



# Storage Heaters

## Features

- › Compact design, with simple controls for ease of use.
- › Requires little or no top up from day energy, resulting in lower annual running costs.
- › Built-in boost element for supplementary heating.
- › High fan speed selectable for faster discharge.
- › Accurate thermostat control of room temperature.
- › Securely wall mountable for safety.
- › Made in the UK.

## Controls

### 1. User Controls

Manually adjustable room temperature thermostat. On/Off switch for boost.

### 2. Installer Set Controls

For commercial applications, installer can permanently select higher fan speed for faster core heat extraction.

## Packing

### 1. Case Assembly and Weights

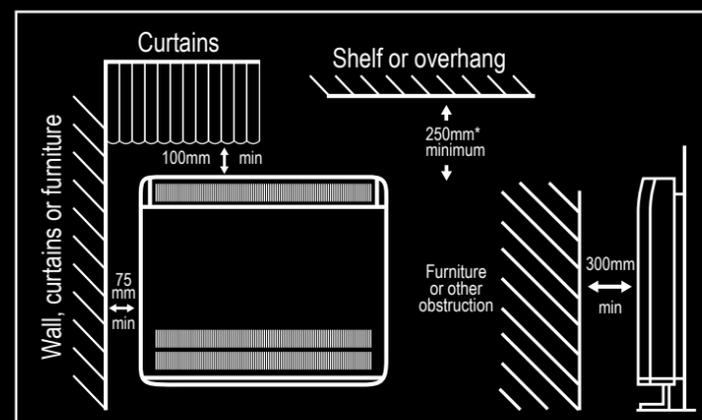
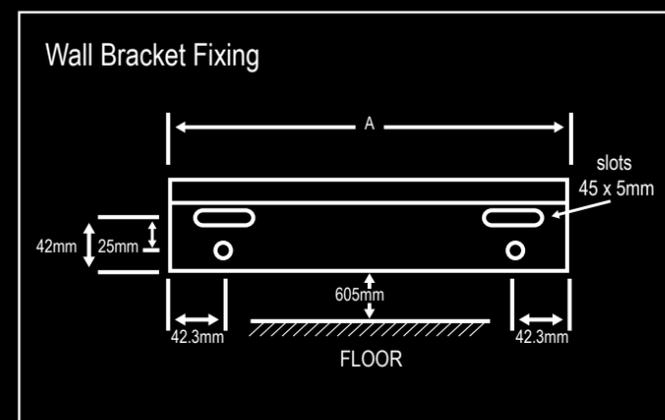
Containing assembled heater case and heating elements. Packed in single carton.

Model	Weight without bricks	Weight with bricks	No. of
FXL 18i	26kg	116kg	12
FXL 24i	32kg	152kg	16

### 2. Storage

Supplied, 2 bricks per pack. Approx weight of each brick 7.5kg.

Model No.	FXL 18i	FXL 24i
Height	700mm	700mm
Width	788mm	1016mm
Depth	183mm	183mm
Storage input loading	2.55kW	3.4kW
Direct acting loading	1.5kW	1.5kW
No. of bricks	12	16
Weight	116kg	152kg
Heat Area	26m <sup>2</sup>	34m <sup>2</sup>



## Cost Effective Heating Solution

*Store & distribute off-peak heat*

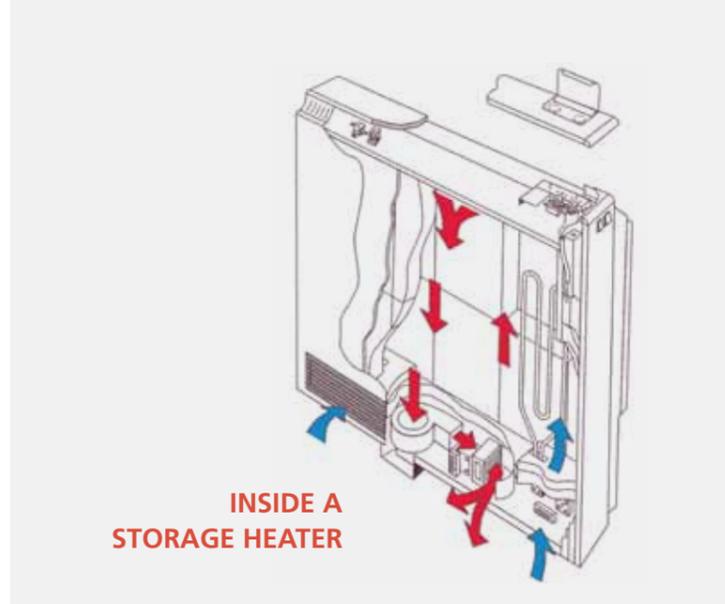


Off-peak storage heating takes advantage of cheap night time tariffs to provide an economical cost-effective heating system. Having stored heat on the cheap night off-peak tariff, the storage heater is designed to gradually release the stored heat throughout the day. If sized correctly, the storage heater will maintain room temperature at a comfortable level over a 24 hour period.

# FXLi range

## WHAT ARE STORAGE HEATERS

- Off-peak storage heating takes advantage of cheap night time tariffs to provide an economical cost-effective heating system.
- Having stored heat on the cheap night off-peak tariff, the storage heater is designed to gradually release the stored heat throughout the day.
- If correctly sized, the storage heater should maintain the temperature in the room at 21C – 23C throughout a 24 hour period.



### OPERATION

#### The storage heater bricks and elements.

The bricks are made of iron ore and are surprisingly heavy, 8kg. There are 12 bricks in an FXL18i and 16 in an FXL24i. The bricks are placed sandwiching the elements – one row in front of and one row behind the elements.

Once the off peak supply switches on, the elements in the heater glow red hot and pass on the heat to the bricks.

After 7 hours of charging overnight the bricks will have reached a temperature of almost 700C and will also be red hot. The casing is usually around 70C.

While keeping the casing of the heater within safe temperature limits, the insulation also retains the heat in the brick and releases it very slowly over the course of the day.

#### Insulation types

Most of the insulation is mineral fibre. This insulation is similar to materials used in the roof space of your house, in cookers etc and is effective in retaining heat.

On the inner front of the unit is a material called 'microtherm'. First used in spacecraft this material is very effective, being 3 times better than mineral wool.

The base is calcium silicate which bears the weight of the brick. The insulation surrounding the bricks allows the heat to be gradually released throughout the day whilst preventing the casing of the heater from being excessively hot. As the day progresses the bricks become cooler and the casing on the heater becomes correspondingly cooler.

The FXLi range offers improved control and economy of operation. Increased levels of insulation ensure that less of the stored heat is lost from the hot casing and more is under the control of the fan. Heat from the casing provides a background level of heat. When comfort heating is required, the fan can be simply switched on. Adjustment of the room thermostat ensures comfort levels are maintained economically.

#### Heater controls

The maximum temperature of the brick is determined by the setting of the 'Input' control. The heater benefits from an automatic input control which varies the level or stored heat to suit the weather conditions. However, it can be manually overridden to allow the customer to control the level of comfort to suit personal circumstances.

The operation of the fan and thus the level of comfort in the room is regulated by the 'Output' control. A 'supplementary' heating element operating on peak electricity can be selected when the heat in the core has been depleted.

#### User controls

The controls are located at the top right hand corner of the heater. These consist of 'Input' control which varies the level of stored heat and an 'Output' control which governs the room temperature. Both these are under the control cover. A 'Boost' switch is selected when the core brick is cool and additional heat is required.

When the fan is not switched on, background heating will be provided by the heater casing. Use the 'Output' control to ensure comfortable conditions are maintained.

While the fan is operating, the 'Output' knob regulates the level of heat output from the heater. Altering the 'Output' knob alters the setting of the room thermostat, which controls the operation of the fan unit.

#### Supplementary or Boost Heating Element

The Boost switch allows the boost element to be selected. The 'supplementary heating element' will operate automatically to maintain heat output when the stored heat has been depleted. Internal regulators ensure that the supplementary element will only operate whenever the heat in the storage core has been depleted. As the heat in the brick decreases, the supplementary element operates automatically in two stages, initially 750W and later when the brick is cooler, the full 1500W operates. The fan will operate at a higher speed when the supplementary heating element is in operation.

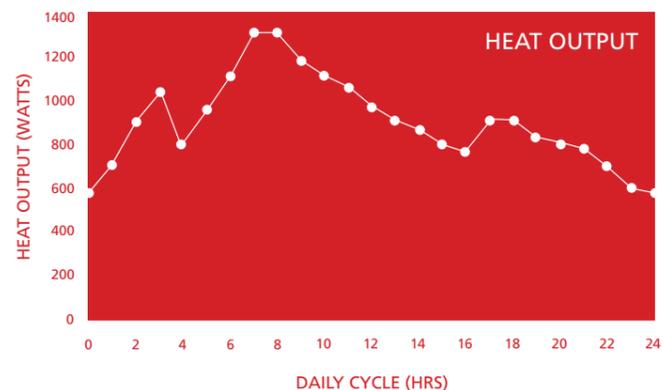
### FEATURES

- › Compact design with simple controls for ease of use.
- › Requires little or no top up from day energy, resulting in lower annual running costs.
- › Built-in boost element for supplementary heating.
- › High fan speed selectable for faster discharge.
- › Accurate thermostat control of room temperature.
- › Securely wall mountable for safety.
- › Made in the UK.

### BENEFITS TO THE CUSTOMER

- › Compact design with simple controls for ease of use
- › Improved comfort levels
- › Simple, easy to use controls
- › Low running costs – utilises off peak / low cost electricity

### HEATER OUTPUT



- › 0-8 hours, Heating up
- › 8 - 16 hours, Heat from casing
- › 16 - 24 hours, Supplementary or Boost heating

#### 0-8 hours

At the start of the off-peak period, heat is transferred from the hot elements to the special night storage bricks. Although the bricks are encased in insulation, the heater casing becomes hotter as the heat of the brick increases.

At the end of the off-peak period, the heater has reached its maximum temperature. This is when the external ambient temperature is at its coldest and the demand for heat is greatest.

#### 8-16 hours

As the day progresses and the ambient external temperatures increases, the demand for heat decreases.

This coincides with a decrease in the output of the Heater due to the decrease in brick temperatures.

#### 16-24 hours

In the evening, as the external ambient temperature decreases, the demand for heat increases. The casing of the heater becomes cooler. Heat released by the fan plays a vital role in maintaining comfort levels.

When the fan operates it draws fresh air from the base of the heater around passages inside the hot brick and discharges this through the low-level grille at the front of the heater. The operation of the fan allows almost 40% of the total heat stored by the heater to be controlled as required by the user.

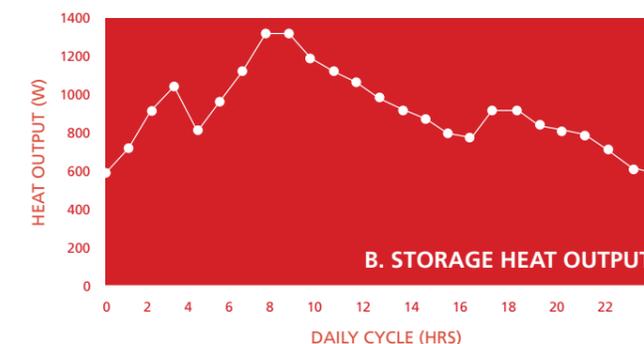
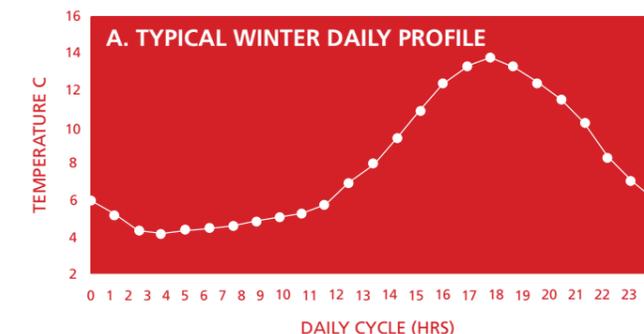
### COST EFFECTIVE

ANNUAL RUNNING COSTS			
	Wattage	Area Covered	Approx. Daily Running Cost
Storage Heater	2600	26m <sup>2</sup>	\$2.00
Panel Heater	2600	26m <sup>2</sup>	\$6.55
Storage Heater	3400	34m <sup>2</sup>	\$2.62
Panel Heater	3400	34m <sup>2</sup>	\$8.57

For the storage heater, a basic calculation can be made by multiplying the hourly off-peak tariff rate by the overnight 7-hour charge, then multiplying that total by the kW rating of your heater (i.e. 11 cents x 7 = 77 x 3.4kW = \$2.62 per day). However, this calculation assumes that the heater has accepted maximum charge which may not be the case on every occasion.

Assuming the panel heater has been correctly sized for the application, the thermostat will ensure the unit is energized on average 50% of the operating time. The estimated running costs have been calculated based on an electricity tariff of 21c per kWh.

### PERFORMANCE



#### Comparison of Graphs

- A) Typical day temperature profile
- B) Heat output from storage heater

When the temperature outside is coldest, the demand for heat in a room is highest. As can be seen from the comparison of the graphs, this is when the output of the storage heater is greatest. As the sun rises and ambient temperature rises, the demand for heat decreases.

The storage heater matches this as the storage bricks omit heat. The critical point is when the sun sets outside, temperatures drop and the demand for heat increase.

The operation of the fan is critical in releasing a small amount of extra heat from inside the core brick to maintain comfortable conditions.