**127137**
**DILEM12-01-G(24VDC)**





# DELIVERY PROGRAM

Product range
Contactors

Application
Contactors for Motors
Mini Contactors for Motors and Resistive Loads

Subrange
DILEM contactors

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

Connection technique
Screw terminals

Description
With auxiliary contact

Number of poles
3 pole

## Rated operational current

AC-3
380 V 400 V [$I_e$]
12 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]
3 kW

AC-3
380 V 400 V [P]
5.5 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


**Instructions**
Integrated diode-resistor combination

For use with
…DILE

Actuating voltage
24 V DC

Voltage AC/DC
DC operation

# TECHNICAL DATA

## General

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

Lifespan, mechanical [Operations]
$5 \times 10^6$

Maximum operating frequency
Mechanical
9000 Ops./h

Maximum operating frequency
electrical (Contactors without overload relay)
[Operations/h]
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Climatic proofing
Damp heat, constant, to IEC 60068-2-78
Damp heat, cyclic, to IEC 60068-2-30

Ambient temperature

Open
-25 - +50 °C

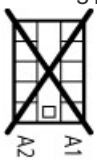
Ambient temperature
Enclosed
- 25 - 40 °C

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
0.206 kg

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

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

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 ϕ to IEC/EN 60947)
120 A

Breaking capacity
220 V 230 V
96 A

Breaking capacity
380 V 400 V
96 A

Breaking capacity
500 V
72 A

Breaking capacity
660 V 690 V
42 A

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

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

## AC

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

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

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

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

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

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

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

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

10.5 A

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

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

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

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

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

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

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

AC-3
Motor rating [P]
500 V [P]
5.5 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]
1.5 kW

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

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

AC-4
Motor rating [P]
440 V [P]
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
DC operated
Pick-up voltage
0.8 - 1.1

Power consumption
DC operation
Power consumption Pick-up = Sealing
2.3 VA/W

Power consumption
DC operation
Notes
Smoothed DC voltage or three-phase bridge rectifier

Duty factor
100 % DF

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

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

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

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

25 ms

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

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

Switching times at 100 % $U_c$
Reversing contactors
Changeover time at 110 % $U_c$
Changeover time max.
50 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
4.4 W

at $I_e$ to AC-3/400 V
1.8 W

Impedance per pole
7.86 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 □ 15 ms
Contacts in series:
1 [24 V]
2.5 A

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

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

Rated operational current
DC L/R □ 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 x $10^6$

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 x $10^6$

Component lifespan at $U_e$ = 240 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
PKZM0-4

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
Pilot Duty
AC operated
A600

Auxiliary contacts
Pilot 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
SCCR
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 [$I_n$]
12 A

Heat dissipation per pole, current-dependent [$P_{vid}$]
0.6 W

Equipment heat dissipation, current-dependent [$P_{vid}$]
1.8 W

Static heat dissipation, non-current-dependent [$P_{vs}$]
2.3 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)

Electric engineering, automation, process control engineering / Low-voltage switch technology / Contactor (LV) / Power contactor, AC switching (ecl@ss10.0.1-27-37-10-03 [AAB718015])

Rated control supply voltage Us at AC 50HZ
0 - 0 V

Rated control supply voltage Us at AC 60HZ
0 - 0 V

Rated control supply voltage Us at DC
24 - 24 V

Voltage type for actuating
DC

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

Rated operation current Ie at AC-3, 400 V
12 A

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

Rated operation current Ie 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
1

Number of auxiliary contacts as normally closed contact
0

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

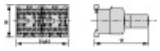


Switching duty for non-motor loads, 3-pole, 4-pole
Operating characteristics
Non-inductive or slightly inductive loads
Electrical characteristics
Make: 1 x rated current
Break: 1 x rated current
Utilization category
100 % AC-1
Typical applications
Electric heat

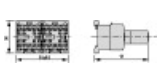
Characteristic curve

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

## DIMENSIONS



2DILE-…+MVDILE+…DILE
2DILE-…-G+MVDILE+…DILE



2DILE-... + MV/DILE + ...DILE
2DILE-...-G + MV/DILE + ...DILE

2DILE-... + MV/DILE
2DILE-...-G + MV/DILE