



Contactors, 380 V 400 V 355 kW, 2 N/O, 2 NC, RA 250: 110 - 250 V 40 - 60 Hz/110 - 350 V DC, AC and DC operation, Screw connection

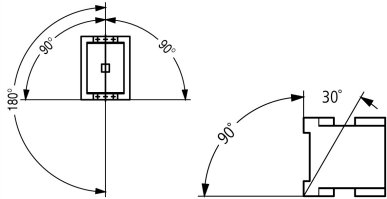
Part no. DILM650/22(RA250)
Catalog No. 208219
Alternate Catalog No. XTCE650N22A
EL-Nummer (Norway) 4134088

Delivery program

| | | | |
|---|----------------|----|--|
| Product range | | | Contactors |
| Application | | | Contactors for Motors |
| Subrange | | | Comfort devices greater than 170 A |
| Utilization category | | | AC-1: Non-inductive or slightly inductive loads, resistance furnaces NAC-3: Normal AC induction motors: starting, switch off during running AC-4: Normal AC induction motors: starting, plugging, reversing, inching |
| Connection technique | | | Screw connection |
| Rated operational current | | | |
| AC-3 | | | |
| 380 V 400 V | I_e | A | 650 |
| AC-1 | | | |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz | | | |
| Open | | | |
| at 40 °C | $I_{th} = I_e$ | A | 1041 |
| Conventional free air thermal current, 1 pole | | | |
| open | I_{th} | A | 2125 |
| Max. rating for three-phase motors, 50 - 60 Hz | | | |
| AC-3 | | | |
| 220 V 230 V | P | kW | 205 |
| 380 V 400 V | P | kW | 355 |
| 660 V 690 V | P | kW | 630 |
| 1000 V | P | kW | 600 |
| AC-4 | | | |
| 220 V 230 V | P | kW | 161 |
| 380 V 400 V | P | kW | 280 |
| 660 V 690 V | P | kW | 494 |
| 1000 V | P | kW | 509 |
| Contact sequence | | |  |
| Can be combined with auxiliary contact | | | DILM820-XHI... |
| Actuating voltage | | | RA 250: 110 - 250 V 40 - 60 Hz/110 - 350 V DC |
| Voltage AC/DC | | | AC and DC operation |
| Contacts | | | |
| N/O = Normally open | | | 2 N/O |
| N/C = Normally closed | | | 2 NC |
| Auxiliary contacts | | | |
| possible variants at auxiliary contact module fitting options | | | on the side: 2 x DILM820-XHI11(V)-SI; 2 x DILM820-XHI11-SA |
| Side mounting auxiliary contacts | | |  |
| Instructions | | | Interlocked opposing contacts according to IEC/EN 60947-5-1 Appendix L, inside the auxiliary contact module Auxiliary contacts used as mirror contacts according to IEC/EN 60947-4-1 Appendix F (not N/C late open) |
| Instructions | | | integrated suppressor circuit in actuating electronics |

Technical data

General

| | | | |
|---|-------------------------------------|-----------------|---|
| Standards | | | IEC/EN 60947, VDE 0660, UL, CSA |
| Lifespan, mechanical | | | |
| AC operated | Operations | $\times 10^6$ | 5 |
| DC operated | Operations | $\times 10^6$ | 5 |
| Operating frequency, mechanical | | | |
| AC operated | Operations/h | | 1000 |
| DC operated | Operations/h | | 1000 |
| Climatic proofing | | | Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30 |
| Ambient temperature | | | |
| Open | | °C | -40 - +60 |
| Enclosed | | °C | -40 - +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 | 10 |
| N/C contact | | g | 8 |
| Degree of Protection | | | IP00 |
| Protection against direct contact when actuated from front (EN 50274) | | | Finger and back-of-hand proof with terminal shroud or terminal block |
| Altitude | | m | Max. 2000 |
| Weight | | | |
| AC operated | | kg | 16.21 |
| DC operated | | kg | 16.21 |
| Weight | | kg | 16.21 |
| Terminal capacity main cable | | | |
| Flexible with cable lug | | mm ² | 50 - 240 |
| Stranded with cable lug | | mm ² | 70 - 240 |
| Solid or stranded | | AWG | 2/0 - 500 MCM |
| Flat conductor | Lamellenzahl x Breite x Dicke | mm | Fixing with flat cable terminal or cable terminal blocks See terminal capacity for cable terminal blocks |
| Busbar | Width | mm | 50 |
| Main cable connection screw/bolt | | | M10 |
| Tightening torque | | Nm | 24 |
| Terminal capacity control circuit cables | | | |
| Solid | | mm ² | 1 x (0.75 - 2.5) 2 x (0.75 - 2.5) |
| Flexible with ferrule | | mm ² | 1 x (0.75 - 2.5) 2 x (0.75 - 2.5) |
| Solid or stranded | | AWG | 18 - 14 |
| Control circuit cable connection screw/bolt | | | M3.5 |
| Tightening torque | | Nm | 1.2 |
| Tool | | | |
| Main cable | | | |

| | | |
|------------------------|------|----|
| Width across flats | mm | 16 |
| Control circuit cables | | |
| Pozidriv screwdriver | Size | 2 |

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 | 1000 |
| Rated operational voltage | U_e | V AC | 1000 |
| Safe isolation to EN 61140 | | | |
| between coil and contacts | | V AC | 500 |
| between the contacts | | V AC | 500 |
| Making capacity (p.f. to IEC/EN 60947) | | A | 7800 |
| Breaking capacity | | | |
| 220 V 230 V | | A | 6500 |
| 380 V 400 V | | A | 6500 |
| 500 V | | A | 6500 |
| 660 V 690 V | | A | 6500 |
| 1000 V | | A | 4350 |
| Component lifespan | | | AC1: See → Engineering, characteristic curves AC3: See → Engineering, characteristic curves AC4: See → Engineering, characteristic curves |
| Short-circuit rating | | | |
| Short-circuit protection maximum fuse | | | |
| Type "2" coordination | | | |
| 400 V | gG/gL 500 V | A | 630 |
| 690 V | gG/gL 690 V | A | 630 |
| 1000 V | gG/gL 1000 V | A | 500 |
| Type "1" coordination | | | |
| 400 V | gG/gL 500 V | A | 1000 |
| 690 V | gG/gL 690 V | A | 1000 |
| 1000 V | gG/gL 1000 V | A | 630 |

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 | 1041 |
| at 50 °C | $I_{th} = I_e$ | A | 931 |
| at 55 °C | $I_{th} = I_e$ | A | 888 |
| at 60 °C | $I_{th} = I_e$ | A | 850 |
| Conventional free air thermal current, 1 pole | | | |
| Note | | | at maximum permissible ambient air temperature |
| open | I_{th} | A | 2125 |
| AC-3 | | | |
| Rated operational current | | | |
| Open, 3-pole: 50 – 60 Hz | | | |
| Notes | | | At maximum permissible ambient temperature (open.) |
| 220 V 230 V | I_e | A | 650 |
| 240 V | I_e | A | 650 |
| 380 V 400 V | I_e | A | 650 |
| 415 V | I_e | A | 650 |
| 440V | I_e | A | 650 |
| 500 V | I_e | A | 650 |
| 660 V 690 V | I_e | A | 650 |

| | | | |
|---------------------------|-------|-----|-----|
| 1000 V | I_e | A | 435 |
| Motor rating | P | kWh | |
| 220 V 230 V | P | kW | 205 |
| 240V | P | kW | 225 |
| 380 V 400 V | P | kW | 355 |
| 415 V | P | kW | 390 |
| 440 V | P | kW | 420 |
| 500 V | P | kW | 470 |
| 660 V 690 V | P | kW | 630 |
| 1000 V | P | kW | 600 |
| AC-4 | | | |
| Rated operational current | | | |
| Open, 3-pole: 50 – 60 Hz | | | |
| 220 V 230 V | I_e | A | 512 |
| 240 V | I_e | A | 512 |
| 380 V 400 V | I_e | A | 512 |
| 415 V | I_e | A | 512 |
| 440 V | I_e | A | 512 |
| 500 V | I_e | A | 512 |
| 660 V 690 V | I_e | A | 512 |
| 1000 V | I_e | A | 348 |
| Motor rating | P | kWh | |
| 220 V 230 V | P | kW | 161 |
| 240 V | P | kW | 176 |
| 380 V 400 V | P | kW | 280 |
| 415 V | P | kW | 307 |
| 440 V | P | kW | 326 |
| 500 V | P | kW | 370 |
| 660 V 690 V | P | kW | 494 |
| 1000 V | P | kW | 509 |

Condensator operation

| | | | |
|--|------------|---------------|-----|
| Individual compensation, rated operational current I_e of three-phase capacitors | | | |
| Open | | | |
| up to 525 V | | A | 463 |
| 690 V | | A | 265 |
| Max. inrush current peak | | $\times I_e$ | 30 |
| Component lifespan | Operations | $\times 10^6$ | 0.1 |
| Max. operating frequency | | Ops/h | 200 |

Current heat loss

| | | | |
|--|--|------------|-------|
| 3 pole, at I_{th} (60°) | | W | 69 |
| Current heat loss at I_e to AC-3/400 V | | W | 41 |
| Impedance per pole | | m Ω | 0.032 |

Magnet systems

| | | | |
|--|----------|----|--|
| Voltage tolerance | | | |
| U_S | | | 110 - 250 V 40-60 Hz 110 - 350 V DC |
| AC operated | Pick-up | | $0.7 \times U_{S \min} - 1.15 \times U_{S \max}$ |
| DC operated | Pick-up | | $0.7 \times U_{S \min} - 1.15 \times U_{S \max}$ |
| AC operated | Drop-out | | $0.2 \times U_{S \max} - 0.6 \times U_{S \min}$ |
| DC operated | Drop-out | | $0.2 \times U_{S \max} - 0.6 \times U_{S \min}$ |
| Power consumption of the coil in a cold state and $1.0 \times U_S$ | | | |
| Note on power consumption | | | Control transformer with $u_k \leq 7\%$ |
| Pull-in power | Pick-up | VA | 800 |
| Pull-in power | Pick-up | W | 700 |
| Sealing power | Sealing | VA | 26.5 |

| | | | |
|--|---------|------|--------------------------------------|
| Sealing power | Sealing | W | 11.4 |
| Duty factor | | % DF | 100 |
| Changeover time at 100 % U _S (recommended value) | | | |
| Main contacts | | | |
| Closing delay | | ms | 70 |
| Opening delay | | ms | 110 |
| Behaviour in marginal and transitional conditions | | | |
| Sealing | | | |
| Voltage interruptions | | | |
| (0 ... 0.2 x U _{C min}) ≤ 10 ms | | | Time is bridged successfully |
| (0 ... 0.2 x U _{C min}) > 10 ms | | | Drop-out of the contactor |
| Voltage drops | | | |
| (0.2 ... 0.6 x U _{C min}) ≤ 12 ms | | | Time is bridged successfully |
| (0.2 ... 0.6 x U _{C min}) > 12 ms | | | Drop-out of the contactor |
| (0.6 ... 0.7 x U _{C min}) | | | Contactor remains switched on |
| Excess voltage | | | |
| (1.15 ... 1.3 x U _{C max}) | | | Contactor remains switched on |
| Pick-up phase | | | |
| (0 ... 0.7 x U _{C min}) | | | Contactor does not switch on |
| (0.7 x U _{C min} ... 1.15 x U _{C max}) | | | Contactor switches on with certainty |
| Admissible transitional contact resistance (of the external control circuit device when actuating A11) | | mΩ | ≤ 500 |
| PLC signal level (A3 - A4) to IEC/EN 61131-2 (type 2) | | | |
| High | | V | 15 |
| Low | | V | 5 |

Electromagnetic compatibility (EMC)

| | | | |
|-------------------------------|--|--|---|
| Electromagnetic compatibility | | | This product is designed for operation in industrial environments (environment A). Its use in residential environments (environment B) may cause radio-frequency interference, requiring additional noise suppression measures. |
|-------------------------------|--|--|---|

Rating data for approved types

| | | | |
|------------------------------|--|----|------|
| Switching capacity | | | |
| Maximum motor rating | | | |
| Three-phase | | | |
| 200 V 208 V | | HP | 200 |
| 230 V 240 V | | HP | 250 |
| 460 V 480 V | | HP | 500 |
| 575 V 600 V | | HP | 600 |
| General use | | A | 1041 |
| Auxiliary contacts | | | |
| Pilot Duty | | | |
| AC operated | | | A600 |
| DC operated | | | P300 |
| General Use | | | |
| AC | | V | 600 |
| AC | | A | 15 |
| DC | | V | 250 |
| DC | | A | 1 |
| Short Circuit Current Rating | | | |
| Basic Rating | | | |
| SCCR | | kA | 30 |
| max. Fuse | | A | 2000 |
| max. CB | | A | 1200 |
| 480 V High Fault | | | |
| SCCR (fuse) | | kA | 85 |

| | | |
|---|----|------|
| max. Fuse | A | 2000 |
| SCCR (CB) | kA | 85 |
| max. CB | A | 1200 |
| 600 V High Fault | | |
| SCCR (fuse) | kA | 85 |
| max. Fuse | A | 2000 |
| SCCR (CB) | kA | 85 |
| max. CB | A | 1200 |
| Special Purpose Ratings | | |
| Definite Purpose Ratings (100,000 cycles acc. to UL 1995) | | |
| LRA 480V 60Hz 3phase | A | 4350 |
| FLA 480V 60Hz 3phase | A | 725 |
| LRA 600V 60Hz 3phase | A | 4350 |
| FLA 600V 60Hz 3phase | A | 725 |

Design verification as per IEC/EN 61439

| | | | |
|--|------------|----|--|
| Technical data for design verification | | | |
| Rated operational current for specified heat dissipation | I_n | A | 650 |
| Heat dissipation per pole, current-dependent | P_{vid} | W | 13.67 |
| Equipment heat dissipation, current-dependent | P_{vid} | W | 0 |
| Static heat dissipation, non-current-dependent | P_{vs} | W | 6.5 |
| Heat dissipation capacity | P_{diss} | W | 0 |
| Operating ambient temperature min. | | °C | -40 |
| 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)

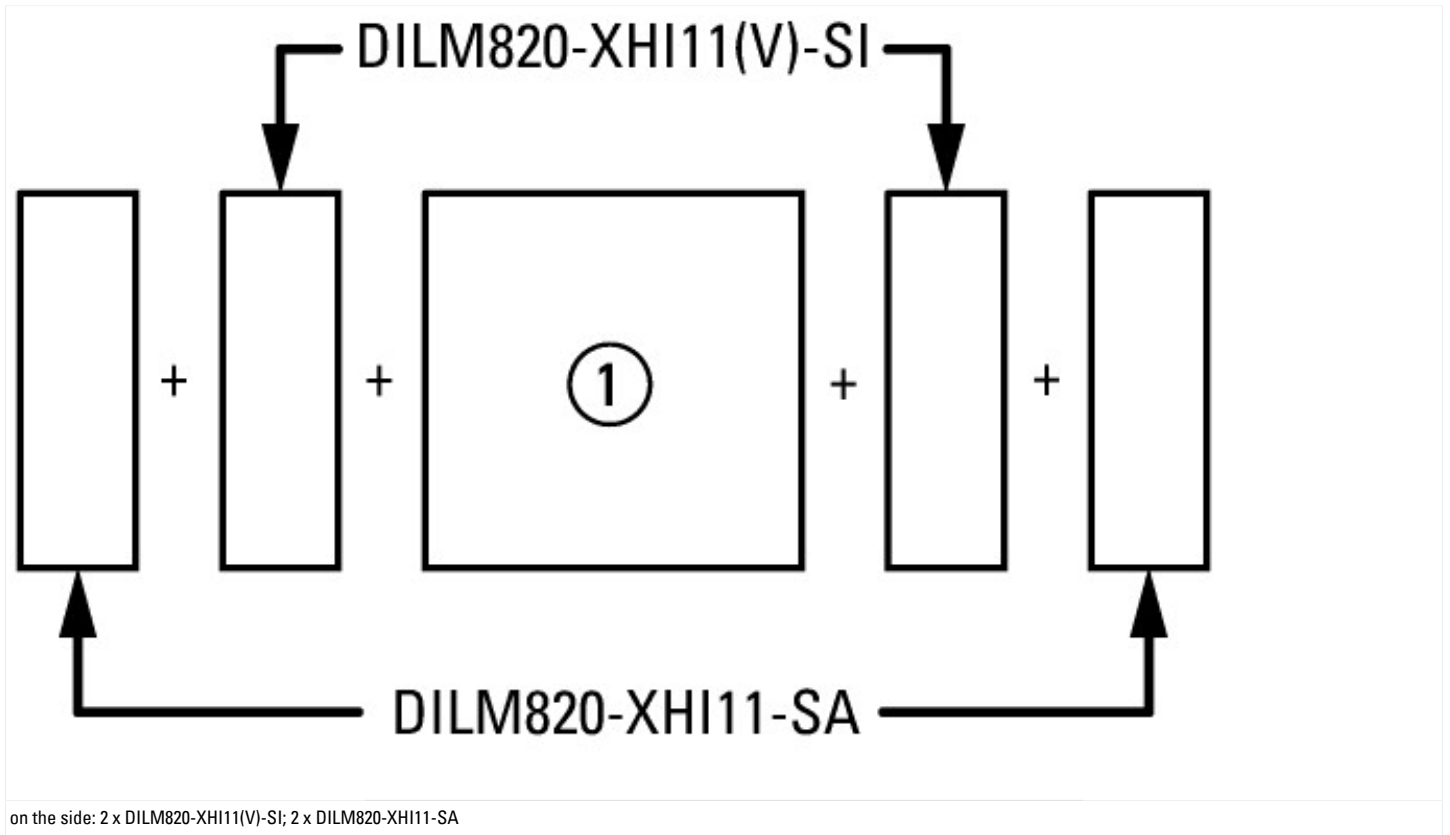
Electric engineering, automation, process control engineering / Low-voltage switch technology / Contactor (LV) / Power contactor, AC switching (ecl@ss10.0.1-27-37-10-03 [AAB718015])

| | | |
|---|----|-----------------|
| Rated control supply voltage Us at AC 50HZ | V | 110 - 250 |
| Rated control supply voltage Us at AC 60HZ | V | 110 - 250 |
| Rated control supply voltage Us at DC | V | 110 - 250 |
| Voltage type for actuating | | AC/DC |
| Rated operation current Ie at AC-1, 400 V | A | 1041 |
| Rated operation current Ie at AC-3, 400 V | A | 650 |
| Rated operation power at AC-3, 400 V | kW | 355 |
| Rated operation current Ie at AC-4, 400 V | A | 512 |
| Rated operation power at AC-4, 400 V | kW | 280 |
| Rated operation power NEMA | kW | 373 |
| Modular version | | No |
| Number of auxiliary contacts as normally open contact | | 2 |
| Number of auxiliary contacts as normally closed contact | | 2 |
| Type of electrical connection of main circuit | | Rail 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. | | 3211-04 |
| North America Certification | | UL listed, CSA certified |
| Specially designed for North America | | No |

Characteristics





Normal switching duty
 Normal AC induction motor
 Operating characteristics
 Switch on: from stop
 Switch off: during run
 Electrical characteristics:
 Switch on: up to 6 x Rated motor current
 Switch off: up to 1 x Rated motor current
 Utility category
 100 % AC-3
 Typical Applications
 Compressors
 Lifts
 Mixers
 Pumps
 Escalators
 Agitators
 fan
 Conveyor belts
 Centrifuges
 Hinged flaps
 Bucket-elevator
 Air-conditioning systems
 General drives for 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

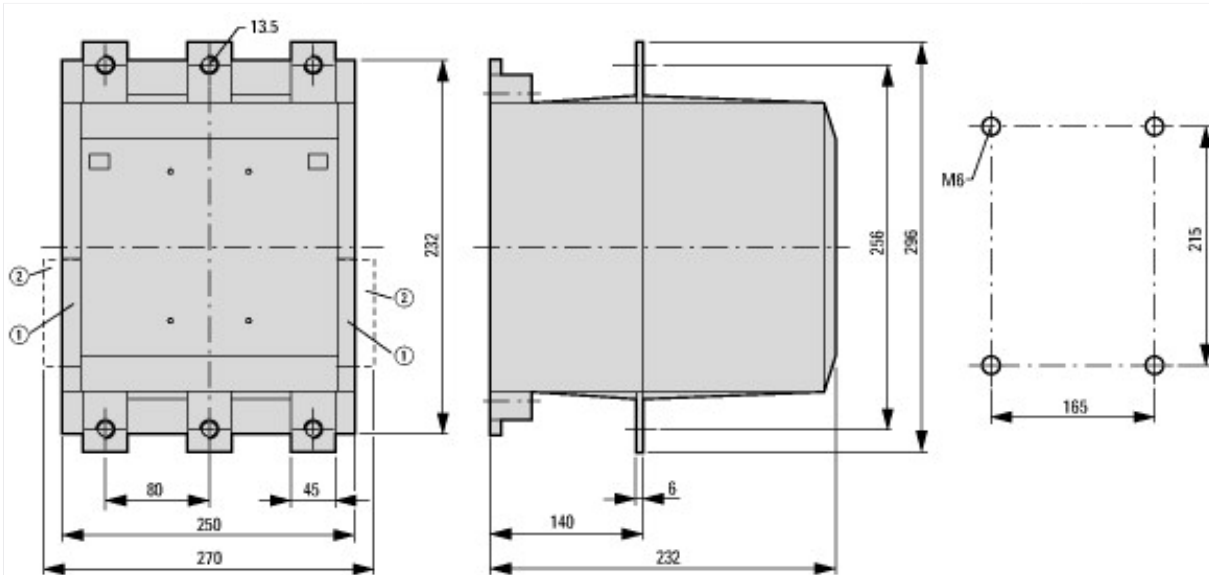


Switching conditions for 3 pole, non-motor loads
 Operating characteristics
 Non inductive and slightly inductive loads
 Electrical characteristics
 Switch on: 1 x rated operational current
 Switch off: 1 x rated operational current
 Utilization category
 100 % AC-1
 Typical examples of application
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



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

Dimensions



Additional product information (links)

IL03407023Z (AWA2100-1697) Contactors >170 A

| | |
|--|---|
| IL03407023Z (AWA2100-1697) Contactors >170 A | https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407023Z2020_04.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 Cable 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 |
| 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 |