

Specifications

Photo is representative

Eaton 230166

Eaton Moeller® series DILEM Contactor, 230 V 50 Hz, 240 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	230166
MODEL CODE	DILEM-01- C(230V50HZ,240V60HZ)
EAN	4015082301668
PRODUCT LENGTH/DEPTH	52 mm
PRODUCT HEIGHT	58 mm
PRODUCT WIDTH	45 mm
PRODUCT WEIGHT	0.17 kg
CERTIFICATIONS	UL File No.: E29096 CSA Class No.: 3211-04 UL Category Control No.: NLDX IEC/EN 60947 CE IEC/EN 60947-4-1 VDE 0660 CSA File No.: 012528 UL 508 CSA-C22.2 No. 14-05 UL CSA
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 150,000 Operations (at 240 V, DC, L/R = 50 ms: 2 contacts in series 0.5 A)
10,000,000 Operations
7,000,000 Operations (Coil 50/60 Hz)
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 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
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-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, 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) mm ² 1 x (1 - 2.5) mm ²
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)** 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

Short-circuit rating

**SHORT-CIRCUIT CURRENT
RATING (BASIC RATING)** 5 kA, SCCR (UL/CSA)
45 A, max. Fuse, SCCR
(UL/CSA)

SHORT-CIRCUIT PROTECTION

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

**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

	ms (with 3 contacts in series) 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)
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	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 auxiliary contacts, According to EN 61140 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

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)	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 1.1 V AC x U_c (voltage tolerance - dual frequency coil 50/60 Hz)
0.8 - 1.1 V AC x U_c (voltage tolerance - single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 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 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 230 V

RATED CONTROL SUPPLY VOLTAGE (US) AT AC, 50 HZ - MAX 230 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 - 0 V

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

MIN	
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

Contacts	
CONTROL CIRCUIT RELIABILITY	< 2 λ, < 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 PVID	1.2 W
HEAT DISSIPATION CAPACITY PDISS	0 W
HEAT DISSIPATION PER POLE, CURRENT-DEPENDENT PVID	0.4 W
RATED OPERATIONAL CURRENT FOR SPECIFIED HEAT DISSIPATION (IN)	9 A
STATIC HEAT DISSIPATION, NON-CURRENT-DEPENDENT PVS	1.8 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	Meets the product standard's requirements.

INSULATING MATERIALS TO NORMAL HEAT	
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.
10.13 MECHANICAL FUNCTION	The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.

Resources

CATALOGUES

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

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

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-00004812.pdf](#)

[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.230166.edz](#)

INSTALLATION INSTRUCTIONS

[IL03407009Z](#)

MCAD MODEL

[DA-CD-dil_em_c](#)

[DA-CS-dil_em_c](#)

SYSTEM OVERVIEW

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

WIRING DIAGRAMS

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

PROJECT NAME:
PROJECT NUMBER:
PREPARED BY:
DATE:



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