

Electrical Characteristic					
Type	ERxxxx, ESxxxx, ETCxxx				ESC080
Description	Modular contactor				Aux. contact
Standard conformity	IEC/EN 61095				
Number of module	1	2	3		½
Thermal current I _{th} (40°C)	25A	25A	40A	63A	6A
Rated frequency	50Hz	50Hz	50Hz	50Hz	50Hz
Rated insulation voltage (U _i)	250V	440V	440V	440V	250V
Rated impulse withstand voltage (U _{imp})	4kV	4kV	4kV	4kV	4kV
Protection degree (IP rating)	2	2	2	2	2

Rated operating currents & power ratings in AC							
AC1/AC7a	Rated operating currents I _e		25A	25A	40A	63A	-
	Rated operating power	230V	4.6kW	4.6kW	7.3kW	11.6kW	
400V		-	13.8kW	22kW	35kW		
AC3/AC7b	Rated operating currents I _e		8.5A	8.5A	25A	32A	
	Rated operating power	230V	880W	880W	2.6kW	3.3kW	
400V		-	2.6kW	7.8kW	10kW		
AC12	Rated operating currents I _e @ 230V	-				6A	
AC15	Rated operating currents I _e @ 230V	-				4A	

Mechanical & electrical endurance		
Mechanical endurance	no. of operations	1,000,000
Electrical endurance @ I _e AC7a (AC12 for aux)	no. of operations	60,000

MCB protected short-circuit withstand				
Associated protection	MCB 25A-6kA	MCB 40A-10kA	MCB 63A-10kA	MCB 6A - 6kA

Power dissipation				
Power dissipation per current path	1.5W	3.2W	5W	0.4W

Magnetic system for standard contactor				
Pick-up	7.4VA	9.2VA	60VA	-
Coil consumption	1.8VA	1.85VA	7VA	
Closing delay	20ms	20ms	20ms	
Opening delay	15ms	15ms	20ms	

Magnetic system for Hum free contactor				
Pick-up	2.2W	2.8W	5W	-
Coil consumption	2.2W	2.8W	5W	
Closing delay	25ms	25ms	25ms	
Opening delay	15ms	15ms	20ms	

Magnetic system for Lighting contactors (control)			
Std and eco	Pick-up	9.5VA	16.3VA
	Coil Consumption	2.5VA	3.1VA
Hum-free	Pick-up	2.5VA	3.2VA
	Coil Consumption	2.5VA	3.2VA

Connection				
Main contact cable section	rigid	1...10mm ²	4...25mm ²	1...16mm ²
	flexible	1...6mm ²	4...16mm ²	1...16mm ²
Main contact connection screw	Type	M3.4	M5	M3.4
	Posidrive	PZ2	PZ2	PZ2
	Max. tight. torque	1.2Nm	3.5Nm	1.2Nm
Coil connection cable section	rigid	1...10mm ²	1...10mm ²	-
	flexible	1...6mm ²	1...6mm ²	
Coil connection screw	Type	M3.5	M4	
	Posidrive	PZ2	PZ2	
	Max. tight. torque	1.2Nm	2.5Nm	

Working temperature	-10°C to +50°C
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Storage temperature	-40°C to +80°C
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Application notes

Choice of contactors

- The choice of contactor is based on many factors:
- type of the load supplied (Motor, Heating, Lighting),
 - nominal current of the load,
 - operating voltage,
 - number of operations

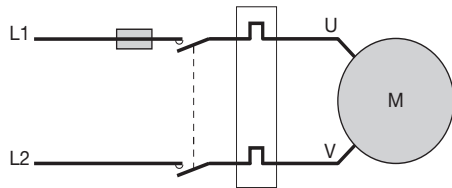
The contactors are AC7-a (resistive load) and AC7-b (inductive load).

Adjacent fitting

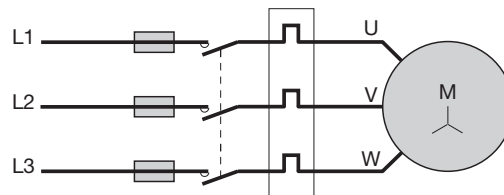
LZ060 inserts are to be fitted between all contactors and adjacent devices to ensure optimum operation and heat dissipation.

Motor applications (AC7-b/AC3)

Single phase 230V (2P switching)



Three phase supply 400V

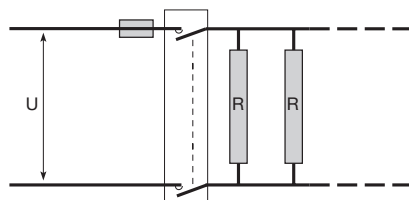


	Contactor rating	Control diagram	
		2P 230V single phase	3P 400V three phase
Maximum power for the motor	25A	0.88 kW	2.65 kW
	40A	2.6 kW	7.8 kW
	63A	3.3 kW	10 kW

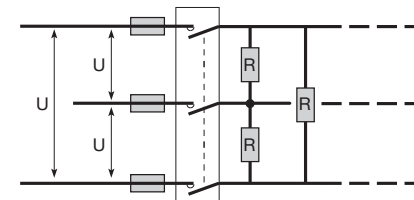
Heating applications (AC7-a/AC1)

The choice of the contactor is based on the electrical heating load, and the targeted life time.

Single phase (2P switching)



Three phase supply



Rated output voltage	Rated output current	AC1/AC7A (maximum load in kilowatts)					
		1	1.35	3	4	4.6	
230V AC	25A	1	1.35	3	4	4.6	
	40A	1.6	2.2	4.7	6.3	7.3	
	63A	2.5	3.5	7.5	10	11.6	
400V AC	25A	3	4.3	8.6	12	13.8	
	40A	5	6.3	14.385	18 500	22	
	63A	7.6	10.2	22.6	30	35	
No. of operations (# see note)		600 000	300 000	150 000	100 000	60 000	

#NOTE: 1 opening +1 closing contact = 2 operations. *On three phase configuration the maximum load per phase corresponds to the values stated divided by 3.

Operating temperatures	Derating factor
Up to 40°C	1
40° - 50°C	0.9

Example application: 4kW (230V AC) heating element ie. AC1/AC7a load

Determine suitability of ESC225 (2 pole, 25A) using load calculation with temperature derating. According to data sheet for AC1/AC7a load on ESC225 – (1 module 25A) the nominal rated current (I_e) = 25A, maximum load = 4.6kW (230 VAC)

Assume operating temperature = 48° C

The maximum load switching capacity at 48° C is calculated as follows: Maximum Load x Derating factor = 4.6kW x 0.9 = 4.14kW

Thus, ESC225 is suitable for a 4kW heating element operating at 48° C maximum.

Duty cycle or durability

The number of reliable operations of ESC225 (2 pole, 25A) contactor depends on the connected load.

- e.g. Connected to 1kW (230V AC) load = 600,000 operations
- Connected to 3kW (230V AC) load = 150,000 operations
- Connected to 4kW (230V AC) load = 100,000 operations



How long will ESC225 (25A) connected to 4kW load last ?

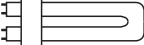

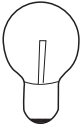
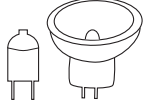
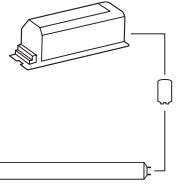
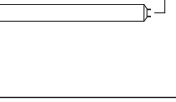
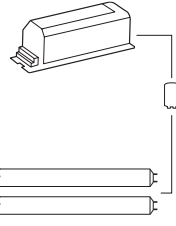
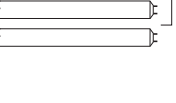
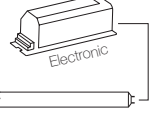
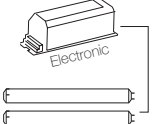
- e.g. At 100 operations per day it will last a minimum of 1000 days (ie 100,000 ÷ 100 = 1000 days).
- At 500 operations per day it will last a minimum of 200 days (ie 100,000 ÷ 500 = 200 days).

If higher durability is required, the contactor can be up-sized to a higher current rating.

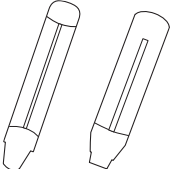
Lighting applications

Modern lighting systems generate high inrush currents. Therefore we recommend to use the table below to calculate the maximum number of lamps (or dual fittings) which can be connected to each pole of a Hager contactor on 230V 50Hz circuits.

- From June 2014, Hager has improved the performance of 1 and 2 module contactors. The products identified on the front face with the pictogram  can accept a higher number of lamps.
- For the 1 and 2 module contactors without the pictogram , divide the results given by 2.

Type	Lamp wattage (W)	Rated output (per pole)			
		25A '+'	40A	63A	
Compact Fluorescent Lamps (CFL's)					
CFL with external electronic ballast 	5 - 7	27	49	76	
	9 - 11	26	40	63	
	15 - 26	22	36	57	
CFL with integrated electronic ballast 	5 - 15	54	86	135	
	18 - 26	40	63	100	
Incandescent lamps					
Tungsten Halogen Lamps 230V 	40	57	76	120	
	60	45	67	105	
	75	38	63	100	
	100	28	41	65	
	150	18	29	45	
	200	14	22	35	
	300	10	15	23	
	500	6	9	14	
Halogen ELV (12 or 24V) with electronic transformer 	1000	2	4	7	
	20	40	139	218	
	35	26	82	129	
	50	18	60	94	
	75	12	52	82	
	100	6	35	55	
	150	4	20	31	
Fluorescent tubes (T5)					
 Single - with starter (Low power factor <0.9)	15 - 20	30	70	100	
	36	28	60	90	
	40	26	60	90	
	42	24	55	83	
	58-65	17	35	56	
	80	15	30	48	
	115	10	20	32	
	140	10	16	26	
	 Single - with starter (High power factor >0.9)	15 - 20	20	36	57
		36	20	34	53
40 - 42		20	29	45	
58 - 80		15	27	42	
115		15	25	39	
 Double - with starter (Low power factor <0.9)	2 x 18	40	50	78	
	2 x 20	38	50	78	
	2 x 36	30	44	69	
	2 x 40	26	40	63	
	2 x 42	24	40	63	
	2 x 58	18	27	42	
	2 x 65	16	27	42	
	2 x 80	14	22	35	
	2 x 115	10	16	25	
	 Double - with starter (High power factor >0.9)	2 x 18	22	34	53
		2 x 20	22	29	45
		2 x 36 - 42	20	27	42
		2 x 58	20	25	39
		2 x 65	14	23	36
2 x 80		14	20	31	
2 x 115		10	17	25	
Single with electronic ballast 	15 - 20	22	36	57	
	36	22	34	53	
	40 - 42	22	29	45	
	58 - 80	20	27	42	
	115	20	25	39	
Double with electronic ballast 	2 x 18	22	34	53	
	2 x 20	22	29	45	
	2 x 36 - 42	20	27	42	
	2 x 58	20	25	39	
	2 x 65	14	23	36	
	2 x 80	14	20	31	
	2 x 115	10	17	25	

The information given should be considered as indicative and is provided on an "as is" basis. Considerable variations may occur depending on the electrical installation and equipment used. Only experienced professionals with the expertise to determine the characteristics of the electrical installation (value and duration of inrush currents, general characteristics of the installation, types of loads, etc.) may approve and implement a configuration, in accordance with the currently applicable installation standards. Hager accepts no liability for the use made of this information.

Type	Lamp wattage (W)	Rated output (per pole)			
		25A '+'	40A	63A	
Discharge lamps					
	High pressure mercury vapour lamps (Low power factor <0.9)	50	28	32	50
		80	18	24	37
		125	10	18	28
		250	6	10	15
		400	2	6	9
		700	0	4	5
	High pressure mercury vapour lamps (High power factor >0.9)	50	22	26	40
		80	16	22	34
		125	10	15	23
		250	6	9	14
		400	2	5	8
		700	0	3	5
	Low pressure sodium vapour lamps (Low power factor <0.9)	18	20	18	21
		35 - 55	9	14	20
		90	6	9	14
		135 - 180	4	6	8
	Low pressure sodium vapour lamps (High power factor >0.9)	18	8	12	24
		35	7	10	23
		55	5	10	19
		90	4	8	16
		135	2	5	7
		180	2	5	6
	High Pressure sodium lamps (Low power factor <0.9)	35	24	30	50
		50	15	22	34
70		12	18	28	
110		10	14	22	
150		8	10	16	
250		5	6	10	
400		2	4	6	
1000		1	2	3	
High Pressure sodium lamps (High power factor >0.9)		35	18	31	50
		50	18	22	35
	70	12	16	25	
	110	8	13	21	
	150	6	8	13	
	250	4	7	11	
	400	2	5	8	
	1000	1	2	3	
Metal - Halide Lamp (Low power factor <0.9)	35	30	42	55	
	70	17	26	36	
	150	12	14	20	
	250	8	9	14	
	400	4	6	9	
	1000	0	3	5	
	Metal - Halide Lamp (High power factor >0.9)	35	18	22	39
		70	13	22	39
		150	8	12	22
		250	7	9	16
400		2	5	7	
1000		1	2	3	
LED's					
LED 230V integrated Driver, Non dimmable, E27 / GU10	4 - 12	54	86	135	
	17 - 22	40	63	101	
	30 - 40	28	44	70	
	50	22	35	55	
LED 230V integrated driver Dimmable, GU 10	4 - 12	120	159	250	
	17 - 22	88	118	185	
	30 - 40	62	82	130	
	50	48	65	102	
LED high bay lighting 230V integrated driver	100	5	6	9	
	150	3	4	6	
	200	2	4	6	
LED 12V external driver Dimmable	1 - 5	120	180	220	
	7 - 10	120	160	200	
	15	88	160	200	