

A compact low noise braking resistor rated for high short time overloads and quick recovery from applied powers.



Features and Benefits

- Rated for repetitive duties
- Resistance never lower than expected
- Robust construction
- Low inductance element
- High overload capacity
- Noise free
- Temperature stable element

Applications

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

Resistor design

Cressall ES braking resistors are based on HP Coils, spiral wire-wound on ceramic formers.

These elements have a high overload capacity and cool rapidly. The resistance material is a high grade stainless steel with no more than 7% resistance increase over the whole temperature range. Cheaper designs using 304 stainless steel can increase in resistance during the heating cycle by as much as 50%, which results in lower current and less effective braking.

The enclosures are made of galvanized steel. Ingress protection is IP 20.

Unit Ratings

Reference number	Resistance value/ Ω (-0/+5%)	Continuous power/kW	10% duty (6secs on 54 secs off)/kW	20% duty (6 secs on 24 secs off)/kW	50% duty (6 secs on 6 secs off)/kW
ES2-18R-SB	18	3	15	10	5
ES2-22R-SB	22	3	15	10	5
ES2-33R-SB	33	3	15	10	5
ES2-52R-SB	52	3	15	10	5
ES3-18R-SB	18	4.5	25	15	6.5
ES3-26R-SB	26	4.5	25	15	6.5
ES4-15R-SB	15	6	33	18	8
ES4-10R-SB	10	6	33	18	8

The above duty cycles are based on a repetitive duty.

Mechanical data

Maximum operating voltage:

1000V AC or DC rms

Connections

Power: Screw terminals for up to 10mm² cable (ES2 & ES3)

M8 terminals (ES4)

Earth: Self tapper screw, positioned near screw terminals

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

Terminal cover (ES2 & ES3)

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



Thermal sensor

Located near screw terminals

Normally closed contact, opens at ~150°C, re-closes at ~135°C.

Voltage: 240V AC rms

Current: 10A AC rms

The sensor is rated for units mounted horizontally with the base facing down.

Installation

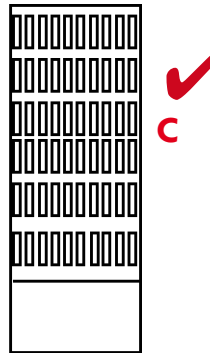
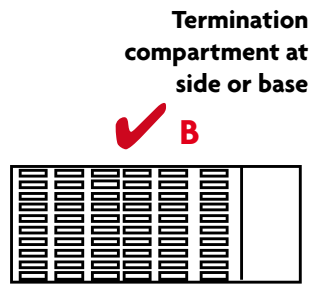
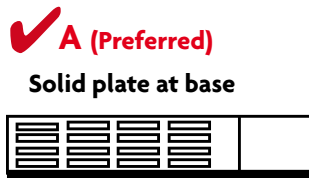
Units have slotted mounting points suitable for M6 fixings. Mount horizontally with base facing down. Other orientations may result in increased element temperatures and may require applied power to be reduced.

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

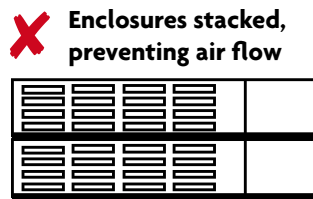
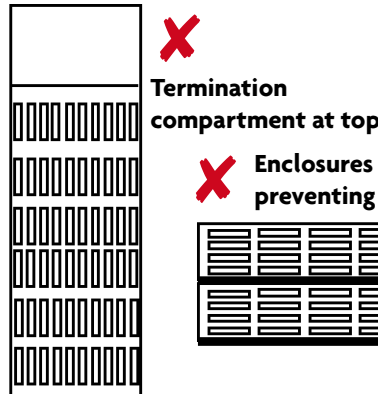
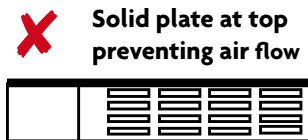
Installation Procedure

- Preferred installed position is horizontal with base facing down (**A**), installation in alternative positions (**B & C**) may result in an increased element temperature.
- Isolate and check that the electrical supply is not live before beginning.
- Fix to mounting surface.
- Cable access is through grommets.
- Connect the resistor using suitably rated cable. The resistor is not polarity sensitive.
- Connect the cable earth to the marked earthing point in the cable enclosure.
- The enclosure gets hot. Do not use it to support any cables.
- If required, connect the over temperature sensor (Push-on terminals).
- Ensure that all connections (including the earth) are tight before refitting the cover.
- Before operation ensure there are no obstructions to prevent proper ventilation.

Correct



Incorrect



Free airflow

- It is essential to allow a free flow of air around the enclosure because the air leaving the resistor and the enclosure surface temperature can exceed 100°C.
- The minimum recommended clearance to other equipment is 250mm.
- Do not obstruct the ventilation holes in the enclosure.

Materials

Materials that are combustible or that may be affected by the heat must not come close to or into contact with the enclosure. This is especially important above the enclosure. Such materials include most plastics and other non-metals.

If the resistor is mounted within a cabinet:

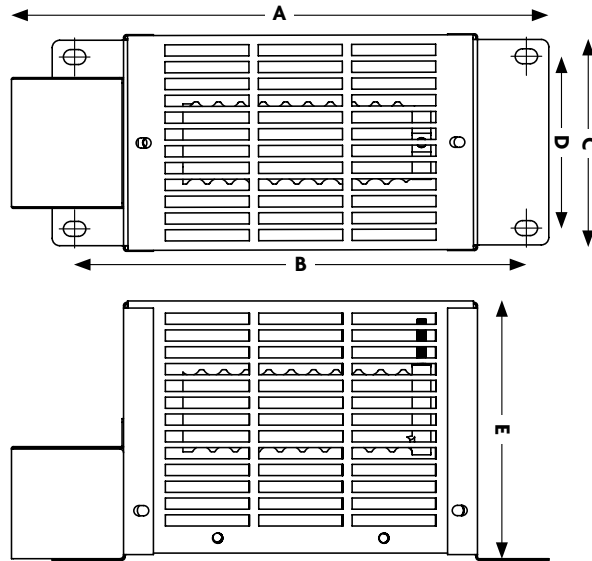
- The cabinet must be well ventilated. This means a minimum free air opening at the top and bottom of the cabinet of 30cm²/kW of DBR power. Forced cooling should be used where there is insufficient natural ventilation.
- The resistor should be mounted as high as possible within the cabinet.

Positioning Requirements

The enclosure must be mounted on a flat surface, ideally horizontally. The cable compartment must be at the bottom when the enclosure is mounted vertically.

Installation Requirements

ES BRAKING RESISTORS



Mounting dimensions (mm) and weights

	A	B	C	D	E	kg
ES2	467	415	213	185	141	3.8
ES3	467	415	307	278	141	5.4
ES4	500	420	380	350	195	6.6

Other Cressall resistor products available through RS Components

HP Coils

A versatile range of resistor elements for continuous and high energy short time duties. They are ideal for motor control and load testing.



ZC Coils

A versatile range of adjustable resistor elements designed for both continuous and high energy short time duties. ZC coils are ideal for motor control or load testing applications.



Cressall is Britain's leading power resistor manufacturer. The advanced design and technology we use to produce them mean that Cressall Resistors are an essential component of the power generation, electric vehicle, rail traction, defense, renewable energy, marine and offshore industries.

To find out more about the full range of our resistor types and their fields of application, [email our sales office](mailto:sales@cressall.com), visit our website www.cressall.com or ring us today for a copy of our latest catalogue.