

Heating

The choice of the contactor depends on the mechanical endurance (number of operations) and on the electrical heating load i.e. resistive elements, infra-red element, convectors.

Choice of Contactors

The choice of contactor is dependant upon many parameters i.e. operating voltage, size of contacts, number of operations, ambient temperature, type of load supplied etc.

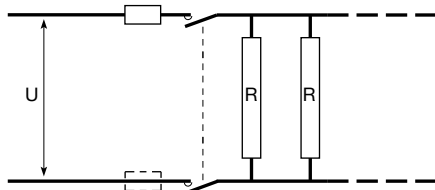
Type of Load

Loads are categorised into various AC ratings, (AC1, AC2, AC3 etc.) and the higher the AC rating the more inductive the load becomes. All Hager contactor ratings are given at AC1, therefore they must be de-rated if used on other types of AC load.

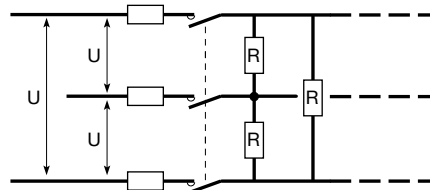
Heat Dissipation Inserts

The ambient temperature around a contactor can affect its life expectancy, therefore, we strongly recommend that heat dissipation inserts (LZ060) are fitted between all contactors and adjacent devices.

Single Phase



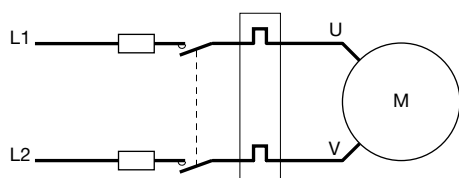
Three Phase



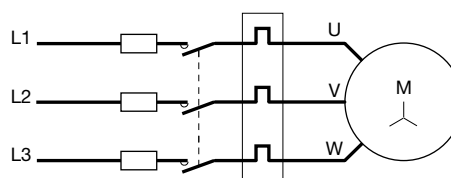
		Number of operations				
		100,000	150,000	200,000	500,000	1,000,000
Max. load in kW	230V	16A	3	2.5	1.9	0.85
		25A	4.6	4	3	1
		40A	7.3	6.3	4.7	2.2
		63A	11.6	10	7.5	3.5
	400V	16A	8.9	8	5.8	2.8
		25A	13.8	12	8.6	4.3
		40A	22	18.5	14.385	6.3
		63A	35	30	22.6	10.2

Motors

Single Phase 230V (AC3 or AC7b)



Three Phase 400V (AC3 or AC7b)



		Choice of Contactor According to control diagram	
Maximum load in kW	Single Phase with Capacitor 230V	Three Phase (AC3 or AC7) 400V	2 Wires
	0.88		2 pole 25A
	2.6		2 pole 40A
		2.6	
		7.8	
			3 Wires
		10	3 pole 25A
			3 pole 40A
			3 pole 63A

Requirements of Use

Influence of Working Temperature

Derating factor between 40°C and 50°C : 0.9

Example: Heating with convector

The maximum load of ESC225 is 4.6kW for 50,000 operations and for a temperature <40°C.

between 40°C and 50°C, the load is 4.6 x 0.9 i.e. 4.14kW

Close Fitting

It is necessary to put a heat dissipation insert (reference LZ060) between each contactor.

Description			Modular contact						Auxiliary contact
Standard conformity			EN 61095						
Approvals			NF - VDE- IMQ - KEMA - RMC / CCC						
			Relay	Contact	Relay	Contact	Contact	Contact	Contact
Number of modules			1		2		3		½
Thermal current I _{th} (40°C)			16A	25A	16A	25A	40A	63A	6A
Rated frequency			50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Rated insulation voltage (U _i)			250V	250V	440V	440V	440V	440V	250V
Rated impulse withstand voltage (U _{imp})			4kV	4kV	4kV	4kV	4kV	4kV	4kV
Protection Degree			2	2	2	2	2	2	2
Rated Operating currents and power ratings in AC									
AC-1 / AC-7a	Rated operational currents I _e		16A	16A	16A	25A	40A	63A	-
	Rated operational power	230V	3kW	4.6kW	3kW	4.6kW	7.3kW	11.6kW	-
		400V	-	-	8.9kW	13.8kW	22kW	35kW	-
AC-3 / AC-7b	Rated operational currents I _e		5.5A	8.5A	5.5A	8.5A	25A	32A	-
	Rated operational power	230V	570W	880W	570W	880W	2.6kW	3.3kW	-
		400V	-	-	1.7kW	2.6kW	7.8kW	10kW	-
AC-12	Rated operational currents I _e @ 230V		-	-	-	-	-	-	6A
AC-15	Rated operational currents I _e @ 230V		-	-	-	-	-	-	2A
Mechanical and Electrical Endurances									
Mechanical endurance		Number of operations	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Electrical endurance @ I _e AC7a (AC12 for aux contact)		Number of operations	60,000	60,000	60,000	60,000	60,000	60,000	60,000
MCB Protected short-circuit withstand									
Prospected short-circuit current		rms	1kA	3kA	1kA	3kA	3kA	3kA	1kA
Associated protection			MCB C16-6kA	MCB C25-6kA	MCB C16-6kA	MCB C25-6kA	MCB C40-10kA	MCB C63-10kA	6A 10x38 gG Fuse
Power dissipation									
Power dissipation per current path			1W	1.5W	1W	1.5W	3.2W	5W	0.4W
Magnetic system for Eco and standard contactor									
Pick-up			2.2W	2.2W	2.8W	2.8W	5W	5W	-
Coil consumption			2.2W	2.2W	2.8W	2.8W	5W	5W	-
Closing delay			25ms	25ms	25ms	25ms	25ms	25ms	-
Opening delay			15ms	15ms	15ms	15ms	20ms	20ms	-
Connection									
Main contact cable section		Rigid	1...10mm ²	1...10mm ²	1...10mm ²	1...10mm ²	4...25mm ²	4...25mm ²	1...6mm ²
		Flexible	1...6mm ²	1...6mm ²	1...6mm ²	1...6mm ²	4...16mm ²	4...16mm ²	1...6mm ²
Main contact connection screw		Type	M3.4	M3.4	M3.4	M3.4	M5	M5	M3.4
		Posidrive	PZ2	PZ2	PZ2	PZ2	PZ2	PZ2	PZ2
		Max. tight. torque	1.2Nm	1.2Nm	1.2Nm	1.2Nm	2Nm	2Nm	1.2Nm
Coil connection cable section		Rigid	1...10mm ²	1...10mm ²	1...10mm ²	1...10mm ²	1...10mm ²	1...10mm ²	-
		Flexible	1...6mm ²	1...6mm ²	1...6mm ²	1...6mm ²	1...6mm ²	1...6mm ²	-
Coil connection screw		Type	M3.5	M3.5	M3.5	M3.5	M4	M4	-
		Posidrive	PZ2	PZ2	PZ2	PZ2	PZ2	PZ2	-
		Max. tight. torque	1.2Nm	1.2Nm	1.2Nm	1.2Nm	1.5Nm	1.5Nm	-
Working temperature									
			-10°C to +50°C						
Storage temperature									
			-40°C to +80°C						

Lighting systems with electronic ballasts cause inrush current peaks. Therefore we recommend you use the chart below to determinate the maximum amount of lamps that can be connected to a Hager contactor: The chart gives the maximum amount of lamps per contact. In 2014 the performances of the contactors in combination with lights increased. The products identified on the front face with the '+' can accept a higher number of lamps. For these products, see the figures in the column with the '+' in the header.

	Lamp Power	16A	25A	16A +	25A +	40A	63A	
Compact fluo lamps								
Compact fluo lamp with external electronic ballast	5W	11	15	17	27	49	76	
	7W	11	15	17	27	49	76	
	9W	9	13	16	26	40	63	
	11W	9	13	16	26	40	63	
	15W	7	11	14	22	36	57	
	18W	7	11	14	22	36	57	
	20W	7	11	14	22	36	57	
	23W	7	11	14	22	36	57	
	26W	7	11	14	22	36	57	
Compact fluo lamp with integrated electronic ballast	5W	17	27	34	54	86	135	
	7W	17	27	34	54	86	135	
	9W	17	27	34	54	86	135	
	11W	17	27	34	54	86	135	
	15W	17	27	34	54	86	135	
	18W	13	20	25	40	63	100	
	20W	13	20	25	40	63	100	
	23W	13	20	25	40	63	100	
	26W	13	20	25	40	63	100	
Incandescent lamps								
Tungsten & halogen lamps 230V	40W	32	50	36	57	76	120	
	60W	21	33	28	45	67	105	
	75W	17	27	24	38	63	100	
	100W	13	20	17	28	41	65	
	150W	8	13	11	18	29	45	
	200W	6	9	8	14	22	35	
	300W	4	7	6	10	15	23	
	500W	2	3	3	6	9	14	
	1000W	0	0	1	2	4	7	
Tungsten & halogen lamps 12 ou 24V	20W	13	20	25	40	139	218	
	35W	8	13	16	26	82	129	
	50W	6	9	11	18	60	94	
	75W	4	6	7	12	52	82	
	100W	2	3	3	6	35	55	
	150W	1	2	2	4	20	31	
LED								
LED 230V with integrated electronic ballast - non dimmable	4W	17	27	34	54	86	135	
	4.5W	17	27	34	54	86	135	
	6W	17	27	34	54	86	135	
	7W	17	27	34	54	86	135	
	8W	17	27	34	54	86	135	
	12W	17	27	34	54	86	135	
	17W	13	20	25	40	63	101	
	18W	13	20	25	40	63	101	
	22W	13	20	25	40	63	101	
	30W	9	14	17	28	44	70	
	34W	9	14	17	28	44	70	
	40W	9	14	17	28	44	70	
	50W	7	11	14	22	35	55	
	LED 230V with integrated electronic ballast - dimmable	4W	38	60	76	120	159	250
		5.5W	38	60	76	120	159	250
		6W	38	60	76	120	159	250
7W		38	60	76	120	159	250	
8W		38	60	76	120	159	250	
12W		38	60	76	120	159	250	
17W		28	44	56	88	118	185	
18W		28	44	56	88	118	185	
22W		28	44	56	88	118	185	
30W		20	31	39	62	82	130	
34W		20	31	39	62	82	130	
40W		20	31	39	62	82	130	
50W		16	24	30	48	65	102	
LED 230V headlight with integrated electronic ballast		100W	-	-	3	5	6	9
		150W	-	-	1	3	4	6
		200W	-	-	1	2	4	6
LED 12V with separated transformer - dimmable	1W	38	60	76	120	180	220	
	2.5W	38	60	76	120	180	220	
	4W	38	60	76	120	180	220	
	5W	38	60	76	120	180	220	
	7W	38	60	76	120	160	200	
	10W	38	60	76	120	160	200	
	15W	28	44	56	88	160	200	
Fluorescent tubes								
T5 single - uncompensated	15W	13	20	19	30	70	100	
	18W	13	20	19	30	70	100	
	20W	12	19	19	30	70	100	
	36W	12	15	17	28	60	90	
	40W	10	13	16	26	60	90	
	42W	9	12	15	24	55	83	
	58W	7	9	10	17	35	56	
	65W	6	8	10	17	35	56	
	80W	5	7	9	15	30	48	
	115W	4	5	6	10	20	32	
	140W	3	5	6	10	16	26	
	T5 single - paralell compensation	15W	7	11	12	20	36	57
		18W	7	11	12	20	36	57
		20W	7	11	12	20	36	57
36W		7	11	12	20	34	53	
40W		7	11	12	20	29	45	
42W		7	11	12	20	29	45	
58W		6	10	9	15	27	42	
65W		6	10	9	15	27	42	
80W		6	10	9	15	27	42	
115W		6	10	9	15	25	39	

	Lamp Power	16A	25A	16A +	25A +	40A	63A
Fluorescent tubes							
T5 double - uncompensated	2 x 18W	13	20	25	40	50	78
	2 x 20W	12	19	24	38	50	78
	2 x 36W	12	15	19	30	44	69
	2 x 40W	10	13	16	26	40	63
	2 x 42W	9	12	15	24	40	63
	2 x 58W	7	9	11	18	27	42
	2 x 65W	6	8	10	16	27	42
	2 x 80W	5	7	8	14	22	35
2 x 115W	4	5	6	10	16	25	
T5 double - serie compensation	2 x 18W	7	11	14	22	34	53
	2 x 20W	7	11	14	22	29	45
	2 x 36W	6	10	12	20	27	42
	2 x 40W	6	10	12	20	27	42
	2 x 42W	6	10	12	20	27	42
	2 x 58W	6	10	12	20	25	39
	2 x 65W	5	7	8	14	23	36
	2 x 80W	5	7	8	14	20	31
2 x 115W	4	5	6	10	17	25	
T5 single - electronic ballast	15W	7	11	14	22	36	57
	18W	7	11	14	22	36	57
	20W	7	11	14	22	36	57
	36W	7	11	14	22	34	53
	40W	7	11	14	22	29	45
	42W	7	11	14	22	29	45
	58W	6	10	12	20	27	42
	65W	6	10	12	20	27	42
	80W	6	10	12	20	27	42
	115W	6	10	12	20	25	39
	2 x 18W	7	11	14	22	34	53
2 x 20W	7	11	14	22	29	45	
2 x 36W	6	10	12	20	27	42	
2 x 40W	6	10	12	20	27	42	
2 x 42W	6	10	12	20	27	42	
2 x 58W	6	10	12	20	25	39	
2 x 65W	5	7	8	14	23	36	
2 x 80W	5	7	8	14	20	31	
2 x 115W	4	5	6	10	17	25	
Discharge lamps							
High-pressure mercury-vapor lamps - without compensation	50W	9	14	17	28	32	50
	80W	6	9	11	18	24	37
	125W	3	5	6	10	18	28
	250W	2	3	3	6	10	15
	400W	1	1	1	2	6	9
	700W	0	0	0	0	4	5
	50W	7	11	14	22	26	40
80W	5	8	10	16	22	34	
125W	3	5	6	10	15	23	
250W	2	3	3	6	9	14	
400W	1	1	1	2	5	8	
700W	0	0	0	0	3	5	
1000W	0	0	0	0	2	3	
Low pressure sodium lamps - without compensation	18W	8	10	8	12	17	23
	35W	4	6	7	9	14	20
	55W	3	6	7	9	14	20
	90W	2	4	5	6	9	14
	135W	1	3	3	4	6	8
	180W	1	2	2	4	6	8
	18W	5	7	5	8	12	24
35W	4	6	4	7	10	23	
55W	3	5	3	5	10	19	
90W	2	3	3	4	8	16	
135W	1	2	1	2	5	7	
180W	1	2	1	2	5	6	
High pressure sodium lamps - without compensation	35W	11	14	15	24	30	50
	50W	9	12	10	15	22	34
	70W	8	9	8	12	18	28
	110W	6	8	6	10	14	22
	150W	4	7	5	8	10	16
	250W	2	4	3	5	6	10
	400W	0	1	1	2	4	6
1000W	0	1	1	1	2	3	
High pressure sodium-vapour lamps - electronic ballast or parallel compensation	35W	6	9	11	18	31	50
	50W	6	9	11	18	22	35
	70W	4	6	7	12	16	25
	110W	3	5	6	8	13	21
	150W	3	5	4	6	8	13
	250W	2	3	3	4	7	11
	400W	1	1	1	2	5	8
1000W	0	0	0	1	2	3	
Metal halide lamps - without compensation	35W	12	24	19	30	42	55
	70W	10	15	12	17	26	36
	150W	6	7	8	12	14	20
	250W	3	5	5	8	9	14
	400W	1	2	2	4	6	9
	1000W	0	0	0	0	3	5
	Metal halide lamps - electronic ballast or parallel compensation	35W	6	10	12	18	22
70W		5	8	10	13	22	39
150W		3	5	6	8	12	22
250W		3	5	6	7	9	16
400W		1	1	1	2	5	7
1000W		0	0	0	1	2	3