



TPI Control

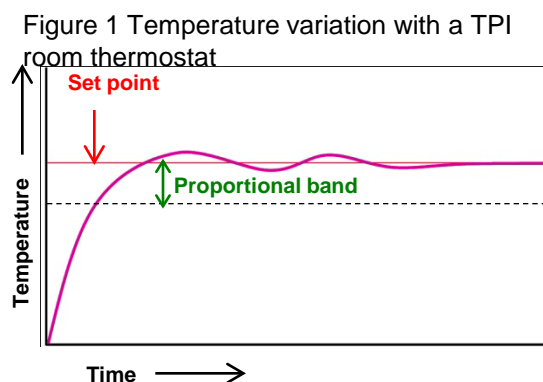
What is TPI Control?

TPI (Time Proportional & Integral) control is an industry standard term for an On/Off control using an advanced energy saving control method that can be used by most heating systems in the UK. The controls simply switch current supplied to the boiler on or off at different times. Unlike a traditional thermostat, these rely on digital technology that matches the boiler firing to the load on the system.

How does TPI Control work?

A thermostat operates using a fixed number of firing periods per hour (normally selected to suit the appliance and system). It then calculates how many minutes are required within each firing period to satisfy the demand of the rooms. This allows the flow temperature from the boiler to fall as demand reduces, which helps the return temperature to stay below the Dew Point (55°C) so that the boiler can operate in condensing mode more frequently.

A TPI room thermostat will have 100% demand when the system first calls for heat. When the room temperature approaches the **set point**, it enters the **proportional band** where the demand varies. The TPI thermostat will then reduce the firing time in that cycle period in proportion with the demand (i.e. if the **proportional band** is 2°C and the room temperature 1°C from **set point**, it will fire the boiler for 50% of the cycle period). This means that as the room temperature approaches **set point**, the boiler is fired progressively less. Further smoothing of this demand is achieved with the Integral part of the calculation, which, when combined, prevent the thermostat 'hunting' at all. The control will be at a steady even temperature with little variation, as can be seen in Figure 1.



The thermostat can then also have an intelligent or self learning facility, so that when it first operates, it can recognise how the system responds to its demand signals and can adjust them to adapt to the fabric of the building and the system as it is installed to give better control.

Can TPI controls be used on all boilers?

Yes.

What is required of heating controls in the Building Regulations?

Building Regulations require that every system has a room thermostat, whether old or new. This will form an essential part of the Boiler Interlock, providing the means to switch the boiler off when it is no longer required. This performance can be enhanced using a TPI thermostat.

How can a system be improved from Building Regulation requirements?

By fitting a TPI, the boiler efficiency is improved, TACMA tests indicate that under steady state conditions this can be as much as 10%. This would be reduced by seasonal and operational losses. But in addition, because the control is so much more accurate, the set point can be reduced, without loss of comfort, introducing extra savings.

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