

**DATASHEET - DILEM4(110V50HZ,120V60HZ)**

**Contactor, 110 V 50 Hz, 120 V 60 Hz, 4 pole, 380 V 400 V, 4 kW, Screw terminals, AC operation**

Powering Business Worldwide™

**Part no. DILEM4(110V50HZ,120V60HZ)**  
**Catalog No. 051801**  
**Alternate Catalog No. XTMF9A00A**

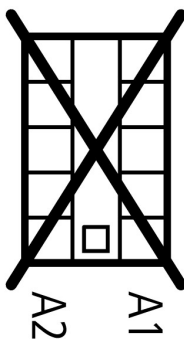
## Delivery program

|   |              |    |  |  |
|---|--------------|----|--|--|
| Product range   |              |    |  | Contactors   |
| Application   |              |    |  | Mini Contactors for Motors and Resistive Loads   |
| Subrange  |              |    |  | DILEM contactors   |
| Utilization category                                      |              |    |  | AC-1: Non-inductive or slightly inductive loads, resistance furnaces<br>NAC-3: Normal AC induction motors: starting, switch off during running<br>AC-4: Normal AC induction motors: starting, plugging, reversing, inching |
| Connection technique                                      |              |    |  | Screw terminals  |
| Number of poles   |              |    |  | 4 pole   |
| <b>Rated operational current</b>                          |              |    |  |  |
| AC-3  |              |    |  |  |
| 380 V 400 V   | $I_e$        | A  |  | 9  |
| AC-1  |              |    |  |  |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz |              |    |  |  |
| Open  |              |    |  |  |
| at 40 °C  | $I_{th}=I_e$ | A  |  | 22   |
| <b>Max. rating for three-phase motors, 50 - 60 Hz</b>     |              |    |  |  |
| AC-3  |              |    |  |  |
| 220 V 230 V   | P            | kW |  | 2.2  |
| 380 V 400 V   | P            | kW |  | 4  |
| 660 V 690 V   | P            | kW |  | 4  |
| AC-4  |              |    |  |  |
| 220 V 230 V   | P            | kW |  | 1.5  |
| 380 V 400 V   | P            | kW |  | 3  |
| 660 V 690 V   | P            | kW |  | 3  |
| Contact sequence  |              |    |  |  |
| For use with  |              |    |  | ...DILEM<br>...DILE  |
| Actuating voltage   |              |    |  | 110 V 50 Hz, 120 V 60 Hz   |
| Voltage AC/DC   |              |    |  | AC operation   |

## Technical data

### General

|  |              |               |  |  |
|--|--------------|---------------|--|--|
| Standards                                      |              |               |  | IEC/EN 60947, VDE 0660, CSA, UL  |
| Lifespan, mechanical; Coil 50/60 Hz            | Operations   | $\times 10^6$ |  | 7  |
| Lifespan, mechanical                           | Operations   | $\times 10^6$ |  | 20   |
| Maximum operating frequency                    |              |               |  |  |
| Mechanical                                     |              | Ops./h        |  | 9000   |
| electrical (Contactors without overload relay) | Operations/h |               |  | Page 05/070  |
| Climatic proofing                              |              |               |  | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30 |
| Ambient temperature                            |              |               |  |  |
| Open   |              | °C            |  | -25 - +50  |
| Enclosed                                       |              | °C            |  | - 25 - 40  |
| Storage  |              | °C            |  |  |

|   |                 |  |
|---|-----------------|--|
| Min. ambient temperature, storage                                     | °C              | - 40   |
| Ambient temperature, storage max.                                     | °C              | + 80   |
| Mounting position   |                 | As required, except vertical with terminals A1/A2 at the bottom                    |
| Mounting position   |                 |  |
| Mechanical shock resistance (IEC/EN 60068-2-27)                       |                 |  |
| Half-sinusoidal shock, 10 ms  |                 |  |
| Basic unit without auxiliary contact module                           |                 |  |
| Main contacts, make contacts  | g               | 10   |
| Basic unit with auxiliary contact module                              |                 |  |
| Main contacts make contact  | g               |  |
| Make  | g               | 10   |
| Auxiliary contacts Make/break contacts                                | g               | 20 / 20  |
| Degree of Protection  |                 | IP20   |
| Protection against direct contact when actuated from front (EN 50274) |                 | Finger and back-of-hand proof  |
| Altitude  | m               | Max. 2000  |
| Weight  | kg              | 0.17   |
| Terminal capacity of auxiliary and main contacts                      |                 |  |
| Screw terminals   |                 |  |
| Solid   | mm <sup>2</sup> | 1 x (0.75 - 2.5)<br>2 x (0.75 - 2.5)   |
| Flexible with ferrule   | mm <sup>2</sup> | 1 x (0.75 - 1.5)<br>2 x (0.75 - 1.5)   |
| Solid or stranded   | AWG             | 18 - 14  |
| Stripping length  | mm              | 8  |
| Terminal screw  |                 | M3.5   |
| Pozidriv screwdriver  | Size            | 2  |
| Standard screwdriver  | mm              | 0.8 x 5.5<br>1 x 6   |
| Max. tightening torque  | Nm              | 1.2  |

**Main conducting paths**

|   |                  |      |       |
|---|------------------|------|-------|
| Rated impulse withstand voltage         | U <sub>imp</sub> | V AC | 6000  |
| Overvoltage category/pollution degree   |                  |      | III/3 |
| Rated insulation voltage                | U <sub>i</sub>   | V AC | 690   |
| Rated operational voltage               | U <sub>e</sub>   | V AC | 690   |
| Safe isolation to EN 61140              |                  |      |       |
| between coil and contacts               |                  | V AC | 300   |
| between the contacts                    |                  | V AC | 300   |
| Making capacity (cos φ to IEC/EN 60947) |                  | A    | 110   |
| Breaking capacity                       |                  |      |       |
| 220 V 230 V                             |                  | A    | 90    |
| 380 V 400 V                             |                  | A    | 90    |
| 500 V                                   |                  | A    | 64    |
| 660 V 690 V                             |                  | A    | 42    |
| Short-circuit protection maximum fuse   |                  |      |       |
| Type "2", 500 V                         | gL/gG            | A    | 10    |
| Type "1", 500 V                         | gL/gG            | A    | 20    |

**AC**

|      |  |  |  |
|------|--|--|--|
| AC-1 |  |  |  |
|------|--|--|--|

|   |                |    |  |     |
|---|----------------|----|--|-----|
| <b>Rated operational current</b>                          |                |    |  |     |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz |                |    |  |     |
| Open  |                |    |  |     |
| at 40 °C  | $I_{th} = I_e$ | A  | 22   |     |
| at 50 °C  | $I_{th} = I_e$ | A  | 20   |     |
| at 55 °C  | $I_{th} = I_e$ | A  | 19   |     |
| enclosed  | $I_{th}$       | A  | 16   |     |
| Notes   |                |    | At maximum permissible ambient air temperature.    |     |
| Conventional free air thermal current, 1 pole             |                |    |  |     |
| Notes   |                |    | At maximum permissible ambient air temperature.    |     |
| open  | $I_{th}$       | A  | 60   |     |
| enclosed  | $I_{th}$       | A  | 50   |     |
| <b>AC-3</b>   |                |    |  |     |
| <b>Rated operational current</b>                          |                |    |  |     |
| Open, 3-pole: 50 – 60 Hz                                  |                |    |  |     |
| Notes   |                |    | At maximum permissible ambient temperature (open.) |     |
| 220 V 230 V   | $I_e$          | A  | 9  |     |
| 240 V   | $I_e$          | A  | 9  |     |
| 380 V 400 V   | $I_e$          | A  | 9  |     |
| 415 V   | $I_e$          | A  | 9  |     |
| 440V  | $I_e$          | A  | 9  |     |
| 500 V   | $I_e$          | A  | 6.4  |     |
| 660 V 690 V   | $I_e$          | A  | 4.8  |     |
| <b>Motor rating</b>                                       |                | P  | kWh  |     |
| 220 V 230 V   | P              | kW |  | 2.2 |
| 240V  | P              | kW |  | 2.5 |
| 380 V 400 V   | P              | kW |  | 4   |
| 415 V   | P              | kW |  | 4.3 |
| 440 V   | P              | kW |  | 4.6 |
| 500 V   | P              | kW |  | 4   |
| 660 V 690 V   | P              | kW |  | 4   |
| <b>AC-4</b>   |                |    |  |     |
| <b>Rated operational current</b>                          |                |    |  |     |
| Open, 3-pole: 50 – 60 Hz                                  |                |    |  |     |
| Notes   |                |    | At maximum permissible ambient air temperature.    |     |
| 220 V 230 V   | $I_e$          | A  | 6.6  |     |
| 240 V   | $I_e$          | A  | 6.6  |     |
| 380 V 400 V   | $I_e$          | A  | 6.6  |     |
| 415 V   | $I_e$          | A  | 6.6  |     |
| 440 V   | $I_e$          | A  | 6.6  |     |
| 500 V   | $I_e$          | A  | 5  |     |
| 660 V 690 V   | $I_e$          | A  | 3.4  |     |
| <b>Motor rating</b>                                       |                | P  | kWh  |     |
| 220 V 230 V   | P              | kW |  | 1.5 |
| 240 V   | P              | kW |  | 1.8 |
| 380 V 400 V   | P              | kW |  | 3   |
| 415 V   | P              | kW |  | 3.1 |
| 440 V   | P              | kW |  | 3.3 |
| 500 V   | P              | kW |  | 3   |
| 660 V 690 V   | P              | kW |  | 3   |
| <b>DC</b>   |                |    |  |     |
| <b>Rated operational current open</b>                     |                |    |  |     |
| DC-1  |                |    |  |     |
| 12 V  | $I_e$          | A  | 20   |     |

|                                    |       |   |     |
|------------------------------------|-------|---|-----|
| 24 V                               | $I_e$ | A | 20  |
| 60 V                               | $I_e$ | A | 20  |
| 110 V                              | $I_e$ | A | 20  |
| 220 V                              | $I_e$ | A | 20  |
| Current heat losses (3- or 4-pole) |       |   |     |
| at $I_{th}$ , 50 °C                |       | W | 7.9 |

### Magnet systems

|  |         |         |           |
|--|---------|---------|-----------|
| Voltage tolerance  |         |         |           |
| AC operated  |         |         |           |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz         | Pick-up | $x U_c$ | 0.8 - 1.1 |
| Dual-frequency coil 50/60 Hz   | Pick-up | $x U_c$ |           |
| Voltage tolerance Dual-frequency coil 50/60 Hz, max. pick-up voltage |         | $x U_c$ | 1.1       |
| Power consumption  |         |         |           |
| AC operation   |         |         |           |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz         | Pick-up | VA      | 25        |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz         | Pick-up | W       | 22        |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz         | Sealing | VA      | 4.6       |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz         | Sealing | W       | 1.8       |
| Duty factor  |         | % DF    | 100       |
| Switching times at 100 % $U_c$                                       |         |         |           |
| Make contact   |         | ms      |           |
| Closing delay  |         | ms      |           |
| Closing delay min.   |         | ms      | 14        |
| Closing delay max.   |         | ms      | 21        |
| Opening delay  |         | ms      |           |
| Opening delay min.   |         | ms      | 8         |
| Opening delay max.   |         | ms      | 18        |
| Closing delay with top mounting auxiliary contact                    |         | ms      | 45        |
| Reversing contactors   |         |         |           |
| Changeover time at 110 % $U_c$                                       |         |         |           |
| Changeover time min.   |         | ms      | 16        |
| Changeover time max.   |         | ms      | 21        |
| Arcing time at 690 V AC  |         | ms      | 12        |

### Auxiliary contacts

|  |           |      |       |
|--|-----------|------|-------|
| Positive operating contacts to EN 60947-5-1 appendix L, including auxiliary contact module |           |      | Yes   |
| Rated impulse withstand voltage  | $U_{imp}$ | V AC | 6000  |
| Overvoltage category/pollution degree  |           |      | III/3 |
| Rated insulation voltage   | $U_i$     | V AC | 690   |
| Rated operational voltage  | $U_e$     | V AC | 600   |
| Safe isolation to EN 61140   |           |      |       |
| between coil and auxiliary contacts  |           | V AC | 300   |
| between the auxiliary contacts   |           | V AC | 300   |
| Rated operational current  |           |      |       |
| AC-15  |           |      |       |
| 220 V 240 V  | $I_e$     | A    | 6     |
| 380 V 415 V  | $I_e$     | A    | 3     |
| 500 V  | $I_e$     | A    | 1.5   |
| DC L/R $\leq$ 15 ms  |           |      |       |
| Contacts in series:  |           | A    |       |
| 1  | 24 V      | A    | 2.5   |
| 2  | 60 V      | A    | 2.5   |
| 3  | 100 V     | A    | 1.5   |
| 3  | 220 V     | A    | 0.5   |
| Conv. thermal current  | $I_{th}$  | A    | 10    |

|   |              |               |  |
|---|--------------|---------------|--|
| Control circuit reliability                         | Failure rate | $\lambda$     | $<10^{-8}$ , < one failure at 100 million operations<br>(at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 5.4$ mA) |
| Component lifespan at $U_e = 240$ V                 |              |               |  |
| AC-15   | Operations   | $\times 10^6$ | 0.2  |
| DC current  |              |               |  |
| L/R = 50 ms: 2 contacts in series at $I_e = 0.5$ A  | Operations   | $\times 10^6$ | 0.15   |
| Notes   |              |               | Switch-on and switch-off conditions based on DC-13, time constant as specified                                     |
| Short-circuit rating without welding                |              |               |  |
| Maximum overcurrent protective device               |              |               |  |
| Short-circuit protection only                       |              |               | PKZM0-4  |
| Short-circuit protection maximum fuse               |              |               |  |
| 500 V   |              | A gG/gL       | 6  |
| 500 V   |              | A fast        | 10   |
| Current heat loss at a load of $I_{th}$ per contact |              | W             | 1.1  |

### Rating data for approved types

|                              |  |      |     |
|------------------------------|--|------|-----|
| Switching capacity           |  |      |     |
| Maximum motor rating         |  |      |     |
| Three-phase                  |  |      |     |
| 200 V<br>208 V               |  | HP   | 2   |
| 230 V<br>240 V               |  | HP   | 3   |
| 460 V<br>480 V               |  | HP   | 5   |
| 575 V<br>600 V               |  | HP   | 5   |
| Single-phase                 |  |      |     |
| 115 V<br>120 V               |  | HP   | 0.5 |
| 230 V<br>240 V               |  | HP   | 1.5 |
| General use                  |  | A    | 15  |
| Short Circuit Current Rating |  | SCCR |     |
| Basic Rating                 |  |      |     |
| SCCR                         |  | kA   | 5   |
| max. Fuse                    |  | A    | 45  |

### Design verification as per IEC/EN 61439

|  |            |    |  |
|--|------------|----|--|
| Technical data for design verification   |            |    |  |
| Rated operational current for specified heat dissipation   | $I_n$      | A  | 22   |
| Heat dissipation per pole, current-dependent   | $P_{vid}$  | W  | 2.39   |
| Equipment heat dissipation, current-dependent  | $P_{vid}$  | W  | 9.56   |
| Static heat dissipation, non-current-dependent   | $P_{vs}$   | W  | 1.8  |
| Heat dissipation capacity  | $P_{diss}$ | W  | 0  |
| Operating ambient temperature min.   |            | °C | -25  |
| Operating ambient temperature max.   |            | °C | 50   |
| IEC/EN 61439 design verification   |            |    |  |
| 10.2 Strength of materials and parts   |            |    |  |
| 10.2.2 Corrosion resistance  |            |    | Meets the product standard's requirements.                         |
| 10.2.3.1 Verification of thermal stability of enclosures   |            |    | Meets the product standard's requirements.                         |
| 10.2.3.2 Verification of resistance of insulating materials to normal heat   |            |    | Meets the product standard's requirements.                         |
| 10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects |            |    | Meets the product standard's requirements.                         |
| 10.2.4 Resistance to ultra-violet (UV) radiation   |            |    | Meets the product standard's requirements.                         |
| 10.2.5 Lifting   |            |    | Does not apply, since the entire switchgear needs to be evaluated. |
| 10.2.6 Mechanical impact   |            |    | Does not apply, since the entire switchgear needs to be evaluated. |
| 10.2.7 Inscriptions  |            |    | Meets the product standard's requirements.                         |
| 10.3 Degree of protection of ASSEMBLIES  |            |    | Does not apply, since the entire switchgear needs to be evaluated. |

|  |  |  |
|--|--|--|
| 10.4 Clearances and creepage distances                   |  | Meets the product standard's requirements.   |
| 10.5 Protection against electric shock                   |  | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.6 Incorporation of switching devices and components   |  | Does not apply, since the entire switchgear needs to be evaluated.   |
| 10.7 Internal electrical circuits and connections        |  | Is the panel builder's responsibility.   |
| 10.8 Connections for external conductors                 |  | Is the panel builder's responsibility.   |
| 10.9 Insulation properties                               |  |  |
| 10.9.2 Power-frequency electric strength                 |  | Is the panel builder's responsibility.   |
| 10.9.3 Impulse withstand voltage                         |  | Is the panel builder's responsibility.   |
| 10.9.4 Testing of enclosures made of insulating material |  | Is the panel builder's responsibility.   |
| 10.10 Temperature rise                                   |  | The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices. |
| 10.11 Short-circuit rating                               |  | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.12 Electromagnetic compatibility                      |  | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.13 Mechanical function                                |  | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.                         |

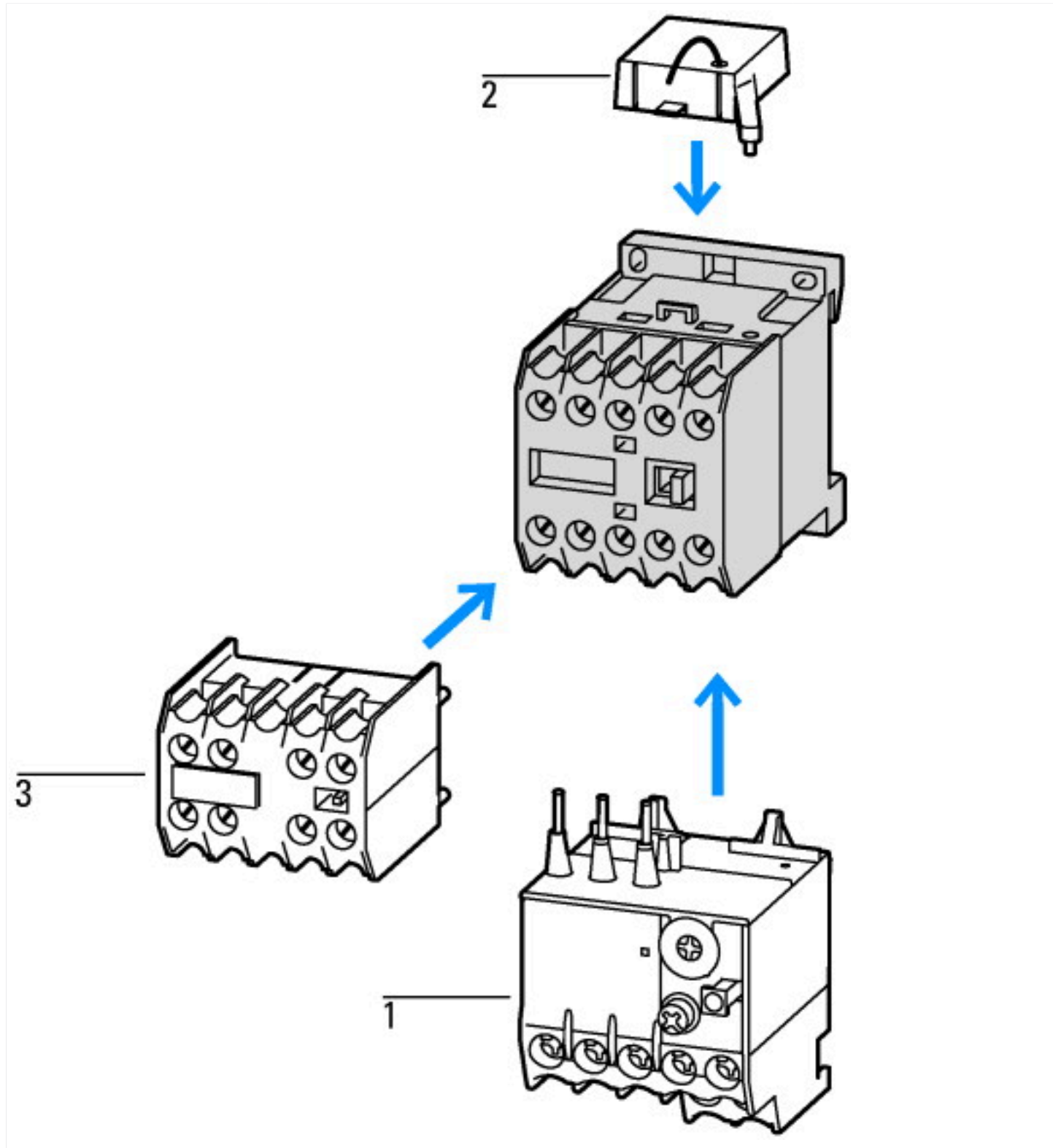
## Technical data ETIM 7.0

|   |    |                  |
|---|----|------------------|
| Low-voltage industrial components (EG000017) / Power contactor, AC switching (EC000066)   |    |                  |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Contactor (LV) / Power contactor, AC switching (ecl@ss10.0.1-27-37-10-03 [AAB718015]) |    |                  |
| Rated control supply voltage Us at AC 50HZ  | V  | 110 - 110        |
| Rated control supply voltage Us at AC 60HZ  | V  | 120 - 120        |
| Rated control supply voltage Us at DC   | V  | 0 - 0            |
| Voltage type for actuating  |    | AC               |
| Rated operation current Ie at AC-1, 400 V   | A  | 22               |
| Rated operation current Ie at AC-3, 400 V   | A  | 9                |
| Rated operation power at AC-3, 400 V  | kW | 4                |
| Rated operation current Ie at AC-4, 400 V   | A  | 6.6              |
| Rated operation power at AC-4, 400 V  | kW | 3                |
| Rated operation power NEMA  | kW | 3.7              |
| Modular version   |    | No               |
| Number of auxiliary contacts as normally open contact   |    | 0                |
| Number of auxiliary contacts as normally closed contact   |    | 0                |
| Type of electrical connection of main circuit   |    | Screw connection |
| Number of normally closed contacts as main contact  |    | 0                |
| Number of main contacts as normally open contact  |    | 4                |

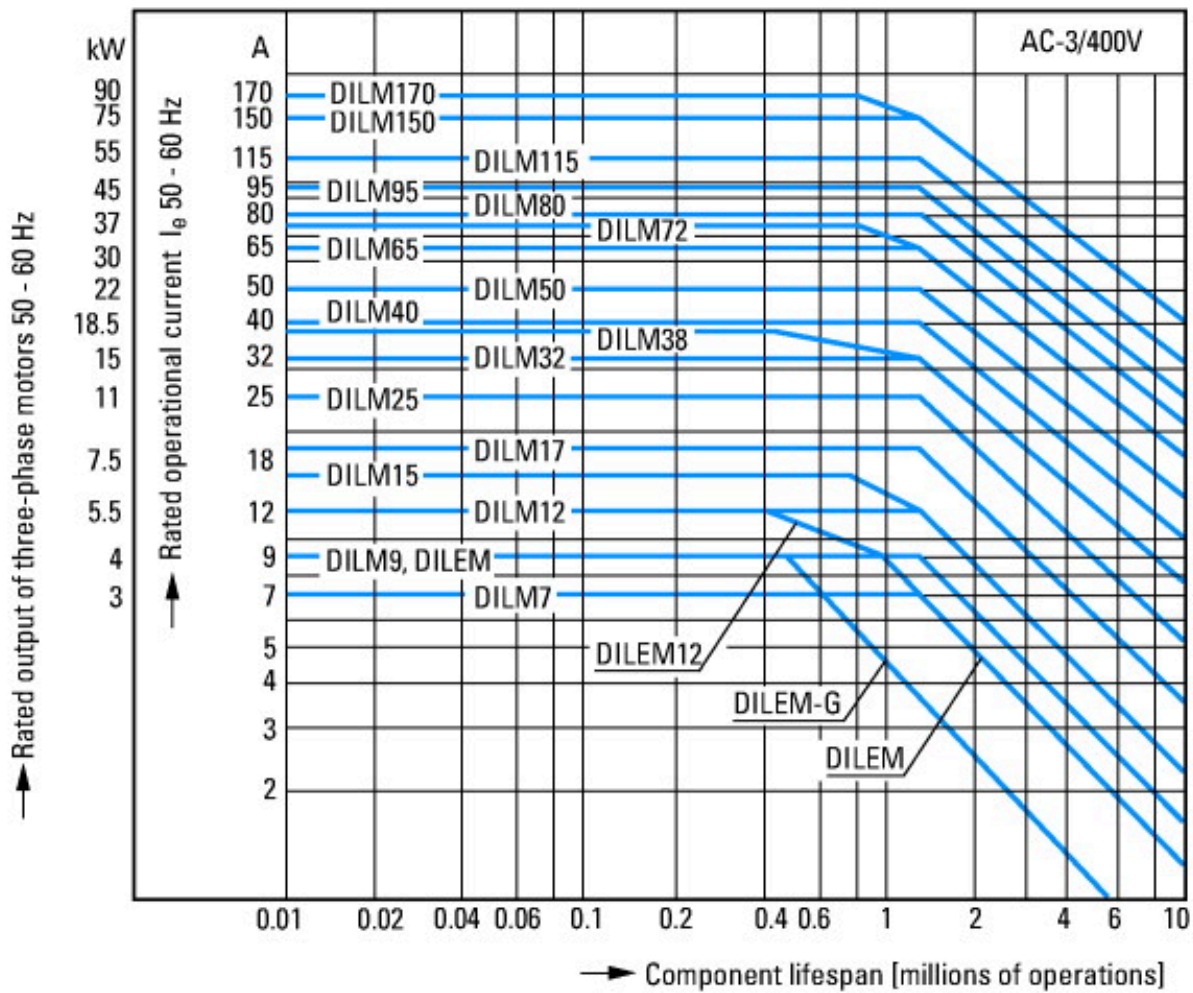
## Approvals

|                                      |  |   |
|--------------------------------------|--|---|
| Product Standards                    |  | IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking |
| UL File No.                          |  | E29096  |
| UL Category Control No.              |  | NLDX  |
| CSA File No.                         |  | 012528  |
| CSA Class No.                        |  | 3211-04   |
| North America Certification          |  | UL listed, CSA certified                                  |
| Specially designed for North America |  | No  |

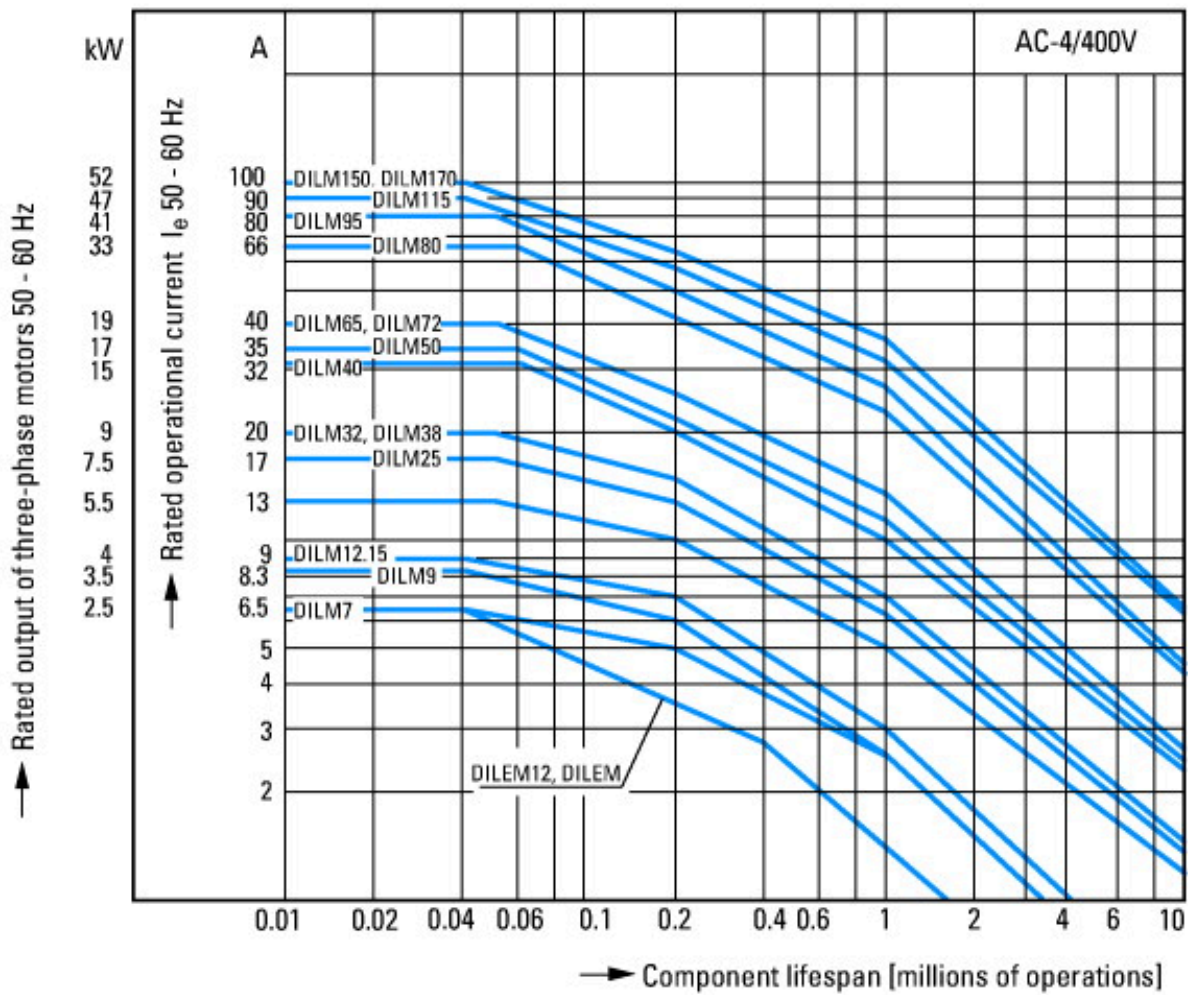
Characteristics



- 1: Overload relay
  - 2: Suppressor
  - 3: Auxiliary contact modules
- Enclosure totally insulated



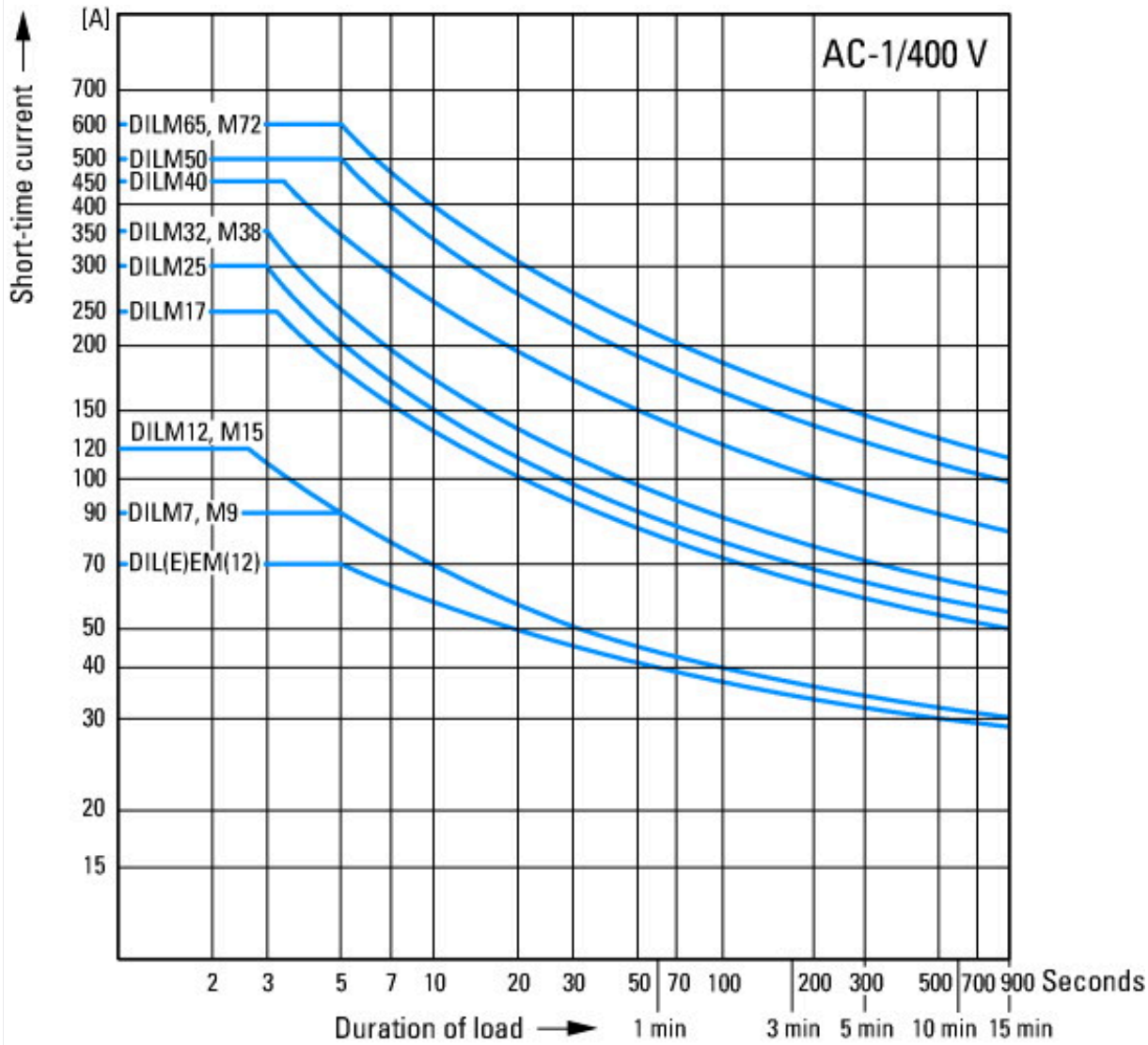
- Squirrel-cage motor
- Operating characteristics
- Starting: from rest
- Stopping: after attaining full running speed
- Electrical characteristics
- Make: up to 6 x rated motor current
- Break: up to 1 x rated motor current
- Utilization category
- 100 % AC-3
- Typical applications
- Compressors
- Lifts
- Mixers
- Pumps
- Escalators
- Agitators
- Fans
- Conveyor belts
- Centrifuges
- Hinged flaps
- Bucket-elevators
- Air conditioning system
- General drives in manufacturing and processing machines



- Extreme switching duty
- Squirrel-cage motor
- Operating characteristics
- Inching, plugging, reversing
- Electrical characteristics
- Make: up to 6 x rated motor current
- Break: up to 6 x rated motor current
- Utilization category
- 100 % AC-4
- Typical applications
- Printing presses
- Wire-drawing machines
- Centrifuges
- Special drives for manufacturing and processing machines

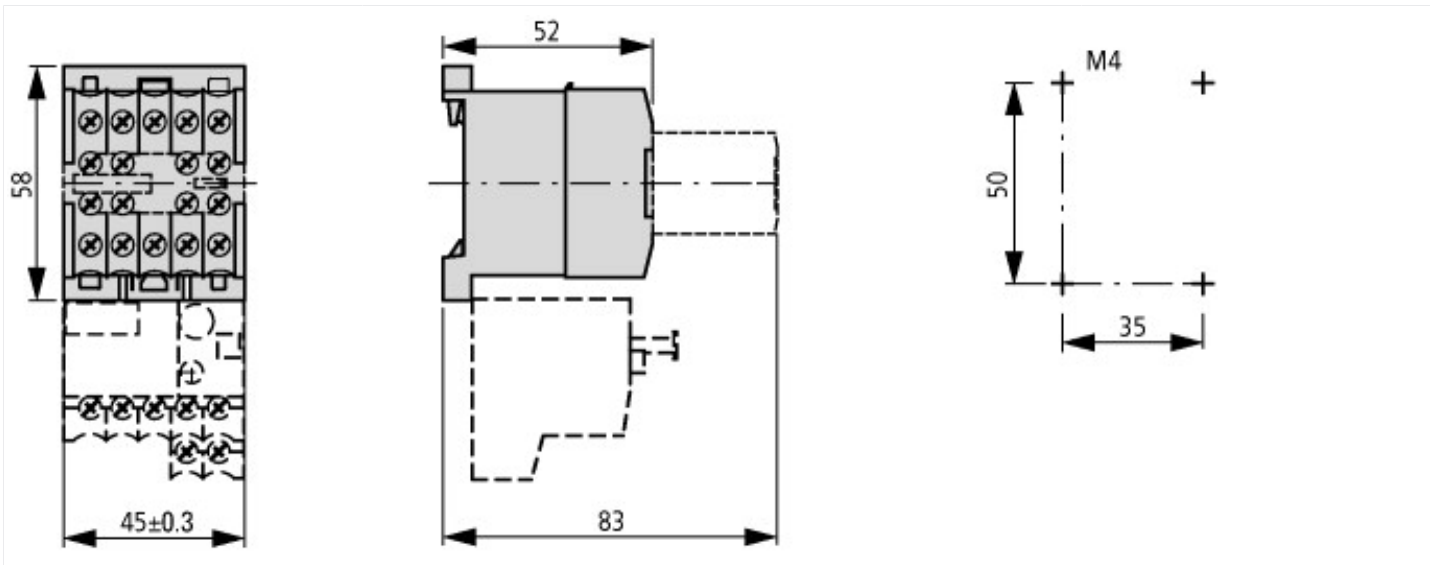


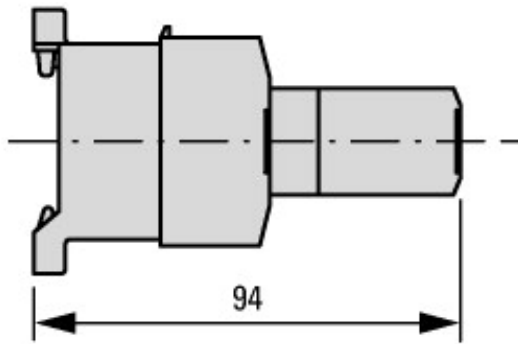
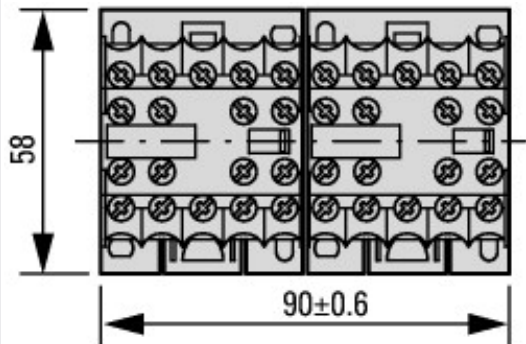
Switching duty for non-motor loads, 3-pole, 4-pole  
 Operating characteristics  
 Non-inductive or slightly inductive loads  
 Electrical characteristics  
 Make: 1 x rated current  
 Break: 1 x rated current  
 Utilization category  
 100 % AC-1  
 Typical applications  
 Electric heat



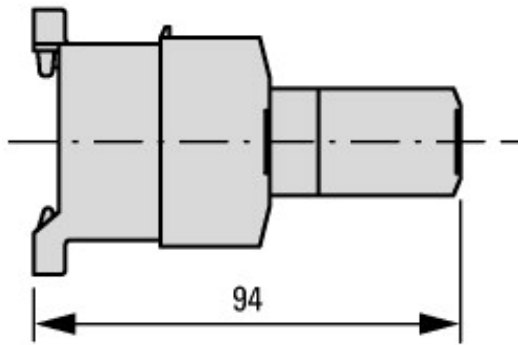
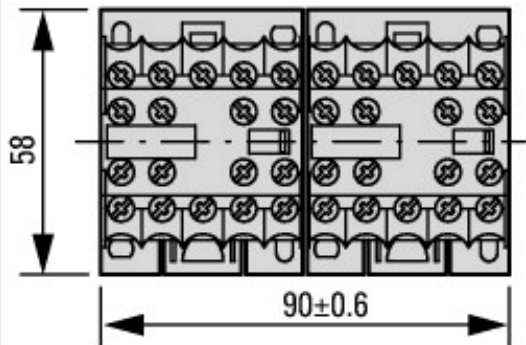
Short-time loading, 3-pole  
 Time interval between two loading cycles: 15 minutes

### Dimensions

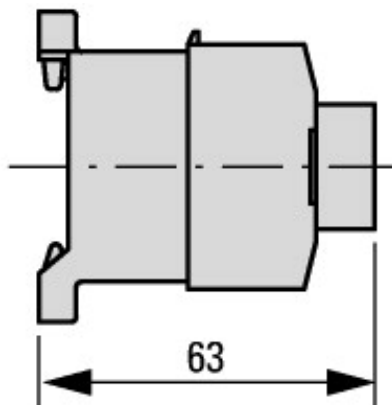
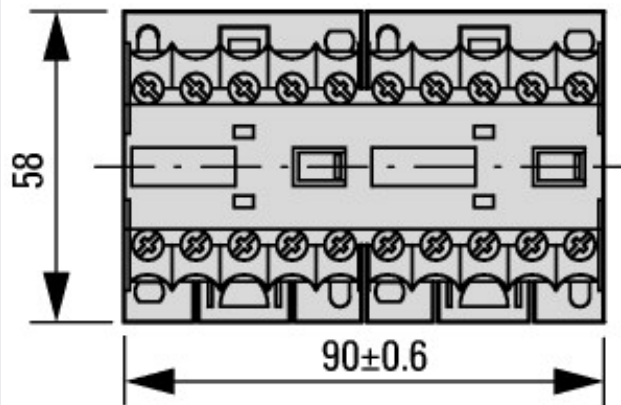




2DILE-... + MVDILE + ...DILE  
2DILE-...-G + MVDILE + ...DILE



2DILE-... + MVDILE + ...DILE  
2DILE-...-G + MVDILE + ...DILE



2DILE-... + MVDILE  
2DILE-...-G + MVDILE



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We fully support every product we sell - for free! Our internal team and external sales engineers can answer any product or application question, no matter the complexity.

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