

## Heat recuperators for open fireplaces

An open fireplace is generally a very inefficient method of heating : only 10 to 15 % of the energy consumed is transformed into heat in the room, the rest is lost up the chimney.

Static recuperators (i.e. without ventilators) were already in use in the last century : a double wall, or hollow tubes, placed at the base of the chimney reheated the air which escaped into the room through openings at either side of the fireplace.

These appliances had to be installed at the time of the construction of the fireplace.

The increase in fuel prices has prompted manufacturers to design more effective systems and for this reason, in 1981, we launched the EQUATAIR.

### EQUATAIR classic (ref. 0130)

A hollow heating element is placed in the hearth, the hottest area of a fireplace ; a ventilator sucks in air and sends it through a flexible metallic tube into the s-shaped element where it heats up before being expelled back into the room.

The effectiveness of this appliance (up to 7 000 W/h of energy) comes from the fact that the air passes through 1.70 metres of piping in the hottest part of the fireplace (750 to 850°C) and that it is expelled into the room when it has reached the maximum temperature. Twenty minutes after lighting the fire, a temperature of 200°C is attained at the out let and after an hour this can exceed 400°C (heating capacity is 230 m<sup>3</sup>).

Expelled through a single outlet, the hot air travels in a horizontal direction for two metres before being absorbed into the air in the room ; the hot air does not burn as it dry heat (the same sensation can be observed when putting your hands in front of the fireplace).

This system is particularly useful in holiday homes as it is capable of heating a room to a pleasant and uniform temperature very rapidly.

In addition, the appliance is simply placed in the fireplace without modification and so is immediately operational.

## Technical information

### - VENTILATOR :

This is a mechanically controlled ventilator with a rotating speed of 1,300 rpm. It is designed to be able to function 24 hours a day for many years. The ventilator is sufficiently large to produce a great quantity of air (60 m<sup>3</sup> per hour at the outlet at 18°C, and therefore a lot more at 350°C) despite the slow rotating speed of the motor.

As the ventilator is of the centrifuge type, the air comes out at a relatively high pressure enabling it to reach far out into the room. The motor uses only 50 watts (less than an electric light-bulb).

The ventilator is fitted in a metal case, lined inside with foam, so that it makes very little noise ; the filter, fixed between two grills, cleans the air and also further reduces the noise ; without this filter the dust in the air would be carbonised and generously distributed throughout the room !

The ventilator can be placed inside the room where it will recycle the surrounding air ; in this case it can be left on all night to make the most of the heat left in the hearth.

Placing the ventilator outside (or in the cellar or outhouse) has the advantage of bringing fresh air into the room but in this case it should be programmed to switch off after a few hours to avoid cooling the house.

**References for spare parts :**

- Ventilator box without electric cable (0100-01)
- Electric cable (0100-02)
- Ventilator filter (0100-12)

**- FLEXIBLE TUBE :**

The tube is made of zinc-electroplated steel without joints for greater flexibility ; this means that it is not completely airtight and the best results are obtained when it is stretched as tight as possible. During use, the tube is cooled by the passage of cool air.

The tube can be extended by adding one metre lengths : the male nozzle at one end fits into a serflex joint at the other. Beyond a length of four metres the loss of energy becomes significant.

The tube can also be used on the outlet of the recuperator to carry hot air into another room : for this, one end of the right-angle joint is screwed onto the telescopic extension then the other end is attached to the serflex end of the tube (the four metre comment applies equally to the transfer of hot air). In both cases (incoming and outgoing air) the tube may be replaced by a rigid pipe of 48.3 mm exterior diameter.

This is a standard size for heating pipes and is known as 40/49. A rigid pipe is completely airtight and so reduces loss of energy.

**References for spare parts :**

One metre flexible tube (0100-04)

**- RIGHT-ANGLE JOINT :**

This enables the user to skirt around the chimney jamb if it is narrow, or to bring in the flexible tube (or 48.3 mm rigid pipe) through the floor (from the cellar for example). It can also be used with the extension to guide the air to one side.

**References for spare parts :**

Right-angle joint (0100-05)

**- HEATING ELEMENT :**

Cast in a single piece from heat-resistant iron, the size of the element has been designed to fit into even small fireplaces while, in larger fireplaces, it corresponds to the width of the fire itself : about 60 cm of a log of 1 m burns at any one time, enough to surround the heating element with embers. A longer appliance would have been less efficient.

The element should be positioned several centimetres above the floor of the fireplace so that it can be heated from below by the embers and from above by the burning wood. If the element is placed in the ashes it loses much of its effectiveness as the ashes insulate it from the heat.

To light the fire, the paper and twigs are put under the element then, when these have caught fire, the wood is added above. All that is then required for a constant supply of hot air is to ensure that there is always a good quantity of glowing embers.

If the firebricks in the fireplace are particularly high, the method of lighting the fire may need to be adapted : the wood should be cut into smaller pieces and fed into the fire regularly at the start to prevent it going out. It may be easier in this case not to put the element on the firebricks at all but to simply raise it a few centimetres off the floor.

The heating element is reversible allowing the user to choose which side the hot air will come out from (or to choose a side for the ventilator).

### **Kit-Deco (ref. 0136)**

The heating element of the Equatair classic is either placed on the existing firebricks in the hearth or on the Kit-deco : this latter consists of a number of cast iron pieces which serve as firebricks and fireguard. Created by a designer, the kit gives a decorative appearance to the recuperator.

### **EQUATAIR compact (ref. 0120)**

The Equatair classic is the most effective solution for transforming an open fire into a true heating system. However some potential buyers may be discouraged by the aesthetic drawbacks of the system (the flexible tube). In response to this, we have created the compact model : here the ventilator is incorporated into the front casing.

### **Technical information**

An in-built thermostat turns the ventilator on as soon as the temperature in the ventilation case reaches 50°C and turns it off when the temperature falls below 30°C.

The air, sucked in through a dust filter, circulates through the heating element where it heats up before being blown out of the other end of the ventilation case.

A speed control enables the rotating speed of the ventilator to be set between 800 and 2000 rpm.

The ventilator protects itself from overheating by sucking in cool air (its temperature never exceeds 35°C) : for this reason it should always be left plugged in and it is not fitted with an on/off button.

In the case of a power cut, the user simply pushes back the firebrick and lifts up the case to remove it.

The casing is reversible allowing the user to choose the side from which the electric cable will arrive or from which the hot air will come out. It also enables the fireplace to be easily cleaned without touching the heating element (the ventilation case is lifted up and the fireplace cleaned with the self-contained ash vacuum cleaner).

The 2 metre long electric cable is made of silicon coated fibreglass giving excellent heat resistance. While the compact model avoids the aesthetic drawbacks of the flexible tube, the smaller size of its ventilator limits the length of the time that the air passes in the heating tube and consequently the air only reaches a temperature of 250°C resulting in a slightly less effective performance (about 5,000 watts per hour, a heating capacity of 170 m<sup>3</sup>).