



Powering Business Worldwide



276865

DILM 12-01(230V50HZ,240V60HZ)

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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  
NAC-3: Normal AC induction motors: starting, switch off during running  
AC-4: Normal AC induction motors: starting, plugging, reversing, inching



Notes  
Also suitable for motors with efficiency class IE3.  
IE3-ready devices are identified by the logo on their packaging.

Connection technique  
Screw terminals

Number of poles  
3 pole

**Rated operational current**

AC-3  
Notes  
At maximum permissible ambient temperature (open.)

AC-3  
380 V 400 V [I<sub>e</sub>]  
12 A

AC-1  
Conventional free air thermal current, 3 pole, 50 - 60 Hz  
Open  
at 40 °C [I<sub>th</sub> = I<sub>e</sub>]  
22 A

AC-1  
Conventional free air thermal current, 3 pole, 50 - 60 Hz  
enclosed [I<sub>th</sub>]  
18 A

AC-1  
Conventional free air thermal current, 1 pole  
open [I<sub>th</sub>]  
50 A

AC-1  
Conventional free air thermal current, 1 pole  
enclosed [I<sub>th</sub>]  
45 A

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

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

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

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

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

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

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

### Contacts

NC = Normally closed  
1 NC

#### Contact sequence



#### Instructions

Contacts to EN 50 012.  
with mirror contact.

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

Actuating voltage  
230 V 50 Hz, 240 V 60 Hz

Voltage AC/DC  
AC operation

Connection to SmartWire-DT  
no

Frame size  
1

## TECHNICAL DATA

### General

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

Lifespan, mechanical  
AC operated [Operations]  
10 x 10<sup>6</sup>

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

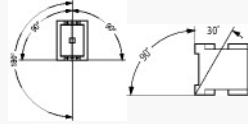
Climatic proofing  
Damp heat, constant, to IEC 60068-2-78  
Damp heat, cyclic, to IEC 60068-2-30

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

N/O contact

10 g

#### Mechanical shock resistance (IEC/EN 60068-2-27)

Half-sinusoidal shock, 10 ms

Auxiliary contacts

N/O contact

7 g

#### Mechanical shock resistance (IEC/EN 60068-2-27)

Half-sinusoidal shock, 10 ms

Auxiliary contacts

N/C contact

5 g

#### Mechanical shock resistance (IEC/EN 60068-2-27) when tabletop-mounted

Half-sinusoidal shock, 10 ms

Main contacts

N/O contact

5.7 g

#### Mechanical shock resistance (IEC/EN 60068-2-27) when tabletop-mounted

Half-sinusoidal shock, 10 ms

Auxiliary contacts

N/O contact

3.4 g

#### Mechanical shock resistance (IEC/EN 60068-2-27) when tabletop-mounted

Half-sinusoidal shock, 10 ms

Auxiliary contacts

N/C 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

AC operated

0.24 kg

#### Screw connector terminals

Terminal capacity main cable

Solid

1 x (0.75 - 4)  
2 x (0.75 - 2.5) mm<sup>2</sup>

Screw connector terminals  
Terminal capacity main cable  
Flexible with ferrule  
1 x (0.75 - 2.5)  
2 x (0.75 - 2.5) mm<sup>2</sup>

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 screw driver  
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) mm<sup>2</sup>

Screw connector terminals  
Terminal capacity control circuit cables  
Flexible with ferrule  
1 x (0.75 - 2.5)  
2 x (0.75 - 2.5) mm<sup>2</sup>

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 screw driver  
2 Size

Screw connector terminals  
Terminal capacity control circuit cables  
Tool  
Standard screw driver  
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 [ $U_i$ ]  
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) [ $I_{up}$  to 690 V]  
144 A

Breaking capacity  
220 V 230 V  
120 A

Breaking capacity  
380 V 400 V  
120 A

Breaking capacity  
500 V  
100 A

Breaking capacity  
660 V 690 V  
70 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]  
20 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]  
25 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.)

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 [ $I_e$ ]  
12 A

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

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

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

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



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

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

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

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

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

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

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

AC-4  
Open, 3-pole: 50 – 60 Hz  
220 V 230 V [I<sub>e</sub>]  
7 A

AC-4  
Open, 3-pole: 50 – 60 Hz  
240 V [I<sub>e</sub>]  
7 A

AC-4  
Open, 3-pole: 50 – 60 Hz  
380 V 400 V [I<sub>e</sub>]  
7 A

AC-4  
Open, 3-pole: 50 – 60 Hz  
415 V [I<sub>e</sub>]  
7 A

AC-4  
Open, 3-pole: 50 – 60 Hz  
440 V [I<sub>e</sub>]  
7 A

AC-4

Open, 3-pole: 50 – 60 Hz  
500 V [U<sub>e</sub>]  
6 A

AC-4  
Open, 3-pole: 50 – 60 Hz  
660 V 690 V [U<sub>e</sub>]  
5 A

AC-4  
Motor rating [P]  
220 V 230 V [U<sub>e</sub>]  
2 kW

AC-4  
Motor rating [P]  
240 V [U<sub>e</sub>]  
2.2 kW

AC-4  
Motor rating [P]  
380 V 400 V [U<sub>e</sub>]  
3 kW

AC-4  
Motor rating [P]  
415 V [U<sub>e</sub>]  
3.4 kW

AC-4  
Motor rating [P]  
440 V [U<sub>e</sub>]  
3.6 kW

AC-4  
Motor rating [P]  
500 V [U<sub>e</sub>]  
3.5 kW

AC-4  
Motor rating [P]  
660 V 690 V [U<sub>e</sub>]  
4.4 kW

## DC

Rated operational current, open  
DC-1  
60 V [U<sub>e</sub>]  
20 A

Rated operational current, open  
DC-1  
110 V [U<sub>e</sub>]  
20 A

Rated operational current, open  
DC-1  
220 V [U<sub>e</sub>]  
15 A

## Current heat loss

3 pole, at  $I_{th}$  (60°)  
2.5 W

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

Impedance per pole  
2.5 mΩ

## Magnet systems

Voltage tolerance  
AC operated [Pick-up]  
0.8 - 1.1 x  $U_s$

Voltage tolerance  
Drop-out voltage AC operated [Drop-out]  
0.3 - 0.6 x  $U_s$

Power consumption of the coil in a cold state and 1.0 x  $U_s$   
50 Hz [Pick-up]  
24 VA

Power consumption of the coil in a cold state and 1.0 x  $U_s$   
50 Hz [Sealing]  
3.4 VA

Power consumption of the coil in a cold state and 1.0 x  $U_s$   
50 Hz [Sealing]  
1.4 W

Power consumption of the coil in a cold state and 1.0 x  $U_s$   
60 Hz [Pick-up]  
30 VA

Power consumption of the coil in a cold state and 1.0 x  $U_s$   
60 Hz [Sealing]  
4.4 VA

Power consumption of the coil in a cold state and 1.0 x  $U_s$   
60 Hz [Sealing]  
1.4 W

Duty factor  
100 % DF

Changeover time at 100 %  $U_s$  (recommended value)  
Main contacts  
AC operated  
Closing delay  
15 - 21 ms

Changeover time at 100 %  $U_s$  (recommended value)  
Main contacts  
AC operated  
Opening delay  
9 - 18 ms

Changeover time at 100 %  $U_N$  (recommended value)  
Arcing time  
10 ms

### Electromagnetic compatibility (EMC)

Emitted interference  
to EN 60947-1

Interference immunity  
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  
10 HP

Switching capacity  
Maximum motor rating  
Three-phase  
575 V  
600 V  
10 HP

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

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

Switching capacity  
General use  
20 A

Auxiliary contacts  
Flot Duty

AC operated  
A600

Auxiliary contacts  
Flot Duty  
DC operated  
F300

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 RK5/45 Class J 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 RK5/45 Class J A

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

Special Purpose Ratings  
Electrical Discharge Lamps (Ballast)  
600V 60Hz 3phase, 347V 60Hz 1phase  
20 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  
20 A

Special Purpose Ratings  
Resistance Air Heating  
600V 60Hz 3phase, 347V 60Hz 1phase  
20 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  
72 A

Special Purpose Ratings  
Definite Purpose Ratings (100,000 cycles acc. to UL 1995)  
FLA 480V 60Hz 3phase  
12 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  
7.5 HP

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

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

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

## DESIGN VERIFICATION AS PER IEC/EN 61439

### Technical data for design verification

Rated operational current for specified heat dissipation [ $I_r$ ]  
12 A

Heat dissipation per pole, current-dependent [ $P_{vd}$ ]  
0,3 W

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

Static heat dissipation, non-current-dependent [ $P_{vs}$ ]  
1.4 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  
230 - 230 V

Rated control supply voltage  $U_s$  at AC 60HZ  
240 - 240 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  
12 A

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

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

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

Rated operation power NEMA  
7.4 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 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

## DIMENSIONS



Contactor with auxiliary contact module DLM32-XH.../DLA-XH...



Contactor with auxiliary contact module DLA-XHT...



