Contactors
Selection Guide

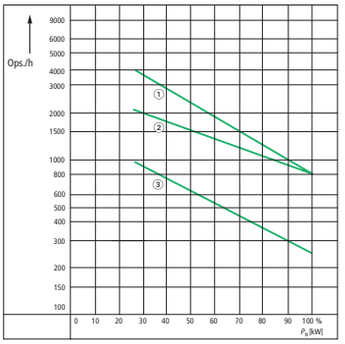
Contactors

By far the most common application of contactors is the control of electrical motors. As a prime mover, the 3-phase AC motor, in particular the squirrel-cage motor, dominates the field, and most of them are controlled by contactors. Contactors are expected to start, stop, reverse, plug, jog and sequence motors and, in conjunction with overload relays, to protect motors in the event of overloads. The load rating stated in HP is the basic data required to enable the correct selection of contactors to be made, but this figure by itself is not always sufficient. The type of load, its operating cycle, switching frequency and total life required, all influence the overall stress on contactors. The electrical durability tests of contactors, outlined in appendix B of IEC 60 947-4, are used by manufacturers to establish contactor ratings which incorporate a sufficient and verifiable switching capability to cover a broad range of applications as defined in the IEC utilization categories (e.g. AC-3, AC-4). The IEC 60 947 standard states that, with respect to its resistance to electrical wear, a contactor or starter is by convention characterized by the number of On-load operating cycles corresponding to the different utilization categories which can be made without repair or replacement. The IEC utilization categories AC-3 and AC-4 are most often encountered in contactor applications and are outlined below. See section 14 of this catalog for additional details.
The curves at right provide a reliable guide for selection based on the electrical life desired.

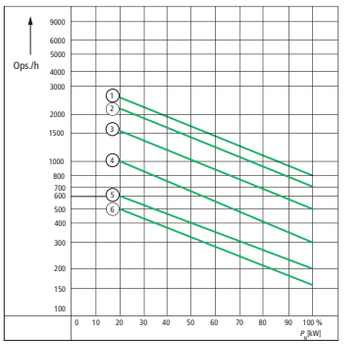
Normal switching duty AC-3 for squirrel-cage motors	Operating characteristics:	Starting: from rest Stopping: after attaining full running speed	
	Typical applications:	Compressors, Elevators, Mixers, Pumps, Escalators, Agitators, Fans, Conveyors, Centrifuges, Valves Bucket elevators Airconditioning	
		Drives in general in manufacturing and processing machines	
	Electrical characteristics:	Make: up to 6 x rated motor current Break: 1 x rated motor current	
	Utilization category:	100% AC-3	
Extreme switching duty AC-4 for squirrel-cage motors	Operating characteristics:	switching, plugging, reversing	
	Typical applications:	Printing presses, Wire-drawing machines	Centrifuges, Special drives for manufacturing and processing machines
	Electrical characteristics:	Make: 6 x rated motor current Break: 6 x rated motor current	
	Utilization category:	100% AC-4	

Determination of the maximum number of operations per hour in relation to rating and utilization category

P_N = Max. motor rating (kW/HP) of the contactor → pages 03/002, 003
Ops./h = Max. number of operations per hour



Type	AC-1	AC-3	AC-2 AC-4
DILE(E)M	2	1	3
DIL00M(-G)	2	1	3
DI 00AM(-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



Type	AC-1	AC-3	AC-4
DIL3M80	1	1	4
DIL4M115	1	1	4
DILM185	1	2	5
DILM225	1	2	5
DILM250	1	2	5
DILM300	2	3	6
DILM400	2	3	6
DILM500	2	3	6
DILM650	2	3	6
DILM750	2	3	6
DILM820	2	3	6

Contactors
Utilization Category Selection Guide

Contactor life expectancy based on utilization categories at 460V, 50/60Hz

AC-3

Electrical characteristics: Make: 6 x motor FLC
Break: 1 x motor FLC

Normal switching duty: (100% AC-3)

Y axis (ordinate)

Bold numbers (HP): 3 phase motor HP rating at 50 - 60 Hz
Green numbers (A): 3 phase motor FLC at 50 - 60 Hz

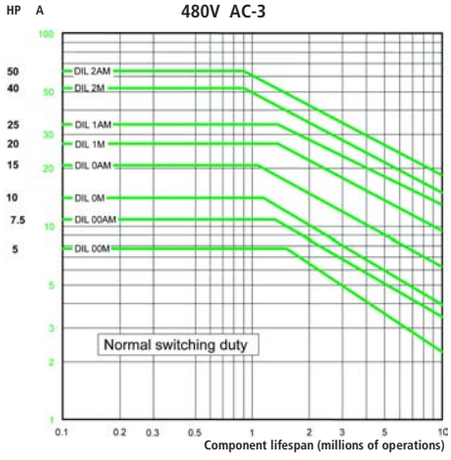
AC-4

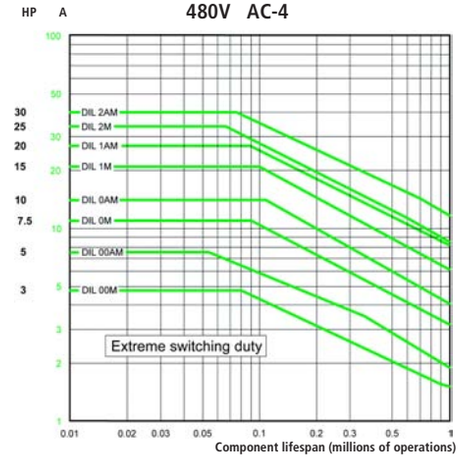
Electrical characteristics: Make: 6 x motor FLC
Break: 6 x motor FLC

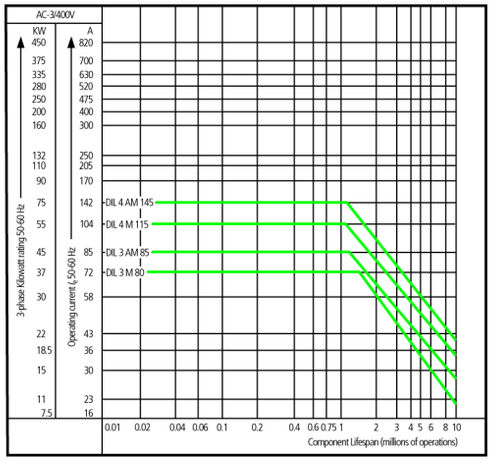
Extreme switching duty: inching, plugging (100% AC-4)

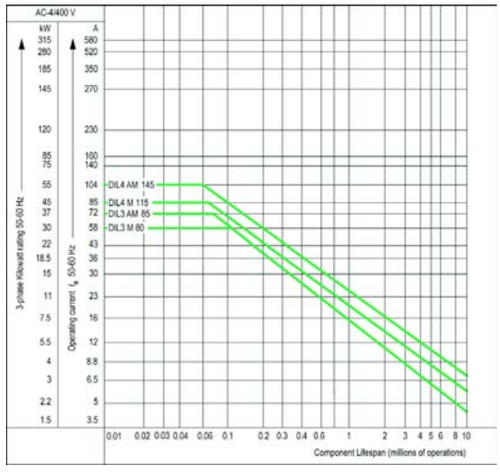
Y axis (ordinate)

Bold numbers (HP): 3 phase motor HP rating at 50 - 60 Hz
Green numbers (A): 3 phase motor FLC at 50 - 60 Hz

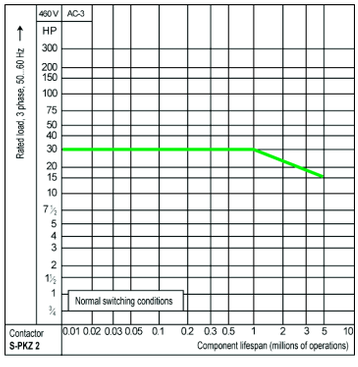


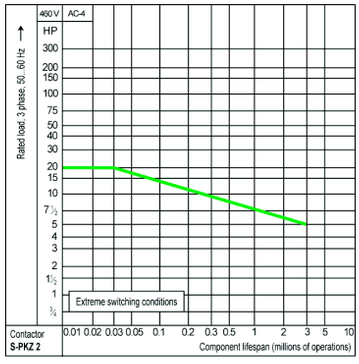






S-PKZ2





Notes:

1) AC-3 and AC-4 lifespan values for DIL3M80 and DIL4M145 are determined at 400V AC
Apply a derating factor of 0.9 (90%) for corresponding 460V AC values.
2) For 600V ratings and larger contactors, please contact Moeller Electric