

The 50plus



Storage Heaters – a repair and replacement guide

1 Background and power supply

Storage heaters (commonly known as night storage heaters) utilise electrical power to heat elements that are set inside bricks, typically made from clay. The bricks store the heat and release it slowly.

Storage heaters originated in the days when most electricity was generated using fossil fuels and it benefitted the power companies to keep generators running overnight.

The electricity companies have two tariffs that are used where storage heaters are fitted in a household:

- Economy 7. This provides lower cost electricity overnight, typically from midnight to 7am and this is used to run the heaters
- Economy 10. This provides lower costs electricity over night and in the afternoon for a 'boost'.

In older electrical installations, the storage heaters (and usually the lower element in an immersion heater) are powered from a separate fuse board or consumer unit, fitted with 15A fuses or 16A MCBs. In modern installations, there may be only a single fuse board (a consumer unit in modern terminology).

Where there is a separate fuse board or consumer unit there will also be an electricity company time switch, which allows power to be provided to the storage heater fuse board or consumer unit only at specified times.

The typical lifetime of a storage heater is 10 to 15 years. Parts can fail sooner.

Some older storage heaters, and more importantly ALL new storage heaters have two supplies to them:

- The economy 7 or 10 supply
- In older models a second supply to run an auxiliary fan (or fan heater) in the base of the heater to provide additional heat when required during the day (peak charge) period. This second supply will be from the main fuse board or consumer unit
- In newer 'Lot 20' models a second supply for the control circuits and typically a fan to disperse heat into the room. The background to this is Lot 20 - a piece of Europe wide legislation. This directive which came into force in January 2018 brought about the redesign of electrical heating products to improve performance for the customers and make savings for the environment.

In summary, all storage heaters have:

- An input control (electrical) which governs the amount of heat stored
- An output control (typically mechanical in older heaters) which allows some control over the rate of heat release)
- Insulation.

Modern 'Lot 20' storage heaters have improved input controls including an electronic thermostat with a 24-hour, 7-day timer with either adaptive start or an open window sensor. Newer models also have improved insulation, which in turn improves storage and allows greater output control.

A storage heater will typically be rated at between 0.5KW and 3Kw (Kw = 1000 watts). Run a 3Kw storage heater continuously for an hour and it will use 3Kw hours of electricity.

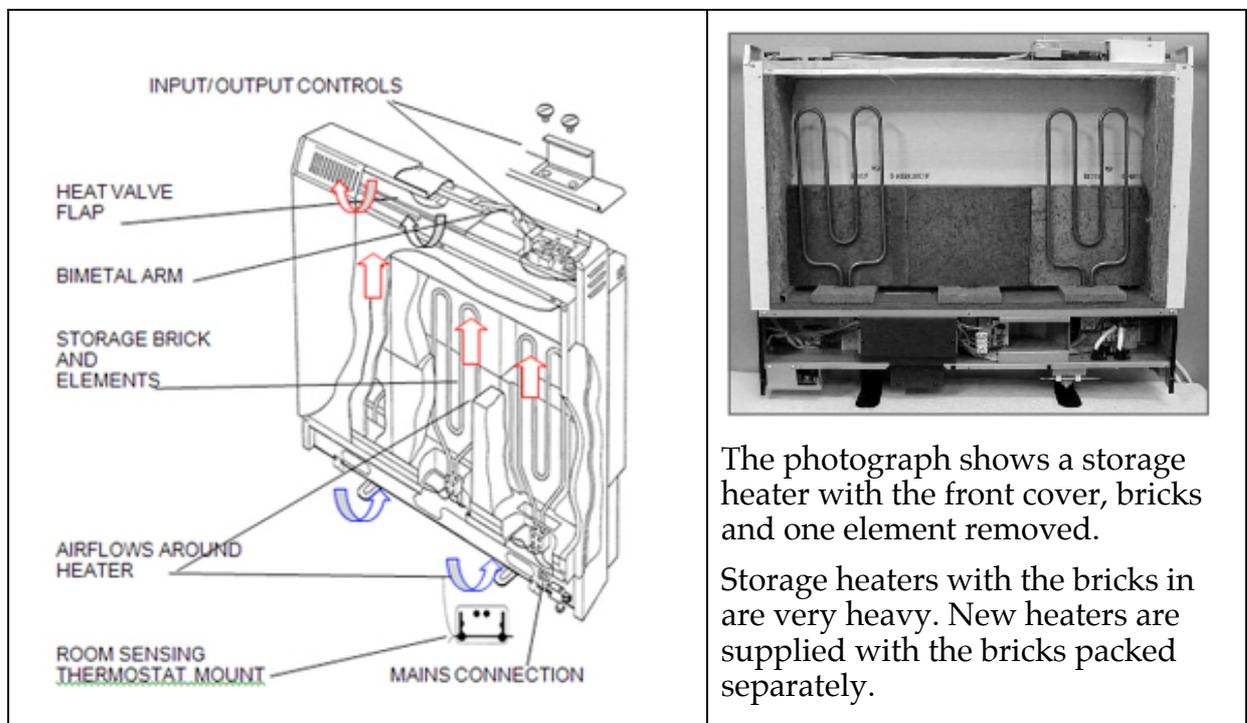
2 What's in a storage heater

A typical storage consists of:

- A thermal fuse and/or input cut-out. These are designed to deal with the potential problem of a heater being covered.
- An input charge control thermostat
- A charge limiter (in some models)
- The heating element(s), which for multiple elements are in parallel
- The cabling, terminal blocks and mechanical parts
- In modern heaters, a timer and environmental sensors.

An overview of a typical heater is shown in Figure 1.

Figure 1 - Typical older type storage heater



The diagram for a simple heater is shown in Figure 2 and for a more complex model in Figure 3. Both figures are sourced from Creda.

Figure 2 - typical storage heater circuit diagram

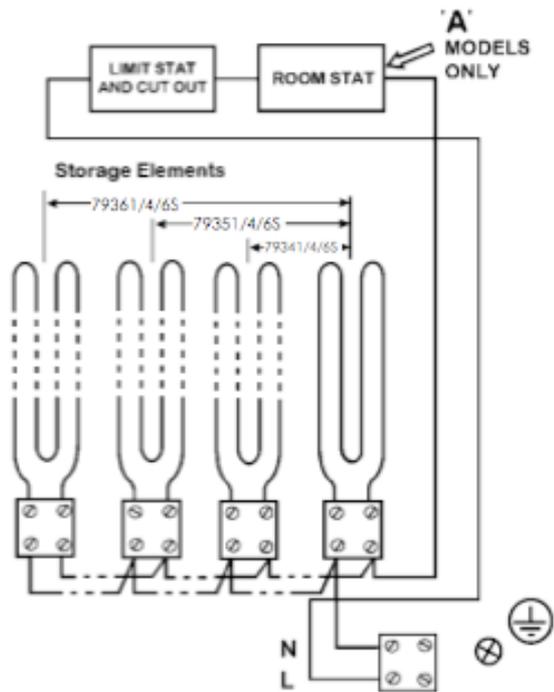
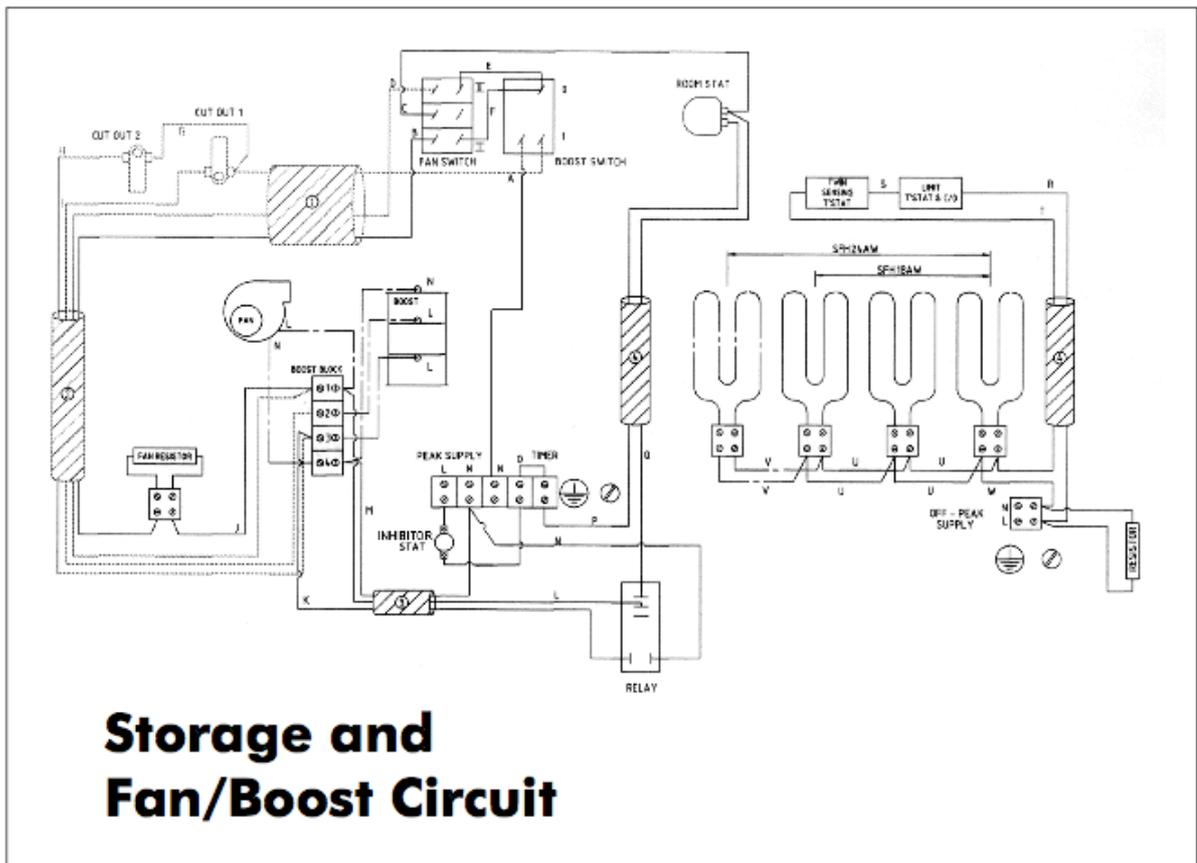


Figure 3 - storage heater with fan heater built in (source Creda)



3 Common problems

There are three sets of common problems with storage heaters:

- (i) Input cut-out tripped or thermal fuse-link blown due to overheating, usually caused by something being placed over the heater. Typically, these can be reset. Usually the front panel and top need to be removed. The cut-out will be adjacent to or integrated with the controls. Look for a small round device about the size of a penny with a red or white dot in the centre, which can pop up. With the power off push this down, you should hear a click. Re-assemble the heater and it should work on the next charge period. See paragraph 4 below for how to double check.
- (ii) Input charge control thermostat faulty. This can in some circumstances, be caused by a build up of dust. If there is a large build up of dust a good clean (with the power off) is required. If it's still faulty replacement thermostats can often be obtained.
- (iii) An element is open circuit. This can be ascertained by measurement with a test meter. This fault is uncommon.

4 Testing and fault finding

We would note that many older storage heaters are now obsolete and repairing old storage heaters, if parts are available, is all too often a futile proposition. Getting parts is a significant issue as there are several sub-model variations for many models and our experience is that something else often goes wrong. Our usual approach now is to recommend replacing the heater(s), either with new storage heaters or more economically with oil filled convector heaters or similar.

If one is fault finding a storage heater the job is typically being undertaken it when the supply to it is not available during the day. Do double check and remember if it's an economy 10 installation the power may come on – so isolate the heater in all circumstances. Most have an isolating switch on the wall. Also, remember that if there is an integrated fan or fan heater or it is a 'Lot 20' heater then this will have a second supply, which also needs isolating.

It is possible to see if a storage heater will call for power when electricity is available by measuring the 'Ohms' between the live and neutral at the input. Ensure when doing this that the live and neutral are disconnected from the supply; otherwise one is measuring all the heaters and quite possibly an immersion element all via the fuse box or consumer unit.

A 3KW heater should have an input impedance in the region of 19 Ohms, a 1KW heater in the region of 57 Ohms. These figures are only guides. Use Ohms law as an approximation to calculate them.

One can also meter out any input cut-outs and thermostats simply by measuring from the main live input through each component in turn to check for continuity.

A note of warning; older heaters can deteriorate (due to constant heating) to the extent that cable insulation and connections literally fall apart when touched. If the heater you are working on is in this condition, then it should be replaced.

If you are planning to fault find a working or partially working heater, ask a customer to ensure it is turned off the day before. Otherwise it could be too hot to work on.

Finally, and as last resort it is possible to connect a storage heater temporarily to a 13 Amp power point. This will allow live testing but be aware of the current the heater will take and the fact that it will not heat up quickly.

5 Replacing a storage heater

There are a number of points to consider when replacing a storage heater:

- Is replacement economical? New storage heaters are far from cheap and in many cases, replacement with modern electric heaters such as oil filled electric radiators should be considered. This can be more economical for users and in the case of let properties, landlords. Replacing storage heaters with electric radiators usually needs some work on the electrical supply, often the fuse box / consumer unit. You can also consider infrared heating panels and ceramic heaters.
- If you are replacing storage heaters it will probably pay to switch your electricity tariff to a standard (rather than economy 7) tariff. Economy 7 tariffs have an oversize day cost for the use of power. Shop around.
- In the UK, if you have faulty or inefficient electric storage heaters in your home and you receive state benefits, tax credits or guaranteed pension credit you may qualify for a grant to replace them.
- Removal of the original heater. It's necessary to remove the bricks before trying to lift a heater. Do this before unscrewing it from the wall. Most heaters need a trolley or sack truck to move them. There will also be a good deal of dust and old insulation tends to break down. Storage heaters made from 1974 onwards are asbestos free. There are few heaters with asbestos in them in circulation. A helpful list is available here: <https://www.aic.org.uk/storage-heaters-asbestos/>
- If replacing a single supply storage heater with a new one a second 24/7 power supply will need to be provided.
- Disposal will need to be via a Hippo Bag, manned waste collection or similar with the bricks taken to the bag separately.
- A new storage heater will be delivered on a pallet, adjacent to the kerb only and with the bricks packed separately.

6 Moving a storage heater

If you are considering moving a storage heater within a property or to another property, then bear in mind the points in paragraph 5 and that:

- (i) You will have to remove the bricks
- (ii) The heater needs to be in reasonable condition to tolerate the move
- (iii) A power supply in a new location has to be wired back the storage heater distribution fuse box or consumer unit. You should not connect a storage heater to a ring main or spur from a ring main.

7 Use of storage heaters

As seen in this guide most storage heaters are very simple. Many end users do struggle with how to use them. The simple rules are:

- Set the input to about 4 to 5 – this ensures the heater will charge
- Set the output to 0 until heat is required. Setting the output to a low level prevents a heater running out of stored heat too soon
- Remember a fan-assisted heater may not have a mechanical flap but could utilise an electric fan to dispel the heat into the room.
- Read the programming instructions for the newer Lot 20 heaters.

For further information contact 50plus.

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