



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

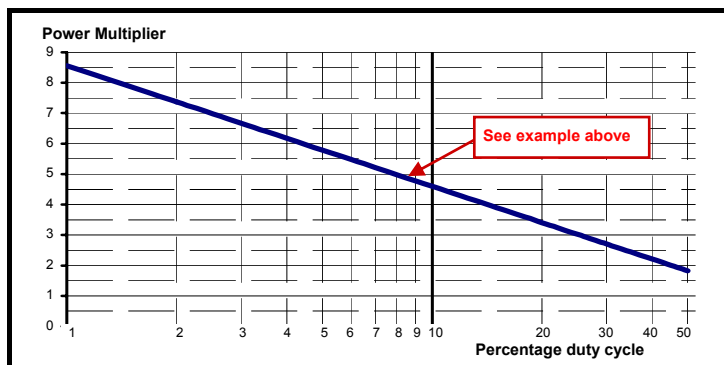
Resistance and power

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.

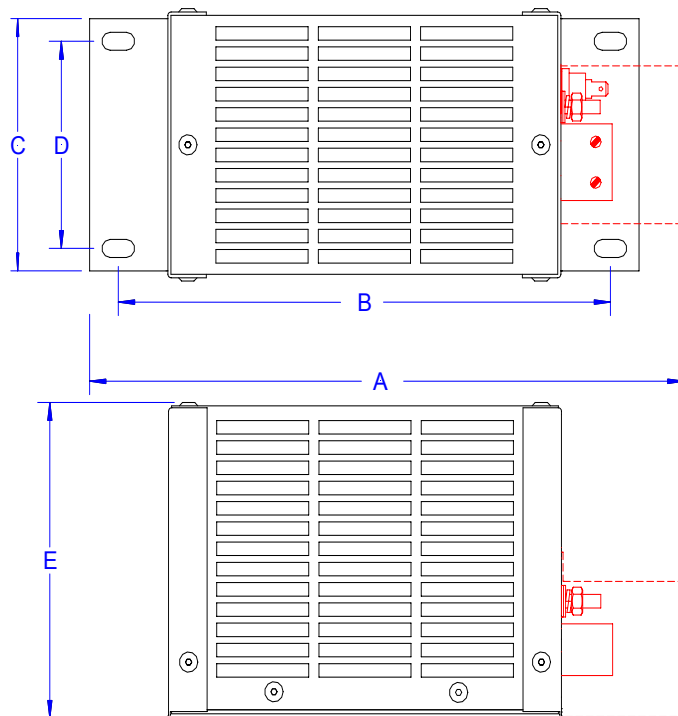
Installation

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.



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