

ES.-S SERIES

Continuous power -

0.6kW

1.0kW

1.5kW

2.0kW

3.0kW

4.5kW

Resistance -

3.9Ω

to 330Ω

Customisable braking resistors - value through choice

A range of compact, customisable, IP20 boxed dynamic braking resistors.

Choice of accessories keeps both purchase and installation costs low.

ES.-S resistors connect via screw terminals, and have optional thermal trip and/or terminal cover.

Applications

- Dynamic braking
- Motor control
- Variable speed drives
- Lifts & elevators
- Cranes & winches
- Conveyors
- Test loads

Features and benefits

- Rated for repetitive duty
- Resistance never lower than expected
- Robust construction
- Low inductance element
- Rated for single shot duty
- Close tolerance (+5% - 0%)
- Negligible audible noise
- Temperature stable element

Ordering information

Resistor part numbering

ESH	3R9	S	B
Enclosure style	Resistance value	Termination method	Thermal switch and/or terminal cover
ESH = 0.6kW	3R9= 3.9Ω	S = screw terminals	C = terminal cover only
EST = 1.0kW	4R7= 4.7Ω		T = thermal switch only
ES1 = 1.5kW	5R6= 5.6Ω		B = both cover and switch
EST2 = 2.0kW	6R8= 6.8Ω		N = neither cover or switch
ES2 = 3.0kW	8R2= 8.2Ω		
ES3 = 4.5kW	10R= 10Ω		
	12R= 12Ω		
	15R= 15Ω		
	18R= 18Ω		
	20R= 20Ω		
	22R= 22Ω		
	24R= 24Ω		
	27R= 27Ω		
	30R= 30Ω		
	33R= 33Ω		
	39R= 39Ω		
	40R= 40Ω		
	47R= 47Ω		
	50R= 50Ω		
	56R= 56Ω		
	68R= 68Ω		
	75R= 75Ω		
	82R= 82Ω		
	100R= 100Ω		
	120R= 120Ω		
	150R= 150Ω		
	180R= 180Ω		
	220R= 220Ω		
	270R= 270Ω		
	330R= 330Ω		

Available values: E12 series and additional popular values shown in bold.

Accessories

ES - CV
HP - PC1
HP - TC1

Terminal cover to suit ES.-S series resistors
3m long, 2.5mm², ferrule terminated, 3-core screened power cable kit, including clamping gland. (Cable not installed).
3m long, 1mm², ferrule terminated, 2-core screened cable kit for thermal sensor, including clamping gland. (Cable not installed).

Electrical and thermal data

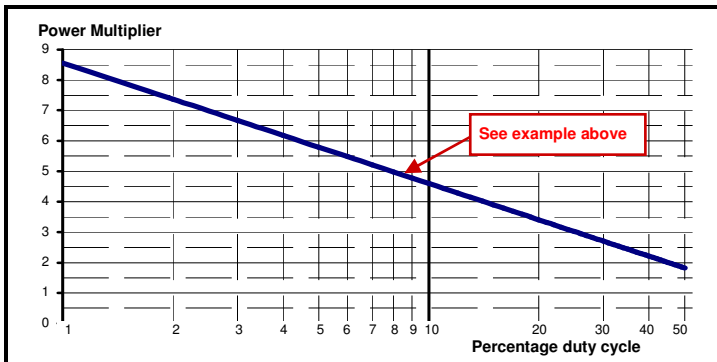
Resistance and power

Resistance / Ω Tolerance +5 / -0%	Enclosure style					
	ESH	EST	ES1	EST2	ES2	ES3
	Maximum Continuous Power / kW					
	0.6	1.0	1.5	2.0	3.0	4.5
3.9	✓			✓	✓	✓
4.7, 5.6, 6.8, 8.2	✓	✓		✓	✓	✓
10, 12, 15, 18, 20, 22, 24, 27, 30, 33, 39, 40, 47, 50, 56, 68, 75, 82, 100, 120, 150	✓	✓	✓	✓	✓	✓
180, 220		✓	✓	✓	✓	✓
270		✓	✓	✓	✓	✓
330			✓	✓	✓	✓

Duty cycle and power

ESH, EST, ES1, EST2, ES2 and ES3 have continuous power ratings of 0.6kW, 1.0kW, 1.5kW, 2.0kW, 3.0kW and 4.5kW respectively. Continuous power ratings can be exceeded when power is applied for less than 100% of the time. The graph below gives "duty cycle" based on a 10 second on time against "power multiplier". Multiply the resistor's continuous power rating by the "power multiplier" number to calculate power. A de-rating factor of 0.8 needs to be applied to: ESH resistors with resistance values of 39 Ω or more; ES1 resistors with resistance values of 100 Ω or more; ES2 resistors with resistance values of 220 Ω or more.

Example: 10 seconds on in 100 seconds is defined as a 10% duty cycle. A 10% duty cycle gives a 4.6 times power multiplier. ES1 resistors are rated 1.5kW continuously and can be rated 6.9kW (4.6 x 1.5kW) for 10 seconds in 100 seconds. If the resistors have a resistance of 100 Ω or more, then the power rating is reduced to 5.5kW (6.9kW x 0.8).



Resistance and element temperature

ES resistors are manufactured using high grade Nickel Chrome wire. The resistance value of this changes little over the temperature range of the element. Cheaper designs using 304 stainless steel can increase in resistance by as much as 50% resulting in less effective braking.

Maximum operating voltage

1000V DC or AC rms

Thermal sensor (optional)

ES..-S - located near screw terminals
Normally closed contact, opens at ~250°C, re-closes at ~210°C
Voltage: 240V AC rms; current: 7A AC rms

Connections

Power: ES..-S - screw terminals for up to 10mm² cable

Earth: ES..-S – Self Tapper, near screw terminals

Thermal sensor: 6.25mm male blade (faston) connections (receptacles not supplied)

Terminal cover (optional)

Two 20mm knockout holes provided on end face. The cover overhangs the resistor by 22mm. The open overhang area can be used for cable entry.

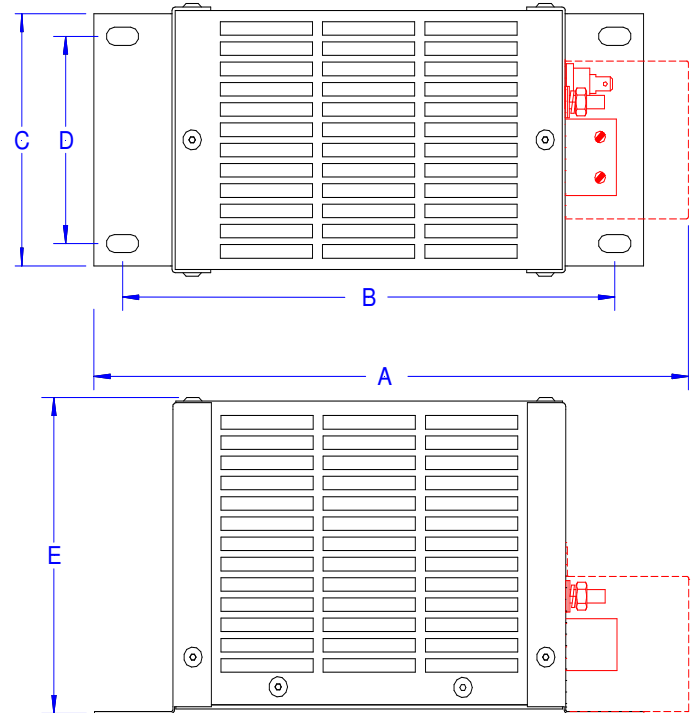
Installation

Units have slotted mounting points suitable for M6 fixings. Mount horizontally with largest closed face (Base) facing down. Other orientations may result in increased element temperatures.

Warning: Units must never be mounted with the terminal area or base uppermost.

Note: On first operation during commissioning these resistors will produce some smoke. This is due to the lubricant used in the manufacture of the Resistor element.

Mounting Dimensions & Weights



	A	B	C	D	E	kg
ESH	288	236	121	92	141	1.4
EST	367	315	121	92	141	1.8
ES1	467	415	121	92	141	2.2
EST2	367	315	213	185	141	3.0
ES2	467	415	213	185	141	3.8
ES3	467	415	307	278	141	5.4

Safety

Resistors get hot in normal operation. Use guards and warning labels where necessary. Avoid proximity to flammable materials. Do not cover. Provide adequate ventilation. Fault conditions in the circuit that feeds the resistor, or the resistor itself, may lead to excessively high temperatures. Restrict access to qualified personnel only.

Cressall reserve the right to change and improve products and specifications
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