | make time ms                          | 8-16     |         |         |         | 10-25    |         |         | 12-28    |         |         |         |
|                                                                                                                                                           | release time ms                       | 5-13     |         |         |         | 8-15     |         |         | 8-15     |         |         |         |
|                                                                                                                                                           | arc duration ms                       | 10-15    |         |         |         | 10-15    |         |         | 10-15    |         |         |         |
| DC operated                                                                                                                                               | make time ms                          | 8-12     |         |         |         | 10-20    |         |         | 12-23    |         |         |         |
|                                                                                                                                                           | release time ms                       | 8-13     |         |         |         | 10-15    |         |         | 10-18    |         |         |         |
|                                                                                                                                                           | arc duration ms                       | 10-15    |         |         |         | 10-15    |         |         | 10-15    |         |         |         |
| Cable cross-section                                                                                                                                       |                                       |          |         |         |         |          |         |         |          |         |         |         |
| Auxiliary connector                                                                                                                                       | solid mm²                             | 0,75-6   |         |         |         | -        |         |         | -        |         |         |         |
|                                                                                                                                                           | flexible mm²                          | 1-4      |         |         |         | -        |         |         | -        |         |         |         |
| flexible with multicore cable end                                                                                                                         | mm²                                   | 0,75-4   |         |         |         | -        |         |         | -        |         |         |         |
| Magnet coil                                                                                                                                               | solid mm²                             | 0,75-2,5 |         |         |         | 0,75-2,5 |         |         | 0,75-2,5 |         |         |         |
|                                                                                                                                                           | flexible mm²                          | 0,5-2,5  |         |         |         | 0,5-2,5  |         |         | 0,5-2,5  |         |         |         |
|                                                                                                                                                           | flexible with multicore cable end mm² | 0,5-1,5  |         |         |         | 0,5-1,5  |         |         | 0,5-1,5  |         |         |         |
| Clamps per pole                                                                                                                                           |                                       | 2        |         |         |         | 2        |         |         | 2        |         |         |         |
| Auxiliary connector                                                                                                                                       | solid AWG                             | 18 - 10  |         |         |         | -        |         |         | -        |         |         |         |
|                                                                                                                                                           | flexible AWG                          | 18 - 10  |         |         |         | -        |         |         | -        |         |         |         |
| Magnet coil                                                                                                                                               | solid AWG                             | 14 - 12  |         |         |         | 14 - 12  |         |         | 14 - 12  |         |         |         |
|                                                                                                                                                           | flexible AWG                          | 18 - 12  |         |         |         | 18 - 12  |         |         | 18 - 12  |         |         |         |
| Clamps per pole                                                                                                                                           |                                       | 2        |         |         |         | 2        |         |         | 2        |         |         |         |

\*1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ . Data for other conditions on request

\*2) Total breaking time = release time + arc duration

\*3) Values for delay of the release time of the making contact and the make time of the break contact will be increased, if magnet coils are protected against voltage peaks (varistor, RC-unit, diode-unit)

| Auxiliary Contacts                                                                                                                                              |                 | Type        | J7KN-85  | J7KN-110 | J7KN-150 | J7KN-175 | J7KN-200 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|----------|----------|----------|----------|----------|
| Rated insulation voltage $U_i^{*1}$                                                                                                                             |                 | V~          | 690      | 690      | 690      | 690      | 690      |
| Thermal rated current $I_n$ to 690V                                                                                                                             |                 |             |          |          |          |          |          |
| Ambient temperature                                                                                                                                             |                 | 40°C A      | 16       | 16       | 10       | 10       | 10       |
|                                                                                                                                                                 |                 | 60°C A      | 12       | 12       | -        | -        | -        |
| <b>Utilization category AC15</b>                                                                                                                                |                 |             |          |          |          |          |          |
| Rated operational current $I_e$                                                                                                                                 |                 | 220-240V A  | 12       | 12       | 3        | 3        | 3        |
|                                                                                                                                                                 |                 | 380-415V A  | 6        | 6        | 2        | 2        | 2        |
|                                                                                                                                                                 |                 | 440V A      | 6        | 6        | 1,5      | 1,5      | 1,5      |
|                                                                                                                                                                 |                 | 500V A      | 4        | 4        | 1,5      | 1,5      | 1,5      |
|                                                                                                                                                                 |                 | 660-690V A  | 2        | 2        | 1        | 1        | 1        |
| <b>Utilization category DC13</b>                                                                                                                                |                 |             |          |          |          |          |          |
| Rated operational current $I_e$                                                                                                                                 |                 | 60V A       | 8        | 8        | -        | -        | -        |
|                                                                                                                                                                 |                 | 110V A      | 1        | 1        | 0,5      | 0,5      | 1        |
|                                                                                                                                                                 |                 | 220V A      | 0,1      | 0,1      | 0,2      | 0,2      | 0,5      |
| <b>Short circuit protection</b>                                                                                                                                 |                 |             |          |          |          |          |          |
| short-circuit current 1kA,<br>contact welding not accepted                                                                                                      |                 |             |          |          |          |          |          |
| max. fuse size                                                                                                                                                  |                 | gL (gG) A   | 25       | 25       | 10       | 10       | 10       |
| For contactors with thermal overload relay the device with<br>the smaller admissible control fuse (contactor or thermal<br>overload relay) determines the fuse. |                 |             |          |          |          |          |          |
| <b>Control Circuit</b>                                                                                                                                          |                 |             |          |          |          |          |          |
| <b>Power consumption of coils</b>                                                                                                                               |                 |             |          |          |          |          |          |
| AC operated                                                                                                                                                     | inrush VA       |             | 280-350  | 350-420  | 550      | 550      | 1100     |
|                                                                                                                                                                 | sealed VA       |             | 16 -23   | 23 -29   | 120      | 120      | 66       |
|                                                                                                                                                                 | W               |             | 4-6      | 6-7,3    | -        | -        | -        |
| DC operated                                                                                                                                                     | inrush W        |             | 170      | 320      | 160      | 160      | 530      |
|                                                                                                                                                                 | sealed W        |             | 2        | 4        | 5        | 5        | 21       |
| <b>Operation range of coils</b>                                                                                                                                 |                 |             |          |          |          |          |          |
| in multiples of control voltage $U_c$                                                                                                                           |                 | AC operated | 0,85-1,1 |          | 0,85-1,1 | 0,85-1,1 | 0,85-1,1 |
|                                                                                                                                                                 |                 | DC operated | 0,8-1,1  |          | 0,85-1,1 | 0,85-1,1 | 0,85-1,1 |
| <b>Switching time</b> at control voltage $U_c \pm 10\%^{*2,*3}$                                                                                                 |                 |             |          |          |          |          |          |
| AC operated                                                                                                                                                     | make time ms    |             | 13-30    |          | 12-30    | 12-30    | 30-40    |
|                                                                                                                                                                 | release time ms |             | 8-15     |          | 15-40    | 15-40    | 15-45    |
|                                                                                                                                                                 | arc duration ms |             | 10-15    |          | -        | -        | -        |
| DC operated                                                                                                                                                     | make time ms    |             | 20-30    |          | -        | -        | -        |
|                                                                                                                                                                 | release time ms |             | 10-18    |          | -        | -        | -        |
|                                                                                                                                                                 | arc duration ms |             | 10-15    |          | -        | -        | -        |
| <b>Cable cross-section</b>                                                                                                                                      |                 |             |          |          |          |          |          |
| Auxiliary connector                                                                                                                                             | solid mm²       |             | 0,75-2,5 |          | 0,75-2,5 |          |          |
|                                                                                                                                                                 | flexible mm²    |             | 0,75-2,5 |          | 0,75-2,5 |          |          |
| flexible with multicore cable end                                                                                                                               | mm²             |             | 0,5-1,5  |          | -        |          |          |
|                                                                                                                                                                 |                 |             |          |          |          |          |          |
| Magnet coil                                                                                                                                                     | solid mm²       |             | 0,75-2,5 |          | 1-2,5    |          |          |
|                                                                                                                                                                 | flexible mm²    |             | 0,5-2,5  |          | 1-2,5    |          |          |
| flexible with multicore cable end                                                                                                                               | mm²             |             | 0,5-1,5  |          | -        |          |          |
|                                                                                                                                                                 |                 |             |          |          |          |          |          |
| Clamps per pole                                                                                                                                                 |                 |             | 14 - 12  |          | 16 - 12  |          |          |
| Auxiliary connector                                                                                                                                             | solid AWG       |             | 18 - 12  |          | 16 - 12  |          |          |
|                                                                                                                                                                 | flexible AWG    |             | 14 - 12  |          | 16 - 12  |          |          |
| Magnet coil                                                                                                                                                     | solid AWG       |             | 18 - 12  |          | 16 - 12  |          |          |
|                                                                                                                                                                 | flexible AWG    |             | 2        |          | 2        |          |          |
| Clamps per pole                                                                                                                                                 |                 |             | 0,75-2,5 |          | 0,75-2,5 |          |          |

\*1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ . Data for other conditions on request

\*2) Total breaking time = release time + arc duration

\*3) Values for delay of the release time of the making contact and the make time of the break contact will be increased, if magnet coils are protected against voltage peaks (varistor, RC-unit, diode-unit)

# Contactors for North America

## Data according to UL508

| Main Contacts (cULus)                                                     | Type                                                                                          | J7KN-10                           | J7KN-14                           | J7KN-18                              | J7KN-22                              | J7KN-24                               | J7KN-32                               | J7KN-40                                | J7KN-50                                | J7KN-62                                | J7KN-74                                |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|--------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| Rated operational current "General Use"                                   | A                                                                                             | 25                                | 25                                | 30                                   | 30                                   | 50                                    | 65                                    | 80                                     | 110                                    | 120                                    | 130                                    |
| Rated operational power of three-phase motors at 60Hz (3ph)               | 110-120V hp<br>200V hp<br>220-240V hp<br>277V hp<br>380-415V hp<br>440-480V hp<br>550-600V hp | 1½<br>3<br>3<br>3<br>5<br>5<br>7½ | 2<br>3<br>3<br>5<br>5<br>7½<br>10 | 2<br>5<br>7½<br>7½<br>10<br>10<br>15 | 3<br>5<br>7½<br>7½<br>10<br>15<br>20 | 5<br>7½<br>10<br>7½<br>10<br>15<br>20 | 5<br>10<br>10<br>10<br>15<br>20<br>25 | 7½<br>10<br>15<br>15<br>20<br>25<br>30 | 10<br>15<br>20<br>20<br>25<br>30<br>40 | 10<br>20<br>25<br>25<br>30<br>40<br>50 | 10<br>25<br>30<br>30<br>40<br>50<br>50 |
| Rated operational power of AC motors at 60Hz (1ph)                        | 110-120V hp<br>200V hp<br>220-240V hp<br>277V hp<br>380-415V hp<br>440-480V hp<br>550-600V hp | ½<br>1<br>1½<br>2<br>3<br>3<br>3  | ¾<br>1,5<br>2<br>3<br>3<br>5<br>5 | 1<br>2<br>3<br>3<br>5<br>5<br>7½     | 1½<br>3<br>3<br>5<br>5<br>7½<br>10   | 1½<br>3<br>5<br>5<br>5<br>7½<br>10    | 2<br>5<br>5<br>7½<br>7½<br>10<br>15   | 3<br>7½<br>7½<br>10<br>10<br>15<br>20  | 3<br>7½<br>10<br>10<br>15<br>20<br>25  | 5<br>10<br>15<br>15<br>20<br>25<br>30  | 7½<br>15<br>15<br>15<br>20<br>25<br>30 |
| Rated operational power of three-phase motors at 60Hz (3ph) for elevators | 110-120V hp<br>200V hp<br>220-240V hp                                                         | -<br>-<br>-                       | -<br>-<br>-                       | -<br>-<br>-                          | -<br>-<br>-                          | 2<br>3<br>5                           | 3<br>5<br>7½                          | -<br>-<br>-                            | 3<br>7½<br>7½                          | 5<br>10<br>10                          | -<br>-<br>-                            |
| Demands according to ANSI A17.5 (500.000 operations)                      | 440-480V hp<br>550-600V hp                                                                    | -<br>-                            | -<br>-                            | -<br>-                               | -<br>-                               | 10<br>10                              | 15<br>20                              | -<br>-                                 | 20<br>25                               | 25<br>30                               | -<br>-                                 |
| Rated operational current                                                 | 600V A                                                                                        | -                                 | -                                 | -                                    | -                                    | 15                                    | 22                                    | -                                      | 27                                     | 37                                     | -                                      |
| Fuses                                                                     | A                                                                                             | 30                                | 40                                | 50                                   | 50                                   | 90                                    | 125                                   | 175                                    | 175                                    | 225                                    | 250                                    |
| Suitable for use on a capability of delivering not more than              | rms A<br>V                                                                                    | 5000<br>600                       | 5000<br>600                       | 5000<br>600                          | 5000<br>600                          | 5000<br>600                           | 5000<br>600                           | 5000<br>600                            | 5000<br>600                            | 5000<br>600                            | 5000<br>600                            |
| Auxiliary Contacts (cULus)                                                |                                                                                               | A600                              | A600                              | A600                                 | A600                                 | -                                     | -                                     | -                                      | -                                      | -                                      | -                                      |

| Main Contacts (cULus)                                                     | Type                                                                                          | J7KN-85                             | J7KN-110                             | J7KN-150                        | J7KN-175                        | J7KN-200                        |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Rated operational current "General Use"                                   | A                                                                                             | 125                                 | 125                                  | -                               | -                               | -                               |
| Rated operational power of three-phase motors at 60Hz (3ph)               | 110-120V hp<br>200V hp<br>220-240V hp<br>277V hp<br>380-415V hp<br>440-480V hp<br>550-600V hp | 15<br>-<br>35<br>-<br>-<br>65<br>85 | -<br>30<br>40<br>-<br>-<br>75<br>100 | -<br>-<br>-<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-<br>- |
| Rated operational power of AC motors at 60Hz (1ph)                        | 110-120V hp<br>200V hp<br>220-240V hp<br>277V hp<br>380-415V hp<br>440-480V hp<br>550-600V hp | 8<br>-<br>20<br>-<br>-<br>-<br>-    | 10<br>20<br>20<br>-<br>-<br>50<br>60 | -<br>-<br>-<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-<br>- | -<br>-<br>-<br>-<br>-<br>-<br>- |
| Rated operational power of three-phase motors at 60Hz (3ph) for elevators | 110-120V hp<br>200V hp<br>220-240V hp                                                         | -<br>-<br>-                         | -<br>-<br>-                          | -<br>-<br>-                     | -<br>-<br>-                     | -<br>-<br>-                     |
| Demands according to ANSI A17.5 (500.000 operations)                      | 440-480V hp<br>550-600V hp                                                                    | -<br>-                              | -<br>-                               | -<br>-                          | -<br>-                          | -<br>-                          |
| Rated operational current                                                 | 600V A                                                                                        | -                                   | 62                                   | -                               | -                               | -                               |
| Fuses                                                                     | A                                                                                             | -                                   | 300                                  | -                               | -                               | -                               |
| Suitable for use on a capability of delivering not more than              | rms A<br>V                                                                                    | 10000<br>600                        | 10000<br>600                         | -<br>-                          | -<br>-                          | -<br>-                          |
| Auxiliary Contacts (cULus)                                                |                                                                                               | A600                                | A600                                 | -                               | -                               | -                               |

# Contactors

## Data according to IEC 947-4-1, EN 60947-4-1, VDE 0660

### Contact Life

For selection of the suitable contactor-type according to supply voltage, power rating and application (utilization category AC1, AC3 or AC4) use contact life characteristic diagram.

For the most common supply voltages four scales of power ratings  $P_n$  are provided for each utilization category.

Select contactor-type according to utilization category **AC3** (breaking current  $I_a = I_n$ ) using the **motor rating** scales to the right, according to utilization category **AC4** (breaking current  $I_a = 6 \times I_n$ ) using the **motor rating** scales to the left.<sup>1)</sup>

Select contactor-type according to utilization category **AC1** (breaking current  $I_a = I_n/AC1$ ) using the **breaking current** scale.<sup>1)</sup>

For contactors frequently used under AC3/AC4-mixed service conditions calculate contact life with the formula:

$$M = \frac{AC3}{1 + \frac{\%AC4}{100} \times \left( \frac{AC3}{AC4} - 1 \right)}$$

M = Contact life (switching cycles) for AC3/AC4-mixed operations

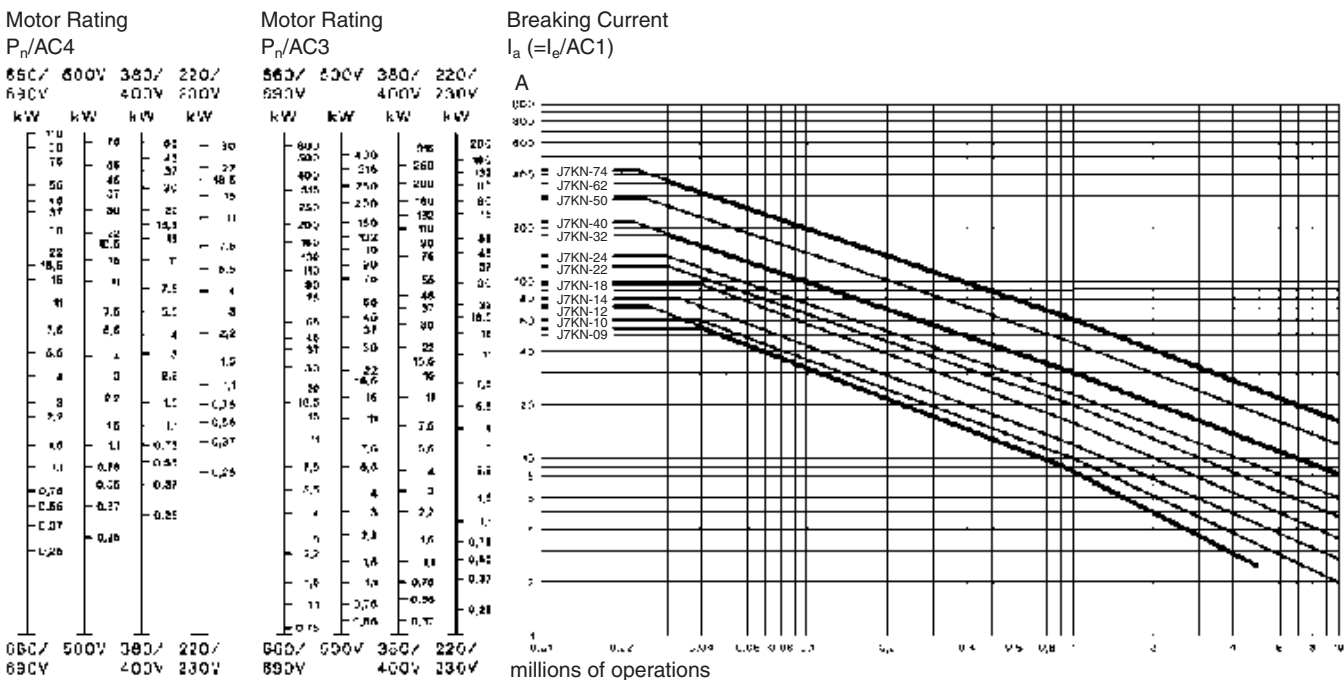
AC3 = Contact life (switching cycles) for AC3 operations (normal switching conditions). Breaking current  $I_a$  = rated motor current  $I_n$ .

AC4 = Contact life (switching cycles) for AC4 operations (inching).

Breaking current  $I_a$  = multiples of rated motor current  $I_n$ .

%AC4 = Percents of AC4-operations related to the total cycles.

1. Pay attention to the approved rated values of the selected contactor according to the national approvals



Motor Rating

$P_n/AC4$

660V 500V 380V 220V  
590V 400V 230V

| kW  | kVA | kW   | kVA |
|-----|-----|------|-----|
| 300 | 400 | 216  | 280 |
| 250 | 330 | 180  | 230 |
| 200 | 260 | 144  | 180 |
| 150 | 200 | 108  | 140 |
| 100 | 130 | 72   | 90  |
| 75  | 90  | 54   | 60  |
| 50  | 60  | 36   | 40  |
| 30  | 30  | 21.6 | 28  |
| 25  | 25  | 18   | 23  |
| 20  | 20  | 14.4 | 18  |
| 15  | 15  | 10.8 | 14  |
| 10  | 10  | 7.2  | 9   |
| 7.5 | 7.5 | 5.4  | 6   |
| 5   | 5   | 3.6  | 4   |
| 3   | 3   | 2.16 | 2.8 |
| 2.5 | 2.5 | 1.8  | 2.3 |
| 2   | 2   | 1.44 | 1.8 |
| 1.5 | 1.5 | 1.08 | 1.4 |

Motor Rating

$P_n/AC3$

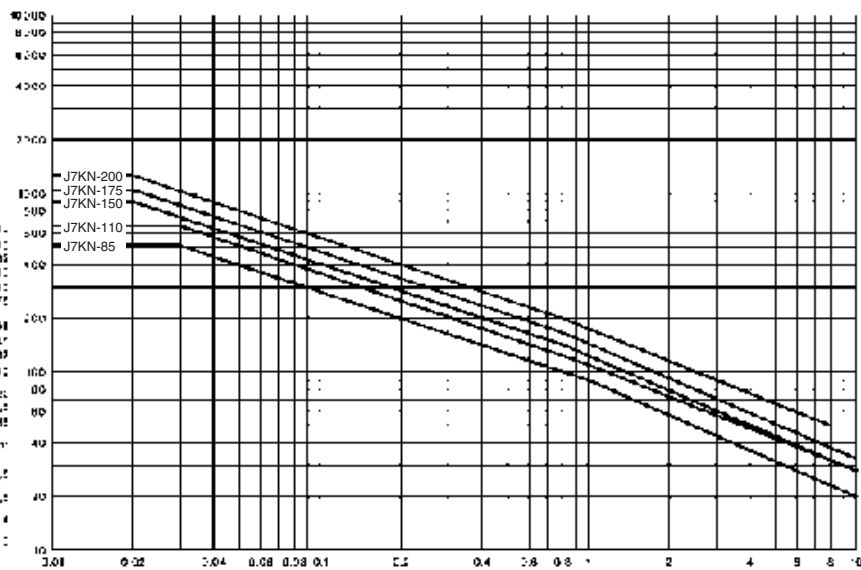
660V 500V 380V 220V  
590V 400V 230V

| kW  | kVA | kW   | kVA |
|-----|-----|------|-----|
| 300 | 400 | 216  | 280 |
| 250 | 330 | 180  | 230 |
| 200 | 260 | 144  | 180 |
| 150 | 200 | 108  | 140 |
| 100 | 130 | 72   | 90  |
| 75  | 90  | 54   | 60  |
| 50  | 60  | 36   | 40  |
| 30  | 30  | 21.6 | 28  |
| 25  | 25  | 18   | 23  |
| 20  | 20  | 14.4 | 18  |
| 15  | 15  | 10.8 | 14  |
| 10  | 10  | 7.2  | 9   |
| 7.5 | 7.5 | 5.4  | 6   |
| 5   | 5   | 3.6  | 4   |
| 3   | 3   | 2.16 | 2.8 |
| 2.5 | 2.5 | 1.8  | 2.3 |
| 2   | 2   | 1.44 | 1.8 |
| 1.5 | 1.5 | 1.08 | 1.4 |

Breaking Current

$I_a (=I_e/AC1)$

A



millions of operations

## Contactors

### Utilization Categories

For easier choice of devices and in order to make the comparison of different products simpler are utilization categories for contactors and motor-starters according to IEC 947-4-1 and VDE 0660 Part 102, for

control circuit devices and switching elements according to IEC 947-5-1 and VDE 0660 Part 200 determined. The table offers different utilization categories, typical applications and assorted test conditions.

| Type of current     | Category | Typical applications                                                                        | Rated operational current | Test conditions for the number of on-load operating cycles |                  |             |                                         |                                |             | Test conditions for making and breaking capacities |                  |             |                                         |                                |             |
|---------------------|----------|---------------------------------------------------------------------------------------------|---------------------------|------------------------------------------------------------|------------------|-------------|-----------------------------------------|--------------------------------|-------------|----------------------------------------------------|------------------|-------------|-----------------------------------------|--------------------------------|-------------|
|                     |          |                                                                                             |                           | Make<br>I <sub>le</sub>                                    | U/U <sub>e</sub> | cosφ        | Break<br>I <sub>c</sub> /I <sub>e</sub> | U <sub>r</sub> /U <sub>e</sub> | cosφ        | Make<br>I <sub>le</sub>                            | U/U <sub>e</sub> | cosφ        | Break<br>I <sub>c</sub> /I <sub>e</sub> | U <sub>r</sub> /U <sub>e</sub> | cosφ        |
| Alternating Current | AC1      | Non-inductive or slightly inductive loads-resistance furnaces                               | all values                | 1                                                          | 1                | 0.95        | 1                                       | 1                              | 0.95        | 1.5                                                | 1.05             | 0.8         | 1.5                                     | 1.05                           | 0.8         |
|                     | AC2      | Slip-ring motors: starting, switching off                                                   | all values                | 2.5                                                        | 1                | 0.65        | 2.5                                     | 1                              | 0.65        | 4                                                  | 1.05             | 0.65        | 4                                       | 1.05                           | 0.65        |
|                     | AC3      | Squirrel-cage motors: starting, switching off motors during running                         | 17A< I <sub>e</sub> ≤ 17A | 6                                                          | 1                | 0.65        | 1                                       | 0.17                           | 0.65        | 10                                                 | 1.05             | 0.45        | 8                                       | 1.05                           | 0.45        |
|                     |          |                                                                                             | I <sub>e</sub> ≤ 100A     | 6                                                          | 1                | 0.35        | 1                                       | 0.17                           | 0.35        | 10                                                 | 1.05             | 0.45        | 8                                       | 1.05                           | 0.45        |
|                     |          |                                                                                             | I <sub>e</sub> > 100A     | 6                                                          | 1                | 0.35        | 1                                       | 0.17                           | 0.35        | 10                                                 | 1.05             | 0.35        | 8                                       | 1.05                           | 0.35        |
|                     | AC4      | Squirrel-cage motors: starting, plugging, inching                                           | 17A< I <sub>e</sub> ≤ 17A | 6                                                          | 1                | 0.65        | 6                                       | 1                              | 0.65        | 12                                                 | 1.05             | 0.45        | 10                                      | 1.05                           | 0.45        |
|                     |          |                                                                                             | I <sub>e</sub> ≤ 100A     | 6                                                          | 1                | 0.35        | 6                                       | 1                              | 0.35        | 12                                                 | 1.05             | 0.45        | 10                                      | 1.05                           | 0.45        |
|                     |          |                                                                                             | I <sub>e</sub> > 100A     | 6                                                          | 1                | 0.35        | 6                                       | 1                              | 0.35        | 12                                                 | 1.05             | 0.35        | 10                                      | 1.05                           | 0.35        |
|                     | AC5a     | Switching of electric discharge lamp controls                                               | all values                | -                                                          | -                | -           | -                                       | -                              | -           | 3                                                  | 1.05             | 0.45        | 3                                       | 1.05                           | 0.45        |
|                     | AC5b     | Switching of incandescent lamps                                                             | all values                | -                                                          | -                | -           | -                                       | -                              | -           | 1.5                                                | 1.05             | 1)          | 4                                       | 1.05                           | 1)          |
|                     | AC6a     | Switching of transformers                                                                   | I <sub>e</sub> ≤ 100A     | -                                                          | -                | -           | -                                       | -                              | -           | 4.5                                                | 1.05             | 0.45        | 3.6                                     | 1.05                           | 0.45        |
|                     |          |                                                                                             | I <sub>e</sub> > 100A     | -                                                          | -                | -           | -                                       | -                              | -           | 4.5                                                | 1.05             | 0.35        | 3.6                                     | 1.05                           | 0.35        |
|                     | AC6b     | Switching of capacitor banks                                                                | -                         | -                                                          | -                | -           | -                                       | -                              | -           | 2)                                                 |                  |             | 2)                                      |                                |             |
|                     | AC7a     | Slightly inductive loads in household appliances and similar applications                   | all values                | -                                                          | -                | -           | -                                       | -                              | -           | 1.5                                                | 1.05             | 0.8         | 1.5                                     | 1.05                           | 0.8         |
|                     | AC7b     | Motor loads for household applications                                                      | I <sub>e</sub> ≤ 100A     | -                                                          | -                | -           | -                                       | -                              | -           | 8                                                  | 1.05             | 0.45        | 6                                       | 1.05                           | 0.45        |
|                     |          |                                                                                             | I <sub>e</sub> > 100A     | -                                                          | -                | -           | -                                       | -                              | -           | 8                                                  | 1.05             | 0.35        | 6                                       | 1.05                           | 0.35        |
|                     | AC8a     | Hermetic refrigerant compressor motor control with manual resetting of overload releases    | I <sub>e</sub> ≤ 100A     | -                                                          | -                | -           | -                                       | -                              | -           | 6                                                  | 1.05             | 0.45        | 6                                       | 1.05                           | 0.45        |
|                     |          |                                                                                             | I <sub>e</sub> > 100A     | -                                                          | -                | -           | -                                       | -                              | -           | 6                                                  | 1.05             | 0.35        | 6                                       | 1.05                           | 0.35        |
|                     | AC8b     | Hermetic refrigerant compressor motor control with automatic resetting of overload releases | I <sub>e</sub> ≤ 100A     | -                                                          | -                | -           | -                                       | -                              | -           | 6                                                  | 1.05             | 0.45        | 6                                       | 1.05                           | 0.45        |
|                     |          |                                                                                             | I <sub>e</sub> > 100A     | -                                                          | -                | -           | -                                       | -                              | -           | 6                                                  | 1.05             | 0.35        | 6                                       | 1.05                           | 0.35        |
|                     | AC12     | Control of resistive loads and solid state loads with isolation by opto couplers            | all values                | -                                                          | -                | -           | -                                       | -                              | -           | 1                                                  | 1                | 0.9         | 1                                       | 1                              | 0.9         |
|                     | AC13     | Control of solid state loads with transformer isolation                                     | all values                | -                                                          | -                | -           | -                                       | -                              | -           | 10                                                 | 1.1              | 0.65        | 1.1                                     | 1.1                            | 0.65        |
|                     | AC14     | Control of small electromagnetic loads (<=72VA)                                             | -                         | -                                                          | -                | -           | -                                       | -                              | -           | 6                                                  | 1.1              | 0.7         | 6                                       | 1.1                            | 0.7         |
|                     | AC15     | Control of electromagnetic load (>72VA)                                                     | -                         | 10                                                         | 1                | 0.7         | 1                                       | 1                              | 0.4         | 10                                                 | 1.1              | 0.3         | 10                                      | 1.1                            | 0.3         |
|                     |          |                                                                                             |                           | Make<br>I <sub>le</sub>                                    | U/U <sub>e</sub> | L/R<br>[ms] | Break<br>I <sub>c</sub> /I <sub>e</sub> | U <sub>r</sub> /U <sub>e</sub> | L/R<br>[ms] | Make<br>I <sub>le</sub>                            | U/U <sub>e</sub> | L/R<br>[ms] | Break<br>I <sub>c</sub> /I <sub>e</sub> | U <sub>r</sub> /U <sub>e</sub> | L/R<br>[ms] |
| Direct Current      | DC1      | Non-inductive or slightly inductive loads resistance furnaces                               | all values                | 1                                                          | 1                | 1           | 1                                       | 1                              | 1           | 1.5                                                | 1.05             | 1           | 1.5                                     | 1.05                           | 1           |
|                     | DC3      | Shunt-motors: starting, plugging, inching dynamic braking of d.c. motors                    | all values                | 2.5                                                        | 1                | 2           | 2.5                                     | 1                              | 2           | 4                                                  | 1.05             | 2.5         | 4                                       | 1.05                           | 2.5         |
|                     | DC5      | Series-motors: starting, plugging, inching dynamic braking of d.c. motors                   | all values                | 2.5                                                        | 1                | 7.5         | 2.5                                     | 1                              | 7.5         | 4                                                  | 1.05             | 15          | 4                                       | 1.05                           | 15          |
|                     | DC6      | Switching of incandescent lamps                                                             | all values                | -                                                          | -                | -           | -                                       | -                              | -           | 1.5                                                | 1.05             | 1)          | 4                                       | 1.05                           | 1)          |
|                     | DC12     | Control of resistive loads and solid state loads with isolation by opto couplers            | all values                | -                                                          | -                | -           | -                                       | -                              | -           | 1                                                  | 1                | 1           | 1                                       | 1                              | 1           |
|                     | DC13     | Control of electromagnets                                                                   | all values                | 1                                                          | 1                | ≤300        | 1                                       | 1                              | ≤300        | 1.1                                                | 1.1              | ≤300        | 1.1                                     | 1.1                            | ≤300        |
|                     | DC14     | Control of electromagnetic loads having economy resistors in circuit                        | all values                | -                                                          | -                | -           | -                                       | -                              | -           | 10                                                 | 1.1              | 15          | 10                                      | 1.1                            | 15          |

U<sub>e</sub> Rated operational voltage, U Voltage before make, U<sub>r</sub> Recovery voltage, I<sub>e</sub> Rated operational current, I<sub>m</sub> Current make, I<sub>b</sub> Current broken

1) Test with incandescent lamps

2) Test conditions according to standard

## Accessories

### Data according to IEC 947-5-1, EN 60947-5-1, VDE 0660

| Auxiliary Contacts                                                                                                                                                                   | Type                                              | J73KN-B  | J73KN-C  | J73KN-B-TP... |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|----------|----------|---------------|
| Rated insulation voltage $U_i^{*1}$                                                                                                                                                  | V~                                                | 690      | 690      | 690           |
| Thermal rated current $I_n$ to 690V                                                                                                                                                  |                                                   |          |          |               |
| Ambient temperature                                                                                                                                                                  | 40°C A                                            | 10       | 10       | 10            |
|                                                                                                                                                                                      | 60°C A                                            | 6        | 6        | -             |
| Frequency of operations z                                                                                                                                                            | 1/h                                               | 3000     | 3000     | 1200          |
| Mechanical life                                                                                                                                                                      | S x 10 <sup>6</sup>                               | 10       | 10       | 1             |
| Power loss per pole at $I_n/AC1$                                                                                                                                                     | W                                                 | 0,5      | 0,5      | -             |
| Utilization category AC15                                                                                                                                                            |                                                   |          |          |               |
| Rated operational current $I_n$                                                                                                                                                      | 220-240V A                                        | 3        | 3        | 4             |
|                                                                                                                                                                                      | 380-400V A                                        | 2        | 2        | 3             |
|                                                                                                                                                                                      | 440V A                                            | 1,6      | 1,6      | 2             |
|                                                                                                                                                                                      | 500V A                                            | 1,2      | 1,2      | 2             |
|                                                                                                                                                                                      | 660-690V A                                        | 0,6      | 0,6      | 2             |
| Utilization category DC13                                                                                                                                                            |                                                   |          |          |               |
| Rated operational current $I_n$                                                                                                                                                      | 60V A                                             | 2        | 2        | 2,5           |
|                                                                                                                                                                                      | 110V A                                            | 0,4      | 0,4      | 1,5           |
|                                                                                                                                                                                      | 220V A                                            | 0,1      | 0,1      | 0,2           |
| Short circuit protection                                                                                                                                                             |                                                   |          |          |               |
| short-circuit current 1kA, contact welding not accepted max. fuse size                                                                                                               | gL (gG) A                                         | 20       | 20       | 10            |
| For contactors with thermal overload relay or auxiliary contacts the device with the smaller admissible control fuse (contactor or thermal overload relay) determines the fuse size. |                                                   |          |          |               |
| Cable cross-sections                                                                                                                                                                 |                                                   |          |          |               |
|                                                                                                                                                                                      | solid or stranded mm <sup>2</sup>                 | 0,75-2,5 | 0,75-2,5 | 1-2,5         |
|                                                                                                                                                                                      | flexible mm <sup>2</sup>                          | 0,75-2,5 | 0,75-2,5 | 0,75-2,5      |
|                                                                                                                                                                                      | flexible with multicore cable end mm <sup>2</sup> | 0,5-1,5  | 0,5-1,5  | 0,75-2,5      |
| Cables per clamp                                                                                                                                                                     |                                                   | 2        | 2        | 2             |

\*1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry):  $U_{imp} = 8kV$ . Data for other conditions on request

### Data according to CSA, UL and CUL

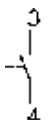
| Auxiliary Contacts                      | Type      | J73KN-B | J73KN-C | J73KN-B-TP... |
|-----------------------------------------|-----------|---------|---------|---------------|
| Rated operational current „General Use“ | A         | 10      | 10      | 10            |
| Rated operational voltage               | max. V AC | 600     | 600     | 600           |
| Auxiliary Contacts                      |           | A600    | A600    | A600          |

## Contactors and Accessories

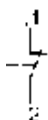
### Wiring diagrams

#### Auxiliary contact blocks

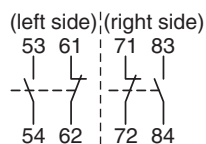
J73KN-B-10



J73KN-B-01



J73KN-C-11S<sup>\*1</sup>

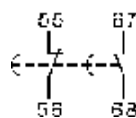


\*1) Correct terminal marking is given by mounting

#### Pneumatic timer

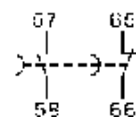
on-delayed

J74KN-B-TP...DA



off-delayed

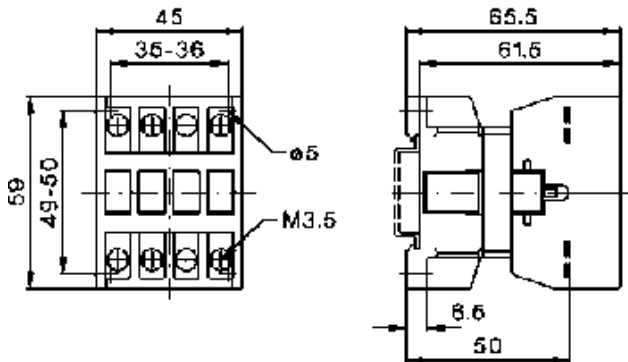
J74KN-B-TP...IA



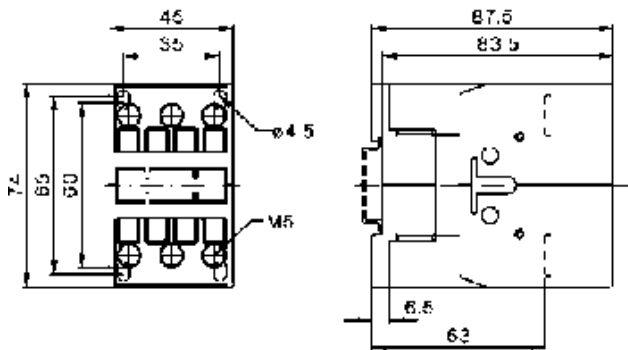
■ Dimensions

AC operated

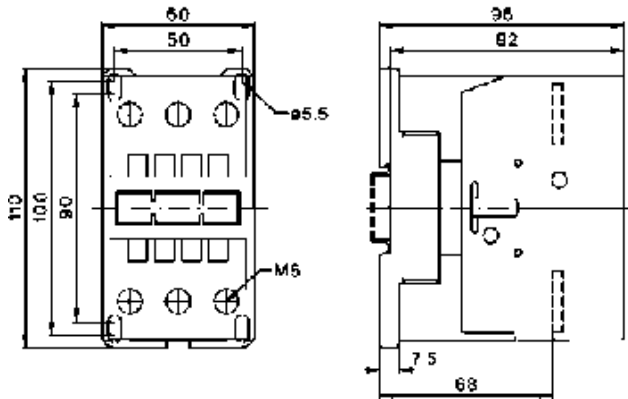
J7KN-10...  
J7KN-10-4  
J7KN-14...  
J7KN-18...  
J7KN-22...



J7KN-24...  
J7KN-32...  
J7KN-40...

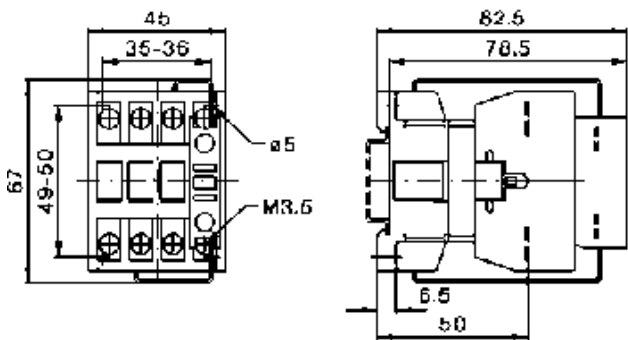


J7KN-50...  
J7KN-62...  
J7KN-74...

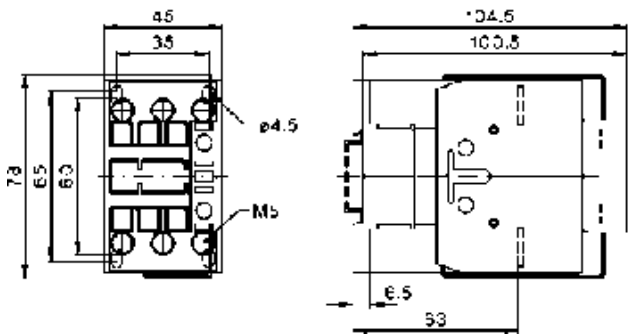


DC operated

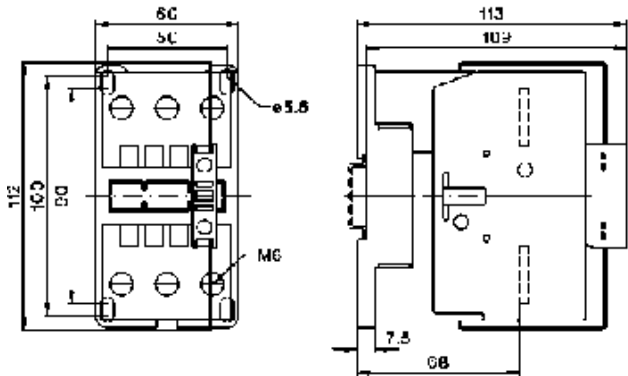
J7KN-10...D  
J7KN-14...D  
J7KN-18...D  
J7KN-22...D



J7KN-24...D  
J7KN-32...D  
J7KN-40...D



J7KN-50...D  
J7KN-62...D  
J7KN-74...D

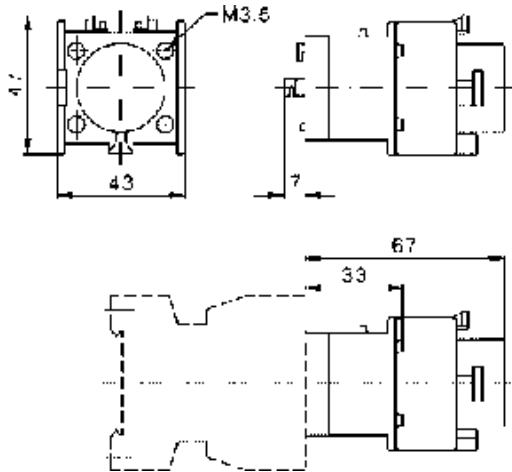


LVSG



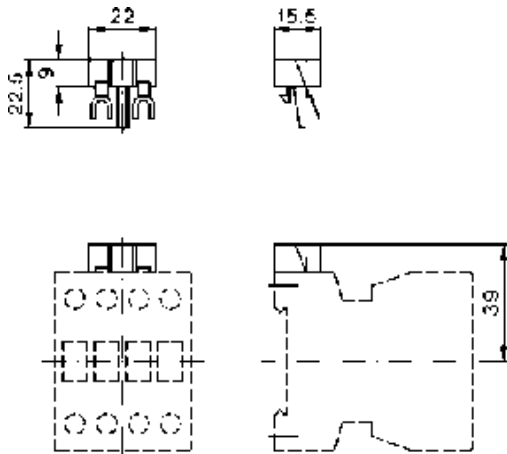
Pneumatic timer

J74KN-B-TP...

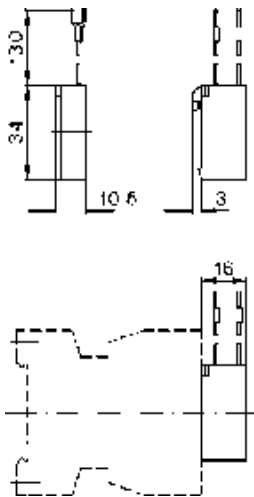


Auxiliary contact blocks

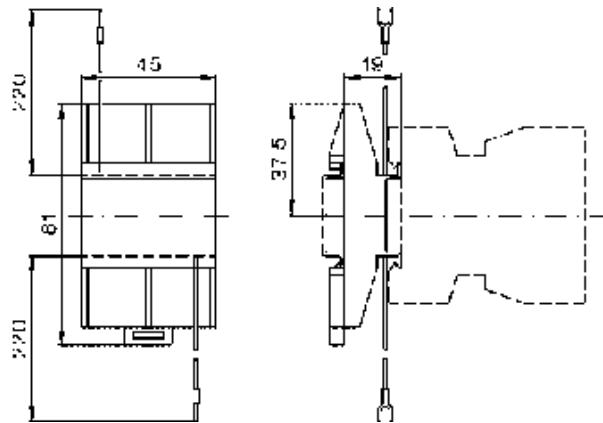
J74KN-A-VG



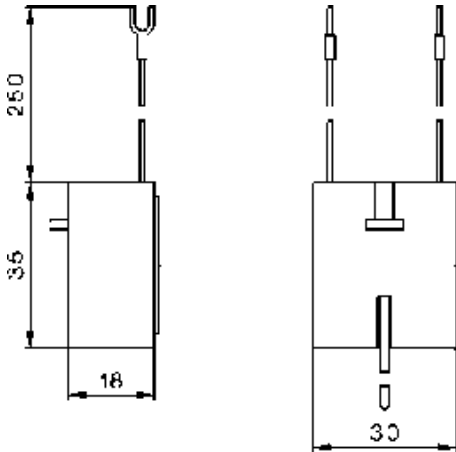
J74KN-B-VG



J74KN-A-RC



J74KN-B-RC



LVSG

# Position of Terminals

AC operated

|                                |                                |                               |                               |                           |
|--------------------------------|--------------------------------|-------------------------------|-------------------------------|---------------------------|
| J7KN-10-10<br>to<br>J7KN-22-10 | J7KN-10-01<br>to<br>J7KN-22-01 | J7KN-24<br>J7KN-32<br>J7KN-40 | J7KN-50<br>J7KN-62<br>J7KN-74 | J7KN-85-22<br>J7KN-110-22 |
|                                |                                | J7KN-24<br>J7KN-32<br>J7KN-40 | J7KN-50<br>J7KN-62<br>J7KN-74 | J7KN-85-22<br>J7KN-110-22 |
| J7KN-150-11<br>J7KN-175-11     | J7KN-200-22                    |                               |                               |                           |

DC operated with double winding coil

|                                                                                |                                                                                |                                                    |                                                    |                                           |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------|-------------------------------------------|
| <p>J7KN-10-10...D<br/>J7KN-14-10...D<br/>J7KN-18-10...D<br/>J7KN-22-10...D</p> | <p>J7KN-10-01...D<br/>J7KN-14-01...D<br/>J7KN-18-01...D<br/>J7KN-22-01...D</p> | <p>J7KN-24...D<br/>J7KN-32...D<br/>J7KN-40...D</p> | <p>J7KN-50...D<br/>J7KN-62...D<br/>J7KN-74...D</p> | <p>J7KN-81-21...D<br/>J7KN-110-21...D</p> |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------|-------------------------------------------|

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

Thermal Overload Relay

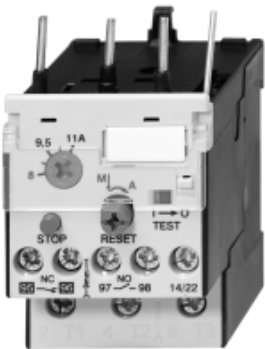
J7TKN

Thermal Overload Relay

- Direct and separate mounting
- Single phasing sensivity according to IEC 947-4-1
- Finger proof (VBG 4)

Accessories

- Busbar sets
- Set for single mounting



Approved Standards

| Standard     | Guide No (US,C) |
|--------------|-----------------|
| UL           | NKCR, NKCR7     |
| ICE 947-4-1  |                 |
| VDE 0660     |                 |
| EN 60947-4-1 |                 |

Ordering Information

■ Model Number Legend

1. Thermal Overload Relay

J7TKN-□-□□□  
1 2 3

- 1) Thermal Overload Relay
- 2) A: for mini motor contactor and motor contactor (4-11 kW)  
B: for motor contactor (4-15 kW)  
C: for motor contactor (18.5 kW)  
D: for motor contactor (22-37 kW)  
E: for motor contactor (45-55 kW)  
F: for motor contactor (75-110 kW)
- 3) Setting range (examples)  
E16: 0.12-0.16 A  
E27: 0.18-0.27 A  
...  
2E7: 1.8-2.7 A  
...  
11: 8-11 A

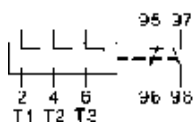
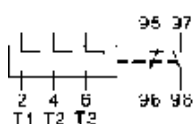
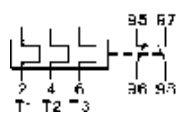
2. Accessories for Thermal Overload Relay

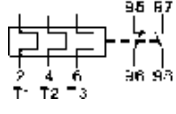
J74TK-□-□□□  
1 2 3

- 1) Accessories for Thermal Overload Relay
- 2) SM: Single mounting for J7TKN-B Types (4-32 kW)  
SU: Busbar sets
- 3) 175: for J7TKN-F Types (75-90 kW)  
200: for J7TKN-F Types (110 kW)

## ■ System overview

### Thermal Overload Relays for plug-in mounting

| Setting Range                                                                       |             |                | Type                                                                                                        | Pack        | Weight |      |
|-------------------------------------------------------------------------------------|-------------|----------------|-------------------------------------------------------------------------------------------------------------|-------------|--------|------|
| D.O.L.                                                                              | (A)         | Star Delta (A) |                                                                                                             | pcs.        | kg/pc. |      |
| For contactors J7KNA-09..., J7KNA-12..., J7KN-10... to J7KN-22...                   |             |                |                                                                                                             |             |        |      |
|    | 0.12 - 0.18 | -              | <br>hand reset            | J7TKN-A-E18 | 1      | 0.10 |
|                                                                                     | 0.18 - 0.27 | -              |                                                                                                             | J7TKN-A-E27 | 1      | 0.10 |
|                                                                                     | 0.27 - 0.4  | -              |                                                                                                             | J7TKN-A-E4  | 1      | 0.10 |
|                                                                                     | 0.4 - 0.6   | -              |                                                                                                             | J7TKN-A-E6  | 1      | 0.10 |
|                                                                                     | 0.6 - 0.9   | -              |                                                                                                             | J7TKN-A-E9  | 1      | 0.10 |
|                                                                                     | 0.8 - 1.2   | -              |                                                                                                             | J7TKN-A-1E2 | 1      | 0.10 |
|                                                                                     | 1.2 - 1.8   | -              |                                                                                                             | J7TKN-A-1E8 | 1      | 0.10 |
|                                                                                     | 1.8 - 2.7   | -              |                                                                                                             | J7TKN-A-2E7 | 1      | 0.10 |
|                                                                                     | 2.7 - 4     | -              |                                                                                                             | J7TKN-A-4   | 1      | 0.10 |
|                                                                                     | 4 - 6       | 7 - 10.5       |                                                                                                             | J7TKN-A-6   | 1      | 0.10 |
|                                                                                     | 6 - 9       | 10.5 - 15.5    |                                                                                                             | J7TKN-A-9   | 1      | 0.10 |
|                                                                                     | 8 - 11      | 14 - 19        |                                                                                                             | J7TKN-A-11  | 1      | 0.10 |
|                                                                                     | 10 - 14     | 18 - 24        |                                                                                                             | J7TKN-A-14  | 1      | 0.10 |
|                                                                                     | 13 - 18     | 23 - 31        |                                                                                                             | J7TKN-A-18  | 1      | 0.10 |
|                                                                                     | 17 - 23     | 30 - 40        |                                                                                                             | J7TKN-A-23  | 1      | 0.10 |
|                                                                                     | 22 - 30     | 38 - 52        |                                                                                                             | J7TKN-A-30  | 1      | 0.10 |
| For contactors J7KN-10... to J7KN-40...                                             |             |                |                                                                                                             |             |        |      |
|   | 0.12 - 0.18 | -              | <br>hand- and auto reset | J7TKN-B-E18 | 1      | 0.14 |
|                                                                                     | 0.18 - 0.27 | -              |                                                                                                             | J7TKN-B-E27 | 1      | 0.14 |
|                                                                                     | 0.27 - 0.4  | -              |                                                                                                             | J7TKN-B-E4  | 1      | 0.14 |
|                                                                                     | 0.4 - 0.6   | -              |                                                                                                             | J7TKN-B-E6  | 1      | 0.14 |
|                                                                                     | 0.6 - 0.9   | -              |                                                                                                             | J7TKN-B-E9  | 1      | 0.14 |
|                                                                                     | 0.8 - 1.2   | -              |                                                                                                             | J7TKN-B-1E2 | 1      | 0.14 |
|                                                                                     | 1.2 - 1.8   | -              |                                                                                                             | J7TKN-B-1E8 | 1      | 0.14 |
|                                                                                     | 1.8 - 2.7   | -              |                                                                                                             | J7TKN-B-2E7 | 1      | 0.14 |
|                                                                                     | 2.7 - 4     | -              |                                                                                                             | J7TKN-B-4   | 1      | 0.14 |
|                                                                                     | 4 - 6       | 7 - 10.5       |                                                                                                             | J7TKN-B-6   | 1      | 0.14 |
|                                                                                     | 6 - 9       | 10.5 - 15.5    |                                                                                                             | J7TKN-B-9   | 1      | 0.14 |
|                                                                                     | 8 - 11      | 14 - 19        |                                                                                                             | J7TKN-B-11  | 1      | 0.14 |
|                                                                                     | 10 - 14     | 18 - 24        |                                                                                                             | J7TKN-B-14  | 1      | 0.14 |
|                                                                                     | 13 - 18     | 23 - 31        |                                                                                                             | J7TKN-B-18  | 1      | 0.14 |
|                                                                                     | 17 - 24     | 30 - 41        |                                                                                                             | J7TKN-B-24  | 1      | 0.14 |
|                                                                                     | 23 - 32     | 40 - 55        |                                                                                                             | J7TKN-B-32  | 1      | 0.14 |
| For contactors J7KN-24... to J7KN-40...                                             |             |                |                                                                                                             |             |        |      |
|  | 28 - 42     | 48 - 73        |                         | J7TKN-C-42  | 1      | 0.30 |

|                                                                                   | Setting Range |                |                                                                                    | Type       | Pack | Weight |
|-----------------------------------------------------------------------------------|---------------|----------------|------------------------------------------------------------------------------------|------------|------|--------|
|                                                                                   | D.O.L. (A)    | Star Delta (A) |                                                                                    |            | pcs. | kg/pc. |
| For contactors J7KN-50...-J7KN-74...                                              |               |                |                                                                                    |            |      |        |
|  | 40 - 52       | 70 - 90        |  | J7TKN-D-52 | 1    | 0.40   |
|                                                                                   | 52 - 65       | 90 - 112       |                                                                                    | J7TKN-D-65 | 1    | 0.40   |
|                                                                                   | 60 - 74       | 104 - 128      |                                                                                    | J7TKN-D-74 | 1    | 0.40   |

**Thermal Overload relays for separate mounting**

| Setting Range                                                                     |           |                                             | Type                                                                                             | Pack<br>pcs. | Weight<br>kg/pc. |      |
|-----------------------------------------------------------------------------------|-----------|---------------------------------------------|--------------------------------------------------------------------------------------------------|--------------|------------------|------|
| D.O.L.                                                                            | (A)       | Star Delta                                  |                                                                                                  |              |                  | (A)  |
| For contactors J7KN-85... to J7KN-150...                                          |           |                                             |                                                                                                  |              |                  |      |
|  | 60 - 90   | 104 - 156                                   | <br>hand reset | J7TKN-E-90   | 1                | 0.90 |
|                                                                                   | 80 - 120  | 140 - 207                                   |                                                                                                  | J7TKN-E-120  | 1                | 0.90 |
| For contactors J7KN-175... to J7KN-200...                                         |           |                                             |                                                                                                  |              |                  |      |
|  | 100 - 150 | 175 - 260                                   | <br>hand reset | J7TKN-F-150  | 1                | 1.5  |
|                                                                                   | 140 - 220 | 240 - 380<br>busbar sets<br>see accessories |                                                                                                  | J7TKN-F-210  | 1                | 1.5  |

**Accessories**

|                                                                                     | for overload relays                | for contactors     | Type         | Pack | Weight |
|-------------------------------------------------------------------------------------|------------------------------------|--------------------|--------------|------|--------|
|                                                                                     |                                    |                    |              | pcs. | kg/pc. |
| <b>Busbar Sets</b>                                                                  |                                    |                    |              |      |        |
|  | J7TKN-F-175                        | J7KN-150, J7KN-175 | J74TK-SU-175 | 1    | 0.6    |
|                                                                                     | J7TKN-F-210                        | J7KN-200           | J74TK-SU-200 | 1    | 0.7    |
|                                                                                     | busbars must be installed by users |                    |              |      |        |

|                                                                                     |                    | Cable Cross-section to clamp (mm <sup>2</sup> ) |          |                                | Type     | Pack | Weight |
|-------------------------------------------------------------------------------------|--------------------|-------------------------------------------------|----------|--------------------------------|----------|------|--------|
|                                                                                     | for overload relay | solid or stranded                               | flexible | flex. with multicore cable end |          | pcs. | kg/pc. |
| <b>Sets for single mounting</b>                                                     |                    |                                                 |          |                                |          |      |        |
|  | J7TKN-B            | 0.75 - 6                                        | 0.75 - 4 | 0.5 - 4                        | J74TK-SM | 1    | 0.035  |

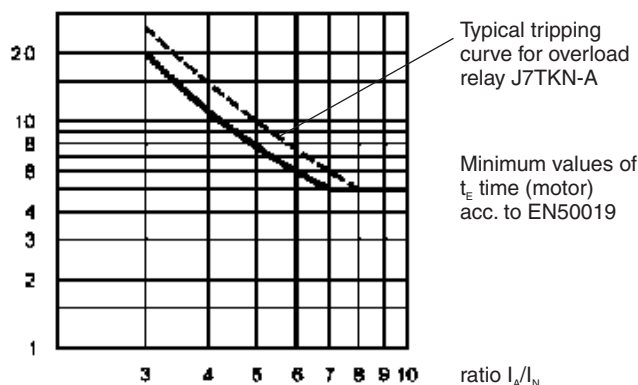
# Specifications

## ■ Engineering data and Characteristics

**Thermal Overload Relays**, tripping times for selection to motors of protection degree EEx e  
**Relays With Standard Tripping Characteristic**

| Setting Range      |        | Tripping time depending on the multiple of the current setting from cold condition (tolerance $\pm 20\%$ of the tripping time) |           |           |           |           |            |
|--------------------|--------|--------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|------------|
| A                  | A      | $I_A/I_N$                                                                                                                      | $I_A/I_N$ | $I_A/I_N$ | $I_A/I_N$ | $I_A/I_N$ | $I_A/I_N$  |
|                    |        | 3                                                                                                                              | 4         | 5         | 6         | 7,2       | 8          |
| <b>J7TKN-A-...</b> |        | s                                                                                                                              | s         | s         | s         | s         | s          |
| 0,12               | - 0,18 | 18,5                                                                                                                           | 10,4      | 7,2       | 5,5       | 4,3       | <b>3,6</b> |
| 0,18               | - 0,27 | 16,7                                                                                                                           | 9,8       | 6,5       | 5         | 4,1       | <b>3,5</b> |
| 0,27               | - 0,4  | 19,4                                                                                                                           | 12,1      | 8,2       | 5,9       | 4,9       | <b>4,2</b> |
| 0,4                | - 0,6  | 18,7                                                                                                                           | 11,2      | 8         | 6         | 4,9       | 4,1        |
| 0,6                | - 0,9  | 19,7                                                                                                                           | 11,6      | 8,1       | 6,1       | 4,9       | <b>4,2</b> |
| 0,8                | - 1,2  | 22,9                                                                                                                           | 13,6      | 10        | 7,3       | 6         | <b>5,2</b> |
| 1,2                | - 1,8  | 22,2                                                                                                                           | 13,2      | 9,2       | 7,6       | 5,8       | <b>5,3</b> |
| 1,8                | - 2,7  | 23                                                                                                                             | 13,7      | 9,3       | 7,6       | 5,7       | <b>5,1</b> |
| 2,7                | - 4    | 24                                                                                                                             | 14,4      | 9,9       | 7,8       | 5,9       | 5,1        |
| 4                  | - 6    | 24,7                                                                                                                           | 13,8      | 9,9       | 7,3       | 5,6       | 4,8        |
| 6                  | - 9    | 22                                                                                                                             | 13,4      | 8         | 5,7       | 4,1       | 3,5        |
| 8                  | - 11   | 17,4                                                                                                                           | 9,2       | 5,9       | 4,1       | 2,9       | 2,3        |
| 10                 | - 14   | 26,4                                                                                                                           | 12,9      | 7,6       | 5,2       | 3,5       | 2,8        |
| 13                 | - 18   | 14,7                                                                                                                           | 7,7       | 4,8       | 3,2       | 2,3       | 1,7        |
| 17                 | - 23   | 16,2                                                                                                                           | 8,4       | 5         | 3,6       | 2,4       | 1,8        |
| 22                 | - 30   | 16,8                                                                                                                           | 8,5       | 5         | 3,6       | 2,3       | 1,9        |
| <b>J7TKN-C-42</b>  |        | s                                                                                                                              | s         | s         | s         | s         | s          |
| 28                 | - 42   | 25,2                                                                                                                           | 13,3      | 8         | 5,5       | 4         | 3,1        |
| <b>J7TKN-D-...</b> |        | s                                                                                                                              | s         | s         | s         | s         | s          |
| 40                 | - 52   | 18,3                                                                                                                           | 9,2       | 5,6       | 3,9       | 2,8       | 2,2        |
| 52                 | - 65   | 17,8                                                                                                                           | 8,7       | 5,2       | 3,4       | 2,5       | 1,9        |
| 60                 | - 74   | 19,5                                                                                                                           | 13,5      | 11        | 10        | 9,5       | 8,5        |
| <b>J7TKN-E-...</b> |        | s                                                                                                                              | s         | s         | s         | s         | s          |
| 60                 | - 90   | 19,5                                                                                                                           | 13,5      | 11        | 10        | 9,5       | 8,5        |
| 80                 | - 120  | 18                                                                                                                             | 11        | 10        | 9         | 8,5       | 8          |
| <b>J7TKN-F-...</b> |        | s                                                                                                                              | s         | s         | s         | s         | s          |
| 100                | - 150  | 34                                                                                                                             | 26        | 24        | 20,5      | 19        | <b>18</b>  |
| 140                | - 210  | 30                                                                                                                             | 24        | 21        | 18,5      | 17        | <b>16</b>  |

All tripping times of overload relays J7TKN-A are shorter than the minimum values of the  $t_E$  time for motors of protection degree EEx e acc. to EN 50019 and therefore are suitable for all motors of protection degree EEx e. For these overload relays the selection on basis of tripping curves is thereby not necessary.



Labels of tripping curves for each setting range, sized 148x105mm (self-adhesive) are available on request.

Specify type and setting range.

When selecting a standard overload, refer to the tripping curve. Determine the values of the starting current ratio  $I_A/I_N$  and the time  $t_E$  which is marked on the label of the motor. The overload must trip within the  $t_E$  time, which means that the tripping curve from cold condition must be (20% due to tolerance) below the coordination point  $I_A/I_N$  and the time  $t_E$ .

$I_A$  = Starting current of motor

$I_N$  = Rated current of motor

$t_E$  =  $t_E$ -time of motor

# Fuses for J7TKN-A; J7TKN-B; J7TKN-C; J7TKN-D; J7TKN-E; J7TKN-F

| Type               | Setting Range   |             | Max. Fuse Size According to Coordination-type                                                                                  |                  |                              |    | Fuse UL |
|--------------------|-----------------|-------------|--------------------------------------------------------------------------------------------------------------------------------|------------------|------------------------------|----|---------|
|                    | DOL             | Star Delta  | "2"<br>"1<br>quick                                                                                                             | slow,<br>gL(gG)  | "1"<br>"1<br>slow,<br>gL(gG) | aM |         |
|                    | A               | A           | A                                                                                                                              | A                | A                            | A  | A       |
| J7TKN-A<br>J7TKN-B | 0.12 - 0.18     | -           | 0.5 <sup>2</sup>                                                                                                               | 0.5 <sup>2</sup> | 25                           | -  | 15      |
|                    | 0.18 - 0.27     | -           | 1.0 <sup>2</sup>                                                                                                               | 1.0 <sup>2</sup> | 25                           | -  | 15      |
|                    | 0.27 - 0.4      | -           | 2                                                                                                                              | 2                | 25                           | -  | 15      |
|                    | 0.4 - 0.6       | -           | 2                                                                                                                              | 2                | 25                           | -  | 15      |
|                    | 0.6 - 0.9       | -           | 4                                                                                                                              | 4                | 25                           | -  | 15      |
|                    | 0.8 - 1.2       | -           | 4                                                                                                                              | 4                | 25                           | 2  | 15      |
|                    | 1.2 - 1.8       | -           | 6                                                                                                                              | 6                | 25                           | 2  | 15      |
|                    | 1.8 - 2.7       | -           | 10                                                                                                                             | 10               | 25                           | 4  | 15      |
|                    | 2.7 - 4         | -           | 16                                                                                                                             | 10               | 25                           | 4  | 15      |
|                    | 4 - 6           | 7 - 10.5    | 20                                                                                                                             | 16               | 25                           | 6  | 15      |
|                    | 6 - 9           | 10.5 - 15.5 | 35                                                                                                                             | 25               | 35                           | 10 | 25      |
|                    | 8 - 11          | 14 - 19     | 35                                                                                                                             | 25               | 35                           | 16 | 30      |
|                    | 10 - 14         | 18 - 24     | 50                                                                                                                             | 35               | 63                           | 16 | 40      |
|                    | 13 - 18         | 23 - 31     | 50                                                                                                                             | 35               | 63                           | 20 | 50      |
|                    | 17 - (23)24     | 30 - (40)41 | 63                                                                                                                             | 50               | 63                           | 25 | 60      |
| (22)23 - (30)32    | (38)40 - (52)55 | 80          | 63                                                                                                                             | 80               | 35                           | 70 |         |
| J7TKN-C            | 28 - 42         | 48 - 73     | 100                                                                                                                            | 80               | 150                          | 50 | 110     |
| J7TKN-D            | 40 - 52         | 70 - 90     | 160                                                                                                                            | 100              | 150                          | 63 | 200     |
|                    | 52 - 65         | 90 - 112    | 160                                                                                                                            | 125              | 150                          | 80 | 250     |
|                    | 60 - 74         | 104 - 128   | 160                                                                                                                            | 125              | 150                          | 80 | 250     |
| J7TKN-E            | 60 - 90         | 104 - 156   | For short circuit protecting overload relays with current transformer use fuse according to the 7contactor of the combination. |                  |                              |    | 300     |
|                    | 80 - 120        | 140 - 207   |                                                                                                                                |                  |                              |    | -       |
| J7TKN-F            | all ranges      |             |                                                                                                                                |                  |                              |    |         |

\*1) Coordination-type according to IEC 947-4-1:

„2“: Light contact welding accepted. Thermal overload relay must not be damaged.

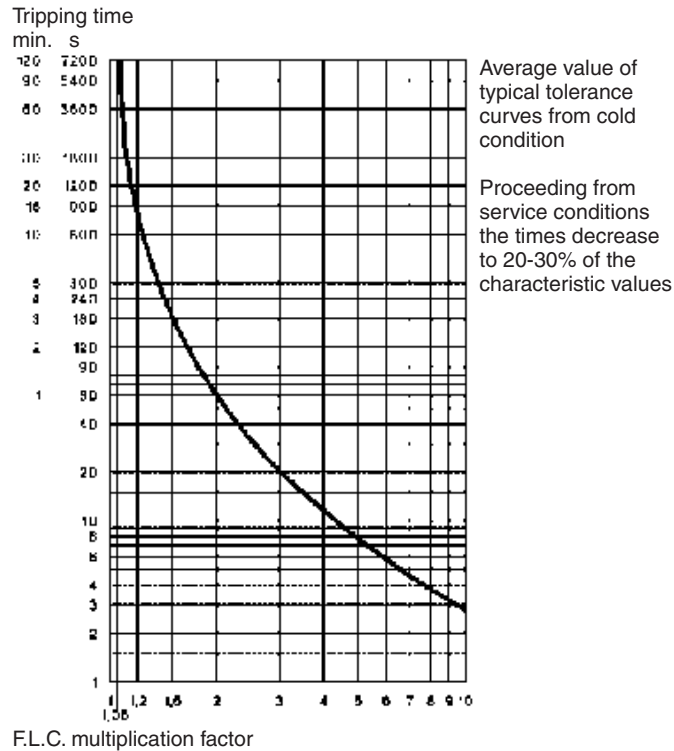
„1“: Welding of contactor and damage of the thermal overload relay allowed.

\*2) Miniature fuse

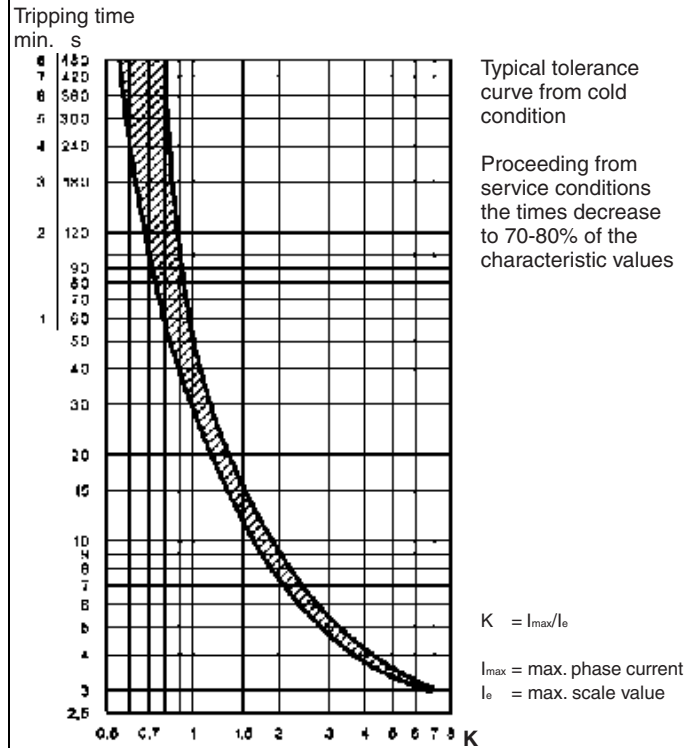
## Tripping Characteristics for J7TKN-A, J7TKN-B, J7TKN-C, J7TKN-D

Detailed tripping times for each range see table page 60

with three-phase load



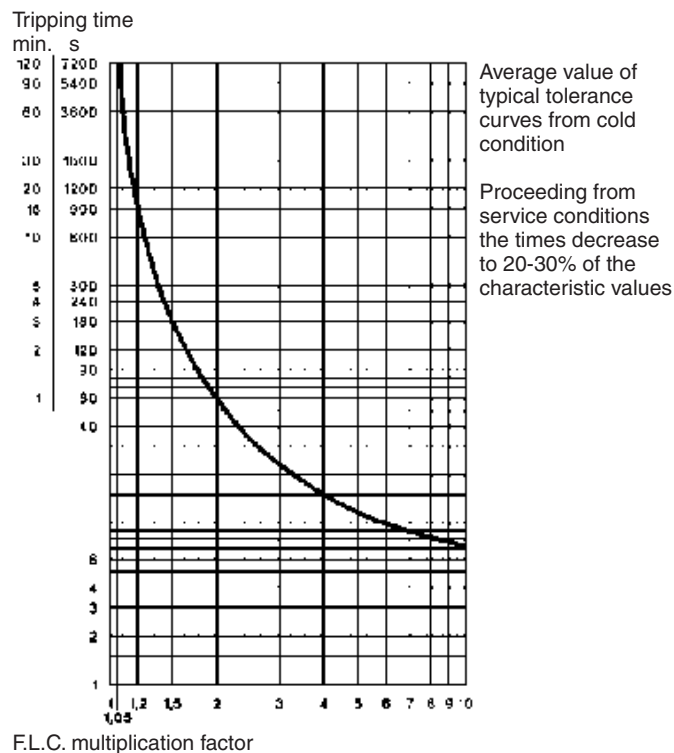
with two-pole load



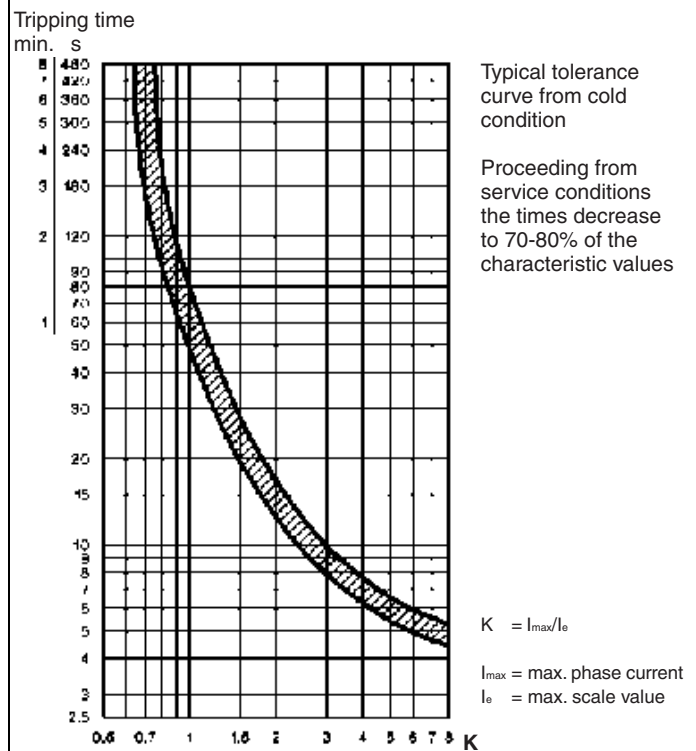
## Tripping Characteristics for J7TKN-E

Detailed tripping times for each range see table page 60

with three-phase load



with two-pole load



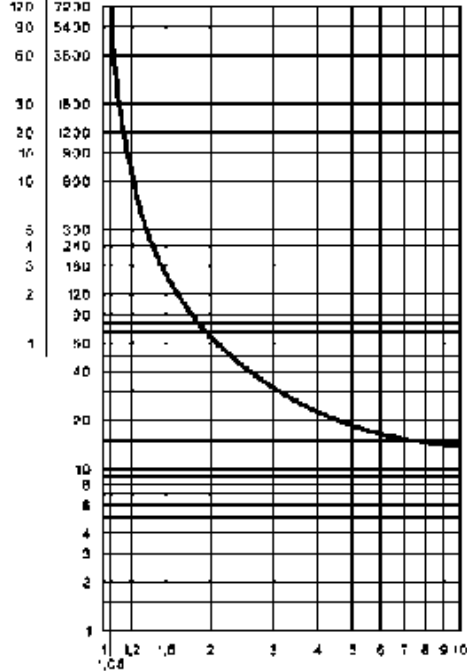
Tripping Characteristics for J7TKN-F

Detailed tripping times for each range see table page 60

with three-phase load

Tripping time

min. s

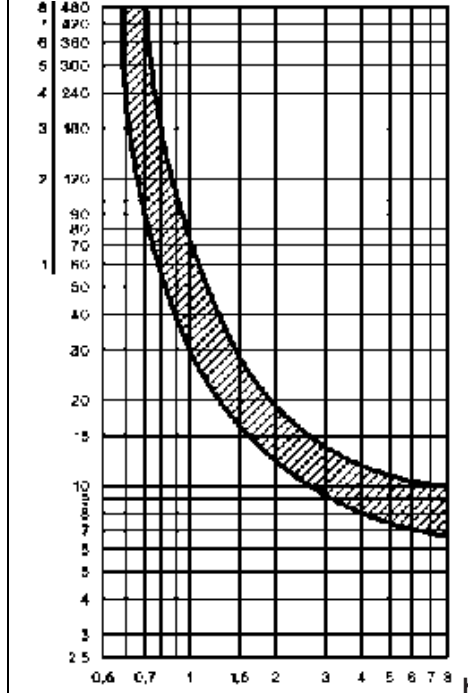


F.L.C. multiplication factor

with two-pole load

Tripping time

min. s



Position of Terminals

| J7TKN-A | J7TKN-B | J7TKN-C; J7TKN-D |
|---------|---------|------------------|
|         |         |                  |

LVSG

# Thermal Overload Relays

Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1

| Type                                                  |                                                   | J7TKN-A                         | J7TKN-B | J7TKN-C                | J7TKN-D            | J7TKN-E       | J7TKN-F       |
|-------------------------------------------------------|---------------------------------------------------|---------------------------------|---------|------------------------|--------------------|---------------|---------------|
| <b>Rated insulation voltage</b> $U_i^{*1}$            |                                                   | 690                             | 690     | 690                    | 690                | 750           | 690           |
| <b>Permissible ambient temperature</b>                |                                                   |                                 |         |                        |                    |               |               |
| operation                                             | open °C                                           |                                 |         | -25 to +60             |                    |               |               |
| storage                                               | °C                                                |                                 |         | -50 to +70             |                    |               |               |
| <b>Trip class according to IEC 947-4-1</b>            |                                                   | 10A                             | 10A     | 10A                    | 10A                | 20            | 20            |
| <b>Cable cross-section</b>                            |                                                   |                                 |         |                        |                    |               |               |
| main connector                                        | solid or stranded mm <sup>2</sup>                 | 0.75-6 + 0.75-2.5 <sup>*2</sup> | 0.75-6  | 0.75-10                | 4-35 <sup>*2</sup> | <sup>*3</sup> | <sup>*4</sup> |
|                                                       | flexible mm <sup>2</sup>                          | 0.75-4 + 0.5-2.5 <sup>*2</sup>  | 1-4     | 0.75-6                 | 6-25 <sup>*2</sup> |               |               |
|                                                       | flexible with multicore cable end mm <sup>2</sup> | 0.5-2.5 + 0.5-1.5               | 0.75-4  | 0.75-6                 | 4-25               |               |               |
| Cables per clamp                                      | number                                            | 1+1                             | 2       | 2                      | 1                  |               |               |
| auxiliary connector                                   | solid mm <sup>2</sup>                             |                                 |         | 0.75-2.5 <sup>*2</sup> |                    |               |               |
|                                                       | flexible mm <sup>2</sup>                          |                                 |         | 0.5-2.5 <sup>*2</sup>  |                    |               |               |
|                                                       | flexible with multicore cable end mm <sup>2</sup> |                                 |         | 0.5-1.5                |                    |               |               |
| Cables per clamp                                      | number                                            |                                 |         | 2                      |                    |               |               |
| <b>Auxiliary contacts</b>                             |                                                   |                                 |         |                        |                    |               |               |
| <b>Rated insulation voltage</b> $U_i^{*1}$            |                                                   |                                 |         |                        |                    |               |               |
| same potential                                        | V~                                                | 690                             | 690     | 690                    |                    | 690           |               |
| different potential                                   | V~                                                | 440                             | 440     | 250                    |                    | 440           |               |
| <b>Utilization category AC15</b>                      |                                                   |                                 |         |                        |                    |               |               |
| Rated operational current $I_o$                       | 24V A                                             | 5                               | 3       | 4 <sup>*5</sup>        |                    | 5             |               |
|                                                       | 230V A                                            | 3                               | 2       | 2.5                    |                    | 3             |               |
|                                                       | 400V A                                            | 2                               | 1       | 1.5                    |                    | 2             |               |
|                                                       | 690V A                                            | 0.6                             | 0.5     | 0.6                    |                    | 0.6           |               |
| <b>Utilization category DC13</b>                      |                                                   |                                 |         |                        |                    |               |               |
| Rated operational current $I_o$                       | 24V A                                             | 1.2                             | 1       | 1.2                    |                    | 1.2           |               |
|                                                       | 110V A                                            | 0.15                            | 0.15    | 0.15                   |                    | 0.15          |               |
|                                                       | 220V A                                            | 0.1                             | 0.1     | 0.1                    |                    | 0.1           |               |
| <b>Short circuit protection</b> (without welding 1kA) |                                                   |                                 |         |                        |                    |               |               |
| highest fuse rating                                   | gL (gG) A                                         | 6                               | 4       | 6                      |                    | 6             |               |
| <b>Setting range</b>                                  | A                                                 | to 23                           | all     | 28-42                  | 52-65              | all           | -             |
| <b>Power loss per current path (max.)</b>             |                                                   |                                 |         |                        |                    |               |               |
| minimum setting value                                 | W                                                 | 1.1                             | 1.1     | 1.3                    | 2.9                | 1.1           | -             |
| maximum setting value                                 | W                                                 | 2.3                             | 2.3     | 3.3                    | 4.5                | 2.5           | -             |

\*1) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry:  $U_{imp}$  = 4kV (at 440V), 6kV (at 690V). Data for other conditions on request.

\*2) Maximum cable cross-section with prepared conductor

\*3) Without terminals, suitable for bushing one connector 70mm<sup>2</sup> (stranded) per phase

\*4) Busbar sets see accessories page 59

\*5) Switching capacity of the start contact: AC15 300VA, max. 1.5A, DC13 (max. 220V) 30W, max. 1.5A

**Data according to cULus**

| Type                            |      | J7TKN-A | J7TKN-B | J7TKN-C | J7TKN-D | J7TKN-E |
|---------------------------------|------|---------|---------|---------|---------|---------|
| <b>Rated insulation voltage</b> | V~   | 600     | 600     | 600     | 600     | 600     |
| <b>Rated current</b>            | A    | 23      | 32      | 42      | 74      | 85      |
| <b>Auxiliary contacts</b>       |      |         |         |         |         |         |
| Rated voltage                   |      |         |         |         |         |         |
| same potential                  | V AC | 600     | 600     | 600     | 600     | 600     |
| different potential             | V~   | 150     | 150     | 150     | 150     | 150     |
| <b>Switching capacity AC</b>    | VA   | 500     | 500     | 600     | 600     | 600     |
| of aux. contacts                | A    | 4       | 2       | 4       | 4       | 4       |

**Temperature Compensation**

In case of higher ambient temperature use the following formula:  
 $(\text{Ambient temperature} - 20) \times 0.125 = \text{correction factor in \% of the full load motor current}$

Example:

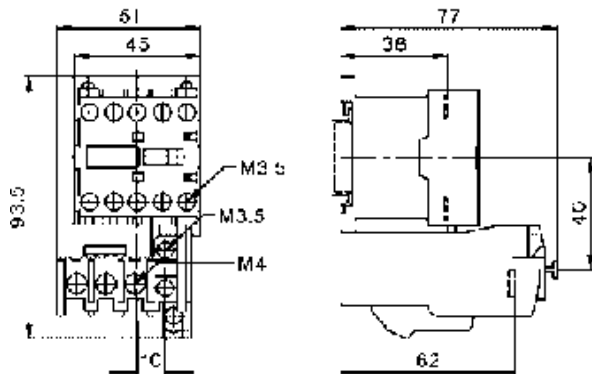
Ambient temperature 70°C, full load motor current 7A

$(70 - 20) \times 0.125 = 6.25\%$

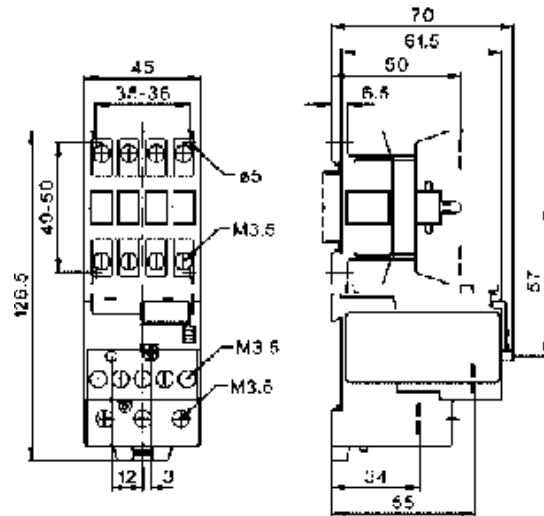
Setting value:  $7A + 6.25\% = 7.44A$

# ■ Dimensions

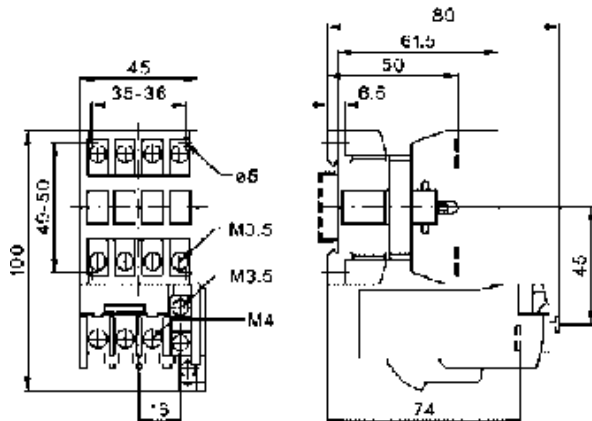
J7KNA-09 + J7TKN-A  
J7KNA-12



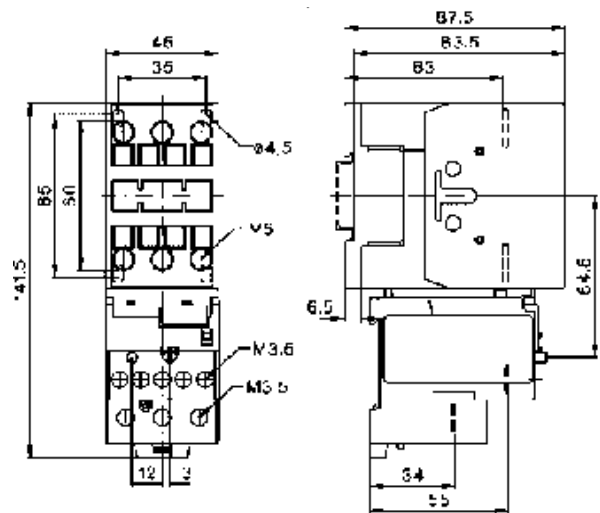
J7KN-10 + J7TKN-B  
J7KN-14  
J7KN-18  
J7KN-22



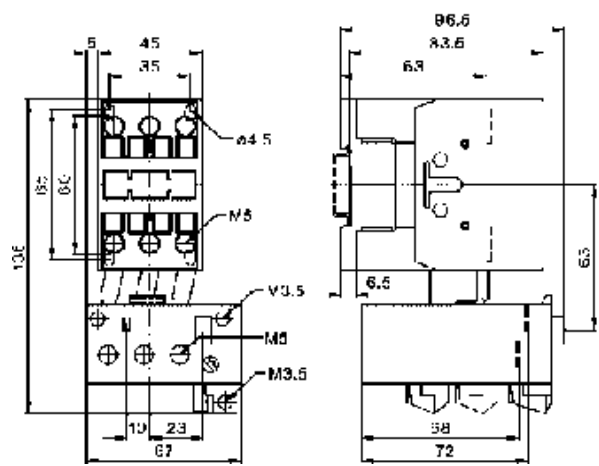
J7KN-10 + J7TKN-A  
J7KN-14  
J7KN-18  
J7KN-22



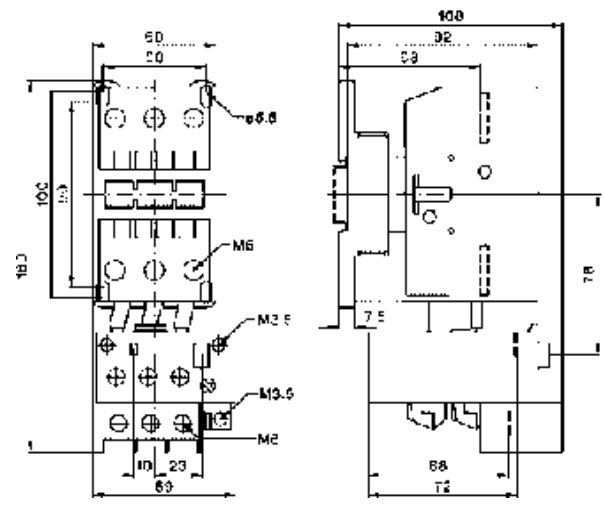
J7KN-24 + J7TKN-B  
J7KN-32  
J7KN-40



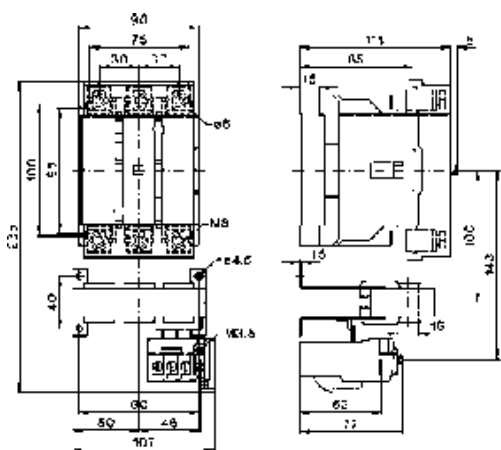
J7KN-24 + J7TKN-C  
J7KN-32  
J7KN-40



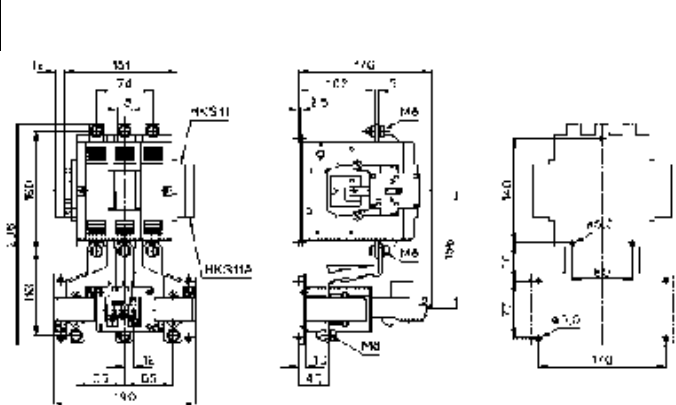
J7KN-50 + J7TKN-D  
J7KN-62  
J7KN-74



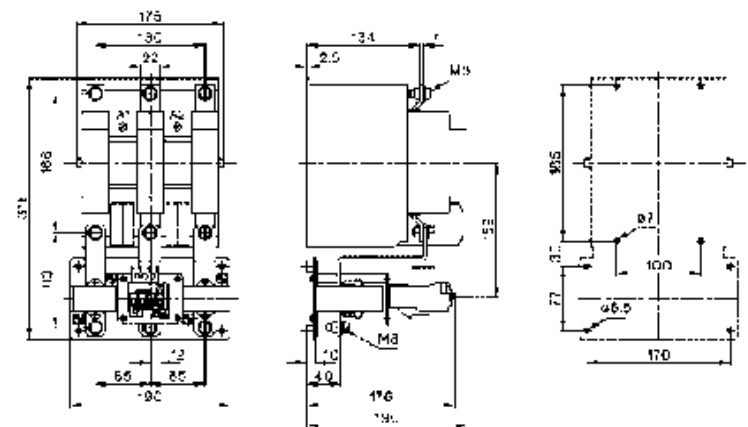
J7KN-85 + J7TKN-E  
J7KN-110



J7KN-150 + J7TKN-F  
J7KN-175



J7KN-200 + J7TKN-210



LVSG

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

Cat. No. J509-E2-02

In the interest of product improvement, specifications are subject to change without notice.

# Motor Protection Circuit Breaker (MPCB) J7MN

## MPCB system (motor protection CLASS 10)

- Rotary and switch types
- Rated operational current = 12 A, 25 A, 50 A and 100 A
- Switching capacity up to 12.5 A = 100 kA/400 V
- Fixed short-circuit release =  $13 \times I_u$
- Overload release adjustable  $0.7 - 1 \times I_u$
- Single phasing sensivity

## Auxiliary contact modules

- ON/OFF indication for MPCB front mounting and side mounting
- Trip indication for MPCB side mounting

## Accessories

- Undervoltage release
- Shunt release
- Three phase busbar system up to 5 MPCB
- Moulded plastic enclosures (IP55)
- Moulded plastic front plates (IP55)
- Door coupling rotary mechanisms (black and red/yellow)



## Approved Standards

| Standard     | Guide No (US,C) |
|--------------|-----------------|
| UL           | see page 95     |
| ICE 947-5-1  |                 |
| VDE 0660     |                 |
| EN 60947-5-1 |                 |

# Ordering Information

## ■ Model Number Legend

### 1. Motor Protection Circuit Breaker (MPCB)

J7MN-□□-□□□  
1 2 3

- 1) Motor Protection Circuit Breaker (MPCB)
- 2) Type
  - 12: Switch type (0.16 - 12 A)
  - 25: Rotary type (0.16 - 25 A)
  - 50: Rotary type (25 - 40 A)
  - 100: Rotary type (45 - 100 A)
- 3) Setting range (examples)
  - E16: 0.11 - 0.16 A
  - E2: 0.14 - 0.2 A
  - 16: 10 - 16 A
  - ...

### 2. Aux. Contacts for MPCB

J73MN-□□□  
1 2 3

- 1) Aux. Contact for MPCB
- 2) 11: 1 NO 1 NC
- 3) S: side mounting  
F: front mounting

J73MN-□-□□□  
1 2 3 4

- 1) Aux. Contact for MPCB
- 2) T: Trip indicating contact
- 3) 11: 1 NO 1 NC
- 4) S: side mounting

### 3. Accessories for MPCB

J74MN-□-□□  
1 2 3

- 1) Accessories for MPCB
- 2) S: Shunt release  
U: Under voltage release
- 3) N1: 230 V 50 Hz / 240 V 60 Hz  
N2: 210 - 230 V 50/60 Hz

J74MN-□□□  
1 2 3

- 1) Accessories for MPCB
- 2) PF: Enclosure IP55  
P: Module plastic front plate  
PH: Holder for front plate
- 3) 12: Switch type  
25: Rotary type

J74MN-□□-□□  
1 2 3

- 1) Accessories for MPCB
- 2) DC: Door coupling rotary mechanism
- 3) B: black / gray  
RY: red / yellow

J74MN-□□-□□□  
1 2 3

- 1) Accessories for MPCB
- 2) L3: 3-phase busbar system (45 mm modular spacing)  
DS: Shroud for unused terminal
- 3) 1/2: for 2 circuit breakers  
1/3: for 3 circuit breakers  
1/4: for 4 circuit breakers  
1/5: for 5 circuit breakers

J74MN-□□□  
1 2 3

- 1) Accessories for MPCB
- 2) TC: Line side terminal
- 3) 12: for switch type  
25: for rotary type

J74MN-□□□□  
1 2 3

- 1) Accessories for MPCB
- 2) TB: Terminal block for UL/cUL type E
- 3) 25: for rotary type up to 25A  
100: for rotary type up to 100A

## ■ System overview

### Motor Protection Circuit Breaker (MPCB)

|                                                                                   | Rated current | Suitable for motors <sup>*1</sup> | Current setting range         |                                          | Short-circuit breaking capacity at 3~400V | Type         | Pack | Weight approx. |
|-----------------------------------------------------------------------------------|---------------|-----------------------------------|-------------------------------|------------------------------------------|-------------------------------------------|--------------|------|----------------|
|                                                                                   | In<br>A       | 3~400V<br>kW                      | Thermal overload release<br>A | Instantaneous short-circuit release<br>A | kA                                        |              | pcs. | kg/pcs.        |
| <b>Circuit-Breakers J7MN-12</b>                                                   |               |                                   |                               |                                          |                                           |              |      |                |
|  | 0.16          | -                                 | 0.11 – 0.16                   | 2.1                                      | 100                                       | J7MN-12-E16  | 1    | 0.21           |
|                                                                                   | 0.2           | -                                 | 0.14 – 0.2                    | 2.6                                      | 100                                       | J7MN-12-E2   | 1    | 0.21           |
|                                                                                   | 0.25          | 0.06                              | 0.18 – 0.25                   | 3.3                                      | 100                                       | J7MN-12-E25  | 1    | 0.21           |
|                                                                                   | 0.32          | 0.09                              | 0.22 – 0.32                   | 4.2                                      | 100                                       | J7MN-12-E32  | 1    | 0.21           |
|                                                                                   | 0.4           | -                                 | 0.28 – 0.4                    | 5.2                                      | 100                                       | J7MN-12-E4   | 1    | 0.21           |
|                                                                                   | 0.5           | 0.12                              | 0.35 – 0.5                    | 6.5                                      | 100                                       | J7MN-12-E5   | 1    | 0.21           |
|                                                                                   | 0.63          | 0.18                              | 0.45 – 0.63                   | 8.2                                      | 100                                       | J7MN-12-E63  | 1    | 0.21           |
|                                                                                   | 0.8           | -                                 | 0.55 – 0.8                    | 10                                       | 100                                       | J7MN-12-E8   | 1    | 0.21           |
|                                                                                   | 1             | 0.25                              | 0.7 – 1                       | 13                                       | 100                                       | J7MN-12-1    | 1    | 0.21           |
|                                                                                   | 1.25          | 0.37                              | 0.9 – 1.25                    | 16                                       | 100                                       | J7MN-12-1E25 | 1    | 0.21           |
|                                                                                   | 1.6           | 0.55                              | 1.1 – 1.6                     | 21                                       | 100                                       | J7MN-12-1E6  | 1    | 0.21           |
|                                                                                   | 2             | 0.75                              | 1.4 – 2                       | 26                                       | 100                                       | J7MN-12-2    | 1    | 0.21           |
|                                                                                   | 2.5           | -                                 | 1.8 – 2.5                     | 33                                       | 100                                       | J7MN-12-2E5  | 1    | 0.21           |
|                                                                                   | 3.2           | 1.1                               | 2.2 – 3.2                     | 42                                       | 100                                       | J7MN-12-3E2  | 1    | 0.21           |
|                                                                                   | 4             | 1.5                               | 2.8 – 4                       | 52                                       | 100                                       | J7MN-12-4    | 1    | 0.21           |
|                                                                                   | 5             | -                                 | 3.5 – 5                       | 65                                       | 100                                       | J7MN-12-5    | 1    | 0.21           |
|                                                                                   | 6.3           | 2.2                               | 4.5 – 6.3                     | 82                                       | 100                                       | J7MN-12-6E3  | 1    | 0.21           |
|                                                                                   | 8             | 3                                 | 5.5 – 8                       | 104                                      | 50                                        | J7MN-12-8    | 1    | 0.21           |
|                                                                                   | 10            | 4                                 | 7 – 10                        | 130                                      | 50                                        | J7MN-12-10   | 1    | 0.21           |
|                                                                                   | 12            | 5.5                               | 9 – 12                        | 156                                      | 50                                        | J7MN-12-12   | 1    | 0.21           |

\*1) Recommended values for standard motors

\*2) max. motor current 95A

|                                                                                     | Rated current<br><br>In<br>A | Suitable for<br>motors*1<br>3~400V<br>kW | Current setting range<br>Thermal<br>overload<br>release<br>A | Instantaneous<br>short-circuit<br>release<br>A | Short-circuit<br>breaking<br>capacity<br>at 3~400V<br>kA | Type         | Pack<br><br>pcs. | Weight<br>approx.<br><br>kg/pcs. |
|-------------------------------------------------------------------------------------|------------------------------|------------------------------------------|--------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------|--------------|------------------|----------------------------------|
| Circuit-Breakers J7MN-25                                                            |                              |                                          |                                                              |                                                |                                                          |              |                  |                                  |
|    | 0.16                         | -                                        | 0.11 – 0.16                                                  | 2.1                                            | 100                                                      | J7MN-25-E16  | 1                | 0.32                             |
|                                                                                     | 0.2                          | -                                        | 0.14 – 0.2                                                   | 2.6                                            | 100                                                      | J7MN-25-E2   | 1                | 0.32                             |
|                                                                                     | 0.25                         | 0.06                                     | 0.18 – 0.25                                                  | 3.3                                            | 100                                                      | J7MN-25-E25  | 1                | 0.32                             |
|                                                                                     | 0.32                         | 0.09                                     | 0.22 – 0.32                                                  | 4.2                                            | 100                                                      | J7MN-25-E32  | 1                | 0.32                             |
|                                                                                     | 0.4                          | -                                        | 0.28 – 0.4                                                   | 5.2                                            | 100                                                      | J7MN-25-E4   | 1                | 0.32                             |
|                                                                                     | 0.5                          | 0.12                                     | 0.35 – 0.5                                                   | 6.5                                            | 100                                                      | J7MN-25-E5   | 1                | 0.32                             |
|                                                                                     | 0.63                         | 0.18                                     | 0.45 – 0.63                                                  | 8.2                                            | 100                                                      | J7MN-25-E63  | 1                | 0.32                             |
|                                                                                     | 0.8                          | -                                        | 0.55 – 0.8                                                   | 10                                             | 100                                                      | J7MN-25-E8   | 1                | 0.32                             |
|                                                                                     | 1                            | 0.25                                     | 0.7 – 1                                                      | 13                                             | 100                                                      | J7MN-25-1    | 1                | 0.32                             |
|                                                                                     | 1.25                         | 0.37                                     | 0.9 – 1.25                                                   | 16                                             | 100                                                      | J7MN-25-1E25 | 1                | 0.32                             |
|                                                                                     | 1.6                          | 0.55                                     | 1.1 – 1.6                                                    | 21                                             | 100                                                      | J7MN-25-1E6  | 1                | 0.32                             |
|                                                                                     | 2                            | 0.75                                     | 1.4 – 2                                                      | 26                                             | 100                                                      | J7MN-25-2    | 1                | 0.32                             |
|                                                                                     | 2.5                          | -                                        | 1.8 – 2.5                                                    | 33                                             | 100                                                      | J7MN-25-2E5  | 1                | 0.32                             |
|                                                                                     | 3.2                          | 1.1                                      | 2.2 – 3.2                                                    | 42                                             | 100                                                      | J7MN-25-3E2  | 1                | 0.32                             |
|                                                                                     | 4                            | 1.5                                      | 2.8 – 4                                                      | 52                                             | 100                                                      | J7MN-25-4    | 1                | 0.32                             |
|                                                                                     | 5                            | -                                        | 3.5 – 5                                                      | 65                                             | 100                                                      | J7MN-25-5    | 1                | 0.32                             |
|                                                                                     | 6.3                          | 2.2                                      | 4.5 – 6.3                                                    | 82                                             | 100                                                      | J7MN-25-6E3  | 1                | 0.32                             |
|                                                                                     | 8                            | 3                                        | 5.5 – 8                                                      | 104                                            | 100                                                      | J7MN-25-8    | 1                | 0.32                             |
|                                                                                     | 10                           | 4                                        | 7 – 10                                                       | 130                                            | 100                                                      | J7MN-25-10   | 1                | 0.32                             |
|                                                                                     | 12.5                         | 5.5                                      | 9 – 12.5                                                     | 163                                            | 100                                                      | J7MN-25-12E5 | 1                | 0.32                             |
|                                                                                     | 16                           | 7.5                                      | 11 – 16                                                      | 208                                            | 50                                                       | J7MN-25-16   | 1                | 0.32                             |
|                                                                                     | 20                           | -                                        | 14 – 20                                                      | 260                                            | 50                                                       | J7MN-25-20   | 1                | 0.32                             |
|                                                                                     | 22                           | -                                        | 17 – 22                                                      | 286                                            | 50                                                       | J7MN-25-22   | 1                | 0.32                             |
|                                                                                     | 25                           | 11                                       | 20 – 25                                                      | 325                                            | 50                                                       | J7MN-25-25   | 1                | 0.32                             |
| Circuit-Breakers J7MN-50                                                            |                              |                                          |                                                              |                                                |                                                          |              |                  |                                  |
|  | 25                           | 11                                       | 18 – 25                                                      | 325                                            | 50                                                       | J7MN-50-25   | 1                | 0.96                             |
|                                                                                     | 32                           | 15                                       | 22 – 32                                                      | 416                                            | 50                                                       | J7MN-50-32   | 1                | 0.96                             |
|                                                                                     | 40                           | 18.5                                     | 28 – 40                                                      | 520                                            | 50                                                       | J7MN-50-40   | 1                | 0.96                             |
|                                                                                     | 45                           | –                                        | 36 – 45                                                      | 585                                            | 50                                                       | J7MN-50-45   | 1                | 0.96                             |
|                                                                                     | 50                           | 22                                       | 40 – 50                                                      | 650                                            | 50                                                       | J7MN-50-50   | 1                | 0.96                             |
| Circuit-Breakers J7MN-100                                                           |                              |                                          |                                                              |                                                |                                                          |              |                  |                                  |
|  | 63                           | 30                                       | 45 – 63                                                      | 819                                            | 50                                                       | J7MN-100-63  | 1                | 2.1                              |
|                                                                                     | 75                           | 37                                       | 57 – 75                                                      | 975                                            | 50                                                       | J7MN-100-75  | 1                | 2.1                              |
|                                                                                     | 90                           | –                                        | 70 – 90                                                      | 1170                                           | 50                                                       | J7MN-100-90  | 1                | 2.1                              |
|                                                                                     | 100                          | 45                                       | 80 – 100 <sup>2</sup>                                        | 1235                                           | 50                                                       | J7MN-100-100 | 1                | 2.1                              |

\*1) Recommended values for standard motors

\*2) max. motor current 95A

## Accessories

|                                                                                           | Description                                                                                                                                                                                                               | Version                                                           | for circuit breaker | Type               | Pack pcs. | Weight approx. kg/pcs. |
|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------|--------------------|-----------|------------------------|
| <b>Transverse auxiliary contact block</b>                                                 |                                                                                                                                                                                                                           |                                                                   |                     |                    |           |                        |
|          | Contact block                                                                                                                                                                                                             | 1NO + 1NC                                                         | all                 | <b>J73MN-11F</b>   | 10        | 0.02                   |
| <b>Auxiliary contact block for left hand side mounting (max 1pc. per circuit breaker)</b> |                                                                                                                                                                                                                           |                                                                   |                     |                    |           |                        |
|          | Contact block                                                                                                                                                                                                             | 1NO + 1NC 9 mm                                                    | all                 | <b>J73MN-11S</b>   | 10        | 0.03                   |
| <b>Signalling switch for left hand side mounting (max 1pc. per circuit breaker)</b>       |                                                                                                                                                                                                                           |                                                                   |                     |                    |           |                        |
|          | Signalling switch                                                                                                                                                                                                         | 1NO + 1NC each<br>Individual tripped and short-circuit signalling | J7MN-25<br>J7MN-50  | <b>J73MN-T-11S</b> | 1         | 0.07                   |
| <b>Auxiliary releases for right hand side mounting (max 1pc. per circuit breaker)</b>     |                                                                                                                                                                                                                           |                                                                   |                     |                    |           |                        |
|          | <b>Undervoltage release</b><br>Trips the circuit-breaker when the voltage is interrupted. Prevents the motor from being restarted accidentally when the voltage is restored, suitable for EMERGENCY STOP acc. to VDE 0113 | AC 50 Hz 230 V<br>AC 60 Hz 240 V                                  | all                 | <b>J74MN-U-N1</b>  | 1         | 0.12                   |
|        | <b>Shunt release</b><br>Trips the circuit-breaker when the release coil energized.                                                                                                                                        | 50/60 Hz 100% ON 210-240 V<br>50/60 Hz, DC 5 sec ON 190-330 V     | all                 | <b>J74MN-S-N2</b>  | 1         | 0.11                   |

## Enclosures and Front Plates

|                                                                                     | Description                                                                               | Version                                                                            | for circuit breaker | Type              | Pack pcs. | Weight approx. kg/pcs. |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------|-------------------|-----------|------------------------|
| <b>Front Plates</b>                                                                 |                                                                                           |                                                                                    |                     |                   |           |                        |
|  | <b>Moulded plastic front plate</b> with actuator diaphragm and holder for circuit breaker | for actuation of circuit-breakers in any enclosure protection degree IP55          | J7MN-12             | <b>J74MN-P12</b>  | 1         | 0.08                   |
|                                                                                     | <b>Moulded plastic front plate</b> with rotary operating mechanism lockable               | for actuation of circuit-breakers in any enclosure protection degree IP55          | J7MN-25<br>J7MN-50  | <b>J74MN-P25</b>  | 1         | 0.08                   |
|                                                                                     | <b>Holder for front plate</b> J74MN-P25                                                   | Holder is mounted on front plate, circuit-breaker (with accessories) is snapped on | J7MN-25             | <b>J74MN-PH</b>   | 1         | 0.12                   |
| <b>Enclosures</b>                                                                   |                                                                                           |                                                                                    |                     |                   |           |                        |
|  | <b>Moulded plastic enclosure</b> with actuator diaphragm knockouts for J7MN-25 sealable   | protection degree IP55 with N- and PE- terminal (+ aux. contact + release)         | J7MN-12             | <b>J74MN-PF12</b> | 1         | 0.27                   |

|                                                                                   | Description                                                                                     | Version                                                                    | for circuit breaker | Type              | Pack pcs. | Weight approx. kg/pcs. |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------|-------------------|-----------|------------------------|
|  | <b>Moulded plastic enclosure</b> with rotary operating mechanism knockouts for J7MN-25 lockable | protection degree IP55 with N- and PE- terminal (+ aux. contact + release) | J7MN-25             | <b>J74MN-PF25</b> | 1         | 0.30                   |

#### Door-coupling mechanisms

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                             |                                                |                    |                    |   |     |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------|--------------------|---|-----|
|  | The door-coupling rotary operating mechanisms consist of a knob, a coupling driver and a extension shaft (5 mm x 5 mm). The door-coupling rotary operating mechanisms are designed for degree of protection IP 65. The door locking device prevents accidental opening of the cubicle door in the ON position of the circuit-breaker. The OFF position can be locked with up to 3 padlocks. |                                                |                    |                    |   |     |
|                                                                                   | <b>Door-coupling rotary mechanism black</b>                                                                                                                                                                                                                                                                                                                                                 | extension shaft 330 mm with supporting bracket | J7MN-25 to J7MN-50 | <b>J74MN-DC-B</b>  | 1 | 0.3 |
|                                                                                   | <b>Emergency-Stop Door-coupling rotary mechanism red/yellow</b>                                                                                                                                                                                                                                                                                                                             | extension shaft 330 mm with supporting bracket | J7MN-25 to J7MN-50 | <b>J74MN-DC-RY</b> | 1 | 0.3 |

#### Busbars

|                                                                                                                                                                                                                                    | Description                                                                                                                               | Version                                                                                              | for circuit breaker | Type                                                                                     | Pack pcs.        | Weight approx. kg/pcs.       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------|------------------|------------------------------|
| <b>Insulated 3-phase busbar systems</b>                                                                                                                                                                                            |                                                                                                                                           |                                                                                                      |                     |                                                                                          |                  |                              |
|                                                                                                                                                   | For feeding several modular circuit-breakers on standard mounting rails, insulated, shock-protected. Rated operational voltage max. 690 V |                                                                                                      |                     |                                                                                          |                  |                              |
|                                                                                                                                                                                                                                    | <b>3-phase busbars</b> modular spacing 45 mm                                                                                              | for 2 circuit-breakers<br>for 3 circuit-breakers<br>for 4 circuit-breakers<br>for 5 circuit-breakers | J7MN-12<br>J7MN-25  | <b>J74MN-L3-1/2</b><br><b>J74MN-L3-1/3</b><br><b>J74MN-L3-1/4</b><br><b>J74MN-L3-1/5</b> | 1<br>1<br>1<br>1 | 0.03<br>0.05<br>0.07<br>0.10 |
| For connecting the 3-phase busbars from circuit-breakers different sizes. Clamping together J7MN-12 and J7MN-25 circuit-breakers is not possible due to the different modular spacings and the different heights of the terminals. |                                                                                                                                           |                                                                                                      |                     |                                                                                          |                  |                              |
|                                                                                                                                                 | <b>Line side terminal</b> 3-pole, connection from top                                                                                     | Conductor cross-section solid or stranded 6- 25 mm <sup>2</sup> with ferrule 4-16 mm <sup>2</sup>    | J7MN-12<br>J7MN-25  | <b>J74MN-TC12</b><br><b>J74MN-TC25</b>                                                   | 1<br>1           | 0.04<br>0.04                 |
|                                                                                                                                                 | <b>Shroud</b>                                                                                                                             | for unused terminals                                                                                 | J7MN-12<br>J7MN-25  | <b>J74MN-DS</b>                                                                          | 20               | -                            |

#### Mounting Parts for Fuseless Load Feeders

|                                                                                     | Description                                                             | Version                                                          | for circuit breaker | Type                                     | Pack pcs. | Weight approx. kg/pcs. |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------|---------------------|------------------------------------------|-----------|------------------------|
| <b>DIN-rail adapters</b>                                                            |                                                                         |                                                                  |                     |                                          |           |                        |
|  | <b>Adapter</b> for mechanical fixing of circuit-breaker and contactor   | 35 mm-DIN-rail (DIN EN50022) or screw mounting                   | J7MN...             | <b>J74MN-HU</b>                          | 10        | 0.05                   |
| <b>Link modules</b>                                                                 |                                                                         |                                                                  |                     |                                          |           |                        |
|  | for electrical connection between circuit-breaker and contactor         |                                                                  |                     |                                          |           |                        |
|                                                                                     | <b>Link module</b>                                                      | up to 20 A<br>up to 32 A                                         | J7MN...             | <b>J74MN-VD-12</b><br><b>J74MN-VD-25</b> | 10<br>10  | -<br>-                 |
| <b>Terminal block</b>                                                               |                                                                         |                                                                  |                     |                                          |           |                        |
|  | with increased creepage distances and clearances acc. to cULus Type „E“ |                                                                  |                     |                                          |           |                        |
|                                                                                     | <b>Terminal block</b>                                                   | up to 600 V acc. to UL 489 not for transverse aux. contact block | J7MN-25<br>J7MN-100 | <b>J74MN-TB25</b><br><b>J74MN-TB100</b>  | 1<br>1    | 0.12<br>0.15           |

# Specifications

## ■ Engineering data and Characteristics

### Components for Fuseless Load Feeders, DIN-Rail Mounting

Type of coordination „1“ 3 x 415 V 10 kA (other conditions on request)

| Motor<br>3~400V<br>kW | Setting range<br>A | Circuit-breaker<br>page 72<br>Type | Contactor<br>220-230V 50Hz<br>Type | Link<br>module<br>Type | DIN-rail<br>adapter<br>Type |
|-----------------------|--------------------|------------------------------------|------------------------------------|------------------------|-----------------------------|
| -                     | 0.11– 0.16         | J7MN-25-E16                        | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| -                     | 0.14– 0.2          | J7MN-25-E2                         | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 0.06                  | 0.18– 0.25         | J7MN-25-E25                        | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 0.09                  | 0.22– 0.32         | J7MN-25-E32                        | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| -                     | 0.28– 0.4          | J7MN-25-E4                         | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 0.12                  | 0.35– 0.5          | J7MN-25-E5                         | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 0.18                  | 0.45– 0.63         | J7MN-25-E63                        | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| -                     | 0.55– 0.8          | J7MN-25-E8                         | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 0.25                  | 0.7– 1             | J7MN-25-1                          | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 0.37                  | 0.9– 1.25          | J7MN-25-1E25                       | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 0.55                  | 1.1– 1.6           | J7MN-25-1E6                        | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 0.75                  | 1.4– 2             | J7MN-25-2                          | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| -                     | 1.8– 2.5           | J7MN-25-2E5                        | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 1.1                   | 2.2– 3.2           | J7MN-25-3E2                        | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 1.5                   | 2.8– 4             | J7MN-25-4                          | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| -                     | 3.5– 5             | J7MN-25-5                          | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 2.2                   | 4.5– 6.3           | J7MN-25-6E3                        | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 3                     | 5.5– 8             | J7MN-25-8                          | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 4                     | 7– 10              | J7MN-25-10                         | J7KN-10-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 5.5                   | 9– 12.5            | J7MN-25-12E5                       | J7KN-14-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| 7.5                   | 11– 16             | J7MN-25-16                         | J7KN-18-10 230                     | J74MN-VD-12            | J74MN-HU                    |
| -                     | 14– 20             | J7MN-25-20                         | J7KN-22-10 230                     | J74MN-VD-25            | J74MN-HU                    |
| -                     | 17– 22             | J7MN-25-22                         | J7KN-22-10 230                     | J74MN-VD-25            | J74MN-HU                    |
| 11                    | 20– 25             | J7MN-25-25                         | J7KN-22-10 230                     | J74MN-VD-25            | J74MN-HU                    |

# Technical Data according to IEC/EN 60947-1, 60947-2, 60947-4-1 and VDE 0660

This table shows the rated ultimate short-circuit breaking capacity  $I_{cu}$  and the rated service short-circuit breaking capacity  $I_{cs}$  of the J7MN circuit-breakers with different operational voltages as a function of the rated current  $I_n$  of the circuit-breakers.

The circuit-breakers can be fed at the top or bottom supply terminals without any reduction of the rated data.

If the short-circuit current exceeds the rated short-circuit breaking capacity of the circuit-breaker specified in the tables at the installation point, a back-up fuse is to be used.

The maximum rated current for the back-up fuse is specified in the tables. These fuses are only suitable for the short-circuit-currents as indicated on the fuses.

| Circuit-breaker Type | Rated current $I_n$<br>A | up to AC 240V <sup>*1)</sup> |                |                           | up to AC 400V <sup>*1)</sup><br>up to AC 415V <sup>*2)</sup> |                |                           | up to AC 440V <sup>*1)</sup><br>up to AC 460V <sup>*2)</sup> |                |                           | up to AC 500V <sup>*1)</sup><br>up to AC 525V <sup>*2)</sup> |                |                           | up to AC 690V <sup>*1)</sup> |                |                           |
|----------------------|--------------------------|------------------------------|----------------|---------------------------|--------------------------------------------------------------|----------------|---------------------------|--------------------------------------------------------------|----------------|---------------------------|--------------------------------------------------------------|----------------|---------------------------|------------------------------|----------------|---------------------------|
|                      |                          | $I_{cu}$<br>kA               | $I_{cs}$<br>kA | max. fuse<br>(gL/gG)<br>A | $I_{cu}$<br>kA                                               | $I_{cs}$<br>kA | max. fuse<br>(gL/gG)<br>A | $I_{cu}$<br>kA                                               | $I_{cs}$<br>kA | max. fuse<br>(gL/gG)<br>A | $I_{cu}$<br>kA                                               | $I_{cs}$<br>kA | max. fuse<br>(gL/gG)<br>A | $I_{cu}$<br>kA               | $I_{cs}$<br>kA | max. fuse<br>(gL/gG)<br>A |
| J7MN-12              | 0.16 to 0.8              | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                          | 100            | --                        |
|                      | 1                        | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                          | 100            | --                        |
|                      | 1.25                     | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 2                            | 2              | 20                        |
|                      | 1.6                      | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 2                            | 2              | 20                        |
|                      | 2                        | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 10                                                           | 10             | 35                        | 2                            | 2              | 35                        |
|                      | 2.5                      | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 10                                                           | 10             | 35                        | 2                            | 2              | 35                        |
|                      | 3.2                      | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 10                                                           | 10             | 40                        | 3                                                            | 3              | 40                        | 2                            | 2              | 40                        |
|                      | 4                        | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 10                                                           | 10             | 40                        | 3                                                            | 3              | 40                        | 2                            | 2              | 40                        |
|                      | 5                        | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 10                                                           | 10             | 50                        | 3                                                            | 3              | 50                        | 2                            | 2              | 50                        |
|                      | 6.3                      | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 10                                                           | 10             | 50                        | 3                                                            | 3              | 50                        | 2                            | 2              | 50                        |
|                      | 8                        | 100                          | 100            | --                        | 50                                                           | 12.5           | 80 <sup>*3)</sup>         | 10                                                           | 10             | 63                        | 3                                                            | 3              | 63                        | 2                            | 2              | 63                        |
|                      | 10                       | 100                          | 100            | --                        | 50                                                           | 12.5           | 80 <sup>*3)</sup>         | 10                                                           | 10             | 63                        | 3                                                            | 3              | 63                        | 2                            | 2              | 63                        |
|                      | 12                       | 100                          | 100            | --                        | 50                                                           | 12.5           | 80 <sup>*3)</sup>         | 10                                                           | 10             | 80                        | 3                                                            | 3              | 80                        | 2                            | 2              | 80                        |
| J7MN-25              | 0.16 to 1.25             | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                          | 100            | --                        |
|                      | 1.6                      | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                          | 100            | --                        |
|                      | 2                        | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 8                            | 8              | 25                        |
|                      | 2.5                      | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 8                            | 8              | 25                        |
|                      | 3.2                      | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 8                            | 8              | 32                        |
|                      | 4                        | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 6                            | 3              | 32                        |
|                      | 5                        | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 6                            | 3              | 32                        |
|                      | 6.3                      | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 100                                                          | 100            | --                        | 6                            | 3              | 50                        |
|                      | 8                        | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 50                                                           | 25             | 63 <sup>*3)</sup>         | 42                                                           | 21             | 63                        | 6                            | 3              | 50                        |
|                      | 10                       | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 50                                                           | 25             | 80 <sup>*3)</sup>         | 42                                                           | 21             | 63                        | 6                            | 3              | 50                        |
|                      | 12.5                     | 100                          | 100            | --                        | 100                                                          | 100            | --                        | 50                                                           | 25             | 80 <sup>*3)</sup>         | 42                                                           | 21             | 80                        | 6                            | 3              | 63                        |
|                      | 16                       | 100                          | 100            | --                        | 50                                                           | 25             | 100 <sup>*3)</sup>        | 20                                                           | 10             | 80                        | 10                                                           | 5              | 80                        | 4                            | 2              | 63                        |
|                      | 20                       | 100                          | 100            | --                        | 50                                                           | 25             | 125 <sup>*3)</sup>        | 20                                                           | 10             | 80                        | 10                                                           | 5              | 80                        | 4                            | 2              | 63                        |
|                      | 22                       | 100                          | 100            | --                        | 50                                                           | 25             | 125 <sup>*3)</sup>        | 20                                                           | 10             | 100                       | 10                                                           | 5              | 80                        | 4                            | 2              | 63                        |
|                      | 25                       | 100                          | 100            | --                        | 50                                                           | 25             | 125 <sup>*3)</sup>        | 20                                                           | 10             | 100                       | 10                                                           | 5              | 80                        | 4                            | 2              | 63                        |
| J7MN-50              | 25                       | 100                          | 100            | --                        | 50                                                           | 25             | 125 <sup>*3)</sup>        | 30                                                           | 15             | 100                       | 12                                                           | 6              | 80                        | 5                            | 3              | 63                        |
|                      | 32                       | 100                          | 100            | --                        | 50                                                           | 25             | 125 <sup>*3)</sup>        | 30                                                           | 15             | 125                       | 10                                                           | 5              | 100                       | 4                            | 2              | 63                        |
|                      | 40                       | 100                          | 100            | --                        | 50                                                           | 25             | 160 <sup>*3)</sup>        | 30                                                           | 15             | 125                       | 10                                                           | 5              | 100                       | 4                            | 2              | 63                        |
|                      | 45                       | 100                          | 100            | --                        | 50                                                           | 25             | 160 <sup>*3)</sup>        | 30                                                           | 15             | 125                       | 10                                                           | 5              | 100                       | 4                            | 2              | 63                        |
|                      | 50                       | 100                          | 100            | --                        | 50                                                           | 25             | 160 <sup>*3)</sup>        | 30                                                           | 15             | 125                       | 10                                                           | 5              | 100                       | 4                            | 2              | 80                        |
| J7MN-100             | 63                       | 100                          | 100            | --                        | 50                                                           | 25             | 160 <sup>*3)</sup>        | 40                                                           | 20             | 160                       | 12                                                           | 6              | 125                       | 6                            | 3              | 80                        |
|                      | 75                       | 100                          | 100            | --                        | 50                                                           | 25             | 160 <sup>*3)</sup>        | 40                                                           | 20             | 160                       | 8                                                            | 4              | 125                       | 5                            | 3              | 100                       |
|                      | 90                       | 100                          | 100            | --                        | 50                                                           | 25             | 160 <sup>*3)</sup>        | 40                                                           | 20             | 160                       | 8                                                            | 4              | 125                       | 5                            | 3              | 125                       |
|                      | 100                      | 100                          | 100            | --                        | 50                                                           | 25             | 160 <sup>*3)</sup>        | 40                                                           | 20             | 160                       | 8                                                            | 4              | 125                       | 5                            | 3              | 125                       |

\*1) 10% overvoltage

\*2) 5% overvoltage

\*3) Back-up fuse required if short-circuit current at installation point > 50 kA

-- No back-up fuse required.

# Technical Data according to IEC/EN 60947-1, 60947-2, 60947-4-1 and VDE 0660

## Main Circuit

| Type                                                                                                                                  |                                 | J7MN-12                                                          | J7MN-25    | J7MN-50 | J7MN-100 |          |
|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------------------------------------------|------------|---------|----------|----------|
| Number of poles                                                                                                                       |                                 | 3                                                                | 3          | 3       | 3        |          |
| Max. rated current Inmax (=max. rated operational current Ie)                                                                         | A                               | 12                                                               | 25         | 50      | 100      |          |
| Permissible ambient temperature                                                                                                       |                                 |                                                                  |            |         |          |          |
| Storage/transport                                                                                                                     | °C                              | -50 to +80                                                       |            |         |          |          |
| Operation                                                                                                                             | °C                              | -20 to +70*1)                                                    |            |         |          |          |
| Permissible rated current at temperature inside cubicle of:                                                                           | +60 °C                          | %                                                                | 100        |         |          |          |
|                                                                                                                                       | +70 °C                          | %                                                                | 87         |         |          |          |
| Circuit-breaker inside enclosure                                                                                                      |                                 |                                                                  |            |         |          |          |
| Permissible rated current at temperature inside enclosure of:                                                                         | +60 °C                          | %                                                                | 100        |         |          |          |
|                                                                                                                                       | +70 °C                          | %                                                                | 87         |         |          |          |
| Rated operational voltage Ue                                                                                                          | V                               | 690*2)                                                           |            |         |          |          |
| Rated frequency                                                                                                                       | Hz                              | 50/60                                                            |            |         |          |          |
| Rated insulation voltage Ui                                                                                                           | V                               | 690                                                              |            |         |          |          |
| Rated impulse withstand voltage Uimp                                                                                                  | kV                              | 6                                                                |            |         |          |          |
| Utilization category                                                                                                                  |                                 |                                                                  |            |         |          |          |
| IEC 60 947-2 (circuit-breaker)                                                                                                        |                                 | A                                                                |            |         |          |          |
| IEC 60 947-4-1 (motor starter)                                                                                                        |                                 | AC-3                                                             |            |         |          |          |
| Class                                                                                                                                 | acc. to IEC 60 947-4-1          | 10                                                               |            |         |          |          |
| DC short-circuit breaking capacity (time constant t = 5 ms)                                                                           |                                 |                                                                  |            |         |          |          |
| 1 conducting path DC 150 V                                                                                                            | kA                              | 10                                                               |            |         |          |          |
| 2 conducting paths in series DC 300 V                                                                                                 | kA                              | 10                                                               |            |         |          |          |
| 3 conducting paths in series DC 450 V                                                                                                 | kA                              | 10                                                               |            |         |          |          |
| Power loss Pv per circuit-breaker<br>dependent on rated current In<br>(upper setting range)<br><br>R per conducting path = P/(I² × 3) | In -> to 1.25 A                 | W                                                                | 5          | -       | -        | -        |
|                                                                                                                                       | In -> 1.6 to 6.3 A              | W                                                                | 6          | -       | -        | -        |
|                                                                                                                                       | In -> 8 to 12 A                 | W                                                                | 7          | -       | -        | -        |
|                                                                                                                                       | In -> 1 to 6.3 A                | W                                                                | -          | 6       | -        | -        |
|                                                                                                                                       | In -> 8 to 16 A                 | W                                                                | -          | 7       | -        | -        |
|                                                                                                                                       | In -> 20 to 25 A                | W                                                                | -          | 8       | -        | -        |
|                                                                                                                                       | In -> to 25 A                   | W                                                                | -          | -       | 12       | -        |
|                                                                                                                                       | In -> 32 A                      | W                                                                | -          | -       | 15       | -        |
|                                                                                                                                       | In -> 40 to 50 A                | W                                                                | -          | -       | 20       | -        |
|                                                                                                                                       | In -> to 63 A                   | W                                                                | -          | -       | -        | 20       |
| In -> 75 to 90 A                                                                                                                      | W                               | -                                                                | -          | -       | 30       |          |
| In -> to 100 A                                                                                                                        | W                               | -                                                                | -          | -       | 38       |          |
| Shock resistance                                                                                                                      | acc. to IEC 68 Part 2-27        | g                                                                | 25         | 25      | 25       | 25       |
| Degree of protection                                                                                                                  | acc. to IEC 60 529              | IP 20                                                            |            | IP 20   | IP 20*3) | IP 20*3) |
| Shock hazard protection                                                                                                               | acc. to DIN VDE 0106 Part 100   | safe against finger touch                                        |            |         |          |          |
| Temperature compensation                                                                                                              | acc. to IEC 60 947-4-1          | °C                                                               | -20 to +60 |         |          |          |
| Phase failure sensitivity                                                                                                             | acc. to IEC 60 947-4-1          | yes                                                              |            |         |          |          |
| Explosion protection                                                                                                                  | acc. to EC Directive 94/191 EC  | yes*4)                                                           |            |         |          |          |
| Isolator characteristics                                                                                                              | acc. to IEC 60 947-3            | yes                                                              |            |         |          |          |
| Main and EM. STOP switch characteristics                                                                                              | acc. to IEC 60 204-1 (VDE 0113) | yes*5)                                                           |            |         |          |          |
| Safe isolation between main and auxiliary circuits                                                                                    | acc. to DIN VDE 0106 Part 101   |                                                                  |            |         |          |          |
|                                                                                                                                       | up to 400 V + 10 %              | yes                                                              |            |         |          |          |
|                                                                                                                                       | up to 415 V+ 5 %                | yes                                                              |            |         |          |          |
| Mechanical endurance                                                                                                                  | operating cycles                | 100 000                                                          | 100 000    | 50 000  | 50 000   |          |
| Electrical endurance                                                                                                                  |                                 | 100 000                                                          | 100 000    | 25 000  | 25 000   |          |
| Max. operating frequency per hour (motor starts)                                                                                      | 1/h                             | 15                                                               | 15         | 15      | 15       |          |
| Permissible mounting position                                                                                                         |                                 | any. acc. to IEC 60 447 start command “I” right-hand side or top |            |         |          |          |

\*1) Over +60°C current reduction

\*2) 500 V with moulded-plastic enclosure

\*3) Terminal compartment IP00

\*4) KEMA-test certification on request

\*5) With appropriate accessories

# Technical Data according to IEC/EN 60947-1, 60947-2, 60947-4-1 and VDE 0660

## Conductor cross-sections for main Circuit

| Type                                   |                 | J7MN-12           | J7MN-25         | J7MN-50           | J7MN-100          |
|----------------------------------------|-----------------|-------------------|-----------------|-------------------|-------------------|
| Terminal type                          |                 | Screw-type        | Screw-type      | Box terminal      | Box terminal      |
| Terminal screw                         |                 | Pozidriv size 2   | Pozidriv size 2 | Pozidriv size 2   | Allen screw 4 mm  |
| Tightening torque                      | Nm              | 0.8 to 1.2        | 2 to 2.5        | 3 to 4.5          | 4 to 6            |
| <b>Conductor cross-sections</b>        |                 |                   |                 |                   |                   |
| solid                                  | mm <sup>2</sup> | 2 x (0.5 to 1.5)  | 2 x (1 to 2.5)  | 2 x (0.75 to 16)  | 2 x (2.5 to 16)   |
|                                        | mm <sup>2</sup> | 2 x (0.75 to 2.5) | 2 x (2.5 to 6)  | —                 | —                 |
|                                        | mm <sup>2</sup> | 1 x (0.5 to 4)    | —               | —                 | —                 |
| finely stranded with end ferrule       | mm <sup>2</sup> | 2 x (0.5 to 1.5)  | 2 x (1 to 2.5)  | 2 x (0.75 to 16)  | 2 x (2.5 to 35)   |
|                                        | mm <sup>2</sup> | 2 x (0.75 to 2.5) | 2 x (2.5 to 6)  | 1 x (0.75 to 25)  | 1 x (2.5 to 50)   |
|                                        | mm <sup>2</sup> | —                 | 1 x (1 to 10)   | —                 | —                 |
| stranded                               | mm <sup>2</sup> | 2 x (0.5 to 1.5)  | 2 x (1 to 2.5)  | 2 x (0.75 to 25)  | 2 x (10 to 50)    |
|                                        | mm <sup>2</sup> | 2 x (0.75 to 2.5) | 2 x (2.5 to 6)  | 1 x (0.75 to 35)  | 1 x (10 to 70)    |
|                                        | mm <sup>2</sup> | 1 x (0.5 to 4)    | 1 x (1 to 10)   | —                 | —                 |
| AWG-wires, solid or stranded           | AWG             | 2 x (18 to 14)    | 2 x (14 to 10)  | 2 x (18 to 3)     | 2 x (10 to 1/0)   |
|                                        | AWG             | —                 | —               | 1 x (18 to 2)     | 1 x (10 to 2/0)   |
| conductor bar (number x width x thick) | mm              | —                 | —               | 2 x (6 x 9 x 0.8) | 2 x (6 x 9 x 0.8) |
|                                        | mm              | —                 | —               | —                 | 18 x 10           |
|                                        | mm <sup>2</sup> | —                 | —               | —                 | up to 2 x 70      |

# Technical Data according to IEC/EN 60947-1, 60947-2, 60947-4-1 and VDE 0660

## Auxiliary switches

| Switching capacity                                              |                                             |                    |                 | Control voltage                      |      |     |  |
|-----------------------------------------------------------------|---------------------------------------------|--------------------|-----------------|--------------------------------------|------|-----|--|
| Front transverse auxiliary switch with 1 NO + 1 NC              |                                             |                    |                 |                                      |      |     |  |
| Rated operational voltage U <sub>e</sub>                        | AC                                          | V                  | 24              | 230                                  |      |     |  |
| Rated operational current I <sub>e</sub> /AC-15                 |                                             | A                  | 2               | 0.5                                  |      |     |  |
| Rated operational current I <sub>e</sub> /AC-12 I <sub>th</sub> |                                             | A                  | 2.5             | 2.5                                  |      |     |  |
| Rated operational voltage U <sub>e</sub>                        | DC L/R 200 ms                               | V                  | 24              | 48                                   | 60   |     |  |
| Rated operational current I <sub>e</sub> /DC-13                 |                                             | A                  | 1               | 0.3                                  | 0.15 |     |  |
| Lateral auxiliary switch and signalling switch                  |                                             |                    |                 |                                      |      |     |  |
| Rated operational voltage U <sub>e</sub>                        | AC                                          | V                  | 24              | 230                                  | 400  | 690 |  |
| Rated operational current I <sub>e</sub> /AC-15                 |                                             | A                  | 6               | 6                                    | 3    | 1   |  |
| Rated operational current I <sub>e</sub> /AC-12 I <sub>th</sub> |                                             | A                  | 10              | 10                                   | 10   | 10  |  |
| Rated operational voltage U <sub>e</sub>                        | DC L/R 200 ms                               | V                  | 24              | 110                                  | 220  | 440 |  |
| Rated operational current I <sub>e</sub> /DC-13                 |                                             | A                  | 2               | 0.5                                  | 0.25 | 0.1 |  |
| Undervoltage release                                            | Power consumption                           | during pick-up     | VA/W            | 20.2/13                              |      |     |  |
|                                                                 |                                             | uninterrupted duty | VA/W            | 7.2/2.4                              |      |     |  |
|                                                                 | Response voltage                            | trip               | V               | 0.7 to 0.35 × U <sub>s</sub>         |      |     |  |
|                                                                 |                                             | pick-up            | V               | 0.85 to 1.1 × U <sub>s</sub>         |      |     |  |
|                                                                 | Max. opening time                           |                    | ms              | 20                                   |      |     |  |
| Shunt release                                                   | Power consumption                           | during pick-up     | AC VA/W         | 20.2/13                              |      |     |  |
|                                                                 |                                             |                    | DC W            | 13 to 80                             |      |     |  |
|                                                                 | Response voltage acc. to IEC 60 947-1, trip | V                  |                 | 0.7 to 1.1 × U <sub>s</sub>          |      |     |  |
|                                                                 | Max. opening time                           |                    | ms              | 20                                   |      |     |  |
| Short-circuit protection for auxiliary and control circuits     |                                             |                    |                 |                                      |      |     |  |
|                                                                 | Fuse                                        | gL/gG              | A               | 10                                   |      |     |  |
|                                                                 | Miniature circuit breaker C-characteristic  |                    | A               | 6 <sup>*1)</sup>                     |      |     |  |
| Conductor cross-sections for auxiliary and control circuits     |                                             |                    |                 | Screw-type Pozidriv size 2           |      |     |  |
|                                                                 | solid                                       |                    | mm <sup>2</sup> | 2 x (0.5 to 1.5) / 2 x (0.75 to 2.5) |      |     |  |
|                                                                 | finely stranded with ferrule                |                    | mm <sup>2</sup> | 2 x (0.5 to 1.5) / 2 x (0.75 to 2.5) |      |     |  |
|                                                                 | stranded                                    |                    | mm <sup>2</sup> | 2 x (0.5 to 1.5) / 2 x (0.75 to 2.5) |      |     |  |
|                                                                 | AWG-wires, solid or stranded                |                    | AWG             | 2 x (18 to 14)                       |      |     |  |

\*1) Prospective short-circuit current < 0.4 kA.

## Description

J7MN circuit-breakers are compact, current-limiting circuit-breakers which are optimised for load feeders. The circuit-breakers are used for switching and protecting three-phase induction motors of up to 18,5 kW at AC 400 V and for loads with rated currents of up to 40 A.

### Construction

The circuit-breakers are available in three sizes:

J7MN-12 overall width 45 mm. Max. rated current 12 A. Suitable for 3-phase induction motors of up to 5.5 kW at voltages of 400 V AC.

J7MN-25 overall width 45 mm. Max. rated current 25 A. Suitable for 3-phase induction motors of up to 11 kW at voltages of 400 V AC.

J7MN-50 overall width 55 mm. Max. rated current 40 A. Suitable for 3-phase induction motors of up to 18,5 kW at voltages of 400 V AC.

### Releases

Circuit-breakers J7MN are equipped with bimetallic-based, inverse-time delayed overload releases and with instantaneous overcurrent releases (electromagnetic short-circuit releases).

The overload releases can be set in accordance with the load current. The overcurrent releases are permanently set to a value 13 times the rated current and thus enable trouble-free start-up of motors.

The scale cover can be sealed to prevent unauthorized adjustments to the set current.

### Operating mechanisms

circuit-breakers J7MN-12 are actuated via a switch operating mechanism and circuit-breakers J7MN-25 and J7MN-50 via a rotary operating mechanism. If the circuit-breaker trips, the rotary operating mechanism switches to the tripped position to indicate this. Before the circuit-breaker is reclosed, the rotary operating mechanism must be reset to the 0 position by hand, in order to prevent the former from closing by mistake before the fault has been cleared.

In the case of circuit-breakers with rotary operating mechanisms, there is an electrical signal via a signalling switch to indicate that the circuit-breaker has tripped.

All operating mechanisms can be locked in the 0 position with a padlock (shackle diameter 3.5 to 4.5 mm).

The J7MN circuit-breakers fulfil the isolation characteristics specified in IEC 60 947-2.

### Operating conditions

Circuit-breakers J7MN are suitable for use in any climate. They are designed for operation in enclosed rooms under normal conditions (e. g. no dust, corrosive vapours or harmful gases). Suitable enclosures must be provided for installation in dusty or damp rooms.

Circuit-breakers J7MN can also be fed from below. The standards in accordance with which the circuit-breakers are constructed, the permissible ambient temperatures, the maximum making and breaking capacities, the tripping currents and other boundary conditions can be found in the technical data and tripping characteristics.

Since the operational currents, starting currents and current peaks vary as a result of the inrush current, even in the case of motors with identical output ratings, the values specified for these output ratings in the selection tables are intended as a guide only. The specific rated and start-up data of the motor to be protected is always paramount to the choice of the most suitable circuit-breaker.

In order to prevent premature tripping due to phase failure sensitivity, the circuit-breakers should always be connected in such a way that current flows through all three main conducting paths.

### Short-circuit protection

The short-circuit releases of J7MN circuit-breakers disconnect the faulty load feeder from the system in the event of a short circuit and thus prevent any further damage.

Circuit-breakers with a short-circuit breaking capacity of 50 kA or 100 kA at a voltage of 400 V AC are practically short-circuit-proof at this voltage, as higher short-circuit currents are not usually encountered at the installation point.

Back-up fuses are only necessary if the short-circuit current at the installation point exceeds the rated ultimate short-circuit breaking capacity of the circuit-breakers.

### Motor protection

The tripping characteristics of J7MN circuit-breakers are designed mainly to protect three-phase induction motors. The circuit-breakers are therefore also referred to as motor circuit-breakers. The current of the motor to be protected is set with the aid of the scale.

Circuit-breakers with thermal overload releases are normally designed in accordance with release Class 10.

### Line protection

J7MN circuit-breakers for motor protection are also suitable for line protection. In order to prevent premature tripping due to phase failure sensitivity, the three conducting paths must always be uniformly loaded. The conducting paths must be connected in series in the case of single-phase loads.

The J7MN circuit-breakers meet the isolation conditions of IEC 60 947-3 as well as the additional test conditions for circuit-breakers with isolation characteristics specified in IEC 60 947-2. Taking IEC 60 204-1 into consideration, they can thus be implemented as main and EMERGENCY STOP switches.

Door-coupling rotary operating mechanism do not fulfil the isolation characteristics specified in IEC 60 947-2. Door-coupling rotary operating mechanism according isolation characteristics specified in IEC 60 947-2 on request.

## Characteristics

The time/current characteristic, the current limiting characteristics and the  $I^2t$  characteristics were determined in accordance with DIN VDE 0660 and IEC 60 947.

The tripping characteristic of the inverse-time delayed overload releases (thermal overload releases or 'a' releases) for DC and AC with a frequency of 0 to 400 Hz also apply to the time/current characteristic.

The characteristics apply to the cold state. At operating temperature, the tripping times of the thermal releases are reduced to approximately 25 %.

Under normal operating conditions, all three poles of the device must be loaded. The three main conducting paths must be connected in series in order to protect single-phase or DC loads.

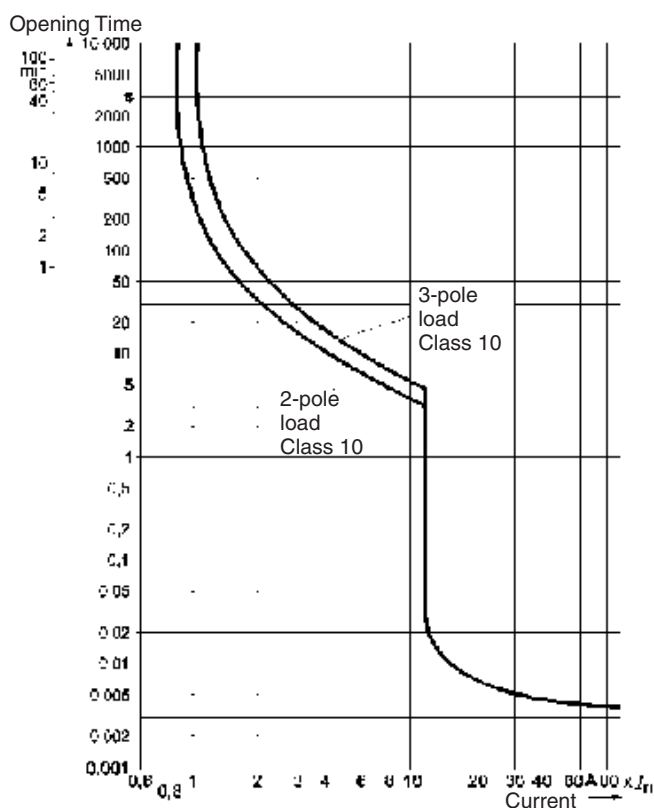
With 3-pole loading, the maximum deviation in the tripping time for 3 times the setting current and upwards is  $\pm 20\%$  and thus in accordance with DIN VDE 0165.

The tripping characteristics for the instantaneous, electromagnetic overcurrent releases (short-circuit releases or 'n' releases) are based on the rated current  $I_n$ , which is also the maximum value of the setting range for circuit-breakers with adjustable overload releases. If the current is set to a lower value, the tripping current of the 'n' release is increased by a corresponding factor.

The characteristics of the electromagnetic overcurrent releases apply to frequencies of 50/60 Hz. Appropriate correction factors must be used for lower frequencies up to 16 2/3 Hz, for higher frequencies up to 400 Hz and for DC.

The characteristic shown here is a schematic representation of circuit-breakers for all ranges.

Time/current characteristics, current limiting characteristics and  $I^2t$  characteristics are available on request.

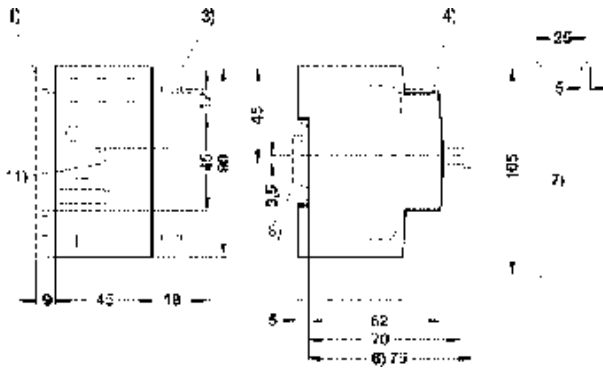


## Wiring diagrams

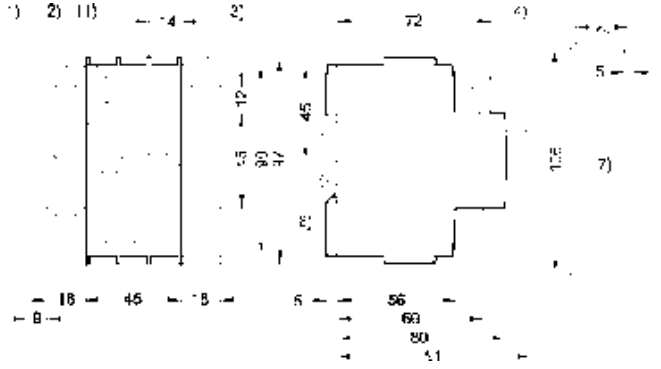
|                                                    |                                                                   |                                                                |
|----------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------|
| <b>Circuit-breaker</b><br><b>J7MN</b><br>          | <b>Transverse auxiliary contact block</b><br><b>J73MN-11F</b><br> | <b>Lateral auxiliary contact block</b><br><b>J73MN-11S</b><br> |
| <b>Signalling switch</b><br><b>J73MN-T-11S</b><br> | <b>Undervoltage release</b><br><b>J74MN-U</b><br>                 | <b>Shunt release</b><br><b>J74MN-S</b><br>                     |

# Dimensions

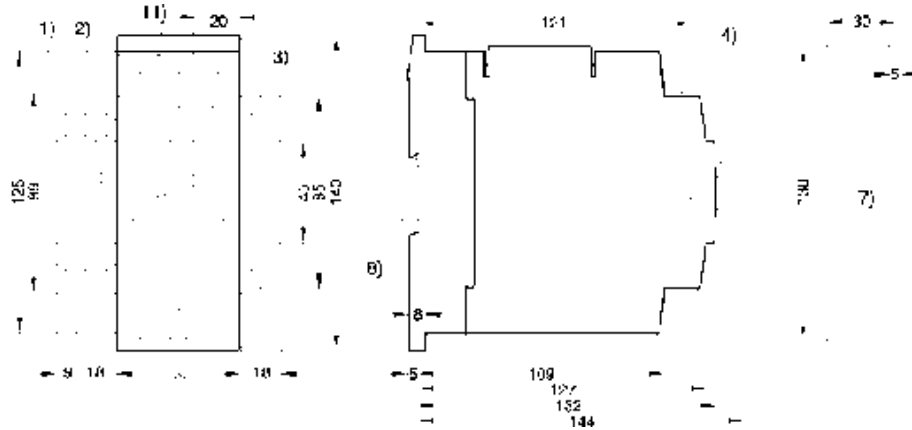
Circuit-breaker J7MN-12



Circuit-breaker J7MN-25

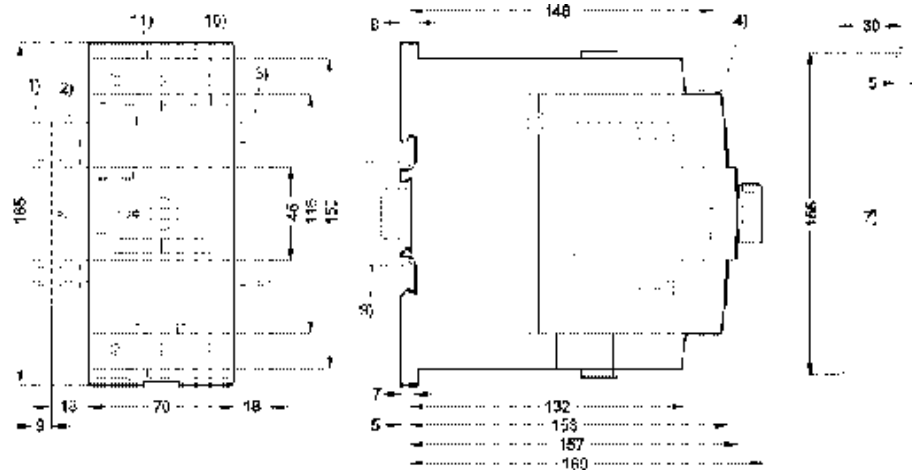


Circuit-breaker J7MN-50



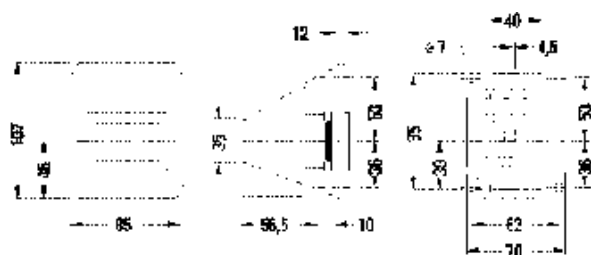
- 1) Lateral aux. contact
- 2) Signalling contact
- 3) Auxiliary release
- 4) Transverse aux. contact
- 7) Mounting holes
- 8) 35mm DIN-rail
- 9) 35mm DIN-rail 15mm high or 75mm DIN-rail
- 10) 4mm hexagon socket screw
- 11) Lockable in 0-position with shackle diameter max.5mm

Circuit-breaker J7MN-100

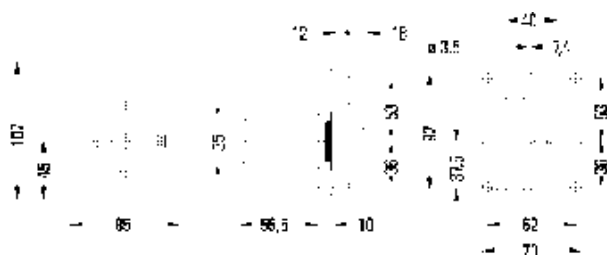


- 1) Lateral aux. contact
- 2) Signalling contact
- 3) Auxiliary release
- 4) Transverse aux. contact
- 7) Mounting holes
- 8) 35mm DIN-rail
- 9) 35mm DIN-rail 15mm high or 75mm DIN-rail
- 10) 4mm hexagon socket screw
- 11) Lockable in 0-position with shackle diameter max.5mm

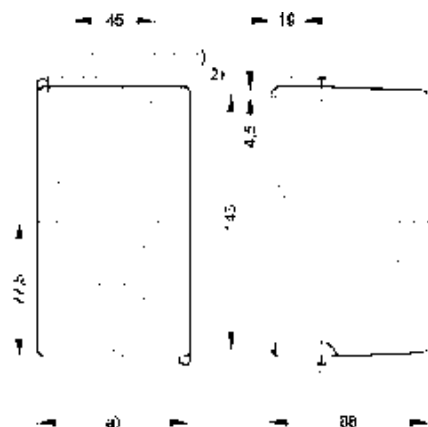
Moulded plastic front plate **J74MN-P12**



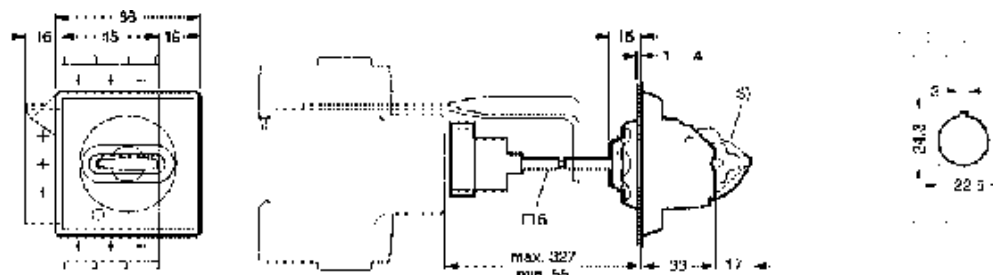
Moulded plastic front plate **J74MN-P25**



Moulded plastic enclosure **J74MN-PF12**

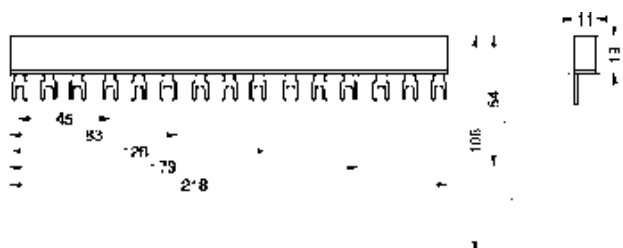


Door-coupling rotary operating mechanism **J74MN-DC**

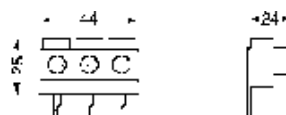


1) Max. for shackle diameter for padlock 8 mm

3-phase busbar **J74MN-L3-□/□**  
for J7MN-12 and J7MN-25, modular spacing 45 mm



3-phase line-side terminal **J74MN-TC12** and **J74MN-TC25**



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

# Appendix

## ● Precautions

### ■ Notice

Use under rated condition, otherwise contactors will not only cause malfunction, but also cause a fire or damage the contactor.

Life period of contactor depends on the operating application. Please check the electrical life under real application in advance.

If you continue to use malfunctioning contactor, a fire or breakdown may occur.

Do not miss-wire or miss-charge the power supply, otherwise the contactor does not work correctly.

Do not operate in places with explosive or flammable gas, otherwise a fire or explosion may occur by arc or heating from contactor.

Make sure to use the circuit well considered about safety, in case there is any possibility to cause secondary disaster by contact trouble (welding, faulty contact).

Do not supply short-circuit current to electromagnetic switch (contactor with thermal relay). Doing so may result failure in heater of thermal relay. Please use short-circuit protection like fuse or protective circuit breaker.

Do not use a contactor or thermal relay which has been dropped or dismantled. Doing so may cause malfunction or a fire.

Make sure to shut off power supply to contactors before wiring or replacing.

Do not operate the actuator of a contactor manually. Doing so may cause contact welding by chattering or burn out by arc.

**Unless otherwise stated in the catalogue, modifications, especially those of stated values, sizes and weights are subject to alternation.**

**Diagrams and tables are subject to alternation and not to be regarded as binding drawings.**

### ■ Correct use

#### General use

Unexpected malfunction may occur in real application. Please carry out as many tests as possible.

Ratings in this catalogue measured under the condition according to IEC unless otherwise specified. In cases of check by real application, please carry out the test under the same condition as expected in the actual application.

#### Selection

##### **Coil specification**

Please select suitable coil to circuit design, otherwise malfunction may occur or coil may have a burn out by overvoltage etc.

##### **Type**

Please check contact ratings, switching capacity, thermal characteristics etc. when selecting product type.

##### **Thermal relay**

Motor current differs by supplier, type, number of poles, frequency. Please confirm operational current level.

##### **Coil surge suppressor**

Coil surge suppressor type should be selected by contactor type, auxiliary relay type and applied voltage. Make sure to use defined each contactor.

In case of installing coil surge suppressor, please check the actual circuit because the release time will be delayed.

##### **Electrical life expectancy**

Electrical life expectancy tests in this catalogue are based on IEC.

#### Circuit design

##### **Supplied voltage waveform for input**

Make sure to apply and remove the voltage instantly. Do not use under the condition that the coil voltage waveform increases or decreases gradually.

##### **In case of DC contactor use (input voltage ripple)**

Please use DC contactor input voltage with a ripple ratio less than 5%. Excessive ripple (pulsating current) may cause contact welding.

##### **Fluctuation of input voltage**

Make sure to supply sufficient voltage to actuate contactors properly. Continuous supply of insufficient voltage results in excessive heating and may cause burn out of coil.

##### **Maximum applied voltage**

Do not supply the voltage over the maximum rated voltage, otherwise burn out or insulation failure may occur.

The temperature inside control panel has much influence to the coil temperature, so make sure not to exceed the specified value in the catalogue.

Basically rated voltage should be supplied to coil. To supply higher voltage than rated would result in shorter electrical life, even if it is lower than the maximum rated voltage.

##### **Reverse**

Make sure to use reversible contactors for reverse operation.

Make sure to use interlock device in reverse operation by two contactors, otherwise short circuit current may burn out or give damage to contactors and motors.

## **Installation**

### **Mounting**

Make sure to use specified wire size, mounting screw size, mounting screw number, and DIN rail size.

### **Tightening Screw**

Tighten each screw securely by specified tightening torque. Loose tightening may cause a fire by excessive heating.

### **Combination**

Please use only OMRON product combinations in case of thermal relay, timer block and auxiliary contact block etc.

Wrong-combinations may result in damage to contactors.

### **Mounting direction**

Some products have a defined specific mounting direction. Please refer to datasheet before use.

## **Operation ambience**

### **Dust**

Dust on the surface of the contacts could result in contact malfunctioning. Take countermeasure in excessive dusty surrounding.

### **Temperature, humidity**

Use contactors within the temperature and humidity conditions specified in datasheet. To use or store contactor in excessive temperature or humidity may result in malfunction of contact by organic film composed by sulfication and oxidation on the surface of the contacts.

Use contactors within the temperature and humidity conditions specified in the datasheet, to prevent contactors from insulation resistance failure by condensation or insulation resistance deterioration by tracking.

### **Gas**

NH<sub>3</sub>, H<sub>2</sub>S, SO<sub>2</sub>, Cl<sub>2</sub>, Si and NO<sub>2</sub> have bad effects on a contactor. With these gases, a corrosive metal film is generated on the surface of the contacts and could result in contact malfunctioning. Use a contactor in low humidity and no corrosive gas surroundings.

### **Oil**

Do not use a contactor in places where oil is sprayed onto the contactor. It will cause cracks on polymer parts.

### **Shock and vibration**

Do not use a contactor in places where there is excessive shock or vibration. It may cause malfunctioning.

### **Storage**

Store contactors in a place with no direct sunshine or ultraviolet rays. It will cause crack on polymer parts.

When contactors are to be stored for a long time, they must be stored with care. Though it generally depends where contactors are stored, deterioration of contacts may occur after long storage. Please check the characteristics before use after long time storage.

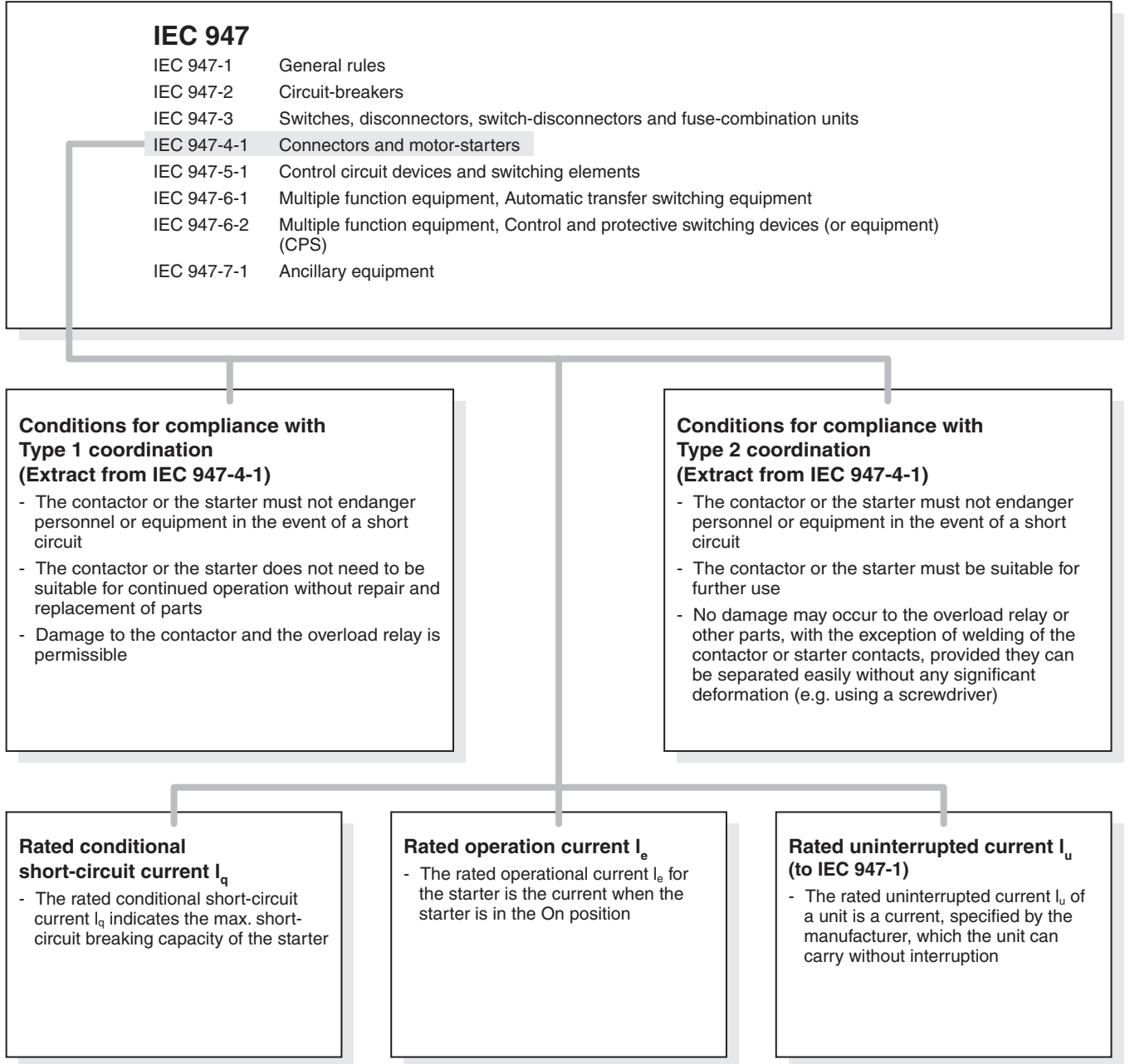
● European Standards

■ IEC 947, EN 60947  
European Standards for Low-Voltage Switchgear

For Europe and most other industrial countries of the world, the new IEC 947 and EN 60 947 specifications for low-voltage switchgear have unified the regulations which previously varied from nation to nation.

This required the introduction of new terms, and new test methods and utilization categories. The new specifications are aimed primarily at manufacturers. However, the user also will come across new technical terms and data in the manufacturers' catalogues and on the devices themselves which are important for the selection and application of the devices. The present paper deals with the currently published specifications. Further specifications and supplements are in preparation.

Since 1993, all low-voltage switchgear purchased in Europe had to satisfy the EN 60 947 European Standard. Installations in existence prior to 1993 are not affected by the standard and need not to be refitted with new devices. Devices constructed and tested to the IEC standards and EN standards can be used worldwide, with the exception of the USA and Canada. In these countries UL and CSA specifications continue to apply. Switchgear which conforms to IEC 947 and EN 60 947 and which has, in addition, UL- and CSA approvals, in the meantime has entered the market. Such 'world market' devices offer the advantage that they can be used throughout the world, including the USA and Canada.



## Overview

The following table shows in summarized form both the previous and the new IEC, EN and DIN VDE standards.

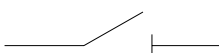
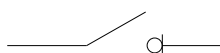
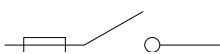
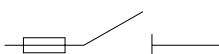
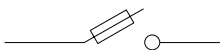
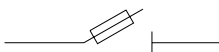
| Previous specification         |                                                                      | New specification |                             | Content                                                                                                   |
|--------------------------------|----------------------------------------------------------------------|-------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------|
| IEC                            | DIN VDE                                                              | IEC               | EN 60947<br>DIN VDE         |                                                                                                           |
| -                              | -                                                                    | 947-1             | 60947-1<br>0660, Part 100   | Low-voltage switchgear,<br>General rules                                                                  |
| 157                            | 0660, Part 101                                                       | 947-2             | 60947-2<br>0660, Part 101   | Low-voltage switchgear,<br>Circuit-breakers                                                               |
| 406                            | 0660, Part 107                                                       | 947-3             | 60947-3<br>0660, Part 107   | Low-voltage switchgear,<br>Switches,<br>Disconnectors,<br>Switch-disconnectors,<br>Fuse-combination units |
| 158<br>292-1<br>292-2<br>292-3 | 0660, Part 102<br>0660, Part 104<br>0660, Part 106<br>0660, Part 301 | 947-4-1           | 60947-4-1<br>0660, Part 102 | Low-voltage switchgear,<br>Control circuit devices and switching elements                                 |
| 337                            | 0660 Part 200 to Part 205                                            | 947-5-1           | 60947-5-1<br>0660, Part 200 | Low-voltage switchgear,<br>Multiple-function equipment,<br>Automatic transfer switching equipment         |
| -                              | -                                                                    | 947-6-1           | 60947-6-1<br>0660, Part 114 | Low-voltage switchgear,<br>Multiple-function equipment,<br>Control and protective switching devices (CPS) |
| -                              | 0611 Part 1 and 2                                                    | 947-7-1           | 60947-7-1<br>0611, Part 1   | Low-voltage switchgear,<br>Ancillary equipment (e.g. terminal blocks)                                     |

## Switches, disconnectors, switch-disconnectors and fuse combination units (IEC 947-3, EN 60947-3)

These devices must now be labelled with the product function designated by the manufacturer. This means placing clearly visible symbols on the device itself.

Devices with an isolating function are subject to special safety requirements. They must for example have greater creepage distances and clearances across the opened contacts than is necessary for other devices.

### Device functions and corresponding symbols

| Making/breaking                                                                                    | Isolating                                                                                                | Making/breaking<br>+ isolating                                                                                    |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Switch<br>      | Disconnector<br>      | Switch-disconnector<br>      |
| Switch-fuse<br> | Disconnector-fuse<br> | Switch-disconnector-fuse<br> |
| Fuse-switch<br> | Fuse-disconnector<br> | Fuse switch-disconnector<br> |

## OMRON equipment is designed for the world's markets

It is manufactured and tested in accordance with national and international specifications, the most important of which are listed below:

|                            |                                                                                    |
|----------------------------|------------------------------------------------------------------------------------|
| IEC 947-..., EN 60947:     | Low-voltage switch gear and control gear                                           |
| IEC 664:                   | Insulation co-ordination including clearances and creepage distances for equipment |
| IEC364:                    | Electrical installations of buildings                                              |
| IEC 204-..., EN 60204-...: | Electrical equipment of industrial machines                                        |
| DIN VDE 0105:              | Operation of electrical power installations                                        |
| IEC 536:                   | Protection against electric shock                                                  |

Utilization categories for contactors to IEC 947-4-1 and EN 60947

| Type of current | Utilization category | Typical examples of application<br>I = current made, I <sub>c</sub> = current broken<br>I <sub>e</sub> = rated operational current<br>U = voltage before make<br>U <sub>e</sub> = rated operational voltage<br>U <sub>r</sub> = recovery voltage | Verification of electrical endurance       |                          |                          |              |                                       |                                       | Verification of rated making and breaking capacities |                                              |                          |                          |              |                                       |                                       |              |
|-----------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|--------------------------|--------------|---------------------------------------|---------------------------------------|------------------------------------------------------|----------------------------------------------|--------------------------|--------------------------|--------------|---------------------------------------|---------------------------------------|--------------|
|                 |                      |                                                                                                                                                                                                                                                  | Make                                       |                          |                          |              | Break                                 |                                       | Make                                                 |                                              |                          |                          | Break        |                                       |                                       |              |
|                 |                      |                                                                                                                                                                                                                                                  | I <sub>e</sub><br>A                        | I<br>-<br>I <sub>e</sub> | U<br>-<br>U <sub>e</sub> | cos φ        | I <sub>c</sub><br>-<br>I <sub>e</sub> | U <sub>r</sub><br>-<br>U <sub>e</sub> | cos φ                                                | I <sub>e</sub><br>A                          | I<br>-<br>I <sub>e</sub> | U<br>-<br>U <sub>e</sub> | cos φ        | I <sub>c</sub><br>-<br>I <sub>e</sub> | U <sub>r</sub><br>-<br>U <sub>e</sub> | cos φ        |
| AC              | AC-1                 | Non-inductive or slightly inductive loads, resistance furnaces                                                                                                                                                                                   | All values                                 | 1                        | 1                        | 0.95         | 1                                     | 1                                     | 0.95                                                 | All values                                   | 1.5                      | 1.05                     | 0.8          | 1.5                                   | 1.05                                  | 0.8          |
|                 | AC-2                 | Slip-ring motors: starting, switching off                                                                                                                                                                                                        | All values                                 | 2.5                      | 1                        | 0.65         | 2.5                                   | 1                                     | 0.65                                                 | All values                                   | 4                        | 1.05                     | 0.65         | 4                                     | 1.05                                  | 0.65         |
|                 | AC-3                 | Squirrel-cage motors: starting, switching off motors during running <sup>4</sup>                                                                                                                                                                 | I <sub>e</sub> ≤ 17<br>I <sub>e</sub> > 17 | 6<br>6                   | 1<br>1                   | 0.65<br>0.35 | 1<br>1                                | 0.17<br>0.17                          | 0.65<br>0.35                                         | I <sub>e</sub> ≤ 100<br>I <sub>e</sub> > 100 | 10<br>10                 | 1.05<br>1.05             | 0.45<br>0.35 | 8<br>8                                | 1.05<br>1.05                          | 0.45<br>0.35 |
|                 | AC-4                 | Squirrel-cage motors: starting, plugging, inching                                                                                                                                                                                                | I <sub>e</sub> ≤ 17<br>I <sub>e</sub> > 17 | 6<br>6                   | 1<br>1                   | 0.65<br>0.35 | 6<br>6                                | 1<br>1                                | 0.65<br>0.35                                         | I <sub>e</sub> ≤ 100<br>I <sub>e</sub> > 100 | 12<br>12                 | 1.05<br>1.05             | 0.45<br>0.35 | 10<br>10                              | 1.05<br>1.05                          | 0.45<br>0.35 |
|                 | AC-5A                | Switching of electric discharge lamp controls                                                                                                                                                                                                    | -                                          | -                        | -                        | -            | -                                     | -                                     | -                                                    | -                                            | 3.0                      | 1.05                     | 0.45         | 3.0                                   | 1.05                                  | 0.45         |
|                 | AC-5B                | Switching of incandescent lamps                                                                                                                                                                                                                  | -                                          | -                        | -                        | -            | -                                     | -                                     | -                                                    | -                                            | 1.5 <sup>2</sup>         | 1.05 <sup>2</sup>        | 2)           | 1.5 <sup>2</sup>                      | 1.05 <sup>2</sup>                     | 2)           |
|                 | AC-6A <sup>3</sup>   | Switching of transformers                                                                                                                                                                                                                        | As given by the manufacturer               |                          |                          |              |                                       |                                       | -                                                    | -                                            | -                        | -                        | -            | -                                     | -                                     |              |
|                 | AC-6B <sup>3</sup>   | Switching of capacitor banks                                                                                                                                                                                                                     | As given by the manufacturer               |                          |                          |              |                                       |                                       | -                                                    | -                                            | -                        | -                        | -            | -                                     | -                                     |              |
|                 | AC-7A                | Slightly inductive loads in household appliances and similar applications                                                                                                                                                                        | As given by the manufacturer               |                          |                          |              |                                       |                                       | -                                                    | 1.5                                          | 1.05                     | 0.8                      | 1.5          | 1.05                                  | 0.8                                   |              |
|                 | AC-7B                | Motor-loads for household applications                                                                                                                                                                                                           | As given by the manufacturer               |                          |                          |              |                                       |                                       | -                                                    | 8.0                                          | 1.05 <sup>1)</sup>       |                          | 8.0          | 1.05 <sup>1)</sup>                    |                                       |              |
|                 | AC-8A                | Hermetic refrigerant compressor motor control with manual resetting of overload releases <sup>5</sup>                                                                                                                                            | As given by the manufacturer               |                          |                          |              |                                       |                                       | -                                                    | 6.0                                          | 1.05 <sup>1)</sup>       |                          | 6.0          | 1.05 <sup>1)</sup>                    |                                       |              |
|                 | AC-8B                | Hermetic refrigerant compressor motor control with automatic resetting of overload releases <sup>5</sup>                                                                                                                                         | As given by the manufacturer               |                          |                          |              |                                       |                                       | -                                                    | 6.0                                          | 1.05 <sup>1)</sup>       |                          | 6.0          | 1.05 <sup>1)</sup>                    |                                       |              |

|    |      |                                                                | $I_e$<br>A | $I$<br>-<br>$I_e$ | $U$<br>-<br>$U_e$ | L/R<br>ms | $I_c$<br>-<br>$I_e$ | $U_r$<br>-<br>$U_e$ | L/R<br>ms | $I_e$<br>A | $I$<br>-<br>$I_e$ | $U$<br>-<br>$U_e$ | L/R<br>ms       | $I_c$<br>-<br>$I_e$ | $U_r$<br>-<br>$U_e$ | L/R<br>ms       |
|----|------|----------------------------------------------------------------|------------|-------------------|-------------------|-----------|---------------------|---------------------|-----------|------------|-------------------|-------------------|-----------------|---------------------|---------------------|-----------------|
| DC | DC-1 | Non-inductive or slightly inductive loads, resistance furnaces | All values | 1                 | 1                 | 1         | 1                   | 1                   | 1         | All values | 1.5               | 1.05              | 1               | 1.5                 | 1.05                | 1               |
|    | DC-3 | Shunt motors: starting, plugging, inching, dynamic braking     | All values | 2.5               | 1                 | 2         | 2.5                 | 1                   | 2         | All values | 4                 | 1.05              | 2.5             | 4                   | 1.05                | 2.5             |
|    | DC-5 | Series motors: starting, plugging, inching, dynamic braking    | All values | 2.5               | 1                 | 7.5       | 2.5                 | 1                   | 7.5       | All values | 4                 | 1.05              | 15              | 4                   | 1.05                | 15              |
|    | DC-6 | Switching of incandescent lamps                                | -          | -                 | -                 | -         | -                   | -                   | -         | -          | 1.5 <sup>2)</sup> | 1.05              | 2 <sup>2)</sup> | 1.5 <sup>2)</sup>   | 1.05                | 2 <sup>2)</sup> |

Note 1:  $\cos \varphi = 0.45$  for  $I_e \leq 100$  A;  $\cos \varphi = 0.35$  for  $I_e > 100$  A.

2: The tests are to be carried out with an incandescent light load.

3: The test data are to be derived from the test values for AC-3 or AC-4 according to Table VIIb, EN 60947-4-1.

4: AC-3 category may be used for occasional inching (jogging) or plugging for limited time periods such as machine set-up; during such limited time periods the number of such operations should not exceed five per minute or more than ten in a ten minute period.

5: A hermetic refrigerant compressor motor is a combination consisting of a compressor and a motor, both of which are enclosed in the same housing, with no external shaft or shaft seals, the motor operating in the refrigerant.

Utilization categories for control switches to IEC 947-5-1 and EN 60947

| Selection categories for circuit breakers to IEC 60947-2 and EN 60947-2 |                      |                                                                                                                                                                                                                                                                                                                                                                                                        |                          |                          |                          |       |                                       |                                       |                            |  |                          |                          |       |                                       |                                       |       |
|-------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|-------|---------------------------------------|---------------------------------------|----------------------------|--|--------------------------|--------------------------|-------|---------------------------------------|---------------------------------------|-------|
| Type of current                                                         | Utilization category | Typical examples of application<br>I = current made, I <sub>c</sub> = current broken<br>I <sub>o</sub> = rated operational current<br>U <sub>o</sub> = rated operational voltage<br>U <sub>r</sub> = recovery voltage<br>U = voltage before make<br>t <sub>0.95</sub> = time in ms to reach 95 % of the steady-state current<br>P = U <sub>o</sub> x I <sub>o</sub> = rated power consumption in watts | Normal conditions of use |                          |                          |       |                                       |                                       | Abnormal conditions of use |  |                          |                          |       |                                       |                                       |       |
|                                                                         |                      |                                                                                                                                                                                                                                                                                                                                                                                                        | Make                     |                          |                          |       | Break                                 |                                       | Make                       |  |                          |                          | Break |                                       |                                       |       |
|                                                                         |                      |                                                                                                                                                                                                                                                                                                                                                                                                        |                          | I<br>-<br>I <sub>o</sub> | U<br>-<br>U <sub>o</sub> | cos φ | I <sub>c</sub><br>-<br>I <sub>o</sub> | U <sub>r</sub><br>-<br>U <sub>o</sub> | cos φ                      |  | I<br>-<br>I <sub>o</sub> | U<br>-<br>U <sub>o</sub> | cos φ | I <sub>c</sub><br>-<br>I <sub>o</sub> | U <sub>r</sub><br>-<br>U <sub>o</sub> | cos φ |
| AC                                                                      | AC-12                | Control of resistive and solid state loads as in opto-coupler input circuits                                                                                                                                                                                                                                                                                                                           |                          | 1                        | 1                        | 0.9   | 1                                     | 1                                     | 0.9                        |  | -                        | -                        | -     | -                                     | -                                     | -     |
|                                                                         | AC-13                | Control of solid state loads with transformer isolation                                                                                                                                                                                                                                                                                                                                                |                          | 2                        | 1                        | 0.65  | 1                                     | 1                                     | 0.65                       |  | 10                       | 1.1                      | 0.65  | 1.1                                   | 1.1                                   | 0.65  |
|                                                                         | AC-14                | Control of small electromagnetic loads (≤ 72 VA)                                                                                                                                                                                                                                                                                                                                                       |                          | 6                        | 1                        | 0.3   | 1                                     | 1                                     | 0.3                        |  | 6                        | 1.1                      | 0.7   | 6                                     | 1.1                                   | 0.7   |
|                                                                         | AC-15                | Control of electromagnetic loads (> 72 VA)                                                                                                                                                                                                                                                                                                                                                             |                          | 10                       | 1                        | 0.3   | 1                                     | 1                                     | 0.3                        |  | 10                       | 1.1                      | 0.3   | 10                                    | 1.1                                   | 0.3   |

|    |       |                                                                              | $I$<br>-<br>$I_e$ | $U$<br>-<br>$U_e$ | $t_{0.95}$         | $I_c$<br>-<br>$I_e$ | $U_r$<br>-<br>$U_e$ | $t_{0.95}$         | $I$<br>-<br>$I_e$ | $U$<br>-<br>$U_e$ | $t_{0.95}$         | $I_c$<br>-<br>$I_e$ | $U_r$<br>-<br>$U_e$ | $t_{0.95}$         |
|----|-------|------------------------------------------------------------------------------|-------------------|-------------------|--------------------|---------------------|---------------------|--------------------|-------------------|-------------------|--------------------|---------------------|---------------------|--------------------|
|    |       |                                                                              |                   |                   |                    |                     |                     |                    |                   |                   |                    |                     |                     |                    |
|    |       |                                                                              |                   |                   |                    |                     |                     |                    |                   |                   |                    |                     |                     |                    |
| DC | DC-12 | Control of resistive and solid state loads as in opto-coupler input circuits | 1                 | 1                 | 1 ms               | 1                   | 1                   | 1 ms               | -                 | -                 | -                  | -                   | -                   | -                  |
|    | DC-13 | Control of electromagnets                                                    | 1                 | 1                 | 6xP <sup>1</sup> ) | 1                   | 1                   | 6xP <sup>1</sup> ) | 1.1               | 1.1               | 6xP <sup>1</sup> ) | 1.1                 | 1.1                 | 6xP <sup>1</sup> ) |
|    | DC-14 | Control of electromagnetic loads having economy resistors in circuits        | 10                | 1                 | 15 ms              | 1                   | 1                   | 15 ms              | 10                | 1.1               | 15 ms              | 10                  | 1.1                 | 15 ms              |

Note 1: The value "6 x P" results from an empirical relationship which is found to represent most DC magnetic loads to an upper limit of  $P = 50$  W, viz  $6 \times P = 300$  ms. Loads having power consumption greater than 50 W are assumed to consist of smaller loads in parallel. Therefore, 300 ms is to be an upper limit, irrespective of the power consumption value.

Utilization categories for switches, disconnectors, switch-disconnectors, and fuse combination units to IEC 947-3 and EN 60947

| Optimization categories for switches, disconnector, switch-disconnectors, and fuse combination units to IEC 547-3 and EN 60547 |                            |                                                                                                                                                                                                                                       |                                      |                          |                          |       |                                       |                                       |       |                                    |                          |                          |       |                                       |                                       |       |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------|--------------------------|-------|---------------------------------------|---------------------------------------|-------|------------------------------------|--------------------------|--------------------------|-------|---------------------------------------|---------------------------------------|-------|
| Type of current                                                                                                                | Utilization category       | Typical applications<br>I = current made, I <sub>c</sub> = current broken<br>I <sub>e</sub> = rated operational current<br>U = voltage before make<br>U <sub>e</sub> = rated operational voltage<br>U <sub>r</sub> = recovery voltage | Verification of electrical endurance |                          |                          |       |                                       |                                       |       | Verification of switching capacity |                          |                          |       |                                       |                                       |       |
|                                                                                                                                |                            |                                                                                                                                                                                                                                       | Make                                 |                          |                          |       | Break                                 |                                       |       | Make                               |                          |                          |       | Break                                 |                                       |       |
|                                                                                                                                |                            |                                                                                                                                                                                                                                       | I <sub>e</sub><br>A                  | I<br>-<br>I <sub>e</sub> | U<br>-<br>U <sub>e</sub> | cos φ | I <sub>c</sub><br>-<br>I <sub>e</sub> | U <sub>r</sub><br>-<br>U <sub>e</sub> | cos φ | I <sub>e</sub><br>A                | I<br>-<br>I <sub>e</sub> | U<br>-<br>U <sub>e</sub> | cos φ | I <sub>c</sub><br>-<br>I <sub>e</sub> | U <sub>r</sub><br>-<br>U <sub>e</sub> | cos φ |
| AC                                                                                                                             | AC-20<br>A(B) <sup>2</sup> | Connecting and disconnecting under no-load conditions                                                                                                                                                                                 | All values                           | 1)                       | 1)                       | 1)    | 1)                                    | 1)                                    | 1)    | All values                         | 1)                       | 1.05                     | 1)    | 1)                                    | 1.05                                  | 1)    |
|                                                                                                                                | AC-21<br>A(B) <sup>2</sup> | Switching of resistive loads, including moderate overloads                                                                                                                                                                            | All values                           | 1                        | 1                        | 0.95  | 1                                     | 1                                     | 0.95  | All values                         | 1.5                      | 1.05                     | 0.95  | 1.5                                   | 1.05                                  | 0.95  |
|                                                                                                                                | AC-22<br>A(B) <sup>2</sup> | Switching of mixed resistive and inductive loads, including moderate overloads                                                                                                                                                        | All values                           | 1                        | 1                        | 0.8   | 1                                     | 1                                     | 0.8   | All values                         | 3                        | 1.05                     | 0.65  | 3                                     | 1.05                                  | 0.65  |

| Utilization categories for switches, disconnectors, switch-disconnectors, and fuse combination units to IEC 947-3 and EN 60947 |                            |                                                                                                                                                                                                                                       |                                      |                |                |       |                |                |                                    |                                              |                |                |              |                |                |              |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------|----------------|-------|----------------|----------------|------------------------------------|----------------------------------------------|----------------|----------------|--------------|----------------|----------------|--------------|
| Type of current                                                                                                                | Utilization category       | Typical applications<br>I = current made, I <sub>c</sub> = current broken<br>I <sub>e</sub> = rated operational current<br>U = voltage before make<br>U <sub>e</sub> = rated operational voltage<br>U <sub>r</sub> = recovery voltage | Verification of electrical endurance |                |                |       |                |                | Verification of switching capacity |                                              |                |                |              |                |                |              |
|                                                                                                                                |                            |                                                                                                                                                                                                                                       | Make                                 |                |                |       | Break          |                | Make                               |                                              |                |                | Break        |                |                |              |
|                                                                                                                                |                            |                                                                                                                                                                                                                                       | I <sub>e</sub>                       | -              | U              | cos φ | I <sub>c</sub> | U <sub>r</sub> | cos φ                              | I <sub>e</sub>                               | -              | U              | cos φ        | I <sub>c</sub> | U <sub>r</sub> | cos φ        |
|                                                                                                                                |                            |                                                                                                                                                                                                                                       | A                                    | I <sub>e</sub> | U <sub>e</sub> |       | I <sub>e</sub> | U <sub>e</sub> |                                    | A                                            | I <sub>e</sub> | U <sub>e</sub> |              | I <sub>e</sub> | U <sub>e</sub> |              |
|                                                                                                                                | AC-23<br>A(B) <sup>2</sup> | Switching of motor loads or other highly inductive loads                                                                                                                                                                              | All values                           | 1              | 1              | 0.65  | 1              | 1              | 0.65                               | I <sub>e</sub> ≤ 100<br>I <sub>e</sub> > 100 | 10<br>10       | 1.05<br>1.05   | 0.45<br>0.35 | 8<br>8         | 1.05<br>1.05   | 0.45<br>0.35 |

|    |                            |                                                                                                    | I <sub>e</sub><br>A | I<br>-<br>I <sub>e</sub> | U<br>-<br>U <sub>e</sub> | L/R<br>ms       | I <sub>c</sub><br>-<br>I <sub>e</sub> | U <sub>r</sub><br>-<br>U <sub>e</sub> | L/R<br>ms       | I <sub>e</sub><br>A | I<br>-<br>I <sub>e</sub> | U<br>-<br>U <sub>e</sub> | L/R<br>ms       | I <sub>c</sub><br>-<br>I <sub>e</sub> | U <sub>r</sub><br>-<br>U <sub>e</sub> | L/R<br>ms       |
|----|----------------------------|----------------------------------------------------------------------------------------------------|---------------------|--------------------------|--------------------------|-----------------|---------------------------------------|---------------------------------------|-----------------|---------------------|--------------------------|--------------------------|-----------------|---------------------------------------|---------------------------------------|-----------------|
| DC | DC-20<br>A(B) <sup>2</sup> | Connecting and disconnecting under no-load conditions                                              | All values          | 1 <sup>1)</sup>          | 1 <sup>1)</sup>          | 1 <sup>1)</sup> | 1 <sup>1)</sup>                       | 1 <sup>1)</sup>                       | 1 <sup>1)</sup> | All values          | 1 <sup>1)</sup>          | 1.05                     | 1 <sup>1)</sup> | 1 <sup>1)</sup>                       | 1.05                                  | 1 <sup>1)</sup> |
|    | DC-21<br>A(B) <sup>2</sup> | Switching of resistive loads, including moderate overloads                                         | All values          | 1                        | 1                        | 1               | 1                                     | 1                                     | 1               | All values          | 1.5                      | 1.05                     | 1               | 1.5                                   | 1.05                                  | 1               |
|    | DC-22<br>A(B) <sup>2</sup> | Switching of mixed resistive and inductive loads, including moderate overloads (e.g. shunt motors) | All values          | 1                        | 1                        | 2               | 1                                     | 1                                     | 2               | All values          | 4                        | 1.05                     | 2.5             | 4                                     | 1.05                                  | 2.5             |
|    | DC-23<br>A(B) <sup>2</sup> | Switching of highly inductive loads (e.g. series motors)                                           | All values          | 1                        | 1                        | 7.5             | 1                                     | 1                                     | 7.5             | All values          | 4                        | 1.05                     | 15              | 4                                     | 1.05                                  | 15              |

**Note 1:** If the switching device has a making and/or breaking capacity, the figures for the current and the power factor (time constants) must be stated by the manufacturer.  
**2:** A: frequent operation, B: infrequent operation.

## Protection against electrical shock, to IEC 536

IEC 536 covers the setting up of electrical apparatus, and its arrangement in electrical installations with rated voltages up to 1000 VAC and 1500 VDC, with regard to protection against direct contact where operating elements such as push-buttons and switches are located in the vicinity of live parts.

“Finger-proofing” relates only to the operating device, and only in the normal direction of operation. A clearance of at least 30 mm radius from the centre point of the device to any live parts, must be ensured.

The IP 20 degree of protection is superior to “finger-proofing” in that it embodies protection against contact with electrical apparatus in any direction. Devices which are “finger-proof” and of IP 00 degree of protection can be provided with further protection against contact in the form of shrouding, if so desired.

## Damp heat, constant, to IEC 68 Part 2-3

In this test, the effects of a constant high level of humidity (93 +2/-3%) and a constant temperature (40 ±2)°C over a prescribed duration, are observed.

## Damp heat, cyclic, to IEC 68 Part 2 - 30, Test Db

This test is used to assess the suitability of electrical products for operation and storage at high relative humidity levels, in conjunction with cyclic temperature fluctuation. A test cycle consists of 12 hours at 40 ±2°C, with relative humidity of 93 ±3%, and 12 hours at 25 ±3°C, with the relative humidity of at least 95%.

## Ambient temperature

Ambient temperature is the temperature of the room (e.g. factory bay or switchgear room), in which the open or enclosed device is installed, a prerequisite being that this temperature is not significantly influenced by the heat losses from the device.

## ● Glossary of standard terms

This Glossary offers brief explanations of some of the standard terms used in this catalogue. However, it must not be regarded as a substitute for the actual text of the standard, especially where the new terms used in IEC 947 are concerned.

Reference is therefore made alongside each such term to the relevant section of the standard, e.g. IEC 947-1 in addition, IEC numbers are given to enable you to find foreign language equivalents in the International Electrotechnical Vocabulary (IEG 50), if required.

### **Rated conditional short-circuit current $I_q$** (IEC 947-1; 2.5.29/IEV 441-17-20)

The prospective current which a switching device, e.g. a circuit-breaker, protected by a short-circuit protective device such as a motor-protective circuit-breaker, can carry for the duration of the protective device tripping time.

### **Minimum command time**

Minimum duration for a trip-initiating factor (control pulse, short circuit) to effect the corresponding reaction, e.g. the short-circuit duration necessary to initiate tripping.

### **Rated breaking capacity** (IEC 947-1; 4.3.5.3)

The r.m.s. value of current which a switching device is capable of breaking according to its utilization category. The rated breaking capacity is stated by reference to the rated operational voltage and the rated operational current.

The equipment must be capable of breaking any value of current up to and including its rated breaking capacity stated.

### **Rated actuating voltage $U_c$** (rated control circuit voltage) (IEC 947-1; 4.5.1)

The voltage which is applied to the actuating make contact in a control circuit. Due to the presence in the control circuit of transformers or resistors, this voltage may differ from the rated control supply voltage.

### **Rated service short-circuit breaking capacity $I_{cs}$** (IEC 947-2; 4.3.5.2.2)

The prospective short-circuit current which, depending on the rated operational voltage, a circuit-breaker is capable of breaking repeatedly (test cycle: O - CO - CO; previously P-2). After interrupting this current value, the circuit-breaker must be capable, despite its own thermal level having increased, of continuing to carry and disconnect in the event of overloading, the rated uninterrupted current.

### **Rating or rated power** (IEC 947-1; 4.3.2.3)

The rated operational power which an equipment is capable of switching at the associated rated operational voltage in accordance with the utilization category.

For example:  
motor contactor utilization category AC-3: 37 kW at 400 V.

### **Rated operational voltage $U_e$** (IEC 947-1; 4.3.1.1)

The voltage to which the characteristics of an equipment are referred. The rated operational current must not in any case exceed the rated insulation voltage.

### **Rated operational current $I_e$** (IEC 947-1; 4.3.2.3)

The current which an equipment is capable of carrying taking into account the rated operational current, duration of operation, utilization category and ambient temperature.

### **Rated uninterrupted current $I_u$** (IEC 947-1; 4.3.2.4)

The value of current which an equipment can carry in uninterrupted duty (i.e. for weeks, months or years).

### **Rated making capacity** (IEC 947-1; 4.3.5.2)

The value of current which an equipment is capable of switching On in accordance with the utilization category and at the rated operational voltage.

### **Rated frequency** (IEC 847-1; 4.3.3)

The frequency for which an equipment is designed and to which the other characteristic values are referred.

### **Rated ultimate short-circuit breaking capacity $I_{cu}$** (IEC 947-2; 4.3.5.2.1)

The maximum prospective fault current which a circuit-breaker is capable of interrupting  
(test cycle: O - CO; previously P-1)

### **Rated insulation voltage $U_i$** (IEC 947-1; 4.3.1 .2)

The voltage to which insulation tests and creepage distances of an equipment are referred. The maximum operational voltage must not in any case exceed the rated insulation voltage.

### **Rated short-circuit breaking capacity $I_{cn}$** (IEC 947-1; 4.3.6.3)

The maximum value of current which an equipment is capable of switching Off at rated operational voltage and rated frequency, and without sustaining damage. It is expressed as r.m.s. value.

### **Motor rating** (IEC 947-1; 4.3.2.3)

Power output of a motor at the associated operational voltage.

### **Rated control supply voltage $U_s$** (IEC 947-1; 4.5.1)

The voltage applied to the input terminals of the control circuit of an equipment. Due to the presence of transformers or resistors in the control circuit, this may differ from the rated actuating (control circuit) voltage.

### **Rated impulse withstand voltage $U_{imp}$** (IEC 947-1; 4.3.1 .3)

Measures the stability of the internal clearances of an equipment against overvoltage peaks. The utilization of suitable switchgear can ensure that overvoltages are prevented from transferring from the mains to deenergized system sections within it.

### **Rated current $I_n$** (of a circuit-breaker) (IEC 947-2; 4.3.2.3)

For circuit-breakers, this current value is equal to the uninterrupted current and the conventional free air thermal current.

### **Protection against direct contact**

Design measures incorporated into equipment in order to prevent direct contact, i.e. without tools, with live parts of a system (finger proof, back-of-hand proof).

### **Control circuit reliability**

Measures the probability of switching states arising during the lifespan of a contact, which would be interpreted as faults by downstream electronic controllers (PLCs). Control circuit reliability is expressed in values based on tests using standard limit values for signal inputs.

### **Damp heat, constant**

This test subjects the equipment to an ambient temperature of 40°C at a constant humidity of 93%. At set intervals during the test, the electrical and mechanical function of the equipment are examined.

### **Damp heat, cyclic**

This test subjects the equipment to cyclically changing climatic conditions: a cycle applies 40°C ambient temperature at 93% relative humidity for 12 hours, followed by 12 hours of 25°C at 95% relative humidity. At set intervals during the test, the electrical and mechanical function of the equipment are examined.

### **Finger proof**

An equipment whose live parts cannot be touched by the operator during actuation is termed finger proof. This also affects operator activity on neighbouring switching devices. The finger proof area of a push-actuated operating medium is a circular area of at least 30 mm radius around the actuating element, and vertical to the direction of actuation.

Within this circular area, touch-critical parts must be located at not less than 80 mm depth under the actuating level.

### **Utilization category** (IEC 947-1; 2.1 .18/IEV 441-17-19)

A combination of specified requirements relating to the condition in which the switching device or the fuse fulfills its purpose, selected to represent a characteristic group of practical applications. The specified requirements may concern, e.g. the values of making capacities, breaking capacities and other characteristic values, data concerning associated circuits, and the relevant conditions of use and behaviour.

### **(IEC 947-2; 4.4)**

For circuit-breakers, the utilization category denotes whether the equipment is designed for selectivity using time delay (category B) or not (category A).

### **Back-of-hand proof**

An equipment whose live parts cannot be touched by a sphere of 50 mm diameter, is regarded as back-of-hand proof.

### **Altitude**

The density of air decreases with increasing altitude, and this reduces its insulating capacity as well as its heat transfer capability. The rated operational voltage and current of switching devices, conductors and motors as well as the tripping behaviour of thermal overload relays are affected by this.

Upon request, OMRON ELECTRONICS will supply information as to the suitability or otherwise of switchgear for operation at altitudes above the 2000 m limit specified by the standard.

### **Conventional free air thermal current** (IEC 947-1; 4.3.2.1)

The maximum value of current which an equipment is capable of carrying for a minimum of eight hours without thermal overloading. As a rule, it corresponds to the maximum operational current.

### **Creepage path** (IEC 947-1; 2.5.51/IEV 151-03-37)

The shortest distance along the surface of the insulating material between two conductive parts. The creepage distance is determined by the rated insulation voltage, the pollution degree and the creepage current resistance of the material used.

### **Clearance** (IEC 947-1; 2.5.46/IEV 441-17-31)

The distance between two conductive parts along a string stretched the shortest way between these conductive parts. The clearance in air is determined by the rated impulse withstand voltage, overvoltage category and pollution degree.

## Emergency-stop switching device

Switching device within an emergency-stop circuit which is intended to prevent danger to persons, damage to machinery or working materials.

### Opening delay (IEV 441-17-36)

The interval of time between the specified instant of initiation of the opening operation and the instant when the arcing contacts have separated in all poles. The opening time is the sum of the tripping time and the inherent delay of the contacts.

### Closing delay

The interval of time between the instant of command and the first make operation of the contacts of the first pole to close. The closing delay is made up of the response delay and the closing time.

### Shock resistance

The capacity of an equipment to withstand pulse-like motions without changing its operating status or sustaining damage. No contact lifting must take place on devices in the On position, the main contacts must not knock against each other in the Off position. A safety switch must not trip, and control circuit switches must not change their switching status.

### Safe isolation (IEC 536, DIN VDE 0106 Part 101)

Isolation of circuits not carrying dangerous voltages (e.g. protective extra-low voltage) from circuits in which dangerous voltages flow. Such isolation is achieved by means of reinforced or double insulation which reliably prevents voltage transfer from one circuit to another. This might otherwise take place between main circuits and control circuits in switching devices or between transformer primary and secondary. "Safe isolation" is a priority requirement for safety circuits and functional low-voltage circuits.

### Isolating function (IEC 947-1; 2.1.19)

Equipments are deemed to possess this isolating function provided their switching contacts when in the open position, achieve the separation distance prescribed for the isolation of electrical circuits, and their creepage paths and clearance distances are of the required size. The power supply to the entire installation or a section of the installation can thus be cut off for safety reasons, e.g. during maintenance.

### Tamper proof

An emergency-stop switching device is regarded as tamper proof provided it cannot be reset without tools or via a prescribed procedure, after tripping has taken place. The device latches in the tripped position. Accidental or deliberate manipulation (inching) is thus ruled out.

## Overvoltage category (IEC 947-1; 2.5.60)

Conventional number for prospective overvoltages at the point of installation, as might be caused for example by the effect of lightning or switching processes. The overvoltage category applicable to industrial switchgear is III. The applicability of switchgear according to the overvoltage categories is defined as follows:

### Overvoltage category IV:

Use allowed directly at the termination point of the installation (directly affected by any lightning), e.g. at an overhead line connection point.

### Overvoltage category III:

Operating media with special requirements as to the serviceability for connection in fixed installations, which are protected by overvoltage diversion measures, e.g. circuit-breakers in low-voltage distribution systems or in control systems for industrial use.

### Overvoltage category II:

Power consumers for connection to fixed installations, e.g. household appliances, electrical tools.

### Overvoltage category I:

Operating media for connection to circuits containing overvoltage protection schemes, e.g. electronic devices.

### Ambient temperature, open (IEV 441-11-13)

Room temperature for example of the workshop or switch room in which the switching device is located.

### Ambient temperature, enclosed (IEV 441-11-13)

Temperature at which the switching device is capable of being operated within a closed housing. For this purpose, it must be taken into account that the heat losses of the device will add to the internal temperature rise within the enclosure.

### Losses (IEV 151-03-18)

The difference between the input power and the output power of a device. The main type of loss in electrical power distribution switchgear and operating media is current heat loss.

### Pollution degree (IEC 947-1; 6.1.3.2)

Conventional number for the prospective quantities of conductive dust and humidity which can lead to a reduction in the control circuit reliability of a device. The pollution degree is described by the following influencing factors:

#### Pollution degree 1:

No pollution or only dry, non-conductive pollution occurs. The pollution does not affect the control circuit reliability.

#### Pollution degree 2:

Usually, only non-conductive pollution. However, transient conductivity through condensation is to be expected.

#### Pollution degree 3: (switchgear for industrial use)

Conductive pollution or dry, non-conductive pollution which is rendered conductive through condensation.

#### Pollution degree 4:

The pollution leads to long-term conductivity, e.g. pollution by conductive dust, rain or snow.

## Coordination type

Status of a switchgear combination (motor starter) during and after testing at **rated conditional current**:

### Coordination Type “1”:

- No risk to persons or installations
- No requirement for immediate readiness for renewed operation
- Damage to the starter is permissible

### Coordination type “2”:

- No risk to persons or installations
- Starter is capable of renewed operation
- No damage to the starter with the exception of a slight welding of the contacts, provided they can be separated without significant deformation.

## Positive opening operation

(IEC 947-1; 2.4.11/IEV 441-16-12)

This opening operation is designed to ensure that auxiliary contacts of a switching device are always in the respective positions corresponding to the open or closed position of the main contacts. The contacts of a contactor are **interlocked opposing contacts**, provided they are mechanically linked in such a way as to ensure that normally open and normally closed contacts can never be closed simultaneously.

This arrangement must also ensure that minimum contact separation of 0.5 mm is maintained over the entire lifespan of the device, even during a fault, e.g. the welding of one contact.

The relevant German Trade Association requires the use of contactors with interlocked opposing contacts for control systems on power presses in the metal processing industry.

## Positive/enforced operation/actuation

This describes an arrangement where a link between the actuator and the switching element ensures that the force exerted on the actuator is transferred directly, i.e. without the intervention of sprung parts, onto the switching element.

## Positive opening

(IEC 947-1; 2.4.10/IEV 441-16-11)

An opening operation which ensures that the main contacts of a mechanical switching device have attained the open position when the actuator is in the Off-position.

## Symbols used in Technical Data and Formulae

|            |                                                     |           |                                                  |
|------------|-----------------------------------------------------|-----------|--------------------------------------------------|
| DF         | Duty factor                                         | $I_{th}$  | Conventional free air thermal current            |
| $I_{cn}$   | Rated short-circuit breaking capacity               | $I_{the}$ | Conventional thermal current of enclosed devices |
| $I_{cs}$   | Rated service short-circuit breaking capacity       | $I_u$     | Rated uninterrupted current                      |
| $I_{cu}$   | Rated ultimate short-circuit breaking capacity      | $S_{NT}$  | Transformer rating                               |
| $I_e$      | Rated operational current                           | $U_c$     | Rated actuating voltage                          |
| $I''_{sc}$ | Transformer initial short-circuit current AC        | $U_e$     | Rated operational voltage                        |
| $I_n$      | Rated current                                       | $U_i$     | Rated insulation voltage                         |
| $I_{NT}$   | Rated transformer current                           | $U_{imp}$ | Rated impulse withstand voltage                  |
| $I_q$      | Rated conditional short-circuit current             | $U_k$     | Transformer short-circuit voltage                |
| $I_r$      | Set value of overcurrent release                    | $U_s$     | Rated control voltage                            |
| $I_{rm}$   | Response value of non-delayed short-circuit release |           |                                                  |

## ● Additional ordering information for contactors

### CE-Marking

The manufacturer has to sign his products with the CE-Marking. With the CE-Marking the manufacturer confirms the accordance with the different EEC Directives. The CE-Marking is absolutely necessary to sell the products in the EEC.

Attached you find the EEC Directives concerning our products.

Low Voltage Directive (73/23/EEC)

EMC Directive (89/336/EEC)

Declarations of Conformity art. no. D586.. on request.

### Test Authorities, Registration Mark, Approvals

OMRON Low voltage switchgear is built and tested to national and international specifications. All devices suit all important specifications without any test obligation, like VDE, BS and also relative to IEC Recommendations and to European Standards like IEC 947 and EN 60947.

It is for this reason OMRON Low voltage switchgear is used all over the world. In order to provide special versions, limitations to the max. voltages, currents and power ratings or special markings are sometimes necessary.

OMRON Low voltage switchgear is also suitable for applications in marine environments.

They are classified in "Lloyd's Register of Shipping" and in the "Maritime Register of Shipping" (GUS). The "American Bureau of Shipping" does not claim a general approval for single components, the complete electrical equipment on board has to be approved. The devices should have UL- and CSA-approvals. Further information for Guide-No. and File-No. (CSA, UL) you will find on page 95.

For approved values see technical data of the devices.State deputy

| Country                                              | Canada                                                                            | USA                                                                                                                                                                                                            | Switzerland                                                                                                                                              | Denmark                                                                           | Norway                                                                            | Sweden                                                                             | Finland                                                                             | Poland                                                                              | Slowa-<br>kia                                                                       | Czech                                                                               | Hun-<br>garia                                                                       |
|------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| State deputy or private examination (state admitted) | CSA UL                                                                            | UL                                                                                                                                                                                                             | SEV                                                                                                                                                      | DEMKO                                                                             | NEMKO                                                                             | SEMKO                                                                              | SETI                                                                                | SEP                                                                                 | SKTC                                                                                | EZU                                                                                 | MEEI                                                                                |
| Label marking of examination boards                  |  |                                                                                                                               |                                                                         |  |  |  |  |  |  |  |  |
| Duty of approvals                                    | All switchgear                                                                    |  or <br>Approval of switchgear commendable | No approval since 1.1.1994<br>Our devices are according to the harmonised European Standards e.g. EN 60947 (IEC 947, VDE 0660) and can be used generally |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| Specification                                        | UL is authorised for approvals acc. to Canadian Standards                         |                                                                                                                                                                                                                | Marking with approbation label is no longer necessary                                                                                                    |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

\*1) CSA-approvals are replaced by UL-approvals valid for USA and Canada. From 1. 1. 2000 switchgear will be marked with the combined approval. UL-mark  or  only.

### Explanations for choice and supply of low voltage switchgears in Canada and USA

#### Marking of auxiliary contacts

At several devices in UL-data are two voltages for auxiliary contacts mentioned (e. g.: 600 volts at same potential, 150 volts at different potentials). That means, if the voltage is higher than 150 volts, the control voltage applied to input terminals must be at the same potential

| Marking of auxiliary contacts according to CSA and UL | Max. rated values per pole |         |       |               | Contact Rating Code Designation |
|-------------------------------------------------------|----------------------------|---------|-------|---------------|---------------------------------|
|                                                       | Voltage                    | Current |       | Cont. Current |                                 |
|                                                       |                            | Make    | Break |               |                                 |
|                                                       | V                          | A       | A     | A             |                                 |
| Heavy Duty (HD or HVY DTY)                            | AC 120                     | 60      | 6     | 10            | A150                            |
|                                                       | AC 240                     | 30      | 3     | 10            | A300                            |
|                                                       | AC 480                     | 15      | 1,5   | 10            | A600                            |
|                                                       | AC 600                     | 12      | 1,2   | 10            | A600                            |
|                                                       | DC 125                     | 2,2     | 2,2   | 10            | N150                            |
|                                                       | DC 250                     | 1,1     | 1,1   | 10            | N300                            |
|                                                       | DC 600                     | 0,4     | 0,4   | 10            | N600                            |
| Standard Duty (SD or STD DTY)                         | AC 120                     | 30      | 3     | 5             | B150                            |
|                                                       | AC 240                     | 15      | 1,5   | 5             | B300                            |
|                                                       | AC 480                     | 7,5     | 0,75  | 5             | B600                            |
|                                                       | AC 600                     | 6       | 0,6   | 5             | B600                            |
|                                                       | DC 125                     | 1,1     | 1,1   | 5             | P150                            |
|                                                       | DC 250                     | 0,55    | 0,55  | 5             | P300                            |
|                                                       | DC 600                     | 0,2     | 0,2   | 5             | P600                            |

Low voltage switchgear for auxiliary circuits (e. g. contactor relays, control units, auxiliary contacts in general) usually approved for "Heavy Duty" or "Standard Duty" UL and besides these marked with the admissible max. voltage or with short codes (see table).

| Marking of<br>auxiliary<br>contacts<br>according to<br>CSA and UL | Max. rated values per pole |         |       |                  | Contact                            |
|-------------------------------------------------------------------|----------------------------|---------|-------|------------------|------------------------------------|
|                                                                   | Voltage                    | Current |       | Cont.<br>Current | Rating<br>Code<br>Designa-<br>tion |
|                                                                   |                            | Make    | Break |                  |                                    |
|                                                                   | V                          | A       | A     | A                |                                    |
| -                                                                 | AC 120                     | 15      | 1,5   | 2,5              | C150                               |
|                                                                   | AC 240                     | 7,5     | 0,75  | 2,5              | C300                               |
|                                                                   | AC 480                     | 3,75    | 0,375 | 2,5              | C600                               |
|                                                                   | AC 600                     | 3       | 0,3   | 2,5              | C600                               |
|                                                                   | DC 125                     | 0,55    | 0,55  | 2,5              | Q150                               |
|                                                                   | DC 250                     | 0,27    | 0,27  | 2,5              | Q300                               |
|                                                                   | DC 600                     | 0,1     | 0,1   | 2,5              | Q600                               |
| -                                                                 | AC 120                     | 3,6     | 0,6   | 1                | D150                               |
|                                                                   | AC 240                     | 1,8     | 0,3   | 1                | D300                               |
|                                                                   | DC 125                     | 0,22    | 0,22  | 1                | R150                               |
|                                                                   | DC 250                     | 0,11    | 0,11  | 1                | R300                               |
| -                                                                 | AC 120                     | 1,8     | 0,3   | 0,5              | E150                               |

# Discernment at UL-Standards

| Recognized Component Industrial Control Equipment                                                                                                                                                      | Listed Industrial Control Equipment                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UL issues yellow "Guide cards" with Guide- and File-No.                                                                                                                                                | UL issues white "Guide cards" with Guide- and File-No.                                                                                                                     |
| Devices have permission to be marked with  on the label                                                               | Devices have to be marked with the "UL-Listing Mark"                                    |
| Devices as components approved for "factory wiring":<br>devices for employment in control panels, when they are selected,<br>mounted and wired according to the charging conditions by skilled worker. | Devices approved for "field wiring",<br>a) devices for employment in control panels, when they are mounted<br>and wired by skilled worker.<br>b) devices for retail in USA |
| Valid UL-Standards:<br>UL 508„Standard for Industrial Control Equipment“<br>(partly limited)                                                                                                           | Valid UL-Standards:<br>UL 508„Standard for Industrial Control Equipment“<br>(unlimited)<br>UL 486"Standard for Wire Connectors and Soldering Lugs"                         |

Are devices approved as "Listed Equipment"  the approval is also valid for using as "Recognized Component" .

## Approvals

| Country                               | USA, Canada                                                                             |                                                                                   | Switzerland                                                                              | Europe                                                                            | Register of Shipping |            |               | CENELEC<br>CB-Certificates |
|---------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------|------------|---------------|----------------------------|
|                                       | UL<br> |  | SEV<br> |  | Great Britain<br>LRS | GUS<br>MRS | Italy<br>RINA |                            |
| Type                                  |                                                                                         |                                                                                   |                                                                                          |                                                                                   |                      |            |               |                            |
| Mini Contactors J7KNA and Accessories |                                                                                         |                                                                                   |                                                                                          |                                                                                   |                      |            |               |                            |
| J7KNA-AR..(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KNA-09..(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KNA-12..(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | -                          |
| J73KN-A..., J73KN-AM                  | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| Contactors Series J7KN                |                                                                                         |                                                                                   |                                                                                          |                                                                                   |                      |            |               |                            |
| J7KN-10...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-14...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-18...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-22...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-24...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-32...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-40...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-50...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-62...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-74...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-85...(D)                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-110...(D)                        | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7KN-150...                           | -                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | -                          |
| J7KN-175...                           | -                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | -                          |
| J7KN-200...                           | -                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | -                          |
| Accessories                           |                                                                                         |                                                                                   |                                                                                          |                                                                                   |                      |            |               |                            |
| J73N-KB...                            | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J73N-KC-115                           | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | x                          |
| J74KN-B-PT...                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | -                          |
| J74KN-A-VG...                         | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | -                          |
| J74KN-B-VG                            | -                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | -                          |
| Thermal Overload Relays               |                                                                                         |                                                                                   |                                                                                          |                                                                                   |                      |            |               |                            |
| J7TKN-B                               | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | x                          |
| J7TKN-C                               | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | x                          |
| J7TKN-D                               | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | x                          |
| J7TKN-A                               | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7TKN-E                               | o                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | o                          |
| J7TKN-F                               | -                                                                                       | -                                                                                 | -                                                                                        | o                                                                                 | -                    | -          | -             | -                          |

o In Standard version approved

x In Test

- Not provided for test until now

 and -Guide- and File-No.

These data are important for UL-inspecting

| Devices                                                  | Guide-No.                                                                         |      |                                                                                     |       |
|----------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------------|-------|
|                                                          |  |      |  |       |
|                                                          | Kanada                                                                            | USA  | Kanada                                                                              | USA   |
| Contactors                                               | NLDX7                                                                             | NLDX | NLDX8                                                                               | NLDX2 |
| Accessories                                              | NKCR7                                                                             | NKCR | NKCR8                                                                               | NKCR2 |
| Thermal Overload Relays                                  | NKCR7                                                                             | NKCR | -                                                                                   | -     |
| Circuit Breakers J7MN<br>as Manual Motor Controller      | NLRV7                                                                             | NLRV | -                                                                                   | -     |
| Circuit Breakers J7MN<br>as Combination Motor Controller | NKJH7                                                                             | NKJH | -                                                                                   | -     |
| J7MN Bus Bar Assemblies                                  | NLRV7                                                                             | NLRV | -                                                                                   | -     |
| J7MN Accessories                                         | NKCR7                                                                             | NKCR | -                                                                                   | -     |

## ■ Technical information

### Degree of protection acc. to EN60947

Protection ratings are prefixed by the internationally agreed letters IP followed by two digits.

1<sup>st</sup> digit: Pertains to solid objects

2<sup>nd</sup> digit: Pertains to water.

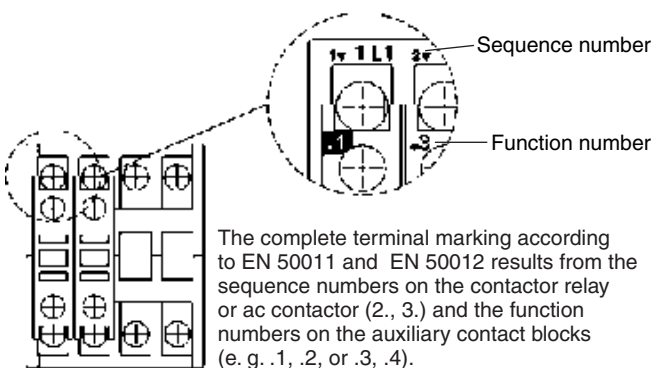
| 1 <sup>st</sup> digit | Short description                                                                                | Definition                                                                                                                                                                               |
|-----------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                     | Protected against solid objects greater than 50 mm                                               | Excludes solid objects exceeding 50 mm in diameter and protects against contact with live and moving parts by a large body surface such as a hand (but not against deliberate access).   |
| 2L                    | Protected against solid objects greater than 12,5 mm and against contact by standard test finger | Excludes solid objects exceeding 12,5 mm in diameter and protects against contact with live and moving parts by a standard test finger or similar objects not exceeding 80 mm in length. |
| 3                     | Protected against solid objects greater than 2,5 mm                                              | Excludes solid objects exceeding 2,5 mm in diameter or thickness.                                                                                                                        |
| 4                     | Protected against solid objects greater than 1 mm                                                | Excludes solid objects exceeding 1 mm in diameter or thickness.                                                                                                                          |
| 5                     | Dust protected                                                                                   | Prevents ingress of dust in quantities and locations that would interfere with the intended operation of the equipment.                                                                  |
| 6                     | Dust tight                                                                                       | Prevents ingress of dust.                                                                                                                                                                |

### Terminal markings acc. to EN50011

Auxiliary contacts of AC contactors and contacts of contactor relays and thermal overload relays are particularly marked. The terminal markings of normally-open contacts are printed as positive figures, they of normally-closed contacts as negative figures.

This gives a clear indication of the function of the contacts.

The figure below illustrates the determination of terminal markings for contactors with auxiliary contact blocks.



| 2 <sup>nd</sup> digit | Short description                                      | Definition                                                                                                                                           |
|-----------------------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                     | Protected against-dripping water                       | Dripping water (vertically falling drops) shall have no harmful effect.                                                                              |
| 2                     | Protected against dripping water when tilted up to 15° | Vertically dripping water shall have no harmful effect when the enclosure is tilted at any angle up to 15° from its normal position.                 |
| 3                     | Protected against spraying water                       | Water falling as a spray at an angle up to 60° from the vertical shall have no harmful effect.                                                       |
| 4                     | Protected against splashing water                      | Water splashed against the enclosure from any direction shall have no harmful effect.                                                                |
| 5                     | Protected against water jets                           | Water protected by a nozzle against the enclosure from any direction shall have no harmful effect.                                                   |
| 6                     | Protected against heavy seas                           | Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quantities.                                       |
| 7                     | Protected against the effects of immersion             | Ingress of water in a harmful quantity shall not be possible when the enclosure is immersed in water under standard conditions of pressure and time. |
| 8                     | Protected against submersion                           | No ingress of water.                                                                                                                                 |

### Resistance to climatic conditions acc. to IEC 68

Open-type devices are climate-resistant in the constant climate according to IEC 68-2-3 (this is a climate with an ambient temperature of 40°C and an atmospheric humidity of 90 to 95%).

Enclosed devices are climate-resistant in an alternating climate according to IEC 68-2-30 (this is a moist alternating climate with a 24-hour cycle between climates with an ambient temperature of 25°C, and an atmospheric humidity of 95 to 100% and an ambient temperature of 40°C, and an atmospheric humidity of 90 to 96% in the presence of condensation during rises in temperature).

Data are valid up to an altitude of 2000m above sea level.

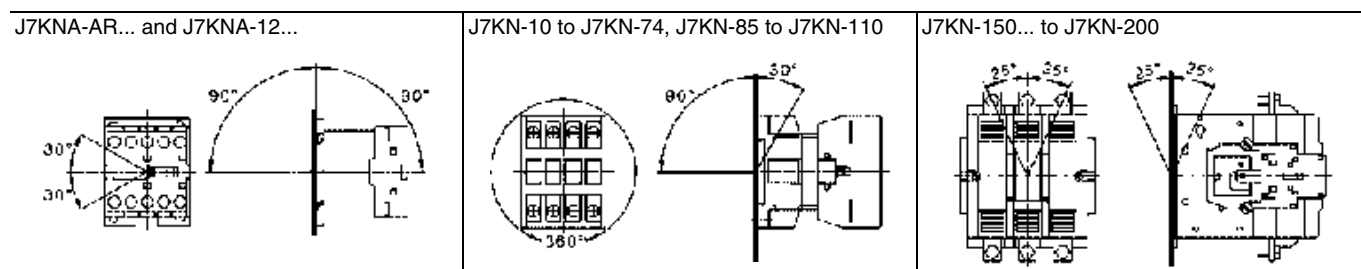
### Short circuit protection

Back up fuses should be used to protect contactors and starters against short circuits. For starters the device with the smaller admissible fuse at the main and at the control circuit (contactor or thermal overload) determines the fuse size.

After a short circuit devices have to be checked for correct operation.

Disconnect power before proceeding with any work on the equipment!

## Mounting positions of contactors



## Terminal screws

| Devices                                                   | Kind of connection |                      |
|-----------------------------------------------------------|--------------------|----------------------|
| Type                                                      | Screw with washer  | Screw with clamp box |
| <b>Mini Contactors</b>                                    |                    |                      |
| All conductors<br>J7KN-AR...; J7KNA-09...;<br>J7KNA-12... | M3,5               | -                    |
| <b>Contactors</b>                                         |                    |                      |
| Main conductor<br>J7KN-10... to J7KN-22...                | M3,5               | -                    |
| J7KN-24... to J7KN-40...                                  | -                  | M5                   |
| J7KN-50... to J7KN-74...                                  | -                  | M6                   |
| J7KN-85..., J7KN-110...                                   | -                  | M8                   |
| Auxiliary conductor<br>J7KN-10... to J7KN-22...           | M3,5               | -                    |
| J7KN-85... to J7KN-110                                    | M3,5               | -                    |

| Devices                                     | Kind of connection |                      |
|---------------------------------------------|--------------------|----------------------|
| Type                                        | Screw with washer  | Screw with clamp box |
| Coil conductor<br>J7KN-10... to J7KN-110... | M3,5               | -                    |
| <b>Accessories</b>                          |                    |                      |
| J73KNA(M)...                                | M3,5               | -                    |
| J73KN-B, J73KN-C                            | M3,5               | -                    |
| <b>Thermal Overload Relays</b>              |                    |                      |
| Main conductor<br>J7TKN-A                   | M4                 | -                    |
| J7TKN-B                                     | M3,5               | -                    |
| J7TKN-C                                     | M5                 | -                    |
| J7TKN-D                                     | -                  | M6                   |
| Auxiliary conductor                         |                    |                      |
| All devices                                 | M3,5               | -                    |

## Terminal screws in relation to screwdriver sizes and tightening torques

| Terminal screws                  |      | Pozidriv | Screw driver | Tightening torque |          |
|----------------------------------|------|----------|--------------|-------------------|----------|
| Version                          | Size |          |              | Nm                | lb. inch |
| Screw with Pozidriv and slot     | M3   | Pz 1     | Size 1       | 0,6 - 1,2         | 5 - 11   |
|                                  | M3,5 | Pz 2     | Size 2, 3    | 0,8 - 1,4         | 7 - 12   |
|                                  | M4   | Pz 2     | Size 3, 4    | 1,2 - 1,8         | 11 - 16  |
|                                  | M5   | Pz 2     | Size 3, 4, 5 | 2,5 - 3           | 22 - 26  |
|                                  | M6   | Pz 3     | Size 4, 5    | 3,5 - 4,5         | 31 - 40  |
| Screw or nut with hexagonal-head | M8   | -        | -            | 6 - 10            | 53 - 88  |

## ● General technical information

### ■ Current carrying capacities of PVC insulated 600/1000 Volt cables with copper or aluminium conductors.

In accordance with the 16th edition of the "Wiring Regulations for Electrical Installations".

Basic assumptions: Ambient temperature of 30°C.

Circuit of protected by a OMRON circuit-breaker to IEC 947-2, or a fuse to BS 88 or BS 1361.

Figures must be adjusted by the correction factors for ambient temperature and/or cable grouping as detailed in the IEE regs.

| Conductor size<br>mm <sup>2</sup>                                                      | In conduit or trunking (enclosed) |        |             |        | Clipped to surface or cable tray, bunched, embedded in plaster (unenclosed) |        |             |        | Fixed to vertical surface of wall or open cable trench with 20 mm separation between cables and wall |        |             |        |
|----------------------------------------------------------------------------------------|-----------------------------------|--------|-------------|--------|-----------------------------------------------------------------------------|--------|-------------|--------|------------------------------------------------------------------------------------------------------|--------|-------------|--------|
|                                                                                        | Single-phase                      |        | Three-phase |        | Single-phase                                                                |        | Three-phase |        | Single-phase                                                                                         |        | Three-phase |        |
|                                                                                        | Cu [A]                            | Al [A] | Cu [A]      | Al [A] | Cu [A]                                                                      | Al [A] | Cu [A]      | Al [A] | Cu [A]                                                                                               | Al [A] | Cu [A]      | Al [A] |
| Single core, PVC insulated cable non-armoured, copper or aluminium conductors.         |                                   |        |             |        |                                                                             |        |             |        |                                                                                                      |        |             |        |
| 1.0                                                                                    | 13.5                              | -      | 12.0        | -      | 15.5                                                                        | -      | 14.0        | -      | -                                                                                                    | -      | -           | -      |
| 1.5                                                                                    | 17.5                              | -      | 15.5        | -      | 20.0                                                                        | -      | 18.0        | -      | -                                                                                                    | -      | -           | -      |
| 2.5                                                                                    | 24.0                              | -      | 21.0        | -      | 27.0                                                                        | -      | 25.0        | -      | -                                                                                                    | -      | -           | -      |
| 4.0                                                                                    | 32.0                              | -      | 28.0        | -      | 37.0                                                                        | -      | 33.0        | -      | -                                                                                                    | -      | -           | -      |
| 6.0                                                                                    | 41.0                              | -      | 36.0        | -      | 47.0                                                                        | -      | 43.0        | -      | -                                                                                                    | -      | -           | -      |
| 10.0                                                                                   | 57.0                              | -      | 50.0        | -      | 65.0                                                                        | -      | 59.0        | -      | -                                                                                                    | -      | -           | -      |
| 16.0                                                                                   | 76.0                              | -      | 68.0        | -      | 87.0                                                                        | -      | 79.0        | -      | -                                                                                                    | -      | -           | -      |
| 25.0                                                                                   | 101.0                             | -      | 89.0        | -      | 114.0                                                                       | -      | 104.0       | -      | 126.0                                                                                                | -      | 112.0       | -      |
| 35.0                                                                                   | 125.0                             | -      | 110.0       | -      | 141.0                                                                       | -      | 129.0       | -      | 156.0                                                                                                | -      | 141.0       | -      |
| 50.0                                                                                   | 151.0                             | 118.0  | 134.0       | 104.0  | 182.0                                                                       | 134.0  | 167.0       | 123.0  | 191.0                                                                                                | 144.0  | 172.0       | 132.0  |
| 70.0                                                                                   | 192.0                             | 150.0  | 171.0       | 133.0  | 234.0                                                                       | 172.0  | 214.0       | 156.0  | 246.0                                                                                                | 185.0  | 223.0       | 169.0  |
| 95.0                                                                                   | 232.0                             | 181.0  | 207.0       | 161.0  | 284.0                                                                       | 210.0  | 261.0       | 194.0  | 300.0                                                                                                | 225.0  | 273.0       | 206.0  |
| 120.0                                                                                  | 296.0                             | 210.0  | 239.0       | 186.0  | 330.0                                                                       | 245.0  | 303.0       | 226.0  | 349.0                                                                                                | 261.0  | 318.0       | 240.0  |
| 150.0                                                                                  | 300.0                             | 234.0  | 262.0       | 204.0  | 381.0                                                                       | 283.0  | 349.0       | 261.0  | 404.0                                                                                                | 301.0  | 369.0       | 277.0  |
| 185.0                                                                                  | 341.0                             | 266.0  | 296.0       | 230.0  | 436.0                                                                       | 324.0  | 400.0       | 299.0  | 463.0                                                                                                | 344.0  | 424.0       | 317.0  |
| 240.0                                                                                  | 400.0                             | 312.0  | 346.0       | 269.0  | 515.0                                                                       | 384.0  | 472.0       | 354.0  | 549.0                                                                                                | 407.0  | 504.0       | 375.0  |
| 300.0                                                                                  | 458.0                             | 358.0  | 394.0       | 306.0  | 594.0                                                                       | 444.0  | 545.0       | 410.0  | 635.0                                                                                                | 469.0  | 584.0       | 435.0  |
| 400.0                                                                                  | 546.0                             | -      | 467.0       | -      | 694.0                                                                       | -      | 634.0       | -      | 732.0                                                                                                | -      | 679.0       | -      |
| 500.0                                                                                  | 626.0                             | -      | 533.0       | -      | 792.0                                                                       | -      | 723.0       | -      | 835.0                                                                                                | -      | 778.0       | -      |
| 630.0                                                                                  | 720.0                             | -      | 611.0       | -      | 904.0                                                                       | -      | 826.0       | -      | 953.0                                                                                                | -      | 892.0       | -      |
| Twin and multi-core PVC insulated cable, non-armoured, copper or aluminium conductors. |                                   |        |             |        |                                                                             |        |             |        |                                                                                                      |        |             |        |
| 1.0                                                                                    | 11.0                              | -      | 11.5        | -      | 15.0                                                                        | -      | 13.5        | -      | 17.0                                                                                                 | -      | 14.5        | -      |
| 1.5                                                                                    | 14.0                              | -      | 15.0        | -      | 19.5                                                                        | -      | 17.5        | -      | 22.0                                                                                                 | -      | 18.5        | -      |
| 2.5                                                                                    | 18.5                              | -      | 20.0        | -      | 27.0                                                                        | -      | 24.0        | -      | 30.0                                                                                                 | -      | 25.0        | -      |
| 4.0                                                                                    | 25.0                              | -      | 27.0        | -      | 36.0                                                                        | -      | 32.0        | -      | 40.0                                                                                                 | -      | 34.0        | -      |
| 6.0                                                                                    | 32.0                              | -      | 34.0        | -      | 46.0                                                                        | -      | 41.0        | -      | 51.0                                                                                                 | -      | 43.0        | -      |
| 10.0                                                                                   | 43.0                              | -      | 46.0        | -      | 63.0                                                                        | -      | 57.0        | -      | 70.0                                                                                                 | -      | 60.0        | -      |
| 16.0                                                                                   | 57.0                              | 54.0   | 62.0        | 48.0   | 85.0                                                                        | 66.0   | 76.0        | 59.0   | 94.0                                                                                                 | 73.0   | 80.0        | 61.0   |
| 25.0                                                                                   | 75.0                              | 71.0   | 80.0        | 62.0   | 112.0                                                                       | 83.0   | 96.0        | 73.0   | 119.0                                                                                                | 89.0   | 101.0       | 78.0   |
| 35.0                                                                                   | 92.0                              | 86.0   | 99.0        | 77.0   | 138.0                                                                       | 103.0  | 119.0       | 90.0   | 148.0                                                                                                | 111.0  | 126.0       | 96.0   |
| 50.0                                                                                   | 110.0                             | 104.0  | 118.0       | 92.0   | 168.0                                                                       | 125.0  | 144.0       | 110.0  | 180.0                                                                                                | 135.0  | 153.0       | 117.0  |
| 70.0                                                                                   | 139.0                             | 131.0  | 149.0       | 116.0  | 213.0                                                                       | 160.0  | 184.0       | 140.0  | 232.0                                                                                                | 173.0  | 196.0       | 150.0  |
| 95.0                                                                                   | 167.0                             | 157.0  | 179.0       | 139.0  | 258.0                                                                       | 195.0  | 261.0       | 170.0  | 282.0                                                                                                | 210.0  | 238.0       | 183.0  |
| 120.0                                                                                  | 192.0                             | -      | 206.0       | 160.0  | 299.0                                                                       | 245.0  | 259.0       | 197.0  | 328.0                                                                                                | -      | 276.0       | 212.0  |
| 150.0                                                                                  | 219.0                             | -      | 225.0       | 184.0  | 344.0                                                                       | 283.0  | 299.0       | 227.0  | 379.0                                                                                                | -      | 319.0       | 245.0  |
| 185.0                                                                                  | 248.0                             | -      | 255.0       | 210.0  | 392.0                                                                       | 324.0  | 341.0       | 259.0  | 434.0                                                                                                | -      | 364.0       | 280.0  |
| 240.0                                                                                  | 291.0                             | -      | 297.0       | 248.0  | 461.0                                                                       | 384.0  | 403.0       | 305.0  | 514.0                                                                                                | -      | 430.0       | 330.0  |
| 300.0                                                                                  | 334.0                             | -      | 339.0       | 258.0  | 530.0                                                                       | 444.0  | 464.0       | 351.0  | 593.0                                                                                                | -      | 497.0       | 381.0  |
| 400.0                                                                                  | -                                 | -      | 402.0       | -      | 634.0                                                                       | -      | 557.0       | -      | 715.0                                                                                                | -      | 597.0       | -      |

## ■ Overall diameter of cables (Copper)

The dimensions are based on BS specification or the average values as given by the manufacturers.  
The overall diameters given are for cables of 600/1000 V grade.

| Number and nominal area of cables (mm <sup>2</sup> ) | Approx. overall diameter in mm |      | Number and nominal area of cables (mm <sup>2</sup> ) | Approx. overall diameter in mm |      |
|------------------------------------------------------|--------------------------------|------|------------------------------------------------------|--------------------------------|------|
|                                                      | PVC/SWA                        | PVC  |                                                      | PVC/SWA                        | PVC  |
| 1 x 1.0                                              | -                              | 4.5  | 2 x 1.0                                              | -                              | -    |
| 1 x 1.5                                              | -                              | 4.9  | 2 x 1.5                                              | 11.7                           | 7.2  |
| 1 x 2.5                                              | -                              | 5.8  | 2 x 2.5                                              | 13.1                           | 8.6  |
| 1 x 4.0                                              | -                              | 6.8  | 2 x 4.0                                              | 15.1                           | 10.7 |
| 1 x 6.0                                              | -                              | 7.4  | 2 x 6.0                                              | 16.5                           | 12.0 |
| 1 x 10.0                                             | -                              | 8.8  | 2 x 10.0                                             | 20.1                           | 14.9 |
| 1 x 16.0                                             | -                              | 10.5 | 2 x 16.0                                             | 21.9                           | 17.2 |
| 1 x 25.0                                             | -                              | 12.5 | 2 x 25.0                                             | 23.0                           | 18.4 |
| 1 x 35.0                                             | -                              | 13.5 | 2 x 35.0                                             | 24.9                           | 20.1 |
| 1 x 50.0                                             | 19.1                           | 15.1 | 2 x 50.0                                             | 27.8                           | 22.8 |
| 1 x 70.0                                             | 21.1                           | 16.9 | 2 x 70.0                                             | 30.4                           | 25.5 |
| 1 x 95.0                                             | 23.4                           | 19.4 | 2 x 95.0                                             | 35.5                           | 29.3 |
| 1 x 120.0                                            | 26.3                           | 21.0 | 2 x 120.0                                            | 38.0                           | 31.8 |
| 1 x 150.0                                            | 28.3                           | 23.2 | 2 x 150.0                                            | 41.3                           | 35.1 |
| 1 x 185.0                                            | 30.8                           | 25.8 | 2 x 185.0                                            | 46.4                           | 39.1 |
| 1 x 240.0                                            | 34.1                           | 29.0 | 2 x 240.0                                            | 51.2                           | 43.9 |
| 1 x 300.0                                            | 37.0                           | 32.1 | 2 x 300.0                                            | 56.4                           | 48.7 |
| 1 x 400.0                                            | 42.0                           | 35.8 | 2 x 400.0                                            | 61.9                           | 54.2 |
| 1 x 500.0                                            | 45.6                           | 39.6 | -                                                    | -                              | -    |
| 1 x 630.0                                            | 49.7                           | 43.8 | -                                                    | -                              | -    |

| Number and nominal area of cables (mm <sup>2</sup> ) | Approx. overall diameter in mm |      | Number and nominal area of cables (mm <sup>2</sup> ) | Approx. overall diameter in mm |      |
|------------------------------------------------------|--------------------------------|------|------------------------------------------------------|--------------------------------|------|
|                                                      | PVC/SWA                        | PVC  |                                                      | PVC/SWA                        | PVC  |
| 3 x 1.0                                              | -                              | -    | 4 x 1.0                                              | -                              | -    |
| 3 x 1.5                                              | 12.3                           | 7.6  | 4 x 1.5                                              | 13.0                           | 8.3  |
| 3 x 2.5                                              | 13.6                           | 9.1  | 4 x 2.5                                              | 14.5                           | 10.0 |
| 3 x 4.0                                              | 15.8                           | 11.5 | 4 x 4.0                                              | 17.8                           | 12.6 |
| 3 x 6.0                                              | 18.0                           | 12.8 | 4 x 6.0                                              | 19.2                           | 14.2 |
| 3 x 10.0                                             | 21.2                           | 15.8 | 4 x 10.0                                             | 22.8                           | 17.7 |
| 3 x 16.0                                             | 23.1                           | 19.7 | 4 x 16.0                                             | 26.3                           | 20.6 |
| 3 x 25.0                                             | 25.0                           | 20.4 | 4 x 25.0                                             | 27.8                           | 22.9 |
| 3 x 35.0                                             | 27.3                           | 22.4 | 4 x 35.0                                             | 30.5                           | 25.4 |
| 3 x 50.0                                             | 30.5                           | 25.5 | 4 x 50.0                                             | 35.4                           | 29.2 |
| 3 x 70.0                                             | 35.0                           | 28.7 | 4 x 70.0                                             | 39.2                           | 33.0 |
| 3 x 95.0                                             | 39.3                           | 33.3 | 4 x 95.0                                             | 44.3                           | 38.3 |
| 3 x 120.0                                            | 42.2                           | 36.3 | 4 x 120.0                                            | 49.3                           | 41.8 |
| 3 x 150.0                                            | 47.5                           | 40.0 | 4 x 150.0                                            | 53.6                           | 46.3 |
| 3 x 185.0                                            | 51.9                           | 44.6 | 4 x 185.0                                            | 59.0                           | 61.3 |
| 3 x 240.0                                            | 57.8                           | 50.1 | 4 x 240.0                                            | 65.7                           | 58.0 |
| 3 x 300.0                                            | 63.2                           | 55.6 | 4 x 300.0                                            | 72.0                           | 64.6 |
| 3 x 400.0                                            | 69.6                           | 62.2 | 4 x 400.0                                            | 81.3                           | 72.0 |

## ■ Conversion table

| To convert                                                                                                                          | Multiply by |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Inches to millimeters (mm)                                                                                                          | 25.4        |
| Millimeters to inches (in.)                                                                                                         | 0.03937     |
| Feet to meters (m)                                                                                                                  | 0.3048      |
| meters to feet (ft)                                                                                                                 | 3.2808      |
| Yards to meters (m)                                                                                                                 | 0.9144      |
| meters to yards (yd)                                                                                                                | 1.0936      |
| Miles to kilometers (km)                                                                                                            | 1.6093      |
| Kilometers to miles (mil.)                                                                                                          | 0.6214      |
| Square inches to square millimeters (mm <sup>2</sup> )                                                                              | 645.16      |
| Square millimeters to square inches (inch <sup>2</sup> )                                                                            | 0.00155     |
| Square yards to square meters (m <sup>2</sup> )                                                                                     | 0.8361      |
| Square meters to square yards (yd <sup>2</sup> )                                                                                    | 1.196       |
| Cubic inches to cubic centimeters (cm <sup>3</sup> )                                                                                | 16.387      |
| Cubic centimeters to cubic inches (inch <sup>3</sup> )                                                                              | 0.06102     |
| Pounds to kilogrammes (kg)                                                                                                          | 0.4536      |
| Kilogrammes to pounds (lb)                                                                                                          | 2.2046      |
| Tons (2,240 lb) to kilogrammes (kg)                                                                                                 | 1,016.05    |
| Kilogrammes to tons (240 lb)                                                                                                        | 0.0009842   |
| Ounces (avoirdupois) to grammes (g)                                                                                                 | 28.3495     |
| Grammes to ounces                                                                                                                   | 0.0353      |
| Gallons to litres (l)                                                                                                               | 4.561       |
| Litres to gallons                                                                                                                   | 0.220       |
| Force N (newtons) to lbft<br>1 N = 1 kg (mass) accelerated at 1 metre/sec.                                                          | 0.225       |
| 1 Nm = 1 J (joule) to calorie                                                                                                       | 0.239       |
| Horse-power to kilowatts (kW)                                                                                                       | 0.7458      |
| Kilowatts to horse-power (h.p.)<br>1 W (watt) = 1J/s                                                                                | 1.3408      |
| Atmospheres to lb per square inch (lb/inch <sup>2</sup> )<br>1 bar = 1 kg/cm <sup>2</sup> = 735.6 mm Hg = 14.2 lb/inch <sup>2</sup> | 14.68       |

### Conversion table for: Centigrade/Fahrenheit

|        |  |     |
|--------|--|-----|
| BP-212 |  | 100 |
| 200    |  | 90  |
| 190    |  | 80  |
| 180    |  | 70  |
| 170    |  | 60  |
| 160    |  | 50  |
| 150    |  | 40  |
| 140    |  | 30  |
| 130    |  | 20  |
| 120    |  | 10  |
| 110    |  | 0   |
| 100    |  | 10  |
| 90     |  | 20  |
| 80     |  | 30  |
| 70     |  | 40  |
| 60     |  | 50  |
| 50     |  | 60  |
| 40     |  | 70  |
| 30     |  | 80  |
| 20     |  | 90  |
| 10     |  | 100 |
| 0      |  | 110 |
| FP-    |  | 120 |
| 40     |  | 130 |
| 30     |  | 140 |
| 20     |  | 150 |
| 10     |  | 160 |
| 0      |  | 170 |
| F      |  | 180 |
|        |  | 190 |
|        |  | 200 |

### Conversion table for mm<sup>2</sup>/AWG cable sizes

| mm <sup>2</sup> | AWG |
|-----------------|-----|
| 0.75            | 18  |
| 1.0             | 17  |
| 1.5             | 16  |
| 2.5             | 13  |
| 4.0             | 12  |
| 6.0             | 10  |
| 10.0            | 8   |

# ■ Rated currents of 3-phase motors (approx. figures for squirrel-cage motors)

## Minimum fuse size for protection of 3-phase motors

The maximum size is determined by the requirements of the switchgear or overload relay.

The rated motor currents are for standard 1500 r.p.m. 3-phase enclosed ventilated and totally enclosed fan-cooled motors.

D.O.L. starting: Maximum starting current 6 x rated motor current. Maximum starting time 5 s.

Y/D starting: Maximum starting current 2 x rated motor current. Maximum starting time 15 s.

Set overload relay in the phase lead to 0.58 x rated motor current.

Rated fuse currents for Y/D starting are also valid for 3-phase motors with slip-ring motors.

For higher rated currents, starting currents and/or longer starting times, larger fuses are required.

Table is valid for "slow" and/or "gL" fuses (DIN VDE 0636).

For NH fuses with aM characteristics, fuses = rated current is selected.

| Motor rating |       |     | 230 V               |                      |     | 400 V               |                      |     | 415 V               |                      |       |
|--------------|-------|-----|---------------------|----------------------|-----|---------------------|----------------------|-----|---------------------|----------------------|-------|
|              |       |     | Rated motor current | Fuse starting D.O.L. | Y/Δ | Rated motor current | Fuse starting D.O.L. | Y/Δ | Rated motor current | Fuse starting D.O.L. | Y/Δ   |
| kW           | cos φ | η % | A                   | A                    | A   | A                   | A                    | A   | A                   | A, BS                | A, BS |
| 0.06         | 0.7   | 58  | 0.37                | 2.0                  | -   | 0.21                | 2.0                  | -   | 0.21                | 2.0                  | 2     |
| 0.09         | 0.7   | 60  | 0.54                | 2.0                  | -   | 0.31                | 2.0                  | -   | 0.30                | 2.0                  | 2     |
| 0.12         | 0.7   | 60  | 0.72                | 4.0                  | 2   | 0.41                | 2.0                  | -   | 0.40                | 2.0                  | 2     |
| 0.18         | 0.7   | 62  | 1.04                | 4.0                  | 2   | 0.6                 | 2.0                  | -   | 0.58                | 2.0                  | 2     |
| 0.25         | 0.7   | 62  | 1.4                 | 4.0                  | 2   | 0.8                 | 4.0                  | 2   | 0.8                 | 4.0                  | 2     |
| 0.37         | 0.72  | 66  | 2.0                 | 6.0                  | 4   | 1.1                 | 4.0                  | 2   | 1.1                 | 4.0                  | 2     |
| 0.55         | 0.75  | 69  | 2.7                 | 10.0                 | 4   | 1.5                 | 4.0                  | 2   | 1.5                 | 6.0                  | 4     |
| 0.75         | 0.79  | 74  | 3.2                 | 10.0                 | 4   | 1.9                 | 6.0                  | 4   | 1.8                 | 6.0                  | 4     |
| 1.1          | 0.81  | 74  | 4.6                 | 10.0                 | 6   | 2.6                 | 6.0                  | 4   | 2.6                 | 10.0                 | 6     |
| 1.5          | 0.81  | 74  | 6.3                 | 16.0                 | 10  | 3.6                 | 6.0                  | 4   | 3.5                 | 16.0                 | 10    |
| 2.2          | 0.81  | 78  | 8.7                 | 20.0                 | 10  | 5.0                 | 10.0                 | 6   | 4.8                 | 16.0                 | 10    |
| 3.0          | 0.82  | 80  | 11.5                | 25.0                 | 16  | 6.6                 | 16.0                 | 10  | 6.4                 | 20.0                 | 16    |
| 4.0          | 0.82  | 83  | 14.8                | 32.0                 | 16  | 8.5                 | 20.0                 | 10  | 8.2                 | 20.0                 | 16    |
| 5.5          | 0.82  | 86  | 19.6                | 32.0                 | 25  | 11.3                | 25.0                 | 16  | 10.9                | 25.0                 | 20    |
| 7.5          | 0.82  | 87  | 26.4                | 50.0                 | 32  | 15.2                | 32.0                 | 16  | 14.6                | 35.0                 | 25    |
| 11.0         | 0.84  | 87  | 38.0                | 80.0                 | 40  | 21.7                | 40.0                 | 25  | 20.9                | 50.0                 | 32    |
| 15.0         | 0.84  | 88  | 51.0                | 100.0                | 63  | 29.3                | 63.0                 | 32  | 28.2                | 80.0                 | 40    |
| 18.5         | 0.84  | 88  | 63.0                | 125.0                | 80  | 36.0                | 63.0                 | 40  | 35.0                | 80.0                 | 50    |
| 22.0         | 0.84  | 92  | 71.0                | 125.0                | 80  | 41.0                | 80.0                 | 50  | 40.0                | 80.0                 | 50    |
| 30.0         | 0.85  | 92  | 96.0                | 200.0                | 100 | 55.0                | 100.0                | 63  | 53.0                | 100.0                | 80    |
| 37.0         | 0.86  | 92  | 117.0               | 200.0                | 125 | 68.0                | 125.0                | 80  | 65.0                | 125.0                | 80    |
| 45.0         | 0.86  | 93  | 141.0               | 250.0                | 160 | 81.0                | 160.0                | 100 | 78.0                | 125.0                | 80    |
| 55.0         | 0.86  | 93  | 173.0               | 250.0                | 200 | 99.0                | 200.0                | 125 | 96.0                | 160.0                | 100   |
| 75.0         | 0.86  | 94  | 233.0               | 315.0                | 250 | 134.0               | 200.0                | 160 | 129.0               | 250.0                | 160   |
| 90.0         | 0.86  | 94  | 279.0               | 400.0                | 315 | 161.0               | 250.0                | 200 | 155.0               | 250.0                | 160   |
| 110.0        | 0.86  | 94  | 342.0               | 500.0                | 400 | 196.0               | 315.0                | 200 | 189.0               | 315.0                | 200   |
| 132.0        | 0.87  | 95  | 401.0               | 630.0                | 500 | 231.0               | 400.0                | 250 | 222.0               | 355.0                | 250   |
| 160.0        | 0.87  | 95  | 486.0               | 630.0                | 630 | 279.0               | 400.0                | 315 | 269.0               | 355.0                | 315   |
| 200.0        | 0.87  | 95  | 607.0               | 800.0                | 630 | 349.0               | 500.0                | 400 | 337.0               | 450.0                | 355   |
| 250.0        | 0.87  | 95  | -                   | -                    | -   | 437.0               | 630.0                | 500 | 421.0               | 500.0                | 450   |
| 315.0        | 0.87  | 96  | -                   | -                    | -   | 544.0               | 800.0                | 630 | 525.0               | 630.0                | 560   |
| 400.0        | 0.88  | 96  | -                   | -                    | -   | 683.0               | 1000.0               | 800 | -                   | -                    | -     |
| 450.0        | 0.88  | 96  | -                   | -                    | -   | 769.0               | 1000.0               | 800 | -                   | -                    | -     |
| 500.0        | 0.88  | 97  | -                   | -                    | -   | -                   | -                    | -   | -                   | -                    | -     |
| 560.0        | 0.88  | 97  | -                   | -                    | -   | -                   | -                    | -   | -                   | -                    | -     |
| 630.0        | 0.88  | 97  | -                   | -                    | -   | -                   | -                    | -   | -                   | -                    | -     |

## Minimum fuse size for protection of 3-phase motors

The maximum size is determined by the requirements of the switchgear or overload relay.

The rated motor currents are for standard 1500 r.p.m. 3-phase enclosed ventilated and totally enclosed fan-cooled motors.

D.O.L. starting: Maximum starting current 6 x rated motor current. Maximum starting time 5 s.

Y/D starting: Maximum starting current 2 x rated motor current. Maximum starting time 15 s.

Set overload relay in the phase lead to 0.58 x rated motor current.

Rated fuse currents for Y/D starting are also valid for 3-phase motors with slip-ring motors.

For higher rated currents, starting currents and/or longer starting times, larger fuses are required.

Table is valid for "slow" and/or "gL" fuses (DIN VDE 0636).

**For NH fuses with aM characteristics, fuses = rated current is selected.**

| Motor rating |       |     | 500 V               |                      |     | 600 V               |                      |     |
|--------------|-------|-----|---------------------|----------------------|-----|---------------------|----------------------|-----|
|              |       |     | Rated motor current | Fuse starting D.O.L. | Y/Δ | Rated motor current | Fuse starting D.O.L. | Y/Δ |
| kW           | cos φ | η % | A                   | A                    | A   | A                   | A                    | A   |
| 0.06         | 0.7   | 58  | 0.17                | 2.0                  | -   | 0.12                | 2.0                  | -   |
| 0.09         | 0.7   | 60  | 0.25                | 2.0                  | -   | 0.18                | 2.0                  | -   |
| 0.12         | 0.7   | 60  | 0.33                | 2.0                  | -   | 0.24                | 2.0                  | -   |
| 0.18         | 0.7   | 62  | 0.48                | 2.0                  | -   | 0.35                | 2.0                  | -   |
| 0.25         | 0.7   | 62  | 0.70                | 2.0                  | -   | 0.50                | 2.0                  | -   |
| 0.37         | 0.72  | 66  | 0.90                | 2.0                  | 2   | 0.70                | 2.0                  | -   |
| 0.55         | 0.75  | 69  | 1.20                | 4.0                  | 2   | 0.90                | 4.0                  | 2   |
| 0.75         | 0.79  | 74  | 1.50                | 4.0                  | 2   | 1.10                | 4.0                  | 2   |
| 1.1          | 0.81  | 74  | 2.1                 | 6.0                  | 4   | 1.5                 | 4.0                  | 2   |
| 1.5          | 0.81  | 74  | 2.9                 | 6.0                  | 4   | 2.1                 | 6.0                  | 4   |
| 2.2          | 0.81  | 78  | 4.0                 | 10.0                 | 4   | 2.9                 | 10.0                 | 4   |
| 3.0          | 0.82  | 80  | 5.3                 | 16.0                 | 6   | 3.8                 | 10.0                 | 4   |
| 4.0          | 0.82  | 83  | 6.8                 | 16.0                 | 10  | 4.9                 | 16.0                 | 6   |
| 5.5          | 0.82  | 86  | 9.0                 | 20.0                 | 16  | 6.5                 | 16.0                 | 10  |
| 7.5          | 0.82  | 87  | 12.1                | 25.0                 | 16  | 8.8                 | 20.0                 | 10  |
| 11.0         | 0.84  | 87  | 17.4                | 32.0                 | 20  | 12.6                | 25.0                 | 16  |
| 15.0         | 0.84  | 88  | 23.4                | 50.0                 | 25  | 17.0                | 32.0                 | 20  |
| 18.5         | 0.84  | 88  | 28.9                | 50.0                 | 32  | 20.9                | 32.0                 | 25  |
| 22.0         | 0.84  | 92  | 33.0                | 63.0                 | 32  | 23.8                | 50.0                 | 25  |
| 30.0         | 0.85  | 92  | 44.0                | 80.0                 | 50  | 32.0                | 63.0                 | 32  |
| 37.0         | 0.86  | 92  | 54.0                | 100.0                | 63  | 39.0                | 80.0                 | 50  |
| 45.0         | 0.86  | 93  | 65.0                | 125.0                | 80  | 47.0                | 80.0                 | 63  |
| 55.0         | 0.86  | 93  | 79.0                | 160.0                | 80  | 58.0                | 100.0                | 63  |
| 75.0         | 0.86  | 94  | 107.0               | 200.0                | 125 | 78.0                | 160.0                | 100 |
| 90.0         | 0.86  | 94  | 129.0               | 200.0                | 160 | 93.0                | 160.0                | 100 |
| 110.0        | 0.86  | 94  | 157.0               | 250.0                | 160 | 114.0               | 200.0                | 125 |
| 132.0        | 0.87  | 95  | 184.0               | 250.0                | 200 | 134.0               | 250.0                | 160 |
| 160.0        | 0.87  | 95  | 224.0               | 315.0                | 250 | 162.0               | 250.0                | 200 |
| 200.0        | 0.87  | 95  | 279.0               | 400.0                | 315 | 202.0               | 315.0                | 250 |
| 250.0        | 0.87  | 95  | 349.0               | 500.0                | 400 | 253.0               | 400.0                | 315 |
| 315.0        | 0.87  | 96  | 436.0               | 630.0                | 500 | 316.0               | 500.0                | 400 |
| 400.0        | 0.88  | 96  | 547.0               | 800.0                | 630 | 396.0               | 630.0                | 400 |
| 450.0        | 0.88  | 96  | 615.0               | 800.0                | 630 | 446.0               | 630.0                | 630 |
| 500.0        | 0.88  | 97  | -                   | -                    | -   | 491.0               | 630.0                | 630 |
| 560.0        | 0.88  | 97  | -                   | -                    | -   | 550.0               | 800.0                | 630 |
| 630.0        | 0.88  | 97  | -                   | -                    | -   | 618.0               | 800.0                | 630 |

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