

Contactor, 3 pole, 380 V 400 V 22 kW, 230 V 50 Hz, 240 V 60 Hz, AC operation, Screw terminals



Part no. DILM50-EA(230V50HZ,240V60HZ)
Catalog No. 190011

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.
380 V 400 V	I_e	A		50
AC-1				
Conventional free air thermal current, 3 pole, 50 - 60 Hz				
Open				
at 40 °C	$I_{th} = I_e$	A		80
enclosed	I_{th}	A		58
Conventional free air thermal current, 1 pole				
open	I_{th}	A		162
enclosed	I_{th}	A		145
Max. rating for three-phase motors, 50 - 60 Hz				
AC-3				
220 V 230 V	P	kW		15.5
380 V 400 V	P	kW		22
660 V 690 V	P	kW		30
AC-4				
220 V 230 V	P	kW		6
380 V 400 V	P	kW		10
660 V 690 V	P	kW		14
Contact sequence				
Instructions				Contacts to EN 50 012.
Can be combined with auxiliary contact				DILM150-XHI(V)... DILM1000-XHI(V)...
Actuating voltage				230 V 50 Hz, 240 V 60 Hz
Voltage AC/DC				AC operation
Connection to SmartWire-DT				no
Frame size				3

Technical data

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

AC operated	Operations	x 10 ⁶	10
Operating frequency, mechanical			
AC operated	Operations/h		5000
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	10
Auxiliary contacts			
N/O contact		g	7
N/C contact		g	5
Degree of Protection			
IP00			
Protection against direct contact when actuated from front (EN 50274)			
Finger and back-of-hand proof			
Altitude			
m			
max. 2000 m			
Weight			
AC operated		kg	0.872
Screw connector terminals			
Terminal capacity main cable			
Solid		mm ²	1 x (0.75 - 16) 2 x (0.75 - 16)
Flexible with ferrule		mm ²	1 x (0.75 - 35) 2 x (0.75 - 25)
Stranded		mm ²	1 x (16 - 50) 2 x (16 - 35)
Solid or stranded		AWG	single 14 - 1, double 14 - 2
Flat conductor	Lamellenzahl x Breite x Dicke	mm	2 x (6 x 9 x 0.8)
Stripping length		mm	14
Terminal screw			M6
Tightening torque		Nm	3.3
Tool			
Pozidriv screwdriver		Size	2
Standard screwdriver		mm	0.8 x 5.5 1 x 6
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
Terminal screw			M3.5
Tightening torque		Nm	1.2
Tool			
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	440
between the contacts		V AC	440
Making capacity (p.f. to IEC/EN 60947)			
	Up to 690 V	A	700
Breaking capacity			
220 V 230 V		A	500
380 V 400 V		A	500
500 V		A	500
660 V 690 V		A	320
Short-circuit rating			
Short-circuit protection maximum fuse			
Type "2" coordination			
400 V	gG/gL 500 V	A	80
690 V	gG/gL 690 V	A	63
Type "1" coordination			
400 V	gG/gL 500 V	A	160
690 V	gG/gL 690 V	A	80

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	80
at 50 °C	$I_{th} = I_e$	A	71
at 55 °C	$I_{th} = I_e$	A	68
at 60 °C	$I_{th} = I_e$	A	65
enclosed	I_{th}	A	58
Conventional free air thermal current, 1 pole			
open	I_{th}	A	162
enclosed	I_{th}	A	145
AC-3			
Rated operational current			
Open, 3-pole: 50 – 60 Hz			
Notes			At maximum permissible ambient temperature (open.) Also tested according to AC-3e.
220 V 230 V	I_e	A	50
240 V	I_e	A	50
380 V 400 V	I_e	A	50
415 V	I_e	A	50
440V	I_e	A	50
500 V	I_e	A	50
660 V 690 V	I_e	A	32

Motor rating	P	kWh	
220 V 230 V	P	kW	15.5
240V	P	kW	17
380 V 400 V	P	kW	22
415 V	P	kW	30
440 V	P	kW	32
500 V	P	kW	36
660 V 690 V	P	kW	30

AC-4

Open, 3-pole: 50 – 60 Hz			
220 V 230 V	I_e	A	21
240 V	I_e	A	21
380 V 400 V	I_e	A	21
415 V	I_e	A	21
440 V	I_e	A	21
500 V	I_e	A	21
660 V 690 V	I_e	A	17

Motor rating	P	kWh	
220 V 230 V	P	kW	6
240 V	P	kW	6.5
380 V 400 V	P	kW	10
415 V	P	kW	11
440 V	P	kW	12
500 V	P	kW	13
660 V 690 V	P	kW	14

DC

Rated operational current, open			
DC-1			
60 V	I_e	A	60
110 V	I_e	A	50
220 V	I_e	A	45

Current heat loss

3 pole, at I_{th} (60°)		W	16.7
Current heat loss at I_e to AC-3/400 V		W	9.9
Impedance per pole		mΩ	1.9

Magnet systems

Voltage tolerance			
AC operated	Pick-up	$x U_c$	0.8 - 1.1
Drop-out voltage AC operated	Drop-out	$x U_c$	0.3 - 0.6
Power consumption of the coil in a cold state and $1.0 \times U_S$			
50 Hz	Pick-up	VA	149
50 Hz	Sealing	VA	16
50 Hz	Sealing	W	4.1
60 Hz	Pick-up	VA	178
60 Hz	Sealing	VA	19
60 Hz	Sealing	W	4.1
Duty factor		% DF	100
Changeover time at 100 % U_S (recommended value)			
Main contacts			
AC operated			
Closing delay		ms	12 - 18
Opening delay		ms	8 - 13
Arcing time		ms	10

Electromagnetic compatibility (EMC)

Emitted interference			according to EN 60947-1
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Interference immunity according to EN 60947-1

Rating data for approved types

Switching capacity			
Maximum motor rating			
Three-phase			
200 V 208 V	HP	15	
230 V 240 V	HP	20	
460 V 480 V	HP	40	
575 V 600 V	HP	50	
Single-phase			
115 V 120 V	HP	3	
230 V 240 V	HP	10	
General use	A	80	
Short Circuit Current Rating			
Basic Rating			
SCCR			
SCCR	kA	10	
max. Fuse	A	250	
max. CB	A	250	
480 V High Fault			
SCCR (fuse)	kA	30/100	
max. Fuse	A	250/150 Class J	
SCCR (CB)	kA	65	
max. CB	A	100	
600 V High Fault			
SCCR (fuse)	kA	30/100	
max. Fuse	A	250/150 Class J	
SCCR (CB)	kA	30	
max. CB	A	250	
Special Purpose Ratings			
Electrical Discharge Lamps (Ballast)			
480V 60Hz 3phase, 277V 60Hz 1phase	A	79	
600V 60Hz 3phase, 347V 60Hz 1phase	A	79	
Incandescent Lamps (Tungsten)			
480V 60Hz 3phase, 277V 60Hz 1phase	A	74	
600V 60Hz 3phase, 347V 60Hz 1phase	A	74	
Resistance Air Heating			
480V 60Hz 3phase, 277V 60Hz 1phase	A	79	
600V 60Hz 3phase, 347V 60Hz 1phase	A	79	
Elevator Control			
200V 60Hz 3phase	HP	10	
200V 60Hz 3phase	A	32.2	
240V 60Hz 3phase	HP	15	
240V 60Hz 3phase	A	42	
480V 60Hz 3phase	HP	30	
480V 60Hz 3phase	A	40	
600V 60Hz 3phase	HP	40	
600V 60Hz 3phase	A	41	

Design verification as per IEC/EN 61439

Technical data for design verification			
Rated operational current for specified heat dissipation	I_n	A	50
Heat dissipation per pole, current-dependent	P_{vid}	W	3.3

Equipment heat dissipation, current-dependent	P _{vid}	W	9.9
Static heat dissipation, non-current-dependent	P _{vs}	W	4.1
Heat dissipation capacity	P _{diss}	W	0
Operating ambient temperature min.		°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 7.0

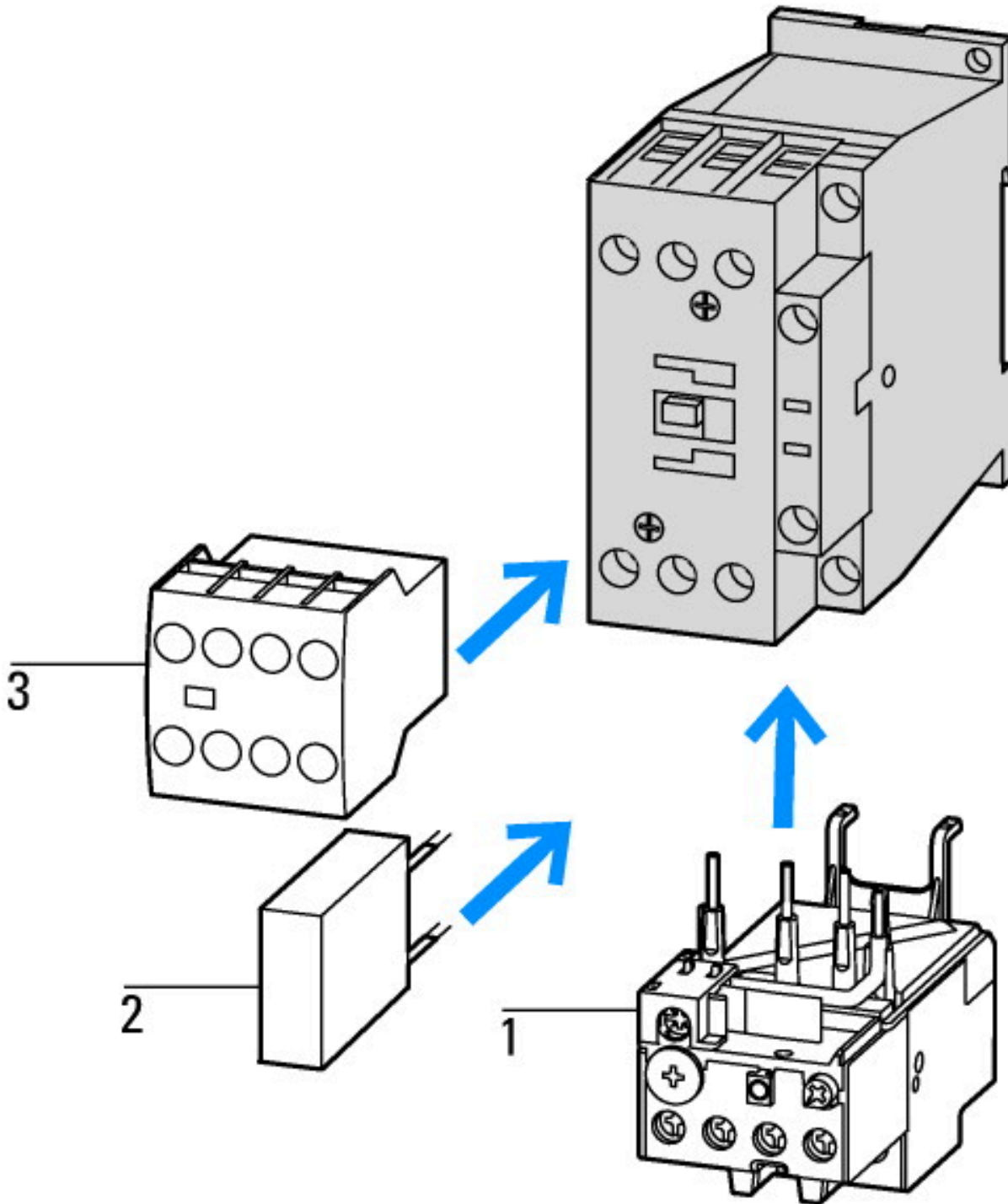
Low-voltage industrial components (EG000017) / Power contactor, AC switching (EC000066)			
Electric engineering, automation, process control engineering / Low-voltage switch technology / Contactor (LV) / Power contactor, AC switching (ecl@ss10.0.1-27-37-10-03 [AAB718015])			
Rated control supply voltage U _s at AC 50HZ	V		230 - 230
Rated control supply voltage U _s at AC 60HZ	V		240 - 240
Rated control supply voltage U _s at DC	V		0 - 0
Voltage type for actuating			AC
Rated operation current I _e at AC-1, 400 V	A		80
Rated operation current I _e at AC-3, 400 V	A		50
Rated operation power at AC-3, 400 V	kW		22
Rated operation current I _e at AC-4, 400 V	A		21
Rated operation power at AC-4, 400 V	kW		10
Rated operation power NEMA	kW		29.8
Modular version			No
Number of auxiliary contacts as normally open contact			0
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
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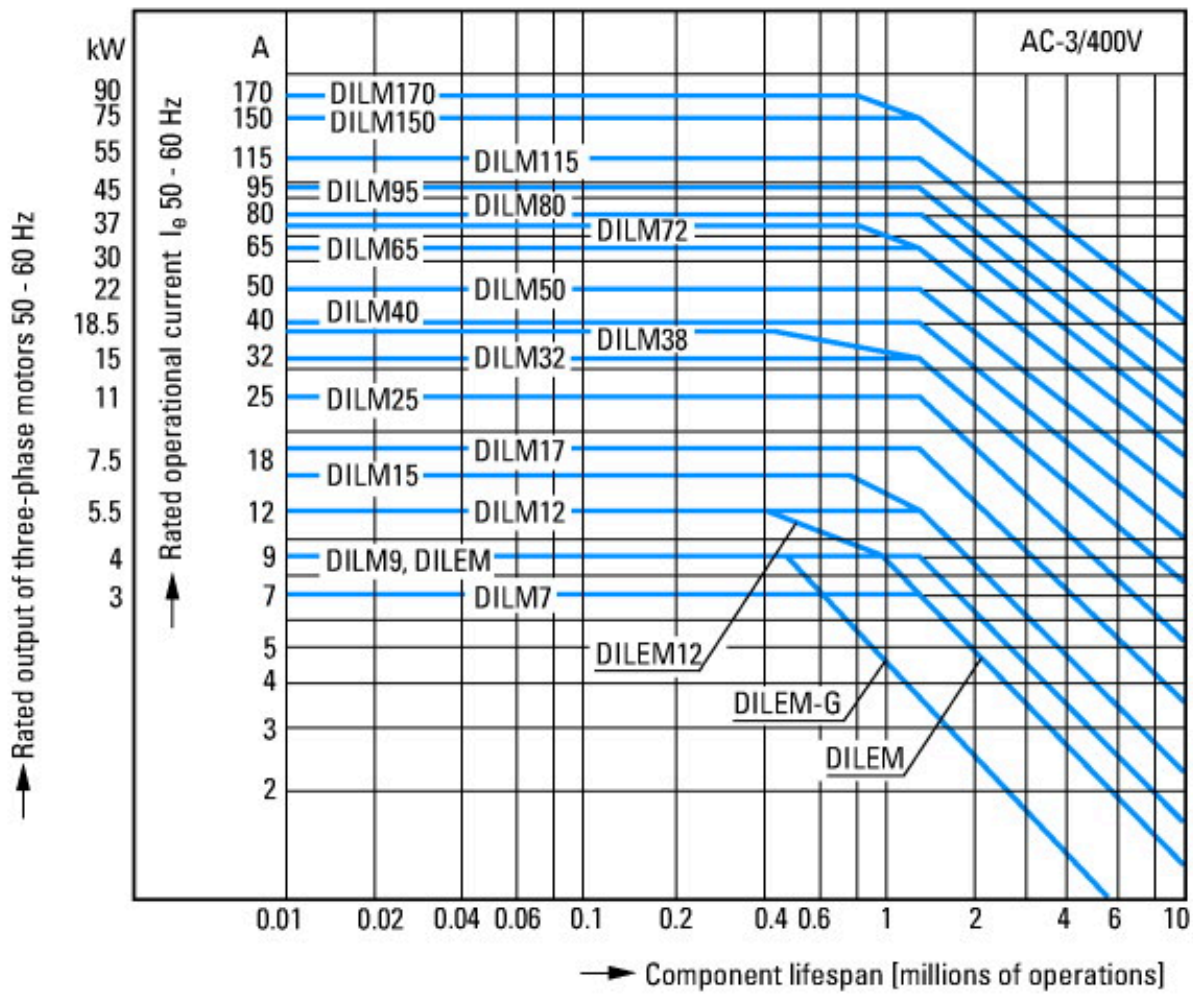
UL File No.	E29096
UL Category Control No.	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
North America Certification	UL listed, CSA certified
Specially designed for North America	No

Characteristics



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

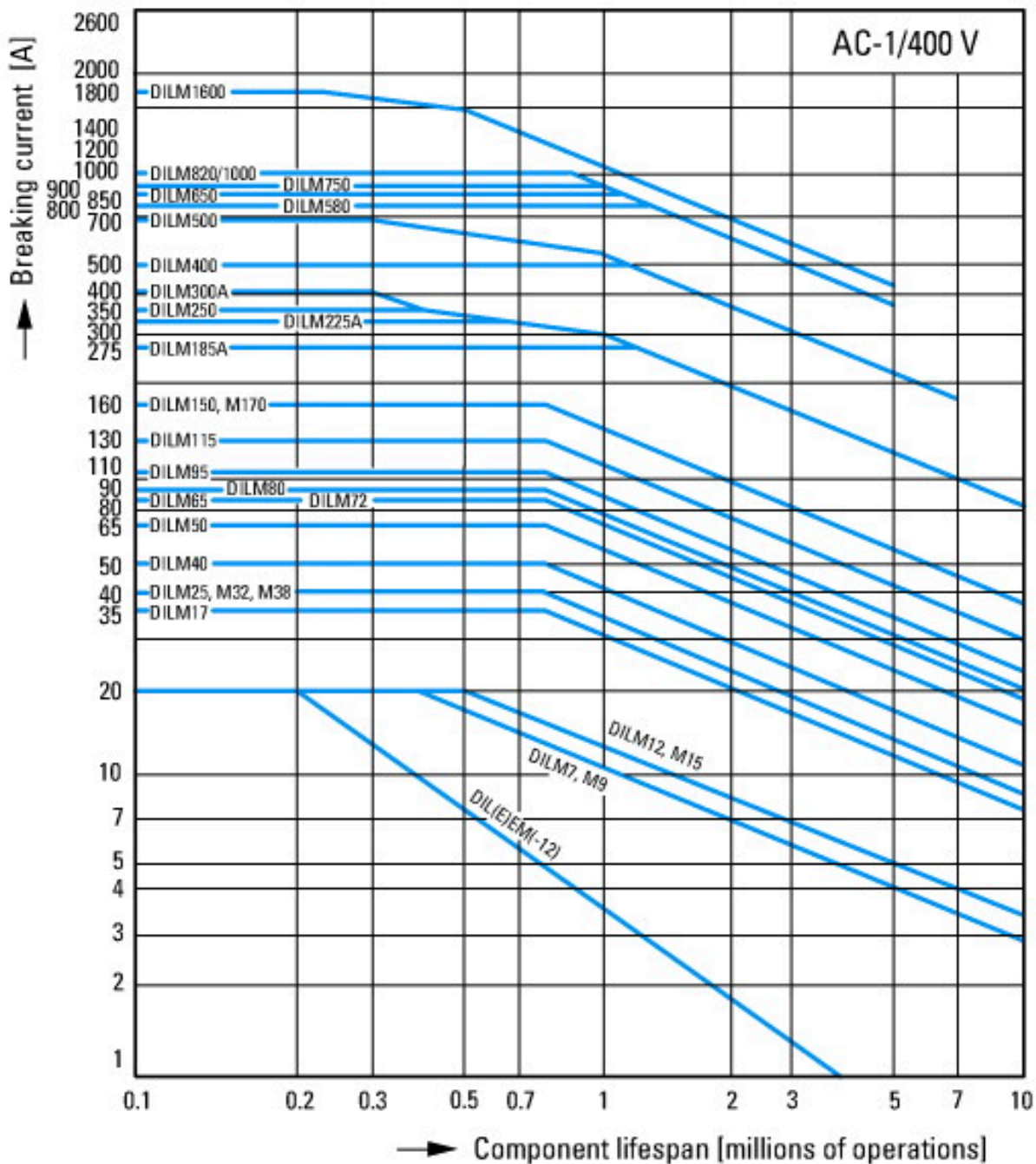
on the side: 2 x DILM1000-XHI(V)11-SI; surface mounting: 1 x DILM150-XHIA11
on the side: 2 x DILM1000-XHI(V)11-SA; surface mounting: 1 x DILM150-XHI (2 pole)
on the side: 1 x DILM1000-XHI(V)11-SI; surface mounting: 1 x DILM150-XHIA22
on the side: 1 x DILM1000-XHI(V)11-SA; surface mounting: 1 x DILM150-XHI (4 pole)



Normal AC induction motor
 Operating characteristics
 Switch on: from stop
 Switch off: during run
 Electrical characteristics:
 Switch on: up to 6 x Rated motor current
 Switch off: up to 1 x Rated motor current
 Utility category



Extreme switching duty
 Normal AC induction motor
 Operating characteristics
 Inching, plugging, reversing
 Electrical characteristics:
 Switch on: up to 6 x Rated motor current
 Switch off: up to 6 x Rated motor current
 Utilization



Switching conditions for 3 pole, non-motor loads
 Operating characteristics
 Non inductive and slightly inductive loads
 Electrical characteristics:
 Switch on: $1 \times$ rated operational current
 Switch off: $1 \times$ rated operational current
 Utility category
 100 % AC-1
 Catalog Number

Dimensions

Contactor with auxiliary contact module

side clearance to earthed parts: 6 mm

Additional product information (links)

Motor starters and "Special Purpose Ratings" for the North American market	http://www.eaton.eu/ecm/groups/public/@pub/@europe/@electrical/documents/content/pct_3258146.pdf
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 Cabel Capacitance of Long Control Cables on the Actuation of Contactors	http://www.moeller.net/binary/ver_techpapers/ver949en.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