

Eaton 231686

Catalog Number: 231686

Eaton Moeller® series DILEM Contactor, 415 V 50 Hz, 480 V 60 Hz, 3 pole, 380 V 400 V, 4 kW, Contacts N/C = Normally closed= 1 NC, Spring-loaded terminals, AC operation

General specifications



Product Name

Eaton Moeller® series DILEM Mini
contactor

Catalog Number

231686

EAN

4015082316860

Product Length/Depth

52 mm

Product Height

58 mm

Product Width

45 mm

Product Weight

0.17 kg

Certifications

IEC/EN 60947-4-1

UL Category Control No.: NLDX

IEC/EN 60947

UL

UL File No.: E29096

CSA File No.: 012528

CSA-C22.2 No. 14-05

CE

CSA Class No.: 3211-04

CSA

UL 508

VDE 0660

Catalog Notes

Also tested according to AC-3e.

Features & Functions

Features

Positive operating contacts to EN 60947-5-1 appendix L, including auxiliary contact module

Fitted with:

Auxiliary contact

Number Of Poles

Three-pole

General

Application

Mini Contactors for Motors and Resistive Loads

Lifespan, mechanical

7,000,000 Operations (Coil 50/60 Hz)

150,000 Operations (at 240 V, DC, L/R = 50 ms: 2 contacts in series 0.5 A)

10,000,000 Operations

200,000 Operations (at 240 V, AC-15)

Mounting position

As required (except vertical with terminals A1/A2 at the bottom)

Operating frequency

9000 mechanical Operations/h

Overvoltage category

III

Pollution degree

3

Product category

Contactors

Protection

Finger and back-of-hand proof, Protection against direct contact when actuated from front (EN 50274)

Rated impulse withstand voltage (Uimp)

6000 V AC

Shock resistance

10 g, N/O main contact, Basic unit without auxiliary contact module, Mechanical, according to IEC/EN 60068-2-27, Half-sinusoidal shock 10 ms

20 g, N/C auxiliary contact, Basic unit with auxiliary contact module, Mechanical, according to IEC/EN 60068-2-27, Half-sinusoidal shock 10 ms

10 g, N/O main contact, Basic unit with auxiliary contact module, Mechanical, according to IEC/EN 60068-2-27, Half-sinusoidal shock 10 ms

20 g, N/O auxiliary contact, Basic unit with auxiliary contact module, Mechanical, according to IEC/EN 60068-2-27, Half-sinusoidal shock 10 ms

10 g, N/C auxiliary contact, Basic unit without auxiliary contact module, Mechanical, according to IEC/EN 60068-2-27, Half-sinusoidal shock 10 ms

Suitable for

Also motors with efficiency class IE3

Utilization category

AC-3: Normal AC induction motors: starting, switch off during running

AC-4: Normal AC induction motors: starting, plugging, reversing, inching

AC-1: Non-inductive or slightly inductive loads, resistance furnaces

Voltage type

AC

Climatic environmental conditions

Ambient operating temperature - min

-25 °C

Ambient operating temperature - max

50 °C

Ambient operating temperature (enclosed) - min

25 °C

Ambient operating temperature (enclosed) - max

40 °C

Ambient storage temperature - min

40 °C

Ambient storage temperature - max

80 °C

Climatic proofing

Damp heat, cyclic, to IEC 60068-2-30

Damp heat, constant, to IEC 60068-2-78

Terminal capacities

Terminal capacity (flexible with ferrule)

2 x (1 - 2.5) mm²

1 x (1 - 2.5) mm²

Terminal capacity (solid/stranded AWG)

16 - 14

Stripping length (main cable)

10 mm

Screwdriver size

0.6 x 3.5 mm, Spring-loaded terminals

Electrical rating

Rated breaking capacity at 220/230 V

90 A

Rated breaking capacity at 380/400 V

90 A

Rated breaking capacity at 500 V

64 A

Rated operational power at AC-3, 240 V, 50 Hz

2.5 kW

Rated operational power at AC-3, 380/400 V, 50 Hz

4 kW

Rated operational power at AC-3, 415 V, 50 Hz

4.3 kW

Rated breaking capacity at 660/690 V

42 A

Rated making capacity up to 440 V (cos phi to IEC/EN 60947)

110 A

Rated operational power at AC-4, 220/230 V, 50 Hz

1.5 kW

Rated operational power at AC-4, 240 V, 50 Hz

1.8 kW

Rated operational power at AC-4, 415 V, 50 Hz

3.1 kW

Rated operational power at AC-4, 440 V, 50 Hz

3.3 kW

Rated operational power at AC-4, 500 V, 50 Hz

3 kW

Rated operational power at AC-4, 660/690 V, 50 Hz

3 kW

Rated operational voltage (Ue) at AC - max

690 V

Rated insulation voltage (Ui)

690 V

Rated operational current (Ie)

2.5 A at 60 V, DC L/R $\leq$ 15 ms (with 2 contacts in series)

2.5 A at 24 V, DC L/R $\leq$ 15 ms (with 1 contact in series)

0.5 A at 220 V, DC L/R $\leq$ 15 ms (with 3 contacts in series)

1.5 A at 100 V, DC L/R $\leq$ 15 ms (with 3 contacts in series)

Rated operational current (Ie) at AC-1, 380 V, 400 V, 415 V

22 A

Rated operational current (Ie) at AC-15, 220 V, 230 V, 240 V

6 A

Rated operational current (Ie) at AC-15, 380 V, 400 V, 415 V

3 A

Rated operational current (Ie) at AC-15, 500 V

1.5 A

Rated operational current (Ie) at AC-3, 220 V, 230 V, 240 V

9 A

Rated operational current (Ie) at AC-3, 380 V, 400 V, 415 V

9 A

Rated operational current (Ie) at AC-3, 440 V

9 A

Rated operational current (Ie) at AC-3, 500 V

Short-circuit rating

Short-circuit current rating (basic rating)

45 A, max. Fuse, SCCR (UL/CSA)

5 kA, SCCR (UL/CSA)

Short-circuit protection

6 A gG/gL, Max. Fuse 500V, Auxiliary contacts, Short-circuit rating without welding

10 A fast, Max. Fuse 500V, Auxiliary contacts, Short-circuit rating without welding

PKZM0-4, Maximum overcurrent protective device, Short-circuit protection only, Auxiliary contacts, Short-circuit rating without welding

Short-circuit protection rating (type 1 coordination) at 500 V

20 A gG/gL

Short-circuit protection rating (type 2 coordination) at 500 V

10 A gG/gL

Conventional thermal current Ith

Conventional thermal current Ith (1-pole, enclosed)

40 A

Conventional thermal current Ith (3-pole, enclosed)

16 A

Conventional thermal current Ith at 55°C (3-pole, open)

19 A

Conventional thermal current Ith of auxiliary contacts (1-pole, open)

10 A

Conventional thermal current Ith of main contacts (1-pole, open)

50 A

Switching capacity

Switching capacity (main contacts, general use)

15 A, Maximum motor rating (UL/CSA)

Switching capacity (auxiliary contacts, general use)

0.5 A, 250 V DC, (UL/CSA)

10 A, 600 V AC, (UL/CSA)

Switching capacity (auxiliary contacts, pilot duty)

6.4 A

Rated operational current (Ie) at AC-3, 660 V, 690 V

4.8 A

Rated operational current (Ie) at AC-4, 220 V, 230 V, 240 V

6.6 A

Rated operational current (Ie) at AC-4, 440 V

6.6 A

Rated operational current (Ie) at AC-4, 500 V

5 A

Rated operational current (Ie) at AC-4, 660 V, 690 V

3.4 A

Rated operational current (Ie) at DC-1, 110 V

20 A

Rated operational current (Ie) at DC-1, 12 V

20 A

Rated operational current (Ie) at DC-1, 220 V

20 A

Rated operational current (Ie) at DC-1, 24 V

20 A

Rated operational current (Ie) at DC-1, 60 V

20 A

Safe isolation

300 V AC, Between coil and contacts, According to EN 61140

300 V AC, Between coil and auxiliary contacts, According to EN 61140

300 V AC, Between auxiliary contacts, According to EN 61140

300 V AC, Between the contacts, According to EN 61140

P300, DC operated (UL/CSA)

A600, AC operated (UL/CSA)

Magnet system

Arcing time

12 ms at 690 V AC

Changeover time

16 - 21 ms

Duty factor

100 %

Pick-up voltage

0.8 - 1.1 V AC x Uc (voltage tolerance - single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz)

1.1 V AC x Uc (voltage tolerance - dual frequency coil 50/60 Hz)

Power consumption, pick-up, 50 Hz

22 W, AC, Single-frequency coil 50 Hz and Dual-frequency coil 50/60 Hz

25 VA, AC, Single-frequency coil 50 Hz and Dual-frequency coil 50/60 Hz

Power consumption, pick-up, 60 Hz

25 VA, AC, Single-frequency coil 50 Hz and Dual-frequency coil 50/60 Hz

22 W, AC, Single-frequency coil 50 Hz and Dual-frequency coil 50/60 Hz

Power consumption, sealing, 50 Hz

1.8 W, AC, Single-frequency coil 50 Hz and Dual-frequency coil 50/60 Hz

4.6 VA, AC, Single-frequency coil 50 Hz and Dual-frequency coil 50/60 Hz

Power consumption, sealing, 60 Hz

1.8 W, AC, Single-frequency coil 50 Hz and Dual-frequency coil 50/60 Hz

Rated control supply voltage (Us) at AC, 50 Hz - min

415 V

Rated control supply voltage (Us) at AC, 50 Hz - max

415 V

Rated control supply voltage (Us) at AC, 60 Hz - min

480 V

Rated control supply voltage (Us) at AC, 60 Hz - max

480 V

Rated control supply voltage (Us) at DC - min

0 V

Rated control supply voltage (Us) at DC - max

0 V

Switching time (AC operated, make contacts, closing delay) - min

14 ms

Switching time (AC operated, make contacts, closing delay) - max

21 ms

Switching time (AC operated, make contacts, opening delay) - min

8 ms

Switching time (AC operated, make contacts, opening delay) - max

18 ms

Switching time (AC operated, N/O, with auxiliary contact module, closing delay)

45 ms

Motor rating

Assigned motor power at 115/120 V, 60 Hz, 1-phase

0.5 HP

Assigned motor power at 200/208 V, 60 Hz, 3-phase

2 HP

Assigned motor power at 230/240 V, 60 Hz, 1-phase

1.5 HP

Assigned motor power at 230/240 V, 60 Hz, 3-phase

3 HP

Assigned motor power at 460/480 V, 60 Hz, 3-phase

5 HP

Assigned motor power at 575/600 V, 60 Hz, 3-phase

5 HP

Contacts

Control circuit reliability

$< 2 \lambda, < 1$ failure at 100,000,000 Operations (at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 5.4$ mA)

Number of auxiliary contacts (normally closed contacts)

1

Number of auxiliary contacts (normally open contacts)

0

Design verification

Equipment heat dissipation, current-dependent P_{vid}

1.2 W

Heat dissipation capacity P_{diss}

0 W

Heat dissipation per pole, current-dependent P_{vid}

0.4 W

Rated operational current for specified heat dissipation (I_n)

9 A

Static heat dissipation, non-current-dependent P_{vs}

1.8 W

10.2.2 Corrosion resistance

Resources

Catalogs

[Switching and protecting motors - catalog](#)

[Product Range Catalog Switching and protecting motors](#)

[eaton-product-overview-for-machinery-catalogue-ca08103003zen-en-us.pdf](#)

Characteristic curve

[eaton-contactors-switch-dilm-characteristic-curve.eps](#)

[eaton-contactors-short-time-loading-dilm-characteristic-curve.eps](#)

[eaton-contactors-component-dilm-characteristic-curve-003.eps](#)

Declarations of conformity

[DA-DC-00004812.pdf](#)

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 Resist. of insul. mat. to abnormal heat/fire by internal elect. 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.

10.9.2 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

[DA-DC-00004788.pdf](#)

Drawings

[eaton-contactors-dimensions-004.eps](#)

[eaton-general-ie-ready-dilm-contactor-standards.eps](#)

[eaton-tripping-devices-mounting-diler-contactor-relay-symbol.eps](#)

eCAD model

[ETN.231686.edz](#)

Installation instructions

[IL03407009Z](#)

mCAD model

[DA-CS-dil_em_c](#)

[DA-CD-dil_em_c](#)

System overview

[eaton-contactors-accessory-diler-relay-explosion-drawing.eps](#)

Wiring diagrams

[eaton-contactors-contact-dilm-wiring-diagram-002.eps](#)

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.



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