

DATASHEET - DILM400/22(RA250)

Contactors, 380 V 400 V 212 kW, 2 N/O, 2 NC, RA 250: 110 - 250 V 40 - 60 Hz/110 - 350 V DC, AC and DC operation, Screw connection

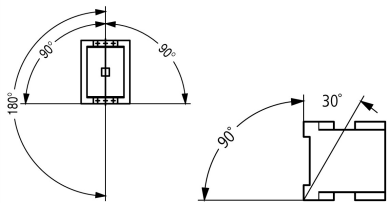
EATON
Powering Business Worldwide™

Part no. DILM400/22(RA250)
Catalog No. 208209
Alternate Catalog No. XTCE400M22A
EL-Nummer (Norway) 4134085

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 | | 400 |
| AC-1 | | | | |
| Conventional free air thermal current, 3 pole, 50 - 60 Hz | | | | |
| Open | | | | |
| at 40 °C | $I_{th} = I_e$ | A | | 612 |
| enclosed | I_{th} | A | | 450 |
| Conventional free air thermal current, 1 pole | | | | |
| open | I_{th} | A | | 1250 |
| enclosed | I_{th} | A | | 1125 |
| Max. rating for three-phase motors, 50 - 60 Hz | | | | |
| AC-3 | | | | |
| 220 V 230 V | P | kW | | 125 |
| 380 V 400 V | P | kW | | 212 |
| 660 V 690 V | P | kW | | 300 |
| 1000 V | P | kW | | 132 |
| AC-4 | | | | |
| 220 V 230 V | P | kW | | 92 |
| 380 V 400 V | P | kW | | 160 |
| 660 V 690 V | P | kW | | 240 |
| 1000 V | P | kW | | 132 |
| 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 |

Instructionsintegrated suppressor circuit in actuating electronics
660 V, 690 V or 1000 V: not directly reversing**Technical data****General**

| | | | |
|---|-------------------------------------|-----------------|---|
| Standards | | | IEC/EN 60947, VDE 0660, UL, CSA |
| Lifespan, mechanical | | | |
| AC operated | Operations | $\times 10^6$ | 7 |
| DC operated | Operations | $\times 10^6$ | 7 |
| Operating frequency, mechanical | | | |
| AC operated | Operations/h | | 2000 |
| DC operated | Operations/h | | 2000 |
| 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 | 8.51 |
| DC operated | | kg | 8.51 |
| Weight | | kg | 8.51 |
| 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 | 25 |
| 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 | 5500 |
| Breaking capacity | | | |
| 220 V 230 V | | A | 5000 |
| 380 V 400 V | | A | 5000 |
| 500 V | | A | 5000 |
| 660 V 690 V | | A | 5000 |
| 1000 V | | A | 950 |
| 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 | 500 |
| 690 V | gG/gL 690 V | A | 500 |
| 1000 V | gG/gL 1000 V | A | 200 |
| Type "1" coordination | | | |
| 400 V | gG/gL 500 V | A | 630 |
| 690 V | gG/gL 690 V | A | 630 |
| 1000 V | gG/gL 1000 V | A | 250 |

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 | 612 |
| at 50 °C | $I_{th} = I_e$ | A | 548 |
| at 55 °C | $I_{th} = I_e$ | A | 522 |
| at 60 °C | $I_{th} = I_e$ | A | 500 |
| enclosed | I_{th} | A | 450 |
| Notes | | | At maximum permissible ambient air temperature. |
| Conventional free air thermal current, 1 pole | | | |
| Note | | | at maximum permissible ambient air temperature |
| open | I_{th} | A | 1250 |
| enclosed | I_{th} | A | 1125 |
| 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 | 400 |
| 240 V | I_e | A | 400 |

| | | | |
|---------------------------|----------------|-----|-----|
| 380 V 400 V | I _e | A | 400 |
| 415 V | I _e | A | 400 |
| 440V | I _e | A | 400 |
| 500 V | I _e | A | 400 |
| 660 V 690 V | I _e | A | 325 |
| 1000 V | I _e | A | 95 |
| Motor rating | P | kWh | |
| 220 V 230 V | P | kW | 125 |
| 240V | P | kW | 132 |
| 380 V 400 V | P | kW | 212 |
| 415 V | P | kW | 232 |
| 440 V | P | kW | 250 |
| 500 V | P | kW | 280 |
| 660 V 690 V | P | kW | 300 |
| 1000 V | P | kW | 132 |
| AC-4 | | | |
| Rated operational current | | | |
| Open, 3-pole: 50 – 60 Hz | | | |
| 220 V 230 V | I _e | A | 296 |
| 240 V | I _e | A | 296 |
| 380 V 400 V | I _e | A | 296 |
| 415 V | I _e | A | 296 |
| 440 V | I _e | A | 296 |
| 500 V | I _e | A | 296 |
| 660 V 690 V | I _e | A | 260 |
| 1000 V | I _e | A | 95 |
| Motor rating | P | kWh | |
| 220 V 230 V | P | kW | 92 |
| 240 V | P | kW | 100 |
| 380 V 400 V | P | kW | 160 |
| 415 V | P | kW | 176 |
| 440 V | P | kW | 186 |
| 500 V | P | kW | 210 |
| 660 V 690 V | P | kW | 240 |
| 1000 V | P | kW | 132 |

Condensator operation

| | | | |
|---|------------|-------------------|-----|
| Individual compensation, rated operational current I _e of three-phase capacitors | | | |
| Open | | | |
| up to 525 V | | A | 307 |
| 690 V | | A | 177 |
| Max. inrush current peak | | x I _e | 30 |
| Component lifespan | Operations | x 10 ⁶ | 0.1 |
| Max. operating frequency | | Ops/h | 200 |

DC

| | | | |
|---------------------------------|--|--|-------------------------------------|
| Rated operational current, open | | | |
| DC-1 | | | |
| Notes | | | see D1LDC300/D1LDC600 or on request |

Current heat loss

| | | | |
|---|--|---|----|
| 3 pole, at I _{th} (60°) | | W | 58 |
| Current heat loss at I _e to AC-3/400 V | | W | 37 |

Magnet systems

| | | | |
|-------------------|---------|--|--|
| Voltage tolerance | | | |
| U _S | | | 110 - 250 V 40-60 Hz 110 - 350 V DC |
| AC operated | Pick-up | | 0.7 x U _{S min} - 1.15 x 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 $u_k \leq 6\%$ |
| Pull-in power | Pick-up | VA | 450 |
| Pull-in power | Pick-up | W | 350 |
| Sealing power | Sealing | VA | 14.2 |
| Sealing power | Sealing | W | 7.9 |
| Duty factor | | % DF | 100 |
| Changeover time at 100 % U_S (recommended value) | | | |
| Main contacts | | | |
| Closing delay | | ms | 80 |
| Opening delay | | ms | 110 |
| Behaviour in marginal and transitional conditions | | | |
| Sealing | | | |
| Voltage interruptions | | | |
| $(0 \dots 0.2 \times U_{C \min}) \leq 10 \text{ ms}$ | | | Time is bridged successfully |
| $(0 \dots 0.2 \times U_{C \min}) > 10 \text{ ms}$ | | | Drop-out of the contactor |
| Voltage drops | | | |
| $(0.2 \dots 0.6 \times U_{C \min}) \leq 12 \text{ ms}$ | | | Time is bridged successfully |
| $(0.2 \dots 0.6 \times U_{C \min}) > 12 \text{ ms}$ | | | Drop-out of the contactor |
| $(0.6 \dots 0.7 \times U_{C \min})$ | | | Contactor remains switched on |
| Excess voltage | | | |
| $(1.15 \dots 1.3 \times U_{C \max})$ | | | Contactor remains switched on |
| Pick-up phase | | | |
| $(0 \dots 0.7 \times U_{C \min})$ | | | Contactor does not switch on |
| $(0.7 \times U_{C \min} \dots 1.15 \times U_{C \max})$ | | | Contactor switches on with certainty |
| Admissible transitional contact resistance (of the external control circuit device when actuating A11) | | m Ω | ≤ 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 | 125 |
| 230 V 240 V | | HP | 150 |
| 460 V 480 V | | HP | 300 |
| 575 V 600 V | | HP | 400 |
| General use | | A | 450 |
| 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 | SCCR | |
| Basic Rating | | |
| SCCR | kA | 30 |
| max. Fuse | A | 800 |
| max. CB | A | 600 |
| 480 V High Fault | | |
| SCCR (fuse) | kA | 30/100 |
| max. Fuse | A | 800/600 Class J |
| SCCR (CB) | kA | 100 |
| max. CB | A | 600 |
| 600 V High Fault | | |
| SCCR (fuse) | kA | 30/100 |
| max. Fuse | A | 800/600 Class J |
| SCCR (CB) | kA | 30 |
| max. CB | A | 600 |
| Special Purpose Ratings | | |
| Definite Purpose Ratings (100,000 cycles acc. to UL 1995) | | |
| LRA 480V 60Hz 3phase | A | 3300 |
| FLA 480V 60Hz 3phase | A | 550 |
| LRA 600V 60Hz 3phase | A | 3120 |
| FLA 600V 60Hz 3phase | A | 420 |

Design verification as per IEC/EN 61439

| | | | |
|--|------------|----|--|
| Technical data for design verification | | | |
| Rated operational current for specified heat dissipation | I_n | A | 400 |
| Heat dissipation per pole, current-dependent | P_{vid} | W | 12.33 |
| Equipment heat dissipation, current-dependent | P_{vid} | W | 0 |
| Static heat dissipation, non-current-dependent | P_{vs} | W | 7.9 |
| 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. |

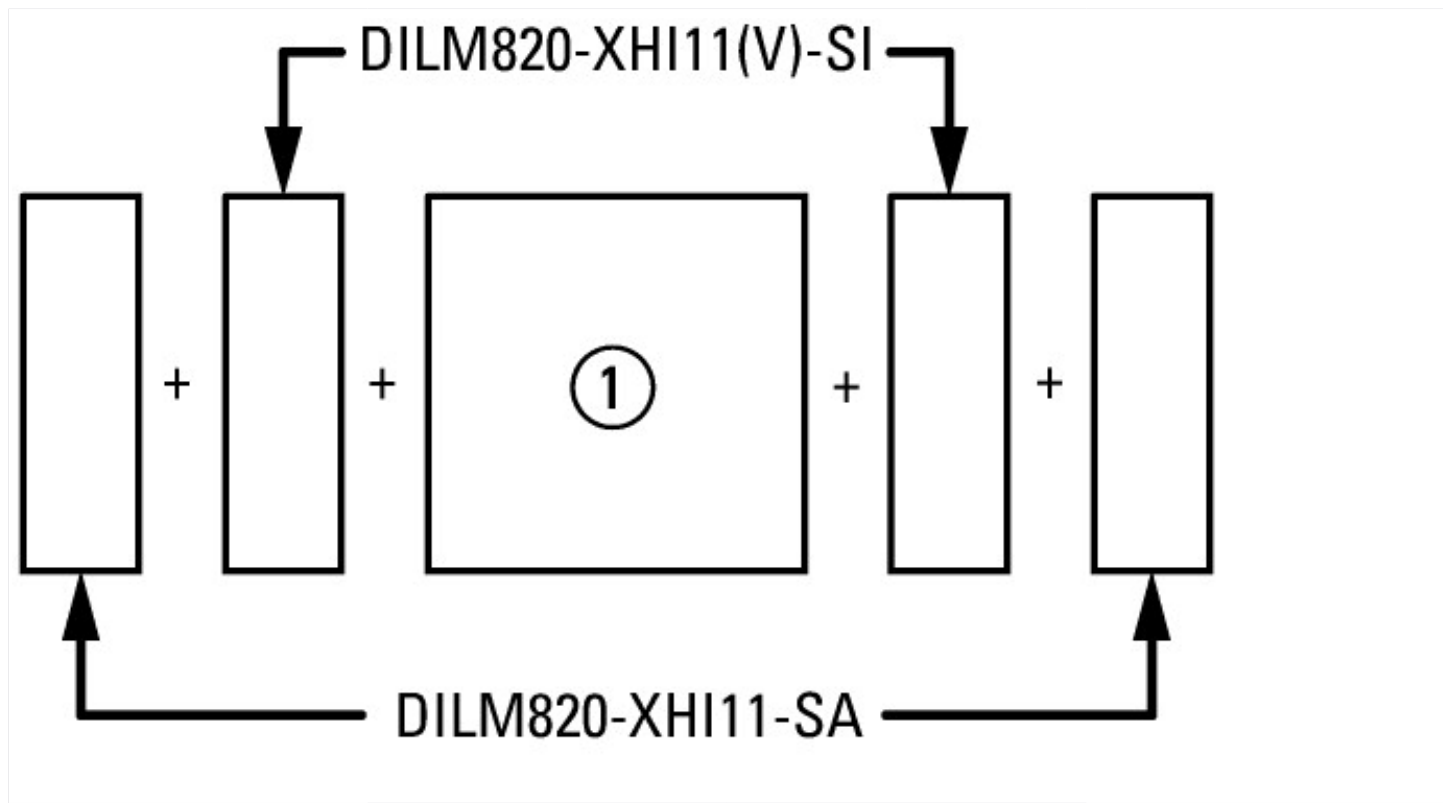
Technical data ETIM 7.0

| | | |
|---|----|-----------------|
| 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 | 612 |
| Rated operation current Ie at AC-3, 400 V | A | 400 |
| Rated operation power at AC-3, 400 V | kW | 200 |
| Rated operation current Ie at AC-4, 400 V | A | 296 |
| Rated operation power at AC-4, 400 V | kW | 160 |
| Rated operation power NEMA | kW | 223 |
| 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 |

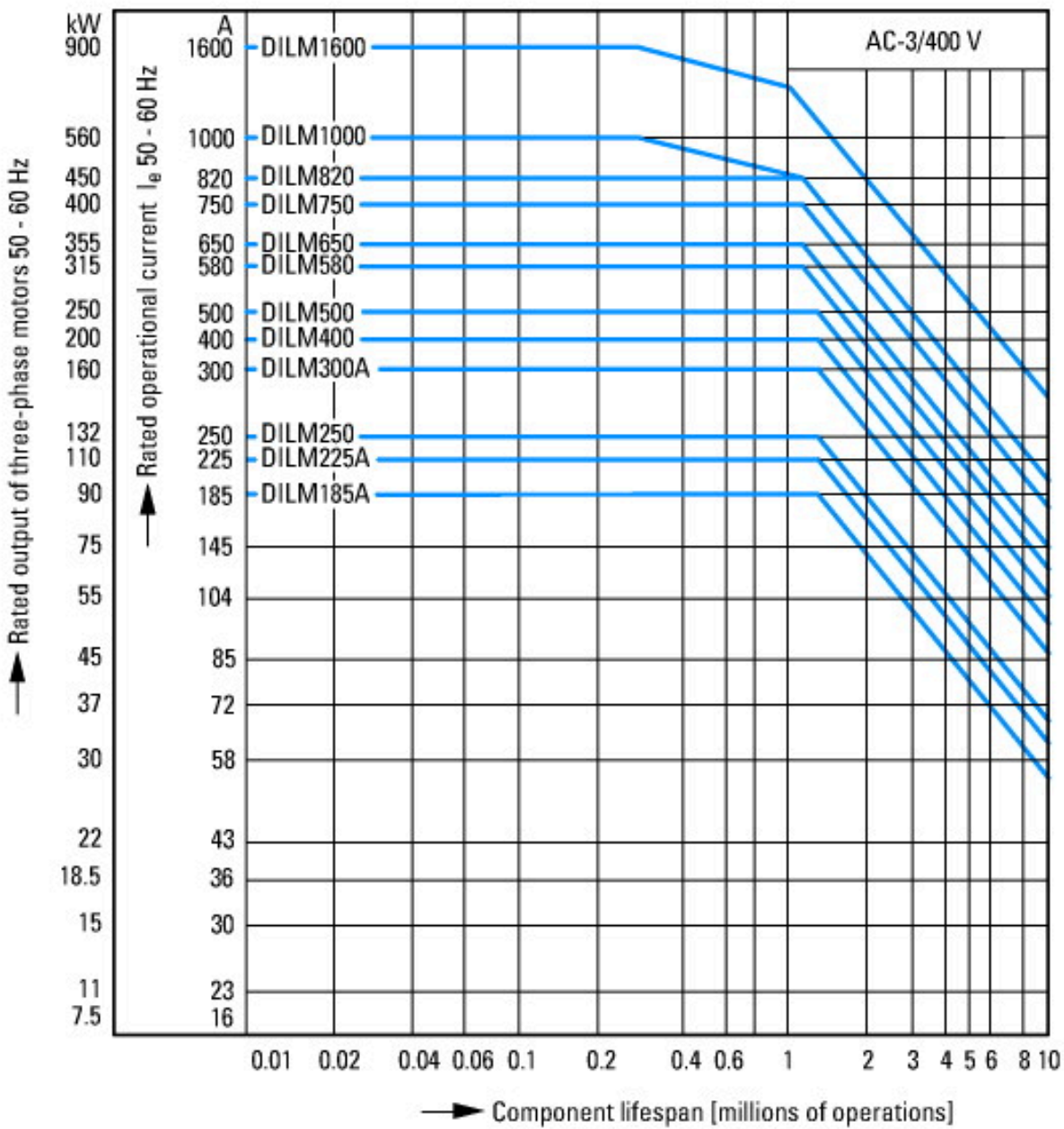
Approvals

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

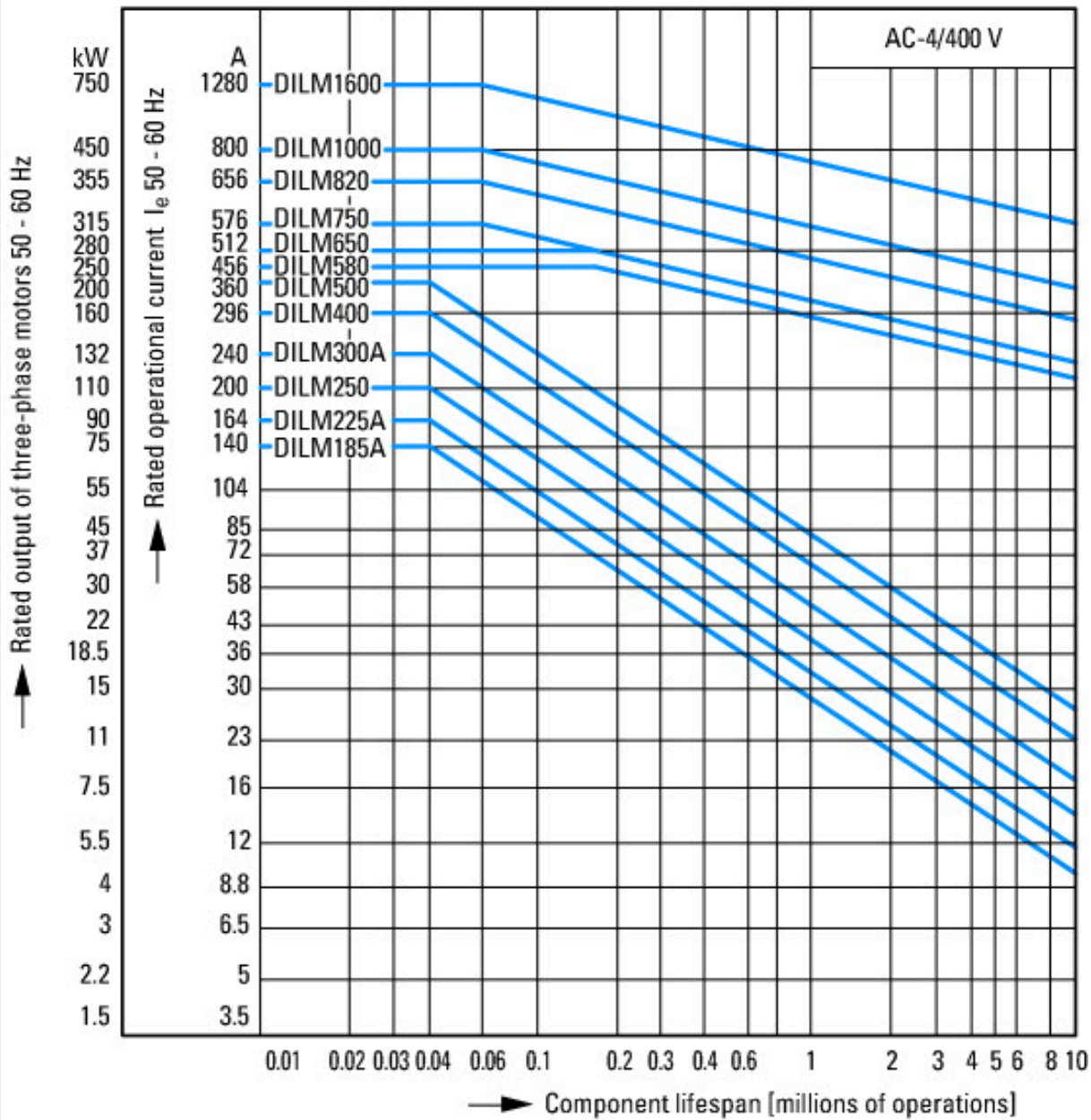
Characteristics



on the side: 2 x DILM820-XHI11(V)-SI; 2 x DILM820-XHI11-SA



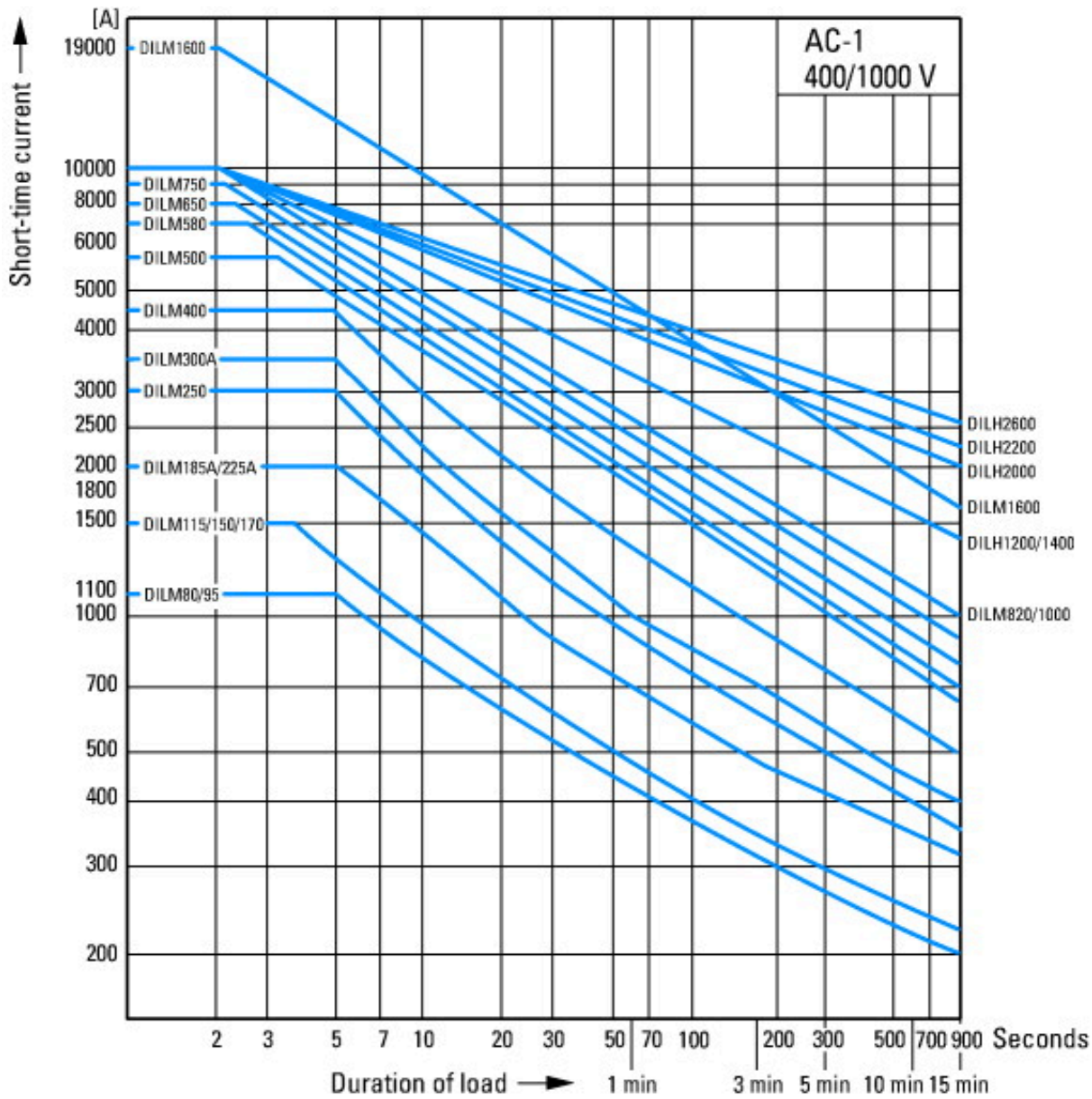
Normal switching duty
 Normal AC induction motor
 Operating characteristics
 Switch on: from stop
 Switch off: during run
 Electrical characteristics:
 Switch on: up to 6 x Rated motor current
 Switch off: up to 1 x Rated motor current
 Utility category
 100 % AC-3
 Typical Applications
 Compressors
 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

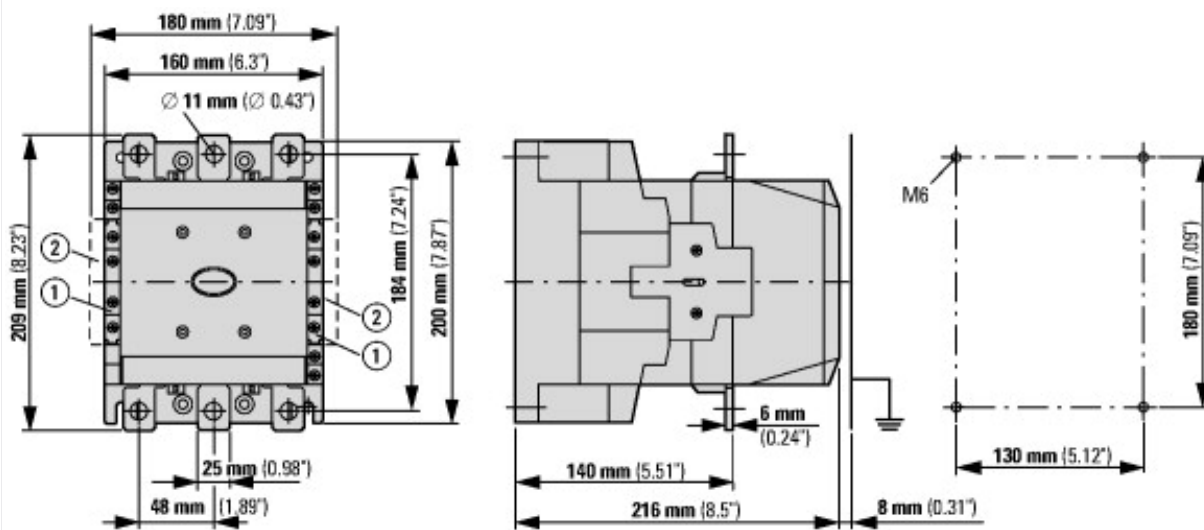


Switching conditions for 3 pole, non-motor loads
 Operating characteristics
 Non inductive and slightly inductive loads
 Electrical characteristics
 Switch on: 1 x rated operational current
 Switch off: 1 x rated operational current
 Utilization category
 100 % AC-1
 Typical examples of application
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



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

Dimensions



- ① DILM820-XHI11(V)-SI
- ② DILM820-XHI11-SA



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