
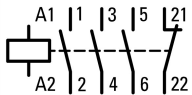


**Contactors, 3 pole, 380 V 400 V 3 kW, 1 NC, 230 V 50 Hz, 240 V 60 Hz, AC operation, Spring-loaded terminals**

**Part no.** DILMC7-01(230V50HZ,240V60HZ)  
**Catalog No.** 277421  
**Alternate Catalog No.** XTCEC007B01F  
**EL-Nummer (Norway)** 4110301

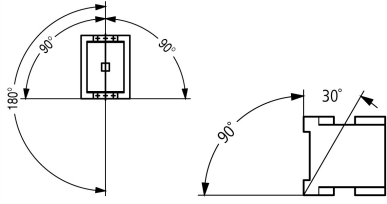
**Delivery program**

|   |                |    |  |   |
|---|----------------|----|--|---|
| Product range   |                |    |  | Contactors  |
| Application   |                |    |  | Contactors for Motors   |
| Subrange  |                |    |  | Contactors up to 170 A, 3 pole  |
| Utilization category                                      |                |    |  | AC-1: Non-inductive or slightly inductive loads, resistance furnaces<br>AC-3/AC-3e: Normal AC induction motors: Starting, switching off while 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   |
| Number of poles   |                |    |  | 3 pole  |
| <b>Rated operational current</b>                          |                |    |  |   |
| AC-3  |                |    |  |   |
| Notes   |                |    |  | At maximum permissible ambient temperature (open.)<br>Also tested according to AC-3e.   |
| 380 V 400 V   | $I_e$          | A  |  | 7   |
| AC-1  |                |    |  |   |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz |                |    |  |   |
| Open  |                |    |  |   |
| at 40 °C  | $I_{th} = I_e$ | A  |  | 22  |
| enclosed  | $I_{th}$       | A  |  | 18  |
| Conventional free air thermal current, 1 pole             |                |    |  |   |
| open  | $I_{th}$       | A  |  | 50  |
| enclosed  | $I_{th}$       | A  |  | 45  |
| <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 |  | 3   |
| 660 V 690 V   | P              | kW |  | 3.5   |
| AC-4  |                |    |  |   |
| 220 V 230 V   | P              | kW |  | 1   |
| 380 V 400 V   | P              | kW |  | 2.2   |
| 660 V 690 V   | P              | kW |  | 2.9   |
| <b>Contacts</b>   |                |    |  |   |
| N/C = Normally closed                                     |                |    |  | 1 NC  |
| Contact sequence  |                |    |  |   |
| <b>Instructions</b>                                       |                |    |  |   |
| Can be combined with auxiliary contact                    |                |    |  | DILA-XHIC(V)...   |
| Actuating voltage   |                |    |  | 230 V 50 Hz, 240 V 60 Hz  |

|                            |  |              |
|----------------------------|--|--------------|
| Voltage AC/DC              |  | AC operation |
| Connection to SmartWire-DT |  | no           |
| Frame size                 |  | 1            |

## Technical data

### General

|   |                              |  |
|---|------------------------------|--|
| Standards   |                              | IEC/EN 60947, VDE 0660, UL, CSA  |
| Lifespan, mechanical  |                              |  |
| AC operated   | Operations x 10 <sup>6</sup> | 10   |
| Operating frequency, mechanical                                       |                              |  |
| AC operated   | Operations/h                 | 9000   |
| Climatic proofing   |                              | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30     |
| Ambient temperature   |                              |  |
| Open  | °C                           | -25 - +60  |
| Enclosed  | °C                           | - 25 - 40  |
| Storage   | °C                           | - 40 - 80  |
| Mounting position   |                              |  |
| Mechanical shock resistance (IEC/EN 60068-2-27)                       |                              |  |
| Half-sinusoidal shock, 10 ms  |                              |  |
| Main contacts   |                              |  |
| N/O contact   | g                            | 10   |
| Auxiliary contacts  |                              |  |
| N/O contact   | g                            | 7  |
| N/C contact   | g                            | 5  |
| Mechanical shock resistance (IEC/EN 60068-2-27) when tabletop-mounted |                              |  |
| Half-sinusoidal shock, 10 ms  |                              |  |
| Main contacts   |                              |  |
| N/O contact   | g                            | 5.7  |
| Auxiliary contacts  |                              |  |
| N/O contact   | g                            | 3.4  |
| N/C contact   | g                            | 3.4  |
| 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  |                              |  |
| AC operated   | kg                           | 0.23   |
| Spring-loaded terminal connection                                     |                              |  |
| Terminal capacity main cable  |                              |  |
| Solid   | mm <sup>2</sup>              | 1 x (0.75 - 2.5)<br>2 x (0.75 - 2.5)   |
| flexible  | mm <sup>2</sup>              | 1 x (0.75 - 2.5)<br>2 x (0.75 - 2.5)   |
| flexible with ferrules  | 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                           | 10   |
| Terminal capacity control circuit cables                              |                              |  |
| Solid   | mm <sup>2</sup>              | 1 x (0.75 - 2.5)<br>2 x (0.75 - 2.5)   |
| Flexible  | 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)   |

|                              |  |     |                  |
|------------------------------|--|-----|------------------|
|                              |  |     | 2 x (0.75 - 1.5) |
| Solid or stranded            |  | AWG | 18 - 14          |
| Stripping length             |  | mm  | 10               |
| Tool                         |  |     |                  |
| Screwdriver blade width      |  | mm  | 3.5              |
| Push-in terminals            |  |     |                  |
| Terminal capacity main cable |  |     |                  |
| Solid or stranded            |  | AWG | 18 - 14          |

### Main conducting paths

|  |             |      |       |
|--|-------------|------|-------|
| Rated impulse withstand voltage        | $U_{imp}$   | V AC | 8000  |
| Overvoltage category/pollution degree  |             |      | III/3 |
| Rated insulation voltage               | $U_i$       | V AC | 690   |
| Rated operational voltage              | $U_e$       | V AC | 690   |
| Safe isolation to EN 61140             |             |      |       |
| between coil and contacts              |             | V AC | 400   |
| between the contacts                   |             | V AC | 400   |
| Making capacity (p.f. to IEC/EN 60947) |             |      |       |
|  | Up to 690 V | A    | 112   |
| Breaking capacity                      |             |      |       |
| 220 V 230 V                            |             | A    | 70    |
| 380 V 400 V                            |             | A    | 70    |
| 500 V                                  |             | A    | 50    |
| 660 V 690 V                            |             | A    | 40    |
| Short-circuit rating                   |             |      |       |
| Short-circuit protection maximum fuse  |             |      |       |
| Type "2" coordination                  |             |      |       |
| 400 V                                  | gG/gL 500 V | A    | 20    |
| 690 V                                  | gG/gL 690 V | A    | 16    |
| Type "1" coordination                  |             |      |       |
| 400 V                                  | gG/gL 500 V | A    | 35    |
| 690 V                                  | gG/gL 690 V | A    | 20    |

### AC

|   |                |   |   |
|---|----------------|---|---|
| AC-1  |                |   |   |
| 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 | 21  |
| at 55 °C  | $I_{th} = I_e$ | A | 21  |
| at 60 °C  | $I_{th} = I_e$ | A | 20  |
| enclosed  | $I_{th}$       | A | 18  |
| Conventional free air thermal current, 1 pole             |                |   |   |
| open  | $I_{th}$       | A | 50  |
| enclosed  | $I_{th}$       | A | 45  |
| AC-3  |                |   |   |
| Rated operational current                                 |                |   |   |
| Open, 3-pole: 50 – 60 Hz                                  |                |   |   |
| Notes   |                |   | At maximum permissible ambient temperature (open.)<br>Also tested according to AC-3e. |
| 220 V 230 V   | $I_e$          | A | 7   |
| 240 V   | $I_e$          | A | 7   |
| 380 V 400 V   | $I_e$          | A | 7   |
| 415 V   | $I_e$          | A | 7   |
| 440V  | $I_e$          | A | 7   |
| 500 V   | $I_e$          | A | 5   |

|                          |       |     |     |
|--------------------------|-------|-----|-----|
| 660 V 690 V              | $I_e$ | A   | 4   |
| 380 V 400 V              | $I_e$ | A   | 7   |
| Motor rating             | P     | kWh |     |
| 220 V 230 V              | P     | kW  | 2.2 |
| 240V                     | P     | kW  | 2.2 |
| 380 V 400 V              | P     | kW  | 3   |
| 415 V                    | P     | kW  | 4   |
| 440 V                    | P     | kW  | 4.5 |
| 500 V                    | P     | kW  | 3.5 |
| 660 V 690 V              | P     | kW  | 3.5 |
| <b>AC-4</b>              |       |     |     |
| Open, 3-pole: 50 – 60 Hz |       |     |     |
| 220 V 230 V              | $I_e$ | A   | 5   |
| 240 V                    | $I_e$ | A   | 5   |
| 380 V 400 V              | $I_e$ | A   | 5   |
| 415 V                    | $I_e$ | A   | 5   |
| 440 V                    | $I_e$ | A   | 5   |
| 500 V                    | $I_e$ | A   | 4.5 |
| 660 V 690 V              | $I_e$ | A   | 4   |
| Motor rating             | P     | kWh |     |
| 220 V 230 V              | P     | kW  | 1   |
| 240 V                    | P     | kW  | 1.5 |
| 380 V 400 V              | P     | kW  | 2.2 |
| 415 V                    | P     | kW  | 2.3 |
| 440 V                    | P     | kW  | 2.4 |
| 500 V                    | P     | kW  | 2.5 |
| 660 V 690 V              | P     | kW  | 2.9 |

## DC

|                                 |       |   |    |
|---------------------------------|-------|---|----|
| Rated operational current, open |       |   |    |
| DC-1                            |       |   |    |
| 60 V                            | $I_e$ | A | 20 |
| 110 V                           | $I_e$ | A | 20 |
| 220 V                           | $I_e$ | A | 15 |

## Current heat loss

|  |  |    |     |
|--|--|----|-----|
| 3 pole, at $I_{th}$ (60°)                |  | W  | 2.4 |
| Current heat loss at $I_e$ to AC-3/400 V |  | W  | 0.3 |
| Impedance per pole                       |  | mΩ | 2.5 |

## Magnet systems

|  |          |         |           |
|--|----------|---------|-----------|
| Voltage tolerance  |          |         |           |
| AC operated  | Pick-up  | $x U_c$ | 0.8 - 1.1 |
| Drop-out voltage AC operated                                       | Drop-out | $x U_c$ | 0.3 - 0.6 |
| Power consumption of the coil in a cold state and $1.0 \times U_S$ |          |         |           |
| 50 Hz  | Pick-up  | VA      | 24        |
| 50 Hz  | Sealing  | VA      | 3.4       |
| 50 Hz  | Sealing  | W       | 1.4       |
| 60 Hz  | Pick-up  | VA      | 30        |
| 60 Hz  | Sealing  | VA      | 4.4       |
| 60 Hz  | Sealing  | W       | 1.4       |
| Duty factor  |          | % DF    | 100       |
| Changeover time at 100 % $U_S$ (recommended value)                 |          |         |           |
| Main contacts  |          |         |           |
| AC operated  |          |         |           |
|  |          | ms      | 15 - 21   |
|  |          | ms      | 9 - 18    |
|  |          | ms      | 10        |

## Electromagnetic compatibility (EMC)

|                       |  |  |               |
|-----------------------|--|--|---------------|
| Emitted interference  |  |  | to EN 60947-1 |
| Interference immunity |  |  | to EN 60947-1 |

## Rating data for approved types

|                                      |  |      |                         |
|--------------------------------------|--|------|-------------------------|
| Switching capacity                   |  |      |                         |
| Maximum motor rating                 |  |      |                         |
| Three-phase                          |  |      |                         |
| 200 V<br>208 V                       |  | HP   | 1.5                     |
| 230 V<br>240 V                       |  | HP   | 2                       |
| 460 V<br>480 V                       |  | HP   | 3                       |
| 575 V<br>600 V                       |  | HP   | 5                       |
| Single-phase                         |  |      |                         |
| 115 V<br>120 V                       |  | HP   | 0.25                    |
| 230 V<br>240 V                       |  | HP   | 1                       |
| General use                          |  | A    | 20                      |
| Auxiliary contacts                   |  |      |                         |
| Pilot Duty                           |  |      |                         |
| AC operated                          |  |      | A600                    |
| DC operated                          |  |      | P300                    |
| General Use                          |  |      |                         |
| AC                                   |  | V    | 600                     |
| AC                                   |  | A    | 10                      |
| DC                                   |  | V    | 250                     |
| DC                                   |  | A    | 1                       |
| Short Circuit Current Rating         |  | SCCR |                         |
| Basic Rating                         |  |      |                         |
| SCCR                                 |  | kA   | 5                       |
| max. Fuse                            |  | A    | 45                      |
| max. CB                              |  | A    | 60                      |
| 480 V High Fault                     |  |      |                         |
| SCCR (fuse)                          |  | kA   | 30/100                  |
| max. Fuse                            |  | A    | 25 Class RK5/20 Class J |
| SCCR (CB)                            |  | kA   | 65                      |
| max. CB                              |  | A    | 16                      |
| 600 V High Fault                     |  |      |                         |
| SCCR (fuse)                          |  | kA   | 30/100                  |
| max. Fuse                            |  | A    | 25 Class RK5/20 Class J |
| Special Purpose Ratings              |  |      |                         |
| Electrical Discharge Lamps (Ballast) |  |      |                         |
| 480V 60Hz 3phase, 277V 60Hz 1phase   |  | A    | 12                      |
| 600V 60Hz 3phase, 347V 60Hz 1phase   |  | A    | 12                      |
| Incandescent Lamps (Tungsten)        |  |      |                         |
| 480V 60Hz 3phase, 277V 60Hz 1phase   |  | A    | 14                      |
| 600V 60Hz 3phase, 347V 60Hz 1phase   |  | A    | 14                      |
| Resistance Air Heating               |  |      |                         |
| 480V 60Hz 3phase, 277V 60Hz 1phase   |  | A    | 12                      |
| 600V 60Hz 3phase, 347V 60Hz 1phase   |  | A    | 12                      |
| Refrigeration Control (CSA only)     |  |      |                         |
| LRA 480V 60Hz 3phase                 |  | A    | 60                      |
| FLA 480V 60Hz 3phase                 |  | A    | 10                      |
| LRA 600V 60Hz 3phase                 |  | A    | 60                      |
| FLA 600V 60Hz 3phase                 |  | A    | 10                      |

| Definite Purpose Ratings (100,000 cycles acc. to UL 1995) |  |    |      |
|---|--|----|------|
| LRA 480V 60Hz 3phase                                      |  | A  | 42   |
| FLA 480V 60Hz 3phase                                      |  | A  | 7    |
| Elevator Control  |  |    |      |
| 200V 60Hz 3phase  |  | HP | 0.75 |
| 200V 60Hz 3phase  |  | A  | 3.7  |
| 240V 60Hz 3phase  |  | HP | 1.5  |
| 240V 60Hz 3phase  |  | A  | 6    |
| 480V 60Hz 3phase  |  | HP | 2    |
| 480V 60Hz 3phase  |  | A  | 3.4  |
| 600V 60Hz 3phase  |  | HP | 3    |
| 600V 60Hz 3phase  |  | A  | 3.9  |

## Design verification as per IEC/EN 61439

| Technical data for design verification   |            |    |  |
|--|------------|----|--|
| Rated operational current for specified heat dissipation   | $I_n$      | A  | 7  |
| Heat dissipation per pole, current-dependent   | $P_{vid}$  | W  | 0.1  |
| Equipment heat dissipation, current-dependent  | $P_{vid}$  | W  | 0  |
| Static heat dissipation, non-current-dependent   | $P_{vs}$   | W  | 1.4  |
| Heat dissipation capacity  | $P_{diss}$ | W  | 0  |
| Operating ambient temperature min.   |            | °C | -25  |
| Operating ambient temperature max.   |            | °C | 60   |
| 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 $U_s$ at AC 50HZ   |  | V | 230 - 230 |
| Rated control supply voltage $U_s$ at AC 60HZ   |  | V | 240 - 240 |

|   |    |                         |
|---|----|-------------------------|
| 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  | 7                       |
| Rated operation power at AC-3, 400 V                    | kW | 3                       |
| Rated operation current Ie at AC-4, 400 V               | A  | 5                       |
| Rated operation power at AC-4, 400 V                    | kW | 2.2                     |
| Rated operation power NEMA                              | kW | 2.2                     |
| 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 60947-4-1; CSA - C22.2 No. 60947-4-1-14; CE marking |
| UL File No.                          |  | E29096   |
| UL Category Control No.              |  | NLDX   |
| CSA File No.                         |  | 012528   |
| CSA Class No.                        |  | 2411-03, 3211-04   |
| North America Certification          |  | UL listed, CSA certified   |
| Specially designed for North America |  | No   |



- 1: Overload relay
- 2: Suppressor
- 3: Auxiliary contact modules





- 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

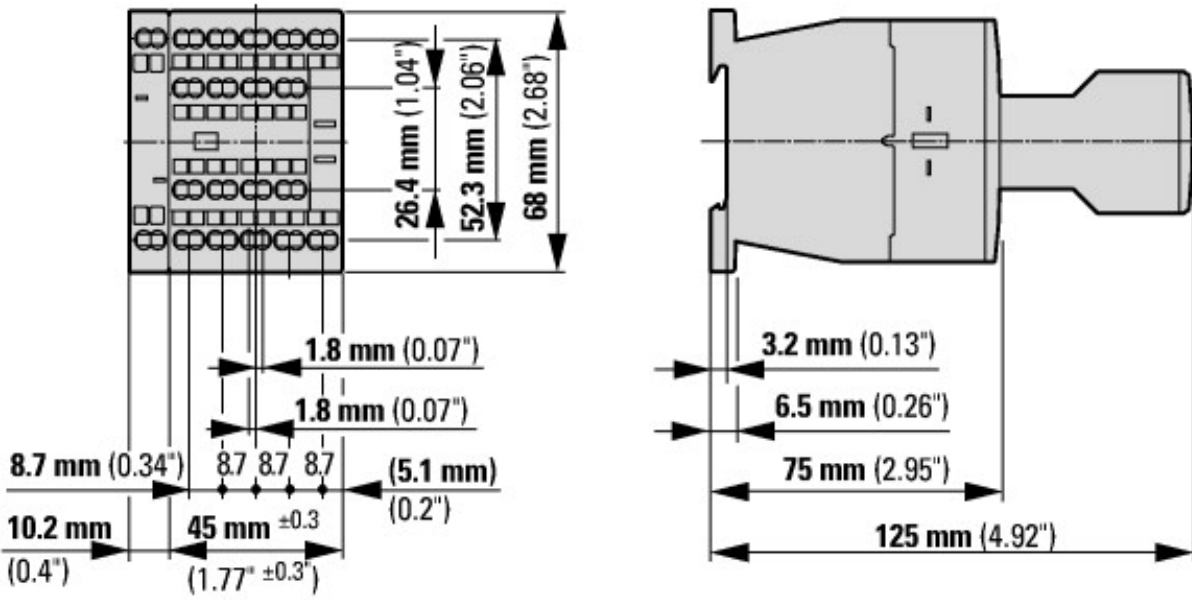


- Extreme switching duty
- Squirrel-cage motor
- Operating characteristics
- Inching, plugging, reversing
- Electrical characteristics
- Make: up to 6 x rated motor current
- Break: up to 6 x rated motor current
- Utilization category
- 100 % AC-4
- Typical applications
- Printing presses
- Wire-drawing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

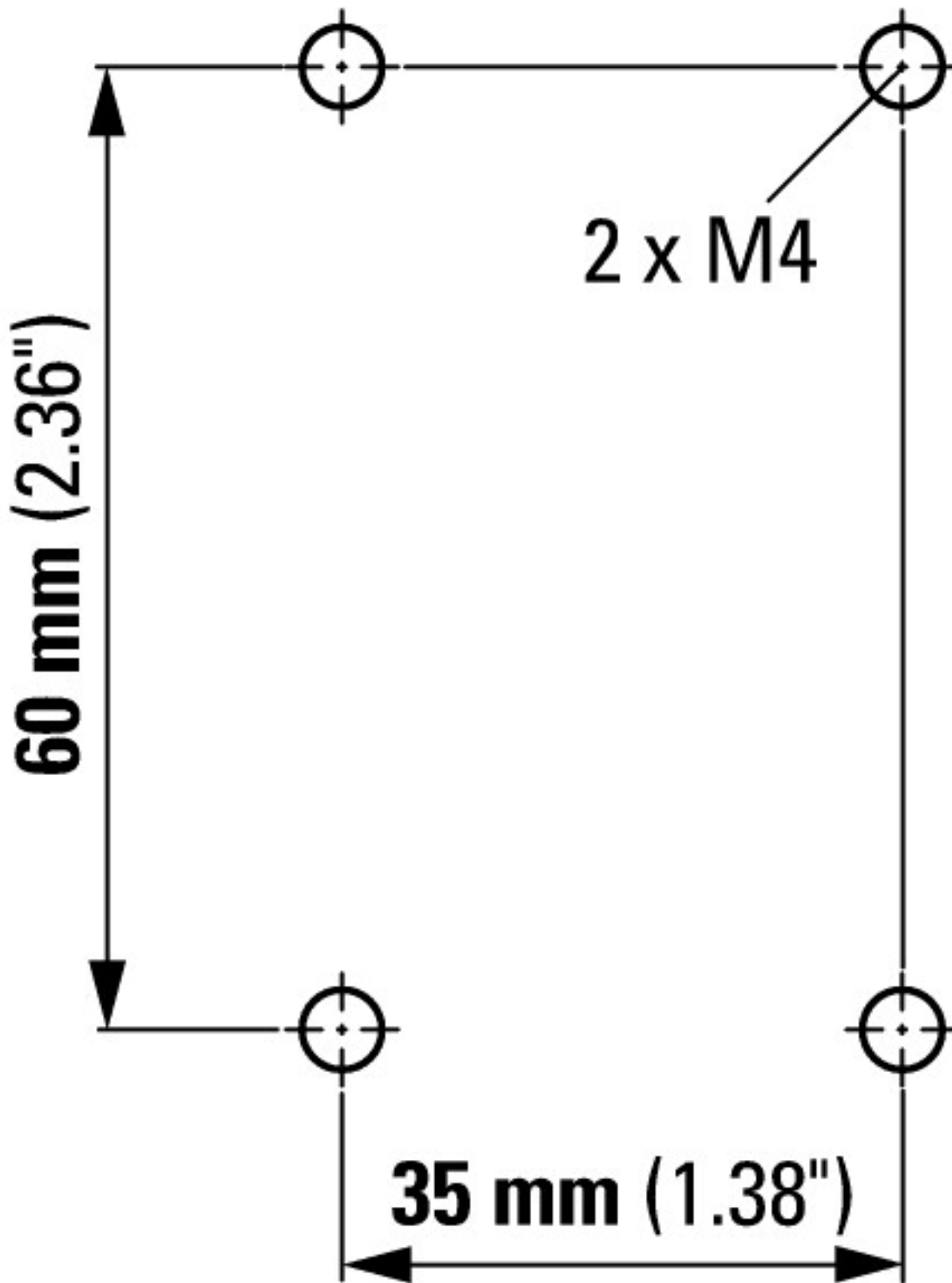


Switching conditions for non-motor consumers, 3 pole, 4 pole  
 Operating characteristics  
 Non inductive and slightly inductive loads  
 Electrical characteristics  
 Switch on: 1 x rated operational current  
 Switch off: 1 x rated operational current  
 Utilization category  
 100 % AC-1  
 Typical examples of application  
 Electric heat

## Dimensions



Contacteur avec module de contact auxiliaire



DILMC7...DILMC15  
 DILAC...  
 DILA-XHIC...

### Additional product information (links)

#### IL03407013Z (AWA2100-2126) Contactors

|  |   |
|--|---|
| IL03407013Z (AWA2100-2126) Contactors  | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407013Z2020_05.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407013Z2020_05.pdf</a>                               |
| Motor starters and "Special Purpose Ratings" for the North American market                   | <a href="http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_3258146.pdf">http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_3258146.pdf</a> |
| Switchgear of Power Factor Correction Systems  | <a href="http://www.moeller.net/binary/ver_techpapers/ver934en.pdf">http://www.moeller.net/binary/ver_techpapers/ver934en.pdf</a>   |
| X-Start - Modern Switching Installations Efficiently Fitted and Wired Securely               | <a href="http://www.moeller.net/binary/ver_techpapers/ver938en.pdf">http://www.moeller.net/binary/ver_techpapers/ver938en.pdf</a>   |
| Mirror Contacts for Highly-Reliable Information Relating to Safety-Related Control Functions | <a href="http://www.moeller.net/binary/ver_techpapers/ver944en.pdf">http://www.moeller.net/binary/ver_techpapers/ver944en.pdf</a>   |
| Effect of the Cable Capacitance of Long Control Cables on the Actuation of Contactors        | <a href="http://www.moeller.net/binary/ver_techpapers/ver949en.pdf">http://www.moeller.net/binary/ver_techpapers/ver949en.pdf</a>   |

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| Switchgear for Luminaires  | <a href="http://www.moeller.net/binary/ver_techpapers/ver955en.pdf">http://www.moeller.net/binary/ver_techpapers/ver955en.pdf</a> |
| Standard Compliant and Functionally Safe Engineering Design with Mechanical Auxiliary Contacts | <a href="http://www.moeller.net/binary/ver_techpapers/ver956en.pdf">http://www.moeller.net/binary/ver_techpapers/ver956en.pdf</a> |
| The Interaction of Contactors with PLCs  | <a href="http://www.moeller.net/binary/ver_techpapers/ver957en.pdf">http://www.moeller.net/binary/ver_techpapers/ver957en.pdf</a> |
| Busbar Component Adapters for modern Industrial control panels                                 | <a href="http://www.moeller.net/binary/ver_techpapers/ver960en.pdf">http://www.moeller.net/binary/ver_techpapers/ver960en.pdf</a> |