Boiler output control

Varies the heat output of a gas or oil boiler connected to a hydronic heat emitter system and may directly affect operational efficiency

Function	Name	Smart	Description
BOC1	On/off control		Sends 'on' signal to boiler to call for heat or in the absence of an 'on' signal the appliance will be off.
BOC2	Sequenced on/off control (algorithm based)		Sends 'on' signal to boiler to call for heat (in the absence of an 'on' signal the appliance will be off) based on an algorithm within the control device to vary the flow temperature of the boiler and the mean water temperature of the heat emitters. Examples of algorithms are PWM, P, P+I, PID, fuzzy logic etc.
BOC3	Modulating control of boiler.		The control communicates with the boiler to sense and vary the flow temperature and/or power of the boiler and the mean water temperature of the heat emitters.

Temperature monitoring

Monitors temperature(s) and provides information to the Boiler Output Control or Emitter Output Control to maintain setpoint

Function	Name	Smart	Description
BTM1	Internal temperature (mechanical)		Measures the internal temperature and generates a control response via wholly or partially thermo-mechanical means when the temperature goes above or below set-point temperature
BTM2	Internal temperature (electronic)		Measures the internal temperature and generates a control response electronically when the temperature goes above or below set-point temperature
BTM3	Internal temperature + set-point deviation		Measures the internal temperature and generates a control response relative to the difference between internal temperature and set-point temperature.
BTM4	Black bulb internal temperature sensor		Measures both air and radiant temperature to generate a control response
BTM5	Dual internal temperature		Measures temperature at 2 points internally and generates a control response relative to the difference between the aggregated internal temperature and set-point temperature
BTM6	Multiple internal temperature		Measures temperature at 3 or more points internally and generates a control response relative to the difference between the aggregated internal temperature and set-point temperature.
BTM7	External temperature sensor		Monitors temperature external to the building and generates a control response in response to this temperature and a temperature compensation curve
BTM8	External temperature data		Receives local temperature data via indirect means (e.g. cloud/web/api) and generates a control response in response to this temperature and a temperature compensation curve
BTM9	External temperature sensor + internal temperature		Monitors temperature external to the building and generates a control response in response to this temperature and a temperature compensation curve. The internal temperature is monitored and used to adjust the compensation curve to improve internal comfort.
BTM10	External temperature data + internal temperature		Receives local temperature data via indirect means (e.g. cloud/web/api) and generates a control response in response to this temperature and a temperature compensation curve. The internal temperature is monitored and used to adjust the compensation curve to improve internal comfort.

Time control

Automatically turns heating system or emitter on and off, or to different setpoint temperatures in accordance with user defined settings.

Function	Name	Smart	Description
BTC1	24-hour time		Allows user to set 'on' and 'off' times for a 24-hour period, which will repeat unless re-set.
BTC2	24-hour, 5+2 day time		Allows user to set different 'on' and 'off' times for two separate 24-hour periods (one for weekdays and one for weekend days)
BTC3	24-hour, 7-day time		Allows user to set 'on' and 'off' times for a 24-hour period for each day of the week
BTC4	24-hour time + temperature		Allows user to set more than one 'on' time and set-point temperature for each 'on' period, for a 24-hour period, which will repeat unless re-set.
BTC5	24-hour, 5+2 day time + temperature		Allows user to set more than one 'on' time and set-point temperature for each 'on' period for two separate 24-hour periods (one for weekdays and one for weekend days)
BTC6	24-hour, 7-day time + temperature		Allows user to set more than one 'on' time and set-point temperature for each 'on' period, for a 24-hour period for each day of the week.

Emitter output control

Automatically changes the heat output of a room emitter

Function	Name	Smart	Description
RHC1	On/off control		Sends 'on' signal to call for heat and 'off' signal when call for heat ends
RHC2	Flow control (emitter)		Varies heat output from an emitter by varying the flow of a hot fluid through it.
RHC3	Flow control (surface heating)		Varies heat output in a room or zone by varying the flow of a hot fluid to that room or zone.

Emitter balancing device

Automatically adjusts the emitter to balance the heating system

Function	Name	Smart	Description
EBD1	Static balancing		Description to be provided
EBD2	Dynamic balancing by temperature		Description to be provided
EBD3	Dynamic balancing by flow		Description to be provided

Central zone control for space heating

Central control of more than one heating zone

Function	Name	Smart	Description
ZCH1	Two zone heating times		Allows user to set different times of heating operation in two zones
ZCH2	Multi zone heating times		Allows user to set different times of heating operation in three or more zones
ZCH3	Multi room heating times		Allows user to set different times of heating operation in each heated room
ZCH4	Two zone heating temp.		Allows user to set different set-point temperatures in two zones
ZCH5	Multi zone heating temp.		Allows user to set different set-point temperatures in three or more zones
ZCH6	Multi room heating temp.		Allows user to set different set-point temperatures in each heated room

Optimisation

Automatically adjusts operating conditions to reduce energy use without compromising comfort

Function	Name	Smart	Description
OPT1	Delayed start		Delays the set starting time for space heating according to the temperature measured inside or outside the building.
OPT2	Optimum start		Adjusts the starting time for space heating according to the temperature measured inside or outside the building, aiming to prevent the building heating to the required temperature before the chosen time.
OPT3	Optimum stop		Adjusts the ending time for space heating according to the temperature measured inside or outside the building, aiming to prevent the building staying at or exceeding the set-point temperature after the chosen time.
OPT4	Presence detection (whole building)		Monitors building occupancy or uses detected presence information to adjust time schedules or temperature control
OPT5	Presence detection (zoned)		Monitors occupancy or uses detected presence information within two or more zones in the building to adjust time schedules or temperature control.
OPT6	Presence detection (rooms)		Monitors occupancy or uses detected presence information within individual rooms to adjust time schedules or temperature control.
OPT7	Open door or window detection		Monitors whether doors or windows are open or closed and uses this information to adjust time schedules or temperature control.
OPT8	Learning (occupancy)	✓	Monitors occupancy and/or usage patterns and, in response, adjusts system operation to optimise performance, based on cost and/or environmental factors
OPT9	Learning (performance)	✓	Monitors building or system performance and, in response, adjusts system operation to optimise performance, based on cost and/or environmental factors
OPT10	Heat source selection	✓	Prioritises between different heat sources, or a combination of these, based on cost and/or environmental factors
OPT11	Response to external signals	✓	Control with consideration for external signals (e.g. electricity tariff, gas pricing, load shedding signal etc.)
OPT12	Thermal storage	✓	Prioritises between space and/or water heating and provision/use of thermal storage

Connectivity

Communications capability that facilitates information exchange internally or externally

Function	Name	Smart	Description
CNC1	Internet connectivity	✔	Device can connect to the internet
CNC2	CAD connectivity	✔	Device can be connected to a UK specified Consumer Access Device
CNC3	Device connectivity	✔	Device can communicate internally and externally to other devices via a communication protocol

User interface

Interfaces to help users set up or modify operating parameters and/or for the presentation of data to the user

Function	Name	Smart	Description
UIN1	Operational feedback		Provides user with feedback on the operation of the heating or hot water system
UIN2	Consumption feedback	✔	Provides user with feedback on the energy consumption resulting from the operation of the heating or hot water system
UIN3	Remote access	✔	Facility for system operational parameters to be set and adjusted without physical access to the control interface
UIN4	Synchronisation	✔	User settings can be synchronised from or with an external device

Safety and security

Monitoring and control features that increase the safety and security of the heating system operation

Function	Name	Smart	Description
SAF1	Frost Protection		A function where a heating system operates (overrides any normal "off" period) to protect the system during periods of adverse low temperatures
SAF2	Minimum Temperature Setting		The feature of a device to have minimum room temperature(s) set which, when reached, will automatically energise the space heating system
SAF3	Carbon Monoxide Monitor		Carbon monoxide detection that results in the generation of a user alarm
SAF4	Carbon Monoxide Shut Off		Carbon monoxide detection or response to a carbon monoxide alarm that shuts down the operation of the heat source
SAF5	Servicing reminder		Provides occupants with information on when system servicing is required
SAF6	Locked Temperature Adjustment		Anti-tamper feature that prevents the set point temperature from being adjusted e.g. for public spaces
SAF7	Service interval limitation		Automatically deactivates or reduces the heating or hot water generation after a set period of time
SAF8	Boiler diagnostics	✔	Automatically senses operating parameters of boiler and sends signal to indicate operational issues or efficiency reductions