

# Eaton 051806

Catalog Number: 051806

Eaton Moeller® series DILEM Contactor, 400 V 50 Hz, 440 V 60 Hz, 4 pole, 380 V 400 V, 4 kW, Screw terminals, AC operation



### General specifications

#### Product Name

Eaton Moeller® series DILEM Mini  
contactor

#### Catalog Number

051806

#### Model Code

DILEM4(400V50HZ,440V60HZ)

#### EAN

4015080518068

#### Product Length/Depth

52 mm

#### Product Height

58 mm

#### Product Width

45 mm

#### Product Weight

0.17 kg

#### Warranty

1 year

#### Compliances

RoHS Compliant  
CE Marked

#### Certifications

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

## Product specifications

### Amperage Rating

15A

### HP rating - max

0.5, 1.5/ 2, 3, 5, 5 hp (1/3PH @120,240/208,240,480,600 V)

### Number Of Poles

Four-pole

### Type

Full voltage non-reversing miniature contactor

### Features

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

#### 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.

#### 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

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

[eaton-contactors-switch-dilm-characteristic-curve.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-004.eps](#)

[eaton-contactors-diler-dimensions-005.eps](#)

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

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

### eCAD model

[ETN.051806.edz](#)

### Installation instructions

[IL03407009Z](#)

### mCAD model

[DA-CS-dil\\_em](#)

[DA-CD-dil\\_em](#)

### Specifications and datasheets

[Eaton Specification Sheet - 051806](#)

### System overview

[eaton-contactors-accessory-dilem-system-overview.eps](#)

### Wiring diagrams

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

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.

#### Frequency rating

50-60 Hz

#### Operating frequency

9000 mechanical Operations/h

#### Pollution degree

3

#### Climatic proofing

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

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

#### Rated impulse withstand voltage (Uimp)

6000 V AC

#### Utilization category

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

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

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

#### Connection

Screw terminals

#### Ambient operating temperature - max

50 °C

#### Ambient operating temperature - min

-25 °C

#### Ambient operating temperature (enclosed) - max

40 °C

#### Ambient operating temperature (enclosed) - min

25 °C

#### Ambient storage temperature - max

80 °C

#### Ambient storage temperature - min

40 °C

#### 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

#### Conventional thermal current $I_{th}$ (1-pole, enclosed)

50 A

#### Conventional thermal current $I_{th}$ (3-pole, enclosed)

16 A

#### Conventional thermal current $I_{th}$ at 55°C (3-pole, open)

19 A

Conventional thermal current  $I_{th}$  of auxiliary contacts (1-pole, open)

10 A

Conventional thermal current  $I_{th}$  of main contacts (1-pole, open)

60 A

Equipment heat dissipation, current-dependent  $P_{vid}$

9.56 W

Heat dissipation capacity  $P_{diss}$

0 W

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

2.39 W

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

45 ms

Application

Mini Contactors for Motors and Resistive Loads

Product category

Contactors

Protection

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

Arcing time

12 ms at 690 V AC

Electrical connection type of main circuit

Screw connection

Screwdriver size

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

2, Terminal screw, Pozidriv screwdriver

Voltage type

AC

Degree of protection

IP20

Mounting position

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

Number of auxiliary contacts (normally closed contacts)

0

Number of auxiliary contacts (normally open contacts)

0

Number of contacts (normally closed) as main contact

0

Number of main contacts (normally open contact)

4

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 breaking capacity at 660/690 V

42 A

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

400 V

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

400 V

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

440 V

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

440 V

Coil voltage

400-440 Vac, 50/60 Hz

Continuous ampere rating

9 A

Overvoltage category

III

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)

Duty factor

100 %

Changeover time

16 - 21 ms

Operation

Reversing

Lifespan, mechanical

20,000,000 Operations

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

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

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

#### Pick-up voltage

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

1.1 V AC x  $U_c$  (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

#### 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

#### 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

#### Screw size

M3.5, Terminal screw

#### 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 operational current ( $I_e$ )

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

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

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

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

#### Terminal capacity (flexible with ferrule)

1 x (0.75 - 1.5) mm<sup>2</sup>

2 x (0.75 - 1.5) mm<sup>2</sup>

#### Shock resistance

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

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

#### Terminal capacity (solid)

2 x (0.75 - 2.5) mm<sup>2</sup>

1 x (0.75 - 2.5) mm<sup>2</sup>

#### Terminal capacity (solid/stranded AWG)

18 - 14

#### Switching capacity (main contacts, general use)

15 A, Maximum motor rating (UL/CSA)

#### Tightening torque

1.2 Nm, Screw terminals

#### Rated control supply voltage (Us) at DC - max

0 V

#### Rated control supply voltage (Us) at DC - min

0 V

#### Rated insulation voltage (Ui)

690 V

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

110 A

#### 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 (I<sub>e</sub>) at AC-3, 220 V, 230 V, 240 V

9 A

Rated operational current (I<sub>e</sub>) at AC-3, 380 V, 400 V, 415 V

9 A

Rated operational current (I<sub>e</sub>) at AC-3, 440 V

9 A

Rated operational current (I<sub>e</sub>) at AC-3, 500 V

6.4 A

Rated operational current (I<sub>e</sub>) at AC-3, 660 V, 690 V

4.8 A

Rated operational current (I<sub>e</sub>) at AC-4, 220 V, 230 V, 240 V

6.6 A

Rated operational current (I<sub>e</sub>) at AC-4, 400 V

6.6 A

Rated operational current (I<sub>e</sub>) at AC-4, 440 V

6.6 A

Rated operational current (I<sub>e</sub>) at AC-4, 500 V

5 A

Rated operational current (I<sub>e</sub>) at AC-4, 660 V, 690 V

3.4 A

Rated operational current (I<sub>e</sub>) at DC-1, 110 V

20 A

Rated operational current (I<sub>e</sub>) at DC-1, 12 V

20 A

Rated operational current (I<sub>e</sub>) at DC-1, 220 V

20 A

Rated operational current (I<sub>e</sub>) at DC-1, 24 V

20 A

Rated operational current (I<sub>e</sub>) at DC-1, 60 V

20 A

Rated operational current for specified heat dissipation (I<sub>n</sub>)

22 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 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, 380/400 V, 50 Hz

3 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 power (NEMA)

3.7 kW

Rated operational voltage (Ue) at AC - max

690 V

Resistance per pole

9.18 m $\Omega$

Static heat dissipation, non-current-dependent P<sub>vs</sub>

1.8 W

Stripping length (main cable)

8 mm

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

21 ms

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

14 ms

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

18 ms

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

8 ms

Short-circuit current rating (basic rating)

5 kA, SCCR (UL/CSA)

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

#### Short-circuit protection

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

6 A gG/gL, 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 $i_{th}$ at 40°C (3-pole, open)

22 A

#### Conventional thermal current $i_{th}$ at 50°C (3-pole, open)

20 A

#### Rated operational power at AC-3, 440 V, 50 Hz

4.6 kW

#### Rated operational power at AC-3, 500 V, 50 Hz

4 kW

#### Rated operational power at AC-3, 690 V, 50 Hz

4 kW

#### Actuating voltage

400 V 50 Hz, 440 V 60 Hz

#### Altitude

Max. 2000 m

#### Operating voltage at AC, 50 Hz - min

24 V

#### Operating voltage at AC, 50 Hz - max

690 V

#### Operating voltage at AC, 60 Hz - min

24 V

#### Operating voltage at AC, 60 Hz - max

690 V



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