

Heating Management Controllers (for Wet Heating Systems)

(Formerly Optimising Controls for Wet Heating Systems)

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1. Definition of Technology

Heating management controllers (for wet heating systems) are products that are specifically designed to control heat generation and distribution within a wet heating system in an energy efficient manner that reflects weather conditions, occupation schedules and user requirements.

2. Technology Description

Heating management controllers (for wet heating systems) realise fuel savings by adapting boiler firing and heat distribution patterns to match variations in heat demand and user requirements.

A wide range of heating management controls is available for wet heating systems including products designed to control space heating within both zoned and un-zoned buildings. The ECA Scheme aims to encourage the purchase of products that automatically adapt to changes in weather conditions, and thermal response time of the building and/or wet heating system.

The ECA Scheme covers three categories of product:

1. **Standalone units** that are self-contained control units that are designed to directly control the operation of, and to be directly connected to, the external control inputs of the boilers/burners, pumps and control valves in a wet heating system.
2. **'Add-on' modules** that designed to be incorporated into other control systems, and to either directly, or indirectly, control the operation of wet heating systems.
3. **Packaged products** that consist of two or more control modules or units that are designed to be connected together during installation, and to either directly, or indirectly, control the operation of wet heating systems.

Investments in heating management controllers (for wet heating systems) can only qualify for Enhanced Capital Allowances if the 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:

1. Incorporate a microprocessor based controller that is pre-programmed to:
 - a) Automatically control heat generation and heat distribution within a wet heating system, in a manner that reflects weather conditions and building occupation schedules.
 - b) Automatically switch between operating modes, in accordance with the predefined weekly occupation schedule of the space (or spaces) being heated.
 - c) Maintain the temperature of the space or spaces being heated within pre-set limits, by modulating the heat flow around each heating circuit, in response to the output of one or more temperature sensors.

2. Be designed to have at least two of the following operating modes:
 - a) A “normal” operating mode in which the wet heating system is operated in a manner consistent with the building being occupied, or prepared for occupation.
 - b) An “economy” mode where the wet heating system operated at a reduced level to reflect, for example, the fact that the building is unoccupied, or reduced levels of activity in the building, or
 - c) A “standby” or “holiday” mode where the wet heating system is switched off or operated solely for fabric, frost and equipment protection.

3. Incorporate:
 - a) An optimum start mechanism that monitors external and/or internal temperatures, and calculates when boilers need to be switched on in order to just reach pre-set temperatures by the start of the next occupancy period.
 - b) A “self-learning” algorithm that automatically monitors the accuracy of the optimum start mechanism and periodically updates the heating curve that the mechanism uses, to reflect changes in building characteristics.
 - c) A “self-adaptive weather compensation” mechanism that automatically saves energy during milder weather conditions, by reducing the temperature set-point of the boiler water circuit as the external temperature rises, and also the temperature of, or heat flow through, any individual zone heating circuits controlled.
 - d) A “frost protection” mechanism that monitors internal or external temperatures (or pipework temperatures), and switches on boilers and heating circuits (as required), in order to prevent equipment and pipework from “freezing up”.
 - e) A building fabric protection mechanism that monitors external or internal temperatures and switches heating on to prevent condensation occurring.
 - f) A mechanism that prevents the boilers supplying the heating system from “dry cycling” (i.e. switching on and off), when there is no change in heat demand.
 - g) Interlock and inhibit mechanisms that can be used to prevent simultaneous heating and cooling, and space heating when windows have been opened.
 - h) An anti-tampering mechanism that prevents the product’s control strategy and configuration settings from being modified and automatic control from being disabled, except during commissioning, maintenance or testing.

4. Provide facilities that enable building managers to:
 - a) Define the normal occupation times for the building and for each zone controlled (in intervals of five minutes or less), 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 operating mode to +/- 1 degree centigrade, and separate set-points for each space heating circuit controlled.
 - c) Define periods or circumstances throughout the year when the wet heating system should be placed into economy, holiday or standby modes.
 - d) Define a separate seven-day schedule for the operation of any domestic hot water (DHW) system controlled, including at least two periods of operation per day.
 - e) “Temporarily override” or manually adjust the degree (or amount) of weather compensation applied to each heating circuit controlled.

5. Provide facilities that enable building users or managers to:
 - a) “Temporarily override” the pre-set time when the heating is scheduled to be switched off for a predefined period not exceeding 24 hours per override.
 - b) Only adjust the temperature set-points in the space (or spaces) being heated for a limited period of time, or by a limited amount (or allow no user adjustment).
 - c) Switch the wet heating system into economy or standby mode for the remaining portion of a pre-set occupation period.

6. 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.

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 the direct costs of installation. Clarity on the eligibility of direct costs is available from HMRC.