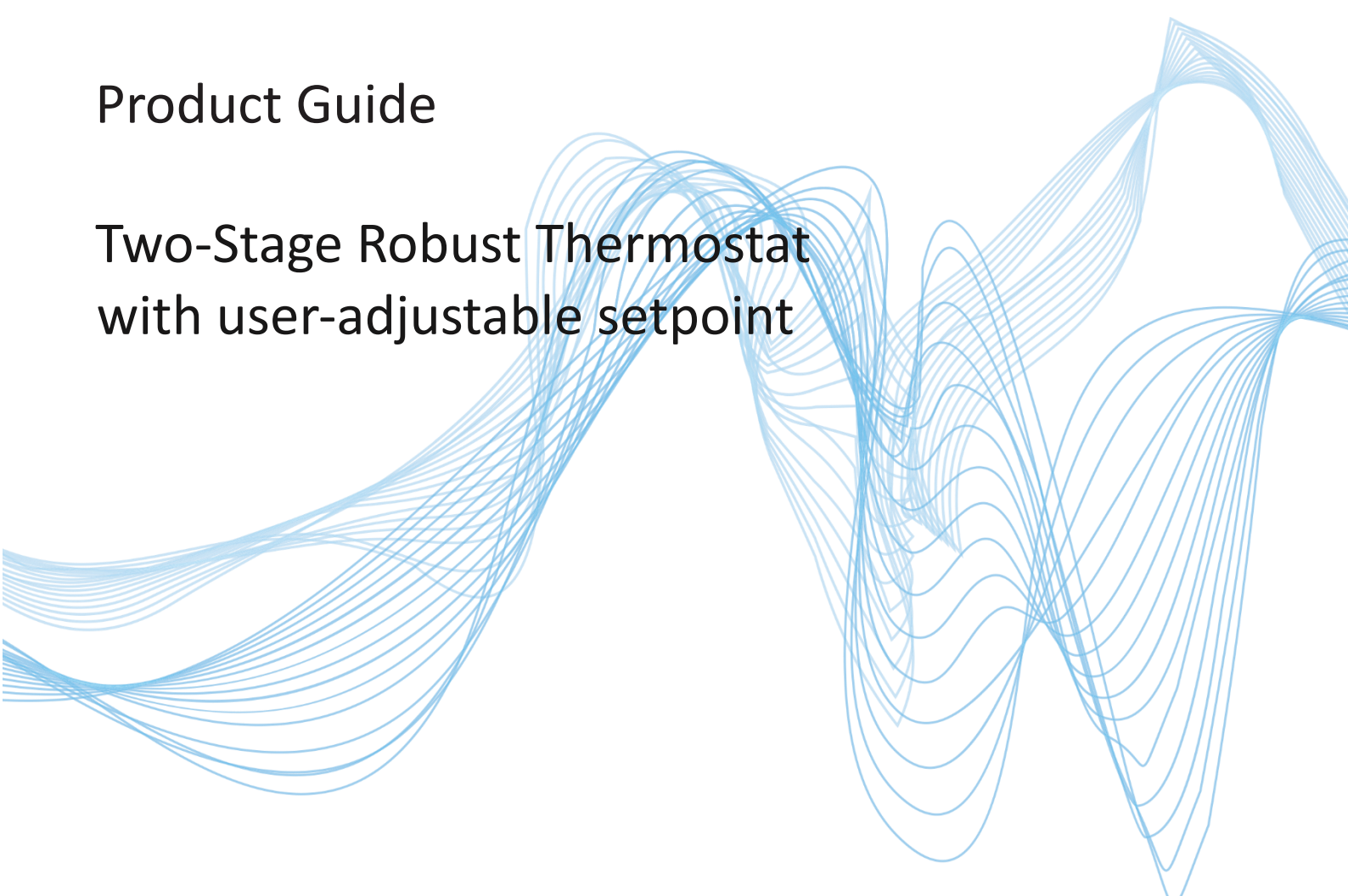


Product Guide

Two-Stage Robust Thermostat with user-adjustable setpoint



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Product Overview

The E812+ADJ is a 2-stage thermostat with user-adjustable setpoint, offering a high quality and robust solution to tamperproof energy-saving thermostatic control. It utilises a high-accuracy radiant heat sensor in conjunction with its die-cast aluminium case and tamperproof screws to ensure vandal-resistant yet accurate tamperproof energy control.

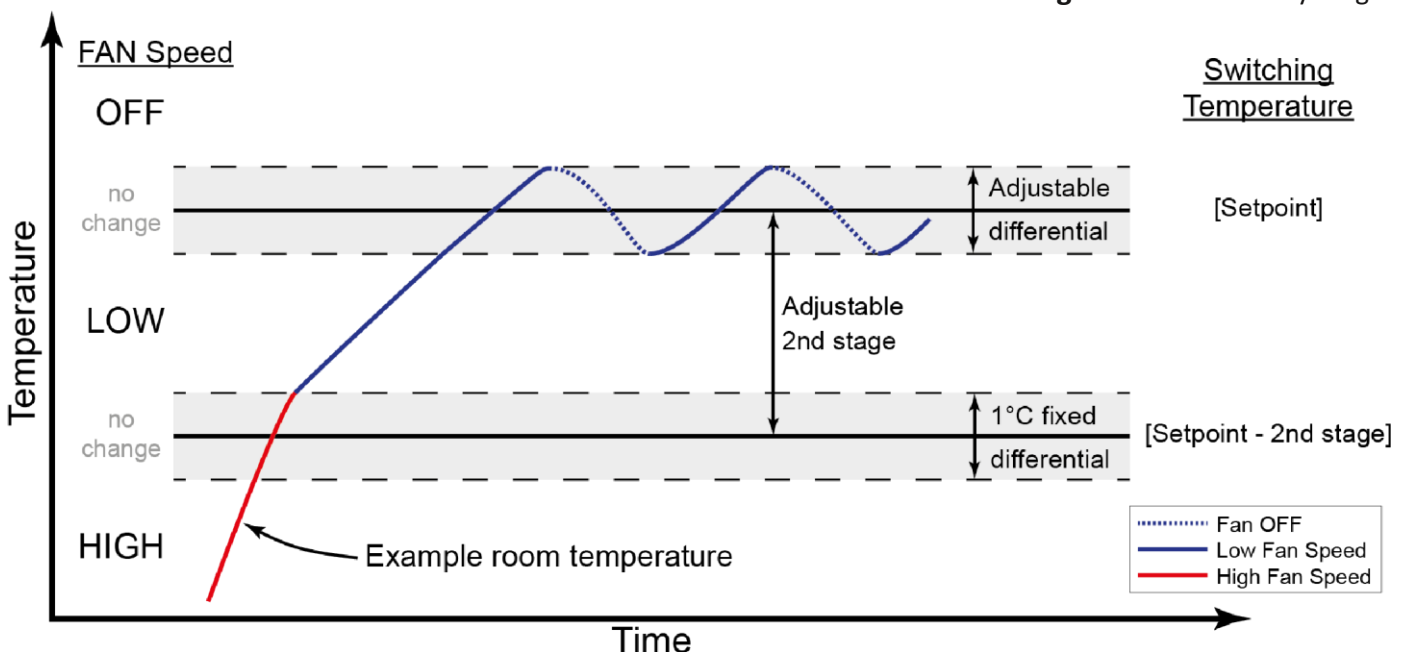
The E812+ADJ regulates to a fully adjustable temperature Setpoint between +16°C and +26°C, combined with an adjustable temperature hysteresis (differential) of anything between 0.25°C and 4°C and an adjustable 2nd Stage between 2°C and 10°C below the Setpoint. The temperature Setpoint is fully adjustable by the end-user up to a pre-defined maximum temperature which is selected at installation. This provides satisfaction to the end-user in that they believe they have full control over the room temperature but also provides significant savings to the bill payer from the fact that they are able to permanently limit the maximum temperature the end-user is capable of selecting.

2-stage functionality is used when the E812+ADJ controls a heating device such as a multi-speed fan convector. The thermostat automatically adjusts the fan speed or heat output depending on how far the sensed room temperature is away from the target room temperature.

When the room temperature is sensed to be below the configurable 2nd Stage temperature the High fan speed is selected. When the temperature is sensed to be between this 2nd Stage temperature and the Setpoint temperature the Low fan speed is selected. When the sensed room temperature reaches the Setpoint temperature the fan is turned Off. The temperature hysteresis (differential) is operational at the Setpoint temperature but is fixed at 1°C around the 2nd Stage temperature. See Figure 1 for a graphical representation.

This 2-stage functionality results in raising the room temperature quickly if it is very low using a high fan speed, but then switches to a lower fan speed (and hence much quieter mode of operation) once the room temperature is reasonably close to the target. This makes the 2-stage thermostat ideally suited to areas such as classrooms where a rapid initial response is required but quiet operation is required thereafter.

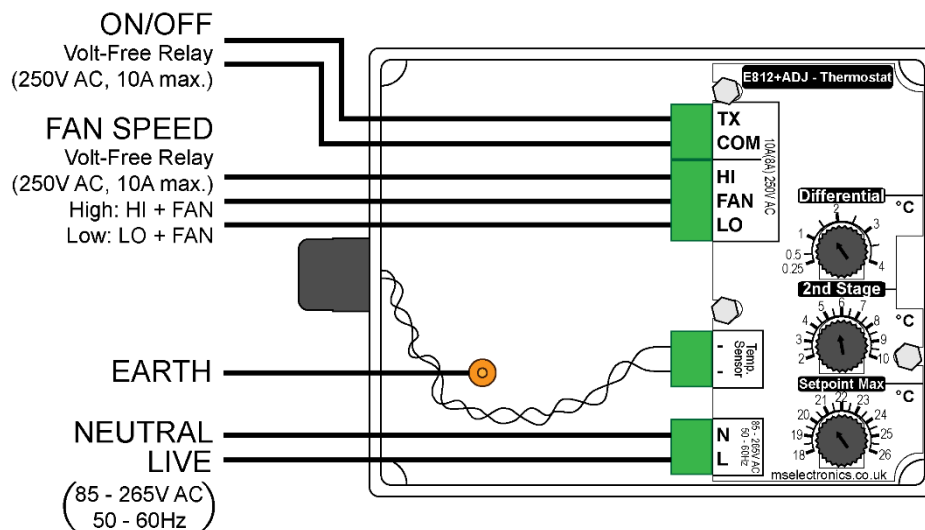
Figure 1: Functionality Diagram



Product Wiring

1. **IMPORTANT:** ensure all electrical connections are isolated before commencing any work on the unit.
2. Power to the thermostat is provided via the Live and Neutral input terminals labelled “L” and “N” (85 - 265V AC, 50 - 60Hz). On the 24 volt product variant (“/24V”) the same terminals are used (24V AC or DC) and are not polarity sensitive.
3. **NOTE:** This thermostat **MUST** be earthed using the earth terminal provided.
4. Two voltage-free relay outputs capable of switching loads of up to 10A, 250V AC (resistive) is provided by the thermostat. The two relays operate as follows:
 - The “FAN” terminal is connected to the “HI” terminal when the sensed room temperature is: Below the temperature “Setpoint” - “2nd Stage”.
Conversely, it is connected to the “LOW” terminal when the sensed room temperature is: Above the temperature “Setpoint” - “2nd Stage”.
 - The “COM” terminal is connected to the “TX” terminal when the sensed room temperature is: Below the temperature “Setpoint”.
Conversely it is disconnected from the “TX” terminal when the sensed room temperature is: Above the temperature “Setpoint”.
5. The temperature sensor is factory fitted to all models with the exception of the Remote Sensor (/RS) versions. A 2-core screened cable connection should be made to the “Temp. Sensor” terminals on /RS versions, with the screen connected to the thermostat Earth terminal only.

Figure 2: Typical Wiring Diagram



Installation

1. **IMPORTANT:** ensure all electrical connections are isolated before commencing any work on the unit.
2. Unscrew the 4 security screws using M.S. Electronics tamperproof screwdriver MSD-152 to remove the front cover. Disconnect the wire at the in-line connector to completely remove the lid.
3. Mount the unit securely using any suitable fixing in conjunction with the mounting holes provided in the unit. For optimal results, position the temperature sensor out of direct sunlight, well away from any heating/cooling sources and approximately 1.5m to 2m from the floor.
4. Using Figures 2 to 5 as a guide, connect the wiring in a suitably appropriate form with the convenient pluggable terminal blocks provided. Contact Technical Support with the heater make and model number for specific help if a suitable wiring method is unclear.
5. On the remote sensor version (/RS), 2-core screened cable should be used to connect the remote sensor to the thermostat. The screen should be connected to the earth terminal ONLY (do not connect the screen to anything at the remote sensor end).
6. Adjust the internal controls to suit the operational requirements (see the ‘Operation’ section).
7. Re-connect the in-line connector and replace the cover securely using the 4 security screws.

Typical Fan Convector Wiring Examples

The diagrams in Figures 3 to 5 illustrate a few generic methods of how to electrically connect the thermostat to a multi-speed fan convector. If you are unsure which of the below diagrams is most suited to your application, please contact our Technical Support team with the specific make and model of heater for further assistance.

Note: The heater may have more than 2 speeds, however the E812+ADJ can only control a maximum of 2 speeds (plus 'Off'). When selecting the low fan speed, ensure that in the worst case there is still sufficient heat output to maintain the desired room temperature. A medium speed may need to be selected for the low speed in some cases.

Figure 3: Hot water fan convector (a)

The transformer and the fan are in the same module.
The thermostat routes the Live supply to the correct speed selection terminal on the heater.

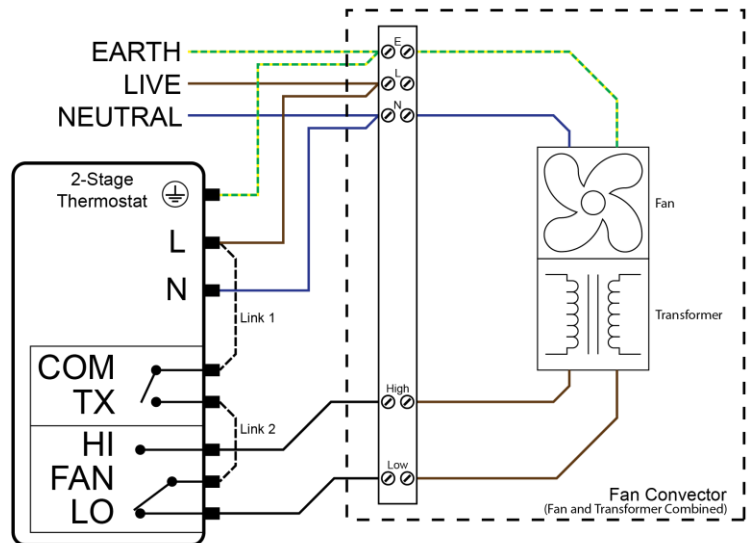


Figure 4: Hot water fan convector (b)

The transformer and the fan are in separate modules.
The transformer has different speed outputs. The thermostat routes the correct speed directly to the fan.

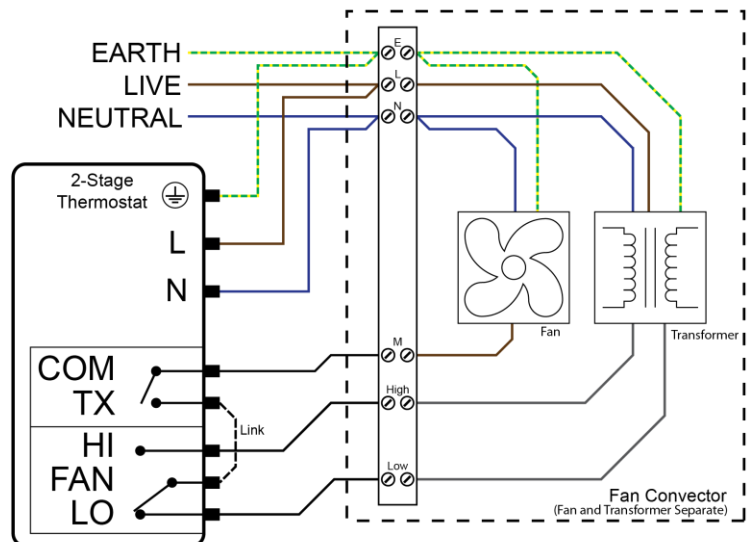
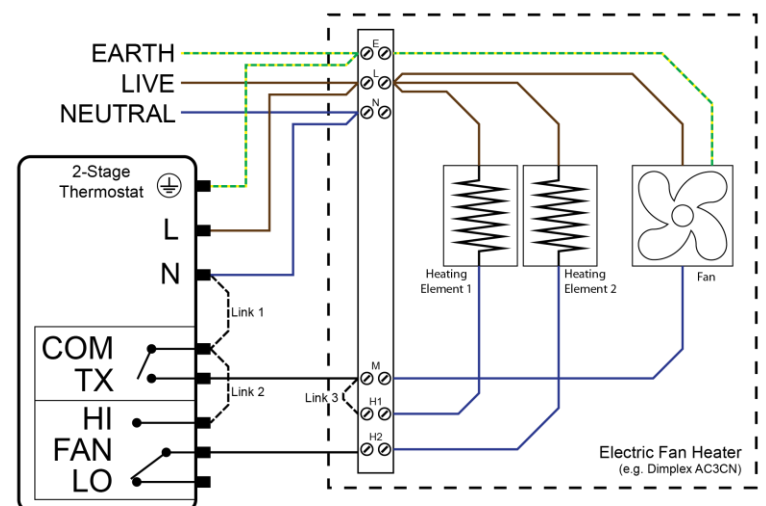


Figure 5: Electric fan convector

Rather than changing fan speeds the thermostat correctly selects either 1 heating element + fan, or 2 heating elements + fan.



Operation

1. **IMPORTANT:** ensure all electrical connections are isolated before commencing any work on the unit.
2. Set the “Differential” to the total temperature swing either side of the “Setpoint” that the room temperature is required to keep within (typically 1°C).
3. Adjust the “2nd Stage” to the temperature below the “Setpoint” that the fan is to automatically change between the High and Low speeds.
4. Adjust the “Setpoint Max” dial to the the maximum room temperature the end-user is allowed to select.

Example of a typical set-up:

“Differential” set to 1°C, “2nd Stage” set to 4°C and “Setpoint Max” set to 23°C.

The end-user will be able to select any temperature between 16°C and 23°C.

The room temperature will be maintained at the selected temperature +/- 0.5°C.

If the sensed temperature is more than 4°C below the selected temperature then the high fan speed will be selected.

If the sensed temperature is less than 4°C below the selected temperature then the low fan speed will be selected.

Technical Specification	
Power supply:	85V - 265V AC 50Hz (live/neutral/earth) 22V - 26V AC or DC (“/24V” variant only)
Output switch rating:	10A, 250V AC (resistive)
Output switch type:	On/Off: Single contact relay (volt-free) High/Low: Changeover relay (volt-free)
Temperature control:	[Setpoint]: +16°C to +26°C [2nd Stage]: 2°C to 10°C below the Setpoint [Setpoint Max]: +18°C to +26°C
Temperature differential:	0.25°C to 4°C
2-stage control:	2 speeds (High/Low) + Off
Sensor drift:	0.15°C over 5 years
Guarantee:	3 Years
Weight:	0.35Kg
Dimensions:	120mm x 95mm x 35mm

Product Accessories	
MSD-152	M.S. Electronics tamperproof screwdriver
MSD-150	Air temperature sensor (sensor only)
MSD-224	Air temperature sensor (internal, boxed)
MSD-370	Air temperature sensor (internal, faceplate)

IMPORTANT INSTALLATION NOTICE

The installation of this product should be carried out in accordance with the latest IEE wiring regulations and all wiring completed by a qualified electrician.

Technical Support

For further help or information on this and the other products in the MS Electronics range visit www.mselectronics.co.uk or call 0333 666 1176.

Alternatively, email techsupport@mselectronics.co.uk

Additional copies of this product guide can be downloaded from our website.

Product Warranty

MS Electronics guarantees all their products against manufacturing defects for 3 years from the purchase date. If your product is found to be faulty, MS Electronics will, at their discretion, repair or replace the product free of charge.

Note

Any modification or damage to the outer casing of the product, as well as any damage to the product due to abuse or incorrect wiring may invalidate the guarantee.

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