Specifications

# Eaton 051644

## Catalog Number: 051644

Eaton Moeller® series DILEEM Contactor, 12 V DC, 3 pole, 380 V 400 V, 3 kW, Contacts N/O = Normally open= 1 N/O, Screw terminals, DC operation

## General specifications

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

**Catalog Number**
051644

**EAN**
4015080516446

**Product Length/Depth**
54 mm

**Product Height**
58 mm

**Product Width**
45 mm

**Product Weight**
0.206 kg

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

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

Powering Business Worldwide

## 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

20,000,000 Operations
200,000 Operations (at 240 V, AC-15)
150,000 Operations (at 240 V, DC, L/R = 50 ms: 2 contacts in series 0.5 A)

### 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/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/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/C auxiliary 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

### 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

DC

## 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)

2 x (0.75 - 2.5) mm²

1 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 24 V, DC L/R ≤ 15 ms (with 1 contact in series)
2.5 A at 60 V, DC L/R ≤ 15 ms (with 2 contacts in series)
1.5 A at 100 V, DC L/R ≤ 15 ms (with 3 contacts in series)
0.5 A at 220 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)

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

10 A, 600 V AC, (UL/CSA)
0.5 A, 250 V DC, (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 the contacts, According to EN 61140

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

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

300 V AC, Between auxiliary 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

40 - 50 ms

Duty factor

100 %

Pick-up voltage

0.8 - 1.1 V DC x Uc

Power consumption

Smoothed DC voltage or three-phase bridge rectifier

2.3 VA/W at DC (Pick-up/Sealing power)

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

0 V

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

0 V

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

0 V

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

0 V

Rated control supply voltage (Us) at DC - min

12 V

Rated control supply voltage (Us) at DC - max

12 V

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

70 ms

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

26 ms

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

35 ms

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

15 ms

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

25 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

2.3 W

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 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

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.

## 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-component-dilm-characteristic-curve-003.eps

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

### Declarations of conformity

DA-DC-00004788.pdf

DA-DC-00004812.pdf

### Drawings

eaton-contactors-diler-dimensions-005.eps

eaton-contactors-diler-dimensions-004.eps

eaton-contactors-dilem-dimensions.eps

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

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

### eCAD model

ETN.051644.edz

### Installation instructions

IL03407009Z

### mCAD model

DA-CS-dil_em

DA-CD-dil_em

### System overview

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

### Wiring diagrams

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

### 10.13 Mechanical function

The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.