



Contactor, 3p+2N/O+2N/C, 4kW/400V/AC3

Part no. DILM9-22(230V50HZ,240V60HZ)
Article no. 106361
Catalog No. XTCE009B22F

Delivery program

Product range			Contactors
Application			Contactors for Motors
Subrange			Complete devices up to 170 A
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
Notes			 Also suitable for motors with efficiency class IE3. IE3-ready devices are identified by the logo on their packaging.

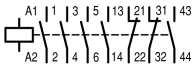
Rated operational current

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			2 N/O
N/C = Normally closed			2 NC
Instructions			Contacts to EN 50012. with mirror contact.
Contact sequence			
Voltage AC/DC			AC operation

Technical data

Standards			IEC/EN 60947, VDE 0660, UL, CSA
Lifespan, mechanical			
AC operated	Operations	x 10 ⁶	10
DC operated	Operations	x 10 ⁶	10
Operating frequency, mechanical			

AC operated	Operations/h	5000
DC 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	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		
AC operated	kg	0.23
DC operated	kg	0.28
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	18 - 10
Main cable connection screw/bolt		M3.5
Tightening torque	Nm	1.2
Terminal capacity control circuit cables		
Solid	mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Flexible with ferrule	mm ²	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)
Solid or stranded	AWG	18 - 14
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
Tool			
Stripping length		mm	10

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)			
	Up to 690 V	A	112
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	P	kWh	
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
440 V	I _e	A	1.3
DC-3			
60 V	I _e	A	20
110 V	I _e	A	20
220 V	I _e	A	1.5
440 V	I _e	A	0.2
DC-5			
60 V	I _e	A	20
110 V	I _e	A	20
220 V	I _e	A	1.5
440 V	I _e	A	0.2

Current heat loss

3-pole at I _{th}		W	2.7
Current heat loss at I _e to AC-3/400 V		W	0.6
Impedance per pole		mΩ	2.5

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
DC operated	Pick-up	x U _c	0.7 - 1.2
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 Hz	Pick-up	VA	24
50 Hz	Sealing	VA	3.4
50 Hz	Sealing	W	1.2
60 Hz	Pick-up	VA	30

60 Hz	Sealing	VA	4.4
60 Hz	Sealing	W	1.4
50/60 Hz	Pick-up	VA	27 25
50/60 Hz	Sealing	VA	4.2 3.3
50/60 Hz	Sealing	W	1.4 1.2
DC operated	Pick-up	W	3
DC operated	Sealing	W	3
Duty factor		% DF	100
Changeover time at 100 % U _C (recommended value)			
Main contacts			
AC operated			
Closing delay		ms	15 - 21
Opening delay		ms	9 - 18
DC operated		ms	
Closing delay		ms	31
Opening delay		ms	12
Arcing time		ms	10
Lifespan, mechanical; Coil 50/60 Hz		x 10 ⁶	Mechanical lifespan at 50 Hz approx. 30% lower than under "Technical data, general"

Electromagnetic compatibility (EMC)

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

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	0.2
Equipment heat dissipation, current-dependent	P _{vid}	W	0
Static heat dissipation, non-current-dependent	P _{vs}	W	1.4
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.

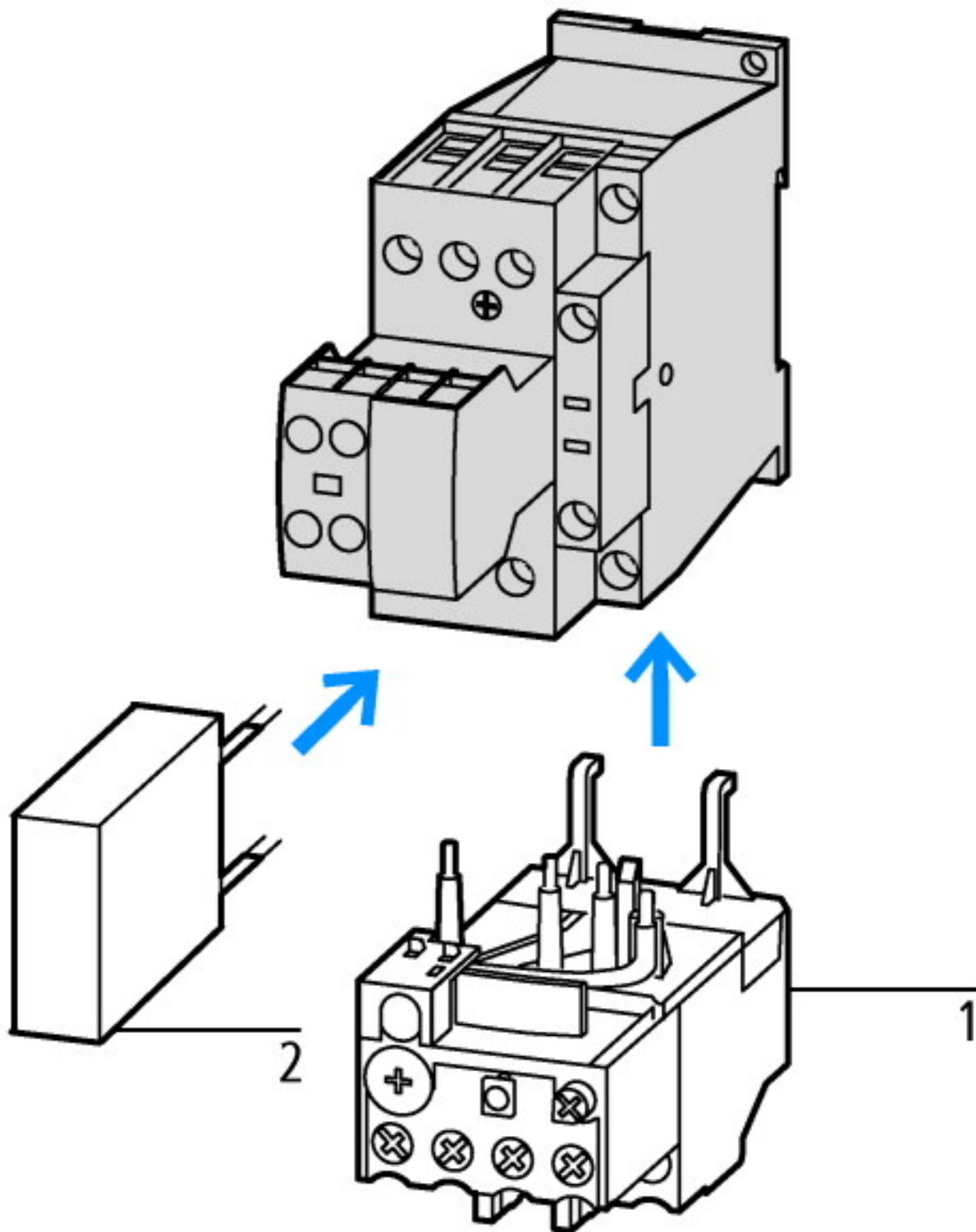
10.10 Temperature rise			The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices.
10.11 Short-circuit rating			Is the panel builder's responsibility. The specifications for the switchgear must be observed.
10.12 Electromagnetic compatibility			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 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 (ecI@ss8.1-27-37-10-03 [AAB718012])			
Rated control supply voltage Us at AC 50HZ		V	230 - 230
Rated control supply voltage Us at AC 60HZ		V	240 - 240
Rated control supply voltage Us at DC		V	0 - 0
Voltage type for actuating			AC
Rated operation current Ie at AC-1, 400 V		A	14
Rated operation current Ie at AC-3, 400 V		A	9
Rated operation power at AC-3, 400 V		kW	4
Rated operation current Ie at AC-4, 400 V		A	6
Rated operation power Ie at AC-4, 400 V		kW	2.5
Modular version			No
Number of auxiliary contacts as normally open contact			2
Number of auxiliary contacts as normally closed contact			2
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

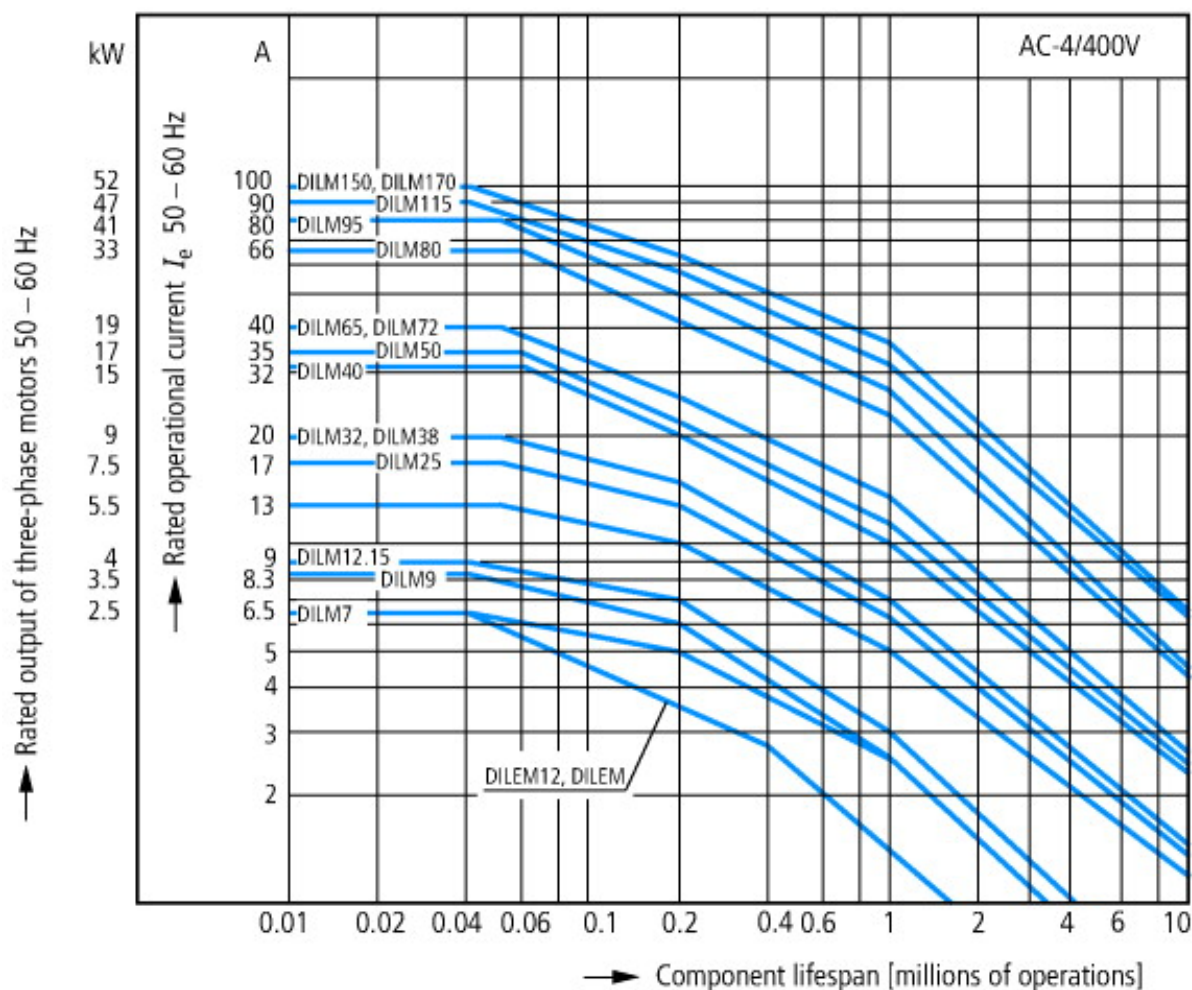
Product Standards			IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.			E29096
UL Category Control No.			NLDX
CSA File No.			012528
CSA Class No.			2411-03, 3211-04
North America Certification			UL listed, CSA certified
Specially designed for North America			No



1: Overload relay
2: Suppressor



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 3 pole, non-motor loads

Operating characteristics

Non inductive and slightly inductive loads

Electrical characteristics

Switch on: 1 x rated operational current

Switch off: 1 x rated operational current

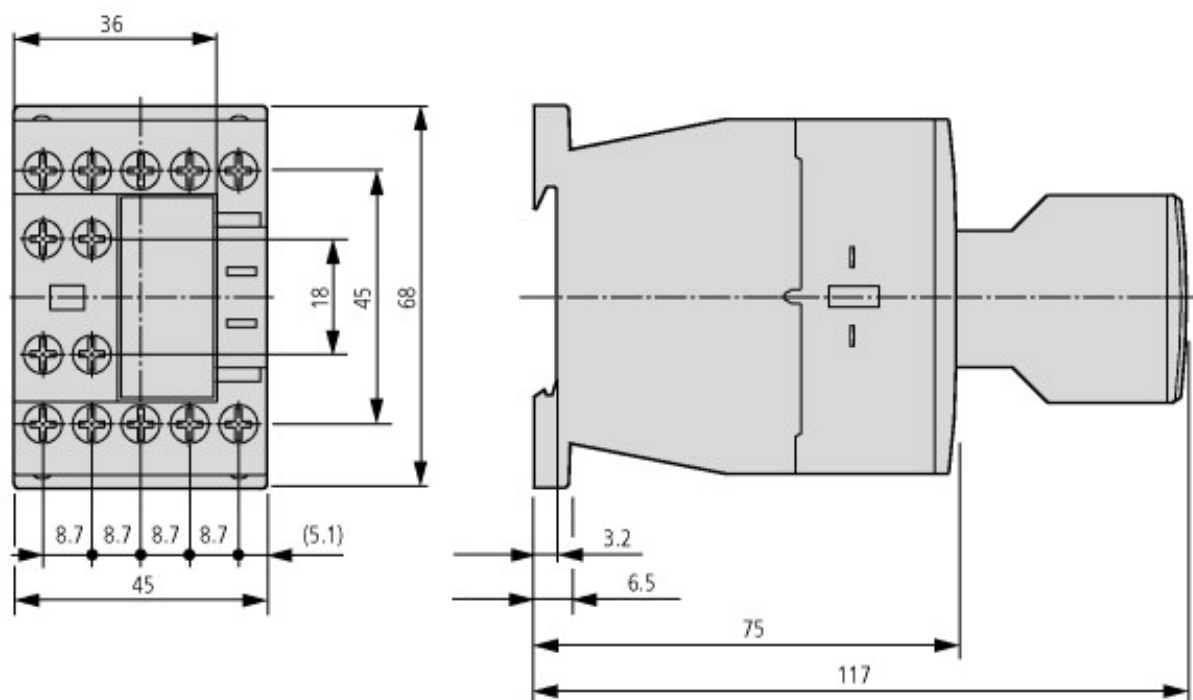
Utilization category

100 % AC-1

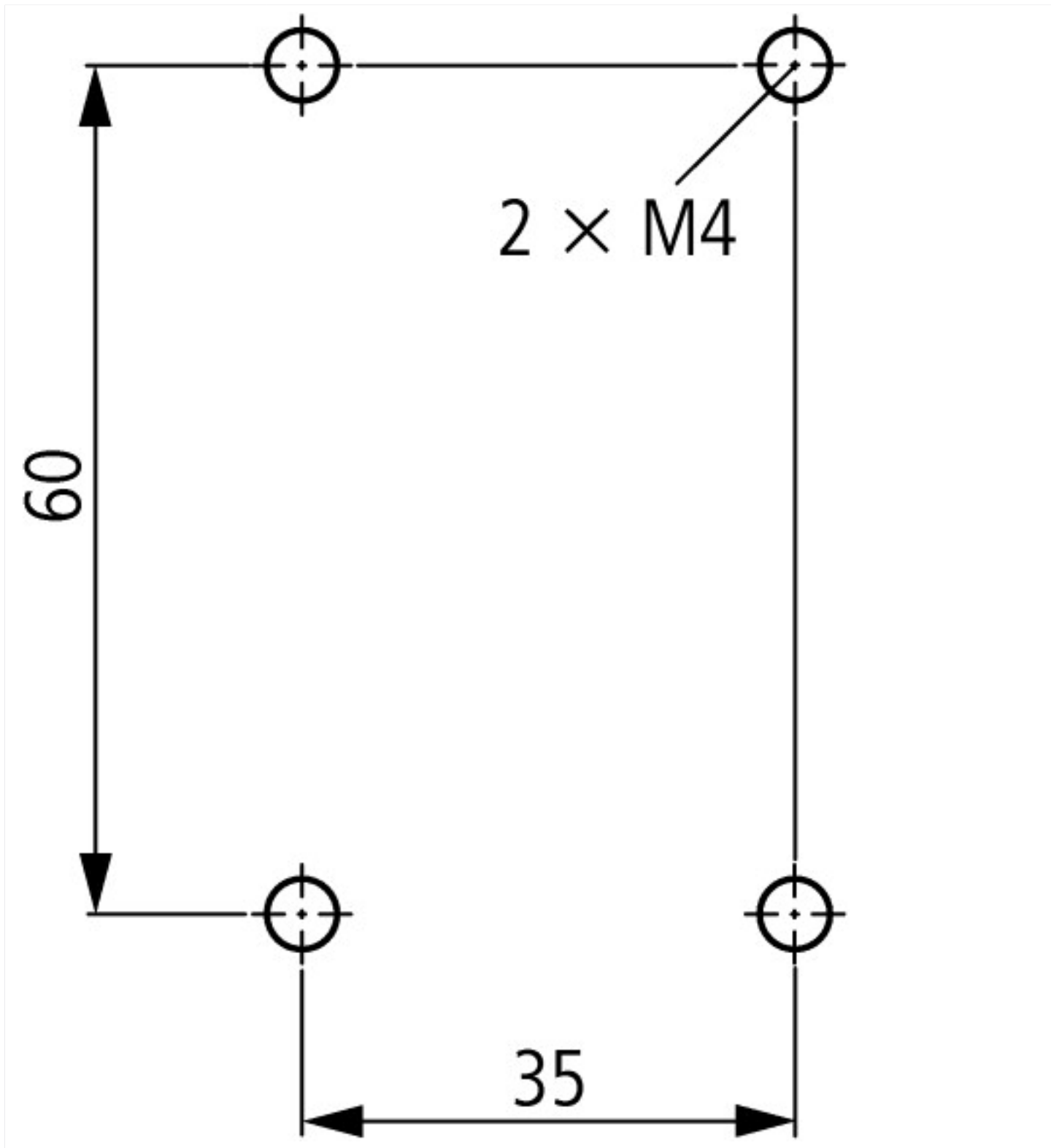
Typical examples of application

Electric heat

Dimensions



Contactor with auxiliary contact module



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
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