


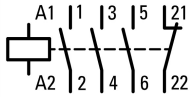


Contactor, 230 V 50/60 Hz, 3 pole, 380 V 400 V, 4 kW, Contacts N/C = Normally closed= 1 NC, Spring-loaded terminals, AC operation



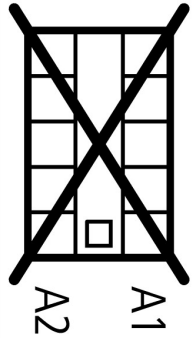
Part no. **DILEM-01-C(230V50/60HZ)**  
 Catalog No. **231690**  
 Alternate Catalog No. **XTMCC9A01G2**

**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 |
| Notes   |                |    | <br>Also suitable for motors with efficiency class IE3.<br>IE3-ready devices are identified by the logo on their packaging.              |
| Connection technique                                      |                |    | Spring-loaded terminals  |
| Description   |                |    | With auxiliary contact   |
| Number of poles   |                |    | 3 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  |
| <b>Contacts</b>   |                |    |  |
| N/C = Normally closed                                     |                |    | 1 NC   |
| Contact sequence  |                |    |    |
| For use with  |                |    | ...DILE-C  |
| Actuating voltage   |                |    | 230 V 50/60 Hz   |
| Voltage AC/DC   |                |    | AC operation   |

**Technical data**

|                                     |            |               |                                 |
|-------------------------------------|------------|---------------|---------------------------------|
| <b>General</b>                      |            |               |                                 |
| Standards                           |            |               | IEC/EN 60947, VDE 0660, CSA, UL |
| Lifespan, mechanical; Coil 50/60 Hz | Operations | $\times 10^6$ | 7                               |
| Lifespan, mechanical                | Operations | $\times 10^6$ | 10                              |
| 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   |
| Main contacts Make/break contacts                                     | g                |      |  |
| Break contact   | 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                      |                  |      |  |
| Spring-loaded terminals   |                  |      |  |
| Flexible with ferrule   | mm <sup>2</sup>  |      | 1 x (1 - 2.5)<br>2 x (1 - 2.5)   |
| Solid or stranded   | AWG              |      | 16 - 14  |
| Stripping length  | mm               |      | 10   |
| Standard screwdriver  | mm               |      | 0.6 x 3.5  |
| <b>Main conducting paths</b>  |                  |      |  |
| 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  |
| <b>AC</b>   |                |     |     |
| <b>AC-1</b>   |                |     |     |
| Rated operational current                                 |                |     |     |
| 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   | 50  |
| enclosed  | $I_{th}$       | A   | 40  |
| <b>AC-3</b>   |                |     |     |
| Rated operational current                                 |                |     |     |
| 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 |
| Motor rating  |                |     |     |
|   | 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>   |                |     |     |
| Rated operational current                                 |                |     |     |
| 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 |
| Motor rating  |                |     |     |
|   | 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   |

## DC

|                                    |       |   |    |     |
|------------------------------------|-------|---|----|-----|
| Rated operational current open     |       |   |    |     |
| 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  | 5.9 |
| at $I_e$ to AC-3/400 V             |       |   | W  | 1.2 |

## Magnet systems

|   |         |         |  |            |
|---|---------|---------|--|------------|
| Voltage tolerance                                 |         |         |  |            |
| AC operated                                       |         |         |  |            |
| Dual-frequency coil 50/60 Hz                      | Pick-up | $x U_c$ |  | 0.85 - 1.1 |
| Power consumption                                 |         |         |  |            |
| AC operation                                      |         |         |  |            |
| Dual-frequency coil 50/60 Hz at 50 Hz             | Pick-up | VA      |  | 30         |
| Dual-frequency coil 50/60 Hz at 50 Hz             | Pick-up | W       |  | 26         |
| Dual-frequency coil 50/60 Hz at 50 Hz             | Sealing | VA      |  | 5.4        |
| Dual-frequency coil 50/60 Hz at 50 Hz             | Sealing | W       |  | 1.8        |
| Dual-frequency coil 50/60 Hz at 60 Hz             | Pick-up | VA      |  | 29         |
| Dual-frequency coil 50/60 Hz at 60 Hz             | Pick-up | W       |  | 24         |
| Dual-frequency coil 50/60 Hz at 60 Hz             | Sealing | VA      |  | 3.9        |
| Dual-frequency coil 50/60 Hz at 60 Hz             | Sealing | W       |  | 1.8        |
| Duty factor                                       |         | % DF    |  | 100        |
| Switching times at 100 % $U_c$                    |         |         |  |            |
| Make contact                                      |         |         |  |            |
| Closing delay                                     |         | ms      |  |            |
| Closing delay min.                                |         | ms      |  | 14         |
| Closing delay max.                                |         | ms      |  | 21         |
| Opening delay                                     |         |         |  |            |
| 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   |
| Auxiliary contacts           |  |      |      |
| Pilot Duty                   |  |      |      |
| AC operated                  |  |      | A600 |
| DC operated                  |  |      | P300 |
| General Use                  |  |      |      |
| AC                           |  | V    | 600  |
| AC                           |  | A    | 10   |
| DC                           |  | V    | 250  |
| DC                           |  | A    | 0.5  |
| 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 | 9   |
| Heat dissipation per pole, current-dependent             | $P_{vid}$ | W | 0.4 |

|  |                   |    |  |
|--|-------------------|----|--|
| Equipment heat dissipation, current-dependent  | P <sub>vid</sub>  | W  | 1.2  |
| Static heat dissipation, non-current-dependent   | P <sub>vs</sub>   | W  | 1.8  |
| Heat dissipation capacity  | P <sub>diss</sub> | 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

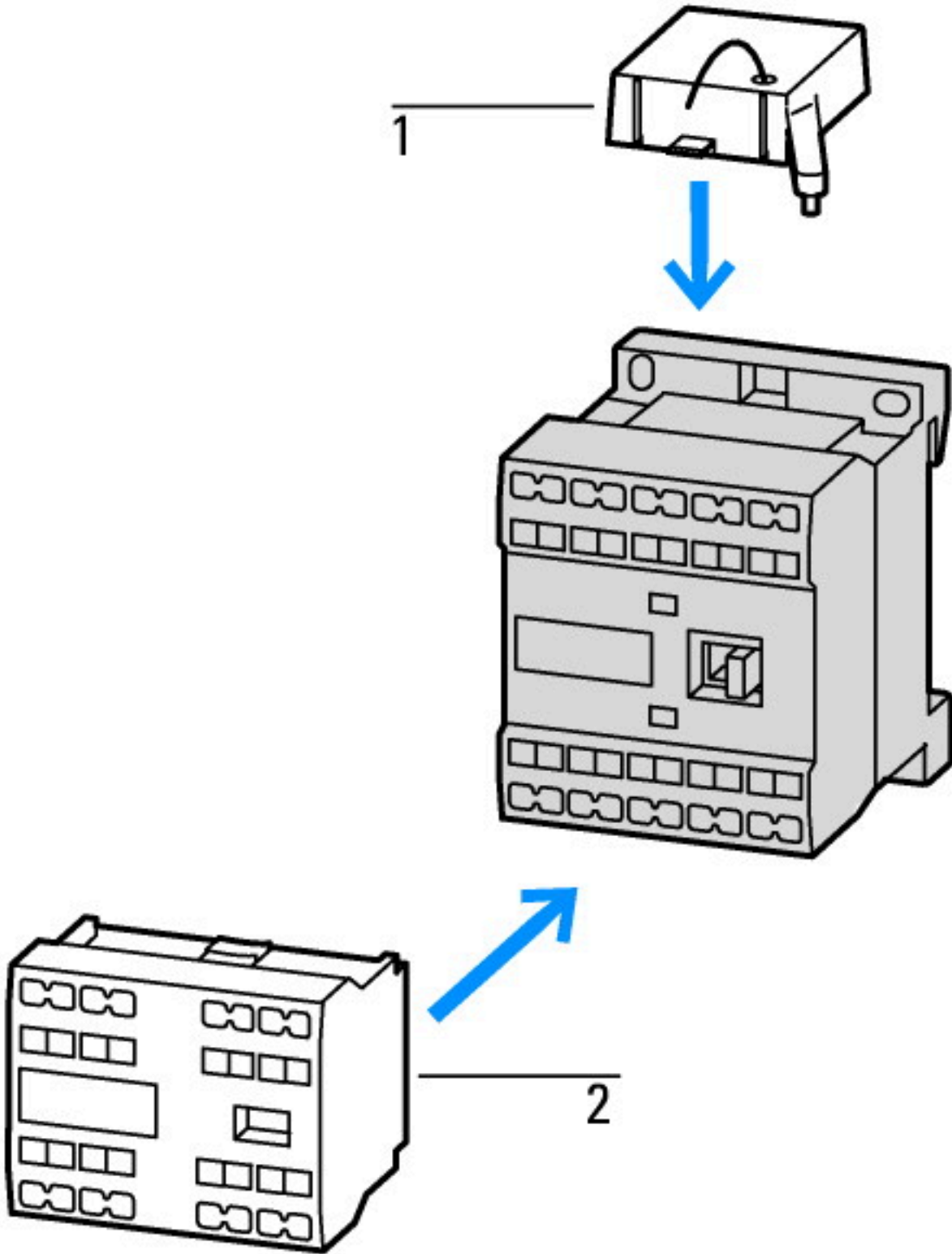
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|---|----|--|-------------------------|
| Low-voltage industrial components (EG000017) / Power contactor, AC switching (EC000066)   |    |  |                         |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Contactor (LV) / Power contactor, AC switching (ecl@ss10.0.1-27-37-10-03 [AAB718015]) |    |  |                         |
| Rated control supply voltage U <sub>s</sub> at AC 50HZ  | V  |  | 230 - 230               |
| Rated control supply voltage U <sub>s</sub> at AC 60HZ  | V  |  | 230 - 230               |
| Rated control supply voltage U <sub>s</sub> at DC   | V  |  | 0 - 0                   |
| Voltage type for actuating  |    |  | AC                      |
| Rated operation current I <sub>e</sub> at AC-1, 400 V   | A  |  | 22                      |
| Rated operation current I <sub>e</sub> at AC-3, 400 V   | A  |  | 9                       |
| Rated operation power at AC-3, 400 V  | kW |  | 4                       |
| Rated operation current I <sub>e</sub> 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   |    |  | 1                       |
| Type of electrical connection of main circuit   |    |  | Spring clamp connection |
| Number of normally closed contacts as main contact  |    |  | 0                       |
| Number of main contacts as normally open contact  |    |  | 3                       |

## 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: Suppressor  
 2: Auxiliary contact module  
 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

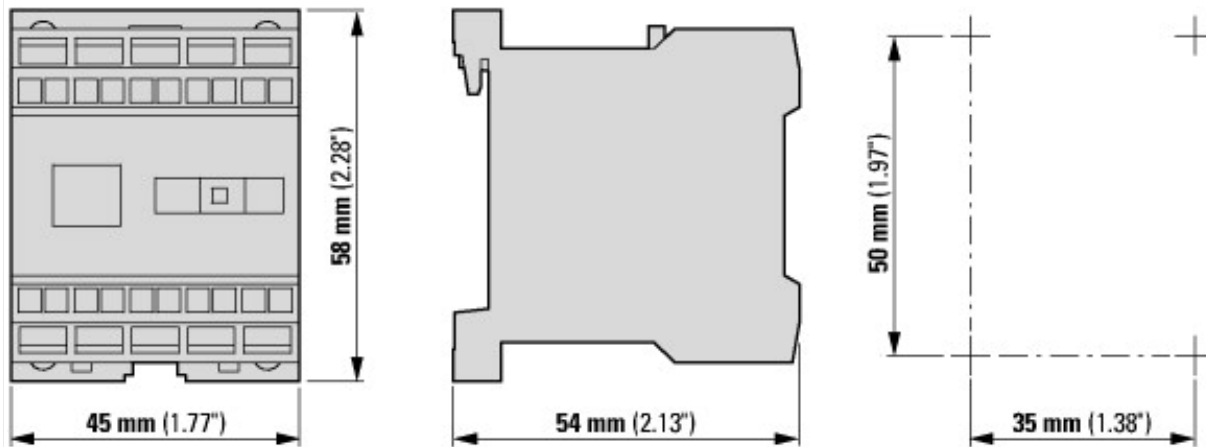


Switching duty for non-motor loads, 3-pole, 4-pole  
 Operating characteristics  
 Non-inductive or slightly inductive loads  
 Electrical characteristics  
 Make: 1 x rated current  
 Break: 1 x rated current  
 Utilization category  
 100 % AC-1  
 Typical applications  
 Electric heat



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

## Dimensions



## Assets (links)

[Declaration of CE Conformity](#)

00003110

[Instruction Leaflets](#)

IL03407009Z2018\_04

## Additional product information (links)

IL03407009Z (AWA2100-0882) mini contactor relay

