Specifications

# Eaton 051609



## Catalog Number: 051609

Eaton Moeller® series DILEEM Contactor, 220 V 50 Hz, 240 V 60 Hz, 3 pole, 380 V 400 V, 3 kW, Contacts N/O = Normally open= 1 N/O, Screw terminals, AC operation

## General specifications

**Product Name**
Eaton Moeller® series DILEEM Mini contactor

**Catalog Number**
051609

**EAN**
4015080516095

**Product Length/Depth**
52 mm

**Product Height**
58 mm

**Product Width**
45 mm

**Product Weight**
0.17 kg

**Certifications**
UL 508
IEC/EN 60947
IEC/EN 60947-4-1
CSA Class No.: 3211-04
CSA-C22.2 No. 14-05
UL
CSA
UL File No.: E29096
CE
CSA File No.: 012528
UL Category Control No.: NLDX
VDE 0660

**Catalog Notes**
Also tested according to AC-3e.

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## 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

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

### 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

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 without 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
8 g, N/O auxiliary contact, Basic unit without 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

### Suitable for

Also motors with efficiency class IE3

### Utilization category

AC-1: Non-inductive or slightly inductive loads, resistance furnaces
AC-3: Normal AC induction motors: starting, switch off during running
AC-4: Normal AC induction motors: starting, plugging, reversing, inching

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

## Terminal capacities

### Terminal capacity (flexible with ferrule)

1 x (0.75 - 1.5) mm²
2 x (0.75 - 1.5) mm²

### Terminal capacity (solid)

1 x (0.75 - 2.5) mm²
2 x (0.75 - 2.5) mm²

### Terminal capacity (solid/stranded AWG)

18 - 14

### Stripping length (main cable)

8 mm

### Screwdriver size

2, Terminal screw, Pozidriv screwdriver
0.8 x 5.5/1 x 6 mm, Terminal screw, Standard screwdriver

### Tightening torque

1.2 Nm, Screw 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

1.8 kW

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

3 kW

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

3.1 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

1.1 kW

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

1.3 kW

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

2.3 kW

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

2.4 kW

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

2.2 kW

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

2.2 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 ≤ 15 ms (with 2 contacts in series)

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

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

1.5 A at 100 V, DC L/R ≤ 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

6.6 A

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

6.6 A

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

6.6 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)

5 A

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

3.5 A

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

5 A

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

5 A

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

3.7 A

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

2.9 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 auxiliary contacts, According to EN 61140

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

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

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

A600, AC operated (UL/CSA)

P300, DC 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

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, pick-up, 60 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, sealing, 50 Hz

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

1.8 W, 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

220 V

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

220 V

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

240 V

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

240 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

0.25 HP

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

1.5 HP

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

1 HP

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

2 HP

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

3 HP

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

3 HP

## Contacts

Control circuit reliability

< 2 λ, < 1 failure at 100,000,000 Operations (at $U_e$ = 24 V DC, Umin = 17 V, Imin = 5.4 mA)

Number of auxiliary contacts (normally closed contacts)

0

Number of auxiliary contacts (normally open contacts)

1

## Design verification

Equipment heat dissipation, current-dependent Pvid

0.6 W

Heat dissipation capacity Pdiss

0 W

Heat dissipation per pole, current-dependent Pvid

0.2 W

Rated operational current for specified heat dissipation (In)

6.6 A

Static heat dissipation, non-current-dependent Pvs

1.8 W

10.2.2 Corrosion resistance

## Resources

Catalogs

Product Range Catalog Switching and protecting motors

Switching and protecting motors - catalog

eaton-product-overview-for-machinery-catalogue-ca08103003zen-en-us.pdf

Characteristic curve

eaton-contactors-short-time-loading-dilm-characteristic-curve.eps

eaton-contactors-component-dilm-characteristic-curve-003.eps

Declarations of conformity

DA-DC-00004812.pdf

DA-DC-00004788.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

## Drawings

eaton-contactors-dimensions-210x005.eps

eaton-contactors-dilem-dimensions.eps

eaton-contactors-dimensions-210x007.eps

eaton-tripping-devices-mounting-diler-contactor-relay-symbol.eps

eaton-general-ie-ready-dilm-contactor-standards.eps

## eCAD model

ETN.051609.edz

## Installation instructions

IL03407009Z

## mCAD model

DA-CD-dil_em

DA-CS-dil_em

## System overview

eaton-contactors-accessory-dilem-system-overview.eps

## Wiring diagrams

eaton-contactors-contact-dilm-wiring-diagram.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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