Product group data DILEEM

General

Standards and specifications			IEC/EN 60947, VDE 0660, CSA, UL
Lifespan, mechanical	Operations	× 10^6	10
Maximum operating frequency			
Mechanical		Ops./h	9000
Operating frequency			See pages 5/6
Climatic proofing			Damp heat, constant, to IEC 60 068-2-3, Damp heat, cyclical, to IEC 60 068-2-30
Ambient temperature			
Open		°C	-25/50
enclosed		°C	-40/40
Mounting position			As required, except vertical with terminals A1/A2 at the bottom
Mechanical shock resistance (IEC/EN 60068-2-27)			
Half-sinusoidal shock, 10 ms			
Basic unit without auxiliary contact module			
Main contacts, make contacts		g	10
Main contacts Make/break contacts		g	10/8
Basic unit with auxiliary contact module			
Auxiliary contacts Make/break contacts		g	10/8
Degree of protection			IP20
Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)			Finger and back-ofhand proof
Weight		kg	0,2
Terminal capacity of auxiliary and main contacts			
Solid		mm^2	1 × (0,75 – 2,5) 2 × (0,75 – 2,5)
Flexible with ferrule		mm^2	1 × (0,75 – 1,5) 2 × (0,75 – 1,5)
Solid or stranded		AWG	18 – 14
Terminal screw			M3.5
Pozidriv screwdriver		Size	2
Standard screwdriver		mm	0,8 × 5,5 1 × 6
Max. tightening torque		Nm	1,2

Main conducting paths

Rated impulse withstand voltage	U_{imp}	V AC	6000
Overvoltage category/pollution degree			III/3
Rated insulation voltage			
AC	U_i	V AC	690
Rated operational voltage			
Rated operational voltage	U_e	V AC	690
Safe isolation to VDE 0106 Part 101 and Part 101/A1			
between coil and contacts		V AC	300
between the contacts		V AC	300
Making capacity ($cos\varphi$ to IEC/EN 60947)		A	110
Breaking capacity			
220/230 V		A	90
380/400 V		A	90
500 V AC		A	64
660/690 V		A	54
Component lifespan			
AC-1 component lifespan			See Page 7
AC-3 component lifespan			See Page 8
AC-4 component lifespan			See Page 9

Short-circuit protection Maximum fuse			
Type "1" coordination	gL/gG	A	20
Type "2" coordination	gL/gG	A	10

AC

AC-1 duty			
conv. therm. current 3-pole 50 – 60 Hz			
open			
at 40 °C		A	22
at 50 °C		A	20
at 55 °C		A	19
Enclosed		A	16
1-pole open		A	50
conv. therm. current three/four main contacts in parallel, enclosed		A	40
AC-3 duty			
Rated operational current AC-3 open, 50 – 60 Hz, 3-pole			
220/230 V	I_e	A	6,6
240 V	I_e	A	6,6
380/400 V	I_e	A	6,6
415 V	I_e	A	6,6
440V	I_e	A	6,6
500 V	I_e	A	5
660/690 V	I_e	A	3,5
Rating, AC-3 motor load switch			
220/230 V	P	kW	1,5
240V	P	kW	1,8
380/400 V	P	kW	3
415 V	P	kW	3,1
440 V	P	kW	3,3
500 V	P	kW	3
660/690 V	P	kW	3
AC-4 duty			
Rated operational current AC-4 open, 50 – 60 Hz, 3-pole			
220/230 V	I_e	A	5
240 V	I_e	A	5
380/400 V	I_e	A	5
415 V	I_e	A	5
440 V	I_e	A	5
500 V	I_e	A	3,7
660/690 V	I_e	A	2,9
AC-4			
220/230 V	P	kW	1,1
240 V	P	kW	1,3
380/400 V	P	kW	2,2
415 V	P	kW	2,3
440 V	P	kW	2,4
500 V	P	kW	2,2
660/690 V	P	kW	2,2

DC

Operations			
Switching DC current		See Pages 5/6	
DC-1			
12 V		A	20
24 V		A	20

60 V		A	20
110 V		A	20
220 V		A	20
DC-3			
12 V		A	6
24 V		A	6
60 V		A	3
110 V		A	2
DC-5			
12 V		A	1,8
24 V		A	1,8
60 V		A	1,8
110 V		A	1,1
220 V		A	0,2
Current heat losses (3- or 4-pole)			
to I_{th}		W	2
at I_e to AC-3/400 V		W	0,3

Magnet systems

Voltage tolerance			
AC operation			
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz		× U_c	0,8 – 1,1
Dual-frequency coil 50/60 Hz		× U_c	0,85 – 1,1
Power consumption			
AC operation			
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Pick-up	VA	25
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Pick-up	W	22
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Sealing	VA	4,6
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Sealing	W	1,3
Dual-frequency coil 50/60 Hz at 50 Hz	Pick-up	VA	30
Dual-frequency coil 50/60 Hz at 50 Hz	Pick-up	W	26
Dual-frequency coil 50/60 Hz at 50 Hz	Sealing	VA	5,4
Dual-frequency coil 50/60 Hz at 50 Hz	Sealing	W	1,6
Dual-frequency coil 50/60 Hz at 60 Hz	Pick-up	VA	29
Dual-frequency coil 50/60 Hz at 60 Hz	Pick-up	W	24
Dual-frequency coil 50/60 Hz at 60 Hz	Sealing	VA	3,9
Dual-frequency coil 50/60 Hz at 60 Hz	Sealing	W	1,1
Duty factor		% DF	100
Switching times at 100 % U_c (main circuits)			
Make contact			
Closing delay			
Closing delay min.		ms	14
Closing delay max.		ms	21
Opening delay			
Opening delay min.		ms	8
Opening delay max.		ms	18
Closing delay with top mounting auxiliary contact		ms	45
Reversing contactors			
Changeover time at 110 % U_c			
Changeover time min.		ms	16
Changeover time max.		ms	21
Arcing time at 690 V AC		ms	12
Coil			
Lifespan, mechanical of the coil 50/60 Hz	at 50 Hz		7

Auxiliary contacts

Interlocked opposing contacts to ZH 1/457, including auxiliary contact module			Yes
Rated impulse withstand voltage	U_{imp}	V AC	6000
Overvoltage category/pollution degree			III/3
Rated insulation voltage	U_i	V AC	690
Rated operational voltage			

Rated operational voltage	U_e	V AC	600
Safe isolation to VDE 0106 Part 101 and Part 101/A1			
between coil and auxiliary contacts		V AC	300
between the auxiliary contacts		V AC	300
Rated operational current			
AC-15			
220/240 V	I_e	A	6
380/415 V	I_e	A	3
500 V	I_e	A	1,5
Top mounting auxiliary contacts			
220/240 V	I_e	A	4
380/415 V	I_e	A	2
500V	I_e	A	1,5
DC-13			
Contacts in series:			
1	24 V	A	2,5
2	60 V	A	2,5
3	100 V	A	1,5
3	220 V	A	0,5
Conventional thermal current	I_{th}	A	10
Control circuit reliability at U_e = 24 V DC, U_{min} = 17 V, I_{min} = 5.4 mA	H_F	Fault probability	$<10^{-8}$, < 1 fault in 100 million Operations
Component lifespan at U_e = 240 V			
AC-15	Operations	$\times 10^6$	0,2
DC-13			
L/R = 50ms: 2 contacts in series at I_e = 0.5 A	Operations	$\times 10^6$	0,15
Short-circuit rating without welding			
Maximum overcurrent protective device			PKZM0-4
Short-circuit protection Maximum fuse			
500 V		A gG/gL	6
500 V		A fast	10
Current heat loss at I_{th}			
Current heat loss per contact at I_e		W	0,2

Notes

See Page 10

Dimensions

See Page 10

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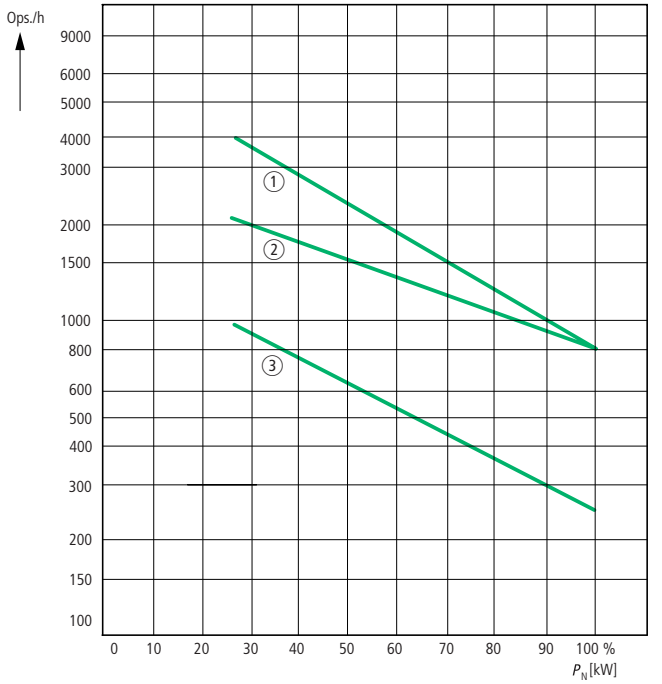
Determination of the maximum number of operations per hour in relation to rating and utilization category (approximate values), at 400 V

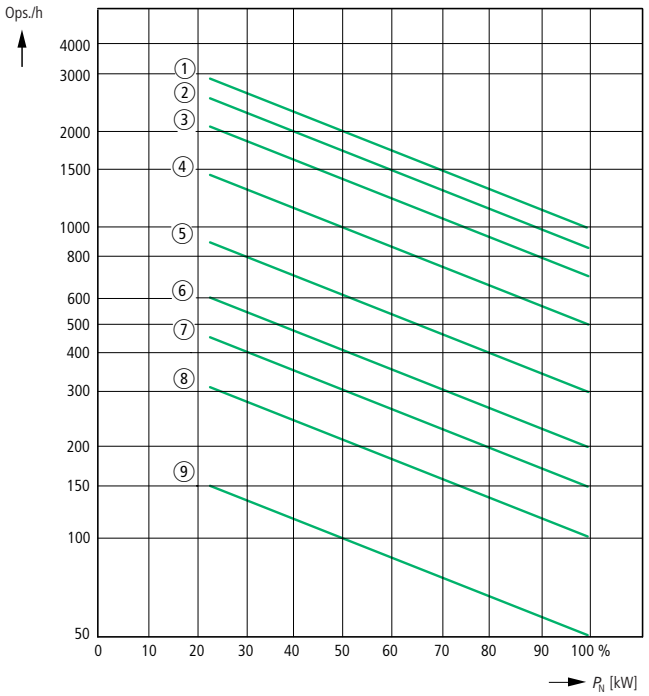
P_N = Max. motor rating (kW) of the relevant contactor
Ops./h = Maximum number of switching operations per hour



Type	Tripping characteristic AC-1	AC-3	AC-2 AC-4
DILE(E)M	2	1	3
DIL00M(-G)	2	1	3
DIL00AM(-G)	2	1	3
DIL0M(-G)	2	1	3
DIL0AM(-G)	2	1	3
DIL1M(-G)	2	1	3
DIL1AM(-G)	2	1	3
DIL2M(-G)	2	1	3
DIL2AM(-G)	2	1	3

Determination of the maximum number of operations per hour in relation to rating and utilization category (approximate values), at 400 V

P_N = Max. motor rating (kW) of the relevant contactor
Ops./h = Maximum number of switching operations per hour



Type	Tripping characteristic AC-1-1	AC-3	AC-4
DIL3M80	2	1	5
DIL3AM85	2	1	5
DIL4M115	2	3	6
DIL4AM145	2	3	6
DILM185	2	1	8
DILM225	2	1	8
DILM250	2	1	8
DILM300	3	2	9
DILM400	3	2	9
DILM500	3	2	9
DILM580	3	4	7
DILM650	3	4	7
DILM750	3	4	7
DILM820	3	4	7

Switching DC

– – – – conductor can be installed by the customer as required

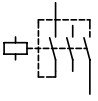
DILEEM to DILM820

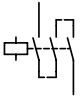
Without overload relay
≦ 60 V DC

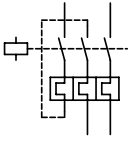
> 60 V DC

With overload relay
> 60V DC

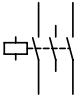
1-pole

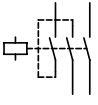


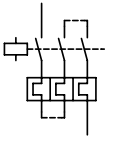




2-pole

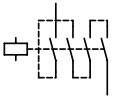


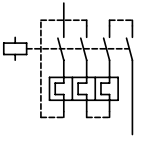




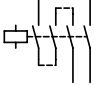
DILEM4
DIL00M4
DILP160 to DILP800

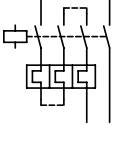
1-pole





2-pole





Switching duty for non-motor loads, 3-pole, 4-pole

Operating characteristics

Non-inductive or slightly inductive loads

Typical applications

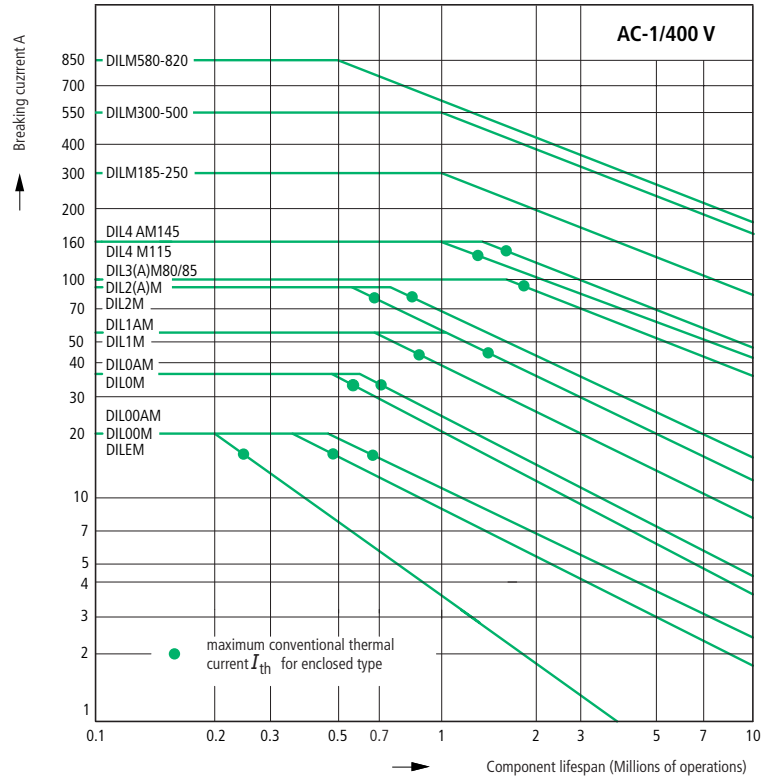
Electric heaters

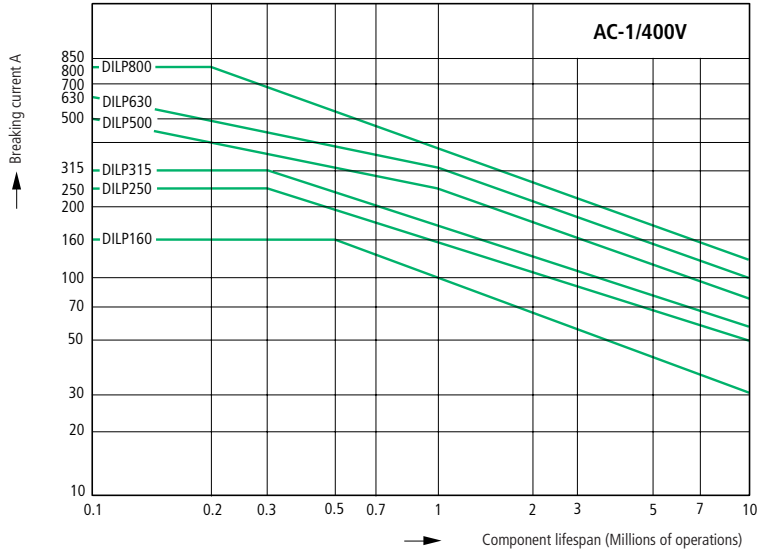
Electrical characteristics

Make: 1 ×rated current
Break: 1 × rated current

Utilization category

100 % AC-1





Normal switching duty

Squirrel-cage motors

Operating characteristics

- Starting: from rest
- Stopping: after attaining full running speed

Electrical characteristics

- Make: up to 6 × rated motor current
- Break: 1 × rated motor current

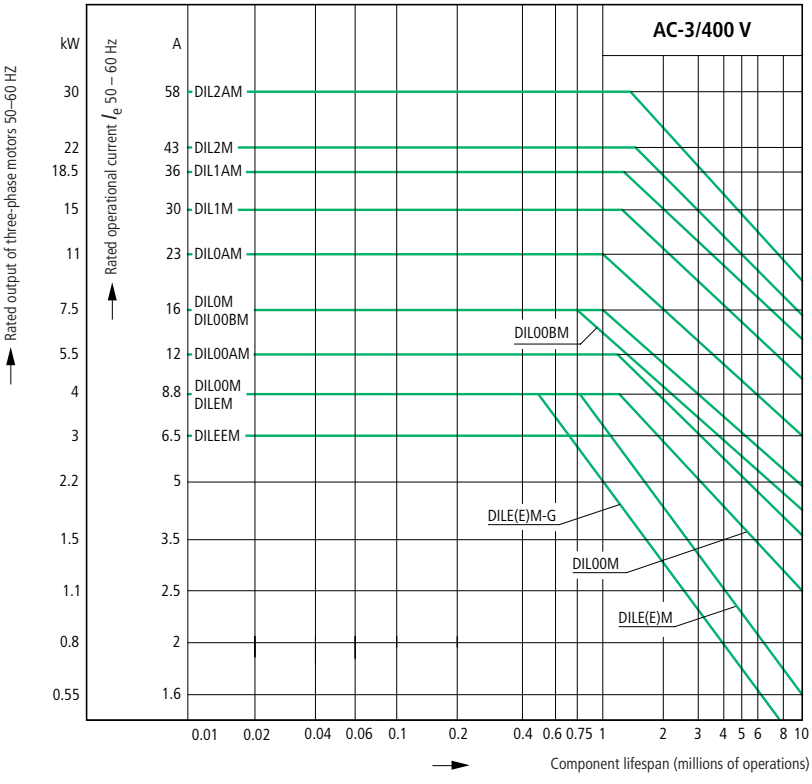
Utilization category

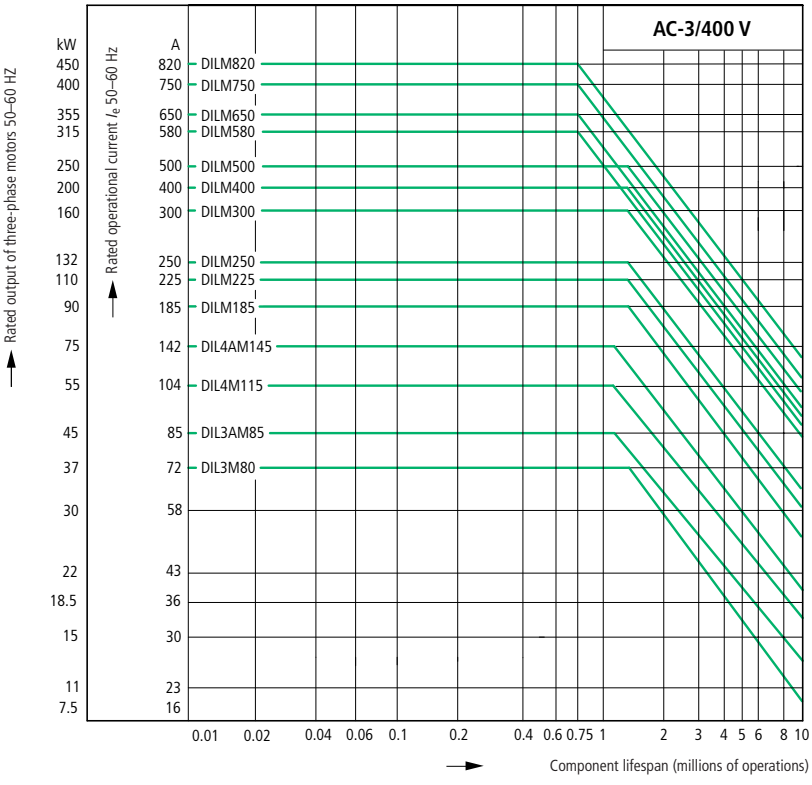
- 100 % AC-3

Typical applications

Compressors	Lifts	Mixers
Pumps	Escalators	Agitators
Fans	Conveyor belts	Centrifuges
Valves	Bucket elevators	Air-conditioning systems

Drives in general in manufacturing and processing machines





Extreme switching duty

Squirrel-cage motors

Operating characteristics

Inching, plugging, reversing

Electrical characteristics

Make: up to 6 × rated motor current

Break: 6 ×rated motor current

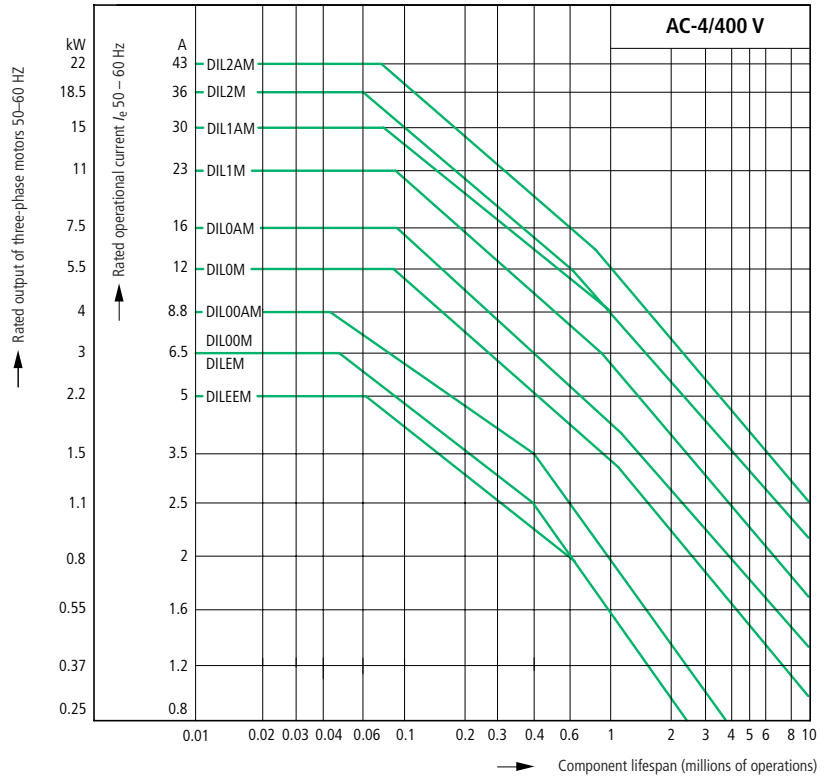
Utilization category

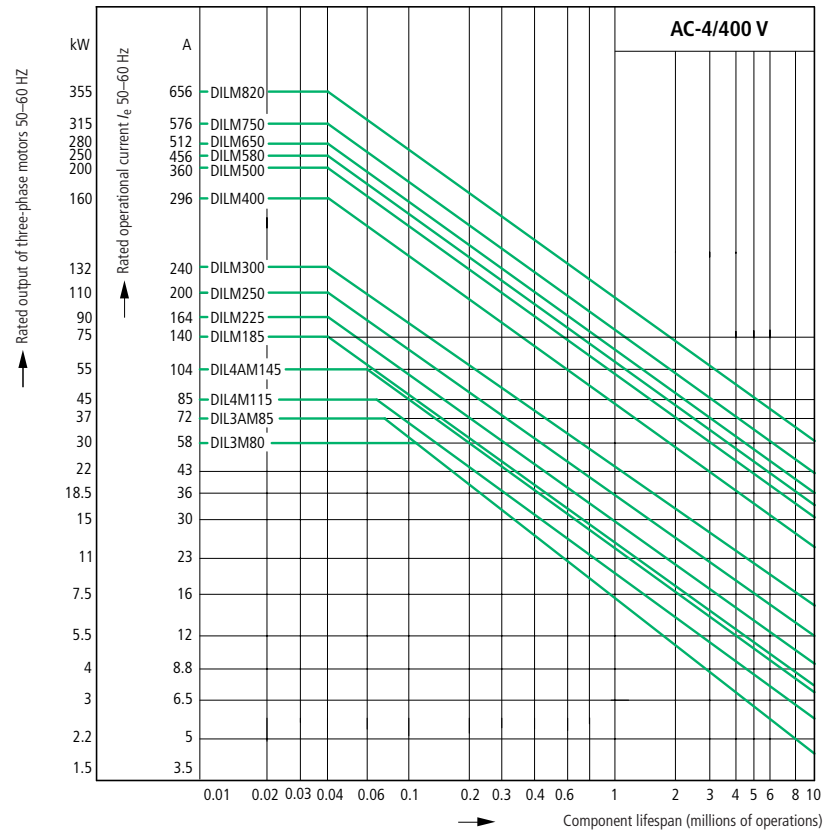
100 % AC-4

Typical applications

Printing presses Wire-drawing machines Centrifuges

Special drives for manufacturing and processing machines





The following applies for the short-circuit rating of the main contacts and the fusing of the auxiliary contacts: See the “Fuses” transparent overlay for time/current characteristics (please enquire).

The following values apply with the max. permissible ambient temperature:

AC

AC-1-duty conv. therm. current - enclosed

AC-1 duty 1-pole - open

AC-1-duty three/four main contacts parallel - enclosed

AC-3-duty rated operational current - open

AC-4-duty rated operational current - open

DC

Rated operational current Open

The following applies for the rated operational current as well as the component lifespan of the DC-13 auxiliary contact: On and off switching characteristics to DC-13, L/R constant as defined

