Heat Pump Dehumidifiers

Date added to ETL 2008 (Revised 2016).

1. Definition of Technology

Heat pump dehumidifiers are products that are specifically designed to remove water vapour from moist air using an electrically driven refrigeration cycle.

2. Technology Description

Heat pump dehumidifiers are widely used to improve personal comfort, to protect building fabric and stored goods or materials, and to dry industrial products. They work by circulating the moist air over the evaporator of the refrigeration system. This reduces the temperature of the air, which causes the water vapour to condense. The resulting condensate can be then drained away.

Heat pump dehumidifiers are available in a range of different designs and efficiencies. The ECA Scheme aims to encourage the purchase of the higher efficiency products that recover both sensible and latent heat released during dehumidification, and use it to heat the air as it leaves the product or for other useful purposes, such as water heating.

Investments in heat pump dehumidifiers 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, products must:

- Either be a single packaged unit or consist of two or more factory built sub-assemblies that are designed to be connected together during installation.
- Incorporate an electrically driven refrigeration system that is designed to remove water vapour from the surrounding atmosphere, as the air is recirculated through the product.
- Recover both sensible and latent heat released during dehumidification, and use it to heat the air as it leaves the product and/or for other useful purposes (such as water heating).
- Incorporate a control system that monitors the relative humidity of the surrounding atmosphere, and automatically switches off dehumidification, or modulates the rate of dehumidification, when the relative humidity falls below a pre-set value.
- Be designed for, and include fittings for, permanent installation within a building.
- Have a dehumidification capacity that is greater than or equal to (>=) 0.625 litres per hour.
- Not be designed to be connected to compressed air systems.
- Be CE marked.

Performance criteria
Products must have a dehumidification efficiency ratio (DER) equal to or greater than the thresholds set out in Table 1 below, which depend on the dehumidification capacity (C) of the product.

### Table 1 - Performance test points for heat pump dehumidifiers

<table>
<thead>
<tr>
<th>Dehumidification capacity (C) (Litres/hour)</th>
<th>Dehumidification efficiency ratio (DER) (Litres/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 0.625 and &lt; 1.5</td>
<td>&gt;= 1.40</td>
</tr>
<tr>
<td>&gt;= 1.5 and &lt; 2.3</td>
<td>&gt;= 1.80</td>
</tr>
<tr>
<td>&gt;= 2.3</td>
<td>&gt;= 2.30</td>
</tr>
</tbody>
</table>

"=>" means "greater than or equal to"

Where the product’s dehumidification capacity and dehumidification efficiency ratio are defined in sections 3.5 and 3.6 (respectively) of BS EN 810:1997 “Dehumidifiers with electrically driven compressors. Rating tests, marking, operational requirements and technical data sheet”.

For the avoidance of doubt, test data should be presented to 2 decimal places. As an example, a DER of 1.39 litres/kWh for a heat pump dehumidifier with a dehumidification capacity of 1.2 litres per hour would be deemed to be a fail.

### Required test procedures

All products must be tested in accordance with the procedures laid down in BS EN 810:1997.

The dehumidification capacity must be determined at the appropriate rating test conditions for the type of product (or intended application) as set out in Tables 2, 3 and 4 of BS EN 810:1997.

The dehumidification efficiency ratio must be determined at an air inlet temperature of 27 degrees Centigrade (dry bulb) and 21 degrees Centigrade (wet bulb) and, where applicable, include the corrections for the power input of fans and water pumps specified in section 4.1 of BS EN 810:1997.

Test results may be submitted in summary form provided that:

- Sufficient data is included to confirm that the dehumidification capacity (kW), COP and DER of each product was determined in accordance with the test procedures in BS EN 810:1997 and at the appropriate rating test conditions as described above.
- At least two detailed test reports are submitted for each range of products. The data must be recorded in a detailed test report as defined in Section 5 of BS EN 810:1997. The test report must include details of the data recording period and duration of the performance measurement.
Representative Testing

Where applications are being made for a range of two or more products that are variants of the same basic design, test data may be submitted for a representative selection of models, provided that all variants:

- Use the same refrigerant as the representative model.
- Have the same compressor type (i.e. manufacturer, method of compression (e.g. reciprocating or scroll) and type of enclosure (e.g. hermetic or semi-hermetic)) as the representative model.
- Use the same defrosting method (e.g. hot gas defrost).
- Consist of the same number of units (e.g. are all single packaged units).

The representative models must be selected by dividing the range of products into groups of models with similar design characteristics, and testing a model in each group. The performance of each model in the group must be predicted using a validated mathematical model. As a minimum, at least two models must be tested in each range of products.

It should be noted that:

- If a manufacturer voluntarily removes the representative model from the Energy Technology Product List (ETPL) then other products linked with that representative model may or may not be permitted to remain on the ETPL.
- If any product submitted under these representative model rules is later found not to meet the performance criteria when independently tested, then all products based on the same representative model will be removed from the ETPL.

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.