



276705
DILM9-10(24VDC)

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DELIVERY PROGRAM

Product range
Contactors

Application
Contactors for Motors

Subrange
Contactors up to 170 A, 3 pole

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.

Connection technique
Screw terminals

Number of poles
3 pole

Rated operational current

AC-3
Notes
At maximum permissible ambient temperature
(open.)
Also tested according to AC-3e.

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

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

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

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

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

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

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

AC-3
660 V 690 V [F]
4.5 kW

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

AC-4
380 V 400 V [F]
2.5 kW

AC-4
660 V 690 V [F]
3.6 kW

Contacts

NO = Normally open
1 NO

Contact sequence



Instructions

Contacts to EN 50 012.
Integrated varistor suppressor circuit.

Can be combined with auxiliary contact
DILM32-XH...
DILA-XH(V)...

Actuating voltage
24 V DC

Voltage AC/DC
DC operation

Connection to SmartWire-DT
yes

in conjunction with DIL-SWD SmartWire DT
contactor module

Frame size
1

TECHNICAL DATA

General

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

Lifespan, mechanical
DC operated [Operations]
 10×10^6

Operating frequency, mechanical
DC operated [Operations/h]
9000

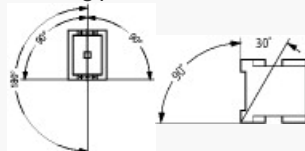
Climatic proofing
Damp heat, constant, to IEC 60068-2-78
Damp heat, cyclic, to IEC 60068-2-30

Ambient temperature
Open
-25 - +60 °C

Ambient temperature
Enclosed
- 25 - 40 °C

Ambient temperature
Storage
- 40 - 80 °C

Mounting position



Mechanical shock resistance (IEC/EN 60068-2-27)
Half-sinusoidal shock, 10 ms
Main contacts
NO contact
10 g

Mechanical shock resistance (IEC/EN 60068-2-27)
Half-sinusoidal shock, 10 ms
Auxiliary contacts
NO contact
7 g

Mechanical shock resistance (IEC/EN 60068-2-27)
Half-sinusoidal shock, 10 ms
Auxiliary contacts
NC contact
5 g

Mechanical shock resistance (IEC/EN 60068-2-27)
when tabletop-mounted
Half-sinusoidal shock, 10 ms
Main contacts
NO contact
5.7 g

Mechanical shock resistance (IEC/EN 60068-2-27)
when tabletop-mounted
Half-sinusoidal shock, 10 ms
Auxiliary contacts
NO contact
3.4 g

Mechanical shock resistance (IEC/EN 60068-2-27)
when tabletop-mounted
Half-sinusoidal shock, 10 ms
Auxiliary contacts
NC contact
3.4 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

DC operated
0.296 kg

Screw connector terminals
Terminal capacity main cable
Solid
1 x (0.75 - 4)
2 x (0.75 - 2.5) mm²

Screw connector terminals
Terminal capacity main cable
Flexible with ferrule
1 x (0.75 - 2.5)
2 x (0.75 - 2.5) mm²

Screw connector terminals
Terminal capacity main cable
Solid or stranded
single 18 - 10, double 18 - 14 AWG

Screw connector terminals
Terminal capacity main cable
Stripping length
10 mm

Screw connector terminals
Terminal capacity main cable
Terminal screw
M3.5

Screw connector terminals
Terminal capacity main cable
Tightening torque
1.2 Nm

Screw connector terminals
Terminal capacity main cable
Tool
Pozidriv screwdriver
2 Size

Screw connector terminals
Terminal capacity main cable
Tool
Standard screw driver
0.8 x 5.5
1 x 6 mm

Screw connector terminals
Terminal capacity control circuit cables
Solid
1 x (0.75 - 4)

2 x (0.75 - 2.5) mm²

Screw connector terminals
Terminal capacity control circuit cables
Flexible with ferrule
1 x (0.75 - 2.5)
2 x (0.75 - 2.5) mm²

Screw connector terminals
Terminal capacity control circuit cables
Solid or stranded
18 - 14 AWG

Screw connector terminals
Terminal capacity control circuit cables
Stripping length
10 mm

Screw connector terminals
Terminal capacity control circuit cables
Terminal screw
M3.5

Screw connector terminals
Terminal capacity control circuit cables
Tightening torque
1.2 Nm

Screw connector terminals
Terminal capacity control circuit cables
Tool
Pozidriv screwdriver
2 Size

Screw connector terminals
Terminal capacity control circuit cables
Tool
Standard screwdriver
0.8 x 5.5
1 x 6 mm

Main conducting paths

Rated impulse withstand voltage [U_{imp}]
8000 V AC

Overvoltage category/pollution degree
III/3

Rated insulation voltage [U]
690 V AC

Rated operational voltage [U_e]
690 V AC

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

Safe isolation to EN 61140
between the contacts
400 V AC

Making capacity (p.f. to IEC/EN 60947) [Up to 690
V]
126 A

Breaking capacity
220 V 230 V
90 A

Breaking capacity
380 V 400 V
90 A

Breaking capacity
500 V
70 A

Breaking capacity
660 V 690 V
50 A

Short-circuit rating
Short-circuit protection maximum fuse
Type "2" coordination
400 V [gG/gL 500 V]
20 A

Short-circuit rating
Short-circuit protection maximum fuse
Type "2" coordination
690 V [gG/gL 690 V]
16 A

Short-circuit rating
Short-circuit protection maximum fuse

Type "1" coordination
400 V [gG/gL 500 V]
35 A

Short-circuit rating
Short-circuit protection maximum fuse
Type "1" coordination
690 V [gG/gL 690 V]
20 A

AC

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

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

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

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

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

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}]
45 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]
7 A

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

AC-3
MOTOR rating [P]
220 V 230 V [P]
2.5 kW

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

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

AC-3
MOTOR rating [P]
660 V 690 V [P]
4.5 kW

AC-4
Open, 3-pole: 50 – 60 Hz
220 V 230 V [I_e]
6 A

AC-4
Open, 3-pole: 50 – 60 Hz
240 V [I_e]

6 A

AC-4
Open, 3-pole: 50 – 60 Hz
380 V 400 V [I_e]
6 A

AC-4
Open, 3-pole: 50 – 60 Hz
415 V [I_e]
6 A

AC-4
Open, 3-pole: 50 – 60 Hz
440 V [I_e]
6 A

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

AC-4
Open, 3-pole: 50 – 60 Hz
660 V 690 V [I_e]
4.5 A

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

AC-4
MOTOR rating [P]
240 V [P]
1.6 kW

AC-4
MOTOR rating [P]
380 V 400 V [P]
2.5 kW

AC-4
MOTOR rating [P]
415 V [P]
2.8 kW

AC-4
MOTOR rating [P]
440 V [P]

3 kW

AC-4
Mtor rating [P]
500 V [P]
2.8 kW

AC-4
Mtor rating [P]
660 V 690 V [P]
3.6 kW

DC

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]
15 A

Current heat loss

3 pole, at I_{th} (60°)
4.4 W

Current heat loss at I_e to AC-3/400 V
0.9 W

Impedance per pole
4.6 m Ω

Magnet systems

Voltage tolerance
DC operated [Pick-up]
0.8 - 1.1 x U_c

Voltage tolerance

Notes

0.85 - 1.1 only with auxiliary contact module with 3 or more NC contacts

0.7 – 1.3 without auxiliary contact module and at ambient air temperature + +40 °C

Voltage tolerance

DC operated [Drop-out]

0.15 - 0.6 x U_c

Voltage tolerance

Notes

at least smoothed two-phase bridge rectifier or three-phase rectifier

Power consumption of the coil in a cold state and

1.0 x U_s

DC operated [Pick-up]

4.5 W

Power consumption of the coil in a cold state and

1.0 x U_s

DC operated [Sealing]

4.5 W

Duty factor

100 % DF

Changeover time at 100 % U_s (recommended value)

Main contacts

DC operated

Closing delay

Closing delay

31 ms

Changeover time at 100 % U_s (recommended value)

Main contacts

DC operated

Opening delay

Opening delay

12 ms

Changeover time at 100 % U_s (recommended value)

Arcing time

10 ms

Electromagnetic compatibility (EMC)

Emitted interference
according to EN 60947-1

Interference immunity
according to EN 60947-1

Rating data for approved types

Switching capacity
Maximum motor rating
Three-phase
200 V
208 V
3 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
7.5 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
20 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
1 A

Short Circuit Current Rating
Basic Rating
SCCR
5 kA

Short Circuit Current Rating
Basic Rating
max. Fuse
45 A

Short Circuit Current Rating
Basic Rating
max. CB
60 A

Short Circuit Current Rating
480 V High Fault
SCCR (fuse)
30/100 kA

Short Circuit Current Rating
480 V High Fault
max. Fuse
25 Class RK5/20 Class J A

Short Circuit Current Rating
480 V High Fault
SCCR (CB)
65 kA

Short Circuit Current Rating
480 V High Fault
max. CB
16 A

Short Circuit Current Rating
600 V High Fault
SCCR (fuse)
30/100 kA

Short Circuit Current Rating
600 V High Fault
max. Fuse
25 Class RK5/20 Class J A

Special Purpose Ratings
Electrical Discharge Lamps (Ballast)
480V 60Hz 3phase, 277V 60Hz 1phase
18 A

Special Purpose Ratings
Electrical Discharge Lamps (Ballast)
600V 60Hz 3phase, 347V 60Hz 1phase
18 A

Special Purpose Ratings
Incandescent Lamps (Tungsten)
480V 60Hz 3phase, 277V 60Hz 1phase
14 A

Special Purpose Ratings
Incandescent Lamps (Tungsten)
600V 60Hz 3phase, 347V 60Hz 1phase
14 A

Special Purpose Ratings
Resistance Air Heating
480V 60Hz 3phase, 277V 60Hz 1phase
18 A

Special Purpose Ratings
Resistance Air Heating
600V 60Hz 3phase, 347V 60Hz 1phase
18 A

Special Purpose Ratings
Refrigeration Control (CSA only)
LRA 480V 60Hz 3phase
60 A

Special Purpose Ratings
Refrigeration Control (CSA only)
FLA 480V 60Hz 3phase
10 A

Special Purpose Ratings
Refrigeration Control (CSA only)
LRA 600V 60Hz 3phase
60 A

Special Purpose Ratings
Refrigeration Control (CSA only)
FLA 600V 60Hz 3phase
10 A

Special Purpose Ratings
Definite Purpose Ratings (100,000 cycles acc. to
UL 1995)
LRA 480V 60Hz 3phase
54 A

Special Purpose Ratings
Definite Purpose Ratings (100,000 cycles acc. to
UL 1995)
FLA 480V 60Hz 3phase
9 A

Special Purpose Ratings
Elevator Control
200V 60Hz 3phase
2 HP

Special Purpose Ratings
Elevator Control
200V 60Hz 3phase
7.8 A

Special Purpose Ratings
Elevator Control
240V 60Hz 3phase
2 HP

Special Purpose Ratings
Elevator Control
240V 60Hz 3phase
6.8 A

Special Purpose Ratings
Elevator Control
480V 60Hz 3phase
3 HP

Special Purpose Ratings
Elevator Control
480V 60Hz 3phase
4.8 A

Special Purpose Ratings
Elevator Control
600V 60Hz 3phase
5 HP

Special Purpose Ratings
Elevator Control
600V 60Hz 3phase
6.1 A

DESIGN VERIFICATION AS PER IEC/EN 61439

Technical data for design verification

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

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

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

Static heat dissipation, non-current-dependent [P_{vs}]
4.5 W

Heat dissipation capacity [P_{diss}]
0 W

Operating ambient temperature min.
-25 °C

Operating ambient temperature max.
+60 °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 U_s at AC 50HZ
0 - 0 V

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

Rated control supply voltage U_s at DC
24 - 24 V

Voltage type for actuating
DC

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 A

Rated operation power at AC-4, 400 V
2.5 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 60947-4-1; CSA - C22.2 No.
60947-4-1-14; CE marking

UL File No.
E29096

UL Category Control No.
NLDX

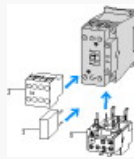
CSA File No.
012528

CSA Class No.
2411-03, 3211-04

North America Certification
UL listed, CSA certified

Specially designed for North America
No

CHARACTERISTICS



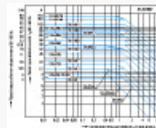
Accessories

1: Overload relay

2: Suppressor

3: Auxiliary contact modules

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

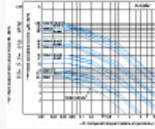
Bucket-elevators

Air conditioning system

General drives in manufacturing and processing

machines

Characteristic curve



- 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

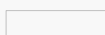


- Switching conditions for non-motor consumers, 3 pole, 4 pole
- Operating characteristics
- Non inductive and slightly inductive loads
- Electrical characteristics
- Switch on: 1 x rated operational current
- Switch off: 1 x rated operational current
- Utilization category
- 100 % AC-1
- Typical examples of application
- Electric heat

Characteristic curve



DIMENSIONS



Contacteur with auxiliary contact module DILMB2-
XHI.../DILA-XHI...

Contacteur with auxiliary contact module DILA-
XHT...

