



*i*CCS COMMERCIAL CONTROL SYSTEM

EVOMAX 2

When replacing any part on this appliance, use only spare parts that you can be assured conform to the safety and performance specification that we require. Do not use reconditioned or copy parts that have not been clearly authorised by Ideal Heating.

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CONTENTS

1	INTRODUCTION	4	3.7.11 Menu – Heating circuit – Settings - Preheat.....	18	
1.1	Combustion Manager.....	4	3.7.12 Menu – Heating circuit – Settings – Heating limit.....	18	
1.2	System Manager.....	4	3.7.13 Menu – Heating circuit – Settings – Room temp. switch diff.....	18	
1.3	VariCAN Adapter.....	4	3.7.14 Menu – Heating circuit – Settings – Pump.....	18	
1.4	Extension Module.....	4	3.7.15 Menu - Heating Circuit - Settings - Heating Curve.....	18	
1.5	VariCAN Bus.....	4	3.7.16 Menu – Heating Circuit – Settings – Frost protection.....	19	
2	PARTIAL HYDRAULIC CIRCUITS	4	3.7.17 Menu – Heating Circuit –Time clock.....	19	
3	OPERATING GUIDE	5	3.7.18 Menu – Heating circuit – Holiday programme.....	19	
3.1	Glossary.....	6	3.8 Menu – DHW.....	19	
3.1.1	Menu function resource definitions.....	6	3.8.1 Menu – DHW - Status.....	19	
3.1.2	Pump definitions.....	6	3.8.2 Menu – DHW – Status - Summary.....	19	
3.2	Introduction.....	6	3.8.3 Menu – DHW – Status – Real time values.....	19	
3.3	Menu.....	6	3.8.4 Menu – DHW – Status – Real time values – Demand inputs.....	19	
3.4	Menu - Configuration.....	6	3.8.5 Menu – DHW – Status – Real time values – Sensors.....	20	
3.4.1	Menu - Configuration – General.....	6	3.8.6 Menu – DHW – Status – Real time values – Outputs.....	20	
3.4.2	Menu - Configuration - General - Language.....	7	3.8.7 Menu – DHW – Operating Mode.....	20	
3.4.3	Menu – Configuration – General - Date.....	7	3.8.8 Menu – DHW – Tank temperature.....	20	
3.4.4	Menu – Configuration – General - Time.....	7	3.8.9 Menu – DHW – Settings.....	20	
3.4.5	Menu – Configuration – General – Access level.....	7	3.8.10 Menu – DHW – Settings – One time boost.....	20	
3.4.6	Menu - Configuration.....	8	3.8.11 Menu – DHW – Settings – Pump.....	21	
3.5	Menu – Boiler.....	9	3.8.12 Menu – DHW – Settings – Legionella.....	21	
3.5.1	Menu – Boiler - Status.....	9	3.8.13 Menu – DHW – Settings – Frost protection.....	21	
3.5.2	Menu – Boiler – Status - Configuration.....	9	3.8.14 Menu - DHW - Setting.....	21	
3.5.3	Menu – Boiler – Status – Configuration - Inputs.....	9	3.8.15 Menu – DHW – Time clock.....	21	
3.5.4	Menu – Boiler – Status – Configuration - Outputs.....	10	3.8.16 Menu – DHW – Holiday programme.....	21	
3.5.5	Menu – Boiler – Status – Configuration - Parameters.....	10	3.9 Menu – Cascade manager.....	22	
3.5.6	Menu – Boiler – Status – Real time values.....	10	3.9.1 Menu – Cascade manager - Status.....	22	
3.5.7	Menu – Boiler – Status – Real time values - Inputs.....	11	3.9.2 Menu – Cascade manager – Status – Summary.....	22	
3.5.8	Menu – Boiler – Status – Real time values - Sensors.....	11	3.9.3 Menu – Cascade manager – Status – Boilers.....	22	
3.5.9	Menu – Boiler – Status – Real time values - Outputs.....	11	3.9.4 Cascade Manager - Operating Mode.....	22	
3.5.10	Menu – Boiler - Service.....	12	3.9.5 Menu – Cascade manager – Settings.....	22	
3.5.11	Menu – Boiler – Settings.....	12	3.9.6 Menu – Cascade manager – Settings – Boiler modulation.....	22	
3.5.12	Boiler Pump Operating Mode.....	13	3.9.7 Modulation max.....	22	
3.5.13	Boiler Pump Overrun time.....	13	3.9.8 Modulation min.....	22	
3.5.14	Menu – Boiler – Flue offset.....	13	3.9.9 Menu – Cascade manager – Settings – Sequence on delay.....	22	
3.5.15	Menu – Boiler – Hours run.....	13	3.9.10 Menu – Cascade manager – Settings – Sequence order.....	22	
3.5.16	Menu – Boiler – Faults.....	13	3.9.11 Menu – Cascade manager - Settings - Hours run.....	23	
3.5.17	Menu – Boiler – Faults – Summary.....	13	3.9.12 Menu – Cascade manager – Settings - Timed.....	23	
3.5.18	Menu – Boiler – Faults – Show detail.....	13	3.9.13 Menu – Cascade manager – Settings - Ext. heat source sequence.....	23	
3.5.19	Menu – Boiler – Faults – Reset.....	13			
3.6	Menu – Plant.....	13	4	INSTALLATION	24
3.6.1	Menu – Plant - Status.....	13	4.1	Electrical Connections.....	24
3.6.2	Menu – Plant – Status – Real time values.....	13	5	CONFIGURATION	25
3.6.3	Menu – Plant – Status – Real time values – Demand inputs.....	14	5.1	System Manager Interface.....	25
3.6.4	Menu – Plant – Status – Real time values - Sensors.....	14	5.2	Cascade Configuration.....	26
3.6.5	Menu – Plant – Status – Real time values - Outputs.....	14	5.3	Plant Configuration.....	28
3.6.6	Menu – Plant – Operating mode.....	14	5.4	Boiler Configuration.....	31
3.6.7	Menu – Plant – Settings.....	14	5.5	Heating Circuit Configuration.....	32
3.7	Menu – Heating circuits.....	16	5.6	DHW circuit configuration.....	34
3.7.1	Menu – Heating circuits - Status.....	16	APPENDIX 1 PARTIAL HYDRAULIC CIRCUITS	36	
3.7.2	Menu – Heating circuits – Status - Summary.....	16	APPENDIX 1a Boiler 1 Master Configuration Options.....	36	
3.7.3	Menu – Heating circuits – Status – Real time values.....	16	APPENDIX 1b Boiler n Slave Configuration Options.....	40	
3.7.4	Menu – Heating circuits – Status – Real time values – Demand inputs.....	16	APPENDIX 1c Extension Module Configuration Options.....	41	
3.7.5	Menu – Heating circuits – Status – Real time values – Sensors.....	16	APPENDIX 1d Abbreviations.....	45	
3.7.6	Menu – Heating Circuits – Status – Real time Values – Outputs.....	17			
3.7.7	Menu – Heating circuit – Operating mode.....	17			
3.7.8	Menu – Heating circuit – Room temperature.....	17			
3.7.9	Menu – Heating circuit – Flow temperature.....	17			
3.7.10	Menu – Heating circuit – Settings.....	17			

NOTE : LEAVE THESE INSTRUCTIONS ADJACENT TO THE iCCS

CONTENTS - Figures

FIGURE 1 SYSTEM MANAGER INTERFACE	5
FIGURE 2 VARICAN ADAPTOR DIAGRAM	24
FIGURE 3 EXTENSION MODULE DIAGRAM.....	24
FIGURE 4 SYSTEM MANAGER INTERFACE.....	25
FIGURE 5 SEQUENCE CONTROL 1-16 BOILERS	36
FIGURE 6 SEQUENCE CONTROL 1-16 BOILERS WITH MIXING HEADER AND SYSTEM PUMP.....	36
FIGURE 7 SEQUENCE CONTROL 1-16 BOILERS WITH INDIRECT HOT WATER STORAGE TANK	36
FIGURE 8 SEQUENCE CONTROL 1-16 BOILERS WITH A CT PUMP CIRCUIT.....	37
FIGURE 9 SEQUENCE CONTROL 1-16 BOILERS WITH COMMON PUMP AND OPTIONAL VALVES	37
FIGURE 10 SEQUENCE CONTROL 1-16 BOILERS WITH LOCAL DHW DEMAND	37
FIGURE 11 SINGLE BOILER WITH A CT PUMP CIRCUIT AND DHW TANK.....	38
FIGURE 12 SINGLE BOILER WITH 2 X CT PUMP CIRCUITS	38
FIGURE 13 SINGLE BOILER WITH CT AND HWS ZONE CIRCUITS	38
FIGURE 14 SINGLE BOILER WITH CT AND HWS ZONE CIRCUITS	39
FIGURE 15 SEQUENCE CONTROL 1-16 BOILERS, BOILER N.....	40
FIGURE 16 SEQUENCE CONTROL 1-16 BOILERS, BOILER N WITH CT PUMP CIRCUIT.....	40
FIGURE 17 SEQUENCE CONTROL 1-16 BOILERS, BOILER N WITH CT PUMP AND INDIRECT HWS CIRCUIT	40
FIGURE 18 SEQUENCE CONTROL 1-16 BOILERS, BOILER N WITH 2 X CT PUMP CIRCUIT	40
FIGURE 19 EXTENSION MODULE WITH 1 X MIXING CIRCUIT.....	41
FIGURE 20 EXTENSION MODULE WITH 2 X MIXING CIRCUITS	41
FIGURE 21 EXTENSION MODULE WITH 1 X MIXING CIRCUIT AND 1 X CT PUMPED CIRCUIT	41
FIGURE 22 EXTENSION MODULE WITH 1 X MIXING CIRCUIT AND 1 X AIR HANDLER CIRCUIT	42
FIGURE 23 EXTENSION MODULE WITH 1 X MIXING CIRCUIT AND 1 X HWS CIRCUIT	42
FIGURE 24 EXTENSION MODULE WITH 2 X AIR HANDLER CIRCUITS	42
FIGURE 25 EXTENSION MODULE WITH 1 X CT PUMPED CIRCUIT AND 1 X HWS CIRCUIT.....	43
FIGURE 26 EXTENSION MODULE WITH 2 X HWS CIRCUIT	43
FIGURE 27 EXTENSION MODULE WITH MIXING CONTROL TO PLATE HEAT EXCHANGER FOR DIRECT HWS	43
FIGURE 28 EXTENSION MODULE WITH MIXING CONTROL TO PLATE HEAT EXCHANGER FOR DIRECT HWS WITH DHW PUMP....	44
FIGURE 29 EXTENSION MODULE WITH MIXING CONTROL TO PLATE HEAT EXCHANGER FOR DIRECT DHW WITH PUMP	44
FIGURE 30 EXTENSION MODULE WITH PRIMARY BUFFER MIXING CONTROL TO PLATE HEAT EXCHANGER FOR DIRECT DHW WITH PUMP.....	44

1 INTRODUCTION

This document describes the *i*CCS which is a commercial control system platform that is integrated at all levels in a plant room, from the combustion manager within the boiler to the extension module at the final heating and DHW circuits.

It covers the description of the system and its modules, along with the configuration, hydraulic circuits supported, interconnection wiring, data logging and fault management.

The *i*CCS consists of:

- Boiler combustion manager
- System manager
- VariCAN adapter
- Extension module
- System accessories

1.1 Combustion Manager

The Combustion manager is mounted in the boiler and controls the internal safety functions associated with a heat engine. It also provides information to the System manager on the status of the heat engine as well as auxiliary inputs and outputs.

1.2 System Manager

The System manager is located within the boiler and provides the controlling functions. One System manager is required per boiler, it can support multiple Combustion managers. The System manager also provides the User interface function.

A System manager can be configured as a Master or Slave in a cascade of Boilers, and/or when any external module is used. E.g. Extension module.

The Master System manager controls both its own Combustion manager and all other Slave System managers as well as the external modules. It can also control other Combustion managers within the same boiler.

1.3 VariCAN Adapter

The VariCAN adapter is an optional accessory that is installed within the boiler. It allows the Bus communication system to be extended outside of the boiler to either other boilers in a Cascade, where each boiler requires one, or to the Extension modules.

1.4 Extension Module

The Extension module adds additional Heating, DHW storage and Hot Water Systems to the installation.

1.5 VariCAN Bus

The *i*CCS communicates using the VariCAN bus. A total of 60 devices can be managed on a single bus, made up from a mix of Combustion managers, System managers and Extension modules. Each of these is counted as one device on the VariCAN bus.

It is possible to cascade up to 16 boilers on the VariCAN bus, 1 Master System manager and 19 Slave System managers.

The system can support up to 8 Extension modules.

However, the total number of devices still cannot exceed 60.

2 PARTIAL HYDRAULIC CIRCUITS

Refer to **APPENDIX 1** on page 36.

3 OPERATING GUIDE

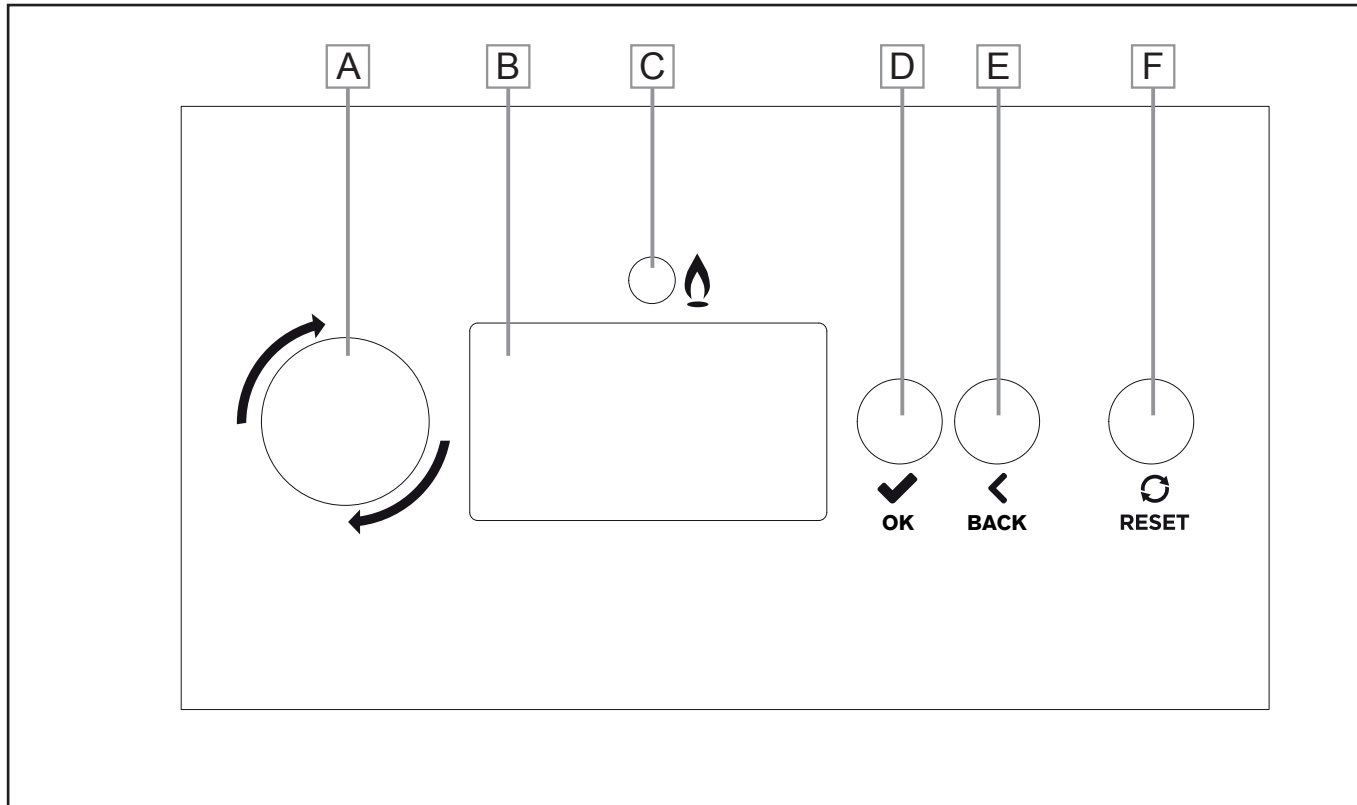


FIGURE 1 SYSTEM MANAGER INTERFACE

A. Rotary Knob

- Enter a menu, if in the normal operation screen, and highlight the first menu item.
- Scroll up (anti-clockwise) or down (clockwise) in a menu
- Change the value in parameter setting.
- If an error is showing in the title bar, scroll to the associated error screen(s), and return.

B. LCD Display Screen

- Menu and status display.

C. Burner LED

- Will be on if the burner is lit.

D. Select button

- Enter a menu, if in the normal operation screen, and highlight the first menu item.
- Enter the highlighted menu (sub menu or parameter), if in a menu or sub menu.
- If in a parameter setting, select a parameter which will then flash for adjustment, once adjusted using the rotary knob press again to store and move on.

E. Back button

- In a menu, return to the previous menu layer.
- In parameter setting, exit the parameter without storing the value.
- In a guided assistant, go back to the previous screen.

F. Reset button

- Reset the associated boiler module error, if a resettable (lockout) error is active.
- Return to the normal operation screen.

3.1 Glossary

3.1.1 Menu function resource definitions

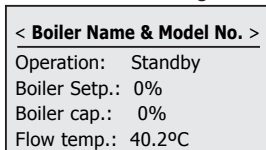
- Plant – related to the master or standalone boiler for plant control (common) functions
- Boiler – only related to an individual boiler and only used by that boiler
- Heating Circuit – only related to an individual heating circuit
- DHW circuit – only related to an individual DHW circuit

3.1.2 Pump definitions

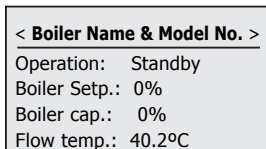
- System pump – used to circulate water through the Heating and/or Domestic Hot Water circuits as well as either the boiler or the secondary side of a Low Loss Header or Plate Heat Exchanger.
- Shared boiler pump – used to only circulate water through more than one boiler
- Shunt pump – used to circulate an amount of water between flow and return to limit the temperature differential
- Boiler pump – used to only circulate water through a single boiler
- HC pump – a pump or valve that allows flow through a Heating Circuit
- DHW pump – a pump or valve that allow flow through a Domestic Hot Water circuit

3.2 Introduction

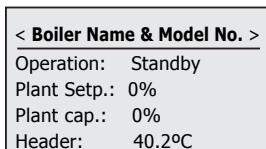
Once the boilers are installed and configured there are still a number of functions available for the overall system Settings, the Status of the Boilers, Heating Circuits, and Cascade. The status screens of each boiler in the cascade are the same, they show the same information in relation to the boiler, and each slave will show the following screen:



The Master will show the same except for a small left pointing chevron in the top left hand corner, this is indicating that there is a second status screen access by turning the knob anticlockwise:



On the Master boiler in the cascade there is an additional status screen which gives information in relation to the system, on rotating the knob anticlockwise:

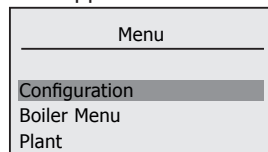


The chevron will now be right pointing and appear on the top right hand corner, indicating that there is another status screen accessed by rotating the knob clockwise. In this case back to the Boiler status screen.

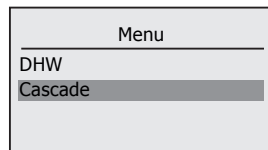
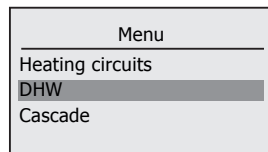
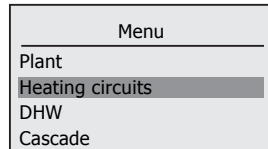
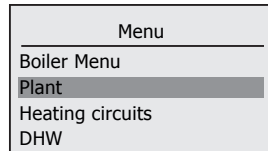
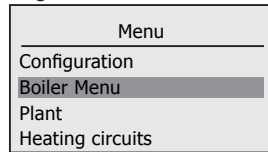
If any boiler faults exist, there will be another right pointing chevron on the boiler status screen. For boiler specific faults refer to the Boiler User guide.

3.3 Menu

When any of the buttons are pressed or the knob rotated the display backlight will brighten up from its standby reduced level. To select the menu, press the 'Select' button, the menu will appear:



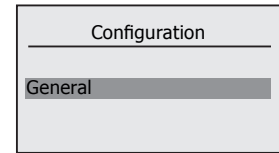
The menu can be scrolled down and contains the following items:



Note: Slave boilers do not have the Cascade menu option.

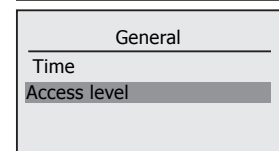
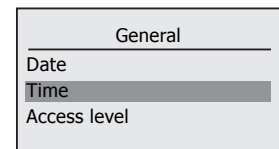
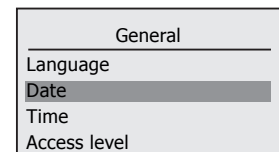
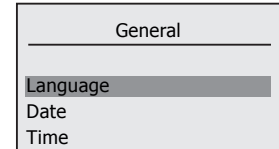
3.4 Menu - Configuration

The configuration menu has the following options, there are other options but these are hidden from the User/Installer:



3.4.1 Menu - Configuration – General

The General menu has the following options:



3.4.2 Menu - Configuration - General - Language

The language menu has the following options:

Language
Local language
System language

Language
Local language
System language

Note: Only the Master boiler has an option to set the System language.

The options are identical for System or Local Language option.

Local language
English
Francais
Nederlands

Local language
English
Francais
Nederlands
Italiano

Local language
Francais
Nederlands
Italiano
Espanol

Local language
Nederlands
Italiano
Espanol
Turkce

Local language
Italiano
Espanol
Turkce
Deutsch

Local language
Espanol
Turkce
Deutsch
Polsky

Local language
Turkce
Deutsch
Polsky
Cesky

Once the language is selected, the Local boiler or complete System will reconfigure itself to the chosen language. The display will change immediately to the selected language.

3.4.3 Menu – Configuration – General - Date

The Date screen is then displayed and each item can be selected and changed:

Date
Year: 2019
Month: 7
Day: 4
Done

Date
Year: 2019
Month: 7
Day: 4
Done

Date
Year: 2019
Month: 7
Day: 4
Done

Date
Year: 2019
Month: 7
Day: 4
Done

3.4.4 Menu – Configuration – General - Time

The Time screen is then displayed and each item can be selected and changed:

Time
Hour: 9
Minute: 11
Auto su/wi time: <input checked="" type="checkbox"/>

Time
Hour: 9
Minute: 11
Auto su/wi time: <input checked="" type="checkbox"/>

Time
Hour: 9
Minute: 11
Auto su/wi time: <input checked="" type="checkbox"/>

Once the setting is made then the screen is left by pressing the back button.

3.4.5 Menu – Configuration – General – Access level

The Access level screen is then displayed and each item can be selected and the default access level code can be changed:

Access level
Advanced user
Installer 1
Installer 2

Access level
Advanced user
Installer 1
Installer 2
Expert

Access level
Installer 1
Installer 2
Expert

Access level
Installer 2
Expert

Once an access level is selected then the display will allow the current access level code to be entered. Each access level has its own initial code:

Advanced user
####

Default code 2222

Installer 1
####

Default code 3333

Installer 2
####

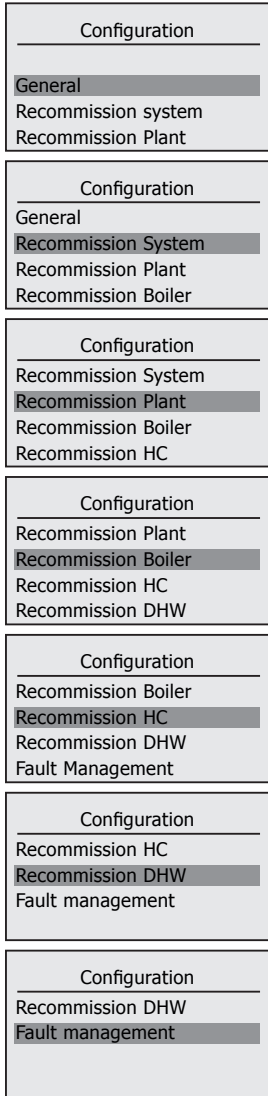
Default code 4444

Once the correct code has been entered the following confirmation screen will be displayed for a short period, depending upon which access level was selected:

Installer 1
Installer 1
Confirm

3.4.6 Menu - Configuration

All menus and setting will now be available for that particular access level. There will now also be the chance to reconfigure different functions within the system:



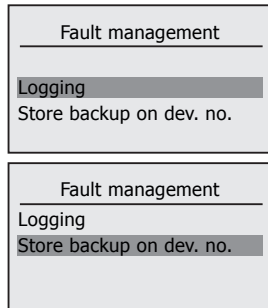
Depending upon the access level, not all configuration options will be available. Once selected, refer to the Configuration section below for guidance.

3.4.6.1 Fault Management

The management section relates to the installed system tools rather than the boiler or accessories. It allows for the ability to set up real time datalogging of system variables in order to allow specific site related issues to be identified and system adjustments to be made to optimise the performance of the iCCS system.

It also allows for the backup configuration file to be updated as a maintenance function when a recommission step has been carried out causing a change in any of the functional modules in the system, Plant, Boiler, HC, DHW. A full recommission system always offers a backup.

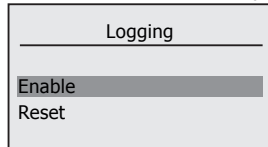
Backup is only possible in boiler cascades of 2 or more boilers where a slave system manager is available.



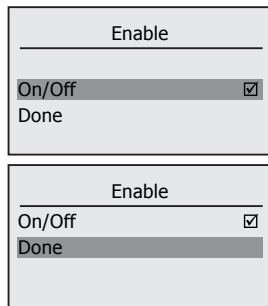
3.4.6.1.1 Data Logging

Data logging can be activated and deactivated. The logging data file can also be cleared. It is a First-In First-Out file with a fixed logging interval of 5 minutes.

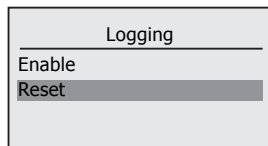
The data file can then be downloaded using the VariSoft utility to a Windows Personal Computer for analysis as a Comma Separated Variable (.CSV) file Type.



Logging can be enabled by setting a flag using the select key, a tick will then appear in the box showing that logging has been enabled.



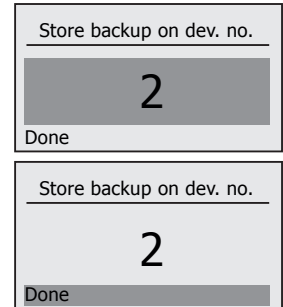
Once a logging period has been completed the enable can be reset in the same way, then the data downloaded, and the store cleared.



3.4.6.1.2 Backup Storage, Post Configuration

A backup of all configuration parameters in a cascade to one or more nominated slave boilers (System managers) can be made post configuration to reflect any changes made.

This allows the system to be restored easily to the original or final saved configuration at any point, particularly if a master boiler system manager has had to be replaced.



3.5 Menu – Boiler

The boiler menu has the following options, there are other options but these are hidden from the User/Installer:

Boiler menu
Status
Service
Settings

Boiler menu
Status
Service
Settings
Flue offset

Boiler menu
Service
Settings
Flue offset
Hours run

Boiler menu
Settings
Flue offset
Hours run
Faults

Boiler menu
Flue offset
Hours run
Faults

Boiler menu
Hours run
Faults

3.5.1 Menu – Boiler - Status

The status sub menus give you access to check the current configuration of the boiler. It also allows you to see the current real time values of the boiler.

The status menu has the following options:

Status
Configuration
Real time values

Status
Configuration
Real time values

3.5.2 Menu – Boiler – Status - Configuration

The configuration menu has the following options:

Configuration
Inputs
Outputs
Parameters

Configuration
Inputs
Outputs
Parameters

Configuration
Outputs
Parameters

3.5.3 Menu – Boiler – Status – Configuration - Inputs

The inputs menu has the following options:

Configuration
Boiler 1
Boiler 2

Depending upon how many boilers are configured in the cascade, they will appear here in a sequential list.

Once a boiler is selected, then the following menu allows you to select which configuration parameters you want to display:

Boiler 1
Demand control
Temperature sensors
Other sensors

Boiler 1
Demand control
Temperature sensors
Other sensors

Boiler 1
Temperature sensors
Other sensors

Demand Control

When the menu option Demand control is selected the following screen will now be displayed, items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled to show all values:

Demand Control
SL1: - -
SL2: DHW1 Boiler 1
OT1: HC1 Boiler 1.1

Demand Control
SL1: - -
SL2: DHW1 Boiler 1
OT1: HC1 Boiler 1.1
OT2: - -

Demand Control
SL2: DHW1 Boiler 1
OT1: HC1 Boiler 1.1
OT2: - -
0-10V: - -

Demand Control
OT1: HC1 Boiler 1.1
OT2: - -
0-10V: - -

Demand Control
OT2: - -
0-10V: - -

Temperature Sensors

When the menu option Temperature sensors is selected the following screen will now be displayed, items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled to show all values:

Temperature sensors
DHW/Room2: - -
Flue: - -
H/X: Yes

Temperature sensors
DHW/Room2:- -
Flue: - -
H/X: Yes
Header: - -

Temperature sensors
Flue: - -
H/X: Yes
Header: - -
Outside: - -

Temperature sensors
H/X: Yes
Header: - -
Outside: - -
Room1: - -

Temperature sensors
Header: - -
Outside: - -
Room1: - -

Temperature sensors	
Outside:	--
Room1:	--

Other Sensors

When the menu option Other sensors is selected the following screen will now be displayed, items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled to show all values:

Other Sensors	
WPS:	Switch
WFS:	--

Other Sensors	
WPS:	Switch
WFS:	--

3.5.4 Menu – Boiler – Status – Configuration - Outputs

The outputs menu has the following options:

Inputs	
Boiler 1	
Boiler 2	

Depending upon how many boilers are configured in the cascade, they will appear here in a sequential list.

Once a boiler is selected, then the following menu allows you to select which configuration parameters you want to display:

Boiler 1	
PWM/0-10V (Boiler pump)	
MFR1 (HC1 pump)	
MFR2 (DHW pump)	

Boiler 1	
PWM/0-10V ()	
MFR1 (HC1 pump)	
MFR2 (DHW pump)	
MFR3 (Boiler on indicator)	

Boiler 1	
MFR1 (HC1 pump)	
MFR2 (DHW pump)	
MFR3 (Boiler on indicator)	
MFR4 (Boiler Fault indicator)	

Boiler 1	
MFR2 (DHW pump)	
MFR3 (Boiler on indicator)	
MFR4 (Boiler Fault indicator)	

Boiler 1	
MFR3 (Boiler on indicator)	
MFR4 (Boiler Fault indicator)	

3.5.5 Menu – Boiler – Status – Configuration - Parameters

The parameters menu has the following options:

Parameters	
Boiler 1	
Boiler 2	

Depending upon how many boilers are configured in the cascade, they will appear here in a sequential list.

Once a boiler is selected, then the following menu allows you to select which configuration parameters you want to display:

Boiler 1	
Soft start time	
Flue type	

Boiler 1	
Soft start time	
Flue type	

Once selected the parameter setting will be displayed:

Soft start time	
30.0sec	

Flue type	
Standard	

3.5.6 Menu – Boiler – Status – Real time values

The Real time values menu has the following options:

Real time values	
Inputs	
Sensors	
Outputs	

Real time values	
Inputs	
Sensors	
Outputs	

Real time values	
Sensors	
Outputs	

3.5.7 Menu – Boiler – Status – Real time values - Inputs

The inputs menu has the following options:

Inputs
Boiler 1
Boiler 2

Depending upon how many boilers are configured in the cascade, they will appear here in a sequential list.

Once a boiler is selected, then the following screen will display the current Real time values for the configured Inputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled to show all values:

Boiler 1
SL1: Off
SL2: On
0-10V: --

Boiler 1
SL1: Off
SL2: On
0-10V: --
OT1: 10.0°C

Boiler 1
SL2: On
0-10V: --
OT1: 10.0°C
OT2: --

Boiler 1
0-10V: --
OT1: 10.0°C
OT2: --
Cap. Setp.: 0%

Boiler 1
OT1: 10.0°C
OT2: --
Cap. Setp.: 0%
HC temp. setp.: 0.0°C

Boiler 1
OT2: --
Cap. Setp.: 0%
HC temp. setp.: 0.0°C
DHW temp. setp.: 0.0°C

Boiler 1
Cap. Setp.: 0%
HC temp. setp.: 0.0°C
DHW temp. setp.: 0.0°C
Max lim. Down.: 100.0°C

Boiler 1
HC temp. setp.: 0.0°C
DHW temp. setp.: 0.0°C
Max lim. Down.: 100.0°C

Boiler 1
DHW temp. setp.: 0.0°C
Max lim. Down.: 100.0°C

3.5.8 Menu – Boiler – Status – Real time values - Sensors

The inputs menu has the following options:

Sensors
Boiler 1
Boiler 2

Depending upon how many boilers are configured in the cascade, they will appear here in a sequential list.

Once a boiler is selected, then the following screen will display the current Real time values for the configured Sensors, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled to show all values:

Boiler 1
Flame: Off
Flow temp.: 37.5°C
Return temp.: 33.0°C

Boiler 1
Flame: Off
Flow temp.: 37.5°C
Return temp.: 33.0°C
H/X temp.: 48.3°C

Boiler 1
Flow temp.: 37.5°C
Return temp.: 33.0°C
H/X temp.: 48.3°C
Flue temp.: --

Boiler 1
Return temp.: 33.0°C
H/X temp.: 48.3°C
Flue temp.: --
Outside temp.: --

Boiler 1
H/X temp.: 48.3°C
Flue temp.: --
Outside temp.: --
WPS: On

Boiler 1
Flue temp.: --
Outside temp.: --
WPS: On
WFS: --

Boiler 1
Outside temp.: --
WPS: On
WFS: --
APS: Off

Boiler 1
WPS: On
WFS: --
APS: Off
Safety interlock: On

Boiler 1
WFS: --
APS: Off
Safety interlock: On

Boiler 1
APS: Off
Safety interlock: On

3.5.9 Menu – Boiler – Status – Real time values - Outputs

The inputs menu has the following options:

Outputs
Boiler 1
Boiler 2

Depending upon how many boilers are configured in the cascade, they will appear here in a sequential list.

Once a boiler is selected, then the following screen will display the current Real time values for the configured Outputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled to show all values:

Boiler 1
PWM/0-10V: 0%
MFR1: Off
MFR2: Off

Boiler 1
PWM/0-10V: 0%
MFR1: Off
MFR2: Off
MFR3: Off

Boiler 1
MFR1: Off
MFR2: Off
MFR3: Off
MFR4: Off

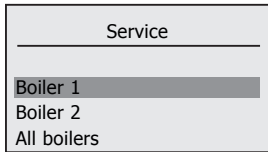
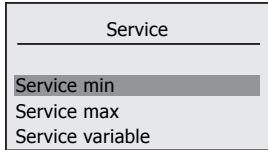
Boiler 1
MFR2: Off
MFR3: Off
MFR4: Off

Boiler 1
MFR3: Off
MFR4: Off

3.5.10 Menu – Boiler - Service

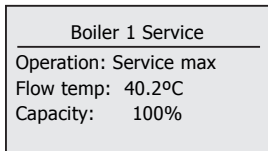
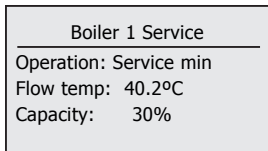
The service sub menus give you the option to run the boiler selected at Min, Max and Variable capacity.

The service menu has the following three options:

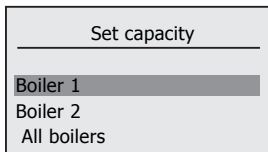
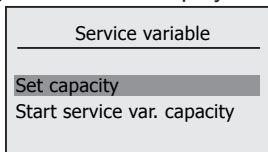


Once the boiler is selected then the service interval will start and the boiler will run in service mode at the selected capacity for a maximum of 10 minutes. If you wish to abort service mode, just use the back key.

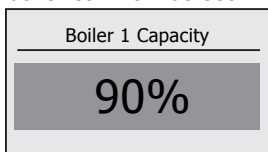
The following screens will be displayed during service mode:



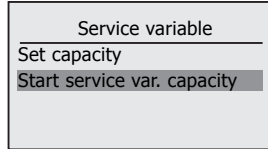
When service variable is selected, an additional parameter needs to be set. The following menu will be displayed:



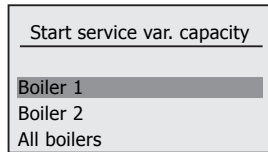
The variable service mode capacity for the selected boiler can now be set:



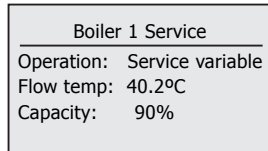
Once this has been adjusted and confirmed by the select key then the back key can be used to return to the Service variable menu:



Once the boiler is selected then the service interval will start and the boiler will run in service mode at the selected capacity for a maximum of 10 minutes. If you wish to abort service mode, just use the back key.



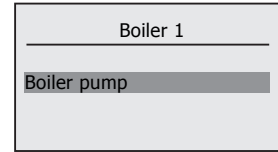
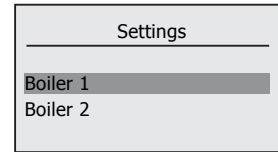
The following screens will be displayed during service mode:



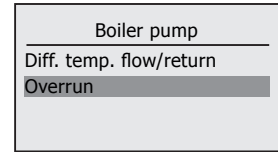
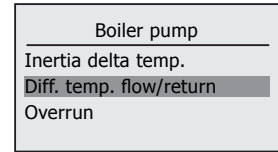
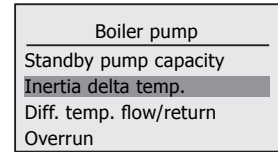
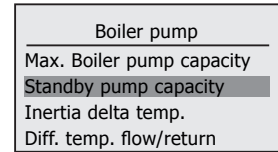
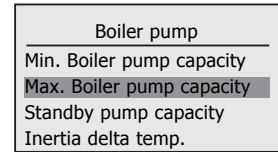
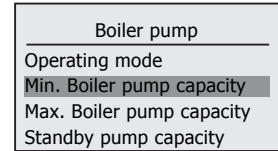
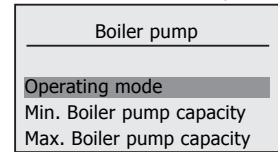
Once the boiler has lit and ramped up to capacity, this is limited to the setting made.

3.5.11 Menu – Boiler – Settings

The settings sub menu allows adjustment of boiler specific variables.



When the boiler pump is controlled by the PWM/0-10V modulating control, the parameters for the pump may be set:



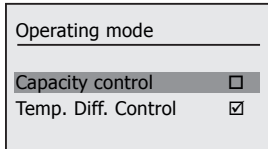
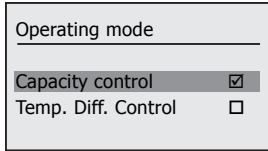
Note: Depending on the selected operating mode additional parameters may be present or omitted.

3.5.12 Boiler Pump Operating Mode

The boiler pump can be controlled in one for two ways.

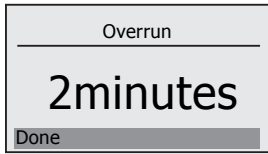
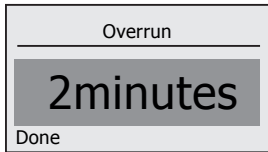
Capacity control means that the pump speed follows the burner capacity proportionally between minimum capacity/minimum pump speed and maximum capacity/maximum pump speed.

Temp. Diff. Control means that the pump speed is controlled to maintain a fixed boiler flow to return temperature differential.



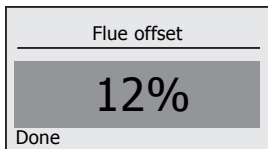
3.5.13 Boiler Pump Overrun time

The boiler pump overrun time can be adjusted if required.



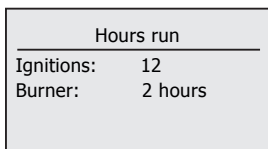
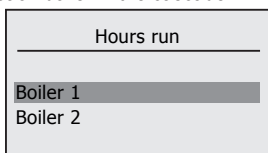
3.5.14 Menu – Boiler – Flue offset

The flue offset parameter allows adjustment of the boiler specific cascade flue setting. The flue offset is an increase in the minimum burner capacity to ensure that the cascade flue pressure or an unpowered flue damper can be overcome safely and avoid any risk of the burner going out at the minimum boiler capacity. When a multiline flue system is selected during configuration this parameter is enabled, it has a predetermined minimum already applied which is required for the optional flue kit that can be supplied for the boiler.



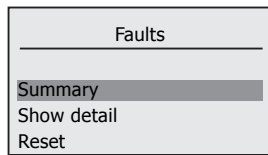
3.5.15 Menu – Boiler – Hours run

The hours run screen show the number of successful burner starts and the number of full burner operating hours for each boiler in the cascade:



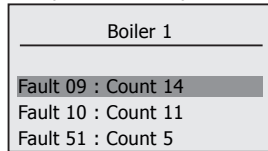
3.5.16 Menu – Boiler – Faults

The fault history, summary and detail, of each boiler in the cascade can be interrogated, this can also be reset:

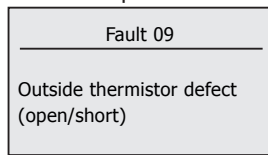


3.5.17 Menu – Boiler – Faults – Summary

On selecting which boiler you want to interrogate, the system will read back the fault summary and display:

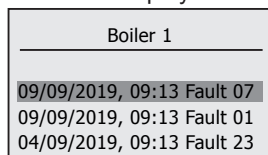


The list can be scrolled and any fault selected will then show the specific fault description:



3.5.18 Menu – Boiler – Faults – Show detail

On selecting which boiler you want to interrogate, the system will then read back the fault detail and display:



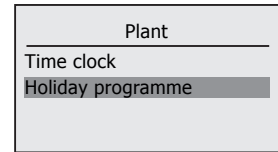
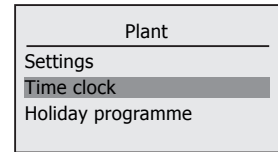
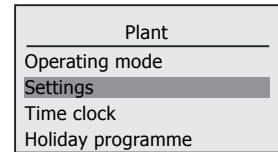
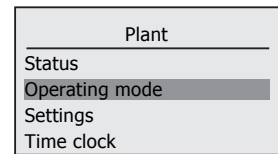
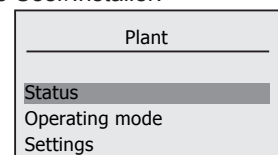
The list can be scrolled to see the last 10 items in the fault history with date and time.

3.5.19 Menu – Boiler – Faults – Reset

By selecting the boiler which you want to reset the fault information, you then the fault summary and details for that specific boiler. It may take some time for the fault information to clear as this process is flagged for action at the next available timeslot.

3.6 Menu – Plant

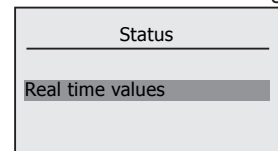
The plant menu has the following options, there are other options but these are hidden from the User/Installer:



3.6.1 Menu – Plant - Status

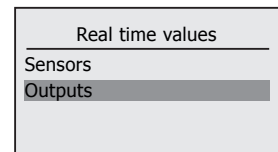
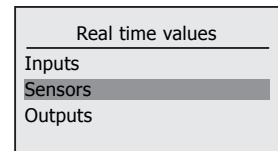
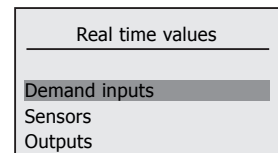
The status sub menus give you access to see the current real time values of the plant.

The status menu has the following options:



3.6.2 Menu – Plant – Status – Real time values

The Real time values menu has the following options:



3.6.3 Menu – Plant – Status – Real time values – Demand inputs

Once inputs is selected, then the following screen will display the current Real time values for the configured Inputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled to show all values:

Demand inputs	
0-10V:	--
SL1:	Off
OT1:	--

Demand inputs	
0-10V:	--
SL1:	Off
OT1:	--
Plant setp.:	0%

Demand inputs	
SL1:	Off
OT1:	--
Plant setp.:	0%
Plant setp.:	0.0°C

Demand inputs	
OT1:	--
Plant setp.:	0%
Plant setp.:	0.0°C

Demand inputs	
Plant setp.:	0%
Plant setp.:	0.0°C

3.6.4 Menu – Plant – Status – Real time values - Sensors

Once sensors is selected, then the following screen will display the current Real time values for the configured sensors, once again items that are not configured will be shown with no value but with 2 dashes to indicate this:

Sensors	
Plant flow temp.:	37.5°C
Outside temp.:	--

3.6.5 Menu – Plant – Status – Real time values - Outputs

Once outputs is selected, then the following screen will display the current Real time values for the configured outputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this:

Outputs	
Shared boiler pump:	--
System pump:	--

3.6.6 Menu – Plant – Operating mode

The plant operating mode can be set. This controls the operation of the complete system, all boilers, all HCs and all DHW circuits. The options are:

Operating mode
Off

Operating mode
Standby

Operating mode
Summer

Operating mode
Automatic

Off – No operation
 Standby – Frost protection only
 Summer – Normal operation but no HCs
 Automatic – Full automatic operation

3.6.7 Menu – Plant – Settings

The plant settings can be adjusted. The options are:

Settings
Plant setp. SL1
OT temp. setpoint
Shared boiler pump

Settings
Plant setp. SL1
OT temp. setpoint
Shared boiler pump
Shunt Pump

Settings
OT temp. setpoint
Shared boiler pump
Shunt Pump
System pump

Settings
Shared boiler pump
Shunt Pump
System pump
PIDs

Settings
Shunt Pump
System pump
PIDs
Frost protection

Settings
System pump
PIDs
Frost protection
Boiler pump

Settings
PIDs
Frost protection
Boiler pump

Settings
Frost protection
Boiler pump

3.6.7.1 Menu – Plant – Settings – Plant setp. SL1

The plant flow temperature set point for the SL1 input can be adjusted:

3.6.7.2 Menu – Plant – Settings – OT temp. setpoint

The plant flow temperature set point for the OT1 input when used as an On/Off demand can be adjusted:

3.6.7.3 Menu - Plant - Settings - Shared Boiler Pump/System Pump/Shunt Pump

When configured the various pumps can have parameters that affect plant operation set within this menu. The shared boiler pump, Shut pump and system pump can all have their maximum speed settings adjusted.

3.6.7.4 Menu - Plant - Settings - PIDs Configuration

The plant cascade control PIDs can be set to compensate for any performance related issues that are caused by the Hydraulic design of the system, the Normal set are optimised for the standard frame and header installation.

The PIDs can be adjusted by the Installer (Level 2) to be Faster or Slower in response time to the Normal settings. These Faster and Slower settings are tolerance within 10% of the nominal values.

For hydraulic systems that cause a faster load capacity change in the header then the Faster response time PIDs should be selected, for a hydraulic system which causes a slower load capacity change, then the Slower response time PIDs should be selected.

Once the setting has been selected, confirm this setting by selecting done.

3.6.7.5 Menu – Plant – Settings – Frost protection

The plant frost protection temperature set point, as measured at the header thermistor, can be adjusted:

3.6.7.6 Menu - Plant - Settings - Boiler Pump

The boiler pump function can have the following plant related parameters adjusted:

3.7 Menu – Heating circuits

The heating circuits menu has the following options, there are other options but these are hidden from the User/Installer:

Heating circuits
Status
Operating mode
Room temperature

Heating circuits
Status
Operating mode
Room temperature
Flow temperature

Heating circuits
Operating mode
Room temperature
Flow temperature
Settings

Heating circuits
Room temperature
Flow temperature
Settings
Time clock

Heating circuits
Flow temperature
Settings
Time clock
Holiday program

Heating circuits
Settings
Time clock
Holiday program

Heating circuits
Time clock
Holiday program

3.7.1 Menu – Heating circuits - Status

The status sub menu give you access to see the current real time values of the heating circuits.

The status menu has the following options:

Status
Summary
Real time values

3.7.2 Menu – Heating circuits – Status - Summary

The summary sub menu lists the configured heating circuits that are configured and can be selected, which then shows the main values for the heating circuit.

Summary
HC1 Boiler 1.1
HC2 Boiler 2.1
HC3 Boiler 2.2

HC1 Boiler 1.1
Status: OpenTherm
Operation: Standby
Room setp.: 0.0°C
Flow setp.: 0.0°C

3.7.3 Menu – Heating circuits – Status – Real time values

The Real time values menu has the following options:

Real time values
Demand inputs
Sensors
Outputs

Real time values
Demand inputs
Sensors
Outputs

Real time values
Sensors
Outputs

3.7.4 Menu – Heating circuits – Status – Real time values – Demand inputs

Once inputs is selected the screen will show the configured list of heating circuits:

Demand inputs
HC1 Boiler 1.1
HC2 Boiler 2.1
HC3 Boiler 2.2

Once a heating circuit is selected, then the following screen will display the current Real time values for the configured Inputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:

Demand inputs
SL1: - -
OT1: 80°C
Room setp.: - -

3.7.5 Menu – Heating circuits – Status – Real time values – Sensors

Once sensors is selected the screen will show the configured list of heating circuits:

Sensors
HC1 Boiler 1.1
HC2 Boiler 2.1
HC3 Boiler 2.2

Once a heating circuit is selected, then the following screen will display the current Real time values for the configured sensors, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:

HC1 Boiler 1.1
Room temp.: 17.8°C
Outside temp.: - -
Source temp: 37.2°C

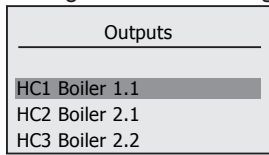
HC1 Boiler 1.1
Room temp.: 17.8°C
Outside temp.: - -
Source temp: 37.2°C
HC flow sensor: - -

HC1 Boiler 1.1
Outside temp.: - -
Source temp: 37.2°C
HC flow sensor: - -

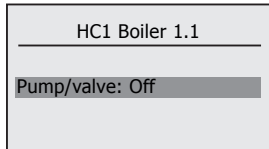
HC1 Boiler 1.1
Source temp: 37.2°C
HC flow sensor: - -

3.7.6 Menu – Heating Circuits – Status – Real time Values – Outputs

Once outputs is selected the screen will show the configured list of heating circuits:

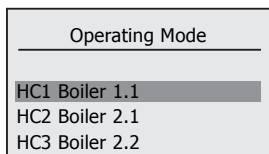


Once a heating circuit is selected, then the following screen will display the current Real time values for the configured outputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:

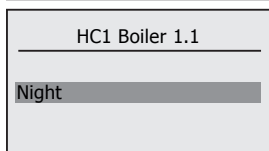
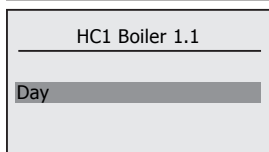
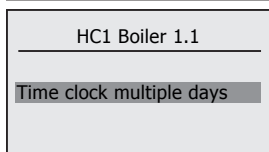
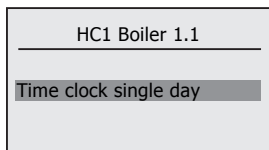
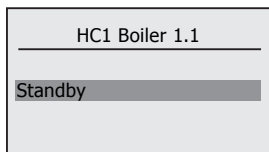


3.7.7 Menu – Heating circuit – Operating mode

Each heating circuit operating mode can be set. This controls the operation of the selected HC.



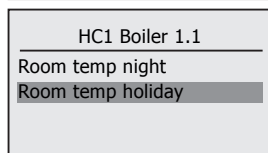
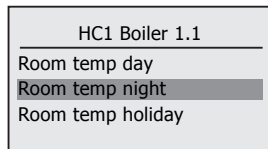
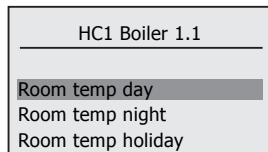
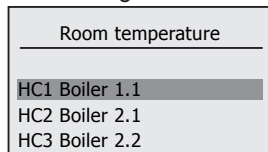
The options are:



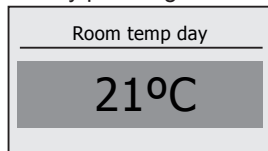
- Standby – Frost protection only
- Time clock single day – Normal operation, timed
- Time clock multiple day – Normal operation, timed
- Day – Normal operation, continuous day mode
- Night – Normal operation, continuous night mode

3.7.8 Menu – Heating circuit – Room temperature

Each heating circuit target room temperature can be set for different operating modes for the selected Heating circuit.

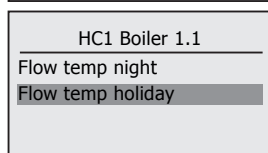
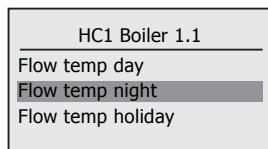
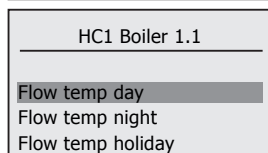
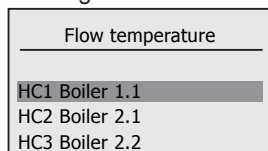


Each selected room temperature set point can be adjusted and then set, the adjustment screen is left by pressing the back button:

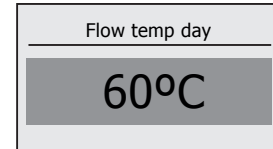


3.7.9 Menu – Heating circuit – Flow temperature

Each heating circuit flow temperature can be set for different operating modes for the selected Heating circuit.



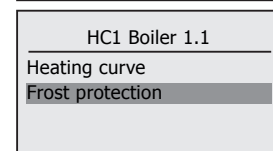
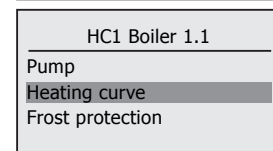
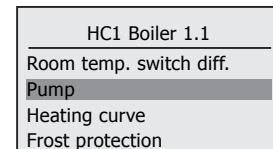
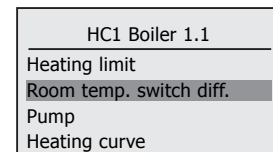
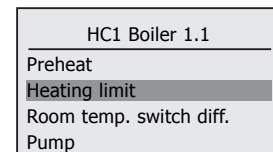
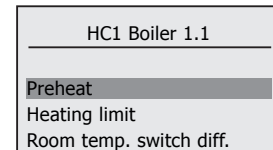
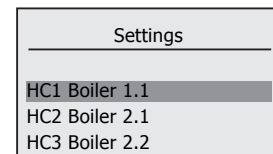
Each selected flow temperature set point can be adjusted and then set, the adjustment screen is left by pressing the back button:



This limits the flow temperature into a HC.

3.7.10 Menu – Heating circuit – Settings

Each heating circuit has a number of settings that can be adjusted for the selected Heating circuit.



3.7.11 Menu – Heating circuit – Settings - Preheat

This controls the preheat compensation for a given heating circuit, if enabled this will bring on demand from that heating circuit prior to an increase in temperature set point. E.g. from night to day mode. The time allowed for preheat is limited by the Maximum preheat time, this ensures that the heating circuit demand can only start within that time value and not start any earlier.

Preheat can be enabled for the selected HC and the maximum allowable preheat time set.

Preheat
Preheat switch
Maximum preheat time
Preheat
On/Off <input type="checkbox"/>
Preheat
On/Off <input checked="" type="checkbox"/>
Preheat
Preheat switch
Maximum preheat time
Preheat
120minutes

3.7.12 Menu – Heating circuit – Settings – Heating limit

This ensures that the heating is not switched on unnecessarily if the average outside temperature, e.g. during the summer months, is higher than the room temperature setpoint in day mode.

Heating limit can be enabled for the selected Heating Circuit and the heating limit temperature setpoint defined.

Heating limit switch
On/Off <input type="checkbox"/>
Heating limit switch
On/Off <input checked="" type="checkbox"/>
Heating limit temperature
19°C

3.7.13 Menu – Heating circuit – Settings – Room temp. switch diff.

This sets the switching differential for the Heating Circuit room sensor. The value ensures that the Heating Circuit does not continuously cycle demand into the system.

Room temp. switch diff.
1°C

3.7.14 Menu – Heating circuit – Settings – Pump

The pump for each individual heating circuit has a number of settings. Some relate to speed if configured for control by a 0-10V output.

Pump
Overrun time
Overrun speed
Maximum speed
Overrun time
10secs
Overrun speed
70%
Maximum speed
100%

3.7.15 Menu - Heating Circuit - Settings - Heating Curve

The heating curve parameters can be adjusted to suit the application if required.

Heating curve
Slope
Parallel shift
Room influence
Heating curve
Slope
Parallel shift
Room influence
Heating curve
Parallel shift
Room influence

The slope of the curve has a default setting of 2.60 can be adjusted between 0.25 and 4.00, see the associated data sheet for example curves. This slope contributes to the adjustments of the flow set point in relation to the outside temperature

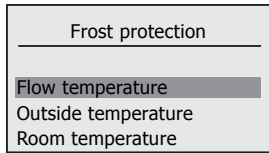
The curve parallel shift has a default setting of 0.0°C, and this can be adjusted between -50.0°C and 50.0°C. This offset adjusts the curve vertically.

The room influence factor has a default setting of 25% and can be adjusted between 0 and 100%. The room influence proportions the effect between outside temperature and room temperature on the flow set point.

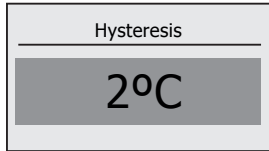
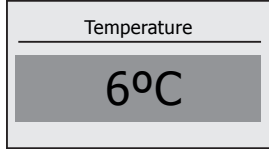
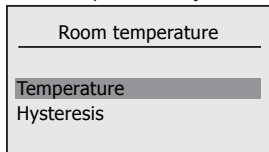
Slope
2.6
Done
Slope
2.6
Done
Parallel shift
0.0°C
Done
Parallel shift
0.0°C
Done
Room influence
25%
Done
Room influence
25%
Done

3.7.16 Menu – Heating Circuit – Settings – Frost protection

Heating circuit frost protection operation can be triggered by a number of measured real time values:



Each of these has a trigger set point and a hysteresis value above which the function is once again deactivated. E.g. Room temperature, if the actual room temperature drops below the temperature setpoint value then Heating Circuit will create a demand into the system. It will only remove this demand once the actual room temperature has risen above this value, plus the hysteresis setting.



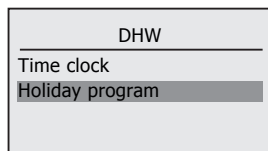
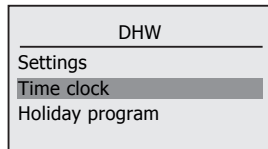
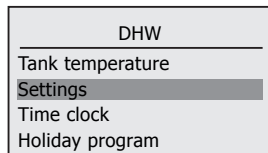
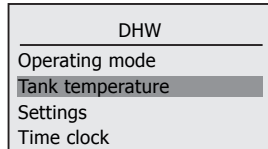
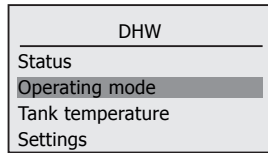
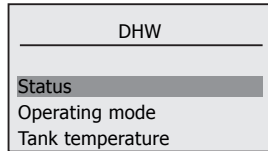
3.7.17 Menu – Heating Circuit –Time clock

Each heating circuit can have its own individual time programme. Refer to the Plant section for guidance on how this is set.

3.7.18 Menu – Heating circuit – Holiday programme

Each heating circuit can have its own individual holiday programmes. Refer to the Plant section for guidance on how this is set.

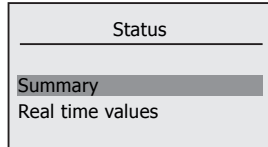
3.8 Menu – DHW



3.8.1 Menu – DHW - Status

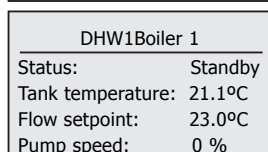
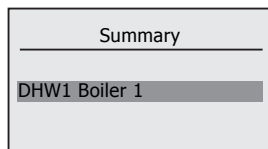
The status sub menu give you access to see the current real time values of the Dometic Hot Water circuits.

The status menu has the following options:



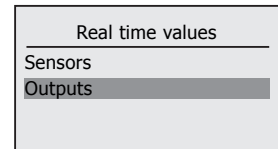
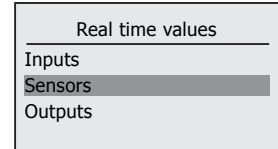
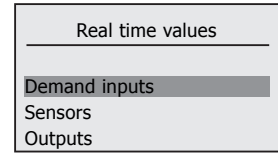
3.8.2 Menu – DHW – Status - Summary

The summary sub menu lists the configured Dometic Hot Water circuits that are configured and can be selected, which then shows the main values for the Domestic Hot Water circuit.



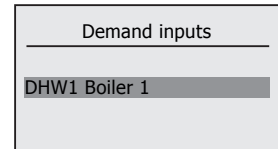
3.8.3 Menu – DHW – Status – Real time values

The Real time values menu has the following options:

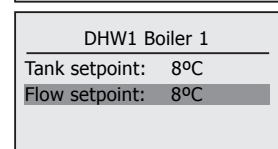
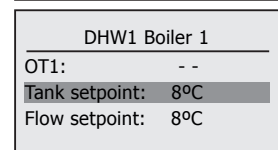
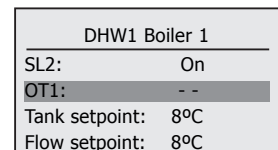
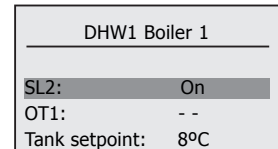


3.8.4 Menu – DHW – Status – Real time values – Demand inputs

Once inputs is selected the screen will show the configured list of Domestic Hot Water circuits:

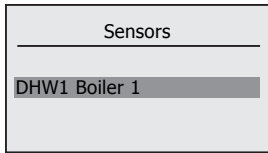


Once a DHW circuit is selected, then the following screen will display the current Real time values for the configured Inputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:

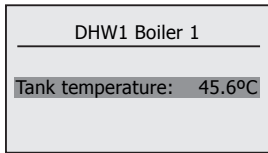


3.8.5 Menu – DHW – Status – Real time values – Sensors

Once sensors is selected the screen will show the configured list of Domestic Hot Water circuits:

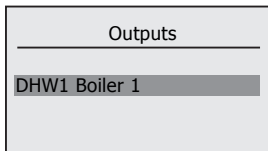


Once a DHW circuit is selected, then the following screen will display the current Real time values for the configured sensors, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:

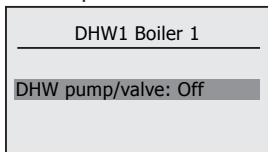


3.8.6 Menu – DHW – Status – Real time values – Outputs

Once outputs is selected the screen will show the configured list of Domestic Hot Water circuits:

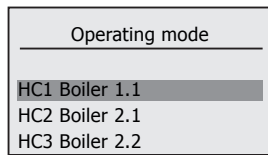


Once a Domestic Hot Water circuit is selected, then the following screen will display the current Real time values for the configured outputs, once again items that are not configured will be shown with no value but with 2 dashes to indicate this, the list can be scrolled if required to show all values:

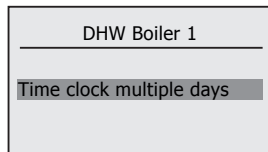
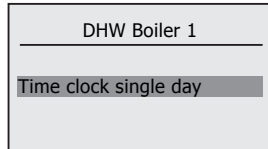
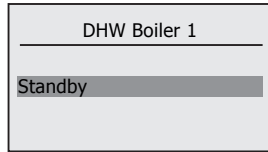


3.8.7 Menu – DHW – Operating Mode

Each Domestic Hot Water circuit operating mode can be set. This controls the operation of the selected Domestic Hot Water circuit.



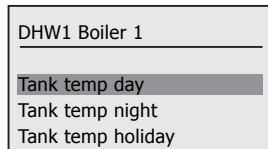
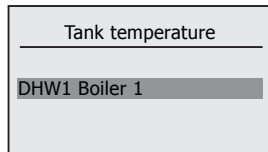
The options are:



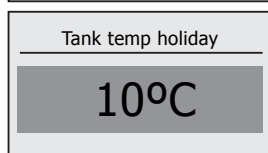
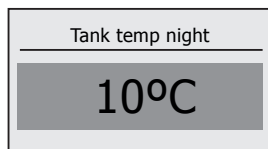
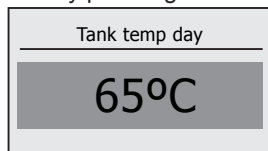
Standby – Frost protection only
 Time clock single day – Normal operation, timed
 Time clock multiple day – Normal operation, timed.

3.8.8 Menu – DHW – Tank temperature

Each Domestic Hot Water circuit target tank temperature can be set for different operating modes for the selected Domestic Hot Water circuit.

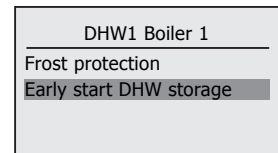
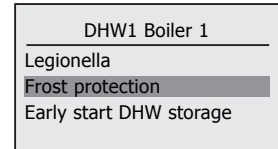
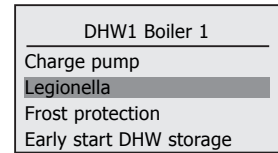
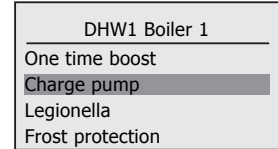
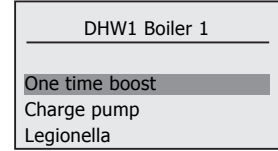
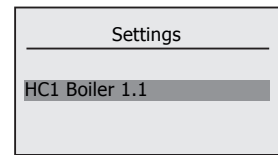


Each selected tank temperature set point can be adjusted and then set, the adjustment screen is left by pressing the back button:



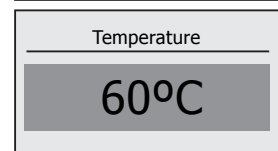
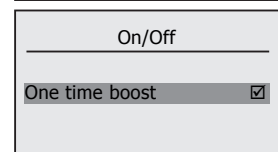
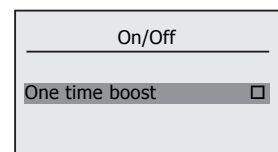
3.8.9 Menu – DHW – Settings

Each Domestic Hot Water circuit has a number of settings that can be adjusted for the selected DHW circuit.



3.8.10 Menu – DHW – Settings – One time boost

Each DHW circuit can have a one-time boost to allow for out of hours hot water requirements. The boost can be enabled and a tank temperature set for this function.



3.8.11 Menu – DHW – Settings – Pump

The primary pump for each individual Domestic Hot Water circuit has a number of settings. Some relate to speed if configured for control by a 0-10V output.

Primary pump
Overrun time
Overrun speed
Minimum speed

Primary pump
Overrun time
Overrun speed
Minimum speed
Maximum speed

Primary pump
Overrun speed
Minimum speed
Maximum speed

Primary pump
Minimum speed
Maximum speed

Overrun time
10secs

Overrun speed
50%

Minimum speed
10%

Maximum speed
100%

3.8.12 Menu – DHW – Settings – Legionella

Two modes of operation of the function for Anti-legionella exist in the system. They can be selected and the parameters adjusted.

Legionella
Operation mode
Temperature
Interval

or

Legionella
Operation mode
Temperature
Interval

The operating mode options are:

Operation Mode
None

Operation Mode
Weekday

Operation Mode
Interval

Weekday – set the weekday and time of operation

Interval- sets the interval between operation

The mode of operation when set changes the last menu option to set the parameter controlling the anti-legionella event. Both modes require a temperature setpoint.

Temperature
65°C
Done

Interval
7day(s)
Done

Weekday and time
Weekday: Saturday
Start time: 01:00

3.8.13 Menu – DHW – Settings – Frost protection

Frost protection
DHW minimum flow

DHW minimum flow
8°C
Done

3.8.14 Menu - DHW - Setting

Domestic Hot Water storage tank charging can be configured to start before the Heating circuit Day time activation. The time prior to this can be defined in minutes.

Early start DHW storage
0minutes
Done

Early start DHW storage
15minutes
Done

3.8.15 Menu – DHW – Time clock

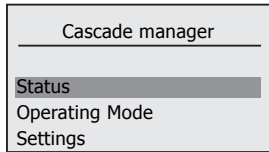
Each Domestic Hot Water circuit can have its own individual time programme. Refer to the Plant section for guidance on how this is set.

3.8.16 Menu – DHW – Holiday programme

Each Domestic Hot Water circuit can have its own individual holiday programmes. Refer to the Plant section for guidance on how this is set

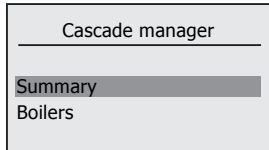
3.9 Menu – Cascade manager

The cascade manager menu has the following sub menus:



3.9.1 Menu – Cascade manager - Status

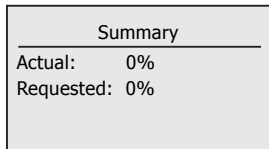
On selecting status, the following sub menus are available:



This will now show the status of the plant cascade, and each boiler in the cascade.

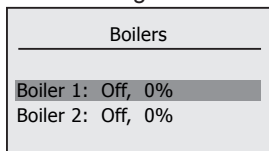
3.9.2 Menu – Cascade manager - Status – Summary

Summary shows the actual heat capacity being generated and the target calculated requirement.



3.9.3 Menu – Cascade manager - Status – Boilers

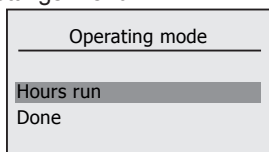
Summary shows the actual operating mode and heat capacity being generated by each boiler, the list can be scrolled if required to show all boilers configured:



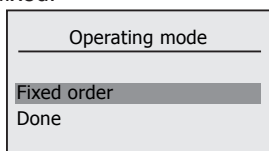
3.9.4 Cascade Manager - Operating mode

The Cascade boiler sequence control can be set to one of three control methods. Select the field in order to scroll through the three options.

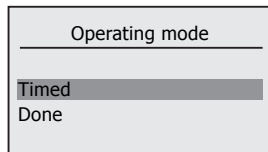
Hours run - The sequence changeover is determined by the number of burner-on hours. The hours run value can be adjusted in the Settings menu.



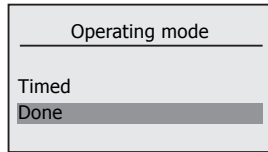
Fixed Order - The sequence changeover order is fixed.



Timed - The sequence changeover is determined by operating time period. The period can be adjusted in the Settings menu.



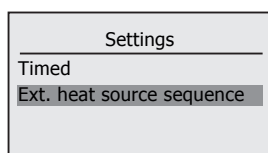
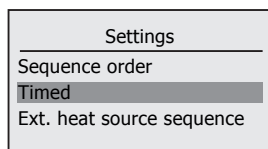
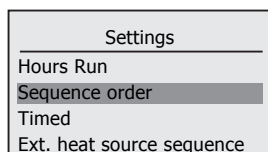
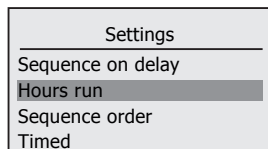
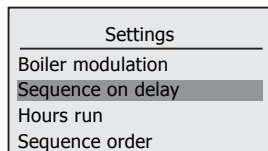
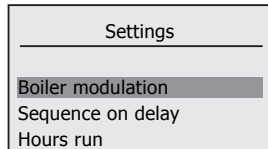
Once selected, select Done to confirm.



3.9.5 Menu – Cascade manager - Settings

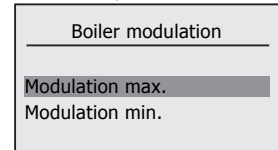
The settings menu will have content based upon configuration of a Slave heat source and the selected Cascade Operating mode. Hours run or Timed.

All options are shown below, but not all may be present.



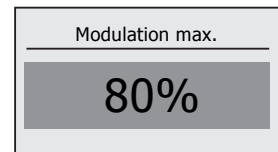
3.9.6 Menu – Cascade manager - Settings – Boiler modulation

Boiler modulation controls the switching capacity set points in the cascade. Each boiler in cascade can be switched on at the earliest or latest modulation capacity set point (modulation max.), as well as switched off in the same way (modulation min.).



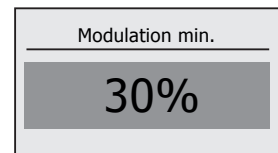
3.9.7 Modulation max

This causes the first boiler in the sequence to modulate up to the Modulation max capacity setting before it brings on the second boiler in the sequence and then modulates down to match the capacity of both. This continues for each boiler.



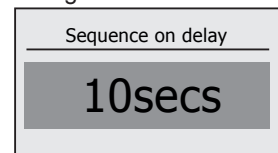
3.9.8 Modulation min

This causes the cascade to modulate down to the Modulation min setting on each boiler before switching one off. This then continues for each boiler.



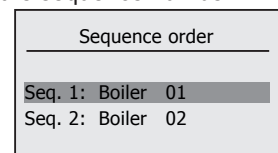
3.9.9 Menu – Cascade manager - Settings – Sequence on delay

This parameter sets the time delay when bringing on boilers in sequence, this is to allow for the boiler cascade to better match the load during the start of a demand cycle.



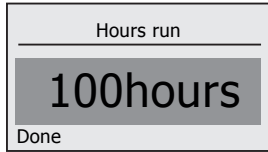
3.9.10 Menu – Cascade manager - Settings – Sequence order

The order that the boilers run in sequence can be set, this does not affect the lead boiler rotation. To change the order, remove the boiler numbers in sequence by setting them to NN and then redefine the boiler numbers as required. By default the boiler number follows the sequence number.



3.9.11 Menu – Cascade manager - Settings - Hours run

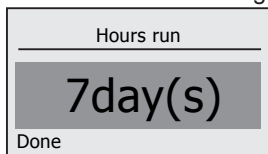
The sequence changeover will occur after the number of burner hours have been completed by the current lead boiler. It can be set in multiples of 10 hours as shown below. Select Done to confirm the change.



A screenshot of a menu titled "Hours run". The menu has a title bar with the text "Hours run". Below the title bar, the value "100hours" is displayed in a large font. At the bottom of the menu, there is a button labeled "Done".

3.9.12 Menu – Cascade manager - Settings - Timed

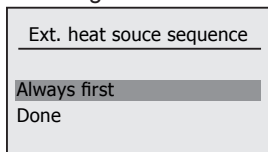
The sequence changeover will occur after the Timed period has been completed. It can be set in multiples of 1 day as shown below. Select Done to confirm the change.



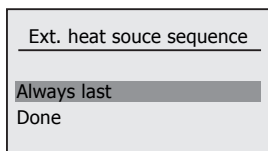
A screenshot of a menu titled "Hours run". The menu has a title bar with the text "Hours run". Below the title bar, the value "7day(s)" is displayed in a large font. At the bottom of the menu, there is a button labeled "Done".

3.9.13 Menu – Cascade manager - Settings - Ext. heat source sequence

The sequence order location for the External heat source can be set. It can be set to be always the first in the sequence order or the last in the sequence order. Select Done to confirm the change.



A screenshot of a menu titled "Ext. heat source sequence". The menu has a title bar with the text "Ext. heat source sequence". Below the title bar, the value "Always first" is displayed in a large font. At the bottom of the menu, there is a button labeled "Done".



A screenshot of a menu titled "Ext. heat source sequence". The menu has a title bar with the text "Ext. heat source sequence". Below the title bar, the value "Always last" is displayed in a large font. At the bottom of the menu, there is a button labeled "Done".

4 INSTALLATION

4.1 Electrical Connections

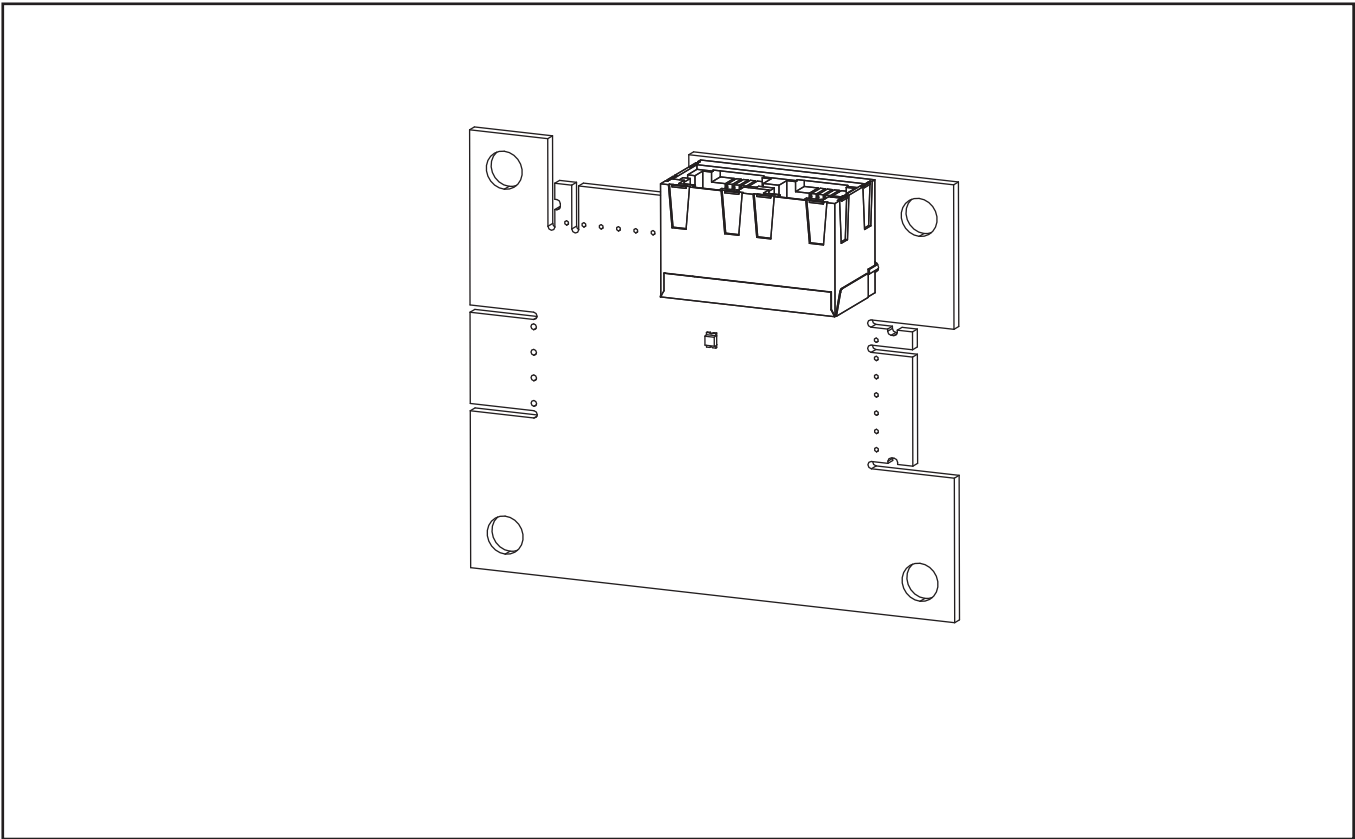


FIGURE 2 VARICAN ADAPTOR DIAGRAM

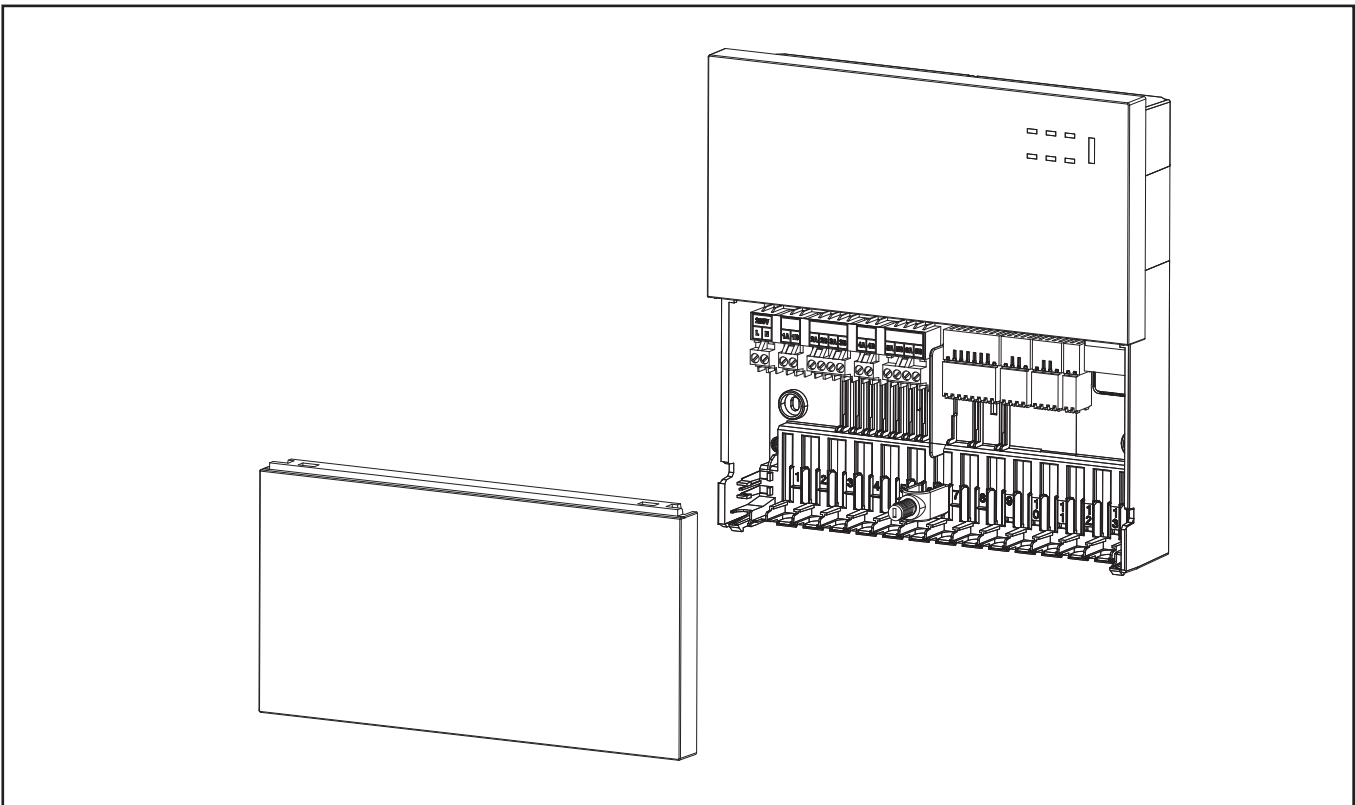


FIGURE 3 EXTENSION MODULE DIAGRAM

5 CONFIGURATION

5.1 System Manager Interface

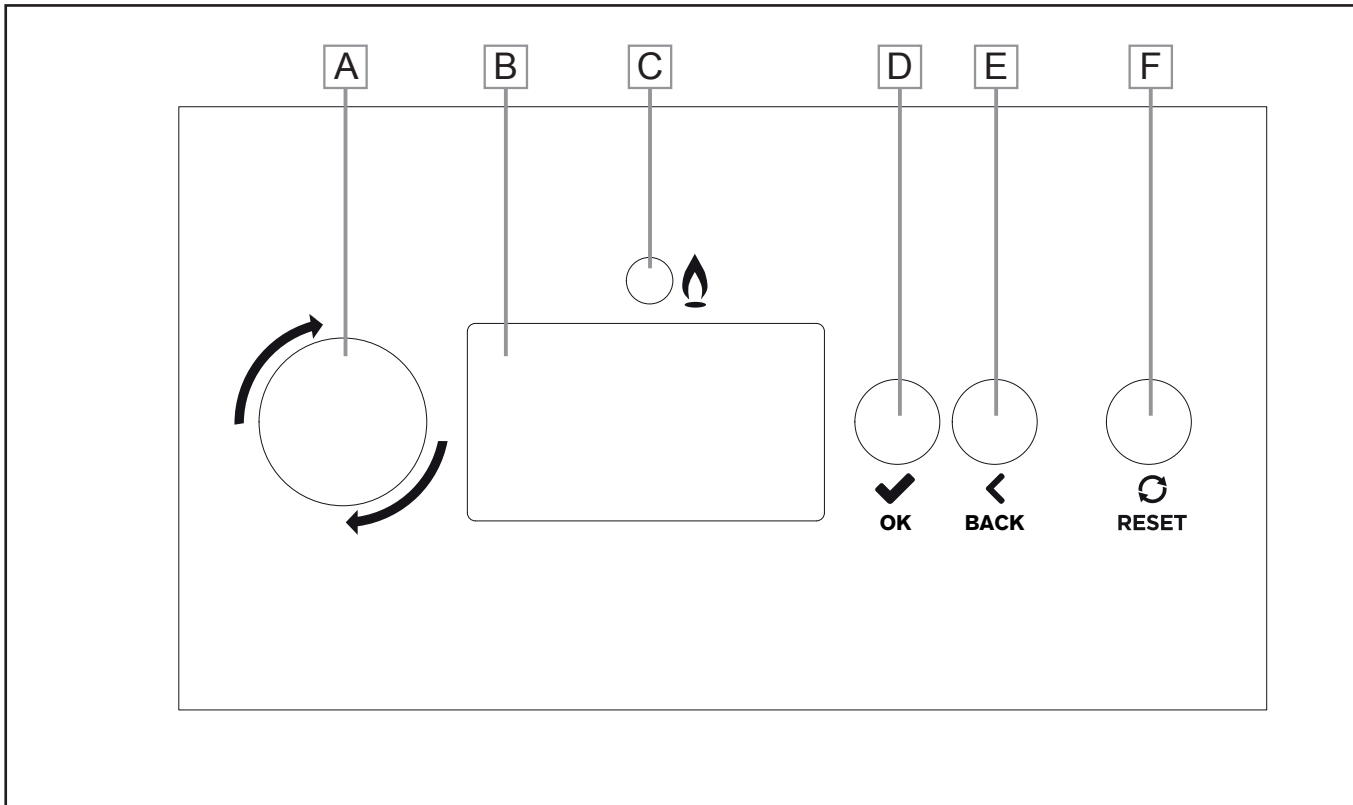


FIGURE 4 SYSTEM MANAGER INTERFACE

A. Rotary Knob

- Enter a menu, if in the normal operation screen, and highlight the first menu item.
- Scroll up (anti-clockwise) or down (clockwise) in a menu
- Change the value in parameter setting.
- If an error is showing in the title bar, scroll to the associated error screen(s), and return.

B. LCD Display Screen

- Menu and status display.

C. Burner LED

- Will be on if the burner is lit.

D. Select button

- Enter a menu, if in the normal operation screen, and highlight the first menu item.
- Enter the highlighted menu (sub menu or parameter), if in a menu or sub menu.
- If in a parameter setting, select a parameter which will then flash for adjustment, once adjusted using the rotary knob press again to store and move on.

E. Back button

- In a menu, return to the previous menu layer.
- In parameter setting, exit the parameter without storing the value.
- In a guided assistant, go back to the previous screen.

F. Reset button

- Reset the associated boiler module error, if a resettable (lockout) error is active.
- Return to the normal operation screen.

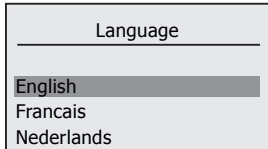
5.2 Cascade Configuration

Once the VariCAN adapters have been installed and connected into each boiler in the cascade then the cascade can be configured.

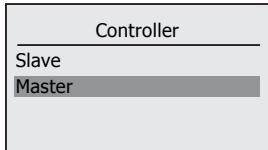
Power up each boiler in the cascade then return to the Cascade Master boiler to start the configuration. The following screens will be displayed on each boiler at power up:



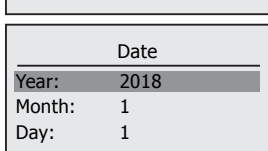
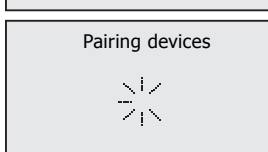
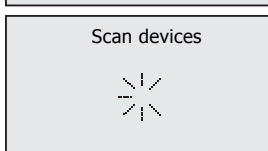
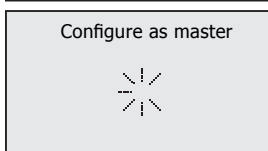
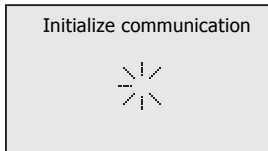
Initial configuration



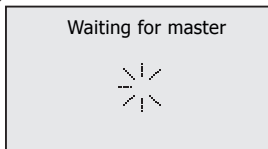
The default language will be selected and highlighted.



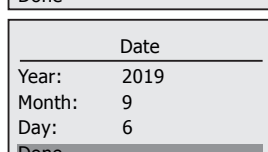
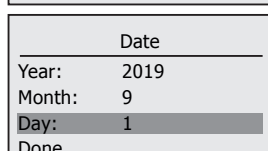
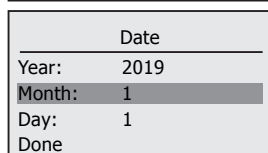
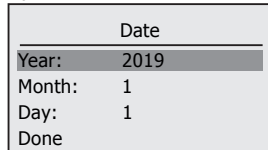
On the Master boiler in the cascade, select "Master", the following screens will appear in the order shown below:



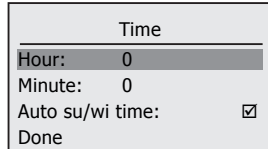
Once the master boiler System Manager has been selected and the Scan Devices completed, all Slave boilers will display the following screen.



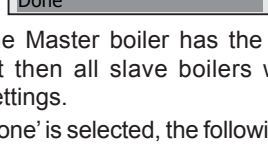
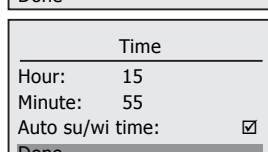
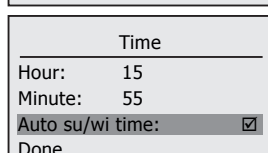
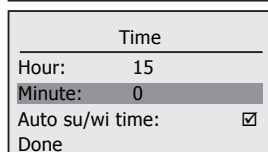
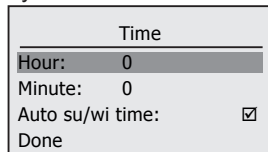
On the Master boiler, set the date fields, followed by "Done".



Once the date is set and "Done" is selected the following screen is displayed:

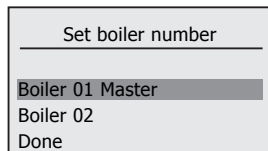


On the Master boiler now set the time and settings for Summer/Winter time change, followed by "Done":



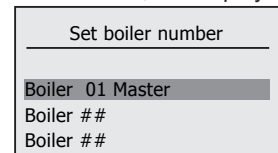
Once the Master boiler has the date and time set then all slave boilers will adopt these settings.

Once 'Done' is selected, the following screen will appear:



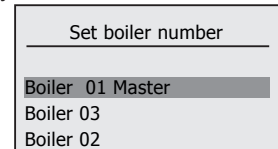
This is an example where there are two boilers in the Cascade, each Slave boiler will be listed from Boiler 02 onwards, Boiler 01 is always the Master, and the configuration of Slave boilers will be different to the Master but will follow the identical procedure.

The Boilers numbers in the case of only 2 boilers can appear in any order, this is in relation to how they are discovered during the Bus Scanning process, and the Slave boiler is also pre-allocated as boiler 2. When a Boiler is highlighted in the menu, the corresponding TTL-i5 VariCAN adapter LED will illuminate, in the case of a Slave boiler the System Manager Display will also change to inverse video to allow identification, selection and labelling. For any Slave boilers where there is more than 2 boilers in the cascade, the display will show:



If any Slave boilers are not listed, check that they are connected correctly to the bus and that they have their power switched on.

Each Slave boiler can be selected and a number allocated, usually corresponding to their physical location in the cascade:



In the case above, the second Slave boiler highlighted was identified as Boiler 03 in the cascade, and the third Slave as Boiler 02, adjacent to the Master boiler.

Once you are happy with the selection of the Slave boiler numbers, select 'Done'. The following screen will then appear:



The Master boiler is now scanning the installation to locate all of the connected boiler Heating Circuits.

Upon completion the following screen will be displayed showing all available Heating Circuits in relation to all boilers:

Set HC number
HC ## Boiler 1.1
HC ## Boiler 1.2
HC ## Boiler 2.1

In this example each boiler has 2 heating circuits that may be selected for use. By scrolling down all boiler Heating Circuits can be selected and allocated a unique number in the system. For example in a two boiler cascade:

Set HC number
HC ## Boiler 1.1
HC ## Boiler 1.2
HC ## Boiler 2.1
HC ## Boiler 2.2

Set HC number
HC ## Boiler 1.2
HC ## Boiler 2.1
HC ## Boiler 2.2
Done

Once you have selected and allocated a number to the Heating Circuits that you wish to use and configure, for example a single HC on the Master boiler and Two HCs on the Slave boiler:

Set HC number
HC 01 Boiler 1.1
HC ## Boiler 1.2
HC ## Boiler 2.1

Set HC number
HC 01 Boiler 1.1
HC ## Boiler 1.2
HC ## Boiler 2.1
HC ## Boiler 2.2

Set HC number
HC ## Boiler 1.2
HC 02 Boiler 2.1
HC ## Boiler 2.2
Done

Set HC number
HC 02 Boiler 2.1
HC 03 Boiler 2.2
Done

Select 'Done' and the following screens will appear:

Set DHW number
DHW ## Boiler 1
DHW ## Boiler 2
Done

Note: The DHW circuit shares resources with the second Heating Circuit on each boiler, therefore if a second HC is already allocated then this will not be available for selection. Once you have selected and allocated a

number to the DHW Circuits that you wish to use and configure, for example, in line with the above example, a single HC on the Master boiler and Two HCs on the Slave boiler with a single DHW circuit on the Master boiler:

Set DHW number
DHW 01 Boiler 1
Done

Select 'Done' and the following screen will appear:

If the System manager has been replaced or a new master recommissioned then the configuration backup file may be recovered from the designated slave providing that a backup was stored during original configuration or updates.

If No is selected below then proceed to section 5.3 Plant Configuration'

Load back up?
No
Yes

Load back up?
No
Yes

Load back up?
2
Done

Commissioning

Done

System will reboot

Then the following status screen will be shown, this screen shows the boiler status for a Master boiler in a cascade, a second status screen exists and can be accessed by rotating the knob anticlockwise:

< Boiler Name & Model No. >	
Operation:	Standby
Boiler Setp.:	0%
Boiler cap.:	0%
Flow temp.:	40.2°C

This then shows that status of the Plant.

< Boiler Name & Model No. >	
Operation:	Standby
Plant Setp.:	0%
Plant cap.:	0%
Header:	40.2°C

No configuration is specifically required for the Cascade Manager. Refer to the Operating Guide for the status and settings within this function.

5.3 Plant Configuration

Configure plant?	
No	<input checked="" type="checkbox"/>
Yes	<input type="checkbox"/>

Plant configuration is related to shared resources necessary for the operation of the complete cascade/plant. To configure these select 'Yes' and then follow the screens.

Hydraulic Separation:

If the boiler has Hydraulic Separation from the intermediate or final circuits in the heating system, or if the boilers have a combined flue system then set this option to either 'Header' or 'Plate heat exchanger'.

Hydraulic separation?	
No	<input checked="" type="checkbox"/>
Header	<input type="checkbox"/>
Plate heat exchanger	<input type="checkbox"/>

Hydraulic separation?	
No	<input type="checkbox"/>
Header	<input checked="" type="checkbox"/>
Plate Heat exchanger	<input type="checkbox"/>

Hydraulic separation?	
Header	<input type="checkbox"/>
Plate heat exchanger	<input checked="" type="checkbox"/>

Header Thermistor:

If the system has a header sensor fitted, combined flow, then select 'Yes', otherwise the system will use the average flow temperature of all running boilers.

Set Flue System:

If the boilers are connected into a common or cascade flue system then you can choose multiline flue system where the minimum capacity of the boiler in a cascade can be increased in order to ensure no backflow in the flue system.

Set flue system	
Standard	<input checked="" type="checkbox"/>
Multiline	<input type="checkbox"/>

Set flue system	
Standard	<input type="checkbox"/>
Multiline	<input checked="" type="checkbox"/>

If the boiler cascade has a common pump that circulates water through all the boilers in the Cascade the select the output of the Master boiler that controls this pump. Otherwise select 'None'.

Loc'n of shared boiler pump?	
None	<input checked="" type="checkbox"/>
PWM/0-10V ()	<input type="checkbox"/>
MFR1 ()	<input type="checkbox"/>

The following outputs can be configured for this function:

Loc'n of shared boiler pump?	
None	<input type="checkbox"/>
PWM/0-10V ()	<input checked="" type="checkbox"/>
MFR1 ()	<input type="checkbox"/>
MFR2 ()	<input type="checkbox"/>

Loc'n of shared boiler pump?	
PWM/0-10V ()	<input type="checkbox"/>
MFR1 ()	<input checked="" type="checkbox"/>
MFR2 ()	<input type="checkbox"/>
MFR3 ()	<input type="checkbox"/>

Loc'n of shared boiler pump?	
MFR1 ()	<input type="checkbox"/>
MFR2 ()	<input checked="" type="checkbox"/>
MFR3 ()	<input type="checkbox"/>
MFR4 ()	<input type="checkbox"/>

Loc'n of shared boiler pump?	
MFR2 ()	<input type="checkbox"/>
MFR3 ()	<input checked="" type="checkbox"/>
MFR4 ()	<input type="checkbox"/>

Loc'n of shared boiler pump?	
MFR3 ()	<input type="checkbox"/>
MFR4 ()	<input checked="" type="checkbox"/>

Note: Once a programmable has been selected the function will appear within the parenthesis at the right of the designated output name.

If the boiler cascade has a common pump that circulates water through either the boiler cascade or cascade header and supplies the heating load then select the output of the Master boiler that controls this pump. Otherwise select 'None'.

Select Loc'n of system pump?	
None	<input checked="" type="checkbox"/>
PWM/0-10V ()	<input type="checkbox"/>
MFR1 ()	<input type="checkbox"/>

The following outputs can be configured for this function:

Select Loc'n of system pump?	
None	<input type="checkbox"/>
PWM/0-10V ()	<input checked="" type="checkbox"/>
MFR1 ()	<input type="checkbox"/>
MFR2 ()	<input type="checkbox"/>

Select Loc'n of system pump?	
PWM/0-10V ()	<input type="checkbox"/>
MFR1 ()	<input checked="" type="checkbox"/>
MFR2 ()	<input type="checkbox"/>
MFR3 ()	<input type="checkbox"/>

Select Loc'n of system pump?	
MFR1 ()	<input type="checkbox"/>
MFR2 ()	<input checked="" type="checkbox"/>
MFR3 ()	<input type="checkbox"/>
MFR4 ()	<input type="checkbox"/>

Select Loc'n of system pump?	
MFR2 ()	<input type="checkbox"/>
MFR3 ()	<input checked="" type="checkbox"/>
MFR4 ()	<input type="checkbox"/>

Select Loc'n of system pump?	
MFR3 ()	<input type="checkbox"/>
MFR4 ()	<input checked="" type="checkbox"/>

If the boiler cascade has a shunt pump to control the temperature differential of the cascade flow to return then select the output of the Master boiler that controls this pump. Otherwise select 'None'.

Select Loc'n of shunt pump?	
None	<input checked="" type="checkbox"/>
PWM/0-10V ()	<input type="checkbox"/>
MFR1 ()	<input type="checkbox"/>

The following outputs can be configured for this function:

Select Loc'n of shunt pump?	
None	<input type="checkbox"/>
PWM/0-10V ()	<input checked="" type="checkbox"/>
MFR1 ()	<input type="checkbox"/>
MFR2 ()	<input type="checkbox"/>

Select Loc'n of shunt pump?	
PWM/0-10V ()	<input type="checkbox"/>
MFR1 ()	<input checked="" type="checkbox"/>
MFR2 ()	<input type="checkbox"/>
MFR3 ()	<input type="checkbox"/>

Select Loc'n of shunt pump?	
MFR1 ()	<input type="checkbox"/>
MFR2 ()	<input checked="" type="checkbox"/>
MFR3 ()	<input type="checkbox"/>
MFR4 ()	<input type="checkbox"/>

Select Loc'n of shunt pump?

MFR2 ()

MFR3 ()

MFR4 ()

Select Loc'n of shunt pump?

MFR3 ()

MFR4 ()

The Master boiler in a cascade can indicate if a system fault condition exists, so any boiler fault, Master or Slave. This can then be used to indicate to plant monitoring equipment if any fault exists in the complete system. If this is required then select the output of the Master boiler that controls this signal. Otherwise select 'None'.

System fault indication

None

PWM/0-10V ()

MFR1 (HC1 pump)

The following outputs can be configured for this function:

System fault indication

None

PWM/0-10V ()

MFR1 (HC1 pump)

MFR2 (DHW pump)

System fault indication

PWM/0-10V ()

MFR1 (HC1 pump)

MFR2 (DHW pump)

MFR3 (Boiler on indicator)

System fault indication

MFR1 (HC1 pump)

MFR2 (DHW pump)

MFR3 (Boiler on indicator)

MFR4 (Boiler Fault Indicator)

System fault indication

MFR2 (DHW pump)

MFR3 (Boiler on indicator)

MFR4 (Boiler Fault Indicator)

System fault indication

MFR3 (Boiler on indicator)

MFR4 (Boiler Fault Indicator)

The plant may be controlled in a number of ways:

- 0-10V analogue input
- 230V 50Hz switched live input via a 'Volts Free' contact
- OpenTherm Master controller

0-10V analogue input control

If the Plant cascade control is via a BMS with a 0-10V signal then this can be selected and configured next. The following options are available:

Configure 0-10V input

None

0-10V Capacity

0-10V Temperature

Configure 0-10V input

None

0-10V Capacity

0-10V Temperature

Configure 0-10V input

0-10V Capacity

0-10V Temperature

If 0-10V Temperature control is selected, then the parameters for the Minimum and Maximum flow temperature in relation to the voltage demand range values can be set.

0-10V input Temp. Setp. 0V:

Temp. setp. 0V

8°C

Done

Temp. setp. 0V

8°C

Done

0-10V input Temp. Setp. 10V:

Temp. setp. 10V

80°C

Done

Temp. setp. 10V

80°C

Done

Once 0-10V control is selected a number of parameters must be defined. The default settings are as shown below but these can be hanged if required. To configure the parameters select 'Yes', to accept the current default settings select 'No'.

Configure 0-10V parameters

No

Yes

Once 'Yes' is selected the parameters can be set using the following screens.

Voltage demand. This setting determines the switching point at which demand is expected by the system, anything below this is at keep alive voltage:

Configure voltage demand

1.0V

Done

Voltage life zero. This setting determines the minimum keep alive voltage where the system expects a voltage to be present on an operational interface, anything below this indicates a wiring fault:

Configure voltage life zero

0.0V

Done

Once this level is set, 'Done' may be selected.

The next plant control signal that may be configured is where a Switched Live signal is used to generate a demand to enable the cascade.

SL1 230V demand

Configure SL1

None

Enable

If this signal is to be configured then select Enable, otherwise select 'None'. This will then prompt for a Cascade flow temperature set point, which will be the target temperature for the cascade under direct SL1 control.

Plant Setp. SL1

85°C

Done

Once this level is set, 'Done' may be selected.

NOTE: The next section can only be selected in software revisions from 443.207.000 and above.

Plant – SL2 230V External heat source availability and control configuration

The Master boiler can control an External heat source to provide heat into the cascade. In order to do this, it requires an input signal to inform it as to when the External heat source is available. SL2 is used as the input to tell the Master that the External heat source is available to supply heat into the cascade.

Once this is determined, the control signal for the External heat source must be defined. It is possible to select the 0-10V output or one of the MFR Multi-Function Relays, 1 to 4.

Configure SL2

None

Ext. heat source release

Configure SL2

None

Ext. heat source release

Once Ext. heat source release is selected the required control signal can be selected and configured.

Ext. heat source control

None

PWM/0-10V ()

MFR1 ()

Ext. heat source control

None

PWM/0-10V ()

MFR1 ()

MFR2 ()

Ext. heat source control

PWM/0-10V ()

MFR1 ()

MFR2 ()

MFR3 ()

Ext. heat source control

MFR1 ()

MFR2 ()

MFR3 ()

MFR4 ()

Ext. heat source control

MFR2 ()

MFR3 ()

MFR4 ()

Ext. heat source control

MFR3 ()

MFR4 ()

0-10V Ext. heat source control settings.

If the 0-10V output is selected to control the demand to the External heat source, then the following parameters must be set.

The voltage threshold to turn on the External heat source.

Configure voltage demand

0.0V

Done

Configure voltage demand

1.5V

Done

Configure voltage off

0.0V

Done

Configure voltage off

1.0V

Done

External heat source capacity

In order to be able to determine the capacity of the cascade the Master boiler needs to know what the maximum capacity rating of the External heat source is.

Maximum rating

35.0kW

Done

Maximum rating

80.0kW

Done

The demand switch on capacity for the external heat source can then be set.

Switch on capacity

60%

Done

Switch on capacity

40%

Done

The next plant control signal that may be configured is the OpenTherm Bus signal which is a bidirectional signal to the cascade.

OpenTherm

This bus signal can both control and monitor the status of the cascade via the Master boiler. It has a number of modes of operation:

1. On/Off demand
2. Temperature setpoint demand
3. Capacity setpoint demand

If no OpenTherm control of the cascade is required then 'None' may be selected.

Configure OpenTherm

No

On demand

Temperature demand

The options that may be selected are as below, if 'On demand' is selected this is effectively a PELV 'volts free' enable signal.

Configure OpenTherm

None

On demand

Temperature demand

Capacity demand

If 'On demand' is configured then this will then prompt for a Cascade flow temperature set point, which will be the target temperature for the cascade under direct OpenTherm control.

OpenTherm Temp. Setpoint

60°C

Done

OpenTherm Temperature demand

Configure OpenTherm

On demand

Temperature demand

Capacity demand

When OpenTherm Temperature demand is selected, the maximum temperature that an OpenTherm master can demand from the Plant can be adjusted.

Set max flow temp

80°C

Done

Set max flow temp

85°C

Done

Once this level is set, 'Done' may be selected.

The next plant function that may be selected is the outside sensor input if one is to be used for the control of the flow temperature from the cascade. If not then select 'Done'.

Outside sensor available?

None

Yes

5.4 Boiler Configuration

The next stage is to configure each of the boilers in the cascade. This process is carried out from the Master boiler. The configuration parameters for the boiler configuration are specific to that particular boiler.

Select the boiler from the list which is to be configured.

Select boiler to configure
Boiler1
Boiler 2
Done

If the selected boiler has its own unique primary water circulation pump this is where it is configured. Once again one of the programmable outputs from the boiler can be used to control this pump function. If no individual boiler pump is present then select 'None'.

Select location of boiler pump
None
PWM/0-10V ()
MFR1 ()

Select location of boiler pump
None
PWM/0-10V ()
MFR1 ()
MFR2 ()

Select location of boiler pump
PWM/0-10V ()
MFR1 ()
MFR2 ()
MFR3 ()

Select location of boiler pump
MFR1 ()
MFR2 ()
MFR3 ()
MFR4 ()

Select location of boiler pump
MFR2 ()
MFR3 ()
MFR4 ()

Select location of boiler pump
MFR3 ()
MFR4 ()

The next boiler configuration step is the Boiler On indication output. Once again any of the programmable outputs may be selected. Usually MFR3 is allocated. The full screens list is omitted for simplicity.

Boiler on indication
None
PWM/0-10V ()
MFR1 ()

The next boiler configuration step is the Boiler Fault indication output. Once again any of the programmable outputs may be selected. Usually MFR4 is allocated. The full screens list is omitted for simplicity.

Boiler fault indication
None
PWM/0-10V ()
MFR1 ()

The next boiler configuration step is the LPG valve control output. This function is for control of an external LPG valve in series with the Gas line as an additional safety feature. It is opened during the burner phase of the Boiler. Once again any of the programmable outputs may be selected. The full screens list is omitted for simplicity.

LPG valve
None
PWM/0-10V ()
MFR1 (HC1 pump)

The next boiler configuration step is the powered flue damper control output. This function is for control of an external flue damper as an additional safety feature. It is opened during the fan start-up and closed after the fan post purge period of the Boiler. Once again any of the programmable outputs may be selected. The full screens list is omitted for simplicity.

Flue damper
None
PWM/0-10V ()
MFR1 (HC1 pump)

Once completed the following screen will be displayed:

Select boiler to configure
Boiler1 ✓
Boiler2
Done

Note: The boiler that has just been configured will now have a 'tick' next to its designation. The next boiler to configure can now be selected. The process above is then repeated for all boilers in the cascade. After all Boilers have been configured, select 'Done'.

5.5 Heating Circuit Configuration

If heating circuits were located and allocated during initial setup then they will now appear here to be configured. There is a maximum number of heating circuits for each boiler, in this case two circuits identified by boiler number and Heating Circuit number.

Select HC to configure
HC1 Boiler 1.1
HC2 Boiler 2.1
HC3 Boiler 2.2

At the end of the list of allocated Heating Circuits 'Done' is displayed.

Select HC to configure
HC1 Boiler 1.1
HC1 Boiler 2.1
HC2 Boiler 2.2
Done

Firstly select the Heating Circuit you wish to configure:

Select HC to configure
HC1 Boiler 1.1
HC2 Boiler 2.1
HC3 Boiler 2.2

The next step is to configure the Heating Circuit pump control signal if it has its own unique circulation pump. If you have already configured a System pump this may not be required so 'None' may be selected. One of the programmable outputs can be selected for this function. The following screen will be displayed.

Select location of HC pump
None
PWM/0-10V ()
MFR1 ()

Select location of HC pump
None
PWM/0-10V ()
MFR1 ()
MFR2 ()

Select location of HC pump
PWM/0-10V ()
MFR1 ()
MFR2 ()
MFR3 ()

Select location of HC pump
MFR1 ()
MFR2 ()
MFR3 ()
MFR4 ()

Select location of HC pump
MFR2 ()
MFR3 ()
MFR4 ()

Select location of HC pump
MFR3 ()
MFR4 ()

Once completed the next step is to set the Maximum and Minimum flow temperature for the Heating Circuit.

Set max flow temp
85°C
Done

Select the temperature and adjust to the desired setting, confirm and then select 'Done'.

Set max flow temp
75°C
Done

Set min flow temp
15°C
Done

Set min flow temp
30°C
Done

Once completed the next step is to confirm if a Room Temperature sensor is connected and being used control the room temperature for this Heating Circuit.

Room Sensor available?
No
Yes

The next step is to confirm is an Outside Temperature sensor is connected and being used as an input to the Heating Circuit to calculate the required flow temperature.

Outside Sensor available?
No
Yes

Depending upon the two item selection above the next screen will show what options are available for control of the flow temperature for that specific Heating Circuit.

Control variant
Flow
Weather
Room

Control variant
Flow
Weather
Room
Weather and Room

The next step is to select the function for the SL1 230V switched live input in relation to this Heating Circuit, if it is required.

It can be used as a Heating Circuit enable signal, an Override signal, a Holiday signal or a Frost protection input from an external 'Volts Free' contact for that specific Heating Circuit. If this input is already configured, you will be queried, or if not required then 'None' can be selected.

Configure SL1
None
HC enable
Override

Configure SL1
None
HC enable
Override
Holiday

Configure SL1
HC enable
Override
Holiday
Frost

Configure SL1
Override
Holiday
Frost

Configure SL1
Holiday
Frost

The next step is to configure the OpenTherm input if it is to be used for this specific Heating Circuit. The OpenTherm interface can be operated in a number of modes, On/Off as a 'volts free' PELV signal, Temperature control from an OpenTherm master, or if already configured you will be prompted, or if not used select 'None'.

Configure OpenTherm
None
On/Off
Temperature control

Configure OpenTherm
None
On/Off
Temperature control

Configure OpenTherm
On/Off
Temperature control

If On/Off or Temperature control is selected then the system needs to know of the OpenTherm Master has a built in timeclock.

OT Master with time clock?
No
Yes

The next step is to configure the pump protection function for this specific heating circuit.

Configure pump protection?
 No
 Yes

If Pump protection is selected then an associated period can be set, the time duration between protection cycles and the time point at which the function should start to operate the pump.

Pump protection interval
1day(s)
 Done

Pump protection time point
12:00
 Done

The next step is to select if any DHW circuit demand configured in the system has priority over this specific heating circuit. If 'Yes' is selected than any DHW circuit demand will interrupt the Heating Circuit function.

DHW priority?
 No
 Yes

The next step is to set the initial mode of operation for this Heating Circuit. By selecting the highlighted field the choices are shown in the following screens. Once selected then select 'Done'.

Operating mode
 Standby
 Done

Operating mode
 Time clock single day
 Done

Operating mode
 Time clock multiple days
 Done

Operating mode
 Day
 Done

Operating mode
 Night
 Done

Operating mode
 Day
 Done

Once completed the following screen will be displayed:

Select HC to configure
 HC1 Boiler 1.1 ✓
 HC2 Boiler 2.1
 HC3 Boiler 2.2

Note: The Heating Circuit that has just been configured will now have a '✓' next to its designation.

The next allocated Heating Circuit to configure can now be selected. The process above is then repeated for all Heating Circuits in the cascade.

Select HC to configure
 HC3 Boiler 2.2 ✓
 Done

After all Heating Circuits have been configured, select 'Done'.

5.6 DHW circuit configuration

If Domestic Hot Water circuits were located and allocated during initial setup then they will now appear here to be configured. There is a maximum number of local Domestic Hot Water circuits for each boiler, in this case one circuit identified by boiler number and Heating Circuit number. E.g. Boiler 1 is boiler 1 Domestic Hot Water circuit.

Select DHW to configure
DHW1 Boiler 1
Done

A Domestic Hot Water circuit can be configured as a Local Domestic Hot Water circuit served by that boiler only. See associated Hydraulics. If this is the case select 'Yes' in the menu.

Local DHW circuit
No
Yes

If the selected boiler has its own unique primary Domestic Hot Water charge pump this is where it is configured. Once again one of the programmable outputs from the boiler can be used to control this pump function. If no individual boiler pump is present then select 'None'.

Select loc'n of DHW pump
None
PWM/0-10V ()
MFR1 ()

Select loc'n of DHW pump
None
PWM/0-10V ()
MFR1 ()
MFR2 ()

Select loc'n of DHW pump
PWM/0-10V ()
MFR1 ()
MFR2 ()
MFR3 ()

Select loc'n of DHW pump
MFR1 ()
MFR2 ()
MFR3 ()
MFR4 ()

Select loc'n of DHW pump
MFR2 ()
MFR3 ()
MFR4 ()

Select loc'n of DHW pump
MFR3 ()
MFR4 ()

Once completed the next step is to set the Maximum tank temperature for the Domestic Hot Water circuit, followed by 'Done'.

Max tank temp
60°C
Done

Max tank temp
60°C
Done

The next step is to confirm if a Tank Temperature sensor is connected for the Domestic Hot Water circuit. This gives greater control to the Tank Temperature and allows multiple temperature storage values. Select 'Yes' if a Tank Temperature sensor is connected to the boiler.

Tank sensor?
No
Yes

The next step is to determine the function of the SL2 input which is a mandatory input for an Unvented Domestic Hot Water tank. If the Tank is Unvented you MUST select Domestic Hot Water Enable or Domestic Hot Water Override and wire the SL2 230V switched live input accordingly. The SL2 input can also provide an override function which will generate a recharge cycle for the tank when operated outside of the Domestic Hot Water timeclock settings.

Select the option as required.

Configure SL2
None
DHW enable
DHW override

Configure SL2
None
DHW enable
DHW override

Configure SL2
DHW enable
DHW override

If an OpenTherm control has been configured on this boiler, then this may also control the Domestic Hot Water timing and Setpoint. If this is not used select 'None'.

Configure OpenTherm
None
Temperature demand

Configure OpenTherm
None
Temperature demand

The next step is to set the Antilegionella operating parameters. The options allow for setting a fixed day and time, or a fixed interval between cycles. Both have the ability to set the Tank temperature that the tank must achieve during the cycle. If the function is not required, 'None' may be selected.

Antilegionella?
None
Weekday
Interval

On selecting weekday the following screens with options are shown, the weekday and Start time can be set:

Antilegionella timing
Weekday: Saturday
Start time: 01:00
Done

Antilegionella
Weekday: Saturday
Start time: 01:00
Done

Once set select 'Done' to continue:

Antilegionella
Weekday: Saturday
Start time: 01:00
Done

Next you will be prompted to set the Tank temperature for the Antilegionella cycle:

Antilegionella temperature
65°C
Done

Once the required temperature has been set select 'Done' to confirm and continue:

Antilegionella temperature
65°C
Done

If Interval is selected then the following screen will be shown and the interval between Antilegionella cycles can be set:

Once the interval is set select 'Done'.

Once again the Antilegionella Tank temperature can be set followed by 'Done'.

The next step is to set the initial mode of operation for this Domestic Hot Water circuit. By selecting the highlighted field the choices are shown in the following screens. Once selected then select 'Done'.

Once completed the following screen will be displayed:

Note: The Domestic Hot Water circuit that has just been configured will now have a '✓' next to its designation.

The next allocated Domestic Hot Water circuit to configure can now be selected. The process above is then repeated for all Domestic Hot Water circuits in the cascade.

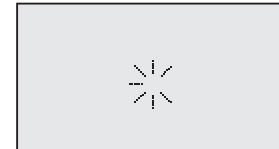
The next allocated Domestic Hot Water circuit to configure can now be selected. The process above is then repeated for all Domestic Hot Water circuits in the cascade.

After all Domestic Hot Water Circuits have been configured, select 'Done'.

If a slave boiler is present the Master data can be stored on this System manager for safe keeping.

The system configuration has now been completed. The settings relating to the Plant, Heating circuits and Domestic Hot Water circuits can be changed in the corresponding settings menu within each of the sections of the menu system. Refer to the operating guide section of this manual.

The system will now reboot and the following screens will be displayed:



443.207.001

< BRAND LOGO >

Loading system table

Then the following status screen will be shown, this screen shows the boiler status for a Master boiler in a cascade, a second status screen exists and can be accessed by rotating the knob anticlockwise:

This then shows that status of the Plant.

No configuration is specifically required for the Cascade Manager. Refer to the Operating Guide for the status and settings within this function.

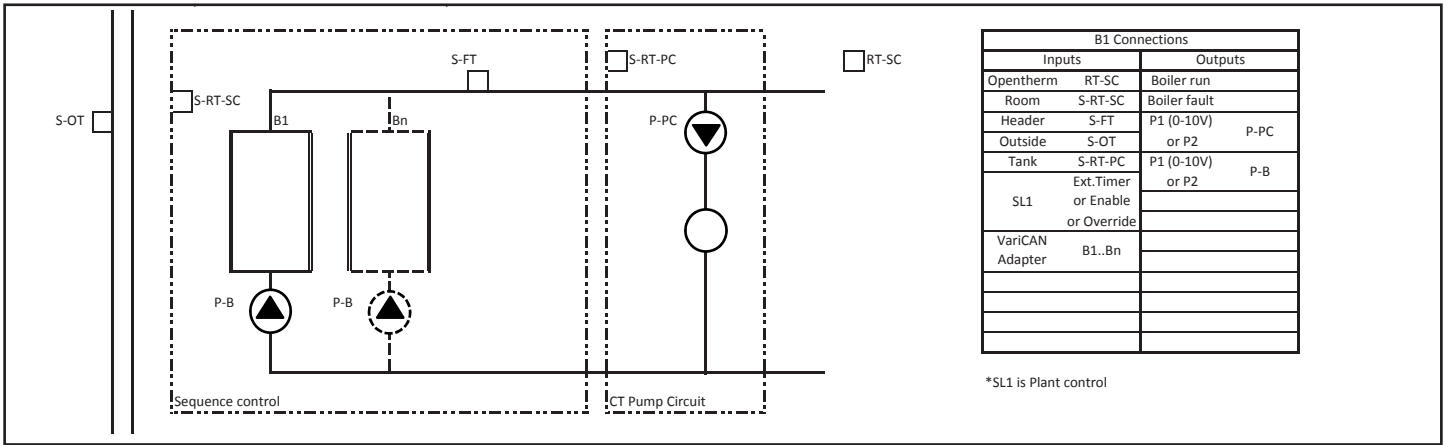


FIGURE 8 SEQUENCE CONTROL 1-16 BOILERS WITH A CT PUMP CIRCUIT

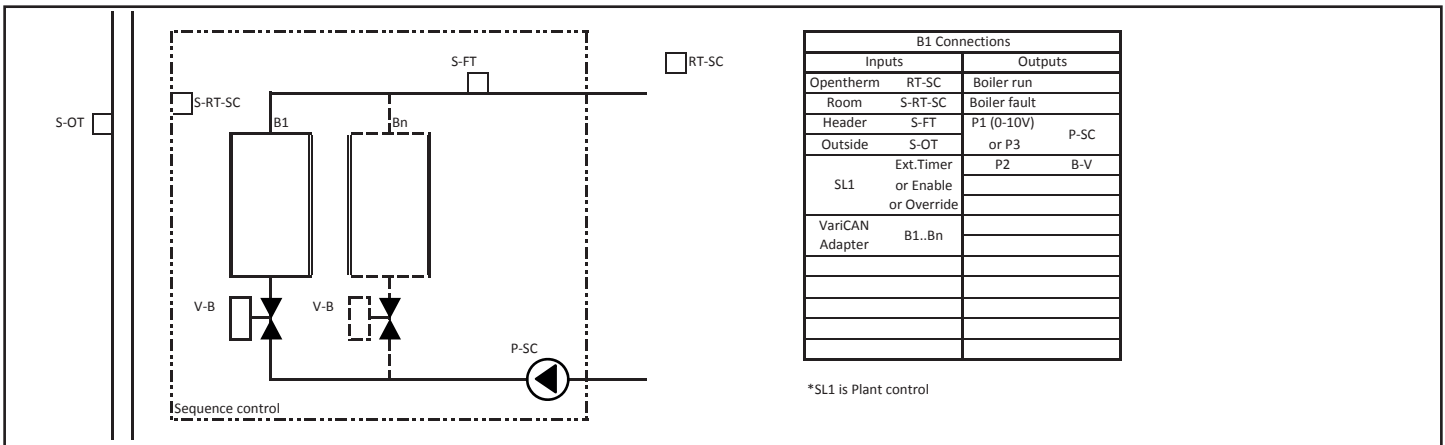


FIGURE 9 SEQUENCE CONTROL 1-16 BOILERS WITH COMMON PUMP AND OPTIONAL VALVES

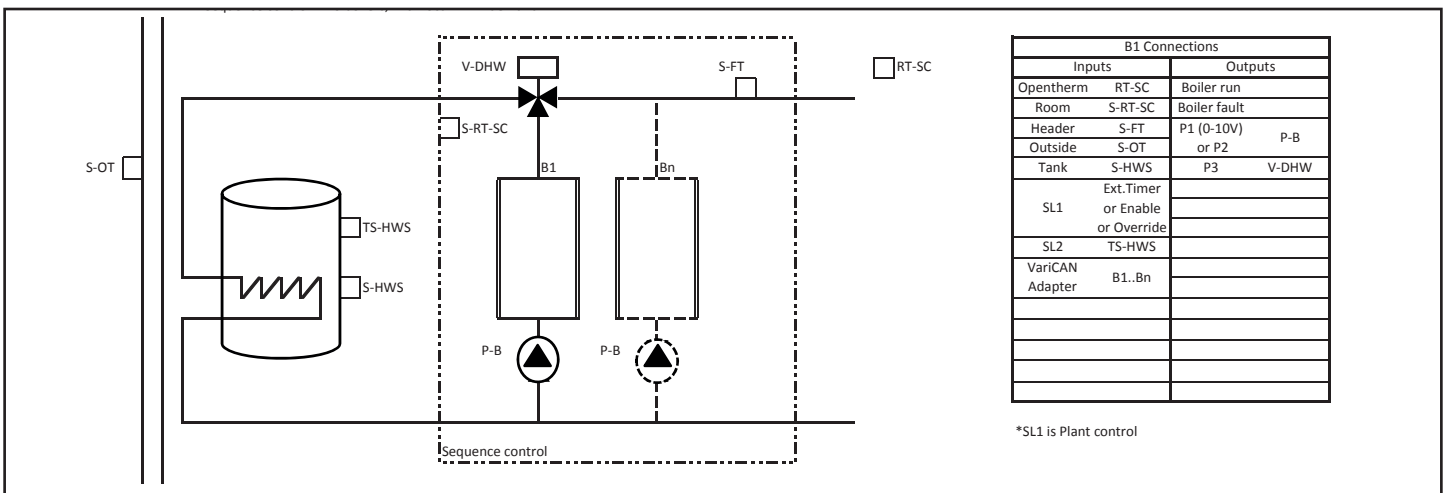


FIGURE 10 SEQUENCE CONTROL 1-16 BOILERS WITH LOCAL DHW DEMAND

APPENDIX 1c Extension Module Configuration Options

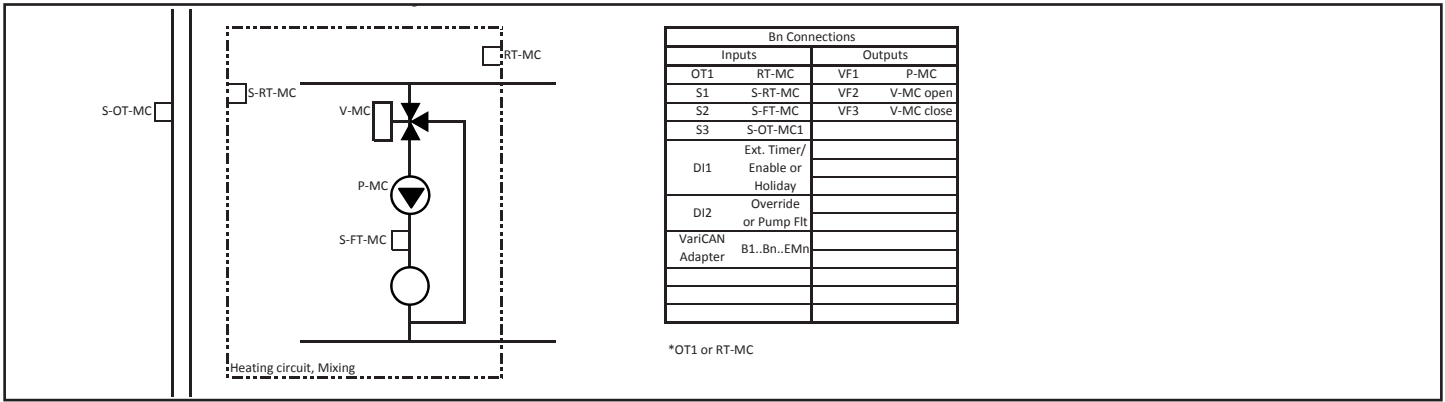


FIGURE 19 EXTENSION MODULE WITH 1 X MIXING CIRCUIT

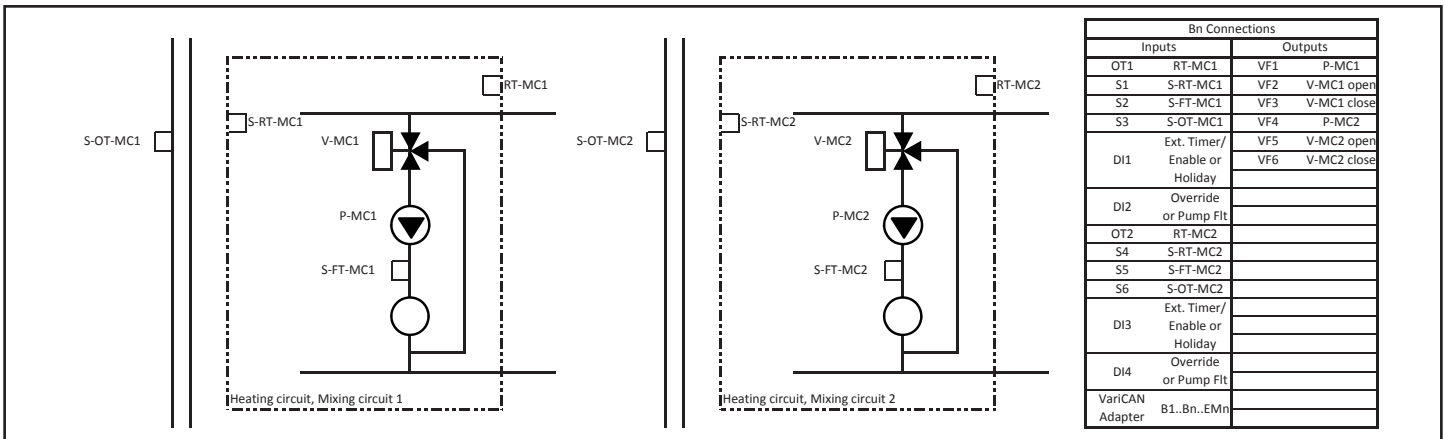


FIGURE 20 EXTENSION MODULE WITH 2 X MIXING CIRCUITS

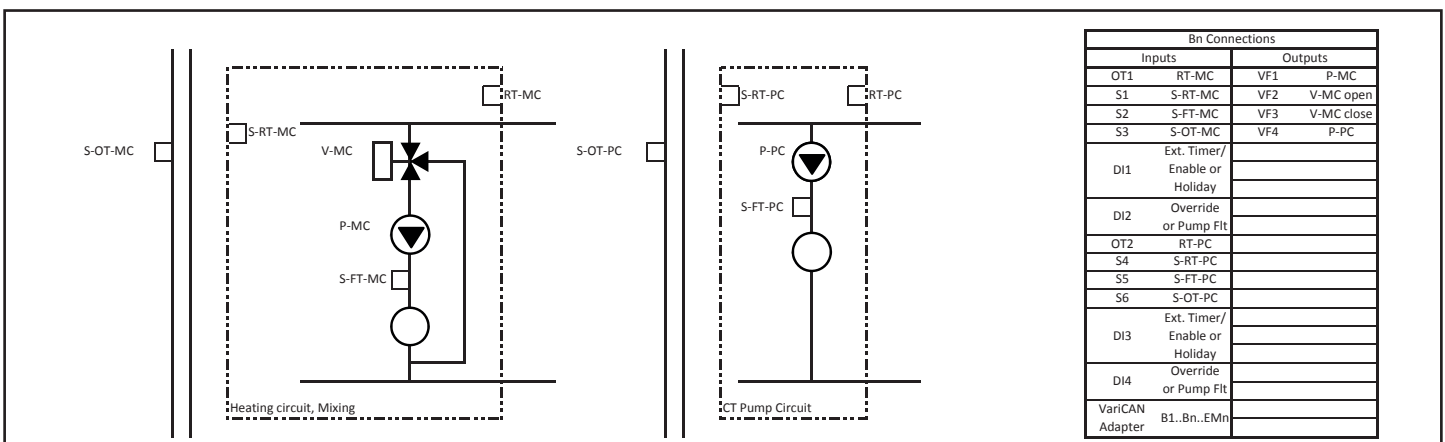


FIGURE 21 EXTENSION MODULE WITH 1 X MIXING CIRCUIT AND 1 X CT PUMPED CIRCUIT

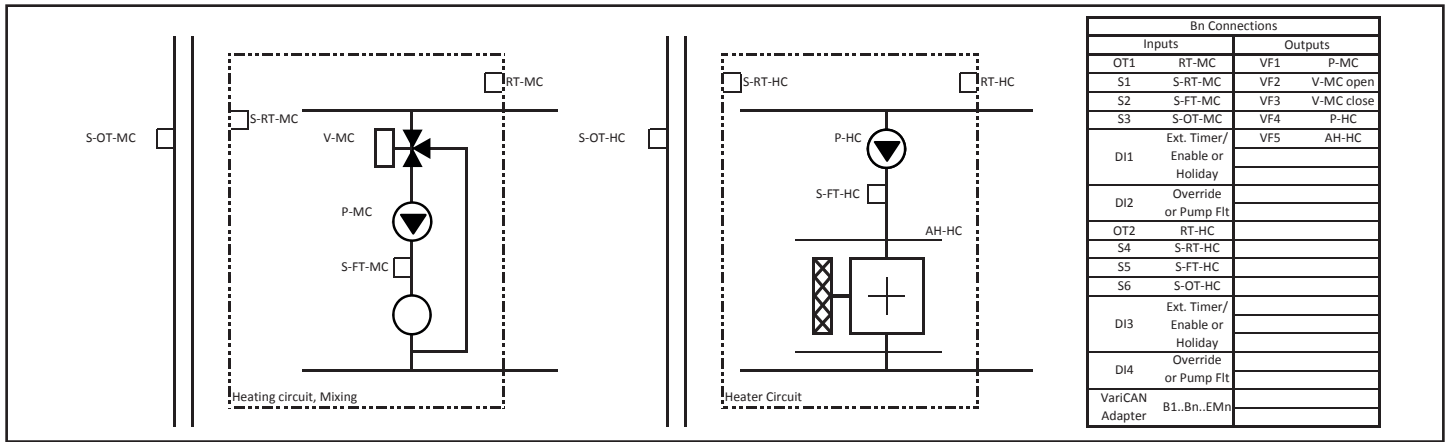


FIGURE 22 EXTENSION MODULE WITH 1 X MIXING CIRCUIT AND 1 X AIR HANDLER CIRCUIT

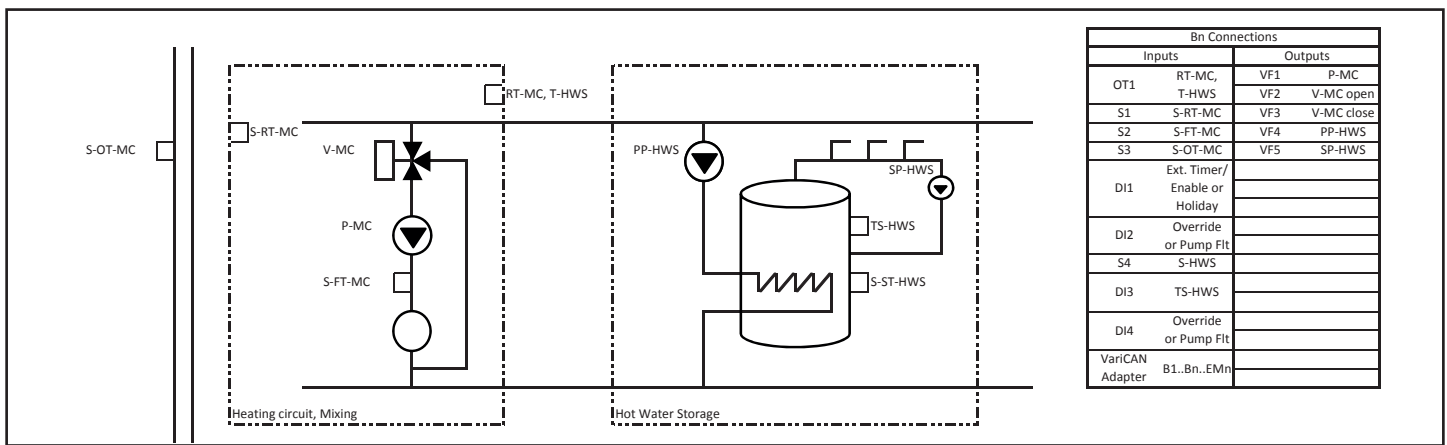


FIGURE 23 EXTENSION MODULE WITH 1 X MIXING CIRCUIT AND 1 X HWS CIRCUIT

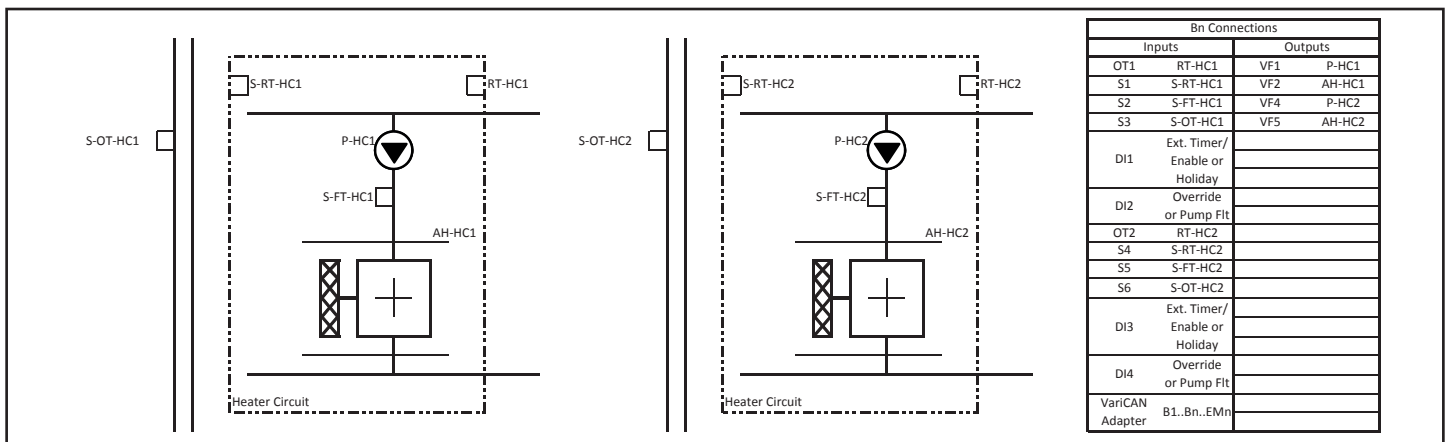


FIGURE 24 EXTENSION MODULE WITH 2 X AIR HANDLER CIRCUITS

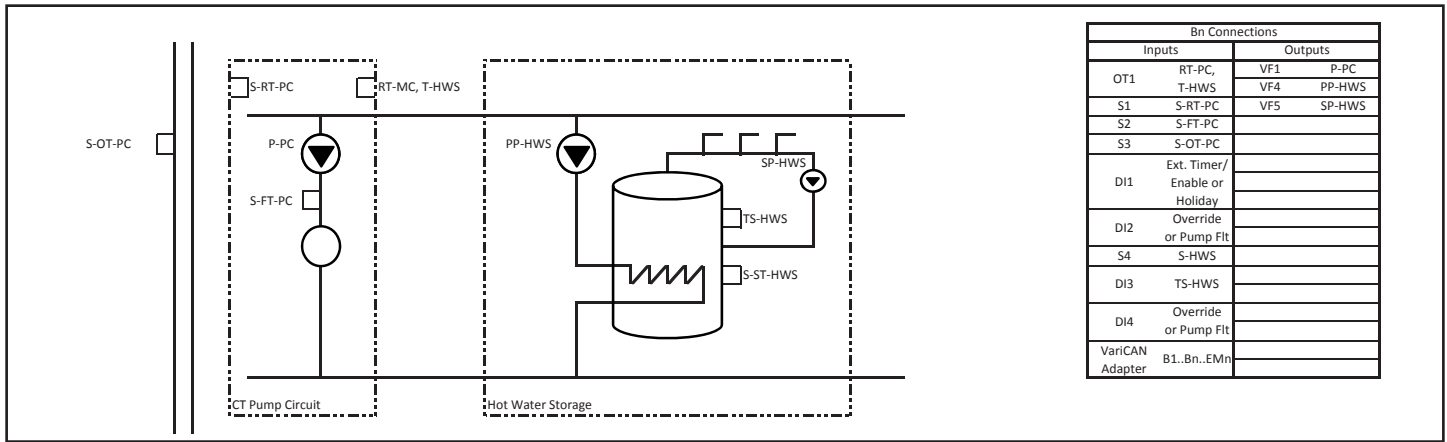


FIGURE 25 EXTENSION MODULE WITH 1 X CT PUMPED CIRCUIT AND 1 X HWS CIRCUIT

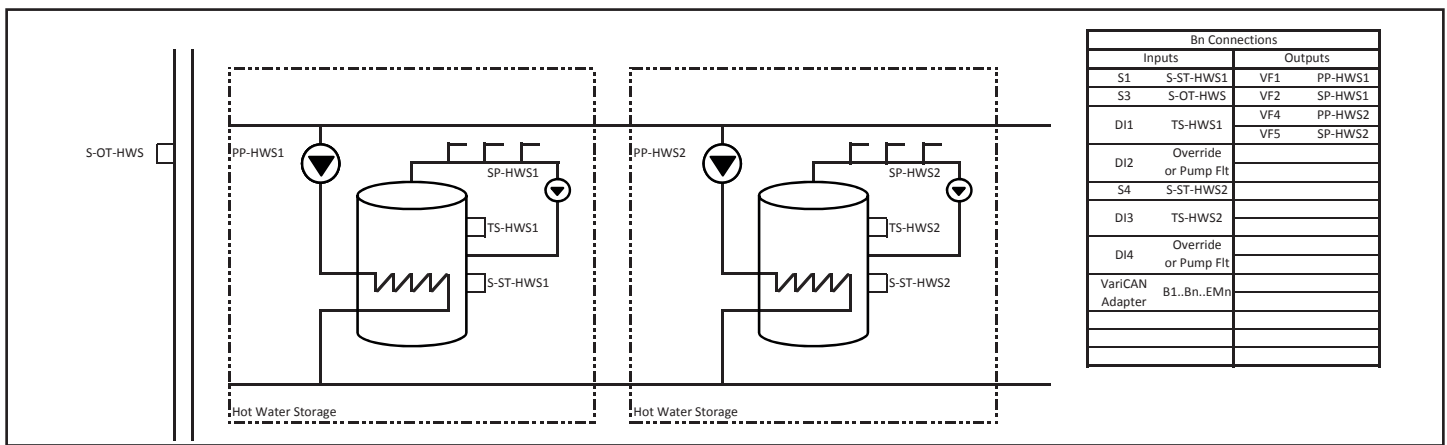


FIGURE 26 EXTENSION MODULE WITH 2 X HWS CIRCUIT

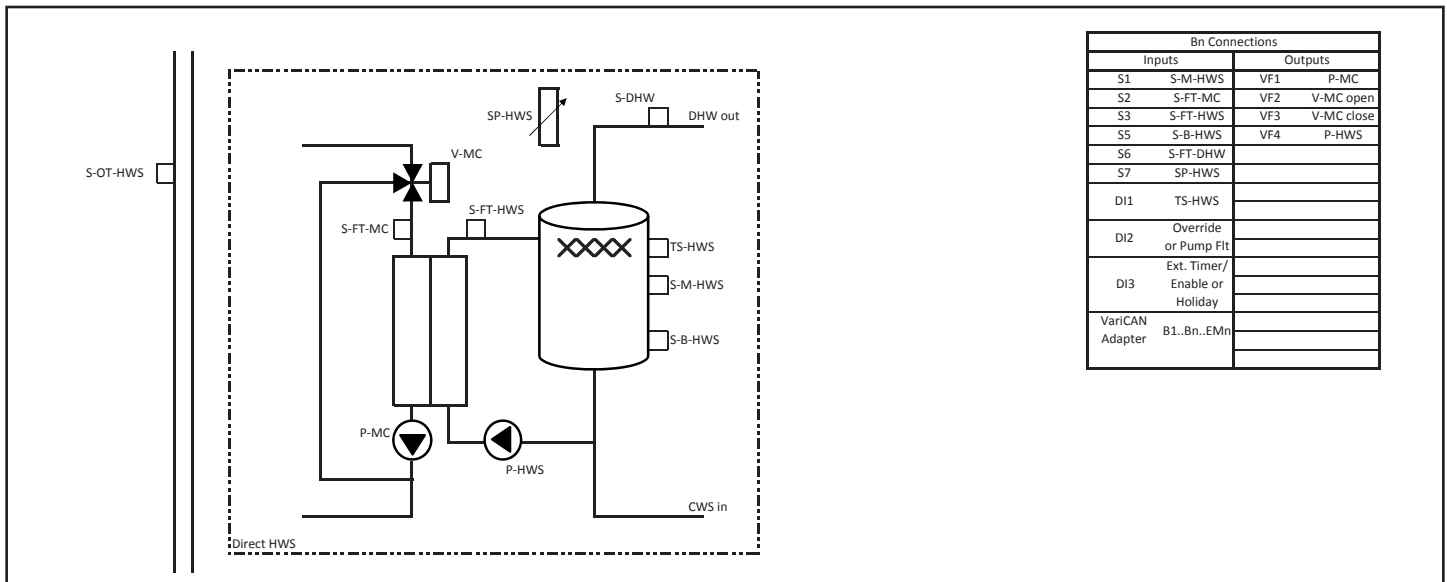
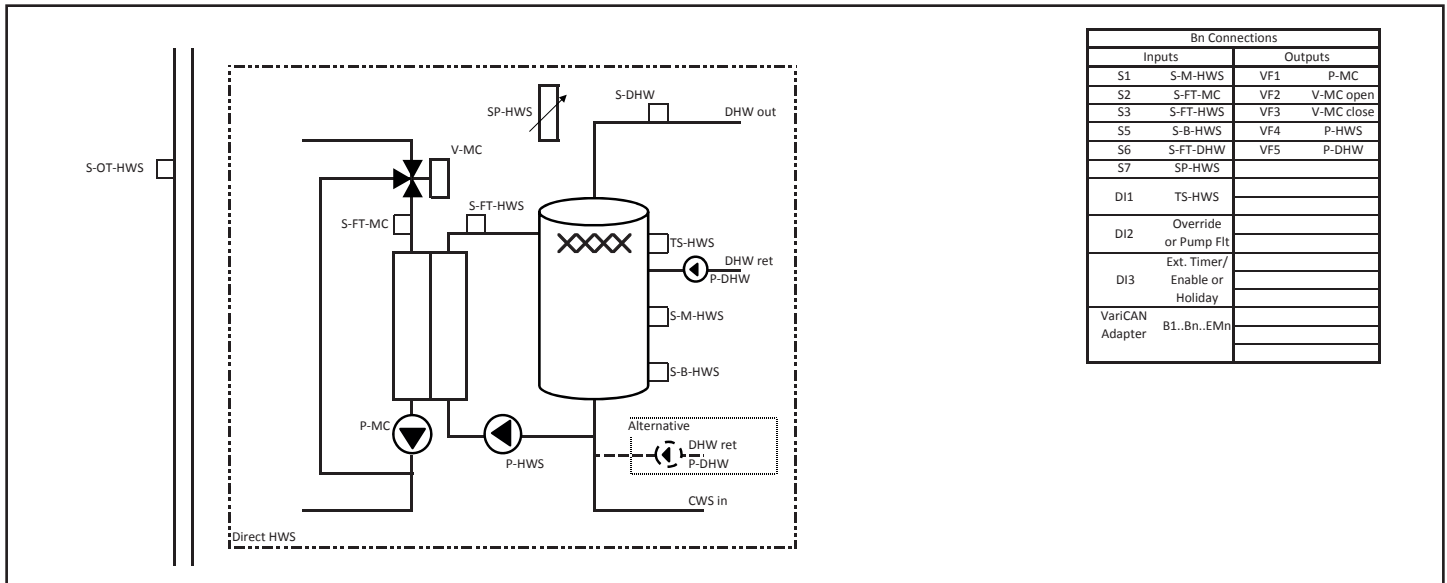
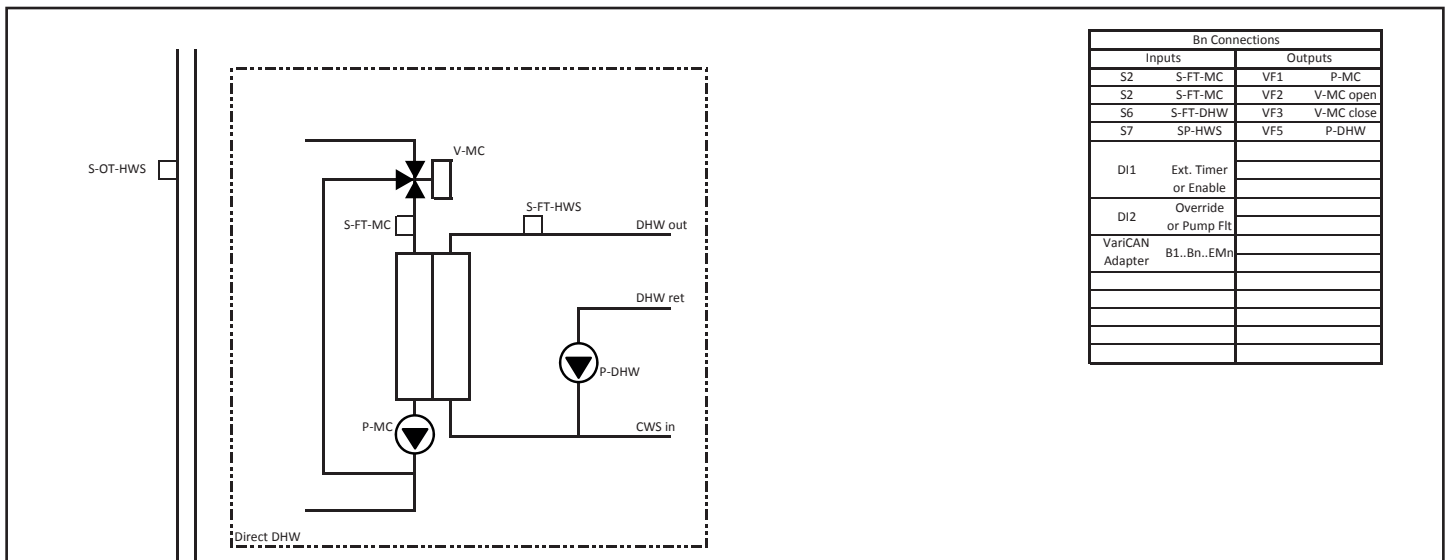


FIGURE 27 EXTENSION MODULE WITH MIXING CONTROL TO PLATE HEAT EXCHANGER FOR DIRECT HWS



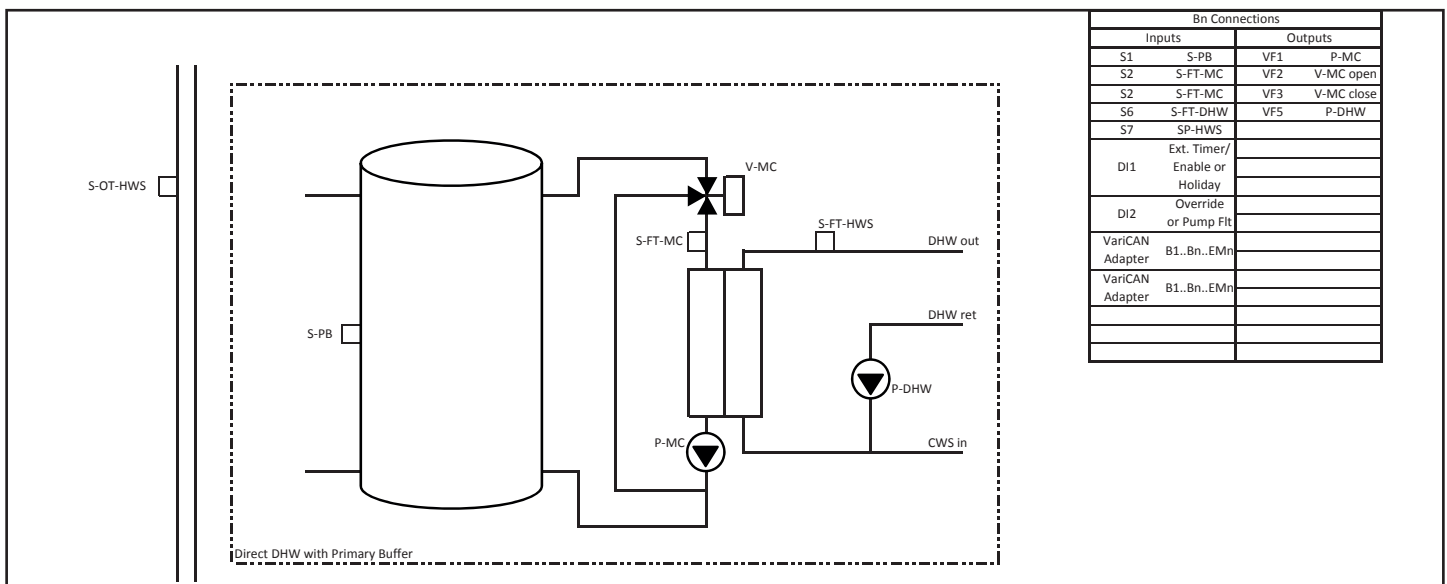
Bn Connections			
Inputs		Outputs	
S1	S-M-HWS	VF1	P-MC
S2	S-FT-MC	VF2	V-MC open
S3	S-FT-HWS	VF3	V-MC close
S5	S-B-HWS	VF4	P-HWS
S6	S-FT-DHW	VF5	P-DHW
S7	SP-HWS		
DI1	TS-HWS		
DI2	Override or Pump Flt		
DI3	Ext. Timer/ Enable or Holiday		
VariCAN Adapter	B1..Bn..EMn		

FIGURE 28 EXTENSION MODULE WITH MIXING CONTROL TO PLATE HEAT EXCHANGER FOR DIRECT HWS WITH DHW PUMP



Bn Connections			
Inputs		Outputs	
S2	S-FT-MC	VF1	P-MC
S2	S-FT-MC	VF2	V-MC open
S6	S-FT-DHW	VF3	V-MC close
S7	SP-HWS	VF5	P-DHW
DI1	Ext. Timer or Enable		
DI2	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		

FIGURE 29 EXTENSION MODULE WITH MIXING CONTROL TO PLATE HEAT EXCHANGER FOR DIRECT DHW WITH PUMP




Bn Connections			
Inputs		Outputs	
S1	S-PB	VF1	P-MC
S2	S-FT-MC	VF2	V-MC open
S2	S-FT-MC	VF3	V-MC close
S6	S-FT-DHW	VF5	P-DHW
S7	SP-HWS		
DI1	Ext. Timer/ Enable or Holiday		
DI2	Override or Pump Flt		
VariCAN Adapter	B1..Bn..EMn		
VariCAN Adapter	B1..Bn..EMn		

FIGURE 30 EXTENSION MODULE WITH PRIMARY BUFFER MIXING CONTROL TO PLATE HEAT EXCHANGER FOR DIRECT DHW WITH PUMP

APPENDIX 1d Abbreviations

Abbreviation	Description
AH-HC	Air heater of Heater Circuit
Bn	On/Off Boiler n
CP	Circulating pump (controlled by Sequence Control)
F-PP-HWSC	Fault contact of primary pump of Hot Water Storage Circuit
FM	Fault Messages Function
F-B	Fault contact of Boiler
F-CP	Fault contact of Circulating pump
F-P-HWSC	Fault contact of pump of Hot Water Storage Circuit
Gen	General Function
HC	Heater Circuit Function
HD-SC	Heat demand contact of Sequence Control
HWS	Hot Water Storage Circuit Function
MC	Mixing Circuit Function
NC	No Connection
PC	Pump Circuit Function
P-HWSC	Pump of Hot Water Storage Circuit
P-MC	Pump of Mixing Circuit
P-PC	Pump of Pump Circuit
PP-HWS	Primary pump of Hot Water Storage Circuit
S-FT	Flow temperature sensor
S-FT-HC	Flow temperature sensor of Heating Circuit
S-FT-MC	Flow temperature sensor Mixing Circuit
S-FT-SC-PT	Common Flow temperature sensor of Sequence Control and Pump Circuit
S-HWS	Water temperature sensor Hot Water Storage Circuit
S-OT	Outdoor temperature sensor
S-RT-HC	Room temperature sensor of Heating Circuit
S-RT-MC	Room temperature sensor Mixing Circuit
S-RT-PC	Room temperature Pump Circuit
S-RT-SC	Room temperature sensor Sequence Control
SC	Sequence Control Function (Plant Control)
T-HC	Overtime contact of Heater Circuit
T-HWS	Overtime contact of Hot Water Storage Circuit
T-MC	Overtime contact of Mixing Circuit
T-PC	Overtime contact of Pump Circuit
T-SC	Overtime contact of Sequence Control
T-SC-HWS	Overtime contact of both Sequence Control and Hot Water Storage Circuit
V-MC	3-Way valve of Mixing Circuit



WEEE DIRECTIVE 2012/19/EU
Waste Electrical and Electronic Equipment Directive

- At the end of the product life, dispose of the packaging and product in a corresponding recycle centre.
- Do not dispose of the unit with the usual domestic refuse.
- Do not burn the product.
- Remove the batteries.
- Dispose of the batteries according to the local statutory requirements and not with the usual domestic refuse.



At Ideal Heating we take our environmental impact seriously, therefore when installing any Ideal Heating product please make sure to dispose of any previous appliance in an environmentally conscious manner. Households can contact their local authority to find out how. See <https://www.gov.uk/managing-your-waste-an-overview> for guidance on how to efficiently recycle your business waste.

Technical Training

Our Expert Academy offer a range of training options designed and delivered by our experts in heating. For details please contact: expert-academy.co.uk

Ideal Boilers Ltd., pursues a policy of continuing improvement in the design and performance of its products. The right is therefore reserved to vary specification without notice.

Ideal is a trademark of Ideal Boilers.

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