



051792
DILEM-01(110V50HZ,120V60HZ)

- Overview
- Specifications
- Resources



Delivery program

Technical data

Design verification as
per IEC/EN 61439

Technical data ETIM 7.0

Approvals

Characteristics

Dimensions

DELIVERY PROGRAM

Product range
Contactors

Application
Mini Contactors for Motors and Resistive Loads

Subrange
DILEM contactors

Utilization category
AC-1: Non-inductive or slightly inductive loads,
resistance furnaces
AC-3/AC-3e: Normal AC induction motors: Starting,
switching off while running
AC-4: Normal AC induction motors: starting,
plugging, reversing, inching



Notes
Also suitable for motors with efficiency class IE3.
Also tested according to AC-3e.

Connection technique
Screw terminals

Description
With auxiliary contact

Number of poles
3 pole

Rated operational current

AC-3
380 V 400 V [I_e]
9 A

AC-1
Conventional free air thermal current, 3 pole, 50 -
60 Hz
Open
at 40 °C [I_{th} = I_e]
22 A

Max. rating for three-phase motors, 50 - 60 Hz

AC-3
220 V 230 V [P]
2.2 kW

AC-3
380 V 400 V [P]
4 kW

AC-3
660 V 690 V [P]
4 kW

AC-4
220 V 230 V [P]
1.5 kW

AC-4
380 V 400 V [P]
3 kW

AC-4

660 V 690 V [P]
3 kW

Contacts

N/C = Normally closed
1 NC

Contact sequence



For use with
...DILE

Actuating voltage
110 V 50 Hz, 120 V 60 Hz

Voltage AC/DC
AC operation

TECHNICAL DATA

General

Standards
IEC/EN 60947, VDE 0660, CSA, UL

Lifespan, mechanical; Coil 50/60 Hz [Operations]
 7×10^6

Lifespan, mechanical [Operations]
 10×10^6

Maximum operating frequency
Mechanical
9000 Ops./h

Maximum operating frequency
electrical (Contactors without overload relay)
[Operations/h]
Page 05/070

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

Ambient temperature
Open
-25 - +50 °C

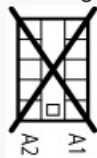
Ambient temperature
Enclosed
- 25 - 40 °C

Ambient temperature
Storage
Min. ambient temperature, storage
- 40 °C

Ambient temperature
Storage
Ambient temperature, storage max.
+ 80 °C

Mounting position
As required, except vertical with terminals A1/A2
at the bottom

Mounting position



Mechanical shock resistance (IEC/EN 60068-2-27)
Half-sinusoidal shock, 10 ms
Basic unit without auxiliary contact module
Main contacts, make contacts
10 g

Mechanical shock resistance (IEC/EN 60068-2-27)
Half-sinusoidal shock, 10 ms
Basic unit without auxiliary contact module
Main contacts Make/break contacts
Break contact
10 g

Mechanical shock resistance (IEC/EN 60068-2-27)
Half-sinusoidal shock, 10 ms
Basic unit with auxiliary contact module
Main contacts make contact

Make
10 g

Mechanical shock resistance (IEC/EN 60068-2-27)
Half-sinusoidal shock, 10 ms
Basic unit with auxiliary contact module
Auxiliary contacts Make/break contacts
20/20 g

Degree of Protection
IP20

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

Altitude
Max. 2000 m

Weight
0.17 kg

Terminal capacity of auxiliary and main contacts
Screw terminals
Solid
1 x (0.75 - 2.5)
2 x (0.75 - 2.5) mm²

Terminal capacity of auxiliary and main contacts
Screw terminals
Flexible with ferrule
1 x (0.75 - 1.5)
2 x (0.75 - 1.5) mm²

Terminal capacity of auxiliary and main contacts
Screw terminals
Solid or stranded
18 - 14 AWG

Terminal capacity of auxiliary and main contacts
Screw terminals
Stripping length
8 mm

Terminal capacity of auxiliary and main contacts
Screw terminals
Terminal screw
M3.5

Terminal capacity of auxiliary and main contacts
Screw terminals
Pozidriv screwdriver
2 Size

Terminal capacity of auxiliary and main contacts
Screw terminals
Standard screwdriver
0.8 x 5.5
1 x 6 mm

Terminal capacity of auxiliary and main contacts
Screw terminals
Max. tightening torque
1.2 Nm

Main conducting paths

Rated impulse withstand voltage [U_{imp}]
6000 V AC

Overvoltage category/pollution degree
III/3

Rated insulation voltage [U_i]
690 V AC

Rated operational voltage [U_e]
690 V AC

Safe isolation to EN 61140
between coil and contacts
300 V AC

Safe isolation to EN 61140
between the contacts
300 V AC

Making capacity ($\cos \phi$ to IEC/EN 60947)
110 A

Breaking capacity
220 V 230 V
90 A

Breaking capacity
380 V 400 V

90 A

Breaking capacity
500 V
64 A

Breaking capacity
660 V 690 V
42 A

Short-circuit protection maximum fuse
Type "2", 500 V [gL/gG]
10 A

Short-circuit protection maximum fuse
Type "1", 500 V [gL/gG]
20 A

AC

AC-1
Rated operational current
Conventional free air thermal current, 3 pole, 50 -
60 Hz
Open
at 40 °C [$I_{th} = I_n$]
22 A

AC-1
Rated operational current
Conventional free air thermal current, 3 pole, 50 -
60 Hz
Open
at 50 °C [$I_{th} = I_n$]
20 A

AC-1
Rated operational current
Conventional free air thermal current, 3 pole, 50 -
60 Hz
Open
at 55 °C [$I_{th} = I_n$]
19 A

AC-1
Rated operational current
Conventional free air thermal current, 3 pole, 50 -
60 Hz
enclosed [I_{th}]
16 A

AC-1
Rated operational current
Conventional free air thermal current, 3 pole, 50 -
60 Hz
Notes
At maximum permissible ambient air temperature.

AC-1
Rated operational current
Conventional free air thermal current, 1 pole
Notes
At maximum permissible ambient air temperature.

AC-1
Rated operational current
Conventional free air thermal current, 1 pole
open [I_{th}]
50 A

AC-1
Rated operational current
Conventional free air thermal current, 1 pole
enclosed [I_{th}]
40 A

AC-3
Rated operational current
Open, 3-pole: 50 – 60 Hz
Notes
At maximum permissible ambient temperature
(open.)
Also tested according to AC-3e.

AC-3
Rated operational current
Open, 3-pole: 50 – 60 Hz
220 V 230 V [I_e]
9 A

AC-3
Rated operational current
Open, 3-pole: 50 – 60 Hz
240 V [I_e]
9 A

AC-3
Rated operational current
Open, 3-pole: 50 – 60 Hz
380 V 400 V [I_e]
9 A

AC-3

Rated operational current
Open, 3-pole: 50 – 60 Hz
415 V [I_e]
9 A

AC-3
Rated operational current
Open, 3-pole: 50 – 60 Hz
440V [I_e]
9 A

AC-3
Rated operational current
Open, 3-pole: 50 – 60 Hz
500 V [I_e]
6.4 A

AC-3
Rated operational current
Open, 3-pole: 50 – 60 Hz
660 V 690 V [I_e]
4.8 A

AC-3
Motor rating [P]
220 V 230 V [P]
2.2 kW

AC-3
Motor rating [P]
240V [P]
2.5 kW

AC-3
Motor rating [P]
380 V 400 V [P]
4 kW

AC-3
Motor rating [P]
415 V [P]
4.3 kW

AC-3
Motor rating [P]
440 V [P]
4.6 kW

AC-3
Motor rating [P]
500 V [P]
4 kW

AC-3
Motor rating [P]
660 V 690 V [P]
4 kW

AC-4
Rated operational current
Open, 3-pole: 50 – 60 Hz
Notes
At maximum permissible ambient air temperature.

AC-4
Rated operational current
Open, 3-pole: 50 – 60 Hz
220 V 230 V [I_e]
6.6 A

AC-4
Rated operational current
Open, 3-pole: 50 – 60 Hz
240 V [I_e]
6.6 A

AC-4
Rated operational current
Open, 3-pole: 50 – 60 Hz
380 V 400 V [I_e]
6.6 A

AC-4
Rated operational current
Open, 3-pole: 50 – 60 Hz
415 V [I_e]
6.6 A

AC-4
Rated operational current
Open, 3-pole: 50 – 60 Hz
440 V [I_e]
6.6 A

AC-4
Rated operational current
Open, 3-pole: 50 – 60 Hz
500 V [I_e]
5 A

AC-4
Rated operational current
Open, 3-pole: 50 – 60 Hz

660 V 690 V [I_e]
3.4 A

AC-4
Motor rating [P]
220 V 230 V [P]
1.5 kW

AC-4
Motor rating [P]
240 V [P]
1.8 kW

AC-4
Motor rating [P]
380 V 400 V [P]
3 kW

AC-4
Motor rating [P]
415 V [P]
3.1 kW

AC-4
Motor rating [P]
440 V [P]
3.3 kW

AC-4
Motor rating [P]
500 V [P]
3 kW

AC-4
Motor rating [P]
660 V 690 V [P]
3 kW

DC

Rated operational current open
DC-1
12 V [I_e]
20 A

Rated operational current open
DC-1
24 V [I_e]
20 A

Rated operational current open
DC-1
60 V [I_e]
20 A

Rated operational current open
DC-1
110 V [I_e]
20 A

Rated operational current open
DC-1
220 V [I_e]
20 A

Magnet systems

Voltage tolerance
AC operated
Single-voltage coil 50 Hz and dual-voltage coil 50
Hz, 60 Hz [Pick-up]
 $0.8 - 1.1 \times U_c$

Voltage tolerance
AC operated
Dual-frequency coil 50/60 Hz [Pick-up]
Voltage tolerance Dual-frequency coil 50/60 Hz,
max. pick-up voltage
 $1.1 \times U_c$

Power consumption
AC operation
Single-voltage coil 50 Hz and dual-voltage coil 50
Hz, 60 Hz [Pick-up]
25 VA

Power consumption
AC operation
Single-voltage coil 50 Hz and dual-voltage coil 50
Hz, 60 Hz [Pick-up]
22 W

Power consumption
AC operation
Single-voltage coil 50 Hz and dual-voltage coil 50
Hz, 60 Hz [Sealing]
4.6 VA

Power consumption
AC operation

Single-voltage coil 50 Hz and dual-voltage coil 50
Hz, 60 Hz [Sealing]
1.8 W

Duty factor
100 % DF

Switching times at 100 % U_c
Make contact
Closing delay
Closing delay min.
14 ms

Switching times at 100 % U_c
Make contact
Closing delay
Closing delay max.
21 ms

Switching times at 100 % U_c
Make contact
Opening delay
Opening delay min.
8 ms

Switching times at 100 % U_c
Make contact
Opening delay
Opening delay max.
18 ms

Switching times at 100 % U_c
Make contact
Closing delay with top mounting auxiliary contact
45 ms

Switching times at 100 % U_c
Reversing contactors
Changeover time at 110 % U_c
Changeover time min.
16 ms

Switching times at 100 % U_c
Reversing contactors
Changeover time at 110 % U_c
Changeover time max.
21 ms

Switching times at 100 % U_c
Reversing contactors
Arcing time at 690 V AC
12 ms

Current heat losses (3- or 4-pole)

at I_{th} , 50 °C
5.9 W

at I_e to AC-3/400 V
1.2 W

Impedance per pole
9.18 mΩ

Auxiliary contacts

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

Rated impulse withstand voltage [U_{imp}]
6000 V AC

Overvoltage category/pollution degree
III/3

Rated insulation voltage [U_i]
690 V AC

Rated operational voltage [U_e]
600 V AC

Safe isolation to EN 61140
between coil and auxiliary contacts
300 V AC

Safe isolation to EN 61140
between the auxiliary contacts
300 V AC

Rated operational current
AC-15
220 V 240 V [I_e]
6 A

Rated operational current

AC-15
380 V 415 V [I_e]
3 A

Rated operational current
AC-15
500 V [I_e]
1.5 A

Rated operational current
DC L/R \square 15 ms
Contacts in series:
1 [24 V]
2.5 A

Rated operational current
DC L/R \square 15 ms
Contacts in series:
2 [60 V]
2.5 A

Rated operational current
DC L/R \square 15 ms
Contacts in series:
3 [100 V]
1.5 A

Rated operational current
DC L/R \square 15 ms
Contacts in series:
3 [220 V]
0.5 A

Conv. thermal current [I_{th}]
10 A

Control circuit reliability [Failure rate]
 $<10^{-8}$, < one failure at 100 million operations
(at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 5.4$ mA) λ

Component lifespan at $U_e = 240$ V
AC-15 [Operations]
 0.2×10^6

Component lifespan at $U_e = 240$ V
DC current
L/R = 50 ms: 2 contacts in series at $I_e = 0.5$ A
[Operations]
 0.15×10^6

Component lifespan at $U_b = 240\text{ V}$
DC current
Notes
Switch-on and switch-off conditions based on
DC-13, time constant as specified

Short-circuit rating without welding
Maximum overcurrent protective device
Short-circuit protection only
PKZMD-4

Short-circuit rating without welding
Short-circuit protection maximum fuse
500 V
6 A gG/gL

Short-circuit rating without welding
Short-circuit protection maximum fuse
500 V
10 A fast

Current heat loss at a load of I_{th} per contact
1.1 W

Rating data for approved types

Switching capacity
Maximum motor rating
Three-phase
200 V
208 V
2 HP

Switching capacity
Maximum motor rating
Three-phase
230 V
240 V
3 HP

Switching capacity
Maximum motor rating
Three-phase
460 V
480 V
5 HP

Switching capacity
Maximum motor rating
Three-phase

575 V
600 V
5 HP

Switching capacity
Maximum motor rating
Single-phase
115 V
120 V
0.5 HP

Switching capacity
Maximum motor rating
Single-phase
230 V
240 V
1.5 HP

Switching capacity
General use
15 A

Auxiliary contacts
Flot Duty
AC operated
A600

Auxiliary contacts
Flot Duty
DC operated
P300

Auxiliary contacts
General Use
AC
600 V

Auxiliary contacts
General Use
AC
10 A

Auxiliary contacts
General Use
DC
250 V

Auxiliary contacts
General Use
DC
0.5 A

Short Circuit Current Rating
Basic Rating
SOCR
5 kA

Short Circuit Current Rating
Basic Rating
max. Fuse
45 A

DESIGN VERIFICATION AS PER IEC/EN 61439

Technical data for design verification

Rated operational current for specified heat
dissipation [I_r]
9 A

Heat dissipation per pole, current-dependent [P_{id}]
0.4 W

Equipment heat dissipation, current-dependent
[P_{id}]
1.2 W

Static heat dissipation, non-current-dependent [P_{is}]
1.8 W

Heat dissipation capacity [P_{diss}]
0 W

Operating ambient temperature min.
-25 °C

Operating ambient temperature max.
+50 °C

IEC/EN 61439 design verification

10.2 Strength of materials and parts
10.2.2 Corrosion resistance
Meets the product standard's requirements.

10.2 Strength of materials and parts
10.2.3.1 Verification of thermal stability of enclosures
Meets the product standard's requirements.

10.2 Strength of materials and parts
10.2.3.2 Verification of resistance of insulating materials to normal heat
Meets the product standard's requirements.

10.2 Strength of materials and parts
10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects
Meets the product standard's requirements.

10.2 Strength of materials and parts
10.2.4 Resistance to ultra-violet (UV) radiation
Meets the product standard's requirements.

10.2 Strength of materials and parts
10.2.5 Lifting
Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts
10.2.6 Mechanical impact
Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts
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 Insulation properties
10.9.2 Power-frequency electric strength
Is the panel builder's responsibility.

10.9 Insulation properties
10.9.3 Impulse withstand voltage
Is the panel builder's responsibility.

10.9 Insulation properties
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.

TECHNICAL DATA ETIM 7.0

Low-voltage industrial components (EG000017) / Power contactor, AC switching (EC000066)

Rated control supply voltage U_s at AC 50HZ
110 - 110 V

Rated control supply voltage U_s at AC 60HZ
120 - 120 V

Rated control supply voltage U_s at DC
0 - 0 V

Voltage type for actuating
AC

Rated operation current I_e at AC-1, 400 V
22 A

Rated operation current I_e at AC-3, 400 V
9 A

Rated operation power at AC-3, 400 V
4 kW

Rated operation current I_e at AC-4, 400 V
6.6 A

Rated operation power at AC-4, 400 V
3 kW

Rated operation power NEMA
3.7 kW

Modular version
No

Number of auxiliary contacts as normally open
contact
0

Number of auxiliary contacts as normally closed
contact
1

Type of electrical connection of main circuit
Screw connection

Number of normally closed contacts as main
contact
0

Number of main contacts as normally open contact
3

APPROVALS

Product Standards
IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05;
CE marking

UL File No.
E29096

UL Category Control No.
NLDX

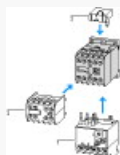
CSA File No.
012528

CSA Class No.
3211-04

North America Certification
UL listed, CSA certified

Specially designed for North America
No

CHARACTERISTICS



Accessories

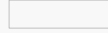
1: Overload relay

2: Suppressor

3: Auxiliary contact modules

Enclosure totally insulated

Characteristic curve



Squirrel-cage motor

Operating characteristics

Starting: from rest

Stopping: after attaining full running speed

Electrical characteristics

Make: up to 6 x rated motor current

Break: up to 1 x rated motor current

Utilization category

100 % AC-3

Typical applications

Compressors

Lifts

Mixers

Pumps

Escalators

Agitators

Fans

Conveyor belts

Centrifuges

Hinged flaps

Bucket-elevators

Air conditioning system

General drives in manufacturing and processing machines

Extreme switching duty

Squirrel-cage motor

Operating characteristics

Inching, plugging, reversing

Electrical characteristics

Make: up to 6 x rated motor current

Break: up to 6 x rated motor current

Utilization category

100 % AC-4

Typical applications

Printing presses

Wire-drawing machines

Centrifuges

Special drives for manufacturing and processing machines

Characteristic curve



Switching duty for non-motor loads, 3-pole, 4-pole

Operating characteristics

Non-inductive or slightly inductive loads

Electrical characteristics
Make: 1 x rated current
Break: 1 x rated current
Utilization category
100 % AC-1
Typical applications
Electric heat

Characteristic curve



Short-time loading, 3-pole
Time interval between two loading cycles: 15
minutes

DIMENSIONS



2DILE... + M/DILE + ...DILE
2DILE...-G + M/DILE + ...DILE



2DILE... + M/DILE + ...DILE
2DILE...-G + M/DILE + ...DILE



2DILE... + M/DILE
2DILE...-G + M/DILE

