Master Controllers

Date added to ETL 2008 (Revised 2009).

1. Definition of Technology

Master controllers are products that are specifically designed to control the operation of multiple air compressors in a manner that maintains the operating pressure of the compressed air system within a narrow band, thereby minimising energy consumption.

2. Technology Description

Master controllers are microprocessor-based controllers that can be used to improve the control of compressed air systems with two or more compressors. They realise energy savings by reducing the pressure fluctuations that are normally present in compressed air systems when simple cascade or sequence controls are used to maintain system pressure, and by allowing users to schedule compressor operations that reflect working patterns.

Investments in master controllers 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:

- Be able to automatically control the operation of:
    a) At least two air compressors.
    b) Both fixed speed and variable speed compressors.
    c) Any positive displacement compressor that is capable of accepting a remote load/unload control signal via a volt-free switching circuit or electromechanical pressure switch, or in the case of variable speed drives capable of accepting a speed control signal or a remote pressure set point adjustment.
- Incorporate a microprocessor based controller that is pre-programmed to provide facilities for users to:
    a) Prioritise the use of more efficient compressors over less efficient ones, whilst making optimal use of any variable speed compressors being controlled.
    b) Schedule the times of the week (to within five minutes), when compressed air system should be switched on and off, and be operated at a reduced pressure.
    c) Schedule at least two different operating pressures for the compressed air system (to enable for example operation at lower pressure at off peak times).
    d) Define the minimum and maximum limits for the operating pressure (or pressure band) that the controller must maintain the compressed air system within.
- Incorporate an anti-tampering mechanism that prevents automatic control from being disabled, except during commissioning, maintenance or testing.
- Incorporate a pressure transducer that has a measurement accuracy of at least (i.e. <=) +/- 0.5% of full scale across its rated operating pressure range and across a rated temperature range of –25 to 80 degrees Centigrade.

- Incorporate automatic control algorithms that monitor rate of change in system air pressure/flow and prevent compressors from being brought on load or unloaded in response to small fluctuations in demand.
- Be capable of automatically regulating the operating pressure of the compressed air system (where all compressors in the system are situated at a single location), based on the output of a single pressure transducer, to within +/-0.2 bar of the operating pressure set-point, as air demand varies between 10% and 100% of the maximum combined, continuous, rated output of air compressors being controlled.
- Conform with the requirements of the EU EMC Directive 89/336/EEC (as amended) or its replacement EU EMC Directive 2004/108/EC, and be CE Marked.

Where products provide facilities for operators to override automatic control, they must be pre-programmed to return to automatic control at the next scheduled time for system switch off / on, and to automatically reset the override within 24 hours.

Where products are also designed to control desiccant air dryers, they must also satisfy the eligibility criteria for 'energy saving controls for desiccant air dryers'.

Automatic control may be implemented either directly by means of an analogue or digital signal connection, or indirectly by means of another control device or network. Where products are designed to indirectly control variable speed compressors, they must be capable of monitoring the operating speed of the variable speed compressors, and of remotely adjusting the speed or pressure set points (or pressure or speed range limits) within the variable speed compressor's control device.

Products that cannot directly control the speed (or speed range) of a variable speed compressor, or indirectly control their speed of operation by adjusting their pressure set points, are not eligible.

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.