

Technical information

Tests according to standard utilisation categories conforming to IEC 60947-4-1 and 5-1 based on rated operational current I_e and rated operational voltage U_e

Contactor

		Electrical durability: making and breaking conditions						Occasional duty: making and breaking conditions					
a.c. supply		Making			Breaking			Making			Breaking		
Typical applications	Utilisation category	I	U	cos φ	I	U	cos φ	I	U	cos φ	I	U	cos φ
Resistors, non inductive or slightly inductive loads	AC-1	I_e	U_e	0.95	I_e	U_e	0.95	$1.5 I_e$	$1.05 U_e$	0.8	$1.5 I_e$	$1.05 U_e$	0.8
Motors													
Slip ring motors: starting, breaking.	AC-2	$2.5 I_e$	U_e	0.65	$2.5 I_e$	U_e	0.65	$4 I_e$	$1.05 U_e$	0.65	$4 I_e$	$1.05 U_e$	0.65
Squirrel cage motors: starting, breaking whilst motor running.	AC-3												
	$I_e \leq (1)$	$6 I_e$	U_e	0.65	$1 I_e$	$0.17 U_e$	0.65	$10 I_e$	$1.05 U_e$	0.45	$8 I_e$	$1.05 U_e$	0.45
	$I_e > (2)$	$6 I_e$	U_e	0.35	$1 I_e$	$0.17 U_e$	0.35	$10 I_e$	$1.05 U_e$	0.35	$8 I_e$	$1.05 U_e$	0.35
Squirrel cage motors: starting, reversing, inching	AC-4												
	$I_e \leq (1)$	$6 I_e$	U_e	0.65	$6 I_e$	U_e	0.65	$12 I_e$	$1.05 U_e$	0.45	$10 I_e$	$1.05 U_e$	0.45
	$I_e > (2)$	$6 I_e$	U_e	0.35	$6 I_e$	U_e	0.35	$12 I_e$	$1.05 U_e$	0.35	$10 I_e$	$1.05 U_e$	0.35

d.c. supply		Making			Breaking			Making			Breaking		
Typical applications	Utilisation category	I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)
Resistors, non inductive or slightly inductive loads	DC-1	I_e	U_e	1	I_e	U_e	1	$1.5 I_e$	$1.05 U_e$	1	$1.5 I_e$	$1.05 U_e$	1
Shunt wound motors: starting, reversing, inching	DC-3	$2.5 I_e$	U_e	2	$2.5 I_e$	U_e	2	$4 I_e$	$1.05 U_e$	2.5	$4 I_e$	$1.05 U_e$	2.5
Series wound motors: starting, reversing, inching	DC-5	$2.5 I_e$	U_e	7.5	$2.5 I_e$	U_e	7.5	$4 I_e$	$1.05 U_e$	15	$4 I_e$	$1.05 U_e$	15

Control relays and auxiliary contacts

		Electrical durability: making and breaking conditions						Occasional duty: making and breaking conditions					
a.c. supply		Making			Breaking			Making			Breaking		
Typical applications	Utilisation category	I	U	cos φ	I	U	cos φ	I	U	cos φ	I	U	cos φ
Electromagnets													
≤ 72 VA	AC-14	–	–	–	–	–	–	$6 I_e$	$1.1 U_e$	0.7	$6 I_e$	$1.1 U_e$	0.7
> 72 VA	AC-15	$10 I_e$	U_e	0.7	I_e	U_e	0.4	$10 I_e$	$1.1 U_e$	0.3	$10 I_e$	$1.1 U_e$	0.3
d.c. supply													
Typical applications	Utilisation category	I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)	I	U	L/R (ms)
Electromagnets	DC-13	I_e	U_e	$6 P (3)$	I_e	U_e	$6 P (3)$	$1.1 I_e$	$1.1 U_e$	$6 P (3)$	$1.1 I_e$	$1.1 U_e$	$6 P (3)$

(1) $I_e \leq 17$ A for electrical durability, $I_e \leq 100$ A for occasional duty.

(2) $I_e > 17$ A for electrical durability, $I_e > 100$ A for occasional duty.

(3) The value $6 P$ (in watts) is based on practical observations and is considered to represent the majority of d.c. magnetic loads up to the maximum limit of $P = 50$ W i.e. $6 P = 300 \text{ ms} = L/R$.

Above this, the loads are made up of smaller loads in parallel. The value 300 ms is therefore a maximum limit whatever the value of current drawn.

3-phase 4-pole motors					Current values for power in hp							
Current values for power in kW					Current values for power in hp							
Rated operational power (1)	Indicative rated operational current values at:				Rated operational power (2)	Indicative rated operational current values at:						
	230 V	400 V	500 V	690 V		110 - 120 V	200 V	208 V	220 - 240 V	380 - 415 V	440 - 480 V	550 - 600 V
kW	A	A	A	A	hp	A	A	A	A	A	A	A
0.06	0.35	0.2	0.16	0.12	1/2	4.4	2.5	2.4	2.2	1.3	1.1	0.9
0.09	0.52	0.3	0.24	0.17	3/4	6.4	3.7	3.5	3.2	1.8	1.6	1.3
0.12	0.7	0.44	0.32	0.23	1	8.4	4.8	4.6	4.2	2.3	2.1	1.7
0.18	1	0.6	0.48	0.35	1 1/2	12	6.9	6.6	6	3.3	3	2.4
0.25	1.5	0.85	0.68	0.49	2	13.6	7.8	7.5	6.8	4.3	3.4	2.7
0.37	1.9	1.1	0.88	0.64	3	19.2	11	10.6	9.6	6.1	4.8	3.9
0.55	2.6	1.5	1.2	0.87	5	30.4	17.5	16.7	15.2	9.7	7.6	6.1
0.75	3.3	1.9	1.5	1.1	7 1/2	44	25.3	24.2	22	14	11	9
1.1	4.7	2.7	2.2	1.6	10	56	32.2	30.8	28	18	14	11
1.5	6.3	3.6	2.9	2.1	15	84	48.3	46.2	42	27	21	17
2.2	8.5	4.9	3.9	2.8	20	108	62.1	59.4	54	34	27	22
3	11.3	6.5	5.2	3.8	25	136	78.2	74.8	68	44	34	27
4	15	8.5	6.8	4.9	30	160	92	88	80	51	40	32
5.5	20	11.5	9.2	6.7	40	208	120	114	104	66	52	41
7.5	27	15.5	12.4	8.9	50	260	150	143	130	83	65	52
11	38	22	17.6	12.8	60	–	177	169	154	103	77	62
15	51	29	23	17	75	–	221	211	192	128	96	77
18.5	61	35	28	21	100	–	285	273	248	165	124	99
22	72	41	33	24	125	–	359	343	312	208	156	125
30	96	55	44	32	150	–	414	396	360	240	180	144
37	115	66	53	39	200	–	552	528	480	320	240	192
45	140	80	64	47	250	–	–	–	604	403	302	242
55	169	97	78	57	300	–	–	–	722	482	361	289
75	230	132	106	77	350	–	–	–	828	560	414	336
90	278	160	128	93	400	–	–	–	954	636	477	382
110	340	195	156	113	450	–	–	–	1030	–	515	412
132	400	230	184	134	500	–	–	–	1180	786	590	472
160	487	280	224	162								
200	609	350	280	203								
250	748	430	344	250								
315	940	540	432	313								
355	1061	610	488	354								
400	1200	690	552	400								
500	1478	850	680	493								
560	1652	950	760	551								
630	1844	1060	848	615								
710	2070	1190	952	690								
800	2340	1346	1076	780								
900	2640	1518	1214	880								
1000	2910	1673	1339	970								

(1) Values conforming to standard IEC 60072-1 (at 50 Hz).

(2) Values conforming to standard UL 508 (at 60 Hz).

Nota : These values are given as a guide. They may vary depending on the type of motor, its polarity and the manufacturer.