

208209 DILM400/22(RA250)	
Overview Specif	ications Resources
Delivery program	DELIVERY PROGRAM
Technical data	Product range Contactors
Design verification as per IEC/EN 61439	Application Contactors for Motors
Technical data ETIM 7.0	Subrange Confort devices greater than 170 A
Approvals Characteristics	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
Dimensions	Connection technique Screw connection
	Rated operational current

AC-3 380 V 400 V [le] 400 A

AC-1

Conventional free air thermal current, 3 pole, 50 -60 Hz Open at 40 °C [l_{th} =l_e] 612 A

AC-1

Conventional free air thermal current, 3 pole, 50 -60 Hz enclosed [I_{th}] 450 A

AC-1 Conventional free air thermal current, 1 pole open $[I_{th}]$ 1250 A

AC-1 Conventional free air thermal current, 1 pole enclosed [I_{th}] 1125 A

Max. rating for three-phase motors, 50 - 60 Hz

AC-3 220 V 230 V [P] 125 kW

AC-3 380 V 400 V [P] 212 kW

AC-3 660 V 690 V [P] 300 kW

AC-3 1000 V [P] 132 kW

AC-4 220 V 230 V [P] 92 kW AC-4 380 V 400 V [P] 160 kW

AC-4 660 V 690 V [P] 240 kW

AC-4 1000 V [P] 132 kW

Contact sequence $A_1 | 1 | 3 | 5 | 13 | 2^1 | 3^1 | 43$ $A_2 | 2 | 4 | 6 | 14 | 22 | 32 | 44$

Can be combined with auxiliary contact DILM820-XH...

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 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] 7×10^{6}

Lifespan, mechanical DC operated [Operations] 7 x 10⁶

Operating frequency, mechanical AC operated [Operations/h] 2000

Operating frequency, mechanical DC operated [Operations/h] 2000

Olimatic proofing Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30

Ambient temperature Open -40 - +60 °C Ambient temperature Enclosed - 40 - + 40 °C

Ambient temperature Storage - 40 - + 80 °C

Mounting position

Mechanical shock resistance (IEC/EN 60068-2-27) Half-sinusoidal shock, 10 ms Main contacts N/O contact 10 g

Mechanical shock resistance (IEC/EN 60068-2-27) Half-sinusoidal shock, 10 ms Auxiliary contacts N/O contact 10 g

Mechanical shock resistance (IEC/EN 60068-2-27) Half-sinusoidal shock, 10 ms Auxiliary contacts N/C contact 8 g

Degree of Protection IP00

Protection against direct contact when actuated fromfront (EN 50274) Finger and back-of-hand proof with terminal shroud or terminal block

Altitude Max. 2000 m

Weight AC operated 8.51 kg

Weight DC operated 8.51 kg Weight Weight 8.51 kg

Terminal capacity main cable Rexible with cable lug 50 - 240 mm²

Terminal capacity main cable Stranded with cable lug 70 - 240 mm²

Terminal capacity main cable Solid or stranded 2/0 - 500 MCMAWG

Terminal capacity main cable Flat conductor [Lamellenzahl x Breite x Dicke] Fixing with flat cable terminal or cable terminal blocks See terminal capacity for cable terminal blocks mm

Terminal capacity main cable Busbar [Width] 25 mm

Main cable connection screw/bolt M10

Tightening torque 24 Nm

Terminal capacity control circuit cables Solid $1 \times (0.75 - 2.5)$ $2 \times (0.75 - 2.5) \text{ mm}^2$

Terminal capacity control circuit cables Hexible with ferrule $1 \times (0.75 - 2.5)$ $2 \times (0.75 - 2.5) \text{ mm}^2$

Terminal capacity control circuit cables Solid or stranded 18 - 14 AWG

Control circuit cable connection screw/bolt MB.5

Tightening torque 1.2 Nm

Tool Main cable Width across flats 16 mm

Tool Control circuit cables Pozidriv screw driver 2 Size

Main conducting paths

Rated impulse withstand voltage $[\mathrm{U}_{\mathrm{imp}}]$ 8000 V AC

Overvoltage category/pollution degree III/3

Rated insulation voltage [U] 1000 V AC

Rated operational voltage [U_e] 1000 V AC

Safe isolation to EN 61140 between coil and contacts 1000 V AC

Safe isolation to EN 61140 between the contacts 1000 V AC

Making capacity (p.f. to IEC/EN 60947) 5500 A

Breaking capacity 220 V 230 V 5000 A

Breaking capacity 380 V 400 V 5000 A Breaking capacity 500 V 5000 A

Breaking capacity 660 V 690 V 5000 A

Breaking capacity 1000 V 950 A

Component lifespan AC1: See \rightarrow Engineering, characteristic curves AC3: See \rightarrow Engineering, characteristic curves AC4: See \rightarrow Engineering, characteristic curves

Short-circuit rating Short-circuit protection maximumfuse Type "2" coordination 400 V [gG/gL 500 V] 500 A

Short-circuit rating Short-circuit protection maximumfuse Type "2" coordination 690 V [gG/gL 690 V] 500 A

Short-circuit rating Short-circuit protection maximumfuse Type "2" coordination 1000 V [gG/gL 1000 V] 200 A

Short-circuit rating Short-circuit protection maximumfuse Type "1" coordination 400 V [gG/gL 500 V] 630 A

Short-circuit rating Short-circuit protection maximumfuse Type "1" coordination 690 V [gG/gL 690 V] 630 A

Short-circuit rating Short-circuit protection maximumfuse Type "1" coordination 1000 V [gG/gL 1000 V] 250 A

AC

AC-1 Rated operational current Conventional free air thermal current, 3 pole, 50 -60 Hz Open at 40 °C [I_{th} =I_e] 612 A

AC-1

Rated operational current Conventional free air thermal current, 3 pole, 50 -60 Hz Open at 50 °C [I_{th}=I_e] 548 A

AC-1 Rated operational current Conventional free air thermal current, 3 pole, 50 -60 Hz Open at 55 °C [I_{th}=I_e] 522 A

AC-1 Rated operational current Conventional free air thermal current, 3 pole, 50 -60 Hz Open at 60 °C [I_{th}=I_e] 500 A

AC-1 Rated operational current Conventional free air thermal current, 3 pole, 50 -60 Hz enclosed [I_{th}] 450 A

AC-1 Rated operational current Conventional free air thermal current, 3 pole, 50 -60 Hz Notes At maximum permissible ambient air temperature. Rated operational current Conventional free air thermal current, 1 pole Note at maximum permissible ambient air temperature

AC-1

Rated operational current Conventional free air thermal current, 1 pole open [I_{th}] 1250 A

AC-1

Rated operational current Conventional free air thermal current, 1 pole enclosed [I_{th}] 1125 A

AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz Notes At maximum permissible ambient temperature (open.)

AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 220 V 230 V [le] 400 A

AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 240 V [le] 400 A

AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 380 V 400 V [le] 400 A

AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 415 V [le] 400 A

AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 440V [le] 400 A AC-3 Rated operational current Open, 3-pole: 50 – 60 Hz 500 V [le] 400 A

AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 660 V 690 V [le] 325 A

AC-3

Rated operational current Open, 3-pole: 50 – 60 Hz 1000 V [le] 95 A

AC-3

Motor rating [P] 220 V 230 V [P] 125 kW

AC-3 Motor rating [P] 240V [P] 132 kW

AC-3 Notor rating [P] 380 V 400 V [P] 212 kW

AC-3 Motor rating [P] 415 V [P] 232 kW

AC-3 Motor rating [P] 440 V [P] 250 kW

AC-3

Motor rating [P] 500 V [P] 280 kW Motor rating [P] 660 V 690 V [P] 300 kW

AC-3

Motor rating [P] 1000 V [P] 132 kW

AC-4

296 A

Rated operational current Open, 3-pole: 50 – 60 Hz 220 V 230 V [le] 296 A

AC-4 Rated operational current Open, 3-pole: 50-60 Hz 240 V [le]

AC-4 Rated operational current Open, 3-pole: 50 – 60 Hz 380 V 400 V [le] 296 A

AC-4 Rated operational current Open, 3-pole: 50 – 60 Hz 415 V [le] 296 A

AC-4 Rated operational current Open, 3-pole: 50 – 60 Hz 440 V [l_e] 296 A

AC-4

Rated operational current Open, 3-pole: 50 – 60 Hz 500 V [le] 296 A

AC-4

Rated operational current Open, 3-pole: 50 – 60 Hz 660 V 690 V [le] 260 A Rated operational current Open, 3-pole: 50 – 60 Hz 1000 V [le] 95 A

AC-4 Motor rating [P] 220 V 230 V [P] 92 kW

AC-4

Motor rating [P] 240 V [P] 100 kW

AC-4 Motor rating [P] 380 V 400 V [P] 160 kW

AC-4

Motor rating [P] 415 V [P] 176 kW

AC-4 Motor rating [P] 440 V [P] 186 kW

AC-4 Motor rating [P] 500 V [P] 210 kW

AC-4 Motor rating [P] 660 V 690 V [P] 240 kW

AC-4 Motor rating [P] 1000 V [P] 132 kW

Condensor operation

Individual compensation, rated operational current $l_{\rm e}$ of three-phase capacitors Open

up to 525 V 307 A

Individual compensation, rated operational current l_e of three-phase capacitors Open 690 V 177 A

Max. inrush current peak 30 x $I_{\rm e}$

 $\begin{array}{l} \text{Component lifespan} \left[\text{Operations} \right] \\ 0.1 \ x \ 10^6 \end{array}$

Max. operating frequency 200 Ops/h

DC

Rated operational current, open DC-1 Notes see DILDC300/DILDC600 or on request

Current heat loss

3 pole, at I_{th} (60°) 58 W

Ourrent heat loss at Ie to AC-3/400 V 37 W

Impedance per pole 0.077 m Ω

Magnet systems

Voltage tolerance U_S 110 - 250 V 40-60 Hz 110 - 350 V DC

Voltage tolerance AC operated [Rck-up] 0.7 x U_{S min} - 1.15 x U_{S max} Voltage tolerance DC operated [Pick-up] 0.7 x U_{S min} - 1.15 x U_{S max}

Voltage tolerance AC operated [Drop-out] 0.2 x U_{S max} - 0.6 x U_{S min}

Voltage tolerance DC operated [Drop-out] 0.2 x U_{S max} - 0.6 x U_{S min}

Power consumption of the coil in a cold state and 1.0 x U_S Note on power consumption Control transformer with $u_k \,\square\, 6\%$

Power consumption of the coil in a cold state and 1.0 x U_{S} Pull-in power [Pick-up] 450 VA

Power consumption of the coil in a cold state and 1.0 x U_{S} Pull-in power [Pick-up] 350 W

Power consumption of the coil in a cold state and 1.0 x U_S Sealing power [Sealing] 14.2 VA

Power consumption of the coil in a cold state and 1.0 x U_{S} Sealing power [Sealing] 7.9 W

Duty factor 100 % DF

Changeover time at 100 % U_S (recommended value) Main contacts Closing delay 80 ms

Changeover time at 100 % Us (recommended

value) Main contacts Opening delay 110 ms

Behaviour in marginal and transitional conditions Sealing Voltage interruptions $(0 \dots 0.2 \text{ x } U_{c \min}) \square 10 \text{ ms}$ Time is bridged successfully

Behaviour in marginal and transitional conditions Sealing Voltage interruptions $(0 \dots 0.2 \times U_{c \min}) > 10 \text{ ms}$ Drop-out of the contactor

Behaviour in marginal and transitional conditions Sealing Voltage drops $(0.2 \dots 0.6 \times U_{c\,min}) \Box 12 \,ms$ Time is bridged successfully

Behaviour in marginal and transitional conditions Sealing Voltage drops $(0.2 \dots 0.6 \times U_{c min}) > 12 \text{ ms}$ Drop-out of the contactor

Behaviour in marginal and transitional conditions Sealing Voltage drops (0.6 ... 0.7 x U_{c min}) Contactor remains switched on

Behaviour in marginal and transitional conditions Sealing Excess voltage (1.15 ... 1.3 x U_{c max}) Contactor remains switched on

Behaviour in marginal and transitional conditions Sealing Hck-up phase $(0 \dots 0.7 \times U_{c \text{ min}})$ Contactor does not switch on

Behaviour in marginal and transitional conditions Sealing Fick-up phase $(0.7 \times U_{c min} \dots 1.15 \times U_{c max})$ Contactor switches on with certainty Admissible transitional contact resistance (of the external control circuit device when actuating A11) \Box 500 m Ω

PLC signal level (A3 - A4) to IEO/EN 61131-2 (type 2) High 15 V

PLC signal level (A3 - A4) to IEC/EN 61131-2 (type 2) Low 5 V

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 125 HP

Switching capacity Maximum motor rating Three-phase 230 V 240 V 150 HP

Switching capacity Maximum motor rating Three-phase 460 V 480 V 300 HP

Switching capacity Maximum motor rating Three-phase 575 V 600 V 400 HP

Switching capacity General use 450 A

Auxiliary contacts Pilot Duty AC operated A600

Auxiliary contacts Pilot Duty DC operated P300

Auxiliary contacts General Use AC 600 V

Auxiliary contacts General Use AC 15 A

Auxiliary contacts General Use DC 250 V

Auxiliary contacts General Use DC 1 A

Short Circuit Current Rating Basic Rating SOCR 30 kA

Short Orcuit Ourrent Rating Basic Rating max. Fuse 800 A

Short Circuit Current Rating Basic Rating max. CB

600 A

Short Circuit Current Rating 480 V High Fault SCCR (fuse) 30/100 kA

Short Circuit Current Rating 480 V High Fault max. Fuse 800/600 Class J A

Short Circuit Current Rating 480 V High Fault SCCR (CB) 100 kA

Short Circuit Current Rating 480 V High Fault max. CB 600 A

Short Circuit Current Rating 600 V High Fault SCCR (fuse) 30/100 kA

Short Circuit Current Rating 600 V High Fault max. Fuse 800/600 Class J A

Short Circuit Current Rating 600 V High Fault SCCR (CB) 30 kA

Short Circuit Current Rating 600 V High Fault max. CB 600 A

Special Purpose Ratings Definite Purpose Ratings (100,000 cycles acc. to UL 1995) LRA 480V 60Hz 3phase 3300 A

Special Purpose Ratings Definite Purpose Ratings (100,000 cycles acc. to UL 1995) FLA 480V 60Hz 3phase 550 A

Special Purpose Ratings Definite Purpose Ratings (100,000 cycles acc. to UL 1995) LRA 600V 60Hz 3phase 3120 A

Special Purpose Ratings Definite Purpose Ratings (100,000 cycles acc. to UL 1995) FLA 600V 60Hz 3phase 420 A

DESIGN VERIFICATION AS PER IEC/EN 61439

Technical data for design verification

Rated operational current for specified heat dissipation $[I_n]$ 400 A

Heat dissipation per pole, current-dependent $[\mathsf{P}_{\text{id}}]$ 12.33 W

Equipment heat dissipation, current-dependent [P_{vid}] 0 W

Static heat dissipation, non-current-dependent $[\mathrm{P}_{\mathrm{vs}}]$ 7.9 W

Heat dissipation capacity $[P_{\text{diss}}]$ 0 W

Operating ambient temperature min. -40 °C

Operating ambient temperature max. +60 $^{\circ}\mathrm{C}$

IEC/EN 61439 design verification

10.2 Strength of materials and parts10.2.2 Corrosion resistanceMeets the product standard's requirements.

10.2 Strength of materials and parts10.2.3.1 Verification of thermal stability of enclosuresMeets the product standard's requirements.

10.2 Strength of materials and parts10.2.3.2 Verification of resistance of insulating materials to normal heatMeets the product standard's requirements.

10.2 Strength of materials and parts 10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects Neets the product standard's requirements.

10.2 Strength of materials and parts10.2.4 Resistance to ultra-violet (UV) radiationMeets the product standard's requirements.

10.2 Strength of materials and parts10.2.5 LiftingDoes not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts10.2.6 Mechanical impactDoes not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts10.2.7 InscriptionsMeets the product standard's requirements.

10.3 Degree of protection of ASSEVBLIES 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 properties10.9.2 Power-frequency electric strength Is the panel builder's responsibility.

10.9 Insulation properties10.9.3 Impulse withstand voltageIs the panel builder's responsibility.

10.9 Insulation properties10.9.4 Testing of enclosures made of insulating materialIs 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 110 - 250 V

Rated control supply voltage Us at AC 60HZ 110 - 250 V

Rated control supply voltage Us at DC 110 - 250 V

Voltage type for actuating AC/DC

Rated operation current le at AC-1, 400 V 612 A

Rated operation current le at AC-3, 400 V 400 A

Rated operation power at AC-3, 400 V 200 kW

Rated operation current le at AC-4, 400 V 296 A

Rated operation power at AC-4, 400 V 160 kW

Rated operation power NEVA 223 kW

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

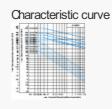
Side mounting auxiliary contacts 24/27



possible variants at auxiliary contact module fitting options on the side: 2 x DIL/NB20-XHI11(V)-SI; 2 x DIL/NB20-XHI11-SA

Characteristic curve

Normal switching duty Normal AC induction motor Operating characteristics Switch on: from stop Switch off: during run **Bectrical 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

Characteristic curve

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

Characteristic curve

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

DIMENSIONS



□ DILM820-XHI11(V)-SI □ DILM820-XHI11-SA





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