

Installer Guide

Boiler Plus **additional** **guidance**



New rules for boiler installations in England 2018

Changes To Part L of the Building Regulations – additional guidance

1. Requirements for all new and replacement gas boilers installed in existing dwellings in England

The following details additional guidance on changes to part L of the Building Regulations for boilers installed in England from 6th April 2018.

Changes to Building Regulations Approved Document L1b and the associated Domestic Building Services Compliance Guide (DBSCG), came into effect on April 6th 2018. The new standards improve the way many people use energy in their homes by giving them greater choice, greater control, and tangible savings on their energy bills.

Note: Part L1B of the Building Regulations and the associated Domestic Building Services Compliance Guide (DBSCG) are both free to download via the following link: <https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l>

Changes to the DBSCG implement a new minimum performance standard for gas boilers installed or replaced in existing dwellings in England, which is now a minimum 92% seasonal space heating efficiency, as defined by the European rating system (ErP)¹. Details of the ErP rating of a boiler must be displayed on the manufacturer's website and in their literature.

In addition, all new gas and oil boiler installations must include 'boiler interlock, time and temperature controls' (programmer, or timer and a room thermostat or a programmable room thermostat) that turn off the boiler and circulation pump when there is no demand for space heating or hot water.

2. Additional Energy Saving Measures for combination boilers

At least one of the following four Additional Energy Saving Measures is required when installing gas combination boilers in existing dwellings in England:

- **Flue gas heat recovery**
- **Weather compensation**
- **Load compensation**
- **Smart thermostat (with automation and optimisation functions)**

This document is intended to assist with the interpretation of additional measures required, as outlined in the Boiler Plus policy document². For each measure; guidance on the technology is given and an interpretation of the standard is provided to help with understanding and compliance. It is recommended that Control manufacturers are contacted regarding the suitability of their controls if you are unsure whether they meet the definitions detailed in this document.



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Note: many manufacturers offer free of charge training which encompasses the detailed operation of their controls and how they meet the new requirements detailed below.

Flue Gas Heat Recovery (FGHR)

This is defined as: **A device which pre-heats the domestic hot water supply by recovering heat from the boiler's flue emissions**

Flue gas heat recovery, sometimes referred to as passive flue gas heat recovery, is an established technology which improves the efficiency of a combination boiler. This measure works by recovering heat from waste flue gases to preheat the cold water prior to entering the combi boiler hot water plate heat exchanger, thereby lowering the overall amount of energy needed.

Different designs of FGHR products are available on the market, some are separate self-contained devices, which are installed above the boiler, and some boilers are available with in-built FGHR solutions. In the case of self-contained units always refer to manufacturer's instructions to ensure compatibility as the FGHR must be approved for use with specific boilers by the boiler manufacturer.

Weather Compensation

This is defined as: **A control function which maintains internal temperatures by varying the flow temperature from the heat generator relative to the measured outside air temperature**

Weather compensation controls run the boiler at the lowest possible flow temperature in relation to the outside temperature, whilst providing sufficient output to the heat emitters to maintain comfort. This helps to optimise the boiler's operation in condensing mode, saving energy and maximising boiler efficiency.

A means of measuring outside air temperature is required, and can be achieved by fitting a sensor external to the dwelling, available as either a wired or wireless configuration. Alternatively, and in accordance with the Government policy document and consultation response, any device which draws outside temperature from internet-sourced local weather data would also meet this requirement.

When using measured weather data it is still necessary to vary the flow temperature from the boiler in order to achieve energy savings, and communication between the control device and the boiler is necessary to modulate the boiler flow temperature directly.

Devices on the market that offer multiple function weather compensation and time and temperature control comply as a single device, whereas a single function weather compensator would also require a programmer and a room thermostat to meet all the requirements of the policy (i.e. boiler interlock, time and temperature control).

Typically a compensation curve is selected when commissioning the installation to reflect the level of thermal efficiency of the building and the emitter type present. Manufacturer's guidance should be followed.³

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Load Compensation

This is defined as: **A control function which maintains internal temperatures by varying the flow temperature from the heat generator relative to the measured response of the heating system**

The principle of load compensation is like that of weather compensation, except internal measured room temperature is used as the reference point.

An internal sensor in the control device measures the room temperature and relays a signal to the boiler. By measuring the gap between the internal room temperature and the user set point temperature, the boiler must modulate its flow temperature and heat output in response, to only use as much fuel as is necessary to close the gap. This optimises the boiler's operation in condensing mode, saving energy and maximising boiler efficiency.

Since the release of the boiler plus policy several questions have been raised, including the validity of Time, Proportional and Integral (TPI) controls in relation to the definition of load compensation. In response, Government released an FAQ document⁴ which states *"The description given for load compensation should not be misinterpreted as including TPI controls. The Domestic Building Services Compliance Guide identifies the technologies in scope and provides descriptions based on SAP definitions, and TPI controls are not included."*

When installed with other measures, for example with flue gas heat recovery, weather compensation, or when fitting a system or regular boiler, TPI control can still be installed.

Note: checking on the manufacturer's website to see if the control has an ErP classification of IV should establish if the control is approved as TPI.

⁵**ErP Class IV - TPI room thermostat** – "for use with on/off output heaters: An electronic room thermostat that controls both thermostat cycle rate and in-cycle on/off ratio of the heater proportional to room temperature..."

As with weather compensation devices, programmable load compensating room thermostats, that fulfil the requirement for time and temperature control, comply as they stand. If the device is a load compensation thermostat only then a programmer is also required, to provide time control.

Communications Protocols

For the control functions which require communication between a control device and a boiler to effect flow temperature modulation it is important to consider communication protocols.

Some manufacturers support generic protocols, such as OpenTherm, which enables communication between similar certified devices, whereas other manufactures' choose to utilise proprietary protocols that are typically only designed to work with their specific system. Please consult with your preferred supplier to determine compatibility and options available to meet the new requirements.

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Smart Thermostat

This required functions are defined as: **Automation – a control function which automatically adjusts time and temperature settings based on occupancy detection and/or stored data from user adjustments over time**

Optimisation – a control function which starts the boiler operation at the optimum time to achieve the set-point temperature at the start of the occupancy period

Smart thermostats are relatively new to market and there is no widely accepted definition of what “smart” entails. However, whilst the DBSCG does not mention internet connectivity or control via a smart phone or similar, it is noteworthy that the Government policy document states “Smart thermostats are products that let consumers remotely control their home temperature via a tablet, smartphone or desktop for greater control over the central heating system”. Where boiler plus is specific is in terms of the two defined functions **required** by a smart thermostat:

Automation: requires the device to automatically adjust the heating schedule times based upon either occupancy detection or stored data from user adjustments over time. The policy document states: *“Advanced examples detect where householders are, such as through sensor data or geolocation based on smart phone data. This means the heating system will not operate more than necessary when it isn’t needed, and if householders are away for an extended period the heating can be switched off remotely or automatically.”*

Optimisation: is optimum start technology which has been in use for some time. The policy document states that *“the device calculates how long it takes the property to reach the desired comfort level, and times the system’s operation to minimise the amount of work it has to do. Usually it also modulates the output of the boiler in a similar way to load compensation, so as little fuel as possible is consumed.”*

This implies a learning capability to meet this definition.

Not all smart thermostats offer both automation and optimisation, but those offering load compensation or weather compensation offer a route to compliance under the respective definitions for these control functions. Note that in such instances, to effect modulation of the flow temperature, communication between the smart thermostat and boiler would be required.

Benchmark commissioning process

Benchmark is a nationally recognised scheme that gives manufacturers and installers the responsibility for ensuring best practice for the installation, commissioning and servicing of domestic heating and hot water products. Building Regulations require users to be provided with a commissioning certificate for the heating system and operating and maintenance instructions for the boiler, which includes information on how to use their controls to reduce energy. The commissioning certificate is completed by the heating engineer as part of the BENCHMARK commissioning process, and is usually detailed in the boiler manufacturers’ operating and maintenance guide, or installation instructions.

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Boiler + standards summary:

- **Boiler efficiency of at least 92% ErP**
- **Time control, temperature control, and boiler interlock**
- **For combi boilers add at least one of the following:**
 - **Flue gas heat recovery**
 - **Weather compensation**
 - **Load compensation**
 - **Smart control with automation and optimisation functions**

Additional information and references:

- ¹ - Commission Regulation (EU) No. 813/2013 - implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters:
<https://publications.europa.eu/en/publication-detail/-/publication/ed0d78b9-0280-11e4-831f-01aa75e-d71a1/language-en/format-PDF/source-71238312>

- ² - Heat in Buildings; Boiler Plus

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/651853/Boiler_Plus_final_policy_and_consultation_response.pdf

- ³ - HHIC Weather Compensation – Installer factsheet:
<http://www.hhic.org.uk/uploads/5A5F2F2C7D545.pdf>

- ⁴ - Department for Business, Energy and Industrial Strategy (BEIS); Boiler Plus: New standards for domestic boiler installations from April 2018; Frequently Asked Questions (FAQ's):
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/673023/Boiler_Plus_Factsheet_v3.pdf

- ⁵ - Commission communication in the framework of the implementation of Commission Regulation (EU) No 813/2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters and of Commission Delegated Regulation (EU) No 811/2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device:
[https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XC0703\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XC0703(01)&from=EN)

- Approved Document L1B: conservation of fuel and power in existing dwellings, 2010 edition (incorporating 2010, 2011, 2013, 2016 and 2018 amendments)

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