Warm Air Heating Equipment

Date added to ETL 2003 (Revised 2009).

1. Definition of Technology

Warm air heating equipment covers products that are specifically designed to provide space heating by using the heat generated by a burner to raise the air temperature in the space(s) being heated, and optimising controllers that ensure warm air heating systems operate in an efficient manner.

2. Technology Description

Warm air heaters are widely used to provide space heating for warehouses, retail sheds, sports centres, factories, and other buildings containing similarly large spaces. Warm air heaters contain a gas or oil fired burner that is used to heat the air in the space directly, or indirectly by means of heat exchanger. A fan is used to distribute the warm air throughout the space(s) being heated.

Warm air heaters are available in a range of different types and efficiencies. The ECA Scheme encourages the purchase of higher efficiency warm air heaters. It also encourages the purchase of optimising controllers that ensure that warm air heating products and systems operate in an energy efficient manner that reflects weather conditions, occupation schedules and user requirements.

The ECA Scheme covers four categories of product:

1. **Indirect fired packaged warm air heater units**
   including both condensing and non-condensing type products.

2. **Indirect fired packaged air heater modules**
   including both condensing and non-condensing type products.

3. **Direct fired packaged warm air heaters**
   that are designed to vent combustion products into the space being heated.

4. **Optimising controllers for warm air heating systems**
   including both standalone unit and add-on module type products.

Investments in warm air heating equipment can only qualify for Enhanced Capital Allowances if the specific product is named on the Energy Technology Product List. To be eligible for inclusion on the Energy Technology Product List, products must meet the eligibility criteria as set out below.

3. Eligibility Criteria

To be eligible, all products must comply with the relevant requirements set out below:

1. All products incorporating warm air heaters must:
   - Be gas or oil fired.
   - Be designed to be permanently installed in one of the following ways:
     a) As a suspended, wall mounted or floor-standing unit.
     b) As a heating module within an air handling unit.

- Incorporate a fan to distribute warm air within the heated space, unless they are warm air heating modules that are specifically designed to be installed in an air handling unit.
- Be CE marked.

2. All direct-fired units must:
   - Incorporate a microprocessor-based controller that monitors product's outlet air temperature, and adjusts the product's operation to maintain pre-set temperature(s).
   - Use modulating burners with a turn down ratio that is greater than, or equal to, 10:1.
   - Be fitted with a variable speed fan controller, or a variable air volume control system, that can vary the fresh air flow through the product by a factor of at least two to one.

3. All products that incorporate optimising controllers must:
   - Incorporate a microprocessor based controller that is pre-programmed to:
     a) Automatically control the air temperature in one or more zones within a building in an energy efficient manner that reflects predefined zone occupation schedules.
     b) Automatically switch warm air heating equipment on and off in accordance with the predefined occupation schedule for each of the zones being controlled.
   - Incorporate the following automatic control mechanisms:
     a) A frost protection mechanism that monitors internal air temperature, and switches on the warm air heaters to prevent equipment and/or pipework from freezing up.
     b) A building fabric protection mechanism that monitors external or internal temperatures and switches heating on to prevent condensation from occurring.
     c) An anti-tampering mechanism that prevents the product's control strategy from being modified, and the specified automatic control mechanisms from being disabled, except during commissioning, maintenance or testing.
   - Provide facilities that enable building managers to:
     a) Define the normal occupation times for the building and for each zone controlled (to within five minutes), for each day of the week, including at least two periods of occupation per day (i.e. at least 14 different occupation period per week).
     b) Define the temperature set-points for each zone to +/- 1 degree centigrade.
   - Provide facilities that enable building users to "temporarily override" the pre-set times when the warm air heating is scheduled to be switched off within an individual zone.
   - Conform with the requirements of the EU EMC Directive 89/336/EEC (as amended) or its replacement EU EMC Directive 2004/108/EC, or be CE Marked.

Where:

- A mechanism is defined as "any sequence of pre-defined actions that performs a given function, where an action can be defined in hardware and/or software terms".

- Products that incorporate control strategies that are specifically designed to control other types of equipment (other than warm air or radiant heaters) are not eligible.

Performance criteria

All indirect fired products must have a net thermal efficiency when operating at 100% of their maximum continuous rating (MCR) that is greater than the value set out in Table 1 below.

Table 1 Performance requirements for warm air heating equipment.

	Product category	**Net thermal efficiency %**
1.	Indirect fired packaged warm air heater units	> 91.0 %
2.	Indirect fired packaged air heater modules	> 91.0 %
There are no efficiency requirements for direct gas-fired warm air heaters.		

">" means "greater than"

For the avoidance of doubt net thermal efficiency test data must be presented to 1 decimal place. As an example, an indirect fired packaged warm air heater unit with a net thermal efficiency of 91.0% at 100% of its maximum continuous rating (MCR) would be deemed to be a fail.

Required test procedures

All indirect fired products must be tested in accordance with the relevant procedures and test conditions in the following standards:

- BS EN 1020:1998, “Non-domestic gas-fired forced convection air heaters for space heating not exceeding a net heat input of 300 kW, incorporating a fan to assist transportation of combustion air and/or combustion products”.
- BS EN 13842:2004, “Oil fired forced convection air heaters. Stationary and transportable for space heating”.
- BS EN 1196:1998, “Domestic and non-domestic gas-fired air heaters. Supplementary requirements for condensing air heaters”.
- BS 5991:2006, “Specification for indirect gas fired forced convection air heaters with rated heat inputs greater than 330 kW but not exceeding 2 MW for industrial and commercial space heating. Safety and performance requirements (excluding electrical requirements) (2nd family gases)”.

If the test report has not been prepared by an independent body, then evidence must be provided that a representative sample of product test data has been independently verified or cross-checked.

4. Scope of Claim

Expenditure on the provision of plant and machinery can include not only the actual costs of buying the equipment, but other direct costs such as the transport of the equipment to site, and some of the direct costs of installation. Clarity on the eligibility of direct costs is available from HMRC.