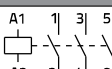


# Contactors KNL95-KNL1000

## Motor contactors

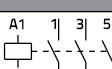
AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 120 mm widths)

| Type     | Rated current $I_n$ | Control voltage 50/60 Hz | Wiring diagram                                                                    | Ordering No. | Weight (kg) | Packaging (pcs) |
|----------|---------------------|--------------------------|-----------------------------------------------------------------------------------|--------------|-------------|-----------------|
| KNL95-00 | 95 A                | 380 V                    |  | 30.050.055   | 5.1         | 1               |
| KNL95-00 | 95 A                | 220 V                    |                                                                                   | 30.050.054   | 5.1         | 1               |
| KNL95-00 | 95 A                | 24 V                     |                                                                                   | 30.050.050   | 5.1         | 1               |

AC/DC



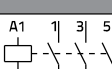
AC 3 acc. to IEC/EN 60947-4-1 (3-pole, 120 mm widths)

| Type      | Rated current $I_n$ | Control voltage 50/60 Hz | Wiring diagram                                                                    | Ordering No. | Weight (kg) | Packaging (pcs) |
|-----------|---------------------|--------------------------|-----------------------------------------------------------------------------------|--------------|-------------|-----------------|
| KNL115-00 | 110 A               | 380 V                    |  | 30.050.069   | 5.1         | 1               |
| KNL115-00 | 110 A               | 220 V                    |                                                                                   | 30.050.068   | 5.1         | 1               |
| KNL115-00 | 110 A               | 24 V                     |                                                                                   | 30.050.064   | 5.1         | 1               |

AC/DC



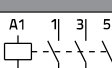
AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 120 mm widths)

| Type      | Rated current $I_n$ | Control voltage 50/60 Hz | Wiring diagram                                                                     | Ordering No. | Weight (kg) | Packaging (pcs) |
|-----------|---------------------|--------------------------|------------------------------------------------------------------------------------|--------------|-------------|-----------------|
| KNL145-00 | 150 A               | 380 V                    |  | 30.050.083   | 5.22        | 1               |
| KNL145-00 | 150 A               | 220 V                    |                                                                                    | 30.050.082   | 5.22        | 1               |
| KNL145-00 | 150 A               | 24 V                     |                                                                                    | 30.050.078   | 5.22        | 1               |

AC/DC



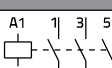
AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 120 mm widths)

| Type      | Rated current $I_n$ | Control voltage 50/60 Hz | Wiring diagram                                                                      | Ordering No. | Weight (kg) | Packaging (pcs) |
|-----------|---------------------|--------------------------|-------------------------------------------------------------------------------------|--------------|-------------|-----------------|
| KNL180-00 | 185 A               | 380 V                    |  | 30.050.097   | 5.22        | 1               |
| KNL180-00 | 185 A               | 220 V                    |                                                                                     | 30.050.096   | 5.22        | 1               |
| KNL180-00 | 185 A               | 24 V                     |                                                                                     | 30.050.092   | 5.22        | 1               |

AC/DC



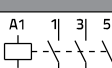
AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 145 mm widths)

| Type      | Rated current $I_n$ | Control voltage 50/60 Hz | Wiring diagram                                                                      | Ordering No. | Weight (kg) | Packaging (pcs) |
|-----------|---------------------|--------------------------|-------------------------------------------------------------------------------------|--------------|-------------|-----------------|
| KNL250-00 | 265 A               | 380 V                    |  | 30.050.111   | 9.1         | 1               |
| KNL250-00 | 265 A               | 220 V                    |                                                                                     | 30.050.110   | 9.1         | 1               |
| KNL250-00 | 265 A               | 24 V                     |                                                                                     | 30.050.106   | 9.1         | 1               |

AC/DC



AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 145 mm widths)

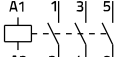
| Type      | Rated current $I_n$ | Control voltage 50/60 Hz | Wiring diagram                                                                      | Ordering No. | Weight (kg) | Packaging (pcs) |
|-----------|---------------------|--------------------------|-------------------------------------------------------------------------------------|--------------|-------------|-----------------|
| KNL400-00 | 420 A               | 380 V                    |  | 30.050.125   | 9.25        | 1               |
| KNL400-00 | 420 A               | 220 V                    |                                                                                     | 30.050.124   | 9.25        | 1               |
| KNL400-00 | 420 A               | 24 V                     |                                                                                     | 30.050.120   | 9.25        | 1               |

AC/DC



## Motor contactors

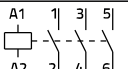
AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 195 mm widths)

| Type      | Rated current $I_e$ | Control voltage 50/60 Hz | Wiring diagram                                                                    | Ordering No. | Weight (kg) | Packaging (pcs) |
|-----------|---------------------|--------------------------|-----------------------------------------------------------------------------------|--------------|-------------|-----------------|
| KNL500-00 | 520 A               | 380 V                    |  | 30.050.138   | 17.6        | 1               |
| KNL500-00 | 520 A               | 220 V                    |                                                                                   | 30.050.137   | 17.6        | 1               |
| KNL500-00 | 520 A               | 24 V                     |                                                                                   | 30.051.116   | 17.6        | 1               |

AC/DC



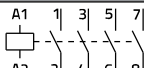
AC-3 acc. to IEC/EN 60947-4-1 (3-pole, 195 mm widths)

| Type      | Rated current $I_e$ | Control voltage 50/60 Hz | Wiring diagram                                                                    | Ordering No. | Weight (kg) | Packaging (pcs) |
|-----------|---------------------|--------------------------|-----------------------------------------------------------------------------------|--------------|-------------|-----------------|
| KNL630-00 | 630 A               | 380 V                    |  | 30.050.150   | 17.9        | 1               |
| KNL630-00 | 630 A               | 220 V                    |                                                                                   | 30.050.149   | 17.9        | 1               |
| KNL630-00 | 630 A               | 24 V                     |                                                                                   | 30.051.120   | 17.9        | 1               |

AC/DC



AC-1 acc. to IEC/EN 60947-4-1 (4-pole, 260 mm widths)

| Type         | Rated current $I_e$ | Control voltage 50/60 Hz | Wiring diagram                                                                      | Ordering No. | Weight (kg) | Packaging (pcs) |
|--------------|---------------------|--------------------------|-------------------------------------------------------------------------------------|--------------|-------------|-----------------|
| KNL1000,4-00 | 1000 A              | 380 V                    |  | 30.050.162   | 21.5        | 1               |
| KNL1000,4-00 | 1000 A              | 220 V                    |                                                                                     | 30.050.161   | 21.5        | 1               |
| KNL1000,4-00 | 1000 A              | 24 V                     |                                                                                     | 30.051.123   | 21.5        | 1               |

AC/DC

# Contactors KNL95-KNL1000

## Accessories



### Snap-on auxiliary switch blocks

AC 15 acc. to IEC/EN 60947-5-1

| Type               | Rated current I <sub>e</sub> | Rated voltage U <sub>e</sub> | Version               | Ordering No. | Weight (g) | Packaging (pcs) |
|--------------------|------------------------------|------------------------------|-----------------------|--------------|------------|-----------------|
| G350 <sup>1)</sup> | 16 A                         | 690 V                        | -12 or -21 reversible | 38.422.650   | 67         | 1               |

<sup>1)</sup> The add-on auxiliary contact block G350 can be applied to contactor KNL95-KNL1000 only up to a maximum of four pieces for each contactor, for a total of 12 contacts. The contact block G350 provides a 2NO+1NC or 1NO+2NC combination depending on its mounting position.



### Mechanical interlock

| Type   | Characteristic                           |           | Ordering No. | Weight (g) | Packaging (pcs) |
|--------|------------------------------------------|-----------|--------------|------------|-----------------|
| G355   | Side-by-side contactors                  |           | 38.902.072   | 25         | 1               |
| G356/1 | One on top of other contactors<br>L (mm) | 225 - 365 | 38.902.073   | 104        | 1               |
| G356/2 |                                          | 265 - 305 | 38.902.074   | 110        | 1               |
| G356/3 |                                          | 305 - 345 | 38.902.075   | 116        | 1               |
| G356/4 |                                          | 345 - 385 | 38.902.076   | 122        | 1               |
| G356/5 |                                          | 390 - 425 | 38.902.077   | 124        | 1               |
| G356/6 |                                          | 470 - 500 | 38.902.078   | 134        | 1               |



G355

### Main terminal covers

| Type | For contactors | Ordering No. | Weight (g) | Packaging (pcs) |
|------|----------------|--------------|------------|-----------------|
| G360 | KNL95, KNL115  | 38.422.669   | 26         | 1               |
| G361 | KNL145, KNL180 | 38.422.677   | 26         | 1               |
| G363 | KNL250, KNL400 | 38.422.679   | 47         | 1               |
| G527 | KNL500         | 38.422.680   | 238        | 1               |
| G528 | KNL500,4       | 38.422.681   | 265        | 1               |
| G529 | KNL630         | 38.422.682   | 250        | 1               |
| G530 | KNL630,4       | 38.422.683   | 290        | 1               |



G363

### Bars for 3 poles star connection

| Type   | For contactors  | Ordering No. | Weight (g) | Packaging (pcs) |
|--------|-----------------|--------------|------------|-----------------|
| BA1595 | KNL95 - KNL180  | 37.551.806   | 82         | 1               |
| BA1721 | KNL250 - KNL400 | 37.551.807   | 140        | 1               |
| BA1846 | KNL500 - KNL630 | 37.551.808   | 340        | 1               |



BA1595

### Bars for 2 poles parallel connection

| Type   | For contactors  | Ordering No. | Weight (g) | Packaging (pcs) |
|--------|-----------------|--------------|------------|-----------------|
| BA1594 | KNL95 - KNL180  | 37.551.812   | 89         | 1               |
| BA1720 | KNL250 - KNL400 | 37.551.813   | 140        | 1               |
| BA1845 | KNL500 - KNL630 | 37.551.814   | 320        | 1               |



BA1595

### Adapter for screw terminal

| Type | Ordering No. | Weight (g) | Packaging (pcs) |
|------|--------------|------------|-----------------|
| G370 | 38.422.685   | 3          | 1               |



G370

### Identification plate

| Type    | Ordering No. | Weight (g) | Packaging (pcs) |
|---------|--------------|------------|-----------------|
| BA126/2 | 37.423.883   | 1          | 1               |

### Thermal overload relay accessories

| Type | Characteristic                    |           |                 | Ordering No. | Weight (g) | Packaging (pcs) |
|------|-----------------------------------|-----------|-----------------|--------------|------------|-----------------|
| G372 | Adapter for mounting on contactor | BRA180    | KNL95 - KNL180  | 37.551.817   | 82         | 1               |
| G373 |                                   |           | KNL250 - KNL400 | 37.551.818   | 100        | 1               |
| G375 |                                   | BRA400    | KNL145 - KNL180 | 37.551.821   | 103        | 1               |
| G376 |                                   |           | KNL250 - KNL400 | 37.551.822   | 165        | 1               |
| G228 | Electric reset                    | all types |                 | 38.422.687   | 58         | 1               |
| G223 | Sealing kit                       | all types |                 | 38.423.476   | 2          | 1               |
| G244 | Start button                      | all types |                 | 38.422.269   | 11         | 1               |
| RB6  | Identification plate              | all types |                 | 37.423.885   | 1          | 1               |



G376

### BRA180 thermal overload relay

up to 200 A for KNL95-KNL250 contactors

| Type       | Setting range (A) | Max. backup fuse (A) |       | Ordering No. | Weight (kg) | Packaging (pcs) |
|------------|-------------------|----------------------|-------|--------------|-------------|-----------------|
|            |                   | aM                   | gL/gG |              |             |                 |
| BRA180-100 | 60 ... 100        | 100                  | 160   | 30.016.895   | 2,15        | 1               |
| BRA180-125 | 75 ... 125        | 125                  | 200   | 30.016.896   |             |                 |
| BRA180-150 | 90 ... 150        | 160                  | 250   | 30.016.897   |             |                 |
| BRA180-200 | 120 ... 200       | 200                  | 315   | 30.016.898   |             |                 |



### BRA400 thermal overload relay

up to 420 A for KNL145-KNL400 contactors

| Type       | Setting range (A) | Max. backup fuse (A) |       | Ordering No. | Weight (kg) | Packaging (pcs) |
|------------|-------------------|----------------------|-------|--------------|-------------|-----------------|
|            |                   | aM                   | gL/gG |              |             |                 |
| BRA400-250 | 150 ... 250       | 250                  | 400   | 30.016.908   | 2,46        | 1               |
| BRA400-300 | 180 ... 300       | 315                  | 500   | 30.016.909   |             |                 |
| BRA400-420 | 250 ... 420       | 400                  | 630   | 30.016.910   |             |                 |



## Ordering data

### For contactors KNL95 - KNL1000

Standard control voltages and designations (AC or DC)

| V | 24 | 48 | 60 | 110/125 | 220/240 | 380/415 | 440/480 |
|---|----|----|----|---------|---------|---------|---------|
|---|----|----|----|---------|---------|---------|---------|

### Ordering data

**KNL95 - 00 - 220/240 - 50/60**



#### Note:

The type designation and control voltage are stated when ordering the contactors.



# Technical characteristics

## Dimensions

## TECHNICAL DATA

|              | Type                                                                                                                                                   | Symbol           | Unit     |                           |           |           |           |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|---------------------------|-----------|-----------|-----------|
|              |                                                                                                                                                        |                  |          | KNL95                     | KNL115    | KNL145    | KNL180    |
| GENERAL      | Standards                                                                                                                                              |                  |          | IEC 60947-4-1, UL 508     |           |           |           |
|              | Approvals                                                                                                                                              |                  |          | CE, UL, EAC               |           |           |           |
|              | Module width                                                                                                                                           |                  | mm       | 3-pole: 120 / 4-pole: 160 |           |           |           |
|              | Number of poles                                                                                                                                        |                  |          | 3 or 4                    |           |           |           |
|              | Pollution degree                                                                                                                                       |                  |          | 3                         |           |           |           |
|              | Ambient temperature:<br>open                                                                                                                           |                  | °C       | -50 ... +70               |           |           |           |
|              | closed                                                                                                                                                 |                  |          | -50 ... +70               |           |           |           |
|              | Storage temperature                                                                                                                                    |                  | °C       | -60 ... +80               |           |           |           |
|              | Maximum altitude<br>U <sub>i</sub> and U <sub>e</sub> is reduced for 1.2 % and I <sub>e</sub> for 0.4 % for every additional 100 m                     |                  | m        | 2000                      |           |           |           |
|              | Number of contactors or switches side-by-side:<br>≤40 °C<br>(40 ... 55) °C                                                                             |                  |          | no limitation             |           |           |           |
|              | Maximum operating frequency with no load                                                                                                               |                  | op. c./h | 2,400                     |           |           |           |
|              | Mechanical endurance                                                                                                                                   |                  | op. c.   | 10,000,000                |           |           |           |
|              | Weight                                                                                                                                                 |                  | kg       | 5,96                      | 5,96      | 6,1       | 10,6      |
|              | Power dissipation per pole                                                                                                                             |                  | W        | 7                         | 7,7       | 14,5      | 20,3      |
|              | Overload current withstand capability<br>10 s                                                                                                          |                  | A        | 760                       | 1100      | 1300      | 1500      |
| MAIN CIRCUIT | Maximum back-up fuse for short-circuit protection gL and gG:<br>coordination type 2                                                                    |                  | A        | 160                       | 200       | 250       | 315       |
|              | Rated insulation voltage                                                                                                                               | U <sub>i</sub>   | V        | 1000                      |           |           |           |
|              | Rated impulse withstand voltage                                                                                                                        | U <sub>imp</sub> | kV       | 8                         |           |           |           |
|              | Rated operational voltage                                                                                                                              | U <sub>e</sub>   | V        | 690                       |           |           |           |
|              | Rated frequency                                                                                                                                        | f                | Hz       | 50/60                     |           |           |           |
|              | Thermal current                                                                                                                                        | I <sub>th</sub>  | A        | 125                       | 160       | 250       | 275       |
|              | Rated operational current for AC-1, AC-7a and AC-21                                                                                                    | I <sub>e</sub>   | A        | 125                       | 160       | 250       | 275       |
|              | Operational power for AC-1, AC-7a and AC-21:<br>single-phase 230 V<br>three-phase 230 V<br>three-phase 400 V<br>three-phase 500 V<br>three-phase 690 V | P <sub>e</sub>   | kW       | 27                        | 35        | 55        | 60        |
|              |                                                                                                                                                        |                  |          | 47                        | 57        | 91        | 95        |
|              |                                                                                                                                                        |                  |          | 82                        | 98        | 150       | 160       |
|              |                                                                                                                                                        |                  |          | 103                       | 129       | 196       | 213       |
|              |                                                                                                                                                        |                  |          | 142                       | 173       | 270       | 298       |
|              | Maximum operating frequency for AC-1, AC-7a and AC-21                                                                                                  |                  | op. c./h | 600                       |           |           |           |
|              | Rated operational current for AC-3, AC-7b and AC-23 (at 400 V)                                                                                         | I <sub>e</sub>   | A        | 95                        | 110       | 150       | 185       |
|              | Operational power for AC-3, AC-7b and AC-23:<br>three-phase 230 V<br>three-phase 400 V<br>three-phase 500 V<br>three-phase 690 V<br>three-phase 1000 V | P <sub>e</sub>   | kW       | 27,6                      | 33        | 46        | 57        |
|              |                                                                                                                                                        |                  |          | 50                        | 61        | 80        | 100       |
|              |                                                                                                                                                        |                  |          | 56                        | 80        | 100       | 123       |
|              |                                                                                                                                                        |                  |          | 74                        | 100       | 120       | 144       |
|              |                                                                                                                                                        |                  |          | 46                        | 63        | 75        | 103       |
|              | Maximum operating frequency for AC-3, AC-7b and AC-23                                                                                                  |                  | op. c./h | 600                       |           |           |           |
|              | Electrical endurance for AC-3, AC-7b and AC-23                                                                                                         |                  | op. c.   | 1,100,000                 | 1,100,000 | 1,100,000 | 1,000,000 |
|              | Rated operational current for AC-4 (at 400 V)                                                                                                          | I <sub>e</sub>   | A        | 43                        | 47        | 57        | 65        |
|              | Operational power for AC-4:<br>three-phase 400 V                                                                                                       | P <sub>e</sub>   | kW       | 23                        | 25        | 31        | 36        |
|              | Maximum operating frequency for AC-4                                                                                                                   |                  | op. c./h | 300                       |           |           |           |
|              | Electrical endurance for AC-4                                                                                                                          |                  | op. c.   | 200,000                   |           |           |           |
|              | Rated motor power according to standards UL and CSA:<br>three-phase 230 V<br>three-phase 460 V<br>three-phase 575 V                                    | P <sub>e</sub>   | HP       | 30                        | 40        | 50        | 75        |
|              |                                                                                                                                                        |                  |          | 50                        | 75        | 100       | 150       |
|              |                                                                                                                                                        |                  |          | 75                        | 100       | 125       | 150       |
|              | Maximum operating frequency for motors acc. to UL and CSA                                                                                              |                  | op. c./h | 600                       |           |           |           |
|              | Electrical endurance for motors acc. to UL and CSA                                                                                                     |                  | op. c.   | 1,100,000                 | 1,100,000 | 1,100,000 | 1,000,000 |

## TECHNICAL DATA

| MAIN CIRCUIT                                                                 | Type                                                                                                                                                                                                   | Symbol                                 | Unit                  | KNL95                                        | KNL115                                              | KNL145                                              | KNL180                                              |  |
|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-----------------------|----------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|--|
|                                                                              | Switching of capacitors AC-6b and AC-7c (at 230 V)                                                                                                                                                     | C                                      | μF                    | 900                                          | 1800                                                | 2400                                                | 2400                                                |  |
|                                                                              | Maximum operating frequency for AC-6b and AC-7c                                                                                                                                                        |                                        | op. c./h              | 600                                          |                                                     |                                                     |                                                     |  |
|                                                                              | Switching of capacitors AC-6b and AC-7c (at 230 V)                                                                                                                                                     |                                        | op. c.                | 100,000                                      |                                                     |                                                     |                                                     |  |
|                                                                              | Rated operational current for DC-1 (L/R ≤ 1 ms):<br>1 pole ... 24 V DC/ 110 V DC/ 220 V DC<br>2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC<br>3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC   | I <sub>e</sub>                         | A                     | 70 / 8 / 6<br>100 / 80 / 40<br>100 / 85 / 55 | 160 / 100 / -<br>160 / 130 / 130<br>160 / 130 / 130 | 220 / 110 / -<br>220 / 150 / 150<br>220 / 150 / 150 | 260 / 120 / -<br>260 / 170 / 150<br>260 / 170 / 170 |  |
|                                                                              | Maximum operating frequency for DC-1                                                                                                                                                                   |                                        | op. c./h              | 300                                          |                                                     |                                                     |                                                     |  |
|                                                                              | Rated operational current for DC-3 (L/R ≤ 2 ms):<br>1 pole ... 24 V DC/ 110 V DC/ 220 V DC<br>2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC<br>3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC   | I <sub>e</sub>                         | A                     | 40 / 3 / 1<br>60 / 40 / 7<br>80 / 60 / 35    | 140 / 70 / -<br>140 / 100 / 80<br>140 / 120 / 100   | 160 / 80 / -<br>160 / 120 / 90<br>160 / 140 / 120   | 180 / 90 / -<br>180 / 250 / 100<br>180 / 160 / 140  |  |
|                                                                              | Maximum operating frequency for DC-1                                                                                                                                                                   |                                        | op. c./h              | 300                                          |                                                     |                                                     |                                                     |  |
|                                                                              | Rated operational current for DC-5 (L/R ≤ 7.5 ms):<br>1 pole ... 24 V DC/ 110 V DC/ 220 V DC<br>2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC<br>3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC | I <sub>e</sub>                         | A                     | 40 / 3 / 1<br>60 / 40 / 7<br>80 / 60 / 35    | 140 / 80 / -<br>140 / 100 / 80<br>140 / 120 / 100   | 160 / 80 / -<br>160 / 120 / 90<br>160 / 140 / 120   | 180 / 90 / -<br>180 / 140 / 100<br>180 / 160 / 140  |  |
|                                                                              | Maximum operating frequency for DC-1                                                                                                                                                                   |                                        | op. c./h              | 300                                          |                                                     |                                                     |                                                     |  |
|                                                                              | Terminal capacity:<br>wire with lug<br>1 or 2 bars                                                                                                                                                     | S                                      | mm <sup>2</sup><br>mm | 70<br>20x3                                   | 70<br>20x3                                          | 120<br>25x3                                         | 150<br>25x3                                         |  |
|                                                                              | Screw                                                                                                                                                                                                  |                                        |                       | M6                                           | M6                                                  | M8                                                  | M8                                                  |  |
|                                                                              | Spanner / wrench size                                                                                                                                                                                  |                                        | mm                    | 10                                           | 10                                                  | 13                                                  | 13                                                  |  |
|                                                                              | Tightening torque                                                                                                                                                                                      |                                        | Nm                    | 3                                            | 3                                                   | 6                                                   | 6                                                   |  |
|                                                                              | COIL                                                                                                                                                                                                   | Range of control voltage for switch-on | U <sub>c</sub>        | %                                            | 80 ... 110                                          |                                                     |                                                     |  |
|                                                                              |                                                                                                                                                                                                        | Range of control voltage for drop out  | U <sub>c</sub>        | %                                            | 30 ... 60                                           |                                                     |                                                     |  |
|                                                                              |                                                                                                                                                                                                        | Kind of voltage                        |                       |                                              | AC/DC                                               |                                                     |                                                     |  |
|                                                                              |                                                                                                                                                                                                        | Standard control voltages              | U <sub>c</sub>        | V                                            | 24, 48, 60, 110/125, 220/240, 380/415, 440/480      |                                                     |                                                     |  |
| Frequency of AC control voltage                                              |                                                                                                                                                                                                        | f                                      | Hz                    | 50/60                                        |                                                     |                                                     |                                                     |  |
| Control mode                                                                 |                                                                                                                                                                                                        |                                        |                       | remote control with U <sub>c</sub>           |                                                     |                                                     |                                                     |  |
| Surge immunity withstand voltage 1,2/50 μs acc. to standard IEC/EN 61000-4-5 |                                                                                                                                                                                                        |                                        | kV                    | 10                                           |                                                     |                                                     |                                                     |  |
| Coil consumption:<br>switch-on<br>operation                                  |                                                                                                                                                                                                        |                                        | VA/W                  | 300/300<br>10/10                             |                                                     |                                                     |                                                     |  |
| Delays:<br>make<br>brake                                                     |                                                                                                                                                                                                        | AC/DC                                  | ms                    | 13-25/60-90<br>8-12                          | 60-100<br>25-60                                     |                                                     |                                                     |  |
| Terminal capacity:<br>Quick-connect                                          |                                                                                                                                                                                                        |                                        | faston                | 1x6,35 mm or 2x2,8 mm                        |                                                     |                                                     |                                                     |  |
| SAFETY                                                                       | MTTF - Mean time to failure<br>MTTF = 1/λ = B10/(0.1 n <sub>op</sub> )                                                                                                                                 | AC-1<br>AC-3                           | h                     | 25,000<br>27,500                             | 25,000<br>27,500                                    | 20,000<br>27,500                                    | 20,000<br>25,000                                    |  |
|                                                                              | MTTF <sub>d</sub> - Mean time to failure dangerous<br>MTTF <sub>d</sub> = 1/λ <sub>d</sub> = B10 <sub>d</sub> /(0.1 n <sub>op</sub> )                                                                  | AC-1<br>AC-3                           | h                     | 33,333<br>36,666                             | 33,333<br>36,666                                    | 26,666<br>36,666                                    | 26,666<br>33,333                                    |  |
|                                                                              | B10 - Number of operating cycles until 10 % of devices fail                                                                                                                                            | AC-1<br>AC-3                           | op. c.                | 750,000<br>825,000                           | 750,000<br>825,000                                  | 600,000<br>825,000                                  | 600,000<br>750,000                                  |  |
|                                                                              | B10 <sub>d</sub> - Number of operating cycles until 10 % of device dangerous<br>B10 <sub>d</sub> = B10/ratio of dangerous failures                                                                     | AC-1<br>AC-3                           | op. c.                | 1,000,000<br>1,100,000                       | 1,000,000<br>1,100,000                              | 800,000<br>1,100,000                                | 800,000<br>1,000,000                                |  |
|                                                                              | λ - Failure rate<br>λ = (0.1 n <sub>op</sub> )/B10                                                                                                                                                     | AC-1<br>AC-3                           | 1/h                   | 0,00004<br>0,00004                           | 0,00004<br>0,00004                                  | 0,00005<br>0,00004                                  | 0,00005<br>0,00004                                  |  |
|                                                                              | λ <sub>d</sub> - Failure rate dangerous<br>λ <sub>d</sub> = (0.1 n <sub>op</sub> )/B10 <sub>d</sub>                                                                                                    | AC-1<br>AC-3                           | 1/h                   | 0,00003<br>0,000003                          | 0,00003<br>0,000003                                 | 0,00004<br>0,000003                                 | 0,00004<br>0,000003                                 |  |
|                                                                              | Ratio of dangerous failures                                                                                                                                                                            |                                        | %                     | 75                                           |                                                     |                                                     |                                                     |  |
|                                                                              | n <sub>op</sub> - Operating cycles (operating cycles/h)                                                                                                                                                |                                        | op. c./h              | 300                                          |                                                     |                                                     |                                                     |  |

## TECHNICAL DATA

| GENERAL                                                                                                                                                | Type                                                                                                                               | Symbol                     | Unit     | KNL250                         | KNL400                          | KNL500                                                      | KNL630                                                      | KNL1000                          |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------|--------------------------------|---------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|----------------------------------|-----|
|                                                                                                                                                        | Standards                                                                                                                          |                            |          | IEC 60947-4-1, UL 508          |                                 |                                                             |                                                             |                                  |     |
|                                                                                                                                                        | Approvals                                                                                                                          |                            |          | CE, UL, EAC                    |                                 |                                                             |                                                             |                                  |     |
|                                                                                                                                                        | Module width                                                                                                                       |                            | mm       | 3-pole: 145 / 4-pole: 192.5    |                                 | 3-pole: 192 / 4-pole: 257                                   |                                                             |                                  |     |
|                                                                                                                                                        | Number of poles                                                                                                                    |                            |          | 3 or 4                         |                                 |                                                             |                                                             |                                  |     |
|                                                                                                                                                        | Pollution degree                                                                                                                   |                            |          | 3                              |                                 |                                                             |                                                             |                                  |     |
|                                                                                                                                                        | Ambient temperature:<br>open<br>closed                                                                                             |                            | °C       | -50 ... +70<br>-50 ... +70     |                                 |                                                             |                                                             |                                  |     |
|                                                                                                                                                        | Storage temperature                                                                                                                |                            | °C       | -60 ... +80                    |                                 |                                                             |                                                             |                                  |     |
|                                                                                                                                                        | Maximum altitude<br>U <sub>i</sub> and U <sub>e</sub> is reduced for 1.2 % and I <sub>e</sub> for 0.4 % for every additional 100 m |                            | m        | 2000                           |                                 |                                                             |                                                             |                                  |     |
|                                                                                                                                                        | Number of contactors or switches side-by-side:<br>≤40 °C<br>(40 ... 55) °C                                                         |                            |          | no limitation                  |                                 |                                                             |                                                             |                                  |     |
|                                                                                                                                                        | Maximum operating frequency with no load                                                                                           |                            | op. c./h | 2,400                          |                                 |                                                             |                                                             |                                  |     |
|                                                                                                                                                        | Mechanical endurance                                                                                                               |                            | op. c.   | 10.000.000                     |                                 |                                                             |                                                             |                                  |     |
|                                                                                                                                                        | Weight                                                                                                                             |                            | kg       | 10,8                           | 10,8                            | 20,8                                                        | 21,5                                                        | 25,6                             |     |
|                                                                                                                                                        | MAIN CIRCUIT                                                                                                                       | Power dissipation per pole |          | W                              | 24,5                            | 52                                                          | 68,6                                                        | 90                               | 140 |
| Overload current withstand capability<br>10 s                                                                                                          |                                                                                                                                    |                            | A        | 2200                           | 3600                            | 4050                                                        | 5040                                                        | 5600                             |     |
| Maximum back-up fuse for short-circuit protection gL and gG:<br>coordination type 2                                                                    |                                                                                                                                    |                            | A        | 400                            | 630                             | 800                                                         | 1000                                                        | /                                |     |
| Rated insulation voltage                                                                                                                               |                                                                                                                                    | U <sub>i</sub>             | V        | 1000                           |                                 |                                                             |                                                             |                                  |     |
| Rated impulse withstand voltage                                                                                                                        |                                                                                                                                    | U <sub>imp</sub>           | kV       | 8                              |                                 |                                                             |                                                             |                                  |     |
| Rated operational voltage                                                                                                                              |                                                                                                                                    | U <sub>e</sub>             | V        | 690                            |                                 |                                                             |                                                             |                                  |     |
| Rated frequency                                                                                                                                        |                                                                                                                                    | f                          | Hz       | 50/60                          |                                 |                                                             |                                                             |                                  |     |
| Thermal current                                                                                                                                        |                                                                                                                                    | I <sub>th</sub>            | A        | 350                            | 550                             | 700                                                         | 800                                                         | 1000                             |     |
| Rated operational current for AC-1, AC-7a and AC-21                                                                                                    |                                                                                                                                    | I <sub>e</sub>             | A        | 350                            | 550                             | 700                                                         | 800                                                         | 1000                             |     |
| Operational power for AC-1, AC-7a and AC-21:<br>single-phase 230 V<br>three-phase 230 V<br>three-phase 400 V<br>three-phase 500 V<br>three-phase 690 V |                                                                                                                                    | P <sub>e</sub>             | kW       | 76<br>124<br>214<br>282<br>380 | 120<br>200<br>345<br>452<br>598 | 153<br>252<br>438<br>575<br>755                             | 175<br>288<br>500<br>655<br>860                             | 218<br>350<br>600<br>750<br>1000 |     |
| Maximum operating frequency for AC-1, AC-7a and AC-21                                                                                                  |                                                                                                                                    |                            | op. c./h | 600                            |                                 |                                                             |                                                             |                                  |     |
| Rated operational current for AC-3, AC-7b and AC-23 (at 400 V)                                                                                         |                                                                                                                                    | I <sub>e</sub>             | A        | 265                            | 420                             | 520                                                         | 630                                                         | /                                |     |
| Operational power for AC-3, AC-7b and AC-23:<br>three-phase 230 V<br>three-phase 400 V<br>three-phase 500 V<br>three-phase 690 V<br>three-phase 1000 V |                                                                                                                                    | P <sub>e</sub>             | kW       | 83<br>140<br>176<br>212<br>156 | 130<br>225<br>271<br>352<br>208 | 156<br>290<br>367<br>416<br>312                             | 198<br>335<br>368<br>440<br>368                             | /<br>/<br>/<br>/<br>/            |     |
| Maximum operating frequency for AC-3, AC-7b and AC-23                                                                                                  |                                                                                                                                    |                            | op. c./h | 600                            |                                 |                                                             |                                                             |                                  |     |
| Electrical endurance for AC-3, AC-7b and AC-23                                                                                                         |                                                                                                                                    |                            | op. c.   | 1.100.000                      | 700.000                         | 700.000                                                     | 700.000                                                     | /                                |     |
| Rated operational current for AC-4 (at 400 V)                                                                                                          |                                                                                                                                    | I <sub>e</sub>             | A        | 92                             | 133                             | 175                                                         | 210                                                         | /                                |     |
| Operational power for AC-4:<br>three-phase 400 V                                                                                                       |                                                                                                                                    | P <sub>e</sub>             | kW       | 52                             | 76                              | 99                                                          | 119                                                         | /                                |     |
| Maximum operating frequency for AC-4                                                                                                                   |                                                                                                                                    |                            | op. c./h | 300                            |                                 |                                                             |                                                             |                                  |     |
| Electrical endurance for AC-4                                                                                                                          |                                                                                                                                    |                            | op. c.   | 200.000                        |                                 |                                                             |                                                             |                                  | /   |
| Rated motor power according to standards UL and CSA:<br>three-phase 230 V<br>three-phase 460 V<br>three-phase 575 V                                    |                                                                                                                                    | P <sub>e</sub>             | HP       | 100<br>200<br>250              | 150<br>350<br>400               | 200 <sup>1)</sup><br>400 <sup>1)</sup><br>450 <sup>1)</sup> | 250 <sup>1)</sup><br>500 <sup>1)</sup><br>500 <sup>1)</sup> |                                  |     |
| Maximum operating frequency for motors acc. to UL and CSA                                                                                              |                                                                                                                                    |                            | op. c./h | 600                            |                                 |                                                             |                                                             |                                  |     |
| Electrical endurance for motors acc. to UL and CSA                                                                                                     |                                                                                                                                    |                            | op. c.   | 1.100.000                      | 700.000                         | 700.000                                                     | 700.000                                                     |                                  |     |

<sup>1)</sup> No UL/CSA ratings; data only for indication and reference purposes only



## TECHNICAL DATA

|              | Type                                                                                                                             | Symbol       | Unit                  | KNL250                    | KNL400          | KNL500          | KNL630          | KNL1000 |
|--------------|----------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------|---------------------------|-----------------|-----------------|-----------------|---------|
| MAIN CIRCUIT | Rated operational current for DC-1 ( $L/R \leq 1$ ms):<br>1 pole ... 24 V DC/ 110 V DC/ 220 V DC                                 | $I_e$        | A                     | 350 / - / -               | 400 / 250 / -   | 650 / 320 / -   | 800 / 460 / -   | /       |
|              | 2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC                                                                                |              |                       | 350 / 300 / 250           | 400 / 400 / 350 | 650 / 550 / 450 | 800 / 800 / 700 | /       |
|              | 3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC                                                                                |              |                       | 350 / 300 / 300           | 400 / 400 / 400 | 650 / 600 / 600 | 800 / 800 / 800 | /       |
|              | Maximum operating frequency for DC-1                                                                                             |              | op. c./h              | 300                       |                 |                 |                 |         |
|              | Rated operational current for DC-3 ( $L/R \leq 2$ ms):<br>1 pole ... 24 V DC/ 110 V DC/ 220 V DC                                 | $I_e$        | A                     | 180 / 150 / -             | 350 / 200 / -   | 550 / 320 / -   | 800 / 460 / -   | /       |
|              | 2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC                                                                                |              |                       | 280 / 250 / 200           | 350 / 350 / 280 | 650 / 550 / 450 | 800 / 800 / 700 | /       |
|              | 3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC                                                                                |              |                       | 180 / 280 / 250           | 350 / 350 / 350 | 650 / 550 / 550 | 800 / 800 / 800 | /       |
|              | Maximum operating frequency for DC-1                                                                                             |              | op. c./h              | 300                       |                 |                 |                 |         |
|              | Rated operational current for DC-5 ( $L/R \leq 7.5$ ms):<br>1 pole ... 24 V DC/ 110 V DC/ 220 V DC                               | $I_e$        | A                     | 180 / 150 / -             | 350 / 200 / -   | 550 / 320 / -   | 800 / 460 / -   | /       |
|              | 2 poles in series ... 24 V DC/ 110 V DC/ 220 V DC                                                                                |              |                       | 280 / 250 / 200           | 350 / 350 / 280 | 650 / 550 / 450 | 800 / 800 / 700 | /       |
|              | 3 poles in series ... 24 V DC/ 110 V DC/ 220 V DC                                                                                |              |                       | 180 / 280 / 250           | 350 / 350 / 350 | 650 / 550 / 550 | 800 / 800 / 800 | /       |
|              | Maximum operating frequency for DC-1                                                                                             |              | op. c./h              | 300                       |                 |                 |                 |         |
| COIL         | Terminal capacity:<br>wire with lug<br>1 or 2 bars                                                                               | S            | mm <sup>2</sup><br>mm | 240                       | 2x150           | 2x240           | 2x240           | /       |
|              | Screw                                                                                                                            |              |                       | 30x4                      | 30x5            | 50x5            | 60x5            | 60x5    |
|              | Screw head                                                                                                                       |              | mm                    | M10                       | M10             | M10             | M12             | M12     |
|              | Tightening torque                                                                                                                |              | Nm                    | 17                        | 17              | 17              | 19              | 19      |
|              | Range of control voltage for switch-on                                                                                           | $U_c$        | %                     | 10                        | 10              | 10              | 14              | 14      |
|              | Range of control voltage for drop out                                                                                            | $U_c$        | %                     | 80 ... 110                |                 |                 |                 |         |
|              | Kind of voltage                                                                                                                  |              |                       | 30 ... 60                 |                 |                 |                 |         |
|              | Standard control voltages                                                                                                        | $U_c$        | V                     | AC/DC                     |                 |                 |                 |         |
|              | Frequency of AC control voltage                                                                                                  | f            | Hz                    | 1)                        |                 |                 |                 |         |
|              | Control mode                                                                                                                     |              |                       | 2)                        |                 |                 |                 |         |
|              | Surge immunity withstand voltage 1,2/50 $\mu$ s<br>acc. to standard IEC/EN 61000-4-5                                             |              | kV                    | 50/60                     |                 |                 |                 |         |
|              | Coil consumption:<br>switch-on<br>operation                                                                                      |              | VA/W                  | remote control with $U_c$ |                 |                 |                 |         |
| SAFETY       | Delays:<br>make<br>brake                                                                                                         |              | ms                    | 10                        |                 |                 |                 |         |
|              | Terminal capacity:<br>Quick-connect                                                                                              |              | faston                | 10/10                     |                 |                 |                 |         |
|              | MTTF - Mean time to failure<br>$MTTF = 1/\lambda = B10/(0.1 n_{op})$                                                             | AC-1<br>AC-3 | h                     | 300/300                   |                 |                 |                 |         |
|              | MTTF <sub>d</sub> - Mean time to failure dangerous<br>$MTTF_d = 1/\lambda_d = B10_d/(0.1 n_{op})$                                | AC-1<br>AC-3 | h                     | 400/400                   |                 |                 |                 |         |
|              | B10 - Number of operating cycles until 10 % of devices fail                                                                      | AC-1<br>AC-3 | op. c.                | 18/18                     |                 |                 |                 |         |
|              | B10 <sub>d</sub> - Number of operating cycles until 10 % of device dangerous<br>$B10_d = B10/\text{ratio of dangerous failures}$ | AC-1<br>AC-3 | op. c.                | 80-120                    |                 |                 |                 |         |
|              | $\lambda$ - Failure rate<br>$\lambda = (0.1 n_{op})/B10$                                                                         | AC-1<br>AC-3 | 1/h                   | 30-75                     |                 |                 |                 |         |
|              | $\lambda_d$ - Failure rate dangerous<br>$\lambda_d = (0.1 n_{op})/B10_d$                                                         | AC-1<br>AC-3 | 1/h                   | 60-100                    |                 |                 |                 |         |
|              | Ratio of dangerous failures                                                                                                      |              | %                     | 1x6,35 mm or 2x2,8 mm     |                 |                 |                 |         |
|              | $n_{op}$ - Operating cycles (operating cycles/h)                                                                                 |              | op. c./h              | 75                        |                 |                 |                 |         |
|              |                                                                                                                                  |              |                       | 300                       |                 |                 |                 |         |
|              |                                                                                                                                  |              |                       | /                         |                 |                 |                 |         |

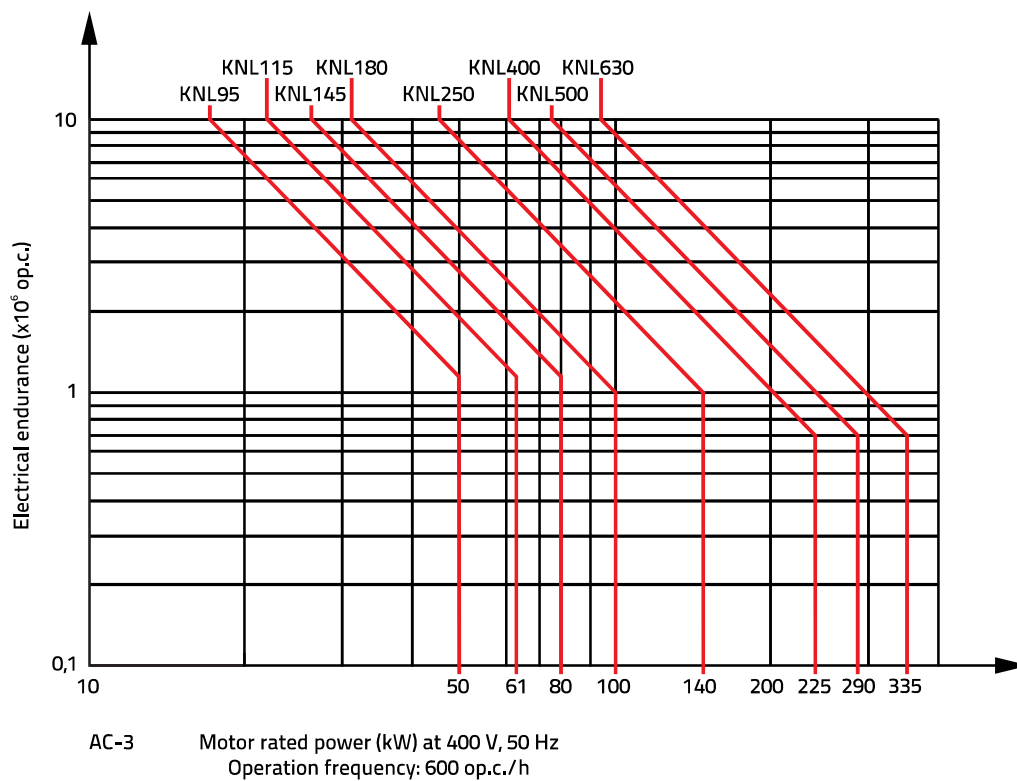
1) 24,48,60,110/125,220/240,380/415,440/480V

2) 48,60,110/125,220/240,380/415,440/480 V

## Electrical endurance

**Diagram 1**

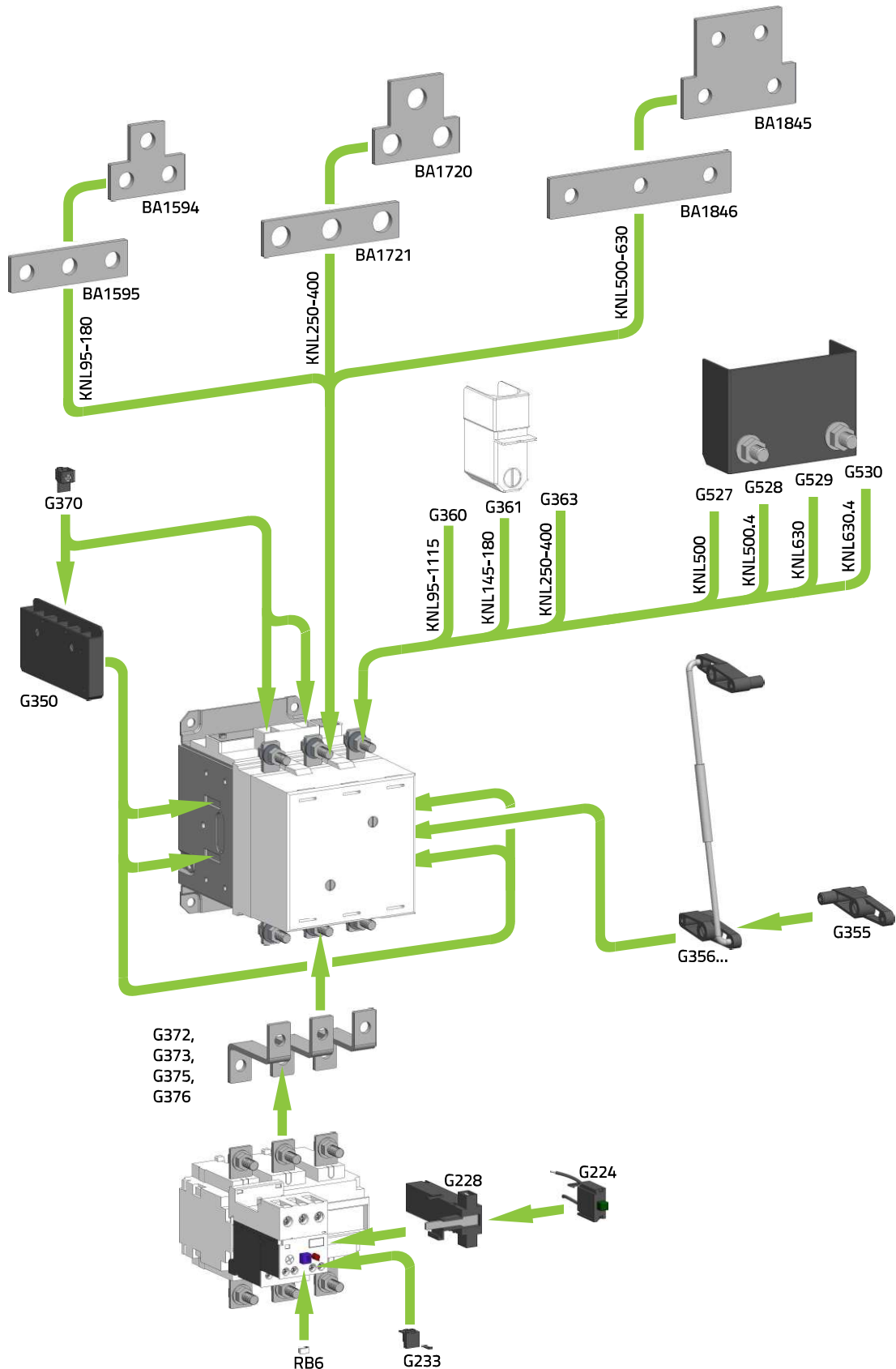
Electrical endurance of motor contactors KNL95 – KNL1000 – AC-3



# Contactors KNL95-KNL1000

## Accessories

### Mounting positions of accessories



### Snap-on auxiliary switch blocks

#### TECHNICAL DATA

| GENERAL           | Type                                                                                | Symbol   | Unit   | G350                     |
|-------------------|-------------------------------------------------------------------------------------|----------|--------|--------------------------|
|                   | Standards                                                                           |          |        | IEC/EN 60947-5-1, UL 508 |
|                   | Approvals                                                                           |          |        | CE, UL, CSA, GOST, CCC   |
|                   | For use with                                                                        |          |        | KNL95 ... KNL1000        |
|                   | Module width                                                                        |          |        | 0.5                      |
|                   | Number of poles                                                                     |          |        | 3                        |
|                   | Degree of protection                                                                |          |        | IP20                     |
|                   | Pollution degree                                                                    |          |        | 3                        |
|                   | Ambient temperature<br>open<br>closed                                               |          | °C     | -50 ... +70              |
|                   | Storage temperature                                                                 |          | °C     | -60 ... +80              |
| AUXILIARY CIRCUIT | Mechanical endurance                                                                |          | op. c. | 5,000,000                |
|                   | Weight                                                                              |          | g      | 80                       |
|                   | Maximum back-up fuse for short-circuit protection gL and gG:<br>coordination type 2 |          | A      | 16                       |
|                   | Rated insulation voltage                                                            | $U_i$    | V      | 690                      |
|                   | Thermal current                                                                     | $I_{th}$ | A      | 16                       |
|                   | Switching of auxiliary loads acc. to standard UL and CSA                            |          |        | A600, P600               |
|                   | Terminal capacity:<br>Quick-connect                                                 |          | faston | 1-6.35 mm or 2-2.8 mm    |

### Mechanical interlock

| Type   | Characteristics                       |
|--------|---------------------------------------|
| G355   | Side-by-side contactors               |
|        | One on top of other contactors L (mm) |
| G356/1 | 225 - 365                             |
| G356/2 | 265 - 305                             |
| G356/3 | 305 - 345                             |
| G356/4 | 345 - 385                             |
| G356/5 | 390 - 425                             |
| G356/6 | 470 - 500                             |

### Main terminal covers

| Type | Characteristics    |
|------|--------------------|
| G360 | for KNL95, KNL115  |
| G361 | for KNL145, KNL180 |
| G363 | for KNL250, KNL400 |
| G527 | for KNL500         |
| G528 | for KNL500.4       |
| G529 | for KNL630         |
| G530 | for KNL630.4       |

### Bars for 3-poles star connection

| Type   | Characteristics     |
|--------|---------------------|
| BA1595 | for KNL95 - KNL180  |
| BA1721 | for KNL250 - KNL400 |
| BA1846 | for KNL500 - KNL630 |

### Bars for 2-poles parallel connection

| Type   | Characteristics     |
|--------|---------------------|
| BA1594 | for KNL95 - KNL180  |
| BA1720 | for KNL250 - KNL400 |
| BA1845 | for KNL500 - KNL630 |

### Adapter

| Type   | Characteristics    |
|--------|--------------------|
| BA1595 | for KNL95 - KNL180 |

### Identification plate

| Type    | Characteristics    |
|---------|--------------------|
| BA126/2 | for KNL95 - KNL630 |

# Contactors KNL95-KNL1000

## Accessories



Thermal overload relay BRA180, BRA400

### TECHNICAL DATA

|                    | Type                                                           | Symbol    | Unit            | BRA180                                             | BRA400                              |
|--------------------|----------------------------------------------------------------|-----------|-----------------|----------------------------------------------------|-------------------------------------|
| GENERAL            | Standards                                                      |           |                 | IEC 60947-1, IEC 60947-4-1, UL508                  |                                     |
|                    | Approvals                                                      |           |                 | CE, UL, CSA, GOST                                  |                                     |
|                    | For use with                                                   |           |                 | KNL95 ... KNL250                                   | KNL145 ... KNL400                   |
|                    | Degree of protection                                           |           |                 | IP00 (main terminals) / IP20 (auxiliary terminals) |                                     |
|                    | Ambient temperature operating                                  |           | °C              | -20 ... +55                                        |                                     |
|                    | storage                                                        |           |                 | -55 ... +70                                        |                                     |
|                    | Dimensions (WxHxD)                                             |           | mm              | 127,5 x 137 x 171,5                                | 145 x 146 x 171                     |
|                    | Operating position                                             |           |                 | vertical                                           |                                     |
|                    | Reset type                                                     |           |                 | auto, manual                                       |                                     |
|                    | Maximum altitude above sea level                               |           | m               | 3000                                               |                                     |
| MAIN CIRCUIT       | Weight                                                         |           | kg              | 2.15                                               | 2.46                                |
|                    | Rated insulation voltage                                       | $U_i$     | V               | 1000                                               |                                     |
|                    | Rated impulse withstand voltage                                | $U_{imp}$ | kV              | 8                                                  |                                     |
|                    | Rated operational voltage                                      | $U_e$     | V               | 690                                                |                                     |
|                    | Adjustable current                                             | $I_r$     | A               | 60 ... 200                                         | 150 ... 420                         |
|                    | Rated frequency                                                | $f$       | Hz              | 50/60                                              |                                     |
|                    | Overvoltage category / pollution degree acc. to IEC/EN 60947-1 |           |                 | III / 3                                            |                                     |
|                    | Trip class acc. to IEC/EN 60947-4-1                            |           |                 | 10                                                 |                                     |
|                    | Sensitivity to phase failure                                   |           |                 | yes                                                |                                     |
|                    | Temperature compensation range                                 |           | °C              | -15 ... +55                                        |                                     |
|                    | Power loss at $I_n$                                            | $P$       | W               | 2.1 ... 7.2                                        |                                     |
|                    | Terminal capacity                                              |           | mm <sup>2</sup> | 150 (with cable lug) ; 20 mm busbar                | 150 (with cable lug) ; 25 mm busbar |
|                    | Conductor insulation stripping length                          |           | mm              | /                                                  |                                     |
|                    | Screw                                                          |           |                 | M8                                                 | M10                                 |
|                    | Screw head                                                     |           |                 | screw + hexagonal nut                              |                                     |
| AUXILIARY CIRCUITS | Tightening torque                                              |           | Nm              | 18                                                 | 35                                  |
|                    | Rated insulation voltage                                       | $U_i$     | V               | 690                                                |                                     |
|                    | Rated impulse withstand voltage                                | $U_{imp}$ | kV              | 6                                                  |                                     |
|                    | Rated operational voltage                                      | $U_e$     | V               | 690                                                |                                     |
|                    | Overvoltage category / pollution degree acc. to IEC/EN 60947-1 |           |                 | III / 3                                            |                                     |
|                    | Thermal current (both contacts)                                | $I_{th}$  | A               | 10                                                 |                                     |
|                    | Contact electrical rating                                      |           |                 | B600 / P600                                        |                                     |
|                    | Rated operational current AC-15 220/230 V                      | $I_e$     | A               | 2.5                                                |                                     |
|                    | Rated operational current DC-13 110 V                          | $I_e$     | A               | 1.1                                                |                                     |
|                    | Terminal capacity                                              |           | mm <sup>2</sup> | max. 2.5                                           |                                     |
|                    | Conductor insulation stripping length                          |           | mm              | 9                                                  |                                     |
|                    | Screw                                                          |           |                 | M3.5                                               |                                     |
|                    | Screw head                                                     |           |                 | PH1                                                |                                     |
|                    | Tightening torque                                              |           | Nm              | 1                                                  |                                     |

### Thermal overload relay BRA180

Setting ranges and maximum permitted back-up fuses

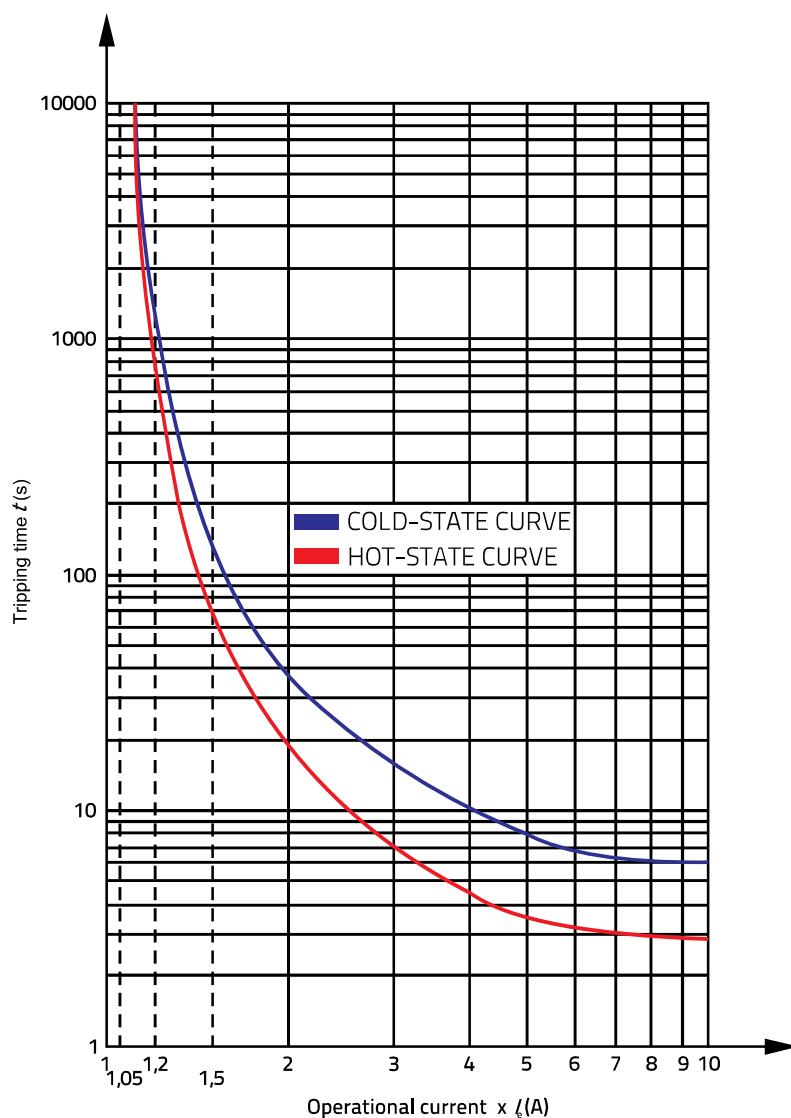
| Setting range<br>(A) | aM  | Max. back-up fuse gL/gG (A) | gL/gG |
|----------------------|-----|-----------------------------|-------|
| 60 - 100             | 100 |                             | 160   |
| 75 - 125             | 125 |                             | 200   |
| 90 - 150             | 160 |                             | 250   |
| 120 - 200            | 200 |                             | 315   |

### Thermal overload relay BRA400

Setting ranges and maximum permitted back-up fuses

| Setting range<br>(A) | aM  | Max. back-up fuse gL/gG (A) | gL/gG |
|----------------------|-----|-----------------------------|-------|
| 150 - 250            | 250 |                             | 400   |
| 180 - 300            | 315 |                             | 500   |
| 250 - 420            | 400 |                             | 630   |

Tripping curve BR90

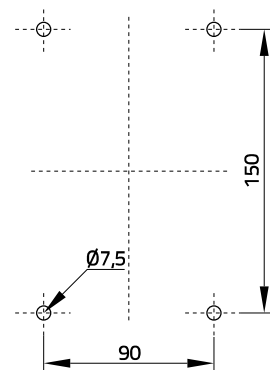
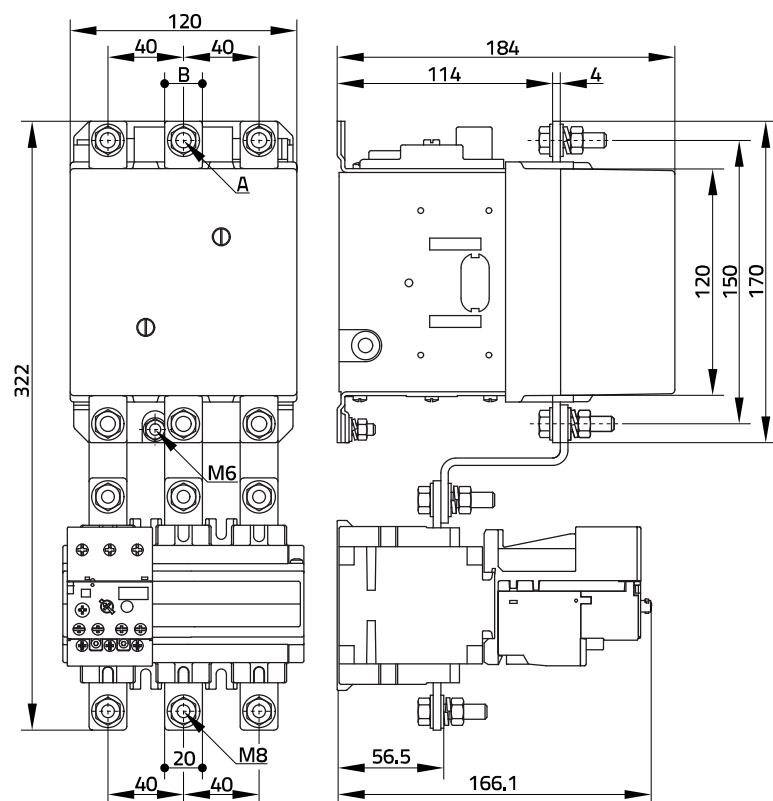


# Contactors KNL95-KNL1000

## Dimensions

KNL95 ... KNL180 – 3-pole  
Contactor + thermal overload relay BRA180

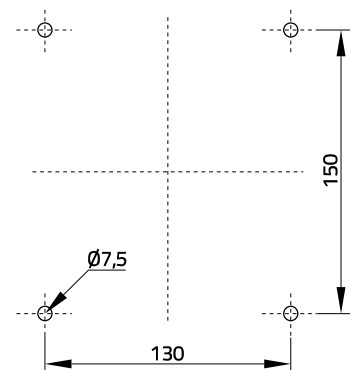
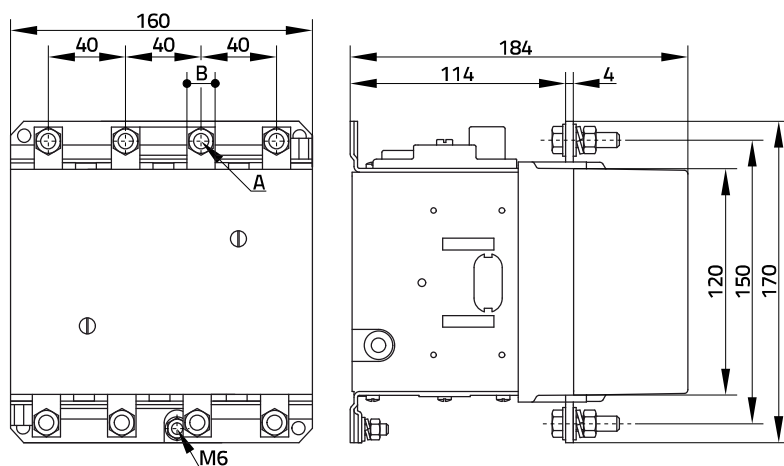
KNL95 ... KNL180 – drilling plan  
3-pole



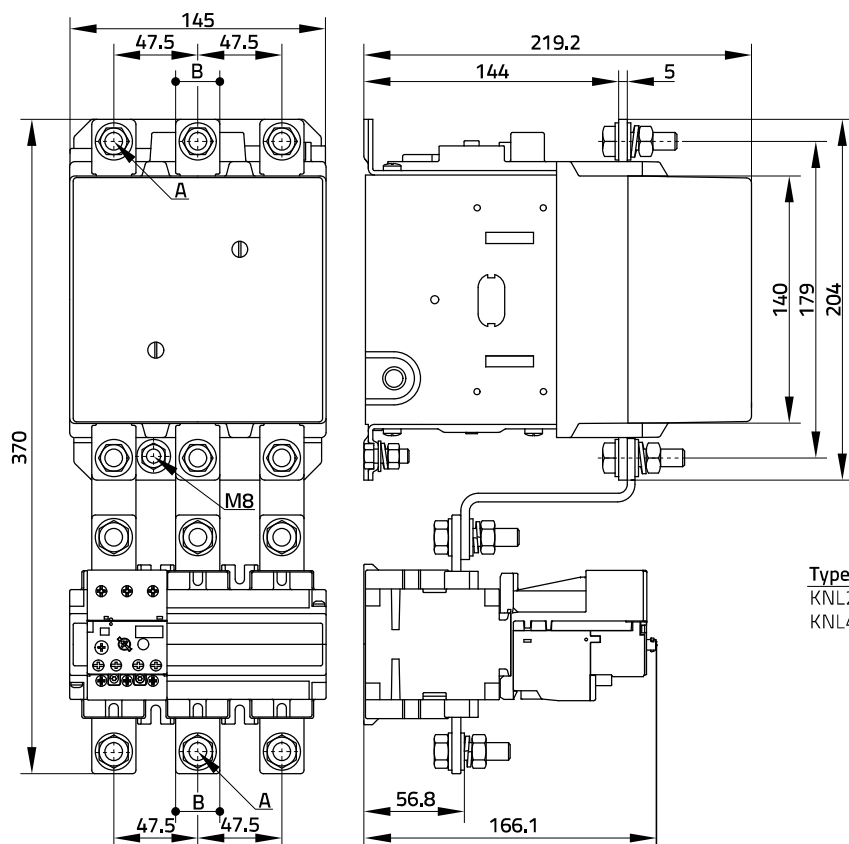
| Type          | A  | B  |
|---------------|----|----|
| KNL95, KNL115 | M6 | 15 |
| KNL145        | M8 | 20 |
| KNL180        | M8 | 20 |

KNL95 ... KNL180 – 4-pole

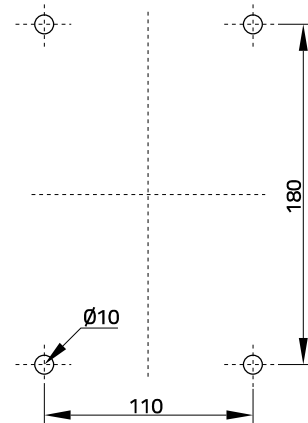
KNL95 ... KNL180 – drilling plan  
4-pole



KNL250, KNL400 – 3-pole  
Contactor + thermal overload relay BRA400

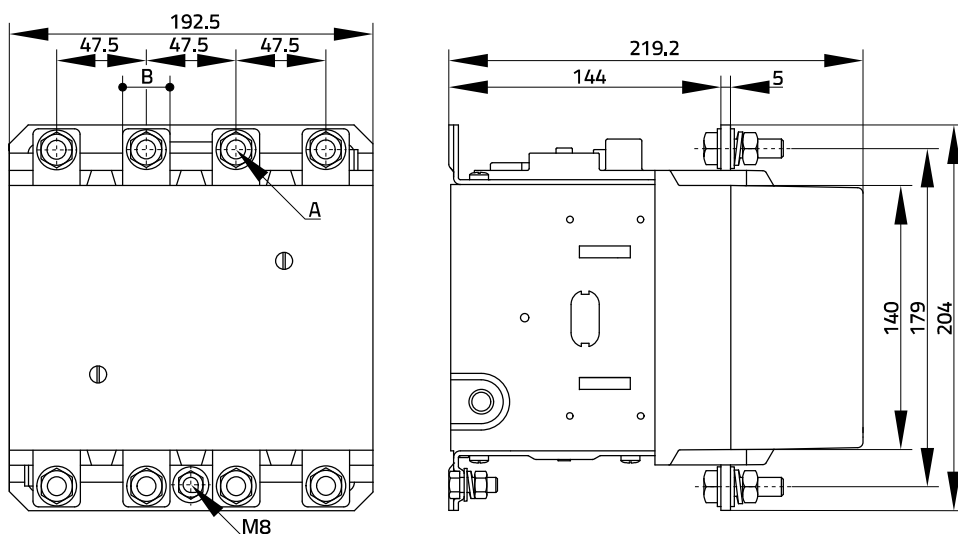


KNL250, KNL400 - drilling plan  
3-pole

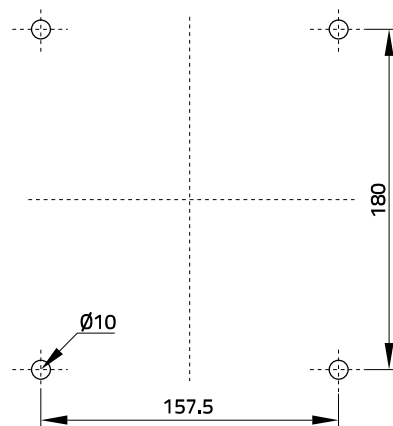


| Type   | A   | B  |
|--------|-----|----|
| KNL250 | M10 | 20 |
| KNL400 | M10 | 25 |

KNL250, KNL400 – 4-pole



KNL250, KNL400 - drilling plan  
4-pole



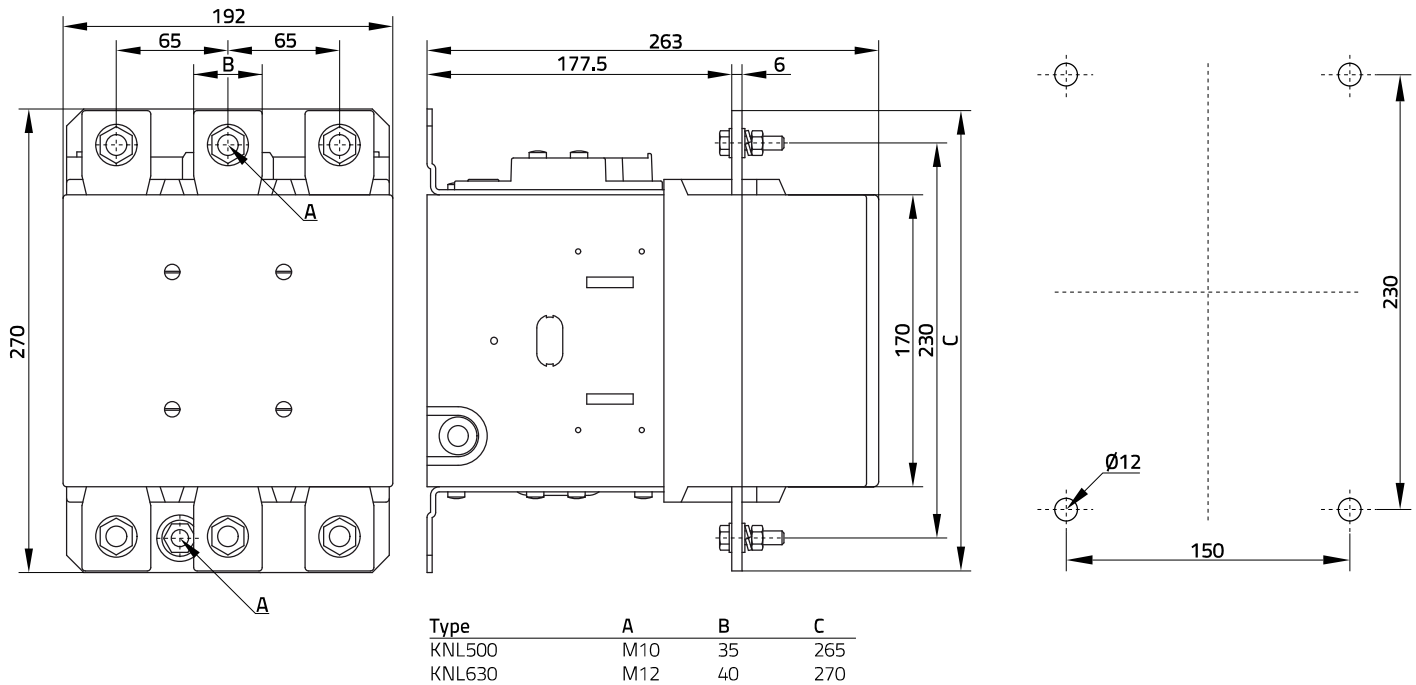


# Contactors KNL95-KNL1000

## Dimensions

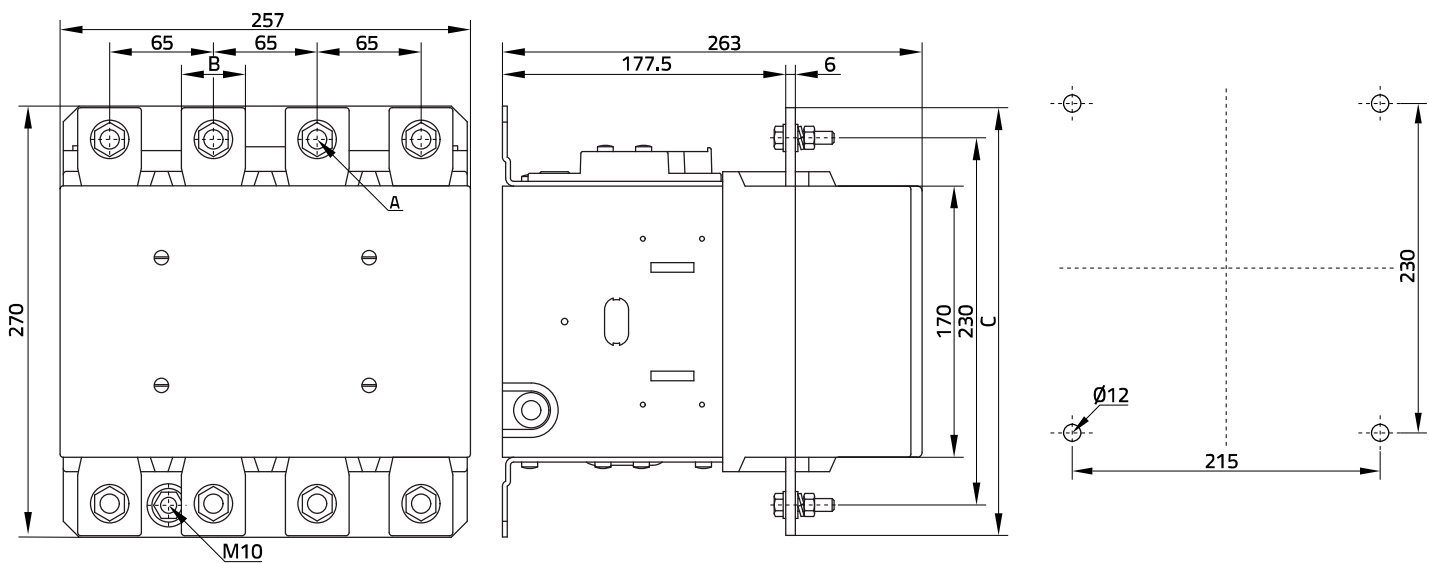
KNL500, KNL630 – 3-pole

KNL500, KNL630 – drilling plan  
3-pole

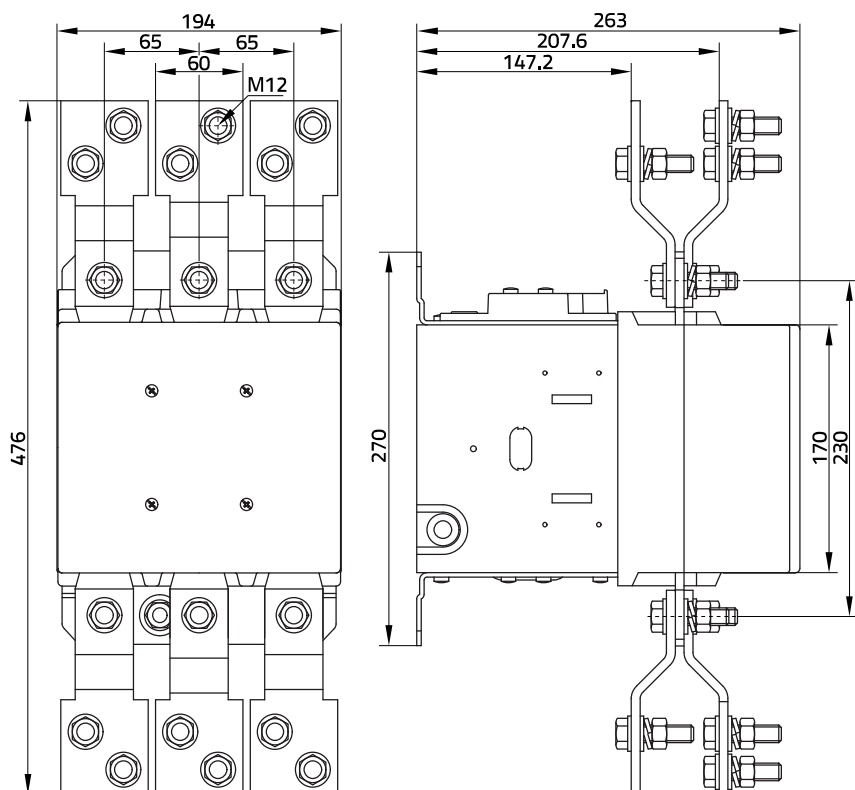


KNL500, KNL630 – 4-pole

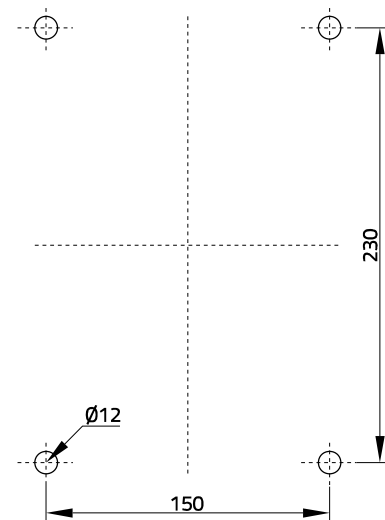
KNL500, KNL630 – drilling plan  
4-pole



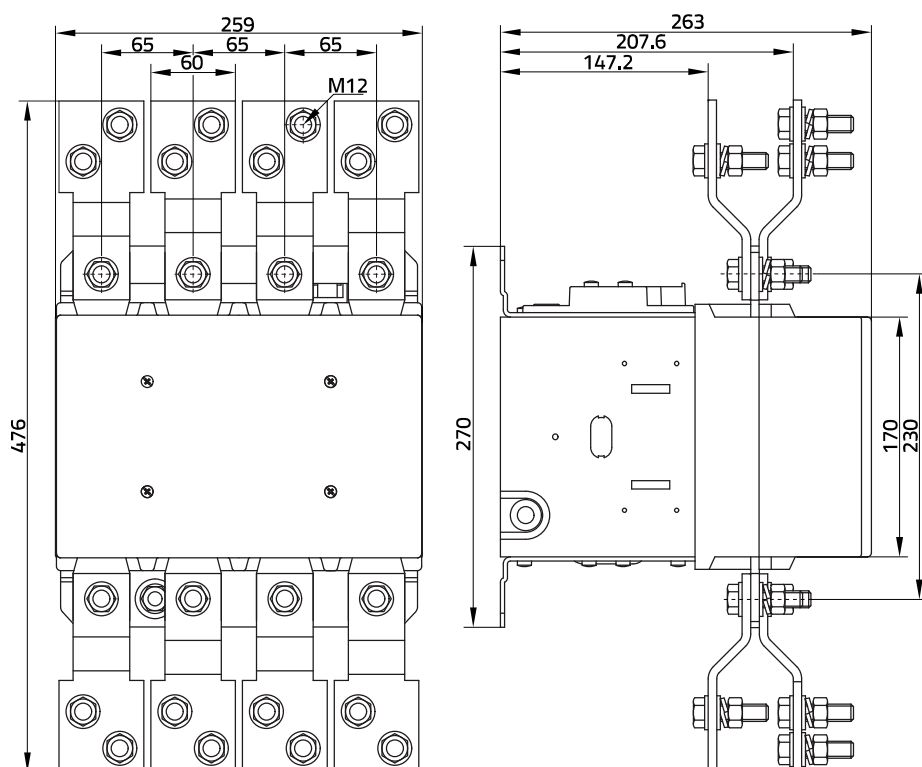
KNL630/1000 – 3-pole



KNL630/1000 - drilling plan  
3-pole



KNL630/1000 – 4-pole



KNL630/1000 - drilling plan  
4-pole

