



Contactor, 3p+1N/O, 4kW/400V/AC3

Part no. DILM9-10(24VDC)
Catalog No. 276705
Eaton Catalog No. XTCE009B10TD
EL-Nummer 4130288
(Norway)



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				
380 V 400 V	I_e	A		9
AC-1				
Conventional free air thermal current, 3 pole, 50 - 60 Hz				
Open				
at 40 °C	$I_{th} = I_e$	A		22
enclosed	I_{th}	A		18
Conventional free air thermal current, 1 pole				
open	I_{th}	A		50
enclosed	I_{th}	A		45
Max. rating for three-phase motors, 50 - 60 Hz				
AC-3				
220 V 230 V	P	kW		2.5
380 V 400 V	P	kW		4
660 V 690 V	P	kW		4.5
AC-4				
220 V 230 V	P	kW		1.5
380 V 400 V	P	kW		2.5
660 V 690 V	P	kW		3.6
Contacts				
N/O = Normally open				1 N/O
Contact sequence				
Instructions				
Can be combined with auxiliary contact				Contacts to EN 50012. Integrated varistor suppressor circuit.
Voltage AC/DC				DC operation

Technical data

General				
Standards				IEC/EN 60947, VDE 0660, UL, CSA
Lifespan, mechanical				

DC operated	Operations	x 10 ⁶	10
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	°C		-25 - +60
Enclosed	°C		- 25 - 40
Storage	°C		- 40 - 80
Mounting position			
			
Mechanical shock resistance (IEC/EN 60068-2-27)			
Half-sinusoidal shock, 10 ms			
Main contacts			
N/O contact	g		10
Auxiliary contacts			
N/O contact	g		7
N/C contact	g		5
Mechanical shock resistance (IEC/EN 60068-2-27) when tabletop-mounted			
Half-sinusoidal shock, 10 ms			
Main contacts			
N/O contact	g		5.7
Auxiliary contacts			
N/O contact	g		3.4
N/C contact	g		3.4
Degree of Protection			
IP20			
Protection against direct contact when actuated from front (EN 50274)			
Finger and back-of-hand proof			
Weight			
DC operated	kg		0.296
Terminal capacity main cable			
Solid			
	mm ²		1 x (0.75 - 4) 2 x (0.75 - 2.5)
Flexible with ferrule			
	mm ²		1 x (0.75 - 2.5) 2 x (0.75 - 2,5)
Also without ferrule.			
Solid or stranded			
	AWG		single 18 - 10, double 18 - 14
Stripping length			
	mm		10
Main cable connection screw/bolt			
			M3.5
Tightening torque			
	Nm		999999999 1.2
Terminal capacity control circuit cables			
Solid			
	mm ²		1 x (0.75 - 4) 2 x (0.75 - 2.5)
Flexible with ferrule			
	mm ²		1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded			
	AWG		18 - 14
Stripping length			
	mm		10
Control circuit cable connection screw/bolt			
			M3.5
Tightening torque			
	Nm		1.2
Tool			
Main cable			
Pozidriv screwdriver	Size		2
Standard screwdriver	mm		0.8 x 5.5 1 x 6

Control circuit cables			
Pozidriv screwdriver	Size		2
Standard screwdriver	mm		0.8 x 5.5 1 x 6

Main conducting paths

Rated impulse withstand voltage	U_{imp}	V AC	8000
Overvoltage category/pollution degree			III/3
Rated insulation voltage	U_i	V AC	690
Rated operational voltage	U_e	V AC	690
Safe isolation to EN 61140			
between coil and contacts		V AC	400
between the contacts		V AC	400
Making capacity (p.f. to IEC/EN 60947)			
	U_p to 690 V	A	126
Breaking capacity			
220 V 230 V		A	90
380 V 400 V		A	90
500 V		A	70
660 V 690 V		A	50
Short-circuit rating			
Short-circuit protection maximum fuse			
Type "2" coordination			
400 V	gG/gL 500 V	A	20
690 V	gG/gL 690 V	A	16
Type "1" coordination			
400 V	gG/gL 500 V	A	35
690 V	gG/gL 690 V	A	20

AC

AC-1			
Rated operational current			
Conventional free air thermal current, 3 pole, 50 - 60 Hz			
Open			
at 40 °C	$I_{th} = I_e$	A	22
at 50 °C	$I_{th} = I_e$	A	21
at 55 °C	$I_{th} = I_e$	A	21
at 60 °C	$I_{th} = I_e$	A	20
enclosed	I_{th}	A	18
Conventional free air thermal current, 1 pole			
open	I_{th}	A	50
enclosed	I_{th}	A	45
AC-3			
Rated operational current			
Open, 3-pole: 50 – 60 Hz			
220 V 230 V	I_e	A	9
240 V	I_e	A	9
380 V 400 V	I_e	A	9
415 V	I_e	A	9
440V	I_e	A	9
500 V	I_e	A	7
660 V 690 V	I_e	A	5
380 V 400 V	I_e	A	9
Motor rating	P	kWh	
220 V 230 V	P	kW	2.5
240V	P	kW	3
380 V 400 V	P	kW	4

415 V	P	kW	5.5
440 V	P	kW	5.5
500 V	P	kW	4.5
660 V 690 V	P	kW	4.5
AC-4			
Open, 3-pole: 50 – 60 Hz			
220 V 230 V	I _e	A	6
240 V	I _e	A	6
380 V 400 V	I _e	A	6
415 V	I _e	A	6
440 V	I _e	A	6
500 V	I _e	A	5
660 V 690 V	I _e	A	4.5
Motor rating			
220 V 230 V	P	kW	1.5
240 V	P	kW	1.6
380 V 400 V	P	kW	2.5
415 V	P	kW	2.8
440 V	P	kW	3
500 V	P	kW	2.8
660 V 690 V	P	kW	3.6

DC

Rated operational current, open			
DC-1			
60 V	I _e	A	20
110 V	I _e	A	20
220 V	I _e	A	15

Current heat loss

3 pole, at I _{th} (60°)		W	4.4
Current heat loss at I _e to AC-3/400 V		W	0.9
Impedance per pole		mΩ	4.6

Magnet systems

Voltage tolerance			
DC operated	Pick-up	x U _c	0.8 - 1.1
Notes			0.85 - 1.1 only with auxiliary contact module with 3 or more N/C contacts 0.7 – 1.3 without auxiliary contact module and at ambient air temperature + +40 °C
DC operated	Drop-out	x U _c	0.15 - 0.6
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 _c			
50/60 Hz	Pick-up	VA	0
50/60 Hz	Sealing	VA	0
DC operated	Pick-up	W	4.5
DC operated	Sealing	W	2.6
Duty factor		% DF	100
Changeover time at 100 % U _c (recommended value)			
Main contacts			
DC operated		ms	
Closing delay		ms	31
Opening delay		ms	12
Arcing time		ms	99999999 10

Electromagnetic compatibility (EMC)

Emitted interference			nach EN 60947-1
Interference immunity			nach EN 60947-1

Rating data for approved types

Switching capacity			
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Maximum motor rating		
Three-phase		
200 V 208 V	HP	3
230 V 240 V	HP	3
460 V 480 V	HP	5
575 V 600 V	HP	7.5
Single-phase		
115 V 120 V	HP	0.5
230 V 240 V	HP	1.5
General use	A	20
Auxiliary contacts		
Pilot Duty		
AC operated		A600
DC operated		P300
General Use		
AC	V	600
AC	A	10
DC	V	250
DC	A	1
Short Circuit Current Rating		
Basic Rating		
SCCR	kA	5
max. Fuse	A	45
max. CB	A	60
480 V High Fault		
SCCR (fuse)	kA	30/100
max. Fuse	A	25 Class RK5/20 Class J
SCCR (CB)	kA	65
max. CB	A	16
600 V High Fault		
SCCR (fuse)	kA	30/100
max. Fuse	A	25 Class RK5/20 Class J
Special Purpose Ratings		
Electrical Discharge Lamps (Ballast)		
480V 60Hz 3phase, 277V 60Hz 1phase	A	18
600V 60Hz 3phase, 347V 60Hz 1phase	A	18
Incandescent Lamps (Tungsten)		
480V 60Hz 3phase, 277V 60Hz 1phase	A	14
600V 60Hz 3phase, 347V 60Hz 1phase	A	14
Resistance Air Heating		
480V 60Hz 3phase, 277V 60Hz 1phase	A	18
600V 60Hz 3phase, 347V 60Hz 1phase	A	18
Refrigeration Control (CSA only)		
LRA 480V 60Hz 3phase	A	60
FLA 480V 60Hz 3phase	A	10
LRA 600V 60Hz 3phase	A	60
FLA 600V 60Hz 3phase	A	10
Definite Purpose Ratings (100,000 cycles acc. to UL 1995)		
LRA 480V 60Hz 3phase	A	54
FLA 480V 60Hz 3phase	A	9
Elevator Control		
200V 60Hz 3phase	HP	2

200V 60Hz 3phase	A	7.8
240V 60Hz 3phase	HP	2
240V 60Hz 3phase	A	6.8
480V 60Hz 3phase	HP	3
480V 60Hz 3phase	A	4.8
600V 60Hz 3phase	HP	5
600V 60Hz 3phase	A	6.1

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I_n	A	9
Heat dissipation per pole, current-dependent	P_{vid}	W	0.3
Equipment heat dissipation, current-dependent	P_{vid}	W	0
Static heat dissipation, non-current-dependent	P_{vs}	W	2.6
Heat dissipation capacity	P_{diss}	W	0
Operating ambient temperature max.		°C	-25
Operating ambient temperature max.		°C	60
IEC/EN 61439 design verification			
10.2 Strength of materials and parts			
10.2.2 Corrosion resistance			Meets the product standard's requirements.
10.2.3.1 Verification of thermal stability of enclosures			Meets the product standard's requirements.
10.2.3.2 Verification of resistance of insulating materials to normal heat			Meets the product standard's requirements.
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.
10.2.4 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 Insulation properties			
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.

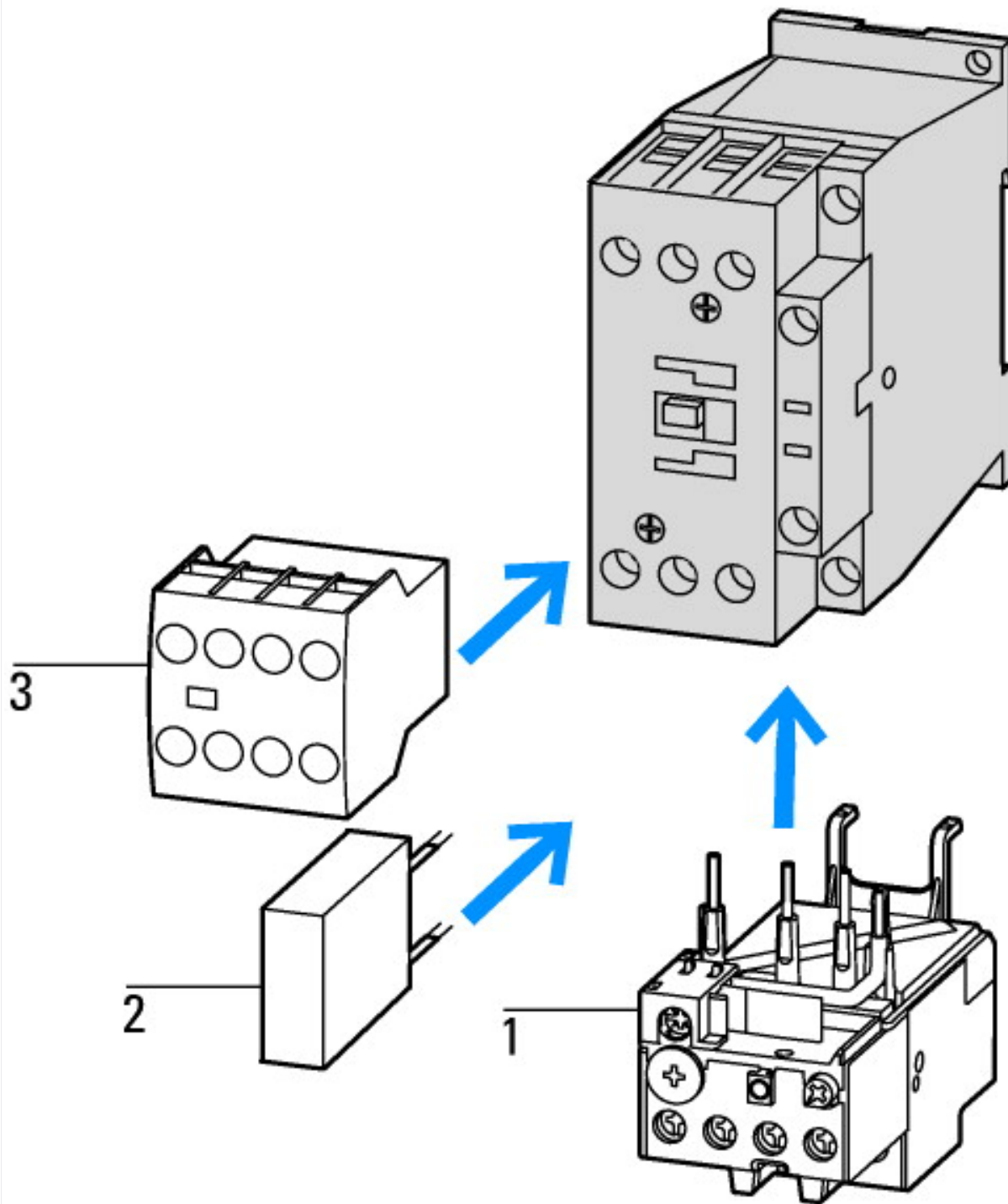
Technical data ETIM 6.0

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@ss8.1-27-37-10-03 [AAB718012])			
Rated control supply voltage U_s at AC 50HZ	V		0 - 0
Rated control supply voltage U_s at AC 60HZ	V		0 - 0
Rated control supply voltage U_s at DC	V		24 - 24
Voltage type for actuating			DC
Rated operation current I_e at AC-1, 400 V	A		22
Rated operation current I_e at AC-3, 400 V	A		9
Rated operation power at AC-3, 400 V	kW		4

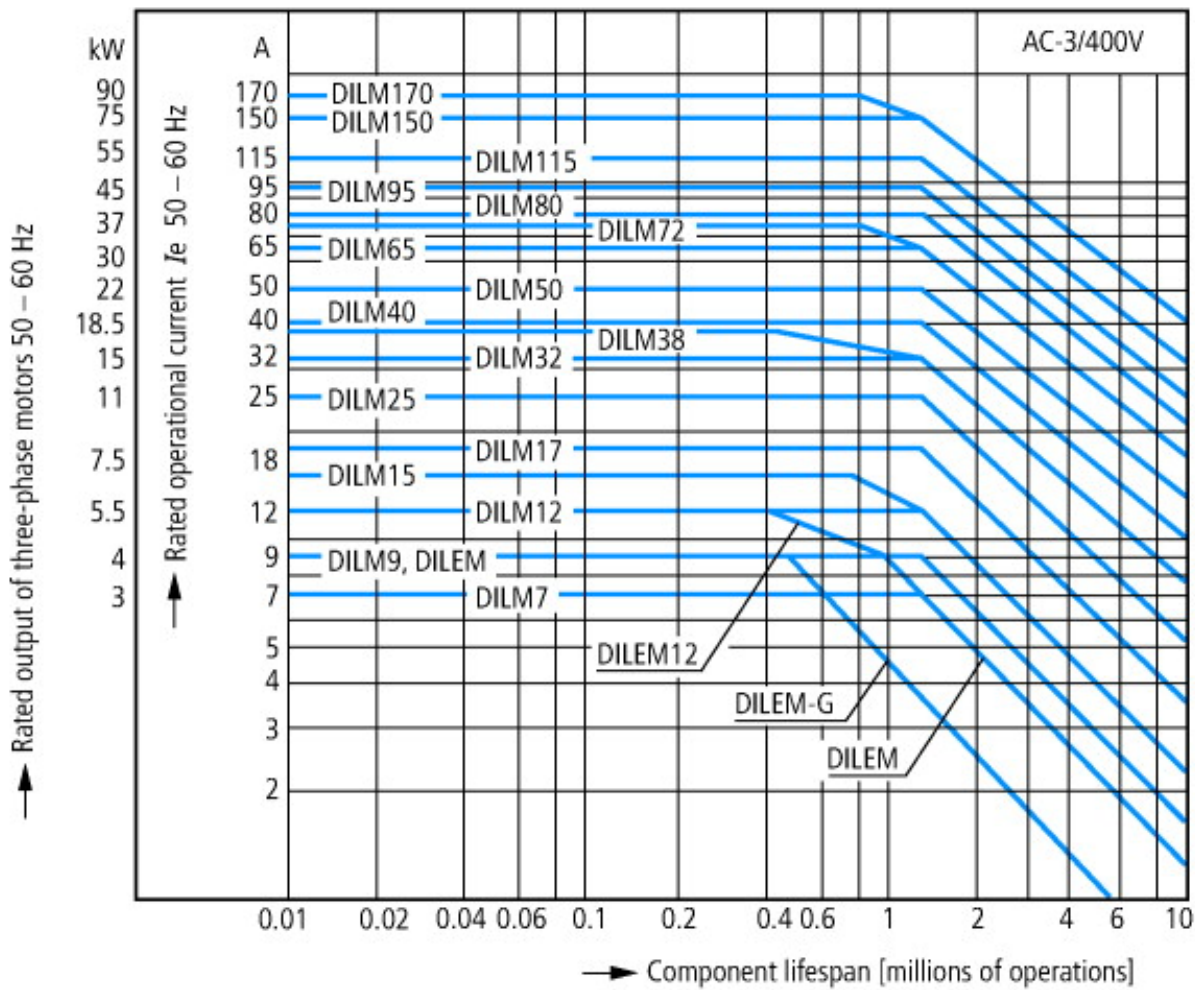
Rated operation current I _e at AC-4, 400 V	A	6
Rated operation power I _e at AC-4, 400 V	kW	2.5
Modular version		No
Number of auxiliary contacts as normally open contact		1
Number of auxiliary contacts as normally closed contact		0
Type of electrical connection of main circuit		Screw connection
Number of normally closed contacts as main contact		0
Number of main contacts as normally open contact		3

Approvals

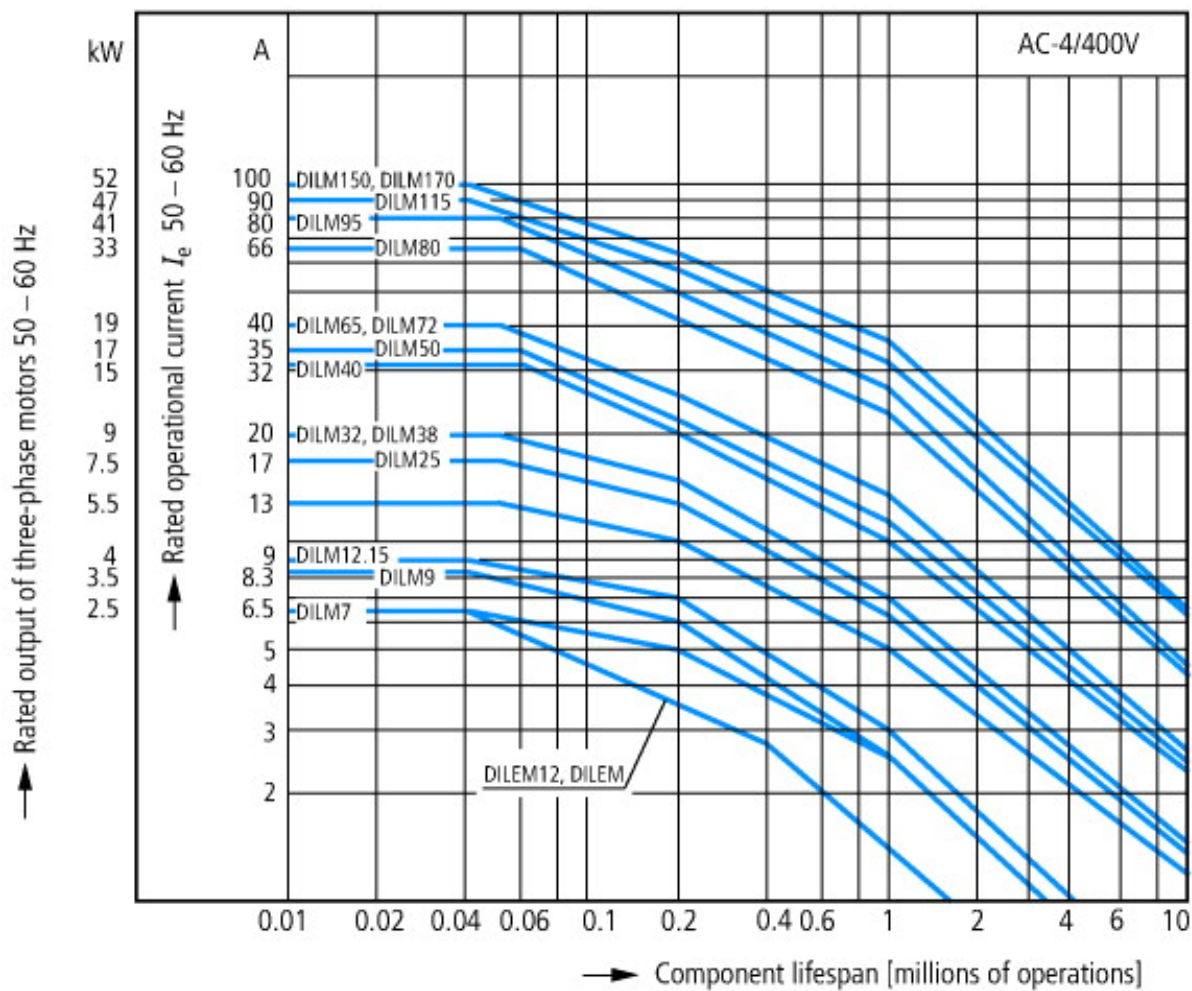
Product Standards		IEC/EN 60947-4-1; UL 60947-4-1; CSA - C22.2 No. 60947-4-1-14; CE marking
UL File No.		E29096
UL Category Control No.		NLDX
CSA File No.		012528
CSA Class No.		2411-03, 3211-04
North America Certification		UL listed, CSA certified
Specially designed for North America		No



- 1: Overload relay
- 2: Suppressor
- 3: Auxiliary contact modules



- 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

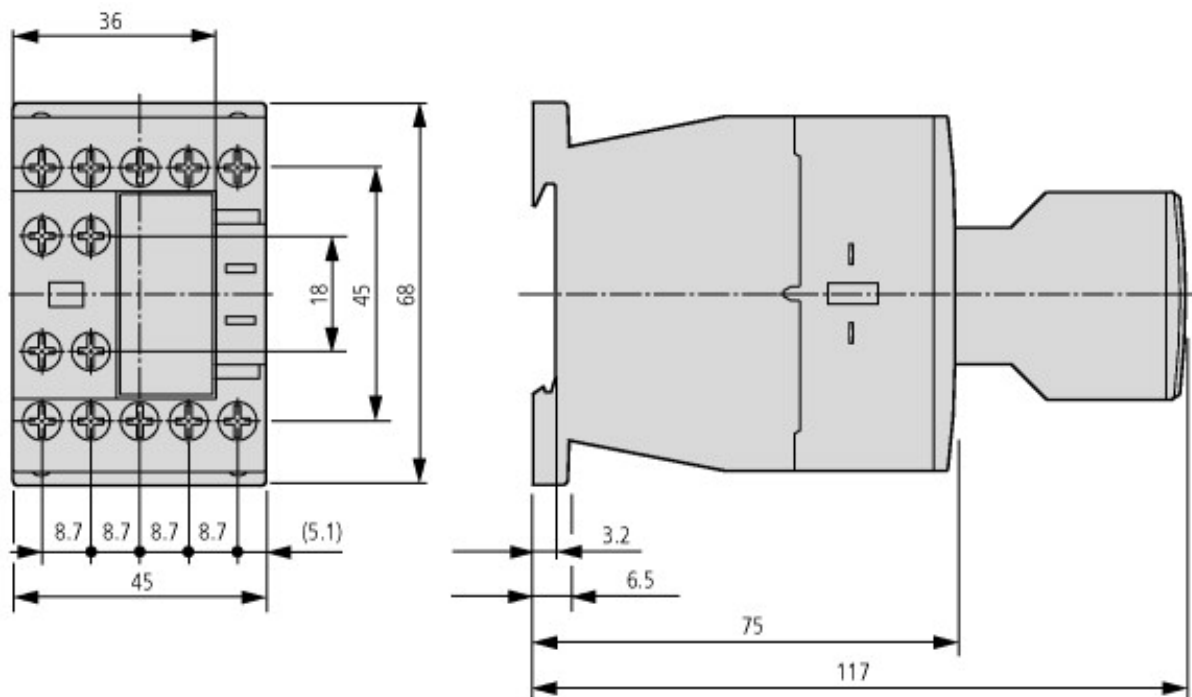


- Extreme switching duty
- Squirrel-cage motor
- Operating characteristics
- Inching, plugging, reversing
- Electrical characteristics
- Make: up to 6 x rated motor current
- Break: up to 6 x rated motor current
- Utilization category
- 100 % AC-4
- Typical applications
- Printing presses
- Wire-drawing machines
- Centrifuges
- Special drives for manufacturing and processing machines

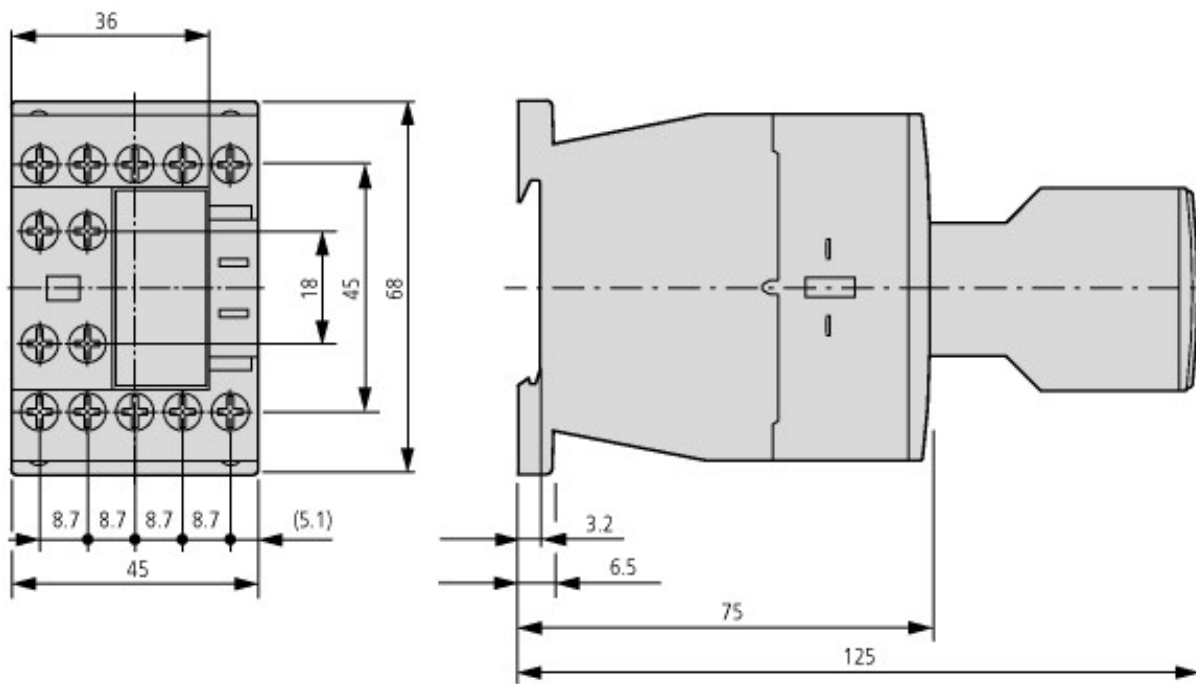


Switching conditions for non-motor consumers, 3 pole, 4 pole
 Operating characteristics
 Non inductive and slightly inductive loads
 Electrical characteristics
 Switch on: 1 x rated operational current
 Switch off: 1 x rated operational current
 Utilization category
 100 % AC-1
 Typical examples of application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

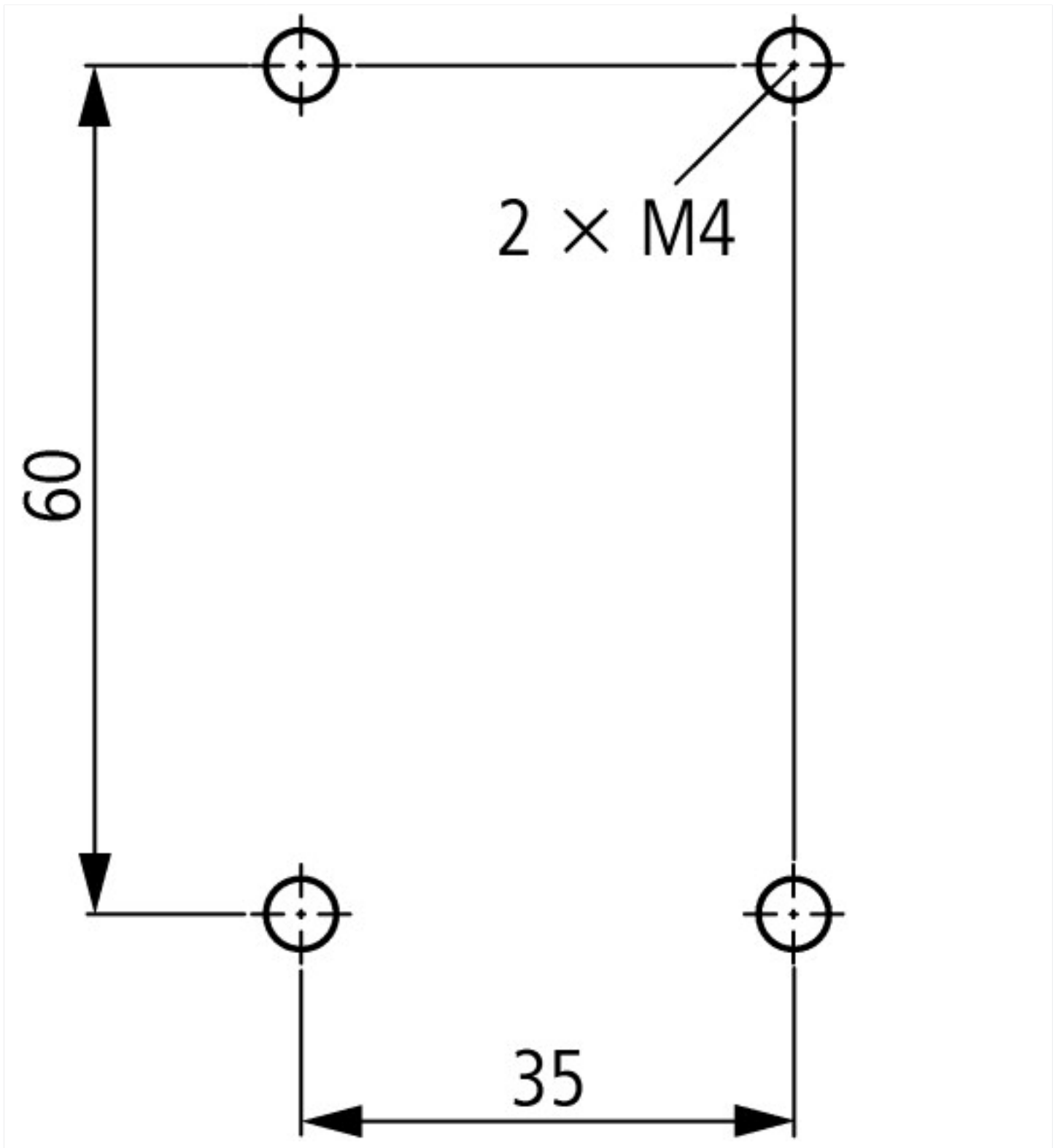
Dimensions



Contactor with auxiliary contact module DILM32-XHI.../DILA-XHI...



Contactor with auxiliary contact module DILA-XHIT...



Additional product information (links)

IL03407013Z (AWA2100-2126) Contactors

IL03407013Z (AWA2100-2126) Contactors	ftp://ftp.moeller.net/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407013Z2012_03.pdf
UL/CSA: Approved rating data	http://de.ecat.moeller.net/flip-cat/?edition=HPLTE&startpage=5.84
UL/CSA: UL/CSA: Special Purpose Rating	http://de.ecat.moeller.net/flip-cat/?edition=HPLTE&startpage=5.85
UL/CSA: UL/CSA: Short Circuit Current Rating (SCCR)	http://de.ecat.moeller.net/flip-cat/?edition=HPLTE&startpage=5.86
Switchgear of Power Factor Correction Systems	http://www.moeller.net/binary/ver_techpapers/ver934en.pdf
X-Start - Modern Switching Installations Efficiently Fitted and Wired Securely	http://www.moeller.net/binary/ver_techpapers/ver938en.pdf
Mirror Contacts for Highly-Reliable Information Relating to Safety-Related Control Functions	http://www.moeller.net/binary/ver_techpapers/ver944en.pdf
Effect of the Cable Capacitance of Long Control Cables on the Actuation of Contactors	http://www.moeller.net/binary/ver_techpapers/ver949en.pdf

Motor starters and "Special Purpose Ratings" for the North American market	http://www.moeller.net/binary/ver_techpapers/ver953en.pdf
Switchgear for Luminaires	http://www.moeller.net/binary/ver_techpapers/ver955en.pdf
Standard Compliant and Functionally Safe Engineering Design with Mechanical Auxiliary Contacts	http://www.moeller.net/binary/ver_techpapers/ver956en.pdf
The Interaction of Contactors with PLCs	http://www.moeller.net/binary/ver_techpapers/ver957en.pdf
Busbar Component Adapters for modern Industrial control panels	http://www.moeller.net/binary/ver_techpapers/ver960en.pdf