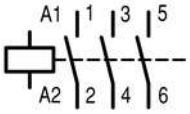
# DATASHEET - DILMF65(RAC48)



**Contactors for Semiconductor Industries acc. to SEMI F47, 380 V 400 V: 65 A, RAC 48: 42 - 48 V 50/60 Hz, Screw terminals**

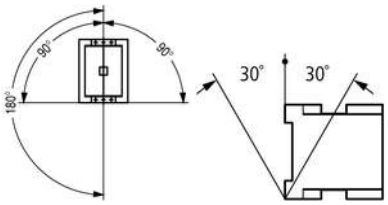
| | |
|---|---|
| **Part no.** | **DILMF65(RAC48)** |
| **Catalog No.** | **104467** |
| **Alternate Catalog No.** | **XTCE065D00W-F47** |

## Delivery program

| | | | |
|---|---|---|---|
| Product range | | | Contactors |
| Application | | | Contactors for Semiconductor Industries acc. to SEMI F47 |
| Subrange | | | Contactors up to 150 A with electronic actuation |
| 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 |
| | | | IE3 |
| Notes | | | Also suitable for motors with efficiency class IE3.<br>Also tested according to AC-3e. |
| Connection technique | | | Screw terminals |
| **Rated operational current** | | | |
| AC-3 | | | |
| 380 V 400 V | $I_e$ | A | 65 |
| AC-1 | | | |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz | | | |
| Open | | | |
| at 40 °C | $I_{th} = I_e$ | A | 98 |
| enclosed | $I_{th}$ | A | 72 |
| Conventional free air thermal current, 1 pole | | | |
| open | $I_{th}$ | A | 200 |
| enclosed | $I_{th}$ | A | 180 |
| **Max. rating for three-phase motors, 50 - 60 Hz** | | | |
| AC-3 | | | |
| 220 V 230 V | P | kW | 20 |
| 380 V 400 V | P | kW | 30 |
| 660 V 690 V | P | kW | 35 |
| AC-4 | | | |
| 220 V 230 V | P | kW | 7 |
| 380 V 400 V | P | kW | 12 |
| 660 V 690 V | P | kW | 17 |
| Contact sequence | | |   |
| Actuating voltage | | | RAC 48: 42 - 48 V 50/60 Hz |
| **Instructions** | | | Contacts to EN 50 012.<br>built-in suppressor circuit'<br>integrated suppressor circuit in actuating electronics |

# Technical data

## General

| | | | |
|---|---|---|---|
| Mounting position | | |  |
| Altitude | | m | Max. 2000 |

## 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 | 98 |
| at 50 °C | $I_{th} = I_e$ | A | 88 |
| at 60 °C | $I_{th} = I_e$ | A | 80 |
| enclosed | $I_{th}$ | A | 72 |
| Conventional free air thermal current, 1 pole | | | |
| open | $I_{th}$ | A | 200 |
| enclosed | $I_{th}$ | A | 180 |
| 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 | 65 |
| 240 V | $I_e$ | A | 65 |
| 380 V 400 V | $I_e$ | A | 65 |
| 415 V | $I_e$ | A | 65 |
| 440V | $I_e$ | A | 65 |
| 500 V | $I_e$ | A | 65 |
| 660 V 690 V | $I_e$ | A | 37 |
| Motor rating | P | kWh | |
| 220 V 230 V | P | kW | 20 |
| 240V | P | kW | 22 |
| 380 V 400 V | P | kW | 30 |
| 415 V | P | kW | 39 |
| 440 V | P | kW | 41 |
| 500 V | P | kW | 47 |
| 660 V 690 V | P | kW | 35 |
| AC-4 | | | |
| Open, 3-pole: 50 – 60 Hz | | | |
| 220 V 230 V | $I_e$ | A | 25 |
| 240 V | $I_e$ | A | 25 |
| 380 V 400 V | $I_e$ | A | 25 |
| 415 V | $I_e$ | A | 25 |
| 440 V | $I_e$ | A | 25 |
| 500 V | $I_e$ | A | 25 |
| 660 V 690 V | $I_e$ | A | 20 |
| Motor rating | P | kWh | |
| 220 V 230 V | P | kW | 7 |
| 240 V | P | kW | 7.5 |
| 380 V 400 V | P | kW | 12 |
| 415 V | P | kW | 13 |

| | | | |
|---|---|---|---|
| 440 V | P | kW | 14 |
| 500 V | P | kW | 16 |
| 660 V 690 V | P | kW | 17 |

## Current heat loss

| | | | |
|---|---|---|---|
| 3 pole, at $I_{th}$ (60°) | | W | 28.8 |
| Current heat loss at $I_e$ to AC-3/400 V | | W | 17.1 |
| Impedance per pole | | mΩ | 1.86 |

## Magnet systems

| | | | |
|---|---|---|---|
| Voltage tolerance | | | |
| AC operated | Pick-up | x $U_c$ | 0.8 - 1.15 |
| Drop-out voltage AC operated | Drop-out | x $U_c$ | 0.2 - 0.5 |
| Power consumption of the coil in a cold state and 1.0 x $U_S$ | | | |
| Electronic actuation | Pick-up | VA | 45 |
| Electronic actuation | Sealing | VA | 1.5 |
| Electronic actuation | Sealing | W | 1.3 |
| Duty factor | | % DF | 100 |
| Operating times | | | |
| Closing delay | | ms | 50 |
| Opening delay | | ms | 45 |
| -suitable according to | | | SEMI F47 |

## Electromagnetic compatibility (EMC)

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

## Additional technical data

| | | | |
|---|---|---|---|
| like the contactar | DIL | | M65 |

## Rating data for approved types

| | | | |
|---|---|---|---|
| Switching capacity | | | |
| Maximum motor rating | | | |
| Three-phase | | | |
| 200 V<br>208 V | | HP | 20 |
| 230 V<br>240 V | | HP | 25 |
| 460 V<br>480 V | | HP | 50 |
| 575 V<br>600 V | | HP | 60 |
| Single-phase | | | |
| 115 V<br>120 V | | HP | 5 |
| 230 V<br>240 V | | HP | 15 |
| General use | | A | 88 |
| Short Circuit Current Rating | | SCCR | |
| Basic Rating | | | |
| SCCR | | kA | 10 |
| max. Fuse | | A | 250 |
| max. CB | | A | 250 |
| 480 V High Fault | | | |
| SCCR (fuse) | | kA | 30/100 |
| max. Fuse | | A | 250/150 Class J |
| SCCR (CB) | | kA | 65 |
| max. CB | | A | 100 |
| 600 V High Fault | | | |
| SCCR (fuse) | | kA | 30/100 |
| max. Fuse | | A | 250/150 Class J |
| SCCR (CB) | | kA | 30 |
| max. CB | | A | 250 |

| | | | |
|---|---|---|---|
| Special Purpose Ratings | | | |
| Electrical Discharge Lamps (Ballast) | | | |
| 480V 60Hz 3phase, 277V 60Hz 1phase | | A | 88 |
| 600V 60Hz 3phase, 347V 60Hz 1phase | | A | 88 |
| Incandescent Lamps (Tungsten) | | | |
| 480V 60Hz 3phase, 277V 60Hz 1phase | | A | 88 |
| 600V 60Hz 3phase, 347V 60Hz 1phase | | A | 88 |
| Resistance Air Heating | | | |
| 480V 60Hz 3phase, 277V 60Hz 1phase | | A | 88 |
| 600V 60Hz 3phase, 347V 60Hz 1phase | | A | 88 |
| Definite Purpose Ratings (100,000 cycles acc. to UL 1995) | | | |
| LRA 480V 60Hz 3phase | | A | 390 |
| FLA 480V 60Hz 3phase | | A | 65 |
| Elevator Control | | | |
| 200V 60Hz 3phase | | HP | 10 |
| 200V 60Hz 3phase | | A | 32.2 |
| 240V 60Hz 3phase | | HP | 15 |
| 240V 60Hz 3phase | | A | 42 |
| 480V 60Hz 3phase | | HP | 30 |
| 480V 60Hz 3phase | | A | 40 |
| 600V 60Hz 3phase | | HP | 40 |
| 600V 60Hz 3phase | | A | 41 |

## Design verification as per IEC/EN 61439

| | | | |
|---|---|---|---|
| Technical data for design verification | | | |
| Rated operational current for specified heat dissipation | $I_n$ | A | 65 |
| Heat dissipation per pole, current-dependent | $P_{vid}$ | W | 5.7 |
| Equipment heat dissipation, current-dependent | $P_{vid}$ | W | 17.1 |
| Static heat dissipation, non-current-dependent | $P_{vs}$ | W | 1.3 |
| 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. |

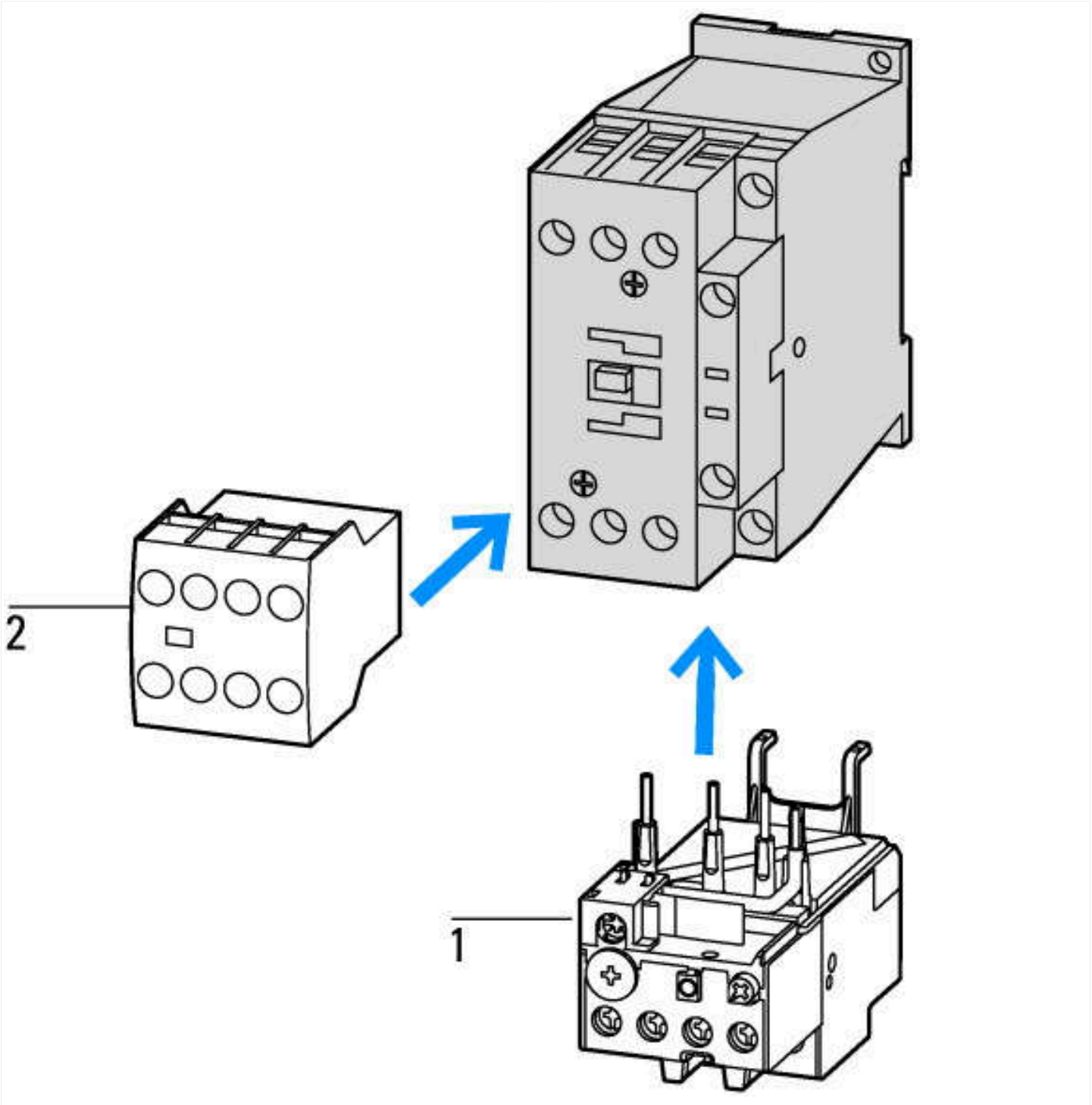
## Technical data ETIM 8.0

| | | | |
|---|---|---|---|
| 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 | 42 - 48 |
| Rated control supply voltage Us at AC 60HZ | | V | 42 - 48 |
| 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 | 85 |
| Rated operation current Ie at AC-3, 400 V | | A | 65 |
| Rated operation power at AC-3, 400 V | | kW | 30 |
| Rated operation current Ie at AC-4, 400 V | | A | 25 |
| Rated operation power at AC-4, 400 V | | kW | 12 |
| Rated operation power NEMA | | kW | 37 |
| 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 normally open contacts as main contact | | | 3 |

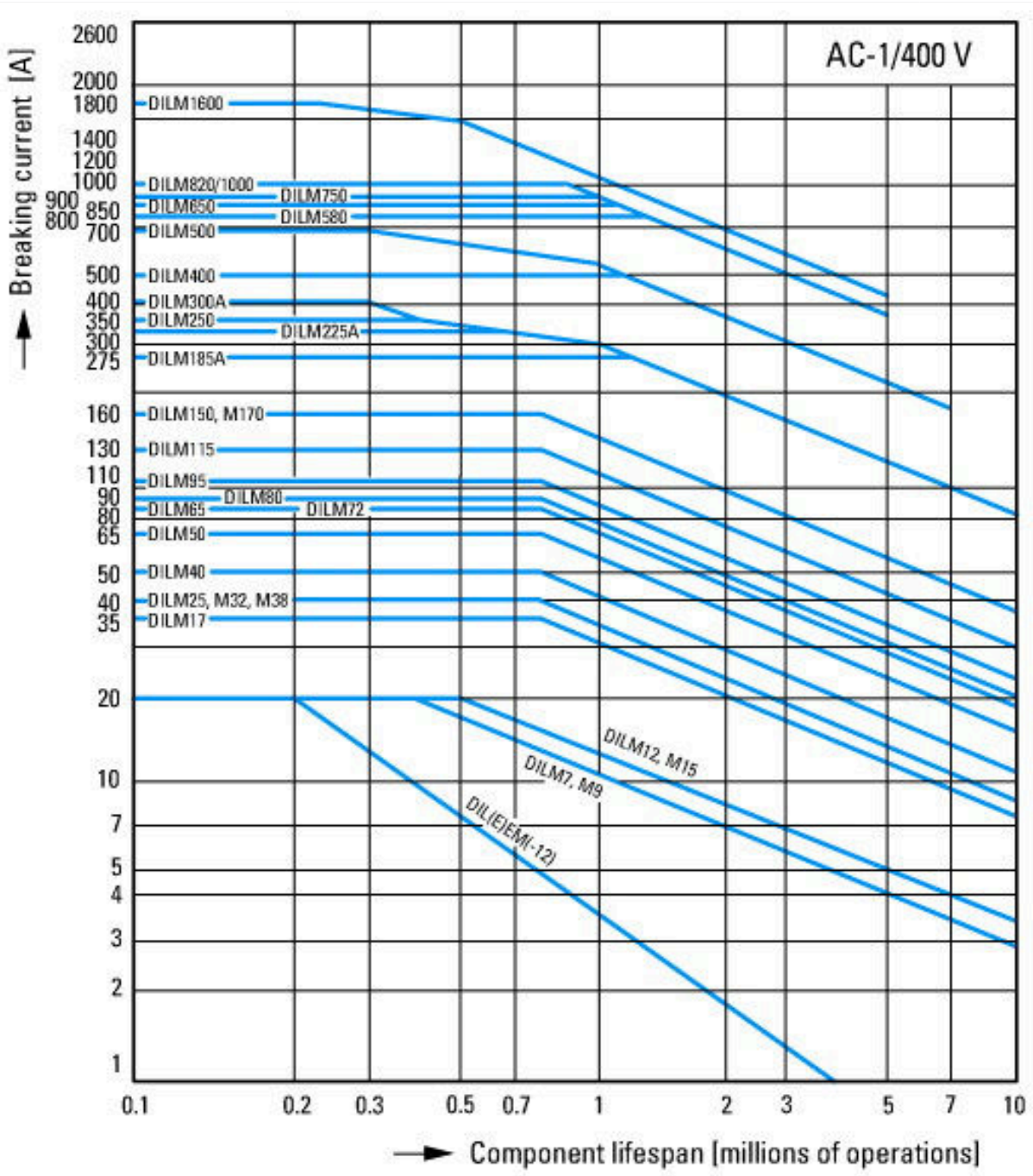
## Approvals

| | | | |
|---|---|---|---|
| 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 |

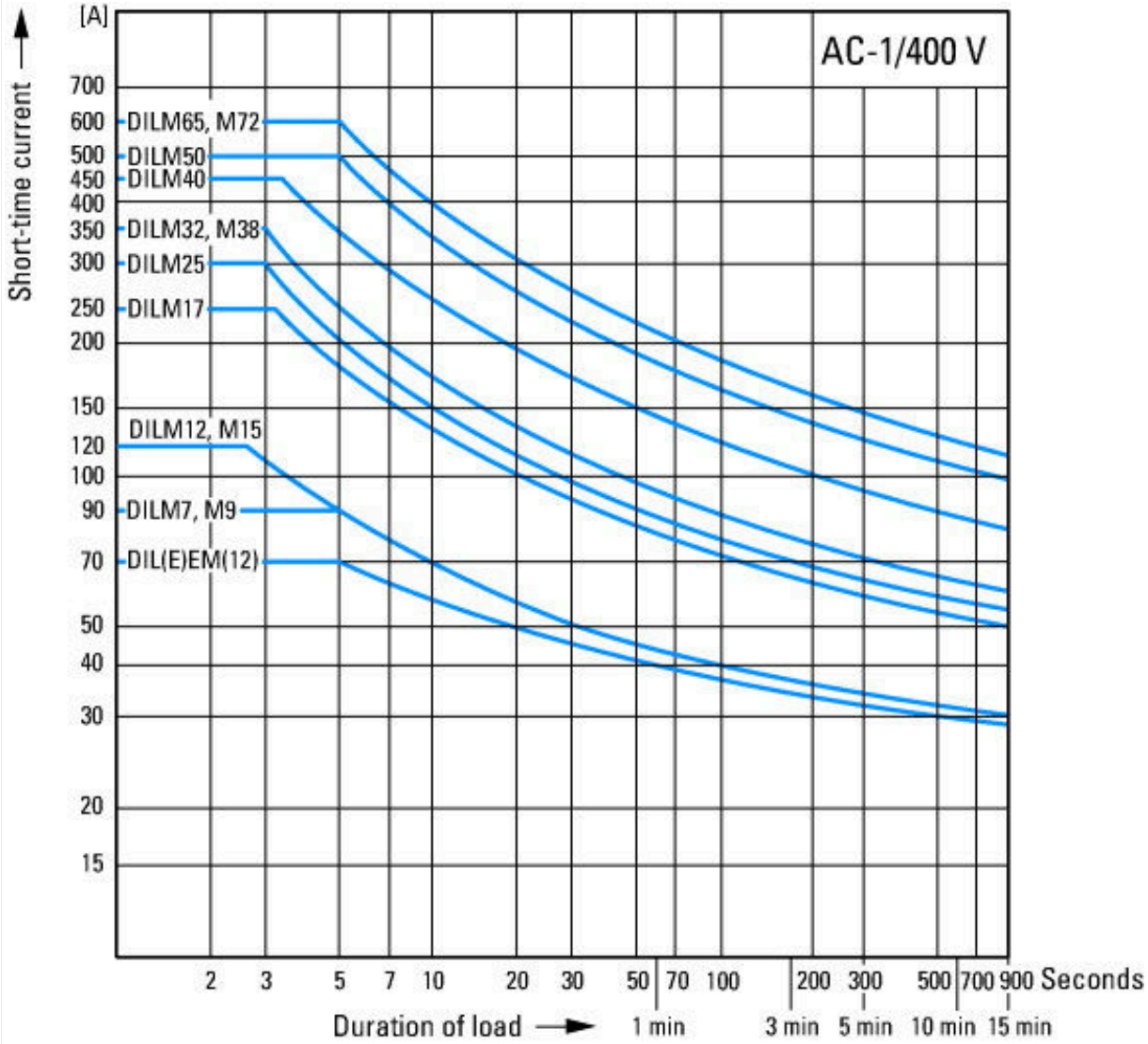
## Characteristics



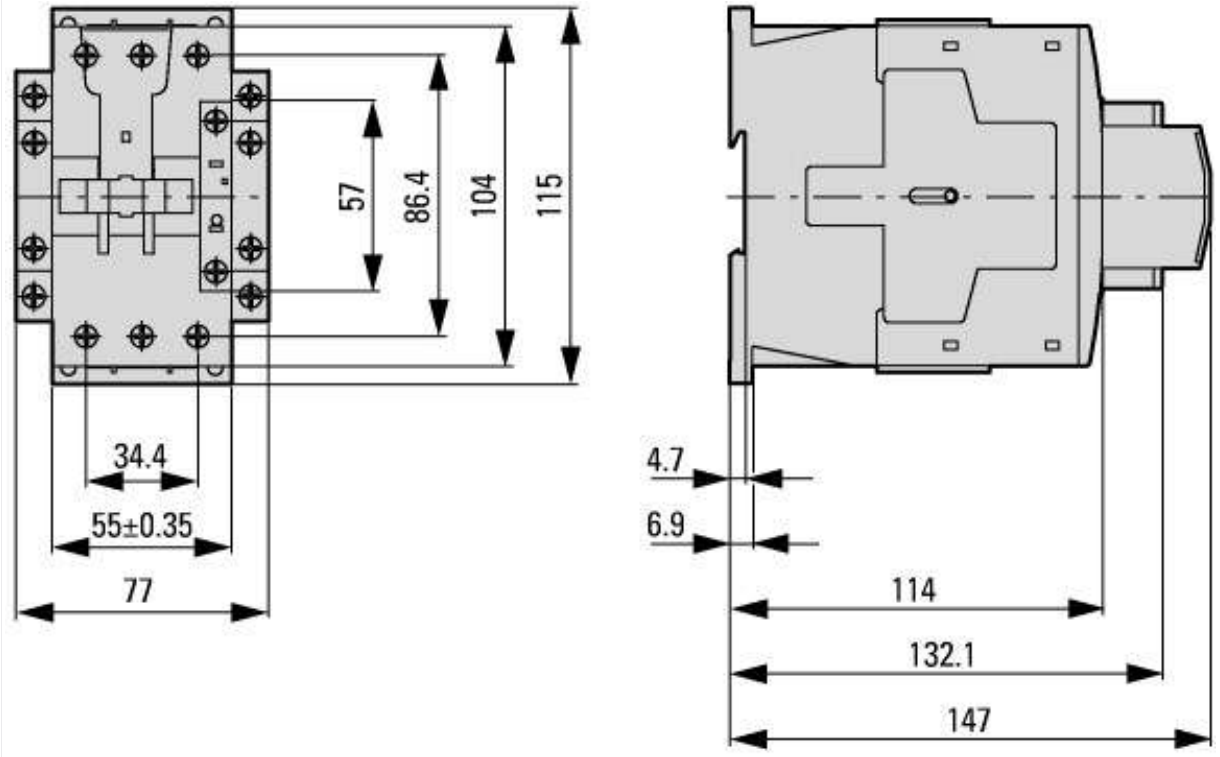

1: Overload relay
2: Auxiliary contact module



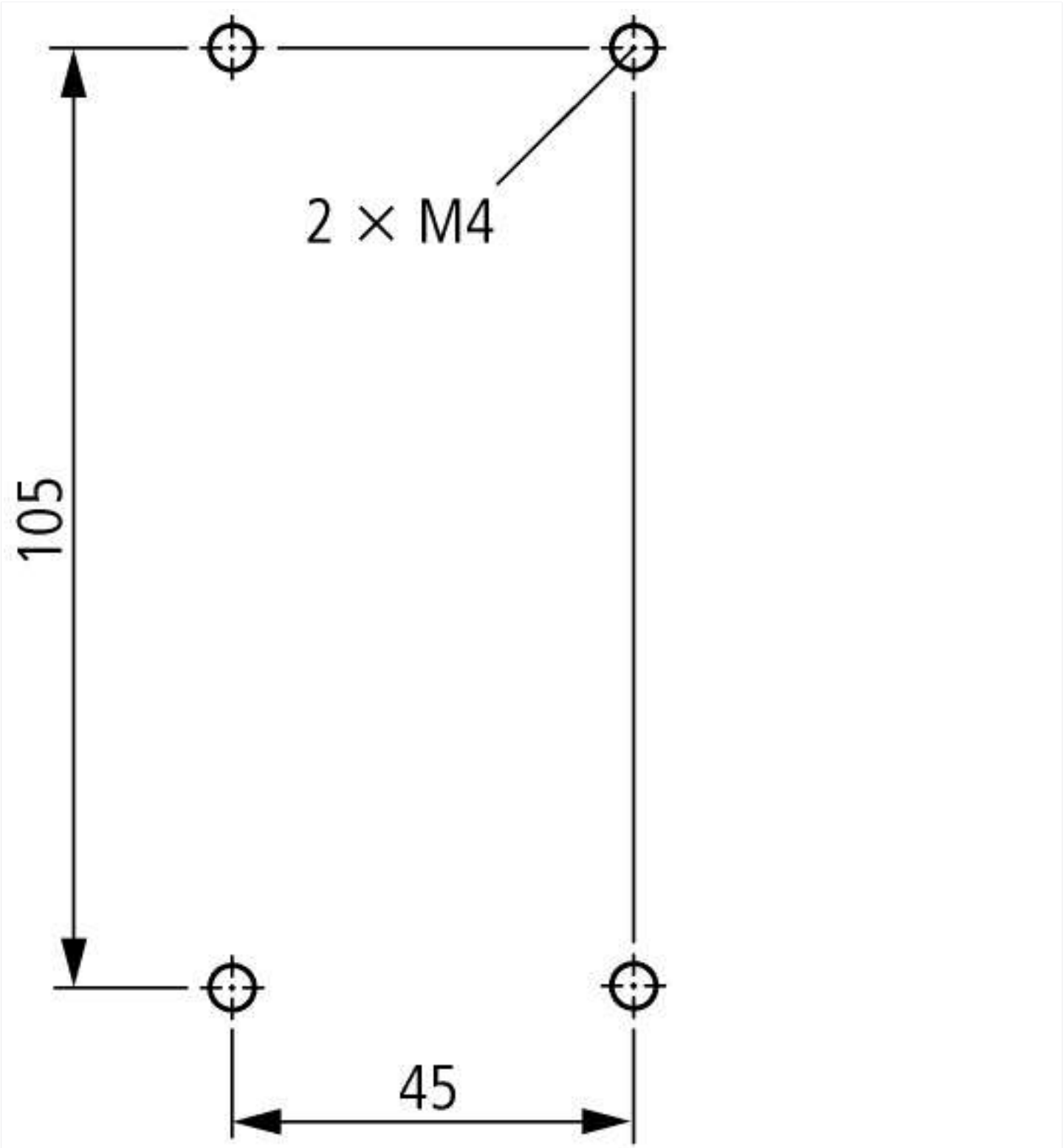

Switching conditions for non-motor consumers, 3 pole, 4 pole
Operating characteristics
Non inductive and slightly inductive loads
Electrical characteristics
Switch on: 1 x rated operational current
Switch off: 1 x rated operational current
Utilization category
100 % AC-1
Typical examples of application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




## Dimensions




Contactor with auxiliary contact module




Lateral clearance to earthed parts: 6 mm

## Additional product information (links)

| **IL03407033Z (AWA2100-2247) Contactor DILM, basic unit** | |
|---|---|
| IL03407033Z (AWA2100-2247) Contactor DILM, basic unit | https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407033Z2021_08.pdf |
| Motor starters and "Special Purpose Ratings" for the North American market | http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_3258146.pdf |
| Switchgear of Power Factor Correction Systems | http://www.moeller.net/binary/ver_techpapers/ver934en.pdf |
| X-Start - Modern Switching Installations Efficiently Fitted and Wired Securely | http://www.moeller.net/binary/ver_techpapers/ver938en.pdf |
| Mirror Contacts for Highly-Reliable Information Relating to Safety-Related Control Functions | http://www.moeller.net/binary/ver_techpapers/ver944en.pdf |
| Effect of the Cabel Capacitance of Long Control Cables on the Actuation of Contactors | http://www.moeller.net/binary/ver_techpapers/ver949en.pdf |
| Switchgear for Luminaires | http://www.moeller.net/binary/ver_techpapers/ver955en.pdf |

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|---|---|
| Standard Compliant and Functionally Safe Engineering Design with Mechanical Auxiliary Contacts | http://www.moeller.net/binary/ver_techpapers/ver956en.pdf |
| The Interaction of Contactors with PLCs | http://www.moeller.net/binary/ver_techpapers/ver957en.pdf |
| Busbar Component Adapters for modern Industrial control panels | http://www.moeller.net/binary/ver_techpapers/ver960en.pdf |


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